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निर्मिति विश्वसुखाय

चारुतर विद्यामंडल - वल्लभ विद्यानगर
कर्मण्येवाधिकारस्ते

BRICK

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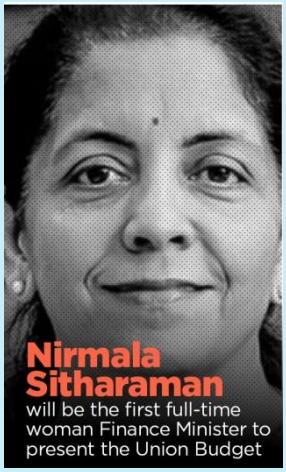
BRICK INDEX

India's first full-time woman Finance Minister Nirmala Sitharaman presented the maiden budget



The Ministry of Agriculture & Farmers Welfare has released the final estimates for 2017-18 and the first estimates for 2018-19 of area and production of horticulture crops.

The final estimates of the 2017-18, horticulture production stood at record 311.7 MT, which are 3.7 per cent higher than the previous year and 10 per cent higher than the previous year and 10 per cent higher than the past five years.

Deposits in Jan Dhan Yojana accounts crosses Rs 1 lakh crore

Deposits in bank accounts opened under Jan Dhan scheme have crossed the **Rs 1 lakh crore mark.** As per the latest finance ministry data, the total balance in **over 36.06 crore** Pradhan Mantri Jan Dhan Yojana accounts was at **Rs 1,00,495.94 crore as on 03rd July 2019.**

The PMJDY was launched on **28th August 2014,** with an aim to provide universal access to banking facilities to the people in the country.

Chandrayaan-2, India's second moon mission launched

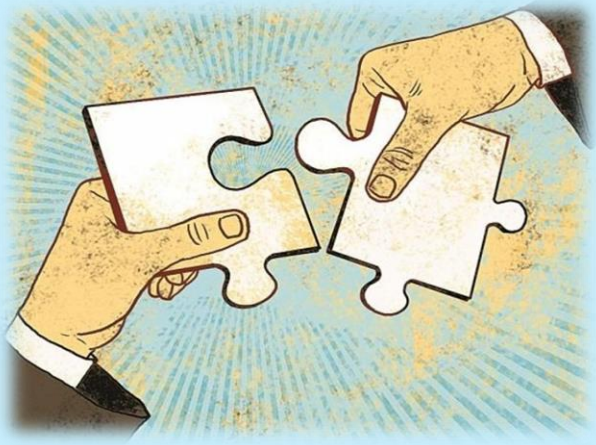
Indian Space Research Organisation has launched **Chandrayaan - 2 from Satish Dhawan Space Center** at Sriharikota. It was launched by **GSLV MkIII-M1 Vehicle at**

14:43 hours IST on 22nd July. The lander-Vikram will land near South Pole of the moon on 07th September, 2019.

President Ram Nath Kovind appointed New Governors to 10 Indian States

- **Madhya Pradesh: Lalji Tandon** will replace Anandiben Patel.
- **Uttar Pradesh: Anandiben Patel** will replace Ram Naik.
- **West Bengal: Jagdeep Dhankhar** will replace Keshari Nath Tripathi.
- **Bihar: Phagu Chuhan** will replace Lalji Tandon.
- **Nagaland: R.N. Ravi** will replace P.B. Acharya.
- **Tripura: Ramesh Bais** will replace Kaptan Singh Solanki.
- **Kalraj Mishra** as the **Governor of Himachal Pradesh.**
- **Acharya Devvrat** has been transferred from Himachal Pradesh and appointed as the **governor of Gujarat.**
- **Anusuiya Uikey** as **Governor of Chhattisgarh.**
- **Biswa Bhusan Harichandan** has been named as Governor of **Andhra Pradesh.**

Government announces Mega Merger of Public Sector Banks



Union Finance Minister **Nirmala Sitharaman** has announced a **big consolidation of public sector banks.** Under the scheme of amalgamation, **10 public sector banks** are to be merged **into four banks**. After the amalgamation, the total number of Public Sector Banks in the country will come down to 12 from 27 banks.

The amalgamation of banks will be in the following manner:

Punjab National Bank, Oriental Bank of Commerce and United Bank of India to be merged into one single bank, with business of Rs 7.95 trillion to make **India's 2nd largest bank.**

Canara Bank and Syndicate Bank are to be merged to become the **4th largest public sector bank** with business of Rs 15.2 lakh crore.

Union Bank of India, Andhra Bank and Corporation Bank are to be merged to become the **5th largest public sector bank** with business of Rs 14.6 lakh crore.

Indian Bank will be merged with Allahabad Bank to become the **7th largest public sector bank** with business of Rs 8.08 lakh crore.

66th National Film Awards

The **66th National Film awards** have been announced by **Rahul Rawail,** head of the **Jury for feature films**. The Jury unanimously conferred the **award for the Most Film Friendly State** to **"Uttarakhand"** for furthering the growth of the film industry in the state including creating an environment for ease of filming in the state.

