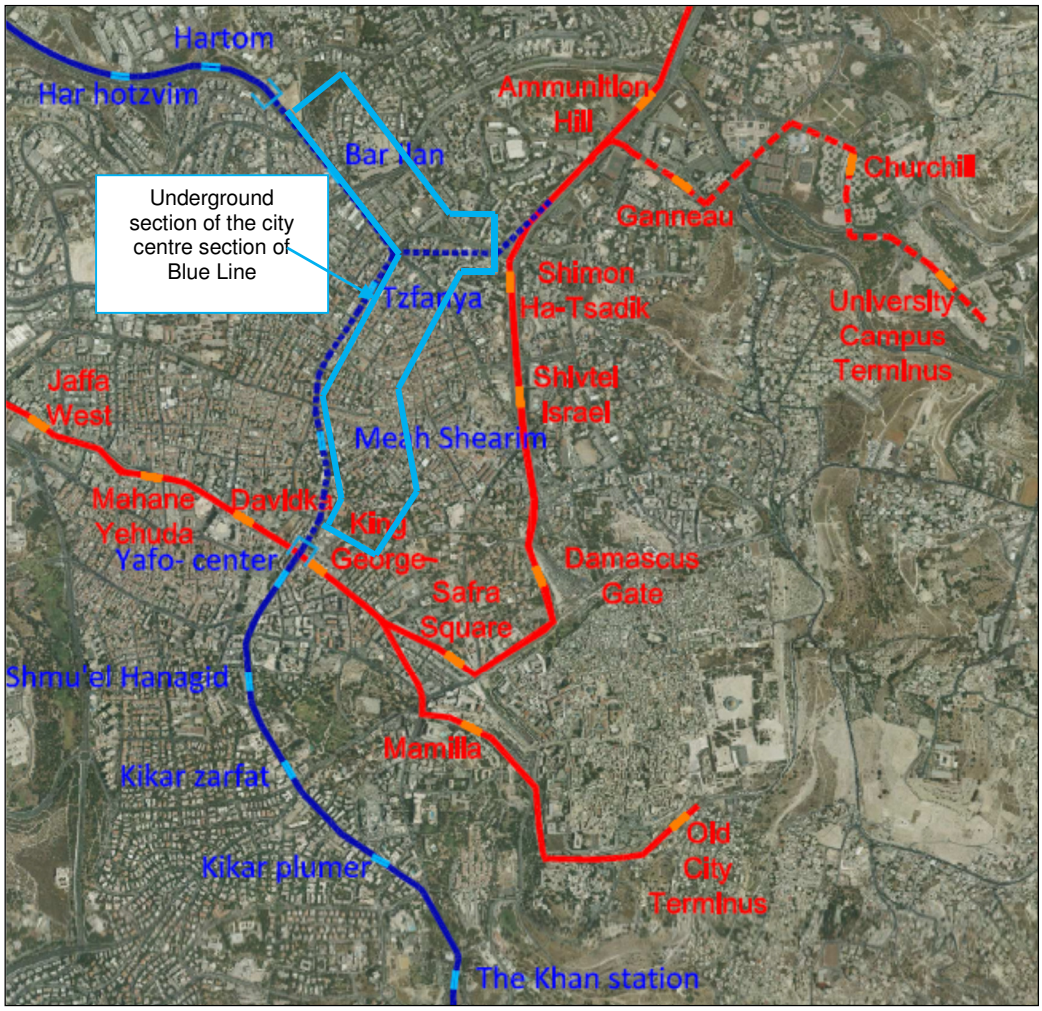
Project reference	V4260_ERA_TD_00041_A25

REQUEST FOR PROPOSALS FOR

ENGINEERING, DESIGN AND OTHER SERVICES FOR THE UNDERGROUND SECTION OF THE CITY CENTRE SECTION OF THE BLUE LINE

INSTRUCTIONS TO BIDDERS (ITB)



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1. GENERAL

1.1 INTRODUCTION AND PURPOSE OF THE DOCUMENT

a) The Jerusalem Transportation Masterplan Team (JTMT) invites Bidders to submit Bids for the provision of engineering, design and other services in connection with the development of the underground section of the city centre section of the Blue Line of the Jerusalem Initial Network.

b) The purpose of this document is to direct Bidders with respect to all aspects of the preparation of their Bids, including the technical and financial information to be submitted, and to provide details about the selection process.

1.2 BACKGROUND

a) The Government of Israel (the "Government") is currently developing the Jerusalem Light Rail Transit (LRT) Initial Network. The Government entered into an agreement with the consortium Citypass (the "Concessionaire") for the design, financing, construction, operation and maintenance of the LRT System, being the first line ("the Red Line") of the Light Rail Transit network in Jerusalem. The Red Line is currently in its operation and maintenance stage.

b) In addition to the above, the Jerusalem Transportation Masterplan Team ("JTMT"), on behalf of the Government, is involved in planning the development of the LRT network, and to this end has entered into agreements for the design of the Red Line Extensions, the University Branch Lines, the Green Line and the Blue Line.

c) The second stage of the LRT system master plan was approved by the Ministry of Transportation, the Ministry of Finance and the Jerusalem Municipality. The main priorities of this plan are as follows:

1) **The Red Line Extensions**: these are extensions to the existing Red Line. All three sections, described below, are in the detailed design phase for the main works with some of the preparatory works including utility relocations, which are already under construction:

(i) The **Neveh Yaakov** section which is a 2,1 km extension of the Red Line to the north, from Pisgat Ze'ev (Kheil ha-Avir) to Neveh Ya'akov along Moshe Dayan Blvd and Neveh Ya'akov Blvd, including 4 LRT stations: Mazal Shor, Mazal Keshet, Yitzhak Tabenkin, and Leah Goldberg.

(ii) The **Hantke** section which is a 1.5 km extension of the Red Line to the south, along Arthur Hantke and the beginning of Henrietta Szold, including 3 LRT stations: Shmaryahu Levin, Haim Haviv, and Tahon.

(iii) The **Hadassah** section which is a 3.2 km extension of the Red Line to the south along Henrietta Szold, on a dedicated track-way between Ora Junction and the entrance to the Hadassah hospital campus, and on the south and west parts of the Hadassah ring road, including 5 LRT stations: Mexico, Iceland, Ora, Hadassah University, and Hadassah hospital.

The Hadassah section is split into 3 subsections, as follows:

- Little Hadassah to Ora – around 1,3 km
- Ora to Hadassah (university station) – around 1,4 km
- Hadassah compound – around 0,5 km

2) **The University Branch Lines (U-Lines)**, about 3.5 km long in total, which will link the university campuses of Mount Scopus and Givat Ram by using a shared section of the Red Line at a first stage. Later on, the branches to Mount Scopus and Givat Ram Universities will become part of the Green Line.

3) **The Green Line,** about 18.3 km long, connecting Mount Scopus to Gilo, with an optional branch in the Talpiot neighbourhood, using part of the U-Line segments. The design consultant for the preliminary design is a joint venture between OBERMEYER and AMY METOM engineering companies.

4) **The Blue line,** about 20.3 km long, connecting Malha to Ramot, including an optional branch on the Hebron Road. The design consultant for the preliminary design is a joint venture between SYSTRA, DEL and MATI engineering companies**.**

5) **The Red, Blue and Green Lines** will be connected based on the findings of the feasibility studies and preliminary design that have recently been completed.

1.3 CURRENT STATUS OF THE NETWORK

The current status of the network is as follows:

a) The Red Line between Pisgat Ze'ev and Mount Herzl is in operation.

b) The detailed design and preliminary works of the Red Line's planned extensions towards the north (Neveh Ya'akov) and the south (Hadassah) are currently underway.

c) Preliminary design is underway for the construction of the university branch lines.

d) Preliminary design is currently underway of the proposed Green Line from Mount Scopus to Gilo (The university branch lines will be incorporated into this line in the future).

e) Preliminary design of the proposed Blue Line is currently underway.

2. THE SERVICES

Part of the city centre section of the Blue Line will require the construction of an underground section (due to the constraints elaborated in the Terms of Reference attached hereto). JTMT is therefore seeking to engage a Consultant to provide the following services:

a) Preliminary, basic and detailed design for such underground section.

b) Interfacing with the Blue Line Consultant with regard to the implementation of the LRT elements of such underground section.

c) Supervision services during the tendering and implementation of the construction of such underground section.

(Hereinafter: the "**Services**"). The Services to be provided are divided for the purposes of this tender into two categories, the Basic Assignment and the Optional Assignments, as follows:

2.1 BASIC ASSIGNMENT

The Basic Assignment consists of the following services:

a) Preliminary design

b) Basic design

c) Detailed design

d) Preparation and approval of statutory process documents in accordance with the Israeli Planning and Building Law;

2.2 OPTIONAL ASSIGNMENTS

The Optional Assignments consist of the following services. Bids will relate separately to each of these:

a) Optional Assignment 1 - supervision of additional geotechnical site investigations

b) Optional Assignment 2 - preparation of tender documents for construction contracts

c) Optional Assignment 3 - tender process assistance

d) Optional Assignment 4 - supervision of construction

3. DEFINITIONS

In this RFP the following terms shall have the meaning ascribed to them as follows:

Authorised Representative	The Authorised Representative of the Bidder is the Member authorised to sign documents in the name of the Bidder as set forth in Section 8 below.
Basic Assignment	As defined hereinabove and in the Terms of Reference (TOR).
Bid	A proposal submitted in accordance with the Instructions to Bidders (ITB).
Bidder	A group of companies eligible to respond to the present Request for Proposals, in compliance with the ITB.
Blue Line	As referred to hereinabove and defined in the TOR.
Blue Line Consultant	The consultant entrusted with the engineering design services for the Blue Line of the Jerusalem LRT System, (currently, a joint venture between SYSTRA, DEL and MATI.
Consultant	The entity which will be chosen as the Preferred Bidder in this tender process and which will sign a contract with JTMT for the performance of the Services or part thereof.
Concessionaire	The single purpose company responsible for the financing, design, construction operation and maintenance of the LRT System, as defined in the Concession Agreement (consolidated version) signed between the State of Israel and the Concessionaire on 22 September 2004.
Contract	The contract to be signed between JTMT and the Preferred Bidder.
General Consultant	The general consultant to JTMT (currently Egis Rail), supervising and coordinating the work for the planning and design of the Blue and Green Lines.
Green Line	As defined in Section 1 above.

Project	The process for the design, construction, testing and commissioning, operation and maintenance of the underground section of the city centre section of the Blue Line as set forth in the TOR.
JTMT	The Jerusalem Transport Masterplan Team, a division of the Association for Urban Planning, Development and Preservation – (R.A.), delegated by the Jerusalem Municipality and the Ministry of Transport to act as the entity responsible for the implementation of the Jerusalem Mass Transit System Project.
Members	Companies joined in a joint venture to bid for the present services
Memorandum of Understanding (MOU)	The joint venture agreement between the Members
Optional Assignments	The services as defined in Section 2.2 above and as set forth in the TOR.
Project Manager	The person designated by the Bidder to manage the Project on behalf of the Bidder.
RFP	Request for Proposals, contents of which are listed in Section 4 below.
Selection Committee	The committee formed by JTMT, which will be responsible for recommending the best Bidders in compliance with the present RFP, to the JTMT management board.
Services	The Basic Assignment and the Optional Assignments as referred to above and set forth in the TOR.
TOR	The Terms of Reference, which include the scope of works, describing the services and deliverables to be provided by the Consultant.

4. LIST OF RFP DOCUMENTS

The Request for Proposals consists of the following documents:

a) Instructions to Bidders (ITB)

b) TOR – consisting of the Project requirements, being the basis upon which the Bidders shall prepare their Technical and Financial Proposals, (together with its annexes including the existing preliminary design of the underground section, and guidelines for preparing a risk management plan, and external interface matrices)

c) Bidding documents and forms

d) Evaluation Criteria

e) General Conditions of Contract

5. GOVERNING LAW

This tender process shall be governed by, and construed in accordance with, the applicable laws and regulations of the State of Israel. Each Bidder, by submitting a Bid, shall be deemed to acknowledge that it is acquainted with the laws, regulations and provisions prevailing in the State of Israel which may be applicable to the Project, and that it will comply with these.

6. LANGUAGE OF THE TENDER

The official language for this tender process shall be English.

7. FOREIGN CURRENCY

a) Where foreign currency is proposed, the Bidder shall refer to one foreign currency only.

b) Exchange risks between such currency and any other currency are to be borne by the Bidder.

c) The foreign currency designated in the Bid shall be either USD (United States Dollar) or EUR (Euros, official currency of the Eurozone).

8. ELIGIBILITY AND PARTICIPATION REQUIREMENTS

For the purpose of determining a Bidder's eligibility to submit a Bid and partake in the Tender process, Bidders are required to comply in full with criteria set forth in this Section 8, including the technical and financial eligibility requirements, and any other requirement set forth in the RFP and its annexes:

a) The Bid shall be submitted by a group of foreign and/or national consulting firms (the Members), each firm being organized as a registered company, lawfully registered or incorporated in its country.

b) Such participation as referred to above, will be dependent upon such Bidders (i.e. the group of the foreign and/or national consulting firms comprising the Bidder and not each individual Member) fulfilling all the terms and conditions for Bidders detailed in the RFP, in their entirety.

c) The Bidder must provide an authorized copy of the executed Memorandum of Understanding (joint venture agreement) between its Members. In this Memorandum of Understanding, a single Member (the “Authorized Representative”) shall be nominated and authorized by the other Members of the Bidder as the Member with power of attorney to act on behalf of the Bidder, be the lead Member and point of contact for the provision of the Services and receive instructions for and on behalf of the Members, without prejudice to the liability of the Bidder as a whole and/or the joint liability of each individual Member in accordance with the terms of the joint venture's memorandum of understanding. It should be noted that the Authorized Representative is required to be both tunnelling and transit system-oriented.

d) A Bidder or any of its Members may not submit a joint proposal with any other Bidder, except if and when authorized or requested by JTMT.

e) A Bidder or any of its Members may not be a sub-consultant nor Member of any other Bidder, except where authorized or requested by JTMT.

f) Where a sub-consultant is included as part of the Bidder's proposed personnel to fulfil one of the roles for which such Bidder's Technical Proposal is to be evaluated in accordance with the provisions of Annex C attached hereto, such sub-consultant may not then be included among the personnel of another Bidder's Bid, whether as part of such other Bidder's mandatory personnel requirements or in any other role.

g) A Bidder shall disclose the composition of its Members and of its proposed sub-consultants, and may not change such composition without the prior written approval of JTMT.

h) A Bidder or any of its Members shall not be blacklisted by the World Bank under its fraud and corruption policy and shall submit a declaration to this effect together with a statement that the contents of the declaration are true and correct under penalty of law. Such declaration should be signed by the Bidder's Authorized Representative in the presence of an attorney who shall confirm such signature.

8.1 ELIGIBILITY

a) Only those Bidders (i.e. the group of the foreign and/or national consulting firms comprising the Bidder and not each individual Member) who are able to demonstrate **ALL** of the following shall be eligible to bid:

(i) Undertaken and completed the full detailed design, civil and MEP (Mechanical, Electrical, and Plumbing) of at least one (1) underground station on three (3) distinct railway/LRT/Metro projects within the last 10 years.

(ii) Undertaken and completed the preliminary and basic design of MEP of a railway/ LRT/Metro tunnel of at least 2 km in urban conditions

(iii) Undertaken and completed the full detailed design of two (2) underground caverns in rock, for whatever purpose (hydraulic, transport, energy) in the last 10 years.

Note:

1. All references must relate to projects for which the fees obtained by the Bidder (or Member as the case may be) were at least 2 Million NIS (Refer to Section 7 above for foreign currency conversion rates).
2. In the event that referenced projects are provided whereby Members performed part of the services via sub-consultants, Bidders are required to describe in detail the particular role and actual tasks and/or services performed by each such Member in the project (independent of the sub-consultant) together with same description regarding the sub-consultant in any such referenced project, clearly demonstrating the particular division of tasks between such bodies.
3. Bidders are required to clearly demonstrate the particular division of tasks between each of the Members, with particular attention to the tasks performed by the proposed personnel, ensuring the proportionate role of each Member in the provision of the Services.

b) References to Bidder's meeting eligibility requirements as set forth above, and other relevant information in this regard, are to be presented in the form set out in Annex B to the ITB (see Eligibility reference requirements form).

9. CONFIDENTIALITY

a) The Bidder is invited to take part in the present tender on the condition that it agrees to keep confidential all information, whether written or oral, concerning the Project which it receives or obtains as a result of the information supplied in this RFP, or in discussions relating to it, except for any such information which is considered public domain. This condition also applies to Members, sub-consultants, and advisers consulted by the Bidder or by such Members. It is the sole responsibility of the Bidder to ensure that any Members, sub- consultants and advisers abide by the terms of this Section.

b) A confidentiality undertaking, to be signed by each Bidder and Member, is included in the Declaration, Warranty and Undertaking Form attached to this RFP in Annex B to the ITB.

c) Subject to the provisions of all relevant laws, JTMT undertakes to preserve as confidential the contents of all Bids submitted to it, and will not disclose, divulge, or permit any unauthorized person access to any part of such Bids, until the end of this process. Thereafter, JTMT shall preserve as confidential only those technical parts of Bids that have been clearly marked by a Bidder as being Commercially Sensitive Information. Without derogating from the generality of the foregoing, the referral of such information by JTMT to consultants who have signed confidentiality undertakings with JTMT shall not be deemed a breach of JTMT's undertaking of confidentiality.

d) Notwithstanding the provisions of Section 9 c) above, the undertaking of confidentiality will not apply to information that:

   (i) is or becomes generally known to the public through no fault of JTMT;

   (ii) the Bidder approves for unrestricted release by written authorization; or

   (iii) is required to be disclosed by law.

e) Notwithstanding the provisions of Section 9c) above, JTMT reserves the right to divulge technical information in a Bid which has not been marked as Commercially Sensitive Information, at any time after such Bid has been withdrawn or has been deemed unsuccessful.

10. CONFLICT OF INTEREST

a) As part of its Declaration, Warranty and Undertaking, the Bidder shall declare that there are no conflicts of interest between any of the prior or current engagements or activities of its Members, and/or those of their employees, and/or the Bidder's proposed sub-consultants, and the obligations or rights of the Consultant under the Contract attached to the RFP.

b) Each Bidder shall attach to their Declaration, Warranty and Undertaking a detailed declaration setting out all contacts, whether commercial or personal, with:

   (i) The Concessionaire of the Red Line of the LRT System of Jerusalem, CityPass Ltd;

   (ii) Any of the Concessionaire's shareholders;

   (iii) Any of the Concessionaire's subcontractors;

   (iv) The Consultants for the design of the Blue Line to the LRT Network;

   (v) The Consultants for the design of the Green Line to the LRT Network;

(vi) Egis Rail S.A., the JTMT General Consultant.

(vii) Any other organization involved in the design, construction, testing and commissioning of the extensions to the Red Line and the design of the Blue and Green lines.

c) JTMT reserves the right to request any clarification on any of these points, and also to decide that certain contacts constitute a conflict of interest and on such basis to bar such Bidder from continued participation in the tender process. Where a Bidder is so barred JTMT reserves the right to allow the Bidder to change the Member(s) with regard to which the conflict of interest exists and to become eligible to re-join the tender process.

d) For the removal of doubt, for the purpose of this Section 10, Bidders are required and expected to submit a list of contacts which in their opinion may constitute a possible conflict of interest with respect to the provision of the Services and/or the obligations or rights of the Consultant under the Contract attached to the RFP, including with respect to such organizations that are involved in the design, construction, testing and commissioning of the extensions to the Red Line and the design of the Blue and Green lines with which Bidders have contact, whether commercial or personal, including such organizations and/or bodies detailed in this Section 10.

11. PROHIBITION ON SOLICITATION AND COMMUNICATIONS

a) Bidders, Members, and all affiliates, subsidiaries or related parties of the above-mentioned, shall not:

(i) directly or indirectly lobby or solicit JTMT, the Selection Committee, or any other relevant authority or any employee, adviser or representative of any of the foregoing with respect to the Project or this process; or

(ii) directly or indirectly communicate with other Bidders or Members, other than those that are part of the same Bidder, regarding any aspect of the Project or their respective Bids.

b) Any failure to comply with any of the above may in and of itself lead to JTMT excluding the Bidder from this process, in addition to any other remedies JTMT may have.

12. COST OF BIDDING

All costs incurred in the preparation and submission of their Bids, together with the amendment of Bids, and including possible attendance at Bid meetings or technical auditions, shall be borne solely by the Bidders and their respective Members.

13. PREPARATION OF BIDS

13.1 INFORMATION SUPPLIED IN THE RFP DOCUMENTS

JTMT has prepared the RFP documents in good faith, providing the most up to date information available to it. Notwithstanding this, JTMT does not represent or warrant that the information contained in the RFP documents is either complete or accurate. Such information is provided for indicative purposes only. JTMT, and anyone acting on its behalf, shall bear no responsibility whatsoever for any loss, damage, or injury

suffered by Bidders, their Members, their employees, officers, agents, or any other persons for whom Bidders may be contractually or legally responsible by reason of any use of information contained in the RFP documents, or for any action or forbearance in reliance thereon.

13.2 SITE VISITS

Bidders are advised to examine the areas designated for the Project, and their surroundings, and to obtain for themselves all information that may be necessary or useful for preparing and submitting the Bid. Such site visits and collection of information shall be at the Bidder's own expense and responsibility.

13.3 QUERIES

a) All requests for information or clarifications should be directed to Mr. Daniel Tudorie, at e-mail: **daniel.tudori-ext@egis.fr** (Egis Rail), and Mr. Amit Blogovski (JTMT), at e-mail**: amit@jtmt.gov.il**, **no later than June 10th, 2015.**

b) JTMT's written response to queries will be posted on JTMT's website (http://www.jtmt.gov.il) **no later than June 24th, 2015.** JTMT's response to queries shall form an integral part of the RFP.

13.4 COMPOSITION OF THE BIDS

a) The Bids shall be prepared by the Bidder in accordance with the details specified below and the provisions included in the RFP documents and shall comprise the following documents:

Part 1 – General

(i) Cover Letter

Bidders shall submit a cover letter addressed to JTMT at the address specified in Section 14.2 a) and signed by the Authorized Representative. The cover letter shall list separately each of the documents comprising the Bid being submitted by the Bidder.

(ii) Declaration, Warranty and Undertaking

Each Member, and the Authorized Representative of each Bidder, shall sign the Declaration, Warranty and Undertaking in the form set out in Annex B to the ITB, stating, inter alia, that all information contained in the Bid is accurate, complete and up-to-date at time of submission; that the Bid has not been prepared in collusion with any other Bidder; that there is nothing to prevent the Bidder from using all information, including know-how and intellectual property, stated in the Bid; and guaranteeing the obligations of the Bidder under the present RFP; and guaranteeing confidentiality and the absence of any conflicts of interest as set forth in Sections 9 and 10 above.

(iii) Memorandum of Understanding (joint venture agreement)

Bidders shall submit a notarised original copy of the **Memorandum of Understanding (joint venture agreement)**.

(iv) Power of Attorney for Authorized Representative

Bidders shall submit an executed, original power of attorney appointing the Authorized Representative in accordance with Section 8c) above in the form set out in Annex B to the ITB.

(v) General Conditions of Contract

Bidders shall sign and submit the General Conditions of Contract in the form attached to this RFP or, if such form is amended by JTMT during the course of this tender process, in the form so amended. The General Conditions of Contract so submitted shall be binding on the Bidder.

Part 2 – Information concerning the Bidder

(i) The Bidder's Corporation

1) Include here information regarding the formation of the Bidder, including the Memorandum of Understanding mentioned in Section 8c); each of the Member companies shall provide authenticated copies (such authentication requirement may be satisfied by submitting a notarized document signed by a notary public confirming that the document is a true and complete copy of the original document) of founding documents, certificates of registration (i.e. the certificate of incorporation issued by the Registrar of Companies officially forming and incorporating the company under the governing laws of the country in which the company is registered) together with an up-to-date extract of the company registry as at the date of submission of the Bids, articles of association, memorandum and/or bylaws (All original documents which are not in the English language must be accompanied by a notarized English translation signed by a notary public certified as an "expert in the English language" confirming that the translation is a true, complete and accurate translation of the original document); lists of shareholders, directors and principal executives of each of the Bidder's Member companies current as of the date of filing the proposals; or, where Members are not companies, relevant details of such Members.

2) Include information regarding any litigation which is current pending or threatened against the Bidder or any of the Members, which may impact on their participation in submitting a compliant Bid, including any litigation or disputes relating to ownership of technology, or intellectual property.

3) Include certification from the central tax authority or other duly empowered governmental authority in the Bidder's Member companies' state(s) of residence confirming that a) the applicable tax returns and b) social security obligations have been filed and/or kept in books in accordance with law.

4) Eligibility reference requirements (in accordance with Section 8.1 above).

(ii) Financial Statements

Bidders shall submit the following documentation:

a. A letter, from the insurance companies of each of the Bidder Members, certifying the existence of such Member's insurance policies, and indicating their level of coverage; and

b. A letter, from the certified accountants of each of the Bidder Members, attesting to the financial turnover of such Member for each of the five (5) years prior to the submission of the Bid.

Part 3 – Technical Part

(i) References

Bidders shall include references relating to the Member companies' experience in the design, construction, testing and commissioning of LRT/BRT systems. Bidders may also include general references regarding any relevant project experience, both national and international.

(ii) Sub-consultants

The Bidder shall give the list of the intended sub-consultants, their profile and references and expected percentage of the contract amount for each sub-consultant. It will be the Bidder's responsibility to ensure that these sub-consultants also comply with their own countries' tax laws and other relevant laws.

(iii) CV's of Proposed Personnel

Bidders shall include CV's of personnel in the forms provided in Annex B to the ITB, in accordance with the mandatory requirements set out in Appendix 1 to the TOR attached to this ITB, outlining national and international experience. The proposed personnel shall include, as a minimum, the following:

a. Project Manager
b. Tunnelling design manager
c. MEP design manager (including Tunnel safety systems/equipment design manager)
d. Chief architect
e. Deputy Project Manager, if required.
f. Design and interface coordinator
g. Tunnel safety expert;
h. Geologist
i. Geotechnical engineer
j. Statutory process manager.
k. Ventilation expert (ventilation/smoke exhaust systems for stations and tunnel);
l. Structural design manager
m. Traffic engineer
n. Passenger flow expert;
o. Station building services manager (MEP, HAVC)
p. Safety expert

p'. Security expert
q. Fire safety engineer
r. Quantity Surveyor/ Cost estimator
s. Construction Manager
t. Supervisor for civil and architectural works
u. Supervisor for MEP and LRT integration works
v. Quality Assurance Manager
w. Health & Safety coordinator
x. Planning Manager

Please note the following:

1. Such proposed personnel will be evaluated based, inter alia, on the mandatory requirements set out in the RFP including their particular relevant experience.

2. In addition to the above list of proposed personnel, Bidders are also required to provide any other and/or additional positions and/or personnel who in their opinion are required and/or essential for the best and most effective execution of the Services. The omission of such additional required personnel will be at the discretion (and risk) of the Bidders.

(iv) Technical Proposal

The Technical Proposal shall be prepared in accordance with the Terms of Reference and shall be presented as set out in the Technical Proposal content and forms attached hereto as part of Annex B to the ITB.

Part 4 – Financial Proposal

a) The Financial Proposal shall be prepared based on the provisions in the Terms of Reference and shall be set out in accordance with the Financial Proposal forms attached hereto as part of Annex B to the ITB. Financial Proposal shall distinguish clearly between the Basic Assignment and each of the respective Optional Assignments.

b) Where the Services extend beyond the contractual period mentioned in Section 17 of Annex A, due to an event which is beyond the control of the Consultant and which prevents the Consultant from completing the Services, and for this reason alone, the instalments payable thereafter shall be adjusted in accordance with: a) with regard to the local currency – the Israeli consumer price index (also known as the cost of living index) which includes fruit and vegetables and which is published by the Central Bureau of Statistics; b) with regard to amounts stated in EUR – the European Central Bank's Harmonized Index of Consumer Prices (HICP) c) with regard to amounts in USD – the United States Consumer Price Index (CPI). The indexation mechanism shall apply after the validity of the Bid expires, in accordance with Section 14.3 below.

c) For both Part 3 (Technical Proposal) and Part 4 (Financial Proposal) the Bidder shall add to the information presented under specific sections, any additional subjects, specifications, tasks, and requirements which it regards as essential for obtaining the best and most effective execution of the Services, and any suggestions for improvements to the TOR.

Important note: Bidders are requested to complete the forms under Annex B to the ITB without making any changes/additions in wording or format to such forms. Any such changes will be disregarded.In addition to the .PDF format of the RFP, for the Bidders convininece, the forms detailed under Annex B are also provided in MS Office format on JTMT's website.

14. SUBMISSION OF BIDS

14.1 FORMAT AND SIGNING OF BIDS

a) The Bidder shall deliver 'Part 1 – General' in four (4) hard copies (two of them original copies) plus a compact disk (CD) each, in one sealed envelope bearing the following terms: "Engineering, design and other services for the underground section of the city centre section of the Blue Line**: Part 1 – General**".

b) The Bidder shall deliver Part 2 – Information concerning the Bidder in four (4) hard copies (two of them original copies) plus a compact disk (CD) each, in one sealed envelope bearing the following terms: "Engineering, design and other services for the underground section of the city centre section of the Blue Line: **Part 2 – Information concerning the Bidder".**

c) The Bidder shall deliver the Technical Proposal in four (4) hard copies (two of them original copies)plus a compact disk (CD) each, in one sealed envelope bearing the following terms: "Engineering, design and other services for the underground section of the city centre section of the Blue Line**: Technical Proposal**". On one of these copies the Bidder should blacken out those parts that are Commercially Sensitive Information, in accordance with the provisions of Section 9 c) above.

d) The Bidder shall deliver the Financial Proposal in four (4) hard copies (two of them original copies) plus a compact disk (CD) each, in one sealed envelope bearing the following terms: "Engineering, design and other services for the underground section of the city centre section of the Blue Line**: Financial Proposal**".

e) All copies of the Technical Proposal and the Financial Proposal shall be initialled on each page and signed on the last page by the Authorized Representative of the Bidder. All pages where entries, corrections or amendments have been made shall also be signed by the Authorized Representative.

f) Bidders shall submit four hard copies (two of them original hard copies) of all forms and/or documents requiring signatures, authorizations, notarizations and any other form of authentication as set forth in the RFP.

14.2 ADDRESS AND DATE OF SUBMISSION

a) The Bids shall be addressed to: **JTMT,** First Floor, Clal Building, 97 Jaffa Road, PO Box 28034, Jerusalem 91280, Israel. **(Att: Mr. Amit Blogovski)**

b) The Bids must be received by **July 8th, 2015, 15:00** Israel time.

14.3 VALIDITY OF BIDS

a) The Bids shall remain valid and open for review by JTMT and the Selection Committee for **360 days**.

b) No Bid may be amended following submission, except as a result of a change, modification, enhancement or adjustment to the details of any Bid or parts thereof specifically requested in writing by JTMT.

c) In the event of a Best and Final Offer (BAFO) Stage, the Bids of those Bidders invited to take part shall remain valid until the end of the selection process.

14.4 TECHNICAL PRESENTATION OF THE BIDDERS

a) Each Bidder shall be invited to a technical presentation of the Bid, after formal receipt of its proposals. The Bidder's representatives, up to five (5) persons, including the Project Manager, the Deputy Project Manager (if any), the Chief Architect, the Main Structural and Tunnelling Engineer and the Statutory Team Leader, shall present the

chosen approach and methodology for carrying out the various Project tasks, the personnel and organizational structure, the proposed Project schedule.

b) The audition meetings will be conducted at the JTMT offices in Jerusalem. The modalities of this appointment, including the setting of the audition date, shall be detailed to each Bidder by JTMT after the Submission.

15. SELECTION PROCES

15.1 SEQUENCE OF OPERATIONS

The selection process will follow the sequence below:

1. Opening of **Part 1 – General, Part 2 – Information concerning the Bidder and Part 3 – Technical Part**
2. Technical presentation by Bidders
3. Technical evaluation

   Following the technical evaluation (in accordance with the Evaluation Criteria) only those Bids which meet the technical evaluation threshold criteria will be further considered
4. Opening of the Financial Proposals of those Bidders complying with the Technical evaluation threshold criteria (see Evaluation Criteria).
5. Verification of compliance with all terms of the RFP in accordance with Section 15.2 below
6. Selection of Preferred Bidder(s) (optional Best and Final) in accordance with Section 15.3 below.
7. Contract award after approval by the governing body of the Association for Urban Planning, Development and Preservation – (R.A.) as defined hereinabove.

15.2 COMPLIANCE

a) Prior to the detailed evaluation of each Bid, the Selection Committee will determine whether the Bid has been prepared in accordance with the instructions set forth herein and complies, in full, and without exception or deviation, with all the terms, conditions and specifications of the RFP and that the Financial Proposal is coherent with the Technical Proposal.

b) Where a Bid is deemed by the Selection Committee not to so comply, JTMT, at its sole discretion, reserves the right to reject such Bid, or to instruct this Bidder to correct the point(s) over which it has failed to comply and to resubmit an amended Bid.

c) The Selection Committee will evaluate and compare only those Bids which have been deemed compliant.

15.3 SELECTION OF PREFERRED BIDDERS

a) The Selection Committee shall recommend to JTMT the Bidder(s) whose Bids are deemed to be the most advantageous in the light of the evaluation criteria set out in Annex C to the ITB attached hereto.

b) JTMT shall send notification of its decision to the Authorized Representatives of the Preferred Bidder(s). Notification shall also be sent to the Authorized Representatives of the other Bidders.

15.4 GENERAL PREROGATIVES OF JTMT

a) Notwithstanding any other provision contained in any part of this RFP, JTMT shall have the following, exclusive prerogatives:

(i) unconditionally to reject any or all of the Bids, or to annul the tender process at any time without thereby incurring any liability to the affected Bidder or Bidders or to any of the Members of the affected Bidder or Bidders;

(ii) to request additional information and/or clarifications from any of the Bidders;

(iii) to visit Bidders' headquarters/offices and/or to interview Bidders' representatives and main specialists;

(iv) to modify the terms and requirements of this RFP at any time but no later than 28 days prior to the Submission of the Bids, subject to Section 15.4a)(v) below;

(v) to change the schedule of the tender, including the Date of Submission, at any time;

(vi) specifically to cancel this RFP at any time;

(vii) to hold a Best and Final stage at JTMT's sole discretion;

(viii) not to be bound to accept an entire Bid, or the Bids with the lowest Financial Proposals, or any Bid at all or part thereof;

(ix) to add to the Services as specified in the TOR, or to request the performance of only part of the Services; to implement proposals in their entirety or in part or not to implement any proposal;

(x) JTMT shall be entitled to combine or divide proposals from different Bidders.

Bidders shall not have the right to claim any damages, expenses or other relief in connection with the exercise by JTMT, the Selection Committee and/or the Association for Urban Planning, Development and Preservation – (R.A.) of any of the abovementioned prerogatives.

Project reference	V4260_ERA_TD_00041_A25

REQUEST FOR PROPOSALS FOR

ENGINEERING, DESIGN AND OTHER SERVICES FOR THE UNDERGROUND SECTION OF THE CITY CENTRE SECTION OF THE BLUE LINE

ANNEX A: TERMS OF REFERENCE (TOR)

Index

1. PROJECT DESCRIPTION

1.1 OBJECTIVE

The Blue Line will be part of an integrated network of Jerusalem Light Rail Transit network (with the Red Line, the Red Line Extensions and the Green Line), serving primary residential areas, the city centre , the main business areas and providing users with efficient connections and the possibility of reaching any part of the city within reasonable travel times.

1.2 INITIAL BLUE LINE STUDIES

a) In parallel to the construction of the Red Line and to the preliminary design of the Red Line Extensions, JTMT issued a tender in 2008 for the design of the Blue Line.

b) The consortium composed of SYSTRA, DEL, MATI and their subcontractors (the "Blue Line Consultant") was selected by JTMT to perform the engineering design services for the Blue Line, as follows:

   (i) The preliminary design of the Blue Line, on the corridor from Ramot to Malha, the so-called "Old Railway Alignment"

   (ii) The preliminary design of the Blue Line on the corridor from Ramot to Gilo, the so-called "Hebron Alignment"

   (iii) A feasibility study of the Blue Line operated with two branches from Ramot to Gilo on the one hand and from Ramot to Malha on the other hand, with a common section from Ramot to the Old Railway Compound.

   (iv) The preparation of the statutory process with the assistance of JTMT.

c) The design of the Blue Line was initiated on 1st December 2011 and is currently in the preliminary design stage.

1.3 GLOBAL VIEW OF THE BLUE LINE ALIGNMENT

a) The Blue Line alignment starts in the Ramot neighbourhood in the north part of Jerusalem and continues along Golda Meir Boulevard until it crosses the Green Line at the Bar Ilan Street intersection. In this segment, due to the fact that most passengers will arrive by bus, a very good connection should be provided. Where possible, "cheek to cheek' stations should be implemented.

b) After crossing the Bar Ilan intersection, the Blue Line enters the city centre, passing along Yehezkel and Strauss streets. Here, the "façade to façade" distance is sometimes very narrow (e.g. only 12 m in Yehezkel Street). Some segments contain both small horizontal and vertical curves, for example when turning from Shmuel Hanavi Street onto Yehezkel Street. The stations are constrained due to lack of space, high longitudinal slopes (e.g. Yehezkel – Strauss) and the small radius of the alignment (less than 500 m).

c) From Strauss Street to the south, the Blue Line crosses the existing track of the Red Line at Jaffa Street and continues along King George and Keren Hayesod streets.

d) South of Kikar Plumer, the alignment of the Blue Line enters the Old Railway compound and then splits into two branches: one branch continues to the south along Hebron Road to Gilo and the second branch continues to the south-west, along the old railway toward Malha.

e) During design development, the alignment of the Blue Line was split into 7 sections:

(i) Ramot section, around 4560 m long

(ii) **City centre – underground section, around 2000 m long**

(iii) City centre – At grade section, around 2370 m long

(iv) Hebron-Road - Gilo section, around 5580 m long

(v) Unterman, around 220 m long

(vi) South- West – Malha section, around 3600 m long

(vii) Old Railway Park section, around 1660 m long

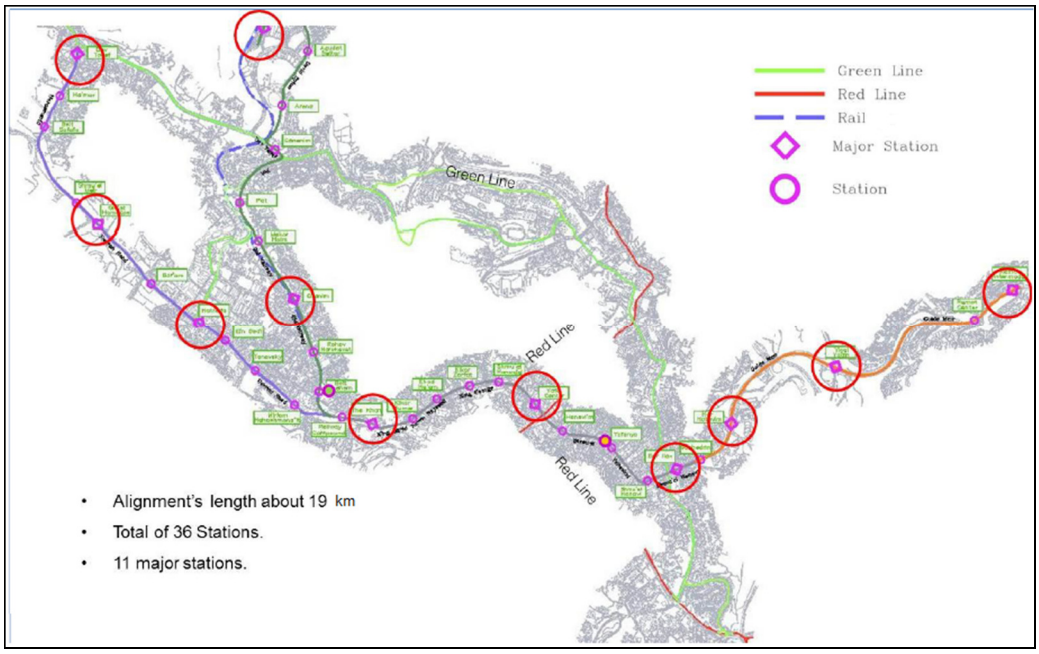


Figure1: Blue Line – **General alignment**

1.4 CITY CENTRE AREA OF THE BLUE LINE

a) The city centre section of the Blue Line begins from the junction of Sanhedrin Street and Golda Meir Boulevard in the north, crosses Bar Ilan Street while interfacing with the Green Line, continues along Shmuel Hanagid, Yehezkel and Strauss streets, crosses the Red Line at Jaffa Street and continues along King George and Karen Hayesod streets to Kikar Plummer.

b) The initial studies identified the following constraints:

(i) Narrow streets

(ii) Wide right of way to Tzfanya Street

(iii) High gradients of up to 9% along the alignment

(iv) Several small horizontal radii

(v) Crossing of the Green Line at Bar Ilan Street constitutes a constraint for at least one of the lines

(vi) Crossing of the existing Red Line at grade in Jaffa constitutes a constraint for the horizontal and vertical track alignments, as well as the operation of the Red Line;

(vii) There are limited public open spaces along the route that could be used as an option for widening

(viii) Considerable pedestrian activity which requires wide sidewalks.

c) In accordance with previous studies, the basic design assumptions have been defined as follows:

(i) A width of 11-12 m between the buildings will not allow locating a station at surface level

(ii) Gradients required at the station are up to 5%. The gradients are higher along most of the segment.

