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GAMMON
Builders to the Nation

GAMMON BULLETIN

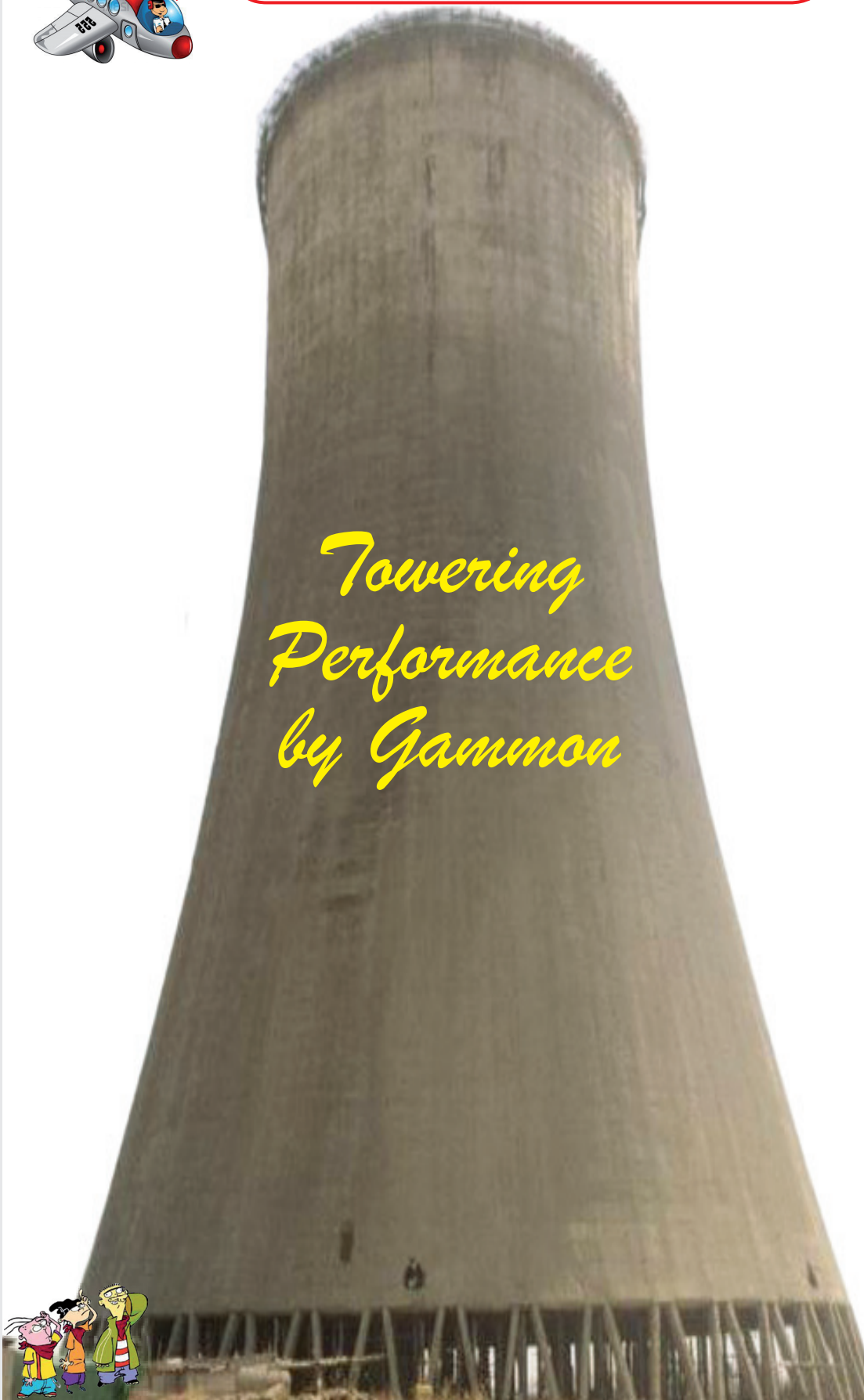
Volume : 9201

April - June 2013

GAMMON

"Hello, Control room? Permit me to fly at higher altitude! Gammon's Cooling Tower is getting Taller and Taller."

Towering Performance by Gammon



IMS POLICY

Editorial

We are pleased to publish April-June 2013 issue of Gammon Bulletin.

We take pleasure in presenting some of our recent significant achievements, successes, learning and events from across the country to our Gammon family, our esteemed customers and other beloved stake holders.

Gammon have pioneered the introduction of RCC Hyperbolic Natural Draft Cooling Towers in 1930s in Asia and maintained 100 % market share for as long as five decades till 1980s. The first such tower to be built in India by Gammon was way back in 1934 for Ahmedabad Electricity Co. Ltd for their 30 MW Thermal Power Station. The height of this tower was approx. 60 m above grade.

Almost eight decades after this, on 27th April 2013, when the concreting of the last lift of Natural Draft Cooling Tower shell was completed by Gammon, a history was created – the tallest Cooling Tower changing the skyline of Nigrie in Madhya Pradesh came in to existence. This over 190 m tall mammoth tower, built in a record time, is equivalent to a sixty storied building in terms of its height and its area of 15,500 sqm is equivalent to four football grounds. This incredible achievement by Gammon adds yet another feather in its cap.

Sheet piling is not new to Gammon but each Project involving sheet piling poses unique challenges. Gammon has just completed deep sheet piling for Wagon Tippler at Rosa for Rosa Power Supply Company Limited to facilitate excavation up to EL -21 m.

On philosophy front, presented is a thought-provoking Chapter from the best seller book titled 'The Power of Positive Thinking' by Dr. Norman Vincent Peale - one of the greatest positive thinker of the century. This Chapter illustrates, with bonafide examples of human experience, as to how positive frame of mind can favourably turn around even the most difficult situations. We thought this inspiring Chapter is most appropriate in today's tough times, not only in personal lives but even in professional lives and also applicable for organisations.

Gammon continues to be bestowed with the Safety Awards one after the other – latest being prestigious Godrej Award secured by Godrej Platinum High Rise Building Project at Bangalore validating Gammon's robust HSE practices of international standard.

In our quest to continue to improve the Bulletin, we will be glad to receive feedback and suggestions from our valued readers to make Gammon Bulletin more and more interesting and informative for the readers.

Your feedback and suggestions may please be sent to bulletin@gammonindia.com

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Construction of Tallest Natural Draft Cooling Tower at Nigri

Dhirendra N Singh
Project In-charge

On 27th April 2013, when the concreting of the last lift of Natural Draft Cooling Tower shell was completed by Gammon, a history was created – the tallest Cooling Tower was built changing the skyline of Nigri in Madhya Pradesh. This 190.5 m tall tower is equivalent to a sixty storied building in terms of its height and its area of 15,500 sqm is equivalent to four football grounds.

Gammon have pioneered the introduction of RCC Hyperbolic Natural Draft Cooling Towers in 1930s in Asia and maintained 100 % market share for as long as five decades till 1980s. The first such tower to be built in India by Gammon was in 1934 for Ahmedabad Electricity Co. Ltd for their 30 MW Thermal Power Station. The height of this tower was approx. 60 m above Grade. Since then there has been continuous increase in capacity of Power Plants in India. In eighties and nineties Mega Power Plants of 210 MW were popular. Current trend is that of Ultra-Mega Power Projects having capacities of 330 to 660 MW per Unit. With increase in capacities of Power Plant, not only heights and diameters of NDCTs have correspondingly increased but even complexities have also increased substantially. Gammon kept pace with these developments in the industry.Its investment in contemporary techniques and technologies, has ensured an optimum and quick response to the above challenging requirements of Cooling Towers in terms of design and construction. Almost eight decades after the construction of its first NDCT, Gammon has registered the above incredible achievement by successfully completing the shell of the NDCT for 660 MW Unit-I at Nigrie (MP) for Jaiprakash Power Ventures Ltd.

The Cooling Tower at Nigrie is designed to cool 85180 cum/hr of Hot Water from 42.5 deg.C to 33 deg.C. The founding level of the tower is at (-) 13 m below Grade.

Gammon's Team both at Corporate and Project Site, backed by a wealth of experience spread over eight decades, achieved the above commendable feat with contribution from approx. 400 workers (skilled & semi-skilled) with zero Lost Time Accident (LTA).

The challenges in this Project were many, few of which are listed below:

1) Very Weak Soil with low bearing capacity
2) Extremely low lying area (all water from plant used to accumulate at NDCT area)
3) Deep foundations involving 13 m depth
4) Unprecedented height (190.5 m) and diameter (140.3 m at base) of tower
5) Arranging Tower Crane of 200 m height with boom length of 72 m
6) Remote Area (Nearest Market facility 45 Km away)

It is always the endeavour of Gammon's Team to meet all the challenges, however tough these may be and deliver high quality and cost competitive value to our esteemed customers.

Gammon's Team take pride in stating that we were able to overcome all the above challenges sucessfully due to timely guidance and support of our client JPVL and Gammon's Regional and HO staffs. The shell profile had zero error and wastage of concrete was restricted to less than one percent. The Table below highlights the volume of work and important milestone dates.

Milestone	Quantity/ Tower	Date of completion
Bhoomi Pooja	--	15/12/2010
Excavation	21000 Cum	10/03/2011
Back fill	86417 Cum	20/10/2011
Ring Raft & Pedestal	5190 Cum	25/09/2011
Raker Column & Ring Beam	3275 Cum	20/04/2012
Shell Up to 60 M	17921 Cum	30/11/2012
Shell Up to 120 M		05/02/2013
Shell Completion		27/04/2013

This is not the end of the story for Gammon. As a repeat telecast, immediately on completion of shell of NDCT-1, we have started the shell for NDCT-2 and other balance internal and mechanical works.

