Project Reference Catalogue
Bridge Design Services

Cable Stay, Extradosed & Suspension Bridges.

COMPANY PROFILE

Wiecon is an internationally active consulting company with technology driven expertise.

The design of bridge structures represents a mixture of sensitively integrated designs, advanced technologies and past experiences.

Wiecon has been involved in many projects covering all types of bridges and services and is proud to present our outstanding capabilities and achievements in bridge engineering.

Wiecon has its main office in Taipei, Taiwan with branch offices located in Hong Kong & Indonesia.

We have been responsible for a complete range of services from preliminary studies, detailed design to the supervision of the final stages of erection.

Our experience from projects includes precast segmental and full span, balanced cantilever, advance shoring, incrementally launched, cable stay, suspension and other special bridges; as well as the design of bridge equipment used during construction and the design of major temporary works. We also specialize in heavy lifting design, maintenance and rehabilitation works of major bridges.

Our team is characterised by their technical competence, their flexibility to complete any task at hand, and their local knowledge and abilities. Our innovative management culture is helping our staff to meet these challenges by combining long term experience with the latest state of the art technological developments.
Project Reference Catalogue

Bridge Design Services

Core Services

Bridge Design Services
- Feasibility Studies & Expert Advice
- Suitability of Construction Techniques
- Preliminary Design of Bridges & Viaducts
- Detailed Design of Bridges & Viaducts
- Value Engineering
- Drainage Design
- Outfitting Design & Coordination
- Interface Design & Coordination
- Supervision Services

Equipment Design Services
- Movable Scaffold System Equipment
- Precast Segmental Erection Girders
- Precast Segmental Moulds
- Self Climbing Formwork
- Balanced Cantilever Equipment
- Heavy Lifting Equipment
- Quality Assurance & Commissioning

Construction Engineering Services
- Programming & Scheduling
- Quantity Surveying
- Claims Management
- Construction Stage Calculations
- Major Temporary Works Design
- Planning of Erection Methods
- Shop Drawings

Bridge Maintenance, Monitoring & Simulation Services
- Health, Safety & Structural Monitoring
- Damage & Health Assessment
- Risk Inspection & Assessment
- Repair Proposals & Studies
- Strengthening of Bridges
- Proposals & Design Supervision
- Structural Component Simulation
- Cost Optimization
- Rolling Stock Analysis
- Simulation of Special Structures
- Simulation of Forces of Nature
Project Reference Catalogue

Bridge Design Services

Core Services

Major Temporary Works Design Services

- Temporary Works Steelwork Design
- Preliminary Design
- Detail Design
- Quality Assurance and Commissioning

Project Management Services

- Construction Management
- Site Supervision
- Installation & Commissioning
- Project Management
- Cost & Schedule Control
- Development Planning & Studies
- Environmental Management
- Quality Management

Bridge Design Methods

- Cable Stayed Bridge Design
- Extradosed Bridge Design
- Precast Segmental Girder Design
- Suspension Bridge Design
- Incremental Launching Methods
- Full Span Launching Methods
- Movable Scaffolding Bridge Design
- High Speed Rail Bridges
- Balanced Cantilever Bridge Design
- Advance Shoring Construction Method
- Arch Bridge Design
- Casting Yard Design

Checking Engineering Services

- Validate Design Concept & Criteria
- Compliance with Project Requirements, Relevant Standards, Specifications, & Statutory Requirements
- Applicable & Accuracy of Computer Program Models
- Calculation Checks For Superstructure & Substructure
- Practicality & Constructability Checks, Value Engineering Checks
Services Provided to Consultants

Bridge Designs

- Feasibility Studies & Expert Advice
- Suitability of Construction Technique
- Suitability of Bridge Structure
- Preliminary Design of Bridges and Viaducts
- Detail Design of Bridges and Viaducts
- Value Engineering
- Outfitting Design & Coordination
- Interface Design & Coordination

Simulation

- Structural Component Simulation to Optimize Costs
- Rolling Stock Analysis for High Speed Rail Structures
- State of the Art Simulation of Special Structures
- Simulation of Forces of Nature

Other Services

- Drainage Design
- Wind Engineering
- Soil & Structures Interaction
- Scour Protection
- Traffic Forecast & Studies
- Earthquake Engineering
- Bridge Dynamics
- Structural Health Monitoring
- Condition Assessment
- Project Management
Project Reference Catalogue

Bridge Design Services

Cable Stay, Extradosed & Suspension Bridges.

Services Provided to Contractors

Construction Engineering

- Programming & Scheduling
- Quantity Survey & Claims Management
- Construction Stage Calculations
- Major Temporary Works Design
- Planning of Erection Method
- Fabrication Drawings
- Shop Drawings

Equipment Design

- Movable Scaffolding System Equipment
- Precast Segmental Erection Girders
- Precast Segment Yard Planning & Layout
- Precast Segment Mould
- Self Climbing Formwork
- Balanced Cantilever Equipment
- Heavy Lifting Equipment

Other Services

- Project Proposals
- Value Engineering
- Quality Assurance & Commissioning
- Equipment Fabrication Supervision
- Site Supervision Services
Services Provided to Owners

Bridge Designs
- Feasibility Studies & Expert Advice
- Suitability of Construction Technique
- Suitability of Bridge Structures
- Preliminary Design of Bridges and Viaducts
- Detail Design of Bridges and Viaducts
- Value Engineering
- Outfitting Design & Coordination
- Interface Design & Coordination

Construction (Project) Management
- Construction Management & Site Supervision
- Installation & Commissioning
- Project Cost Estimation
- Cost & Schedule Control
- Development Planning & Services
- Environmental Management & Engineering
- Quality Management

Other Services
- Independent Checking Engineering
- Bridge Health Safety & Structural monitoring
- Damage & Health Assessment
- Risk Inspection & Assessment
- Repair Proposal & Studies
- Strengthening of Bridges
Phra Samut Chedi Cable Stay Bridge (PSCD Cable Stay Bridge), Phra Samut Chedi District, Samut Prakan Province, Outer Bangkok, Kingdom of Thailand.

Client: Epsilon Co. Ltd.

Project: Phra Samut Chedi Cable Stay Bridge. Chao Phraya River Crossing Project.

Services: Detail Design Specialist Consultant

Services period: 2016 (ongoing)

Background: The PSCD Cable Stay Bridge spans the Chao Phraya River located in the Phra Samut Chedi District, Samut Prakan Province located south of Bangkok, Thailand.

Span Configuration (m): 52+52+156+660+156+52+52 giving a total bridge length of 1.180km.
Concrete Pylon Height: 178.5m above deck level.
Composite Deck Width: 40.4m with a depth of 4.3m.
The cross beam located at the top of the pylon will be open to the public as a viewing platform and restaurant facilities.
Exat Cable Stay Bridge, Dao Khanong to the Port Section of Chalerm Maha Nakhon Expressway, Yan Nawa & Rat Burana districts, Bangkok, Kingdom of Thailand.

