Dedicated Freight Corridor Corporation of India Limited

(A Government of India Enterprise)

CONTRACT STRATEGY FOR BHAUPUR – MUGHALSARAI SECTION (EC – 2)

India

Project Name: Dedicated Freight Corridor Project
Loan No. (8066 - IN)

Title of Consulting Service: Engineering Consultancy Services for Mughalsarai – Bhaupur Section and Dadri – Khurja – Ludhiana Section

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EASTERN DEDICATED FREIGHT CORRIDOR - PHASE 2

CONTRACT STRATEGY BHAUPUR – MUGHALSARAI SECTION

1.0 INTRODUCTION

Eastern DFC Project entails construction of 1183 Km of mostly double line electrified railway tracks connecting Sahnewal (near Ludhiana) to Dankuni except single line between Khurja – Sahnewal. The construction planning and implementation of Phase 1 of Eastern Corridor (EC) between Khurja –Bhaupur under World Bank Loan No. 8066 has since been initiated by DFCCIL.

EC Phase 2 covers the construction of double line electrified section of about 393 Km. length between Bhaupur and Mughalsarai. EC Phase 3 involves construction of single line electrified track of about 404 Km. length between Khurja-Meerut-Saharanpur-Ambala-Sahnewal(near Ludhiana) and about 43 Km. electrified double line connecting Khurja and Dadri; where it links with Western Corridor of DFC. Sub Structure such as Bridges and embankment would be designed for 32.5 Tonne Axle load while the Track Super structure would be designed for handling 25 Tonne axle load with train speed up to 100 Kmph.

1.1 EC Phase 2 corridor alignment is mostly parallel to existing adjacent Indian Railway Track except for some detour at certain locations to avoid social/environmental/wild life impact.

1.2 Location and Surroundings of the Section

Mughalsarai – Bhaupur Section (Double line about 393 Kms) of the Eastern Dedicated Freight Corridor project starts from existing Indian Railways (IR) approx. Km.670 (near Howrah end of Mughalsarai yard between Mughalsarai-Ganjkhwaja stations) and meetsBhaupur via Mirzapur - Allahabad - Fatehpur - Prempur - Kanpur. Alignment is generally parallel to the existing IR lines except in detours at Mirzapur, Manda Road, Allahabad, Bharwari, Sirathu, Khaga, Fatehpur& Kanpur totalling to a length of 130km. Grade separators(fly overs) are planned over existing Indian Railway tracks for uninterrupted flow of both Indian Railways (IR) traffic and DFCC traffic at Jeonathpur, Chunar, over Manikpur line near Naini& over Jhansi line near Panki.. The project route between Mughalsarai to Bhaupur passes through the State of U.P.

2.0 OBJECTIVES

As per Clause 5.0 of TOR - General Requirements of Engineering Consulting (EC) Services, the Consultant is required to develop Complete Bid Documents for Design – Build (Lump Sum) Contract for International Competitive Bidding.

The objective of this paper is to identify most suitable Contracting Strategy for design and construction of Civil, Track, Structures, Buildings, Non-traction Power Supply,

design and installation of systems i.e. Signaling & Telecom and Overhead Electrification Works including traction power supply for Phase 2 of the Eastern Corridor following Design-Build Lump Sum Approach of Contracting.

The Consultant has reviewed the data provided so far, carried out the analysis of the requirements of the Project, the contracting environment both in India and worldwide. DFCCIL have posted on their web site the result of the PQ process for EC Phase 1;The information provided therein has been taken in to consideration during the course of the analysis. Consultant has reviewed various options of contract packaging in order to have the most optimum infrastructure which is durable, cost effective, avoids serious interface & integration issues, reduces the risk of delayed completion and is functionally suited to the given site conditions. The review includes a “Strength, Weaknesses, Opportunities and Threats” (SWOT) analysis to enable the clear formulation of the recommendations.

3.0 PROJECT REQUIREMENTS

The construction and commissioning of double line heavy haul electrified railway with suitable signaling system is a complex project involving large number of variables and interdependencies. The project has a mix of following key activities:

3.1 Civil and Track Works involving:

- Earthwork in cutting and filling on the agreed/designed alignment;
- Laying and compacting suitably designed sub-grade and blanket layers – up to the designed formation level;
- Construction of important bridges, rail flyovers, road over bridges, road under bridges, major & minor bridges, rail-road crossings;
- Track works for main line and yard lines (station yards & connecting lines);
- Operational buildings and structures, such as maintenance facilities, stations and maintenance equipment structures etc.;
- Non-traction electrical works;
- Drainage;
- Boundary wall/fencing, if required;
- Residential housing, if required; and
- Any other civil works as per the defined scope of work.

3.2 System Works involving:

- Signaling
- Telecommunication
- Train Control System
- Traction Power Supply (2 x 25 KV OHE);

- Overhead Electrical System; and
- SCADA, RAM etc.

3.3 Key Considerations:

The discussions below are based on the following key considerations:

- Potential interface issues for Civil Contracts;
- Potential Integration issues between the Civil & Track Works Contract(s) and System Contracts;
- Potential Interface issues between System domains;
- Impact on competition in Bidding;
- Potential Risk in not meeting Project Timeline;
- Potential for contractual disputes/claims either between the Contractors or Contractor/Client; and
- Potential of Project Cost overrun.

3.4 Current Strategies Adopted on DFCCIL

A. Civil & Track Works –Eastern Corridor Phase 1

EC-Phase 1 having approximate route length of 347 Km has been divided in to three Slices. Out of the 14 Applicants pre-qualified for bidding (**Annexure 1**), nine Applicants had met the qualifying criteria for all the three slices. Though all the nine pre-qualified Applicants did not submit proposal for all the three Slices, it is noted that eight Applicants did participate in all three Slices.

DFCCIL have recently awarded Contracts for these three slices of EC-Phase 1. The Contract Price for each of these three slices is in the range of Rs. 1,000 Cr. to 1,400 Cr. The Contracts for all the three Slices have been awarded to One Contractor.

A.1 Civil & Track Works –Western Corridor Phase 1

Only two applications were received for two Civil & Track Work Packages each of approximate route length of over 300 Km. The two Applicants qualified meeting the qualifying criteria for both the Packages.

The bids have been invited by DFCCIL by merging both the Civil Work Packages – which has a route length of over 600 Km.

A.2 Systems – Signaling and OHE –Eastern Corridor Phase 1

The pre-qualification applications for unified Systems Contract comprising of both Signaling and OHE works have been received by DFCCIL on Feb. 1, 2013. Six Applications have been received. The list of Applicants is placed at **Annexure 2**.

These Contracts are still in the early stages and as such no result can be drawn from these cases.

3.5 Similar Works Executed Internationally

List of similar railway infrastructure works completed internationally, together with a brief commentary on the Contract split is given in **Annexure 3**.

