Presentation on launching Girders

Submitted to – Prof. Yuvraj singh

Submitted by-

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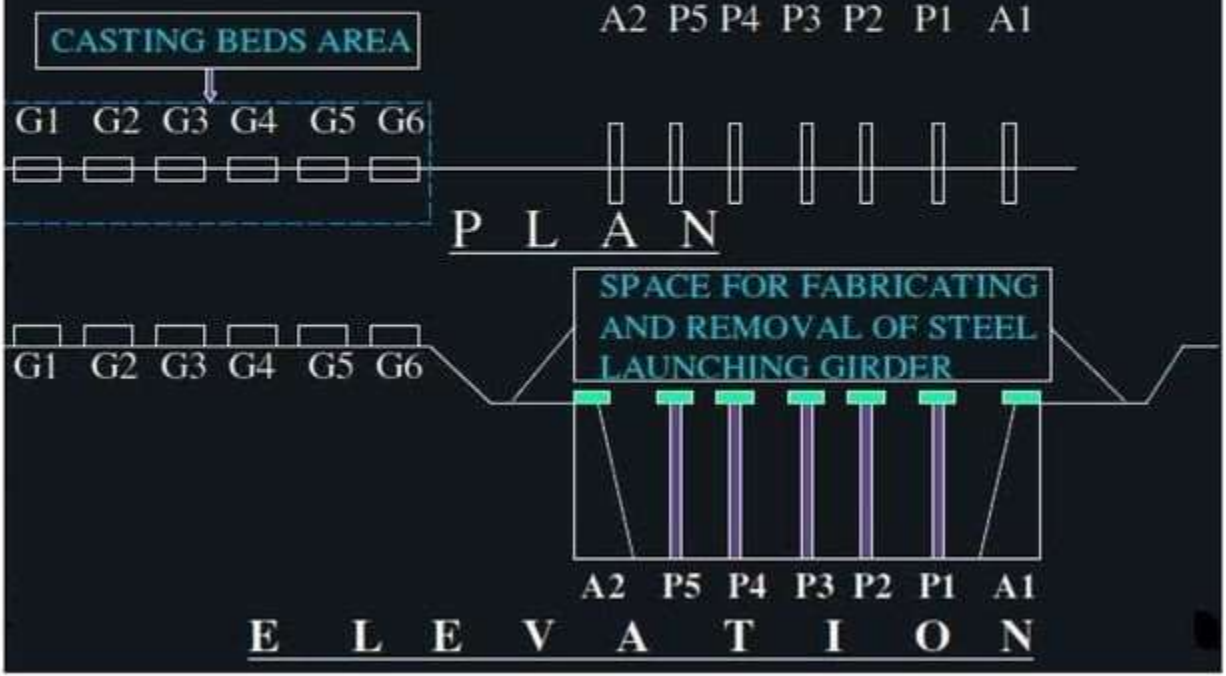
Introduction

- Bridges have two components, Superstructure and sub structure.
- The substructure is normally cast in place over the foundation and various methods are available for this task.
- Placing the superstructure (girders) on the substructure is an important task for the engineers.

