

**Design engineering and construction appendix**  
**for an underground parking facility shaft**

Draft - Non Binding Version

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## 1. **General**

### 1.1 Technical data

The expression "robotic parking systems" in the contract document refers to the expression "parking facility" in this document.

- The underground parking facility has a minimum diameter of up to 10 m and depth of up to 12 m under the ground, with an aboveground entrance structure, all as specified and subject to the documents of the agreement and the Tender.
- The structure of the shaft for the underground parking facility will be built of reinforced concrete, peripheral retaining wall with a form of a circle, reinforced concrete coating walls. The steel made robotic facility will be installed inside the pit. Above the shaft, a structure is designed for inserting the bicycle into the robotic facility built of steel construction.

It is hereby emphasized that some of the structures will be built in urban density areas, which includes infrastructures, existing buildings of various types, railway infrastructure, pedestrian activity, roads, etc. The Supplier shall be solely responsible for safety and shall make sure to prevent interference with the station's activities, and shall take all necessary precautions to keep the safety of passers-by, maintain the accessibility at all stages of the engagement and prevent damage to existing infrastructures and other elements in the station area.

The Supplier shall take into account that Israel Railways (ISR) may demand that some or most of the work be carried out by night work.

### 1.2 Manner of engagement

All design engineering documents submitted by the supplier are subject to ISR comments. It is hereby clarified that until a particular document has been approved by ISR, the supplier is not entitled to rely on it, or performing works on its basis. The client shall be entitled to comment on any document and or demand and the supplier undertakes to comply with these requirements in the schedules set by ISR, all at no additional cost.

Despite the foregoing, ISR comments and all the changes that required, the comments do not impose any responsibility on ISR. The supplier will perform the works and/or anyone acting on its behalf, and the supplier alone will be responsible for any work performed by him and waive any claim and/or demand from ISR, including that a certain work was performed by him due to ISR instruction.

ISR on its decision, appoint a control team and the supplier undertakes to cooperate fully with the control team and provide them any information and/or document required by the team immediately upon demand.

Any approval by ISR shall be approved in writing and in advance by those authorized by ISR project coordinator, as defined in the agreement. The supplier shall not be entitled to rely on an approval that was not given in this manner.

A. scope of work

The supplier shall arrange, at its own expense and responsibility, to hire and operate consulting services for the design engineering and execution of the works subject of this appendix, including design engineers and consultants in all areas required for the design engineering and execution of the shaft and for obtaining all the necessary approvals for carrying out the works. Without derogating from the provisions of the agreement, the supplier will be responsible for any act and/or omission of any of the consultants and/or subcontractors on its behalf.

B. Quality control – will be carried out by the supplier.

C. Quality assurance – will be carried out by ISR

D. The client shall provide the laboratory and its payment for the required tests.

However, all actions involved in coordinating the work with such laboratory and/or coordinating with it shall be carried out by the supplier and will be his responsibility.

E. The design engineers on behalf of the Supplier shall be approved by the ISR in writing and in advance; ISR shall be entitled to disqualify a design engineer at its decision, without the supplier being able to appeal.

- F. At the completion of the shaft building works, the supplier shall submit an approval by all the design engineers on its behalf that the work was carried out according to the design engineering and instructions given by them. ISR shall be entitled to inspect the execution of the works and if and insofar as the works were not performed to its satisfaction, then the Supplier undertakes to perform any repair at its own expense and responsibility in the schedules set by ISR.

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**Infrastructure coordination**

The supplier will be responsible for the design engineering and relocation of infrastructure, as well as the connection to the infrastructure required for the operation of the facility, including, if required, submission to the authorities or infrastructure owners and receipt of approvals for implementation. It is hereby clarified that all actions will be performed by the supplier in coordination with ISR.

1.3 **Design team of engineers and professionals on behalf of the supplier**

As part of the work, the supplier must appoint a team of design engineers on its behalf to design the engineering structures; the team shall include, among other:

- A. A project manager.
- B. Structural engineer (Constructor).
- C. Foundation consultant.
- D. Buildings architect.
- E. Drainage design engineer.
- F. Hydrologist (if required).
- G. Traffic design engineer, includes infrastructure design.
- H. Sealing consultant.
- I. Corrosion protection consultant
- J. Welding engineer.
- K. Qualified surveyor.
- L. Concrete mixtures design engineer.
- M. Safety consultant.
- N. Quality control team.
- O. Electric consultant.
- P. Communications consultant.
- Q. Automation consultant.

