E-RFE No.: IRSDC/HQ/RFE/28/2017/Architect: Request for Empanelment (RFE) for Preparation of Station Development Plan for railways stations under Indian Railways.

APPENDIX-I
Form-7

Proposed Methodology and Work Plan

Understanding of TOR

Primary scope of services will include a survey based analytical study of operational, technical, social and economic aspects to postulate a concept plan, a master plan and a feasibility study towards future station development program. The scope will include development/ redevelopment of the Station on both sides and its surroundings (on railway land) along with a schematic plan for handling train and passenger operations, besides provision of facilities for maintenance and operations. It will also include optimal plans for real-estate development and allied facilities such as parking, inter-modal transfer and incoming/outgoing road traffic at the Station. All the applicable laws, bylaws and Master Plan of the city will be followed to enable ‘in principle’ approvals from municipal authorities.

MSSRS (Manual for Standards and Specifications for Railway Stations) 2009 or any such document as suggest by IRSDC will be the key document to follow while preparing Master/ Concept plan and feasibility report including the technical sections of bid/agreement documents.

The consultant will be fully responsible for conceptualizing the vision of developing the Station to achieve the objectives as per all the directives from IRSDC to provide superior services to railway passengers. This vision will be used to define the IRSDC requirements for development and construction of the railway station and facilities. It will also enable the prospective contractors/ developers to assess the requirements for the purpose of bidding and to carry further detailed design. As part of initial study towards understanding the context, growth patterns, existing problems and future vision, following studies will be conducted:

Surveys:
- Building condition survey including ascertaining ownership of land and structure
- Rail Passenger Count at Entry/Exit of Railway Station for all entries and exits
- Pick/Drop Survey at Railway Station
- Origin-Destination Survey
- Boarding/Alighting Surveys at Bus Stops at railway station
- Passenger characteristics
- Distribution studies
- Willingness to Pay
- Geotechnical Survey
- Study of identification of sensitive structures

Analytical Studies:
- Review of previous reports/drawing/data and verify the available drawings of the site
- Traffic study and development of integrated traffic plans; inter-modal transfer and incoming/outgoing road traffic at the Station.
- Engineering Surveys and Railway Operations Study to ascertain:
  I. Optimal integration strategy for future development
  II. Optimal strategy towards constructability
  III. Limitations/ challenges for future developments
- Future Yard plan proposal Study and examination of constraints of the yard
- Green Building strategy implementation
Urban / Contextual Studies:
- Urban Morphology and contextual parameters
- Real Estate Study
- Social and Environmental Impact Assessment Study

The Technical Feasibility Report and Master Plan to be prepared by the Consultant will not require any detailed design of the Project components, but will necessarily contain the preliminary designs and sufficient details to judge the constructability and feasibility of various layouts as well as the estimated cost related to such development. The Concessionaire/contractor may propose alternate lay-outs on the ground of relative economics of such solutions, but these must not be challengeable on architectural, technical or practical considerations. It will be the Consultant’s responsibility to fully defend the solutions proposed by him should these be questioned by MOR, IRS DC or the developer/contractor at any stage of the bidding process for award of development contract.

The Consultant shall assist IRSDC in selection of prospective developers/contractors for the railway station Project. The services under this task shall include providing technical inputs for preparation of bid documents and evaluating the conceptual designs/technical proposal submitted by the prospective developers/contractors. The Consultant shall perform this task in coordination with the Financial Consultant and Legal Adviser appointed by IRSDC.

Assistance will also be provided to the Financial Consultant and the Legal Adviser by furnishing such clarifications as may be required for legal and financial appraisal. Once the bid documents are released, the Consultant will prepare replies to the written queries made by the bidders on the technical aspects of the bid documents. The Consultant will take part in the pre-bid conference for award of concession and furnish such technical clarifications as may be called for.

