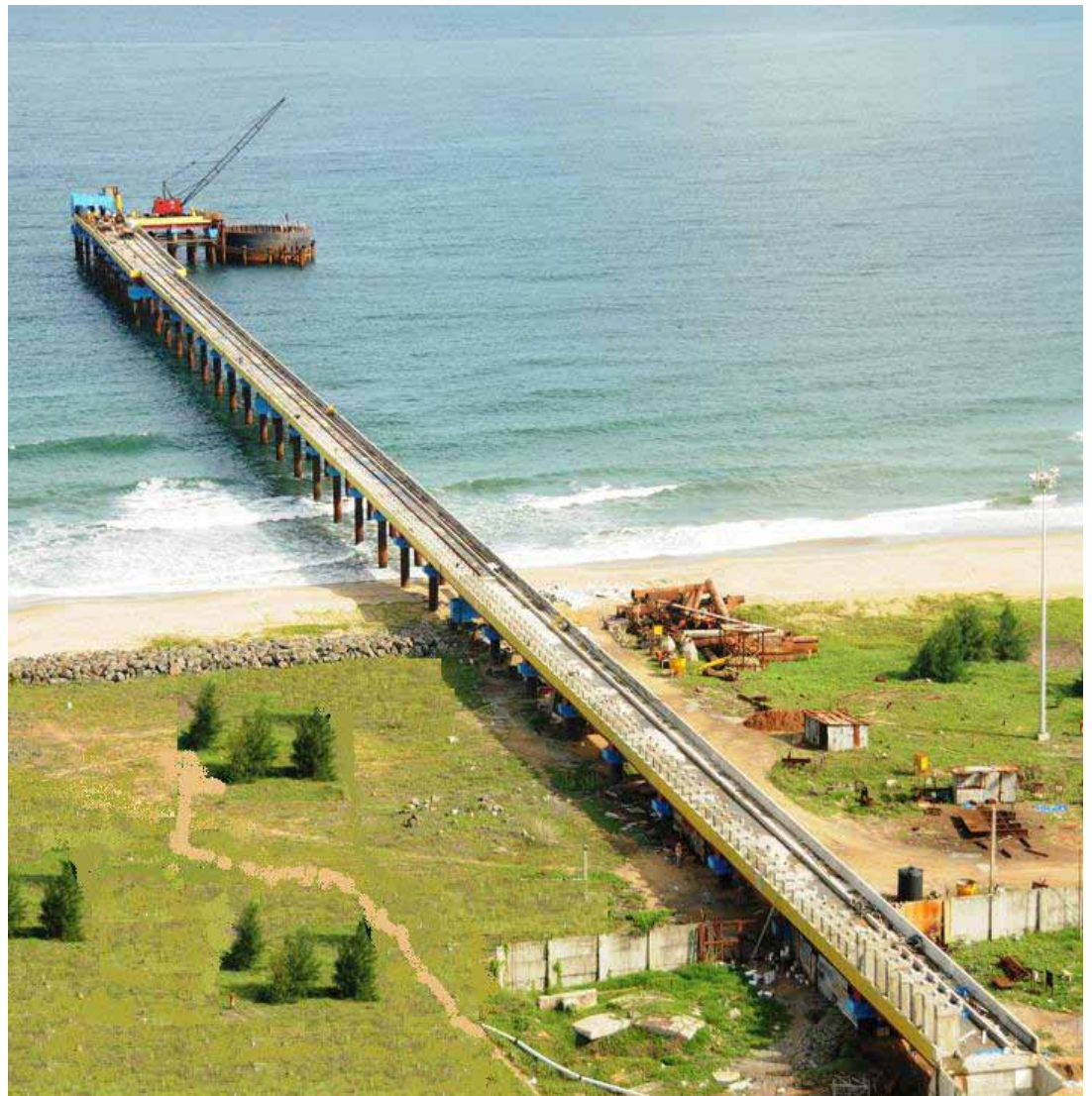


GAMMON BULLETIN

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“We Love water, We thank water, We respect water,
We are all water, We are all one.....”

- *Dr. Masaru Emoto*

IMS POLICY



Editorial

We are pleased to publish January - March, 2014 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 stakeholders.

Annual mega event of IRC (74th Session) was held in Guwahati from 18th to 22nd January. Gammon has been one of the most active organizational participants of this event since several decades. Apart from deputation of senior executives in the session, Mr. Anupam Das presented a paper titled "Innovative execution of Cassion and cutting edge for Bogibeel Bridge at Guwahati". The paper was appreciated by august gathering of delegates. The paper has been reproduced in this Bulletin as a cover story. The paper highlights how even under most difficult adversity of nature, one can achieve success by meticulous planning and killing instinct.

Another international event took place in Mumai. **The 4th fib (fédération internationale du béton / International Federation of Structural Concrete) congress** was hosted in Mumbai from 10th to 14th February, 2014. This honour was bestowed on India second time after 1986.

Gammon participated as a Silver sponsor for this prestigious event. The main theme of this Congress was to achieve sustainability, Eco-friendliness and energy conservation in use of structural concrete so that quality and longevity are improved

There were around as many as 275 technical papers presented in this Congress. Gammon submitted and presented nine papers in the Congress – highest by any single organization. These papers were well received and applauded.

In our quest to continually 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

CONTENTS

| | | | |
|--|----|--------------------------|----|
| Innovative Foundation works at Bogibeel Bridge | 3 | We Shall Overcome..... | 13 |
| Life Transforming Quotes | 10 | News Flash from Projects | 18 |
| Gammon's Contribution in 4th fib Congress 2014 | 12 | Company News | 19 |

INNOVATIVE EXECUTION OF CAISSON FOUNDATIONS AND CUTTING EDGE AT BOGIBEEL BRIDGE*



Anupam Das
Dy. Gen. Manager

ABSTRACT:

Bridging the mighty & ferocious river Brahmaputra is a great challenge in itself and when this is coupled with adversity of nature it becomes even more challenging. Gammon team developed innovative engineering solutions and used successfully for the construction of two difficult Caisson foundations (P2 & P3) in River Brahmaputra at a water depth of 14m to 18m, under high velocity (ranging from 3 to 5m/sec,) done within very short period of four months (from November to February) only. After adopting the revised methodology, both the Caissons were successfully grounded only in 74 days and thereby saving 53 days in comparison to earlier season. The fabrication/ erection of each cutting edge at location was achieved in 10 days thereby saving 15 days in comparison to earlier season. This paper would be beneficial for Bridge Engineers, as it involves substantial reduction of time of execution by over 40% for caisson foundation & over 60% for fabrication & erection of cutting edge at location.

1. INTRODUCTION:

The Bogibeel Bridge is the fourth bridge across river Brahmaputra, approximately 17km downstream of Dibrugarh located in eastern part of Assam. This rail-cum-road bridge (Double Line BG Track with three lanes road) will be the

lifeline of North eastern part of the country. It will facilitate connectivity between North and South of river Brahmaputra in the eastern region of Assam and Arunachal Pradesh. This is the fourth bridge over river

Brahmaputra, after Saraighat Bridge @ Guwahati, NaranarayanSetu @ Jogighopa and Kaliabhomora Bridge @ Tezpur. National Security of the eastern region of India will get further strengthening after commissioning of the Bridge. Though this strategically important rail-cum-road bridge was announced on 22nd April 2002 by the then Prime Minister Shri Atal Behari Vajpai, the work of main bridge (sub-structure) was started in April 2008. The bridge when completed by December 2016, will be the longest rail-cum-road bridge in India having total length of 4.94 km.

2. THE PROJECT:

Gammon were entrusted with the Construction of Well Foundation and Sub-structure of this prestigious Rail cum Road Bridge across the River Brahmaputra. Line sketch of the bridge as well as cross-section details of well foundation is given in fig 1 & 2 respectively. Since the bridge falls in a seismically active zone (Zone-V), special care has been taken in the design of the bridge to mitigate disasters. For this, the depth of the wells has been increased by 25 per cent and the thickness of the steining of wells has been increased to 3m instead of 1.5 or 2.0 m. Two out of three caissons (viz P2 & P3) are in main deep channel (Water depth 14m to 18m), having water velocity, ranging from 3m/sec. to 5m/sec. Also the Caissons were to be constructed in a limited working season of 4 months (from November to February) including Fabrication, Erection, launching, grounding and sinking of Caissons up to safe depth (atleast 20m below bed level).

