مجلس تنظيم مزاولة المهن الهندسية
The Council for Regulating the
Practice of Engineering Professions

التاريخ: 16 يناير 2024

تعميم رقم (01) لسنة 2024

دليل تقديم خدمات تصميم وتنفيذ الخرسانة اللاحقة الإجهاد (Post Tensioning Concrete Slabs)

يعلن مجلس تنظيم مزاولة المهن الهندسية عن إصداره دليل تقديم خدمات الخرسانة اللاحقة الإجهاد ويجب على جميع شركات المقاولات والمكاتب الهندسية التي تقوم بهذه الأعمال حاليا أو التي ترغب بالعمل في هذا المجال أن تلتزم بهذا الدليل وتبادر إلى تصحيح أوضاعها بالتعاون مع المجلس في مدة لا تزيد على ستة أشهر من تاريخ إصدار هذا التعميم.

للاستفسارات، يرجى الاتصال على الرقم (17534747)، أو مراسلتنا عبر البريد الإلكتروني (crpep@crpep.bh).

Date: 16th January 2024

Circular No. (01) of 2024

Guidelines for the Regulation of Post-Tensioning Slabs in the Kingdom of Bahrain

The Council for Regulating the Practice of Engineering Professions wishes to announce the issuance of the "Guidelines for the Regulation of Post-Tensioning Slabs in the Kingdom of Bahrain" and urge all Contracting Companies and Engineering Offices engaged in or intending to undertake Post Tensioning works, to follow the attached guidelines, and to coordinate with the Council for reconciliation of their status within 6 months from the date of this circular.

For any clarifications, please contact the Council on Tel. (17534747) or by email (crpep@crpep.bh).

الدكتور عبد الله يوسف طالب
رئيس المجلس
Dr. Abdulla Yusuf Taleb
Chairman

نسخة إلى:
- جميع المكاتب الهندسية.
- جميع شركات المقاولات والشركات الأخرى.
- الموقع الإلكتروني للمجلس.

Copies to:
- All Engineering Offices.
- All contracting and other companies.
- CRPEP's website.

مجلس تنظيم مزاولة المهن الهندسية

The Council for Regulating the
Practice of Engineering Professions

Guidelines for the Regulation of Post-Tensioning Slabs in the Kingdom of Bahrain

January 2024

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Regulations of Post-Tensioning Works (Slabs)
Kingdom of Bahrain

1. Introduction

The Post-Tensioning Sector in the Kingdom of Bahrain is presently run by several specialist subcontractors in an unregulated manner and the extent of technical checks done by the Project Consultants is not clear. The Ministry of Works published its updated Specification for Construction Work document in 2019 which included a section on Post-Tensioned Concrete works specification.

Due to the noticeable increase in demand for the inclusion of post-tensioned concrete slabs for buildings, CRPEP took the initiative to define and regulate the design and construction aspects of this sector in line with the jurisdiction stipulated by the provisions of Law No. (51) for 2014 with respect to Regulating the Practice of Engineering Professions and the Executive Regulations.

This document is prepared in response to this urgent need for ensuring the quality control of the Post-Tensioning Concrete slabs and thereby ensuring the safety of the of the buildings and its occupants by setting up a regulating framework for the Post Tensioning Works Industry in the Kingdom of Bahrain

This document aims to cover the following aspects:

- The roles and responsibilities of all stakeholders involved in the Post-Tensioning Industry and their inter-relationship.
- The general requirements for licensing the post-tensioning contractors (PT).
- Recommendations on technical aspects (detailed in the appendices) to be used as guidance by PT contractors.

This document replaces CRPEP Circular No. (4) of 2022 dated 21st September 2022 regarding the Regulation of Post Tensioning Works in the Kingdom of Bahrain and shall be updated as and when needed.

2. Stakeholders Role in Respect of PT Works

There are 4 stakeholders involved in any PT project, namely: the Main Engineering Office, the Main Civil Contractor, the PT Sub-Contractor and the associated PT Engineering Office.

The following is the role and responsibility of each stakeholder involved in a PT project.