(iii) The minimum horizontal radius at station is R= 1000m, but most of the alignment contains smaller horizontal radii.

1.5 DESCRIPTION OF THE UNDERGROUND SECTION OF THE CITY CENTRE SECTION OF THE BLUE LINE

Based on the initial studies the preliminary design has established the following design and alignment.

(i) The southern portal will be placed north of Yafo Street.

(ii) The line crosses the Green Line at Bar Ilan Street underground level.

(iii) The northern portal will be placed north of the Sanhedrin intersection.

(iv) Three underground stations are planned. For indicative purposes only, the first underground station is anticipated to be placed in the Mea Shaarim area, the second in the Tzfanya area and the third in the region of Bar Ilan street to be used as an interchange (convenient passengers traffic solution only) with the Green Line.

(v) The final position of these underground stations will be defined by the Consultant following consultation with the Blue Line Consultant, and approved by JTMT.

(vi) The positioning of the northern portal shall allow an at-grade connection with Hartom at grade station. At-grade alignment for this connection is not part of the Consultant's scope of work.

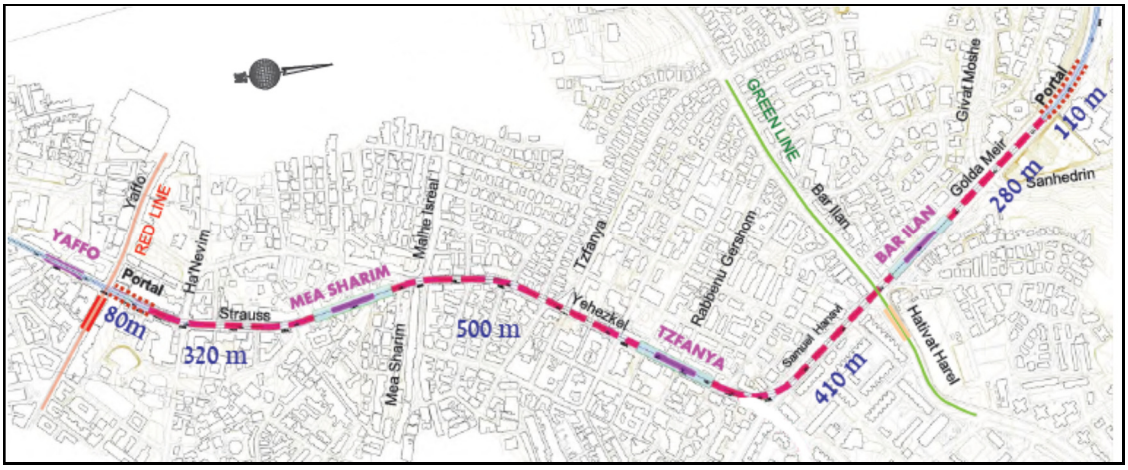


Figure 2: Underground section of the city centre section of the Blue Line: **General Alignment**

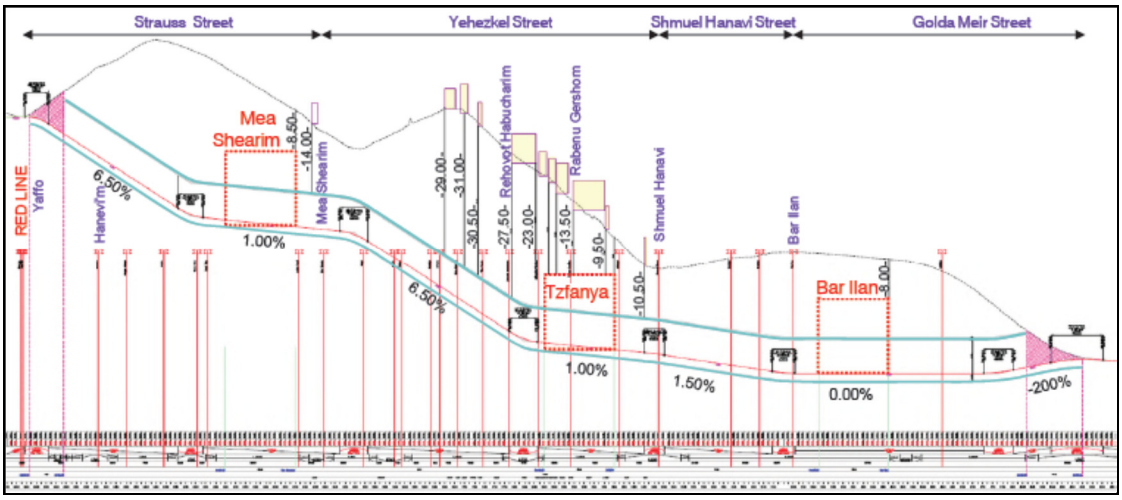


Figure 3: Underground section of the city centre section of the Blue Line: **General Profile**

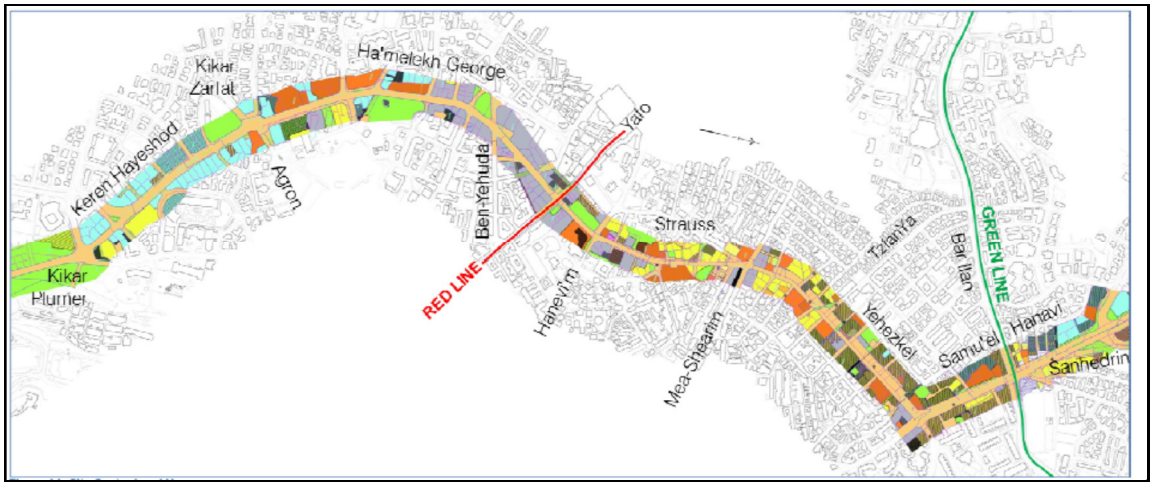


Figure 4: Underground section of the city centre section of the Blue Line: **land use map**

(vii) The line will be split underground near Shmuel Hanavi/ Yehezkel intersection. A third portal will be designed together with a connection branch running under Pituhei Hotam and Shimon Hatsadik up to Sderot Hayim Bar Lev where it will connect at grade to the existing Red Line. An additional "at grade" station will be provided for a convenient interchange with the Red Line. The underground connection to the Red Line (a branch tunnel of about 350m) is included in the Consultant's scope of work. The remaining at-grade connection is included in the Blue Line Consultant's scope of work and represents an important interface between the Blue Line Consultant and the Consultant.

For such connection branch, **the length of the underground section should be kept to a minimum**.

1.6 THE PROJECT IN NUMBERS

The underground section of the city centre section of the Blue Line will comprise the following:

a) Portal sections at three locations. These portal sections shall comprise retaining walls, excavation and arrangements to allow for tunnel excavation.

b) A tunnel of about 2,000m in length, in accordance with Sections 1.5 (i) to (vi)) above**;**

c) A branch tunnel of about 350m in length, (not included in the studies provided with these tender documents, connecting the Blue Line with the Red Line, (in accordance with Section 1.5 (vii) above).

d) Two underground stations (not cut & cover).

e) One 'cut and cover' station (the third station, Bar Ilan, may possibly also be constructed underground depending on the results of the Consultant's updated preliminary design studies).

Important Note: For the sake of clarity, the road names and other geographical indications given above are to be understood as indications for the reader to appreciate the intentions of the city planner and not as absolute geographical limitations of the scope of services. In line with the Project's preliminary alignment, this geographical scope shall extend as much as necessary to match the already designed "at grade" sections of the Blue Line in a coherent way, optimising both railway and roadway operating modes, but also enhancing the public friendliness of the arrangement.

2. ROLE OF JTMT'S GENERAL CONSULTANT

2.1 GENERAL SUPERVISION

a) The Services will be carried out under the supervision of Egis Rail – JTMT's General Consultant.

b) The General Consultant acts as JTMT's Representative. The General Consultant's role and functions consist of the following:

- Supervising and coordinating the proper execution of the contracts by the Consultant;
- Giving all technical clarifications required by the Consultant with regard to the contract;
- Ensuring that the Consultant's outputs (deliverables, procedures etc.) are in accordance with its contract and with good industry practices/standards;
- Leading all procedures related to change of the scope of the Project, after formal request by any of the Parties, as and if appropriate;
- Contributing to the resolution of any claims or disputes.

2.2 GENERAL CONSULTANT'S INTERFACE ROLE

The General Consultant's interface role consists of:

- Initiating contact with the interfacing party (other consultants or third party);
- Supervising the interface progress and issues during the review meeting;
- Participating – if necessary – in interface meetings;
- Assisting the Consultant in resolving any dispute with the interfacing parties.

3. ADJOINING PROJECTS

a) Where the Services relating to the underground section of the city centre section of the Blue Line interface with adjacent/ connected projects, the Consultant shall be required to organize dedicated meetings with all relevant third parties or consultants to assess the interfaces, their criticality and eventually find technical solutions if pinch points are found.

b) The Consultant shall be responsible for its internal or external interfaces in accordance with, but not limited to Section 4 below. Close coordination will be necessary with the Jerusalem Municipality (particularly with the city architects).

4. INTERFACES

a) External and internal interfaces shall be identified, analysed, addressed and managed rigorously by the Consultant.

b) The following lists describe a range of such interfaces.

4.1 INTERNAL INTERFACES

a) All internal interfaces are under the responsibility of the Consultant. They include the following:

- Interfaces between each of the design elements
- Interfaces between Members
- Interfaces between Members and sub-consultants,
- Interfaces between the various locations where the Services are performed.

b) It is emphasized that JTMT will require a highly integrated level of team work, i.e. not simply coverage of all necessary disciplines. The Consultant's organizational structures should reflect this.

c) These interfaces shall be defined in the Interface Matrix and developed in the Interface Sheets, which shall be finalised as part of the Inception Reports of each design phase.

d) Note: An Interface Sheet shall treat interfacing issues between 2 sub-systems only.

4.2 EXTERNAL INTERFACES

4.2.1 Interface with the Blue Line and the Blue Line Consultant

a) It is part of the Consultant's scope of work to ensure the homogeneity and functionality of the Services provided in connection with the underground section of the city centre section of the Blue Line, to check the consistency of the Consultant's design with that of the Blue Line Consultant, and to define all the other relevant interfaces with the Blue Line design and the Blue Line Consultant.

b) The Services of the Consultant impact directly on those of the Blue Line Consultant as shown in the preliminary interface matrix and described below. Based on these parameters, the Consultant shall define a detailed matrix of interfaces. Please note: it shall be the responsibility of the Blue Line Consultant to manage the interfaces between the Consultant's designs and the Blue Line Consultant's design. The Consultant's responsibilities in respect of such interfaces are described in Section 4.3 below.

c) The following is a general description of the interfaces with the Blue Line Consultant and the tasks related thereto:

i. The following interfaces will exist on a continual basis between track/LRT system & rolling stock requirements on the one hand (Blue Line Consultant) and tunnel design and geological/risk constraints (Consultant).

(1) Design of the horizontal and vertical track alignment is within the responsibility of the Blue Line Consultant and will be based on both the Consultant's requirements and track alignment requirements.

(2) The design of the alignment on straight tracks, curves, transition, clothoids, tunnel offset, dynamic envelop, structural gauge, track inter-axis, track laying types, chainage are all part of the Blue Line Consultant's scope of work but all depend on full compatibility with the Consultant's scope of work.

(3) LRT system requirements (such as power, signalling, Operating Control Centre (OCC)) will be defined by the Blue Line Consultant but will depend on compatibility with the Consultant's scope of work. Likewise the Consultant must ensure its designs are fully compatible with the proposed designs of the Blue Line Consultant in this regard.

(4) Design of the at-grade section up to the tunnel portal wall is part of the Blue Line Consultant's scope of work, with the exception of the portal wall itself. The Blue Line Consultant may be required to adapt the at-grade section near the portal wall to take into account any tunnel construction requirements (temporary or permanent) provided by the Consultant.

(5) Permanent (final) traffic arrangements around the portals are the responsibility of the Blue Line Consultant. The Blue Line Consultant will also manage the over-all impact of the project on the city's traffic. However the latter may be impacted by local requirements around the station accesses and emergency shafts/tunnels (which are defined by the Consultant).

Note: Permanent (final) traffic arrangement and traffic light design around portals, underground station exits and shafts are included in the scope of work of the Blue Line Consultant, in order to ensure a fluid movement of passengers when leaving underground stations due to the exiguity of the available surface space and a coordinated general road traffic management along the Blue Line.

(6) The Consultant shall provide the architectural insertion and landscape concept design within the immediate vicinity of portals, station access and emergency access/ventilation shafts. The Blue Line Consultant will be responsible for the design of the urban insertion, architectural insertion and landscaping for entire at grade section above the city centre underground section of the Blue Line, including the design of the access ramp to the tunnel, by integrating the architectural insertion and landscape concept design which is to be provided by the Consultant.

ii. The following are examples of the implications of the above interfaces

(1) The portals will be designed by the Consultant, however the exact location of the portals will be the result of consultation between the Consultant and Blue Line Consultant.

(2) The trackbed as a whole will be designed by the Blue Line Consultant but the track bed invert (on which the tracks will be placed) will be designed by the Consultant (as part of the tunnel).

(3) As part of its designs for the stations, the Consultant will be responsible for the design of all electrical power rooms. These will need take account of all the LRT power requirements.

(4) The Consultant is responsible for the design of the SCADA system for stations but taking account of the SCADA requirements for the Blue Line as provided by the Blue Line Consultant.

4.2.2 Other external interfaces

a) Aside from the external interface with the Blue Line design and the Blue Line Consultant, other external interfaces are listed below:

(i) Interfaces with JTMT

(ii) Interfaces with the General Consultant

(iii) Interfaces with statutory bodies and processes (“Tabba” etc.)

(iv) Interfaces with utilities concessionaires/authorities/bodies

(v) Interfaces with the Municipality’s departments (e.g. the Traffic Control & Management Department)

(vi) Interfaces with contractors in charge of additional site investigations (ground or building)

(vii) Interfaces with the contractors for the works and equipment

(viii) Interfaces with the Red Line Concessionaire, CityPass Ltd;

(ix) Interfaces with the Green Lines Consultants;

b) Throughout the design process and preparation of the deliverables, the Consultant shall be required to maintain a high level of coordination within its own organization, with the General Consultant, with JTMT and any of its relevant specific consultants, with adjacent urban or facility development projects and associated consultants, and with any relevant third parties. The Consultant shall maintain close contact with JTMT and be available for meetings at JTMT’s premises as required.

c) To help understand the present scope of services refer to the preliminary General External Interface Matrix given in Appendix 8 to this TOR.

4.3 CONSULTANT RESPONSIBILITIES REGARDING INTERFACES

a) The Consultant shall request and provide information directly from / to the interfacing party. All correspondence shared with the interfacing party shall be copied to JTMT.

b) The Consultant shall be responsible for notifying JTMT in case of any lack of cooperation from the interfacing party.

c) The Consultant will be responsible for integrating into its designs all requirements deriving from the Blue Line Consultant’s design.

d) The Consultant shall nominate a Design and Interface coordinator who shall have full authority to represent the Consultant and to act on its behalf, and who shall be responsible for fulfilment of all the Consultant's interface obligations.

e) The Design and Interface coordinator shall be responsible for the management and coordination of all involved stakeholders regarding each interface.

f) The entire design of the Consultant shall be fully coordinated with the Antiquities Authorities and Security Authorities.

g) A preliminary General External Interface Matrix is provided in Appendix 8 to this TOR. This is to be completed, to provide the reference interface matrix for the Project, and be updated as part of the inception reports of each phase.

5. INITIAL INPUT DATA

After the Notice to Proceed, the Consultant will be provided with additional and existing documentation and information relating to the Project. The documentation and information will include the following:

(i) Soft copies of all available relevant studies produced for the Initial Network, including alignments and basic operation principles.
(ii) Applicable LRT design standard/ criteria for horizontal and vertical track alignments.
(iii) An initial design, prepared by the Blue Line Consultant for the entire Blue Line, including the underground section of the city centre section.
(iv) LRT design standards and criteria, description and specifications of the LRT systems, LRT vehicles and on-board systems;
(v) Traffic data, service forecasts, expected patronage and station occupant loads from JTMT's traffic model team;
(vi) A topographical survey of the proposed corridor;
(vii) Existing geotechnical, geological and hydrological information,
(viii) Existing building condition surveys of the surrounding buildings, indicating the type and the depth of the building foundations located in a strip of 35m to each side of the planned centre line of the tunnel.
(ix) Survey of the existing public utilities on the proposed corridor, and also possible private utilities such as optic fibres from private companies;
(x) A preliminary functional programme for the underground stations indicating the list of rooms in the stations (operation rooms, technical rooms, and safety/security rooms), the operation principles of the stations, in accordance with Appendix 3 to this TOR below.
(xi) Operating principles of the entire Blue Line (track plan and traffic management);
(xii) Available specific requirements from the security requirements for design, in accordance with Appendix 4 to this TOR attached hereto.

6. ADDITIONAL INPUT DATA

a) **In addition to the input data set out above**, and at the start of the preliminary design phase, the Consultant shall provide JTMT with all the Consultant's requirements for the additional site investigations (ground and building) which are necessary for the basic design and the detailed design stages, and which relate to:

(1) **Geotechnical, geological and hydrological additional investigations**:

- For the final geotechnical, geological and hydrological report, the Consultant shall propose in due time its programme of additional investigations, subject to JTMT's approval.
- It is the Consultant's responsibility to obtain all necessary permits (including utilities coordination permits) for performing the investigation drillings, in accordance with an approved programme of investigation. The Consultant shall give JTMT immediate notice regarding any fee to be paid in connection with this process.
- JTMT will appoint and pay a contractor to perform all drillings in accordance with the approved programme of investigation, including collection, transportation and delivery of soil samples. The Consultant shall supervise, coordinate with and manage this contractor.
- It is the Consultant's responsibility to carry out the final geotechnical, geological and hydrological report (Geotechnical design Memorandum) in accordance with the FHWA (Federal Highways Authority of the USA) guidelines. The Consultant shall have responsibility for the overall supervision of the contractual aspects of the appointed contractor.

  Note: JTMT will appoint and pay a certified laboratory to perform all necessary tests and investigations

(2) **Additional land surveys:**

- In addition to the surveys to be provided by JTMT and referred to in Section 5 above, the Consultant shall request any missing data and provide a programme for these additional topographical surveys. The scale of any additional topographical survey will be 1:250.
- The land surveyor for performing these services will be appointed and paid for by JTMT. The Consultant shall coordinate with and manage this contractor.

(3) **Additional Building Condition Surveys (BCS) of surrounding constructions:**

- In addition to the building condition surveys to be provided by JTMT and referred to in Section 5 above, the Consultant shall request any missing data and provide a programme for further additional building condition surveys.
- The surveyor will be appointed and paid for by JTMT. The Consultant shall coordinate with and manage this surveyor. The time consuming nature of this survey means that the initial programme may still be on-going in parallel to the Services. Consequently, when nominated, the Consultant will coordinate with JTMT regarding this on-going investigation.

(4) **Additional utilities information**

- After coordination with the utilities companies, the Consultant shall submit to JTMT a list of information it considers is missing from the input data. The Consultant shall prepare a programme for additional site investigations to obtain the missing information and/or to obtain more accurate information regarding the location of all utilities.
- The surveyor will be appointed and paid for by JTMT. The Consultant shall coordinate with and manage this surveyor.

b) During the preliminary design phase, the Consultant shall be fully responsible, at its own cost, for obtaining:

(1) Maps of final existing utility networks for the surface works relating to the station and any shafts or access adits:

- The Consultant shall collect the available data from the relevant third parties.
- The Consultant will inform JTMT, in due time, about any missing data. JTMT will appoint and pay a specialised contractor to survey the missing data of utility manholes (including internal manhole elements and contents). The Consultant will coordinate and manage the activities of this specialized contractor.

(2) A survey of existing trees adjacent to the proposed corridor, including phyto-sanitary status of the existing trees. (Note: the Consultant's team shall include a certified agronomist).

(3) A list of historical buildings in coordination with all relevant authorities.

(4) An inventory of missing or additional information relating to existing buildings adjacent to the proposed corridor (the building condition survey, comprising the foundation/ basement survey of surrounding constructions may be incomplete for the requirements of the basic design. This will lead to specific design risks);

(5) A survey of the ownership of the land adjacent to the proposed corridor, in order to assess any need for acquisition and/or expropriation;

(6) A definition of all security requirements provided by the Ministry of Defence, in cooperation with JTMT's security advisor, together with design requirements related thereto.

Note: The Consultant shall provide a security expert, in accordance with Section 16' of Appendix 1 to Annex A, who shall be responsible for coordination with and obtaining all necessary validations, permits and approvals from all relevant security authorities. JTMT's security advisor will only review, comment on and approve all relevant documents.

(7) A definition of all fire-fighting and safety requirements provided by the relevant authorities in accordance with the appropriate laws and regulations and standards, together with design requirements related thereto.

7. DESIGN STANDARDS AND CRITERIA

a) The Consultant will be provided with a list of design standards and criteria used for the development of the Blue Line. It is the Consultant's responsibility to check the full compatibility between the requirements set out in this list and the specific requirements of the design of an underground section and/or station for an LRT system.

b) The Consultant shall prepare and submit a design standards and criteria report for the Basic Assignment for the approval of JTMT. This report will be prepared as part of the initial inception report (defined in Section 16.1 below). The report shall define the set of design standards and criteria which are intended to be used as input data for the Consultant's design development, as specified hereafter, describing each standard/criterion and its application, including drawings, sketches, schematics and tables as required for illustrating the relevant design standards and criteria.

c) The design standards and criteria report shall cover the entire scope of works defined under the present RFP and shall integrate all appropriate Israeli standards, and/or relevant foreign standards where necessary.

8. PRESERVING THE BUILT ENVIRONMENT

8.1 LIMITING IMPACT ON BUILDINGS

a) Following the Notice to Proceed, the Consultant shall perform risk assessment and propose risk treatment measures with regard to buildings which may be impacted by the construction of the underground section of the city centre section of the Blue Line.

b) The Consultant shall assess which are the most cost and time effective and efficient safety measures to be implemented in order to mitigate the close interactions between the built environment, geological and geotechnical environment and the proposed design of the tunnel. For each mitigation measure the Consultant shall describe the options through a technical, costs, schedule and risk comparison table which shall indicate the pros and cons of each alternative. The Consultant shall propose its preferred option with appropriate reasons/explanations**.**

8.2 UPDATING THE ZOI (ZONE OF INFLUENCE)

a) The Consultant shall determine a new ZOI based on the initial design (see below) and all available information. This may require further additional detailed survey of the building.

b) The design of the tunnel shall be optimised and shall minimise the cost of the Project and reduce risks relating to the impact on third parties and delays in implementation.

(1) The Consultant shall adjust the position of the tunnel's and stations' civil works and construction methodology in order to minimise the amount of damage, reduce the number of buildings affected, or to avoid particularly sensitive property, especially items of infrastructure.

Note: The tunnel's alignment must take into consideration the LRT functional requirements as given by the Blue Line Consultant which is responsible for the production of alignment drawings showing track and systems information along the whole Blue Line, inclusive of the underground section. The Consultant however is responsible for producing the civil works alignment

drawings (not including rail or catenary), dimensions, indicating position of civil works with respect to track reference alignment, buildings, ground level and any other structure or utilities.

(2) The Consultant shall provide the geological interpretive report based on the initial input data. The report shall be updated at the end of each design phase.

(3) The Consultant shall determine the level of risk associated with each building.

- The Consultant shall indicate the 'at risk' category of each existing building and shall provide possible alternatives for protective and remedial measures, including cost estimates and a time-table for design and implementation for each measure.
- JTMT will decide the applicable protective and remedial measures for each building, in accordance with the documentation provided by the Consultant above.
- The Consultant shall provide a full detailed design (including "shop drawings" and "for construction" drawings) of the applicable protective, remedial or other mitigation measures to limit damage for each building or item of infrastructure, in accordance with JTMT's instructions.
- The Consultant shall provide the detailed design of the applicable mitigation measures to limit damage to the buildings. Protective and remedial measures that may be deemed necessary to be undertaken to reinforce a building are not within the scope of the Consultant.

8.3 MONITORING OF BUILDINGS

a) All buildings believed to be potentially at risk because of the implementation of the underground section of the city centre section of the Blue Line shall be monitored. The degree of monitoring will depend on the expected risks and on the type of building. The Consultant shall establish a monitoring of buildings plan which will be implemented:

(1) Prior to the works by a surveyor nominated by JTMT

(2) During the works by the civil works contractor of the underground section of the city centre section of the Blue Line.

b) The monitoring will be carried out over a time-scale commencing at least 1 year prior to the start of excavation works at the portals in order to bench mark the measurement during the works.

9. PRELIMINARY DESIGN

9.1 OBJECTIVE

The purpose of the preliminary design, amongst other things, will be to set out all alternatives with regard to the alignment, station/portal locations, tunnel /station construction methods together with possible alternatives for architecture/streetscape design (compatible with adjacent/connected projects) in order to allow decision makers to choose the solution which will form part of the application for approval under local planning and building laws and which will be further developed at basic and detailed design stages.

9.2 LIST OF TASKS FOR PRELIMINARY DESIGN

a) The preliminary design will consist of, but not be limited to the following tasks and/ or activities:

1) Analysis of all input data provided by JTMT, and preparation of a report indicating all missing information and the list of additional input data that the Consultant considers necessary for the development of the design. This report shall be submitted 14 days following the Notice to Proceed.

2) Analysis of the expected LRT requirements and local site conditions in accordance with the initial input data. Based on these the Consultant shall prepare a complete functional programme.

3) The Consultant will prepare, in collaboration with the Blue Line Consultant, a proposal for the various track alignment alternatives. Such alternatives shall define and locate crossovers, passenger stations, portals and connecting branches to the Red Line.

Note: Definition of the horizontal and vertical alignment is an iterative process which will require a close cooperation between the Consultant and the Blue Line Consultant. Out of this iterative process, the Blue Line Consultant will be responsible for providing the final horizontal and vertical alignment, for JTMT's approval. In order to allow for such approval, as part of the preliminary design, the Consultant shall undertake multi-criteria analyses for each alignment alternative required to take into consideration the constraints of a tunnel/underground station as well as LRT system constraints provided by the Blue Line Consultant. This multi-criteria analysis shall take into account all impacts on the civil part of the project in terms of costs, time, risks, quality etc. The final alignment of the chosen solution shall be integrated into the global alignment of the Blue Line.

4) As part of the track alignment alternatives, the Consultant shall define the major functionalities and structures required within the line's underground stretch: station and tunnel ventilation/smoke exhaust systems, passenger evacuation measures, traction substation location, low voltage rooms, drainage systems, particularly at portal locations, signalling rooms, sectioning equipment according to the proposed track plan, etc.

5) The Consultant shall prepare a tunnel emergency evacuation report according to safety standards (safety in tunnel), showing the necessity or not of emergency shafts.

6) The Consultant shall set out ventilation/smoke exhaust systems principles showing the location of such systems in stations and/or emergency shafts.

7) The Consultant shall propose options for the construction of the tunnel and the stations (construction methods) and the location of construction sites (civil work compounds) within and/or outside the city centre, including, without limitation, site installation footprints, construction traffic integration, possible spoil disposal sites, modes of access, environmental, safety and security issues, traffic diversion.

8) **Value Engineering Workshops.** These workshops shall be prepared by the Consultant to illustrate the various applicable design alternatives. These will be backed up by design notes and drawings, describing, amongst other comparison criteria (for each design alternative):

   (1) Preliminary volumes and footprints of the structures, particularly in accordance with the input data of the geotechnical report;

   (2) Proposed modifications to the adjacent roadway and traffic arrangement;

   (3) Construction methodology, including worksite footprints, road traffic modifications, utility diversions, types of equipment and machinery, modes of access to sites, environmental protection measures including a first risk assessment / analysis during excavation / construction (mainly geotechnical risks), etc.

   (4) Architectural conceptual design (at least two different architectural concepts to be prepared and discussed with the city Architect. Final architectural concept to be approved by the city architect)

   (5) Capital expenditure (Capex) estimate;

   (6) Master schedule;

   (7) Residual risks;

   Note: The Consultant shall organize at least four value engineering workshops with the following main proposed topics (others will be defined during the studies):

   (1) Tunnelling / excavation techniques, dimensioning criteria, prerequisites and applicability to the operation;

   (2) Functional and architectural design of the stations, showing the passenger flow routes, the means of passenger evacuation, public and technical area layout, manning, safety / security, urban insertion of the station entrances, streetscape, study of the potentialities for bus transfers, car parks;

   (3) Railway systems and LRT vehicles in coordination with the Blue Line Consultant;

   (4) Functional and architectural design of the portals, showing safety / security measures, urban insertion of the portals, streetscape;

   The proposed alternative/s will result from the Value Engineering Workshops;

9) Preparation of the detailed scope of works and specifications for additional input data, as defined in Section 6 above.

10) Proposed tendering packages and methods;

b) At the conclusion of the preliminary design, the Consultant shall compile a **preliminary design report** that shall constitute the basis for the "Environmental Impact Assessment study and statutory process (TABBA)".

9.3 PRELIMINARY DESIGN DELIVERABLES

9.3.1 Written document, including but not limited to:

1) Report concerning the analysis of all input data which shall be submitted by the Consultant to JTMT no later than 2 weeks from the Notice to Proceed;

2) Inception report as defined in 16.1 below.

3) Technical report indicating the passenger flows in each station and on both platforms of each station in order to define appropriate figures for proceeding to the pre-dimensioning of the modes of access, platform surface area, fare gates, fire evacuation, etc…The information will be provided at the first operation time, at mid and long terms. This report will be carried out according to the station usage/profile given as input data at the "kick-off" meeting;

4) Technical report regarding the horizontal and vertical track alignment alternatives, including a description of the station locations;

5) Technical report of LRT operations giving a description of the nominal and degraded operating modes.

6) Technical report concerning the integration of the railway systems, that will mainly address the locations and service functionalities to be installed in the LRT underground section, prescribed/in accordance with, the requirements as established by the Blue Line Consultant (as input data) giving specific emphasis to:

   (1) the traction power substations and sectioning recesses and equipment;

   (2) placing of the railway signaling system;

   (3) platform screen doors (if applicable);

7) Technical report concerning the ventilation/smoke exhaust system and fire-fighting strategy, including diagrams of ventilation/smoke exhaust systems in tunnels and stations, and main fire scenarios in tunnel and stations. (note that this preliminary report and its updating along the design process will be part of the Tunnel Safety Report to be submitted to the relevant Authorities);

8) General information about Mechanical, Electricity and Plumbing issues ("MEP") including water supply, drainage, sewerage, lighting and functional/emergency lighting, lifts, escalators, HVAC and air conditioning) in the stations;

9) List of main requirements deriving from the design criteria defined by the Blue Line Consultant;

10) General Technical Report of the underground section of the city centre section of the Blue Line. This shall include a general presentation of the project, connected projects, architectural/functional concepts of the structures (tunnel, portals, stations), rules regarding station accessibility (escalators, lifts), safety/security for each structure, internal arrangements of the structures as well new roadway and traffic arrangements, streetscape at portal and station locations (existing trees, existing trees to be kept, new trees, civil works and finishes of the structures. Note that each alternative shall be described as indicated above. A technical and costs comparison table shall indicated the pros and cons of each alternative, and then the consultant shall propose the preferred option with appropriate reasons/explanations;

11) Geological/geotechnical report including risk assessment, foundations/ basements of surrounding constructions, archaeological requirements;

12) Geotechnical factual report identifying all available sources of information, with borehole logs, test data, and statistical review of the test data, as established by the geological investigation contractors (drillers, geophysics labs);

13) Geotechnical interpretive report establishing the hypothesis to be used in the design of the underground works;

14) Building conditions survey factual report. As established by the building survey contractor;

15) Building damage risk report establishing the hypothesis to be used in the design of the underground works;

16) Risk register concerning all external context risks (i.e surrounding buildings, archaeology, construction methods, logistics, etc) with their evaluation and enacted treatment to obtain the residual risks at the end of the phase;

17) Technical note indicating the list of rooms in the stations (technical, operation and safety rooms) with their main specifications (length, width and height dimensions, false floor or cable channels, natural/mechanized ventilation, air conditioning …). All information concerning the LRT system/equipment will be provided by the Blue Line Consultant. Allocation of these rooms in each station (table);

18) Technical report on existing utilities and main proposed utilities relocations, including the scheduling of the proposed relocations;

19) Construction methodology, including site installations footprints, construction traffic integration, possible spoil disposal sites, modes of access, environmental, safety and security issues, traffic diversion

20) Interface matrix and interface sheets;

21) Main schedule of the underground section (stages of design, main construction phases, operation, etc), and a detailed construction schedule of each structure (main stages);

22) CAPEX estimates;

9.3.2 Graphic documents, including but not limited to:

Discipline	Drawings – preliminary design
Location plan	Plan of the proposed corridor at scale 1/5000
Key map	Key map of the underground section with appropriate numbering of each map
Geotechnical	Geotechnical longitudinal profile 1/2000
Buildings	Buildings' risk damage plan 1/2000
Alignment	Horizontal and vertical alignment drawings prepared using 'Inrail' or similar road design software, describing the track alignment, the tunnel and structure contours, the location of stations, crossovers, recess and shafts, at scale 1/1000; The actual ground level shall be displayed on the vertical alignment drawing, together with any additional structure (building foundation, sewage pipe, etc.) located in the tunnels' vicinity. Cross sections shall be prepared for each underground structure, showing train gauges, track curvature effects, track cant, etc.

Discipline	Drawings – preliminary design
Alignment plan	Tunnel alignment and station location plan and longitudinal profile. Based on the track plan that shall be provided by the the Blue Line Consultant.
Stations	A set of drawings for each station: • Plan view at each floor (platform, concourse levels) showing the functional aspects of the station, public and technical area layout, elevators, lifts, etc, at scale 1/200; • Plan at surface level showing the urban insertion of the station entrances, the streetscape, roadway arrangement, etc at scale 1/500 • At least 1 longitudinal and 1 cross sections or more if necessary to the understanding of the station design at scale 1/200 • 3D architectural renderings of the stations' accesses (urban insertion)
Portals	A set of drawings for each portal: • Plan view showing the functional aspect (security, safety measures) and the structure of each portal including the open trench, ... at scale 1/200 • Plan at surface level showing the urban insertion of each portal, the streetscape, roadway arrangement,…at scale 1/500 • At least 1 longitudinal and 1 cross sections or more, if necessary to the understanding of the portal design at scale 1/200 • 3D architectural renderings of the portal (urban insertion).
Tunnel	• Typical cross sections on a straight alignment and canted curve at scale 1/100, showing the space proofing of the proposed sections (LRT gauges, secondary civil works, LRT systems' location gauges). • Typical cross sections of proposed tunnel construction methods, • Tunnel longitudinal profile indicating the geology, the geotechnical zones with the proposed construction approach of each.
Shafts	If one or more shafts are necessary: • Plan view at each floor showing the functional aspects of the shaft, emergency stairs, lifts, ventilation/smoke exhaust systems, etc… at scale 1/200; • Plan at surface level showing the urban insertion of the shaft exit, the ventilation grids, the accessibility for the firemen, the streetscape, roadway arrangement,…at scale 1/500; • At least 1 vertical cross sections, or more if necessary, to the understanding of the shaft design at scale 1/200; • 3D architectural renderings of the shaft head (urban insertion).
Work site definition	• Map at scale 1/1000 showing the location of the various work sites (tunnel, portals, shafts, station constructions). • Plan of each work site at scale 1/500 showing the main functionalities of the compounds.
Low voltage Systems distribution	• 1 single line diagram of the low voltage distribution principle

Discipline	Drawings – preliminary design
Medium voltage distribution	• 1 single line diagram of the medium voltage distribution principle for non LRT Systems
Utilities	• Combined service drawings of all existing utility networks, feeding points (water supply, MV, LV, drainage, sewerage, etc.) at scale 1/500 • Drawing of main utilities relocation at scale 1/500
Tunnel and station ventilation	1 diagram of the entire ventilation concept 1 diagram of each station ventilation concept will be part of the report

9.4 JTMT DECISION REGARDING PREFERRED ALTERNATIVE

a) The Consultant shall ensure that the preliminary design contains all relevant information to enable JTMT to choose the alternative to be developed at the basic design stage (the "LRT Reference Alignment"). This decision will be taken by JTMT after receipt of the preliminary design deliverables.

b) The Consultant shall participate in all meetings with relevant authorities and other decision making representatives as scheduled by JTMT.

c) If new alternatives are suggested during these meetings, the Consultant shall update accordingly the relevant part of the preliminary design.

9.5 ENVIRONMENTAL IMPACT ASSESSMENT STUDY AND STATUTORY PROCESS (TABBA)

a) The Consultant shall assist the Blue Line Consultant's Statutory Manager (certified Israel office) in supplying all technical information and impact studies relating to the underground works including by attending meetings.

b) The global environmental impact assessment study for the Project as a whole is part of the scope of work of the Blue Line Consultant. Specific impact studies shall be provided by the Consultant, following the guidelines of the Blue Line Consultant and the Blue Line design.

These shall include:

1) Details of the proposed modes of access and transport arrangements, passenger flows and expected station patronage;

2) Description of the environment of the Project (land usage and classification, ownership of the lands, legal provisions applicable);

3) Particular environmental constraints (archaeological sites, historical buildings monuments, schools, landscape and topography, parks and green areas, etc.) and associated constraints;

4) Technical description of the Project, including its integration into the urban context;

5) Description of the construction works, including their phasing, construction techniques, materials and machinery, a description of the footprint of the work areas, proposed traffic arrangements, a preliminary list of nuisance limiting parameters (noise, dust, ground settlements, etc.) and preliminary site management requirements (waste waters, dump materials, storage of flammable or toxic materials, etc.);

6) Description of the usage of the structures, their manning, a description of the fire protection and fighting measures, of the supervision and the security of the public areas, of emergency and rescue scenarios;
7) Evaluation of the airborne noise and ground borne noise and vibrations generated by LRT operation (trains, fans, etc.) into the Project's neighbouring buildings, together with potential mitigation measures when exceeding the allowable thresholds.
8) Assessment of all direct and indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative effects of the Project onto human beings, flora, fauna and geology, land, water, air and climate shall be made and, when adverse effects are identified which exceed the allowable thresholds, these shall be accompanied by a description of the measures to be adopted to avoid, reduce or remedy such effects.

9.5.1 Statutory Process follow-up

As part of this process, the Consultant shall, in particular:

1) Attend the statutory staff meetings and the statutory committees meetings as and when required by the Statutory Manager of the Blue Line Consultant.
2) Prepare and submit drawings and other materials for the different municipality and government departments with a view to JTMT receiving approval for the statutory plan.
3) Carry out any modifications to the plan during the course of the process as required.
4) Assist the Statutory Manager in coordinating the statutory plan with other statutory plans in the city which may be in the process of preparation and/or have an impact on this Project's plan, and participate in the corresponding coordination meetings.
5) Assist the Statutory Manager in presenting the drawings to the public (community centres, etc.).
6) Prepare answers and materials which will arise from the public hearing process.
7) Prepare in collaboration with the Statutory Manager, any materials and testimonies as may be required at court hearings if the Tabba process is challenged.
8) The Consultant shall make available all necessary competencies in support of the Statutory Manager for the period between the filing of the Tabba application and the obtaining the final approval of the Tabba.

9.5.2 Statutory process specific provisions

1) All statutory documentation shall be produced in Hebrew with an English translation.
2) In order to ensure the proper course of actions in the statutory process, the Consultant shall liaise throughout the course of the services relating to the statutory process with both the Blue Line Consultant's Statutory Manager and JTMT's statutory staff.
3) Following Tabba approval, the preliminary design documents shall be updated as necessary to incorporate all requirements of the relevant authorities provided during the environmental impact assessment study approval phase.

