The firm submitting the nomination is a member of

China National Association of Engineering Consultants (CNAEC)

(Please indicate name of FIDIC MA/Associate or Affiliate and country)

Please attach a letter from the FIDIC MA/Associate or Affiliate in your country validating your submission.

Why do you think this project should receive an award? How does it demonstrate:

- Innovation, quality, and professional excellence
- The principles of transparency and integrity
- Sustainability and respect for the environment

1. Overview

Datong-Xi'an High Speed Railway is 678.4 km long from Datong (its north end) of Shanxi province to Xi'an (its south end) of Shaanxi province. It's not only an important passage linking the two provinces to Southwest, Northwest, North and Northeast China, but also a main intercity passenger channel running through the main economically developed cities in Shanxi province. Jin-Shaan Yellow River Super Major Bridge, 50 meters high and 9,969.18 meters long, is one of the key projects among the "Three Tunnels and One Bridge" on Datong-Xi'an High Speed Railway. Crowned as the "the First High Speed Railway Bridge Over the Yellow River", it is now the highest and the longest high speed railway bridge with the largest construction scale over the Yellow River in China.

The construction of the bridge started in March, 2010 as planned, and was completed in October, 2013. The bridge was officially put into use in June, 2014. The total project investment is 1.91 billion RMB, (308.1 Million USD)

2. A bridge featured with innovation, high quality, and technical excellence

Jin-Shaan Yellow River Super Major Bridge has used 15 gangs of (2×108m) T continuous rigid frame and stiffed steel truss composite structure in the main bridge. With its length runnuing over 3 km, the bridge has satisfied the landscape requirements of equal span arrangement and the national IV level navigation requirements. Without using rail temperature regulator, the high speed railway bridge, nearly 10 km in total length, has satisfied the needs of performance flatness and smoothness of high speed

railway. The use of stiffed steel truss has effectively improved the rotation angle and creep camber of the beam and ensured the regularity of ballastless track structure. Lying in a highly seismic area (8 degree of China standard), the bridge has reduced its main bridge structure height and has tremendously lessened earthquake effect. As a combination of large span, high pier, deepwater, overlength pile foundation, mass concrete and new bridge structure, the bridge is a giant bridge on high speed railway fully integrated with natural environment.

2.1 Jin-Shaan Yellow River Super Major Bridge has reflected the newest notion of environment protection and ecology in its design and has realized the harmonious integration of building and nature.

2.2 T rigid frame and stiffed steel truss composite structure has been used for the first time in China. The novel structure is the result of learning from others countries' pre-embedded joint in the PC box girder with steel webs or steel-concrete composite bridge, which is of great value for reference. The Super Major Bridge which leaps over Lanzhou-Xining Highway on the Lanzhou-Xinjiang high speed railway has successfully adopted one gang of (80+168+80)m continuous beam and stiffed steel truss composite structure

2.3 Stiffed steel truss and concrete are linked by a new perforated steel connector (PBL connector). In other words, cut-out steel gusset plates are installed on both sides of the linking part (length wise direction). Rebars run through the cut-outs and cement is poured in, realizing effective link between steel truss and cement. Compared with traditional stud shear connectors, PBL connector has the strengths of high ultimate bearing capacity, good ductility and high anti-fatigue performance.

2.4 The chord panel points of the stiffed steel truss are connected by a plug-in structure, which not only has a nice outlook, but also reduces the construction difficulty.

2.5 The river that the bridge runs across is a silting wandering river (meeting China's level IV navigation standards), and therefore the span needs to be no less than 100 m. The span arrangement is the result of considering watercourse evolution. With navigation requirements met and the number of water piers reduced, the bridge is a

unification of aesthetics and function.

2.6 The choice of the main bridge structure type is the result of considering a number of factors including structural behavior subject to force, dynamic performance, convenience of construction, landscape effect, building costs, and environment protection, etc.

2.7 To ensure the structural safety of the new bridge, several famous universities in the field of transportation infrastructure engineering in China have worked together to conduct comprehensive and in-depth experimental studies in nonlinearity of stiffening steel truss and concrete beam connecting node, vehicle & bridge dynamics simulation, anti-seismicity and other aspects. The design has proved to be excellent with the reasonable scheme and advanced technology. The field test results and operation performance have shown that stress, displacement of key positions and other indexes are all within normal ranges.

