

UNIVERSITY OF CAPE COAST

CONTRACT DOCUMENT

FOR

THE CONSTRUCTION OF ACEC_oR BUILDING
COMPLEX (PHASE 1) AT
UNIVERSITY OF CAPE COAST

IFT NO. CR/UCC/WK/0008/2022 (UCC/ACE/001/2022)

UNIVERSITY OF CAPE COAST

APRIL, 2022

AA-5
VICE CHANCELLOR
UNIVERSITY OF CAPE COAST
CAPE COAST
27/04/2022

PART I
Letter of Acceptance

PART II

Agreement and General Conditions of Contract

AA.S
VICE CHANCELLOR
UNIVERSITY OF CAPE COAST
CAPE COAST
29/04/2022

Part II - Agreement and General Conditions of Contract

Agreement

This CONTRACT AGREEMENT (this "Contract") is made as of the ^{29th} day of ^{April}....., 2022, between **University of Cape Coast (UCC)** (the "Employer"), on the one part, and **Antartic Limited** (the "Contractor"), of the other part:

RECITALS

WHEREAS

- (a) the Employer desires that the Works known as **Construction of the Africa Centre of Excellence in Coastal Resilience (ACECoR) Building Phase 1** should be executed by the Contractor, and has accepted a Tender by the Contractor for the execution and completion of these Works and the remedying of any defects therein at a contract sum of **Twelve Million and Sixty-Seven Thousand, Eight Hundred and Sixty-Four Ghana Cedis, Twenty-Four Pesewas (12,067,864.24)**.

NOW, THEREFORE, the parties to this Contract agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.
 - (i) the Letter of Acceptance;
 - (ii) the Letter of Tender;
 - (iii) the addenda Nos _____ (if any);
 - (iv) the Special Conditions;
 - (v) the General Conditions;
 - (vi) the Specification;
 - (vii) the Drawings;
 - (viii) the Bills of Quantities; and
 - (ix) any other documents
3. In consideration of the payments to be made by the Employer to the Contractor as set forth in this Contract, the Contractor hereby covenants with the Employer to provide the Works (as defined in this Contract) and to remedy defects therein in conformity in all respects with the provisions of this Contract.

A.A.R.
VICE CHANCELLOR
UNIVERSITY OF CAPE COAST
CAPE COAST
29/07/2022


Part II - Agreement and General Conditions of Contract

4. Subject to the terms of this Contract, the Employer hereby covenants to pay the Contractor in consideration of the provision of the Works, the Contract Price (as defined in this Contract) or such other sum as may become payable under the provisions of this Contract at the times and in the manner prescribed by this Contract.

IN WITNESS whereof the parties hereto have caused this Contract to be executed in accordance with the laws of Ghana as of the day, month and year first indicated above.

For University of Cape Coast (UCC):

Name: Prof. Johnson Nyarko Boampong


Signature: 
VICE CHANCELLOR
UNIVERSITY OF CAPE COAST
CAPE COAST
Designation: Vice-Chancellor

Date:

Stamp: 29/04/2022

Witnessed by: Prof. Moses Boji Eghan

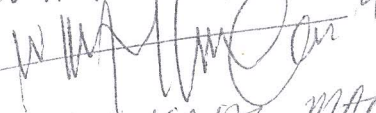
Name:

Signature: 
Designation: PROVOST-CAMS

Date: 29-04-22

For Antarctic Limited:

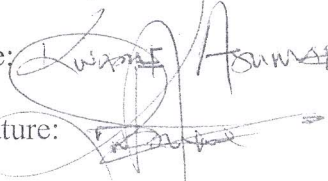
Name: KWAME DANJAWA

Signature: 
Designation: GENERAL MANAGER

Date: 29/4/2022

Stamp: ANTARTIC LIMITED
P. O. BOX 15703
ACCRA - NORTH

Witnessed by:

Name: Kwame Asumadu-Yeboah
Signature: 
Designation: CONTRACTS MANAGER

Date: 29/04/2022

A.A.S
VICE CHANCELLOR
UNIVERSITY OF CAPE COAST
CAPE COAST
29/04/2022

Conditions of Contract

For CONSTRUCTION

FOR BUILDING AND ENGINEERING WORKS
DESIGNED BY THE EMPLOYER

General Conditions

INTERNATIONAL FEDERATION OF CONSULTING ENGINEERS
FEDERATION INTERNATIONALE DES INGENIEURS-CONSEILS
INTERNATIONALE VEREINIGUNG BERATENDER INGENIEURE
FEDERACION INTERNACIONAL DE INGENIEROS CONSOLTORES

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General Conditions

1. General Provisions

1.1 Definitions In the Conditions of Contract (“these Conditions”), which include Particular Conditions and these General Conditions, the following words and expressions shall have the meanings stated. Words indicating persons or parties include corporations and other legal entities, except where the context requires otherwise.

1.1.1 The Contract

1.1.1.1 “**Contract**” means the Contract Agreement, the Letter of Acceptance, the Letter of Tender, these Conditions, the Specification, the Drawings, the Schedules, and the further documents (if any) which are listed in the Contract Agreement or in the Letter of Acceptance.

1.1.1.2 “Contract Agreement” means the contract agreement (if any) referred to in Sub-Clause 1.6 [Contract Agreement].

1.1.1.3 “**Letter of Acceptance**” means the letter of formal acceptance, signed by the Employer, of the Letter of Tender, including any annexed memoranda comprising agreements between and signed by both Parties. If there is no such letter of acceptance, the expression “Letter of Acceptance” means the Contract Agreement and the date of issuing or receiving the Letter of Acceptance means the date of signing the Contract Agreement.

1.1.1.4 “**Letter of Tender**” means the document entitled letter of tender, which was completed by the Contractor and submitted with the Letter of Tender, which includes the signed offer to the Employer for the Works.

1.1.1.5 “**Specification**” means the document entitled specialization, as included in the Contract, and any additions and modifications to the specification in accordance with the Contract. Such document specifies the Works.

1.1.1.6 “Drawings” means the drawings of the Works, as included in the Contract, and any additional and modified drawings issued by (or on behalf of) the Employer in accordance with the Contract.

1.1.1.7 “Schedules” means the document(s) entitled schedules, completed by the Contractor and submitted with the Letter of Tender, as included in the Contract. Such document may include the Bill of Materials, data, lists, and schedules of rates and/r prices.

1.1.1.8 “**Tender**” means the Letter of Tender and all other documents which the Contractor submitted with the Letter of Tender, as included in the Contract

1.1.1.9 “Appendix to Tender” means the completed pages entitled

appendix to tender which are appended to and form part of the Letter of Tender.

1.1.1.10 **“Bill of Quantities”** and **“Daywork Schedule”** means the documents so named (if any) which are comprised in the Schedules.

**1.1.2
Parties and
Persons**

1.1.2.1 **“Party”** means the Employer or the Contractor, as the context requires.

1.1.2.2 **“Employer”** means the person named as employer in the Appendix to Tender and the legal successors in title to this person.

1.1.2.3 **“Contractor”** means the person(s) named as contractor in the Letter of Tender accepted by the Employer and the legal successors in title to this person(s).

1.1.2.4 **“Engineer”** means the person appointed by the Employer to act as the Engineer for the purposes of the Contract and named in the Appendix to Tender, or other person appointed from time to time by the Employer and notified to the Contractor under Sub-Clause 3.4 [Replacement of the Engineer].

1.1.2.5 **“Contractor’s Representative”** means the person named by the Contractor in the Contract or appointed from time to time by the Contractor under Sub-Clause 4.3 [Contractor’s Representative], who acts on behalf of the Contractor.