Scope of work includes, 42nos. of double 'D' (16.2m X 10.5m) well foundations of 58.6m depth for P2 to P39, 68.75m depth for P1 and P40 and 42m depth for A1 and A2, including 3nos. of Caisson foundations along with Pier and Pier Caps.

The total Concrete involved is nearly 3.5 Lakh cum. Caisson foundations are, one

of the most difficult deep foundations to construct in any river and more so in mighty and ferocious River like Brahmaputra. Sudden flash floods due to untimely and unprecedented heavy rains in the upper reaches of the river made this task even more challenging. The fact is, working on a river Brahmaputra, one cannot follow a strict methodology. The river takes a new form/ changes its course every year – the depth, bed level etc. keep changing leading to forced change in the planned methodology. The working season is hardly, four months i.e. Nov to Feb, as workable water level recedes only by end of Oct and Starts rising from 1st week of March itself.

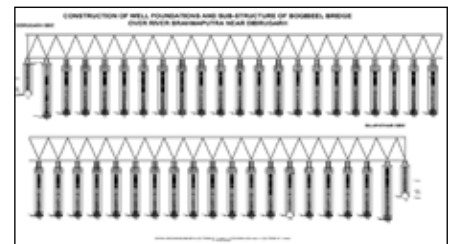


Fig-1: Line Sketch of the Bridge

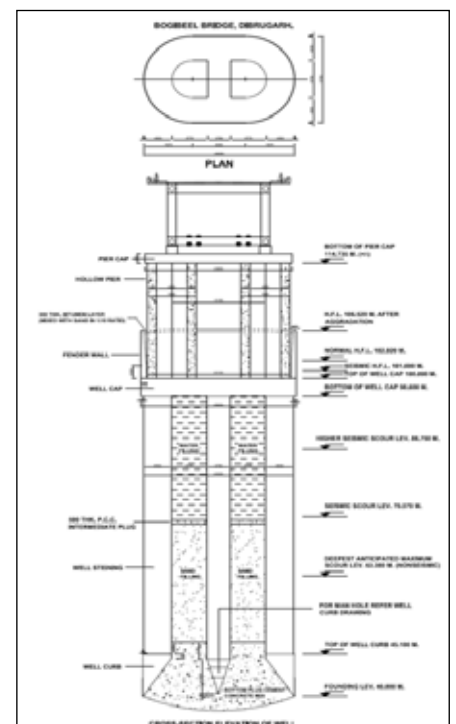


Fig-2: Cross Section Elevation of Well

* Presented during 74th session of IRC at Guwahati on 19th January 2014.

3. CASE STUDY & LESSONS LEARNT ON CAISSON FOUNDATIONS:-

Coffer dams for P2 and P3 caisson launching bed were constructed at 1000 mtr upstream side of bridge centre line in Oct'09. This was made after detailed survey. When selected, the depth at the location, was around 5m. After both caissons were erected up to 5.1m ht, two flash floods came on 10/10/09 & 19/11/09, causing heavy siltation near the launching bed. There after dredging of river for shifting of Caisson were done. (Refer Fig: 3)



Fig-3: Dredging of River for Shifting of Caisson

The caissons (i.e. P2 / P3) were taken to the actual location on 17/01/2010 and 21/01/2010 respectively, after dredging and making the channel (Refer Fig 4)



Fig-4: P2/ P3 caissons shifted to actual location

There was a delay of around 22 days in shifting of caisson because of heavy siltation.

Further works of both the caissons were done at location. There was a sudden unexpected increase of water level from RL 96.990m to 97.870m on 04/03/2010, due to heavy rainfall in Arunachal Pradesh and at upper Assam region (Ref Fig: 5). Due to the increase in water velocity, the total force applied by water on caisson drastically increased.



Fig-5: Unprecedented flood in river Brahmaputra

Two of the three anchors of P2 caisson gave way due to heavy wind and water current. The caisson P2 gradually drifted and stabilized at about 130m downstream side from the original location. (Refer Fig: 6)



Fig-6: P2 Caisson drifted 130m downstream

Since the draft of Caisson was 9.7m, it was not possible to shift to a safer place at that time. Therefore, it was secured in that position with four nos. of 32mm dia wire ropes tied with well P1 and two nos. from downstream side anchors. But in that location due to heavy scouring the caisson started tilting. The scouring was uncontrollable due to heavy water current at that location and it was not possible for any boat or person to approach the caisson. Ultimately all the wire ropes anchored with the caisson were snapped one by one and slowly the P2 caisson submerged into water. (Refer Fig: 7)



Fig-7: P2 caisson submerged in river

Similarly at location P3, due to unexpected rise of water level coupled with heavy water current/ force, tremendous scouring took place and as a result the caisson started tilting. The scouring was uncontrollable due to heavy water current at that location and it was not possible for any boat or

person to approach the caisson.

Ultimately all the wire ropes anchored with the caisson were snapped one by one and P3 caisson drifted away very fast at about 1.2km d/s to the centre line and finally got submerged into water. (Refer Fig: 8)



Fig-8: P3 caisson submerged in river

Before snapping of the tethering arrangements the status of both the caissons were as follows:- (Ref. Table: 1)

| S/ No | Description | Unit | Caisson P2 | Caisson P3 |
|-------|-------------------------|------|------------|------------|
| 1 | Height of the Caisson | m | 18.7 | 13.9 |
| 2 | Weight of structural | t | 138 | 117 |
| 3 | Weight of reinforcement | t | 77 | 77 |
| 4 | Weight of concrete | t | 960 | 315 |
| 5 | Total weight of caisson | t | 1175 | 509 |
| 6 | Draft | m | 9.7 | 5.6 |
| 7 | Free board | m | 9 | 8.3 |

Table-1: Status of Caisson P2 & P3 before snapping of tethering arrangements

To conclude, both the caissons were lost due to:

- Heavy siltation enroute which resulted in loss of 22 days in shifting of caissons.
- Early onset of floods with heavy water velocity in 1st week of March.
- Sudden flood and change in direction & velocity of water, caused unprecedented angular force/ impact on caissons, which snapped the tethering arrangements.

3.1 Revised methodology adopted in 3rd Working Season (2010-11) for construction of Caissons.

A comprehensive strategy was decided for 3rd Season, especially to

reassess the design of Caissons under worst scenario along with tethering arrangements & anchor blocks, to revise the Construction Methodology and to make an unassailable plan with additional precautions, to ground the caisson by 15th Jan 2011, so that by end of Feb'11 both the Caissons could be taken to

safe depth below bed level to prevent such unprecedented loss.

3.1.1 Review of Caisson Design

The structural adequacy check for vertical angle frame ISA 90x90x8 at 1374mm c/c at well curb portion of steel caisson was an important aspect to be checked.

3.1.1.1 Check for vertical frame during floating condition

Maximum water head/ Static Water pressure on the curb portion was considered to be around 7.50 m along with Water current of 3 to 5 m/sec. The pressure due to water current was then evaluated. Concrete pressure during concreting of well curb was also evaluated. Therefore, considering maximum of the two, the Design pressure was considered.

(i) External Plate –

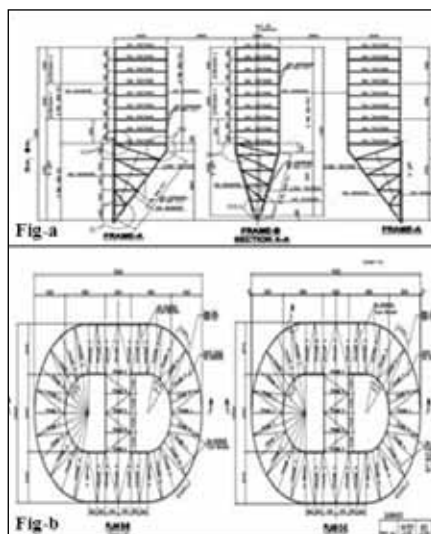
Suitable plate of 8 mm Thickness was found to be suitable, considering the maximum size of the panel, Bending stress and Deflection within permissible values.

(ii) Vertical Angle –

Maximum Pressure on vertical Angle was considered to be 0.75 kg/cm², keeping in view the Spacing of Vertical angle, Length of Vertical Angle & B.M. Since effective Width cannot be more than spacing between angles, Properties of Angles, Properties of combined section was checked for Permissible Bending Stress & Maximum Bending Stress.