We take this opportunity to thank our young and energetic team at Site without whose dedicated support it would not have been possible to sucessfully achieve this incredible milestone safely. We also thank Mr. Sunny Gaur, MD-JPVL, Mr. Amit Goel, VP-Civil, JVPL and all other officials of JPVL and our CMS (Mr. R.B. Sainani & Mr. D.K. Singh) and other officials of Gammon at HO for their continous motivation and moreover for giving us the opportunity to be a part of this unique achievement in Gammon's Cooling Tower History.

FROM BARREN LAND TO TALLEST COOLING TOWER.....

Open Land Handed Over for Construction of Two NDCTs

Bhoomi Puja performed on 15.12.2010

Main Excavation Work from 03.01.2011 to 10.03.11

Ring Raft & Pedestals from 15.01.2011 to 25.09.2011

Ring Beam from 15.06.11 to 25.05.12

Shell up to 60 m Height from 20.06.12 to 30.11.12

Shell up to 120 m Height from 01.12.12 to 05.02.13

Shell Completed from 20.06.12 to 27.04.13 (10 Months)

A Marvel in the Making: Bogibeel Bridge in Assam

Human beings came into existence about 160,000 years ago and the modern men nearly 50,000 years ago. Since then, very little has changed in their physical outlook, as all the efforts of evolution were vested in the brain – the most complex machine on earth. During his evolution, men have created quite a lot of machines from proton reactors to spaceships, which were all amazing amours in the repository of human beings. These innovations came into being because of their necessity, as we aptly phrase"necessity is the mother of invention". This necessity actually played a vital role in the development of human civilization, and some of them can be attributed to the urge to continuously challenge his own ability. Most of the global mega structures became possible for two reasons, the need and the innovations of human mind – ranging from Eiffel Tower in Paris to Taj Mahal in India.

Now, here in Assam, we have an opportunity to feel happy and proud owing to the upcoming mega structure – the Bogibeel Bridge.

The Bogibeel Bridge, a much talked about phenomenon in our media made me curious to make a visit to the site. In my mind, I envisaged the field to be with lots of howling, with lots and lots of welding done, lots of people in uniform with yellow helmets, all hovering around the mega bridge. Thus, when I reached the site, the first thing that I was expecting to see was the bridge, or for that matter a part of it. But, the bridge was nowhere to be seen; rather I could only see a self-sustained town. I wondered, where this town suddenly crop up from. Even maps do not have any information about it!

Have I found a lost city? Or is it a magic? Guess, it's a magic realized due to human power and need. Here, I could see a whole township being developed. It's hard to believe that a whole town is being established with entire facility including wireless connectivity, to support the construction of the mega structure the Bogibeel Bridge.

The Bogibeel Rail-cum-Road Bridge on the river Brahmaputra is situated about 17 km downstream of Dibrugarh city in Assam. The bridge is designed to host a double lined broad gauge track and three-lane road. Once completed, the bridge will become the lifeline of the northeastern part of our country. It will facilitate connectivity between the north and south banks of river Brahmaputra, in the eastern region of Assam and Arunachal Pradesh, as it will be the only other bridge over the river to cross over after the Kaliabhomora Bridge at Tezpur. Moreover, security of the eastern region of India will get further strengthened following the commissioning of this bridge. Thus, the Government of India has given utmost importance to the project by declaring it as a National Project in the year 2007. Upon completion, this Bridge, which is a part of Assam Accor 1985, will be the longest rail-cum-road bridge in India with a total length of 4.94 km.

Being sanctioned in 1997-98, with an estimated cost of Rs.3,230 crore the foundation stone of the project was laid by the then Prime Minister Atal Bihari Vajpayee on April 22, 2002. On April 4, 2008, Gammon India Limited was awarded the project for constructing the well foundation and substructure of the Bogibeel road-cum-rail bridge.

Once completed, we the people of Assam will have another feather onour cap and can proudly say that we hail from a state where nature and technology meets.

The Regional Head of Gammon India Limited, Mr. Anupam Das was courteous enough to share some of interesting facts and challenges faced by them in the bridge construction. Below are the abstracts from his interview,

"The fact is, when we are working on a river we cannot follow a strict methodology. The river takes a new form every year – the depth, bed level, siltation, etc., may change leading to forced change in the planned methodology. In totality, there will be 42 well foundations with 84 piers in all to hold the mega structure. Work on eleven well foundations has already been completed, with work going on in other 32 foundations. In our facility, quality control is ensured by state-of-art automatic batching plant where an automated system checks the quality of the concrete used.

At any single point in time, the bridge is expected to carry a load of about 30,000 t. Since the bridge is made in a seismically active zone, special care has been taken in the design of the bridge to mitigate any future risks. For this, the depth of the well foundation has been increased by 25% and the thickness of the steining of wells has been increased to 3 m while in general it is confined to 1.5 to 2 m".

Reproduced from "The Assam Tribune", Dibrugarh - authored by Jayaditya Purkayastha

TECHNICAL FEATURES

Length of Bridge: 4.940 km

Span arrangement: 2 x 32.75 m + 39 x 125 m

Substructure: Double D well foundation of size and twincircular hollow piers of 5.5m (OD) x 3.5 m (ID)

Superstructure: Composite welded steel truss with oncretedeck carrying road on upper deck and rail on lower deck.

Configuration: 2 BG tracks and 3-lane road

Navigation clearance

1. Horizontal: 100 m
2. Vertical: 10 m

Length of guide bunds

1. North Bank: 2,792 m
2. South Bank: 2,043 m

Flood dyke & strengthening North Bank: 9 km upstream to 7 km downstream

South Bank: 9 km upstream to 7 km downstream

Rail links Chalkhowa to Moranhat at South Bank: 44 km

Dhamalgaon to New Sisiborgaon: 32 km

New stations on South Bank: Dibrugarh, Dhamalgaon and Khowang

New stations on North Bank: Tanagni and New Sisiborgaon

Shri. S. K. Vij, Member Engineering, Railway Board Visited at Bogibeel Bridge Site on 24.02.2009

Visit of Hon'ble Union Minister of State for DoNER Shri Paban Singh Ghatowar at Bogibeel Site on 12.09.2011

Visit of Hon'ble Shri B. K. Handique, DoNER Minister at Bogibeel Site on 19.01.2010

Site Visit of Lt. Gen J S Bajwa Chief of Staff, Headquarters Eastern Command, Kolkata on 02.12.2011

"Souvenir" Presented by H. E. Gen J. J. Singh, PVSM, AVSM, VSM, Governor, Arunachal Pradesh as a token of apperciation to "GAMMON" during his site visit on 07.08.2010

TO WHOMSOEVER IT MAY CONCERN !!!

- M U Shah

One elderly Civil Engineer working in Marketing consulted one specialist Doctor for a checkup.

The Doctor thoroughly examined him and stated that he is absolutely fit for married life.

Delighted, the Engineer requested for a Certificate which Doctor agreed to fax the next day as typist was unavailable.

When Engineer received the Certificate, he phoned the Doctor; "Doc, the Certificate needs to be corrected. Instead of addressing it to my wife, can you just say : ***' TO WHOMSOEVER IT MAY CONCERN ' !!! "***

Deep Sheet Piling for Wagon Tippler at ROSA

Sanjay Kumar
Project In-charge

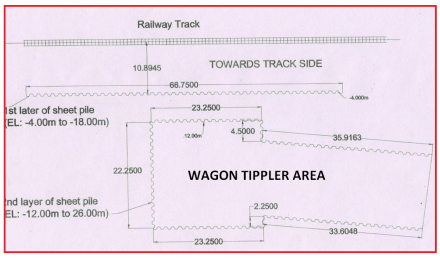
Introduction:

Sheet piling is a form of driven piling using thin interlocking sheets of steel to obtain a continuous barrier in the ground. The main application of sheet piles is in retaining walls and coffer dams erected to enable permanent works to proceed. Normally, vibrating hammer, crawler crane with power pack etc. are used to drive sheet piles.

Site Conditions:

Gammon was awarded the work of construction of Yard Conveyor and Wagon Tippler (CHP Augmentation Work) at Rosa by Rosa Power Supply Company Limited. To execute yard conveyor work, sheet piling was not required as enough surrounding space was available and accordingly we made excavation in steps up to required depth i.e. EL (-14.5 m). However in Wagon Tippler work site, which involved deep excavation up to depth of EL (-21 m), working space was not available. The Wagon Tippler work also contains the possibility of collapsing the nearby railway track, which is just 11 m away from deep excavation work, because of sandy soil strata.

To resolve all these issues, the technology of sheet piling became the ultimate solution as suggested by designers.



Layout of Sheet pile

Sheet Piling Methodology:

The installation and retrieving of Sheet piling can be executed in the following two ways depending upon choice of equipment:

1. Excavator Driven (Mainly useful in small piling length <= 8 m depending on soil strata)
2. Crane Driven (For long piling length)

Equipment Required:

1. Excavator driven method

a) Excavator with extended (long Jib) boom length
b) Vibro Hammer (Excavator mounted)

Vibro Hammer

2. Crane Driven method

a) Crawler Crane of 50 to 75 t capacity
b) Vibro Hammer
c) Power pack with accessories

Crawler Crane with Vibro Hammer

Technical Data-

As per approved design, we have to install "AZ" type sheet piles at site. The section was in two shapes AZ 25 & AZ 28. The AZ type section was not readily available in market and would have to be imported. All

Power Pack

these logistic issues forced us to look for alternate section and finally the AZ section was replaced with "AU" type which is easily available section. The Section used is in two shapes AU 25 & AU 20 which differ only in thickness. The dimensions of AU 25 are 14800 x 750 x 14 mm while that of AU 20 are14800 x 750 x12 mm.

As per approved design GIL has to execute sheet piling in two layers as follows:

1. First layer- For the protection of nearby railway track comprising of 89 no. Piles without engaging any area i.e. only spread along the parallel length of 66.4 m. Elevation of first layer starts from EL (-4 m) to EL (-18 m) - Main purpose of first layer is to protect the nearby railway track from collapsing, by binding and structuring the soil. The length of sheet piles is 14 m.

