SKYSCRAP

TECHNICAL MAGAZINE

DEPARTMENT OF CIVIL ENGINEERING

Meghnad Saha Institute of Technology

Volume 2

April 2019

VISION OF THE DEPARTMENT

To be a center of excellence in Civil Engineering keeping pace with rapidly changing technologies and global needs.

MISSION OF THE DEPARTMENT

M1: To provide quality education in Civil Engineering through effective teaching learning process in a congenial academic environment.

M2: To serve the nation by providing professional Civil Engineering expertise.

M3: To promote research capability and innovative ideas in budding Engineers to address different emerging issues in Civil Engineering.

M4: To impart soft skills, leadership qualities and professional ethics amongst the young Engineers to handle real life projects with holistic concern for the society.

HOD'S MESSAGE

It is a great pleasure to present Volume 2 of SKYSCRAP, the departmental magazine of the Civil Engineering Department, Meghnad Saha Institute of Technology.

The story of the progress of civilizations is interconnected with the story of the progress of Civil Engineering. It is important to remember that our engineers have always been involved in the process of building a new world with innovative materials into complex shapes to withstand forces of nature beyond their control. SKYSCRAP is introducing its second edition. It showcases the technical and creative writing skills of the students and a few articles by the faculty members.

I congratulate the editorial team and hope that the readers will enjoy the insight into the world of Civil Engineering.

EDITORIAL COMMITTEE

SAPTAPARNI GHOSH MAJUMDER (B.Tech 3RD YEAR)

SAYANTAN BANERJEE (B.Tech 3RD YEAR)

EDITORIAL

A thought that has been enduring in mind when it becomes real; is truly an interesting and exciting experience. This magazine was one such cherished work that had its roots in persuasion.

This magazine will serve to reinforce and allow increased awareness, improved Interaction, and integration among all of us.

The progress of society mainly depends on many people who are working behind the scenes, overtime round the clock planning things to the smallest. We thank each and every person who has worked behind SKYSCRAP and helped make it a success this year too, as the preceding year. Also, an immense amount of gratitude goes out to every single author of all the articles for their sincere and excellent efforts.

This is only a small step forward towards a long journey. To achieve progress and meet objectives, we have to reach numerous milestones. Best wishes to the Civil Engineering Department of Meghnad Saha Institute of Technology in this endeavour.

Contents

None can destroy iron, but its own rust can. Likewise, none can destroy a person but his own mindset can

~ Sri Ratan Tata

Fatigue and Fracture Behaviour of Plain Concrete

Concrete is one of the most widely used construction materials due to its high compressive strength, durability, and low cost. However, its mechanical properties, such as tensile strength, play an important role in determining its behaviour under cyclic loading conditions, which can cause fatigue failure. Furthermore, the fracture behaviour of concrete is affected by the presence of cracks, which can lead to the propagation of cracks and ultimately cause failure. In this essay, we will discuss the fatigue and fracture behaviour of plain concrete and the factors that influence it.

Fatigue behaviour of concrete refers to the ability of the material to resist failure under repeated loads. In the construction industry, concrete is subjected to repeated loads in various forms, such as traffic loads, wind loads, and temperature changes. Over time, these loads can cause the development of cracks, which can lead to fatigue failure. The tensile strength of concrete is essential for understanding its behaviour under cyclic loading conditions. The tensile strength of concrete is much lower compared to its compressive strength, which makes it susceptible to fatigue failure.

The fracture behaviour of concrete is also an important factor to consider. The presence of cracks in concrete can lead to the propagation of cracks and ultimately cause failure. The rate of crack propagation is dependent on various factors, such as the size and orientation of the crack, the load direction, and the presence of stress concentrators. In addition, the fracture behaviour of concrete is also influenced by environmental factors, such as temperature and humidity. For example, changes in temperature can cause the concrete to expand and contract, which can lead to the development of cracks. Similarly, changes in humidity levels can cause the absorption and desorption of moisture, which can affect the mechanical properties of the concrete.