Client: Epsilon Co. Ltd.

Project: Exat Cable Stay Bridge. Chao Phraya River Crossing Project.

Services: Detail Design, Specialist Consultant

Services period: 2016 (ongoing)

Background:
The Exact Cable Stay Bridge spans the Chao Phraya River located between the districts of Yan Nawa & Rat Burana, Bangkok, Thailand. The new bridge will be constructed along side the existing Rama IX bridge that forms part of the expressway between Dao Khanong to the port section of Chalem Maha Nakhon. Span configuration (m): 46.8+57.6+61.2+450+61.2+57.6+46.8 giving a total bridge length of 781.2m. Concrete Pylon Height: 81m above deck level. Composite Deck Width: 42.3m with a depth of 3.87m.
Sultangani Cable Stay Bridge, State of Bihar, India.

Client: S.P. Singla Construction Pvt. Ltd.

Project: Sultangani Cable Stay Bridge.

Services: Detail Design, Shop Drawings, Construction Engineering

Services period: 2016-2017

Background: The Sultangani Cable Stay Bridge is part of the reconstruction of the B.P. Mandal Road connecting NH 31 & NH80 in Bihar, Khagaria District, Bihar State, India. The bridge consists of 4 lanes and a footpath that crosses the Ganga River Between Bhagalpur District and Khagaria District.

Sultangani Cable Stay Bridge.
Spans: 140m+270m+140 = 550m Total Bridge Length. Concrete Pylon height: 44.5m from deck level. Concrete Deck Width: 25.5m / Depth: 7.0m max & 4.0m min.
Silifke Cable Stay Bridge, Mersin Province, Turkish Republic.

**Client:**
TTS Muhendislik Engineering.

**Project:**
Silifke Cable Stay Bridge

**Services:**
Tender Design
Detail Design

**Services period:**
2016

**Background:**
The Silifke Cable Stay Bridge is located west of the town of Silifke and forms part of the new highway towards the town of Mut in Mersin Province. The cable stay bridge crosses a deep gorge over the Goksu River.

**Silifke Cable Stay Bridge.**
Spans: 205.2m+205.2m = 410.4m Total Bridge Length.
Concrete Pylon height: 77.5m from deck level.
Concrete Pier Height: Approximately 97m from top of foundation to underside of deck.
Concrete Deck Width: 27m.
Concrete Deck Depth at Pylon: 11.7m.
Concrete Deck Depth at Abutments: 2.7m.
Khagaria Cable Stay Bridge, State of Bihar, India.

Client: S.P. Singla Construction Pvt. Ltd.

Project: Khagaria Cable Stay Bridge.

Services: Detail Design, Shop Drawings, Deck Form Traveler Design, Construction Engineering

Services period: 2016-2017

Background: The Khagaria Cable Stay Bridge is part of the reconstruction of the B.P. Mandal Road bridge at Km 16 on the main NH-107 road in Khagaria district, Bihar State, India.

Khagaria Cable Stay Bridge.
Spans: 75m+140m+750 = 290m Total Bridge Length.
Concrete Pylon height: 124m from deck level.
Concrete Deck Width: 12.68m x 2.3m depth.
The Komurhan Cable Stay Bridge
Eastern Anatolia, Turkish Republic.

Client:
Gulsan Holding, Turkish Republic.

Project:
The Komurhan Cable stay Bridge.

Services:
Detail Design.
Shop Drawings.
Construction Engineering.

Services period:
2015 - 2017 (approx)

Background:
The Komurhan cable stay bridge forms part of the crossing over the Karakay dam reservoir situated on the Euphrates river in Eastern Anatolia, Turkish Republic. The bridge has a single main span of 380m in length and consists of a steel deck with a width of 25m and a depth of 3.5m. The back span road is at ground level and the stay cables are anchored into a concrete anchor block giving the back span a total length of 180m. The Inverted “Y” shaped concrete pylon has a total height of 160m and consists of steel box casing that is located inside the pylon at the stay cable anchorage region. The bridge also has two side spans consisting of a concrete deck with each span being 50m in length thus giving a total bridge length of 660m.
The Korabelny Fairway Cable Stay Bridge.
Western High Speed Diameter Project, St Petersburg, Russian Federation.

Client: ICA Construction & MegaYapi

Project: The Korabelny Cable Stay Bridge


Services period: 2015 - 2018 (approx.)

Background: The WHSP project is a new multilane motorway that runs from the south to the north and connects the St. Petersburg ring road with the seaport area, Kurortny district, Vasilievsky Island and the Scandinavian motorway. The total length of the new motorway is 47km.

Korabelny Cable Stay bridge. Spans: 150m + 320m + 150m = 620m Total Length. Pylon height: 125m. Outer Concrete Pylons. Deck Width: 39m x 2.7m depth. Steel Composite Deck. Bridge Under Clearance: 40m.
The Korabelny Fairway Cable Stay Bridge.
Western High Speed Diameter Project, St Petersburg, Russian Federation.
The Petrovsky Fairway Cable Stay Bridge.
Western High Speed Diameter Project, St Petersburg, Russian Federation.

Client:
ICA Construction & MegaYapi

Project:
The Petrovsky Cable Stay Bridge

Services:
Construction Engineering.
Deck Erection Equipment Design.
Specialist Consultant & Site Supervision.

Services period:
2015 - 2018 (approx.)

Background:
The WHSP project is a new multilane motorway that runs from the south to the north and connects the St. Petersburg ring road with the seaport area, Kurortny district, Vasilievsky Island and the Scandinavian motorway. The total length of the new motorway is 47km.

Petrovsky Cable Stay bridge.
Spans: 110m + 240m + 110m = 460m Total Length.
Pylon height: 124m. Central Concrete Pylons.
Deck Width: 48m x 2m depth. Steel Composite Deck.
Bridge Under Clearance: 25m.

Construction of the two pylons and side span piers already completed.
The Petrovsky Fairway Cable Stay Bridge.
Western High Speed Diameter Project, St Petersburg, Russian Federation.
Nissibi Cable Stayed Road Bridge,

Turkish Republic

Client
Gulsan Construction Company, Turkish Republic.

Project
Nissibi Cable Stayed Road Bridge Project, Turkish Republic.

Services
Tender design services
Consulting services
Construction Engineering
Shop Drawings

Services period
2012-2015

Background
The Nissibi cable stayed road bridge project is to cross the upper reaches of the 817 km² reservoir created by the Ataturk Dam across the Euphrates River in south eastern Anatolia.