3.1.1.2 Check for vertical frame during sinking condition

During sinking of well, the caisson was subjected to earth pressure from outside and concrete pressure from inside. Thus, the pressures would be balanced and the vertical frame was not



(Refer Fig 9 a & b).

subjected to any additional pressure. From the above, it was concluded that, the vertical frame angle ISA 90x90x8 @ 1374 mm c/c was safe in floating condition / sinking as land based well, due to proper bracing with other vertical frames as well as planned bracing at appropriate spacing

3.1.2 Review of Design of Tethering Arrangement for Floating Caisson

Since wells constructed by Caisson method of this bridge was located in relatively deep water channel of the river, it was proposed to use floating caisson for construction of these wells. Caisson of certain height ('K' lift) was to be fabricated and assembled in the fabrication yard on bank of the river. This caisson will then be floated into the river. The caisson will then be towed to the location of foundation and will be aligned at the exact location. The caisson will be held in position by suitable tethering arrangement. Concrete will be placed inside caisson in lifts as given in construction sequence drawing. The caisson will get submerged in the water upto certain height. Next lift of the steel caisson will then be built and concrete will be poured in the caisson. In this manner the caisson will be built till the cutting edge reaches the bed level. During the stage when cutting edge reaches the bed level, caisson will be secured in position by using wire rope connected to floating buoy. The Design

for tethering arrangement of floating caisson were done by evaluating the following:-

3.1.2.1 Water Current Force: It was Calculated, considering the max. design stream velocity = 5 m/s (assumed during Iwl condition) & pressure due to water current. Based on this, the no of tethering arrangement, force in each wire rope & force in inclined wire rope were evaluated.

3.1.2.2 Wind Force: It was Calculated, considering the basic wind speed =50 m/sec, designed wind velocity & pressure due to water velocity. Based on this, no of tethering arrangement, force on each wire rope, force on inclined wire rope was evaluated.

Subsequently the total force on each Wire rope and its design force were evaluated.

3.1.2.3 Design of Wire Rope

- Main wire rope force was checked, with steel core wire rope as per IS:2266:2002, considering the breaking load and factor of safety.
- Force from three sheave pulley to double sheave pulley, was checked considering the force, no of wire rope, load on each wire rope with steel core wire rope as per IS:2266:2002, breaking load and factor of safety.
- Force from single sheave pulley to E – bolts were checked, considering the force, no of wire rope, load on each wire rope with steel core wire rope as per IS:2266:2002, breaking load and factor of safety.

The design of tethering arrangement had been revised, considering all the parameters including the unprecedented water flow in an angular direction also. The tethering arrangement was modified (Refer Fig 10), amongst which the most significant changes were:

- In place of 32mm dia sling 52mm dia sling were used
- Number of winch brackets had been increased. Additional three winches had been placed on the boulder crate of launching apron of guide bund for P2, this helped in handling

of caissons during unprecedented rise in water flow of the current.

- In U/S side, nos. of anchor was also increased from 3 nos. to 6 nos.

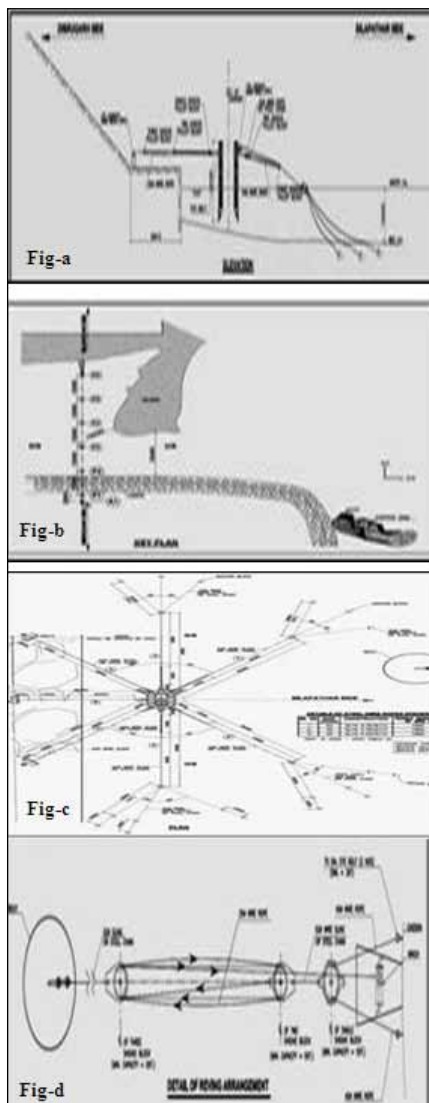


Fig-10 (a, b, c & d): Modified Details of Tethering arrangement of Caissons

Revised tethering arrangement by using 52mm dia wire rope in place of 32mm dia wire rope and 40mm dia wire rope in place of 25mm dia wire rope are shown in Fig:11. Fixing of winches from ground anchors are shown in Fig: 12.



Fig-11: Revised tethering arrangement of Caisson



Fig-12: Revised winch arrangement from ground anchor

3.1.3 Review of Design of Anchor Block

The Design was based on total force, volume of block, total density, weight of one anchor block, buoyant weight, nos. of anchor block in one buoy & force in one anchor block. After computing the Vertical Component of Tensile force & Resultant Forces in Each Anchor Block, the Total Forces in Each Anchor Block were calculated. The anchor was of concrete anchor of drag embedment type. The anchor holding power was generated due to penetration of anchor in the river bed creating

a heave of mass of soil resulting in the passive resistance of soil. The anchor efficiency was derived as per BS-6349 Part-6-1989 that is by dividing Anchor Holding power by anchor mass in air. As per BS-6349 Part-6-1989, the Anchor efficiency for stock anchor in poor to Good soil is 5 (Average of 5 & 10). Based on this the anchor holding power with factor of safety was calculated and checked.

3.1.4 Revised Methodology Adopted for Caisson Foundations

The methodology for fabrication and erection of caisson had been revised to minimize the time of execution. Accordingly the Caissons in Modules were pre fabricated. Fabrication of K-lift ($5.1\text{m} + 1.6\text{m} = 6.7\text{m}$) and required Modules of 2.4m height in the fabrication yard were executed during the monsoon period. Prefabricated Modules of Caisson were shifted at Launching Bed after cutting in segments as per pre approved cutting plan. Reassembling of Caisson Modules at Launching Bed up to 6.7m was done.

Floating and placing the Caisson at location with the help of wire ropes & pulley as per tethering arrangement drawing were executed. Target had been kept for Caisson Floating in November'10. Addition of required pre fabricated modules and placing of stage wise concrete as per sequential drawing of Grounding were done. Grounding the Caisson were done as per drawing. Target was kept for grounding the caissons by 15th Jan' 2011.

3.1.4.1 Revised Methodology for Fabrication of Caisson.

Fabrication & erection of caisson were done at Fabrication Yard. Bending of the ISA 200X200X20 by Hydraulic Jack in required radius into 8 pieces (5565mm long 6nos. for curve portion & 5700mm long 2nos. for straight portion) were done (Refer Fig: 13)



Fig-13: Bending of the ISA 200X200X20

Placement of the bent angle and straight angle as per drawing over the already made pedestals at yard as per drawing were done. (Refer Fig: 14)



Fig-14: Placement of the bent angle

Fixing and welding of 8mm thk. outer skin plate upto 0.8m height throughout the outer portion, Fixing the 20mm thk. & 450mm wide outer plate as per drawing & fixing the inner skin plate up to 0.575m throughout were done. Fixing all stiffeners at the bottom and all overhead welding at the bottom were completed (Refer Fig: 15)



Fig-15: Fixing and welding of 8mm thk. outer



Fig-16: Fixing the diaphragm angle



Fixing of inner & outer skin plates in layer up to 5.1 m. height throughout along with diaphragm portion, including fixing of Hoop angles and cross bracings with the skin plates were done. (Refer Fig: 18)