In conclusion, the fatigue and fracture behaviour of plain concrete is essential for ensuring the safety and durability of structures. It is important to consider the influence of environmental factors, such as temperature and humidity, on the fatigue and fracture behaviour of concrete. Furthermore, the development of new materials and construction techniques that can improve the fatigue and fracture behaviour of concrete is crucial for ensuring the long-term performance of structures. By understanding the fatigue and fracture behaviour of concrete, engineers and construction professionals can design and construct structures that are safe, durable, and sustainable.

Priyobroto Guho

Assistant Professor

Structured Irrigation Network

A structured irrigation network is a system of channels, reservoirs, and pumps designed to efficiently distribute water to crops and other agricultural land. The goal of this type of irrigation is to provide consistent, controlled amounts of water to plants and crops,

promoting healthy growth and maximizing yields.

There are several key components that make up a structured irrigation network. Channels are the primary method of transporting water from sources such as lakes or rivers to the fields. Pumps are used to increase the pressure of the water, allowing it to flow through the channels and reach the fields. Reservoirs serve as storage areas for water, allowing it to be stored and used when needed.

One of the major benefits of a structured irrigation network is the improved efficiency of water use. By using controlled amounts of water and delivering it directly to crops, farmers are able to reduce water waste and minimize the amount of water lost to evaporation or runoff. This results in more efficient use of resources, as well as cost savings for the farmer.

Another key benefit of a structured irrigation network is improved crop yields. By providing consistent, controlled amounts of water to crops, farmers are able to promote healthy growth and maximize yields. This can result in increased profits and a more sustainable agricultural system.

However, there are also some challenges associated with structured irrigation networks. For example, the cost of building and maintaining the system can be high. Additionally, the infrastructure required can take up a significant amount of land, potentially reducing the amount of available agricultural land.

Despite these challenges, structured irrigation networks are an important tool for improving agricultural efficiency and sustainability. With careful planning and management, they can help farmers maximize yields and use resources more efficiently, leading to a more sustainable and profitable agricultural system.

In conclusion, a structured irrigation network is a vital component of modern agriculture. By improving water efficiency and promoting healthy crop growth, it has the potential to significantly improve the sustainability and profitability of agricultural operations. Despite the challenges it faces, its benefits make it an important investment for farmers and for the future of agriculture as a whole.

Susmita Bakshi

Assistant Professor

Design Considerations for Roadside Safety

Roadside safety is a critical aspect of road design, as it aims to prevent crashes and minimize the severity of accidents that occur along roadways. Design considerations for roadside safety include several key factors that must be considered to ensure the safety of drivers, passengers, and pedestrians.

One of the most important design considerations for roadside safety is the selection of appropriate road materials and construction methods. This includes the use of durable and crash-resistant materials for road barriers, guardrails, and other safety features. In addition, road designers must also consider factors such as the location of utilities and other underground structures, as well as the slope and drainage patterns of the road site.

Another key consideration for roadside safety is the design of road features such as medians, shoulders, and interchanges. These features must be designed to accommodate

the flow of traffic and to provide safe, clear areas for drivers to recover from emergencies. For example, wide medians can provide a safer area for vehicles to cross over in the event of an accident, while wider shoulders can help prevent vehicles from running off the road and colliding with trees or other obstacles.

In addition to road design, it is also important to consider the impact of road users on roadside safety. This includes factors such as vehicle speed, driver behavior, and the presence of pedestrians or cyclists. By understanding the behavior of road users, designers can develop safer roadways that minimize the risk of crashes and minimize the severity of accidents that do occur.

Finally, roadside safety must also take into account the needs of emergency responders, including police, firefighters, and paramedics. This includes providing safe areas for emergency vehicles to park, as well as clear and accessible access routes for emergency responders.

In conclusion, roadside safety is a critical aspect of road design that must be carefully considered in order to ensure the safety of all road users. From the selection of materials and construction methods to the design of road features and the impact of road users, there are many factors that must be taken into account to create safer, more sustainable roadways. With careful planning and design, we can help ensure the safety of drivers, passengers, and pedestrians and prevent accidents along our roads.