The list of **Award winners** under the **different categories** is mentioned as under:

Sr.No.	Category	Winner
1	Best Feature Film	Hellaro (Gujarati Film)
2	Best non feature film	Son Rise by Vibha Bakshi and The Secret Life of Frogs by Ajay

		and Vijay Bedi
3	Best Director	Adhitya Dhar for Uri : The Surgical Strike
4	Best Actor	Ayushmann Khuranna for Andhadhun and Vicky Kaushal for Uri : The Surgical Strike
5	Best Actress	Keerthy Suresh for Mahanati

Article 370 and Article 35A revoked from J&K

A series of historical decisions which includes the scrapping of Article 370 & Art-35-A and the introduction of "J&K Reorganisation Bill 2019" were taken during the session of Rajya Sabha. Article 370 was providing special autonomous status to the Indian state "Jammu & Kashmir" which will be no longer applicable from today. The Constitution (Application to Jammu & Kashmir) Order 2019 made by Indian President Ram Nath Kovind was published. Once this order was tabled by the home minister, it came into force immediately and supersedes the Constitution (Application to Jammu & Kashmir) Order 1954. All the provisions related to the state of Jammu & Kashmir mentioned in the order will apply to the state. With the above proceedings, Home Minister moved a resolution in Rajya Sabha that all clauses of Article 370 of the Constitution, which gives special status to Jammu and Kashmir, will not be applicable in the state.

Prime Minister launches Fit India Movement

On the occasion of National Sports Day (29th August), Prime Minister Narendra Modi has launched the Fit India Movement at the Indira Gandhi Stadium Complex in New Delhi. During the event, PM appealed to the nation to join this fitness movement and make a 'Fitter & Better India'.

The nation-wide Fit India Movement aims to motivate every Indian to incorporate simple, easy ways of staying fit in their everyday life.

ISRO loses contact with Moon lander "Vikram"

Indian Space Research Organisation has announced that it lost contact with the Moon lander "Vikram" which was scheduled to land on the moon between 1.30 a.m. and 2.30 a.m. (IST). Further the roll out of the rover "Pragyan" was scheduled between 5.30 a.m and 6.30 a.m. Lander "Vikram" started its descent at about 1.38 a.m. from an altitude of 30 km at a velocity of 1,680 metres per second, but lost its communication with the Chandrayaan-2 Orbiter when it was at an altitude of 2.1 Km from Moon's surface.

According to ISRO, the performance of the lander was as per the plan till it was 2.1 km from the moon surface. Although, the

2,379 kg Chandrayaan-2 orbiter continues to fly around the moon. Its mission life is of one year.

ISRO launched the Chandrayaan-2 (on July 22, 2019) into the space from India's heavy lift rocket Geosynchronous Satellite Launch Vehicle-Mark III (GSLV Mk III). The Chandrayaan-2 spacecraft comprised three segments: the Orbiter, lander 'Vikram' and rover 'Pragyan'.

US Open 2019: Complete List

The 2019 US Open was the 139th edition of tennis' US Open. Since 1987, the US Open has been chronologically the fourth and final Grand Slam tournament of the year. This year US Open was held on outdoor hard courts at the USTA Billie Jean King National Tennis Center in New York City. The tournament was an event run by the International Tennis Federation (ITF) and was part of the 2019 ATP Tour and the 2019 WTA Tour calendars under the Grand Slam category. The tournament consisted of both men's and women's singles and doubles draw as well as a mixed doubles event.

SR. No.	Category	Winner	Runner Up
1.	**Men's Singles**	Rafael Nadal (Spain)	Daniil Medvedev (Russia)
2.	**Women's Singles**	Bianca Andreescu (Canada)	Serena Williams (USA)
3.	**Men's Doubles**	J.S. Cabal (Colombia) and R. Farah (Colombia)	M. Granollers (Spain) and H. Zeballos (Argentina)
4.	**Women's Doubles**	E.Mertens(Belgium) and A. Sabalenka(Belarus)	V. Azarenka (Belarus) and A. Barty(Australia)

5.	**Mixed Doubles**	B. Mattek-Sands (USA) and J. Murray (U.K)	H. Chan(Taipei) and M. Venus (New Zealand)

FIFA Football Awards 2019

"Fifa Football Awards 2019" felicitated in Milan. Barcelona's Lionel Messi won the best men's player at the Best Fifa Football Awards in Milan.It is the 6th time Messi has been voted the world's best men's player after winning it in 2009, 2010, 2011, 2012 and 2015.

The complete list of awards is as follows:

Best Men's Player Award: Lionel Messi

Best Women's Player Award: Megan Rapinoe

Men's Coach of the Year: Jurgen Klopp

Women's Coach of the Year: Jill Ellis

Best Men's Goalkeeper: Alisson

Best Women's Goalkeeper: Sari van Veenendaal

Fair Play Award: Marcelo Bielsa and the Leeds United squad

Puskas Award for the Best Goal: Daniel Zsori

FIFA Fan Award: Silvia Grecco

Nobel Prize Winners 2019

The **Nobel Prize 2019** were announced recently in 6 different fields viz. Physiology or Medicine, Physics, Chemistry, Literature, Peace, and Economic Sciences. The Nobel Prize distribution was first done on 1901. The winners will receive a full cash prize, valued this year at 9-million kronor ($918,000), a gold medal and a diploma.