Fig-18: Fixing of inner & outer skin plates & Hoop angles

For extension of 1.6 m (Module-1) Frames were fabricated in fabrication yard followed by erection and alignment of the frames over the curb of 5.1m height. Welding of the frames temporarily with curb frames was done. Placing the hoop angles, cross bracings as per drawing and welding the same with frames were done. Placement

and alignment of the inner and outer skin plates in position and welding temporarily with bottom plate of well curb were done. Other welding like skin plates with vertical frames & hoop angles are then completed. Complete welding of caisson up to K-Lift (5.1+1.6m), except the joints where caisson will be cut for making pieces for shifting were done. Fabrication and erection

offurther required Modules at fabrication yard were then executed. (Refer Fig: 19)



Fig-19: Fabrication and erection Modules

Cutting of the Modules as per cutting plan were taken up after appropriate numbering (Refer Fig: 20)

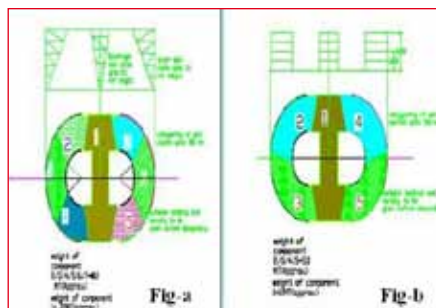


Fig-20 (a & b): Cutting Plan of Prefabricated Caisson

Cutting of Caisson being done (Refer Fig: 21)



Fig-21: Cutting of Caisson in Modules

Lifting of Cut Piece (1.6m Height) & Lowering and stacking the pieces appropriately at yard were done. (Refer Fig: 22)



Fig-22: Lifting of Cut Piece of Modules

Cutting of the Curb (5.1m) portion as per cutting plan after suitable numbering were executed. Lifting of Cut Piece (Well Curb) were then done (Refer Fig:23)



Fig-23: Lifting of the Curb (5.1m) portion

The top module i.e. Module-3, were cut after appropriate numbering and the same were stacked with the help of Crane. In the same way the Module-2 and Module-1 was cut and stacked. Subsequently, required nos. of Modules were fabricated, cut as per cutting plan, dismantled & stacked in the same manner before shifting to the location.

Suitable cross bracings, stiffeners for strengthening, lifting hooks were also provided in all components before dismantling. Shifting of Pre-Fabricated Caisson Module by Trailer were done thereafter (Refer Fig: 24).



Fig-24: Shifting of Pre-Fabricated Caisson Module

Coffer Dam for Launching of Caisson were made. Location was selected after conducting thorough survey and considering the depth of water along the towing route. (Refer Fig: 25)



Fig-25: Coffor Dam for Launching of Caisson

Erection of Caisson at Launching Bed were done. The pieces of Module-1 were placed as per pre marking at erection platform, followed by alignment and leveling the pieces perfectly. Welding of the vertical & other joints temporarily were done. Placement of the pre fabricated frames of Module-2 (3.2m) over the Module-1 were then done. Welding of the frames temporarily with Module-1 frames were executed. Placing the hoop angles, cross bracings as per drawing and welding the same with frames was done. Placement and alignment of the inner and outer skin plates in position and welding temporarily with bottom plate of Module-1 were then done. Other welding like skin plates with vertical frames &

hoop angles were then completed. In the same manner Module-3 (3.2m) were erected above Module-2. (Refer Fig: 26)



Fig-26: Erection of Module

Two Cranes were placed at suitable position for Floating/ Launching of Caisson (Refer Fig: 27)



Fig-27: Cranes being used for Floating/ Launching of Caisson

Grabbing from inside the dredge hole and as well as from outside the caisson were executed. Sinking the caisson as per reqd. draft for Floating/ Launching of Caisson were done. Dismantling of coffer dam to allow water to enter in the assembly area of Caisson were then executed. Grabbing continued till the caisson floated into water. (Refer Fig: 28)



Fig-28: Grabbing inside the Caisson for Floating into the water

Caisson was towed to location with three nos. of high power Tugs (Refer Fig: 29)



Fig-29: Caisson being towed to location

3.1.4.2 Grounding Sequence of Caisson

150 t concrete were uniformly placed in curb portion. Additional lifts were built up, Reinforcement was extended, winches were lifted and concreting was done after checking the bed levels. This process continued till the caisson reached nearer to bed level. During the last stage, the free board was kept minimum 5m and C.E atleast 0.5m above bed level. (Refer Fig: 30)

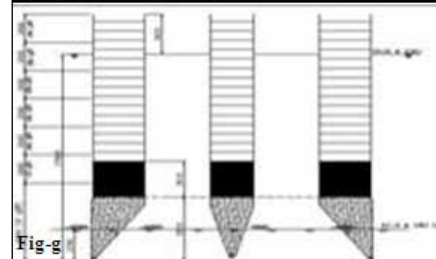
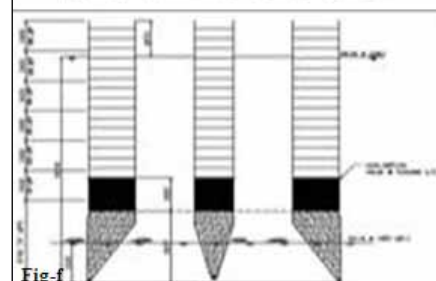
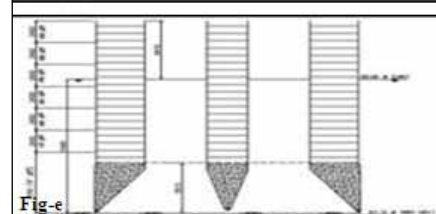
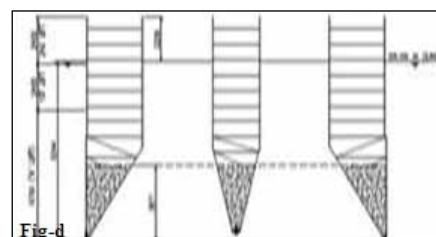
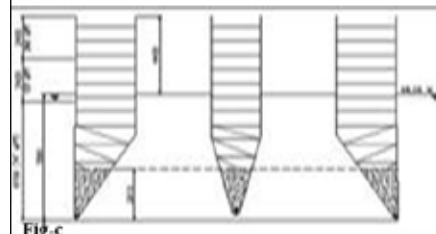
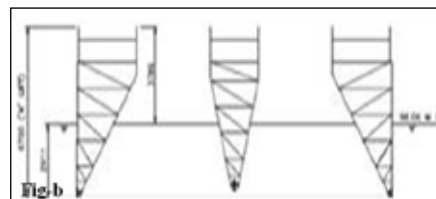
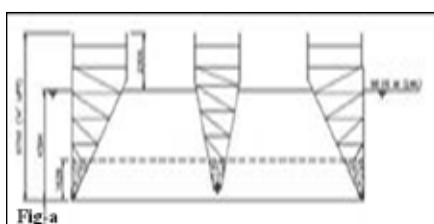


Fig- 30 (a, b, c, d, e, f & g): Grounding Sequence of Caisson

As the cutting edge reached near to Bed, the preparation of grounding were started. Bed level was checked and necessary grabbing done for leveling the bed. Sand bags were dropped around the caisson to prevent scouring. Tremie with hopper (7 Nos) were placed in position for concreting. The alignment of Caisson

was checked by total station placed in pre established control points. Caisson was ready for grounding. Concrete was poured continuously and faster. Caisson started to sink down and the C.E reached below the bed level. Caisson Modules were added further, concrete was placed and sinking done until the Caisson reached up to safe gripping length. In the above operation, the alignment of Caisson was checked in every half an hour by total station and control points. The final adjustment of alignment was done with the help of winch arrangements.

Concreting by using Crane & Bucket were executed. (Refer Fig: 32)

Initially concrete was poured at caisson by Crane & Bucket method to prevent tilting in floated condition. 7 nos. of Tremie pipes were attached with the Hopper from the top of Caisson. During concreting necessary care were taken to prevent Tilting of Caisson.

In all stages the free board was kept not less than 2.0m. After Caisson reached the safe grip length (Minimum 1/3 of total depth of water), concreting was done up to the top of Caisson and all tethering arrangements were removed.

Erection of Further Modules at Location were done (Refer Fig: 31)



Fig-31: Erection of Further Modules at Location

Total fabrication and erection involved in P2 Caisson was 390 t (40.3m ht.) & for P3 Caisson was 225 t (21.9m ht). Time cycle of 7 days was achieved for a 2.4m lift module including erection, fit up, welding, reinforcement fixing, winch lifting and concreting, whereas in earlier season it took 12 days per 2.4m lift.

