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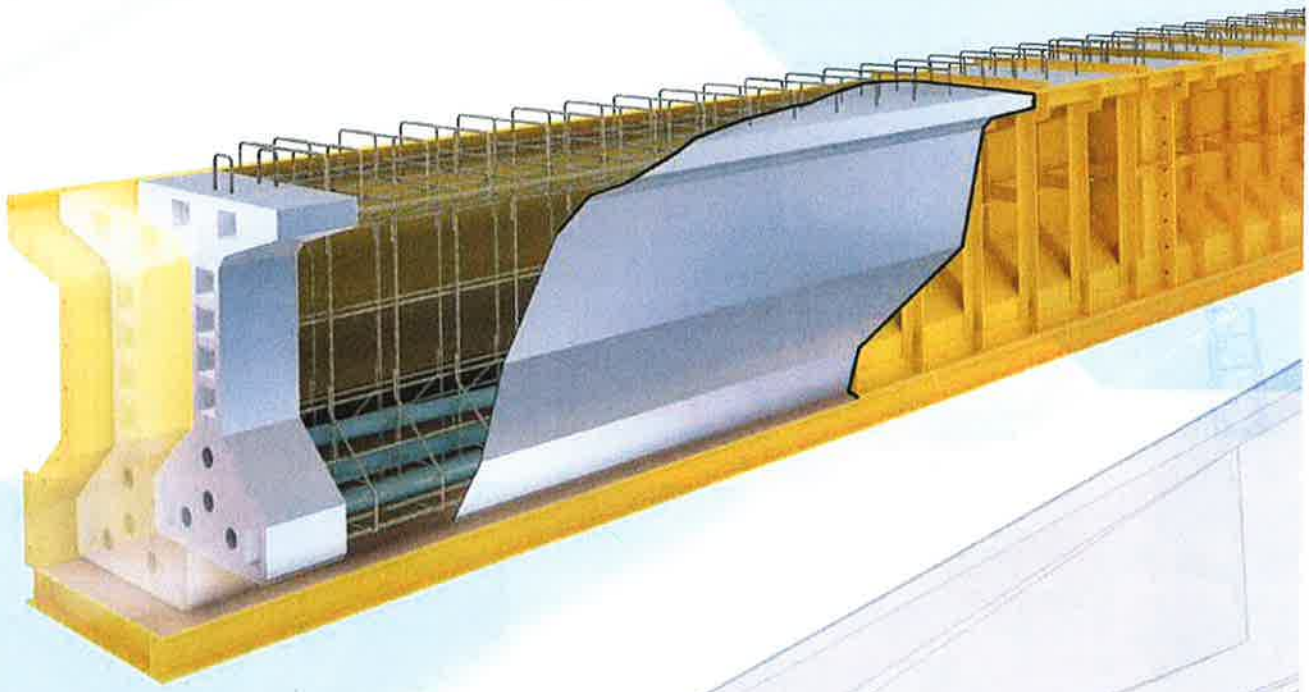
An innovative spliced PSC Girder

SegBeam®



A partnership of

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TOWOONG E&C
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Concept of SegBeam

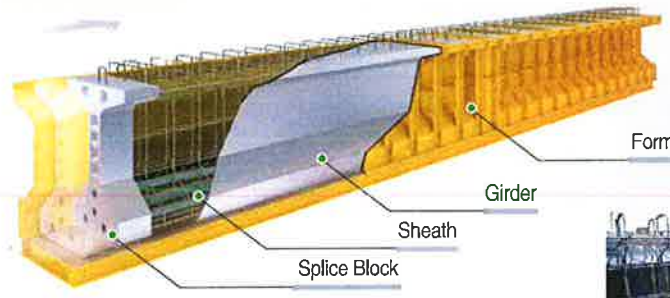
Plant fabrication — **Transportation** — **Assemble at the on-site**

Splice Block

- Perfect Match casting
  (pour concrete downward to the concrete splicing face)
- Use higher strength concrete for precise and safe splicing
- Variable length of segment by moving the splice block in the form

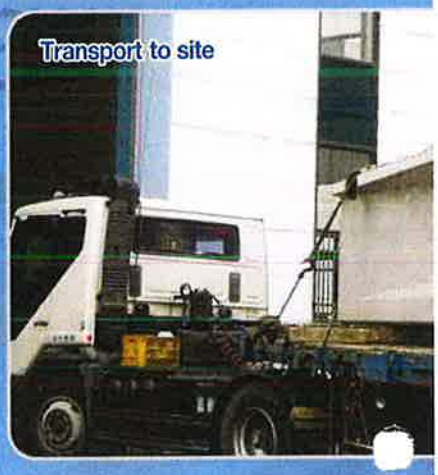
Shorten on-site working time

Plant Fabrication



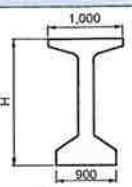
- Movable in the form
- Variable SegBeam length

Transport to site



Span vs Girder height

Span length (m) / No. of Segment / Girder Height (m)	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	Section
	2 Seg.			3 Seg.																		
0.9																						
1.1																						
1.3																						
1.5																						
1.7																						
1.9																						