3.6 Size of Civil and Track Work Slice

(i) As per the experience gained during the bidding process of three slices of EC – P1, it is noted that there has been adequate competition, serious involvement and interest of the local infrastructure Contractors for DFCCIL project Civil & Track Works; with **Nine Applicants** qualifying for all the three slices.

(ii) DFCCIL have recently awarded the Contract for mechanical laying of approximately 66 Km track between Mughalsarai and Sonepur. Though 66 Km length of track to be laid under this Contract cannot be considered as optimum, it is encouraging to note the interest of track laying Contractors in DFCCIL Project.

(iii) Considering the experience of PQ for EC P-1 and Applications sold(over 20 numbers sold on both the occasions) for PQ of two Contract Packages of Western Corridor, it is noted that sufficient number of Contractors would be interested in participation in EC P-2 Civil & Track Works.

(iv) One single large value Civil & Track Work Contract for entire stretch of EC – P2 (of approximately Rs. 4,260 Cr.) will be almost twice of the size of Civil & Track Works completed internationally. Such large size Civil & Track Work Contract also entails the risk of the Contractor being over-committed and failing to meet Project Milestones resulting in delay in completion of works.

(v) A Contract Value of over Rs. 2,000 Cr. (requiring laying of 150 to 200 Km route length (300 Km to 400 Km Track Length) will encourage the Contractor to procure these track laying and tamping equipment by entering in to suitable technical arrangements with other qualified track work Sub-contractors, gain experience to bid for future Contracts involving track laying, where these machines could possibly be redeployed.

(vi) In view of the above, route length of 393 Km for EC P-2 can be possibly divided in to two Slices allowing the Bidders to apply for one or both the Slices; with the provision that One Contractor can be considered for award of both the Slices provided he meets the pre-qualifying criteria for each Slice separately. Such an arrangement will possibly encourage International Infrastructure Companies to participate competitively due to large size of the two combined Slices.

3.7 Systems Contract

The analysis undertaken by the Consultant in respect of execution of System works in India and overseas brings out the following:

(i) **Availability of System Contractors in India:**
There are not many Signaling Contractors in India (the best known are two

foreign groups based in India, Siemens and Alstrom); while there are about 6 to 8 OHE Contracting firms – mostly engaged in Railway Electrification works based on RDSO approved designs. The currently operating OHE Contractors have to depend upon foreign collaboration for Systems design. System works are therefore undertaken by foreign specialized firms dealing in manufacture, supply and erection of equipment. Unified Contract for Systems would require formation of joint venture between foreign firms located in India and/or foreign firms engaged in these two domains internationally.

(ii) **Applicant's Response to DFCCIL's invitation for pre-qualification of unified Systems Package for EC P-1**: The pre-qualification applications for unified Systems Contract have been received by DFCCIL on Feb. 1, 2013. Six Applications have been received (**Annexure 2).** The Applicants comprise of foreign firms located in India as well as Indian firms in participation with foreign firms. The response has yet to be evaluated.

(iii) **Experience of Indian Railways**: Indian Railways (IR) had earlier awarded unified Systems Contracts and consultations with the System experts of Indian Railways reveals that there had been difficulties in the past with unified Systems contracts and the presently there appears to be a consensus in favor of two separate contracts for OHE and Signaling.

(iv) **Delhi Metro**: has been executing the Signaling and OHE works following the award of separate contracts for these two domains of System Works and have successfully completed over 200 Km of Metro Rail in NCR of India. Award of separate Systems Contracts is proposed to be followed in other Metro Rail Systems under construction in India.

(v) **DFCCIL Western Corridor Phase 1**: DFCCIL has decided to award separate Systems Contracts for WC P-1.

(vi) **International Experience**: List of seven rail infrastructure works completed outside India is placed at **Annexure 3**. Out of these seven projects, five projects (S. N. 3 to S. N. 7) relating to electrified railway Signaling and OHE were executed through separate contract packages.

From the position stated above, it is observed that "OHE" and "Signaling & Communications" Packages of work are normally undertaken as separate tender packages. This reflects the issue that typically companies that are the strongest with rail systems (Signaling & Communications) are not necessarily the same companies that are strongest for Electrification services.

4.0 CONTRACT PACKAGING OPTIONS

Following possible options have been considered in this paper:

(a) Single Civil &Track Work Contract package with a consortium/JVto execute the entire Systems (Signaling & OHE) works covering the entire length of EC phase 2.

(b) Two Civil &Track Work Contracts each in JV with System Contract involving both S & T and OHE i.e. one each for each individual civil contract.

(c) Two separate System Contracts (Signaling and OHE) each covering the entire stretch of EC P-2; and two Civil &Track Work Contracts.

(d) One single unified System Contract inclusive of Signaling and OHE for the entire stretch of EC P-2 and two Civil &Track Work Contracts.

(e) One single unified System Contract inclusive of Signaling and OHE for the entire stretch of EC P-2 and One Civil &Track Work Contract.

4.1 Single track & civil contract package with a consortium/JV to execute the Systems works i.e. Signaling and OHE

Civil & Track Works **Systems - OHE& S&T etc.**

The proposed contracting arrangement will require JV between the multiple discipline Contractors i.e. Civil &Track Work, Signaling &Telecom and OHE, traction power etc.; and could face the following issues which will need close management monitoring in respect of:

(i) One single large civil works contract in JV/Consortium/association with Systems Contractors could carry a greater risk of the contractors being over-committed and failing to meet Project Milestones. Any one of the JV partner not meeting the project schedule is likely to delay the entire project.
(ii) There is greater risk of failure resulting in delay in completion of project due to large value of Civil and Track Works and joint venture amongst various areas of expertise; especially due to non-availability of S & T Contractors in India.
(iii) This may also result in the issue relating to joint and several responsibility in case of failure of any party thus leading to disputes and claims by the Employer/Contractor.

In addition, it is observed that:

One single contract for Civil & Track Works and Systems is likely to result in merging four separate areas of expertise and specialization namely Civil, Track, Signaling & Telecom and Overhead Electrification and as estimated by DFC, this cost is in the vicinity of INR 6000 Cr. This will increase the contract size enormously and could restrict available Local Contractors to meet the World Bank Qualifying Criteria. In order to explore the best possible working scenario, it is suggested that Civil & Track Works should be segregated from the System Works Contract(s). The expertise required would

be so diverse that it will not be possible for any single Contractor to possess the expertise of all these domains. In any case the System works commence only after about six to nine months from the commencement of Civil & Track Works.

4.2 Two Civil & Track Work Contracts each in JV with System Contract involving both S & T and OHE i.e. one each for each individual civil contract.

Civil & Track Works - 1 System (OHE & S&T etc.)	Civil & Track Works - 2 System (OHE & S&T etc.)