2. Second Layer- from EL (-12 m) to EL (-26 m) - This layer is distributed over an area and bounds the soil to support civil structure over it. Its span is 23 m in length and 20.5 m in width.

As the PCC level of raft is at EL(-20.76 m), to perform excavation up to that depth it is required to put a supporting arrangement to respective layer of sheet pile. Here as per design strutting of sheet piles by the support of waler (beam inbuilt with brackets) is to be done to overcome the buckling tendency of piles. The strutting will have to be done at two elevations viz. at EL -14 m and -17.5 m.

Sheet Piling Work at Rosa CHP Site:

1. Application of Excavator Driven Method

The Installation and retrieving work of sheet piles was firstly attempted with excavator driving assembly in which Vibro Hammer

of capacity 2.5 t was mounted with boom of excavator. The installation of piles up to depth 6 to 7 m was possible without any appreciable earth resistance. However, the designed length of sheet piles was 14 m from EL (-4 m to -18 m) and further driving work was not successful due to various reasons mentioned below:

1. Under capacity of Vibro Hammer- As soil "N" value was as high as 30, the required capacity of Vibro Hammer was 4 t but capacity of Vibro Hammer unit available was only 2.5 t.

2. Short Boom Length of Excavator- As the size of sheet pile is 14 m; it needs extended boom length for driving. But initially excavator with basic boom length i.e. 5 m was deployed. Due to small boom length the excavator was unable to hold the pile from top of it. The holding point of Vibro hammer was flange of sheet pile which caused eccentric loading during driving. Due to eccentric load application the driving of sheet pile became difficult during interlocking of one pile to other.

Eventually, GIL decided to adopt different methodology.

2. Application of Crane Driven Method

At this time we arranged Vibro Hammer of capacity 4 t ICE 416 L with Power Pack ICE 335 and mobilised GIL owned Crawler Crane of 75 t capacity. The above methodology was quite successful and we are easily driving sheet pile of length 14 m in just six minutes. The crane driven method comprises of following steps:

1. There are two types of pulleys fitted in the boom of crane. First one from which two ropes passes and from second one only single rope passes. Single rope pulley is just fitted in between the double rope pulley.

2. Firstly the Vibro hammer is lifted by crane with the help of two rope pulley.

3. Secondly laid sheet pile is lifted with the help of single rope pulley.

4. After lifting the pile, as the rope of single rope pulley is just in the centre of double rope pulley, the lifted pile automatically comes in the centre of already lifted Vibro Hammer. Finally the Vibro hammer grips the pile with the help of hydraulic pressure supplied by power pack.

5. After completing the above procedure, the power pack which is connected with Vibro hammer starts driving the pile. Required pressure to drive piles is 240 bar which is obtained at 2100 to 2200 rpm of engine speed.

Difficulties encountered and Solutions:

During this process we faced following difficulties:

1. During interlocking of piles, the first pile is also being driven with second one as the nature of soil is sandy. This results

in an unevenness in top level of piles.This was resolved by just retrieving the first pile after driving the desired one and maintain the level.

2. It is found that if first pile of row gets little bit tilted with the vertical even by less than 2 to 3 degree angle, the piling process may have to be stopped after driving 15 to 16 continuous interlocking piles as deviation from vertical increases at rapid rate with increase of row length. To avoid such a situation it is highly important to take care of accuracy in the alignment of first pile of the row.

How to choose the best formwork system?

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Deputy Manager
-Engineering,
Construction Planning
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ABSTRACT

Appropriate selection of a formwork system is a crucial factor in successfully completing most building projects. However, in practice, selection of an appropriate formwork system has traditionally depended mainly on the intuitive and subjective opinion of practitioners based on their own limited exposure at personal level. Aimed to assist Engineers to determine the appropriate formwork system at the inception stage of future projects this article, discusses the guidelines on how to scientifically choose formwork, factors affecting its selection, economics involved in formwork and the present scenario of formwork in India.

A) INTRODUCTION

Formwork is a die or a mould, including all supporting structures, used to shape and support fresh concrete until it attains sufficient strength to carry its own weight. It should be capable of carrying all imposed dead and live loads apart from its own weight.

A formwork system is defined as "the total system of support for freshly placed concrete including the mould or sheathing which contacts the concrete as well as supporting members, hardware and necessary bracing". However, "System" implies a fully compatible arrangement of formwork with a minimum of individual components with re-usable elements intended to solve each forming task thereby rationalizing the forming work.

Formwork system is among the key factors determining the success of a construction project in terms of speed, quality, cost and safety of works. Nowadays, most projects are required to be completed in the shortest time possible as a means to minimise costs.

For high-rise buildings, the most effective way to speed up works is to achieve a very short floor cycle i.e. to have the structure of a typical floor completed in the shortest time. On the other hand, aiming purely at speed often conflicts the achievement of other quality standards. Problems such as misalignment, misplacement, defective concrete may result in holding up other works causing serious interruption.

The basic parameters of formwork are:

- **Quality:** in terms of strength, rigidity, position, and dimensions of the forms
- **Safety:** of both workers and the concrete structure
- **Efficiency:** in operation, the ease of handling, erection and dismantling, number of repetitions within the optimal limits
- **Economy:** the least cost, consistent with quality and safety

B) SHARE OF FORMWORK COST

In a typical multi-storey reinforced concrete building, formwork cost is one of the largest cost components, accounting nearly 20-40 % of cost of concrete and involves more than 60% cost of time. Overall formwork related cost have significant share i.e. 10% in the total construction cost.

A large proportion of the cost of formwork is related to formwork labour cost. Significant cost savings could be achieved by reducing labour cost. A quick comparison reveals that the additional concrete use of up to 15% is economical than the handling of angular forming areas, since their assembly is rather time-consuming and the cost per square meter is higher than that for a straight surface.

C) AN INTEGRATED FORMWORK / CONCRETE LIFE CYCLE

The process of providing formwork and concrete is highly integrated.

In the figure 1, the left circle represents the formwork life cycle, while the right circle

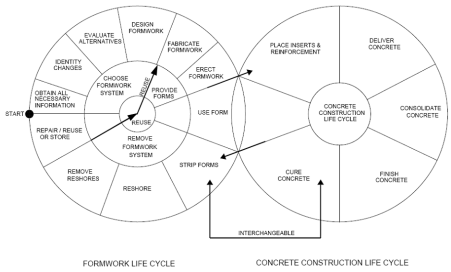


Figure 1 - Integrated formwork/concrete lifecycle

represents the concrete construction life cycle. The two intersection points represent the end of formwork life cycle and beginning of concrete construction life cycle. It should be noted that the phases 'cure concrete' and 'stripping of formwork' are interchangeable depending on the type of structural element. For example, columns and walls are cured after stripping the forms while slabs and beams are cured before and then stripped.

D) VARIOUS FORMWORK SYSTEMS

Formwork can be classified according to a variety of categories as follows:

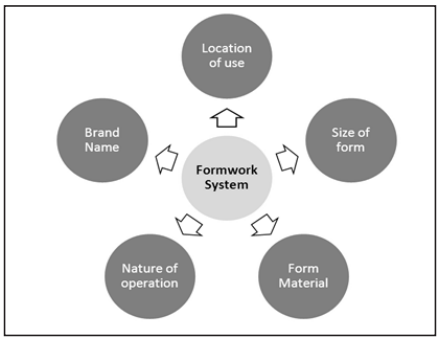


Figure 2 - Categories of formwork classification

Classification according to sizes

- Small-sized formwork
- Operation by workers manually
- Wooden and aluminium formwork
- Large-sized formwork
- Crane facilities are required in the operation
- Reduce the number of joints and to minimize the number of lift
- Stiffening components -studs and soldier

Classification according to location of use

Various elements in the structure have specific design and performance requirements in the use of formwork. Some systems are more adaptive for specific location of use, such as

- Irregular frame structure – Conventional traditional timber form
- Wall, Column – Girder form, Frame panel form, Climb form or Jump form
- Slab – Conventional Timber form, Modular Slab formwork, Primary-and-Secondary-beam method, Panel form, Drop head-beam- panel system, Table form
- Repeated regular section – Tunnel form, Modular Aluminium form
- Core walls, shells- Climbing formwork, Jump form and slip-form
- Precast structure- Steel /Aluminium Mould forms

Classification according to materials of construction

- **Timber :** Most popular formwork material characterised by low initial cost, high adaptability to complicated shape and labour intensive but environmentaly unfriendly
- **Steel :** Hot-rolled or cold-formed sections characterised by heavy weight and suitable for large-sized panels
- **Aluminium :** Stiff and light weight, higher material and labour cost, excellent finish
- **Plastic :** Recyclable, tough, lighter weight
- **Sacrificial concrete panels** - Left in place formwork

Classification according to nature of operation

- Crane independent-
  - Manually handled formwork
  - Self-climbing formwork
- Crane-dependent formwork
  - Gantry, traveling and tunnel type formwork system

Classification according to brand name of the product

Some companies in the market that are specialised in formwork manufacturing are DOKA, PERI, MEVA RMD, ULMA, TABLA, TITAN, MIVAN, HARSCO etc. Each of the above brands has a different system for various structures.

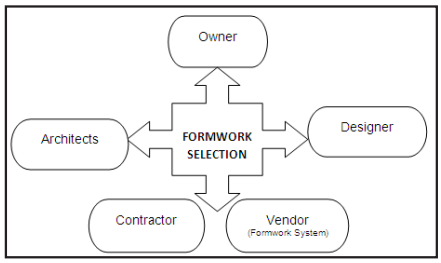


Figure 3 - Parties involved in formwork selection process

Earlier formwork was once built in-place, used once, and subsequently wrecked. The trend today, however, is towards increasing prefabrication, assembly in large units, erection by mechanical means, and repetitive use of forms. These developments are in tune with the increasing mechanisation of production in construction sites and other fields.