After adopting this revised methodology, both the Caissons were successfully grounded by 30th Dec'10. Both the Caissons (P2 Caisson ht. =



Fig-32: Concreting by using Crane & Bucket

19.5m and P3 = 14.7m at the time of Grounding), were erected, floated and grounded only in 74 days saving valuable time of 53 days in comparison to earlier season

4. INITIATIVES TAKEN IN CUTTING EDGE CONSTRUCTION

4.1 Cutting edge fabrication & erection methodology adopted in 2010-2011

Cutting edge used to be fabricated at fabrication yard up to 1.0 mtr height. (Refer Fig: 33)



Fig 33: Cutting Edge Fabricated up to 1.0 mtr. height

4.2 Cutting edge fabrication & erection methodology adopted in 2011-2012

Cutting edge were fabricated at fabrication yard up to the required height (i.e. 2.0 m). (Refer Fig: 34)



Fig 34: Fabricated Cutting Edge height up to 2.0 mtr.

Fabricated Cutting edge were then cut in 7 pieces as per cutting plan and then shifted to location and erected with the



Fig 35: Erection of Fabricated Modules of Cutting Edge

The Cutting edge modules were then shifted to location by Tugger (Refer Fig: 36)



Fig 37: Erection of Cutting edge modules at location

Erection of Cutting edge modules at location were then done (Refer Fig: 37)



Fig 38: Cutting edge modules erected

Cutting edge Modules were erected up to 2.0 m height at location. (Refer Fig: 38)



Fig 39: Cutting edge erection completed

Erection of Cutting Edge was then completed. (Ref Fig: 39)

4.3 Detailed break up of Time saved due to Revision in Methodology:-

After adopting this revised methodology, successful fabrication

& erection of each cutting edge in only 10 days was achieved and a time of 15 days was saved in comparison to earlier season.

5.CONCLUSION:

Since limited working season is available for executing work in river Brahmaputra, the primary objective was to minimize the time of execution to fullest extent.

Innovative technical solutions on one hand and creative time saving techniques on the other hand are twin key success factors when it comes to bridging rivers vulnerable to unpredictable flash floods, heavy siltation and tendency to change the course all of a sudden.

Gammon team developed innovative engineering solutions derived, in executing the Caisson foundation & fabrication / erection of cutting edge at location in

mighty and ferocious River Brahmaputra resulting in substantial reduction of time of execution by over 40% for caisson foundation & by over 60% for fabrication & erection of cutting edge at location.

The successful completion of this highly complex project of North East Frontier Railway will not be, just a routine completion of bridge, but the execution of this bridge, especially the revised & innovative methodology adopted in executing the Caisson foundation & fabrication/ erection of cutting edge at location in mighty and ferocious River Brahmaputra, certainly exhibits the success story of meticulous designing, planning & execution at all levels.

Gammon is proud to be associated with this Bridge, which on completion will fulfill a long cherished dream of the people on both sides of the river, especially the

districts of Dhemaji, Lakhimpur & Dibrugarh of Assam and also the neighboring State of Arunachal Pradesh.

Enhancing the beauty in Upper Assam's landscape, this aesthetically pleasing bridge serves to be an example of the best civil Engineering structure of the day. The success story of this bridge proves that "All Construction Bottlenecks, however difficult they may be can be won by innovative Engineering Solutions"

REFERENCES

1. N F Railway's GAD & Cross Section Elevation Drawing of Bogibeel Well Foundation & Substructure.
2. Inputs from Design Department of Gammon.
3. Inputs from project Site of Gammon

Twenty Five Life Transforming Powerpacked Quotes

- M. U. Shah

History has witnessed several radical transformations of lives like robber Valmiki becoming great Saint Valmiki or a poor farmer's son (Abraham Lincoln) becoming a President of USA inspite of repeated failures or an ordinary matriculate person becoming a greatest inventor (Thomas Alva Edison) or an ordinary farmer becoming a billionaire. What triggered such transformations? In many cases a small piece of advice or little coaching trigger such transformations.

Here is a precious collection of such powerpacked Quotes from the greatest and most successful human beings of the world who are speaking based on their personal experiences. These quotes have in them power to transform our lives. Packed with dynamite kind of life transforming power in them, these quotes are worth their weight in gold.

Consider reading these Quotes and if convinced, consider implementing these in your life and you will see a radical transformation in your attitude, your health, wellbeing and wealth and once this positive spiral is triggered, no one can stop you from reaching at the top in hierarchy - whatever may be your field of endeavor.

| | |
|----------|--|
| Attitude | 1. "The greatest discovery of our generation is that human beings can alter their lives by altering their attitudes of mind." - William James of Harvard University. |
| | 2. "We cannot change our past... we cannot change the fact that people will act in a certain way. We cannot change the inevitable. The only thing we can do is play on the only one string we have, and that is our attitude. I am convinced that life is 10% what happens to me and 90% of how I react to it. And so it is with you... we are in charge of our Attitudes." - Charles R. Swindoll |
| | 3. "A man who is self-reliant, positive, optimistic, believes in himself and undertakes his work with the strong desire for success, magnetizes his condition. He draws to himself, the creative power of the universe." - Dr. Norman Vincent Peale |
| | 4. "The greatest day in your life and mine is when we take total responsibility for our attitudes. That's the day we truly grow up." - John C. Maxwell |
| Faith | 5. "If ye have faith...nothing shall be impossible unto you." - Jesus Christ |
| | 6. "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" - Dr. Norman Vincent Peale |
| | 7. "If you think you can or if you think you can't, you are right in either case" - Henry Ford |



| | |
|-------------------|--|
| Goals | 8. "Get going. Move forward. Aim High. Plan a takeoff. Don't just sit on the runway and hope someone will come along and push the airplane. It simply won't happen. Change your attitude and gain some altitude. Believe me, you'll love it up here at top." - Donald Trump |
| | 9. "A Goal casually set and lightly taken is likely to be freely abandoned at the first obstacle itself." - ZigZiglar |
| Hard Work | 10. The average person puts only 25% of his energy and ability into his work. The world take off its hat to those who put in more than 50% of their capacity and stands on its head for those few and far between souls who devote 100%. - Andrew Carnegie |
| | 11. "I would like to work half a day. I don't care if it is first twelve hours or second twelve hours" - Kammons Wilson, CEO, Holiday Inn. |
| Excellence | 12. "The quality of a person's life is in direct proportion to their commitment to excellence regardless of their chosen field of endeavor". - Vince Lombardi |
| | 13. "If a man is called to be street sweeper, he should sweep streets even as Michelangelo painted or Beethoven composed music or Shakespeare wrote poetry. He should sweep streets so well that all the hosts of heaven and earth will pause to say, here lived a great street sweeper who did his job excellently". - Martin Luther King, Jr. |
| Responsibility | 14. "Responsibilities gravitate to the persons who can shoulder them". - Elbert Hubbard |
| | 15. "The price of greatness is responsibility". - Winston Churchill |
| People Management | 16. "I will pay more for the ability to deal with people than for any other ability under the sun". - John Rockefeller |
| | 17. "You can buy a man's time, you can buy man's physical presence, you can buy a measured number of skilled muscular motion per hour, but you cannot buy initiative, enthusiasm, devotion or loyalty - you, as a leader, have to painstakingly earn these" |
| Criticism | 18. "When I am tempted to criticize I will bite on my tongue; when I am moved to praise I will shout from the roof tops." - O G MANDINO |
| | 19. "Criticize the performance; not the performer." - ZigZiglar |
| Art of Giving | 20. "We cannot help ourselves without helping others. We cannot enrich our lives without enriching others. We cannot prosper without bringing prosperity to others". - Janette Cole, Spellman College |
| | 21. "No person was ever honored for what he received. Honour has been the reward for what he gave." - Calvin Coolidge |
| Success | 22. "Most people fail not because of lack of ability or intelligence but because of lack of desire, direction, dedication and discipline". - Shiv Kherra |
| | 23. "Success doesn't mean the absence of failures; it means the attainment of ultimate objectives. It means winning the war, not every battle". - Edwin C. Bliss |
| Paradigm Change | 24. "Usually the first problems you solve with the new paradigm are the ones that were unsolvable with the old paradigm." - Joel A. Barker |
| | 25. "How many centuries did it take for us to discover that the caterpillar and the butterfly were the same entity? We spend most of our lifetimes like a caterpillar struggling to survive, and only thinking of our immediate needs. The metamorphous which we undergo is extremely painful, but unless we endure the metamorphous, we will remain as caterpillars. When we live with our souls, we are like a butterfly, gliding above the ground and enjoying the true beauty of the world." |



Gammon's Contribution in 4th fib Congress 2014

City of Mumbai witnessed a mega technical event in February, 2014. The 4th fib congress was hosted in Mumbai from 10th to 14th February, 2014. (Fédération internationale du béton / International Federation of Structural Concrete). This honour was bestowed on India second time after 1986.