Aveek Ray

Assistant Professor

Instant Concrete Road Repair Solution

Instant Concrete Road Repair Solution is an innovative and efficient solution for fixing damaged roads quickly and effectively. It is a cost-effective alternative to traditional road repair methods, which often require weeks or even months to complete. The solution uses a unique formula of fast-drying concrete, which can be applied to any surface in just a matter of hours.

One of the biggest advantages of Instant Concrete Road Repair Solution is its speed. With traditional repair methods, roads must be closed for extended periods of time while repairs are made, causing major traffic disruptions and inconvenience to drivers. However, with this solution, repairs can be completed in a fraction of the time, allowing roads to be reopened quickly. This not only benefits drivers but also helps to keep traffic flowing smoothly, reducing congestion and delays.

Another advantage of Instant Concrete Road Repair Solution is its durability. The fast-drying concrete formula used in this solution is designed to be strong and long-lasting, providing a permanent solution to road damage. This means that roads will not need to be repaired again in the near future, saving time and resources in the long run.

In addition to its speed and durability, Instant Concrete Road Repair Solution is also environmentally friendly. Traditional road repair methods often involve the use of heavy machinery, which can cause damage to the surrounding environment and produce significant amounts of pollution. However, this solution requires minimal equipment, reducing its environmental impact.

Finally, Instant Concrete Road Repair Solution is an affordable solution for repairing roads. The cost of traditional road repair methods can be substantial, particularly for large-scale projects. However, the quick and efficient nature of this solution means that repairs can be completed at a fraction of the cost, making it an attractive option for

governments and organizations looking to maintain their roads in a cost-effective manner.

In conclusion, Instant Concrete Road Repair Solution is a revolutionary solution for fixing damaged roads. Its speed, durability, environmental friendliness, and affordability make it an attractive option for any organization looking to maintain their roads quickly, efficiently, and cost-effectively.

Prasenjit Sanyal

Assistant Professor

MANUFACTURING OF RAILWAY SLEEPER USING RECYCLED PLASTIC

The manufacturing of railway sleepers using recycled plastic is a sustainable solution to a growing problem of plastic waste. A railway sleeper is an essential component of the railway track system, used to support the rails and ensure their stability. Traditionally, these sleepers have been made from wood, concrete, or steel, all of which have significant environmental and economic impacts. However, by using recycled plastic, the manufacturing of railway sleepers can be made more environmentally friendly while also reducing costs.

One of the key benefits of using recycled plastic to manufacture railway sleepers is its sustainability. Plastic waste is a growing problem worldwide, and it is important to find ways to recycle and repurpose it. The use of recycled plastic for railway sleepers not only helps to reduce the amount of waste in the environment but also extends the life of the plastic, keeping it out of landfills for longer. Additionally, the manufacturing process of railway sleepers from recycled plastic generates less greenhouse gas emissions than traditional methods, making it a more environmentally friendly solution.

Another advantage of using recycled plastic for railway sleepers is its durability and low maintenance requirements. Plastic is a highly durable material that can withstand harsh weather conditions and heavy loads without showing significant signs of wear or damage. This means that railway sleepers made from recycled plastic are more likely to last longer than traditional sleepers, reducing the need for maintenance and repairs. Additionally, plastic sleepers are resistant to rot, termites, and other pests, making them a more sustainable and cost-effective solution.

The cost benefits of using recycled plastic for railway sleepers are also significant. The production of plastic sleepers requires less energy and raw materials than traditional methods, reducing the cost of production. Furthermore, the longer lifespan of plastic sleepers means that they are a more cost-effective solution in the long run, as they need to be replaced less frequently. Additionally, the use of recycled plastic reduces the need for new raw materials, which helps to reduce the cost of production even further.

In conclusion, the manufacturing of railway sleepers using recycled plastic is a sustainable solution to the growing problem of plastic waste. It offers a range of benefits, including reduced greenhouse gas emissions, durability, low maintenance requirements, and cost savings. By adopting this solution, the railway industry can play a significant role in reducing the environmental impact of its operations while also reducing costs and improving sustainability.

