

# **Advanced Programme - Planning, Design \_ Construction of Long Span Bridges- (Batch I) - 22**

**Prevailing construction practices and kind of failures witnessed in last  
couple of years including proposed mitigation measures**

National Rural Infrastructure  
Development Agency



Ministry of Rural Development

Engineering Staff College of  
India (ESCI)

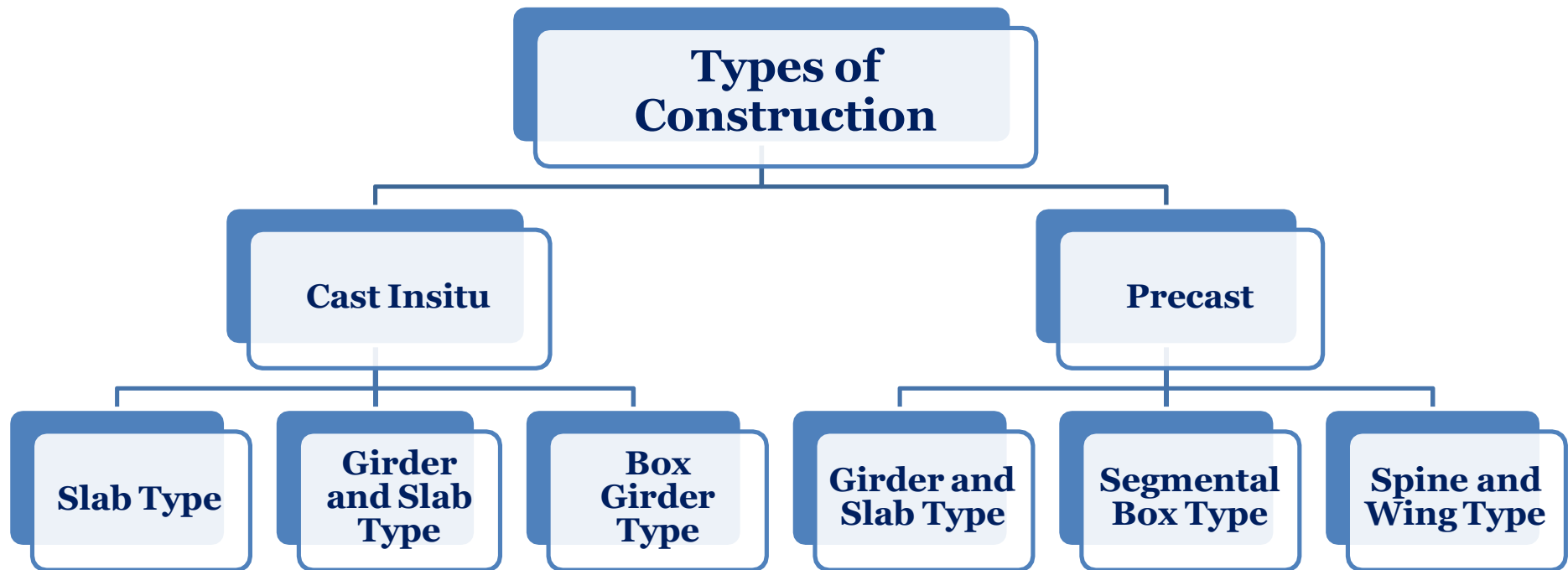


Hyderabad

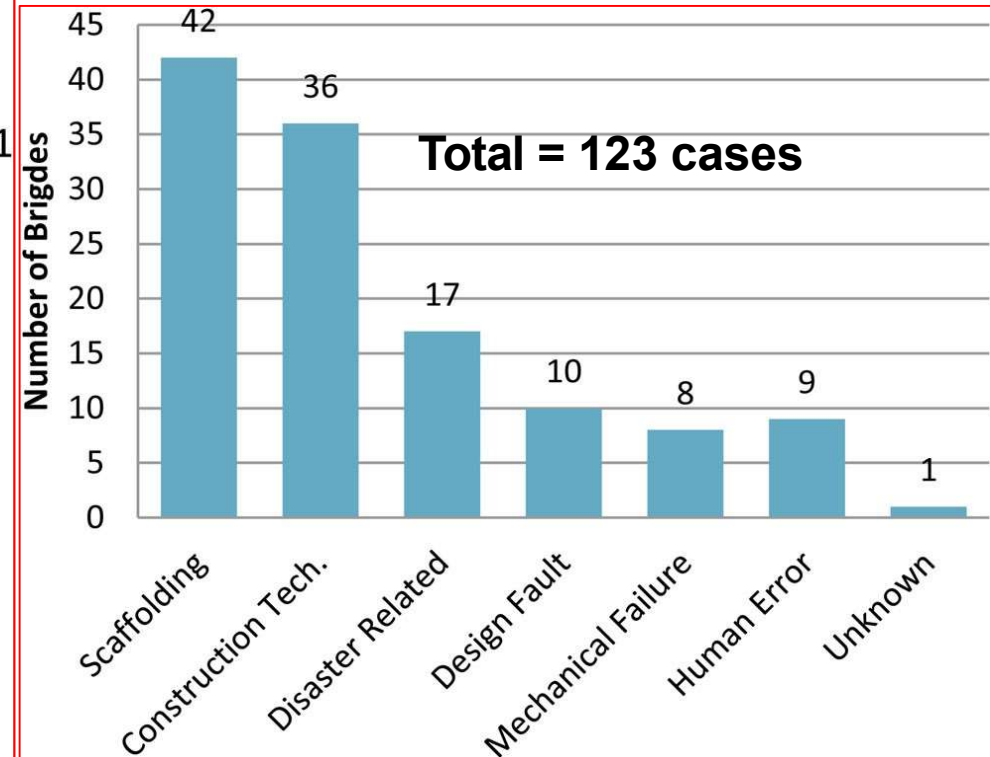
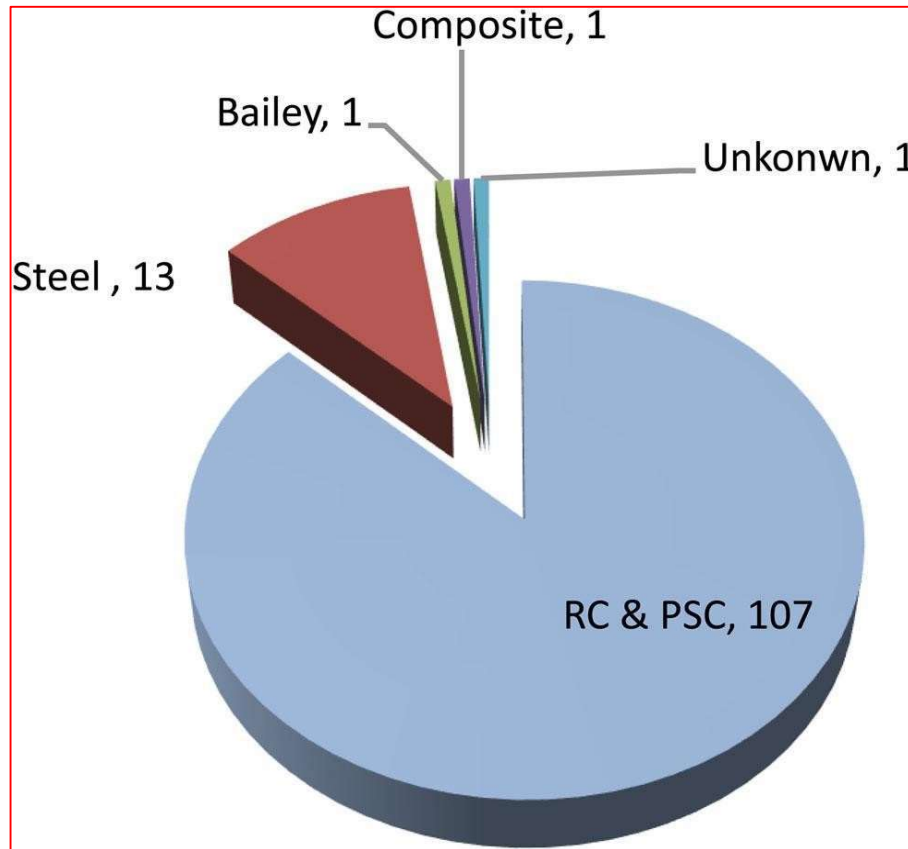
## **Lecture 5**