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Sr.No.	Field	Winners	Description	Associated With
1	Physiology or Medicine	William G. Kaelin (USA)	for their discoveries of how cells sense and adapt to oxygen availability	Harvard Medical School
		Sir Peter J. Ratcliffe (United Kingdom)		University of Oxford
		Gregg L. Semenza (USA)		Johns Hopkins University
2	Physics	James Peebles (Canada)	for theoretical discoveries in physical cosmology	Princeton University
		Michel Mayor (Switzerland)	for the discovery of an exoplanet orbiting a solar-	University of Geneva

		Didier Queloz (Switzerland)	type star	University of Geneva
3	Chemistry	John B. Goodenough (Germany)	for the development of lithium-ion batteries	University of Texas
		M. Stanley Whittingham (United Kingdom)		Binghamton University
		Akira Yoshino (Japan)		Asahi Kasei Corporation
4	Literature (2018)	Olga Tokarczuk (Poland)	for a narrative imagination that with encyclopedic passion represents the crossing of boundaries as a form of life	-
	Literature (2019)	Peter Handke (Austria)	for an influential work that with linguistic ingenuity has explored the periphery and the specificity of human experience	-
5	Peace	Abiy Ahmed Ali	for his efforts to achieve	Prime Minister of

		(Ethiopia)	peace and international cooperation	Ethiopia
6	Economics	Abhijit Banerjee (India)	for their experimental approach to alleviating global poverty	Massachusetts Institute of Technology
		Esther Duflo (France)		Massachusetts Institute of Technology
		Michael Kremer (USA)		Harvard University

Uddhav Thackeray takes oath as Maharashtra CM

Shiv Sena Chief and Maha Vikas Aghadi nominee Uddhav Thackeray took oath as the Chief Minister of Maharashtra. He is the 19th Chief Minister of Maharashtra.

- He was named as the leader of the Shiv Sena-NCP-Congress alliance called the 'Maha Vikas Aghadi'.
- Governor of Maharashtra Bhagat Singh Koshyari administered the oath to Thackeray at Shivaji Park, Dadar in Central Mumbai.
- He is the first Thackeray family member to become Maharashtra's CM. The alliance is yet to decide the candidate for the Deputy CM post.

Home Ministry launches campaign to End Violence Against Women

The **Home Ministry** in collaboration with the **UN Women** flagged off an awareness campaign To End Violence Against Women from Sultanpur metro station in Delhi.

The initiative is part of the **#OrangeTheWorld** global campaign.

As part of the campaign, people would be made aware about India's single emergency helpline 112, an internationally recognised emergency number used in several countries.

Under the campaign, people would be made aware of India's single emergency Response Support System helpline 112, which is launched by the Ministry of Home Affairs earlier in 2019.

The **112 helpline services**, available in 27 States/UTs(Union Territories), can be reached through voice call, 112 India App, SMS (Short message service), email, respective state's 112 websites, and the panic button on mobile phones.

Hemant Soren sworn as CM of Jharkhand

Jharkhand Mukti Morcha leader Hemant Soren was sworn in as the 11th Chief Minister of Jharkhand. Governor of Jharkhand Droupadi Murmu has administered the oath of office and secrecy to Soren, in the presence of senior political leaders and chief ministers from across states.

This will be the 44-year-old JMM leader's second stint as Jharkhand Chief Minister. In the just-conducted Assembly elections, the JMM, Congress and Rashtriya Janata Dal (RJD)

alliance triumphed over the BJP, winning 47 seats in the 81 member House.

NEFT transactions to be made 24×7 from December 16

The Reserve Bank of India announced round-the-clock transactions will be allowed 24×7 facility under the National Electronic Funds Transfer (NEFT) system on all days including weekends and holidays from December 16.

These transactions after the usual banking hours are set to be automated initiated using 'Straight Through Processing (STP)' modes by the banks.

The existing discipline for crediting the beneficiary's account or returning the transaction within 2 hours of settlement to the originating bank will also continue.

Member banks are also advised to initiate necessary action and ensure availability of all necessary infrastructural requirements at their end for providing seamless NEFT 24×7 facility to their customers.

Pre Engineered Buildings:

Pre Engineered Buildings (PEB) are the buildings which are engineered at a factory and assembled at site. Usually PEBs are steel structures. Built-up sections are fabricated at the factory to exact size, transported to site and assembled at site with bolted connections. This type of Structural Concept is generally used to build Industrial Buildings, Metro Stations, and Warehouses etc.

The adoptability of PEB in the place of Conventional Steel

Building design concept resulted in many advantages, including economy & easier fabrication. These type of building structure can be finished internally to serve any functions that is actually help in low rise building design. Examples of Pre-Engineered Buildings are warehouses, Canopies, Factories, Bridges etc.

Components of PEB:

Pre Engineered Buildings consist different steel structural member which are as follows,

- **Primary Frame**: Primary framing of a PEB is an assembly of builtup I-Shaped steel members & that framing consist trusses or castellated beams etc.
- **Secondary Structural Elements**: It is actually Cold Formed Members, which can be in diff. shapes like "Z", "C" etc. In general known as "Purlins".
- **Roof & Wall Panels** : Tin shades & Curtain Wall made of Glass & Roll-formed steel sheets usually comes in this category , S
- **Sandwich Panels**: Sandwich Panel is made of three layers , in which a non-Aluminum Core is inserted b/w two aluminum sheet.
- **Other Accessories**: Mezzanine floors, Bolts, Insulation, etc.