2.1 Main Engineering Office

a) Ensure that the PT Contractor is licensed/approved by CRPEP.
b) Provide design working drawings of the project showing all service cut-outs (openings).
c) Specify all types of load combinations and the loading diagrams on the working drawings for various slabs. Refer to loading Guidelines in Appendix 3.
d) Review the Design Basis Report prepared by the PT Sub-Contractor and approve the same prior to permitting construction of PT works at Site.

e) Perform the Final check of the PT design calculations and drawings with all services cutouts and approve the same for construction.
f) Regularly supervise the PT works at site and particularly before concreting and during the stressing of the PT tendons.
g) Check and approve the PT Stressing Report.
h) Approve the As-Built drawings for PT works and the Completion Certificate for Post Tensioning Works
i) Ensure Receipt of the 10-year Guarantee Certificate from the Supplier (Works shall be Designed for a minimum life of 25 years).

2.2 Main Civil Contractor

a) The Main contractor shall be responsible for all co-ordination, submittals and obtaining approvals from the Main Engineering Office.
b) Supply and install shuttering works along with sufficient working platforms all round subject to the instructions and approval of the Main Engineering Office.
c) Supply and place the ancillary reinforcement for the PT elements.
d) Coordinate with the PT Sub-Contractor for the installation of ducts for PT cables.
e) Provide suitable safety measures to prevent the dislocation of the PT ducts & Tendons by stepping over etc.
f) Supply, pour and cure the concrete structure including testing of concrete cubes.
g) Coordinate with PT Sub-Contractor for installing and tensioning the cables after the approval of the Main Engineering Office.
h) Coordinate with the PT Sub-Contractor for the supply of Grouting Material and Grouting of the PT ducts after approval of the Main Engineering Office.

2.3 Post-Tensioning Sub-Contractor

PT Sub-contractor shall associate with an Engineering Office (associated PT Engineering Office) to vet the designs of PT elements for building projects **of Four storeys** and above **And/Or** having **Floor Area equal to or greater than 800 m².** The PT Sub-Contractors must enter into an agreement with an Engineering Office detailing the responsibility of the two parties in accordance with the format given in Appendix 5.

The following are the roles of the PT Sub-Contractor:

a) Prepare and submit the Basis of Design Report for the approval of the main Engineering Office prior to undertaking the PT Design.
b) Prepare design calculations, sectional details and shop drawings of the PT concrete structure.
c) Obtain approval of the above documents from the Associated Engineering Office if applicable.
d) Coordinate program of PT Works (erection and casting prior to work on site) with the Main Civil Contractor and the Main Engineering Office.

e) Submit Material Approval Forms for obtaining approval of the Main Engineering Office Via the Main Civil Contractor.

f) Supply and install the PT Ducts in coordination with the Main Civil Contractor.

g) Prepare and submit PT Stressing Report to the Main Engineering Office via the Main Civil Contractor.

h) Supply the Grouting Mix and carry out the Grouting Operation of the PT Ducts in coordination with the Main Civil Contractor and to the satisfaction of the Main Engineering Office.

i) Supervise the workmanship and quality of works.

j) Submit Guarantee as per employed standard specifications and requirements but not less than 10 years.

2.4 Associated PT Engineering Office

a) Check & Approve the Basis of Design Report (including its subsequent revisions if applicable) prepared by the PT subcontractor prior to submission to the Main Consultant

b) Check and approve all design calculations and drawings prior to submission to the Main Civil Contractor/ Main engineering Office.

c) Ensure the design is revised by the PT Sub-Contractor as per the comments of the Main Engineering Office.

d) Conduct site inspections as required, in coordination with the Main Contractor and the Main Engineering Office to ensure that the works are being executed in compliance with the design requirements.