And other additional design engineers and consultants as required and request by ISR or anyone on its behalf.

The buildings (construction) design engineer on behalf of the supplier will be a design engineer with at least 10 years of design engineering experience.

The design engineer shall have an engineer's license in accordance with the Engineers and Architects Law, (5718-1958 Section 11) in the Civil Engineering org- Buildings Department.

The engineer's license will be valid by the Ministry of Economy, the department of registration and licensing of businesses – the registration unit for engineers and architects.

The soil consultant on behalf of the supplier will be a design engineer with proven experience of at least 10 years in construction design engineering in the field of soil engineering.

The architect will have a valid license as described above, and will have at least 5 years of experience.

The project and the construction site manager will be a civil engineer with 10 years of experience in the field of construction or a civil engineer with 5 years of experience in the field of soil mechanics works, including experience of directing and coordination between the various design engineers, as well as the various works required for the execution of this Appendix and/or other commitment as detailed in the Agreement.

The design engineers and consultants on behalf of the Supplier shall be approved by ISR at its discretion.

## **2. Engineering structures**

### **2.1 General design engineering principles – Underground shaft structure**

#### **2.1.1 General**

The minimum diameter of the underground shaft space will be not less than 10 m (interior), and about 12 m in depth. At the ground surface level (of the entrance to the station), the parking facility will stand out with an access structure with a shed, which will serve as an entrance for the bicycle to the robotic elevator.

### **2.1.2 Shaft structure components**

The underground structure is a reinforced concrete structure. The structure will be built of: retaining walls made of piles, perimeter concrete beams (“rings”) or horizontal steel supports, piles covered by concrete coating walls, concrete floor, reinforced concrete ceiling as the roof of the structure.

In addition, in the bottom of the floor the structure will include a pumping chamber for drainage, sealing systems, electrical grounding, etc.

The superstructure on the ground level will be an opening to the robotic elevator for the facility, which is a light structure in an area of up to 3\*3 meters according to the manufacturer’s standard.

### **2.1.3 Concrete and reinforcement**

The concrete type in the structures will be at least B- 40, and for thin concrete: B- 20.

The concretes shall comply with the requirements of IS 466 and IS 118 including compliance with the exposure conditions required in the standard.

The reinforcing steel shall comply with the requirements of IS 4466, for “ribbed, weldable” reinforcing steel. 400 or 500.

The reinforcement details design engineering will be in accordance with the appropriate standards instructions.

### **2.1.4 Concrete covering over the reinforcing steel**

The concrete covering over the reinforcing steel shall be as required by the Israeli standards for the suitable environmental conditions, but the covering shall be at a minimum of (net) 5.0 cm, in all the concrete elements, except for the retaining wall elements in which the covering shall be larger, approximately 7.5 cm.

### **2.1.5 Loads**

The loads on the structure will be according to the Israeli standards and according to the requirements for the functioning of the structure and its systems, as follows:

- (1) Loads in structures according to SI 412, including of loads due to self-weight, groundwater pressures, etc.
- (2) The floor of the structure shall be designed for a portable usable load of at least 1,000 kg/m<sup>2</sup> and of ground water pressure load.
- (3) The roof of the structure shall be designed for a minimum portable usable load of 350 kg/m<sup>2</sup>.
- (4) The structure foundation will be designed according to SI 940.
- (5) The structure will be designed for an earthquake according to the Israeli standard for earthquakes no. 413, including a site survey and amplification coefficients that will be required according to the region of the structure.
- (6) The steel elements will be designed according to SI 1225.
- (7) Loads at the perimeter of the structure will be designed for vehicle loads as required in IS 1227 and SI 412.
- (8) In addition, the structure will be designed according to all the requirements of the relevant additional standards, including the requirements of the above client Safety and security department and as required by the client.