10. BASIC DESIGN

10.1 DESCRIPTION OF INPUT DATA FOR BASIC DESIGN

The following data will, as a minimum, form the basis and background for beginning the basic design phase:

(1) **From the preliminary design phase:**

- Approved preliminary design
- Updated building condition surveys.
- Geotechnical factual reports.
- Deliverables of the preliminary design phase updated according to the progress of the statutory process;
- Updated topographical surveys.
- Any additional developing requests from JTMT

(2) **Design requirements resulting from the designs of the Blue Line Consultant relating to the integration of LRT systems within the project, including:**

a. **Track system**:
   - Description and justification of the various track components and their characteristics: track bed types, rails, fastenings, sleepers, track equipment (e.g.: switches, crossovers, expansion joints).
   - Types of track bed, rail and track equipment, all in accordance with the geographical constraints and operating principles.

b. **Overhead Contact System (OCS)**:
   - Description of the various OCS components and their characteristics: contact wire(s), masts (various types and functions) or fastening devices in tunnels, supporting devices, tensioning devices, loads for the design of the supporting devises.
   - preliminary staking layout at a scale of 1:500, identifying the types of masts and foundations and the electrical sections, all in accordance with the geographical constraints (e.g. bridgeworks or underground structures, existing maintained or relocated utilities) and operating principles.
   - Calculations of pole foundations.

c. **Low voltage and light current systems**:
   - LRT signalling, including description of the setting out of specific systems (restrictive signals, information for driver etc), track circuits, interface with traffic light signalling, projected train routes, hazards and troubleshooting monitoring.
   - Cable transmission network, Operating Control Centre (OCC) equipment, SCADA system, Automatic Vehicle Location (AVL) and Public Information (PI) systems, public address, communication systems, fare collection system, video surveillance system, access control systems, etc., with for each system a description of the following:
     - equipment and components functional and technical constraints and specifications
     - system general architecture
     - targeted objectives
     - supply and cable trays (when applicable).
       - Medium voltage distribution for LRT Systems
       - Signalling room

The location of signalling rooms as well as all dedicated information (dimensions, ventilation, live loads) shall be provided to the Consultant in order to implement such rooms in the appropriate structures.

d. Traction power - underground substations and recesses:

- Arrangement of equipment;
- Openings, cable routings
- Power remote control system schematic flowchart
- Electrical logic diagram for MV cells and for all traction power switches
- General release system diagrams (blue light stations)
- And all relevant information enabling the implementation of such rooms in the appropriate structures.

e. Gauges and clearances:

- Definition of the universal vehicle gauge in tunnel, enlarged as necessary by vehicle centre and end throws due to the track curvature and by track cant effects.
- Unless specifically foreseen (e.g. station platforms), no part of any structure shall – under any circumstances – infringe this enlarged gauge.

10.2 ELEMENTS OF BASIC DESIGN

1. Urban planning, insertion, architecture and landscaping

(1) Urban planning:

The Consultant shall be responsible for:

- The updating of the different urban environments (mapping) at station accesses and intermediate emergency access / ventilation shafts further to the preliminary design;
- The suggestion of 3 scenarios for improvement and/or renovation of each area which is impacted by the LRT alignment;
- The identification of modes of access to properties along the alignment by pedestrians and vehicles, for purposes such as parking, loading and unloading, rescue and emergency operations, etc. in the vicinity of the surface structures;

(2) Urban Insertion:

- The identification of modes of access to properties at portals, shafts and stations entrance locations for pedestrians and vehicles, for purposes such as parking, loading and unloading, rescue and emergency operations, etc.;
- The definition of station signage strategy, including route finding, information and advertising as well as emergency evacuation such as fire emergency;
  Such proposals shall be backed up by complete documentation necessary to illustrate how the proposed arrangements will work and their urban benefits.
  The urban furniture design and material (benches, public lights, traffic lights, bins, trees, kerbs, pavement, etc.) represented in these insertion designs shall be those applicable to the entire Blue Line. In the absence of such definition, the Consultant shall select this furniture in accordance with the Jerusalem Municipality's design guideline.

(3) Architectural and functional design of the structures (portals, shafts and stations)

The Consultant shall:

- Develop the design for the LRT Reference Alignment using site plans at proper scale including entrances to the underground stations, portals, other underground buildings and shafts and access to the street level (elevators, stairs and escalators).
- Develop the architectural and functional concept design for each underground station (e.g.: volumes, geometry, public areas, accessibility, passenger routes, stations functionalities);
- Provide the dimensioning of the platform, accesses according to passenger flows as well as the number of fare gates, suitable for normal and emergency operations;
- Provide analysis and proposal of finishes and materials, including typical dimensions.
- Provide way-finding strategy for passengers including route finding and information and signage strategy.
- Brief statement on sustainability to give an overview of the environmental impact of the design, construction and operation of the built elements. This overview should take into account how the long-term environmental impacts of the project may be reduced.

(4) Landscape/ streetscape design:

The Consultant shall:

- Identify existing trees and plants in the vicinity of the works, and, taking due consideration of these and the impact of the construction/temporary works land and the proposed final layout, propose any possible, desirable relocation;
- Propose new trees and any other landscape to be planted;
- Design the corresponding irrigation system.

2. Traffic engineering and light signalling

(1) Project surface structures along the underground section

- Road traffic arrangements at the tunnel portals / shafts / station entrances shall be designed to match the quantitative requirements expressed in the traffic forecast study prepared by JTMT, at all phases of the construction structures/ infrastructures.
- Whilst preparing these arrangements, particular care shall be given to satisfying public needs (resident accesses and parking, loading / unloading bays in commercial areas, etc.) and more specifically to the permanent availability of accesses for rescue teams (firemen, ambulances, police).
- At relevant road junctions, at all phases of the project, traffic arrangements shall preferably be regulated through the use of automated traffic lights.
- Traffic management activities shall be performed in close cooperation with JTMTS's representative and with the Municipality of Jerusalem.
- The Consultant shall take into account the impact of:
    - the main works relating to the portal and tunnel excavation and the surface accesses to the station and ventilation shafts construction.
    - the internal structures, finishes, building services, system/equipment, etc).

(2) Traffic management final arrangement (interface with the Blue Line design)

The Consultant shall:

- Interface with the Blue Line Consultant and the Blue Line design to furnish all required information for developing new, reorganised traffic arrangements for vehicles, public transport, cycles, pedestrians, taking into account LRT implementation, based on traffic forecasts provided by JTMT's model experts;

(3) Traffic management during construction:

- The Consultant shall verify the feasibility of alternative, temporary traffic arrangements and phasing during construction works for each construction stage and for each structure (work sites, portals, shafts, station accesses).

3. Utilities coordination and relocation

(1) Obtain information:

The Consultant shall identify the existing public and private utility networks affected by the implementation of the underground section of the city centre section of the Blue Line, based on the Consultant's project requirements.

(2) Define relocation requirements

- determine, in agreement with the utility bodies/authorities, the segments of utility networks to be relocated due to the Project design, or because of future maintenance and/or upgrade considerations as affected by the Project future operation;
- propose relocation arrangements for the relevant segments of utility networks;
- prepare coordination drawings displaying all existing and maintained, relocated, planned and cancelled utility networks on top of the Project plans, fully coordinated both horizontally and vertically;
- carry out the schedule of each utility relocation in coordination with the utility bodies/authorities, and in accordance to the master schedule;
- obtain, with the assistance of JTMT, the approval of each of the utility bodies/authorities of the resulting relocation arrangements.

(3) Interface with utility companies

The Consultant shall review the design provided by utility companies for the relocation of their infrastructure. Furthermore the consultant shall:

- Ensure that all the latest project information has been taken into account in the relocation detailed design.
- Adapt its design in case of particular difficulties.

4. Civil and structural works design

(1) The Consultant shall provide the description of each structure and associated equipment, as follows:

- Determine the structural design parameters, including:
  - traffic conditions and clearance profiles;
  - design loads (including equipment where applicable);
  - soil conditions (geological, hydrogeological and geotechnical);
- Carry out the geometrical (dimensions, profile) and structural design calculations for the walls.

- Describe the adequate construction methods and phasing of the associated works in conjunction with works managed by the Blue Line Consultant (such as utility relocation in the vicinity of the portals).

(2) Structural works shall include all shafts, vents, station accesses and floors/walls, portal retaining walls.

(3) The Consultant shall provide the description of each structure and associated equipment, as follows:

- Carry out the geometrical (dimensions, profile) and structural design calculations.
- Describe the associated equipment and/or services, such as:
  - drainage and (where applicable) pumping systems, sewage;
  - for underground structures specifically: ventilation system and safety systems (fire detection and fire-fighting systems, emergency evacuation systems, smoke exhaust system, signposting etc., all in accordance with applicable laws and regulations);
  - protection and support of potentially affected utilities or structures;
  - ease and safety of access for maintenance purposes (in accordance with urban conditions and public service conditions).
- Describe appropriate construction methods and phasing of the associated works.

4'. Equipment

(1) The main objectives of the basic design are to identify:

- The interfaces with the civil works, including location of the technical rooms, information for the surfaces, the routing of cables inside the technical rooms but also inside and outside the tunnel.
- The ventilation strategy to adopt in order to assess the impacts on the civil works and on the power supply.
- The organization of the power supply distribution.
- The required equipment inside the technical rooms and inside/outside the tunnel.
- The philosophy regarding the type of information exchange with the SCADA system (supervision).
- The scenarios for equipment replacement (and impact on the operation of the tunnel).
- The robustness of the safety systems with respect to equipment failure or fire.
- The location of the main equipment inside the tunnel, equipped cross sections of the tunnel, technical room(s) arrangement, HV and LV power supply.

Note: Special attention shall be given to the continuity of service of the main equipment in order to ensure the safety of the users in all situations (main equipment will be defined during the safety study).

(2) The Consultant shall provide the following documents:

- General equipment report including main characteristics;
- Ventilation report;
- Safety report;

- Synoptic of each equipment in a general lay out of the tunnel (including approach zones).
- Different cross sections of the tunnel depending on equipment.
- Technical room arrangements (including lighting and HVAC).
- Single line diagrams for HV/LV.
- PLC (Programmable Logic Controller) and remote control centre.
- Pumping system including piping.
- The routing of cables inside the tunnel.

5. Design of tunnel and underground stations

The basic design for tunnels and underground stations will be made up of the following elements:

(1) Tunnel and stations and corridor alignment design:

- The Consultant shall indicate, based on the track alignment provided by the Blue Line Consultant, the tunnel and structure contours, the location of stations, crossovers, recess and shafts. The actual ground level shall be displayed on the vertical alignment design together with any additional structure (building foundation, sewage pipe, etc.) located in the tunnels' vicinity.

(2) Functional design:

- Internal layout at all levels (e.g.: platform, concourse, mezzanine), public spaces and technical areas and rooms of the chosen solution
- Passenger flow analysis
- Access and shaft layout
- Cross section and site impacts (buildings, etc.)
- Update of operation calculations (e.g.: egress, platform width, fare gates in accordance to passenger flow analysis, main ventilation shafts (intake/exhaust)
- Accessibility report

(3) Architectural design and station's access insertion:

The Consultant shall develop the architectural design and station access insertion for the LRT Reference Alignment with site plans on a scale of 1:100 in general and up to 1:50 for details including entrances and other shafts;
Civil & structural design

- The Consultant shall provide a preliminary structural calculation report for all main civil and structural design elements of the tunnel and stations: slabs, temporary and final retaining structures, accesses, ventilation shafts.

(4) Risk appraisal

- The Consultant shall provide a risk assessment report regarding the construction methods of the tunnel and stations, and the impact on surrounding constructions.
- Risk register of both design and construction risks

(5) Urban insertion / traffic arrangement:

The Consultant shall set out urban architectural arrangements at:

- All extremities of the underground section
- Shafts, stations and other above ground structures

- 3D renderings of the urban rearrangement around these structures (ground level)
- Temporary traffic arrangements (cars, pedestrians) during construction
- Permanent traffic arrangements around station and emergency services accesses

(6) Tunnel and station ventilation

Ventilation & air conditioning (HVAC) and civil defence, ventilation systems for each underground station, to be designed jointly with tunnel ventilation systems (TVS) of the tunnel sections between underground stations.

(7) MEP (Mechanical, Electrical and Plumbing)

Design of each sub-system and geographical area: drainage, lighting, emergency lighting, fire- fighting, water supply, etc.

(8) Fire safety in Tunnel

- A fire strategy including the fire safety system;
- A description of the fire ventilation/smoke exhaust system including appropriate calculations showing the proposed dimensioning of the systems (synopsis, smoke control)
- A description of all means/arrangements implemented for the safety/security of the passengers and of the fire brigade;
- Design of emergency routes and accessibility for the fire brigade including any use of fireman's lifts (if applicable);
- Egress analysis including expected evacuation times to places of safety,
- Specific provisions to ensure an uninterrupted passenger evacuation path along the tunnel sections to the underground station, and/or portals / emergency shafts

(9) Fire safety in station design

A separate fire safety report shall be prepared for the tunnel and each underground station and shaft. Each report shall cover, as a minimum:

- The fire strategy including the fire safety system;
- The description of all means/arrangements implemented for the safety/security of the passengers and of the fire brigade;
- Materials used for the finishes (rooms, corridors, exits);
- A description of each ventilation /smoke exhaust system including the appropriate calculations showing the proposed dimensioning of the systems (synopsis, fire compartment zones, vertical openings and smoke control, corridor partitions and walls corridor doors;
- Emergency routes and accessibility for the fire brigade including any use of Fireman's lifts (if applicable);
- Egress analysis including expected evacuation times to places of safety,
- Access for fire-fighting and rescue services including any use of fireman's lifts
- Initial fire safety drawings indicating means of escape and preliminary smoke ventilation strategy;
- The building services for each structure shall include:
    - Fire alarm system
    - Smoke detection and alarm systems
    - Automatic sprinkler systems
    - Standpipes, hose and hydrant systems

It is the Consultant's responsibility to apply for, follow-up and obtain any approval of the fire safety documentation by the Fire Authority or any other relevant authority.

(10) Safety of people and goods

The Consultant shall prepare a report on safety of goods and people for all underground structures. The report shall cover, as a minimum, the following:

- Risk identification analysis and operability;
- Interface risk analysis;
- Risk frequency estimation, consequence assessment, quantitative risk assessment;
- determination of risk acceptability criteria (risk matrix);
- SES/CFD simulations (Subway Environment Simulation / Computational Fluid Dynamics);

(11) Design of main openings, cable routings

At this stage of the design the main openings and cable routings shall be designed in order to be taken into account in the structural design.

6. Operational Modes

As part of the Basic Design, the Consultant shall prepare a description of its proposed LRT operational principles, including with respect to station patronage and dimensioning, addressing normal and downgraded operating modes (emergency scenarios).

7. Construction methodology

The Consultant shall provide its construction methodology for portals, tunnel, underground stations and shafts, including excavation techniques report, risk assessment, phasing, job sites layouts, worksite footprints, modes of access and accessibility, equipment and machineries, environmental, safety and security issues, traffic diversions, etc.

8. Schedule of detailed design and construction works

The Consultant shall prepare an overall schedule of works, to a level of detail consistent with the basic design being produced. This shall include the following:

(1) An outline schedule of the works (detailed design and construction) for the various development stages.

(2) An analysis of construction planning, methodology and organization, in order to identify optimal construction and operation phasing. The analysis shall cover plausible options and illustrate the Consultant's recommendations, with drawings and sketches clarifying the sequence of construction works and methodology, necessary temporary works (including ground preparation and traffic arrangements), utility relocation sequences and identification of all public and/or private entities with which coordination will have to be achieved. The analysis shall also take into account possible future extensions to the Line.

(3) A detailed schedule of the works (detailed design and construction), on the basis of the analysis above.

(4) A schedule (length of tunnel vs. duration of construction works vs. construction works), taking into account all construction works tasks up to the commencement of commercial operation for the underground section of the city centre section of the Blue Line.

9. Investment, operation and maintenance cost estimate

(1) The Consultant shall prepare an overall capital investment cost estimate of construction works for all stages of the construction works, to a level of detail consistent with the design being produced. The format shall be as approved by JTMT, and shall identify:

- clearly defined project components as items;
- clearly defined geographical sections (for example, between stations);
- each development stage (specifically the first stage of development shall be provided as a separate chapter, and each further stage shall identify the items required to enable the transition from the previous stage).

(2) The Consultant shall prepare a cost estimate of the operational and maintenance costs for a period of 30 years of use of the underground section of the city centre section.

(3) The Consultant shall also prepare cash flow estimates for the construction period.

10.3 LIST OF DELIVERABLES FOR TUNNEL ALIGNMENT BASIC DESIGN

10.3.1 General

(1) Inception report

(2) Geotechnical factual report presentation of the site (geological and hydrogeological contexts), programme of investigations (boreholes, in situ tests, laboratory tests,…), geotechnical characteristics for tests (in situ and laboratory) of the sub-soil, hydrogeological conditions (permeability, water table level);

(3) Geotechnical interpretive report (for stations, tunnel, shafts, portals), context and objectives, geotechnical synthesis (geotechnical model), retained parameters for pre-dimensioning of tunnel, station, shafts and portals (retaining walls). With a geological and geotechnical profile along the tunnel's alignment and indicating the tunnel's vertical profile (excavation and inner lining);

(4) Building risk assessment report based on the design and Building condition survey comprising also a review of remaining uncertainties;

(5) Technical report indicating which additional geotechnical investigations and building condition surveys are needed for the detailed design (for stations, shafts, tunnel, portals);

(6) Interface matrix;

(7) Interfaces sheets;

(8) Updated risk management plan;

(9) Risk analysis/assessment report including the proposals to be implemented resulting from the risk analysis/assessment and updated risk registers;

(10) Master schedule of the implementation of the underground section of the city centre section of the Blue Line;

(11) Location plan of the proposed corridor at scale 1;2000;

(12) Key map of the underground section with adequate numbering of each map, including adequate overlapping;

(13) Horizontal and vertical alignment drawings integrating the track alignment information which will be provided as part of the Blue Line design (straights, curves, transition curve characteristics, dynamic and structural gauges, track cant, chainage, clearances, …);

(14) Tunnel and structure contours, the location of stations, crossovers, recess and shafts, at scales 1:500 and 1:500/1:100.

10.3.2 Tunnel section

(1) Structural pre-dimensioning assumption report;

(2) Technical report including the pre-dimensioning calculation note of the tunnel, the stations, each shaft, portal and any associated Cut & Cover section;

(3) Technical Report on the dimensioning (1D simulation) of ventilation/smoke exhaust systems (stations, shafts and tunnel);

(4) Horizontal and vertical tunnel alignments indicating also the track alignment as per information provided by the Blue Line Consultant as part of the Blue Line design;

(5) Utility relocation report;

(6) Utility relocation schedule;

(7) Typical functional cross section of the tunnel (space proofing cross section, including positioning of all LRT Systems equipment, and in particular safety equipment) on a straight alignment and canted curves at scale 1/100;

(8) Typical structure cross sections of each type of tunnel at scale 1/100; main construction phases shall be indicated;

(9) Location of safety equipment in the tunnel;

(10) Map indicating the work sites, the temporary traffic arrangement during the works, and the accessibility to these sites, at scale 1:500;

(11) Construction schedule.

10.3.3 Surface structures

(1) Utility Relocation Report;

(2) Utility Relocation Schedule;

(3) Drawings showing location of safety equipment (hydrant location for example) at scale 1/500;

(4) Track-bed drawings indicating the multitubular duct banks, the draw pits, the location of catenary poles, the track laying types, the track-bed drainage systems, the track-bed surfacing;

(5) Landscaping/ streetscaping arrangements (report and drawings);

(6) The roadway arrangements (e.g.: traffic lanes, parking, loading bays, access to car parks, buildings, accessibility for emergency vehicles,) – (report and drawings);

(7) Utilities drawings indicating all existing utilities at scale 1/500;

(8) Utilities drawings indicating all utility relocations at scale 1/500.

10.3.4 Shafts, portals and open trench sections (Blue Line and connection to the Red Line)

(1) Structures pre-dimensioning assumption report

(2) Technical report including the pre-dimensioning calculation note of the tunnel, the stations, each shaft, portal and any associated Cut & Cover section;

(3) Functional drawings of each shaft, portal and associated cut & cover section at scale 1/100, all safety / security means shall be implemented in accordance with appropriate standards and Civil Defence requirements (e.g.: emergency stairs, lifts, ventilation/smoke exhaust systems);

(4) Finishes and building services drawings of each shaft, portal and associated cut & cover section at scale 1:100, with details of the implementation of the finishes, equipment;

(5) Plan at surface level showing the urban insertion of each portal, shaft (e.g.: exit, ventilation grids) open trench section, the streetscape, the roadway arrangement, accessibility for the firemen, at scale 1/100;

(6) Longitudinal and cross sections at the right locations for the understanding of these structures design at scale 1/100;

(7) 3D architectural renderings of the portals and shafts;

(8) Structural drawings of each shaft, portal and associated cut & cover section at scale 1:100;

(9) Shafts, portals, open trench construction phasing drawings at scale 1:500;

(10) Temporary traffic diversion arrangement drawings per construction phase at scale 1:500;

(11) Map indicating the work sites, the accessibility to these sites, at scale 1:500;

(12) Construction schedule;

(13) Utilities drawings indicating all existing utilities at scale 1/500;

(14) Utilities drawings indicating all utility relocations at scale 1/500;

10.4 LIST OF DELIVERABLES FOR UNDERGROUND STATIONS BASIC DESIGN

10.4.1 General

(1) Executive summary report in Hebrew, with its translation in English, covering all design issues and deliverables. The table of contents of this executive summary report shall be subject to prior approval by JTMT;

(2) Note that the LRT system information shall be integrated in the written and graphic documents in coordination with the Blue Line Consultant;

(3) A3 book of typical structures at appropriate scales;

(4) Technical report and drawings (A3 book of typical equipment layouts) at appropriate scales;

(5) Public building safety general report (including the fire safety system report);

(6) Accessibility general note;

(7) List of documents foreseen for the detailed design stage;

10.4.2 For each station

(1) Station box drawing (diaphragm walls) at scale 1/100;

(2) Station box technical report (diaphragm walls);

(3) Report on the impact on neighbouring construction (existing and future if appropriate);

(4) Technical note including the structural pre-dimensioning calculations;

(5) Risk analysis/assessment report including the proposals to be implemented resulting from the risk analysis/assessment;

(6) Accessibility note;

(7) Safety note;

(8) Ventilation/Smoke Exhaust Systems Technical Report;

(9) Dimensioning Calculation Note according to the Passenger Flows;

(10) Construction schedule;

(11) Utility Relocation Report;

(12) Utility Relocation Schedule;

(13) Functional drawings of each floor (platform, under-platform, concourse levels, etc.) showing the functional aspects of the station, public and technical area layout, elevators, lifts, etc., at scale 1:100; all safety / security means shall be implemented in accordance with appropriate standards and Civil Defence requirements;

(14) Finishes, building services drawings of each shaft, portal and associated Cut & Cover section at scale 1:100, with details of the implementation of the finishes, equipment;

(15) Plan at surface level showing the urban insertion of the station entrances, the ventilation grids, the streetscape, roadway arrangement, at scale 1:100;

(16) Longitudinal and cross sections at appropriate locations for the understanding of the station design at scale 1:100;

(17) System integration drawings at scale 1:100;

(18) Equipment drawings at scale 1:100;

(19) 3D architectural renderings of the station;

(20) Map indicating the work sites, the accessibility to these sites, … at scale 1:500;

(21) Station construction phasing drawings at scale 1:500;

(22) Temporary traffic diversion arrangement drawings per construction phase at scale 1:500;

(23) Structural drawings at scale 1:100;

(24) Utilities drawings indicating all existing utilities at scale 1:500;

(25) Utilities drawings indicating all utility relocations at scale 1:500;

11. DETAILED DESIGN

a) Following approval of the basic design by JTMT, the Consultant shall proceed with the detailed design phase for the **civil works build-only contracts and the equipment design and build contracts.**

b) The full background will be provided to the Consultant at an initial "kick-off" meeting for this detailed design stage with JTMT, where the status of the design of the underground section of the city centre section of the Blue Line, staging of the implementation, and organization of the detailed design work will be discussed.

11.1 INPUT DATA FOR DETAILED DESIGN

- The basic design and the comments of JTMT on the basic design;
- The list of detailed design documents produced at the basic design stage;
- Design requirements resulting from the designs of the Blue Line Consultant relating to the integration of LRT systems within the project;
- All other technical documentation which will be requested by any relevant authority to allow for submission and approval of the building permits;
- Other requirements arising from other administrative permissions and coordination with utilities providers;

11.2 ELEMENTS OF DETAILED DESIGN

The detailed design shall cover the following elements and tasks:

(1) Civil works

- Site layout plan views at a scale of 1:250 including existing situation, track alignment (as supplied by the Blue Line Consultant) underground structures and buildings (including existing structures to be demolished or modified), multi-tubular cable ducts, pulling chambers, manholes, track equipment, roadway arrangements and signing (e.g.: traffic lanes, parking, loading bays, access to car parks, buildings, accessibility for emergency vehicles), road markings and signage and traffic light equipment, urban furniture, plants, etc. and showing the Project boundaries above ground;
- Longitudinal profile of all pavements along axis and gutter;
- Typical cross-sections at scales of 1:50/1:100;
- Cross-sections every 10 m along track, 20 m otherwise at scales of 1:50/1:100 giving levels, drainage and cable ducts, etc.;
- Levelling plans, and functional plans at a scale of 1:100;
- Road markings and signing (including direction signing) details at surface structures;
- Associated description notes, listings, etc.

(1') Equipment

- Description of the works and establish tracking plans necessary for an understanding of the project;
- Detailed characteristics of all equipment and materials including the applicable standards;

- Plans, sections and elevations, the shapes of various elements of the construction, nature and characteristics of the materials and the conditions for their implementation;
- Documents regarding routing of electrical cables and evacuation of fluids and, depending on the mode of devolution works, coordination of information and constraints necessary for the spatial organisation of the works;
- Pre-dimensioning of the electrical cables, ventilation system and air conditioning systems in the technical rooms;
- Definition of the inputs/outputs list;
- Documentation establishing downgraded modes and Minimum Operating Conditions (MOC);
- Documentation showing that the interfaces with the civil works and other organisations involved in the project have been checked;
- List of final acceptance testing, both on-site and in factory, including types of tests to be done;
- Description of the hand-over process;
- Description of the guarantees and the relationship between the operator and contractor during the guarantee period;
- Detailed Bill Of Quantities (BOQ) broken down by trades;
- Estimated detailed design cost of work broken down by trade based on quantity take-offs from final drawings and technical specifications;
- List of spare parts and all documents to be provided to the operator before commissioning.

(2) Drainage

- Characteristics of catchment basins and water tables;
- Identification of storage areas, outlets, and verification of their capacity;
- Schematic network at appropriate scale (1:5 000 or 1:2 000);
- General layout, including gutters, ducts and connections (outlets) to the primary network, and providing manhole and duct invert levels for the track-bed at scale 1:250;
- Technical specifications for the track-bed drainage;
- Technical specifications for the roadway drainage;
- Typical and specific manholes (detail);
- Calculation notes.

(3) Earthworks and pavements (surface structures around station access, shafts)

- Set out nature and characteristics of cut materials, possibility of usage as fill materials, determination of alternative sources of adequate fill materials, calculation of the earthwork volumes;
- Identification of pavement categories: new, and existing to be demolished, rebuilt, strengthened, resurfaced;
- Identification of pavement requirements, according to the expected traffic nature, volumes and loads to be borne;
- Determination of any foundation course/soil treatment requirements;
- Design of road, sidewalk, etc. pavement structures (with calculation notes);
- Incorporation of any specific arrangements for noise and vibration sensitive areas;
- Technical specifications for pavement structures and pavement materials, including execution constraints, tolerance margins, etc.

(4) Buildings

For each building:

- Foundations plans, civil engineering and structural plan views, elevations, cross-sections at a scale of 1:50, and details at appropriate scale.
- Associated description (including soil conditions) and calculation notes.

(5) Structural works

For each structure:

- Specific layout plan at appropriate scale, elevation at same scale.
- Longitudinal profile and cross-section at same scale horizontally and 10 times larger vertically.
- Transversal cross-sections at a scale of 1:20.
- Construction details at appropriate scale.
- Structural drawings (e.g. foundations, formwork, lining) at appropriate scale.
- Associated description (including soil conditions) and calculation notes.
- Specific cost estimate.

(6) Utilities relocation:

The detailed design shall be based on the approved basic design and corresponding relocation and coordination concept, as approved by the various utility bodies/authorities, whilst following the Project detailed design development.

- Improved data resolution and accuracy may be required with respect to location and depth of underground utilities, to be obtained by one or more of the following methods (subject to JTMT and utility bodies/authorities agreements):
    - field survey of data from the various utilities manholes;
    - radio detection site survey of cable routes, pipe routes, or up to a full site survey (this is the most advised practice as it enables to improve significantly the accuracy of the data collected);
    - site check boreholes (this is the most accurate method, but also the most invasive, expensive, complicated and disturbing; it should therefore be used only in very specific occasions).

  The utilities routes located will be marked up on site, temporarily or with traffic paint and pegs as required. The network of surveyed utilities is then to be captured using total stations and added to the digital base plan. Plans shall be produced with utilities structured in easily identifiable layers.

- The Consultant shall perform an implementation and constructability analysis in order to identify optimal utilities relocation staging.
- The Consultant shall also provide general proposals with respect to stray current monitoring and protection measures to be implemented for the operating phase of the LRT system.

(7) Utilities:

The Consultant shall ensure that the detailed designs correspond to the basic design and that the following is taken into consideration in its interface with the utility companies:

- Improved data resolution and accuracy may be required with respect to the location and depth of underground utilities. This will be obtained by one or

more of the following methods (subject to JTMT approval together with that of the utility companies/authorities where required):

- field survey of data from the various utilities manholes,
- radio detection site survey of cable routes, pipe routes, or up to a full site survey (this is the most advised practice as it enables to improve significantly the accuracy of the data collected),
- site check boreholes (where necessary)

- The Consultant shall perform an implementation and constructability analysis in order to identify optimal utilities relocation staging (coordination activity with and between utility companies),
- The Consultant shall also provide general proposals with respect to stray current monitoring and protection measures to be implemented for the operating phase of the LRT system,
- The Consultant shall carefully check any designs provided by the utility companies to verify that the utility companies' specifications match with the LRT project.

(8) Operation and maintenance plans

Part of the Blue Line design will be to detail the operational and maintenance characteristics of the Blue Line. The Consultant will consult with the Blue Line Consultant in order to prepare, as part of its detailed design the following:

- A description of the degraded operating modes in the tunnel.
- An operational safety case.
- A maintenance plan addressing the following:

  - the expected repair and replacement schedules for the various relevant items of the works in tunnel;
  - the major maintenance access constraints; and
    the outline organization and planning of maintenance activities

(9) Testing and commissioning programme

The Blue Line Consultant will be responsible for preparing a testing and commissioning programme for the entire Blue Line. The Consultant will consult with the Blue Line Consultant in this regard and shall then prepare a testing and commissioning programme and schedule for the underground section of the city centre section of the Blue Line, including factory tests of certain equipment, sub-system and system tests, integration tests, safety specific tests, trial (shadow) running, etc.

(10) Construction method

The Consultant shall prepare a report addressing:

- A description of the construction methods envisaged and the corresponding phasing, outlining the functional worksite constraints which will enable contractors to assess the impact of construction works on the urban environment, as well as on their own worksites. This shall include road traffic aspects, pedestrians, nearby residents and shops, etc. The impact study shall concern the routes used by the construction logistics.
- Phasing of the works, detailed by way of cross-section drawings at an appropriate scale, showing:

  - the complete sequence of works from the existing situation to the final arrangements; and

- for each phase, the worksite boundaries, spaces available for road and pedestrian traffic, the safety arrangements provided (taking into account the relevant Health and Safety Laws and Regulations), and the specification of all works to be carried out in this phase.

- Phasing of the traffic arrangements during the works, to include, for each phase:
  - a general traffic management plan;
  - a description of the temporary arrangements for the concerned junctions, and their operation;
  - a description of the impacted road network operation (temporary traffic lights, signing and markings).

Note: The Consultant shall carry out the design of temporary traffic arrangements and traffic lights in close liaison with the Blue Line Consultant, JTMT and the Municipality. The Blue Line Consultant will be responsible for final traffic arrangements, traffic lights and utilities relocation.

(11) Interface management and monitoring:

The Consultant shall prepare a list of technical, functional and spatial interfaces, as identified between the various disciplines involved (including between the various contractors which may be involved), and a monitoring methodology. Interface specifications shall be established so that the respective contractors' scopes of work and interfaces are defined thoroughly.

(12) Worksite management:

The Consultant shall prepare a worksite management report including descriptive drawings showing at a scale of 1:250 the statutory boundaries as well as worksite installations and compounds, supply and storage sites, sanitary equipment, aid stations, and the proposed means to determine worksite boundaries. **Note: The detailed design for the layout of the worksites shall show adaptations according to the construction phases of the stations, shafts, and portals.**

(13) Investment cost estimates:

The Consultant shall:

- Define accurately the various quantities of items to be measured during the execution of the works and thus to be priced in the Bills of Quantities which will be part of the ensuing tender documents.

- The format shall be approved by JTMT, and shall identify, in particular:
  - each phase of the works;
  - the appropriate geographical sections (e.g. inter-stations, or between junctions); and
  - individually, each major structural work.

- Provide a construction capital investment cost estimate based on its substantiated cost estimate for each of these items.
- Provide an analysis of the evolution between this construction cost estimate, based on the detailed design, and the construction cost estimate for the underground section of the city centre section of the Blue Line provided at basic design phase as per Section 9.

(14) Operation and Maintenance costs

The Consultant shall provide substantiated annual operation and maintenance cost estimates for operation and maintenance of the underground section of the city centre section of the Blue Line for a period of 30 years.

(15) Scheduling of the works:

The Consultant shall prepare a construction work schedule, to a level of detail consistent with the detailed design. This shall include:

- A description of the construction work scheduling principles, specifying the worksite constraints (traffic, environment, special events, etc.) and the various technical and functional task sequencing constraints, the phasing principles, etc.
- A detailed schedule of the complete works (construction design and construction works, testing and commissioning) for the underground section of the city centre section of the Blue Line.
- A schedule (length of tunnel vs. duration of construction works vs. construction works), taking into account all construction works tasks up to the commencement of commercial operation for the underground section of the city centre section of the Blue Line.
- In addition the Consultant shall prepare a cash-flow schedule for the construction works, based on the works schedule provided and the detailed cost estimate produced.

(16) Procurement strategy:

The Consultant shall propose the most appropriate distribution of work packages allotment for carrying out the construction works and equipment, and prepare a specific schedule of the corresponding tender process.

11.3 LIST OF DELIVERABLES FOR DETAILED DESIGN

11.3.1 General

(1) As part of the detailed design stage, the Consultant shall provide sufficient design details to allow the relevant authorities to approve all necessary building permit(s) for the full implementation and construction of the underground section of the city centre section of the Blue Line;

(2) The Consultant is required to provide structural “engineering drawings” only, including all details required under Section 11.3.1 (1) above. The construction design and shop drawings with full reinforcement detailing shall be prepared by the contractor;

(3) The Consultant shall provide a basic design for MEP with extensive functional requirements and pre dimensioning sufficient to ensure the civil works provide the volumes necessary whatever equipment supplier is chosen, including all details requested by Section 11.3.1 (1) above;

(4) Technical specifications and datasheets for equipment shall allow for a competitive procurement process for purchasing of equipment, which may be proprietary;

(5) The civil works contractor will undertake the coordination with the equipment supplier in establishing the construction design and civil/building works shop drawings which will integrate the equipment adapting the Consultant's detailed design. As part of the services in Optional Assignment O4, the Consultant shall be responsible for verification and approval of the “for construction” design.

(6) The Consultant shall prepare a detailed design executive summary report in Hebrew together with its translation in English, covering all of the above issues. The table of contents of this executive summary report shall be subject to prior approval by JTMT.

(7) The Consultant shall prepare a detailed technical and functional description of the underground section of the city centre section of the Blue Line, including:

(8) detailed layout plans;

(9) characteristics and dimensions;

(10) associated calculation notes and verifications;

(11) nature and quality of the materials and equipment, and corresponding workmanship requirements;

(12) technical specifications, general arrangements and layout of equipment required for operations;

(13) operating plan: normal and degraded modes;

(14) testing and commissioning requirements.

(15) Bills of quantities, the corresponding Consultant's construction cost estimate and a projection of the operating and maintenance cost estimates.

(16) Definition of the appropriate number (and content) of work packages for tendering build-only and design build contracts.

(17) All necessary approved building permits, including any necessary permits for temporary works and/or site compounds;

(18) Master schedule of the LRT Line Implementation;

(19) Location plan of the alignment at scale 1:1000;

(20) Key map of the underground section with adequate numbering of each map, including adequate overlapping;

(21) Description and drawings of horizontal and vertical tunnel alignment (with the track alignment information provided by the Blue Line Consultant under the Blue Line design, e.g.: straights, curves, transition curve characteristics, dynamic and structural gauges, track cant, chainage, clearances), the tunnel and structure contours, the location of stations, crossovers, recesses and shafts, at scales 1:250 and 1:250/1:50;

(22) Geotechnical baseline report (for stations, tunnel, portals), including the risk assessment, the geological / geotechnical profile based on the vertical profile of the track;

(23) Building risk assessment study;

(24) Structural dimensioning assumption report;

(25) Technical report on the dimensioning (3D simulation) of ventilation/smoke exhaust systems (stations, shafts and tunnel);

(26) Interface matrix;

(27) Interface sheets;

(28) Risk analysis/assessment report including the proposals to be implemented resulting from the risk analysis/assessment;

(29) Utility Relocation Report;

(30) Utility Relocation Schedule.

11.3.2 Tunnel

(1) Technical report including the dimensioning calculation note;

(2) Functional cross sections of the tunnel (space proofing cross section, including positioning of all LRT Systems equipment, and in particular safety equipment) at scale 1:50;

(3) Structural cross sections of each type of tunnel at scale 1/50, indicating each construction phase;

(4) Location of safety equipment in the tunnel (hydrant location for example) at scale 1/250;

(5) Map indicating the work sites, the temporary traffic arrangement during the works, the accessibility to these sites, at scale 1:250;

(6) Construction schedule;

(7) Risk assessments/analysis;

(8) Risk analysis/assessment report including the proposals to be implemented resulting from the risk analysis/assessment.

11.3.3 Underground Stations

For each station:

(1) A3 book of typical structures at appropriate scales;

(2) Technical report and A3 book of typical equipment layouts at appropriate scales;

(3) Public Building Safety General Report (including the Fire Safety System Report);

(4) Accessibility General Note;

(5) Accessibility note;

(6) Safety note;

(7) Ventilation/Smoke Exhaust Systems Technical Report;

(8) Dimensioning Calculation Note according to the Passenger Flows;

(9) Utility Relocation Report;

(10) Utility Relocation Schedule;

(11) Station box drawing (Diaphragm walls) at scale 1/50 (for cut & cover);

(12) Station box technical report (Diaphragm walls) (for cut & cover);

(13) Excavation and temporary support drawings showing the excavation phasing of the works;

(14) Excavation and temporary support methodology and design report (for underground);

(15) Report on the impact on neighbouring construction (existing and future if appropriate);

(16) Functional drawings of each floor (platform, under-platform, concourse levels, ….) showing the functional aspects of the station, public and technical area layout, elevators, lifts, etc., at scale 1:50; all safety / security means shall be

implemented in accordance with appropriate standards and Security Authorities requirements;

(17) Finishes, building service drawings of each shaft, portal and associated Cut & Cover section at scale 1:50, with details of the implementation of the finishes, equipment;

(18) Plan at surface level showing the urban insertion of the station entrances, the ventilation grids, the streetscape, roadway arrangement, at scale 1:50;

(19) Longitudinal and cross sections at appropriate locations for the understanding of the station design at scale 1:50;

(20) LRT System integration drawings at scale 1:50;

(21) Equipment drawings at scale 1:50;

(22) 3D architectural renderings of the station;

(23) Map indicating the work sites, the accessibility to these sites, at scale 1:250;

(24) Station construction phasing drawings at scale 1:250;

(25) Temporary traffic diversion arrangement drawings for each construction phase at scale 1:250;

(26) Technical note including structural dimensioning calculations;

(27) Structural drawings at scale 1:100;

(28) Utilities drawings indicating all existing utilities at scale 1/250;

(29) Utilities drawings indicating all utility relocations at scale 1/250;

(30) Construction schedule;

(31) Risk assessments/analysis;

(32) Risk analysis/assessment report including the proposals to be implemented resulting from the risk analysis/assessment.