3. Requirements For Licensing/Approving Post Tensioning Contractors

- Any Contractor whose annual turnover exceeds the limit of Small & Medium Enterprises (SMEs) as stipulated by the Ministry of Industry and Commerce i.e., BD 3 million and who wishes to undertake post-tensioning works shall compulsorily apply to CRPEP for licensing as an Engineering Office, Category “E”.
- The above requirement notwithstanding, any Contractor whose turnover is less than BHD 3 million can also apply to be licensed by CRPEP as a Category ‘E’ Engineering Office to undertake post tensioning works.
- If the Post Tensioning Contractor is not licensed by CRPEP as a Category ‘E’ Office, then the PT Contractor shall enter into an agreement with a Licensed Engineering Office as per the format suggested by CRPEP (Appendix 5) to vet all PT designs in accordance with the conditions mentioned in Clause 2.3 above.
- The Post Tensioning Contractor shall maintain an office of at least 100 Sq.m floor area with well designated spaces for the owner/manager, Engineers, Technicians, Administration, records and utilities.
- The Post Tensioning Contractor shall also maintain a well-protected and suitably ventilated warehouse storing the Post Tensioning equipment as well as the cables, ducts, plates and bolts etc. in a safe manner.

- The Post Tensioning Contractor shall own licensed copies of the latest versions of the standard Software for preparing Post Tensioning Designs and Drawings.
- The Post Tensioning Sub-Contractor shall have a minimum of Three Engineers: one category "A" Structural Design engineer experienced in Post Tensioning Works, one Category "B" Structural Design engineer experienced in Post Tensioning Works and one Category "B" Civil Site Engineer.
- The Associated Engineering Office for vetting the Post Tensioning Contractor's Designs and Drawings must be a licensed Engineering Office and shall have one Category "A" Structural Design engineer and one Category "B" Civil engineer.
- The Associated Engineering Office must also have licensed copies of the latest versions of the same design Software for preparing Post Tensioning Designs and Drawings which should be used to vet the submissions of the Post Tensioning Contractor.
- The Associated Engineering Office must also have a valid PII as per the Executive Regulations.

4. Inter-Alia Agreement with Ministry of Industry & Commerce (MoIC)

All Post Tensioning Contractors shall have their Commercial Registrations (CRs) amended to include the ISIC Code for undertaking Post Tensioning works. Unless this amendment is done, no Contractor will be allowed to undertake Post Tensioning Works. MoIC shall include the ISIC code in the Post Tensioning Contractor's CR only after he has been Licensed/Approved by CRPEP in accordance with the provisions of Clause 3 above.

5. Recommended Codes, Standards and Software

a. Ministry of Works Standard Specifications for Construction Works (2019):
   i. Euro Code2-200 (EN1992-1-1:2004).
   ii. EN-2 for shop drawings.
   iii. Works to be guaranteed for not less than 25 years.
   iv. Concrete Grade M45 (characteristic Compressive Strength 45N/mm^2).

b. Technical Report No. 43 of Concrete Society: Post Tensioned concrete floor slabs design Handbook.

c. Dubai Building Code 2021 Edition.

d. Ras Al Khaima Structural Guidelines RAKG-2021 (Ras Al Khaima Municipality).

e. RAM Concept: Concrete Slab Design Software by Bently Systems

f. ADAPT-Builder full 3D Finite Element Modelling, Analysis, and Design software for conventionally reinforced and post-tensioned concrete buildings by RISA (USA)

6. Appendices

Appendix 1: Stakeholders Relationship Diagram.

Appendix 2: Minimum Staffing Requirements.