Nissibi cable stayed road bridge will connect Adiyamen City across the Euphrates River to the historic city of Diyarbakir on the banks of the Tigris River. The bridge will considerably shorten the present road journey.

Services are being provided for the tender design stage of the Nissibi cable stayed bridge; which includes the preliminary design.

The 620 m long cable stayed road bridge comprises of a 420 m long, 17.81 m wide, steel box orthotropic deck central span. With a 1.5 m walkway, and a 1.5 m emergency lane and 3.5 m traffic lane in both directions. Two 100 m back span areas are cast in place concrete roadway pavement.

The steel bridge is supported by the double splay cables from 2 inverted Y shaped concrete pylons between 4.5 and 5 m wide; 5 m thick and with heights of 113.6 m above the cable stay bridge deck.

Two sets of 9 double splay cables supporting the bridge and the back stays are anchored in 32 m x 25 m, 8 m deep concrete blocks tied down with prestressed ground anchors at both ends of the bridge.
Nissibi Cable Stayed Road Bridge,
Turkish Republic
Nonthaburi Extradosed Bridge,
Mueang District, Nonthaburi Province, The Kingdom of Thailand.

Client:
NCE NorCiv Engineering, Co. LTD.

Project:
Nonthaburi Extradosed Bridge, Mueang District, Nonthaburi Province.

Services:
Construction Engineering.
Main Bridge Only.

Services period:
2012-2015

Background:
The Chao Phraya River-crossing bridge at Nonthaburi 1 Road construction project is a project to construct a bridge in the area of Mueang District in Nonthaburi Province, Thailand, over the Chao Phraya River.

It is located between Phra Nangklao Bridge and Rama V Bridge (downstream), connects Nonthaburi 1 Road, on the east side of the river, and Wat Bot Don Phrom-Thanam Nonthaburi Road and Ratcha Phruek Road, on the west side of the river.

The project has a total length of approximately 4.3km, consisting of an interchange at Nonthaburi 1 Road, a 6-lane extradosed concrete bridge with 200m long main span and the total length of 460m, an intersection at Wat Bot Don Phrom - Thanam Road, and a 6-lane at-grade road to an interchange at Ratcha Phruek Road.

It is part of the completed main road linking network developed by the Department of Rural Roads (DRR) in the area on the west side of the river, to ease the traffic on Rama V Bridge, Phra Nangklao Bridge and Rama IV Bridge. The Bridge is due to open to traffic in March 2015.
Nonthaburi Extradosed Bridge,
Mueang District, Nonthaburi Province, The Kingdom of Thailand.
Merah Putih Cable Stay Bridge, Ambon City, Maluku, Republic of Indonesia.

Client: Waskita.

Project: Merah Putih Cable Stay Bridge. (Galala ~ Poka Bridge)

Services: Detail Design, Construction Engineering, Specialist Consultant

Services period: 2012-2015

Background: Merah Putih Bridge (Indonesian: Jembatan Merah Putih) is a cable stayed bridge located in Ambon city, Maluku, Indonesia. The bridge spans over Ambon Bay in Ambon Island, connecting Rumah Tiga village (Poka) in Sirimau sub-district on the north side, with Hative Kecil/Galala village in Teluk Ambon sub-district on the south side. This bridge is the longest bridge in the eastern region of Indonesia.

The Bay of Ambon is a narrow and deep bay that divides Ambon Island into two peninsulas; the larger Lei Hitu peninsula in the north and the Lei Timur peninsula in the south. Ambon Island region is a tectonic earthquake prone area. The south approach bridge has a total length of 360m and the north approach bridge has total length of 405m. The max span length is 45m for both the North & South approach bridges. The main cable stay bridge has a span configuration of 75m+300m+75m giving a total length of 450m. The total project length is 1,065km. The concrete pylons have a total height of 54m above deck level and the composite deck width is 21.5m.
Project Reference Catalogue
Bridge Design Services

Cable Stay, Extradosed & Suspension Bridges.

Merah Putih Cable Stay Bridge, Ambon City, Maluku, Republic of Indonesia.
Suhua Highway No.9 Improvement Project. First Extradosed Bridge & FCC Bridges

Ilan & Haulien Counties, Taiwan.

Client:
Pan Asia Construction, Taiwan.

Project:
First Extradosed Bridge & FCC Bridges.
Suhua Highway No.9 Improvement Project.

Services:
Construction Engineering

Services period:
2013 – 2014

Background:
Highway number 9 is located on the east of Taiwan and links the counties Ilan, Haulien and Taitung with Taipei City. A major upgrade of this highway is currently underway to provide better and quicker access between Taipei and the scenic east coast of Taiwan without compromising the natural beauty of the environment. The improvement project is also the result of recent damage to infrastructure and roads due to numerous typhoons.

The Extradosed Bridge has a span configuration of 95m+160m+105m giving a total bridge length of 360m with a concrete deck width of 19.2m. The concrete pylons have a height of 23m each.

The Concrete FCC (Free Cantilever Bridges) have a span configuration as follows. The deck widths vary between 9m and 16.5m on average.

**FCC01**
- U1N 65m+110m+65m = 240m
- U2N 60m+80m+68m+37m = 245m
- U1S 65m+95m+50m = 210m
- U2S 50m+85m+85m+53m = 273m

**FCC02**
- U1N 68m+127m+127m+127m+127m+68m = 644m
- U1S 67m+130m+130m+130m+69m = 656m
Suhua Highway No.9 Improvement Project. First Extradosed Bridge & FCC Bridges

Ilan & Haulien Counties, Taiwan.
Suhua Highway No.9 Improvement Project. Second Extradosed Bridge

Ilan & Haulien Counties, Taiwan.

Client:
RSEA Construction, Taiwan.

Project:
Second Extradosed Bridge.
Suhua Highway No.9 Improvement Project.

Services:
Construction Engineering.
Site Engineering Supervision

Services period:
2013 - 2014

Background:

Highway number 9 is located on the east of Taiwan and links the counties Ilan, Hualien and Taitung with Taipei City. A major upgrade of this highway is currently underway to provide better and quicker access between Taipei and the scenic east coast of Taiwan without compromising the natural beauty of the environment. The improvement project is also the result of recent damage to infrastructure and roads due to numerous typhoons.

The Extradosed Bridge has a span configuration of 95m+150m+95m giving a total bridge length of 340m. The deck consists of a composite section whereby the top and bottom slab consists of reinforced concrete and the webs are constructed out of corrugated steel plates. The deck has a total width of 15m. The concrete pylons have an approximate height of 32m each & the pylon profiles depict the shape of a grain of rice.
Suhua Highway No.9 Improvement Project. Second Extradosed Bridge
Ilan & Haulien Counties, Taiwan.
Siak IV Cable Stay Bridge Project.