Gammon participated as a Silver sponsor for this prestigious event. The main theme of this congress was to achieve sustainability, Eco-friendliness and energy conservation in use of structural concrete so that quality and longevity are improved

There were around 275 non-technical papers presented in this congress, Gammon submitted and presented nine papers in the Congress – highest by any single organization. These papers were well received and applauded. The papers were presented by Mr. Rajesh Patel, Mr. Manish Mokal, Mr. R.K. Mehta, Mr. V.K. Rane and Mr. Ekhlakh Khan. Mr. Anupam Das' paper on Bogibeel Bridge was presented by Mr. V.N. Heggade while Mr. Amal Bhattacharya's paper on KMRC project was presented by Mr. A.Y. Mahendrakar as they could not attend the Congress due to their professional occupation.

Mr. Sanjay Kapoor, Mr. P. Y. Manjure and Mr. Sunil Dangar from FPCC (a Gammon Group Company) also attended the Congress and Mr. Manjure presented couple of papers.

Mr. Heggade, Member Board of Management, who was key member of the Scientific Committee and Organizing Committee for this flagship event, apart being Master of Ceremony for inauguration function, chaired 4 sessions while Technical Director of Gammon, Mr. M.V. Jatkar had the opportunity to chair some of the very important sessions on improving performance of concrete structures.

The Congress was well attended by around 300 foreign delegates consisting of academicians, researchers, designers and contractors, apart from around 350 Indian delegates from all over the country.

Gammon has been traditionally the supporters of IABSE, FIB in the country in line with the theme "technology seeks expression". Gammon's participation in fib Congress 2014 is noteworthy especially when the infrastructure industry is going through turbulent times and in fact is a testimony of our CMD, Mr. Abhijit Rajan's continued commitment to keep Gammon a frontrunner in technology development.



TRAINING REPORT

Derek Bok once said, "If you think training is expensive, try ignorance."

After a hiatus, the Training & Development activity resumed in August 13 in a big way in Gammons. We mostly relied on internal expertise as training faculty and used video conferencing facility for simultaneously delivering the sessions at multiple sites/ locations. Keeping in mind the business needs most sessions were Technical Training and few were Functional sessions.

Since Sept'13, Monthly Training Calendar is being published on the intranet & the same is circulated to all Project In charges on regular basis for inviting participation

In addition to the training programs, regular induction for new joiners has also been resumed.

The table below captures the statistics about number of programme conducted, its beneficiaries and man-hours invested.

| Sr. No | Month | Sessions Conducted | Participant coverage | Monthly Man-hours |
|-----------------|--------|--------------------|----------------------|-------------------|
| 1 | Jan'14 | 9 | 157 | 740 |
| 2 | Feb'14 | 9 | 119 | 435 |
| 3 | Mar'14 | 12 | 187 | 1125 |
| Q4 Contribution | | | 463 | 2300 |

Some of the popular sessions are listed below:

- Quality Control during Production & Placement of Concrete.
- Statutory Compliance for Labour Laws.
- IMS SMR Auditor Training
- Mind Maps - A Powerful approach.
- Basics of Design, Construction Planning & Methods for Bridges. Part II.
- Induction.



We Shall Overcome.....

Are you frustrated? Are you feeling Low? Do you feel like fighting against whole system and radically changing it but not able to make even a start?

Then close your fist tightly and chant aloud, "We Shall Overcome"

We shall overcome
We shall overcome
We shall overcome some day
Oh, deep in my heart, I do believe
We shall overcome some day

We'll walk hand in hand
We'll walk hand in hand
We'll walk hand in hand some day
Oh, deep in my heart, I do believe
We'll walk hand in hand some day

We are not afraid
We are not afraid
We are not afraid some day
Oh, deep in my heart, I do believe
We are not afraid some day

We shall all be free
We shall all be free
We shall all be free some day
Oh, deep in my heart, I do believe
We shall all be free some day

We'll live in peace
We'll live in peace
We'll live in peace some day
Oh, deep in my heart, I do believe
We'll live in peace some day

We shall overcome
We shall overcome
We shall overcome some day

हम होंगे कामयाब

होंगे कामयाब, होंगे कामयाब
हम होंगे कामयाब एक दिन
मन में है विश्वास, पूरा है विश्वास
हम होंगे कामयाब एक दिन।

हम चलेंगे साथ-साथ
डाल हाथों में हाथ
हम चलेंगे साथ-साथ, एक दिन
मन में है विश्वास, पूरा है विश्वास
हम चलेंगे साथ-साथ एक दिन।

होगी शान्ति चारों ओर, एक दिन
मन में है विश्वास, पूरा है विश्वास
होगी शान्ति चारों ओर एक दिन।

नहीं डर किसी का आज एक दिन
मन में है विश्वास, पूरा है विश्वास
नहीं डर किसी का आज एक दिन।

Shropshire. This was published in People's Song magazine in 1948. This song was made immortal by Pit Singer and since then, it is widely used exclusively to inject inspiration when going gets tough.

Each nation has got its national anthem but this is the only song used across nations for inspirational purpose. Late Martin Luther King is accredited with success of movement of African people in America during 1955 to 1968 but equal credit goes to this song also. We can imagine the magnitude of vibration created when over 3 Lakh people with their fist in air, jointly sing this song under the leadership of Martin Luther King.

When sung with sincerity, this revolutionary song is capable of rejuvenating all your veins by circulation of hot blood.

All of us are capable of achieving much more than we normally achieve. This song can shake you up and unleash your potential to its fullest by activating latent capabilities. This song can serve as a catalyst and generate necessary will power and zeal for success.

This is one of the most inspiring songs in the history of mankind. Who composed this song is not known but in olden days it was used in prayers of Jesus.

In 1901 Rev. Charles Albert Tindley took copyright of similar looking song.

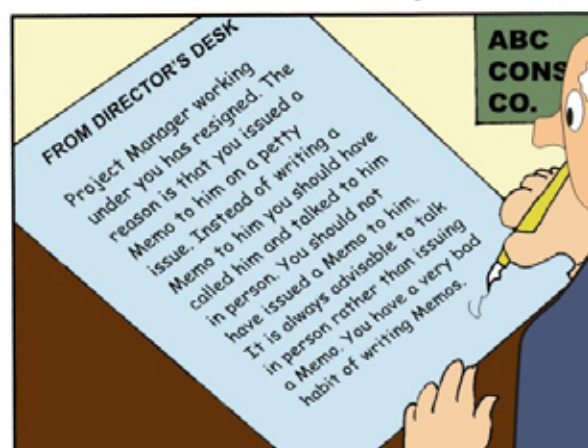
The composition in its present form was claimed in 1930 by Luise

Pencil sketch of Gate way of India (Foundations done by GAMMON)

- Jairaj Chetas Desai



ENGINEER SAID IT... By M.U.SHAH





SERIOUSLY, LAUGHTER IS THE BEST MEDICINE

Concrete Facts about Salary Revisions and Increments in a Construction Company !!

Comes the month of January and employees start dreaming about salary revisions and increments. However, amidst divergent views and various pushes and pulls, deciding about salary revisions and increments in a Construction Company is always a tricky issue.

Sometimes back one major Construction Company thought of revising salaries of its employees. Since every time after revisions in salaries there were comments/criticisms etc., this time the Chairman thought he should obtain views from his Senior Executives beforehand prior to taking a final decision about salary revisions and increments and accordingly the Chairman started the process of consulting Senior Executives.

EXECUTIVE No. 1

The Chairman started the consultation process with his senior most Executive who had spent over four decades in the Company.

The Chairman said to him, "We are thinking about revising the salaries and giving increments. What do you think we should do? What should be the quantum of increments according to you?"