11.3.4 Shafts, portal and Cut and Cover section

Technical report including the dimensioning calculation note of each shaft, portal and associated Cut & Cover section;

(1) Functional drawings of each shaft, portal and associated cut & cover section at scale 1/50, all safety / security means shall be implemented in accordance with appropriate standards and requirements of Israel Police and Israel security authorities (e.g.: with regard to emergency stairs, lifts, ventilation/smoke exhaust systems);

(2) Finishes, building services drawings of each shaft, portal and associated Cut & Cover section at scale 1:50, with details of the details of the implementation of such finishes, equipment;

(3) Plan at surface level showing the urban insertion of each portal, shaft (e.g.: exit, ventilation grids), open trench section, the streetscape, the roadway arrangement, accessibility for the firemen, at scale 1/50;

(4) Longitudinal and cross sections at the right locations for detailed definition of these structures design at scale 1/100;

(5) 3D architectural renderings of the portals and shafts;

(6) Structural drawings of each shaft, portal and associated Cut & Cover section at Scale 1/50;

(7) Shafts, portals, open trench construction phasing drawings at scale 1:250;

(8) Temporary traffic diversion arrangement drawings per construction phase at scale 1:250;

(9) Map indicating the work sites, the accessibility to these sites, … at scale 1:250;

(10) Utilities drawings indicating all existing utilities at scale 1/250;

(11) Utilities drawings indicating all utility relocations at scale 1/250;

(12) Utility Relocation Report;

(13) Utility Relocation Schedule;

(14) Construction schedule;

(15) Risk assessments/analysis;

(16) Risk analysis/assessment report including the proposals to be implemented resulting from the risk analysis/assessment.

11.4 STATUTORY PLAN ENVIRONMENTAL REQUIREMENTS AND PERMITS

The Consultant shall be responsible for:

(1) Preparation of all material (drawings, surveys) required by the Statutory Plan (TABBA) for the receipt of building permits, as well as doing all the work necessary for obtaining all permits for temporary works and/or site compounds (including: more detailed architectural drawings, detailed environmental reports, static calculations, any mitigating arrangements specified (e.g. noise protection, prevention of water table pollution), etc.)

(2) Submission of applications and drawings to the Municipality, with specific registration for each of the building permits to be obtained.

(3) Presentation to and eventual approval by all Municipality and Government departments as required for obtaining the building permits. (The list will be determined by the relevant Local Committees.)

(4) Preparation of any modifications required to building permit drawings and approval by the relevant Local and/or District Committees where applicable.

(5) Follow-up on the entire process and obtaining all necessary permits.

Note: All building permit documentation shall be produced in Hebrew, with an English translation.

12. OPTIONAL ASSIGNMENT 1: SUPERVISION OF ADDITION GEOTECHNICAL SITE INVESTIGATIONS

a) During the Basic Assignment phase, the Consultant may consider that further site investigations are required to ensure the adequacy of the design inputs (see Basic Assignment additional input data). In this event, on-site drilling and/or geophysical contractors will be contracted for this purpose by JTMT.

Note: The remuneration for the Basic Assignment will cover the interpretation by the Consultant of the results of these investigations by updating the Geotechnical Design Memorandum.

b) **This Optional Assignment shall cover the supervision of drilling and/or geophysical contractors. Payment will be per bore-hole.**

c) Supervision tasks shall include:

- On-site presence of a certified geologist, who shall be responsible for the elaboration of all necessary geological documentation.
- Daily check on the quality of the works
- Adapting the site investigations to the actual conditions met (changing the drill locations and/or length and/or in-situ tests.
- Control of equipment (dimensions and weights, calibration certificates, condition, mast verticality).
- Ensuring the cored samples are correctly placed and stored and that the core photos meet the required standards to enable interpretation.
- Control of calculations (some in-situ and lab tests require calculations to provide final results: control of each formula and calculation or inputs and parameters where professional software is used).
- Creation of a non-compliance record system where each non-compliance is recorded and documented, giving all necessary information for the decision to validate or reject the test (completely or partially).

13. OPTIONAL ASSIGNMENT 2

Preparation of all technical parts of the tender documents for the underground section of the city centre section of the Blue Line

a) Under Optional Assignment 2, the Consultant shall prepare the scope of works, technical specifications and bills of quantities necessary for the build-only and design and build contracts for the works entailed in the construction of **the underground section of the city centre section of the Blue Line,** based on procurement strategy which is to be defined by the Consultant in accordance with Section 11.2 (16) above following approval by JTMT**.**

b) The work in Optional Assignment 2 shall include:

- Definition of scope of works;
- General technical specifications, which shall refer as a minimum to the requirements for the contractor's organization and key personnel, site handing-over procedures, temporary traffic arrangements, project documents to be provided by the contractor, progress management, design management (including design review and approval procedures for the design performed under build-only and/or design and build contract(s)) and change control management, interface management, quality management (quality organization, material and products certification, procurement quality

assurance, tests on site and off site), risk management, health and safety management, environmental management, material and workmanship general requirements, verification, test and acceptance management, standards management, document management systems);
- A description of the works (functional, physical, objectives);
- Functional system specification and technical specifications for the recommended LRT system works equipment;
- Definition of all possible interfaces and interfacing sheets/ drawings with regard to all potential bodies involved in the Project;
- The applicable codes and standards;
- The design principles, parameters and methodology (planning and design manual);
- The material and workmanship specifications;
- Drawings in sufficient detail to clarify the layout and quantities of the works to be performed and the interfaces with other work packages;
- A Bill of Quantities;
- A Project Time Schedule;
- A budget price;
- Various reports backing up the proposed design and construction methodology, such as a geotechnical report describing the excavation processes and the corresponding risk assessment matrix.

14. OPTIONAL ASSIGNMENT 3: TENDER PROCESS ASSISTANCE

The Consultant's scope of work as part of Optional Assignment 3 shall be based on procurement strategy which is to be defined by the Consultant in accordance with Section 11.2(16) above following approval by JTMT, and shall include the following:

- Preparation of potential contractors list;
- Preparation of tender evaluation criteria for the approval of JTMT (e.g.: experience in the specific domain; availability/workload; programme; design capacity; communications; quality (QA, ISO, quality certificates); price; payment terms; seriousness (able to keep schedule / deadline) (recommendations, rumours); service – if necessary; financial status; SHWE – safety, health, welfare, environment management, market status);
- Preparation of tender evaluation reports and comparison tables based on criteria approved by JTMT, in order to facilitate selection of the contractor;
- Requesting additional information from bidders, when necessary;
- Preparing answers to all clarifications requested by bidders;
- Assistance to JTMT during the procurement and negotiation process and participation in all negotiation meetings;
- Approval of planning and supervising the delivery/completion of works;
- Providing detailed comparison tables and tender reports after each tender phase.

15. OPTIONAL ASSIGNMENT 4: SUPERVISION OF CONSTRUCTION

The Consultant's scope of work under Optional Assignment 4 shall comprise the following:

a) Managing the implementation of all works contracts for the underground section of the city centre section of the Blue Line including build-only civil works contract(s) and design and build equipment contract(s).

b) In cooperation with the General Consultant, the Consultant shall provide overall supervision services, in accordance with Israeli regulations (including "supreme supervision" services), during implementation of the contract(s) for the underground section of the city centre section of the Blue Line. These services shall include *inter alia*:

15.1 DESIGN CHECK

- Review and approval of the construction design and "for construction" and/or "shop drawings" prepared by the contractor(s).
- Review and approval of any additional or modified drawing, specifications and/or bill of quantities which are provided by the contractor(s), in accordance with procedures defined as part of the General Technical Specification, part of the tender package for the construction/equipment contract(s);
- Define the interface technical specifications between equipment suppliers, the construction design and shop drawings relating to equipment being undertaken by the supplier(s).
- Participation in the site meetings required for the supervision of the works (weekly site meetings, risk management meetings, contract management meetings, etc.).
- Preparation and submission to JTMT of the monthly supreme supervision report.
- Approval of "as made" drawings produced by build-only and/or design and build contractor(s).
- Preparation of preliminary and final reports at the end of the construction phase, including detailed list of "remedial items/punch lists";
- Preparation of the final supreme supervision report at the end of build-only and/ or design and build contract(s);
- Preparation of the final supreme supervision report at the end of the warranty period of build-only and/or design and build contract(s);

15.2 CONSTRUCTION MANAGEMENT

- Site organization: The Consultant shall control the contractors' site activities with particular attention to site layout, safety, fire protection, security, logistics, materials handling, pollution control, site attendances, temporary utilities and clean-up. The Consultant shall require the contractors to organize pre-commencement subcontractor orientation meetings, and attend weekly site meetings, handle queries, arrange for site datum and expedite the contractors' monthly reporting.

- Deviation from technical documentation on site
  - Where events on site require a deviation from the technical documentation, this may only be effected following an instruction issued by the Consultant.
  - The Consultant's design team shall be available immediately to manage all these situations and shall be alert to what is happening on the site and take whatever steps may be necessary to ensure the works taking place on the site are not impeded.

- Management of contractors' construction: The Consultant shall monitor and expedite the progress and performance of the contractors on a daily basis on behalf of JTMT, in accordance with their general contracts and the agreed project procedures, including the inspection of hidden works. The Consultant shall monitor design, material, equipment and labour resources and check that the work complies with the technical documentation.

- Site logistics: The Consultant shall review and approve the contractors' planning and management of the site logistics including site operations such as access, storage, site accommodation, welfare, utilities, fire services, medical facilities, safety and emergency routes.

- Reporting: The Consultant's responsibilities in this area include commenting on the general contractor's monthly reports that will be required to include progress photographs, status of design, construction permits/licenses, agreements and negotiations with third parties and subcontract bid packages; subcontractor performance; schedule report; cost/financial report; bonds; problem areas and recommendations for action. The Consultant shall require the contractor to keep accurate written reports on labour, weather, progress, materials/equipment, accidents and other pertinent matters.

- Submittal process: The Consultant shall monitor and review the contractors' material procurement schedules and submittal logs for completeness, accuracy and compliance.

- Safety and security management: The Consultant shall prepare guidelines for JTMT approval, for the management of site safety and security. All security, safety, cleaning services, support functions, customs clearance, local transport etc. shall be included within these guidelines. In preparing the guidelines, the Consultant must also coordinate with the requirements of the Security Authorities.

- Health and Safety supervision

  - Continuous supervision of site from the point of view of health and safety, in accordance with the requirements of all applicable laws and regulations.
  - Developing site safety handbook and introduction to all persons on site
  - Manage and conduct "New Employee HSE Orientation" course.

  The Consultant shall include in the project team an authorized Health & Safety coordinator.

- Quality management:
  The Consultant shall establish and expedite the use of a quality management system in accordance with its technical specifications and quality control procedures.

15.3 COST CONTROL

- Change order management: The Consultant shall establish and agree a change order reporting system with JTMT and the contractor(s). The Consultant shall make recommendations on the settlement of change orders to minimise any adverse quality, time and/or cost impacts. No change orders shall be implemented without the approval of JTMT's representative.

- Performance measurement: Performance measurement involves reporting on progress, in terms of work performed and progress achieved and tying together physical progress and financial status as the Project evolves. The Consultant shall monitor compliance and assess performance of the contractor(s). Also, the Consultant shall evaluate and make recommendations on the contractors' requests for progress payments.
- Claims management: The Consultant shall advise JTMT on the minimisation and avoidance of contractual disputes. Where claims occur, the Consultant shall establish a 'claims log', evaluate claims and advise at negotiations with the contractors.

15.4 COMMISSIONING AND ACCEPTANCE

- Review and monitor each contractor's commissioning programme for all building components and systems. Commissioning shall include validation of each contractor´s As-built design, product submittals, pre-installation inspections, equipment start-up, testing, balancing, system demonstrations, operations training, and acceptance procedures.
- Coordination to ensure that defective or incomplete items are identified and completed prior to final acceptance.
- Advise when the contractors and suppliers have satisfactorily completed all work under the terms of their contracts.
- Preparation of final acceptance report including financial closeout upon contract completion.
- Obtaining on behalf of JTMT from contractors and suppliers warranties, licenses, and guarantees for equipment and materials.
- Preliminary handing over: The Consultant shall list all the necessary documents requested by JTMT, the Municipality and/or other authorities for the preliminary handing over. The Consultant shall follow-up the progress of the contractor(s) on this task.
- Punch List: The Consultant shall approve a comprehensive list of items to be completed or corrected by the contractor(s) (commonly named "punch lists" and "snagging lists").

15.5 POST CONSTRUCTION PHASE (BETWEEN PRELIMINARY HANDING OVER AND FINAL HANDING OVER)

- Final acceptance: The Consultant shall establish standards for final acceptance and shall follow-up the completion of all items defined in the "punch lists" and "snagging lists" and shall advise JTMT on acceptance of practical completion;
- Final handing over: The Consultant shall define all the necessary documents requested by JTMT, the Municipality and/or other Authorities for the final handing over. The Consultant shall follow-up the progress of the contractor(s) on this task and shall manage handover to operations and maintenance staff.
- O&M manuals and 'As-Built' drawings collation: The Consultant shall verify the completion and correctness of the contractor's assembly and collation of all operating and maintenance manuals, as-built drawings, instructions and procedures provided by their subcontractors, and their material and equipment suppliers.
- The Consultant shall prepare a contract(s) close-out report which shall include all necessary forms and documents (including as-built documentation from contractors) and its recommendations to JTMT with regard to payment of the contractors' final accounts.

Note: Additional considerations regarding Optional Assignment 4 are given in Appendix 7 to this TOR document.

16. MANAGEMENT

16.1 INCEPTION REPORT

a) The Consultant shall prepare an inception report, **no later than 2 weeks following the start of each design phase**, for JTMT's approval.

b) The inception report shall define all work to be carried out by the Consultant for that design phase under the present TOR and shall detail the organization, procedures, schedule, and quality assurance methods to be applied throughout the course of the Services during that design phase.

c) The inception report shall include, at least:

- A full list of deliverables for the respective design phase, as set out below.
- Quality Assurance/Quality Control procedures such as:
  - Design changes
  - Risk management plan and risk register
  - Internal checks/quality control
  - Electronic files control
  - Documentation control
  - Communication and correspondence procedures, including preparation of all Minutes of Meetings
  - CAD/BIM Management
- Staffing plan (names, functions, organization breakdown structure)
- Project schedule with any significant milestones and deliverables.

16.2 LIST OF DELIVERABLES

a) As part of the inception report, the Consultant shall, at the start of each design phase, prepare a list of documents in the following format:

Phase of design	Discipline	Element	Presentation Title	Target Scale	Information Level	Date of 1st draft	Document control work flow
Example:							
basic design	Architecture	Underground Station	Plans / sections and/ or elevations	1:100	To show all public and non-public areas, all circulation routes, emergency routes, shafts, all MEP rooms	05/06/15	Author's name Checker's name Approver's name

b) This list of deliverables shall be updated periodically (and at the very least, at the end of each design phase), at the discretion and review of JTMT.

16.3 PROJECT REVIEWS AND REPORTING

Review by JTMT of the Consultant's work progress shall take place periodically over the course of the Project. JTMT shall monitor the Consultant's work, and the Consultant shall be available (as requested by JTMT) to discuss the progress and the content of its work, on a continuing, cooperative basis.

16.4 DESIGN REVIEWS

a) **There shall be 5 (five) main milestones for reviews to be performed by JTMT** during the course of the Basic and Optional Assignments. These shall be scheduled as follows:

Basic Assignment

- Milestone 1: After completion of the preliminary design by the Consultant
- Milestone 2: After completion of the basic design by the Consultant
- Milestone 3: After completion of the detailed design by the Consultant

Optional Assignment

- Milestone 4: Where JTMT gives notice to proceed with Optional Assignment 2 – (Preparation of tender documents) design review milestone 4 shall follow the Consultant's completion of the tender documentation for the works contract(s).
- Milestone 5: Where JTMT gives notice to proceed with Optional Assignment 3 – (tender process assistance) design review milestone 5 shall follow delivery of the final tender report by the Consultant.

b) Following each design review JTMT will provide comments to the Consultant via the JTMT document management system in no more than **6 (six) weeks.**

c) The Consultant's responsibilities with respect to design reviews shall be:
- Preparation and submission of appropriate design documentation;
- Attendance at all design review meetings ensuring appropriate participation of Consultant's personnel;
- Integration of any requirements arising from JTMT's review of the presented design.

d) While the first version of documents is to be approved by JTMT (including "approved with comments" status), the Consultant shall start the preparation of the documents which are included in the next submission, without delay, in parallel with the finalisation of the documents which belong to the previous submission stage.

If the first version of documents includes rejected deliverables, the Consultant shall provide an updated version of the rejected documents as soon as possible and JTMT will review them within 6 weeks. Any delay due to rejection of deliverables will not give rise to an extension of time.

16.5 PROGRESS REVIEWS

As part of, or in addition to, design review meetings, the Consultant shall participate in regular fortnightly progress review meetings with JTMT and its General Consultant, and with any third parties (as and when required), to discuss technical, schedule and other management and administrative issues.

16.6 PROGRESS REPORTS

a) The Consultant shall submit a monthly progress report within **seven (7) days** following each month during the course of the Project. Such reports shall address at least the following issues:

- Contractual schedule updates, reflecting progress for each work task (in particular all deliverables and submissions, JTMT and/or any third parties input, reviews and approvals).
- A summary of concerns and/or decisions required which may affect the Project and/or the contractual schedule.
- Explanations for any variances from the contractual schedule and presentation of recovery plans to bring those activities back on schedule.

b) All text and associated material shall be produced on MS Office software.

16.7 PRESENTATIONS

a) Presentations by the Consultant of the progress of design shall take place periodically as requested by JTMT. The Consultant shall be responsible for the preparation of the materials and the presentation to JTMT and any other third parties as requested by JTMT.

b) Presentations shall be produced on MS Office software (latest version), and one (1) electronic copy of all presentations shall be provided to JTMT following each presentation.

16.8 GENERAL INSTRUCTION CONCERNING DELIVERABLES

a) The Consultant shall comply with the document management system operated by JTMT and the CAD management requirements.

b) Draft documents shall be submitted in one (1) colour hard copy, two (2) black and white copies (drawings in A1 size or other size if expressed agreed prior with JTMT, reports in A3/A4 size), and one set of electronic files (CD- or DVD-ROM). All submissions from the Consultant shall be thoroughly reviewed, checked and signed by the appropriate Consultant staff prior to submission to JTMT. All reports/drawings shall bear the signature of the relevant originator; reviewer, and manager. A full drawing and report register of all deliverables shall be submitted by the Consultant one month prior to the scheduled submission date.

c) Final documents shall be submitted in three (3) colour hard copies of updated documents (drawings in A0/A1 size or other size if expressed agreed prior with JTMT, reports in A3/A4 size), and one set of CD/DVD-ROMs containing all documents in their original format and the set of colour ".plt" files (full size) for all drawings delivered. Each CD/DVD and its container will include the CD/DVD's title and a table of contents. A full drawing and report register of all deliverables shall be submitted by the Consultant one month prior to the scheduled submission date.

d) Electronic copies of documents in progress (or in their final form) may be required at any time during the course of the Project, upon request of JTMT. Such electronic copies of reports, studies, etc. shall be provided in both full Adobe ".pdf" file format and the format of the original software application.

16.9 DELIVERABLES APPROVAL PROCESS

a) Upon receipt of the first version of documents from the Consultant, a dedicated meeting (or more, as required) shall be held between the Consultant and JTMT to review the delivered documents and exchange comments. Comments to deliverables shall be summarized and documented during the meeting(s).

b) Once the acceptance process is finalized as determined by JTMT, the Consultant shall submit a final version of the documents incorporating all comments provided by JTMT during the review and exchange period. JTMT shall review the final documents to determine their completeness, i.e. the extent to which they incorporate all changes and instructions given during the review and exchange period as recorded in the minutes of meetings.

16.10 SCHEDULE AND MANAGEMENT CONTROL

a) The Consultant shall be required to employ rigorous schedule and management control methods to ensure that the contractual schedule is met and submissions conform to the delivery schedule in accordance with this TOR.

b) The Consultant shall perform all management and scheduling with JTMT approved software.

16.11 BUILDING INFORMATION MODELLING (BIM)

The Consultant shall perform the design using BIM for the station design beginning from the basic design phase.

16.11.1 Description of BIM

a) Building Information Modelling (BIM) is a process involving the generation and management of digital representations of physical and functional characteristics of constructions. Building Information Models are files which can be exchanged / networked to support decision-making about a project.

b) The Consultant shall design all the stations, the portals and shafts using the BIM at the basic design and detailed design phases.

c) An appropriate BIM chart shall be defined (e.g.: layers, types, colours of lines, equipment/finishes library) in order to carry out the BOQ, then the cost estimates.

16.11.2 General process of use of BIM

The general process in the employment of BIM is as follows:

- Production of a 3D functional model for each station;
- Production of 3D models for each discipline from the functional model and implementation of rules for simultaneous work by several persons on such 3D models;
- Production of graphic deliverables from each specific 3D model;

16.11.3 3D functional model

a) The 3D functional model is created from the architectural concept, the functional programme, (provided in this document as a guideline), the requirements of the Municipality (connected projects, for instance), and also safety requirements for facilities such as tunnel/station ventilation/smoke exhaust systems.

b) The integration work of these various components is the production of the 3D functional model of the station, which necessitates a significant degree of coordination between JTMT, the General Consultant, the Municipality, the city architects, the Fire Brigade, the operator of the LRT System, the LRT System Concessionaire, and the Consultant's teams (architects, design manager,

geotechnical engineers, civil work/structures engineers, non LRT system engineers, safety engineers).

c) The design of an LRT station consists of a multitude of various disciplines, from the functional layout of the station (dimensioning of the platforms, the fare gates, the access widths according to the ridership at the peak hours) to the technical, operation and safety rooms' arrangement in accordance with the architectural concept and safety/security requirements.

d) The purpose of the 3D functional model is to lead to a nearly final definition of the station box at the end of the preliminary design stage, in order to provide a good basis for initiating the basic design and detailed design stages.

e) The model will enable the design and the dimensioning of the structures (walls and internal structures). The other components of the station can be detailed without altering the station box definition.

16.11.4 3D Structural Model

a) The 3D structural model is produced from the 3D functional model. This shows the modelling of the structural elements of the station: walls, slabs, pillars, beams, frame walls.

b) The use of structure engineering software compatible with the BIM software presents a big advantage as the station modelling is carried out only once.

c) At the preliminary design stage, a structural pre-dimensioning is done, awaiting the final location of station equipment released at the basic and detailed design stages, which necessitates specifics requirements altering the final structure calculations.

d) The definition of the types of station structural elements allows elaborating the BOQ, and the cost estimate at basic and detailed design stages**.**

16.11.5 3D model – finishing works

a) The production of a 3D model for finishing works necessitates close coordination between the architect and the design team, JTMT and the Municipality if some specifics requirements are requested (e.g: definition of pavement, wall surfacing, hand rails, false ceiling).

b) At the preliminary design stage a summary definition of the finished materials (e.g: walls, floors,) is required in order to determine the functional dimensions of the station box. At the basic and detailed design stages the change of a wall surfacing material (for instance) can modify the functional dimensions of the station box, requiring further work on the 3D functional model. The updating of the functional model should be done at the beginning of the detailed design stage.

c) If during the basic and detailed design stages, the location of the equipment modifies the technical rooms layout (for instance), a specific procedure has to be defined in order not to change the whole set of 3D models.

d) The definition of the station finished materials, with an appropriate detailed library developed by the consultant in the BIM software allows elaborating the BOQ and the cost estimate at preliminary and detailed design stages.

16.11.6 3D Equipment 3D Model

a) The 3D equipment model is determined from the 3D functional model and is mainly dedicated to the implementation of the ventilation/smoke exhaust systems of the station and the tunnel.

b) The design and the 3D information of the equipment (e.g: ventilators, noise attenuators, dampers, ventilation ducts) enable a quick and easy understanding of these systems.

16.11.7 3D MEP 3D Model

Once the station equipment is located in the station, cable routes, potable water, standpipes, hoses passages can be designed using MEP BIM software (Mechanical Electrical Plumbing), in fact for all the building services.

16.11.8 Process of Synthesis

a) The synthesis is the computing assembly or the superposition of the 3 D models (civil works, finishes, equipment, and MEP), and has to be carried out at the basic and detailed design stages.

b) This superposition allows for verification of the consistency of the station components and for detection of possible conflicts/clashes between them. Openings, niches in the structure (e.g: slab, walls), can be defined according to the Synthesis 3D model.

c) Clashes between various designs are resolved according to their complexity: minor ones may be managed solely by updating the 3D models concerned. Major ones will impact the 3D functional model.

d) The whole set of resolved clashes/conflicts requires the updating of each impacted 3D model.

17. DURATION AND MILESTONES OF THE PROJECT

a) The overall duration of performance of the Basic Assignment, including review and acceptance by JTMT of the detailed design is **120 weeks beginning at the date of the Notice to Proceed**.

b) The duration of the Services for Optional Assignment 1 shall be determined by JTMT following submission by the Consultant of its requests for additional site investigations.

c) The estimated duration of the Services for Optional Assignments 2 and 3 are set out in the table below.

d) The duration of the Services for Optional Assignment 4 - supervision of construction will be defined by JTMT following the execution of the contracts for construction.

e) The dates for the completion of any stage of the Services may be altered in accordance with the progress of the statutory process and the Consultant shall not be entitled to any additional remuneration in this regard. The Consultant's responsibility to provide full and continuing services to JTMT, in coordination with the Blue Line Consultant in all the relevant proceedings relating to the statutory process shall apply notwithstanding any change to the schedule.

f) With "M_0" as the start date of the Project indicated in the Notice to Proceed, the delivery schedule shall be as indicated in the following table:

Basic Assignment	**Reference Section / page**	**Milestone**
Inception report for preliminary design	*16.1 / 51*	M_0 + 2 weeks
Preliminary design	*9 / 17*	M_0 + 16 weeks
Environmental Impact Assessment study and Statutory Process (TABBA)	*9.5 / 22*	M_0 + 20 weeks
Preliminary design review by JTMT	*16.4 / 52*	M_0 + 22 weeks
Tabba submission	*9.5.1 / 23*	M_0 + 22 weeks
Basic design studies	*10 / 24*	M_0 + 42 weeks
Basic design review by JTMT	*16.4 / 52*	M_0 + 48 weeks
Detailed design studies	*11 / 36*	M_0 + 88 weeks
Detailed design review by JTMT	*16.4 / 52*	M_0 + 94 weeks
Building permit approval	*11.4 / 45*	M_0 + 120 weeks
Optional Assignments	**Reference Section / page**	***Estimated total duration***
Optional Assignment 2: Preparation of all tender documents	*13 / 46*	12 weeks
Tender documents review by JTMT	*16.4 / 52*	6 weeks
Optional Assignment 3: Tender process assistance	*14 / 47*	12 weeks
Final tender report review by JTMT	*16.4 / 52*	6 weeks

18. RISK TRANSFER

Based on the Risk Management Plan annexed to the Terms of Reference, the following uncertainties, and their associated design risks with regard to cost and schedule, are transferred to the Consultant:

a. Changes in the length of the tunnel within +/- 300m

b. Change in the number of stations, going from three to two (this will be notified through an instruction for reducing the scope of the assignment and the associated station costs, as quoted in the financial proposal). No claim based on the reduced scope shall be accepted.

   Note: This risk means that if the scope of the assignment is reduced regarding the number of stations, the Consultant may not make a claim.

c. Number of iterations to obtain approvals from regulatory authorities.

   Note: This risk refers to all iterations necessary to clarify and explain the design; it does not refer to unforeseeable changes in design.

The above list highlights the main risk borne by the Consultant. However other risks are also to be borne by the Consultant, such as:

a. Number of building permits, number of tender packages, number of tenders and number of contractors on site which have to be proposed by the Consultant and approved by JTMT following completion of detailed design.

b. Other risks explicitly described in the various clauses of the present RFP, both technical and economic (such as exchange rates between the reference foreign currency, chosen by the Consultant, and other foreign currencies).

APPENDIX 1: MANDATORY REQUIREMENTS FOR PROPOSED PERSONNEL

1) **Project Manager**

(i) The Bidder's proposed Project Manager should be provided by the Bidder's Authorised Representative.

(ii) The general professional experience of the Project Manager shall be at least 20 years.

(iii) Experience as Project Manager of underground structures: minimum two eligible type 1 projects.

(iv) Experience in designing LRT systems: minimum one eligible type 2 project.

(v) The Project Manager shall be based in Israel during the course of the Project. In addition, the Bidder shall ensure that either:

a) The Project Manager is fluent in both English and Hebrew (spoken, reading); or

b) The Project Manager is fluent in English only. In this case, a **Deputy Project Manager** shall be designated from within the projected staff, being a person based in Israel who is fluent in both English and Hebrew (spoken, reading).

2) **Tunnelling design manager**

(i) The tunnelling design manager shall have at least 15 years general professional experience.

(ii) Experience as tunnelling and design manager (or similar) of underground structures (tunnels and/or caverns): minimum two eligible type 1 projects.

3) **MEP design manager (including Tunnel safety Systems/Equipment design Manager)**

(i) The MEP design manager shall have at least 15 years general professional experience.

(ii) Experience as **MEP design manager** (or similar) of underground structures (tunnels and/or caverns): minimum two eligible type 2 projects.

4) **Chief architect**

(i) The Chief architect shall have at least 15 years general professional experience and at least 10 years' experience in public buildings and infrastructure projects.

(ii) Experience as Chief Architect (or similar) of underground stations (relates to LRT/Metro stations of both types, underground and cut and cover): minimum four of those stations.

5) **Deputy Project Manager**

The Deputy Project Manager (where relevant) shall be fluent in English and Hebrew (spoken, reading) and shall have 10 years' experience in infrastructure projects.

Note: The Deputy Project Manager may also hold another position in the proposed personnel.

6) **Design and Interface coordinator**

The design and interface coordinator shall have experience of at least 3 projects in the role of design and interface coordinator on LRT/Metro projects and at least 10 years' experience.

7) **Tunnel safety expert**

(i) 15 years' experience in transportation underground projects

(ii) Safety planner for at least 2 previous projects (implemented and opened to public) each comprising at least two eligible type 1 projects.

8) **Geologist**

More than 10 years' experience in the role of geologist, of which at least 2 in Israel.

9) **Geotechnical tunnelling engineer**

10 years' experience in tunnelling, in the role of geotechnical engineer with at least 3 eligible type 1 projects.

10) **Statutory architect**

(i) Israeli registered architect

(ii) 10 years' experience in infrastructure projects, with at least 10 projects in urban environment, each of them with a construction value of over 5 M NIS.

11) **Ventilation expert (ventilation/smoke exhaust systems for stations and tunnel);**

10 years' experience in tunnel infrastructure projects in the role of ventilation expert, with at least two eligible type 2 projects.

12) **Structural design manager**

10 years' experience with at least 5 years' experience in infrastructure projects in the role of structural design manager.

13) **Traffic engineer**

5 years' experience in the role of traffic engineer.

14) **Passenger flow expert;**

15 years' experience in the analysis of crowd behaviour in enclosed spaces with at least 3 projects involving metro, underground or surface, stations, in the role of passenger flow expert.

15) **Station building services manager (MEP, HAVC)**

10 years' experience with at least 5 years' experience in infrastructure projects in the role of building services manager or similar for a Metro, underground or surface, station.

16) **Safety expert**

10 years' experience in the field of safety officer and/or safety designer in underground projects.

16') **Security expert**

10 years' experience in the field of security in large urban infrastructure projects.

17) **Fire safety engineer**

10 years' experience in the field of fire safety or fireman officer

18) **Quantity Surveyor/ Cost estimator**

10 years' experience as quantity surveyor/ cost estimator with at least 3 underground metro project estimator with at least one station per project.

19) **Construction manager**

(i) The general professional experience of the construction manager shall be at least 20 years.

(ii) Experience as construction manager of underground structures: minimum two eligible type 1 projects.

(iii) Experience in construction of the LRT systems: minimum two eligible type 2 projects.

(iv) The construction manager shall be fluent in English.

(v) The construction manager shall be based in Israel during the course of the construction phase.

20) **Supervisor for civil and architectural works**

(i) 15 years' experience in urban infrastructure projects

(ii) Supervisor for civil and architectural works or similar position for at least 2 previous eligible type 1 projects (implemented and opened to public).

21) **Supervisor for MEP and LRT integration works**

(i) 15 years' experience in urban infrastructure projects as supervisor for MEP or system transportation works or similar position

(ii) Supervisor for MEP and LRT integration works or similar position for at least at least 2 previous eligible projects type 2 (implemented and opened to public).

22) **Quality Assurance Manager**

(i) 10 years' experience in urban infrastructure projects as quality assurance manager or similar position

(ii) Quality assurance manager for at least 2 previous urban infrastructure projects (implemented and opened to public)

23) **Health & Safety coordinator**

(i) Israeli certified Health & Safety coordinator

(ii) 15 years' experience in urban infrastructure projects as Health & Safety coordinator

(iii) Health & Safety coordinator for at least 2 previous urban infrastructure projects (implemented and opened to public)

24) **Planning Manager**

(i) 10 years' experience in urban infrastructure projects as planning manager or similar

(ii) Planning Manager or similar for at least 2 previous urban infrastructure projects (implemented and opened to public)

Note: The following definition shall apply:

- **Eligible type 1 project** (for civil engineering works): either
  - 1.an urban road or rail tunnel of at least 1 km in length or
  - 2. an underground metro or LRT station (either cut and cover or cavern);
- **Eligible type 2 project** (for transportation safety & equipment in tunnels and underground stations): a metro or underground LRT or urban rail tunnels, of at least 2 km in length and comprising at least one underground station;

APPENDIX 2: CONSULTANT'S ORGANISATION

1) The Consultant shall have an office in Jerusalem for the duration of the Basic Assignment. The mandatory full-time presence in Israel is required, by phase as follows:

Personnel	Phases where full time presence in Jerusalem is mandatory
Project Manager	preliminary design; basic design; detailed design,
Deputy Project manager, if any	preliminary design; basic design; detailed design
Statutory architect	preliminary design; basic design; detailed design
Design and Interface coordinator	preliminary design; basic design; detailed design

2) The following will be required at weekly/fortnightly meetings with JTMT or with the Blue Line Consultant:

Personnel	Phases were full time presence in Jerusalem is mandatory
Tunnelling design manager	preliminary design; basic design;
Tunnel safety expert	basic design;
MEP design manager	basic design;

3) All other key personnel will be required to attend meetings with JTMT or with the Blue Line Consultant, as a function of the meeting's agenda, at monthly meetings.

APPENDIX 3: PRELIMINARY FUNCTIONAL PROGRAMME FOR UNDERGROUND STATION

1. AIM

The purpose of this document is to set out general information necessary to the station design, concerning the technical, operation, safety/security room programme, the dimensioning of the platforms, the number and the arrangement of the points of access, the accessibility to the station for mobility impaired persons.

Note: This preliminary Functional Programme is indicative and shall be updated and completed by the Consultant during all design stages.

2. STANDARDS

The station design will be carried out according to the following standards (this list is non-exhaustive):

- Israeli Standard : SI 545 January 2006 " Fixed Guideway Transit and Passenger Rail Systems : Fire safety requirements " (NFPA 130, 2000 version),
- Israeli Standards applicable to the safety for rail systems : SI 1227, SI 5350, SI 50119, SI 62128,
- Israeli Standard : SI 921 " Non-combustible construction materials",
- Israeli Standard : SI 931 " Fire resistance ",
- Israeli Standard : SI 755 " Smoke density for construction materials ",
- American standard : ASTME 662-1994 (American Society for Testing and Materials) smoke density for other materials,
- American standards: NFPA 271 or ASTME 1354 "Rate of Heat".

3. ACCESSIBILITY FOR MOBILITY IMPAIRED PERSONS

Mobility impaired persons include in particular wheelchair users, blind or visually impaired persons, deaf or hearing impaired persons, as well as pregnant persons, the elderly, persons with pushchairs or bulky objects such as luggage.

The aim is to ensure their mobility inside the station following the route used by the others passengers, the accessibility to the train as well as to the station equipment (e.g.: ticket vending machines, access control gates,

In lateral platforms and stations with a concourse level, two lifts (or one big capacity lift) will serve the concourse level from the street and two additional lifts (located in the paid area) will serve each platform from the concourse level. This configuration obliges all passengers using the lifts to go through the access control gates, located at the concourse level, for accessing the platforms.

In central platform station, the number of lifts can be reduced by using big capacity lifts, one lift from the street level to the concourse level, then passing through the access control gates another lift to the platform level.

4. ACCESS TO THE STATIONS

The points of access to the stations must allow connecting the street to the platform level (through a concourse level if required). They are the connection between the city and the transportation system. The visibility of the points of access to the station and thus their location, will be designed according to the characteristics of the relevant urban site.

The points of access to the transportation system consist of staircases connecting from the street to the platforms via the concourse level.

The preferable arrangement of each staircase will be composed of a fixed stair and at least one escalator.

The rule for the location of climbing/descending escalators is as follows:

- Height ≥ 4.50 m : one climbing escalator only,
- Height ≥ 7.00 m : one climbing and one descending escalators,

A. Fixed stairs

The fixed stairs will be composed of parts not exceeding 25 continuous steps and a landing of 1.50m long. Each step is 0.30m wide and 0.16m high.

The minimum fixed stair width is 1.40m (finished width

B. Escalators

As already indicated above, the escalators will be installed so as to provide a passenger a means of mechanised travel in the up/down direction from the street level to the platform level. The escalators will be as much as possible placed beside a fixed stair. This configuration is most appropriate for the passengers, as they can use the fixed stair in case of escalator breakdown or maintenance.

The escalator free width shall be to 1.00m, and the inclination 30°.

C. Elevators

According to the station typology, two kinds of lifts can be envisaged: 8 persons lifts for the lateral platforms stations and 13 persons lifts for the central platform stations.

A free space of 1.50m x 1.50m has to be provided in front of the lifts inside the station as well as at street level. Lift doors shall have a minimum clear width of 0.915m.

D. Corridors

According to the NFPA130 standard, the minimum corridor width is 1.12m. When the corridor is located between two walls, 0.30m shall be deducted at each sidewall.

For the project, the minimum corridor width is fixed to 1.40m, thus 2.00m for corridor between two walls, and 1.70m with only one sidewall.

5. ATRIUM

The atrium is the place of convergence of all passengers getting in or getting out of the station. It is composed of:

- An area of free access in connection to the street / city,
- An area under control where the connections to the platforms are organized.

The boundary between both areas is created by the location of access control gates. These two distinct areas introduce the notion of a “Paid Area” and an “Unpaid Area ".

The ticket vending machines shall be located in the unpaid area. In the paid area, the passengers shall have their travel ticket validated.

The best location of the atrium is at the concourse level. The atrium will be an area large enough where the passengers will find all the services necessary to their travel. The ticket vending machines and the access control gates in the atrium will be located so as to ensure the passengers enough comfort, and no hindrance to passenger flows.

Advertising panels could be installed in the atrium without disrupting the visibility of station equipment (video cameras, signage …).

An operation room (SAR) will be provided at the station agent’s disposal in the unpaid area. The surface area of the room will be 15 m^2 for passenger information / assistance, station control / supervision, safety, vending desk… This operation room will be easily visible for passengers entering the station, and will ensure the station agent has overall visibility of the atrium, in particular the control access gates (glass walls are required). The air conditioning system will be installed in this room.

6. ACCESS CONTROL GATES

The access control gates will clearly show the boundary between the paid and unpaid areas in the atrium, at concourse level. They will control the validity of the transportation tickets of passengers getting in and getting out of the station and ensure the passage of the Mobility Impaired Persons as well as of the safety services (a 1.50m wide specific door, will be provided for the firemen).

The location of the access control gates will be, as much as possible, perpendicular to the main passenger flows entering the station. There shall be no obstacles located at less than 3.00 m at each side of the access control gates. In front of the control gates, a minimum distance of 5.00 m is required between the gates and the structures (e.g.: wall, stair.

The number of access control gates shall be determined according to the ridership for each station in nominal operation. This fare gate number shall be checked in emergency conditions (time calculations for station evacuation).

7. PASSENGERS’ ROUTE INSIDE THE STATIONS

The passengers’ route inside the station will be designed according to the egress route from the platforms to the street level. At least two means of egress remote from each other shall be provided from each station platform, i.e. two separate egress routes to a point of safety (street level in most cases).

8. PLATFORM SIZE

As an input data, the net (free) length of the platform is 70 m (free length).

Platform width: in accordance with the NFPA 130 standard, 0.30 m shall be deducted at each sidewall. The platform screen doors can be considered as a side wall, so 0.60 m will be added to the free platform width. For the installation of the platform screen doors an additional 0.40m width has to be taken into account.

In the case of platform edges open to the train way, 0.45 m shall be deducted.

The total platform width will be determined as follows:

- Side platform width with PSD : free platform width + 1.00 m,
- Side platform width without PSD : free platform width + 0.75 m
- Central platform width with PSD: free platform width + 2.00 m (a 2 x 0.30 m additional width is considered in the middle of the platform for benches, information panels …).
- Central platform width without PSD: free platform width + 1.50 m (a 2 x 0.30 m additional width is considered in the middle of the platform for benches, information panels …).

The dimensioning of the platforms (platform width, as the length is already fixed) is carried out according to the following criteria:

- The free surface area of a platform will be calculated taking into account a ratio of 2 p/m2 (passenger comfort condition in normal operation),
- The headway,
- The hyper peak hour coefficient ,
- The safety coefficient (operation disruption).

Note that, whatever the results of platform width calculations, the minimum free side platform width is fixed to 3.00 m and 4.00 m for free central platform width. In case of location of stairs inside the platform area, the minimum required distance between the handrail of the stairs and the PSD or platform edge is 1.50 m.