1.1.2.6 **“Employer’s Personnel”** means the Engineer, the assistants referred to in Sub-Clause 3.2 [Delegation by the Engineer] and all other staff, labour and other employees of the Engineer and of the Employer; and any other personnel notified to the Contractor, by the Employer or the Engineer, as Employer’s Personnel.

1.1.2.7 **“Contractor’s Personnel”** means the Contractor’s Representative and all personnel whom the Contractor utilizes on Site, who may include the staff, labour and other employees of the Contractor and of each Subcontractor, and any other personnel assisting the Contractor in the execution of the Works.

1.1.2.8 **“Sub-contractor”** means any person named in the Contract as a subcontractor, or any person appointed as a subcontractor, for a part of the Works; and the legal successors in title to each of these persons.

1.1.2.9 **“DAB”** means the person or three persons so named in the Contract, or other person(s) appointed under Sub-Clause 20.2 [Appointment of the Dispute Adjudication Board] or Sub-Clause 20.3 [Failure to Agree Dispute Adjudication Board].

1.1.2.10 “FIDIC” means the Federation Internationale des Ingenieurs-Conseils, the International federation of consulting engineers.

**1.1.3
Dates, Tests,
Periods and
Completion**

1.1.3.1 “Base Date” means the date 28 days prior to the latest date for submission of the Tender

1.1.3.2 “Commencement Date” means the date notified under Sub-Clause 8.1 [Commencement of Works].

1.1.3.3 “**Time for Completion**” means the time for completing the Works or a Section (as the case may be) under Sub-Clause 8.2 [Time for Completion], as stated in the Appendix to Tender (with any extension under Sub-Clause 8.4 [*Extension of Time for Completion*]), calculated from the Commencement Date.

1.1.3.4 “**Tests on Completion**” means the test which are specified in the Contract or agreed by both Parties or instructed as a Variation, and which are carried out under Clause 9 [Tests on Completion] before the Works or a Section (as the case may be) are taken over by the Employer.

1.1.3.5 “Taking-Over Certificate” means a certificate issued under Clause 10 [Employer’s Taking Over].

1.1.3.6 “Tests after Completion” means the tests (if any) which are specified in the Contract and which are carried out in accordance with the provisions of the Particular Conditions after the Works or a Section (as the case may be) are taken over by the Employer.

1.1.3.7 “Defects Notification Period” means the period for notifying defects in the Works or a Section (as the case may be) under Sub-Clause 11.1 [Completion of Outstanding Work and Remedying Defects], as stated in the Appendix to Tender (with any extension under Sub-Clause 11.3 [Extension of Defects Notification Period]), calculated from the date on which the Works or Section is completed as certified under Sub-Clause 10.1 [Taking Over of the Works and Sections].

1.1.3.8 “Performance Certificate” means the certificate issued under Sub-Clause 11.9 [Performance Certificate].

1.1.3.9 “**day**” means a calendar day and “**year**” means 365 days.

**1.1.4
Money and
Payments**

1.1.4.1 “Acceptance Contract Amount” means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the Remedying of any defects.

- 1.1.4.2 “**Contract Price**” means the price defined in Sub-Clause 14.1 [*The Contract Price*], and includes adjustments in accordance of with the Contract.
- 1.1.4.3 “**Cost**” means all expenditure reasonably incurred (or to be incurred) by the Contractor, whether on or off the Site, including overhead and similar charges, but does not include profit.
- 1.1.4.4 “**Final Payment Certificate**” means the payment certificate issued under Sub-Clause 14.13 [Issue of Final Payment Certificate].
- 1.1.4.5 “**Final Payment Statement**” means the statement defined in Sub-Clause 14.11 [Application for Final Payment Certificate].
- 1.1.4.6 “**Foreign Currency**” means a currency in which part (or all) of the Contract Price is payable, but not the Local Currency.
- 1.1.4.7 “**Interim Payment Certificate**” means a payment certificate issued under Clause 14 [Contract Price and Payment], other than the Final Payment Certificate.
- 1.1.4.8 “**Local Currency**” means the currency of the Country.
- 1.1.4.9 “**Payment Certificate**” means a payment certificate issued under Clause 14 [Contract Price and Payment].
- 1.1.4.10 “**Provisional Sum**” means a sum (if any) which is specified in the Contract as a provisional sum, for the execution of any part of the Works or for the supply of Plant, Materials or services under Sub-Clause 13.5 [Provisional Sums].
- 1.1.4.11 “**Retention Money**” means the accumulated retention moneys which the Employer retains under Sub-Clause 14.3 [Application for Interim Payment Certificate] and pays under Sub-Clause 14.9 [Payment of Retention Money].
- 1.1.4.12 “**Statement**” means a statement submitted by the Contractor as part of an application, under Clause 14 [*Contract Price and Payment*], for a payment certificate.

**1.1.5
Works and
Goods**

- 1.1.5.1 “Contractor’s Equipment” means all apparatus, machinery, vehicle and other things required for the execution and completion of the Works and the remedying of any defects. However, Contractor’s Equipment exclude Temporary Works, Employer’s Equipment (if any), Plant, Materials and any other things intended to form or forming part of the Permanent Works.

- 1.1.5.2 **“Goods”** means Contractor’s Equipment, Materials,, Plant and temporary Works, or any of them as appropriate.
- 1.1.5.3 **“Materials”** means things of all kinds (other than Plant) intended to form or forming part of the Permanent Works, including the supply-only materials (if any) to be supplied by the Contractor under the Contract.
- 1.1.5.4 **“Permanent Works”** means the permanent works to be executed by the Contractor under the Contract.
- 1.1.5.5 **“Plant”** means the apparatus, machinery and vehicles intended to form or forming part of the Permanent Works.
- 1.1.5.6 **“Section”** means a part of the Works specified in the Appendix to Tender as a Section (if any).
- 1.1.5.7 **“Temporary Works”** means all temporary works of every kind (other than Contractor’s Equipment) required on Site for the execution and completion of the Permanent Works and the remedying of any defects.
- 1.1.5.8 **“Works”** means the Permanent Works and the Temporary Works, or either of them as appropriate.

1.1.6

Other Definitions

- 1.1.6.1 **“Contractor’s Documents”** means the calculations, computer programs and other software, drawings, manuals, models and other documents of a technical nature (if any) supplied by the Contractor under the Contract.
- 1.1.5.8 **“Country”** means the country in which the Site (or most of it) is located, where the Permanent Works are to be executed.
- 1.1.5.9 **“Employer’s Equipment”** means the apparatus, machinery and vehicles (if any) made available by the Employer for the use of the Contractor in the execution of the Works, as stated in the Specification: but does not include Plant which has not been taken over by the Employer.
- 1.1.5.10 **“Force Majeure”** is defined in Clause 19[*Force Majeure*].
- 1.1.6.11 **“Laws”** means all national (or state) legislation, statutes, ordinances and other laws, and regulations and by-laws of any legally constituted public authority.
- 1.1.6.6 **“Performance Security”** means the security (or securities, if any) under Sub-Clause 4.2[*Performance Security*].

1.1.6.7 **“Site”** means the places where the Permanent Works are to be executed and to which Plant and Materials are to be delivered, and any other places as may be specified in the Contract as forming part of the Site.

1.1.6.8 **“Unforeseeable”** means not reasonably foreseeable by an experienced contractor by the date for submission of the Tender.

1.1.6.9 **“Variation”** means any change to the Works, which is instructed or approved as a variation under Clause 13[*Variations and Adjustments*].

