

# Fanling Bypass Eastern Section

## Horizontal Bridge Rotation Method



CEDD Case 1



Before Rotation



After Rotation

Contract No.	ND/2019/05
Contract Title	Fanling North New Development Area, Phase 1: Fanling Bypass Eastern Section (Shung Him Tong to Kau Lung Hang)
Contract Sum	\$3.34 Billion
Project Office	CEDD North Development Office
Consultant	AECOM Asia Company Limited
Main Contractor	CRCC-PY JV
Contract Type	NEC3 ECC Option C

The Fanling Bypass Eastern Section (FLBP) is a major infrastructure project for easing traffic congestion in the Northern District and supporting 74,000 new residents in the Fanling North New Development Area. The FLBP is delivered through two CEDD contracts, namely ND/2019/04 and ND/2019/05, and the latter embraced NEC3 ECC Option C, fostering a collaborative environment built on trust, transparency, and shared goals. Partnering among stakeholders was central to the project’s success, driving innovation and a strong safety culture. A standout achievement was the use of the Horizontal Bridge Rotation Method (HBRM), which allowed bridge spans to be constructed parallel to the East Rail Line during daytime and rotated into place overnight, which minimized disruption and enhanced safety. The project team of ND/2019/05 exemplifies how effective collaboration and engineering creativity can overcome complex infrastructure challenges.

### Overcoming Technical & Operational Challenges



#### Working Above Railway with Limited Access

The team faced major challenges in constructing two bridges over live railway tracks, with construction windows limited to short non-traffic periods at midnight. Traditional methods like vertical lifting of precast segments would have needed over 120 MTR-approved timeslots, each restricted to just three hours, thereby posing serious safety and potential service disruptions risks.



#### Site Constraints and Infrastructure Complexity

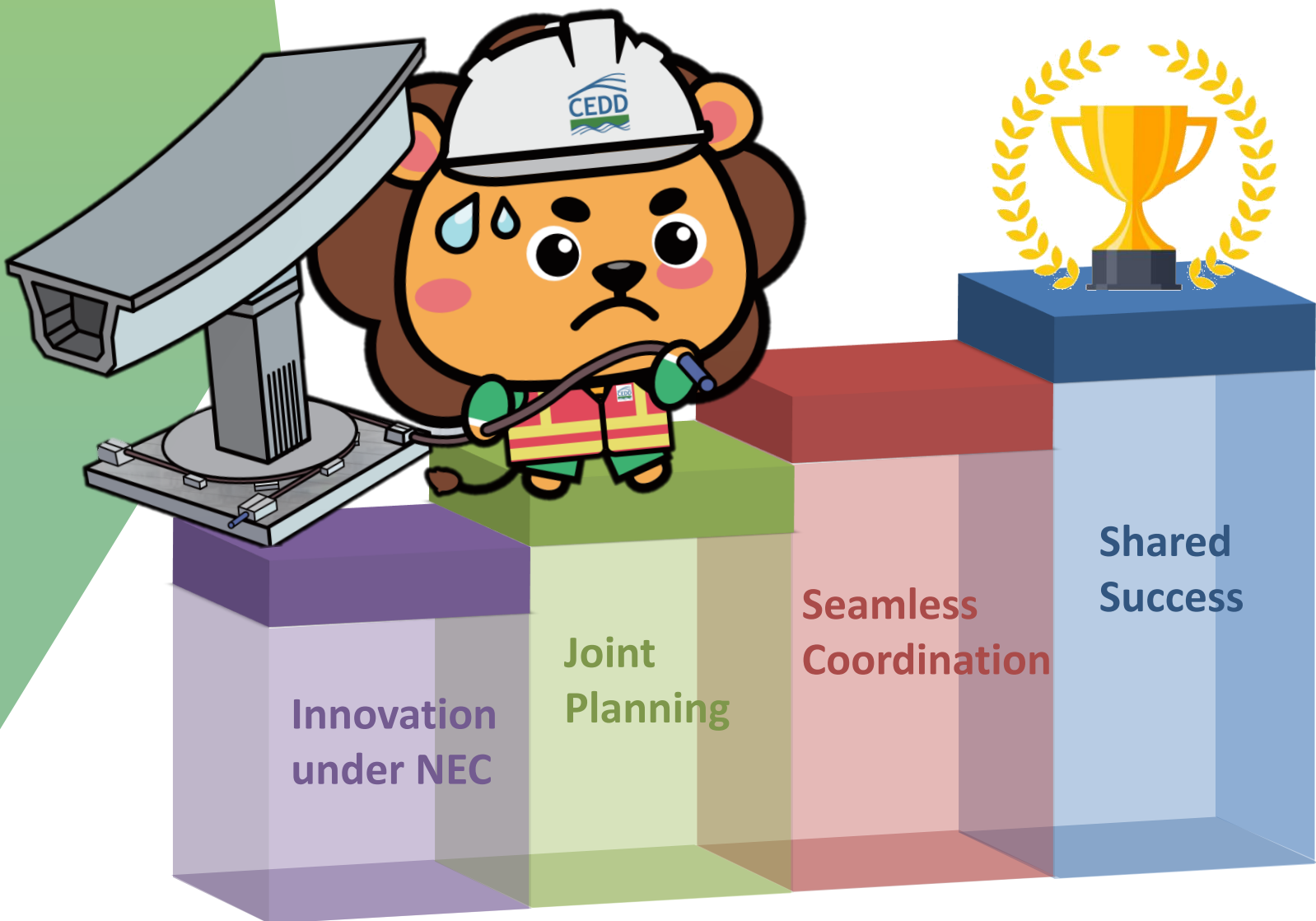
The team had to navigate complex site conditions, including working around critical infrastructure such as large-diameter Dongjiang water mains and high-voltage power cables serving the Heung Yuen Wai Control Point. Careful planning was also required for works near sensitive structures, including a pedestrian footbridge lift shaft and residential areas, ensuring minimal disruption and maximum safety.