**Prevailing construction practices and kind of failures witnessed in last couple of years including proposed mitigation measures**

# Types of Constructions



# Failure statistics



Source :Analysis of bridge failures in India from 1977 to 2017, Rajeev Kumar Garg , Satish Chandra and Aman Kumar , CSIR-Central Road Research Institute, New Delhi, India; RTC Institute of Technology, Ranchi, Jharkhand, India

# ROB Near Gwalior- 2002



**Cause of Failure – Incorrect Prestressing and Construction Sequence**

# Surat Bridge Collapse - 2014



**Cause of Failure - Instability**

# **Nandnagari ROB Failure - 2014**



**Cause of Failure – Poor Quality of Concrete**

# **Varanasi Flyover Collapse – May 2018**



**Cause of Failure – Inadequate Bracings in temporary condition & poor temporary supports**



# **Karamnasa River Bridge – Dec 2019**



**Cause of Failure – Improper Reinforcement Detailing  
and Incorrect Bearing Installation**

# **Farakka Bridge – Feb 2020**



**Cause of Failure – Launching girder failure**

# **Sohna Road Flyover (Pkg. 2) – July 2020**



**Cause of Failure – Poor Quality of Concrete & Segment Gluing operation**

# **Sohna Road Flyover (Pkg. 1) – Aug. 2020**



**Cause of Failure – Poor Quality of Concrete & Segment  
Gluing operation**

# **NH Bypass near Thalassery – Aug. 2020**



**Cause of Failure – Inadequate Bracings in temporary condition**

# Ghagra River Bridge– Dec. 2020



**Cause of Failure – Poor Quality Segment Gluing operation/ Cable profiling**

# Tirupati Flyover– Jan. 2021



**Cause of Failure – Instability during lowering operation**

# **Dwaraka Expressway (Pkg. 3)– Mar. 2021**



**Cause