1.2

Interpretation

In the Contract, except where the context requires otherwise:

- (a) words indicating one gender include all genders;
- (b) words indicating the singular also include the plural and words indicating the plural also include the singular;
- (c) provisions including the word “agree”, “agreed” or “agreement” require the agreement to be recorded in writing, and
- (d) “written” or “in writing” means hand-written, type-written, printed or electronically made, and resulting in a permanent record.

The marginal words and other headings shall not be taken into consideration in the interpretation of these Conditions.

1.3

Communications

Where these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices and requests, these communications shall be:

- (a) in writing and delivered by hand (against receipt), sent by mail or courier, or transmitted using any of the agreed systems of electronic transmission as stated in the Appendix to Tender, and
- (b) delivered, sent or transmitted to the address for the recipient’s communications as stated in the Appendix to Tender. However:

Part II - Agreement and General Conditions of Contract

- (i) if the recipient gives notice of another address, communications shall thereafter be delivered accordingly; and
- (ii) if the recipient has not stated otherwise when requesting an approval or consent, it may be sent to the address from which the request was issued.

Approvals, certificates, consents and determinations shall not be unreasonably withheld or delayed. When a certificate is issued to a Party, the certifier shall send a copy to the other Party. When a notice is issued to a Party, by the other Party or the Engineer, a copy shall be sent to the Engineer or the other Party, as the case may be.

1.4 Law and Language

The Contract shall be governed by the law of the country (or other jurisdiction) stated in the Appendix to Tender.

If there are versions of any part of the Contract which are written in more than one language, the version which is in the ruling language stated in the Appendix to Tender shall prevail.

The language for communications shall be that stated in the Appendix to Tender. If no language is stated there, the language for communications shall be the language in which the Contract (or most of it) is written.

1.5

Priority of Documents

The documents forming the Contract are to be taken as mutually explanatory of one another. For the purposes of interpretation, the priority of the documents shall be in accordance with the following sequence:

- (a) the Contract Agreement (if any),
- (b) the Letter of Acceptance,
- (c) the Letter of Tender
- (d) the Special Conditions,
- (e) these General Conditions,
- (f) the Specification,
- (g) the Drawings, and
- (h) the Schedules and any other documents forming part of the Contract.

If an ambiguity or discrepancy is found in the documents, the Engineer shall issue any necessary clarification or instruction.

1.6

Contract Agreement

The Parties shall enter into a Contract Agreement within 28 days after the Contractor receives the Letter of Acceptance, unless they agree otherwise. The Contract Agreement shall be based upon the form annexed to the Particular Conditions. The costs of stamp duties and similar charges (if any) imposed by law in connection with entry into the Contract Agreement shall be borne by the Employer.

1.7

Assignment

Neither Party shall assign the whole or any part of the Contract or any benefit or interest in or under the Contract. However, either party:

- (a) may assign the whole or any part with the prior agreement of the other Party, at the sole discretion of such other Party, and
- (b) may, as security in favour of a bank or financial institution, assign its right to any moneys due, or to become due, under the Contract.

1.8

Care and Supply of

Documents

The Specification and Drawings shall be in the custody and care of the Employer. Unless otherwise stated in the Contract, two copies of the Contract and of each subsequent Drawing shall be supplied to the Contractor, who may make or requires further copies at the cost of the Contractor.

Each of the Contractor's Documents shall be in custody and care of the Contractor, unless and until taken over by the Employer. Unless otherwise stated in the Contract, the Contractor shall supply to the Engineer six copies of each of the Contractor's Documents.

The Contractor shall keep, on the Site, a copy of the Contract, publications named in the Specification, the Contractor's Documents (if any), the Drawings and Variations and other communications given under the Contract. The Employer's Personnel shall have the right of access to all these documents at all reasonable times.

1.9

**Delayed Drawings
or Instructions**

The Contractor shall give notice to the Engineer whenever the Works are likely to be delayed or disrupted if any necessary drawing or instruction is not issued to the Contractor within a particular time, which shall be reasonable. The notice shall include details of the necessary drawing or instruction, details of why and by when it should be issued, and details of the nature and amount of the delay or disruption likely to be suffered if it is late.

If the Contractor suffers delay and/or incurs Cost as a result of a failure of the Engineer to issue the notified drawing or instruction within a time which is reasonable and is specified in the notice with supporting details, the Contractor shall give a further notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost plus reasonable profit, which shall be included in the Contract Price.

After receiving this further notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.

However, if and to the extent that the Engineer's failure was caused by any error or delay by the Contractor, including an

error in, or delay in the submission of, any of the Contractor's Documents, the Contractor shall not be entitled to such extension of time, cost or profit.

1.10

Employer's Use of Contractor's Documents

As between the Parties, the Contractor shall retain the copyright and other intellectual property rights in the Contractor's Documents and other design documents made by (or on behalf of) the Contractor.

The Contractor shall be deemed (by signing the Contract) to give to the Employer a non-terminable transferable non-exclusive royalty-free license to copy, use and communicate the Contractor's Documents, including making and using modifications of them. This license shall:

- (a) apply throughout the actual or intended working life (whichever is longer) of the relevant parts of the Works.
- (b) entitle any person in proper possession of the relevant part of the Works to copy, use and communicate the Contractor's Documents for the purposes of completing, operating, maintaining, altering, adjusting, repairing and demolishing the Works, and
- (c) in the case of Contractor's Documents which are in the form of computer programs, and other software, permit their use on any computer on the Site and other places as envisaged by the Contract, including replacements of any computers supplied by the Contractor.

The Contractor's Documents and other design documents made by (or on behalf of) the Contractor shall not, without the Contractor's consent, be used, copied or communicated to a third party by (or on behalf of) the Employer for purposes other than those permitted under this Sub-Clause.

1.11

Contractor's Use of Employer's Documents

As between the Parties, the Employer shall retain the copyright and other intellectual property rights in the Specification, the Drawings and other documents made by (or on behalf of) the Employer. The Contractor may, at his cost, copy, use, and obtain communication of these documents for the purposes of the Contract. They shall not, without the Employer's consent, be copied, used or communicated to a

third party by the Contractor, except as necessary for the purposes of the Contract.

1.12

Confidential Details

The Contractor shall disclose all such confidential and other information as the Engineer may reasonably require in order to verify the Contractor's compliance with the Contract.

1.13

Compliance with Laws

The Contractor shall, in performing the Contract, comply with applicable Laws. Unless otherwise stated in the Particular Conditions:

- (a) the Employer shall have obtained (or shall obtain) the planning, zoning or similar permission for the Permanent Works, and any other permissions described in the Specification as having been (or being) obtained by the Employer; and the Employer shall indemnify and hold the Contract harmless against and from the consequences of any failure to do so; and
- (b) the Contractor shall give notices, pay all taxes, duties and fees, and obtain all permits, licenses and approvals, as required by the Laws in relation to the execution and completion of the Works and the remedying of any defects; and the Contractor shall indemnify and hold the Employer harmless against and from the consequences of any failure to do so.

1.14

Joint and Several Liability

if the Contractor constitutes (under applicable Laws) a joint venture, consortium or other unincorporated grouping of two or more persons:

- (a) these persons shall be deemed to be jointly and severally liable to the Employer for the performance of the Contract;
 - (b) these persons shall notify the Employer of their leader who shall have authority to bind the Contractor and each of these persons; and
 - (c) the Contractor shall not alter its composition or legal status without the prior consent of the Employer.
-

2. The Employer

2.1 Right of Access to The Site

The Employer shall give the Contractor right of access to and possession of, parts of the Site within the time (or times) stated in the Appendix to Tender. The right and possession may not be exclusive to the Contractor. If, under the Contract, the Employer is required to give (to the Contractor) possession of any foundation, structure, plant or means of access, the Employer shall do so in the time and manner stated in the Specification. However, the Employer may withhold any such right or possession until the Performance Security has been received.