Pekanbaru Province Riau, Indonesia

Client:
Waskita Engineering, Indonesia

Project:
Siak IV Cable Stay Bridge Project at Pekanbaru Province Riau, Indonesia.

Services:

Services period:
2013

Background:
The Siak IV cable stayed bridge project has two planes of stay cables supporting the main span which is a composite deck composed of steel I-girders and reinforced concrete deck slab.

The side span or approach span is also a composite structure however it is virtually independent of the main bridge except for the vertical bearing support that the cable stay bridge provides for this structure at the pylon cross beam level.

The main span is integrated into the cross beam at the pylon and is supported by two stay cable planes on either side of the deck.

The back stays are anchored in a massive anchor block which is connected by an underground beam to the pylon base in order to equilibrate the horizontal forces.

The pylon height is 75m high and consists of two spans with the main span being 155m and the back span being 70m. The deck width is 18m wide and consists of 4 traffic lanes and two sidewalks.
Chung-Hua High Speed Rail Station Road Extension Extradosed Bridge

Chung-Hua County, Taiwan.

Client: Chan Shenn Engineering Consultants, Taiwan.

Project: The New Chang-Hua High Speed Rail Station Road Extension. Extradosed Bridge, Changhua County, Taiwan.

Services: Preliminary Design & Detail Design

Services period: 2013

Background: The New Chang-Hua High Speed Rail Station Road Extension Project.

Chang Hua HSR Extradosed Bridge, Changhua County, Taiwan.

The Extradosed Bridge deck consists of 3 spans; 65m+120m+65m giving a total main bridge length of 250m.

The deck width of 28m is a continuous concrete quad-ruple box girder constructed in segments using the balanced cantilever construction method.

The two concrete pylons are inclined and are a height of 20m above the deck level.

The pylons support the concrete deck segments with a total of 36 stay cables. The tallest pier is 10.53m in height.
Chung-Hua High Speed Rail Station Road Extension Extradosed Bridge
Chung-Hua County, Taiwan.
Fong Peng Extradosed Bridge & Approach Bridges.

Hualien County, Taiwan.

Client: OVM Corporation.

Project: Fong Peng Extradosed Bridge & Approach Bridges, Hualien County, Taiwan.

Services: Construction Engineering.

Services period: 2011 ~ 2012

Background:

The Fong Peng Extradosed Bridge spans across the Sou Fong Shi River in Hualien County located on the scenic east coast of Taiwan. The bridge is located just off national highway number 9 on Zhongsan Road Section 1, Lin Zhong Village just South of Hualien City on the main route towards Taitung City.

The Main Extradosed Bridge has a span configuration of 84m+140m+140m+140m+84m giving a total bridge length of 588m. The concrete deck is 28.2m wide and consists of two traffic lanes and two motorbike lanes. The concrete deck is constructed using the balanced cantilever method. The three concrete pylons consists of single plane stay cables and are 27.9m, 29.9m & 27.9m in height respectively.

The Extradosed bridge consists of Two Approach Bridges constructed using the CIP method (Cast in Place).

North Approach Bridge.
45m+45m+45m+45m+45m+41m+40m = 306m in length

South Approach Bridge.
40m+40m+36m+36m = 152m in length.
Fong Peng Extradosed Bridge & Approach Bridges.

Hualien County, Taiwan.
The Dan Lin Extradosed Bridge spans across the Lin Bien Shi river in Pingtung County, Taiwan. The new bridge replaces the old bridge that links the villages of Dan Lin and Laiyi located just off the main national road No.185 to the east of Kaohsiung City.

The Extradosed Bridge has a span configuration of 99m+148m+99m giving a total bridge length of 346m. The prestressed concrete deck has a varying width of 9.8m to 11.2m and consists of two traffic lanes. The deck is constructed using the cantilever method. The double plane cable stay pylons are constructed with reinforced concrete and are both 15.80m in height above the deck level.
Dan Lin Extradosed Bridge.

Pingtung County, Taiwan.
Client: 
Mega Yapi Construction and Trading Company, Turkish Republic.

Project: 
Agin Cable Stay Bridge

Services: 

Services period: 
2007—2014

Background: 
The Agin Cable Stay Bridge links the roadway between the cities of Agin and Elazig in the Turkish Republic.

The bridge spans across the Keban Baraji Reservoir near the main town of Elazig in central Turkey and is to provide a more quick and alternative route between the towns of Agin and Elazig.

The three span arrangement is 120m+280m+120m which gives a total bridge length of 520m.

The main deck is composed of an orthotropic steel box section with a width of 13.0m and is about 31.5m above the water level at the center of the main span.

The two steel pylons are 55m in height from the deck level.
Project Reference Catalogue
Bridge Design Services

Agin Cable Stay Bridge, Elazig Province, Turkish Republic

Elazig Province Infrastructure upgrade between the towns of Agin & Elazig.
Shetze Cable Stay Bridge, Taipei County, Taiwan

Client:
Chun Yuan Construction, Taiwan.

Project:
Shetze Cable Stay Bridge.

Services:
Construction Engineering, Site Supervision & Technical Services.

Services period:
2010—2013

Background:
The Shetze Cable Stay Bridge, Taipei County, Taiwan

The Shetze bridge is a cable stay bridge spanning the Keelung river in Taipei County, Taiwan.

The deck consists of a two span continuous steel beam girder with a span configuration of 70m +180m giving a total bridge length of 250m.

The deck width varies from 38m to 42m and consists of a double road lane, bicycle lane, motor bike lane and sidewalks.

The inverted “Y” shaped pylon height is 105m from the deck level and is tilted at an angle of 78 degrees.
Project Reference Catalogue
Bridge Design Services

Cable Stay, Extradosed & Suspension Bridges.

Shetze Cable Stay Bridge, Taipei County, Taiwan
Dapeng Bay Cable Stay Bridge,
Pingtung County, Taiwan.

Client:
VSL, Taiwan

Project:
Dapeng Bay Cable Stay Bridge,
Pingtung County,
Taiwan.

Services:
Construction Engineering.
Main Bridge Only.

Services period:
2009 ~ 2010

Background:
The Dapeng Cable Stay Bridge, is a unique landmark in the picturesque Dapeng Bay, Pingtung County in Southern Taiwan.

The bridge consists of two asymmetrical spans with the back span being 55m and the main span being 100m giving a total bridge length of 155m.

The 72.90m high concrete pylon supports the deck with a double stay cable system and the pylon depicts the shape of a sail to enhance the bay’s oceanic imagery due to its close proximity to the Taiwan straight.