Atanu Debnath
Assistant Professor

Modern Air Pollution Control Technologies

Modern air pollution control technologies aim to mitigate the harmful effects of air pollution on human health and the environment. The following are some of the most significant air pollution control technologies currently in use:

Scrubbers: Scrubbers are devices that remove pollutants from industrial chimney stacks. They work by using water or a chemical solution to remove pollutants from the exhaust gases before they are released into the atmosphere.

Catalytic Converters: Catalytic converters are devices that are fitted to the exhaust systems of vehicles. They use catalysts to convert harmful pollutants, such as nitrogen oxides, into less harmful substances before they are released into the atmosphere.

Carbon Capture and Storage (CCS): CCS is a process that captures carbon dioxide emissions from power plants and other industrial facilities, and stores them underground in secure geological formations. This technology is particularly useful in reducing emissions from the use of fossil fuels.

Biofilters: Biofilters are systems that use natural processes to remove pollutants from the air. They typically consist of a layer of organic material, such as peat or compost, through which contaminated air is passed. The organic material acts as a biological filter, removing pollutants as the air passes through it.

Solar-Powered Air Purifiers: Solar-powered air purifiers use photovoltaic cells to convert sunlight into electricity, which is then used to power air purifiers. These devices can be used to remove pollutants from the air in areas without access to grid-based electricity.

Green Roofs: Green roofs are roofs that are covered in vegetation. They help to reduce air pollution by absorbing pollutants, such as nitrogen oxides, through the plants' leaves. They also help to mitigate the urban heat island effect by reducing the amount of heat absorbed by buildings.trol Technologies

Dr Biswajit Thakur
Associate Professor

Application of Membrane Technology in Waste Water Management

Membrane technology has become an increasingly important tool in the management of wastewater. This technology uses thin, semi-permeable membranes to separate contaminants from water, making it a highly effective way of purifying wastewater. The following are some of the key applications of membrane technology in wastewater management:

Desalination: Membrane technology is widely used in the desalination of seawater to produce fresh water. This process uses reverse osmosis membranes to separate salt and other contaminants from seawater, making it safe to drink.

Municipal Waste Water Treatment: Membrane technology is also used in the treatment of municipal wastewater. It is used to remove contaminants such as suspended solids, organic matter, and pathogens from wastewater, making it safe for reuse or discharge into the environment.

Industrial Waste Water Treatment: Membrane technology is particularly useful in

the treatment of industrial wastewater, which often contains high levels of contaminants and pollutants. It can be used to separate and purify specific contaminants, such as heavy metals or toxic chemicals, making the wastewater safe for discharge into the environment.

Recycling: Membrane technology is also used in the recycling of wastewater, particularly in industrial processes where water is used repeatedly. By removing contaminants and pollutants from wastewater, membrane technology makes it possible to reuse water, reducing the need for fresh water and helping to conserve this precious resource.

Water Reuse: Membrane technology is also used to purify wastewater for reuse in non-potable applications, such as irrigation, industrial processes, and cooling systems. This helps to reduce the demand for fresh water and improve water sustainability.

Atanu Debnath
Assistant Professor

BIOMEDICAL WASTE MANAGEMENT

Biomedical waste management refers to the collection, treatment, and disposal of waste generated from healthcare activities. This type of waste can include sharps (e.g. needles and syringes), surgical instruments, pathological waste, and infectious waste. The following are some of the key aspects of biomedical waste management:

Collection: Biomedical waste should be collected separately from other types of waste to minimize the risk of infection or injury to waste handlers. This typically involves the use of color-coded bags or containers, which help to distinguish biomedical waste from other types of waste.

Treatment: Biomedical waste should be treated to ensure that it is safe for disposal. This may involve sterilization, disinfection, or other treatments to kill pathogens and reduce the risk of infection.

Disposal: Biomedical waste should be disposed of in a safe and responsible manner. This may involve incineration, landfilling, or other methods of disposal that minimize the risk of harm to human health and the environment.

Regulations: Biomedical waste management is regulated by local, national, and international laws and regulations. These regulations typically require healthcare facilities to manage their biomedical waste in accordance with specific standards and guidelines, including those related to collection, treatment, and disposal.