9. ACCESS DIMENSIONING

The dimensioning of points of access for emergency situations will be carried out according to the NFPA 130 Standard:

- The platform occupant load shall be evacuated from the station platform(s) in 4 minutes or less,
- The station occupant load shall be evacuated to a point of safety in 6 minutes or less.

As indicated in § 8, at least two means of egress remote from each other shall be provided from each station platform, i.e. two separate egress routes to a point of safety. Thus, a minimum of two staircases will be considered for accessing each platform (lateral or central platform), as well as for accessing the concourse level from the street.

10. STATIONS ROOMS

In the underground station there are 3 types of rooms:

- The operation rooms,
- The technical rooms,
- The safety / security rooms.

A. Operation rooms

The operation rooms include the maintenance rooms for the stations as well as the rooms dedicated to the station staff for operating the stations.

- Station Agent Room (**SAR**) :
  - Purpose: operation room at the station agent's disposal in the unpaid area for passenger information / assistance, station control / supervision, safety, vending desk, etc.
  - Characteristics: the room shall be easily visible for passengers entering the station, and will ensure to the station agent an overall visibility of the atrium, in particular the control access gates (glass walls are required). An air conditioning system will be installed in this room.
  - Surface area = 15 m^2,
  - Height = 2.30 m minimum,

- Station Agent Toilet (**SAT**) :
  - Purpose: the toilets are provided only for station agents during their presence in the station.
  - Characteristics: toilets will be provided for male and female agents: WC and washbasin for female agent; WC, urinal and washbasin for male agents. Ventilation systems will be installed in both toilets.
  - Surface area = 8 m^2,
  - Height = 2.30 m minimum,
- Cleaning Room (**CLR**) :
  - Purpose: enables the storing of cleaning products and cleaning equipment such as cleaning machines.
  - Characteristics: this room requires natural or mechanized ventilation.
  - Surface area = 15 m^2,
  - Height = 2.30 m minimum,
- Water Meter Room (**WMR**) :
  - Purpose: arrival of the water supply from the utility company to the station and location of the water meter, as well as the water distribution system for the station.
  - Characteristics: the room should be located at the concourse in the unpaid area so that the utility company agent can read the water meter without passing through the access control gates.
  - Surface area = 5 m^2.
  - Height = 2.30 m minimum.

- Trash Room (**TRR**) :
  - Purpose: houses the bins for trash storage.
  - Characteristics: preferred location at the concourse level. This room requires natural or mechanized ventilation
  - Surface area = 5 m^2,
  - Height = 2.30 m minimum.
- Marketing Room (**MAR**) :
  - Purpose: houses the equipment such as panels, for commercial, entertainment events in the station.
  - Characteristics: preferred location at the concourse level.
  - Surface area = 15 m^2,
  - Height = 2.50 m minimum.
- Spare Part Storage Room (**SSR**) :
  - Purpose: houses the finishing equipment such as tiling, painting, neon tubes, electrical bulbs, ladder, etc…
  - Characteristics: preferred location at the concourse level.
  - Surface area = 15 m^2,
  - Height = 2.50 m minimum.

B. Technical rooms

The technical rooms include all the rooms ensuring the technical operation of stations as well as of the tunnel.

The technical rooms will be fitted out according to the regulations relative to the work safety and the fire strategy, in particular for technical rooms with fire risks.

The technical rooms are divided into two kinds: the LRT system rooms and the non-LRT system rooms.

1. LRT system technical rooms

- High Voltage Rooms (**HVR**) :
  - Purpose: ensures the transformation of high voltage in low alternative voltage for providing electrical supply needed for the equipment and facilities of stations and the tunnel.
  - Characteristics: accessibility to be provided to this room from the street level with the possibility of parking a truck for handling the equipment, in particular the transformers.
- Transmissions and Telecommunication equipment Room (TTR) :
  - Purpose: ensures the electrical supply and the transmission of the control data to the CCR (Central Command Room located in the depot) of equipment such as public address system, passenger information, video camera, access control gates, … , and secures the continuity of the functioning of systems linked to safety.
  - Characteristics: the TTR has to be located far from the HVR and LVR in order to avoid electromagnetic interferences between high/low voltage and very low voltage. An air conditioning system will be provided in this room.

- Track Signalling Room (**TSR**) :
  - Purpose: houses the technical equipment relative to the signalling / circulation of the trains.
  - Characteristics: the TSR are located close to the shunting zones (mechanized crossovers, turnouts).
- Traction Energy Room (**TER**) :
  - Purpose: houses the transformers and rectifiers necessary to transform high voltage to direct current for the traction energy of trains. Other equipment as such circuit breakers, disconnectors are also located in this room. .
  - Characteristics: air conditioning system will be provided in that room.

2. Non-LRT system technical rooms

- Inverter Room (**INR**) :
  - Purpose: inverters ensure the transformation of low alternative voltage in direct voltage for the electrical supply of station-specific equipment (lifts, for instance), in case of electrical failure.
  - Characteristics: The INR has to be located as much as possible close to HVR. An air conditioning system will be provided in this room.
- Batteries Room (**BAR**) :
  - Purpose: in case of low voltage loss, ensures the electrical supply of equipment such as ATC (Automatic Train Control), communication systems, fire detection, … This room will also house the safety address system.
  - Characteristics: the BAR has to be located as much as possible close to LVR and INR. An air conditioning system will be provided in this room without any extension required of the proposed surface area.
- Pumping Room (**PUR**):
  - Purpose: this room will collect all the water coming from rooms equipped with a water point (cleaning room, for instance), from the cleaning of points of access, from rain, and from the toilets (sewage has to be treated before evacuation to the sewer). The PUR will ensure the evacuation of the water to the main sewer with the aid of, at least, two pumps.
  - Characteristics: the PUR shall to be located at the low point of the station. A pit is necessary to store the water before pumping to the main sewer.
  -
- Escalator Room (**ESR**) :
  - Purpose: houses the electrical board in a specific technical room.
  - Characteristics: the room should be located as much as possible at the upper level of the escalator. A ventilation system will be provided in this room.

- Escalator Cubicle (**ESC**) :
  - Purpose: the electrical board is located in a cubicle. This will be the preferred solution as it can be easily integrated in the station and requires less room.
  - Characteristics: the cubicle should be located as much as possible at the upper level of the escalator.

- Lift Room (LIR) :
  - Purpose: houses the electrical board in a specific technical room.
  - Characteristics: the room should be located as much as possible at the lower level of the lift, except at street level. A ventilation system will be provided in that room.

- Lift Cubicle (**LIC**) :
  - Purpose: the electrical board is located in a cubicle. This will be the preferred solution as it can be easily integrated in the station and required less room.
  - Characteristics: the cubicle should be located as much as possible at the lower level of the lift.

- Air Conditioning Room (**ACR**) :
  - Purpose: ensures the ventilation and the renewal of cool air in the stations in order to provide suitable temperature for the passengers in the stations.
  - Characteristics: the ACR should be located at the concourse level. Air conditioning units will be located in this room.

C. Commercial area

- The design for the underground stations may include retail or commercial areas. Such areas are not mandatory. Any retail areas included in the design shall be ancillary to the main function of the underground stations and shall not infer with the safe and efficient flow of passengers to and from the platform areas to the street level.
- The design for retail areas shall take into account:
  - servicing of each retail unit (materials delivered to unit and waste materials to be take away)
  - staff welfare facilities
  - emergency escape
  - all mechanical and electrical requirements
  - the opening hours of the station (stations will be open late at night)
  - flexibility of layout for different configurations of the retail area
  - the efficient use of any 'dead-end' space in the design

D. Safety / Security rooms

- Fire Brigade Room (**FBR**) :
    - Purpose: this room houses the equipment required by firemen in case of emergency intervention (for instance, manual control of the tunnel / station ventilation / smoke exhaust systems).
    - Characteristics: has to be located close to the SAR at the concourse level, and to be equipped with telecom equipment for communication with LRT CCR and Firemen CCR.
    - Surface area = 6 m^2,
    - Height = 2.30 m minimum,

- First Aid Room (**FAR**):
    - Purpose: this room houses the first aid equipment in case of emergency.
    - Characteristics: has to be located close to the SAR at the concourse level, and to be equipped with telecom equipment for communication with LRT CCR and Firemen CCR,
    - Surface area: 10 m^2,
    - Height = 2.30 m minimum,

- **Security requirements:** refer to Appendix 4 to the TOR: Security guidelines for design below.

APPENDIX 4: SECURITY GUIDELINES FOR DESIGN

NOTE: This guideline is indicative only and shall be updated and completed by the Consultant during all design stages.

1. GENERAL

a) Lockable roller shutters shall be installed at the entrances to the underground station(s). The exact locations will be determined during design stages although the preferred location should be as close as possible to street-level in order to prevent undesirable elements from entering the locked station.

b) Ventilation shaft openings shall be located at three meters above ground level. They shall have a lockable screen/louver that will not only prevent people from entering through the shafts but also keep anything larger that 5cm x 5cm from being introduced into the system.

   i. A damper shall be installed inside each shaft so that it can be closed in an emergency and the station can be hermetically sealed and no external air be allowed to enter.

   ii. If possible, the immediate vicinity of the shafts (2m radius) should be clear of objects that would make it possible to climb up to the opening.

   iii. The underground portion of the shafts shall include as a minimum one 90° angle "elbow".

c) Hardening of the stations: The stations must be designed and constructed so that the ceiling will not collapse after explosion. The relative threat scenario will be provided by the Security Authorities.

d) Entrances to the underground stations:

   i. Checking/screening area located 9 meters from escalators at entrance area (3m of run-off, 6m of queuing and security checks), must be covered by a roof.

   ii. The exterior surface of the roof should be sloped in order to minimize the possibility of placing objects on top (outside direction, not inside slope).

e) Both sides of the entrance area should be closed in a manner that prevents the possibility of accessing the entrance area from both sides.

f) The lateral and the back sides of the stairs/escalators peer should be closed in a manner that prevents people from jumping/throwing objects.

g) The width of the entrance area shall be divided into “exit” part and ‘entrance” part.

h) Infrastructure for power and communication supply will be designed for metal detector gates and/or X-ray machines that may be requested at street level.

i) At each underground station a security room of 4x4mrs is to be provided.

2. TUNNELS

a) There shall be security doors at each tunnel portal.

b) The space between the tracks and the tunnel wall, on both sides, shall be blocked with metal bollards that are strong enough to prevent a vehicle transporting a car-bomb from charging into the tunnels but which can be removed and/or folded over and/or retracted so that emergency vehicles can gain access.

c) A one-way spike barrier shall be installed at the tunnel portals, between the tracks in order to prevent a vehicle transporting a car-bomb from charging into the tunnel. It must be possible to neutralize the spike barrier, such as covering it with a metal strip, so emergency vehicles can gain access.

d) Ventilation shafts inside the tunnel – see point 1b) above.

e) When ventilation shafts are provided at tunnel portals, their openings shall have a lockable screen of heavy-duty wire mesh that will not only prevent people from entering through the vent shafts but also keep anything larger that 5cm x 5cm from being introduced into the system.

APPENDIX 5: PRELIMINARY RISK MANAGEMENT PLAN AND RISK REGISTER

1. INTRODUCTION

1.1 AIM

a) This document gives an overview of the Risk Management Plan (RMP) that shall be implemented by the Consultant, for JTMT's approval.

b) The Preliminary Risk Management Plan and the Risk Register (RR) table shall form part of the Bid and shall be updated where necessary by the Consultant. By this document, the Consultant shall show how the performance of the Services will comply with all requirements which are set out in the General Conditions of Contract and the TOR in relation to Risk Management.

c) The RMP shall include the preliminary risk register.

1.2 SCOPE

The Employer's requirement requires of the consultant to produce a distinct Risk Register (RR) for the design and Construction risks. Two types of RR's are to be produced:

a) During the various design stages the Consultant shall produce, for the risk sources of External Context, distinct RR's for technical design risks and for technical construction risks;

b) For the procurement process (Construction RFP) the consultant shall provide a Preliminary Risk Management Plan with its Risk Register, which shall refer only to construction risks of External Context and which will clearly indicate those risks explicitly transferred to the Contractor.

1.3 APPLICABLE STANDARDS

For the preparation of the RMP, the Consultant shall follow-up the requirements of the following standards:

- ISO 31000:2009
- ISO Guide 73:2009
- ISO 31010:2010
- International Tunnelling Association's (ITA) Guidelines for tunnelling risk management: Working Group No 2 (2004)

1.4 RISK APPRECIATION PROCESS

The risk appreciation process, as defined by ISO 31000:2009, shall include the following mandatory chapters:

- Bid Risk Register format and content presentation
- Risk Identification process
- Risk Analysis process
- Risk Evaluation process
- Risk Treatment

1.5 TERMINOLOGY (ISO 31000)

1.5.1 Risk

Effect of uncertainty on objectives	
Note 1	An effect is a deviation from the expected — positive and/or negative.
Note 2	Objectives can have different aspects (such as financial, health and safety, and environmental goals) and can apply at different levels (such as strategic, organization-wide, project, product and process).
Note 3	Risk is often characterized by reference to potential events (2.19) and consequences (2.20), or a combination of these.
Note 4	Risk is often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated likelihood (2.21) of occurrence.
Note 5	Uncertainty is the state, even partial, of deficiency of information related to, understanding or knowledge of an event, its consequence, or likelihood.

1.5.2 Risk identification

Process of finding, recognizing and describing risks (2.1)	
Note 1:	Risk identification involves the identification of risk sources (2.18), events (2.19), their causes and their potential consequences (2.20).
Note 2:	Risk identification can involve historical data, theoretical analysis, informed and expert opinions, and stakeholders' (2.15) needs.

1.5.3 Risk context

External context:	external environment in which the organization seeks to achieve its objectives Note External context can include: - the cultural, social, political, legal, regulatory, financial, technological, economic, natural and competitive environment, whether international, national, regional or local; - key drivers and trends having impact on the objectives of the organization; and - relationships with, and perceptions and values of, external stakeholders (2.15).
Internal context:	internal environment in which the organization seeks to achieve its objectives Note Internal context can include: - governance, organizational structure, roles and accountabilities; - policies, objectives, and the strategies that are in place to achieve them; - the capabilities, understood in terms of resources and knowledge (e.g. capital, time, people, processes, systems and technologies); - perceptions and values of internal stakeholders; - information systems, information flows and decision-making processes (both formal and informal); - relationships with, and perceptions and values of, internal stakeholders;

- the organization's culture; - standards, guidelines and models adopted by the organization; and - form and extent of contractual relationships.

Please note that there are external context risk sources which can generate internal context risks. Notably the external context of an economic situation may lead to a lack of competent personnel.

1.5.4 Degree of Confidence

a) Please note that the absence of information does not modify the risk. In this case, the level of confidence allocated for respective risk is rated accordingly during the performance of the risk assessment. **Despite any ambiguity, please note that site investigations are not considered as a mitigation measure!**

b) Definition of each degree of confidence depends on the volume of information and the complexity of the situation.

2. RISK MANAGEMENT PROCESS

a) The RMP is the reference document for the production of the RR.

b) The RMR shall be updated on a monthly basis and every time:

- An event occurs,
- New information is available,
- A new appreciation of an existing risk is made.

3. ORGANISATION OF THE RISK REGISTERS

3.1 GENERALITIES

a) The present chapter presents the format of the preliminary risk register to be used by the Consultant in the preparation of the Bid.

b) The terms of the risk register refer to ISO 31000:2009 terminologies.

c) Please note that the risk register is a method of listing the risks by risk source.

3.2 LIST OF REGISTERS

3.2.1 Scope of contract

a) Two distinct risk registers shall be managed by the Consultant as follows:

- Design risk register (during the design phases),
- Construction risk register.

b) Only risk sources generated by the External Context are to be included in both registers.

c) The construction risk register shall not include any risk sources of Internal Context.

3.3 HEADER

a) A risk register shall apply to a specific project which is defined by geometry, location and construction method.

b) When alternative designs or construction methods are to be assessed, a distinct risk register shall be established to determine the risk profile of each alternative.

c) The risk register shall be updated on an iterative process during each phase (design and construction). A specific numbering system shall be implemented for each phase and for each version of the risk register.

d) The risk criteria shall be referenced in the header. The risk criteria and/or risk matrix may evolve during the Project and could generate financial or time implications which may modify JTMT's risk attitude.

e) The reference Risk Register shall refer to risk treatment measures which have already been implemented. When the "as low as reasonably practicable" principle (ALARP) is applied, a distinct risk register shall be produced, together with proposed risk treatment measures and associated costs.

f) A risk register shall refer either to internal context risk sources (risks under contractor(s)'s responsibility) or to external context risk sources (risks which are not under contractor(s)'s responsibility). (Note: Internal risks which relate to JTMT, its representatives or the Consultant are not required. Furthermore, Internal Risks of the contractor are to be identified only in as much as the risk could be so important as not to be manageable by the Contractor).

3.4 TABLE

The risk register shall include the following columns. Some columns refer to the registers produced during the design phases (the design and the construction risk registers) and others refer solely to the columns relative to the procurement and surveillance of the construction contract:

3.4.1 Risk identification (design and procurement phases)

1) Context
    a. Context type
    b. Category
    c. Sub category
2) Risk
    a. Risk Source
    b. Assessed by
    c. Risk pilot
    d. Cause and Event
    e. Risk number

3.4.2 Raw Risk analysis (design phase only)

1) Consequence
2) Likelihood (probability or frequency in project period)
3) Impact of raw risks on the following objectives (impact classification)
    a. Workers
    b. Third party corporal damage

c. Cost to owner
d. Cost to third party
e. Environmental
f. Delay
g. Performance

3.4.3 Raw Risk Evaluation (design phase only)

1) Risk level
2) Degree of confidence
3) Acceptability of the risk

3.4.4 Raw Risk treatment (design phase only)

Risk treatment options can include the following actions:

a. Avoiding the risk by deciding not to start or continue with the activity that gives rise to the risk;
b. Taking or increasing the risk in order to pursue an opportunity;
c. Removing the risk source;
d. Changing the likelihood;
e. Changing the consequences;
f. Sharing the risk with another party or parties (including contracts and risk financing) after JTMT's approval;
g. Retaining the risk, after JTMT's approval.

3.4.5 Residual Risk analysis (design and procurement phases)

1) Consequences (remaining)
2) Impact of residual risks on the following items:
    a. Workers
    b. Third party corporal
    c. JTMT's costs
    d. Third party's costs
    e. Environmental
    f. Delay
3) Risk level
4) Degree of confidence

3.4.6 Evaluation of residual risk (design and procurement phases)

Acceptability level of the residual risk as per risk matrix

3.4.7 Risk treatment of residual risks (procurement phase only)

1) Provisional works in case of pre-emptive detection during the works
2) Remedial action after risk materialises

3.4.8 Risk Transfer (procurement phase only)

1) Transfer thresholds
2) Risk owner

4. RISK IDENTIFICATION PROCESS

4.1 SCOPE

ISO 31000 defines the scope of risk identification as follows:

Risk identification:	*Process of finding, recognizing and describing risks (2.1)*
Note 1:	*Risk identification involves the identification of risk sources (2.18), events (2.19), their causes and their potential consequences (2.20).*
Note 2:	*Risk identification can involve historical data, theoretical analysis, informed and expert opinions, and stakeholders' (2.15) needs.*

Extract from chapter 5.4.2 of ISO 31000:

The organization should identify sources of risk, areas of impacts, events (including changes in circumstances) and their causes and their potential consequences. The aim of this step is to generate a comprehensive list of risks based on those events that might create, enhance, prevent, degrade, accelerate or delay the achievement of objectives. It is important to identify the risks associated with not pursuing an opportunity. Comprehensive identification is critical, because a risk that is not identified at this stage will not be included in further analysis.

Identification should include risks whether or not their source is under the control of the organization, even though the risk source or cause may not be evident. Risk identification should include examination of the knock-on effects of particular consequences, including cascade and cumulative effects. It should also consider a wide range of consequences even if the risk source or cause may not be evident. As well as identifying what might happen, it is necessary to consider possible causes and scenarios that show what consequences can occur. All significant causes and consequences should be considered.

The organization should apply risk identification tools and techniques that are suited to its objectives and capabilities, and to the risks faced. Relevant and up-to-date information is important in identifying risks. This should include appropriate background information where possible. People with appropriate knowledge should be involved in identifying risks.

The risk identification process shall provide all necessary inputs for the completion of the following risk register fields:

1) Risk source definition
    a. Source context
    b. Category
    c. Sub category
2) Description of the source of risk

3) Risk identification
    a. Risk pilot (person tracking the risk)
    b. Event description
    c. Consequence description
    d. Risk number

4.2 COLUMN CONTENT

4.3 RISK SOURCE DEFINITION

A Risk Source shall be related to an Internal or External Context. The Risk Source context is subdivided into categories and sub categories as below:

4.3.1 Internal Context risk sources

i. Equipment issues
   a. reliability
   b. fit for purpose
ii. Material issues
   a. quality
   b. storage
iii. Human issues
   a. competence
   b. workmanship
   c. communication skills
iv. Management
   a. competence
   b. organization
   c. other

4.3.2 External Context risk sources

i. Regulatory and legal constraints
   a. law and regulations
   b. codes and standards
ii. Administrative procedures
   a. authorizations
   b. applicable courts
iii. Macroeconomic
   a. labour availability
   b. material availability
   c. inflation
   d. exchange rate

iv. Ground conditions
   a. lithological
   b. properties (Geotechnical)
   c. hydrological
   d. anthropogenic
v. Existing structures
   a. position
   b. vulnerability
vi. Climatic
   a. rain
   b. floods
   c. winds
vii. Social
   a. public access (to homes or work place)
   b. public services (transport, rescue, etc.)
   c. environmental disturbances (sound, dust, etc.)

d. social events (marathons, national day celebrations, etc.)

viii. Interface
   a. owner or his representatives
   b. other contracts
   c. utility companies
   d. site access

4.4 DESCRIPTION OF THE RISK SOURCE

a) Any description of a Risk Source shall start with "**uncertainty in…**" and shall represent a major reason of the risk category under consideration.

b) A description of a Risk Source shall not refer in any way to the Project (location or hypothesis).

Examples:

1) uncertainty in the quality of the water
2) uncertainty in the soil's compressibility

4.5 RISK

4.5.1 Risk Pilot

The Risk Pilot is the person nominated by the Consultant who is in charge of tracking the risks.

4.5.2 Cause and Events

a) In accordance with ISO 31000, causes can also be events (the ISO does not give a definition for cause).

b) Events (and causes) refer to a change in circumstances.

c) Events (and causes) can be dynamic or passive.

d) An Event shall:

1) place the Risk Source in the context of the Project as following:
   a. **Location:** above, below, across, etc.;
   b. **Hypothesis:** lower than, harder than, softer than, bigger than, poorer than, faster than, not adapted to, etc.
2) or relate to dynamic situations as following:
   a. **Sudden change:** Fall-in, cave-in, flooding, collapse, loss in, failure, etc.;
   b. **Movements:** Convergence, settlement, etc.;
   c. **Evolution:** deterioration, degradation, wear, decomposition, etc.;
   d. **Quality:** Ovalisation, deviation from alignment, inadequate material, measurements, precision, etc.;
   e. **Work situation:** difficulty in, problem in, etc.

e) Examples relating to project hypotheses:

1) The quality of water is poorer than expected;
2) The soil's compressibility is greater than expected.

f) Examples of cascading events:

1) The abrasivity of the rock is higher than expected giving rise to faster wear of the TBM's cutters;
2) Crossing the lithological levels which induces a mixed face situation with hard rock on bottom half of face thus difficulty in avoiding over-excavation leading to settlement;
3) Crossing an unidentified well inducing loss in face pressure leading to settlement to adjoining structures;
4) Tunnel face cave-in leading to surface settlement;
5) Tunnel temporary support convergence leading to surface settlement;
6) Tunnel temporary support failure leading to surface settlement.

4.5.3 Consequences

a) A description of each consequence is necessary in order to understand the risk analysis. Each consequence of a given event shall be provided with its own likelihood and impact on JTMT's objectives.

b) Consequences can be in cascade

The general consequences to the Project or to the environment (human, built or natural) are as following:

1) **Time**: slower, faster, stoppages, delay in, downtime, etc.;
2) **Quantity (material, plant, manpower or performance)**: more, less, excessive, extra, reduced (more concrete, more polluted muck, more maintenance, reduced penetration rate, over-break, over-excavation, etc.);
3) **Usage**: damage to, closing down of, interruption of, evacuation of, etc.;
4) **Performance**: noncompliance with operating speed criteria, reduction in life expectancy, etc.;
5) **Compensation**: repairs, liquidated damages, etc.

c) Examples of consequences:

1) For an event on the critical path: more maintenance downtime which induces a slower progress rate which leads to delay in handing over the Project;
2) For an event not on the critical path: more maintenance downtime which induces a slower progress rate;
3) Reduction in operating speed of the line;

4.5.4 Risk number

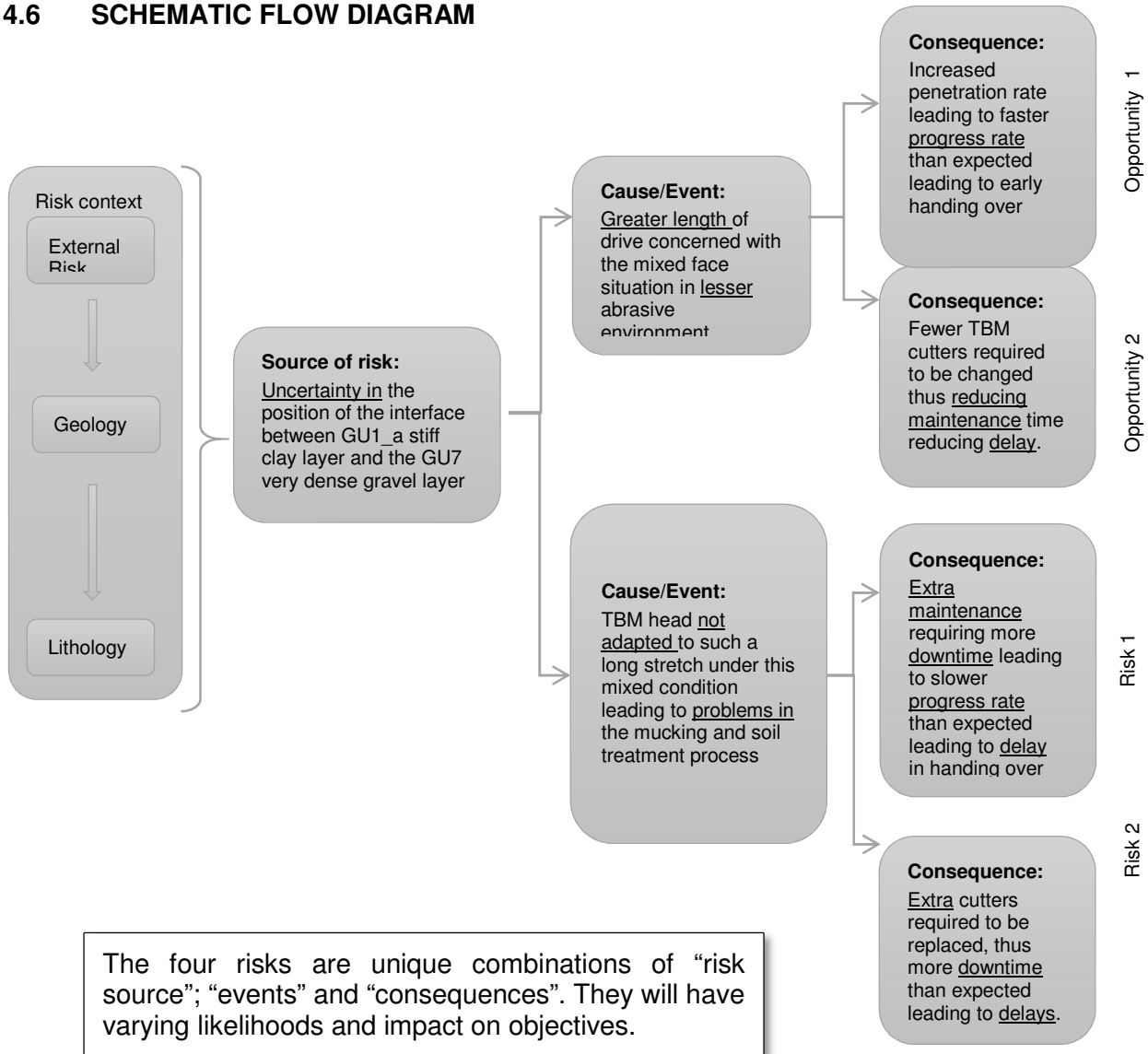
The Consultant shall provide a Project reference for each consequence.

4.5.5 Objectives

There are 6 objectives for which the risks are to be evaluated:

i. Workers' safety
ii. Third party safety
iii. Cost to owner
iv. Cost to third party
v. Environmental
vi. Delay

4.6 SCHEMATIC FLOW DIAGRAM



The four risks are unique combinations of "risk source"; "events" and "consequences". They will have varying likelihoods and impact on objectives.

Risks can often share the same consequences, but because they relate to differing events, they are to be considered distinct.

4.7 QUICK GUIDANCE SHEET

Context of the risk		Risk source	Cause / Event	Consequence
Internal **Equipment issues** Reliability, Fit for purpose, **Material issues** Quality Storage **Human issues** Competence, Workmanship, Communication skills **Management** Competence Organization …	**External** **Political** **Regulatory and legal constraints change** Law and decree Codes and standards **Administrative procedures** Authorizations Applicable courts **Macroeconomic conditions** Labour availability Material availability, Inflation exchange rate **Ground conditions** Lithological properties (Geotechnical) Hydrological Anthropogenic **Existing structures** Position Vulnerability **Climatic** Rain Floods Winds **Social** Public access Public services (transport, rescue, etc.) Nuisances Social events **Interfaces** Owner or his representatives Other contracts Utility companies Site access	Uncertainty in …	**Location:** above, below, across, etc… **Hypothesis:** lower than, harder than, softer than, bigger than, poorer than, faster than, not adapted to, etc. **Sudden change:** Fall-in, cave-in, flooding, collapse, loss in, failure, etc. **Movements:** Convergence, settlement, etc. **Evolution:** Deterioration, degradation, wear, decomposition, etc. **Quality :** Ovalisation, deviation from alignment, inadequate material, measurements, precision **Work situation:** Difficulty in, problem in, etc.	**Time**: slower, faster, stoppages, delay in, downtime, etc. **Quantity (material, plant, manpower or performance)**: More, less, excessive, extra, reduced (more concrete, more polluted muck, more maintenance, reduced penetration rate, over-break, over-excavation, etc.) **Usage**: Damage to, closing down of, interruption of, evacuation of, etc. **Performance**: Noncompliance with operating speed criteria, reduction in life expectancy, etc. **Compensation**: Repairs, liquidated damages, etc.

5. RISK ANALYSIS PROCESS

5.1 SCOPE

a) ISO 31000 defines the scope of the risk analysis process as follows:

Risk analysis:	*process to comprehend the nature of risk (2.1) and to determine the level of risk (2.25)*
Note 1:	*Risk analysis provides the basis for risk evaluation (2.26) and decisions about risk treatment (2.27).*
Note 2:	*Risk analysis includes risk estimation.*

b) Extract from chapter 5.4.3 of ISO 31000:

Risk analysis involves developing an understanding of the risk. Risk analysis provides an input to risk valuation and to decisions on whether risks need to be treated, and on the most appropriate risk treatment strategies and methods. Risk analysis can also provide an input into making decisions where choices must be made and the options involve different types and levels of risk.

Risk analysis involves consideration of the causes and sources of risk, their positive and negative consequences, and the likelihood that those consequences can occur. Factors that affect consequences and likelihood should be identified. Risk is analysed by determining consequences and their likelihood, and other attributes of the risk. An event can have multiple consequences and can affect multiple objectives. Existing controls and their effectiveness and efficiency should also be taken into account.

The way in which consequences and likelihood are expressed and the way in which they are combined to determine a level of risk should reflect the type of risk, the information available and the purpose for which the risk assessment output is to be used. These should all be consistent with the risk criteria. It is also important to consider the interdependence of different risks and their sources.

The confidence in determination of the level of risk and its sensitivity to preconditions and assumptions should be considered in the analysis, and communicated effectively to decision makers and, as appropriate, other stakeholders. Factors such as divergence of opinion among experts, uncertainty, availability, quality, quantity and ongoing relevance of information, or limitations on modelling should be stated and can be highlighted.

Risk analysis can be undertaken with varying degrees of detail, depending on the risk, the purpose of the analysis, and the information, data and resources available. Analysis can be qualitative, semi-quantitative or quantitative, or a combination of these, depending on the circumstances.

Consequences and their likelihood can be determined by modelling the outcomes of an event or set of events, or by extrapolation from experimental studies or from available data. Consequences can be expressed in terms of tangible and intangible impacts. In some cases, more than one numerical value or descriptor is required to specify consequences and their likelihood for different times, places, groups or situations.

c) The risk analysis process shall provide all necessary inputs for the completion of the risk register fields below for the Raw risks and the Residual risks:

1) Likelihood
2) Impacts on objectives
    a. Workers
    b. Third party corporal
    c. JTMT's costs
    d. Third party's costs
    e. Environmental
    f. Delay
    g. Performance Level of Risk
3) Degree of confidence

5.2 COLUMN CONTENT

5.2.1 Likelihood

a) This evaluation of the likelihood of a consequence shall be calculated automatically by using the following formula:

"Likelihood of the event" x "likelihood of the consequence if the event takes place"

b) For determining the level of likelihood, the table below shall be used:

Frequency of occurrence				
Frequency class		Central value	Minimum	Maximum
Very likely	5	1	3/10	3
Likely	4	1/10	3/100	3/10
Occasional	3	1/100	3/1000	3/100
Unlikely	2	1/1000	3/10000	3/1000
Very unlikely	1	1/10000	3/100000	3/10000

c) Please note that an event may have multiples consequences, each consequence with its own likelihood.

d) Example: A particular event can lead to two different consequences: slight damage or severe damage to a building, each consequence with a different likelihood.

5.2.2 Impacts

5.2.2.1 Generalities

There are 5 levels of impact which correspond to the levels of consequences used in the Risk Register:

Consequence	
Disastrous	5
Severe	4
Serious	3
Considerable	2
Insignificant	1

5.2.2.2 Impact on worker safety (not applicable to design risk register)

The level of impact on worker safety shall be determined by using the table below:

		Injury to workers and ermergency crew				
		Disastrous	Severe	Serious	Considerable	Insignificant
Number of fatality	Minimum	10	1	0		
	Maximum	100	10	1		
Number of major injuries	Minimum		10	1	0	
	Maximum		100	10	1	
Number of minor injuries	Minimum				1	0
	Maximum				10	1

5.2.2.3 Impact on third party safety (not applicable to design risk register)

The level of impact on third party safety shall be determined by using the table below:

		Injury to third parties				
		Disastrous	Severe	Serious	Considerable	Insignificant
Number of fatality	Minimum	0				
	Maximum	1				
Number of major injuries	Minimum	10	1	0		
	Maximum	100	10	1		
Number of minor injuries	Minimum			1	0	0
	Maximum			10	1	0

5.2.2.4 Impact on economic loss to third parties (not applicable to design risk register)

The level of impact on economic loss to third parties shall be determined by using the table below:

		Damage or economic loss to third parties				
		Disastrous	Severe	Serious	Considerable	Insignificant
Loss (M€)	Minimum	3	0.3	0.03	0.003	0.0003
	Maximum	30	3	0.3	0.03	0.003

5.2.2.5 Impact on economic loss to owner

a) The level of impact on economic loss to owner generated by the construction risk register shall be determined by using the table below:

		Economic loss to the owner				
		Disastrous	Severe	Serious	Considerable	Insignificant
Loss (M€)	Minimum	30	3	0.3	0.03	0.003
	Maximum	300	30	3	0.3	0.03

b) The level of impact on economic loss to owner generated by the design risk register (i.e. extra costs associated with design issues entailing possible redesign costs for instance) shall be determined by using the table above, with the difference that in this case the values shall be divided by 10.

5.2.2.6 Delay

The level of impact on delay of the construction and/or design risk register shall be determined by using the table below:

		Delay				
		Disastrous	Severe	Serious	Considerable	Insignificant
Month per hazard	Minimum	24	6	2	0.5	0.1
	Maximum	48	24	6	2	0.5

5.2.2.7 Environmental (not applicable to the design risk register)

The level of impact on environment of the construction register shall be determined by using the table below:

	Harm to environment				
	Disastrous	Severe	Serious	Considerable	Insignificant
Guideline for proportions of damage	Permanent severe damage	Permanent minor damage	Long-term effects	Temporary severe damage	Temporary minor damage

6. RISK EVALUATION PROCESS

6.1 INTRODUCTION

6.1.1 Scope

a) ISO 31000 defines the scope of the risk evaluation process as follows:

Risk Evaluation:	*process of comparing the results of risk analysis (2.23) with risk criteria (2.24) to determine whether the risk (2.1) and/or its magnitude is acceptable or tolerable*
Note:	*Risk evaluation assists in the decision about risk treatment (2.27).*

b) Extract from chapter 5.4.4 of ISO 31000:

The purpose of risk evaluation is to assist in making decisions, based on the outcomes of risk analysis, about which risks need treatment and the priority for treatment implementation.

Risk evaluation involves comparing the level of risk found during the analysis process with risk criteria established when the context was considered. Based on this comparison, the need for treatment can be considered.

Decisions should take account of the wider context of the risk and include consideration of the tolerance of the risks borne by parties other than the organization that benefits from the risk. Decisions should be made in accordance with legal, regulatory and other requirements.

In some circumstances, the risk evaluation can lead to a decision to undertake further analysis. The risk evaluation can also lead to a decision not to treat the risk in any way other than maintaining existing controls. This decision will be influenced by the organization's risk attitude and the risk criteria that have been established.

c) The risk evaluation process shall compare the risk levels and compile them into a risk matrix which will allow JTMT to take any decision regarding acceptability of any risk.

d) The following columns of the risk register shall be completed by the Consultant as part of the risk evaluation process:

1. Level of risk, calculated automatically based on the risk analysis;
2. Degree of confidence;
3. Acceptability of the risk, evaluated based on the risk matrix;
4. Actions to be taken, relates to the acceptability of the risk.

6.2 COLUMN CONTENT

6.2.1 Level of risk

a) The risk level shall be calculated automatically by using the following formula:

Likelihood of the event x max (impact level on the objectives)

b) The Consultant shall identify a risk level for each objective. The highest risk level shall be used to sort the risks in a hierarchical manner.

6.2.2 Degree of confidence

The degree of confidence shall be classified in accordance with the following table:

Level	Label	Context	Action
0	No risk analysis as insufficient information exists	No information	Insufficient information to be able to undertake any specific data collection. Systematic information gathering must first be conducted
1	No confidence in the risk analysis may deviate substantially with further information	The available information does not enable an understanding of the context due to the complexity of the situation.	Insufficient information to be able to undertake any specific data collection. Systematic information gathering must first be conducted
2	Very limited confidence in the risk analysis may deviate significantly with further information	The available information could lead to a number of possible interpretations (models)	Site investigations focused on identified uncertainties
3	Limited confidence in the risk analysis may be adjusted with further information	The available information is sufficient to have an appreciation of the situation (a single model) but there remain large uncertainties on the possible amplitudes.	Site investigations focused on identified uncertainties

Level	Label	Context	Action
4	Confident in the reliability of the risk analysis. Change in the analysis unlikely	The available information leaves only marginal uncertainties	No further information necessary as investigations would have to be very extensive to achieve a signficant increase in the confidence level

6.2.3 Acceptability

Acceptability shall be calculated automatically and derive from comparing the risk level with the risk matrix below:

Risk Matrix		Disastrous	Severe	Serious	Considerable	Insignificant
		5	4	3	2	1
Very likely	5	25	20	15	10	5
Likely	4	20	16	12	8	4
Occasional	3	15	12	9	6	3
Unlikely	2	10	8	6	4	2
Very unlikely	1	5	4	3	2	1

6.2.4 Action to be taken

This column shall be calculated automatically and derive from comparing the risk level with the risk matrix below:

Risk Classification	
Unacceptable	The risk shall be reduced at least to "Acceptable" regardless of the costs of risk mitigation.
Unwanted	Risk mitigation shall be identified. The measures shall be implemented as long as the costs of the measures are not disproportional with the risk reduction obtained (ALARP principle). Contingency actions have to be foreseen.
Acceptable	The hazard shall be managed throughout the project. Consideration of risk mitigation is not required. Contingency actions have to be foreseen.
Negligible	No further consideration of the hazard is needed.

7. RISK TREATMENT PROCESS

7.1 INTRODUCTION

7.1.1 Scope

a) ISO 31000 defines the scope of the risk treatment process as follows:

Risk Treatment:	*process to modify risk (2.1)*
Note 1	*Risk treatment can involve:* *– avoiding the risk by deciding not to start or continue with the activity that gives rise to the risk;*

	– taking or increasing risk in order to pursue an opportunity; *– removing the risk source (2.18);* *– changing the likelihood (2.21);* *– changing the consequences (2.20);* *– sharing the risk with another party or parties (including contracts and risk financing); and* *– retaining the risk by informed choice.*
Note 2:	*Risk treatments that deal with negative consequences are sometimes referred to as "risk mitigation", "risk elimination", "risk prevention" and "risk reduction".*
Note 3:	*Risk treatment can create new risks or modify existing risk processes to comprehend the nature of risk (2.1) and to determine the level of risk (2.25)*

b) Extract from chapter 5.4.5 of ISO 31000:

Risk treatment involves selecting one or more options for modifying risks, and implementing those options. Once implemented, treatments provide or modify the controls.