Advantages of PEB:

There are many advantages of Pre Engineered Buildings, which are as follows,

- Quality control is the main advantage as all the structural member are engineered beforehand, standards of different codes also taken into consideration & these components are made in factory under the supervision of Quality Control Engineer.
- Lower cost due to the saving in design, manufacturing and on site erection cost.
- Minimizing time of construction due to the use of software for design of the structural components.
- Low Maintenance due to use of standard quality of paints over steel members , which increases the ability to withstand & finally the maintenance cost will be low as compare to conventional steel building.

- Quick Erection, as all the members are Pre Manufactured & skilled labor is used for connections of different components.
- Warranty on PEB, mostly warranty period of 20 years given by manufactures for PEB.

Disadvantages of PEB

Although PEB have many advantages in the field of Industrial structure but still there are some demerits of Pre Engineered Buildings, which are as follows,

- **Rusting / Corrosion Sensitive**, as if the quality of steel used or paint used for coating of steel members is not of good quality , than it can damage the structure and thus reduces the life of structure.
- **Insulation Cost**, as insulating the building to an agreeable benchmark will furthermore add to your construction costs.
- **Appearance**, Steel Sections can be unattractive when left exposed.

Design Methodology:

- Method Used : Stiffness Matrix Method
- Standard Code used :
  - AISC
  - ASCE
  - IS : 800
- Software used : Staad.Pro v8i, ETABS, RAM Steel
- Load Considerations & their Calculations : Loads considered in the PEB design are same as for general building structure. These are as follows ,

- *Dead load Calculations* : It includes Self Wt. of Purlins , Roof & Wall Sheeting , insulation material & other structural component.
- *Live / Imposed Load Calculations* : It should be Considered as per given in IS 875 (Part 2) for diff. type of
- *Wind Load Calculations* : Consider the Basic wind Speed as per Area of that particular structure. Design wind Pressure is calculated as per IS 875 (Part 3) . Wind Load on Roof can be UDL & calculation for this can be done as per IS875(Part 3)
- *Seismic Load Calculations* : Earthquake Loads affect the design of structure in areas of great seismic activity. The seismic load can be calculated as per IS 1893-2002(Part 1).
- *Other Moving Loads* : It can be Moving EOT Crane load or Mono Rail etc.

Smart City Updates

Rajkot-Smart City

Rajkot has been selected in the list of 100 Smart cities under the Smart City Mission of Ministry of Urban Development (MoUD), Government of India launched in June 2015. Moving forward the city is in the process of preparing a Smart City Proposal (SCP) as a requirement to participate in the Smart City Challenge. Under the Smart City Challenge, top 20 cities will be selected from 100 shortlisted cities based on the SCP.

State	Gujarat
Location	Centre of the Saurashtra region of Gujarat.
Area	129 Sq. Km (4th largest city in Gujarat)
Population	12,86,678 (Census, 2011)
Part of National Urban Development Schemes and Programmes	1. Smart City Mission 2. Atal Mission for Rejuvenation and Urban Transformation Scheme (AMRUT) 3. Swachh Bharat Mission (SBM) 4.Housing for All

CCTV

CCTV is possibly the most effective means of deterring crime, principally as it provide invaluable evidence to use against anyone caught committing an offence. In any city, public areas, CCTV are often

an efficient tool that can help in investigation relating to a paTendercular occurrence, beside the fact that they act as a deterrent.

Under the Rajkot Eye Project Total 967 CCTV would be installed in entire city in two phases. In 1st phase Total 487 cameras were installed in 107 difference locations in entire city. Out of 487 cameras 277 were Fixed Cameras, 110 PTZ cameras, 16-360 degree, 56 ANPR, 28 RLVD cameras were installed in city.

WiFi

Under the Rajkot Eye Project Total 14 different location declared as a public wifi spot where people can get free wifi upto 300 MB/day. All the major public garden are converted under this free wi-fi facilities.

LED SCREEN

There are many advantages to using a led scrolling message board. They display messages in a quick, efficient manner for one, and they also allow flexibility in the messages that can be displayed. A led board is a much better way to conduct adveTendersing than a traditional, static, boring billboard.

Under the Rajkot Eye Project , at difference 10 places LED Display board were installed in highly populated area, which is used for promotion of government scheme, public awareness and adveTendersing on it.