The team pioneered the innovative Horizontal Bridge Rotation Method (HBRM)

## A Breakthrough in Construction: The HBRM

The innovative HBRM revolutionized the project, offering remarkable benefits:

- ✓ **Time Efficiency:**  
Casting two bridge decks alongside railway during daytime and rotating them at night saved approximately one year of construction time.
- ✓ **Cost Savings:**  
Cost reduced by 5% through minimizing work over the tracks and avoiding expensive cranes and night shifts.
- ✓ **Quality and Technical Excellence:**  
Daytime construction and positioning works alongside, rather than above the railway enhanced workmanship and precision.
- ✓ **Safety and Health Improvements:**  
Relocating most activities strategically away from high-risk zones ensured safe execution and zero operational incidents.
- ✓ **Environmental and Social Benefits:**  
The accelerated construction timeline alleviated traffic congestion and minimized environmental impact, delivered tangible benefits to the community.







# How Did The Team Make It Happen?

## “One Team – One Goal” culture

### ✓ Fostering Trust and Collaboration

The project team cultivated a collaborative culture grounded in openness, mutual respect, and aligned objectives. Drawing on principles established during the Partnering Workshop, they promoted transparency and encouraged proactive problem-solving across all stakeholders including CEDD, consultants, contractors and MTR, ensuring unified efforts and shared accountability.

### ✓ Early Engagement with MTR

From the project inception stage, extensive collaboration with MTR fostered mutual trust and ensured strict adherence to safety protocols and operational needs in maintaining uninterrupted railway services.

### ✓ Joint Planning and Extensive Rehearsals and Simulations

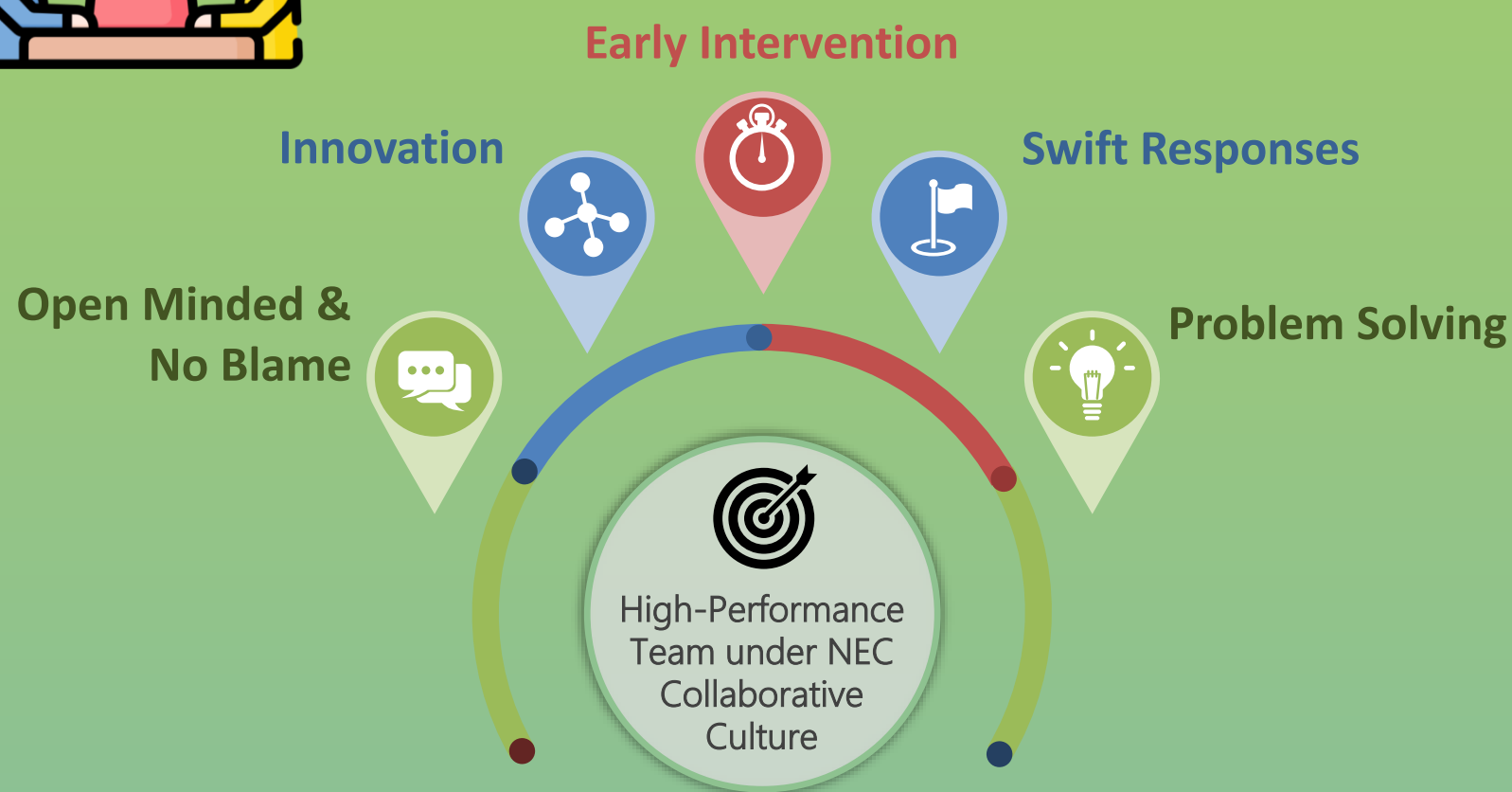
A meticulously crafted, minute-by-minute bridge rotation operation plan was collaboratively developed and optimised through extensive rehearsals and high-fidelity simulations, which ensured seamless execution within the tight three-hour non-traffic window and empowered the team to respond swiftly and effectively to any unexpected challenges.