#### **2.1.6 Underground parking facility foundation**

The shaft's perimeter retaining wall system will be designed from reinforced concrete and will also be used for foundations. The system includes:

- (1) In areas where the floor of the shaft penetrates below the water level, the retaining walls shall include piles and J.G. injection between them, or scant piles ("one inside the other") for a continuous retaining wall element, or a slurry wall using the mortise and tenon method, or with a rubber seal.
- (2) In areas where the floor of the installation does not penetrate below the water level, retaining wall piles will be designed 10 cm apart.
- (3) The pile construction method will be examined and approved by the client staff.
- (4) In the event that the level of the piles is designed below the water level or in case of the presence of unstable soil layers, the retaining wall elements will be carried out using the bentonite method or the CFA method (the use of the CFA method will be approved for execution according to the accessibility and safety restrictions at each site).

- (5) Foundation and retaining wall elements of sheet piles inserted with vibration and hammering will not be approved.
- (6) At the bottom level of the shaft, a reinforced concrete floor will be placed, suspended or laid according to the soil cross-section to be found in the test drilling.
- (7) For the horizontal support of the retaining wall elements, perimeter beams (reinforced concrete “rings”) will be made in order to obtain the horizontal pressure forces.
- (8) All the laboratory tests and control required in accordance with the foundation standard and the relevant standards shall be performed on the foundation and retaining wall elements, as well as ultrasonic tests to check the quality of the piles and the slurry elements.

**Note:**

Ground anchors for retaining walls will not be approved for use.

**A foundation consultant on behalf of the supplier will prepare a separate foundation report for each structure (in each station), including the soil data, foundation instructions, excavation and retaining walls as well as retaining walls calculations, details of the various groundworks, with emphasis on the manner of preparation on the site in terms of all the groundworks and their implementation.**

**In addition, in the design engineering stages, the Supplier must define the organization area and site area, considering the limitations (if any).**

**2.1.7 Radial concrete structure (inner shaft)**

The supplier shall avoid sand leakage between the piles and in the event of this case, the supplier shall immediately take measures to prevent the leakage.

The internal concrete structure will be carried out after cleaning the retaining wall elements using basalt sand blasting, according to the environmental protection approval and completion of the sealing systems.

The interior of the shaft will be coated with a reinforced concrete wall.

The concrete floor in the shaft structure will also be designed for loads of uplift forces from groundwater to a maximum future level determined by the hydrologist. At the bottom of the floor, a water pumping pit shall be carried out according to the manufacturer's design, and sealing systems shall be installed at the bottom of the floor.

At the upper level of the underground structure, i.e., the ground level at the station, a partial concrete ceiling will be carried out over the retaining wall elements. An upper entrance structure for the robotic elevator will be performed out of steel elements, including a roof for the entrance structure (according to the product specifications).

#### **2.1.8 Sealing**

The steel and automation fittings used in the parking facility will be anchored in the concrete structure elements.

All steel fittings shall be anchored in concrete elements so as not to damage the sealing systems in the structure.

The sealing systems in the underground structure will be continuous sealing systems includes the bottom floor, the retaining wall elements and up to above the ground surface level, all according to the supplier's design.

The concrete elements shall include sealant additives on a crystalline basis.

The sealing systems shall be designed by an expert sealing consultant who has experience in projects designed under the ground water level.

## **2.2 Structure designs**

Detailed designs will be submitted for each structure, including:

Architecture Designs.

Construction designs including an excavation and retaining wall design.

Electrical and automation designs.

Infrastructure facilities.

Landscaping design.

As well as any design required for the structure in accordance with the designed works in the structure.

The designs will include all the details of the structure regarding its construction method, including the structure components, concrete thickness, iron details, concrete covering, concrete type of at least B- 40 , foundation, production designs (Shop Drawing) for the steel elements, cladding panels, electrical grounding details, sealing designs for the structures, etc.

It is hereby emphasized that the structure designs will also include the erection of existing and designed infrastructures, including the relocation of existing infrastructures located in the area of the structure.

### 2.3 Welding expert

The steel welding works shall be designed and accompanied by an expert welding engineer on behalf of the supplier.

The engineer will authorize the welders to perform the welds.

The design engineer will prepare a weld testing scheme design according to the American standard AWS.D1.1.

In any case, the design of the number of tests shall be at least as follows:

Visual inspections for 100% of the welds.

Magnetic testing for 100% of the welds.

Ultrasonic testing shall be performed on all main connections and at least 30% of the total welds.

It is hereby emphasized that the tests will also include all the components of the steel elements of the parking facility structure. Acceptance conditions will be according to AWS D1.1.

No cracks will be allowed.