Appendix 3: Loading and General Design terms

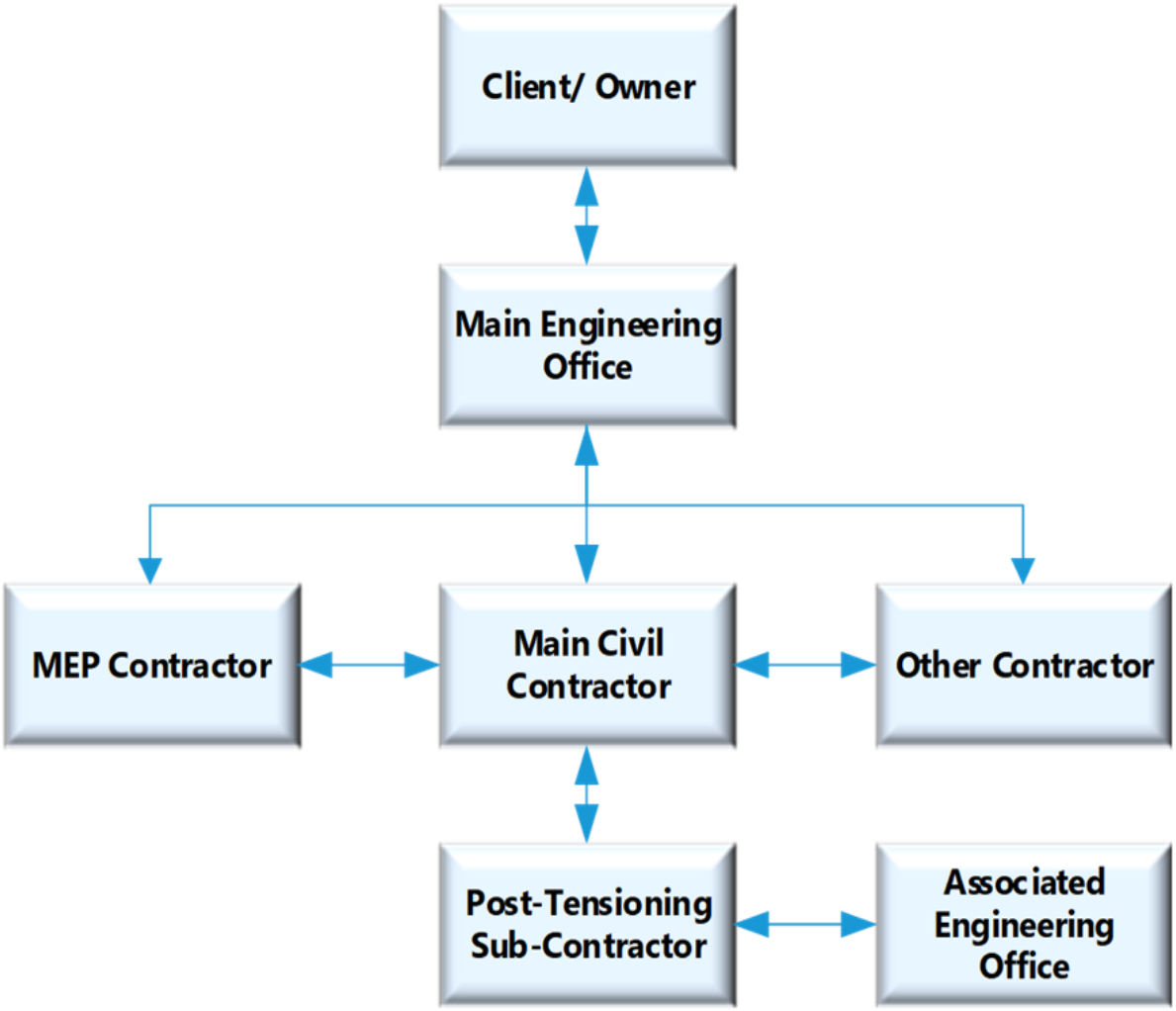
Appendix 4: Suggested Checklists

4.1: Design Review Checklist for Post-Tensioning Works (Slabs).

4.2: Pre-Pour Site Inspection Checklist for Post-Tensioning Works.

Appendix 5: CRPEP Agreement Template to be signed between the Post-Tensioning Subcontractor and the Associated Engineering Office.

Appendix 1: Stakeholders Relationship Diagram.



Appendix 2: Minimum Staffing Requirements.

1 Category A Structural Design Engineer

1 Category B Structural Design Engineer

1 Category B Site Civil Engineer

1 Category A Structural Design Engineer

1 Category B Civil Engineer

* Agreement is required for Buildings of four or more floors And / Or floor area equal to or greater than 800 m².

Appendix 3: Loading and General Technical Terms

Loading:

1. For 1-4 Floors project – Maximum Height 15m, the following Loads to be taken into consideration:

    Gravity Loads:
    a. Dead loads (including internal/partition Blockwork Loads)
    b. Live loads
    c. Dynamic Loads
    d. Blockwork loads for External Walls
    e. All Mechanical and Air-conditioning Equipment

2. For more than Four Floors, in addition to above loading, the following to be considered:

    a. Lateral Horizontal Loads, in Bahrain, the basic wind speed is 45m/s and the design Speed is 26 m/s.
    b. Diaphragm Actions to be studied and Structural Elements to be used to transfer the load from the outside face to the core of the building.