### ✓ Transparent Risk Management

Regular joint meetings and open communication channels enabled early identification and resolution of potential risks. This transparent, collaborative approach fostered shared accountability and supported the safe, efficient, and timely delivery of the project amid the great complexity and challenges imposed by working over live railway tracks.



## Create a High-Performance Team

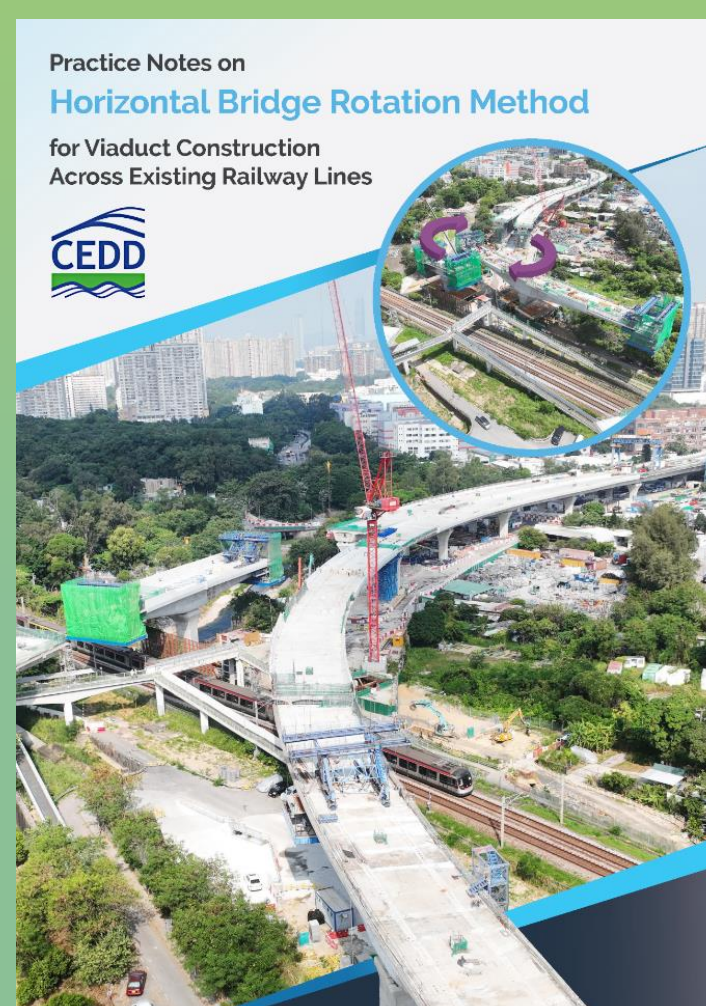


Driven by shared commitment, mutual trust and deep collaboration, meticulous joint planning, the team transformed complex technical and operational challenges into a pioneering achievement, setting new industry benchmarks and earning prestigious awards.



## Knowledge Sharing and Capability Building

To inspire wider adoption of HBRM, the team organized multiple on-site visits and technical seminars attended by over 600 professionals, showcasing the method's practicality and encouraging industry-wide innovation.



## A Legacy of Excellence

The team authored a comprehensive technical report “Practice Notes on Horizontal Bridge Rotation Method”, contributing to Hong Kong’s engineering knowledge base and fostering a culture of continuous advancement.

## Hong Kong’s First Horizontal Bridge Rotation Operation



Bridge rotation operation sharing event cum bridge rotation completion ceremony on early morning of 29 September 2024

SCAN ME!



Horizontal Bridge Rotation Operation