If no such time is stated in the Appendix to Tender, the Employer shall give the Contractor right access to, and possession of, the Site within such times as may be required to enable the Contractor to proceed in accordance with the programme submitted under Sub-Clause 8.3 [*Programme*].

If the Contractor suffers delay and/or incurs Cost as a result of a failure by the Employer to give any such right or possession within such time, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) An extension of time for any such delay, if completion is or will be delayed under Sub-Clause 8.4 [*Extension of Time for Completion*], and
- (b) Payment of any such Cost plus reasonable profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.

However, if and to the extent that the Employer's failure was caused by any error or delay by the Contractor, including an error in, or delay in the submission of, any of the Contractor's Documents, the Contractor shall not be entitled to such extension of time, Cost of profit.

2.2

Permits, Licences or Approvals

The Employer shall (where he is in a position to do so) provide reasonable assistance to the Contractor at the request of the Contractor:

Part II - Agreement and General Conditions of Contract

- (a) By obtaining copies of the Laws of the Country which are relevant to the Contract but are not readily available, and
- (b) For the Contractor's applications for any permits, licences or approvals required by the Laws of the Country:
 - (i) which the Contractor is required to obtain under Sub-Clause 1.13 [Compliance with Laws],
 - (ii) for the delivery of Goods, including clearance through customs, and
 - (iii) for the export of Contractor's Equipment when it is removed from the Site.

2.3

Employer's Personnel

The Employer shall be responsible for ensuring that the Employer's Personnel and the Employer's other Contractors on the Site.

- (a) co-operate with the Contractor's efforts under Sub-Clause 4.6[Co-operation], and
- (b) take actions similar to those which the Contractor is required to take under sub-paragraphs (a), (b) and (c) of Sub-Clause 4.8 [*Safety Procedures*] and under Sub-Clause 4.18 [*Protection of the Environment*].

2.4

Employer's Financial Arrangements

The Employer shall submit, within 28 days after receiving any request from the Contractor, reasonable evidence that financial arrangements have been made and are being maintained which will enable them to pay the Contract Price (as estimated at that time) in accordance with Clause 14 [*Contract Price and Payment*]. If the Employer intends to make any material change to his financial arrangements, the Employer shall give notice to the Contractor with detailed particulars.

2.5

Employer's Claims

If the Employer considers himself to be entitled to any payment under any Clause of these Conditions or otherwise in connection with the Contract, and/or to any extension of the Defects Notification Period, the Employer or the Engineer shall give notice and particulars to the Contractor. However, notice is not required for payments due under Sub-Clause 4.19

[Electricity, Water and Gas), under Sub-Clause 4.20 [Employer's Equipment and Free-Issue Material], or for other services requested by the Contractor.

The notice shall be given as soon as practicable after the Employer became aware of the event or circumstances giving rise to the claim. A notice relating to any extension of the Defects Notification Period shall be given before the expiry of such period.

The particulars shall specify the Clause or other basis of the claim, and shall include substantiation of the amount and/or extension to which the Employer considers himself to be entitled in connection with the Contract. The Engineer shall then proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine (i) the amount (if any) which the Employer is entitled to be paid by the Contractor, and/or (ii) the extension (if any) of the Defects Notification Period in accordance with sub-Clause 11.3 [*Extension of Defects Notification Period*].

This amount may be included as a deduction in the Contract Price and Payment Certificates. The Employer shall only be entitled to set off against or make any deduction from an amount certified in a Payment Certificate, or to otherwise claim against the Contractor, in accordance with this Sub-Clause.

3. The Engineer

3.1 Engineer's Duties and Authority

The Employer shall appoint the Engineer who shall carry out the duties assigned to him in the Contract. The Engineer's staff shall include suitably qualified engineers and other professionals who are competent to carry out these duties.

The Engineer shall have no authority to amend the Contract.

The Engineer may exercise the authority attributable to the Engineer as specified in or necessarily to be implied from the Contract. If the Engineer is required to obtain the approval of the Employer before exercising a specified authority, the requirements shall be as stated in the Particular Conditions. The Employer undertakes not to impose further constraints on the Engineer's authority, except as agreed with the Contractor.

However, whenever the Engineer exercises a specified authority for which the Employer's approval is required, then (or the

purposes of the Contract) the Employer shall be deemed to have given approval.

Except as otherwise stated in these Conditions:

- (a) whenever carrying out duties or exercising authority, specified in or implied by the Contract, the Engineer shall be deemed to act for the Employer.
- (b) the Engineer has no authority to relieve either Party of any duties, obligations or responsibilities under the Contract, and
- (c) any approval, check, certificates, consent, examination, inspection, instruction, notice, proposal, request, test, or similar act by the Engineer (including absence of disapproval) shall not relieve the Contractor from any responsibility he has under the Contract, including responsibility for errors, omissions, discrepancies and non-compliance.

3.2

Delegation by the Engineer The Engineer may from time to time assign duties and delegate authority to assistants, and may also revoke such assignment or delegation. These assistants may include a resident engineer, and/or independent inspectors appointed to inspect and /or test items of Plant and/or Materials. The assignment, delegation or revocation shall be in writing and shall not take effect until copies have been received by both Parties. However, unless otherwise agreed by both Parties, the Engineer shall not delegate the authority to determine any matter in accordance with Sub-Clause 3.5 [*Determinations*].

Assistants shall be suitably qualified persons, who are competent to carry out these duties and exercise this authority, and who are fluent in the language for communications defined in sub-Clause 1.4 [*Law and Language*].

Each assistant, to whom duties have been assigned or authority has been delegated, shall only be authorized to issue instructions to the Contractor to the extent defined by the delegation. Any approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test, or similar act by an assistant, in accordance with the delegation, shall have the same effect as though the act had been an act of the Engineer. However:

- (a) any failure to disapprove any work, Plant or Materials shall not constitute approval, and shall therefore not

prejudice the right of the Engineer to reject the work, Plant or Materials;

- (b) if the Contractor questions any determination or instruction of an assistant, the Contractor may refer the matter to the Engineer, who shall promptly confirm, reverse or vary the determination or instruction.

3.3

Instructions of the Engineer

The Engineer may issue to the Contractor (at any time) instructions and additional or modified Drawings which may be necessary for the execution of the Works and the remedying of any defects, all in accordance with the Contract. The Contractor shall only take instruction from the Engineer, or from an assistant to whom the appropriate authority has been delegated under this Clause. If an instruction constitutes a Variation, Clause 13 [*Variations and Adjustments*] shall apply.

The Contractor shall comply with the instructions given by the Engineer or delegated assistant, on any matter related to the Contract. Whenever practicable, their instructions shall be given in writing, if the Engineer or a delegated assistant:

- (a) give an oral instruction,
- (b) receives a written confirmation of the instruction from (or on behalf of) the Contractor, within two working days after given the instruction, and
- (c) does not reply by issuing a written rejection and /or instruction within two working days after receiving the confirmation, then the confirmation shall constitute the written instruction of the Engineer or delegated assistant (as the case may be).