The prestressed quadruple cell concrete deck is 30m wide and consists of two traffic lanes and two motorcycle lanes. In front of the main there a bascule bridge with a span of 40m that rotates upwards to allow shipping traffic to pass through. The rotation time only takes 2 minutes and rotates to an angle of 75 degrees.
Dapeng Bay Cable Stay Bridge,
Pingtung County, Taiwan.
Golden Horn Metro Crossing Project, Istanbul, Turkish Republic

Istanbul Metro MRT Four Rail Bridge Crossing over the Golden Horn Inlet

Client: Astaldi Gulermak Joint Venture, Turkish Republic

Project: Istanbul Metro, Golden Horn Crossing Project.


South Concrete Approach Viaduct: 17+25+25+42+32+27.9 meter spans. (168.9m total).
Steel Swing Bridge: 50+70 meter spans. (120m total).
Steel Cable Stay Bridge: 90+180+90 meter spans (360m total).
North Concrete Approach Viaduct: 27+36+36+36+36+45+28.5+23.5 meter spans (268m total).

Services period: 2007—2014

Background:

Golden Horn Metro Crossing Project, Istanbul, Turkish Republic. Swing Bridge Lifting Equipment Design.
The swing bridge forms part of the Golden Horn Metro Crossing across the Halic, Istanbul.

The bridge was constructed in segments using the unbalanced cantilever method with an induced counterweight applied during the final stages.

The swing bridge has a span arrangement of 50m+70m giving a total length of 120m.

The maximum weight of a segment lifted is approximately 220 tones including the two footbridges that are attached to each side of the deck.
Golden Horn Metro Crossing Project, Istanbul, Turkish Republic

Istanbul Metro MRT Four Rail Bridge Crossing over the Golden Horn Inlet
The Neak Loeung Cable Stay Bridge, Kingdom of Cambodia.
Form Traveler Design Works & Construction Engineering.

Client:
DSI, Taiwan & Sumitomo Mitsui Construction.

Project:
The Neak Loeung Cable Stay Bridge, Kingdom of Cambodia

Services:
Form Traveler Detailed Design & Construction Engineering.

Services period:
2013-2014

Background:
The Neak Loeung Cable Stay Bridge, Kingdom of Cambodia.

The cable stay bridge is part of the NR1 road that forms part of the Asian Highway Route that connects Ho-Chi Minh City and Bangkok through Phnom Penh.

The bridge spans across the Mekong River in the Indochina region of Cambodia and links Neak Loeung and the Vietnam border. The bridge has a span configuration of 154.7m+165m+157.7m giving a total length of 474.4m. The concrete deck that is constructed using the under slung formwork system has a width of 16.9m and sits approximately 40m above the water level.

The bridge consists of two concrete "H" shaped pylons each having a total height of approximately 85m above the deck level.
The Neak Loeung Cable Stay Bridge, Kingdom of Cambodia. Form Traveler Design Works & Construction Engineering.
Naluchi Earthquake Memorial Extradosed

West Bank Bypass Jehlum River, Pakistan

Client: Ghulam Rasool & Company Pty LTD.

Project: Naluchi Earthquake Memorial Extradosed Bridge.

Services: Construction Engineering & Lifting Equipment Detail Design For Main Bridge Deck Segments. Construction Supervision.

Services period: 2009 ~ Ongoing

Background: The Naluchi East and West Viaducts are the approaches to the main bridge crossing the Jehlum River. The spans of East side approach viaduct are 29.5m + 29.5m = 59m. For the West side approach viaduct, the span configuration is 42m + 42m +42m +42m = 168m. The superstructures are prestressed box girders with four cells for east side approach bridge and with single cell for west side approach bridge. The depth of deck cross section for east side approach viaduct is 1.5m and 2.3m for west side.

Completion Time 990 Days
Target Completion Time 850 Days
Total Length of Bridge 473M
Length of East Side Approach Viaduct 59M
Length of Naluchi Bridge 246M
Length of West Side Approach Viaduct 168M
Project Reference Catalogue
Bridge Design Services

Cable Stay, Extradosed & Suspension Bridges.

Naluchi Earthquake Memorial Extradosed Bridge
West Bank Bypass Jehlum River, Pakistan
Rokan 1 & 2 Extradosed Bridges, Rokan River.

Republic of Indonesia.

Client: PT Waskita Karya

Project: Rokan 1 & Rokan 2 Extradosed Bridges

Services: Construction Engineering, Construction Supervision, for Approach Bridges & Main Bridge Form Traveler Design. Contractors Consultant.

Services period: 2009 ~ Ongoing

Background: The Rokan 1 & 2 Bridges are extradosed bridges spanning over the Rokan river in Indonesia.

Rokan 1 main bridge has a span configuration of 61+112+112+112+61m. There are two approach viaducts each with a span configuration of 45+45+30m. The height of the pylons is 21.6m and deck width is 15m.

Rokan 2 main bridge has a span configuration of 62+112+112+112+62m. There are two approach viaducts each with a span configuration of 45+45+45+45+25m. The height of the pylons is about 18m at the highest point and with a deck width of 15m.

All Pylons are supported by double plane stays and will be constructed as a free cantilever from the pylon outwards.

The width of the decks are 15m and about 9.7m above water level.
Feasibility Study for Railway cum Road Bridge, Extradosed Type Bridge

River Karnaphuly at Kalurghat Point in Vicinity of Existing Railway Bridge in Chittagong District, Bangladesh

Client: Bangladesh Railway & SMEC

Project: Railway cum Road Bridge, Extradosed Type Bridge. River Karnaphuly at Kalurghat Point in Vicinity of Existing Railway Bridge in Chittagong District, Bangladesh

Services:
Review of all available previous reports, maps and other data related to study/design of major railway road bridges, and recommend on the basis of the studies covering socio-economic and technical consideration. Assist Team Leader in preparing Inception Report. Undertake physical surveys to identify the number of rail-road crossing, location of rail-road crossing, number and nature of river crossings, canal and culvert crossing, and number of bridges to be constructed. Undertake survey and investigation of the existing structures and site condition.

Monitor geotechnical investigations at the bridges site following approved method. Develop alternative combinations of bridge. Prepare an outline of the preliminary design of the proposed bridge on the basis of the findings of the studies and considering the economic and technical aspects of the project. Prepare outline designs and conceptual drawings for preferred option, together with capital and recurrent cost estimates. Prepare preliminary designs, drawing and Bill of Quantities. Prepare design report with recommendation outlining the type of structures to be suited in preliminary form with their relative construction cost estimates, and assist TL in the preparation of feasibility study report.

Services period: 2011 ~ 2013
Golden Horn Metro Crossing Project, Istanbul, Turkish Republic

Istanbul Metro MRT Four Rail Bridge Crossing over the Golden Horn Inlet

Client: Hakan Kiran Architects, Istanbul, Turkish Republic.

Project: Istanbul Metro, Golden Horn Crossing Project.


Services period: 2007—2014

Background:

The Metro Crossing Project consists of four bridges and two station entrance structures that span the Golden Horn Inlet, Istanbul, Turkey!