Training: Healthcare workers and waste handlers should receive appropriate training in biomedical waste management to ensure that they are aware of the risks associated with this type of waste and know how to handle it safely.

Prasenjit Sanyal
Assistant Professor

CORROSION CONTROL OF UNDERWATER PILES

Corrosion control of underwater piles is crucial for the preservation and maintenance of coastal structures such as bridges, docks, and piers. Underwater piles are susceptible to corrosion due to their constant exposure to salt water and other corrosive elements, which can lead to structural weakness and eventual failure. The following are some of

the key strategies for corrosion control of underwater piles:

Coatings: Applying protective coatings to underwater piles is an effective way of controlling corrosion. These coatings create a barrier between the pile and the surrounding water, reducing the rate of corrosion and extending the life of the pile.

Cathodic protection: Cathodic protection involves the use of electrical currents to prevent corrosion. A sacrificial anode is connected to the pile, which corrodes in preference to the pile, reducing the rate of corrosion.

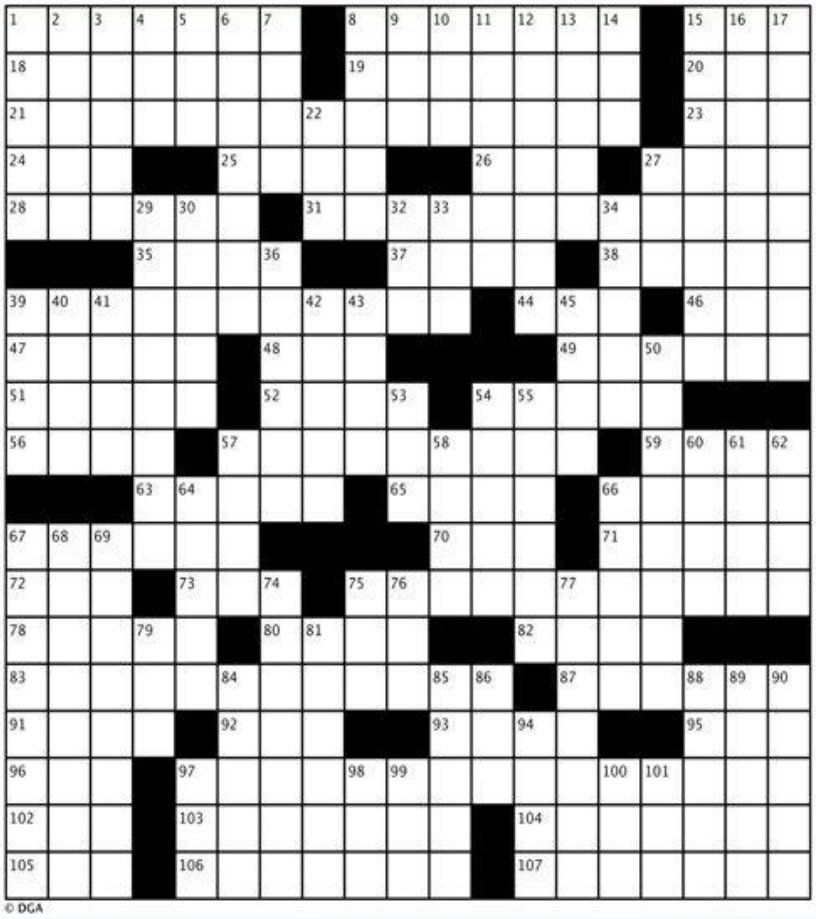
Inhibition: Corrosion inhibitors can be added to the water to reduce the rate of corrosion. These inhibitors alter the chemical environment around the pile, making it less favorable for corrosion to occur.