The engineer will also prepare a design for the treatment of defective welds as required by the relevant standards, as well as repeated tests after the repair, including galvanic repairs and color corrections.

### 2.4 Binding standards for structure design engineering

The following is a list of the binding standards for structure design engineering:

Standard no.	Standard name
1	Cement (all parts)
26	Concrete testing methods
109	Weights of building materials and structural elements
118	Concrete for structural uses – Production control conditions and compressive strength
127	Certification tests for welders
412	Structural loads – typical loads
413	Structure earthquake durability design
414	Typical loads in buildings – Wind load
466	Concrete code (all parts)
789	Deviations in buildings: Permissible deviations in construction work
812	Lighting poles: steel columns
904	Concrete formwork
918	Hot-dip zinc coating on steel products
940	Soil and foundation (all parts)
1032/2	Approval of welding procedures
1142	Railings and armrests (pedestrian railings)
1225	Steel code (all parts)
1227	Loads on bridges (all parts)
1458	Steel pipes for buildings
1630	Retaining walls from reinforced ground
1923	Cast concrete works on site (all parts)
4466	Concrete reinforcing steel (all parts)
4467	Rules for welding structures – steel

In general:

- A. All the standards mentioned in the standards content listed above.
- B. Any other relevant standard.
- C. Design engineering guidelines by the Israel Railways.
- D. Foreign standards required by the ISR.

All standards will be in their latest updated editions and will also include all the amendment sheets included in each and every standard.

## 2.5 Special technical specifications

After the completion of the structure design by the design engineering team on behalf of the Supplier, the team must prepare a special technical specification (**as mentioned later in the “Construction Portfolio” chapter**) describing the implementation of all the components of the parking facility. All as required until its full completion, including performance documentation and control.

The following is a list of the main chapters in the special technical specification (Construction Portfolio) that the supplier’s design engineer must prepare and submit to the ISR as part of the design engineering documents:

Chapter	Chapter name
01	Earthworks for buildings
02	Cast concrete works on site
03	Precast concrete works
04	Construction work
05	Sealing work
06	Joinery products and steel frames
08	Electrical facilities
09	Plaster works
10	Flooring and paving
11	Painting works
19	Steel works
21	Prefabricated concrete elements
23	Piles and slurry elements, for the foundations of buildings and retaining walls
40	Landscape development
51	Paving works
57	Drainage

As well as any special technical specifications that will be required for the execution of the buildings compound, including ISR specifications and according to the ISR requirements.

The chapters will be based on the general inter-ministerial specification for construction work (the Blue Book Israeli code), all in their latest and updated editions.

### **3. Stages of design engineering and submission of documents**

### 3.1 Submission of documents

#### A. General

The supplier shall submit the design according to the timetable for submission of the detailed design in chapter 6 of this appendix.

It is hereby emphasized that the project includes a control team, including various design engineering consultants. Each stage will be approved by ISR.

**Do not** proceed to the next design engineering stage, as long as the previous design engineering stage has not been approved by ISR. All designs will be submitted in hard copy and computerized copy.

#### B. Design engineering stages

The following are the fundamental design engineering stages that will be performed for each structure that will be defined by the Supplier and approved by ISR.

All documents will be submitted in a readable, orderly manner, stating the designer's name, signature, date, date of update, version, subject, etc.

#### 3.1.1 Initial design engineering

##### A. Submission of designs and adapting them to the site

For each and every station, the Supplier shall submit an initial proposal detailing the facility determined by ISR, and detailing the site area and the organization areas, all after conducting preliminary visits.

An initial design for each structure shall be submitted to the ISR. Against a background of the existing situation, road structures, drainage ditches, access roads, communications lines, existing infrastructures, etc.

Upon receiving of the design plans, ISR staff will check the supplier's submission with an emphasis on the adaptation of the structure locations, both in the designs and in a joint site visits with ISR, the supplier and its representatives.

The visit will take place in order to examine and inspect the structure's location, its various components and the organization area and their implications on the entire existing system.

#### 3.1.2 Preliminary design engineering

After obtaining the approval for the initial design engineering, the Supplier and the design engineers on its behalf will advance to the preliminary design engineering, with an emphasis on meeting the schedule.