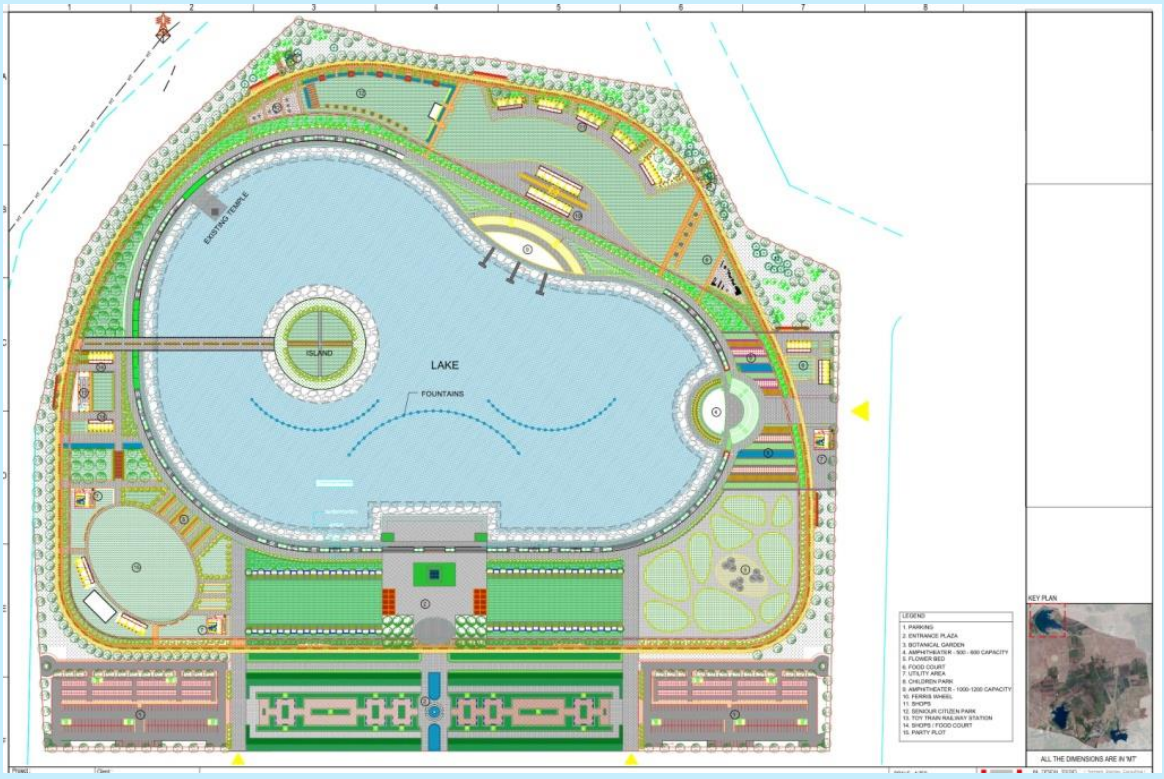
ICC

Integrated Command and Control Centre is a place which gathers all the departments and mind of the city using ICT (Information and communication technology) as a backbone.

Under the Rajkot EYE Way Project, there are two ICC has been installed. (1) At NANA Mava Circle (2) Police Commissioner Office.

ATAL Sarovar

Rajkot smart city – raiya green field area lake-1(named as - atal sarovar) deepening under sujalam sufalam jalsanchay abhiyan - 2018, deepening work of lake was begin as on 05-05-2018 and name (atal sarovar) also given by honable chief minister of gujarat shri vijaybhai rupani with a wide vision of rain water



conservation and ground water recharge enhancing peoples prosperity and enviromental sustainability

Estimated project cost is rs.3.5 crore and as on 10-07-2018 more than 4, 00,000 cubic meter of soil including hard rock have been excavated off the lake creating @ 400 millon litres of more water storage capcity of lake and deepening work is still in progress.stake holding and active participating of citizens, rmc, rscdl and ngo is appreciable and noteworthy in development of atal sarovar & cm vision.

Civil Engineering Personality

Balkrishna Vithaldas Doshi, **OAL**, (born 26 August 1927) is an Indian architect. He is considered to be an important figure of Indian architecture and noted for his contributions to the evolution of architectural discourse in India. Having worked under Le Corbusier and Louis Kahn, he is a pioneer of modernist and brutalist architecture in India.

His more noteworthy designs include the IIM Bangalore, IIM Udaipur, NIFT Delhi, Amdavad ni Gufa, CEPT University, and the Aranya Low Cost Housing development in Indore which was awarded the Aga Khan Award for Architecture.

(IIM Bangalore)

In 2018, he became the first Indian architect to receive the Pritzker Architecture Prize, which is considered one of the most prestigious prizes in architecture. He was also awarded the Padma Shri and Padma Bhushan.

In 1950, he went to Europe. He worked closely with Le Corbusier on the latter's projects in Paris between 1951 and 1954. In 1954, he returned to India to supervise Corbusier's buildings in Ahmedabad, which included the Villa Sarabhai, Villa Shodhan, Mill Owners' Association Building, and Sanskar Kendra. Corbusier is described as a major influence on Doshi's later work.

(Amdavad ni Gufa)

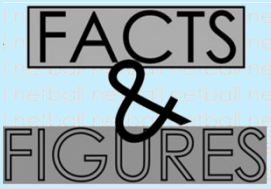
His studio, Vastu-Shilpa (environmental design), was established in 1955. Doshi worked closely with Louis Kahn and Anant Raje, when Kahn designed the campus of the Indian Institute of Management, Ahmedabad. In 1958 he was a fellow at the Graham Foundation for Advanced Studies in the Fine Arts. He then started the School of Architecture (S.A) in 1962.

In recognition of his distinguished contribution as a professional and as an academician, Dr. Doshi has received several international and national awards and honours.