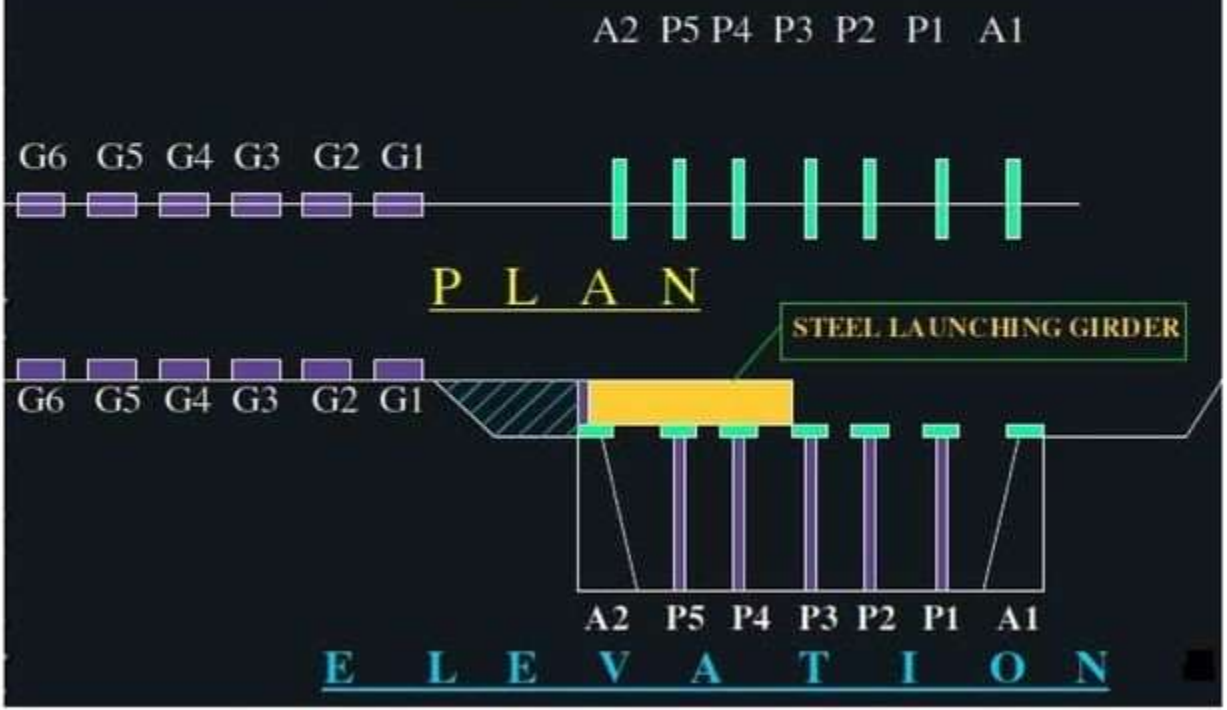
EARTH WORK ON APPROACHES

PSC Box girder and girder casting area Layout

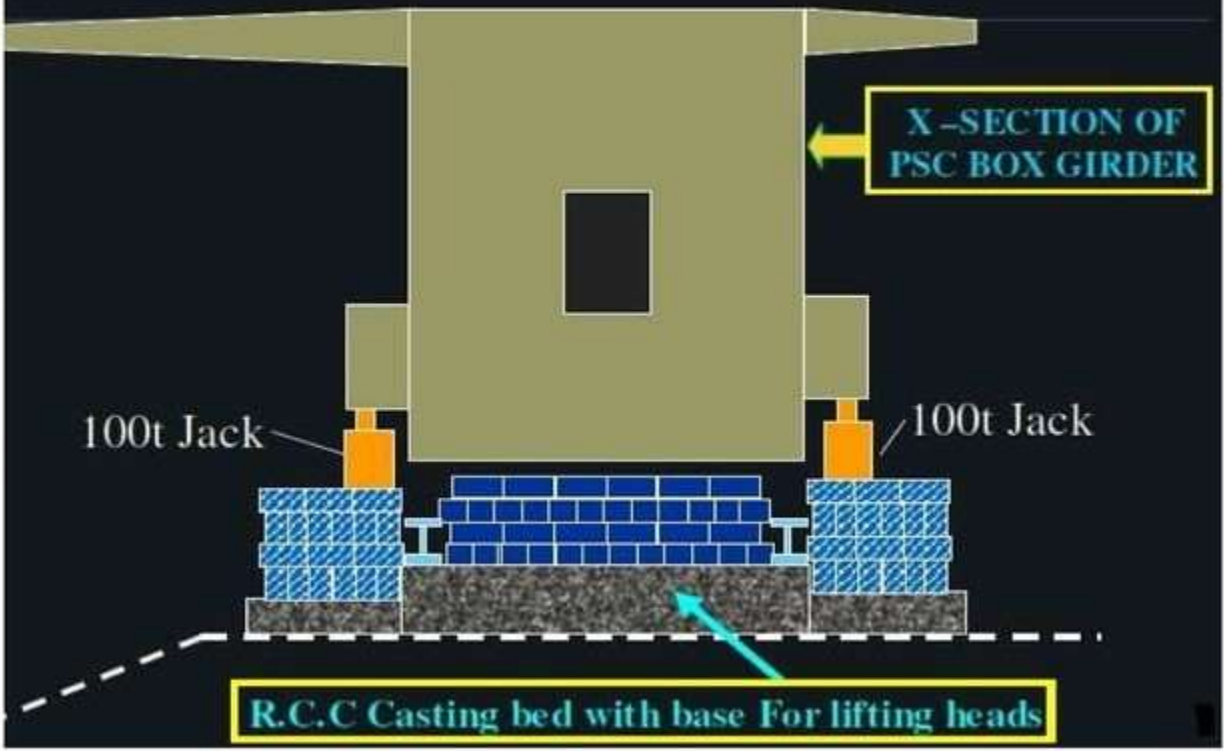


CASTING SCHEME

GIRDER CASTING AREA LAYOUT