In case EC P-2 is divided in two Civil & Track Work Packages of approximate route length of about 200 Km, it is likely to invite better participation and thus adequate competition. It will also have sufficient track length in both the Contract Packages encouraging the Contractor to invest in track laying and maintenance equipment.

In view of the position submitted above, it is observed that in case EC P-2 Civil and Track Works is divided in two contract packages, there would be better participation of construction contractors (singly or in JV with local or international Contractors) and receive competitive offers.

This arrangement of two Civil & Track Work Packages in joint venture with the two separate Systems Packages could face the following issues which will need close management monitoring in respect of:

(i) Interface amongst the two civil contracts limited to one geographical location;

(ii) Interface amongst the two system contracts involving Signaling and OHE limited to one geographical location;

(iii) With two system contractors for two civil works packages, any delay by any of the contractors either civil or system will in all probability adversely affect the completion of the entire project. This may also result in disputes and claims between the Employer/Contractor.

(iv) Both the System Contractors are likely to adopt different design as the contracts are being awarded on Design-Build basis. This may therefore have serious integration issues during operations.

(v) Multifarious system designs and vendors which such a scenario entails, poses problems of integration especially between the power supply systems and OHE.

(vi) There is risk of failure resulting in delay in completion of project due to joint venture amongst various areas of expertise; especially due to non-availability of S & T Contractors in India.

(vii) This may also result in the issue relating to joint and several responsibility in case of failure of any party thus leading to disputes and claims by the Employer/Contractor.

(viii) Introduction of different systems is likely to increase the inventory of spares.

(ix) Being two separate systems, the training needs for the staff operating the system is likely to be more.

4.3 Two separate System Contracts (Signaling and OHE) each covering the entire stretch of EC P-2; and two civil & track work contracts

Civil & Track Works - 1	Civil & Track Works - 2
System - OHE	
System - S&T etc.	

This arrangement could face the following issues which will need close management monitoring in respect of:

(i) Integration problems amongst the two system contractors.

(ii) Interface problems with the two civil works contractors limited to one geographical location.

(iii) Entails the risk of delay due to default of any of four contracts (two civil & track work, two for systems - one for signaling & telecom and the second for OHE).

(iv) There is risk of failure resulting in delay in completion of project by any of the Contractors failing to meet the milestones thus resulting in disputes and claims by the Employer/Contractor.

(v) Interface and integration issues amongst the Systems and the Civil Works Contractors are likely to adversely affect the project completion.

However, any interface issues between the two disciplines S&T and OHE (which would tend to favour putting the two disciplines together) do not seem to be significant enough to offset the benefits of separate specialist providers providing lowest overall cost.

As mentioned in Para 3.7 (Sub-Para i, iii, iv, v and vi) separation of two typically different domains is a practice being followed internationally and has been adopted on Indian Railways and Indian Metro Rail Projects.

4.4 One single System Contract inclusive of Signaling and OHE for the entire stretch of EC P-2 and two Civil &Track Work Contracts

Civil & Track Works - 1	Civil & Track Works - 2
System – OHE and S&T etc. for entire EC P-2	

One single System Contract inclusive of Signaling and OHE for the entire stretch of EC P-2 and two Civil & Track Work Contracts will need close management monitoring in respect of:

(i) Interface between the Civil Contractors limited to one geographical location.

(ii) Integration between the Civil & Track Work Contractors with System Contract.

(iii) A single System Contract would not suffer from any serious integration issues.

(iv) This arrangement will involve joint venture amongst the Signaling Systems Contractor and OHE Systems Contractor – most likely the foreign firms and as such is not likely to be cost effective.

(v) There are likely to be contractual disputes between the two Systems Contractors due to the conditionality of joint and several responsibilities in case of failure by any one partner of the joint venture.

This Option will however:

(i) take care of the issues of compatibility of system design over the entire stretch, and
(ii) take care of the interface issues amongst the systems works

4.5 One single System Contract inclusive of Signaling and OHE for the entire stretch of EC P-2 and One Civil & Track Work Contract

Civil & Track Works for entire EC P-2
System – OHE and S&T etc. for entire EC P-2

One single System Contract inclusive of Signaling and OHE and One Civil & Track Work Contracts for the entire stretch of EC P-2 will need close management monitoring in respect of:

(i) Integration between the Civil & Track Work Contractors with System Contract.

(ii) This arrangement will involve joint venture amongst the Signaling Systems Contractor and OHE Systems Contract – most likely the foreign firms and as such may not be cost effective despite economy of scale.

(iii) There are likely to be contractual disputes between the two Systems Contractors

due to the conditionality of joint and several responsibilities in case of failure by any one partner of the joint venture.

(iv) There would be one single Civil & Track Works contract for the entire length of EC–P2 costing approximately INR 4,260 Cr. and could carry an unacceptable risk of the Contractor being over-committed and failing to meet Project Milestones. It is also likely to result in insufficient participation and inadequate competition, particularly in view of the fact that Contractors would already be committed for EC-P1as also for construction of the Western Corridor thus reducing the success rate.

This Option however does not suffer from issues of multiplicity of system design.

5.0 CIVIL CONTRACTS SPLIT (If two Civil Contracts are adopted)

The total value of the civil contracts as estimated by DFC for the entire length of 393 Kms of EC Phase II is approx. INR 4,260 Cr. As submitted in Para 3.6 above, this can be split up in two parts with the approximate cost of each package being divided almost equally. In the entire reach of EC Phase II there are only two important bridges. As such each package would be designed to contain one of these important bridges.The overall length of each Slice will be critically reviewed once final data about the alignment, type of terrain, bridging length and cost estimate are available; based on which the exact boundaries of the two proposed Slices will be suitably defined to meet the proportional quantum of various work components. The boundary limits of the two proposed Slices is intended so as to facilitate defining the similar pre-qualifying criteria for invitation of Pre-qualification Applications for thus permitting simultaneous processing for both the packages.

6.0 SWOT ANALYSIS

SWOT Analysis of the four options discussed above has been carried based on the elements of risk to the Employer, interface and integration issues, effect on costing, probability of contractual disputes, completion schedule, and coordination requirements amongst the civil contracts, amongst the system contracts and amongst the civil and system contracts.

OPTION 1: Single civil & track contract package with a consortium/JV to execute the entire Systems (Signaling & OHE) works covering the entire length of EC phase 2.

One Contract Package comprising of Civil & Track Works and Systems - OHE& S&T etc.