- Padma Bhushan, Government of India,2020
- Pritzker Architecture Prize, 2018

- Padma Shri, Government of India, 1976
- Honorary doctorate from the University of Pennsylvania.
- France's highest honour for arts the 'Officer of the Order of Arts and Letters', 2011,
- 6th Aga Khan Award for Architecture for Aranya Community Housing, 1993-1995.
- 1969-71 ECIL Township, Hyderabad.
- 1979-80 Sangath, BV Doshi's office, Ahmedabad
- 1979-87 Shakti Bhavan, Administrative Office of M.P. Electricity Board, Jabalpur
- 1972 Centre for Environment and Planning Technology (CEPT), Ahmedabad
- 1962-74 Indian Institute of Management Bangalore
- 1989 National Institute of Fashion Technology, Delhi
- 1990 Amdavad ni Gufa, Ahmedabad
- Aranya Low Cost Housing, Indore
- IFFCO township, Kalol
- Sawai Gandharva, Pune
- Premabhai Hall, Ahmedabad
- Tagore Memorial Hall, Ahmedabad
- Vidyadhar Nagar, Jaipur
- Udayan the Condoville, Udita (HIG), Utsav (MIG) Utsarg (LIG) 2500 homes, Kolkata
- Indian Institute of Management, Lucknow
- Institute of Indology, Ahmedabad

https://en.wikipedia.org/wiki/B._V._Doshi



Facts & Figures

The **Bandra–Worli Sea Link** (officially known as **Rajiv Gandhi Sea Link** is a cable-stayed bridge with pre-stressed concrete-steel viaducts on either side that links Bandra in the Western Suburbs of Mumbai with Worli in South Mumbai. The bridge is a part of the proposed Western Freeway that will link the Western Suburbs to Nariman Point in Mumbai's main

business district.

The 1M Bridge was commissioned by the Maharashtra State Road Development Corporation (MSRDC), and built by the Hindustan Construction Company. The first four of the eight lanes of the bridge were opened to the public on 30 June 2009. All eight lanes were opened on 24 March 2010.

The sea-link reduces travel time between Bandra and Worli during peak hours from 20–30 minutes to 10 minutes. As of October 2009, BWSL had an average daily traffic of around 37,500 vehicles.

Design

BWSL was designed as the first cable-stayed bridge to be constructed in open seas in India. Due to the underlying geology, the pylons have a complex geometry and the main span over the Bandra channel is one of the longest spans of concrete deck attempted. Balancing these engineering complexities with the aesthetics of the bridge presented significant challenges for the project.

The superstructures of the viaducts were the heaviest precast segments to be built in India. They were built using a span-by-span method using overhead gantry through a series of vertical and horizontal curves.

The 20,000 tonne Bandra-end span of the bridge deck is supported by stay cables within a very close tolerance of deviations in plan and elevation.

The Bandra–Worli Sea Link was the first infrastructure project in Mumbai to use seismic arresters. These will enable it to withstand earthquakes measuring up to 7.0 on the Richter scale.

Foundation and substructure

The construction of the bridge's structure presented major engineering challenges. These included the highly variable geotechnical conditions due to the underlying marine geology of the seabed. At times, even for plan area of a single pile had a highly uneven foundation bed. Further complications included the presence of a variable intertidal zone, with parts of the foundation bed exposed in low tide and submerged in high tide.

The foundations for the BWSL's cable-stayed bridges consist of 120 reinforced concrete piles of 2,000 millimeters (6.6 ft.) diameter. Those for the viaducts consist of 484 piles of 1,500 millimeters (4.9 ft.). These 604 piles were driven between 6m and 34m into the substrate in geotechnical conditions that varied from highly weathered volcanic material to massive high strength rocks.

Pylon tower

BWSL's largest pylon towers are 128 m (420 ft) high.

The largest pylons for the bridge consist of diamond shaped 128 meters (420 ft.) high concrete tower featuring flaring lower legs, converging upper legs, a unified tower head housing the stays and a continuously varying cross section along the height of tower.

The bridge's pylon towers gradually decrease in cross-section with height. They have horizontal grooves every 3m in height, which permitted inserts. Vertical grooves in the circular sections require special form liners, as well as require attention for de-shuttering. The tower legs are inclined in two directions, which presented challenges in alignment and climbing of soldiers. Construction joints were permitted at 3m intervals only.

To build the pylons, Doka of Austria was commissioned to build a custom automatic climbing shutter formwork system, based on their SKE-100 automatic climbing shutter system. This was fabricated on site and employed to execute all tower leg lifts below deck level.

Pre-cast yard

The pre-cast yard was located on reclaimed land. The yard catered to casting, storing and handling of 2342 concrete-steel pre-cast segments for the project. The storage capacity requirement of the yard was about 470 precast segments. As the area available was limited, the segments were stored in stacks of up to three layers.

Structure

BWSL consists of twin continuous concrete box girder bridge sections for traffic in each direction. Each bridge section, except at the cable-stayed portion, is supported on piers typically spaced 50 meters (160 ft.) apart. Each section is designed to support four lanes of traffic with break-down lanes and concrete barriers.

Sections also provide for service side-walks on one side. The bridge alignment is defined with vertical and horizontal curves.

The bridge consists of three distinct parts: the north end viaduct, the central cable-stayed spans and the south end viaduct. Both the viaducts used precast segmental construction. The cable-stayed bridge on the Bandra channel has a 50m-250m-250m-50m span arrangement and on the Worli channel it has a 50m-50m-150m-50m-50m span arrangement.

Northern & Southern viaducts

The viaducts on either side of the central cable-stayed spans are arranged in 300-metre (980 ft.) units consisting of six continuous spans of 50 meters (160 ft.) each. Expansion joints are provided at each end of the units. The superstructure and substructure are designed in accordance with IRC codes. Specifications conform to the IRC standard with supplementary specifications covering special items. The foundation consists of 1.5 meters (4 ft. 11 in) diameter drilled piles (four for each pier) with pile caps. Bridge bearings are of disc type. The modular expansion joints for the bridge were provided by Swiss Civil Engineering firm mageba.