R.C.C.CASTING BEDS &PSC BOX LIFTED WITH JACKS

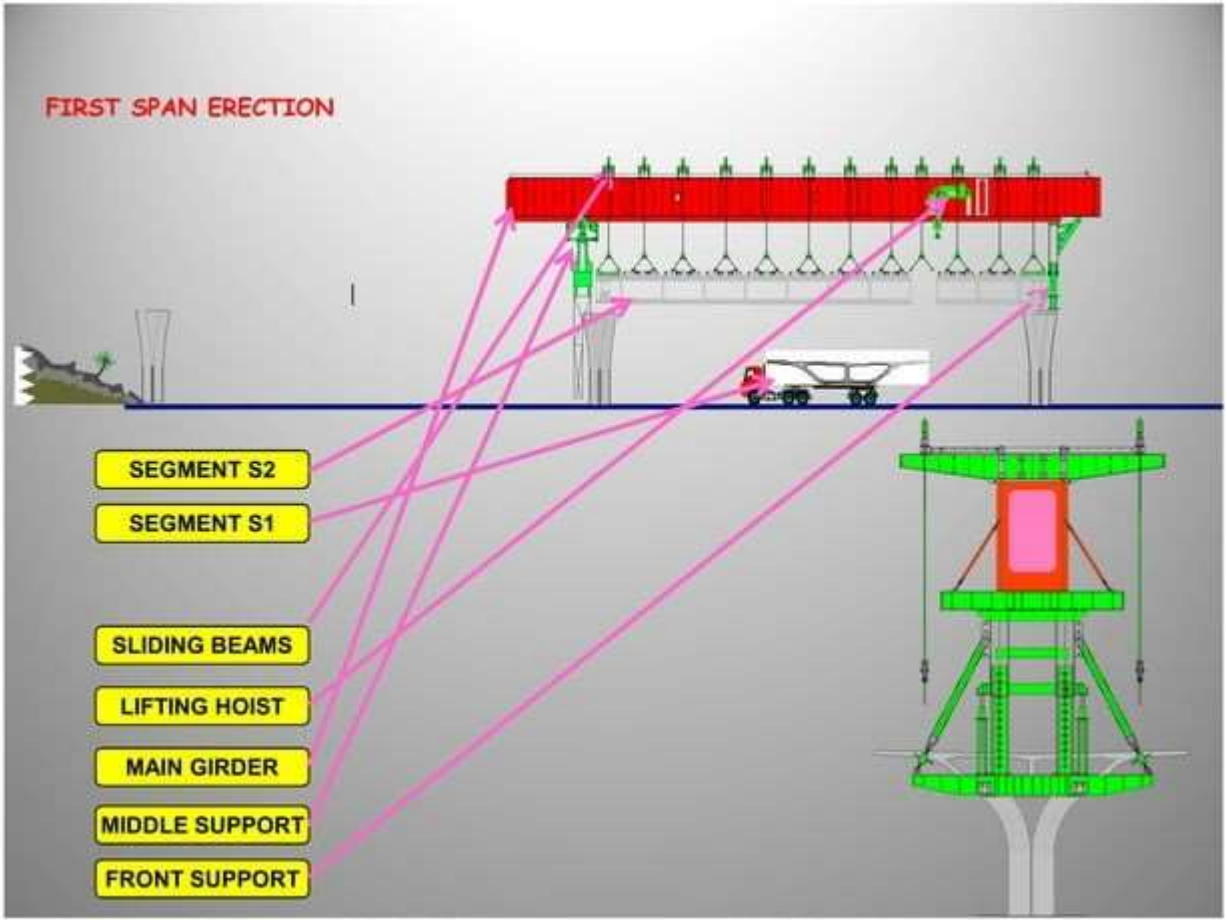


WORKS TO BE ENSURED BEFORE LAUNCHING

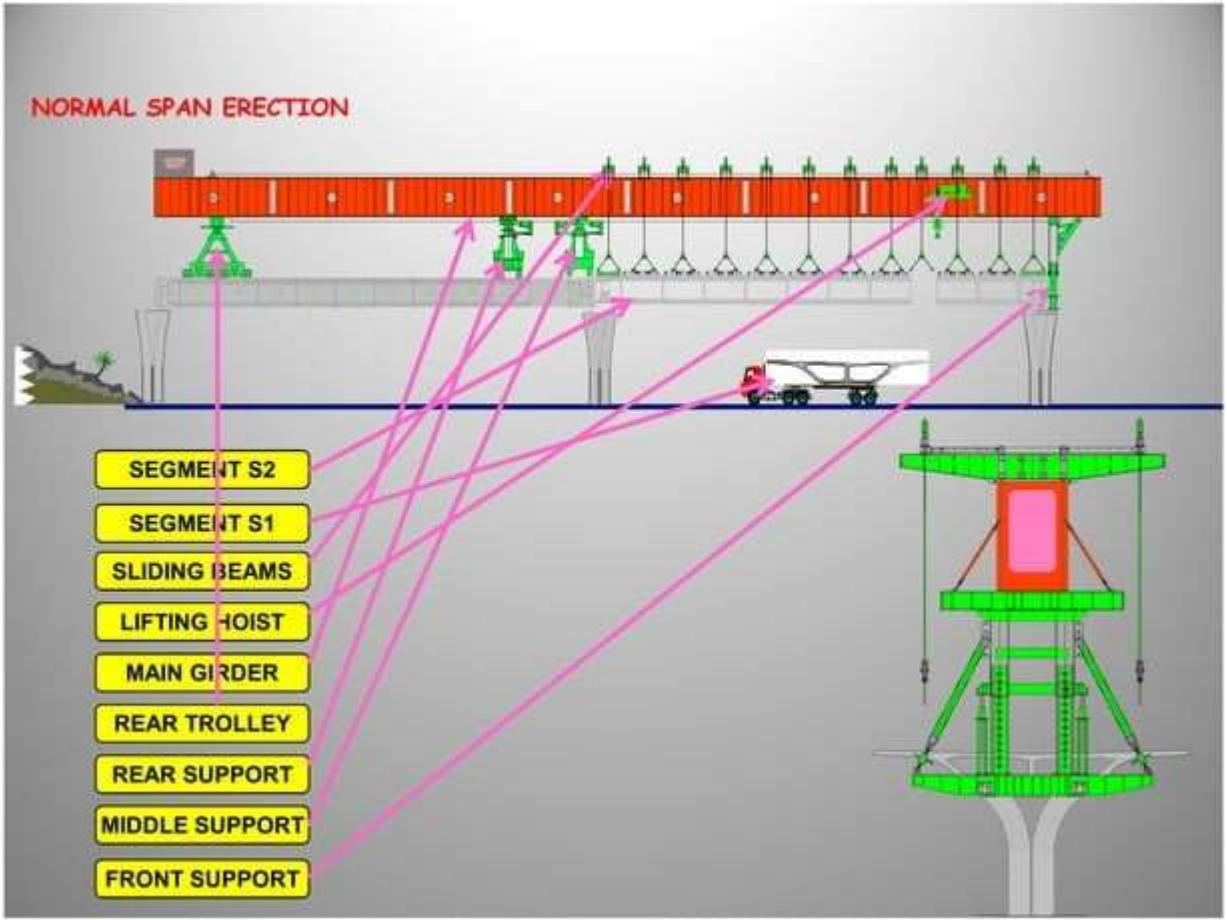
- Abutments and Piers to be completed including bed blocks.
- Dirt wall and fly wings of Abutment not to be concreted to facilitate movement of steel Launching girder.
- The fabricated launching girder is assembled on Abutment side approach in the launching direction.
- Track is welded on steel launching