3.4

Replacement of the Engineer

If the Employer intends to replace the Engineer, the Employer shall, not less than 42 days before the intended date of replacement, give notice to the Contractor of the name, address and relevant experience of the intended replacement Engineer. The Engineer shall not replace the Engineer with a person against whom the Contractor raises reasonable objection by notice to the Employer, with supporting particulars.

3.5

Determinations

Whenever these Conditions provide that the Engineer shall proceed in accordance with this Sub-Clause 3.5 to agree or determine any matter, the Engineer shall consult with each

Party in an endeavour to reach agreement. If agreement is not achieved, the Engineer shall make a fair determination in accordance with the Contract, taking due regard of all relevant circumstances.

The Engineer shall give notice to both Parties of each agreement or determination, with supporting particulars. Each Party shall give effect to each agreement or determination unless and until revised under Clause 20 [*Claims, Disputes and Arbitration*].

4. The Contractor

4.1

Contractor's General Obligations

The Contractors shall design (to the extent specified in the Contract), execute and complete the works in accordance with the Contract and with the Engineer's instructions, and shall remedy any defects in the Works.

The Contractor shall provide the Plant and Contractor's Documents specified in the Contract, and all Contractor's Personnel, Goods, consumables and other things and services, whether of a temporary or permanent nature, required in and for this design execution, completion and remedying of defects.

The Contractor shall be responsible for the adequacy, stability and safety of all Site operations and of all methods of construction. Except to the extent specified in the Contract, the Contractor (i) shall be responsible for all Contractor's Documents, Temporary Works, and such design of each item of Plant and Materials as is required for the item to be in accordance with the Contract, and (ii) shall not otherwise be responsible for the design or specification of the Permanent Works.

The Contractor shall, whenever required by the Engineer, submit details of the arrangements and methods which the Contractor proposes to adopt for the execution of the Works. No significant alteration to these arrangements and methods shall be made without this having previously been notified to the Engineer.

If the Contract specifies that the Contractor shall design any part of the Permanent Works, then unless otherwise stated in the Particular Conditions:

- (a) the Contractor shall submit to the Engineer the Contractor's Documents for this part in accordance with the procedures specified in the Contract;
- (b) these Contractor's Documents shall be in accordance with the Specification and Drawings, shall be written in the language for communications defined in Sub-Clause 1.4 [*Law and Language*], and shall include additional information required by the Engineer to add to the Drawings for co-ordination of each Party's designs;
- (c) the Contractor shall be responsible for this part and it shall, when the Works are completed, be fit for such purposes for which the part is intended as are specified in the Contract; and
- (d) prior to the commencement of the Tests on Completion, the Contractor shall submit to the Engineer the "as built" documents and operation and maintenance manuals in accordance with the Specification and in sufficient detail for the Employer to operate, maintain, dismantle, reassemble, adjust and repair this part of the Works. Such part shall not be considered to be completed for the purposes of taking-over under Sub-Clause 10.1 [*Taking Over of the Works and Sections*] until these documents and manuals have been submitted to the Engineer.

4.2

Performance Security

The Contractor shall obtain (at his cost) a Performance Security for proper performance, in the amount and currencies stated in the Contract Data and denominated in the currency (ies) of the Contract or in a freely convertible currency acceptable to the Employer. If an amount is not stated in the Contract Data, this Sub-Clause shall not apply.

The Contractor shall deliver the performance Security to the Employer with 28 days after receiving the Letter of Acceptance, and shall send a copy to the Engineer. The Performance Security shall be issued by a reputable bank or financial institution selected by the Contractor, and shall be in the form annexed to the Particular Conditions or in another form approved by the Employer.

The Contractor shall ensure that the Performance Security is valid and enforceable until the Contractor has executed and completed the Works and remedied any defects. If the terms of the Performance Security specify its expiry date, and the Contractor has not become entitled to receive the Performance Certificate by the date 28 days prior to the expiry day, the

Contractor shall extend the validity of the Performance Security until the Works have been completed and any defects have been remedied.

The Employer shall not make a claim under the Performance Security, except for amounts to which the Employer is entitled under the Contract in the event of:

- (a) failure by the Contractor to extend the validity of the Performance Security as described in the preceding paragraph, in which event the Employer may claim the full amount of the Performance Security,
- (b) failure by the Contractor to pay the Employer an amount due, as either agreed by the Contractor or determined under Sub-Clause 2.5 [Employer's Claims] or Clause 20 [Claims, Disputes and Arbitration], which 42 days after this agreement or determination,
- (c) failure by the Contractor to remedy a default within 42 days after receiving the Employer's notice requiring the default to be remedied, or
- (d) Circumstances which entitle the Employer to termination under Sub-Clause 15.2 [*Termination by Employer*], irrespective of whether notice of termination has been given.

The Employer shall indemnify and hold the Contractor harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from a claim under the Performance Security to the extent to which the Employer was not entitled to make the claim.

The Employer shall return the Performance Security to the Contractor within 21 days after receiving a copy of the Performance Certificate.

4.3 Contractor's Representatives

The Contractor shall appoint the Contractor's Representative and shall give him all authority necessary to act on the Contractor's behalf under the Contract.

Unless the Contractor's Representative is named in the Contract, the Contractor shall, prior to the Commencement Date, submit to the Engineer for consent the name and particulars of the person the Contractor proposes to appoint as Contractor's Representative. If consent is withheld or subsequently revoked, or if the appointed person fails to act as

Contractor's Representative, the Contractor shall similarly submit the name and particulars of another suitable person for such appointment.

The Contractor shall not, without the prior consent of the Engineer, revoke the appointment of the Contractor's Representative or appoint a replacement.

The whole time of the Contractor's Representative shall be given to directing the Contractor's performance of the Contract. If the Contractor's Representative is to be temporarily absent from the site during the execution of the Works, a suitable replacement person shall be appointed, subject to the Engineer's prior consent, and the Engineer shall be notified accordingly.

The Contractor's Representative shall, on behalf of the Contractor, receive instructions under Sub-Clause 3.3 [*Instructions of the Engineer*].

The Contractor's Representative may delegate any powers, function and authority to any competent person, and may at any time revoke the delegation. Any delegation or revocation shall not take effect until the Engineer has received prior notice signed by the Contractor's Representative, naming the person and specifying the powers, functions and authority being delegated or revoked.

The Contractor's Representative and all these persons shall be fluent in the language for communication defined in Sub-Clause 1.4 [*Law and Language*].

4.4

Subcontractors

The Contractor shall not subcontract the whole of the Works.

The Contractor shall be responsible for the acts or defaults for any Subcontractor, his agents or employees, as if they were the acts or defaults of the Contractor. Unless otherwise stated in the Particular Conditions:

- (a) the Contractor shall not be required to obtain consent to suppliers of Materials, or of a subcontract for which the Subcontractor is named in the Contract;
- (b) the prior consent of the Engineer shall be obtained to other proposed Subcontractors;
- (c) the Contractor shall give the Engineer not less than 28 days' notice of the intended date of the commencement of each Subcontractor's work, and of the

commencement of such work on the Site; and

- (d) each subcontract shall include provisions which would entitle the Employer to require the subcontract to be assigned to the Employer under Sub-Clause 4.5 [*Assignment of Benefit of Subcontract*] (if or when applicable) or in the event of termination under Sub-Clause 15.2 [*Termination by Employer*].

4.5

Assignments of Benefit of Subcontract

If Subcontractor's obligations extend beyond the expiry date of the relevant Defects Notification Period and the Engineer, prior to this date, instructs the Contractor to assign the benefit of such obligations to the Employer, then the Contractor shall do so. Unless otherwise stated in the assignment, the Contractor shall have no liability to the Employer for the work carried out by the Subcontractor after the assignment takes effect.