Jin-Shaan Yellow River Super Major Bridge has obtained three China Practical New Model Patents. It has also lodged an application of invention model patent.

3. Harmonious integration between bridge building and nature by sustainability and respect for nature

Determined by the route direction, the bridge has to run through the edge of Qiachuan national scenic area and the Yellow River wetland, home to more than sixty rare bird species such as swan, grey crane, white crane and mandarin duck. Due consideration has been given to the survival and migration of birds.

3.1 The project has always been environmental friendly in route selection. After careful comparison, the selected route has bypassed the major natural landscapes in scenic areas and bird habitats in the wetland natural reserve.

3.2 After careful study on the fitting span of the main bridge, the idea of using all kinds of long-span structure (250 m to 500 m) with steel truss girder in the upper structure has been given up, e.g. cable-stayed steel truss bridge, steel truss arch bridge, etc., for the impact on birds' flying and habitation and on environment caused by high structure, large space taken and high noise volume. The final span of the bridge is 108 m.

3.3 Research has been conducted on the type of the main bridge. A number of factors (earthquake desity, structural behavior subject to force, dynamic performance, construction difficulty, landscape effect, building costs, etc.) have been included in consideration, environment protection in particular, before the (2×108m) T rigid frame and stiffed steel truss composite structure has been chosen. This structure is blessed with advanced technology, innovative design, reasonable structure, good dynamic performance, and little bird interference (caused by train operation).

3.4 A 7.5-km long acoustic barrier has been installed on both sides of the bridge, to avoid bird collision, to lessen noise caused by train operation, and to protect water birds from disturbance and harm.

3.5 The long-term observation by forestry department has found that the flight height of birds is usually below 30 m for inhabiting and foraging and above 100 m for migration. In order to ensure the activity space for birds, after consultation with experts from Ministry of Environmental Protection and Ministry of Communications, the height of the bridge has been raised from 37 m to 50 m, allowing 35 m minimum height under the bridge for birds' inhabitation and migration.

3.6 Environmental supervision has been conducted throughout the entire project process, aiming at implementing working measures and controlling the impact of the project on vegetation resources and animals.

3.7 Auxiliary measures have always been taken on the top of the bridge, which have saved the 28 temporary piers usually needed in ordinary bridge construction, for the benefit of environment protection.

3.8 In terms of pollutants control, strict measures have been taken. Waste water has been collected for comprehensive utilization, throw dirt has been curbed with reduction measures such as watering, and construction residue and household garbage have been collected and sent away.

3.9 Soft light has been used intead of hard light to reduce the impact of light on animals.

3.10 Vegetation recovery has been ensured upon completion of construction.

Jin-Shaan Yellow River Super Major Bridge is a result of technical breakthrough and innovation, fully demonstrating FIDIC's idea of going green and environment protection. This magnificent bridge represents design innovation, harmonious integration with nature, and perfect unity of aesthetics, environment protection, function, technology and thrift.

4. Transparency and Integrity

4.1 With the integration of ISO Quality Management System, this project has been systematically guided by FIDIC Integrity Management System in the project planning stage. Its pragmatic Integrity management system has covered the entire process of the project including consultation, design, and construction, operation management.

4.2 Integrity evaluation (identification, analysis and evaluation) has been conducted and code of conduct has been formulated. The colleagues have received training and signed liability statements.

4.3 Integrity measures have been formulated and implemented. Integrity management process program has been made for the key phases of the project such as project bidding and procurement. Integrity files have been made with sensitive information recorded.

4.4 The third party consultation has been conducted with China Railway Siyuan Survey and Design Group Co., Ltd., Huatie Engineering Consulting Co., Ltd., and Deutsche Eisenbahn -Consulting GmbH in order to carry out consultative examination on technological achievements and to realize openness and transparency of technology.

4.5 Internal and external communication and negotiation mechanism has been established. In line with legal requirements, public information has been disclosed for media supervision and to satisfy the citizen's right to know.

4.6 The whole process of the project has been open to close supervision and examination with regular internal audit. Upon completion, the project has received audit from related state and local departments. With the project fund reasonably regulated, no breach of code of conduct has been found on the part of consulting engineers.