One entrance structure is located on each bank of the Golden Horn Inlet. The total length of all four bridges equate to just under 950 meters.

South Concrete Approach Viaduct: 17+25+25+42+32+27.9 meter spans. (168.9m total).

Steel Swing Bridge: 50+70 meter spans. (120m total).

Steel Cable Stay Bridge: 90+180+90 meter spans (360m total).

North Concrete Approach Viaduct: 27+36+36+36+45+28.5+23.5 meter spans (268m total).
Golden Horn Metro Crossing Project, Istanbul, Turkish Republic

Istanbul Metro MRT Four Rail Bridge Crossing over the Golden Horn Inlet
Manavgat Antalya Cable Stayed Road Bridge,
Turkish Republic

Client
Mega Yapi Construction and Trading Company, Turkey.

Project
The Manavgat Antalya Cable Stayed Road Bridge, Turkey.

Services
- Preliminary design
- Detailed design
- Construction Engineering
- Erection Gantry Design

Services period
2007 - 2008

Background
Services are being provided for the preliminary design and detail design for the Ministry of Public Works and Settlement, General Directorate of Highways, Manavgat Antalya Cable Stayed Bridge.

The steel cable stayed bridge will be 202 m long and 13.7 m in width, with equal spans of 101 m; and designed for two lanes of road traffic.

The bridge is supported by 7 sets of cable stays either side of the inverted Y shaped steel pylon; which is 40 m in height above the steel deck.

The central steel pylon is supported on a concrete pier, a pile cap which measures 25 m x 16 m x 3 m deep and on 24 driven piles.

The detailed design services includes the structural analysis of the bridge; dynamic analysis in accordance with the seismic requirements and detailed design of the piled foundation, pier, pylon, superstructure and abutments.
Manavgat Antalya Cable Stayed Road Bridge,
Turkish Republic
Taipei Ring Road Project No. 3, Taiwan

Cable Stayed Bridge

Client
The Ministry of Interior, Construction and Planning Agency, Taiwan; and Chun - Yuan Construction.

Project
Taipei Ring Road Project No. 3, Cable Stayed Bridge, Taiwan.

Services
- Construction stage calculations
- Contractors consultant
- Camber control calculations
- Project planning
- Supervision
- Cable vibration testing
- Services period
2006 - ongoing

Background
The cable stayed bridge project is a part of the new Taipei Ring Road that is to span a canal feeding into the Tamsui River.

The new cable stayed bridge with its diamond shaped pylon and four cable stay configuration will become a new landmark for the Taipei City area.

The symmetric cable stayed bridge has a total length of 400 m; each span being 200 m. The 135 m high concrete diamond shaped pylon will support the 43 m wide fully welded orthotropic steel box girder deck.

The construction engineering support services will include:
- develop the construction method
- check stresses for each stage
- prepare pylon camber at each lift
- determine bearings presets
- geometry control procedures
- fabrication and erection planning
- Shoring Platform fabrication designs and drawings will be provided.

Services for the temporary supports to the pylon and pier table segments include the designs for:
- fabrication shop drawings
- pylon temporary struts
- tower crane & pylon connections

Services for the engineering of cable forces provide the:
- stressing procedure & instructions
- stressing forces & extensions
- cable lengths & sag calculations
- camber control instructions

The responsibilities also include for cable vibration testing to assess...
Taipei Ring Road Project No. 3, Taiwan
Cable Stayed Bridge
Keshu Suspension Bridge,
Miaoli, Taiwan

Client
Miaoli City Government & Yong Lian Construction Engineering Company, Taiwan.

Project
Keshu Suspension Bridge, Miaoli County, Taiwan.

The bridge concept was developed for a turnkey bid and was selected as the winning design.

Services
- Concept design
- Feasibility study
- Preliminary & detailed design
- Contractors consultant
- Camber control calculations
- Project planning
- Supervision during construction

Services period
2003 - 2006

Background
The Keshu Bridge is Taiwan's first suspension bridge for road traffic and crosses the Houlong River main channel.

The project has an overall length of 808 m. Commencing with two prestressed concrete spans of 58 and 78 m in the south; then two suspension bridge spans of 96 m and 215 m; with pylon spans of 20, 20 and 85 m; and five prestressed concrete spans of 69, 57, 50, 30 and 30 m in the north. A tubular section was designed for the main suspension span to save weight.

Problems during the design were to:
- arrive at a technical solution for this unconventional suspension bridge design
- ensure the bridge can withstand large earthquake forces
- ensure the bridge is stable during typhoon conditions

These problems were overcome by undertaking an extensive nonlinear dynamic calculation program as well as conducting the scale model wind tunnel tests.

The suspension bridge was opened to road traffic in July 2006.
Keshu Suspension Bridge,
Miaoli, Taiwan
Cuu Long Cable Stayed Road Bridge,
Can Tho, Vietnam

Client
Taisei Corporation.

Project
The 1,010 m long Cuu Long cable stayed road bridge and a prestressed concrete approach bridge near Can Tho City. The project is currently the largest bridge project in Vietnam.

Services
- Construction engineering
- Specialist consultant for Cuu Long steel cable stayed road bridge and the separate prestressed concrete balanced cantilever bridge

Services period
2005 - 2008

Background
After its 4,800 km journey from the Tibetan Plateau the Mekong River splays across southern Vietnam in a web of waterways that discharge into the South China Sea through nine branches known as the "Cuu Long - Nine Dragons".

Can Tho is the major city located in the Mekong Delta some 170 km south west of Ho Chin Minh City; and is the regional transportation center sited among a network of rivers and canals.

The Cuu Long cable stayed bridge and the approach bridge is the last section of the new road system in the Mekong River Delta connecting with Ho Chi Minh City.

The bridge deck has a total length of 1,010 m which comprises of two 230 m long prestressed concrete 4 cell side spans; with a 550 m main span of which the 210 m center part consists of an orthotropic steelwork section in order to reduce the overall weight of the bridge structure.

The bridge is supported by two cable stay planes arranged in a classical fan arrangement and supported by the two reinforced concrete pylons each towering 135 m above the deck. The pylon cross section is 7 m wide and varies from 5 to 6 m in thickness.

The prestressed concrete cantilever box girder approach road bridge is a separate structure spanning a nearby canal and is to be constructed by the balanced cantilever method with five spans of 50 m + 3 x 80 m + 50 m. 
Cuu Long Cable Stayed Road Bridge,
Can Tho, Vietnam
No.6 National Highway, Contract C 608, Taiwan

Extradosed Bridge

Client
MOTC, Ministry of Transportation and Communications and Riato Construction Company.

Project
No.6 National Highway, Contract C 608 Extradosed Bridge.