4.6

Co-operation

The Contractor shall, as specified in the Contract or as instructed by the Engineer, allow appropriate opportunities for carrying out work to:

- (a) the Employer's Personnel,
- (b) any other Contractor's employed by the Employer, and
- (c) the personnel of any legally constituted public authorities.

Who may be employed in the execution on or near the Site of any work not included in the Contract.

Any such instruction shall constitute a Variation if and to the extent that it causes the Contractor to incur Unforeseeable Cost. Services for these personnel and other contractors may include the use of Contractor's Equipment. Temporary Works or access arrangements which are the responsibility of the Contractor.

If under the Contract, the Employer is required to give to the Contractor possession of any foundation, structure, plant or means of access in accordance with Contractor's Documents, the Contractor shall submit such documents to the Engineer in the time and manner stated in the Specification.

4.7

Setting Out

The Contractor shall set out the Works in relation to original points, lines and levels of reference specified in the Contract or notified by the Engineer. The Contractor shall be responsible for the correct positioning of all parts of the Works, and shall rectify any error in the positions, levels, dimensions or alignment of the Work.

The Employer shall be responsible for any errors in these specified or notified items of reference, but the Contractor shall use reasonable efforts to verify their accuracy before they are used.

If the Contractor suffers delay and/or incurs Cost from executing work which was necessitated by an error in these items of reference, and an experienced contractor could not reasonably have discovered such error and avoided this delay and/or Cost, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to;

- (a) an extension of time for any such delay, if completion is or will be delayed under Sub-Clause 8.4 [*Extension of Time for Completion*], and
- (b) payment of any such Cost plus reasonable profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine (i) whether and (if so) to what extent the error could not reasonably have been discovered, and (ii) the matters described in sub-paragraphs (a) and (b) above related to this extent.

4.8

Safety Procedures

The Contractor shall:

- (a) comply with all applicable safety regulations,
- (b) take care for the safety of all persons entitled to be on the Site,
- (c) use reasonable efforts to keep the Site and Works clear of unnecessary obstruction so as to avoid danger to these persons,
- (d) provide fencing, lighting, guarding and watching of the Works until completion and taking over under Clause 10 [*Employer's Taking Over*], and

- (e) provide any Temporary Works (including roadways, footways, guards and fences) which may be necessary, because of the execution of the Works, for the use and protection of the public and of owners and occupiers of adjacent land.

4.9

Quality Assurance

The Contractor shall institute a quality assurance system to demonstrate compliance with the requirements of the Contract. The system shall be in accordance with the details stated in the Contract. The Engineer shall be entitled to audit any aspect of the system.

Details of all procedures and compliance documents shall be submitted to the Engineer for information before each design and execution stage is commenced. When any document of a technical nature is issued to the Engineer, evidence of the prior approval by the Contractor himself shall be apparent on the document itself.

Compliance with the quality assurance system shall not relieve the Contractor of any of his duties, obligations or responsibilities under the Contract.

4.10

Site Data

The Employer shall have made available to the Contractor for his information, prior to the Base Date, all relevant data in the Employer's possession on sub-surface and hydrological conditions at the Site, including environmental aspects. The Employer shall similarly make available to the Contractor all such data which come into the Employer's possession after the Base Date. The Contractor shall be responsible for interpreting all such data.

To the extent which are practicable (taking account of cost and time), the Contractor shall be deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Tender or Works. To the same extent, the Contractor shall be deemed to have inspected and examined the Site, its surroundings, the above data and other available information, and to have been satisfied before submitting the Tender as to all relevant matters, including (without limitation).

- (a) the form and nature of the Site, including sub-surface conditions,
- (b) the hydrological and climatic conditions,

- (c) the extent and nature of the work and Goods necessary for the execution and completion of the Works and the remedying of any defects.
- (d) the Laws, procedures and labour practices of the Country, and
- (e) The Contractor's requirements for access, accommodation, facilities, personnel, power, transport, water and other services.

4.11

Sufficiency of the Accepted Contract Amount

The Contractor shall be deemed to:

- (a) have satisfied himself as to the correctness and sufficiency of the Accepted Contract Amount, and
- (b) have based the Accepted Contract Amount on the data, interpretations, necessary information, inspections, examinations and satisfaction as to all relevant matters referred to in Sub-Clause 4.10 [*Site Data*].

Unless otherwise stated in the Contract, the Accepted Contract Amount covers all the Contractor's obligations under the Contract (including those under Provisional Sums, if any) and all things necessary for the proper execution and completion of the Works and the remedying of any defects.

4.12

Unforeseeable Physical Conditions

In this Sub-Clause, "physical conditions" means natural conditions and man-made and other physical obstructions and pollutions, which the Contractor encounters at the Site when execution the Works, including sub-surface and hydrological conditions out excluding climatic conditions.

If the Contractor encounters adverse physical conditions which he considers to have been Unforeseeable, the Contractor shall give notice to the Engineer as soon as practicable.

This notice shall describe the physical conditions, so that they can be inspected by the Engineer, and shall set out the reasons why the Contractor considers them to be Unforeseeable. The Contractor shall continue executing the Works, using such proper and reasonable measures as are appropriate for the physical conditions, and shall comply with any instruction which the Engineer may give. If an instruction constitutes a Variation, Clause 13 [*Variations and Adjustments*] shall apply.

If and to the extent that the Contractor encounters physical conditions which Unforeseeable, gives such a notice, and suffers delay and/or incurs Cost due to these conditions, the Contractor shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [*Extension of Time for Completion*], and
- (b) payment of any such Cost, shall be included in the Contract Price,

After receiving such notice and inspecting and/or investigating these physical conditions, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine (i) whether and (if so) to what extent these physical conditions were Unforeseeable, and (ii) the matters described in sub-paragraphs (a) and (b) above related to this extent.

However, before additional Cost is finally agreed or determined under subparagraph (ii), the Engineer may also review whether other physical conditions in similar parts of the Works (if any) were more favourable than could reasonably have been foreseen when the Contractor submitted the Tender. If and to the extent that these more favourable conditions were encountered, the Engineer may proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine the reductions in Cost which were due to these conditions, which may be included (as deductions) in the Contract Price and Payment Certificates. However, the net effect of all adjustments under subparagraph (b) and all these reductions, for all the physical conditions encountered in similar parts of the Works, shall not result in a net reduction in the Contract Price.

The Engineer may take account of any evidence of the physical conditions foreseen by the Contractor which submitting the Tender, which may be made available by the Contractor, but shall not be bound by the any such evidence.

4.13

Rights of Way and Facilities

The Contractor shall bear all costs of and charges for special and/or temporary rights-of-way which he may require, including those for access to the Site. The Contractor shall also obtain, at his risk and cost, any additional facilities outside the Site which he may require for the purpose of the Works

4.14

Avoidance of Interference

The Contractor shall not interfere unnecessarily or improperly with:

- (a) the convenience of the public, or
- (b) the access to and use occupation of all roads and footpaths, irrespective of whether they are public or in the possession of the Employer or of others.

The Contractor shall indemnify and hold the Employer harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from any such unnecessary or improper interference.

4.15

Access Route

The Contractor shall be deemed to have been satisfied as to the suitability and availability of access routes to the Site. The Contractor shall use reasonable effects to prevent any road or bridge from being damaged by the Contractor's traffic or by the Contractor's Personnel. The efforts shall include the proper use of appropriate vehicles and routes.

