

# World's First Ultra-high Strength S960 Steel Footbridges in the Northern Metropolis

Contract No.: ND/2019/04

Contract Title: Fanling North New Development Area Phase 1:  
Fanling Bypass Eastern Section  
(Shek Wu San Tsuen North to Lung Yeuk Tau)

## Adoption of Ultra-high strength S960 steel – Project milestones

The Employer

The Project Manager and Supervisor



AECOM

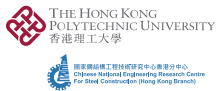
The Contractor

S960 Steel Footbridges Designer and On-site Assembler



YWL

Academic Partners



06/2023



The CEDD and PolyU signed a Memorandum of Understanding to deepen collaboration in the research and adoption of high strength steel for facilitating the use of ultra-high strength S960 steel in bridge construction projects

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08/2023-06/2024



Ultra-high strength S960 steel welding examination and compression test of welded section at PolyU

Ultra-high strength S960 steel welding trial mimicking actual operating condition and welding test at construction site

07/2024



First section of ultra-high strength S960 steel footbridge assembly ceremony

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This contract encompasses the construction of the northern half of Fanling Bypass Eastern Section, which spans approximately 2 kilometres between Shek Wu San Tsuen North and Lung Yeuk Tau. This major infrastructure project includes several critical components to enhance transportation efficiency and local amenities.

The project is set to significantly enhance regional infrastructure by constructing a dual two-lane carriageway with elevated, at-grade and underground sections. A key feature is the Lung Yeuk Tau Interchange, designed to facilitate seamless connectivity between Fanling Bypass Eastern Section and Sha Tau Kok Road. The project also features two footbridges—one spanning across Ng Tung River and another integrated with a cycle track over the Lung Yeuk Tau Interchange, for enhancing connectivity while promoting sustainable transportation.

This project exemplifies cutting-edge innovation through the world's first use of ultra-high strength S960 steel in these two footbridges. This innovation enables substantial structural efficiency with reduced weight, leading to safer and more economical lifting operations and minimised foundation requirements. The adoption of S960 steel facilitated off-site fabrication, reducing on-site labour, construction time and safety risks.

07/2025



Delegates from various government departments and professional bodies were invited to witness the successful erection of the **quadruple span circular footbridge** using S960 steel, right after the 28th anniversary of the establishment of the Hong Kong Special Administrative Region.

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04/2025



The project team collaborated with the University of Hong Kong and Lands Department to **conduct 3D Swept Path Analysis and Virtual Trial Runs using 3D Laser scan and BIM Rendering** simulating anticipate transportation risks for transporting oversized footbridge modules of 7.3m wide and 12m long to reduce unnecessary street furniture removal and minimise potential risks.

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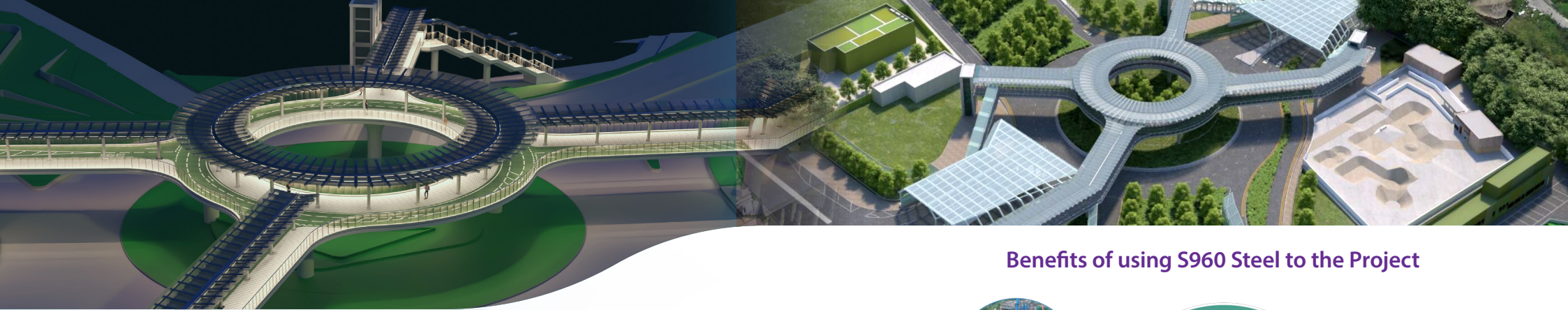
08-09/2024



The team managed to complete the erection of two spans of the S960 steel footbridge across Ng Tung River with a mobile crane, right before the 75th anniversary of the founding of the People's Republic of China.