The preliminary design engineering shall include:

- (1) General plans, including location, distance from the station, with existing and designed position.
- (2) Initial soil and foundation report.
- (3) The boundaries of the construction site should be compatible with the reality at the time of organization, indicating the storage and machine placing space. (At the Savidor Tel Aviv station the site area is no more than 30\*40 m<sup>2</sup>).
- (4) In addition to the work site, a separate area may be allocated for the storage and organization of tools and equipment (which will be given within the station parking lot area or adjacent to the site, depending on the station's limitations).
- (5) General construction plans, including the dimensions of the constructive, foundation elements plans, concrete elements plans, steel plans, sealing plans, etc.
- (6) Architecture Designs.
- (7) A design indicating the location of the additional test drilling (if the Supplier wishes to perform test drilling), as well as the soil consultant instructions and a program for drilling and laboratory tests.
- (8) Facilities design.
- (9) Infrastructure design engineering and relocation of an existing infrastructure if necessary, drainage ditches, access road, accessibility, etc.

ISR will examine the submission and the data and provide its comments.

The Supplier's addressing and response to these comments will be corrected and stated in the detailed design engineering submission.

### **3.1.3 Detailed design engineering**

The supplier and the design engineers on its behalf shall submit the detailed design engineering, including the required amendments that were requested at the preliminary design engineering stage,

according to the schedule detailed in section 6.

The detailed design engineering shall include:

- (1) Updating the designs in accordance with ISR and other authorities comments, as well as the requirements given in the preliminary design engineering.
- (2) Placement designs, regarding the existing elements and the design .
- (3) Detailed designs of the structure elements intended for construction, including cross-section positions, foundation details, reinforcement details, sealing, electrical groundings, infrastructure connections, etc.
- (4) A complete foundation report, including test drilling and soil tests. The report will be for each and every structure in the various stations.
- (5) Complete static calculations for all structures.
- (6) Detailed designs of the designed structure elements, including production designs.
- (7) Submission of an “Construction Portfolio” (as detailed in the next section).
- (8) Approvals received from ISR at each and every site.
- (9) Construction stages considering traffic and pedestrians at the existing rail stations and accessibility regulations.
- (10) Special technical specifications required for the implementation of the structures.
- (11) Quality assurance system procedures for execution by the Supplier.
- (12) Any additional documents and drawings required from ISR and/or anyone on its behalf, all without additional cost.
- (13) Operational maintenance design for the facilities.

A detailed set of drawings for execution will be submitted, signed by the Supplier’s design engineers, printed in two (paper) copies and a computerized copy.

One copy of the set will be delivered to the supplier with an “Approved for Execution” stamp.

### 3.2 Construction Portfolio

As part of the detailed design engineering submission, the Supplier will submit an “Construction Portfolio” for each bicycle facility (separately) containing drawings for execution and a plans detailing all the contents of the tasks and the manner of their implementation.

**Each file submission will comply with the station’s special conditions. Some sites have access and site area which are limited in size, therefore the accuracy of the reported details stated therein is extremely important.**

**The contents of the file will constitute a practical document of implementation and will be found on the site at all times. It will back up the implementation and accompany the project during the works.**

The file will list the following topics:

- A. Organizing on site. The contents of the document will specify: the site size, details of preparations and dismantling prior to implementation, the various structures, mechanical tools (mobile, stationary, and their location on the site), location of the material used for implementation, the manner of using the existing infrastructures such as electricity and water, means of lifting, defining a workers’ rest area and all that is relevant to the type of individual designed work.
- B. Details of contractors according to designed tasks.
- C. Details of the mechanical tools that will work on the site.
- D. Manner of performance of the various works.
- E. The materials and their application methods at any stage of the implementation.
- F. For each type of designed work, an example record form will be submitted for tracking at the time of implementation. The forms will be checked and approved by the supplier’s design engineering team.
- G. Details of the training and experience of the management and supervision team on behalf of the Supplier and the manufacturer.
- H. Details of the stages of implementing the supreme supervision of design engineers or supervisors.
- I. Safety arrangements for the safety officer on behalf of the supplier.
- J. Schedule.

ISR will approve the contents of the file.

The file will be backed up with the approval of the design engineers on behalf of the Supplier and the approval of ISR does not disclaim the supplier's responsibility from the manner of performance, the quality of performance, the work methods, the tools and materials chosen, and in general the entire contents of the file.