General Technical Design Terms

1. The design shall be limit state in accordance with BS 8110 and shall account for the following:
    - Jacking force shall not exceed 75% of the characteristic strength of the strand.
    - Punching shear shall be checked at column supports.
    - long term deflection shall not exceed span /250 or max. or 10mm whichever is lesser.
    - The effect of restraint of walls shall be accounted for in the design and additional conventional reinforcement of a pour strip provided.
    - Minimum pre-stress at any location shall be 07N/mm².
    - Serviceability classification may be taken as class 3.
    - Element dimensions (particularly slab thickness) shown on the general arrangement drawing shall not be reduced.
    - Horizontal tying forces shall be taken accordance with BS 8110 clause 3.123.
2. Unbounded tendons shall not be used.
3. Concrete grade for slabs shall be C45 minimum and the strength at transfer shall be at least 28n/mm².
4. Reinforcement shall be grade 460 to BS 4449.
5. Post- tensioned strands, anchorage's, ducts, and other system components shall conform to BS 5896 and BS 4447. Details of all proposed materials including material test certificates shall be submitted to the engineer for approval.
6. Shrinkage compensated grout shall be used such the unrestrained expansion is 0-5%.
7. Nominal cover to all reinforcement (including links) shall not be less than

- 30mm for slabs (internal)
- 30mm for beams (horizontal)

8. All elements shall achieve a 2-hour fire resistance in accordance with BS 8110
9. The floor slab shall be designed to carry its own weight plus the loads shown in the loading diagram.
10. Parking floor slab edge shall be checked for a negative moment of 40KN-m/m due to vehicular impaction force.
11. A detailed method statement shall be submitted which covers all aspects of site works and including:
    - Organization chart showing the project team.
    - Stressing operations.
    - Grouting operations.
    - Removal of form work and props.
12. contractor should provide sufficient top reinforcement in the slab to avoid any shrinkage cracks.

Appendix 4: Suggested Checklists and Design Transmittal Forms

4.1: Design Review Checklist for Post-Tensioning Works (Slabs).

4.2: Design Transmittal Form & Comments Resolution Sheet (CRS)

4.3: Pre-Pour Site Inspection Checklist for Post-Tensioning Works.

4.1: Design Review Checklist for Post-Tensioning Works (Slabs).

Benayat No.		Submission Date	
Location			
Main Contractor		PT Sub-Contractor	
Main Engineering Office			

S/N	ELEMENTS TO BE CHECKED	CONTRACTOR		MAIN ENGG. OFF.	
		Comply	N/A	Approved	Revise as commented
1	Design code / standard is either BS Code or Euro Code	❑	❑	❑	❑
2	Loading diagrams matching with originally approved drawings.	❑	❑	❑	❑
3	Seasonal thermal, creep and drying shrinkage (if any)	❑	❑	❑	❑
4	Early thermal for different slab thickness	❑	❑	❑	❑
5	Tendon spacing as per design code guidelines	❑	❑	❑	❑
6	Design sections width as per design code guidelines	❑	❑	❑	❑
7	Minimum reinforcement at column locations for two-way flat slabs is 0.00075bh	❑	❑	❑	❑
8	At all column location a minimum of bonded strands passed through the column,otherwise bonded normal reinforcement added at bottom of slab at column location.	❑	❑	❑	❑
9	Service stresses within design code limits	❑	❑	❑	❑
10	If allowed by design code, when tension stresses exceed the allowable tensilestress additional reinforcement added and crack width within design code limits	❑	❑	❑	❑
11	Deflection “both long term deflection and deflection after installing partitions” within design code limits	❑	❑	❑	❑
12	If allowed by design code, when tension stresses exceed the allowable tensilestress cracked deflection within design code limits.	❑	❑	❑	❑
13	Secondary actions due to post-tension considered in ultimate checking	❑	❑	❑	❑
14	Punching shear check at critical column locations verified by manual calculation	❑	❑	❑	❑
15	Reinforcement detailing provided as per intermediate seismic zone requirements	❑	❑	❑	❑
16	Additional reinforcement due to lateral forces provided if any	❑	❑	❑	❑

Comments of Main Engineering Office	
Comments:	Approval Status: ❑ Approved for Construction ❑ Approved for Construction subject to comments. ❑ Revise and resubmit.