He replied, "It is good that you have started consulting me! As regards increments, in fact I joined this Company only because I was impressed with the way the company recognized the performance and gave the increments. I was working with Government Department where this Company was a contractor. Once, the then Chairman came to site for a routine visit. Impressed by good performance of one site Engineer, he gave him on-the-spot increment during the round of site. Nothing was available to write instructions, so he used a cigarette pack and wrote a note to Personnel Dept. on the back of cigarette pack. I thought if this is how this Company recognizes the performance and gives increment, I

must join this Company and that is how I landed in this Company. Of course four decades have gone but I am yet to see any cigarette pack!! History and my personal grievances apart, there are many deadwoods in the Company. We must remove them first before we talk of increments"

The Chairman was hurt by the taunts but the taunts apart, he was not sure what to derive from this reply.

EXECUTIVE No. 2

Then the Chairman went to another equally Senior Executive whose USP was contractual claims. He said, "Only those who successfully pursue contractual claims with clients (i.e. likes of Mr. and Mr.) should be considered for increments."

The Chairman was unable to appreciate the above comment.

EXECUTIVE No. 3

Then the Chairman went to another Senior Executive (who is vocal having strong opinions and who had diverse exposure to other construction companies) with the hope that he will get definite answer from him. He replied, "Everyone including Contracts Managers completely ignore technical issues. As I have been repeatedly bringing to your kind notice, the Company is losing crores of Rupees on account of negligence on these issues. If they pay attention to these issues, we will have enough money for increments. However there are two outstanding performers who listen to me and are prompt in implementing all of my directives and whatever I minute during my site visits. They must be encouraged, uplifted and promoted apart from handsome increments."

Still the Chairman was clueless.

EXECUTIVE No. 4

Then the Chairman went to another senior Executive thinking that he will get answer from him. He said "Let us first talk about what employees are bringing on table. None of the projects of the Company, in the last two decades, have given to the Company contribution that was estimated in the tenders. Invariably there is an erosion of contribution and that too by wild margins. Unless there is productivity improvement, there are cost control measures in place, audit compliances based on reports of Company's internal auditors improve, tendered contributions are protected, how can we talk about increments?"

EXECUTIVE No. 5

Then the Chairman went to yet another Executive who said, "If we want to give 10 % increments, at least 10% of non-performers need to be removed so that cost burden in post-increment scenario is neutralised by this removal. Also those who have business like acumen with commercial sharpness must be incentivized based on performance related criteria rather than general increments."

EXECUTIVE No. 7

Then the Chairman went to yet another Executive. He said in his typical vernacular ascent, "I don't agree with Mr."

The Chairman said, "How do you know what Mr. has opined?"

The Executive replied, "Whatever it is but I don't agree with him !".

EXECUTIVE No. 8

Then Chairman went to another Senior Executive, who said, "Employees who keep plant running – by whatever

means - even if it is by cannibalizing so be it, must be recognized".

EXECUTIVE No. 9

By now the Chairman was becoming restless. Since he didn't get any clue so far, he decided to consult his second line Executives and went to one of his most obedient Executives who is affectionately known by his initials rather than his name.

The Chairman said, "I think we should give good increment this year."

He replied, "I agree with you, Sir"

The Chairman said, "But if you see overall economic situation in the country and also globally, on second thought, there is a case for skipping increments this year."

He replied, "Absolutely, Sir. I was about to tell you exactly the same thing, Sir. I fully agree with you, Sir"

EXECUTIVE No. 10

Then the Chairman went to yet another Executive who said, "Our Organisation is facing three problems:

1st problem is TIME OVERRUN

2nd problem is TIME OVERRUN

3rd problem is TIME OVERRUN

Unless we eliminate all the three problems mentioned above, how can we think about salary revisions?"

EXECUTIVE No. 11

Then Chairman approached another Executive who said, "Unfortunately we are operating at level which is far below breakeven level. Firstly we must start operating above breakeven level. If we do so, many of our problems will automatically get resolved and our paying capacity will increase by leaps and bounds"

EXECUTIVE No. 12

The Chairman was annoyed by now as he was not getting any specific answer

from any of his trusted persons and hence he thought of asking Executives who have just retired and volunteered to help the organization and continued their service and asked the most neutral gentleman of the organization. The answer came but after a big pause, "It is a good idea. Let us take the stock of the situation and review what we have done in the last ten years, Who are the outstanding performers, what are their qualifications, what are their value additions etc. We should not hurry up but go step by step so that proper revision can take place. Let this exercise takes its time...."

The Chairman could not wait any further.

EXECUTIVE No. 14

The Chairman then went to the next room to a person who is very vocal and frank in his opinion. The same question was repeated to him.

He replied, "In my tender estimates, I always allow 10 % increments but if you look at the strength of staff at site, the same is far in excess of what is allowed in tenders".

EXECUTIVE No. 15

Chairman went to yet another Executive, who, kicking the ball back in Chairman's court, said "In the context of overall position of the Company, keeping in view HR, legal and other angles, you may take appropriate call."

EXECUTIVE No. 16

Then the Chairman went to another Executive, who said "I will definitely look in to this and come back to you next fortnight."

HR EXECUTIVE

Then the Chairman went to HR Executive, who said "If you look at salary structure of other construction companies, we are paying '**competitive salaries**'. I have always been upgrading salaries and making it '**competitive**'. If up gradation is required, I would be the

first person to tell you"

I had come to HO after spending most part of my life in small towns so I did not understand this at that time but later on, after spending a decade in HO, I realized that when he says that he is paying '**competitive salaries**' what he meant was that to make our Company '**competitive**' he pays less salaries to our employees than '**competitors**' which he himself confirmed recently when I met him.

This exercise took lot of time. Meanwhile employees are guessing as to what each of Senior Executives might have recommended in closed-door consultation and what would be the magnitude of the increments that may be finally approved. In fact in whole office the only topic under discussions, whether in lobbies or corridors or canteen, was salary increments with varying levels of expectations building up.

FINANCE EXECUTIVE

Lastly the Chairman went to Finance Executive. He replied, "As I am repeatedly harping, there is a severe drain on EPC division of our Company because of subsidiary and associate Companies. We must firstly plug this draining. Secondly I think we should work out allocable surplus profits. Definitely employees deserve a portion of profits. Having worked out allocable surplus profits, we should throw equivalent currency notes high up in the air. Whatever comes down remain with the Company and balance, I strongly suggest, should be definitely distributed to employees!"

The Chairman returned to his cabin and said, "I wish I consulted only Finance Executive !!!"

P.S.: All the characters portrayed in this humour article are fictitious. Resemblance to any person living or dead is purely coincidental. This is not withstanding that some of the quotes above might sound familiar with some of the signature statements (तकिया कलाम) we come across.

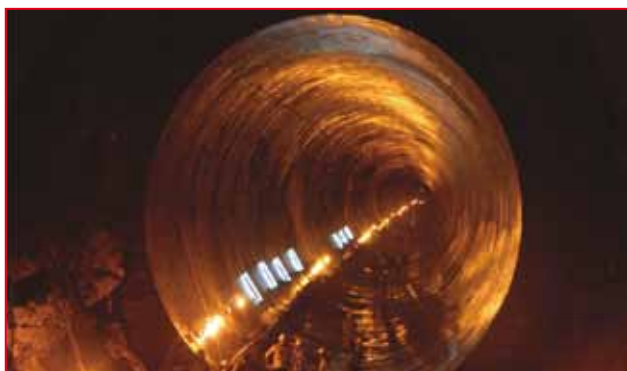
WORKS IN PROGRESS



275 m Chimney at Raghunathpur



ESP and Boiler at Pravara Power Project



Concrete lining at Bhutan HEP



Submarine tunnel under the sea for sea water intake at Kalpakkam



NDCT at Krishnapattanam, AP.



Ventilation Stack at Kalpakkam



A Million thanks to our **ESTEEMED CUSTOMERS**



NEWS FLASH FROM PROJECTS

1. Inauguration of Wazirabad approach

Eastern side Wazirabad approach popularly known as Khajuri khas Flyover which is the part of Gammon's *Signature Bridge* Project in Delhi was inaugurated & Opened for traffic by Mr. S. K. Shrivastav – Chief Secretary – Government of Delhi on 1st March 2014.