Risk treatment involves a cyclical process of:

– assessing a risk treatment;

– deciding whether residual risk levels are tolerable;

– if not tolerable, generating a new risk treatment; and

– assessing the effectiveness of that treatment.

Risk treatment options are not necessarily mutually exclusive or appropriate in all circumstances. The options can include the following:

a) avoiding the risk by deciding not to start or continue with the activity that gives rise to the risk;

b) taking or increasing the risk in order to pursue an opportunity;

c) removing the risk source;

d) changing the likelihood;

e) changing the consequences;

f) sharing the risk with another party or parties (including contracts.

c) The following columns of the risk register shall be completed by the Consultant as part of the risk treatment process:

4) Adaptations to design;
5) Adaptations to construction;
6) Transfer (when defined in the bidding documents: from owner to Contractor);
7) Threshold of transfer (applies when a transfer is foreseen);
8) Degree of confidence;
9) Exemption from the risk matrix.

7.2 COLUMN CONTENT

7.2.1 Adaptations to design

Description of design measures to be taken during the design phase, in order to mitigate and / or to reduce and /or to eliminate any risks.

7.2.2 Adaptations to construction

Description of measures to be taken during the construction phase, in order to mitigate and / or to reduce and / or to eliminate any risks.

7.2.3 Transfer

a) All external risks are owned by JTMT, if they are not explicitly transferred to contractor(s) as part of the tender documents.

b) All internal source risks are owned by the contractor(s). These are never transferred to JTMT, but they may be transferred to an insurer.

7.2.4 Threshold of transfer

a) When a risk is transferred to the contractor(s), this shall be specified in the tender documents.

b) Example: Settlement threshold.

When settlement is under the threshold, any damage which may occur will be borne by JTMT, when settlement is above the threshold, the consequences will be borne by contractor(s).

7.2.5 Exemptions from the risk matrix

a) Exemptions shall not be allowed when the degree of confidence is 4.

b) The absence of mitigation measures is considered as a valid exemption if both conditions below are available:

1. The cost of the possible treatment is out of proportion in comparison with the risk to be taken

and

2. The level of the risk is defined as non-acceptable by the risk matrix (otherwise the as low as reasonably practicable principle applies.)

7.2.6 Financing Risk

a) The Financing Risk column shall indicate the proposed technical measures to be adopted when a Residual Risk occurs and represents the basis for contractual provisions for the risks to be owned by the contractor(s).

b) Please note that provisional mitigation measures which may be implemented, subject to further information, could enable a major risk to be mitigated or eliminated but this will require a financial effort.

APPENDIX 6: INITIAL DESIGN PREPARED BY THE BLUE LINE CONSULTANT

Table of content

PART A: Reports

Coding number	Name of the document
V3210_P2_02-00_SDM_TR_05184	Volume D : Description of Safety Means
V3210_P2_02-00_SDM_TR_05185	Volume E: Interfaces closely related to LRT Project
V3210_P2_02-00_SDM_TR_05186	Volume F: Operations
V3210_P2_02-00_SDM_TR_05189	Volume I : Program for additional investigations
V3210_P2_02-00_TR_SDM_05177	Volume B07: Structures
V3210_P2_02-02_SDM_05300	Volume B11: OCS Underground Section
V3210_P2_02-02_SDM_TR_05290	Volume B01: Alignment and Profile City Center Underground
V3210_P2_02-02_SDM_TR_05291	Volume B03: Traffic & Road Equipment Underground Portals
V3210_P2_02-02_SDM_TR_05292	Volume G: Phases of Works Underground Section
V3210_P2_02-02_SDM_TR_05296	Volume B12: Tunnels
V3210_P2_02-02_SDM_TR_05298	Volume B12: Tunnel HRVAC
V3210_P2_02-02_SDM_TR_05301	Volume B09: Track TrackBed Underground
V3210_P2_02-02_SDM_TR_05307	Volume B02: Stations Technical Rooms City Center
V3210_P2_02-03_SDM_TR_05293	Volume G: Phases of Works City Center At Grade
V3210_P2_02-03_SDM_TR_05294	Volume B03: Traffic & Road Equipment City Center At Grade
V3210_P2_02-03_SDM_TR_05302	Volume B11: OCS City Center At Grade
V3210_P2_02-03_SDM_TR_05303	Volume B09: Track TrackBed City Center At Grade
V3210_P2_02-06_SDM_05183	Volume C: Workshop/Depot
V3210_PD_02_ 02_SDM_TR_05299	Volume B06: Utilities Underground Section
V3210-P2-02-02_SDM_TR_05283	Volume A: Presentation Corridor Underground
V3210-P2-02-02_SDM_TR_05306	Volume A: Presentation Corridor City Center
V3210-P2-02-03_SDM_TR_05305	Volume B06: Utilities City Center

PART B: Drawings

Coding number	Name of the document
T1230_PD_02_02_MAT_DW_2215	Underground Section Works Phases
T1230_PD_02_03_MAT_DW_22141	King George- Keren Hayesod. workphase A
T1230_PD_02_03_MAT_DW_22142	King George- Keren Hayesod. workphase B
T1230_PD_02_03_MAT_DW_22143	King George- Keren Hayesod. workphase C
T1230_PD_02_03_MAT_DW_22144	Harakevet st. workphase A
T2100_PD_02_02_ACK_DW_54000	Utilities Relocation City Center
T2100_PD_02-04_THL_DW_81000	Utilities Drawings Hebron Road
T3211-P2-02-03-DEL-DW-15503	Planimetry Plan Jaffa Khan
T3211-P2-02-05-DEL-DW-15505	Planimetry Old Railway
T3216-P2-02-03-DEL-DW-15513	Longitudinal Section - Jaffa - Oranim
T3218-P2-02-03-DEL-DW-15533	City Center At Grade Cross Sections
T3310_PD_02-03_MAT_DW_21103	Jaffa KhanTraffic Plan
T3310_PD_02-05_MAT_DW_21105	Old Railway Section Traffic Plan
T3333_PD_02-02_IBL_DW_42002	Public Lighting - Underground Section
T5200_PD_02-03_MIC_DW_25411	City Center At Grade Stations
T5200_PD_02-03_MIC_DW_26004_A01	City Center at Grade Substations
T5211_PD_02-03_ARO_DW_30230	City Center Landscape Planimetry
T5221_PD_02-02_ARO_DW_30620	Underground Section Architectural Cross Sections
T5221_PD_02-03_ARO_DW_30630	City Center Landscape Section
T6110_P2_02-02_SYS_DW_13002	Track Typical cross sections Underground Section
T6110-PD-02-02-SYS-DW-13001	Track laying and surfacing plan Underground Section
T6110-PD-02-03-SYS-DW-13001	Track - Jaffa - Khan
T6110-PD-02-05-SYS-DW-13001	Khan Oranim Section - Track and Track Bed
T6220-PD-02-02-SYS-DW-14001	Underground Section OCS
T6220-PD-02-03-SYS-DW-14001	OCS Jaffa Oranim Section
T6220-PD-02-05-SYS-DW-14001	Khan Oranim Section - OCS
T6230_P2_02-02_SYS_DW_10101	Power Supply General diagram and sectioning for the underground line section
T6230_P2_02-02_SYS_DW_10102	Line multitubular typical section for tunnel
T6510_P2_02-02_SYS_DW_10107	Public Address - General diagram for underground line section
T6520_P2_02-02_SYS_DW_10109	Emergency Call and Telephone - General diagram for underground line section
T6540_P2_02-02_SYS_DW_10106	CCTV - General diagram for underground line section
T7300_P2_02-02_SYS_DW_10108	Radio Transmission - General diagram for underground line section
T7300_P2_02-02_SYS_DW_10110	Wireless Communication System - General diagram for underground line section
T7500_P2_02-02_SYS_DW_10103	Signaling General diagram for underground line section

Coding number	Name of the document
T7500_P2_02-02_SYS_DW_10104	Signaling Schematic Plan for the underground line section
T7500_P2_02-02_SYS_DW_10105	AVLS General diagram for underground line section
T1230_PD_02_02_MAT_DW_22151_A_01	Underground Section Phases of Work
T3211-P2-02-02-DEL-DW-15502-A-01	Underground Section Planimetry Plan
T3216-P2-02-02-DEL-DW-15512-A-01	Underground Section Longitudinal Section
T3218-P2-02-02-DEL-DW-15532-A-01	Underground Section Cross Sections
T3310_PD_02-01_MAT_DW_21102_A_05	Underground Section Northern Portal Traffic Design
T5200_PD_02-02_MIC_DW_25002_A05	City Center Section - Suggested Blue Line
T5211_PD_02-02_ARO_DW_30220_A03	Underground Section Landscape Planimetry
T6340_P2_02-01_SYS_DW_10203_A02	Typical underground Substation equipment layout
T6340_P2_02-01_SYS_DW_10204_A02	Typical partially-underground Substation equipment layout

Important Note:

The entire content of Appendix 6 – "Initial design prepared by the Blue Line Consultant" is available at the following URL: **ftp://82.166.163.226**

The details to allow the Bidders to connect to the above mentioned FTP server are:

- Username: **public**
- Password: **jtmt**

APPENDIX 7: ADDITIONAL CONSIDERATIONS FOR OPTIONAL ASSIGNMENT 4

1. Project Management Plan (PMP)

a) The Project Management Plan (PMP) shall be prepared by the Consultant and submitted for JTMT's approval no later than 28 days after JTMT notifies to proceed with Optional Assignment 4.

b) The Consultant shall in the PMP provide the following:

- A summarized framework of the project and its purpose;
- A high-level description of the project, including detailed contractor(s)'s scope of work;
- Overall management approach for the project , including the roles and authority of project team members;
- Resources for the project and any resource constraints or limitations;
- Summary of its Quality Management Plan (QMP);
- Summary of its health and safety plan for all activities involved in the execution of the Works;
- Summary of its Risk Management Plan (RMP) for all activities involved in the execution of the works;
- A design control method statement summarising all activities required to translate technical specification requirements into detailed designs to the point of release for procurement and manufacturing;
- Change control and request for change procedures to be applied;
- A comprehensive Work Breakdown Structure (WBS) identifying in sufficient detail each aspect of the works, all the necessary construction permits and approvals, site establishment, installation of equipment and materials, testing and commissioning of the installation for operation etc.;
- A baseline schedule in bar chart format and developed using as an interface the up to date version of MS Project or similar. The baseline schedule shall:
    - clearly identify one or more critical paths through the network,
    - be sufficiently detailed in costs allocations, in order to provide an accurate outline for the progress of all the works and the contents for each payment milestone,
    - indicate key dates and milestones to be achieved for each area, clearly identifying completion dates, and interfaces with other third parties;
- Payment schedule organised in the same WBS-like way as the baseline schedule, by consolidating the Bill of Quantities items;
- List of method statements to be requested from contractor(s);
- Methodology for managing inspection and testing activities, defined as the management process to be used to identify all inspection and testing activities to be performed;
- Description of the project deliverables;.
- Full list of applicable Standards.

c) Any subsequent alteration to the PMP during the course of the Contract shall require the prior approval of JTMT before implementation.

2. Progress Management

2.1 Progress Management Plan

No later than 28 days after JTMT notifies the Consultant to proceed with Optional Assignment 4, the Consultant shall submit for the approval of JTMT its Progress Management Plan describing the procedures and resources to be deployed to plan, monitor and control the progress of the works generally.

2.2 Daily site diary

a) The Consultant shall maintain a daily site diary in which shall be recorded, as a minimum, the following information:

- The number and categories of work personnel engaged on site for each contractor;
- The names and employers of authorised visitors to the site;
- Record of materials and equipment arrivals;
- Details of any workplace accident;
- Details of major items of construction plant and equipment arrivals and departure from site;
- A summary of the Works undertaken that day;
- Other information required by the local laws and regulations.

b) The daily site diary shall be signed at the end of each working day by the authorised representative of the contractor(s), shall be available for inspection by JTMT at all reasonable times and shall be added to the Document Management System (DMS) on a daily basis.

2.3 Progress Review Meetings

a) The Consultant shall host weekly Progress Review Meetings. (Note: All site facilities shall be defined by the Consultant and integrated in the relevant tender documents, as part of the contractor's scope of work).

b) The Consultant's Construction Manager shall always be present throughout the meeting.

c) The Consultant shall ensure the attendance of its personnel of the requisite professional and technical disciplines necessary to address the subjects on the agenda for the respective phases of the works.

d) At the end of each Progress Review Meeting, the Consultant shall prepare and forward to the contractor(s) the draft minutes of meeting. The contractor(s) shall be entitled to propose amendments to the draft minutes.

e) The first item on the agenda at any Progress Review meeting shall be the agreement of the minutes of the immediately preceding meeting. The final version of the minutes shall be at the discretion of JTMT.

f) At least two working days prior to the date of each Progress Review Meeting the Consultant shall submit to JTMT a proposed agenda which shall address, but shall not be limited to, the following topics, as applicable:

- Review of actual progress versus planned progress; (by using the baseline programme for comparison);
- Weekly labour histogram update - planned vs actual;

- Drop line on 28 days look ahead schedule indicating progress relative to the baseline schedule;
- Information and documents related to: shop drawing execution and Consultant's review status, material review status, procurement schedule, requests for information (RFI's) (issued/answered), change orders and other significant documents;
- Progress slippage mitigation measures;
- Identification and resolution of current or anticipated issues relating to design, supply, installation, testing, commissioning and training;
- Interface management;
- Quality control matters;
- Safety matters;
- Contract management matters;
- Deliverables and activities for the next month;
- Other Contractual issues.

2.4 Monthly Progress Report

a) The Consultant shall submit to JTMT its Monthly Progress Report within five days following the end of the month that is the subject of the report.

b) The initial format, content and level of detail required for the Monthly Progress Report shall be established jointly by the Consultant and JTMT within 28 days after JTMT notifies the Consultant to proceed with Optional Assignment 4 based on a format proposed by the Consultant. Thereafter, the format and level of detail may change as agreed with JTMT to reflect the current stage of the works. Topics to be covered in the Monthly Progress Report shall include, but shall not be limited to:

- Executive Summary;
- Updated Progress Schedule against Baseline Schedule;
- Actual status of the key dates and milestones;
- Performance charts
- Schedule of the activities planned for the next two months;
- Identification and analysis of any schedule coordination or external interface issues;
- Critical supply, installation, testing, commissioning and training activities;
- List of deliverables report;
- Design approval status;
- Material and equipment approval status;
- Change control form register;
- Request for change form register;
- Identification of any quality control, quality assurance, health & safety or environmental problems;
- Risk identification and mitigation;
- Status of inspections, testing and acceptance;

- Copies of logs for incoming and outgoing correspondence and documents for the report period;
- Actual status of payments, retentions and insurances;
- A forecast of the amounts of individual progress payment applications for the next six months;
- Resources status;
- A list of major equipment and materials delivered to the site and leaving the site during the month;
- Progress photography;
- Updated list of applicable standards;
- Other contract management issues.

3. Quality Management Plan

a) Within 28 days of notification by JTMT to proceed with Optional Assignment 4 the Consultant shall prepare and submit for the approval of JTMT a Quality Management Plan (QMP).
b) The QMP shall describe how the quality assurance and quality control activities (including requirements to contractors) will be planned and implemented throughout the various stages of the works.
c) The Quality Management Plan shall set out the written policies and procedures to be followed by the contractor(s) for quality control and by the Consultant for quality assurance throughout all stages of implementation of the works including, but not limited to, design and document production, procurement, manufacture, fabrication, assembly, packaging, shipping, storing, installation, inspection, testing, commissioning and defects rectification.
d) Any revision of the QMP requires the prior written approval of JTMT.
e) As a minimum the QMP shall comply in all relevant aspects with the procedures and requirements of the following standards:
    - ISO 9001-1-2:2008 – Series of Quality Management Standards;
    - ISO 10005-Guidelines for Quality Plans.

3.1 Quality Assurance Organisation

a) In general, the quality assurance system is responsible for accompanying, examining, monitoring and controlling quality control activities.

b) The organization of quality assurance consists in the following organization:
    - Project quality assurance shall be managed, operated and executed by the Consultant, which will be represented by the **Quality Assurance Manager**.
    - As part of the quality assurance system, all verification tests will be performed by an "Authorized Lab", accredited by the National Authority for Laboratories Certification and a "Certified Lab" approved by the Standards Supervisor in the Ministry of Commerce and Trade, with which JTMT will enter into an agreement and which will be managed by the Consultant.
    - As part of quality assurance system, the necessary verification measurements shall be performed by an external measurement company with which JTMT will enter into an agreement and which will be managed by the Consultant. (Note: the quality assurance measurement team will be headed by a chief surveyor who

will be a certified surveyor with at least 5 years of proven professional experience in works similar to those of the project.)

3.2 Quality Assurance Records

a) The Consultant shall maintain readily retrievable records providing evidence of quality and accountability. In particular, records for monitoring work performance and for inspecting and testing shall indicate the acceptability of work or products and the action taken to correct any con-compliance.
b) These records shall include results of audits, inspections, tests, process controls, certification of processes and personnel, non-compliant material or components (including records of disposal), and other quality requirements.
c) These records shall be maintained, completed and made available to JTMT upon its request at all times during the performance of services.

4. Method statement / Work procedures

a) The method statement for each section and type of work shall be submitted by the contractor(s) and shall be approved by the Consultant, no later than 5 days before starting of respective work.
b) The method statement shall explain how the works are to be carried out and must include, but not be limited to, the following:
    - Scope of the works to be undertaken, with reference to the associated drawings and calculation notes, or to workshop drawings;
    - Sensitive aspects of the process (i.e. any particular aspects of the process which require specific care to achieve the expected result) for each phase of the construction, including a description of the construction measures to be adopted and the recommendations to be followed up;
    - Interactions with other procedures and the conditions to be achieved before proceeding with the ulterior construction steps;
    - Acceptance criteria and the measures to be adopted in case of non-conformities;
    - Specific Personal Protective Equipment (PPE);
    - Associated health and safety risk assessments;
    - Associated environmental impact assessment;
    - Description of the technology to be applied;
    - Site logistic plan, including temporary working areas;
    - Detailed Construction schedule;
    - Phasing plans and sections;
    - Plant and equipment plan;
    - Procurement schedule giving milestone dates for the ordering of key elements of the works.
c) All method statements must be specific to the task to be undertaken and not a generic method statement, which covers various elements of work.

5. Health and Safety Management

5.1 Construction Health & Safety Management Plan

a) The Consultant shall approve the Construction Health and Safety Management Plan (CHSMP) for the works to be prepared by each contractor(s), before the respective contractor may start any activity on site.

b) Each CHSMP shall include at least:

- The applicable health and safety Laws and regulations;
- The health and safety organisation including key safety personnel list and roles;
- The Site health & safety rules to be followed;
- The hazard identification and health & safety procedures to mitigate the risk corresponding to each type of work and material used by the contractor(s);
- Any drawings related to the location of the Health and Safety facilities, evacuation routes, emergency vehicle accesses and itineraries, etc.;
- Communication process regarding health & safety;
- Any other items as revised, in accordance with all local laws and regulations.

c) No later than 14 days prior to the scheduled commencement date of works at a particular construction area, the Consultant shall request the contractor(s) to submit an updated and final CHSMP, for that construction area. The Consultant shall approve the document before the scheduled commencement date of works at a respective particular construction area. No construction work may proceed until the contractor's updated CHSMP has been approved by the Consultant.

d) Prior to commencement of the works in a particular construction area, and at all times thereafter, the Consultant shall coordinate the authorised representatives of all contractors engaged in works in that construction area to ensure that worker health and safety matters are fully taken into account.

5.2 Safety Enforcement

a) The Consultant shall employ a full time qualified, certified and experienced health & safety coordinator who shall enforce all site safety matters in all areas where the works are being carried out.

b) The health & safety coordinator shall organize and attend site health & safety committee meetings that shall meet at least twice per month.

c) Approved copies of the contractor's CHSMP shall be produced by the contractor and distributed and displayed at each place of work or as decided by the health & safety coordinator together with other documents: i.e.: posters, notice boards, or other items of a like nature which the health & safety coordinator may direct or are required by law.

5.3 Safety Reports

Interim Health & Safety reports shall be submitted by the Consultant on a weekly basis and a Health & Safety chapter summarising the results of those interim reports shall be submitted within the Monthly Progress Report.

5.4 Notification of Incidents

a) JTMT shall be notified immediately of any incidents that occur whether on-site or off-site. Such notification may be verbal, in the first instance, but shall always be confirmed in

writing within 24 hours of the occurrence of the incident. The report shall include as many details as possible.

b) A formal report, shall, after investigation of the occurrence, be submitted to JTMT. The report shall detail the proposed mitigation measures the Consultant intends to be taken to remedy the effects of the incident, and to prevent incidents of a similar nature from occurring.

5.5 Audits

a) The health & safety manager shall carry out audits to ensure regular review of the main programmes and processes covered by the CHSMP.

b) Audits shall be planned according to the importance of the process to be verified and the results of preceding audits.

5.6 On-going Improvement

The Consultant shall take all necessary measures to ensure on-going improvement of the CHSMP, which shall include a pro-active approach to the making of its employees, suppliers and subcontractors aware of the importance of health & safety issues and shall encourage them to contribute actively in its effective implementation.

6. Environmental Management

6.1 Legislation and Consents

a) The Consultant shall prepare a management system for the monitoring and control of environmental impacts during the execution of the works so as to:

- Encourage the establishment and maintenance of a responsible approach to the protection of the environment;
- Identify those actions of the contractor(s) that could cause degradation of the environment;
- Describe the measures to be adopted to mitigate such degradation;
- Monitor the actual environmental changes to determine if the measures are successful;
- Take corrective action if the measures are not successful.

b) The Consultant shall impose on the contractor(s) all the requirements (e.g. levels of noise, dust, vibration, waste management) imposed by the Environmental Impact Study, TABBA, Construction Permit, Building Permit, the instructions of the Government Ministry for Environment Protection and the provisions of all applicable laws and regulations.

6.2 Environmental Management Plan

a) Before starting any work, the Consultant shall provide for the contractor(s) a guideline for the preparation of the Environmental Management Plan (EMP) and shall review documents prepared by the contractor(s) subsequently.

b) The EMP shall be divided into a minimum of four parts as follows:

- Management procedures;
- Organisation & staffing;

- Reporting procedures;
- Environmental management provisions.

c) In particular, the procedures and monitoring programme shall also contain, inter alia, a detailed analysis of the following environmental parameters:

1) Air pollutants and particles:
   Description of the preventive measures intended to be implemented and of the equipment and installations intended to avert escape of pollutants into the air and methods controlling the particles produced in all the areas where construction works and other activities take place.
2) Methods and arrangements controlling noise and vibrations caused by the operation of every kind of mobile and fixed machines, placing special emphasis on construction activities that include outdoor mechanical installations: pile driving works, hydraulic hammers, compactors, etc.
3) Description of the preventive measures intended to be implemented and of the equipment and installations intended to avert escape of pollutants to surface and ground water and into the soil.
4) Description of the methods for the handling of all kinds of liquid and solid waste, placing special emphasis on any eventual toxic or highly contaminating waste.
5) Proposals for the complete handling of the excavated materials, placing special emphasis on the measures to be taken during their transportation, as well as on the selection of the dumping places.
6) For each individual worksite area, the contractor(s) shall prepare and submit a ‘’special study for the protection of urban green areas and flora”, which shall include a topographical diagram of the worksite area, showing the existing trees, bushes, other green areas, a detailed description of each existing tree (species, perimeter, height, age) with photographs, noting trees that need to be cut, transferred and/or replaced.
7) Addressing emergencies concerning degradations to the environment and the health & safety of employees and residents. This concerns existing environmental problems as well as those that may be encountered in the immediate project area (e.g. soil pollution within worksites, formerly accommodating a heavy industrial plant, gas station, etc.), as well as environmental accidents during the project’s construction.

6.3 Notification of Incidents

a) The Consultant shall notify JTMT immediately of any incidents which occur whether on-site or off-site in which any contractor, its personnel or construction plant, or those of any subcontractors are directly or indirectly involved and which may have an adverse impact on the environment. Such notification may be verbal, in the first instance, but shall always be confirmed in writing within 24 hours of the occurrence of the incident. The written notification writing shall include as much detail as is possible.

b) A formal report, shall, after investigation of the occurrence, be submitted to JTMT. The report shall detail the proposed mitigation measures the Consultant intends to take to remedy the effects of the incident, and to prevent incidents of a similar nature from occurring.

7. Inspection and testing

a) The Consultant shall provide guidelines to contractor(s) for the preparation of a comprehensive Inspection and test programme, which shall provide the means to verify their conformity with the approved design and specified performance criteria.

b) This programme shall detail inspections and test' scope, frequency, sampling, responsibilities, input and outputs, acceptance criteria, etc.

c) The Consultant shall submit for JTMT's approval the schedule of the hold points and the notification time associated with each of them.

d) The Consultant shall verify that only certified laboratories – or organizations – will carry out inspections and tests and assess the results (notably for compliance with the applicable codes and standards and with the technical requirements).

e) At the conclusion of the works, the Consultant shall submit to JTMT a document gathering together all inspections performed, with their date, scope and the result of each inspection, and referencing the inspection forms that have been prepared during the course of the works.

f) The elaboration of the document shall include the following rules:

- Each verification requirement shall be assessed for its criticality and classified as critical ("Hold Point") or non-critical. The Consultant shall attend all Inspections and tests marked by a Hold Point.
- The plan shall also provide procedures for implementing corrective actions after failed inspections, tests, or demonstrations and follow-up procedures to ensure incorporation of corrections into system design.
- For each test/verification, the following general information shall be available, where applicable:
  - Name of test/reference number;
  - Procedure, objective and scope;
  - Special environmental requirements, if any;
  - Sample size;
  - Equipment, facilities, and personnel required;
  - Step-by-step procedures for tests;
  - Glossary of technical terms used in procedures;
  - Estimated time required;
  - Description of set-up;
  - Data to be recorded (data sheet);
  - Pass/Fail criteria;
  - Documentation required.

g) **Inspection of the materials** - The Consultant's acceptance of materials, products and components shall be conditioned by:

- The results of the inspection process with regards to their identification (gap between order and delivery receipt);
- An examination of their compliance certificates;
- Visual and geometrical controls and a verification of their compliance with the specifications when subject to specific inspections and test requirements (at the factory, on the production site or at receipt on the worksite);
- The application of proper transportation, handling and storage procedures.

h) **Type Tests:**

- The Consultant shall verify that all type tests are performed in accordance with industry standard tests and specifications and/or established quality assurance test specifications.
- Type testing may be performed by one or more of the following methods to verify that the technical specifications will be met:
    - Supplier testing;
    - Submission by the contractor(s) of reports of certified test results;
    - Previous testing of the item and submission by the contractor(s) of reports of certified test results;
    - Testing witnessed by the Consultant;
    - Evidence of service proven equipment with documented results and certification.
- Type testing shall be approved by the Consultant for all new design and product modifications for which acceptable data are not provided.
- Sub-system or component type tests may be waived by the Consultant only if acceptable data is available for the same design or identical equipment proven in a similar application or by a prior type test. The conditions for granting a waiver of prequalification testing of a component or subsystem are as follows:
    - The design is identical to a design which has been prequalified by previous type testing, and
    - If prequalified by previous testing, copies of testing documents shall demonstrate results to the same or greater level of detail as described below.

i) Tests of materials, equipment and subassemblies

- The Consultant shall check if all materials and each item of equipment have a certificate of compliance;
- If necessary, the Consultant shall request the contractors(s) to perform site tests, non-destructive testing, and destructive testing to ensure that the design, fabrication and quality of workmanship meet the requirements of the technical specifications.

j) Factory Acceptance Tests

- No equipment or material, forming part of the works, shall be used by contractor(s) for prequalification testing purposes without the prior written approval of the Consultant.

APPENDIX 8: PRELIMINARY GENERAL EXTERNAL INTERFACE MATRIX AND INTERFACE SHEETS FORM

PARTIES					Phase																																			
					CONTRACT & ENTITY																																					
					SYSTEM	SAFETY					TUNNEL														SHAFT and or Emergency Acces Tunnels (if required)																
					Domaine	-					CIVIL WORKS					M & E									ARCHITECTURE	CIVIL WORKS						M & E									
					SUB-SYSTEM	Detection	Users safety / evacuation	Emergency services access	Protecting the structure	Reliability /maintainability / availability / safety	Excavation and Lining	Niches & rooms	Access tunnel	drainage	dry networks and recesses	Lighting	Fire / emergency Ventilation	Detection and CCTV / supervision	Communication systems (radio, phone…)	fire fighting and dewatering	cabling for power distribution & eqt control/command	Steel works (fire doors, ramps etc..)	Sign-posting	Surface structure	Road works and permanent traffic control	utilities relocation	Drainage	Shaft excavation & lining	Inner civil works	Lighting	Fire / emergency Ventilation	Detection and CCTV	Communication systems (radio, phone…)	fire fighting and dewatering	cabling for power distribution & eqt control/command	Steel works (fire doors, ramps etc..)	
	CONTRACT & ENTITY	SYSTEM	DOMAINE	SUB-SYSTEM	CODE																																			
DESIGN INTERFACES	GENERAL CONSULTANT			Checking Coordination		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BLUE LINE CONSULTANT	RUNNING SECTION	CIVIL WORKS	Road works Drainage Utility diversions										X																											
			M & E	Lighting (non underground) Traffic signalling												X							X																		
			TRACKS SYSTEM	At-grade sections Underground							X	X		X	X																											
		STATION	EQUIPMENT	Fare Collection System																																					
		LRT System	Rolling stock																																						
			M & E	Signaling system							X							X					X																		
				Catenary							X	X			X																											
				Parking Revenue Control System (PRCS)																																						
				Telecommunication system															X				X																		
		OPERATIONS CONTROL CENTER						X	X	X						X	X	X	X	X			X						X	X	X	X	X								
		POWER SYSTEMS		Traction Power Supply											X																											
				20KV Medium Voltage Power Supply											X																											
		TESTING/COMMISIONING - TRAINING	LRT System	Testing and Commissioning																																					
				Training - operation																																						
				Training - maintenance																																						
	RED LINE CONCESSIONNAIR																																								
	GREEN LINE CONSULTANT																																								
	SITE INVESTIGATION										X																	X	X												
	BUILDING CONDITIONS										X																	X	X												
	LAND SURVEYOR																											X													

PARTIES		SUB-SYSTEM	Detection	Users safety / evacuation	Emergency services access	Protecting the structure	Reliability /maintainability / availability / safety	Excavation and Lining	Niches & rooms	Access tunnel	drainage	dry networks and recesses	Lighting	Fire / emergency Ventilation	Detection and CCTV / supervision	Communication systems (radio, phone…)	fire fighting and dewatering	cabling for power distribution & eqt control/command	Steel works (fire doors, ramps etc..)	Sign-posting	Surface structure	Road works and permanent traffic control	utilities relocation	Drainage	Shaft excavation & lining	Inner civil works	Lighting	Fire / emergency Ventilation	Detection and CCTV	Communication systems (radio, phone…)	fire fighting and dewatering	cabling for power distribution & eqt control/command	Steel works (fire doors, ramps etc..)	
		Phase																																
		CONTRACT & ENTITY																																
		SYSTEM	SAFETY					TUNNEL													SHAFT and or Emergency Acces Tunnels (if required)													
		Domaine	-					CIVIL WORKS					M & E								ARCHITECTURE	CIVIL WORKS					M & E							
EXTERNAL INTERFACES	Public Utilities	ELECTRICITY										?											X											
		WATER										?											X											
		SEWERS																					X											
		GAS																					X											
		TELECOM										?											X											
		DRAINAGE									X	?											X	X										
		ENVIRONMENT																					X											
	TABBA		X	X	X	X		X	X		X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X			X	
	JERUSALEM MUNICIPALITY					X								X								X	X					X						
	TRAFFIC / POLICE		X	X		X								X		X				X		X						X		X				
	FIRE BRIGADE		X	X	X	X								X		X	X		X	X								X		X	X		X	
	THIRD PARTIES	RESIDENTS																																
		OTHER PUBLIC TRANSPORT				X																												
CONSTRUCTION INTERFACES	CONTRACTORS *Bid reference case* (Packages are to be defined by the Consultant)	TUNNEL & CENTRAL STATION (underground)																																
		CUT AND COVER STATION 1																																
		CUT AND COVER STATION 2																																
		TUNNEL M&E																																
		STATION INTERNAL STRUCTURES (underground station)																																
		STATION M&E																																
		ROAD WORKS (arround station accesses, etc..)																																

PRELIMINARY GENERAL EXTERNAL INTERFACE MATRIX

PARTIES					Phase																							
					CONTRACT & ENTITY																							
					SYSTEM	STATIONS (Underground and Cut & Cover)																						
					Domaine	ARCHITECTURE					CIVIL WORKS							M & E										
					SUB-SYSTEM	Spacial organisation	Surface structure integration	Passenger flow	Sanitary, Water & Plumbing	Finishes	Excavation & Lining	Internal structural elements	Platforms	Road works and permanent traffic control	Drainage	utilities relocation (surface access)		Lighting & Emergency Lighting	Fire Detection, & Protection	Detection and CCTV / supervision	Communication systems (radio, phone…)	fire fighting and dewatering	Low Voltage Power Supply	Station Ventilation and cooling	Plateform screen doors	Steel works (fire doors, ramps etc..)
	CONTRACT & ENTITY	SYSTEM	DOMAINE	SUB-SYSTEM	CODE																							
DESIGN INTERFACES	GENERAL CONSULTANT			Checking Coordination		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	BLUE LINE CONSULTANT	RUNNING SECTION	CIVIL WORKS	Road works Drainage Utility diversions																								
			M & E	Lighting (non underground) Traffic signalling																								
			TRACKS SYSTEM	At-grade sections Underground																								
		STATION	EQUIPMENT	Fare Collection System		X																	X					
		LRT System	Rolling stock																									
			M & E	Signaling system Catenary Parking Revenue Control System (PRCS) Telecommunication system																		X						
		OPERATIONS CONTROL CENTER															X	X	X	X	X	X	X	X				
		POWER SYSTEMS		Traction Power Supply 20kV Medium Voltage Power Supply																								
		TESTING/COMMISIONING - TRAINING	LRT System	Testing and Commissioning Training - operation Training - maintenance																								
	RED LINE CONCESSIONNAIR																											
	GREEN LINE CONSULTANT																											
	SITE INVESTIGATION										X																	
	BUILDING CONDITIONS										X																	
	LAND SURVEYOR						X				X			X														

PRELIMINARY GENERAL EXTERNAL INTERFACE MATRIX

PARTIES			Phase																														
			CONTRACT & ENTITY																														
			SYSTEM	STATIONS (Underground and Cut & Cover)																													
			Domaine	ARCHITECTURE						CIVIL WORKS							M & E																
			SUB-SYSTEM	Spacial organisation	Surface structure integration	Passenger flow	Sanitary, Water & Plumbing	Finishes	Excavation & Lining	Internal structural elements	Platforms	Road works and permanent traffic control	Drainage	utilities relocation (surface access)		Lighting & Emergency Lighting	Fire Detection, & Protection	Detection and CCTV / supervision	Communication systems (radio, phone…)	fire fighting and dewatering	Low Voltage Power Supply	Station Ventilation and cooling	Plateform screen doors	Steel works (fire doors, ramps etc..)									
EXTERNAL INTERFACES	Public Utilities	ELECTRICITY												X																			
		WATER												X																			
		SEWERS												X																			
		GAS												X																			
		TELECOM												X																			
		DRAINAGE											X	X																			
		ENVIRONMENT												X																			
	TABBA			X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X	X	X	X									
	JERUSALEM MUNICIPALITY			X	X							X		X																			
	TRAFFIC / POLICE											X		X					X														
	FIRE BRIGADE																X		X	X		X		X								
	THIRD PARTIES	RESIDENTS																															
		OTHER PUBLIC TRANSPORT																															
CONSTRUCTION INTERFACES	CONTRACTORS *Bid reference case* (Packages are to be defined by the Consultant)	TUNNEL & CENTRAL STATION (underground)																															
		CUT AND COVER STATION 1																															
		CUT AND COVER STATION 2																															
		TUNNEL M&E																															
		STATION INTERNAL STRUCTURES (underground station)																															
		STATION M&E																															
		ROAD WORKS (arround station accesses, etc..)																															

PRELIMINARY GENERAL EXTERNAL INTERFACE MATRIX

PARTIES						Phase	CONSTRUCTION																	
						CONTRACT & ENTITY																		
						SYSTEM	PORTAL								LOGISTICS				SITE SUPERVISION		DESIGN CHECKING			COORDINATION	
						Domaine	ARCHITECTURE	CIVIL WORKS				M & E							Works	M & E	Civil Works	Building works	M & E	civil and building Contractors	M & E
						SUB-SYSTEM	Portal strcture	Excavation and trench support wall					Lighting	Tunnel access control	Temp Traffic deviations	Spoil disposal, site locations	Construction traffic management	Site installations							
	CONTRACT & ENTITY	SYSTEM	DOMAINE	SUB-SYSTEM	CODE																			
DESIGN INTERFACES	GENERAL CONSULTANT			Checking Coordination			X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X
	BLUE LINE CONSULTANT	RUNNING SECTION	CIVIL WORKS	Road works				X																	
				Drainage				X																	
				Utility diversions				X																	
			M & E	Lighting (non underground)									X												
				Traffic signalling										X											
			TRACKS SYSTEM	At-grade sections																					
				Underground																					
		STATION	EQUIPMENT	Fare Collection System																					
		LRT System	Rolling stock																						
			M & E	Signaling system																					
				Catenary																					
				Parking Revenue Control System (PRCS)																					
				Telecommunication system																					
		OPERATIONS CONTROL CENTER											X	X											
		POWER SYSTEMS		Traction Power Supply																					
				20kV Medium Voltage Power Supply																					
		TESTING/COMMISIONING - TRAINING	LRT System	Testing and Commissioning																X				X	
				Training - operation																X				X	
				Training - maintenance																X				X	
	RED LINE CONCESSIONNAIR																								
	GREEN LINE CONSULTANT																								
	SITE INVESTIGATION							X																	
	BUILDING CONDITIONS							X																	
	LAND SURVEYOR						X	X																	

PRELIMINARY GENERAL EXTERNAL INTERFACE MATRIX

PARTIES			Phase	CONSTRUCTION																				
			CONTRACT & ENTITY																					
			SYSTEM	PORTAL								LOGISTICS				SITE SUPERVISION		DESIGN CHECKING			COORDINATION	
			Domaine	ARCHITECTURE	CIVIL WORKS				M & E							Works	M & E	Civil Works	Building works	M & E	civil and building Contractors	M & E
			SUB-SYSTEM	Portal strcture	Excavation and trench support wall					Lighting	Tunnel access control	Temp Traffic deviations	Spoil disposal, site locations	Construction traffic management	Site installations							
EXTERNAL INTERFACES	Public Utilities	ELECTRICITY														X						
		WATER														X						
		SEWERS														X						
		GAS														X						
		TELECOM														X						
		DRAINAGE														X						
		ENVIRONMENT														X						
	TABBA			X	X	X	X	X		X	X	X	X	X	X							
	JERUSALEM MUNICIPALITY				X							X	X	X	X	X						
	TRAFFIC / POLICE										X	X				X						
	FIRE BRIGADE										X					X						
	THIRD PARTIES	RESIDENTS														X						
		OTHER PUBLIC TRANSPORT														X						
CONSTRUCTION INTERFACES	CONTRACTORS *Bid reference case* (Packages are to be defined by the Consultant)	TUNNEL & CENTRAL STATION (underground)														X	X	X			X	
		CUT AND COVER STATION 1														X		X			X	
		CUT AND COVER STATION 2														X		X			X	
		TUNNEL M&E															X			X	X	X
		STATION INTERNAL STRUCTURES (underground station)														X	X		X		X	
		STATION M&E															X			X	X	X
		ROAD WORKS (arround station accesses, etc..)														X					X	

INTERFACE SHEET # DESIGN 2/3

Entity		
Company		
System		
Sub-System		
Sub-Level		

Creation Date: 18/01/2015 Revision: A Alteration Date: 18/01/2015 Filled in: ☐ Approved: ☐

SUMMARIZED DESCRIPTION OF THE FORESEEN INTERFACE DEFINITION DESIGN

☐ Hardware

☐ Software

☐ Functional (please mention above all the involved sub-systems)

DESIGN TO BE CARRIED OUT (*: If needed, previous partners' design tasks to be indicated)

#	Company A	*
A1		
A2		
A3		
A4		
A5		
A6		
A7		
A8		
A9		

#	Company B	*
B1		
B2		
B3		
B4		
B5		
B6		
B7		
B8		
B9		

REFERENCE DOCUMENTS (DRAWINGS, SPECIFICATIONS, …)

INTERFACE SHEET # TECHNICAL 1/3

Entity		
Company		
System		
Sub-System		
Sub-Level		

Creation Date: 18/01/2015 Revision: A Alteration Date: 18/01/2015 Filled in: ☐ Approved: ☐

SUMMARIZED DESCRIPTION OF THE INTERFACE

☐ Hardware

☐ Software

☐ Functional (please mention above all the involved sub-systems)

TECHNICAL TASKS TO BE CARRIED OUT (*: If needed, previous partners' tasks to be indicated)

#	Company A	*
A1		
A2		
A3		
A4		
A5		
A6		
A7		
A8		
A9		

#	Company B	*
B1		
B2		
B3		
B4		
B5		
B6		
B7		
B8		
B9		

REFERENCE DOCUMENTS (DRAWINGS, SPECIFICATIONS, …)

INTERFACE SHEET # DESIGN 2/3

Entity		
Company		
System		
Sub-System		
Sub-Level		

Creation Date: 18/01/2015 Revision: A Alteration Date: 18/01/2015 Filled in: ☐ Approved: ☐

SUMMARIZED DESCRIPTION OF THE FORESEEN INTERFACE DEFINITION DESIGN

☐ Hardware

☐ Software

☐ Functional (please mention above all the involved sub-systems)

DESIGN TO BE CARRIED OUT (*: If needed, previous partners' design tasks to be indicated)

#	Company A	*
A1		
A2		
A3		
A4		
A5		
A6		
A7		
A8		
A9		

#	Company B	*
B1		
B2		
B3		
B4		
B5		
B6		
B7		
B8		
B9		

REFERENCE DOCUMENTS (DRAWINGS, SPECIFICATIONS, …)

INTERFACE SHEET # TESTING 3/3

Entity		
Company		
System		
Sub-System		
Sub-Level		

Creation Date: 18/01/2015 Revision: A Alteration Date: 18/01/2015 Filled in: ☐ Approved: ☐

SUMMARIZED DESCRIPTION OF THE FORESEEN INTERFACE TESTS

☐ Hardware

☐ Software

☐ Functional (please mention above all the involved sub-systems)

TESTS TO BE CARRIED OUT (*: If needed, previous partners' tests to be indicated)

#	Company A	*
A1		
A2		
A3		
A4		
A5		
A6		
A7		
A8		
A9		

#	Company B	*
B1		
B2		
B3		
B4		
B5		
B6		
B7		
B8		
B9		

REFERENCE DOCUMENTS (DRAWINGS, SPECIFICATIONS, …)

Project reference	V4260_ERA_TD_00041_A25

REQUEST FOR PROPOSALS FOR

ENGINEERING, DESIGN AND OTHER SERVICES FOR THE UNDERGROUND SECTION OF THE CITY CENTRE SECTION OF THE BLUE LINE

ANNEX B: BIDDING DOCUMENTS AND FORMS

Index

1. TECHNICAL PROPOSAL CONTENT AND FORMS

1.1 GENERAL PROVISIONS

The Bidders shall prepare a detailed Technical Proposal for the execution of the Services described in the TOR, in accordance with the following instructions and mandatory forms:

a) **List of forms to be used in the Bid:**

- Letter
- Bidder Members' references form
- Bidder's personnel form

b) Description of the applicable methodology for performing the Services, with special attention to the following key items:

- Establishing the Geotechnical Design Memorandum
- Design methodology
- Risk optimisation of Project, including risk treatment measures
- Logistic studies
- Schedule of works
- Tendering process
- Site supervision methodology

c) **Organization Breakdown Structure (OBS)**

- The Bidder shall present an Organization Breakdown Structure (OBS) of the proposed Consultant team for each stage of the Services. This shall include details on the organization between teams of foreign and local companies and major sub-consultants forming the Bidder.
- This chapter shall be split between the Basic Assignment and the Optional Assignments**.**

d) **Proposed Deployment Schedule**

- The Bidder shall provide a monthly based deployment schedule, for each of the team member during the Contract Period.
- Each phase of the Basic Assignment and each Optional Assignment shall be detailed separately. The proposed deployment schedule shall be consistent with the information to be provided as part of the financial form for the cost breakdown of each billing item.

e) **List of Deliverables** for each phase of the Services

- As part of the Technical Proposal, the Consultant shall develop a full list of deliverables (including an estimated dates for submission of each deliverable) containing those deliverables set out in the TOR (written and graphic documents) for each phase of design, tender and site supervision and arrange

them in a hierarchical system (tree), together with any additional deliverables not contained in the TOR.