SUBMITTED BY	CONTRACTOR		REVIEWED BY	MAIN ENGINEERING OFFICE	
NAME		STAMP	NAME		STAMP
EPP License No.			EPP License No.		
SIGNATURE			SIGNATURE		
DATE			DATE		

4.2: Design Transmittal Form & Comments Resolution Sheet (CRS)

CONTRACTOR'S NAME & ADDRESS

ENGINEERING OFFICE'S NAME & ADDRESS

PROJECT NAME

DATE OF SUBMISSION

TRASMITTED BY:
(CONTRACTOR'S ENGINEER AND LICENSE No.)

TRANSMITTAL NUMBER

TRANSMITTED TO:	

DRAWING No./DESIGN CALCS No.	**DRAWINGS/DESIGN CALCS DESCRIPTION**

ENGINEERING OFFICE'S COMMENTS:

	Approved and work shall be proceeded.
	Approved with comments and works shall be proceeded.
	Revise and resubmit as per the comments.

NAME & LICENSE No. OF THE ENGINEERING OFFICE'S CHECKER:

ENGINEERING OFFICE'S STAMP & CHECKER'S SIGNATURE

DATE OF SIGNATURE

COMMENTS RESOLUTION SHEET (CRS)

ENGINEERING OFFICE'S COMMENTS: Date:

DRAWING No./DESIGN CALCS No.	ENGINEERING OFFICE'S COMMENTS	RESOLUTION BY CONTRACTOR

SUBMITTED BY:

(NAME OF CONTRACTOR'S ENGIEER AND LICENSE No.)

(SIGNATURE & DATE) *(STAMP OF CONTRACTING OFFICE)*

CHECKED & APPROVED BY:

(NAME OF ENGINEERING OFFICE'S CHECKER AND LICENSE No.)

(SIGNATURE & DATE) *(STAMP OF ENGINEERING OFFICE)*

4.3: Pre-Pour Site Inspection Checklist for Post-Tensioning Works

PRE-POUR INSPECTION CHECKLIST			
Project			
Main Engineering Office			
Main Contractor			
Post Tension Contractor			
Date of Inspection	**Zone Identification**	**Floor Number**	**Drawing Number**

Sl. No	Items	Comments	Approved	Not Approved
1	Top X Steel			
2	Top Y Steel			
3	Bottom mesh			
4	Edge U-Bar			
5	Distribution Steel			
6	Core wall Steel			
7	Shear links (Punching)			
8	Anti-Burst Steel			
9	Beam steel			
10	Additional Steel for Pan Box and Opening			
11	Pre Camber			
12	PT Work (Live end, Dead end, Supports, No of Strands, Bursting Links).			

Summary of Main Engineering Office Comments

Name of Main Engineering Office Checker	EPP License Number	Signature	Date

Appendix 5: CRPEP Agreement Template to be signed between the Post-Tensioning Sub-Contractor and the Associated Engineering Office.

Note:

This Agreement shall be entered into in case any of the following conditions is applicable:

1. Buildings with a total floor area equal to or exceeding 800 Sq.m.
2. Buildings with equal to or more than 4 floors.

AGREEMENT FOR CHECKING AND APRROVING DESIGNS OF POST TENSIONING WORKS

THIS AGREEMENT is made the ..... day of ..... 20..... between *[Name of Contracting Company]* of *[P.O. Box # or Postal Address]*, Manama, Kingdom of Bahrain Represented by Mr.---------- (hereinafter called **"the Contractor"**) of the one part AND *[Name of the Engineering Office]* of *[P.O. Box # or Postal Address]*, Manama, Kingdom of Bahrain represented by Mr. ---------- (hereinafter called **"the Engineering Office**") of the other part.