Except as otherwise stated in these Conditions:

- (a) the Contractor shall (as between the Parties) be responsible for any maintenance which may be required for his use of access routes,
- (b) the Contractor shall provide all necessary signs or directions along access routes, and shall obtain any permission which may be required from the relevant authorities for his use of routes, signs and directions
- (c) the Employer shall not be responsible for any claims which may arise from the use of otherwise of any access route,
- (d) the Employer does not guarantee the suitability or availability of particular access routes, and
- (e) Costs due to non-suitability or non-availability, for the sue required by the Contractor, of access routes shall be borne by the Contractor.

4.16

Transport of Goods

Unless otherwise stated in the Particular Conditions:

- (a) the Contractor shall give the Engineer not less than 21 days' notice of the date on which any Plant or a major item of other Goods will be delivered to the Site;

- (b) the Contractor shall be responsible for packing, loading, transporting, receiving, unloading, storing and protecting all Goods and other things required for the Works; and
- (c) the Contractor shall indemnify and hold the Engineer harmless against and from all damages, losses and expenses (including legal fees and expenses) resulting from the transport of Goods, and shall negotiate and pay all claims arising from their transport.

4.17

Contractor's Equipment

The Contractor shall be responsible for all Contractor's Equipment. When brought on to the Site, Contractor's Equipment shall be deemed to be exclusively intended for the execution of the Works. The Contractor shall not remove from the Site any major items of Contractor's Equipment without the consent of the Engineer. However, consent shall not be required for vehicles transporting Goods or Contractor's Personnel off Site.

4.18

Protection of the Environment

The Contractor shall take all reasonable steps to protect the environment (both on and off the Site) and to limit damage and nuisance to people and property resulting from pollution, noise and other results of his operations.

The Contractor shall ensure that emissions, surface discharges and effluent from the Contractor's activities shall not exceed the value indicated in the Specification, and shall not exceed the values prescribed by applicable Laws.

4.19

Electricity, Water and Gas

The Contractor shall, except as stated below, be responsible for the provision of all power, water and other services he may require. The Contractor shall be entitled to use for the purposes of the Works such suppliers of electricity, water, gas and other services as may be available on the Site and of which details and prices are given in the Specification. The Contractor shall, at his risk and cost, provide any apparatus necessary for his use of these services and for measuring the quantities consumed.

The quantities consumed and the amounts due (at these prices) for such services shall be agreed or determined by the Engineer in accordance with Sub-Clause 2.5 [*Employer's Claims*] and Sub-Clause 3.5 [*Determinations*]. The Contractor shall pay these amounts to the Employer.

4.20

Employer's Equipment and Free-Issue Material

The Employer shall make the Employer's Equipment (if any) available for the use of the Contractor in the execution of the Works in accordance with the details, arrangements and prices stated in the Specification. Unless otherwise stated in the Specification:

- (a) the Employer shall be responsible for the Employer's Equipment, except that,
- (b) the Contractor shall be responsible for each item of Employer's Equipment whilst any of the Contractor's Personnel is operating it, directing it or in possession or control of it.

The appropriate quantities and the amounts due (at such stated prices) for the use of Employer's Equipment shall be agreed or determined by the Engineer in accordance with Sub-Clause 2.5 [*Employer's Claims*] and Sub-Clause 3.5 [*Determinations*]. The Contractor shall pay these amounts to the Employer.

The Employer shall supply, free of charge, the "free-issue materials" (if any) in accordance with the details stated in the Specification. The Employer shall, at his risk and cost, provide these materials at the time and place specified in the Contract. The Contractor shall then visually inspect them, and shall promptly give notice to the Engineer of any shortage, defect or default in these materials. Unless otherwise agreed by both Parties, the Employer shall immediately rectify the notified shortage, defect or default.

After this visual inspection, the free-issue materials shall come under the care, custody and control of the Contractor. The Contractor's obligations of inspection, care, custody and control shall not relieve the Employer of liability for any shortage, defect or default not apparent from visual inspection.

4.21

Progress Report

Unless otherwise stated in the Particular Conditions, monthly progress reports shall be prepared by the Contractor and submitted to the Engineer in six copies. The first report shall cover the period up to the end of the first calendar month following the Commencement Date. Reports shall be submitted monthly thereafter, each within 7 days after the last day of the period to which it relates.

Reporting shall continue until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking-Over Certificate for the Works.

Each report shall include:

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- (a) charts and detailed descriptions of progress, including each stage of design (if any), Contractor's Documents, procurement, manufacture, delivery to Site, construction, erection and testing; and including these stages for work by each nominated Subcontractor (as defined in Clause 5 [*Nominated Subcontractors*]),
- (b) photographs showing the status of manufacturer and of progress on the Site;
- (c) for the manufacture of each main item of Plant and Materials, the name of the manufacturer, manufacture location, percentage progress, and the actual or expected dates of:
 - (i) commencement of manufacture,
 - (ii) Contractor's inspections,
 - (iii) tests, and
 - (iv) shipment and arrival at the Site
- (d) the details described in Sub-Clause 6.10 [Records of Contractor's Personnel and Equipment],
- (e) copies of quality assurance documents, test results and certificates of Materials,
- (f) list of notices given under Sub-Clause 2.5 [*Employer's Claims*] and notices given under Sub-Clause 20.1 [*Contractor's Claims*],
- (g) safety statistics, including details of any hazardous incidents and activities relating to environmental aspects and public relations, and
- (h) comparisons of actual and planned progress, with details of any events or circumstances which may jeopardize the completion in accordance with the Contract, and the measures being (or to be) adopted to overcome delays.

4.22

Security of the Site

Unless otherwise stated in the Particular Conditions:

- (a) the Contractor shall be responsible for keeping unauthorized persons off the Site, and

- (b) authorized persons shall be limited to the Contractor's Personnel and the Employer's Personnel; and to any other personnel notified to the Contractor, by Employer's or the Engineer, as authorized personnel of the Employer's other contractors on the Site.

4.23

Contractor's Operations on Site

The Contractor shall confine his operations to the Site, and to any additional areas which may be obtained by the Contractor and agreed by the Engineer as working areas. The Contractor shall take all necessary precautions to keep Contractor's Equipment and Contractor's Personnel within the Site and these additional areas, and to keep them off adjacent land.

During the execution of the Works, the Contractor shall keep the Site free from all unnecessary obstruction, and shall store or dispose of any Contractor's Equipment or surplus materials. The Contractor shall clear away and remove from the Site any wreckage, rubbish and Temporary Works which are no longer required.

Upon the issue of a Taking-Over Certificate, the Contractor shall clear away and remove, from the part of the Site and Works to which the Taking-Over Certificate refers, all Contractor's Equipment, surplus material, wreckage, rubbish and Temporary Works. The Contractor shall leave that part of the Site and the Works in a clean and safe condition. However, the Contractor may retain on Site, during the Defects Notification Period, such Goods as are required for the Contractor to fulfill obligations under the Contract.

4.24

Fossils

All fossils, coins, articles of value or antiquity, and structures and other remains or items of geological or archaeological interest found on the Site shall be placed under the care and authority of the Employer. The Contractor shall take reasonable precautions to prevent Contractor's Personnel or other persons from removing or damaging any of these findings.

The Contractor shall, upon discovery of any such finding, promptly give notice to the Engineer, who shall issue instructions for dealing with it. If the Contractor suffers delay and/or incurs Cost from complying with the instructions, the Contractor shall give a further notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [*Extension of Time for Completion*], and
- (b) payment of any such Cost, which shall be included in the Contract Price.

After receiving this further notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.