### 3.3 Supplier's responsibility for design engineering documents for the various structures

The supplier's documents approval by ISR does not derogate from the full and sole responsibility of the Supplier and the design engineers on its behalf for the content of the documents, the calculations, and the drawings submitted for ISR approval, including its responsibility for the implementation of the structures according to the approved design.

Approval of the design engineering by ISR shall not exempt the supplier of its responsibility for errors, mistakes, inaccuracies or defects in design engineering and implementation that may be discovered at a later date at any time.

Any defects in the structures during the work and during the maintenance period, including design and implementation faults, are under the overall responsibility of the supplier and will be completely repaired by the supplier according to the instructions and details to be designed by the team of the supplier's design engineers and approved by ISR in writing and in advance. All will be in the content of the supplier's work and at its own expense.

## 4 **Supervision**

### 4.1 General – Roles and powers of managers and supervisors on site

A. A Site Project Manager on behalf of the Supplier shall be present at all work times, supervise the entire course of execution and be responsible for carrying out all the design engineering instructions.

For an appointment of an additional or replacement manager to the one agreed upon at the beginning of the project, an application detailing their professional training and experience must be submitted to the manager on behalf of ISR and approved by them.

- B. The management and design engineering control team on behalf of ISR is a means of ensuring that the supplier meets the requirements of the design engineering and the technical specification in full including all its stages. Work must be coordinated and with full cooperation between the various parties.
- C. A safety manager on behalf of the Supplier shall submit periodic reports as detailed in the chapter “Safety manager”.
- D. It should be taken into account that some of the work sites near a railway or communication points may require coordination of the reception of work instructions or require the supervision of safety supervisors or communications supervisors on behalf of ISR. Operation must be with full coordination and cooperation.
- E. When works are performed in factories, a work log and a supervision record form will be managed in the factories. The contents of the log and the forms will be performed by the team of the Supplier’s design engineers, and example forms will be transferred to ISR while submitting an “Construction Portfolio”.

#### 4.2 Supervision and management team on behalf of the supplier

- A. The entire process of implementation and construction of the engineering structures will be performed by the site project manager who is a civil engineer (according to the prerequisites of section “Team of design engineers and professionals”).

The site manager will be constantly present at the site throughout the whole implementation process. In addition, each unique type of work (subcontractors) will have an implementation manager on behalf of the subcontractor, who will accompany the entire work according to the implementation stages specified in the “Implementation File”.

Prior to implementation, the management team personnel will be approved by ISR. It will include, engineers who are registered in the civil engineering industry and have a valid license. The site manager will update ISR with the course of implementation, implementation rate, exceptional events, etc.

- B. Supreme supervision**

The design engineering team on behalf of the Supplier will carry out supreme supervision and accompany the implementation according to the work stages and timing defined for it in the Construction Portfolio. And as required by the Design Engineering and Building Law.

**Each tour will be accompanied by a visit report**, if there are any changes or deviations from the design, these will be submitted for approval by ISR.

At the end of the implementation, design engineers tour will be coordinated for receiving the structure and preparing a report that the structure has been completed as designed.

The supplier will prepare “As Made” drawings for all the structure elements.

The designs will be approved and signed by the supplier’s design engineers.

The above set of drawings including plans files and reports will be submitted to ISR.

#### 4.3 Tasks for the supervision and management team on behalf of the supplier

The following are the tasks to be performed by the site manager and the site supervision team:

- (1) The Site Manager will ensure that the implementation closely follows the (current) design and details of the work process in the “Construction Portfolio”. And that the implementation was performed according to the approved implementation specifications in their updated version.
- (2) **For each individual type of work, record and documentation of the course of implementation will be managed (by filling out work forms).**

**The content of the work form shall be approved by the Supplier’s design engineers at the time of the design engineering submissions and shall be transferred to ISR for control.** ISR may request a procedure for documentation or amendment of the content of the form and the Supplier must cooperate on all such matters.

- (3) The manager will record all the meetings on the site, including the summary of the meetings, and the transfer of the supreme supervision reports of the design engineers on behalf of the Supplier, in conjunction with the timing of the work stages detailed in the “Construction Portfolio” on each site. They will also transfer copies and report relevant inspection reports and updates. Each work log page will be signed by a Site Manager on behalf of the Supplier.