E) SELECTION CRITERIA FOR FORMWORK

Formwork planning includes detailed layouts, cycle plans, calculation of optimum amount of material for the site, observance of fixed schedules and selection of the most appropriate and the most economic formwork system duly considering the following selection criteria:

1.Geometry of building / structure

• Internal layout

Some buildings may have very simple layouts with few in-situ walls and floor plates framed with regularly spaced columns, as seen in many commercial and office buildings. However, some developments feature very complicated load-bearing internal walls that can make the casting process difficult.

• Structural forms

Like internal layout, the structural form of buildings also affects the formwork options. For example, buildings with a structural core in the form of a vertical shaft limit the use of other formwork systems other than those of a self-climbing nature. Buildings in flat slab design make table forms or flying forms the most obvious choice. For buildings with regularly arranged shear wall designs, the best selection is large-panel type steel forms or other types of gang forms.

• Consistency in building dimensions

Some buildings may have non-standardised dimensions due to the architectural design and layout or to fulfill other structural requirements. These include the reduction of sizes for beams, columns and walls in high-rise buildings as the structure ascends. Formwork systems like the climb-form or steel form, may be quite difficult to use in such situations, due to the frequent adjustments of the form to meet the changes in dimensions may eventually result in extra cost and time.

• Headroom

Higher headroom increases the amount (height) of staging required and can also create accessibility and safety problems. It can also make the erection of formwork, ensuring formwork stability and the placing of concrete more difficult.

• Building span

Large building spans also create problems similar to those with high headroom situations. In addition, long-span structures generally have larger beam sections, heavier reinforcement provisions, or accompany post-tension works. This will further complicate the formwork's design and erection process.

• Repetitive nature

High-rise block-shaped structures usually require highly repetitive cycles and this is favourable to the use of formwork. However, the degree of repetition in building with very large construction area like a podium or underground structures such as basements is limited and the use of formwork, as an expensive resource, becomes very critical.

2. Project Planning/speed of work

The over-all construction sequence must be planned to use formwork in efficient manner and to permit the optimum investment in formwork to meet schedule requirements. Contractor should plan formwork and job sequence at the time of making a bid. Project planning such as the phasing or sectioning arrangement, integration of the structure, site layout and set-up arrangements or hoisting provisions and concrete placing facilities are influencing factors when considering formwork selection and application.

When working with buildings with large construction areas and horizontal spread, projects can be expedited by the introduction of additional sets of formwork, to create more independent work fronts. This will, of course, increase the cost of construction. For high-rise buildings, increasing the number of formwork used cannot always expedite the project, for the critical path still depends on the floor cycle. However, a properly selected, designed and arranged formwork system will increase work efficacy for each typical cycle. In some cases, adding a full set or even a half set of formwork, especially for the floor forms, may help to speed up the cycle as the additional set can provide more flexibility when the form is struck at an earlier time.

3. Construction process, methods

For selecting formwork one must know the sequence of construction activities and methods to be followed. Construction method will always give idea about inter dependency of the activities, specifications and additional requirements in pour. This will enable us to workout appropriate system which fullfils the construction needs.

4. Site logistics

Exceptionally small or very large sites sloped or very crowded sites, proximity to sensitive structures, sites where other major activities are underway, or sites with many physical or contractual restrictions will increase the difficulty of working with formwork. There is no specific solution to improve the situation in general and problems are tackled according to site specific circumstances.

Proper access to all components should be considered while planning a site layout. Accessibility problems may arise due to segregation, temporary discontinuation, or blocking of the layout by the partially completed building or, in cases constructing a shaft-type core wall is constructed in an advanced phase, the shaft may stand independently for a long period of time before it is connected to the horizontal elements.

5. Climate condition

Formwork systems are sensitive to weather conditions. Typically, in vertical forming systems, the newly placed concrete is supported by the wall already cast below it. The lower wall section must get the sufficient strength to support the fresh concrete above. The rate of strength gain of lower wall is influenced by the ambient temperature, moisture content, and the freezing and thawing cycles.

Another factor that affects the economy of the selected system is the effect of stopping formwork activity and concreting because of extreme weather conditions. In the case of a slip-form, the work is usually continuous, 24 hrs around the clock. If the slip-form stops because of weather conditions, it may impact structure as well as cost.

6.Labour efficiency

Considering the availability and qualification of the work force, improving labour cost efficiency is a major factor, especially in markets experiencing a building boom. Here, the qualification of workers tends to be low in relation to ever higher demands posed by construction methods.

7. Cost of formwork system

This is a vital factor for deciding formwork system as one must know the capital provision for formwork in the project. It is always beneficial to work out these details at the time of bid. Cost is influenced by three components;

• Initial cost or make-up cost, Includes cost of transportation, materials, assembly and erection

• Reuse cost of formwork system

The formwork system cost goes on reducing as we increase reuse of same. A careful balance between cost, speed, performance and the quality of output should be properly considered when making the selection.

• Maintenance & storage cost

It includes cost of stripping, repair, storage, etc. Formwork materials are a valuable asset of company. If proper care is taken during handling and storage, much return is obtained on the investment. Formwork needs to be handled correctly, maintained, repaired if necessary and finally, cleaned regularly. Avoiding damage reduces costs incurred. Proper storage of formwork materials gives easy reconciliation, faster retrieval of material, better space management and avoids unnecessary expenditures, improve safety at work place.

8. Availability of lifting devices (Crane time)

These include considerations of whether there will be lifting appliances provided for the erection of formwork; whether these appliances will be able to access the work spot to assist in the operation as the structural works proceed; whether any special equipment will be required for striking the forms; and how the removed formwork panels can be transported to other spot to continue work.

Characteristic to high rise building sites is the confined and congested space availability for working. Crane time and space is regularly limited. In general, reinforcing (rebar) activities are most critical, since lifting the reinforcement to building level is the most crane- time consuming job of all. Thus, the capability of formwork to rely less on or be used independently of crane time is critical in high rise construction.

9. Simple logic of the system

Formwork system ought to be self-explanatory to use, this automatically eases the usage for the engineers/supervisor and also the labour who are end users of the system.

10. Working safety

Formwork should be self-securing with safe access and working platforms. Thus, it is not left to the end user whether they

takes safety measures or not. Creating a safe work environment for the entire work force involved in the construction process, has become the pivotal issue in emerging construction markets.

11. Special requirements on Concrete surface/finish

Fair-faced concrete demands very high quality formwork in terms of surface treatment of the panels, tightness of the formwork joints and in dimensional accuracy. Requirements are slightly relaxed where the concrete surface is to be finished at a later stage.

12. Area or volume of cast per pour

The optimum volume of cast per pour depends on the types of formwork used, the particular elements of structure to be placed, the actual scale of work, and different levels of provisions of plant facilities.

13. Involvement of other construction techniques

Tensioning and prefabrication activities are often involved in construction. This may create certain impacts on the use of formwork, especially where precast elements are to be incorporated during the casting process. Provision should be made for temporary supports or slot spaces and box out positions in the formwork for the precast elements, or extra working space for placing stressing tendons and onward jacking.

14. Provision of construction joints in structures

Many a times a large number of construction joints are inevitable in a large structure because of the subdivision of works into effectively workable sizes. The provision of construction joints can challenge the output and affect the quality of the concrete. Careful selection should be made to ensure a particular formwork system can satisfactorily allow such arrangements.

15. Inventory- The fewer, the better

The most frequent time and cost consuming activity of formwork assembly is the loose and small components/accessories. The lesser inventories will help to reduce risk of losing parts and provide ease in construction.

F) THE CURRENT SCENARIO IN INDIA

In the past, India had been lagging behind over the other advanced countries in applying advanced and safe concepts for formwork in reinforced concrete construction resulting in a poor surface quality, wastage and low productivity of the manpower involved in concrete construction. This unfortunate situation continued for a long time because of availability and use of very cheap unskilled labour and very few skilled personnel who have had professional training for formwork jobs.

With increasing demand and competition and reducing project completion times, there have been significant developments in the construction industry in terms of experience and mastering of the required managerial, construction or engineering skills for handling very large and complex projects. At the same time, the motivating factors highlighted above have created an eagerness and readiness within the industry to advance. From the building construction point of view, the use of better formwork systems is no doubt a very direct way for introducing innovative methods in the construction of buildings.

- Formwork labour cost is so immense that any innovative system resulting in a labour cost reduction is highly lucrative.
- Fulfilment of fast track construction schedule provides fewer choices, one of which is to adopt more innovative formwork systems.
- Traditional systems can hardly satisfy the tight quality standard that is required nowadays nor it can satisfy current safety and environmental standards.
- The accumulation of experienced crews makes the application of more sophisticated formwork systems more reliable and economical.
- Many developers view the application of innovative technology in the construction process as a positive image-building factor.