F_{ck} 50 MPa F_{ck} 70 MPa

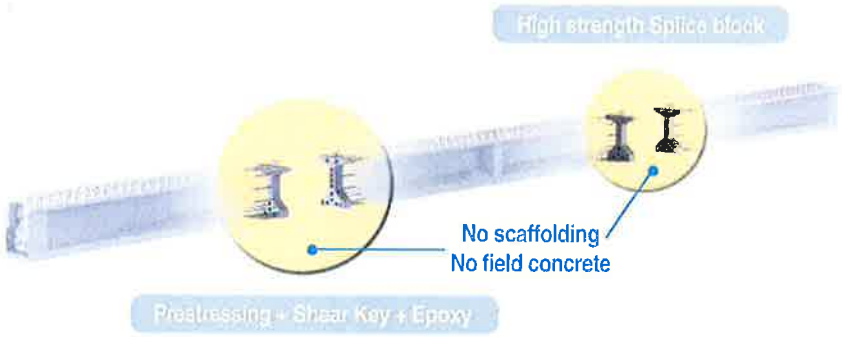
SegBeam Application

- Economical longer span girder bridge
- Bridge which requires small number of girders
- Bridge which requires non-standard length girders
- Bridge which has difficulty in preparing the on-site fabricating field
- Site which requires rapid construction
- Bridge which has difficulty in using high strength concrete
- bridge which requires girders of neat appearance

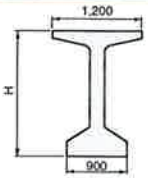
SegBeam Characteristics

Advantages	Disadvantages
Construction aspect	**Construction aspect**
• Easy quality control due to plant fabrication • Short on-site working period • High strength concrete could be used • Variable length of girder with the same form	• Additional job of transportation and assembly are required
Social aspect	**Social aspect**
• Environmental damage minimized • Working environment could be improved	• Currently a spliced prestressed concrete beam is not familiar

2 / 3 / 5 Segments



Span length (m) / No. of Segment	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	Section
Girder Height (m)	5 Seg.																				
1.7	■	■	■	■																	
1.9					■	■	■	■	■												
2.1										■	■	■	■	■							
2.3															■	■	■				
2.5																		■	■	■	



Based on 2 lane Highway standard (Korea)

Economical advantage

P.C Box girder **SegBeam + Launching Truss**

ILM	FCM	MSS	FSM
145	240	240	145

→

SegBeam + Launching Truss
100

Steel girder **SegBeam + Launching Truss**

Steel Plate Girder	Steel Box Girder
145	175

→

SegBeam + Launching Truss
100

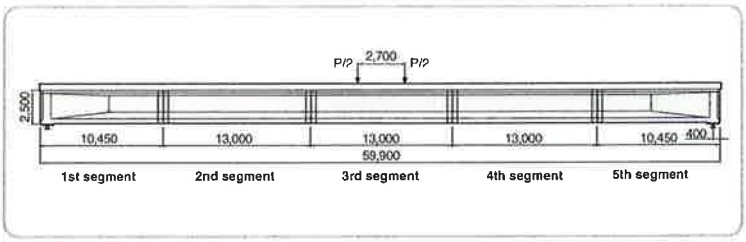
*Comparative bridge construction cost per square meter when SegBeam costs 100.

Loading test of SegBeam

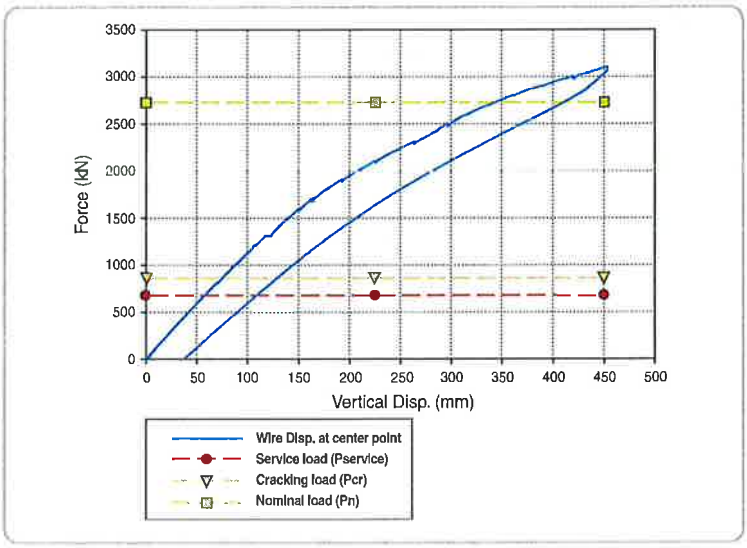
5-segments-60m

2-segments-25m

3-segments-30m



Configuration of loading test



Load-deformation curve at center

- P of Dead and live load after composite VS. Cracking moment P
  $P_{service}$ = 68 ton < P_{cr} = 130 ton
- Live load(Δ_l) vs. Allowable(Δ_a)
  Δ_l = 36.7 mm < Δ_a = 73.6 mm
- Cracking moment P at center(P_{cr}) vs. Cracking moment P at splice joint(P'_{cr})
  P_{cr} = 130 ton < P'_{cr} = 160 ton
- It is observed that SegBeam behaves stably under static loading

Construction Flow

Plant fabrication

Fabricating the splice block

Completed splice blocks

Place a splice block in the form

Fabricating rebar and sheath

Pouring concrete

Detach form and move to store

On-site work

Transport to site

Setting assembly table

Assembly and prestressing

Erection

Completion

Korea 10th Innovative technology IPC Girder

An innovative spliced PSC Girder SegBeam

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