The viaducts were built utilizing pre-cast, post-tensioned, segmental concrete-steel box girder sections. An overhead gantry crane with self-launching capability was custom built on the site to lay the superstructure of the precast segments. The Pre-Cast segments are joined together using high strength epoxy glue with nominal pre-stressing initially. The end segments adjacent to the pier are short segments "cast-in-situ joints". Geometrical adjustments of the span are made before primary continuous tendons are stressed.

Segment types are further defined by the changes in the web thickness and type of diaphragms cast in cell. The segment weights vary from 110 to 140 tons (110 to 140 long tons; 120 to 150 short tons) per segment. The segment length varies from 3,000 to 3,200 mm (9.8 to 10.5 ft.). Deck post tensioning is

performed at the completion of the erection of each 50-metre (160 ft.) bridge span.

Cable-stayed spans

Main cable-stayed span

The cable-stayed portion of the Bandra channel is 600 meters (2,000 ft) in length between expansion joints and consists of two 250-metre cable supported main spans flanked by 50 meters conventional approach spans. A Centre tower, with an overall height of 128 meters above pile cap level, supports the superstructure by means of four planes of cable stay in a semi-harp arrangement. Cable spacing is 6.0 meters along the bridge deck.

The cable-stayed portion of the Worli channel is 250 meters (820 ft.) in length between expansion joints and consists of one 150 meters cable supported main span flanked on each side by two 50 meters conventional approach spans. A Centre tower, with an overall height of 55 meters, supports the superstructure above

the pile cap level by means of four planes of cable stay in a semi-harp arrangement. Cable spacing here is also 6.0 meters along the bridge deck.

The superstructure comprises twin precast concrete box girders with a fish belly cross sectional shape, identical to the approaches. A typical Pre-Cast segment length is 3.0 metres with the heaviest superstructure segment approaching 140 tonnes. Balanced cantilever construction is used for erecting the cable supported superstructure as compared to span-by-span construction for the approaches. For every second segment, cable anchorages are provided.

A total of 264 cable stays are used at Bandra channel with cable lengths varying from approximately 85 meters to nearly 250 meters. The tower is cast in-situ reinforced concrete using the climbing form method of construction. The overall tower configuration is an inverted "Y" shape with the inclined legs oriented along the axis of the bridge. Tower cable anchorage recesses are achieved by use of formed pockets and transverse and longitudinal bar post-tensioning is provided in the tower head to resist local cable forces.

A total of 160 cable stays are used at Worli channel with cable lengths varying from approximately 30 meters minimum to nearly 80 meters maximum. Like the Bandra channel, the tower here is also cast in-situ reinforced concrete using the climbing form method of construction but the overall tower configuration is "I" shape with the inclined legs. Similarly, tower cable anchorage recesses are achieved by use of formed pockets.

The foundations for the main tower comprise 2-metre-drilled shafts of 25-metre length each. Cofferdam and tremie seal construction have been used to construct the six-meter deep foundation in the dry.

https://en.wikipedia.org/wiki/Bandra%E2%80%93Worli_Sea_Link#Design

English Comprehension

Caffeine, the stimulant in coffee, has been called “the most widely used psychoactive substance on Earth.”Synder, Daly and Bruns have recently proposed that caffeine affects behavior by countering the activity in the human brain of a naturally occurring chemical called adenosine. Adenosine normally depresses neuron firing in many areas of the brain. It apparently does this by inhibiting the release of neurotransmitters, chemicals that carry nerve impulses from one neuron to the next. Like many other agents that affect neuron firing, adenosine must first bind to specific receptors on neuronal membranes. There are at least two classes of these receptors, which have been designated A1 and A2.

Snyder et al propose that caffeine, which is structurally similar to adenosine, is able to bind to both types of receptors, which prevents adenosine from attaching there and allows the neurons to fire more readily than they otherwise would.

For many years, caffeine’s effects have been attributed to its inhibition of the production of phosphodiesterase, an enzyme that breaks down the chemical called cyclic AMP. A number of neurotransmitters exert their effects by first increasing cyclic AMP concentrations in target neurons. Therefore, prolonged periods at the elevated concentrations, as might be brought about by a phosphodiesterase inhibitor, could lead to a greater amount of neuron firing and, consequently, to behavioral stimulation. But Snyder et al point out that the caffeine concentrations needed to inhibit the production of phosphodiesterase in the brain are much higher than those that produce stimulation. Moreover, other compounds that block phosphodiesterase’s activity are not stimulants.

To buttress their case that caffeine acts instead by preventing adenosine binding, Snyder et al compared the stimulatory effects of a series of caffeine derivatives with their ability to dislodge

adenosine from its receptors in the brains of mice. In general, they reported, "the ability of the compounds to compete at the receptors correlates with their ability to stimulate locomotion in the mouse; i.e., the higher their capacity to bind at the receptors, the higher their ability to stimulate locomotion." Theophylline, a close structural relative of caffeine and the major stimulant in tea, was one of the most effective compounds in both regards. There were some apparent exceptions to the general correlation observed between adenosine-receptor binding and stimulation. One of these was a compound called 3-isobuty1-1-methylxanthine (IBMX), which bound very well but actually depressed mouse locomotion. Snyder et al suggest that this is not a major stumbling block to their hypothesis. The problem is that the compound has mixed effects in the brain, a not unusual occurrence with psychoactive drugs. Even caffeine, which is generally known only for its stimulatory effects, displays this property, depressing mouse locomotion at very low concentrations and stimulating it at higher ones.