- (4) **It should be hereby clarified that no work is to be performed unless all the designs, reports and specifications related to the work are physically found, that is, printed, on the site.** ISR may stop the work at the site if the Supplier fails to comply with this requirement.
- (5) The Site manager will make sure that all the necessary approvals are available for the commencement of the work and also for delivery at the end of each work.
- (6) The Site manager will make sure that a **laboratory representative is invited** to perform testing at the required timing and that they are being performed. The Manager will perform quality control and submit the approvals to ISR.
- (7) The manager will verify the approval of subcontractors, the suppliers. The quality of the materials and products supplied to the site according to the specifications and instructions in the “Construction Portfolio”.
- (8) The manager shall report unusual progress in the rate of performance in coordination with ISR and alert of delays in the work if any.
- (9) The manager will coordinate reception tours and tracking of the necessary repairs to the satisfaction of ISR.
- (10) The manager will concentrate the submissions at the end of the implementation including post-implementation (As Made) drawings, the concentration of the tests conducted, work logs and documentation, supervision reports and relevant correspondence. And coordinate a tour for the delivery of the structure.

Note:

It is hereby emphasized that ISR shall be entitled, at its discretion, at any time, to add, update and change all the tasks of the Site Manager on behalf of the supplier in accordance with the situation on the site and the requirements of ISR, and the supplier undertakes to fulfill these requirements at no additional cost in the schedules set by ISR.

## **5. Electric works**

All the works will be designed and carried out according to the binding specifications for the design engineering as well as the special specifications listed below:

- (1) General specifications for electrical installations.
- (2) General specifications for communication infrastructure – Chapter 18 according to the "Blue Book" (Israeli code) and according to the Israeli Railways specifications.

- (3) The Electricity code – with its latest publication and regulations in their most recent version.
- (4) Israel Railways Electricity Administration instructions for the implementation of foundation grounding and preparations for electrification.
- (5) A qualified examiner for the electrical installations, including submission of a report and repairing all defects discovered until final delivery to ISR.
- (6) Implementation of As made drawings.
- (7) Regular maintenance will be performed using the documentation and submission of control reports procedure.

A report will be submitted for every periodic visit to the facility.

**At the time of submission of the design, the Supplier will submit the design engineering data and specify the details of the designed work within the Construction Portfolio.**

## **6. Schedule**

### **Schedule for the design engineering stage**

<b>Stage</b>	<b>Time table</b>
Initial design engineering	A week
Preliminary design engineering	2 weeks
Detailed design engineering	4 weeks
Final detailed design engineering after ISR notes	A week

### **Schedule for the implementation stage**

#### **A. General**

The schedule design will specify the various works in the construction of the shaft and the facility and the time allocation for each work of the participating contractors in it. The schedule will also include the dates of ordering and arrival of materials to the site.

The design will specify the general time that will be required for completing the construction of the shaft and the facility. The design will be submitted for approval at the time of submission of the “Construction Portfolio”.

B. Site work schedules

Immediately after the issuing of any assignment, the supplier will visit the sites to check for performance limitations and their effect on the schedule.

At the stations: Netanya, Herzliya and Be'er Sheva, the works can be performed day and night at the Supplier's choice. Request for execution times shall be submitted by the supplier to ISR for prior written approval. Notwithstanding the foregoing at the beginning of this section, the rail has the right to demand work at one time or another and the Supplier must comply with this requirement.

**Savidor station in Tel Aviv is characterized by traffic congestion of passengers at the station. By default, all Works at this station will be performed during the night unless otherwise enabled.**

C. **At future stations, the work execution times will be determined by ISR at its discretion and ISR will be entitled to order the execution of night works at its discretion and the Supplier waives any claim and/or demand, including a demand in respect of additional price and/or loss of profits.**

Meeting the schedule

It will be within the authority of ISR to determine an increase in working staff or work hours in order to meet the schedule or if the rate of the work does not satisfy the predetermined schedule design or for any other limitation. The supplier may have to work more than one work shift (long shifts and/or night shifts).

The supplier will have to comply with these instructions at no additional cost.

No monetary claim will be recognized for the need for re-organization and split work due to the rainy season and continuation of subsequent work.