Aveek Ray
Assistant Professor

BRAIN TWISTER

CROSSWORD PUZZLE

Double Trouble



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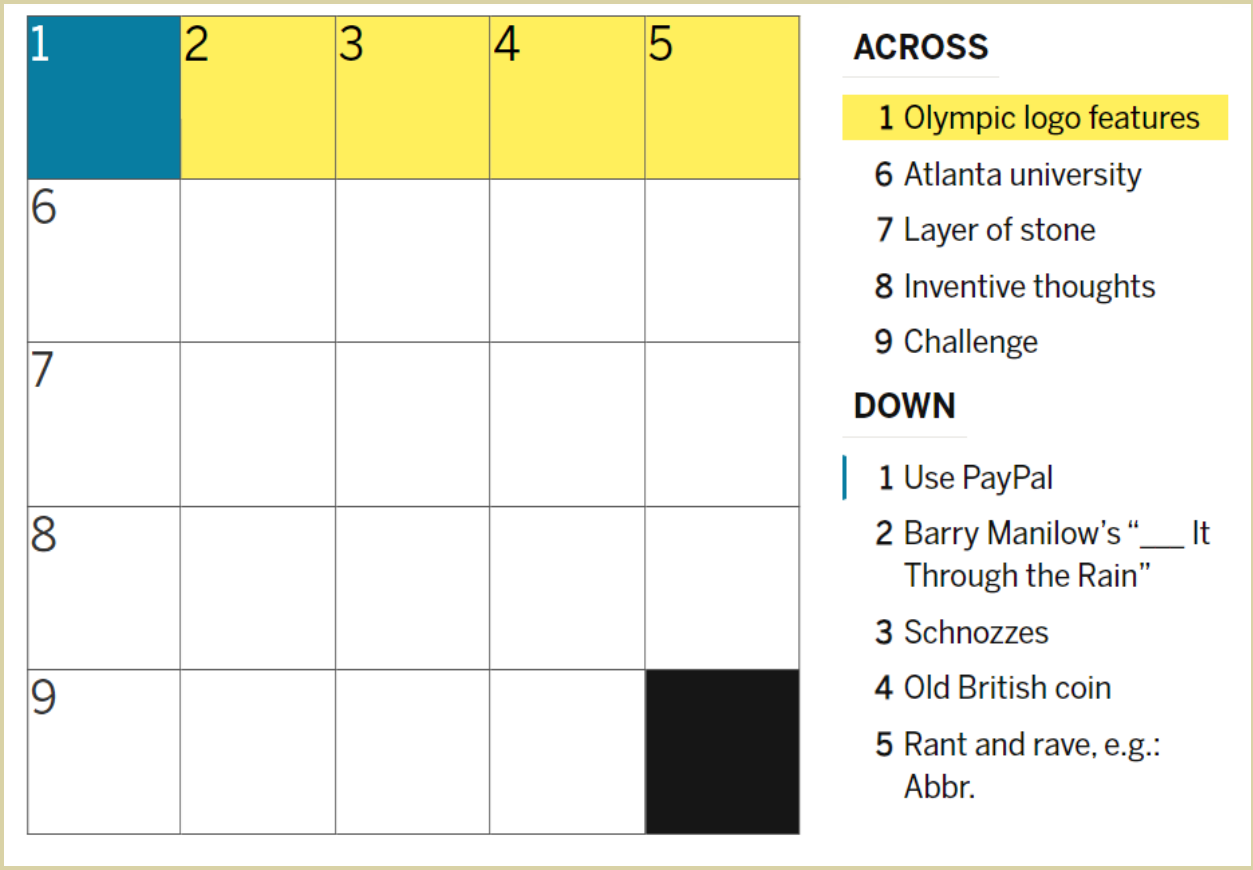
ACROSS

1. Reduced significantly, as prices
8. Like many Poe stories
15. Actress Dennings
18. Broadcasting unit?
19. Old West Action, for Clint Eastwood
20. Syr. neighbor
21. Frequent Marcello Mastroianni director
23. Farrow of "Crimes and Misdemeanors"
24. Summer by the Seine
25. Actress Loughlin of "Full House"
26. From __ Z
27. Like 25-Across, often
28. 14-line poem form
31. Director who started as a "Rolling Stone" writer
35. Eye layer
37. Rte. through Houston
38. Allergic reaction
39. "Stranger Than Paradise" director
44. Facial locale
46. With 7-Down, 1920s-'30s design style
47. Like Ozu or Kurosawa
48. Egyptian slitherer
49. Sharp, in a bad way
51. Cold ones
52. With 29-Down, 2012 Best Actor winner
54. More faithful
56. Email command
57. "Run Lola Run" director
59. To be, to Brutus
63. Sympathetic words
65. "Orinoco Flow" singer
66. Award for 52-Across
67. Realize
70. Old Campus resident
71. Cheech's partner in comedy
72. "Notes ___ Scandal"
73. Scroogean outburst
75. "Bringing Up Baby" director
78. Trappers' object
80. Recedes
82. iPhone 5 feature
83. Documentarian who directed "Fahrenheit 9/11"
87. Typographical flourishes
91. Silencers?
92. Part of a Latin threesome
93. "Full Metal Jacket" gp.
95. Estuary
96. Rep. counterpart
97. Directed his first film for TV
102. Is more?
103. Entourage
104. One learning the ropes
105. In the distance
106. Entomologist's subject
107. Too long, hyperbolically