WHEREAS the Contractor intends to proceed with the execution of Post Tensioning Works for certain Structural Elements of various building construction projects (The Projects) in the Kingdom of Bahrain and has requested the Engineering Office to undertake and perform the services described in this Agreement (hereinafter called "the Services") which the Engineering Office has agreed to do upon and subject to the terms and conditions set out in this Agreement.

NOW IT IS HEREBY AGREED AND DECLARED by and between the parties hereto as follows:

1. APPOINTMENT OF THE ENGINEERING OFFICE

1.1 The Engineering Office is a Category *[A/B/C]* Engineering Office with Commercial Registration No. ---------- and registered with the Council for Regulating the Practice of Engineering Professions in the Kingdom of Bahrain (CRPEP) with Office License No. ---------- and is licensed to practice Civil Engineering Profession.

1.2 The Contractor hereby appoints the Engineering Office to perform the Services and the Engineering Office accepts the appointment on the terms and conditions set out in this Agreement.

2. THE SERVICES

The Engineering Office shall be responsible for the checking and approval of all the structural designs for all the Post Tensioning works being undertaken by the Contractor for the Project. The Engineering Office shall be in possession of the required standard software for checking the designs prepared by the Contractor.

The Contractor shall submit to the Engineering Office all the documents (structural calculations, software program details along with the input/output files and all the construction drawings etc.) prepared by him in relation to the Structural Elements of the Project for which the Post Tensioning is intended to be carried out. All the submittals made by the Contractor to the Engineering Office shall be signed and stamped by the Licensed Structural Engineers of the Contractor and the submittals shall be done formally with a Transmittal Form attached. The Engineering Office shall ensure that all

the relevant documents have been prepared and submitted by the Contractor for the satisfactory checking and approval of the Structural Designs for the Post Tensioning Works. The Structural Design Calculations, Drawings and related documents for the Post Tensioning Works shall be checked, signed and stamped by the licensed Structural Engineers of the Engineering Office. Any comments on the documents submitted by the Contractor shall be endorsed by the Engineering Office on the Transmittal Form. The approval of the Engineering Office to the designs and drawings submitted by the Contractor shall be deemed as approval for proceeding with the construction of the works subject to receiving the final approval from the Main Consultant appointed by the client for his project. The Engineering office shall receive any comments provided by the Main Consultant and ensure that they are resolved through the required amendments to the designs.

Representative(s) of the Engineering Office shall also conduct critical site visits in coordination with the Main Consultant to ensure that the designs are being properly implemented at site.

3. THE RESOURCES

3.1 Both the Contractor and the Engineering Office shall employ suitably qualified Engineers licensed by CRPEP for the performance of their respective duties under this Agreement.

3.2 The Contractor hereby covenants that he shall employ at least one licensed Category “A” Civil Engineer with Structural Design Experience (in Post Tensioning Works) and at least one licensed Category “B” Civil Engineer with Structural Design Experience (in Post Tensioning Works). The Resources employed by the Contractor are listed in Annex (1) of this Agreement.

3.3 The Engineering Office hereby covenants that he shall employ at least one licensed Category “A” Civil Engineer with Structural Design Experience and at least one licensed Category “B” Civil Engineer. The Resources employed by the Engineering Office are listed in Annex (2) of this Agreement.

3.4 Either Party shall inform each other in case there is any change in the engineering resources employed by them.

4. RESPONSIBILITIES OF THE ENGINEERING OFFICE

4.1. The Engineering Office shall exercise all reasonable skill, care and diligence in the performance of the Services.

4.2 The Engineering Office shall perform the Services in such a way that they:

a) Accord with recognized current international professional practice and standards and take into account the particular conditions prevailing in Bahrain.

b) Comply with Bahrain Statutory Requirements and/or National Standards as the case may be with respect to:

i. The health and safety of employees of all the stakeholders of the Project and the general public at large.

ii. The protection of the environment.

Where these are not applicable the appropriate international standards shall be duly followed.

c) If applicable, ensure at the design stage of the Project the proper integration with the necessary utilities and services both existing and planned for the future are addressed properly.