Scan to view video:





## Benefits of using S960 Steel to the Project



### Robotic welding

Building Technology Research Institute was engaged for compiling the technical guidance and specification for **robotic welding on high strength steel** which can ensure the welding quality.

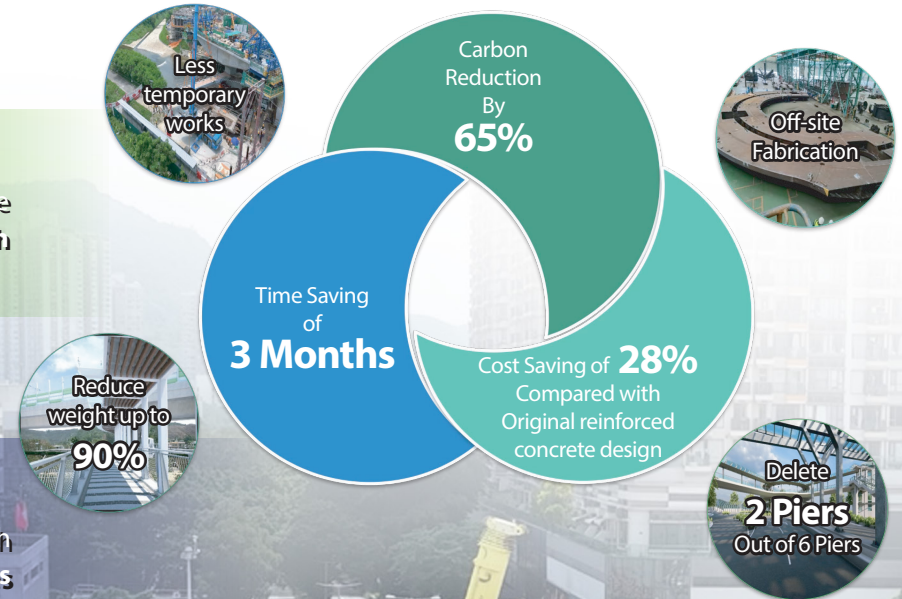


Technical Note on Structural Design of Plate Girder Structure Using Ultra-High Strength S960 Steel

### S960 Technical guideline

The collaboration facilitates the innovation application of ultra-high strength S960 steel in bridge construction projects and **formulates relevant technical guidelines and specification** for its future use in Hong Kong. **Efficient design rules and reliable and economical welding procedures for adopting ultra-high strength S960 steels** and its welded sections are to be developed and implemented.

The development of the Group Standard is the first step to promote the wider use of high strength steel in China, so as to facilitate the further development of the national standard on the use of steel of strength up to 960MPa. Currently, PolyU is developing the Group Standard on the design of high strength steel structures from 690 MPa to 960 MPa. The draft was discussed at the Expert Meeting of the China Steel Construction Society on 22 May 2025 and is being finalised for promulgation.





## Benefits of using S960 Steel to the Industry

**Promoting Green and Low-Carbon Development:**

- Reduces steel usage by over 30%
- Decreases carbon emissions by 15%






**Enhancing Safety and Durability:**

- Prevents safety risks
- Improves seismic resistance
- Improves overall resilience of large-scale infrastructure




**Driving Industrial Chain Upgrading:**

- Reduces the self weight of large scale bridges by over 30% by using S690-S960
- Encourages adoption of **robotic welding**

100% NDT passed



Double Productivity

**Materialising long-term economic benefits**

- Grows market scale
- Saves life-cycle cost by 15% in the long run
- Forms a complete high-strength steel industry chain with high-skilled jobs

# Belt and Road Initiative & Go Global Strategy

**Broadening use in various scenarios**

- Application in large-span stadiums and ultra-tall buildings
- Bridges with self-weight reduced by over 30% with extended design lifespan
- Specialised application in energy infrastructures