G) MAJOR SYSTEMS DOMINATE TODAY'S STATE OF ART FORMWORK APPROACH IN HIGH RISE CONSTRUCTION

- Slab edge protection by screens, providing a safe working environment on the construction levels
- Modular slab formwork, operated independently of the crane time, adapted flexibly to different building geometries and floor layouts
- Undisturbed shoring for slab with drop beam systems
- Frame formwork for columns and walls
- Crane dependent climbing formwork for shear walls/mega columns
- Crane independent climbing formwork for core

H) CONCLUSIONS

1. Selection of formwork system, is highly dependent on individual site/ project environment
2. Economy of formwork can be achieved with seamless collaboration between owner, architect, designer, formwork system vendor and contractor
3. The structural form of the building is one of the critical factors to determine the choice of formwork
4. System products can contribute much in the success of formwork application

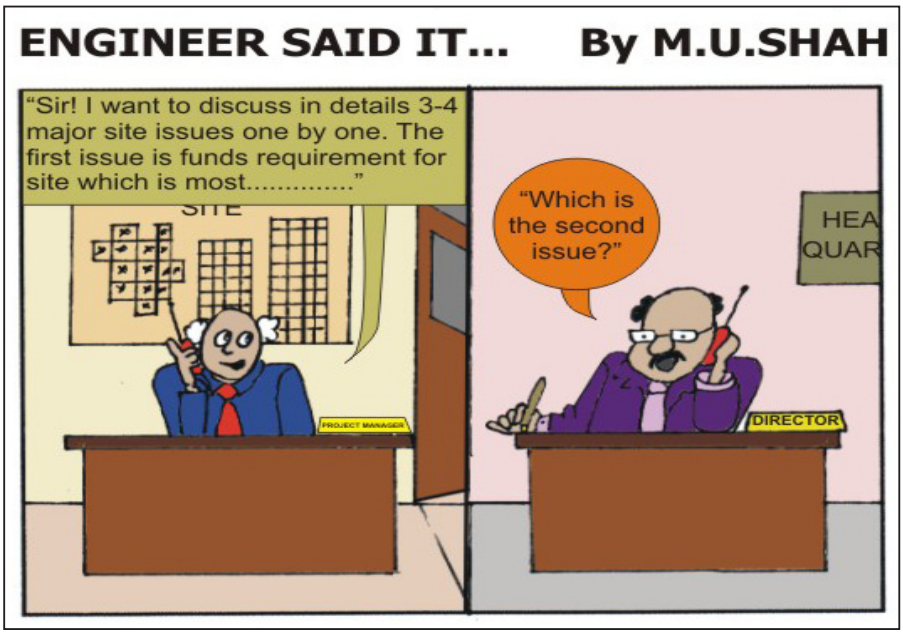
REFERENCES

1. ACI 347_04, "Guide to formwork for concrete", American concrete institute, 2005

2. Hanna A. S. & Sanvido V.E. , " An interactive knowledge based on formwork selection system for building", Computer integrated construction, 1989

3. Hurd M. K. , "Formwork for concrete", American concrete institute, 1915, 6th edition

4. Raymond W. W. M. , "Application of formwork for high rise and complex building structures- Hongkong cases", Division of building science & technology, city university of Hongkong



The Power of Positive Thinking

One of the most important and powerful facts about you is expressed in the following statement by William James, who was one of the wisest men America has produced. He said, "The greatest discovery of my generation is that human beings can alter their lives by altering their attitudes of mind." As you think, so shall you be. So flush out all old, tired, worn-out thoughts. Fill your mind with fresh, new creative thoughts of faith, love, and goodness. By this process you can actually remake your life. And where do you find such personality remaking thoughts?

I know a business executive, a modest man, but the type of individual who is never defeated. No problem, no setback, no opposition ever gets him down. He simply attacks each difficulty with an optimistic attitude and a sure confidence that it will work out right, and, in some strange way, it always does for him. He seems to have a magic touch on life—a touch that never fails.

Because of that impressive characteristic this man always interested me. I knew there was a definite explanation of his being this way and of course wanted to hear his story, but in view of his modesty and reticence it was not easy to persuade him to talk about himself.

One day when he was in the mood he told me his secret, an amazingly simple but effective secret. I was visiting his plant, a modern, up-to-date structure, much of it air- conditioned. Latest-type machinery and methods of production make it a factory of outstanding efficiency. Labor-management relations seem as nearly perfect as is possible among imperfect human beings. A spirit of good will pervades the entire organization.

His office is ultra-modernistically decorated and furnished with handsome desks, rugs, and paneled with exotic woods. The decorating scheme is five startling colors blended together pleasantly. All in all it is the last word, and then some.

Imagine, then, my surprise to see on his highly polished white mahogany desk an old battered copy of the Bible. It was the only old object in those ultra-modern rooms. I commented upon this seemingly strange inconsistency.

"That book," he replied, pointing to the Bible, "is the most up- to-date thing in this plant. Equipment wears out and furnishing styles change, but that book is so far ahead of us that it never gets out of date.

"When I went to college, my good Christian mother gave methat Bible with the suggestion that if I would read and practice its teachings, I would learn how to get through life successfully. But I thought she was just a nice old lady"—hechuckled—"at my age she seemed old—she wasn't really, and to humor her, I took the Bible, but for years practically never looked at it. I thought I didn't need it. Well," hecontinued slangily, "I was a dope. I was stupid. And I got mylife in a terrible mess.

"Everything went wrong primarily because I was wrong. I was thinking wrong, acting wrong, doing wrong. I succeededat nothing, failed at everything. Now I realize that my principal trouble was wrong thinking. I was negative, resentful, cocky, opinionated. Nobody could tell me anything. I thought I knew everything. I was filled with gripes at everybody. Little wonder nobody liked me. I certainly was a 'washout.'

"So ran his dismal story." One night in going through somepapers," he continued, "I cameacross the long-forgotten Bible. It brought up old memories and I started aimlessly to read it. Do you know it is strange how things happen; how in just a flashing moment of time everything becomes different.

Well, as I read, a sentence leaped up at me, a sentence that changed my life—and when I say changed, I mean changed. From the minute I read that sentence everything has been different, tremendously different." "What is this wonderful sentence?" I wanted to know, and he quoted it slowly, "The Lord is the strength of my life...in this will I be confident.' (Psalm 27:1, 3)

"I don't know why that one line affected me so," he went on, "but it did. I know now that I was weak and a failure because I had no faith, no confidence. I was very negative, a defeatist. Something happened inside my mind. I guess I had what they call a spiritual experience. My thought pattern shifted from negative to positive. I decided to put my faith in God and sincerely do my best, trying to follow the principles outlined in the Bible. As I did so I began to get hold of a new set of thoughts. I began to think differently. In time my old failure thoughts were flushed out by this new spiritual experience and an inflow of new thoughts gradually but actually remade me."

So concluded the story of this businessman. He altered his thinking, and the new thoughts which flowed in displaced the old thoughts which had been defeating him and his life was changed.

This incident illustrates an important fact about human nature: you can think your way to failure and unhappiness, but you can also think your way to success and happiness. The world in which you live is not primarily determined by outward conditions and circumstances but by thoughts that habitually occupy your mind. Remember the wise words of Marcus Aurelius, one of the great thinkers of antiquity, who said, "A man's life is what his thoughts make of it."

It has been said that the wisest man who ever lived in America was Ralph Waldo Emerson, the Sage of Concord. Emerson declared, "A man is what he thinks about all day long."

A famous psychologist says, "There is a deep tendency in human nature to become precisely like that which you habitually imagine yourself to be."

It has been said that thoughts are things, that they actually possess dynamic power. Judged by the power they exercise one can readily accept such an appraisal. You can actually think yourself into or out of situations. You can make yourself ill with your thoughts and by the same token you can make yourself well by the use of a different and healing type of thought. Think one way and you attract the conditions which that type of thinking indicates. Think another way and you can create an entirely different set of conditions. Conditions are created by thoughts far more powerfully than conditions create thoughts.

Think positively, for example, and you set in motion positive forces which bring positive results to pass. Positive thoughts create around yourself an atmosphere propitious to the development of positive outcomes. On the contrary, think negative thoughts and you create around yourself an atmosphere propitious to the development of negative results.

To change your circumstances, first start thinking differently. Do not passively accept unsatisfactory circumstances, but form a picture in your mind of circumstances as they should be. Hold that picture, develop it firmly in all details, believe in it, pray about it, work at it, and you can actualize it according to that mental image emphasized in your positive thinking.

This is one of the greatest laws in the universe. Fervently do I wish I had

*Reproduced from the best seller book **"The Power of Positive Thinking"** by Dr. Norman Vincent Peale - Chapter 13*

discovered it as a very young man. It dawned upon me much later in life and I have found it to be one of the greatest if not my greatest discovery, outside of my relationship to God. And in a deep sense this law is a factor in one's relationship with God because it channels God's power into personality.

This great law briefly and simply stated is that if you think in negative terms you will get negative results. If you think in positive terms you will achieve positive results. That is the simple fact which is at the basis of an astonishing law of prosperity and success. In three words: Believe and succeed.

I learned this law in a very interesting manner. Some years ago a group of us consisting of Lowell Thomas, Captain Eddie Rickenbacker, Branch Rickey, Raymond Thornburg, and others established an inspirational self-help magazine called Guideposts. This magazine has a double function: first, by relating stories of people who through their faith have overcome difficulties, it teaches techniques of victorious living, victory over fear, over circumstances, over obstacles, over resentment. It teaches faith over all manner of negativism.

Second, as a non-profit, non-sectarian, inter-faith publication it teaches the great fact that God is in the stream of history and that this nation was founded on belief in God and His laws.

The magazine reminds its readers that America is the first great nation in history to be established on a definitely religious premise and that unless we keep it so our freedoms will deteriorate.

Mr. Raymond Thornburg as publisher and I as editor in starting the magazine had no financial backing to underwrite it. It was begun on faith. In fact, its first offices were in rooms above a grocery store in the little village of Pawling, New York. There was a borrowed typewriter, a few ricketychairs, and that was all; all except a great idea and great faith. Slowly a subscription list of 25,000 developed. The future seemed promising. Suddenly one night fire broke out, and within an hour the publishing house was destroyed and with it the total list of subscribers. Foolishly no duplicate list had been made.

Lowell Thomas, loyal and efficient patron of Guide posts from the very start, mentioned this sad circumstance on his radio broadcast and as a result we soon had 30,000 subscribers, practically all the old ones and many new ones.

The subscription list rose to approximately 40,000, but costs increased even more rapidly. The magazine, which has always been sold for less than cost in order widely to disseminate the message, was more expensive than anticipated and we were faced with difficult financial problems. In fact, at one time it seemed almost impossible to keep it going.

At this juncture we called a meeting, and I'm sure you never attended a more pessimistic, negative, discouraging meeting. It dripped with pessimism. Where were we going to get the money to pay our bills? We figured out ways of robbing Peter to pay Paul. Complete discouragement filled our minds.

A woman had been invited to this meeting whom we all regarded most highly. But one reason she was included in this meeting was because, on a previous occasion, she had contributed $2,000 to help inaugurate Guideposts magazine. It was hoped that lightning might strike twice in the same place. But this time she gave us something of more value than money.