Based on the Passage, answer the following questions:

1. The primary purpose of the passage is to

(A) Discuss a plan for investigation of a phenomenon that is not yet fully understood

(B) Present two explanations of a phenomenon and reconcile the differences between them

(C) Summarize two theories and suggest a third theory that overcomes the problems encountered in the first two

(D) Describe an alternative hypothesis and provide evidence and arguments that support it

(E) Challenge the validity of a theory by exposing the inconsistencies and contradictions in it

ANS: D

2. According so Snyder et al, caffeine differs from adenosine in that caffeine

(A) Stimulates behavior in the mouse and in humans, whereas adenosine stimulates behavior in humans only

(B) Has mixed effects in the brain, whereas adenosine has only a stimulatory effect

(C) Increases cyclic AMP concentrations in target neurons, whereas adenosine decreases such concentrations

(D) Permits release of neurotransmitters when it is bound to adenosine receptors, whereas adenosine inhibits such release

(E) Inhibits both neuron firing and the production of phosphodiesterase when there is a sufficient concentration in the brain, whereas adenosine inhibits only neuron firing

ANS: D

3. In response to experimental results concerning IBMX, Snyder et al contended that it is not uncommon for psychoactive drugs to have

(A) Mixed effects in the brain

(B) Inhibitory effects on enzymes in the brain

(C) Close structural relationships with caffeine

(D) Depressive effects on mouse locomotion

(E) The ability to dislodge caffeine from receptors in the brain

ANS: A

4. According to Snyder et al, all of the following compounds can bind to specific receptors in the brain EXCEPT

(A) IBMX

(B) Caffeine

(C) Adenosine

(D) Theophylline

(E) Phosphodiesterase

ANS: E

5. Snyder et al suggest that caffeine's ability to bind to A1 and A2 receptors can be at least partially attributed to which of the following?

(A) The chemical relationship between caffeine and phosphodiesterase

(B) The structural relationship between caffeine and adenosine

(C) The structural similarity between caffeine and neurotransmitters

(D) The ability of caffeine to stimulate behavior

(E) The natural occurrence of caffeine and adenosine in the brain

ANS: B

https://byjus.com/free-cat-prep/comprehension-solutions-01/

Quantitative Aptitude

A train running at the speed of 60 km/hr crosses a pole in 9 seconds. What is the length of the train?

A. 120 metres

B. 180 metres

C. 324 metres

D. 150 metres

ANS: D

Two ships are sailing in the sea on the two sides of a lighthouse. The angle of elevation of the top of the lighthouse is observed from the ships are 30° and 45° respectively. If the lighthouse is 100 m high, the distance between the two ships is:

A. 173 m

B. 200 m

C. 273 m

D. 300 m

ANS: C

A sum of money at simple interest amounts to Rs. 815 in 3 years and to Rs. 854 in 4 years. The sum is:

A. Rs. 650

B. Rs. 690

C. Rs. 698

D. Rs. 700

ANS: C

The cost price of 20 articles is the same as the selling price of x articles. If the profit is 25%, then the value of x is:

A. 15

B. 16

C. 18

D. 25

ANS: B

It was Sunday on Jan 1, 2006. What was the day of the week Jan 1, 2010?

A. Sunday

B. Saturday

C. Friday

D. Wednesday

ANS: C

https://www.indiabix.com/aptitude/questions-and-answers/

Multiple Choice Questions

1. For a fluid at rest

(a) The shear stress depends upon the coefficient of viscosity
(b) The shear stress is zero
(c) The shear stress is zero only on horizontal planes
(d) The shear stress is maximum on a plane inclined at 45-degree to the horizontal

2. The pressure intensity at a point in a fluid is the same in all directions, only when

(a) The fluid is frictionless
(b) The fluid is frictionless and incompressible
(c) The fluid has zero viscosity and is at rest
(d) There is no motion of one fluid layer relative to an adjacent layer

3. The bending moment at the fixed end of a cantilever beam is

(a) Maximum
(b) Minimum
(c) Wl/2
(d) Wl

4. The bending moment diagram for a cantilever with point load, at the free end will be

(a) A triangle with max. height under free end
(b) A triangle with max. height under fixed end
(c) A parabolic curve
(d) None of these

5. Colluvial soils (talus) are transported by :

(a) Water
(b) Wind
(c) Gravity
(d) Ice

6. Water – transported soil are termed :

(a) Aeoline
(b) Alluvial
(c) Colluvial
(d) Till

Job & Career

Gujarat Public Service Commission

Post Name: Assistant Engineer (Civil), Class-II, Under Narmada and Water Resources Department

Basic Qualification:

Possess a bachelor's degree in Engineering (Civil) or Technology (Civil) obtained from any of the Universities or institutions established or incorporated by or under the Central or State Act in India; or any other educational institutions recognized as such or declared to be a deemed University under section 3 of the University Grants Commission Act, 1956.

Possess the basic knowledge of computer application as prescribed in the Gujarat Civil Services Classification and Recruitment (General) Rules, 1967;

Possess adequate knowledge of Gujarati or Hindi or both

NAME OF THE POST	DISCIPLINE	NO. OF POSTS
Assistant Engineer (Civil)	Civil Engineering	113

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