STRENGTH	WEAKNESS
✓ One single entity is responsible for interdisciplinary coordination, schedule implementation, interfaces and integration. ✓ Ease in integrated testing and commissioning. ✓ Ease in sourcing of equipment and spares. ✓ Coordinated approach to train control. ✓ Economy in deployment of track laying and maintenance equipment due to large track length to be laid in Civil & Track Work Contract.	✓ Large value civil and track work inputs may restrict the local participation. ✓ One single large civil works contract carries greater risk of the contractor being over-committed and thus failing to meet milestones. ✓ Restricted local participation may result in adverse effect on the cost of civil & track works. ✓ Greater risk of failure resulting in delay in completion of project and may also result in disputes and claims by the Employer/Contractor.
OPPORTUNITY	**THREAT**
✓ It will provide opportunities to local contractors to develop technical and management skills for installation of systems in collaboration with the JV System partners.	✓ Being large value civil works input, there is serious risk of failure of the entire contract with failure of any component of the civil works; thus delaying the entire project implementation schedule. ✓ May result in the issues relating to joint and several responsibility in case of failure of any party. ✓ Risk of Contractual disputes and claims due to failure by any of the involved joint venture partners. ✓ Risk in timely completion of the project due to any dispute between the JV partners comprising of one Civil and two Systems Contractors.

OPTION 2: Two Civil & Track Work Contracts each in JV with System Contract involving both S & T and OHE i.e. one each for each individual civil contract.	
Civil & Track Works–1 and System (OHE & S&T) etc.	**Civil & Track Works–2 and System (OHE & S&T) etc.**
STRENGTH	**WEAKNESS**
✓ No interface and integration issues between the civil and systems contracts. ✓ Economy in deployment of track laying and maintenance equipment due to enough track length to be laid in each Civil & Track Work Contracts.	✓ Interface and integration between the two system contractors. ✓ Both the System Contractors are likely to adopt different design as the contracts are being awarded on Design-Build basis thus increase in Employer's involvement/risk in these areas. ✓ Being two separate systems, the training needs for the staff operating the system is likely to be more. ✓ Introduction of different systems is likely to increase the inventory of spares.
OPPORTUNITY	**THREAT**
✓ It will provide opportunities to local contractors to develop technical and management skills for installation of systems in collaboration with the JV System partners.	✓ With two system contractors for two civil works packages, any delay by any system contractor is likely to have adverse project wide impact. ✓ Likely delay in integrated testing and commissioning. ✓ Potential for program delays due to two separate systems contracts. ✓ This is likely to result in disputes and claims between the Employer and the Contractor(s) due to likely delays as a result of interface issues. ✓ May result in the issue relating to joint and several responsibility in case of failure of any party. ✓ Risk of Contractual disputes and claims due to failure by any of the involved joint venture partners. ✓ Risk in timely completion of the project due to any dispute between the JV partners comprising of one Civil and two Systems Contractors.

OPTION 3: Two separate System Contracts (Signaling and OHE) each covering the entire stretch of EC P-2; and two civil & track work contracts.

Civil & Track Works - 1	**Civil & Track Works - 2**
System - OHE	
System - S&T etc.	
STRENGTH	**WEAKNESS**
✓ Single sourcing of system equipment and spares. ✓ Manageable Civil & Track Work Contract Packages. ✓ Likely to result in reduced overall cost for the system works.	✓ Interface and integration issues amongst the two system contracts. ✓ Interface amongst the civil & track work contractors and the two system contractors.
OPPORTUNITY	**THREAT**
✓ Potential for reduced system prices due to large scale purchase. ✓ Adequate participation by local Civil & Track Work Contractors. ✓ Manageable Civil & Track Work Packages carry lesser risk of the contractor being over-committed and thus likely to meet key deliverable milestones. ✓ Economy in deployment of track laying and maintenance equipment due to enough track length to be laid in each Civil & Track Work Contracts. ✓ No joint and several responsibility in case of failure of any party. Each party is responsible for its own domain of work. No risk of disputes and claims due to such contractual issues.	✓ Delay by any one of the systems contractors is likely to result delay in overall project completion. ✓ Likely delay in integrated testing and commissioning. ✓ This may result the risk due to disputes and claims between the Employer and the Contractor(s) due to likely delays as a result of interface issues.

OPTION 4: One single System Contract inclusive of Signaling and OHE for the entire stretch of EC P-2 and two civil & track work contracts.	
Civil & Track Works - 1	**Civil & Track Works - 2**
System – OHE and S&T etc.	
STRENGTH	**WEAKNESS**
✓ Ease in sourcing of equipment and spares. ✓ Manageable Civil & Track Work Packages carry lesser risk of the contractor being over-committed and thus likely to meet key deliverable milestones. ✓ Good systems integration. ✓ Single source equipment and spares. ✓ More coordinated approach to train control. ✓ Uniform system design over the reach.	✓ Both the Civil & Track Work Contractors have to independently interface with the Systems Contracts. ✓ Will involve joint venture amongst the Signaling Systems Contractor and OHE Systems Contract – most likely the foreign firms and as such is not likely to be cost effective.
OPPORTUNITY	**THREAT**
✓ Adequate participation by local Civil & Track Work Contractors. ✓ Economy in deployment of track laying and maintenance equipment due to enough track length to be laid in each Civil & Track Work Contracts.	✓ There are likely to be contractual disputes between the two Systems Contractors due to the conditionality of joint and several responsibilities in case of failure by any one partner of the joint venture. ✓ Risk in timely completion of the project due to any dispute between the JV comprising of two Systems Contractors.

OPTION 5: One single System Contract inclusive of Signaling and OHE and one Civil & Track Work Contract for the entire stretch of EC P-2.	
Civil & Track Works for the entire stretch of EC P-2	
System – OHE and S&T etc. for the entire stretch of EC P-2	
STRENGTH	**WEAKNESS**
✓ Ease in sourcing of equipment and spares. ✓ Good systems integration. ✓ Single source equipment and spares. ✓ More coordinated approach to train control. ✓ Uniform system design over the reach.	✓ Civil & Track Work interface with the Systems Contractor. ✓ Large value civil and track work inputs may restrict the local participation. ✓ One single large civil works contract carries greater risk of the contractor being over-committed and thus failing to meet key deliverable milestones. ✓ Restricted local participation may result in adverse effect on the cost of civil & track works.
OPPORTUNITY	**THREAT**
✓ Economy in deployment of track laying and maintenance equipment due to enough track length to be laid in each Civil & Track Work Contracts.	✓ Claims from Contractors due to any delay in meeting project milestones by the civil & track work contracts or the systems contractor. ✓ There are likely to be contractual disputes between the two Systems Contractors due to the conditionality of joint and several responsibilities in case of failure by any one partner of the joint venture. ✓ Risk in timely completion of the project due to any dispute between the JV partners comprising two Systems Contractors.