As this dismal meeting progressed she remained silent for a long time, but finally said, "I suppose you gentlemen would like me to make another financial contribution. I might as well put you out of your misery. I am not going to give you another cent."

This did not put us out of our misery. On the contrary, it put us deeper into our misery. "But," she continued, "I will give you something far more valuable than money."

This astonished us, for we could not possibly imagine anything of more value than money in the circumstances.

"I am going to give you an idea," she continued, "a creative idea."

"Well," we thought to ourselves unenthusiastically, "how can we pay our bills with an idea?"

Ah, but an idea is just what will help you pay bills. Every achievement in this world was first projected as a creative idea. First the idea, then faith in it, then the means of implementing the idea. That is the way success proceeds.

"Now," she said, "here is the idea. What is your present trouble? It is that you lack everything. You lack money. You lack subscribers. You lack equipment. You lack ideas. You lack courage. Why do you lack all these requirements? Simply because you are thinking lack. If you think lack you create the conditions that produce a state of lack. By this constant mental emphasis upon what you lack you have frustrated the creative forces that can give impetus to the development of Guideposts. You have been working hard from the standpoint of doing many things, but you have failed to do the one all-important thing that will lend power to all your other efforts: you have not employed positive thinking. Instead, you have thought in terms of lack.

"To correct that situation—reverse the mental process and begin to think prosperity, achievement, success. This will require practice but it can be done quickly if you will demonstrate faith.

The process is to visualize; that is, to see Guideposts in terms of successful achievement. Create a mental picture of Guideposts as a great magazine, sweeping the country. Visualize large numbers of subscribers, all eagerly reading this inspirational material and profiting thereby. Create a mental image of lives being changed by the philosophy of achievement which Guideposts teaches monthly in its issues.

"Do not hold mental pictures of difficulties and failures, but lift your mind above them and visualize powers and achievements. When you elevate your thoughts into the area of visualized attainment you look down on your problems rather than from below up at them and thus you get a much more encouraging view of them. Always come up over your problems. Never approach a problem below.

"Now let me continue further," she said. "How many subscribers do you need at the moment to keep going?"

We thought quickly and said, "100,000." We had 40,000.

"All right," she said confidently, "that is not hard. That is easy. Visualize 100,000 people being creatively helped by this magazine and you will have them. In fact, the minute you can see them in your mind, you will have them."

She turned to me and said, "Norman, can you see 100,000 subscribers at this minute? Look out there, look ahead of you. In your mind's eye can you see them?"

I wasn't convinced as yet, and I said rather doubtfully, "Well, maybe so, but they seem pretty dim to me."

She was a little disappointed in me, I thought, as she asked,

"Can't you imaginatively visualize 100,000 subscribers?"

I guess my imagination wasn't working very well because all I could see was the insufficient but actual 40,000.

Then she turned to my old friend Raymond Thornburg who has been blessed with a gloriously victorious personality, and she said, calling him by his nickname, "Pinky, can you visualize 100,000 subscribers?"

I rather doubted that Pinky would see them. He is a rubber manufacturer who gives his time freely from his own business to help

advance this inspirational, non-profit magazine, and you would not ordinarily think that a rubber manufacturer would respond to this type of thinking. But he has the faculty of creative imagination. I noticed by the fascinated look on his face that she had him. He was gazing straight ahead with rather a look of wonder when she asked, "Do you see the 100,000 subscribers?"

"Yes," he cried with eagerness, "yes, I do see them."

Electrified, I demanded, "Where? Point them out to me."

Then I, too, began to visualize them.

"Now," continued our friend, "let us bow our heads and together thank God for giving us 100,000 subscribers."

Frankly I thought that was pushing the Lord rather hard, but it was justified by a verse in the Scriptures where it says, "And all things, whatsoever ye shall ask in prayer, believing, ye shall receive them." (Matthew 21:22) That means when you pray for something, at the same time visualize what you pray for. Believe that if it is God's will and is worthwhile, not selfishly sought after, but for human good, that it is at that moment given you.

If you have difficulty in following this reasoning, let me tell you that from that moment until the present writing Guideposts never lacked for anything. It has found wonderful friends and has had fine support. It has been able always to meet its bills, purchase needed equipment, finance itself, and as I write these words Guideposts is nearing the half million mark and more subscriptions are coming in regularly, sometimes as many as three or four thousand per day.

I recite this instance not for the purpose of advertising Guideposts, although I strongly recommend this magazine to all my readers, and if you would like to be a subscriber, write to Guideposts, Pawling, New York, for information. But I tell the story because I was awed by this experience, realizing that I had stumbled upon a law, a tremendous law of personal victory. I decided to apply it thereafter to my own problems and wherever I have done so can report a marvelous result. Wherever I have failed to do so, I have missed great results.

It is as simple as this—put your problem in God's hands. In your thoughts rise above the problem so that you look down upon it, not up at it. Test it according to God's will. That is, do not try to get success from something that is wrong. Be sure it is right morally, spiritually, and ethically. You can never get a right result from an error. If your thinking is wrong, it is wrong and not right and can never be right so long as it is wrong. If it is wrong in the essence it is bound to be wrong in the result.

Therefore be sure it is right, then hold it up in God's name and visualize a great result. Keep the idea of prosperity, of achievement, and of attainment firmly fixed in your mind. Never entertain a failure thought. Should a negative thought of defeat come into your mind, expel it by increasing the positive affirmation. Affirm aloud, "God is now giving me success. He is now giving me attainment." The mental vision which you create and firmly hold in consciousness will be actualized if you continually affirm it in your thoughts and if you work diligently and effectively. This creative process simply stated is: visualize, prayerize, and finally actualize.

People in all walks of life who accomplish notable achievements know the value of this law in their experience.

Henry J. Kaiser told me that at one time he was building a levee along a riverbank, and there came a great storm and flood which buried all his earth-moving machinery and destroyed the work that had been done. Upon going out to observe the damage after the water receded, he found his workers standing around glumly looking at the mud and the buried machinery.

He came among them and said with a smile, "Why are you so glum?"

"Don't you see what has happened?" they asked. "Our machinery is covered with mud."

"What mud?" he asked brightly.

"What mud!" they repeated in astonishment. "Look around you. It is a sea of mud."

"Oh," he laughed, "I don't see any mud."

"But how can you say that?" they asked him.

"Because," said Mr. Kaiser, "I am looking up at a clear blue sky, and there is no mud up there. There is only sunshine, and I never saw any mud that could stand against sunshine. Soon it will be dried up, and then you will be able to move your machinery and start all over again."

How right he is. If your eyes are looking down in the mud and you feel a sense of failure, you will create defeat for yourself. Optimistic visualization combined with prayer and faith will inevitably actualize achievement.

Another friend of mine who started from the lowliest beginnings has performed some outstanding achievements. I remember him in his schooldays as an awkward, unprepossessing, very shy country boy. But he had character and one of the keenest brains I have ever encountered. Today he is an outstanding man in his line. I asked him, "What is the secret of your success?"

"The people who have worked with me across the years and the unlimited opportunity given any boy in the United States of America," he replied.

"Yes, I know that is true, but I am sure you must have some personal technique, and I would be interested in having it," I said.

"It all lies in how you think about problems," he replied. "I attack a problem and shake it to pieces with my mind. I put all the mental power I have upon it. Second, I pray about it most sincerely. Third, I paint a mental picture of success. Fourth, I always ask myself, 'What is the right thing to do?' for," he said, "nothing will be right if it is wrong. Nothing that is wrong will ever come out right. Fifth, I give it all I've got. But let me emphasize again," he concluded, "if you're thinking defeat, change your thoughts at once. Get new and positive thoughts. That is primary and basic in overcoming difficulties and in achieving."

At this very minute, as you read this book, potential ideas are in your mind. By releasing and developing these ideas you can solve your financial problem, your business situation, you can care for yourself and your family, and attain success in your ventures. A steady inflow and practical use of these creative thoughts can remake your life and you along with it.

There was a time when I acquiesced in the silly idea that there is no relationship between faith and prosperity; that when one talked about religion he should never relate it to achievement, that it dealt only with ethics and morals or social values. But now I realize that such a viewpoint limits the power of God and the development of the individual. Religion teaches that there is a tremendous power in the universe and that this power can dwell in personality. It is a power that can blast out all defeat and lift a person above all difficult situations.

We have seen the demonstration of atomic energy. We know that astonishing and enormous energy exists in the universe. This same force of energy is resident in the human mind. Nothing on earth is greater than the human mind in potential power. The average individual is capable of much greater achievement than he has ever realized.

This is true regardless of who is reading this statement. When you actually learn to release yourself you will discover that your mind contains ideas of such creative value that you need not lack anything. By the full and proper use of your power stimulated by God power, you can make your life successful.

You can make just about anything of your life—anything you will believe or

will visualize, anything you will pray for and work for. Look deeply into your mind. Amazing wonders are there.

Whatever your situation may be, you can improve it. First, quiet your mind so that inspirations may rise from its depths.

Believe that God is now helping you. Visualize achievement. Organize your life on a spiritual basis so that God's principles work within you. Hold firmly in your mind a picture not of failure but of success. Do these things and creative thoughts will flow freely from your mind. This is an amazing law, one that can change anybody's life including your own. An inflow of new thoughts can remake you regardless of every difficulty you may now face, and I repeat - *every difficulty.*

In the last analysis the basic reason a person fails to live a creative and successful life is because of error within himself. He thinks wrong. He needs to correct the error in his thoughts. He needs to practice right thinking. When the 23rd Psalm says, "He leadeth me in the paths of righteousness," it not only means the paths of goodness, but the paths of right- mindedness as well. When Isaiah says, "Let the wicked for sake His way and the unrighteous man his thoughts," (Isaiah 55:7) it not only means that a person is to depart from evil and do good, but that he is to change his thinking from wrong to right, from error to truth. The great secret of successful living is to reduce the amount of error in oneself and increase the amount of truth. An inflow of new, right, health-laden thoughts through the mind creatively affects the circumstances of life, for truth always produces right procedures and therefore right results.