- The list of deliverables shall be presented as set out in the following table:

Phase of design	Discipline	Element	Presentation	Target Scale	Information Level
Example:					
Concept design	Architecture	Underground Station	Plans/ sections and/or elevations	1:100	To show all public and non-public areas, all circulation routes, emergency routes, shafts, all MEP rooms

f) **Preliminary Risk Management Plan and the Risk Register**

- The Bidder shall prepare a Preliminary Risk Management Plan indicating how the Risk Management Plan provided in Appendix 5 to the TOR will be implemented during each phase of design.
- The Bidder shall prepare a risk register, in accordance with guidelines provided in Appendix 5 to the TOR, indicating the main identified risks. The aim of this document is to demonstrate the Bidder's understanding of how the Risk Management Plan will be implemented**.**

g) **Management of interfaces**

- This chapter shall include a list of internal and external interfaces relating to the Services, as well as a proposed methodology to handle these as understood by the Bidder.
- As part of such methodology, the Bidder shall also provide an initial interfaces matrix for the internal interfaces within its own teams, together with an illustrated example of an interface sheet to be used, taking into account the preliminary General External Interface Matrix provided with the present RFP (Appendix 7 to the TOR).
- This chapter shall be split between the Basic Assignment and the Optional Assignments.

h) **Overall schedule**

- The Bidder shall prepare an overall schedule, from contract award to the end of post construction stage. This schedule shall feature the projected Services, with no more than a hundred (100) tasks. It shall also be consistent with the tasks detailed in the corresponding Financial Proposals form.
- This chapter shall be split between the Basic Assignment and the Optional Assignments.

i) **Examples of drawing deliverables**

- This chapter consists in representative examples of drawing deliverables (".dwg" files) for preliminary, basic and detailed design levels produced by the Bidder Member companies for referenced projects.

Note: There is no particular requirement regarding the language of the written part of such drawings.

j) **Specific software to be used**

- The Bidder shall provide details of specific software proposed to be used during the performance of the Services, showing relevant Bidder's experience with this software.

k) **Comments and suggestions of the Consultant**

- The Bidder is to highlight those aspects of its Technical Proposal that, in its opinion, represent those aspects which recommend the Bidder to be chosen to undertake the Services. Where the Bidder is in any doubt, it should state clearly the hypotheses and assumptions underlying its proposal.

1.2 FORMS ATTACHED TO TECHNICAL PROPOSAL

1.2.1 LETTER

From:

_____
_____
_____
_____
_____

To:

JTMT
Jaffa St. 97
PO Box 28034
Jerusalem, 91280
Israel

Subject: **Engineering, design and other services for the implementation of the underground section of the city centre section of the Blue Line**

Dear Sir,

We, the undersigned, offer to provide to JTMT the Consultancy Services in accordance with your Request for Proposals dated _____ and our Technical and Financial Proposals. Our attached Technical Proposals are enclosed herewith.

Yours faithfully,

Signature of the Authorised Representative:

Name and Title of Signatory:

Address:

1.2.2 BIDDER MEMBERS' REFERENCES FORM

Company Name	
Name of the Project	
Type of project (Metro, LRT, BRT)	
Length in km or other particulars	
Description of services performed by the Applicant firm:	
Name of client and Address: (Indicate whether public or private entity)	
Name, telephone no. and fax no. of client's representative:	
Estimated capital cost of Project (in NIS million):	
Payment received by the Applicant: (in NIS thousands)	
Start date and finish date of the services (month/ year)	
Brief description of the Project :	

Notes:

1) Use a separate sheet for each project.
2) The Bidder may attach separate sheets to provide brief particulars of other relevant experience of the Bidder.
3) Exchange rates should be taken as the conversion rates of the currencies at the daily representative exchange rates published by the International Monetary Fund 60 days prior to the Date of Submission of Bids
4) For establishing the eligibility of the Bidder and to score the Bidder's Technical Proposal the Selection Committee will consider only completed projects within the last 10 calendar years.

1.2.3 BIDDER'S PERSONNEL FORM

General information

Name and forename	
Date of birth and age :	
Nationality :	
Key qualifications	
Years of experience:	
Employed in company since:	
Languages spoken/written):	("mother tongue" (or "bilingual" if more than one mother tongue), "good", "fair", or "notions")

Languages	**Written**	**Spoken**
Hebrew		
English		
French		

Current position	

Reason for proposing this person

Proposed position	

Main <u>pertinent</u> competencies and experience

Proposed references as per evaluation criteria

Ref	**Position held**	Project name	responsibilities	Aspects of the project which qualify it as a reference project
1				
2				
3				
4				

Total number of projects:	XX

Career (in reverse order)

Period (mm/yyyy to mm/yyyy)	Company name	Position held	Work undertaken and responsibilities

Projects to demonstrate the years of experience required

Year	Company name	Project name	Work undertaken and responsibilities and description of the project (type of tunnel, special difficulties)

Total number of years of relevant experience:	XX

Certification: (Following statement to be signed by staff member.)

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes my qualifications and experience relevant to the Services.

Signature of key personnel:_____

Date (day/month/year): _____

Signature of Authorised Representative of the Bidder undertaking that the person is available to undertake the Services which are the subject of the Bid.

Signature of Authorised Representative of the Bidder: _____

Date (day/month/year): _____

2. FINANCIAL PROPOSAL CONTENT AND FORMS

2.1 FORMS ATTACHED TO FINANCIAL PROPOSAL

2.1.1 LETTER (INCLUDING PROPOSALS FOR BASIC AND OPTIONAL ASSIGNMENTS)

From:

_____
_____
_____
_____
_____

To:

JTMT
Jaffa St. 97
PO Box 28034
Jerusalem, 91280
Israel

Subject: **Engineering, design and other services for the implementation of the underground section of the city centre section of the Blue Line**

Dear Sir,

We, the undersigned, offer to provide to JTMT the consultancy Services in accordance with your Request for Proposals dated _____ and our Technical Proposal. Our attached Financial Proposal indicates the proportion in our reference foreign currency and the proportion in local currency associated with the required Services with respect to each assignment:

BASIC ASSIGNMENT Bill items, Optional Assignments not included (lump sums, excluding VAT):

Basic Assignment (series 01)	Unit of measure	Chosen foreign currency (for costs abroad) (_____)	NIS (for local costs)
01.01 Preliminary design	Lump sum		
01.02 Obtaining TABBA approval	Lump sum		
01.03 Basic design of tunnel and portals	Lump sum		
01.04 Basic design of Mea Sharim station	Lump sum		
01.05 Basic design of Tzfanya station	Lump sum		
01.06 Basic design of Bar Ilan station	Lump sum		
01.07 Detailed design tunnel and portals	Lump sum		
01.08 Detailed design of Mea Sharim station	Lump sum		
01.09 Detailed design of Tzfanya station	Lump sum		
01.10 Detailed design of Bar Ilan station	Lump sum		
Total in each currency (series 01)			

O1: OPTIONAL ASSIGNMENT 1 Bill items: Supervision of addition geotechnical site investigations (lump sums, excluding VAT):

Optional Assignment description (series 02)	unit	Quantity	Unit price		Total amount	
			Chosen foreign currency for costs abroad) (_____)	NIS (for local costs)	Chosen foreign currency for costs abroad) (_____)	NIS (for local costs)
02.01 Supervision of drilling	Bore-holes	25				
02.02 Supervision of geophysical investigations	kilometre	2				
Total in each currency (series 02):						

O2: OPTIONAL ASSIGNMENT 2, Bill Items: Preparation of tender documents (lump sums monthly fee, excluding VAT):

Optional Assignment description (series 03)	unit	Chosen foreign currency (for costs abroad) (_____)[1]	NIS (for local costs)
03.01 Preparation of RFPs for the civil works packages for tunnel(s), shafts, adits, stations and portal(s).	Lump Sum		
03.02 Preparation of RFPs for the safety equipment packages (ventilation, CCTV, link with the SCADA system, etc..).	Lump Sum		
03.03 Preparation of RFPs for the building works services and related equipment in station(s).	Lump Sum		
Total in each currency (series 03):			

O3: OPTIONAL ASSIGNMENT 3, Bill Items: Tender process assistance (lump sums, excluding VAT):

Optional Assignment description (series 04)	unit	Chosen foreign currency (for costs abroad) (_____)	NIS (for local costs)
04.01 Tender process assistance during selection of contractor(s) for the civil works packages for tunnel(s), shafts, adits, station and portal(s).	Lump Sum		
04.02 Tender process assistance during selection of contractor(s) for the safety equipment packages.	Lump Sum		
04.03 Tender process assistance during selection of contractor(s) for the building works, services and related equipment in station(s).	Lump Sum		
Total in each currency (series 04):			

O4: OPTIONAL ASSIGNMENT 4, Bill Item: Supervision of construction (lump sums and/or monthly fee, excluding VAT):

Optional Assignment description (series 05)	Unit	Quantity	Unit price		Total amount	
			Chosen foreign currency for foreign personnel (_____)	NIS (for local personnel)	Chosen foreign currency (_____)	NIS
05.01 Design checks of civil work for tunnel, ventilation shafts and portals	Lump sum	1				
05.02 Design checks of civil works Mea Sharim station	Lump sum	1				
05.03 Design Checks of civil works Tzfanya station	Lump sum	1				
05.04 Design Checks of civil works Bar Ilan station	Lump sum	1				
05.05 Design checks of safety equipment global integration between tunnel and stations, general concepts.(ventilation, SCADA link, etc..)	Lump sum	1				
05.06 Design checks of safety equipment in stations, per underground station	Unit	3				

Optional Assignment description (series 05)	Unit	Quantity	Unit price		Total amount	
			Chosen foreign currency for foreign personnel (_____)	NIS (for local personnel)	Chosen foreign currency (_____)	NIS
05.07 Design check of building works, services and related equipment in station(s), per underground station.	Unit	3				
05.11 General construction management comprising all staff permanently on site for the duration of the works.(total of items from 05.11.01 to 05.11.05)	Month	48				
05.11.01 Construction manager (100% allocation to the Project)	Month	48				
05.11.02 Quality Assurance Manager (100% allocation to the Project)	Month	48				
05.11.03 Health & Safety coordinator (50% allocation to the Project)	Month	48				
05.11.04 Planning Manager (25% allocation to the Project)	Month	48				
05.11.05 Other expences	Month	48				
05.12 Supervision Civil works for tunnel and 2 underground stations (total of items from 05.12.01 to 05.12.02)	Month	36				
05.12.01 Supervisor for civil and architectural works (100% allocation to the Project)	Month	36				
05.12.02 Other expences	Month	36				
05.13 Supervision of Civil works for 1 cut and cover underground station (total of items from 05.13.01 to 05.13.02)	Month	24				

Optional Assignment description (series 05)	Unit	Quantity	Unit price		Total amount	
			Chosen foreign currency for foreign personnel (_____)	NIS (for local personnel)	Chosen foreign currency (_____)	NIS
05.13.01 Supervisor for civil and architectural works (100% allocation to the Project)	Month	24				
05.13.02 Other expenses	Month	24				
05.14 Supervision of installation of safety equipment installations in tunnel(s), stations and portals and interface with LRT, for 2 or 3 underground stations (total of items from 05.14.02 to 05.14.01)	Month	12				
05.14.01 Supervisor for MEP and LRT integration works	Month	12				
05.14.02 Other expenses	Month	12				
05.15 Supervisor for building works services and related equipment in underground station(s) (total of items from 05.15.01 to 05.15.02)	Month	18				
05.15.01 Supervisor for MEP and LRT integration works	Month	18				
05.15.02 Other expences	Month	18				
05.21 Commissioning and acceptance, for the entire works, including 2 or 3 underground stations (estimated for 6 months duration)	Lump sum					
05.22 Post construction phase, for the entire works, including 2 or 3 underground stations (estimated for 24 months duration)	Lump sum					
Total in each currency (series 05):						

Note: [1] *Foreign currencies may be either US Dollars or Euros only. No other foreign currencies may be accepted. The conversion rate used for bid evaluation will be the daily representative exchange rates as published by the International Monetary Fund 30 days prior to the Bid Submission Date.*

We, the Bidder, understand that following the preliminary design the number of stations could be reduced to two stations without entitling us to any claim in respect of a change in scope of the services. In this event, the price quoted for the stations shall be the basis for adapting the contract price, without any further compensation.

The total amounts below include all taxes, duties, fees, levies, excise or other charges levied on the Consultant in accordance with all applicable laws but not including any linkage differentials or local VAT.

Our Financial Proposal is binding upon us up to the expiration of the validity of the Bid.

Yours faithfully,

Signature of the Authorised Representative:

Name and Title of Signatory:

Company name:

Address:

2.1.2 BREAKDOWN BY COST CATEGORIES

The Bidder shall complete a breakdown of **each of** the lump sum or unit rates prices set out in the letter above according to the categories of costs and format set out below:

Billing item reference number: __	***Description:*** _____			
Cost category	***Time spent (days)***	***Daily rates (___ or ₪)[1]***	***Foreign currency (___) [1]***	***Local currency (₪) [1]***
Foreign Personnel:				
F1 – Project Manager/ Construction Manager				
F2 – Expert				
F3 – Chief Engineer, Chief Architect				
F4 – Senior Engineer, Senior Architect				
F5 – Engineer, Architect				
F6 – Draftsman				
F7 – Secretary				
Total foreign personnel				
Local Personnel:				
L1 – Project Manager				
L2 – Expert				
L3 – Chief Engineer, Chief Architect				
L4 – Senior Engineer, Senior Architect				
L5 – Engineer, Architect				
L6 – Draftsman				
L7 – Secretary				
Total local personnel				
Travels:				
(Between each foreign location involved and Israel)				
Total travel costs				
Office accommodation in Israel:				
Specific office space in Israel [2]:				
Israel office equipment				
Total accommodation costs				
Total for Bill item reference number: __ (sum of above totals)				

Note[1] Allowances in ₪ are for foreign personnel in Israel, in foreign currency for local personnel abroad, both amounts covering accommodation (Per Diem, hotel and other living expenses in Israel).

Note[2] For the performance of the Optional Assignment 4, the Consultant will be provided by the contractor(s), free of charge, with an on-site office, including basic furniture (desks, chairs, toilet) and functional connection to the main utilities (water, electricity and air conditioning). The running costs with water and electricity will be paid by the contractor(s) also.

It will be the Consultant's responsibility to include all requirements relating to this on-site office in the relevant tender documents.

The above-mentioned cost categories are established in accordance with the criteria set-out in the table below:

Cost Category	Education level	Minimum general professional experience on the proposed position	Minimum relevant professional experience on similar projects to the proposed position
F1/ L1 – Project Manager / Construction Manager	University degree	20 years	12 years
For F2 / L2– Expert	University degree	15 years	10 years
F3/ L3 – Chief Engineer, Chief Architect	University degree	15 years	10 years
F4/ L4 – Senior Engineer, Senior Architect	University degree	10 years	5 years
F5 / L5– Engineer, Architect	University degree	5 years	2 years
F6 / L6– Draftsman	Not applicable		
F7 / L7 – Secretary	Not applicable		

2.2 PROJECT PAYMENT SCHEDULES AND ADDITIONAL WORK

A. Basic Assignment

The proposed payment schedules for the Basic Assignment are as follows:

1) Advance payment

The Consultant shall not receive any advance payment. However to ensure reasonable cash flow for the consultant a sum of 5% of the basic assignment shall be paid on mobilisation of the team.

2) Milestones and payment schedule for Basic Assignment:

Deliverable	***% of total amount***
Mobilisation and submittal of inception report.	*5%*
Approval of the preliminary design	*15%*
TABBA submission	*5%*
Approval of the basic design	*25%*
TABBA approval	*5%*
Submittal of design for building permit approval	*20%*
Approval of detailed design	*15%*
Approval of building permit	*10%*

It is hereby clarified that payments shall be made only after approval by JTMT of the corresponding progress of the performance of the Services**.**

B. Milestones and payment schedule for Optional Assignments

The payment milestones and payment schedule for Options shall be proposed by the Consultant, as part of the Financial Proposal.

C. Additional work

The Consultant may be required to carry out additional work which is not included in the TOR.

In such instances the price of such additional work shall be agreed in advance between JTMT and the Consultant, based on the table of unit rates used for establishing the lump sum and unit prices as set out in 2.1.2 above;

3. DECLARATION REGARDING CONTACTS AND ABSENCE OF CONFLICT OF INTEREST

Name of Bidder:

Date:

We the undersigned, being the authorized representative/s of _____ (insert bidder's name) (hereinafter: the "**Bidder**"), in accordance with the Power of Attorney attached to the Bidder's proposal, hereby declare on behalf of the Bidder as follows:

This declaration regarding contacts and absence of conflicts of interest (hereinafter: the "**Declaration**") is being submitted as part of the materials comprising the proposal of the Bidder for the tender for the provision of engineering, design and other services for the underground section of the city centre section of the Blue Line published by JTMT (hereinafter: the "**Tender**").

We hereby declare, that:

1. Neither the Bidder nor any of its employees or sub-consultants is connected with JTMT employees, nor with employees of Egis Rail S.A. the JTMT General Consultant.

2. There are no conflicts of interest between any of the prior or current engagements or activities of the Bidder's Members, and/or those of their employees, and/or the Bidder's proposed sub-consultants, and the obligations or rights of the Consultant under the Contract attached to the RFP for the Tender.

For the removal of any possible risk of conflict of interest, attached to this declaration is a detailed statement setting out all contacts, whether commercial or personal, with:

(i) The Concessionaire of the Red Line of the LRT System of Jerusalem, CityPass Ltd;

(ii) Any of the Concessionaire's shareholders;

(iii) Any of the Concessionaire's subcontractors;

(iv) The consultants for the design of the Blue Line to the LRT Network;

(v) The consultants for the design of the Green Line to the LRT Network;

(vi) Egis Rail S.A., the JTMT General Consultant.

(vii) Any other organization involved in the design, construction, testing and commissioning of the extensions to the Red Line and the design of the Blue and Green lines.

We further declare and undertake:

1. That the execution and performance of the services under the tender (hereinafter: "the **Services**") do not conflict with any of the Bidder's other obligations and/or those of its Personnel towards third parties, and that neither it nor its personnel will face a claim from any third parties with regard to the fulfilment of their obligations in accordance with the tender or the contract.

2. To fully indemnify JTMT for all costs and/or damages caused to JTMT arising from any claim being submitted against JTMT with respect to the aforesaid including any settlement reached by JTMT pursuant to the submission of such claim.

3. To report to JTMT immediately regarding anything that may create a situation of conflict of interest or the risk of such. Such reporting shall take place at any time in the course of the performance of the services under the Tender and/or contract, and immediately upon the Bidder becoming aware of such situation.

4. That in the event that the Bidder is awarded a contract pursuant to the RFP or part thereof, it will refrain from any activity that might constitute a conflict of interest in the execution of its duties under the terms of the contract, all in accordance with the terms of the contract, including, without limitation, the prohibition, for the entire period of the contract, on engaging in any work for or on behalf of any member of the current Red Line Concessionaire without the prior written approval of JTMT.

5. That in the event the Bidder is awarded a contract pursuant to the RFP and for two (2) years after the termination of any such agreement for whatever reason, the Bidder, including its shareholders, managers, personnel, employees, sub-consultants, representatives and privies shall refrain from any activity or association which may, directly or indirectly, constitute:

   (i) a conflict of interest between the fulfilment of its duties under the terms of such contract and the fulfilment of any other its duties and/or any corporation directly or indirectly controlled by it, or between the fulfilment of their duties under the terms of such contract and their private interests.

   (ii) taking advantage of a business opportunity to obtain a benefit for themselves and/or any corporations under its direct or indirect control, arising from the services under such contract.

6. That the interest of JTMT and the project for the design and construction of an underground section for the city centre section of the Blue Line, including the successful deployment of the Services, shall supersede all other interests, and that it shall immediately report to JTMT of any potential conflict of interests that may develop or arise including regarding any approach or possibility of such a transaction with the aforesaid bodies for the Bidder or in connection with any of its employees, sub-consultants, representatives or privies. The Bidder shall be entitled to enter such a transaction only with the prior written approval of JTMT and subject to the directives of JTMT with regard to the terms and/or details of the transaction including demanding that conditions be appended to such transaction by the Bidder with said bodies.

The Bidder understands and agrees that JTMT reserves the sole right and discretion to request any clarification and/or further information and/or details on any of the aforesaid points, and also to decide that certain contacts constitute a conflict of interest and on such basis to bar such Bidder from continued participation in the Tender process.

Where a Bidder is so barred JTMT reserves the right to allow the Bidder to change the Member(s) with regard to which the conflict of interest exists and to enable the Bidder to become eligible to re-join the Tender process.

The Bidder hereby agrees to indemnify JTMT for all damages incurred by it as a result of a breach of any of the declarations, warranties and undertakings contained herein.

This Declaration is delivered and takes effect on the date first written above.

Signed by:

_____
(Insert name and Position)
Authorized Representative of Bidder

_____
(Insert name and Position)
Authorized Representative of Bidder

In the presence of:

_____
[Insert name] , attorney
Bidder's
Legal Counsel

4. IRREVOCABLE POWER OF ATTORNEY FOR BIDDER'S AUTHORIZED REPRESENTATIVE

We, the undersigned

Name and address of Members	
1.	
2.	
3.	
4.	
5.	

being the Members of _____ [*insert name of Bidder*] (hereinafter: the "Bidder") in the project for the provision of engineering, design and other services for the underground section of the city centre section of the Blue Line (the "Project"), hereby appoint and empower _____ [*insert name of Member company to be Authorized Representative of the Bidder*] to be the Authorized Representative of the Bidder and, for the purposes of this tender, of the Members, and to perform and/or sign on our behalf, throughout the tender Process, all or any of the actions, matters, agreements and/or documents set forth hereinafter:

1. To receive, on behalf of the Bidder and/or Members, all tender documents and all documents and other material which may be issued by JTMT to the Bidders throughout the tender Process.
2. To submit, on behalf of the Bidder and/or Members, to JTMT, all requests for clarification, proposed amendments and other inputs which JTMT may require from the Bidder and/or Members from time to time throughout the tender Process.
3. To give the Bidder's consent to changes of schedule and/or other conditions of the tender Process which may be required by JTMT from time to time throughout the tender Process.
4. To appear in the name of the Bidder and/or Members and on its/their behalf before JTMT, the Selection Committee and/or any representative therefrom, in all matters, including and in addition to those set forth herein, affecting or connected with the tender Process, and to sign and execute any document before JTMT and/or its representatives on behalf of the Bidder and/or Members, and to perform all actions and matters which are required of the Authorized Representative of the Bidder and/or Members to perform

in accordance with the tender documents, and/or which may be required of the Authorized Representative by JTMT.

5. This Power of Attorney may not be revoked, transferred or changed in any way without the prior written approval of JTMT.

We hereby undertake to confirm and uphold any act or matter which our Authorized Representative shall do or cause by virtue of this power of attorney.

IN WITNESS WHEREOF, the parties hereto have signed this power of attorney:

	Name of Member	**Signature of Member's authorized representative**	**Confirmation of signature**
1.		By: Position: Date:	
2.		By: Position: Date:	
3.		By: Position: Date:	
4.		By: Position: Date:	
5.		By: Position: Date:	

Authorization by attorney/notary:

Signed by:

_____ _____

[Insert name] , attorney Date
Bidder's
Legal Counsel

5. IRREVOCABLE POWER OF ATTORNEY FOR AUTHORIZED SIGNATORY FOR BIDDER'S AUTHORIZED REPRESENTATIVE

I the undersigned, being legal counsel of _____ (insert company name) (hereinafter: the "**Authorized Representative**"), hereby confirm the following and attach my signature below as testimony thereof:

Further to the irrevocable power of attorney signed by the Members of the Bidder, the Authorized Representative has duly appointed _____ (insert individual/s name/s and position/s) as its authorized signatory/s for the duration of the tender process for the provision of engineering, design and other services for the underground section of the city centre section of the Blue Line (hereinafter: the "**Tender**") and for the duration of the contract to be signed with JTMT in the event the Bidder is determined as the Preferred Bidder and awarded the contract in accordance with the provisions of the Tender, and has authorized the aforesaid authorized signatory/s in the Bidder's name or otherwise, and on its behalf:

1. To receive, on behalf of the Authorized Representative (on behalf of the Bidder and/or its Members) all Tender documents and all documents and other material which may be issued by JTMT to the Bidders throughout the tender.
2. To submit, on behalf of the Authorized Representative (on behalf of the Bidder and/or the Members), to JTMT, all requests for clarification, proposed amendments and other inputs which JTMT may require from the Bidder and/or Members from time to time throughout the tender.
3. To give the Authorized Representative's (on behalf of the Bidders and/or the Members) consent to changes of schedule and/or other conditions of the tender which may be required by JTMT from time to time throughout the tender.
4. To appear in the name of the Authorized Representative (on behalf of the Bidder and/or the Members and on its/their behalf) before JTMT, the Selection Committee and/or any representative therefrom, in all matters, including and in addition to those set forth herein, affecting or connected with the tender process, and to sign and execute any document before JTMT and/or its representatives on behalf of the Authorized Representative and/or the Bidder and/or the Members, and to perform all actions and matters which are required of the Authorized Representative of the Bidder and/or Members to perform in accordance with the tender documents, and/or which may be required of the Authorized Representative by JTMT.

5. To consider, settle, sign, execute, deliver and/or issue all agreements, documents, certificates and instruments which the Bidder considers desirable in connection with the Tender and/or the contract awarded pursuant thereto.

In accordance with the provisions of the Tender, this Power of Attorney may not be revoked, transferred or changed in any way without the prior written approval of JTMT.

Signed by:

_____ _____

[Insert name] , attorney Date
Authorized Representative's
Legal Counsel

6. DECLARATION, WARRANTY AND UNDERTAKING

Name of the Bidder:

Date:

We the undersigned, being the Authorized Representative/s of _____ (insert bidder's name) (hereinafter: the "**Bidder**"), in accordance with the Power of Attorney attached to the Bidder's proposal, hereby declare, warrant and undertake on behalf of the Bidder as follows:

This declaration, warranty and undertaking (hereinafter: the "**Declaration**") is being submitted as part of the materials comprising the proposal of the Bidder for the tender for the provision of engineering, design and other services for the underground section of the city centre section of the Blue Line published by JTMT (hereinafter: the "**Tender**").

The Bidder has received a complete copy of the Request for Proposals (hereinafter "RFP"), including the Instructions to Bidders, the Terms of Reference, the General Provisions of Contract and all other attachments. The Bidder has understood the contents of the RFP in its entirety, and submits its proposals in accordance with the terms and provisions in the RFP. The Bidder further declares that it agrees to all of the provisions in the RFP, and undertakes to be bound by all the normative provisions in the RFP.

The Bidder warrants that the proposals are accurate, complete and up-to-date, in accordance with the requirements of the RFP and the Bidder's best professional judgment. The Bidder has carefully read and understood all parts of its Bid including its Financial Proposal. The Bidder understands that it shall not be able to change any part of its Financial Proposal as a result of any new information it might receive.

The Bidder warrants that the Bid has not been prepared in collusion with any other Bidder participating in this tender, nor with any entity associated with such Bidder, and that no Member of the Bidder is a member, either directly or indirectly, in any other Bidder participating in the tender.

The Bidder warrants that it is legally entitled to use and transfer all information, know-how, trade secrets, patents and/or other intellectual property contained in the Bid.

The Bidder understands that the submission of its proposals shall not be deemed in any way to create an obligation on the part of JTMT to award it a contract for performing the Services contemplated therein, and that JTMT has the unfettered right to reject any or all proposals submitted; to request additional information from the Bidder or other parties; to cancel or modify the RFP at any time; and to negotiate with any or all Bidders.

In the event the Bidder is awarded the contract for performing the Services under the RFP the Bidder, its personnel and/or its managers and/or its shareholders and/or it sub-consultants, representatives and privies shall:

1. Perform all such services without exception, subject to any further directions from JTMT.

2. At all times hold the interests of JTMT paramount, without any consideration for future work, and avoiding conflicts with other assignments or its own corporate interests and/or those corporate interests of its sub-consultants.

The Bidder hereby agrees to indemnify JTMT for all damages incurred by it as a result of a breach of any of the declarations, warranties and undertakings contained herein.

This Declaration is delivered and takes effect on the date first written above.

Signed by:

_____
(Insert name and Position)
Authorized Representative of Bidder

_____
(Insert name and Position)
Authorized Representative of Bidder

In the presence of:

_____
[Insert name] , attorney
Bidder's
Legal Counsel

7. CONFIDENTIALITY UNDERTAKING

Name of the Bidder:

Date:

This confidentiality undertaking (hereinafter: the "**Undertaking**") is being submitted as part of the materials comprising the proposal of the Bidder for the tender for the provision of engineering, design and other services for the underground section of the city centre section of the Blue Line published by JTMT (hereinafter: the "**Tender**").

We/I the undersigned, being the authorized representative/s of _____ (insert bidder's name) (hereinafter: the "**Bidder**"), in accordance with the Power of Attorney attached to the Bidder's proposal, hereby declare, warrant and undertake on behalf of the Bidder as follows:

The Bidder and/or the Members and/or their personnel and/or managers and/or shareholders and/or sub-consultants, representatives and privies shall safeguard keep confidential and not disclose and/or convey and/or inform and/or transfer and/or bring to the attention of any person and/or body, either during the term of the Tender process and the contract and following the expiration of the term of the contract to be awarded to the Preferred Bidder in accordance with the provisions of the Tender, any information and/or data and/or programmes and/or software of any kind received or made known to it in whatever way in the course of the Tender process or in the event the contract is awarded to it during the term of such contract for performance of the Services detailed therein, and shall also see to it that its employees shall also observe such confidentiality both during the Tender process or the term of such agreement and also following the expiration thereof.

The Bidder undertakes to keep confidential all information, whether written or oral, concerning the provision of Services, which it receives or obtains as a result of the information supplied in the RFP, or in discussions related thereto.

The Bidder shall not disclose or publish any information with regard to its work regarding the provision of the Services, including, without limitation, information regarding the results of its work or any details of such work, without the prior written consent of JTMT.

The Bidder and/or the Members and/or their personnel and/or managers and/or shareholders and/or sub-consultants, representatives and privies undertakes not to use, whether directly or indirectly, outside its work for JTMT, any professional or commercial information or intellectual property which serves and/or will serve it in the Tender process or the performance of the Services. Any such use may be permitted only with the authorisation of the JTMT executive director.

Notwithstanding the above, it is explicitly set forth that the disclosure of such information as directed by any Laws and Regulations shall not be considered a breach of this Undertaking provided, however, that JTMT receives prior forewarning of such disclosure.

In the event of denial to continue in the tender process for any reason and/or termination or expiration of the contract executed following such Tender process, unless otherwise specifically directed by JTMT, the Bidder hereby undertakes to deliver to JTMT, not later

than upon the date such termination or expiration comes into effect, the RFP and the accompanying documents attached thereto (hereinafter: the "**RFP Documents**") and any other document and/or material received during the tender process and/or the term of the contract and/or in connection thereto, together with a detailed inventory thereof.

The Bidder undertakes to ensure that all Members, sub- consultants and advisers abide by the terms of this Undertaking.

The Bidder hereby agrees to indemnify JTMT for all damages incurred by it as a result of a breach of any of the declarations, warranties and undertakings contained herein.

This Declaration is delivered and takes effect on the date first written above.

Signed by:

_____
(Insert name and Position)
Authorized Representative of Bidder

_____
(Insert name and Position)
Authorized Representative of Bidder

In the presence of:

_____
[Insert name] , attorney
Bidder's
Legal Counsel

8. DECLARATION REGARDING ABSENCE OF LITIGATION

Name of the Bidder:

Date:

This declaration regarding absence of litigation (hereinafter: the "**Declaration**") is being submitted as part of the materials comprising the proposal of the Bidder for the tender for the provision of engineering, design and other services for the underground section of the city centre section of the Blue Line published by JTMT (hereinafter: the "**Tender**").

We/I the undersigned, being the authorized representative/s of _____ (insert bidder's name) (hereinafter: the "**Bidder**"), in accordance with the Power of Attorney attached to the Bidder's proposal, hereby declare under penalty of jury, on behalf of the Bidder the following:

No prior and/or current and/or pending civil litigation exists against the Bidder and/or its Members **or**

In the event litigation history exists,

Set out herein below is the civil litigation history arising out of the performance of a consulting contract in which the:

(1) Bidder and/or its Members, including any person who is in a management position with, or has an ownership interest in the contracting entity in the Bidder and/or its Members, **or**

(2) The qualifying person to perform the services described in the Tender, including any such person when they were manager, owner, or responsible managing employee of a consulting contractor other than the Bidder and/or its Members, was a named plaintiff or defendant in a lawsuit brought by or against the Bidder and/or its Members:

a. The name and court case identification number of each case
b. The jurisdiction in which it was filed
c. The outcome of the litigation, e.g., whether the case is pending, a judgment was entered, a settlement was reached, or the case was dismissed.

This Declaration is delivered and takes effect on the date first written above.

Signed by:

_____
(Insert name and Position)
Authorized Representative of Bidder

_____
(Insert name and Position)
Authorized Representative of Bidder

In the presence of:

_____
[Insert name] , attorney
Bidder's
Legal Counsel

9. BIDDER'S ELIGIBILITY REFERENCE REQUIREMENTS

Firm Name:

Each Member is to submit this form. All Member forms added together must meet the minimal eligibility criteria of the RFP to qualify the Bidder.

S.No	Name of Project	Name of Client	Estimated capital cost of Project (IN NIS million)	Payment of professional fees received by the Applicant (in NIS)
(1)	(2)	(3)	(4)	(5)

The Bidder or Member shall provide details of only those projects that have been undertaken by it under its own name.

Certificate from the Statutory Auditor*

This is to certify that the information contained in Column 5 above is correct as per the accounts of the Firm.

Name of the audit firm:

Seal of the audit firm

Date:
(Signature, name and designation of the authorised signatory)

Note: The Bidder's Members shall attach separate sheets to provide brief particulars of each project justifying that it qualifies in accordance with the requirements of Section 8.1 of the ITB.

*Where the Bidder does not have a statutory auditor, it shall provide the certificate from its chartered accountant that ordinarily audits the annual accounts of the Bidder.

10. GENERAL CONDITIONS OF CONTRACT

Part I: General Conditions of Contract

FORM OF CONTRACT NO. _____/15

This contract (hereinafter referred to as the "**Agreement**") is made this ___ day of ____, 2015

Between

Jerusalem Transportation Masterplan Team
From 97 Jaffa Street, Jerusalem, Israel
(hereinafter referred to as the "**JTMT**")

on the one side;

and

_____

(hereinafter referred to as the "**Consultant**")

on the other side;

WHEREAS: JTMT, operating through "The Association for Urban Planning, Development and Preservation – Jerusalem (R.A.)" as part of its work towards a transport network in the metropolitan area of Jerusalem and to advance various transport projects, is interested in receiving the Services which form the subject of this Agreement in the field of engineering design services and supervision as part of the project for the design and construction of an underground section for the city centre section of the Blue Line; and

WHEREAS: JTMT is interested in receiving the Services from the Consultant in accordance with the terms set forth in this Agreement and in the annexes attached thereto; and

WHEREAS: The Consultant declares that it has read and understood and agrees to all the terms set forth in this Agreement, and that it is capable, both professionally and financially and in all other respects, of accepting on itself the performance of the work set forth herein to the highest standard and in accordance with the terms set forth herein; and

WHEREAS: JTMT, acting in accordance with the decision of the Steering Committee as defined in the Special Conditions, and based on the Consultant's aforementioned representations and undertakings, has resolved to bestow on the Consultant the performance of the Services as defined hereunder, and the Consultant wishes to perform the Services, all in accordance with the terms of this Agreement;

NOW THEREFORE the Parties hereto agree as follows:

1. The following documents shall form an integral part of this Agreement:
   a) the preamble and introduction to the Agreement
   b) the General Conditions of Contract;
   c) the Special Conditions of Contract; and
   d) the Appendices attached to this Agreement and/or detailed in the Special Conditions of Contract, including but not limited to the following appendices:
   - **Appendix A** Request For Proposals (RFP) including the Terms of Reference
   - **Appendix B** Specification of Services and Fee
   - **Appendix C** Consultant's Technical Proposal dated
   - **Appendix D** Consultant's Financial Proposal dated
   - **Appendix E** Consultant's Declarations
     - 1 - Declaration regarding contacts and absence of conflict of interest
     - 2 - Power of attorney for Authorized Representative
     - 3 - Declaration, Warranty and Undertaking
     - 4 - Confidentiality Undertaking
     - 5 - Declaration regarding absence of Litigation
   - **Appendix G** Consultant's Incorporation Documentation

2. Order of Precedence

Unless otherwise specified in the Special Conditions, in the event of contradiction between the various documents forming part of this Agreement, the following order of precedence shall apply:

The Special Conditions of Contract;

The General Conditions of Contract;

Appendices

Appendix B Specification of Services and Fee

Appendix A Request For Proposals (RFP) and Terms of Reference

Appendix C Consultant's Technical Proposal dated

Appendix D Consultant's Financial Proposal dated

Appendix E Consultant's Declarations

Additional appendices detailed in the Special Conditions of Contract (as the case may be).