**7. landscape plan, cleaning the area surface and return to previous state**

When submitting design engineering documents, a development design must be submitted separately for each site, which includes instructions for the execution time and restoration of the site to its previous state. When work is accomplished, the site will be returned clean. The supplier's invoice will not be approved for payment until satisfaction of ISR. This includes completing all parts of the roads and/or paths that were destroyed or damaged as a result of the execution of the works such as: arranging temporary entry and exit to the work site, arranging a temporary path for pedestrians (if necessary), handling drainage ditches, and relocation of infrastructures.

As much as possible, the supplier shall design and use materials that are identical to the origin materials or approved according to architectural drawings that has submitted in the design engineering stages. The landscape design shall be approved by ISR with the submission of all other design engineering stages.

Prior to the works, the site area must be documented in a comprehensive manner (by monitoring and by taking pictures). the documents must be submitted to ISR.

**8. Safety**

**Safety manager on behalf of the supplier**

The supplier must appoint a qualified safety officer or an authorized safety company regardless to the number of employees employed by it, in addition to the Site Manager.

The safety manager will be responsible for guidance, training of employees, compliance and implementation of all safety procedures required for carrying out the work and services for ISR.

The above is in addition to and without derogating from the supplier's responsibility.

The safety manager on behalf of the supplier shall prepare a preliminary risk survey for each work separately.

Among other things, the survey should address the main hazards in the various workplaces, how to prevent injury to workers during work, create scenarios of possible risk events and how to prepare for calling the emergency services when necessary. The survey will be submitted at the time of submitting the “Construction Portfolio” for ISR’s approval.

Only after the risk survey has been approved by ISR, the supplier will be allowed to perform his works. It is emphasized that the risk survey is a stipulation for the commencement of execution on every site.

Once every two weeks, a site visit will be conducted by the supplier’s safety manager at all work sites. The tour will be conducted in the presence of the supplier’s work managers. During the site visit, the safety issues will be checked and kept in place during execution. Within two working days from the end of the site visit, a final report will be submitted to ISR.

ISR shall be entitled to impose fines on the supplier if it fails to comply with the safety regulations on the site, in accordance with the fines table set out in the “safety appendix for performing various works in the Railways Complex”.

Prior to the commencement of the works, the supplier or its representative will undergo safety training with the Israel Rail Safety manager and sign a safety declaration. The supplier will also sign all the workers on a safety declaration according to the provisions of the railway safety appendix.

## **9. cranes for the construction**

- A. Details of manner of work and design engineering should be submitted by consultants and design engineers in an orderly manner at the time of submission of the design engineering documents.
- B. During the operation of the crane with all its components, including the piles drillings, the structures elements, etc., a sterile area must be maintained according to the constraints of the area. at least within the radius of the crane boom length.
- C. The supplier is obliged to act according to a detailed plans of the crane establish manager, which will be approved by a certified crane inspector and with the approval of ISR.
- D. The supplier will invite a certified crane and lifting accessories inspector as close as possible to the time of performing the lifting for the purpose of checking the crane, especially addressing the subject of the counter weight, computer software, etc.

- E. The lifting procedure will be coordinated with the traffic arrangements that are designed and approved by ISR, taking into consideration all the existing area constraints and conditions, as well as the constraints of existing traffic near existing roads that will be approved by the police.
- F. The supplier is obligated to provide its employees the required personal protective equipment and to make sure that they are using it.
- G. In addition, the supplier shall act in accordance with all laws and regulations in the State of Israel relating to the issue of lifting with a crane, including the fulfillment of all the requirements of the supplier's safety consultant.
- H. These instructions apply in practice to all crane operations in the area, and not necessarily just to assembling elements.
- I. No additional charges or exceptions will be paid for all the special activities listed above.
- J. The supplier must include all the components of the design, considering the railways, roads, stations and other existing infrastructures, and coordinate its works with ISR, Netivei Israel Company, the municipal authority, the police and fulfill all their demands. It must also indicate the course of work in the Construction Portfolio.

## **10. relocation of the Parking facility and mobility**

The parking facility relocation works will include all the performance procedures for detaching the facility, from its current location and operating it in the future location. The construction works of the shaft itself are not included.

The mobility works of the parking facility will include disconnecting, dismantling, transporting, lifting, loading, unloading, assembly, installation, feeding, operating, calibration and all necessary for operating the facility for use, including the approvals by a qualified electrical inspector, a constructor and any approval required, all according to the requirements as stated in this document. .