DOWN

1. More guarded, perhaps
2. Deceive
3. Shakespearean forest
4. E.U. member
5. Part of a sarcastic laugh
6. More dastardly
7. See 46-Across
8. Frequent subject for Scorsese
9. Gas suffix
10. Seth Rogen's "40-Year-Old Virgin" role
11. Harshly bright
12. English
13. Kept going
14. Owner of Abbey Road Studios
15. "Vertigo" star
16. So to speak
17. Mockery
22. Tolkien creature
27. "...___ quit!"
29. See 52-Across
30. Chris of "The Avengers"
32. Rapper's prop
33. Biblical suffix
34. Rub the wrong way
36. Scale with three sharps
39. Quick, sharp blows
40. "Gotcha..."
41. Manner
42. "I'm completely at your disposal!"
43. Tiff
45. Rain hard
50. NPR show hosted by Terry Gross
53. PBS' "Science Guy" Bill
54. "Movin' Out" choreographer Tharp
55. Broadcasts again
57. Lake ____, head of the Blue Nile
58. Understood
60. Garbage barge
61. Didn't swim
62. Physics units
64. Snake charmed by a snake charmer
66. Clay color
67. "___ Preppers" (National Geographic show)
68. Travis Bickle from "Taxi Driver," for one
69. 2009 superhero film directed by Zack Snyder
74. Motorcycle needs
75. "The Wire" channel
76. Bear, in Baja
77. Make out
79. Apathetic reactions
81. Unlikely Oscar nominee
84. Put away
85. Sly tactics
86. Sixth sense
88. "The Whirl of Life" actress Castle
89. Lets go
90. Wise men
94. Tiny amount
97. Lanka
98. SASE, e.g.
99. Hazel or cashew
100. Chap
101. Cartoonist Keane

For answers go to http://www.dga.org/Craft/DGAQ/All-Articles/1302-Spring-2013/Crossword-Puzzle.aspx



1	2	3	4	5
6				
7				
8				
9				

ACROSS

1 Olympic logo features
6 Atlanta university
7 Layer of stone
8 Inventive thoughts
9 Challenge

DOWN

1 Use PayPal
2 Barry Manilow's "___ It Through the Rain"
3 Schnozzes
4 Old British coin
5 Rant and rave, e.g.: Abbr.

1 R	2 I	3 N	4 G	5 S
6 E	M	O	R	Y
7 M	A	S	O	N
8 I	D	E	A	S
9 T	E	S	T	

SUDOKU 16×16 (USE 1-9 & A-G)

G		2		D	9	3			8		5			7	E
	4				5	G			2			F		C	
							7	A							
7	E	C					4						G	B	2
1							G	C		9	F	4		5	
	F	B			7	D		2						9	
		8				5	2			G	3		E		
9		3	G	4		E			5	D		8	B		
4	6	7		5			E	D					9	8	A
2		A	9			B					6	E			
	5			7	G		A			2	4	B			3
		F			4	C		3	G		E	2			7
C					2	F		G	B		9	D	7		
	7	4				9	5	6	E	F		C			
F	8	G		C	A				D	3					5
	3		2		D				A	4	C		8	G	