7.0 ASSESSMENT OF OPTIONS

In addition to the SWOT analysis of the five options presented above i.e. one or two track & civil works contracts in JV with systems contractors or independent system contractors or in joint venture/consortium of systems contractors comprising of signaling & telecom and OHE systems and one civil & track work and one unified systems contract for entire stretch of EC P-2, an assessment matrix as per the following criteria and ranking is also presented for the five options described above:

S. N.	Criteria	Rating	Maximum Points	Points
1	Potential Interface issues for civil contracts	Low/Medium/High	10	10/6/4
2	Potential Integration issues between the Civil & Track Works Contract(s) and System Contracts.	Low/Medium/High	15	15/10/5
3	Potential Interface issues between systems domains i.e. Signaling & Telecom and OHE.	Low/Medium/High	15	15/10/5
4	Adverse Impact on Competition in Bidding	Low/Medium/High	15	15/10/5
5	Potential Risk of not meeting the Project timeline	Low/Medium/High	15	15/10/5
6	Potential for Contractual Disputes/Claims either between the Contractors or Contractor/Client	Low/Medium/High	15	15/10/5
7	Potential of Project Cost overrun	Low/Medium/High	15	15/10/5

The overall assessment of SWOT analysis based on the above indicated point marking for the five Options considered is presented below:

ASSEMENT MATRIX

Activity	Weight	OPTION 1		OPTION 2			OPTION 3		OPTION 4		OPTION 5	
Contract Packaging and Combination	**Max.**	**Single Civil & Systems Contract**	**Points**	**Two Civil &Track Contracts each in JV with System Contract**		**Points**	**Two Civil and Two separate systems contracts one each for Signalling and OHE**	**Points**	**Two Civil and one unified systems contract comprising of Signalling and OHE**	**Points**	**One Civil and one unified systems contract comprising of Signalling and OHE**	**Points**
	→	**Civil Systems - OHE& S&T etc.**		**Civil -1 System (OHE & S&T etc.**	**Civil -2 System (OHE & S&T etc.**		**Civil 1** / **Civil 2** **System - OHE** **System - S&T etc.**		**Civil 1** / **Civil 2** **System – OHE and S&T etc.**		**Civil & Track Works** **System – OHE and S&T etc.**	
Potential Interface Issues for Civil Contracts	**10**	Low	10	Medium		6	Medium	6	Medium	6	Low	10
Potential Integration issues between the Civil & Track Works Contract(s) and System Contracts.	**15**	Low	15	Low		15	Medium	10	Medium	10	Medium	10
Potential Interface issues between systems domains.	**15**	Low	15	Medium		10	Medium	10	Low	15	Low	15
Adverse Impact on Competition in Bidding	**15**	High	5	Medium		10	Low	15	Medium	10	High	5
Potential Risk of not meeting the Project timeline	**15**	High	5	High		5	Medium	10	Medium	10	High	5
Potential for Contractual Disputes/Claims either between the Contractors or Contractor/Client	**15**	High	5	High		5	Low	15	Medium	10	Medium	10
Potential of Project Cost overrun	**15**	High	5	High		5	Medium	10	Medium	10	Medium	10
TOTAL	**100**		**60**			**56**		**76**		**71**		**65**

7.1 Discussion of the allocated points for each option

1. **Potential Interface Issues for Civil Contracts**– The marks for this parameter have been assigned depending upon the difficulty that the option is likely to face to overcome those problems. Accordingly, if there is only one civil contractor, there would be no interface issues and as such the situation warrants full marks for this parameter. For others options, the marks have been assigned depending upon the relative difficulty to overcome the interface issues.

2. **Potential Integration issues between the Civil & Track Works Contract(s) and System Contracts**–the logic for assigning the marks is the same as that for Civil Contracts interface except that in the present case it would be the interface between the Civil/Systems.

3. **Potential Interface issues between systems domains–**In case of only one system contractor comprising of all the disciplines i.e. signaling & telecomm and OHE etc. there are likely to be no serious integration issues. However, with the higher numbers of the system contractors, the problems are likely to be more.

4. **Adverse Impact on Competition in Bidding –**The proposed packaging system will directly impact on the competition in bidding process. Larger the size of the Contract less would be the competition during the bidding process.

5. **Potential Risk of not meeting the Project timeline**- The issues of missed milestones normally increase with the complexity of the problem i.e. with the increase in the overall size of the contract. There is possibility of missed milestones in case of JV comprising different domains i.e. Civil & Track works, Signaling Systems and or OHE Systems. The points for this parameter have been assigned accordingly for the options under consideration.

6. **Potential for Contractual Disputes/Claims either between the Contractors or Contractor/Client–** while there is a possibility of claims/disputes in any contract, the experience shows that the probability is more when the number of Contractors operating simultaneously in the same geographical limit for the same project, are more. In case of JV comprising different domains there is serious possibility of disputes amongst the JV partners due to joint and several responsibility. This will result in Contractor/Client Claims. The allocation of points has been done accordingly.

7. **Potential of Project Cost overrun–**more number of JVs in any contractual arrangement pose risk of delays and contractual disputes lading to cost overrun. This has been the basis of allocating points for this criterion.

7.2 Ranking of various options

The ranking of the various options as per the above illustrated matrix (out of **100** total points) is as given under:

Option	Contract Packaging Description	Points (Max. 100)
Option 1	Single Civil & Systems Contract	60
Option 2	Two Civil each in JV with System Contract	56
Option 3	Two Civil and Two separate Systems Contracts one each for Signalling and OHE	**76**
Option 4	Two Civil plus One Unified Systems Contract	71
Option 5	One Civil and One Unified Systems Contract comprising of Signalling and OHE	65

8.0 BIDDING PROCESS

8.1 Objectives

In terms of Clause 5.3 of Section 7, Terms of Reference for the Engineering Consulting Services, the Bid Documents are required to be developed for "Design Build (Lump Sum)" Contract for International Competitive Bidding. The Bidding Documents for identifying suitable Contractors shall be based on the latest version of "The World Bank Standard Bidding Document" (SBD) for Procurement of Plant – Design, Supply and Installation. The SBD permits identification of the suitable Contractor following Single Stage or two stage bidding process.

This section discusses the various options that are available to the Employer for selecting the Contractor(s) for implementation of EC Phase 2 and to identify the most suitable methodology to achieve the objective of identifying the Contractor(s) who could deliver the project meeting the defined timelines.

Essentially the options available are Prequalification (or not), followed by a Single Stage or Two Stage Bidding process.

Prequalification can be described as the screening of contractors by the Employer prior to issuing a bid document. The exercise is based on a set of criteria, selected to determine the contractors' competence or ability to participate in the project bid and their ability to execute the proposed construction contract, if selected through the process of competitive bidding.

The process is especially suitable for: (i) Large or complex civil work, (ii) Custom designed equipment, (iii) Industrial plant, (iv) Specialized services, (v) Complex information technology, (vi) Turnkey, design and build, management contracting.