Years ago I knew a young man who for a while was one of the most complete personality failures in my entire experience. He had a delightful personality, but he failed at everything. A person would employ him and be enthusiastic about him, but soon his enthusiasm would cool and it was not long until he was out of that position. This failure pattern was repeated many times. He was a failure as a person as well as an employee. He missed connections with everything. He just couldn't do anything right, and he used to ask me, "What is wrong with me that everything goes wrong?"

Still he had a lot of conceit. He was cocky and smug, and had the irritating habit of blaming everybody but himself. Something was wrong with very office with which he was connected or every organization that employed him. He blamed everybody else for his failures—never himself. He would never look inside himself. It never occurred to him that anything could be wrong with him.

One night, however, he wanted to talk with me, and as I had to make a drive of about a hundred miles to deliver a speech he drove there and back with me. On our return we stopped along about midnight at a roadside stand for a hamburger and a cup of coffee. I don't know what was in that hamburger sandwich, but since this incident I have had a new respect for hamburgers, for of a sudden he shouted, "I've got it! I've got it!"

"You've got what?" I asked in astonishment.

"I've got the answer. Now I know what the trouble with me is. It's that everything goes wrong with me because I myself am wrong."

I clapped my hand on his back and said, "Boy, at last you are on your way."

"Why, it's as clear as a crystal," he said. "I have been thinking wrong, and as a result I have created wrong outcomes."

By this time we were out in the moonlight standing alongside my car, and I said to him, "Harry, you must go one step further and ask God to make you right inwardly." I quoted this passage from the Bible, "'Ye shall know the truth, and the truth shall make you free.'" (John 8:32) Get the truth into your mind and you will be free of your failures.

He became an enthusiastic practicing follower of Jesus Christ. Through real faith and a complete change of thoughts and personal habits, wrong thinking and wrong acting were removed from his nature. He straightened out by developing a right (or righteousness) pattern instead of an error pattern. When he was made right, then everything began to go right for him.

Following are seven practical steps for changing your mental attitudes from negative to positive, for releasing creative new thoughts, and for shifting from error patterns to truth patterns. Try them—keep on trying them. They will work.

1. For the next twenty-four hours, deliberately speak hopefully about everything, about your job, about your health, about your future. Go out of your way to talk optimistically about everything. This will be difficult, for possibly it is your habit to talk pessimistically. From this negative habit you must restrain yourself even if it requires an act of will.

2. After speaking hopefully for twenty-four hours, continue the practice for one week, then you can be permitted to be "realistic" for a day or two. You will discover that what you meant by "realistic" a week ago was actually pessimistic, but what you now mean by "realistic" is something, entirely different; it is the dawning of the positive outlook. When most people say they are being "realistic" they delude themselves: they are simply being negative.

3. You must feed your mind even as you feed your body, and to make your mind healthy you must feed it nourishing, wholesome thoughts. Therefore, today start to shift your mind from negative to positive thinking. Start at the beginning of the New Testament and underscore every sentence about Faith. Continue doing this until you have marked every such passage in the four books, Matthew, Mark, Luke, and John. Particularly note Mark 11, verses 22, 23 , 24. They will serve as samples of the verses you are to underscore and fix deeply in your consciousness.

4. Then commit the underscored passages to memory. Commit one each day until you can recite the entire list from memory. This will take time, but remember you have consumed much more time becoming a negative thinker than this will require. Effort and time will be needed to unlearn your negative pattern.

5. Make a list of your friends to determine who is the most positive thinker among them and deliberately cultivate his society. Do not abandon your negative friends, but get closer to those with a positive point of view for a while, until you have absorbed their spirit, then you can go back among your negative friends and give them your newly acquired thought pattern without taking on their negativism.

6. Avoid argument, but whenever a negative attitude is expressed, counter with a positive and optimistic opinion.

7. Pray a great deal and always let your prayer take the form of thanksgiving on the assumption that God is giving you great and wonderful things; for if you think He is, He surely is. God will not give you any greater blessing than you can believe in. He wants to give you great things, but even He cannot make you take anything greater than you are equipped by faith to receive. "According to your faith (that is, in proportion to) be it unto you." (Matthew 9:29)

The secret of a better and more successful life is to cast out those old, dead, unhealthy thoughts. Substitute for them new, vital, dynamic faith thoughts. You can depend upon it—an inflow of new thought will remake you and your life.

सत्यमेव जयते - M. U. Shah

The Boss of one Construction Company phoned his Arbitration Consultant and asked, "Today the Arbitration Award was to be published. How is the Award? Who has won?"

The Arbitration Consultant replied cryptically, " Sir, it is a victory of truth."

The Boss ordered, "Immediately make arrangements to move High Court to set aside the Award !!!"

SERIOUSLY , LAUGHTER IS THE BEST MEDICINE

I am the Boss (in my house), my wife is just the decision maker!!!

- M. U. Shah

I sat down to pen Humour column for the Bulletin. After exploring various topics, I narrowed down on the topic: "I am the Boss". As I thought deeply, the title appeared to be bit vague and unsatisfactory to me. I thought I need to qualify this title and be specific. Firstly I thought of writing "I am the Boss (in the office) but then I thought how I can write about what I am not. With Corporate Finance around, I would be lying if I say I am the Boss!! Then I thought let me write on "I am the Boss (in my house)". Of course, I must honestly admit, even this is equally or rather more untrue. Eventually I settled down with the above title based on famous quote by Woody Allen – an American film maker and writer which is valid not only in America but equally valid in India (notwithstanding geographical separation by seven oceans) at least in my case, though I am not sure about the valued readers.

ENTERTAINMENT DECISION

The last Monday my office colleague asked me," How was the week end? What did you do?"

I replied, "I wanted to see a new Hindi movie. My wife wanted to see a Gujarati drama. I explained her ……."

Interrupting me, he straightaway asked, "Which Gujarati drama you saw ?"

MENU SELECTION

In typical Gujarati family, though lunch menu is permanently fixed, dinner menu is always a matter of discussions in the family.

While I was busy in a meeting, my wife called on mobile. I said, "I am bit busy. Anything urgent?"

She asked, "What would you like to have in the dinner tonight?"

"Anything will do." was my answer.

"No, you name some dish." she insisted.

I said, "Then you may prepare green peas pulav."

She said, "Good dish but green peas are not available in the house. What other dish you would like to have?

I said, " You may prepare Khichdi."

She replied, "I would love to prepare Khichdi but our daughter does not like it."

I said, "You decide. I am busy."

She replied, "By the way, I have made preparation for idlies in the morning!"

I got irritated and said, "If you have already made preparation for idlies from the morning itself, why are you asking me?"

She replied, "You should not feel that I am unilaterally deciding menu!!"

Fed up by this daily chore, I decided to replace my dinner with a Protein shake which not only avoided this irritating daily discussions on dinner menu but incidently also helped me to reduce my kilos and inches!

MEDICAL DECISIONS

My wife's medical checkup was to be done. I decided a particular Health checkup package viz. Package A for her. I could not accompany her as I was busy.

In the middle I phoned her and asked how the checkup was progressing.

She said, "I decided to take Package B"

I asked, "Why?"

She replied, "Package A which you decided had a discount of only 5% (on fees of Rs. 5000) but Package B selected by me has a discount of 20 % (on fees of Rs. 9000)!"

After finishing the checkup and consultation with the Doctor, she phoned me and said, " Entire Rs. 7200 has gone down the drain."

I asked, "What happened ? Doctors were not good?"

She replied, " No, no; doctors were very good but all reports are normal- all money has gone down the drain !!"

PURCHASE DECISIONS

Once I went to Kolkata and bought a Sari for her.

She asked, "What is the price?"

" Rs. 850" was my honest answer

"Oh! Don't you think, I deserve some rather expensive Sari?"

Subsequently when I went to Chennai, I bought a Sari worth Rs. 1500 but told her that it was bought at Rs. 1800"

She immediately concluded, "You have been cheated. This Sari is not worth even Rs. 1200!"

In next tour when I went to Bangalore for a Seminar, I changed my strategy and bought a silk Sari worth Rs. 2500 but told her that I bought it at Rs. 1500.

Extremely delighted she said, "At last now, after so many years of association with me, you have learnt the art of bargaining."

I was happy that at last my strategy worked. However my happiness did not last long as the next day evening when I returned from the office, I saw her in a happy mood counting currency notes.

She said, "I have earned a profit of Rs. 250 ! The Sari which you purchased at Rs. 1500, I sold to neighbor at Rs. 1750!"

"Oh my God!" was the only thing I could whisper trying to keep decibels as low as possible.

This didn't stop at that as next day she asked me, "When are you going to Bangalore again?"

Surprised by this unusual question, I asked; "Why? You don't like my going on tour."

She said, "Yahh but your office trip can now become a business trip. I have got orders for 20 Saris from my kitty party group at Rs. 1750 and collected full amount of Rs. 35,000. I will earn profit of Rs. 5000 which will supplement your salary income!"

This time I could not control my decibels when 'Oh my God' came out from my throat. My position was very vulnerable. Neither my salary level will permit me to bear this large loss of Rs. 15,000 nor I can admit that I had lied. If I admit that I had lied, for the rest of my life, all my statements, however true they may be, will be viewed by extrapolating this incidence. The only thing I could do was to write to my Boss and HR that you may send me any wherein India or abroad on tour but please do not ever send me to Bangalore! I also took lifelong oath not to purchase Sari.

PAINTING DECISION

I had to paint my flat after renovation. I went to Asian Paints gallery and selected light blue colour.

The experienced sales executive asked me, "Have you consulted the Madam?"

"You do what I am saying." I ordered ignoring his question.