SUDOKU 16×16 SOLUTION

G	A	2	F	D	9	3	C	4	8	B	5	1	6	7	E
3	4	6	D	B	5	G	8	E	2	7	1	F	A	C	9
5	9	1	B	2	E	6	7	A	F	C	G	3	D	4	8
7	E	C	8	F	1	A	4	9	3	6	D	5	G	B	2
1	2	E	7	A	B	8	G	C	6	9	F	4	3	5	D
6	F	B	5	1	7	D	3	2	4	E	8	A	C	9	G
A	D	8	4	9	C	5	2	B	1	G	3	7	E	F	6
9	C	3	G	4	6	E	F	7	5	D	A	8	B	2	1
4	6	7	3	5	F	2	E	D	C	1	B	G	9	8	A
2	G	A	9	8	3	B	D	F	7	5	6	E	4	1	C
E	5	D	C	7	G	1	A	8	9	2	4	B	F	6	3
8	B	F	1	6	4	C	9	3	G	A	E	2	5	D	7
C	1	5	E	3	2	F	6	G	B	8	9	D	7	A	4
D	7	4	A	G	8	9	5	6	E	F	2	C	1	3	B
F	8	G	6	C	A	4	B	1	D	3	7	9	2	E	5
B	3	9	2	E	D	7	1	5	A	4	C	6	8	G	F

Some of the important IS Codes for Reference:

- IS 383 : 2016 – COARSE and FINE AGGREGATE for CONCRETE - SPECIFICATION
- IS 456 : 2000 -- PLAIN and REINFORCED CONCRETE - CODE of PRACTICE
- IS 800 : 2007 -- GENERAL CONSTRUCTION in STEEL - CODE of PRACTICE
- IS 875 (Part 1 - 5) – CODE of PRACTICE for DESIGN LOADS (OTHER THAN EARTHQUAKE) for BUILDINGS and STRUCTURES
- IS 1201 – 1220 : 1978 -- METHODS for TESTING TAR and BITUMINOUS MATERIALS
- IS 1343 : 2012 -- CODE of PRACTICE for PRESTRESSED CONCRETE
- IS 1622 : 1981 -- METHODS of SAMPLING and MICROBIOLOGICAL EXAMINATION of WATER
- IS 1893 (Part 1) : 2016 -- CRITERIA for EARTHQUAKE RESISTANT DESIGN of STRUCTURES -- GENERAL PROVISIONS and BUILDINGS
- IS 2386 (Part 1, 4 & 16) -- METHODS of TEST for AGGREGATES for CONCRETE
- IS 2502 : 1963 -- CODE of PRACTICE for BENDING and FIXING of BARS for CONCRETE REINFORCEMENT
- IS 2720 -- METHODS of TEST for SOILS
- IS 2911 – (Part 1 - 4) -- DESIGN and CONSTRUCTION of PILE FOUNDATIONS — CODE of PRACTICE
- IS 3025 -- METHODS of SAMPLING and TEST (PHYSICAL and CHEMICAL) for WATER and WASTEWATER
- IS 4986 : 2002 -- INSTALLATION of RAINGAUGE (NON-RECORDING TYPE) and MEASUREMENT of RAIN -- CODE of PRACTICE
- IS 4987 : 1994 -- RECOMMENDATIONS for ESTABLISHING NETWORK of RAINGAUGE STATIONS
- IS 5225 : 1992 -- METEOROLOGY - RAINGAUGE, NON-RECORDING - SPECIFICATION
- IS 6403 : 1981 -- CODE of PRACTICE for DETERMINATION of BREAKING CAPACITY of SHALLOW FOUNDATIONS
- IS 6512 : 1984 -- CRITERIA for DESIGN of SOLID GRAVITY DAMS
- IS 8009 – (Part 1 - 2) -- CODE of PRACTICE for CALCULATION of SETTLEMENTS of FOUNDATIONS
- IS 10262 : 2019 – RECOMMENDED GUIDELINES for CONCRETE MIX DESIGN
- IS 10500 : 2012 – DRINKING WATER — SPECIFICATION
- IS 13920 : 2016 -- DUCTILE DETAILING of REINFORCED CONCRETE STRUCTURES SUBJECTED to SEISMIC FORCES - CODE of PRACTICE