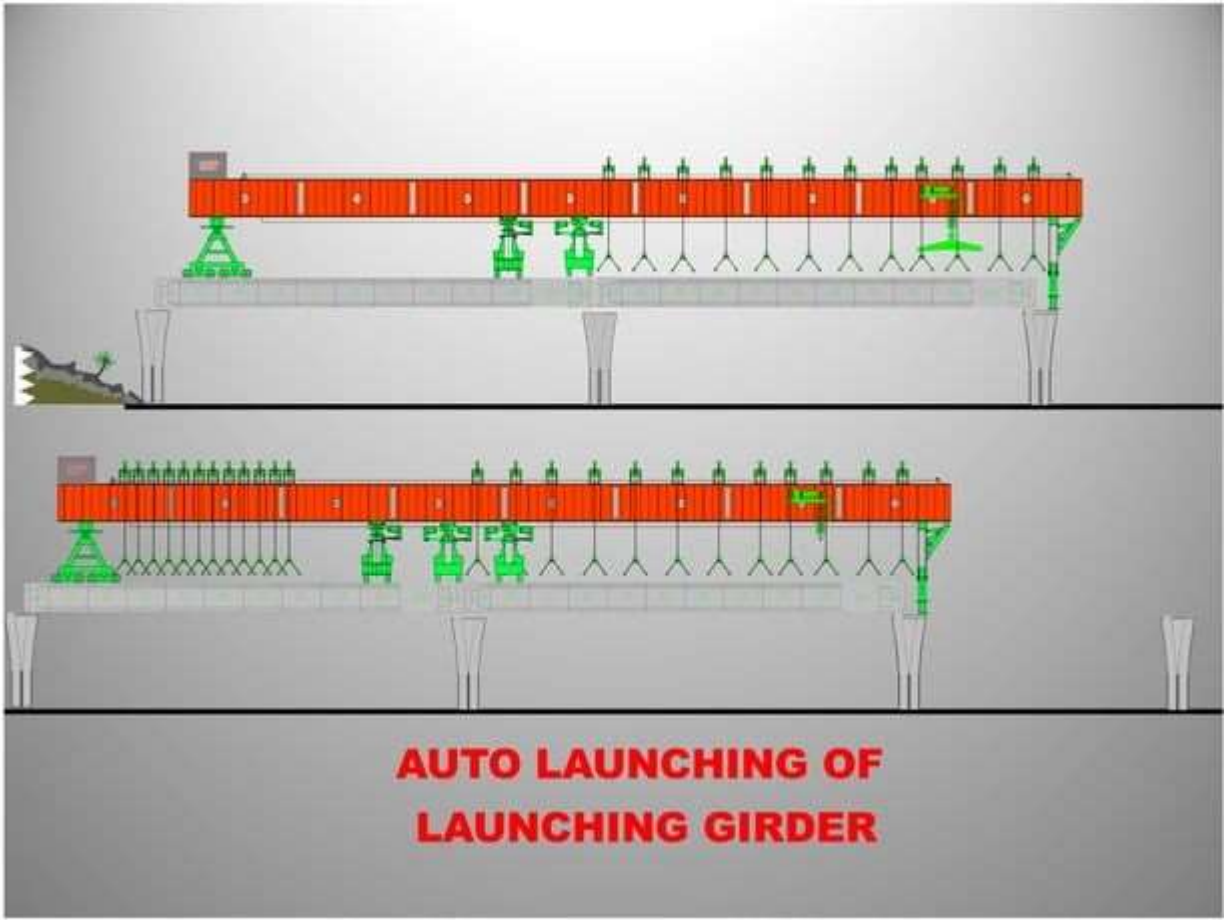
LAUNCHING EQUIPMENTS

- Steel launching girder of appropriate length and weight.
- 5 M.T winch trolley for movement of steel launching girder
- Counterweight trolley
- Trolleys for transporting of girders - 2 nos.
- 5 M.T winch trolley(for movement of girder trolleys)
- Hydraulic jacks
- Gantry Portals