Along with preparation of Concept plan, Master plan and feasibility study following are other deliverables/ duties of the consultant:
- Development control norms
- Assessment of additional requirement of utility infrastructure such as power, water as well as their availability for their project
- Relocation plan of building and structures;
- Construction methodology, sequencing, scheduling and time frame
- Social impact assessment including R & R Plan
- Environment impact assessment actively work with IRSDC and obtain environment clearance
- Preliminary designs and prepare design criteria/outline specifications
- Project cost and Preparation of indicative BOQ and Cost Estimates
- Prepare submissions for the purpose of obtaining in principle statutory approval/clearances for the Master Plan and obtain such clearances
- Preparation of various Technical Schedules of the Development Agreement
- Preparation & Management of “Request of Technical Proposal

Challenges:

Such projects are not easy to realize, being complex, and involving the interests of multiple stakeholders. Achieving the consensus needed to proceed with implementation requires careful management, and benefits from consultants experienced in such projects such that all parties involved can be confident that a solution will be created that is beneficial to all. AECOM brings this experience from projects elsewhere in the world.
Methodology and Work Plan

The approach towards meeting the final objective as per TOR will be based on detailed field studies, analysis and through an iterative process of discussion with various Railways/local authorities and IRSDC. Legal and Financial Consultants appointed by IRSDC will be continuously consulted for taking into account the real estate potential/appetite of the city, the possible land use, optimum product mix and estimated cost of development.

The assignment will be initiated with a 2 days site visit by entire team followed by various surveys and detailed field studies like Topographic Survey, Geotechnical Investigation, Building Condition Survey, Traffic Survey, Passenger Profile Survey, Land use and ownership Study, Real Estate Study, Infrastructure Redevelopment Study, Social and Environmental Impact Assessment Study, Railway Operation study and examination of constraints of the yard, study of existing plans etc. Some of these studies will be carried out in conjunction with Financial and Legal consultants appointed by IRSDC.

In order to understand the present operating conditions in terms of station capacity and performance levels, a passenger simulation modelling using VISWALK or similar software will be done. The various station design parameters and general understanding of the user’s requirements will be developed through following traffic & transportation surveys within the station complex:

- Rail Passenger Count at Entry/Exit of Railway Station
- Pick/Drop Survey at Railway Station
- Origin-Destination Survey
- Boarding/Alighting Surveys at Bus Stops/public transport at railway station
- Passenger characteristics and Distribution studies

Based on above analysis/data along with AECOM’s experience on similar projects in other parts of the world, a series of internal design workshop (within AECOM team) and external design workshop (with IRSDC and its consultants) will be conducted in an iterative manner to come up with final concept plan, master plan and feasibility study report.

The assignment will be spearheaded by our team leader and Chief Urban designer Mr. Sushil Verma, who will also be responsible for city level intervention and integration. Chief architect Shaun will be the key international concept architect to bring in AECOM’s award winning transportation design experiences/concepts on-board and chief architect Manish Shangari will be the overall architectural lead to contextualize the architectural concepts and bring in the sustainability and green building design ethos right from the planning stage. Station planning expert Nevendu Pal along with our transport planning expert Sarabpreet Singh will be closely involved in all on-field surveys and will strategies the planning and connectivity aspects of station design. Structural engineer and construction expert Sanjeev Aggarwal will not only be involved in optimal construction sequencing to ensure minimal disruption to railway operations but will also be responsible for all structural interventions and safety of existing build stock and associated risk analysis. Environmental expert Chetan Zaveri will be taking care of environmental Impact assessment. The published data from various departments will be collected to establish the baseline environmental condition of the project area. Also the data will be collected through site and in its vicinity by conducting the Environmental monitoring.

Core Team :

<table>
<thead>
<tr>
<th>Role</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chief Urban Designer/ Planner</td>
<td>Sushil Verma</td>
</tr>
<tr>
<td>Chief Architect</td>
<td>Manish Shangari/ Shaun Russell</td>
</tr>
<tr>
<td>Station Planning Expert</td>
<td>Nevendu Pal</td>
</tr>
<tr>
<td>Structural Engineer/ Construction</td>
<td>Sanjeev Aggarwal</td>
</tr>
<tr>
<td>Transport Planning Expert</td>
<td>Sarabpreet Singh</td>
</tr>
<tr>
<td>Environmental Expert</td>
<td>Chetan Zaveri</td>
</tr>
</tbody>
</table>
Important activities:

<table>
<thead>
<tr>
<th>Sequence</th>
<th>Task description</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity 1</td>
<td>High Level Site Visit</td>
<td>Site</td>
</tr>
<tr>
<td>Activity 2</td>
<td>Background Studies and Surveys</td>
<td>AECOM Office / IRSDC Office / Railway’s Office</td>
</tr>
<tr>
<td>Activity 3</td>
<td>Internal Design Workshop</td>
<td>AECOM Office</td>
</tr>
<tr>
<td>Activity 4</td>
<td>Preliminary Design Presentation</td>
<td>IRSDC Office</td>
</tr>
<tr>
<td>Activity 5</td>
<td>Internal Design Workshop</td>
<td>AECOM Office</td>
</tr>
<tr>
<td>Activity 6</td>
<td>Preliminary Design Presentation 2</td>
<td>IRSDC Office / Railway’s Office</td>
</tr>
<tr>
<td>Activity 7</td>
<td>Internal Design Workshop</td>
<td>AECOM Office</td>
</tr>
<tr>
<td>Activity 8</td>
<td>Definite Design Presentation</td>
<td>IRSDC Office / Railway’s Office</td>
</tr>
<tr>
<td>Activity 9</td>
<td>Internal Design Workshop</td>
<td>AECOM Office</td>
</tr>
<tr>
<td>Activity 10</td>
<td>Final Design Presentation</td>
<td>IRSDC Office</td>
</tr>
</tbody>
</table>

Quality Assurance plan for carrying out the Consultancy Services

AECOM Project Delivery System (PDS)

AECOM’s Quality Policy spells out our quality objectives and principles. Our Business Groups have used the policy as a foundation for quality programs specific to the services we provide, whether governed by ISO 9001, Nuclear Quality Assurance, Execution with Certainty, or others.

Quality Objectives:
- Client Satisfaction
- Employee Engagement
- Business Profitability
- Project Delivery & Technical Execution Consistency; and
- Continual Improvement.

We achieve our objectives by following our six quality principles:
- Leading Quality At All Levels
- Customer Focus
- Collaborating For Success
- Risk-Based Thinking
- Employee Empowerment
- Organizational Learning
Concept Plan: Howrah Railway Station, Kolkata, W.B.

Howrah Railway Station
Howrah Junction is one of the major railway stations in the city of Kolkata, India. Approximately 293 passenger trains pass through the station each day requiring its 23 platforms and a high train handling capacity.

Urban Context
The Howrah railway station is a terminus station located on the banks of river Hooghly. It is one of the oldest stations in India and an iconic landmark of the city. The station is flanked by the iconic Howrah Bridge which spans over the Hooghly River. The current infrastructure has challenges in terms of upgradation but also has equal opportunities in terms of channelizing the space for passenger easement and public recreation with the thoughtful integration and interventions.

Road Network
- The Station yard is flanked by Grand Trunk Road on the east side and hooghly ghats and station road on the west.
- On the west bank the Brabourne road and strand roads connect the station to the Kolkata city via the iconic Howrah Bridge.

Barriers
- The Station road and ghats on the west restricts the any expansion.
- Bunkim Sutu in the north restrict any developments.
- North side is flanked by the main arterial rod connecting the ISBT via Howrah Bridge.
- South edge has a proposed expansion plans for the existing yard up till a functioning Railway museum.
Design Challenges

The building came into operations over a century ago, since then numerous upgrades and redevelopments have been done to the station premises. The station is in need of another upgrade considering the stressed infrastructure and the amount of the increased traffic forecast. In order to provide passengers convenient and comfortable transient experience, following challenges shall need to addressed and resolved. The challenges are classified as infrastructure level which requires a careful analysis of urban context and its symbiotic relationship with the station. The second classification is more related to the building level challenge in order to ease and improve the passenger experience.

**Infra Structure Level**
- Main Access from Station Road is congested as arriving and departing passengers sharing the same entry and exit road lanes. Roads next to station entry are always packed.
- The new Underground Metro Station is under construction between the platforms. The metro would need to be integrated with the current circulation to avoid sudden influx and outflow of passenger.
- Provision for parking is insufficient for the terminal.
- Congestions during peak operating hours at Subways leading to Bus stand and ferry Ghats at current levels of passenger traffic.