4.3. The Engineering Office shall be responsible for the correctness, completeness and soundness of all documents checked and approved by them in connection with the Services. All such documents shall be the property of the Contractor and shall not be shown, given or related by the Consultants to any third party without the prior written approval of the Contractor.

4.4 The Engineering Office shall report to the Contractor without delay any arising need for information, investigation or analysis in connection with the performance of the Services.

4.5 The Engineering Office shall employ all means within their control to ensure the timely completion of the Services such that the Project's progress is in line with the targeted completion dates.

4.6 The Engineering Office is obliged to co-operate fully with all other Engineering Offices/Consultants and experts engaged on the Project and who are relevant to the proper performance of the Services.

6. INDEMNITY AND INSURANCE

6.1 The Consultants hereby covenant to maintain a valid Professional Indemnity Insurance (PII) Policy as approved by CRPEP at all times and to procure any additional insurance if required specifically for the Project.

6.2 The Contractor hereby covenants to maintain valid Insurance Policies (Third Party Liability and or PII etc.) as required for the Project.

7. ASSIGNMENT AND SUB-LETTING

Neither the Contractor nor the Engineering Office shall sub-let their duties and obligations under this Agreement to any third party.

8. THE ENGINEERING OFFICE's REMUNERATION

In consideration of the due and diligent performance of the Services by the Engineering Office, in accordance with the terms and conditions of this Agreement the Contractor

shall pay to the Engineering Office the remuneration specified in Annex 3 attached hereto, in due proportion to the Services performed.

9. **TERMINATION OF ENGAGEMENT**

This Agreement may be terminated by either of the parties with mutually accepted terms taking care that the Project is not affected adversely by giving at least two weeks' notice period.

10. **CONFIDENTIALITY**

The Engineering Office shall use all information received from the Contractor in hard & soft copy formats for the express performance of the Services under this Agreement. The Engineering Office shall not, except as required in the performance of the Services either during or after the expiry of this Agreement, disclose any information which the Engineering Office receives and possesses by virtue of this Agreement to any third party without the consent of the Contractor.

11. **ARBITRATION**

All disputes and differences which may arise between the Contractor and the Engineering Office touching on the provisions of this Agreement or any part thereof or operation or construction thereof or the rights or liabilities of the parties hereunder shall be settled amicably but failing amicable settlement shall be referred to arbitration as per the laws of the Kingdom of Bahrain

12. **LAW OF AGREEMENT**

This Agreement is made in Bahrain and is subject to the Laws of Bahrain. All dates and periods of time shall be construed in accordance with the Gregorian Calendar.

13. **CLAUSE HEADINGS**

The clause headings set out in this Agreement are provided for the purpose of reference only.

IN WITNESS WHEREOF this Agreement has been signed & Stamped by the parties hereto on the day and year first above written.

SIGNED on behalf of:

[Name & Address of the Contractor] _____

[Name of Authorized signatory of the Contractor]

In the presence of _____

Witness - Name: .....

Address: .....

Occupation: .....

SIGNED on behalf of:

[Name & Address of the Engineering Office] _____

[Name of Authorized signatory of the Engineering Office]

In the presence of _____

Witness - Name: .....

Address: .....

Occupation: .....

ANNEX 1

THE CONTRACTOR'S RESOURCES

[The Contractor shall list here all the names, CPR numbers, Designations and the EPP license Numbers of all his Engineers and identify the Engineers who shall be carrying out the Post Tension Designs for them]

ANNEX 2

THE ENGINEERING OFFICE'S RESOURCES

[The Engineering Office shall list here all the names, CPR numbers, Designations and the EPP license Numbers of all their Engineers and identify the Engineers who shall be carrying out the checking and approval of the Post Tension Designs prepared and submitted by the Contractor as per the Terms of the Agreement.]

ANNEX 3

THE ENGINEERING OFFICE's REMUNERATION

[The remuneration and the terms of the remuneration agreed between the Contractor and the Engineering Office shall be detailed here.]

NOTE: This sheet shall be left blank while submitting the draft of the Agreement to CRPEP for their approval