FIRST SPAN ERECTION
SEGMENT S2
SEGMENT S1
SLIDING BEAMS
LIFTING HOIST
MAIN GIRDER
MIDDLE SUPPORT
FRONT SUPPORT

NORMAL SPAN ERECTION




AUTO LAUNCHING OF
LAUNCHING GIRDER


DIRECTION

SALIENT FEATURES OF SUPER STRUCTURE

Location	Sathdhara, Barman, Narsinghpur, Madhya Pradesh
KM	0.3
SPAN	30m
SUPER STRUCTURE	PSC GIRDER
LENGTH OF GIRDER	27.5m
WIDTH OF GIRDER	1.5m
HEIGHT OF GIRDER	1.8m
CONCRETE QUANTITY (EACH)	33 m3
WEIGHT OF GIRDER	87.5 MT
REINFORCEMENT STEEL	3.5 MT

SHIFTING OF LAUNCHING GIRDER PROJECT DESCRIPTION

- The steel girder is pulled with the help of power operated winch and is placed on first two spans i.e. on abutment and adjacent pier.
- Rollers are placed on bank and on the bed blocks for shifting.
- After proper position of launching girder, remove the rollers and ensure firm sitting of launching girder on the bed blocks.
- Construct dirt wall , fly wings of ABUTMENT .
- Now the launching girder is ready for launching of PSC girder.


Shifting of fabricated truss


Pulley arrangement


Fabricated truss shifted


Arrangement of bed


Casting Yard & Stacking yard

LIFTING OF PRECAST GIRDER USING JACKS FOR LOADING ON TROLLEY

- The PSC Girder is to be lifted over the casting bed with the help of four hydraulic jacks of appropriate capacity each.
- Each lift is to be in stages of 100mm.
- Wooden blocks supports to be placed underneath PSC girder.
- Supports to be provided at the bearing location areas only.
- Jacks to be placed below the lifting pads only.
- In successive increments PSC girder is to be lifted to a ht. of 2.00 m over the casting beds.
- Now the PSC Girder is ready for placement of track and trolleys below it to facilitate leading.


Girder placed on rail


Railing track


Attachment of winching
machine to PC GIRDER

GIRDER PLACED ON TROLLEY AND SHIFTING TO THE SPAN

- Keep the PSC girder over the hydraulic jacks placed below the lifting heads.
- Remove the wooden blocks in the bearing area for linking purpose.
- Link the track below the PSC girder.
- Place two trolleys below the PSC girder in the bearing area.
- Rest the PSC girder over the trolley by lowering hydraulic jacks.
- Remove the wooden blocks and hydraulic jacks.
- Now the trolleys are ready to shift to the first span.
- Shift the PSC girder using winch machine.


Launching girder


Place on Position

GIRDER SHIFTING TO POSITION FOR PLACEMENT

- Once the girder placed on trolleys reaches at proper launching location,(Exactly over the bearing area) lock the trolleys.
- The PSC girder is slowly lifted from the trolleys and supported on the specially designed platforms using 4 Nos. jacks.
- Once the girder is loaded on the platforms and jacks, the trolleys are removed and sent back to casting bed for shifting of another PSC girder.