After placing this Order I went on tour and when I returned I was eager to see the house painted in a light blue colour but I realized that it was not to be when I saw chocolate brown colour on the walls !

PHONE CALLS

The landline phone rang. It is an unwritten law in our house that when I am around in the house, phones are to be attended by me though nine out of ten calls are for madam and tenth one is for our daughter. The person at other end of the receiver said, " Can I talk to someone in family who takes decisions?"

I yelled to my wife," Dear ....., call for you !!"

Yet another caller asked," Can I talk to some responsible person in the family - someone who takes decisions?"

I replied," You make up your mind. If you want to talk to someone who takes decisions, I will hand over receiver to my wife. If you want to talk to someone (who is held) responsible (for each wrong decision), you may talk to me!!!"

BIG AND SMALL OF DECISION MAKING

Once my colleague asked me how decision making works in your family.

I replied, "I am the Boss. All big decisions are obviously taken by me. All other decisions are taken by my wife."

He happily remarked, "That is very good. But how do you differentiate between big and small decisions? Can you give some examples?"

I replied, "Very simple. Whether America should ceasefire in Iraq or whether BJP should support Lokpal Bill or whether Reserve Bank should reduce interest rates etc. are all examples of big decisions! "

WORKS IN PROGRESS

172 m tall Cooling Tower Shell in Progress at Krishnapattanam for Tata Power

Chimney & Cooling Tower at KORBA for NTPC

275 m tall Chimneys for Indiabulls Power at Amaravati

Turbine Building at Kalpakam for NPCL

Development Rail Infrastructure Facilities from LAPANGA Station to proposed Plant for Aditya Birla Group

PQC laying at Wazirabad Bridge Project, New Delhi

275 m Chimney at Lapanga, Orissa

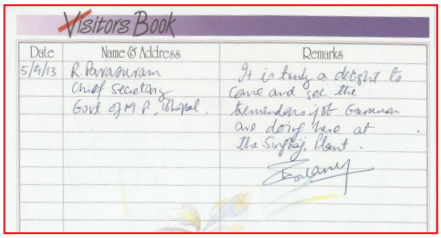
Completed sub-structure at Bogibeel bridge

135 m tall NDCT Shell completed at Parli for MAHAGENCO

NEWS FLASH FROM PROJECTS

1. VIP Visit

Sri R Parasuram, Chief Secretary (Govt. of Madhya Pradesh) visits Gammon's Project at Malawa



Visitors Book

Date	Name & Address	Remarks
5/4/13	R Parasuram, Chief secretary, Govt of M P Bhopal.	It is truly a delight to come and see the tremendous job Gammon are doing here at the Singaji Plant.

Valued Comments by Sri. R Parasuram, Chief Secretary (Govt. of Madhya Pradesh)

2. CSR Activities

As an initiative towards CSR activities, focusing on the education of underprivileged children, Gammon family of Kolkata Metro Project,have distributed free magazines ("KhelarChole") among underprivileged children & students of Municipality School near Gammon site. Mr. Subrata Gupta (IAS) & eminent writer Mr. Shankar Lal Bhattacharya attended the function on request of Gammon.

3. Signature Bridge in News

THE ASSAM TRIBUNE
FRIDAY, MAY 24, 2013
LEISURE

Signature Bridge

Delhi is all set to have an iconic structure of its own, writes **Gaurav Sharma**

National Capital New Delhi, which has so far basked in the glory of historic monuments and edifices built by the Mughals and Edward Lutyens, will boast of an iconic structure of its own in the form of the Signature Bridge – a cable-supported steel bridge spanning the Yamuna river – which is set to be ready by September 2014.

And an added attraction will be a recreation park, complete with water sports, boating, walkways and restaurants, developed on a one-kilometre stretch adjoining the bridge in east Delhi's Wazirabad area.

Coming up 600 metres downstream from the Wazirabad Barrage, the Signature Bridge will be 150 metres-tall – double the height of the Qutub Minar. When ready, it will connect Khajuri Khas intersection on the east bank of the Yamuna to the outer Ring Road on the west bank.

"It will be a bow-shaped, cable-stayed structure which is entirely made of steel. Around 80 percent of the work has been completed as the foundation work is over. Pillars have to be erected," a chief engineer of the Delhi government told IANS.

"This will be a landmark structure in the capital. The bridge will be thrown open to the public by September 2014," a Delhi government official said.

"The structure will have an asymmetrical central pylon which will support the deck with cables," said the chief engineer, who preferred not to be identified.

The ambitious bridge project was announced in 2004 to decongest traffic.

Asked why it was taking so long to complete the project, a Delhi government official said, "In 2002, many saplings were planted in the area. Constructing the bridge required destroying all the plants. We had to take clearance; only then work could be started."

An added attraction will be a viewing gallery right at the top of the central pylon to give tourists a bird's eye view of the area.

"Four high-speed lifts will be installed to take people to the top of the structure. These will be passenger-cum-service lifts," an official of the Delhi Tourism and Transportation Development Corporation (DTTDC), which has been entrusted with the task of completing the bridge, told IANS.

A recreation park is also being planned around the bridge where Delhiites could go for some boating, water sports, ambling along the tree-lined pathways or just eat at the many restaurants in the area, said an official.

"There is scope for promoting water sports in the area. Besides boating, restaurants and parks are likely to be developed there," an official said.

"A pool will be created by erecting a rubber dam across the river so that water sports facilities can be developed," said the Delhi government official.

"This will be a one-of-its-kind tourist attraction in the capital and will generate employment," he added.

(Source: IANS)

4. Foundation Stone Laying

नर्मदा गुड़ामालानी पेयजल परियोजना
का शिलान्यास

श्री अशोक गहलोत, माननीय मुख्यमंत्री राजस्थान

डॉ. जितेन्द्रसिंह

सौजन्य : मेसर्स गैमन इंडिया लिमिटेड, मुम्बई

जन स्वास्थ्य अभियांत्रिकी विभाग
शिलान्यास समारोह
नर्मदा गुड़ामालानी पेयजल परियोजना
लागत रु. 160.00 करोड़
दिनांक : जून, 2013

5. Completion of 27th Habitable Floor

Tower No. 2 of prestegious Runwal Green Residential Building in Mumbai has reached level of 111 m when 27th habitable floor was cast. Upon completion, this 39 storied tower will be one among few tallest Residential buildings in Mumbai

COMPANY NEWS

THANKS TO ESTEEMED CUSTOMERS

Bajoli - Hoil - HEP Package 2 - **Rs. 400 Crores**

Narmada - Guhanmalani pipe line - **Rs. 121.5 Crores**

Civil Works for BRM No. 2 for JSW Steels Limited - **Rs. 24 Crores**

WELCOME To GAMMON FAMILY

Senior Manager
Prasad Neelkanth Dixit

Manager
Ravindra Patle

Deputy Manager
Sumanta Kumar Roy
Sourave Dey
Desh Ratn Dwivedi

Assistant manager
Vinayak Ravindra Supekar
Amar Jaywant Thorat
Surendra Yadav
Anuj Rajnikant Shah
Choppa Regan
S Kanaka Raju

Engineer
Girija Priya Guruprakash Gadige
Vaibhaw Kumar
Naveenchand Zaswanth sai Valvala
Chinka Vijaya Kumar

Jr. Engineer
Prince Lal K

Executive
Devyani Joshi

Officer
Anil Kumar Dasmohapatra

AWARDS

Safety Award for Project Site

Gammon was conferred with prestigious Safety Award for – ISCON Temple, Mayapur by Confederation of Indian Industry (Eastern Region) – CII (ER). Gammon India Limited is the first & only Construction Company to get this Award as on date.

Safety Performance Award

Gammon was conferred with Safety Performance Award 2011-12 for Project Site – Vallur IDCT & Chimney as recommended by Safety Award Committee of NTPC.

Award for promoting healthy & safe work environment

Gammon was conferred with Godrej Safety Award for it's Project - Godrej Platinum, standing at first position among all the current Godrej projects across the country.

This Award is constituted by M/s Godrej Properties Limited to appreciate and recognize outstanding contribution and commitment of project team in promoting healthy and safe working condition and Gammon has been adjudged as the best among the nine participating projects being executed by renowned agencies like, M/s L&T, M/s SPCL and M/s MAN INFRA and others.

LECTURES DELIVERED

Dr. N. V. Nayak

8th to 11th May 2013

Delivered a lecture on "EXCELLENCE IN ENGINEERING FOR SUSTAINABLE AND INCLUSIVE GROWTH" at Second FEIAP Convention 2013 & International Conference at Hyderabad, organized by The Institution of Engineers (India), Hyderabad.

12th June 2013

Delivered lecture on "Approach Towards Producing More Durable, Sustainable & Economical Concrete" during the Concrete Show India, Mumbai held at Holiday Inn, Andheri (East).

GIL PARTICIPATION IN SEMINARS

V. N. HEGGADE

2nd May'13 to 4th May'13

Attended the workshop for the Revised Limit State Code of Practice for Concrete Road Bridges IRC : 112 : 2011 as a faculty at Delhi.

Girish Bhat

21st May 2013

Attended and participated in ACBI Board Meeting at Chennai.

FAMILY RECOGNITIONS

Desiree Nayak

Grand daughter of Dr. N.V. Nayak won the first prize for "Astro – Poetry Writing Competition" conducted by Nehru Science Centre on their 36th Anniversary.

A Million thanks to our
ESTEEMED CUSTOMERS

NHAI

MSRDC

Bihar State Road Development Corporation Ltd.

KSHIP

MPRDC

NTPC

NHPC

NPCIL

MAHAGENCO

SIEMENS

JINDAL STEEL & POWER

Reliance Power
Anil Dhirubhai Ambani Group

TATA POWER
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Delhi Transport Corporation

DELHI TOURISM
Official Tourism Website for Government of NCT of Delhi

GWSSB
GUJARAT WATER SUPPLY AND SEWERAGE BOARD
(Gujarat Government Undertaking)

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