of Failure – Poor Quality of Concrete & Segment Gluing operation**



# Vishakhapatnam Flyover – Jul. 2021



**Cause of Failure – Inadequate Bracings in temporary condition & poor temporary supports**

# Madurai Natham Road Flyover – Aug. 2021



**Cause of Failure – Inadequate Bracings in temporary condition & poor temporary supports**

# **Santacruz - Chembur Link Road – Sep. 2021**



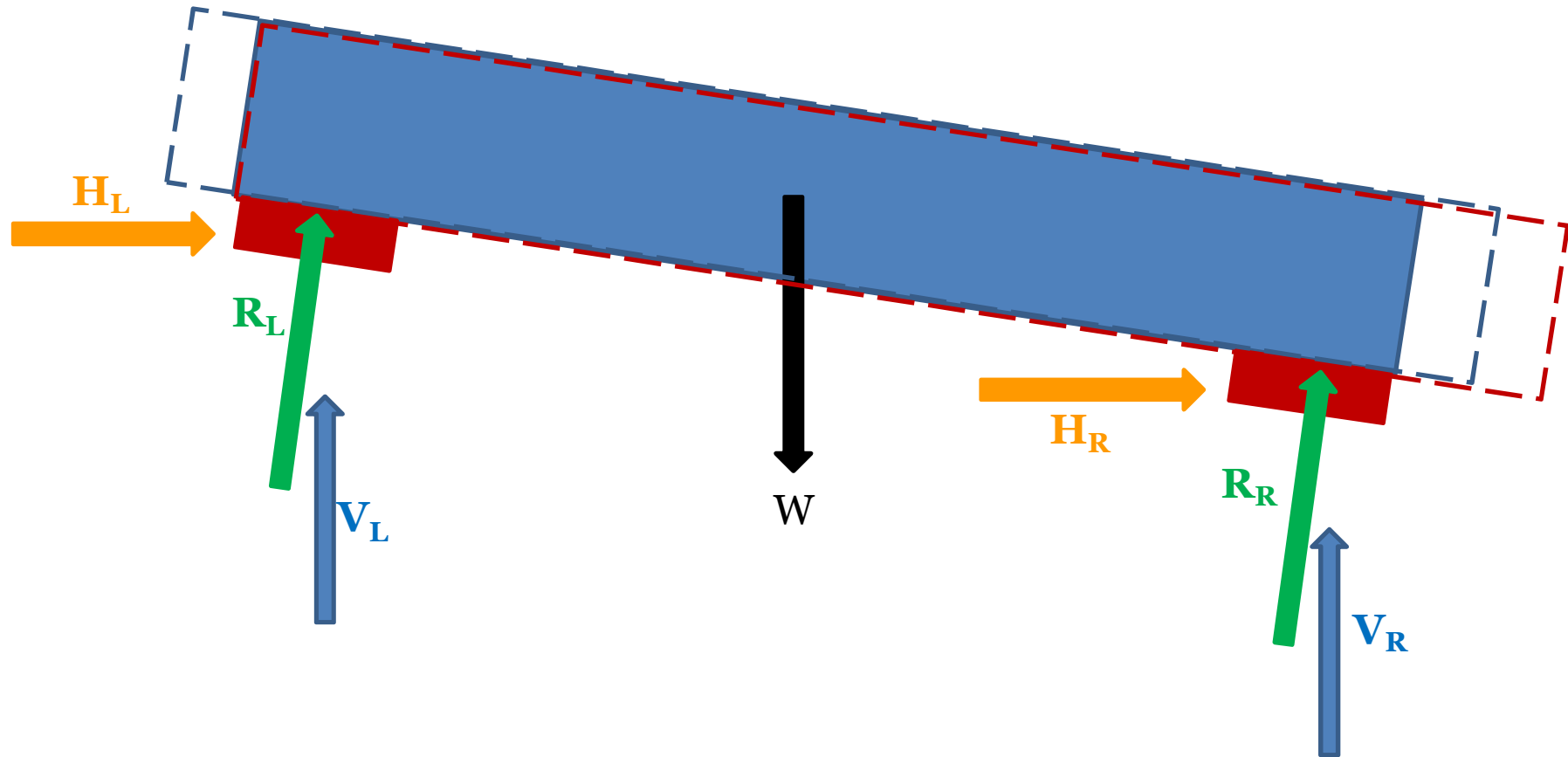
**Cause of Failure – Inadequate temporary Support & poor temporary Bracings**

# Pardi Flyover, Nagpur – Oct. 2021



**Cause of Failure – Incomplete Deck Continuity over a long time interval**

# Probable Explanation for Pardi Flyover failure



# Learnings

Causes of Failures are generally

1. Design
2. Temporary Works
3. Quality of Concrete
4. Quality of Workmanship
5. Inadequate precautions / Unsafe practices

Most of the failures happen during construction

# Mitigation Measures

Mitigation measures can be classified under the following categories:

1. Design control – involving systematic check and review of the details as they say the “Devil is in the Detailing”
2. Construction Control – “Say no to adhoc (Jugaad) processes. Carry out works only in the well defined manner.
3. Material and Concrete production control – This process should include checks from procurement, production, placement and handling stages.

# Conclusions

Absolute commitment to the processes and procedures at all stages of the Project and this can only be achieved by believing and growing to the sage where

Designers understand the Site work fully in the office and the Site Engineers understand the Design aspects fully at site.