Shifting of girder

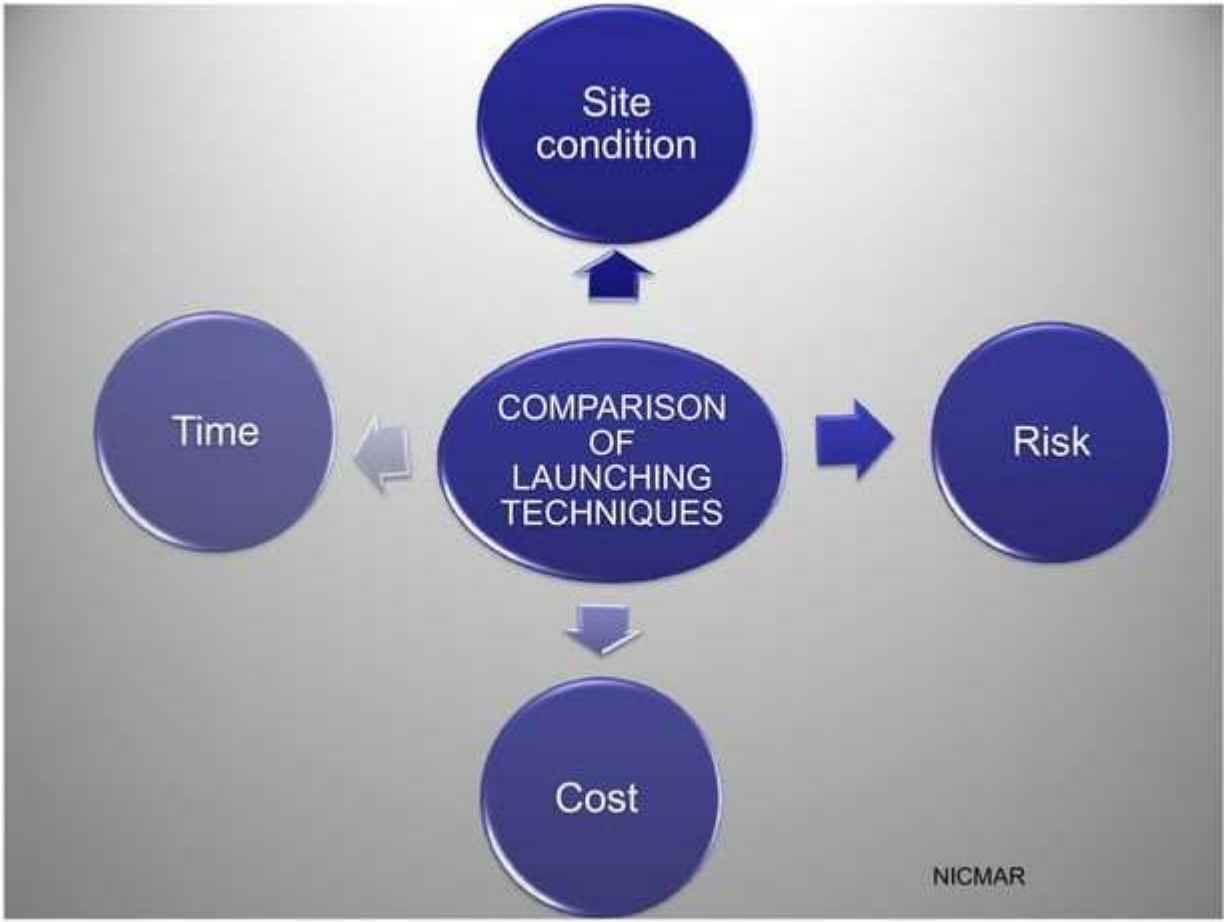

Shifting of girder

ALTERNATIVE METHODS OF LAUNCHING GIRDER

- CAST IN SITU
  - CONVENTIONAL METHOD
  - SEGMENTAL METHOD
- PRE-CAST

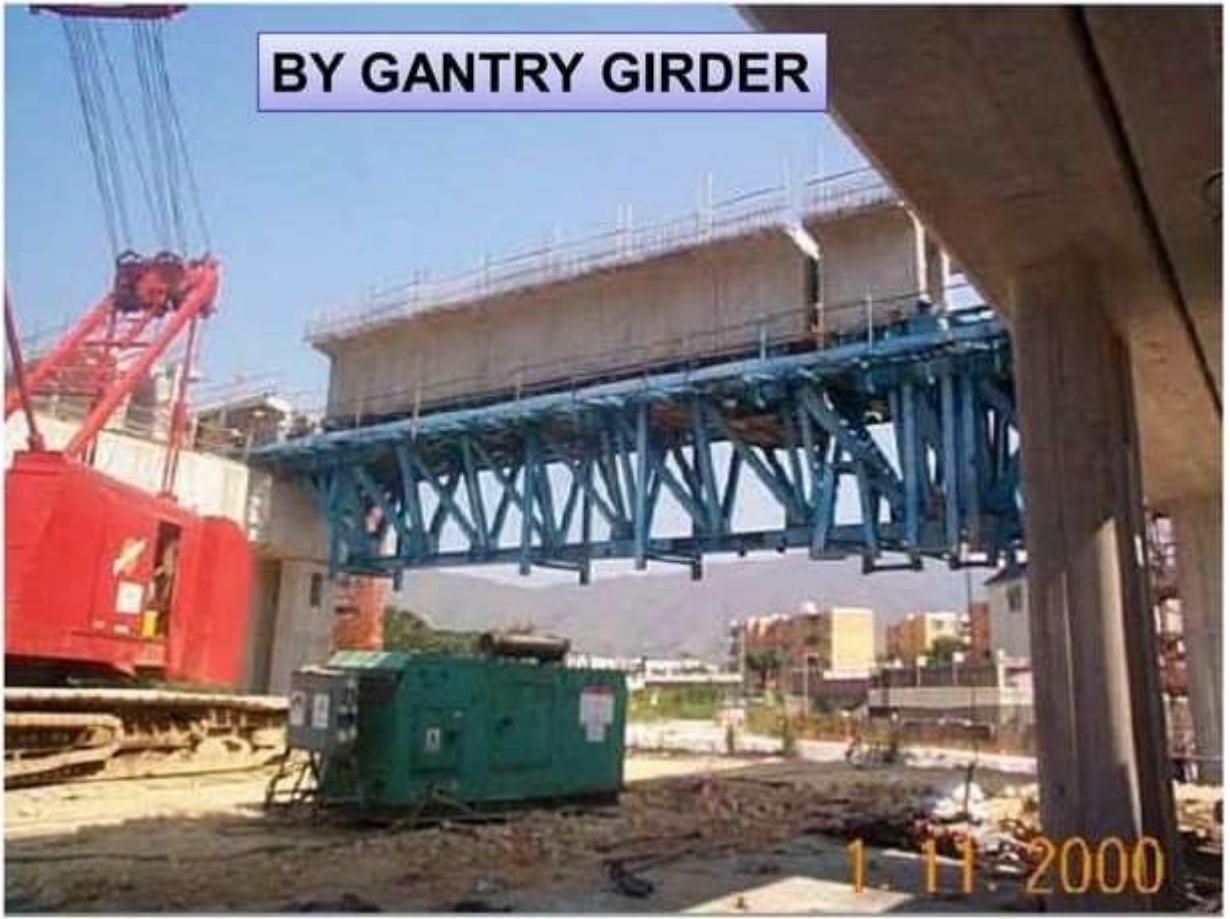
ALTERNATIVE TECHNIQUES OF LAUNCHING

- BY RAIL / JACK/ WINCH MACHINE
- BY STAGING/SUPPORT METHOD
- BY TOWER CRANE METHOD
- BY GANTRY GIRDER


Site condition
Time
COMPARISON OF LAUNCHING TECHNIQUES
Risk
Cost
NICMAR


STAGING METHOD


BY TOWER CRANE
19/03/2005


BY GANTRY GIRDER
1. 11. 2000

ADVANTAGES OF LAUNCHING METHOD

- Height of bridge is not the criteria and this method is applied at any height.
- Ground supports can be totally avoided during launching and as such launching scheme is best suited for perennial course.
- Proper quality control can be ensured in case of pre cast method since the girders will be cast on approach formation.
- There will be lot of working space available around the girder for providing supporting system to shuttering and movement of men.
- Simultaneous construction of sub structure and super structure.
- This scheme is more feasible for multiple spans and cost of launching is cheaper.

DISADVANTAGES OF LAUNCHING METHOD

- Maintenance is difficult as number of machinery involved are more.
- Number of operations are more so individual supervision is required.
- High risk involved in accident.