8.2 International Funding Agencies Guidelines on Prequalification:

Given below are the extracts of the procurement guidelines of ADB/WB/JICA:

8.2.1 World Bank & ADB

Para 2.9 of WB/ADB Procurement Guidelines: *Prequalification is usually necessary for large or complex works, or in any other circumstances in which the high costs of preparing detailed bids could discourage competition, such as custom-designed equipment, industrial plant, specialized services, some complex information and technology and contracts to be let under turnkey, design and build, or management contracting. This also ensures that invitations to bid are extended only to those who have adequate capabilities and resources. Prequalification shall be based entirely upon the capability and resources of prospective bidders to perform the particular contract satisfactorily, taking into account their (a) experience and past performance on similar contracts, (b) capabilities with respect to personnel, equipment, and construction or manufacturing facilities, and (c) financial position.*

8.2.2 JICA:

Procurement Guidelines: Section 3.02 Prequalification of Bidders, Page 78 Paragraph (1):

(01) This Section concerns prequalification, usually conducted for contracts for large construction works, etc.

(02) *JICA considers that prequalification is "in principle required" in view of emphasis on quality. At least, Prequalification is required for large-scale procurement amounting to more than one-billion Yen for complex works/contracts or under any other circumstances such as design-build contracting in which preparing detailed bids is costly. This ensures that invitations to bid are extended only to those with adequate capabilities and resources. Prequalification may also be required when participation of numerous bidders is expected and, thus, prescreening to a certain extent should be carried out at this stage for an efficient evaluation of bids.*

Prequalification is also required as per the DFCCIL Works Manual wherein there is a stipulation that for contracts above INR 50 Crores, Prequalification should be applied.

8.2.3 Evaluation of the Pre-qualification Process

The advantages to the prospective Bidders, Employer and the disadvantages of following the process of pre-qualification are described below:

A. Advantages to prospective Bidders:

a) It works as a form of pre-auditing of a contractor's ability. The process usually starts by establishing decision criteria, which will vary according to the selection scenario, such as type of project, type of client, time scale.

b) The well-qualified firms may also price their bids competitively with the knowledge that they would be competing with other qualified bidders.

c) The assurance that competitors lacking the necessary qualifications will be excluded from tendering encourages qualified contractors not to quote unreasonably low rates.

d) Since prequalification reduces the size of the playing field, each contractor has a higher probability of being awarded the contract.

B. Advantages to Employer:

(i) It pre-informs the Employer about a possible interest that the bid is likely to generate among the eligible Contractors.

(ii) Reduces the amount of work and time involved in evaluating the eventual Bids as the unqualified Bidders are barred from applying for the work;

(iii) Being forewarned, it gives sufficient time to the perspective bidders to enter into JV/Consortiums;

(iv) By pre-qualifying the contractor, the odds of the contractor performing unsatisfactory work are decreased, thereby minimizing Employer's risk;

(v) Enhances participation of serious contractors (since unqualified bidders are excluded);

(vi) The Employer improves the probability of receiving reasonably priced bids as only competent firms are in the fray.

(vii) Ensures the probability of success of the Contractor as the capabilities of the Contractor are scrutinized both at the prequalification and during technical bid submission.

C. Disadvantages of Pre-qualification:

(i) This is an additional burden to the contractor who has to do extra paper work for submitting prequalification, although it is noted that the submission requirements are of a more procedural nature (eg capability, financial statements etc).

(ii) There is an additional cost involved in the prequalification process of Contract procurement;

(iii) Increased time for the bidding process could be perceived as a disadvantage. This is discussed in Section 8.4.

8.2.4 Summary

The foregoing leads to a conclusion that by and large the only disadvantage for going in for prequalification could be a marginal increase in the cost of procurement process which is rather insignificant in the entire gamut of implementation of such a large value project.

The extra time required for prequalification is largely offset in the overall bid process.

Advantages such as transparent and competitively priced bids, improving the probability of getting a better Contractor far outweigh any disadvantage which apparently may seem to be associated with dispensation of prequalification.

8.3 Two Stage Bidding Process

8.3.1 Methodology as per Funding Agencies

The following bidding procedures are normally followed for works funded by ADB/WB/JICA:

ADB

Para 2.6 (a) of Procurement Guidelines: In the case of turnkey contracts or contracts for large complex facilities or works of a special nature or complex information and communication technology, it may be undesirable or impractical to prepare complete technical specifications in advance. In such a case, a two-stage bidding procedure may be used, under which unpriced technical proposals are invited first. These are prepared on the basis of a conceptual design or performance specification, and are subject to technical as well as commercial clarifications and adjustments. The first stage technical proposal clarification is to be followed by issuance of amended bidding documents and the submission of final technical proposals and priced bids in the second stage.

2.6 (b) of Procurement Guidelines: Two-envelope procedures, wherein bids with separate envelopes for technical and financial proposals are submitted simultaneously, may be used for the procurement of goods, works or turnkey contracts. The borrower has the option to use the two-envelope procedure with single-stage or two-stage bidding. In the single-stage, two-envelope procedure, the technical proposal is opened first and reviewed to determine responsiveness to the bidding documents. Only the financial proposals of bidders with responsive technical proposals are opened for evaluation and comparison. The financial proposals of bidders whose technical proposals are not responsive shall be returned unopened. In the two-stage, two-envelope procedure, bidders are allowed to amend their technical proposals in order to ensure conformance to the same technical standards. Only the financial proposals, including supplementary price proposals, of bidders whose original or revised technical proposals are found conforming to the agreed technical standards, are opened for evaluation and comparison. The use of these procedures must be agreed upon by ADB and the borrower.

The World Bank

The World Bank allows Single Stage or Two-Stage bidding procedure for Procurement of Plant and Equipment; the Standard Bidding Document used for Design Build Lump Sum Contracts. In the Single Stage – technical and financial proposals are received together from the Bidders. Technical Bids are first evaluated followed by Economic Evaluation. However, Para 2.6 of Procurement Guidelines suggests the use of Two Stage Bidding Procedure for large complex works involving design, supply and installation.

Para 2.6 of Procurement Guidelines: *In the case of turnkey contracts or contracts for large complex facilities or works of a special nature or complex information and communication technology, it may be undesirable or impractical to prepare complete technical specifications in advance. In such a case, a two-stage bidding procedure may be used, under which first unpriced technical proposals on the basis of a conceptual design or performance specifications are invited, subject to technical as well as commercial clarifications and adjustments, to be followed by amended bidding documents and the submission of final technical proposals and priced bids in the second stage.*

JICA

Section 2.03 of Procurement Guidelines: Single-Stage: Two-Envelope Bidding and Two-Stage Bidding

(1) For works, machinery and equipment for which complete technical specifications are prepared in advance, a single-stage: two-envelope bidding procedure should be adopted. Under this procedure, bidders will be invited to submit technical and financial proposals simultaneously in two separate envelopes. The technical proposals are opened first and reviewed to determine that they conform to the specifications. After the technical review has been completed, the financial proposals of the bidders whose technical proposals have been determined to conform to the technical specifications are then opened publicly, with bidders or their representatives allowed to be present. Opening of financial proposals shall follow the procedures stipulated in Section 5.02 of these Guidelines. Evaluation of financial proposals shall be consistent with Section 5.06 of these Guidelines. The financial proposals of the bidders whose technical proposals have been determined not to conform to the technical specifications shall promptly be returned unopened to the bidders concerned. The use of this procedure must be agreed upon by JICA and the Borrower.