2. Completion of Concrete Shell for NDCT.

Gammon's Project Team at GMR-Raipur had successfully completed the concreting of first 165.3 m tall Natural Draught Cooling Tower Shell (NDCT-1) at 2 x 685 MW GMR Raipur Power Project for GMR Chattisgarh Energy Ltd, Raipur with remarkable Quality, Safety & Shell Profile on 10th February, 2014.



3. Completion of Civil Works at Rampur Hydro Project.

Gammon's Project Team at Rampur Hydro Project successfully completed all the Civil Works for the Rampur HE project and handed over to the Project Authorities (SJVN) on 23rd February 2014. The first Unit Spinning is commissioned by from 27th February 2014.



4. National Safety Day

As an initiative towards Safe Working Practices, National Safety day was celebrated in Gammon on March 4, commemorating the Foundation Day of National Safety Council. Various promotional & motivational events & programmes were organized across Gammon Sites & HO. The Theme for 2014 was decided as "Manage Stress at Workplaces and Control Hazards"

5. International Women's Day

On the occasion of International Women's Day, Gammon Springs organized Health Check Camp by VLCC for Ladies Employees at Gammon House.

6. Presentation in IRC

Mr. Anupam Das Presented a Paper on "Innovative Foundation Works at Bogibeel Bridge" during 74th IRC session at Guwahati.



HEAVENLY MODES OF COMMUTING !!!

- M U SHAH

A Civil Engineer and his wife died on the same day.

While Civil Engineer's wife was made to wait outside God's chamber, her husband was sent inside where interrogations are conducted and depending upon the outcomes of interrogations announcements are made by almighty God as regards eligible modes of commuting in heaven.

While waiting, she met wives of a Doctor and a lawyer.

The first to come out was a Doctor who came in a latest model of beautiful Mercedes car. He takes his lovely wife inside the car. Astonished, the Civil Engineer's wife asks the Doctor as to what questions were asked inside. The Doctor said that in reply to God's question, I said that I never had an affair either before or after my marriage and the God granted me a Mercedes car.

The second to come out was a lawyer. He came in old Ambassador car. The lawyer said that in reply to God's question I said, "I must confess, though I had pre-marital affairs but once married I was faithful to my wife and never had an affair after my marriage and the God granted me Ambassador car."

Civil Engineer's wife was moving in old Mahindra Jeep all throughout her life and hence a mere thought of moving around in Mercedes car thrilled her and she was excited like anything..

After a long wait, she saw her husband coming riding on a bicycle !!!

COMPANY NEWS

THANKS TO ESTEEMED CUSTOMERS

NDCTs & Water Pump House for
RAPP- Kota, Rajasthan
Rs. 648.39 Crores

BTG Package for
Nagai Thermal Power Plant
Rs. 134.46 Crores

Seven Stations for Kolkata Metro
Rail Line for RVNL
Rs. 338.96 Crores

WELCOME TO GAMMON FAMILY

Chief People Officer

Ramchandra Rao

Cheif Executive Officer – Shrishti

Arif Sheikh

Senior Vice President

K Lakshmi Srinivasan

Project Director

Syed Nadeem

Senior General Manager

T S Venkat Ram

Deputy General Manager

Baratbhushan Thombare

Senior Manager

Ashok Prasad Kushwaha

Shashi Ranjan

S R K Lanka Venkata

N Balakrishnan

Manager

Vinubhai Vekaria

Pravin Parasnaik

Chayan Bhowmic

Nirmalya Bhattacharjee

Goutam Paul

Kanagaraj V

M E Manimaran

Deputy Manager

Bijay Mahapatra

Rakesh Chaturvedi

Anupam Chakraborty

Nageswara Rao Reddy

Palash Palit

Alok Mathur

Anantha Kini

Chundi Gananadh

LECTURES DELIVERED

Dr. N. V. Nayak

January 24th, 2014

Delivered a lecture presentation on "Soil investigations for foundations of Nuclear Power Projects in Alluvial sites" during one day Discussion Meet on "Design of foundations for nuclear power plant (NPP) structures on alluvial sites" at Mumbai, on invitation from Atomic Energy Regulatory Board (AERB).

February 27th, 2014

Delivered a lecture during One Week QIP course on Soil Structure Interaction Using Computer and Realistic Constitutive Models at VJTI, Mumbai

RECOGNITIONS

1. Mr. Bal Krishna Shukla, (HO- Stores) Participated in Standard Chartered Mumbai Marathon 2014 and completed the same.

2. Mr. Sumit Gupta – Son of Mr. K. Gupta (HO-Marketing) participated in State Level Indian Martial Arts Championship and awarded with Silver Medal in age group of 8 to 9.

Bereavement



We regret to inform that Mr. Ramji Chopra, popularly known as R. D. Chopra who had the longest innings in Gammon India Limited, passed away in Jammu on 31st January 2014 at the age of 91 years.

Mr. Chopra joined the Company in 1938 and worked continuously in the Company for over 59 years in various positions before retiring as Chief Engineer in 1997.

He will always be fondly remembered in Gammon by one and all.

MAY HIS SOUL REST IN PEACE.

Ten Safety Resolves from Corporate Safety for 2014.

By. Sudhikumar TV, Head Safety

While celebrating the 43rd National Safety Day, it is the time to rededicate ourselves for the cause of Safety with the following 'Ten Safety Resolves' which were brought out with an earnest wish to bring 'fatalities to zero' and the other accidents to a level tending to zero.

R-1 Acceptance of "zero" deviation on Safety:

Continual efforts on this resolve can be made through Project level safety committee meetings, Safety walk throughs, inspections, induction trainings, tool box talks, 3 Q meetings, SRD reports and so on. Active support and efforts from line managements is required for implementing this.

R-2 Prevention of Single mistakes of worker – leading to accident:

We need to provide a dependable second barrier of defense at work places in the form of proper access and working platforms, safety nets, overhead protection, barricading, added specific supervision for high risk jobs to observe and correct worker practices and so on.

R-3 Visible second Level of safety protections:

The implementation of the Safety management vision at R-2 needs to be made visible at work sites by the executing agencies.

R-4 Responsibility & Accountability in Safety:

Documented matrix of responsibility and accountability of all levels in following the HO Safety Procedures need to be implemented and made visible through MoMs and other verifiable mode of communication at Site.

R-5 Compliance to accident causation theory and dominos:

Proactive actions in detecting and correcting SRDs, recording and investigating low level events, Near Misses, potential First Aid cases and minor injuries along with LTI and serious cases should be promoted in a verifiable manner at Site.

R-6 Detection of large numbers of SRDs:

Encourage and ensure that as many SRDs as possible are detected and get them corrected parallelly to achieve the safety resolve at R-5.

R-7 Near Miss Accidents (NMAs):

Added focus is required to categorize NMAs correctly. Promote and encourage reporting such incidents; correcting the situations and practices leading to such Near Miss Accidents proactively.

R-8 First Aid and Minor injuries:

It is a must that the first aid cases and such injuries are immediately analyzed for investigating the potential ones for serious injury.

R-9 Safe Access, egress and working platforms:

Provide and maintain safe access, egress and working platform.

R-10 Electrical Safety, traffic Safety and Safety with material handling:

Ensure metallic boards with double earthing, earthing to the metallic body of all electrical appliances, tools, machines, sub distribution boards and extension boards, on off switch to extension boards.





A CAPITAL EXCELLENCE

- THE *Signature Bridge* ACROSS YAMUNA AT DELHI



India's First Cable Stay Bridge with an Inclined Steel Pylon

India's first "*Signature Bridge*" being constructed by Gammon across Yamuna at Wazirabad, promises to be a great tourist attraction of Delhi, the Capital of India. This cable-stayed bridge will link NH-1 at Wazirabad on Western bank and at Khajuri Khas on eastern bank of the river Yamuna, connecting North Delhi with East Delhi.

With a length of about 575 m and a height of 175m, the proposed *Signature Bridge* would have a bow-shaped steel pylon in the middle. Two high towers will provide double cable support in the inner periphery of the carriage way. The deck will be composite (steel and concrete) while the pylon will be in steel.

Equipped with four lanes, this engineering masterpiece will have a 1.2m wide central verge, space for anchoring cables, maintenance walk way and crash barrier on either side of the central verge. Once operational the *Signature Bridge* will dramatically improve access between North and West Delhi reducing present congestion and traffic jams and will become the identity of Capital City – the way Taj Mahal is to Agra

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