Services
- Construction stage calculations
- Contractors consultant
- Camber control calculations
- Prestress shop drawings
- Supervision during construction

Services period
2005 - 2007

Background
Contract C 608 bridge is a part of the east - west development programme between Nantou County and the west coast of Taiwan; designed to cross the Nankang River.

Extradosed bridges incorporate the characteristics of cable stayed and a segmental box structure.

In a cable stayed bridge the vertical loads are carried exclusively by the stay cables; but in a true extradosed bridge, the vertical loads are shared between the cables and the bridge deck. The cables are arranged at the center of the deck in dual cable stay planes and the deck itself consists of a multi cell prestress segmental box.

The 300 m long bridge is a part of No. 6 National Highway with a 26 m wide multi cell concrete deck, a main span of 140 m, and two 80 m back spans.

Near the pylons the concrete deck is 5.1 m in depth as the deck is required to carry a substantial portion of the loads and at mid span is reduced to 3 m as the cables carry some of the loads in this section.

The low profile pylons are needle type reinforced concrete structures with a height of 20 m above the deck. The double plane cable stays slope gently from both sides of the pylons which is a feature of an extradosed bridge.
No.6 National Highway, Contract C 608, Taiwan

Extradosed Bridge
Bei Kang Extradosed Bridge,

Yunlin County, Taiwan

Client
MOTC; Ministry of Transportation and Communications and Riato Construction Company.

Project
Bei Kang Extradosed Bridge.

Services
- Construction stage calculations
- Contractors consultant
- Camber control calculations
- Prestress shop drawings
- Supervision during construction

Services period
2005 – 2007

Background
Bei Kang bridge project is part of the development programme between Yunlin and Chiayi countries in south west Taiwan; crossing the Bei Kang River in Yunlin Country. Extradosed bridges incorporate the characteristics of cable stay and a externally prestressed concrete box segmental structure as illustrated in this design.

In a cable stayed bridge the vertical loads are carried exclusively by the stay cables; but in a true extradosed bridge, the vertical loads are shared between the cables and the deck of the bridge.

Cables are arranged at the center of the deck as double plane stays; and the deck itself is a multi cell pre-stress concrete box.

The bridge is 250 m long and 27 m in width, with equal spans of 125 m; having a multi cell concrete deck with varying depths between 2.5 to 6.0 m. The pylon is a single needle type concrete structure 35 m high.

In a longitudinal direction the double plane cable stays, the main multi cell concrete deck, pylons and pier forms a vertical structural plane.
Bei Kang Extradosed Bridge,
Yunlin County, Taiwan
Industrial Ring Road Cable Stayed Bridges,  
Contracts 1 & 2, Bangkok, Thailand  

Client  
Ministry of Interior, Public Works Department, Thailand; and the Contractor, Taisai Corporation.  

Project  
Industrial Ring Road Contracts 1 & 2; Cable Stayed Bridges.  

Services  
- Construction engineering  
- Specialist consultant for both cable stayed bridges at each construction stage  
- Designs of temporary works structures  

Services period  
2002 - 2006  

Background  
The cable stayed bridges project is a part of the new industrial ring road that spans the Chao Praya River.  

Both of the bridges are 37.4 m in width. The southern cable stayed bridge is 702 m in length, with a composite span of 398 m; and two prestressed concrete side spans 152 m long; deck area 25,201 m².  

The northern cable stayed bridge is 576 m in length, with a composite span of 326 m; and two prestressed concrete side spans of 125 m long and deck area of 20,678 m².  

Each cable stayed bridge has two concrete diamond shaped pylons, with two cable planes. The north bridge pylons are 176 m high and 163 m high on the south bridge.  

Both bridges have a clear height above the river of 51 m for ships to enter and exit Bangkok Port.  

The ring road project was open to road traffic in mid 2006 and now connects the Bangkok Port to an industrial development area south of the river.
Industrial Ring Road Cable Stayed Bridges,
Contracts 1 & 2, Bangkok, Thailand
Taichung No. 4 Cable Stayed Bridge,
Taiwan

Client
- Taichung City Government
- Chun Yuan Construction

Project
Taichung No. 4 Cable Stayed Bridge.

Services
- Construction stage calculations
- Contractors consultant
- Camber control calculations
- Project planning
- Site supervision
- Temperature and wind monitoring systems planning and installation

Services period: 2002 - 2005

Background
The Taichung No. 4 cable stayed road bridge crosses the Han River south of Taichung City. The bridge has a steel deck and an arch shaped steel pylon with a twin cable plan configuration. Services included the:

- detail construction stage analysis according to the tender design and final stage calculations
- detailed analysis of the cable stay stressing operation
- construction sequence planning
- cable stay stressing schedule and instructions
- check on the final stresses under service loading conditions
- bearing preset calculations
- stress check of deck and pylon for all stages of construction
- camber control calculations and values to monitor the pylon and deck for all construction stages
- design for additional stiffeners required during construction

The 28.9 m wide and 179 m long steel deck had 89.5 m side spans. The deck area was 5,173 m²; and the steel arch was 60 m high.
Taichung No. 4 Cable Stayed Bridge,
Taiwan
Tempisque River Cable Stayed Bridge, Costa Rica

Bridge Design & Construction

**Client**
Taiwan and Costa Rica Government.

**Project**
Tempisque Cable Stayed Bridge.

**Services**
- Construction engineering
- Design of superstructure elements
- Specialist consultant for the cable stayed bridge construction stage design checks and for the as built design calculations

**Services period**
1998 - 2003

**Background**
The cable stay bridge was part of the development programme between Taiwan and Costa Rica and opened to traffic in mid 2003. The cable stayed bridge crossing now eliminates a two hour journey to cross the Tempisque River and is bringing tourism development to the Nicoya Peninsula. The bridge has two lanes for vehicles and two for pedestrians.

The 780 m long, 13.3 m wide bridge included a 260 m cable stay of two spans of 90 and 170 m on the west side; with a 520 m long composite box girder bridge 2.5 to 3.0 m deep on the east side.

Tempisque cable stayed bridge has a concrete H shaped pylon 65 m in height above the deck; with 4 pairs of asymmetrical cables. The bridge having a height clearance of 15 m over the shipping channel.
Tempisque River Cable Stayed Bridge, Costa Rica

Bridge Design & Construction
Tah Chi Cable Stayed Bridge,
Taipei, Taiwan

**Client**
Taipei City Government, Taiwan.

**Project**
Tah Chi Cable Stayed Bridge.

**Services**
- Feasibility study
- Preliminary & final design
- Equipment and temporary works designs
- Construction stage calculations
- Contractors consultant
- Camber control calculations and stressing instructions
- Project planning
- Supervision during construction

**Services period**
1998 – 2003

**Background**
The deck elevation of the old Tah Chi bridge could not meet the demand for the Keelung River flood control and was not wide enough for future road traffic. Hence the new Tah Chi bridge was built to meet these requirements.