(2) In the case of turnkey contracts or contracts for large and complex plants or procurement of equipment which is subject to rapid technological advances, such as major computer systems, for which it may be undesirable or impractical to prepare complete technical specifications in advance, a two-stage bidding procedure may be adopted. Under this procedure, bidders will first be invited to submit technical offers without prices on the basis of the minimum operating and performance requirements. After technical and commercial clarifications and adjustments, followed by amended bidding documents, the bidders will be invited to submit final technical proposals and financial proposals in the second stage. The use of this procedure must be agreed upon by JICA and the Borrower.

It is noted that all the three international funding agencies suggest use of two stage bidding procedure for contracts for large and complex works involving design, construction and installation.

8.3.2 Proposed Two Stage Bidding Process for EC Phase 2

A) Advantages

The procurement of suitable Contractor following two stage bidding process has following distinct advantages:

(i) It is a more flexible approach to awarding contracts because it allows participation of prospective bidders in the definition of the technical specifications and scope of work.
(ii) The preferred bidder is more likely to have a good understanding of the requirement, which potentially reduces risks at the implementation stage of the contract.
(iii) Prospective bidders are able to make suggestions for improvement of the technical specifications and scope of work of the assignment, through their technical proposal and clarification discussions.
(iv) The technical approach and methodology can be adjusted to suit the agreed technical specifications and scope of work.
(v) Invitation of Bids following two stage bidding procedure has the advantage of evaluating the entire technical proposal of the Bidder documenting the clarifications made in writing and/or in a meeting, if any, and including an Annex listing all decisions, and required amendments or changes resulting from the clarification of the First Stage technical proposal. The Memorandum will be communicated to the Bidder as part of the invitation to submit the Second Stage bid. Such a procedure has accordingly the advantage of inclusion of an otherwise worthwhile proposal which in a Single Stage Bidding Process could have been rejected due to minor deviations from the stipulations.
(vi) The Bidder has better understanding of the Employer's Requirements and Design expectations as a result of interaction with the Employer after opening of First Stage Technical Bid and as such the price bid is submitted only after reaching agreement on the technical specifications and scope of work and thus optimally/competitively priced.
(vii) A contract is negotiated on the basis of the agreed technical specifications and scope of work.
(viii) There is more certainty regarding the qualifications of the preferred bidder.

8.4 TIME FRAME REQUIRED FOR PROCUREMENT WITH PREQUALIFICATION AND TWO-STAGE BIDDING PROCESS.

Annexure 4 describes in some detail the tasks required for the Prequalification and Two Stage Bidding Process.

While the estimated durations could be adjusted somewhat, it can be seen that the tasks for the Prequalification process run for the large part in parallel with the preparation and approval of the Bid documents, which are critical tasks that must be completed prior to issue of the Bid documents.

9.0 CONCLUSIONS & RECOMMENDATIONS

9.1 Contracting Strategy

Option 1: has one single track and civil contract of such a large value which is likely to discourage local contractors due to their possible inability to meet the WB Qualifying Criteria for participation thus limiting competition. The arrangement will involve contractual problems amongst the JV partners and may result in failure of the Contract thus delaying the entire project implementation schedule and as such this option is not recommended for this project.

Option 2: has been rated as the lowest. As brought out above in the SWOT analysis, Option 2 has the issue of serious interface and integration amongst the two civil contracts and multifarious system designs (two systems contracts)poses problems of integration especially between the power supply systems and OHE. The arrangement will also involve contractual problems amongst the JV partners and may result in failure of the Contract thus delaying the entire project implementation schedule. All these issues are likely to pose serious contract management issues for the Employer and hence this option is not considered suitable for this project.

Option 4: comprises of two manageable civil contracts and a unified systems contract encompassing Signaling, OHE and other allied system works JV comprising of two different domains possibly of foreign origin firms is likely to have contractual issues relating to joint and several responsibility in case of delays requiring Employer's intervention and claims. It may be observed that Option 4 (71 Points) which is currently planned to be implemented on EC P-1 closely follows Option 3 (76 Points) scoring the highest ranking in the Assessment Matrix.

However, as a result of analysis undertaken by the Consultant, it transpires that this Option is not being followed internationally. It is also not being favored either by Metro Rail or Indian Railways and as such is not recommended.

Option 5: comprises of One Civil and One Unified Systems Contract comprising of Signaling and OHE. This has a large value Civil & Track Work Contract besides unified systems contract encompassing Signaling, OHE and other allied system works. JV comprising of two different domains possibly of foreign origin firms is likely to have contractual issues relating to joint and several responsibility in case of delays requiring Employer's intervention and claims. This Option is therefore not recommended for EC P-2.

Option 3: scores the highest points as per the Assessment Matrix. It has two Civil and Track Work Contracts and two Systems Contract, one for OHE and other for S&T and other allied systems works. This option will not involve any contractual issue amongst the System Contracts. The interface and integration issues which are likely to affect the project completion will, however, require Employer's intervention. This Option is being

currently used in Indian Railways and Metro Systems in India and is being internationally followed for implementation.

The Consultant acknowledges that the difference between Option 3 and 4 is very small, however, based on the AECOM international experience, it is observed that "OHE" and "Signalling & Communications" packages of work are normally separate tender packages. This reflects the issue that typically companies that are the strongest with Signalling systems are not necessarily the same companies that are strongest for Electrification services. Any interface issues between the two disciplines (which would tend to favour putting the two disciplines together) do not seem to be significant enough to offset the benefits of separate specialist providers providing lowest overall cost.

In view of the foregoing, Option 3 with two Track & Civil Works Contracts and two separate System Contracts is considered the most suitable option and as such is recommended for adoption in implementation of EC Phase – II.

9.2 Pre-qualification of Bidders

While the estimated durations could be adjusted somewhat, it can be seen that the tasks for the Prequalification process run for the large part in parallel with the preparation and approval of the Bid documents.

Accordingly, it is recommended that prequalification for procurement for Eastern Corridor Phase-2 be adopted.

9.3 Two Stage Bidding Process

It is noted that all the three international funding agencies recommend the use of the two stage bidding procedure for contracts with large and complex works involving design, construction and installation such as this project.

The advantages of adopting this process are listed in detail in Section 8.3, and accordingly it is recommended that this be adopted for Eastern Corridor Phase-2.