**Building Level**
- Being a terminus station and the waiting areas becomes a congestion points for both arriving and departing passengers.
- Long walking distances for passengers along the platform length.
- Existing Built forms for Goods Sheds are placed alternatively between passenger terminal buildings.
- Unused underground linkages to jetty and the untapped potential of the riverfront greens.
Design Interventions

The design interventions aim at mitigating the issues currently faced by commuters during the entire transition process. The stressed infrastructure requires additional area to accommodate the future increase in passenger traffic in addition to the review of the existing entry and exits routes to the terminal.

In order to decongest the existing premises, a new overhead concourse for departing passengers is proposed and the existing building shall be used for arriving passengers. The new concourse would be given accessed via an extension along the Bunkim setu which shall be connected via cab roads from station road, hence decongesting the station road. This new connection will gives an opportunity for a new look and entrance to the terminal and create a modern station building and at the same time retain historic and the landmark terminal building which will essentially be the arrival gateway to the city. The new concourse shall be positioned over the platforms connected to Bunkim Setu extension with a green plaza and a MLCP below.

The traffic from the station road from Kolkata city via Howrah bridge can be routed through the renovating the existing Cab Roads. The integration of the underground metro station is to be achieved by a vertical core. The core shall be designed as such to segregate passenger traffic and the commuters to the offices blocks above. The office blocks and the concourse will adopt the green passive and active strategies to reduce cap-ex and op-ex with modern technology and design strategies. The Office towers are massed in order to minimize the exposure to direct sun and the domino type arrangement gives the scenic view of the city and the riverside to all towers.
Segregation Of Departure And Arrivals At Terminal Level

**Departure Passenger Movement**

The scheme proposes an iconic overhead concourse building spanning the platforms and fronted by an expansive entrance plaza and a ceremonial drop off zone from Bunkim Setu. The direct connectivity for the passengers travelling by metro shall be via a central vertical core. The Concourse shall extend on one side to connect to bus stand via overhead bridge and on the other side shall extend to future platforms. It shall house all amenities such as Ticket Counters, Information counter, F&B, Public telephone & Internet, Toilets and Facilities for Disabled for passengers.

**Arrival Passenger Movement**

All Arriving passengers shall use the platforms to make way towards the exits from the existing Terminal Buildings for Taxi or take subways to Bus stand sand Ferry Ghats. Seamless connection with metro will help dissipate arriving passengers for further connectivity. Additional Waiting areas related to departing passenger amenities can be converted to house onward travel kiosks and ticketing booths further decongesting the station road.

**Commercial development and Integration**

The station is in midst of dense urban fabric and attracts a sizable foot falls, the commercial development atop the station concourse supported by MLCP parking can tap the revenue potential for the site. The commercial development can have office towers coupled with retail area and open rooftop of concourse providing a scenic view of the station and the twin cities. The proposed extension of Bunkim Setu and connection to the concourse via podium over proposed MLCP block shall aid in decongestion and segregation of the passenger and retail footfall.
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**Activities with time schedule & manpower deployment to meet the objective of Consultancy**

**Team Site Visit** (2 Days)
Manpower Deployment: TL, CA, SPE, SE, TPE, EE + 3

**Surveys** (3 Weeks)
Manpower Deployment: [Survey Team of 10 for Data collection]

**Background Studies** (3 Weeks)
Manpower Deployment: TL, CA, SPE, SE, TPE, EE + 5

**Internal Design Workshop** (2 Days)
Manpower Deployment: TL, CA, SPE, SE, TPE, EE + 10

**Preliminary Design Presentation** (1 Days)
Manpower Deployment: TL, CA + 2

**Internal Design Workshop and Update** (2 Days)
Manpower Deployment: TL, CA, SPE, SE, TPE, EE + 10

**Definitive Design Presentation** (1 Days)
Manpower Deployment: TL, CA, SPE, SE, TPE, EE + 2

**Internal Design Workshop and Updates** (5 Days)
Manpower Deployment: TL, CA, SPE, SE, TPE, EE + 10

**Final Design Presentation** (1 Days)
Manpower Deployment: TL, CA, SPE, SE, TPE, EE + 2

**Designation Codes:**
- Chief Urban Designer/Planner (The Team Leader) [TL]
- Chief Architect [CA]
- Station Planning Expert [SPE]
- Structural Engineer/Construction Expert [SE]
- Transport Planning Expert [TPE]
- Environmental Expert [EE]