GENERAL CONDITIONS OF CONTRACT

1. GENERAL PROVISIONS

1.1. The Agreement

1.1.1. JTMT hereby procures the Services as defined hereunder from the Consultant and the Consultant hereby undertakes to provide JTMT with such Services, all in accordance with, and subject to the terms of this Agreement.

1.1.2. In the event of additional agreements with the Consultant in the course of the Project, including regarding additional services as defined hereunder, these may be performed by the execution of addendums to the Special Conditions of Contract. In this event the terms of the General Conditions of Contract shall continue to apply.

2. Definitions

The following terms whenever used in this Agreement shall have the following meanings:

Authorities	Any authority with powers under all Laws and Regulations which relate to the Project;
Agreement	The Agreement signed by the Parties, an integral and inseparable part of which are these General Conditions of Contract together with all documents listed in Section 1 to the preamble to this Agreement ;
Foreign Currency	Euros (EUR €);
Consultant	The consultant engaged by JTMT for the performance of the Services as defined hereunder, including any person and/or body engaged by such consultant for the performance of such Services.
General Conditions	The General Conditions of Contract;
Government	The Government of the State of Israel;
JTMT	The Jerusalem Transportation Masterplan Team, operating through "The Association for Urban Planning, Development and Preservation – Jerusalem (R.A.)". The execution of this Agreement is subject to the Laws and Regulations applying to such operation and the terms of this Agreement. The executive director of JTMT or his/her authorised representative, or the professional body for the implementation of this Agreement, shall hereby be authorised to act on behalf of JTMT in all matters pertaining to the performance of this Agreement
Laws and Regulations	The laws and regulations as may be issued and in force from time to time in the State of Israel;
Local Currency	New Israeli Shekel (NIS);
LRT	Light Rail Transit
Party	The JTMT or the Consultant, as the case may be; "Parties" refers to both of them;

Personnel	Persons assigned by the Consultant, whether as employees or otherwise, to the performance of the Services or any part thereof; "Foreign Personnel" means such persons who at the time of being so assigned had their domicile outside Israel; and "Local Personnel" means such persons who at the time of being so assigned had their domicile inside Israel;
Project	The design and construction of an underground section for the city centre section of the Blue Line.
Special Conditions	The Special Conditions of Contract by which the GC may be amended or supplemented;
Services	The engineering design services and supervision work to be performed by the Consultant pursuant to this Agreement, as described in the Special Conditions and the Request for Proposals attached hereto as Appendix A;
Steering Committee	The managing committee of the JTMT comprising representatives from the Ministry of Transport and the Municipality of Jerusalem;
Third Party	Any person or entity other than the Government, JTMT, the Consultant or a sub-consultant;

2.1. **Law Governing Agreement**

This Agreement, its meaning and interpretation, and any relation between the Parties shall be governed by the Laws and Regulations of the State of Israel.

3. Headings

Headings in this Agreement are used for purposes of convenience only, and shall not serve for purposes of interpretation.

4. Miscellaneous

4.1. **Notices and addresses**

The addresses of the Parties for the purposes of this Agreement shall be as set out in the Preamble. Any notice sent by registered mail in Israel to either of the aforementioned addresses shall be considered as having been lawfully received within seventy two (72) hours of it being sent by registered mail.

4.2. **Location of performance of Services**

The Services shall be performed at such locations as are specified in Appendix A and, where the location of a particular task is not so specified, at such locations, whether in Israel or elsewhere, as may be approved by JTMT.

4.3. **Taxes and Duties**

4.3.1. Unless otherwise specified in this Agreement, the Consultant and/or the Consultant's Personnel shall pay such taxes, duties, fees, levies and other impositions as may be levied under all Laws and Regulations.

4.3.2. Notwithstanding the provisions of Section 4.3.1 above, where, under all Laws and Regulations, the Consultant becomes liable for Israeli income tax the requirement for payment of Income Tax by the Consultant may be performed by JTMT deducting the relevant tax sums from the regular payments to the Consultant. This deduction will be performed according to the Tax Authorities' instructions.

4.3.3. For the purposes of the fulfilment of JTMT's undertaking as set forth in Section 4.3.2 above, the Consultant hereby undertakes to cooperate fully with JTMT in all contacts with the Income Tax Authorities.

5. Representations, warranties and undertakings of the parties

5.1. The Consultant hereby represents and warrants that it has the qualifications, ability and professional experience necessary to perform the Services in accordance with this Agreement and in accordance with all Laws and Regulations, to the highest professional standard, and that it will perform the Services in accordance with the provisions of this Agreement, and adhere to the instructions received from JTMT to its full satisfaction, and that it will be solely responsible for the performance of such Services.

5.2. The Consultant hereby represents and warrants that there is no prohibition against, and/or no impediment of any kind, including by force of law or contract to its contracting under this Agreement and performing its obligations hereunder. The Consultant is not subject to any obligation, including any conditional obligation, which may contravene its undertakings under this Agreement, and there is nothing in the execution of this Agreement or its implementation of its undertakings hereunder which might constitute a breach of any contract or other undertaking and/or a breach of any law.

5.3. Where the Consultant has undertaken to perform the Services or any part thereof through or by a specific representative whose name it has presented before JTMT, the Consultant shall not replace such representative without the prior written approval of JTMT. Such approval shall be at the exclusive discretion of JTMT and shall be subject to any such replacement having the same or superior experience, qualifications and skills as the representative being replaced. It is hereby clarified that any such replacement may not serve as grounds for postponing and/or delaying and/or derogating from and/or any diminution in the performance of the undertakings of the Consultant as set out hereunder, and the Consultant shall be prevented from raising any claim of any kind whatsoever in this regard.

5.4. The Consultant undertakes to fulfil all the conditions precedent for the implementation of this Agreement including as set forth in Appendix A attached hereto and any addenda to this Agreement, throughout the period of the Agreement.

Any deviation from the fulfilment of such conditions precedent shall constitute a material breach of this Agreement, with all that this entails.

5.5. The Consultant undertakes to act in good faith towards JTMT, its employees and/or contractors, and not perform any act liable to harm JTMT, its business, its good name, or the Project.

5.6. JTMT represents and warrants that it is a body set up and funded by the Jerusalem Municipality and the Ministry of Transport of Israel. JTMT currently functions through "The Association for Urban Planning, Development and Preservation – Jerusalem (R.A.)". The Consultant hereby declares that it is aware and in agreement, that the transaction in accordance with this Agreement is subject to the Laws and Regulations applicable in Israel to activity of the kind entailed hereunder and in accordance with the essence and scope of the Project and the Agreement.

5.7. It is hereby clarified and agreed by the Consultant that, in light of the complexity of both this present Project and other projects currently being undertaken by JTMT and the numerous bodies involved in such projects, and also in light of the fact that JTMT is a body which may assign its rights and obligations to an alternative body which will lead the implementation of the Project, changes to the Services may be necessary which will require full compliance on the part of the Consultant and total cooperation with JTMT, in accordance with the instructions which may be issued from time to time by JTMT at its sole discretion.

5.8. The Consultant shall submit to JTMT a detailed work programme and a report on the progress of the Services, as well as any documents, explanations and/or information regarding the Services which JTMT may require from time to time. The submission of documents shall be in accordance with the time schedule determined by JTMT in each case.

5.9. JTMT shall make available to the Consultant all the information and data in its possession which the Consultant deems necessary and relevant for the performance of the Services. Nothing in the foregoing shall derogate from the obligation of the Consultant to obtain all material necessary for the performance of the Services in accordance with this Agreement.

5.10. The Consultant will receive instructions from a representative of JTMT with regard to all aspects of the Services and their performance, as well as with regard to the reports, programmes and documents to be prepared by the Consultant. It is hereby agreed that the absence of such instructions shall in no way release the Consultant from its obligations under this Agreement, nor does this provision entail an obligation upon JTMT to issue such instructions to the Consultant.

5.11. JTMT shall be entitled to require modifications and/or clarifications and/or additions to the work to be performed by the Consultant and likewise shall be entitled to require that any written opinion, piece of work or other document submitted by the Consultant be rewritten or otherwise revised. The Consultant undertakes to make whatever modifications to its work as may be required of it at any time by JTMT.

Notwithstanding the foregoing, it is hereby agreed that where, as a result of such request and for the performance of such modifications, clarifications or additions, the Consultant is required to incur material additional outlays, the Parties shall agree on an additional consideration to be paid to the Consultant for the performance of such modifications, clarifications or additions as the case may be. In all other events it is hereby agreed that the consideration to be paid to the Consultant under this Agreement represents full and adequate consideration including for the performance of such modifications.

5.12. Without derogating from the generality of the foregoing, it is hereby agreed that any document to be submitted by the Consultant shall be prepared on computer and shall be submitted in electronic medium (CD, memory stick, or forwarding of computer file(s) or any other way) in a form and format which are compatible with the JTMT computer and information systems. Subject to the directions of JTMT, any such submission shall be accompanied by a hard copy print-out of the contents of the submission. The Consultant likewise hereby undertakes to receive and/or enable transfer to or from it of any material in electronic form, using software in accordance with the directions of JTMT.

5.13. Where any aspect of the Services requires a registration or the obtaining of a licence or permit in accordance with any Laws and Regulations as these may be in force, or changed, from time to time, the Consultant shall be required so to comply at its own expense.

5.14. The Consultant shall bear full and exclusive responsibility for ensuring that all of its actions undertaken for the provision of the Services shall be performed in accordance with the Laws and Regulations in force. The Consultant undertakes to perform any action or service so as to ensure that at all times the implementation of the Services meets the requirements of any Laws and Regulations. The Consultant shall not be entitled to any additional payment in lieu of such actions, and all such actions performed shall be at the sole expense of the Consultant. The Consultant hereby undertakes immediately to inform JTMT in the event of the discovery of a discrepancy of any kind between the performance of the Services and the provisions of any Laws and Regulations. The Consultant shall bear full and exclusive responsibility for compliance with the provisions of this Section 5.14.

5.15. In addition, the Consultant undertakes to perform any act which an expert would perform so as to perform the Services under this Agreement, in accordance with the rules of its trade, the highest standards of professional practice and the provisions of all Laws and Regulations applying to the performance of the Services. The Consultant further undertakes to take any measures which may be required for the efficient and effective performance of the Services.

5.16. The Consultant shall participate in meetings regarding and/or connected with the Project and/or the performance of the Services, including meetings of the Standardization Committee and/or with the Local Consultant as may be required from time to time by JTMT for the purposes of performing the Services.

5.17. The Consultant shall work in cooperation with all other consultants and experts engaged on the Project, with particular attention to the Local Consultant and the Standardization Committee and/or with any other body as JTMT may direct, and as

may be required for the performance of the Services. It is hereby clarified that JTMT's authorised representative shall have the exclusive authority to provide the Consultant with instructions as regards the Project, the performance of the Services and the manner of cooperation as set forth herein.

5.18. The Consultant shall keep a written record of all hours worked under this Agreement. This written record shall be submitted to JTMT at its request. Where the Consultant is engaged to work a set number of hours, it undertakes to inform the JTMT representative immediately when the number of hours worked amounts to 75% of the total number of hours set forth in the Special Conditions of Contract. It is hereby clarified that, where the number of hours worked by the Consultant exceeds the number of hours set forth in the Special Conditions of Contract, the Consultant shall not be entitled to any payment/consideration in lieu of this and shall have no claim whatsoever against JTMT in this regard.

5.19. In addition, and without derogating from the generality of the foregoing, it is hereby agreed that nothing in this Agreement shall give the Consultant exclusivity with regard to the performance of the Services and/or to affect the scope of work of other consultants. JTMT shall be entitled at all times, and at its exclusive discretion, to engage additional consultants for the performance of the Services and/or for the performance of similar services, to change consultants or perform the Services itself, and to do so in any way it chooses, including during the course of this Agreement.

6. Remuneration and payment

6.1. Remuneration for the consulting Services is provided for in the Special Conditions and set out in detail in Appendix B attached hereto.

6.2. It is hereby clarified that the remuneration shall be rendered only for Services actually performed, and in accordance with the instructions of JTMT.

6.3. The remuneration shall be rendered in accordance with the *de-facto* progress of the performance of the Services, and according to the decision of JTMT. Notwithstanding anything to the contrary in Appendix B and the Special Conditions of Contract, it is hereby clarified that where the progress of the work under this Agreement does not proceed as swiftly planned, or where there is a delay or change in the schedule for the performance of the Services for whatever reason, JTMT shall be entitled to change the schedule of payments at its sole reasonable discretion, and in accordance with circumstances which may arise.

6.4. Payments owed to the Consultant shall be made at the scheduled date + sixty (60) days after submission of an invoice by the Consultant and the approval of such by JTMT's representative.

6.5. The Consultant shall submit its invoices on invoice forms which JTMT shall provide. It shall be the responsibility of the Consultant to make sure that its invoice is detailed and includes all the relevant necessary documentation (such as: approved order for work, calculations and so forth) in order for JTMT to be able to understand the manner in which the invoice has been made out. It is hereby clarified that invoices which are not submitted as set forth in this Section 6.5 shall not be considered, and the number of days for JTMT payment as set forth in Section 6.4 shall not apply.

6.6. Where the performance of Services is to be calculated by number of hours worked, the Consultant shall be required to submit a detailed breakdown of hours worked, showing the days, dates and hours worked together with a detailed explanation of the work undertaken and the matters dealt with.

6.7. The Consultant shall submit its invoices on a regular basis and immediately following the performance of the relevant part of the Services. Where an invoice is submitted three or more months following the completion of such work, JTMT shall be entitled, at its sole discretion, and following the issuing of a written notice to the Consultant, to set off up to 10% of the consideration for each month of delay, beginning at the fourth month of delay. The penalty shall be imposed cumulatively (for each month of delay) and will be set off from the consideration due to the Consultant.

6.8. The remuneration as stipulated in the Special Conditions shall be in full satisfaction of all consideration due to the Consultant as a result of the Services and as a result of any rights or claims relating thereto, including other expenses incurred in the preparation of the Services, except as specifically set forth in the Special Conditions.

7. Schedule for performance of Services

7.1. Except where otherwise stated in the Special Conditions of Contract, the Consultant shall perform the Services in accordance with the schedule for the performance of the Services to be defined by JTMT's representative.

7.2. A delay of more than fourteen (14) days in the performance of any stage in the stages of work defined in the schedule for the performance of the Services shall entitle JTMT to deduct 5% of the remuneration owed to the Consultant for such stage of work for each week of delay, or part thereof, beginning on the fifteenth (15^{th}) day of such delay onwards.

8. Liability Indemnification and Insurance

8.1. The Consultant shall be professionally liable towards JTMT and towards any third party for the performance of the Services to the highest professional standard and with the greatest expertise and as provided in accordance with all Laws and Regulations.

8.2. The Consultant accepts full and complete liability, in accordance with all Laws and Regulations for any accident and/or injury and/or damage and/or loss (hereinafter: the "damage") of any kind caused for whatever reason to JTMT and/or to the Consultant and/or to JTMT's property and/or to the property of the Consultant or any third party, arising from an action and/or an omission, whether directly or indirectly in the course of and/or as a result of the performance of this Agreement and/or in connection thereto.

8.3. The liability of the Consultant for the work of the Consultant shall be borne solely by the Consultant itself in accordance with all Laws and Regulations. The Consultant shall bear similar liability with respect to the type and manner of the provision of the Services and/or the performance of the work by it and/or by any employee acting on its behalf. The agreement and/or approval of JTMT with regard to matters related to the performance of the Services do not release the Consultant from its exclusive

liability for such work or Services.

8.4. It is hereby set forth and agreed that JTMT shall under no circumstances bear any vicarious liability for any actions, torts or omissions of the Consultant or any employee acting on its behalf which are not included under the professional liability insurance as set forth hereunder. The Consultant undertakes to compensate JTMT for any damage or cost incurred by JTMT as a result of negligence by the Consultant in the performance of its work, or as a result of the breach of a statutory duty, or as a result of a breach of this Agreement.

8.5. The Consultant shall be solely liable for payment for the indemnification of any damages, or compensation or any other payment owed by the Consultant, in accordance with all Laws and Regulations, to JTMT and/or any body connected with the procurement of the Project and/or the employees of such body and/or other any third party. In addition the Consultant shall compensate and indemnify JTMT for all expenses and/or payments and/or losses of any kind resulting from any claim or lawsuit submitted against it by any third party in connection with the performance of the Services and/or the results of such performance. JTMT shall duly inform the Consultant of the filing of any such claim or lawsuit and will enable it to participate in any dispute settlement negotiations and/or to undertake the defence of the lawsuit at its expense.

8.6. **Insurance to be taken out by the Consultant**

The Consultant shall (i) take out and maintain, and cause any sub-consultant to take out and maintain, at its own cost (or that of the sub-consultant's, as the case may be) but on terms and conditions approved by the JTMT, insurance against the risks, and for the coverages, as shall be specified in the Special Conditions of Contract; and (ii) at the JTMT's request, provide JTMT with documentation showing that such insurance has been taken out and maintained and that the current premiums therefor have been paid. JTMT shall not require an insurance policy unreasonably exceeding the coverage used in projects similar to the Project.

9. Assignment of Rights

9.1. The Consultant hereby undertakes not to assign this Agreement or any part of it, and not to transfer to any third party whatsoever any right and/or obligation arising from this Agreement without specific advance written approval from JTMT. The granting of such approval shall not release the Consultant from any of its obligations and/or responsibilities in accordance with all Laws and Regulations and/or in accordance with this Agreement.

9.2. JTMT shall be entitled to assign transfer or pledge its rights and obligations under this Agreement, in whole or in part, to a third party, without requiring the agreement of the Consultant.

10. Relations between the Parties

10.1. The Consultant shall be considered an independent contractor in its relations with JTMT. The right of JTMT to instruct, supervise or otherwise direct the Consultant and/or its employees and/or those it engages in the implementation of this Agreement shall not be construed as establishing a relation of employer and

employee or of principal and agent between JTMT and the Consultant.

10.2. For the removal of any doubt the Parties declare that neither the Consultant nor its employees nor those engaged by it in the implementation of this Agreement shall have any rights as employees of JTMT, and accordingly shall not be entitled to any of the rights accruing to JTMT employees, nor to any compensation and/or benefits of any kind in connection with the performance of this Agreement and/or its cancellation or termination and/or the termination of the performance of the work, for any reason.

10.3. JTMT shall not pay any amount in lieu of National Insurance, parallel tax, or any other employee rights with regard to the Consultant's Personnel. Where under any Laws and Regulations there exists a duty to deduct amounts from the salaries of the Consultant's Personnel, this shall be done by the Consultant and at its sole expense.

10.4. The Consultant undertakes that the employment of its employees shall be in accordance with the provisions of all Laws and Regulations and that it shall act in accordance with Israeli Labour Law.

10.4.1. In the event the Consultant is in breach of one or more of the provisions of the Law for the Increased Enforcement of Labour Law – 5772-2011, JTMT shall be entitled to send the Consultant notice of the fact that it is required to act immediately to correct such breach.

10.4.2. In the event JTMT sends the Consultant such notice, it shall correct the breach within a reasonable space of time.

10.4.3. Where the Consultant fails to correct the breach within a reasonable space of time, JTMT shall be entitled to cancel the Agreement forthwith, and the Consultant shall not be entitled to demand any compensation of any kind for the cancellation of the Agreement.

10.5. Where a claim is filed against JTMT by any of the Consultant's Personnel, including where JTMT receives a final demand prior to the filing of such a claim, the Consultant undertakes to indemnify JTMT for any amount which may be required this in light of the fact that this Agreement covers the entire remuneration to which the Consultant may be entitled. JTMT shall inform the Consultant of such demand and/or claim at the first opportunity and shall give the Consultant reasonable opportunity to defend against such demand or claim. Without derogating from the foregoing –

10.5.1. It is hereby agreed between the Parties that, in any event that a claim is made against JTMT by any of the Consultant's Personnel, and to the extent JTMT shall requests, the Consultant shall agree to JTMT being joined as a defendant in such claim.

10.5.2. Where JTMT is required in any court judgement in such case to pay an amount to one or more of the Consultant's Personnel, the Consultant undertakes to indemnify JTMT for the entire amount it was required to pay under the court judgement, together with reasonable legal costs.

11. Intellectual Property

11.1. It is hereby clarified that all materials collected and/or prepared by the Consultant for JTMT in connection with its performance of the Services under this Agreement, including any written or unwritten product of its work in connection with the Project, including, without limitation, reports, programmes, drawings, analyses, planning ideas, and any other ideas, specifications, designs, and software (hereinafter "Project Material"), shall be the property of JTMT exclusively, and the Consultant shall have no intellectual property rights with respect to these other than the right to append its name to the products of its work. Likewise, JTMT will be entitled to require that the name of the procurer of the work and/or the body financing the work and/or JTMT and/or the Ministry of Transport and/or the Municipality of Jerusalem and/or the "Association for Urban Planning Development and Preservation – Jerusalem" shall appear on documents relating to its work on the Project.

11.2. It is hereby agreed that JTMT shall be entitled to make use of the Project Material, including, without limitation, to apply it in whatever manner it deems appropriate, or to amend it or transfer it to third parties for amendment, performance or for whatever other purpose. The Consultant shall not be entitled to make any claim in this regard. In particular, it shall not be entitled to claim that the amendments are to be performed by it and/or that the amendments detract from its copyright and/or from its moral rights in the Project Material.

11.3. The Consultant shall not be entitled to make any use of the materials (including software and the results of professional development) which have been prepared and paid for by JTMT. The Consultant shall not be entitled to sell or offer for sale to any of its clients any products which have been developed for JTMT.

11.4. The Consultant shall have no rights of lien with regard to the Project Material including any document relating to the performance of its work or which it obtained as part of the implementation of this Agreement. The aforementioned shall not derogate from the obligation of the Consultant to keep copies of all documents as required under all Laws and Regulations.

11.5. The intellectual property provisions in this Agreement shall continue to apply whether the Agreement is implemented in full, or whether the Agreement is annulled for whatever reason or its performance interrupted, whatever the cause of the annulment and/or interruption, and whatever the identity of the party in breach and/or the contributory negligence of the other party.

11.6. The parties hereby declare that the remuneration of the Consultant as stipulated in the Special Conditions represents ample consideration owed to the Consultant even taking into consideration the provisions of this Section 11.

11.7. Equipment and materials made available to the Consultant by JTMT, or purchased by the Consultant with funds provided by the JTMT, shall be the property of the JTMT exclusively, and shall be marked accordingly. Upon termination or expiration of this Agreement, the Consultant shall make available to the JTMT an inventory of such equipment and materials and shall dispose of such equipment and materials in accordance with JTMT's instructions.

12. Confidentiality

12.1. The Consultant undertakes to keep confidential and not to disclose, transfer, or bring to the attention of any person or body, any information and/or data and/or programmes and/or software of any kind received or made known to it in whatever way, in connection with the performance of this Agreement or JTMT, and shall also see to it that its employees shall also observe such confidentiality, both during the term of this Agreement and also following the expiration thereof. Notwithstanding the foregoing, the disclosure of such information as directed in accordance with any Laws and Regulations shall not be considered a breach of the confidentiality undertaking under this Agreement, provided, however, that JTMT receives prior forwarning of such disclosure.

12.2. The Consultant shall not disclose or publish any information with regard to its work under the Project, including, without limitation, information regarding the results of its work or any details of such work, without the prior written consent of JTMT.

12.3. The Consultant undertakes not to use, whether directly or indirectly, outside its work for JTMT, any professional or commercial information or intellectual property which serves and/or will serve the Consultant in the performance of the Services. Any such use may be permitted only with the authorisation of the JTMT executive director.

13. Conflict of Interest

13.1. The Consultant hereby declares and undertakes that its execution and performance of this Agreement does not conflict with any of its other obligations and/or those of its Personnel towards third parties, and that neither it nor its Personnel will face a claim from any third parties with regard to the fulfilment of their obligations in accordance with this Agreement.

13.2. In the event of JTMT becoming aware that if faces such a claim as set forth above, JTMT shall be entitled to take whatever steps it considers necessary so as to ensure the efficient and swift progress of the Project, including, without limitation, by reaching a settlement with such third party after informing the Consultant of such claim and/or settlement. In this event, the Consultant shall fully indemnify JTMT for all costs and/or damages caused to JTMT arising from such settlement.

13.3. The Consultant and its Personnel undertake to refrain from any activity which may constitute a conflict of interest between the fulfilment of their duties under this Agreement and the fulfilment of any other duty of theirs and/or any corporation directly or indirectly controlled by them, or between the fulfilment of their duties under this Agreement and their private interests. The interest of JTMT and the Project shall supersede all other interests.

13.4. The Consultant and its Personnel agree to report to JTMT immediately regarding anything that may create a situation of conflict of interest or the risk of such. Such reporting shall take place at any time in the course of the performance of the Services under this Agreement, and immediately upon the Consultant becoming aware of such situation.

13.5. Throughout the period of this Agreement and for two (2) years after its termination for whatever reason, the Consultant, including its shareholders, managers and Personnel shall refrain from any activity which may constitute taking advantage of a business opportunity to obtain a benefit for themselves and/or any corporations under their direct or indirect control, arising from its Services under this Agreement.

13.6. The Consultant hereby agrees and undertakes to accept no money or other consideration for anything relating to the performance of its Services under this Agreement, other than that to be received from JTMT and in accordance with the terms of this Agreement.

13.7. For the removal of any possible risk of conflict of interest and for the sake of good order, the Consultant and its Personnel shall declare all professional and business connections with any bodies directly or indirectly connected with the following bodies:

(i) All transport operators in the Jerusalem metropolitan area;

(ii) Egis Rail (S.A.);

(iii) CityPass Ltd – the Concessionaire for the LRT System being the first line (Red Line) of the Jerusalem Transport Network, including all bodies making up the Concessionaire: a) Alstom Transport; b) Ashtrom Properties Ltd; c) Harel Insurance Company Ltd.; d) T.S.I. Infrastructure Jerusalem Light Rail Limited Partnership; e) T.S.I. Israel Transportation Infrastructure Ltd., f) Transdev en-Ile-de-France.

(iv) The Green Line consultant;

(v) The Blue Line consultant.

The Consultant's declaration shall be attached as an appendix to this Agreement. The Consultant shall set out in this appendix any relevant information, including with respect to the nature and duration of the connection.

13.8. All the Consultant's Personnel and/or its managers and/or its shareholders shall refrain from entering into any transaction, whether directly or indirectly with any of the aforementioned bodies or their representatives which may constitute a conflict of interest. The Consultant undertakes to update JTMT regarding any approach or possibility of such a transaction. It is hereby clarified that JTMT may in this event shall be entitled to demand any further details, or append conditions to such transaction by the Consultant with said bodies. The Consultant shall be entitled to enter such a transaction only with the prior written approval of JTMT and subject to the directives of JTMT with regard to the terms and/or details of the transaction.

14. Termination and Annulment

14.1. JTMT may decide, at any time, and at its sole and exclusive discretion, to cancel the performance of the Services under this Agreement, or part thereof. Such cancellation shall take place by JTMT's representative giving the Consultant thirty

(30) days advance written notice, and without need to provide any justification for its decision.

14.2. In the circumstances of a decision in accordance with Section 14.1 above, JTMT shall only pay the Consultant an amount out of the Remuneration as set forth in the Special Conditions of Contract relating to the work actually performed by the Consultant up to the date of the cancellation. In this event JTMT shall not be liable for any compensation, remuneration or other payment in connection with the cancellation of the Services or part thereof as relevant.

14.3. JTMT shall be entitled to demand the immediate cessation of the work of any person engaged by the Consultant in the implementation of this Agreement. Such demand may be for reasons of security, for professional reasons, or for any other reasonable cause.

14.4. Without derogating from the above, this Agreement shall be terminated immediately, and without JTMT having any obligation with respect to its contractual relations with the Consultant, in the event the Consultant becomes (or, where the Consultant consists of more than one entity, if any of its Members becomes) insolvent or bankrupt, or enters into any agreement with any of its creditors for relief of debt, or takes advantage of any law for the benefit of debtors, or goes into liquidation or receivership whether compulsory or voluntary (and, in the event of a registered corporation, including, without limitation, in the event of a freezing order being issued against it). It is clarified that JTMT shall pay the Consultant for the work performed by it up to the date of the termination of the Agreement because of the insolvency of the Consultant. It is further clarified that JTMT reserves to itself the right to set off against such payment for any damage incurred by JTMT as a result of the sudden termination of the work because of the financial circumstances of the Consultant. The Consultant undertakes to bring to the immediate attention of JTMT any change in its legal circumstances as set forth in this Section 14.4.

15. Assistance of JTMT

JTMT shall use its best efforts in order to assist the Consultant to obtain those approvals and/or permits necessary to enable the Consultant's personnel to perform the Services provided, provided however that JTMT shall bear no liability whatsoever if the Consultant does not succeed in obtaining any such approval and/or permit, nor shall the above be construed as permitting the Consultant to avoid complying with and satisfying the requirements of any Laws and Regulations.

16. Breaches and Remedies

16.1. In the event of a failure in the performance of the obligations of the Consultant under this Agreement, JTMT shall be entitled to require a remedy of such failure within seven (7) days of the occurrence of such breach. Where the Consultant fails so to remedy such failure, it will be considered a material breach, and JTMT will be entitled to terminate this Agreement and, in addition, to any remedies to which it may be entitled under all Laws and Regulations and under this Agreement. , Without derogating from the foregoing, JTMT shall be entitled to take action to correct the breach, whether by itself or by another acting on its

behalf and to hold the Consultant liable for the full amount of any costs and/or damages incurred as a result.

16.2. Where the Consultant has breached one or more of its obligations under this Agreement, it shall be liable to pay JTMT compensation for damages and losses caused to JTMT as a result of such breach. Without derogating from the generality of the foregoing, JTMT in this event shall be entitled to obtain any other legal remedy against the Consultant, including, without limitation, a court preventive injunction, a court order, an ex parte interim injunction without need to deposit any bond.

16.3. For the removal of doubt, the omission or non-response by JTMT to such breach or non-performance of the Consultant's obligations under this Agreement shall not be construed as a waiver of its rights by JTMT pursuant to such breach, and the Consultant shall be prevented from claiming such waiver unless it receives a notice of waiver in writing from JTMT regarding such specific event or breach or specific provision in the Agreement. No waiver shall have any validity unless made out in writing and signed by a JTMT representative.

17. Right of Set off and Miscellaneous

17.1. JTMT shall be entitled to set off from any payment to the Consultant, any amount owed to JTMT, whether as payment, reimbursement, compensation or indemnification by the Consultant, whether in accordance with this Agreement or any other agreement and/or transaction between JTMT and the Consultant.

17.2. This Agreement exhausts all agreements between the Parties. There shall be no force or significance to any negotiations, declaration, representation, undertaking or agreement between the Parties made, if made, whether in writing or oral, whether explicit or implied, prior to the execution of this Agreement.

17.3. The behaviour of either of the Parties shall not be construed as a waiver of any of its rights, whether under this Agreement or any Laws or Regulations, and/or as a waiver or agreement on its part to accept the existence of any breach by the other or the non-performance of any of the terms of this Agreement, unless the waiver, agreement, postponement, modification, annulment or addendum are made explicitly and in writing.

17.4. No modification or change of any kind to this Agreement shall have any validity unless in a written document signed by the Parties to be attached to this Agreement. For the removal of all doubt it is hereby clarified that it shall not be possible to change any term of this Agreement by means of practice, behaviour and so forth.

17.5. Without derogating from the generality of the foregoing and further to Section 5.7 above, it is hereby clarified, and the Consultant hereby agrees that, throughout the duration of the Agreement JTMT may at its complete and sole discretion and exclusive prerogative reduce the scope of the Services, in part or in full, and request the performance of only part of the Services at any time, and adjust the remuneration and payment accordingly.

17.6. The Consultant shall have no claim of any kind whatsoever against JTMT with respect to the exercise of its prerogative as set out in Section 17.5 above, including with respect to any damages, expenses or other relief.

18. Settlement of Disputes

18.1. Amicable Settlement

The Parties shall use their best efforts to settle amicably all disputes arising out of or in connection with this Agreement or the interpretation thereof.

18.2. Jurisdiction and Dispute Settlement

The competent court in Jerusalem shall have exclusive jurisdiction over any matter, including disputes, arising out of and/or in connection with the execution of this Agreement.

IN WITNESS WHEREOF, the Parties hereto have signed these General Conditions.

FOR AND ON BEHALF OF THE JTMT:

_____ _____
Managing Director, JTMT Date

_____ _____
Jerusalem Municipality Treasurer Date
Authorized Representative

FOR AND ON BEHALF OF THE CONSULTANT:

_____ _____
Authorized Representative Date

_____ _____
Authorized Representative Date

_____ _____
Company Stamp Date

PART II: SPECIAL CONDITIONS of CONTRACT

Purposely left blank

[TBD following selection of Preferred Bidder in accordance with the RFP]

Project reference	V4260_ERA_TD_00041_A25

REQUEST FOR PROPOSALS FOR

ENGINEERING, DESIGN AND OTHER SERVICES FOR THE UNDERGROUND SECTION OF THE CITY CENTRE SECTION OF THE BLUE LINE

ANNEX C: EVALUATION CRITERIA

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1. WEIGHTING

The overall mark for the Bid (Technical proposal + Financial proposal) shall be rated on a one hundred (100) points basis. The overall mark for the Technical Proposal shall be rated out of eighty (80) points. The overall mark for the Financial Proposal shall be rated out of twenty (20) points.

2. TECHNICAL PROPOSAL EVALUATION THRESHOLD

Only those Bids whose Technical Proposals meet the following requirements shall go forward to the evaluation of the Financial Proposal:

1. Compliance with all mandatory requirements (including for proposed staff)
2. At least twenty (20) points with respect to the proposed staff and CVs, and
3. At least sixty (60) points with respect to the complete Technical Proposal.

3. TECHNICAL PROPOSAL EVALUATION

a) The overall mark for the Technical Proposal shall be eighty (80) points taking into consideration the Bidder's references; approach, organization and methodology; adequacy of the proposed Project staff and CV's; and the Technical Presentation.

b) The evaluation takes into account the experience in an eligible project depending on the domain of expertise. An eligible tunnel project is defined as follows:

- **Eligible type 1 project** (for civil engineering works), either:
  - 1.an urban road or rail tunnel of at least 1 km in length or
  - 2. an underground metro or LRT station (either cut and cover or cavern);

- **Eligible type 2 project** (for transportation safety & equipment in tunnels and underground stations): a metro or underground LRT or urban rail tunnels, of at least 2 km in length and comprising at least one underground station.

c) The following criteria and related marks will be considered by the Selection Committee to select the preferred Bidders. For convenience purposes, the technical proposal evaluation criteria and respective weighting are summarised in the table below:

Subdivision				Subdivision max. mark	Overall mark for category
Corporate references	1 point per railway/metro/LRT project (600 million NIS per project; Member(s) invoiced 2m+ NIS)			5	**10**
	1 point per project (300m+ NIS) with underground station – Member(s) main designer (invoiced 2m+ NIS)			5	
Proposed personnel	**Project Manager**	Gen professional experience in construction	3	15	**42**
		Particular experience as a project manager for eligible projects (type 1)	7		
		Particular experience as a project manager for eligible projects (type 2)	5		
	Tunnelling design manager	General professional experience	4	11	
		Particular experience as a tunnelling design manager for eligible projects (type 1)	7		
	MEP design manager	General professional experience	3	8	
		Particular experience as an MEP design manager for eligible projects (type 1)	5		
	Chief Architect	General professional experience	2	8	
		Particular experience as chief architect for underground stations	6		
Technical Proposal	Bidder's assessment of existing design			7	**28**
	Description of the applicable methodology for performing the Services			7	
	Organization Breakdown Structure (OBS) and Proposed Deployment Schedule			3	
	List of deliverables and example of drawing deliverables			3	
	Risk management in design process			8	

1. Maximum 10 points for Bidder's corporate references

The following evaluation criteria and weights will be used:

- One point for each railway/LRT/Metro project with a tunnel in urban environment of at least 2 km and with a total project value of over 600 Million NIS on which any of the Members have invoiced at least 2 million NIS, within the last 10 years, up to a maximum of 5 points.
- One point for each project over 300 Million NIS containing at least one underground station (excavated underground, not cut and cover) for which any of the Bidder's Members were the main designer and invoiced at least 2 million NIS within the last 10 years, up to a maximum of 5 points.

2. **Maximum 42 points for the adequacy of the proposed personnel and related CVs, divided as follows:**

1) Maximum 15 points for the Project Manager:

The following evaluation criteria and weights will be used for the Project Manager. Weighting in each case will be awarded based on the extent, quality and relevance of the experience:

- General relevant professional experience in construction - Maximum of **3 points** (where 3 represents more than 30 years; and 1 point represents more than 20 years)

- Particular experience as a project manager for **eligible type 1projects maximum of 7 points** (where 7 represents more than 5 eligible type 1projects, 5 represents more than 3 eligible type 1 projects and 3 for three eligible type 1 projects).

- Particular experience as a project manager for **eligible type 2projects – maximum of 5 points** (where 5 represents more than three (3) finished eligible type 2 projects, 3 represents more than two finished eligible type 2 projects and one (1) for two finished eligible type 2 projects).

2) Maximum 11 points for the tunnelling design manager

The following evaluation criteria and weights will be used for the **tunnelling design manager**. Weighting in each case will be awarded based on the extent, quality and relevance of the experience:

- General relevant professional experience in construction - Maximum of **4 points** (where 4 represents more than 20 years, 1 between 15 and 20 years)

- Particular experience as a **tunnelling design manager** for **eligible type 1 projects maximum of 7 points** (where 7 represents more than 5 eligible type 1 projects, 5 for more than 3 eligible type 1 projects and 3 for three eligible type 1 projects.

3) Maximum 8 points for the MEP design manager

The following evaluation criteria and weights will be used for the **MEP design manager**. Weighting in each case will be awarded based on the extent, quality and relevance of the experience:

- General relevant professional experience in construction - Maximum of **3 points** (where 3 represents more than 20 years, 1 between 15 and 20 years)
- Particular experience as an **MEP design manager** for **eligible type 2 projects maximum of 5 points** (where 5 represents more than 5 eligible type 1 projects, 3 represents more than 3 eligible type 1 projects and 3 for three eligible type 1 projects.

4) Maximum 8 points for the Chief Architect

The following evaluation criteria and weights will be used for the **Chief Architect**. Weighting in each case will be awarded based on the extent, quality and relevance of the experience:

- General relevant professional experience in construction - Maximum of **2 points** (where 2 represents more than 20 years, 1 between 15 and 20 years)

- Particular experience as chief architect for underground stations (relates to LRT/Metro stations of both types, underground and cut and cover) – maximum of **6 points** (where 6 represents more than 7 of those finished stations, 3 points represents 5 of those finished stations, 1 point represents more than 3 of those finished stations).

Note: Each member of the proposed personnel that is part of the technical evaluation shall meet all requirements set-out in Appendix 1 to Annex A.

3. Maximum 28 points for the technical proposal, divided as follows:

1) **Maximum 7 points for Bidder's assessment of the existing design**

The following evaluation criteria and weights will be used:

- Identification of the uncertainties in the project, both in design and input data with an appreciation of their possible impact on the design studies. The uncertainties are to be categorised by risk source.
- Further design and alignment studies which offer improvements in the project's functionality, costs, construction time, risks, environmental impact.

2) **Maximum 7 points for description of the applicable methodology** for performing the Services, including management of interfaces, overall schedule, specific software to be used and proposed design methodology;

3) **Maximum 3 points for proposed Organization Breakdown Structure (OBS) and Proposed Deployment Schedule;**

4) **Maximum 3 points for completion and accuracy of the list of deliverables and example of drawing deliverables;**

5) **Maximum 8 points** for **d**escription of how the **risk management** will be integrated into design process and which risks are those perceived as the most critical during design and at construction stage;

4. FINANCIAL PROPOSAL EVALUATION CRITERIA

a) **Financial Proposal Evaluation Threshold -** JTMT reserves the right to reject any Bid whose Bid Price deviates by **25%** or more from JTMT's own Bid Price estimate.

b) The lowest valid Financial Proposal (Fm) will be given a financial score (Sf) of 20 points (out of a possible 20). The financial score for each Bid will be calculated by the following formula:

Sf = Fm/F x 20, where:

- **Sf** is the financial score of the Bid
- **Fm** is the lowest bid price
- **F** is the Bid Price

c) Foreign currencies are converted to Israeli NIS using the daily representative exchange rates as published by the International Monetary Fund 30 days prior to Bid Due Date.

d) **Bid Price**

The **Bid Price (F)** will be calculated by the following formula:

$$F = BA + O1 + O2 + O3 + 0{,}7xO4$$

Where:

BA	Basic Assignment, (lump sum)
O1	Optional Assignment 1: Supervision of additional geotechnical site investigations (lump sum) (See comments in Section 12 of the TOR)
O2	Optional Assignment 2: Preparation of tender documents (lump sum) (See comments in Section 13 of the TOR)
O3	Optional Assignment 3: tender Process assistance (lump sum) (See comments in Section 14 of the TOR)
O4	Optional Assignment 4: Supervision of construction (lump sum and monthly fee combined) (See comments in Section 15 of the TOR)