Annexure 1

List of Pre-qualified Applicants for EC Phase – I

S. N	Name of the Applicant	Number of Slices
1	CRFG-SOMA	3
2	OHL - Punjlloyd	3
3	Corsan – Kalindee – C&C	2
4	Alarko - NCC	3
5	KEC-REMPUT-Simplex	3
6	ESSAR-PATEL-BSCPL	1
7	SANJOSE-ECI	2
8	STS-ERA	3
9	TATA-ALDESA	3
10	IVRCL-KMB	3
11	NAVAYUGA-SEW	2
12	HCC-ALSTOM	3
13	GAMMON-CMC	3
14	DSC-LANCO Infratech	2

Annexure 2

Applications received by DFCCIL on Feb. 1, 2013 for PQ – Unified Systems Package

EC Phase 1

1. ALSTOM India Ltd. + ALSTOM Transport S.A.
2. SIEMENS India + SIEMENS AG Germany
3. KEC + ELECNOR (Spain) + KYSON (Japan)
4. ENGLIQUE (India) + COBRA (Spain)
5. TATA Projects Ltd. + IISA + LSIS
6. ENABENSA (Spain) + ANSALDO + EMC + BESTON and CROMPTON (India)

Annexure 3

Sample of Recently Completed International Railway Infrastructure Projects

1. Brookfield Rail-Mid-West Rail Upgrade Project (2010-2013)

The project involved construction of 60km of new duplicated track within the existing rail alignment, 130km of track structure upgrade on existing formation, strengthening of structures where required, 6 new passing loops and modification/upgrade of existing terminal and servicing yards..

Packaging: The project was delivered on 'construct only' contracts with Early Contractor Involvement (ECI) in design commissioned separately by the Client. Two construction contractors (1. JHG, 2. Laing O'Rourke +NRW JV) were engaged with geographical split as the basis for split of scope. Signalling was procured in a single package and was directly managed by Brookfield Rail.

2. Karara to Tilley Railway (2008-11)

The work involved 80km of new green field non-electrified railway to 32tal standard. All below rail infrastructure: civil works including ground improvement, structures and track, was lumped in a single package on a 'construct only' package and was awarded to McMahon Contractors. The signalling and systems work was delivered in an independent single package. The designers, the contractor and the signalling contractor had independent contracts with the Client, KML. But for the issues mainly attributed to the client supplied materials/services, the construction was delivered on schedule and within budget.

3. Perth to Mandurah Railway (2004-07)

The work involved construction of duplicated electrified railway over 60km route length, including a short (<2km) tunnelled section and a major bridge.

The below rail work was packaged into three D&C contracts each covering the underground section, the major bridge and the remaining route length of the railway. In addition, there was a package for station building and facilities (excluding systems). The signalling and communication were delivered within a single package whose main contractor used separate D&C contracts for signalling and communications. The train control was an independent package. Then there were packages for OHE and station services systems.

4. Robina to Varsity Lakes Rail Extension

The Robina to Varsity Lakes Rail Extension Project extended the reach of public transport into the Gold Coast, one of Queensland's fastest growing regions. It included:

- 4.1 km of dual electrified track
- new train station at Varsity Lakes
- 300 commuter car parks

- Innovative 300 m cut-and-cover tunnel
- 3.2 km of new roads
- Remediation of previous landfill.

5. Corinda to Darra Rail Upgrade

The Corinda to Darra Rail Upgrade Project increased the capacity of the Ipswich rail line and made connection the Springfield Transport Corridor. It included:

- two new tracks between Corinda and Darra in a heavily congested urban network corridor
- rail link to the new Springfield rail line
- upgraded facilities at Darra and Oxley train stations
- 70 additional commuter car parks at Oxley Station
- 40 additional commuter car parks at Darra Station
- rail bridge at Manburgh Terrace, Darra.

6. **Beerwah Rail Crossing:**

The Beerwah Rail Crossing Project was part of Queensland Rail's Rail Smart initiative to eliminate level crossings from the rail network. It included:

- 1.2 km road bridge over the rail line in Beerwah
- two new roundabouts
- two new signalised intersections
- new pedestrian underpass
- new pedestrian and cycle paths

7. **Richlands to Springfield Transport Corridor**

The Richlands to Springfield Project extended the reach of rail transport into Springfield. It includes:

- 9.5 km of dual electrified track
- two new rail stations (Springfield and Springfield Central) including provision for a future station at Ellen Grove
- Seven rail bridges including the 800m Logan Motorway Rail Viaduct
- Provision for the future reconstruction and dualing of 5km the Centenary highway
- 100 commuter car parks at Springfield Central
- 200 commuter car parks at Springfield

In the projects listed at S. N. 3 to 7 above, the OHLE and Signalling were undertaken as separate packages of work and managed on an Alliance framework, a Target Outturn Cost (TOC) was put together for each package, which enabled PM to manage the design and construction works.

Annexure-4

Envisaged Time Frame for Procurement Using Prequalification and Two-Stage Bid Process

S. No.	Prequalification			Bid		
	Activity	Estimated Duration	Total Time	Activity	Estimated Duration	Total Time
1.	Publishing of PQ document	-	D	-	D	-
2.	Pre-submission meeting for PQ	15 days	D+15	Framing of Bid Document and approval by DFCC	120 days*	D+120
3.	Preparation of replies for PQ	15 days	D+30	World Bank comments on Bid document	30 days	D+150
4.	World Bank approval for replies to PQ and publishing of addendum	30 days	D+60	Incorporation of comments & resubmission to WB	30 days	D+180
5.	Receipt of PQ documents	21 days	D+81	NOC by WB on bid document	15 days	D+195
6.	Finalization of PQ evaluation report by GC & DFCCIL	45 days	D+126	Publication of Bid document	7 days	D+202
7.	NOC from WB on PQ evaluation report	15 days	D+141	Pre-bid conference	15 days	D+217
8.	Publication of final PQ list	7 days	D+148	Modification of the bid document & submission to WB	15 days	D+232
9.				Comments of WB & preparing final Bid document	15 days	D+247
10.				Publication of addendum to bid document	7 days	D+254
11.				Opening of Bid document	30 days	D+284
12.				Examination of the bids	10 days	D+294
13.				Clarification meetings with Bidders	10 days	D+304
14.				First stage technical Evaluation of Bids and submission to	40 days	D+344

S. No.	Prequalification			Bid		
	Activity	Estimated Duration	Total Time	Activity	Estimated Duration	Total Time
				DFCC		
15.				Submission of technical evaluation report to WB	7 days	D+351
16.				NOC from World Bank for first stage technical evaluation report	10 days	D+361
17.				Issuing of Memorandum of changes to bidders and invitation to second stage bid	7 days	D+368
18.				Receipt of second stage bid	30 days	D+398
19.				Preparation of Evaluation Report of bid	7 days	D+405
20.				NOC from WB on evaluation report	7 days	D+412
21.				Negotiation if any, and signing of Agreement	30 days	D+442

Note: - * 120 days is considered to be a minimum time for preparation of bid documents for systems. For CST works, the period can be reduced to 90 days.