The Tah Chi cable stay bridge has a 172 m long main span and two side spans of 50 m and 23 m. The bridge having a deck area of 6,838 m².

The scope of work consisted of the aesthetic evaluation and preliminary design at the proposal stage. The detail design included static, seismic, buckling & cable sagging analysis.

The new bridge is a landmark in the newly created river side park; and was opened in 2002.

The superstructure is a fully welded orthotropic steel deck with a depth of 3.2 m and suspended by 6 twin stay cables and 10 back stay cables from a steel bow shaped pylon structure.

The height of the support structure was limited to 70 m above ground due to the proximity of the Domestic Airport flight path. Special erection procedures were developed to lift the support pylon into position.
Tah Chi Cable Stayed Bridge,
Taipei, Taiwan
Maoluo Creek Cable Stay Bridge.

Nantou County, Taiwan

Client
CECI

Project
Maoluo Creek Cable Stay Bridge.

Services
Detail Design
Independent Check Engineering

Services period
1999-2002

Background
The cable stay bridge was designed to cross the Maoluo Creek and connect to the tunnel directly adjacent to the river. Due to geographical constraints, the arch type bridge was selected for the pylon of the bridge and located in a way so that it was perpendicular to the bridge main deck while the bridge girder is horizontally curved. Such a geometry for the bridge that is a cable stay bridge with a single pylon of the arch type makes it one of the rarest types of cable stay bridges in the world. The bridge width varies from 17.2m to 21.8m and is divided into two spans of lengths 51 and 119m respectively. The arch has a height of 60m and width of 85. A link beam was added at the bottoms of the arch to reduce the forces induced. The superstructure of the bridge is composed of two almost parallel steel box girders and there is a total of 36 sets of stay cables with radial shapes. The bridge was opened in 2002.
Maoluo Creek Cable Stay Bridge.

Nantou County, Taiwan
Kao Ping Hsi Cable Stayed Bridge, Taiwan

Second Freeway, Contract C 381

Cable Stayed Bridge Design

Client
Taiwan Area National Expressway Engineering Bureau; TANEEB.

Project
Kao Ping Hsi Cable Stayed Bridge.

Services
- Feasibility study
- Preliminary & detailed design
- Wind tunnel testing

Services periods

Background
The Kao Ping His Bridge is located on the border between Kaohsiung and Pintung Counties. The Bridge is a part of the Second North South Freeway and was opened to traffic in January 2004.

The asymmetric cable stayed bridge crosses the Kao Ping River and is a landmark for freeway traffic entering Pingtung. The 510 m asymmetric cable stayed bridge is the longest in Taiwan and the second longest of its type in the world.

The reinforced concrete inverted Y pylon is 183.5 m high, with a 34.5 m wide hybrid deck, 180 m prestressed concrete side span and a 330 m fully welded orthotropic main span. The bridge deck is 17,787 m² in area.

Various dynamic design methods were used during the services work phases of the:
- feasibility study
- preliminary & detailed design
- wind tunnel testing

Between 1998 & 2000 services were provided to TANEEB as a specialist consultant during the construction.
Kao Ping Hsi Cable Stayed Bridge, Taiwan
Second Freeway, Contract C 381

Construction Engineering

Client
The Taisei, Kawada, Raito, Pan Asia Joint Venture Contractors.

Project
Kao Ping Hsi Cable Stayed Bridge, Second Freeway, Contract C 381.

Services
- Construction engineering
- Temporary works design
- JV specialist consultant
- Camber control
- Pylon stability analysis
- Project planning
- Construction equipment
- Site supervision
- Wind tunnel testing

Services period
1996 - 2000

Background
The Cable Stayed Bridge is at the border of Kaohsiung and Pintung Counties, crossing the Kao Ping River. This freeway section was opened to traffic in January 2004.

The 510 m asymmetric cable stayed bridge is the longest in Taiwan and the second longest of its type in the world.

The reinforced concrete inverted Y Pylon is 183.5 m high, with a 34.5 m wide hybrid deck, 180 m prestressed concrete side span and a 330 m fully welded orthotropic main span. The bridge deck is 17,787 m² in area.

Service responsibilities included:
- all technical issues
- construction design calculations
- camber control
- construction equipment design
- design of temporary works
- wind tunnel testing during each bridge erection stage
Kao Ping Hsi Cable Stayed Bridge, Taiwan
Second Freeway, Contract C 381
Shin Dong Cable Stayed Bridge, 
Miaoli, Taiwan

Client 
Miaoli City Government, Taiwan.

Project 
Shin Dong Cable Stayed Bridge.

Services 
- Preliminary & detailed design
- Construction stage calculations
- Contractors consultant
- Camber calculations and bearing presets
- Supervision during construction
- Wind tunnel testing

Services period 
1995 – 1997

Background 
Services included the preliminary and the detail design for the Shin Dong Cable Stayed Bridge.

The cable stay bridge has a multi cell fully welded orthotropic steel deck 2.5 m deep, suspended by a single plane of stay cables.

The Shin Dong bridge is:
- 325 m in length
- 21 m in width
- 175 m main span
- 6,838 m² deck area

The single needle pylon steel type structure was 44.6 m high.

The bridge was fitted with special hydraulic shock absorbers, which allow the earthquake forces to be distributed over several supports.
Shin Dong Cable Stayed Bridge,
Miaoli, Taiwan
Tai 8 Cable Stayed Bridge,
Taroko Gorge, Taiwan

Client
Provincial Highway Bureau, Taiwan.

Project
Tai 8 Cable Stayed Bridge is located in the Taroko Gorge on the east side of Taiwan.

Services
- Preliminary design
- Detail design
- Construction consulting services
- Project planning

Services period
1991 – 1993

Background
Taroko Gorge is one of Taiwan’s famous scenic areas where the marble deposits have been eroded over time by the Liwa River creating lofty mountains, impressive canyons, sheer precipices and waterfalls and rapids.

The Tai 8 cable stayed bridge was designed to cross the Liwa River as a replacement for an existing bridge, which was heavily damaged during an earlier typhoon.

The bridge had a single central H shaped steel pylon and the deck designed as a composite structure in order to allow for rapid erection.

The bridge being 15 m wide, with a 136 m deck; and the deck area was 2,040 m².

The bridge is located in an area of very strong seismic activity and the design needed to consider the impact of seismic loads on the structure.
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**Bridge Design Services**

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**Bridge Design Services**

### Cable Stay, Extradosed & Suspension Bridges.

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<td>Kao Ping Hsi Cable Stayed Bridge, Second Freeway, Contract C 381, Taiwan</td>
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Project Reference Catalogue
Bridge Design Services

Cable Stay, Extradosed & Suspension Bridges.

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