5. Nominated Subcontractors

5.1

Definition of “nominated Subcontractor”

In the Contract, “nominated Subcontractor” means a Subcontractor;

- (a) who is stated in the Contract as being a nominated Subcontractor, or
- (c) whom the Engineer, under Clause 13 [Variations and Adjustments], instructs the Contractor to employ as a Subcontractor.

5.2

Objection to Nomination

The Contractor shall not be under any obligation to employ a nominated Subcontractor against whom the Contractor raises reasonable objection by notice to the Engineer soon as practicable, with supporting particulars. An objection shall be deemed reasonable if it arises from (among other things) any of the following matters, unless the Employer agrees to indemnify the contractor against and from the consequences of the matter:

- (a) there are reasons to believe that the Subcontractor does not have sufficient competence, resources or financial strength,
- (b) the subcontract does not specify that the nominated Subcontractor shall indemnify the Contractor against and from any negligence or misuse of Goods by the nominated Subcontractor, his agents and employees, or
- (c) the subcontract does not specify that, for the subcontracted work (including design, if any), the nominated Subcontractor shall:

- (i) undertake to the Contractor such obligations and liabilities as well enable the Contractor to discharge his obligations and liabilities under the Contract, and
- (ii) indemnify the Contractor against and from all obligations and liabilities arising under or in connection with the Contract and from the consequences of any failure by the Subcontractor to perform these obligations or to fulfill these liabilities.

5.3

Payments to nominated Subcontractors

The Contractor shall pay to the nominated Subcontractor the amounts which the Engineer certifies to be due in accordance with the subcontract. These amounts plus other charges shall be included in the Contract Price in accordance with subparagraph (b) of Sub-Clause 13.5 [Provisional Sums], except as stated in Sub-Clause 5.4 [Evidence of Payments].

5.4

Evidence of Payments

Before issuing a Payment Certificate which includes an amount payable to a nominated Subcontractor, the Engineer may request the Contractor to supply reasonable evidence that the nominated Subcontractor has received all amounts due in accordance with previous Payment Certificates, less applicable deductions for retention or otherwise. Unless the Contractor:

- (a) submits this reasonable evidence to the Engineer, or
- (b) (i) satisfies the Engineer in writing that the Contractor is reasonably entitled to withhold or refuse to pay these amounts, and
- (ii) submits to the Engineer reasonable evidence that the nominated Subcontractor has been notified of the Contractor's entitlement.

Then the Employer may (at his sole discretion) pay, direct to the nominated Subcontractor, part or all of such amounts previously certified (less applicable deductions) as are due to the nominated Subcontractor and for which the Contractor has failed to submit the evidence described in sub-paragraphs (a) or (b) above. The Contractor shall then repay, to the Employer, the amount which the nominated Subcontractor was directly paid by the Employer.

6. Staff and Labour

6.1

Engagement of Staff and Labour

Except as otherwise stated in the Specification, the Contractor shall make arrangements for the engagement of all staff and labour, local or otherwise, and for their payment, housing, feeding and transport.

6.2

Rates of Wages and Conditions of Labour

The Contractor shall pay rates of wages, and observe conditions of labour, which are not lower than those established for the trade or industry where the work is carried out. If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by employers whose trade or industry is similar to that of the Contractor.

6.3

Persons in the Service of Employer

The Contractor shall not recruit, or attempt to recruit, staff and labour amongst the Employer's Personnel.

6.4

Labour Laws

The Contractor shall comply with all the relevant labour Laws applicable to the Contractor's Personnel, including Laws relating to their employment, health, safety, welfare, immigration and emigration, and shall allow them all their legal rights.

The Contractor shall not permit any of the Contractor's Personnel to maintain any temporary or permanent living quarters within the structures forming part of the Permanent Works.

6.5

Working Hours

No work shall be carried out on the Site on locally recognized days of rest, or outside the normal working hours stated in the Appendix to Tender, unless:

- (a) otherwise stated in the Contract,
- (b) the Employer given consent, or
- (c) the work is unavoidable, or necessary for the protection of life or property or for the safety of the Works, in which case the Contractor shall immediately advise Engineer.

6.6

Facilities for Staff and Labour

Except as otherwise stated in the Specification, the Contractor shall provide and maintain all necessary accommodation and welfare facilities for the Contractor's Personnel. The Contractor shall also provide facilities for the Employer's Personnel as stated in the Specification.

The Contractor shall not permit any of the Contractor's Personnel to maintain any temporary or permanent living quarters within the structures forming part of the Permanent Works.

6.7

Health and Safety

The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personnel. In collaboration with local health authorities, the Contractor shall ensure that medical staff, first aid facilities, sick bay and ambulance service are available at all times at the Site and at any accommodation for Contractor's and Employer's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.

The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the execution of the Works, the Contractor shall provide whatever is required by this person to exercise this responsibility and authority.

The Contractor shall send, to the Engineer, details of any accident as soon as practicable after its occurrence. The Contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the Engineer may reasonably require.

6.8

Contractor's Superintendence

Throughout the execution of the Works, and as long thereafter as is necessary to fulfill the Contractor's obligations, the Contractor shall provide all necessary superintendence to plan, arrange, direct, manage, inspect and test the work.

Superintendence shall be given by a sufficient number of persons having adequate knowledge of the language for communications (defined in Sub-Clause 1.4 [Law and

Language] and of the operations to be carried out (including the methods and techniques required, the hazards likely to be encountered and methods of preventing accidents), for the satisfactory and safe execution of the Works.

6.9

Contractor's Personnel

The Contractor's Personnel shall be appropriately qualified, skilled and experienced in their respective trades or occupations. The Engineer may require the Contractor to remove (or cause to be removed) any person employed on the Site or Works including the Contractor's Representative if applicable, who:

- (a) persists in any misconduct or lack of care,
- (b) carries out duties incompetently or negligently,
- (c) fails to conform with any provisions of the Contract, or
- (d) persists in any conduct which is prejudicial to safety, health, or the protection of the environment.

If appropriate, the Contractor shall then appoint (or cause to be appointed) a suitable replacement person.

6.10

Records of Contractor's Personnel and Equipment

The Contractors shall submit, to the Engineer, details showing the number of each class of Contractor's Personnel and of each type of Contractor's Equipment on the Site. Details shall be submitted each calendar month, in a form approved by the Engineer, until the Contractor has completed all work which is known to be outstanding at the completion date stated in the Taking-Over Certificate for the Works.

6.11

Disorderly Conduct

Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst the Contractor's Personnel, to prevent peace and protection of persons and property on and near the Site.

7. Plant, Materials and Workmanship

7.1

Manner of Execution

The Contractor shall carry out the manufacture of Plant, the production and manufacture of Materials, and all other execution of the Works:

- (a) in the manner (if any) specified in the Contract,
- (b) in a proper workmanlike and careful manner, in accordance with recognized good practice, and
- (c) with properly equipped facilities and non-hazardous Materials, except as otherwise specified in the Contract.

7.2

Samples

The Contractor shall submit the following samples of Materials, and relevant information, to the Engineer for consent prior to using the Materials in or for the Works:

- (a) manufacturer's standard samples of Materials and samples specified in the Contract, all at the Contractor's cost, and
- (b) additional samples instructed by the Engineer as a Variation.

Each sample shall be labeled as to origin and intended use in the Works.

7.3

Inspection

The Employer's Personnel shall at all reasonable times:

- (a) have full access to all parts of the Site and to all places from which natural Materials are being obtained, and
- (b) during production, manufacture and construction (at the Site and elsewhere) be entitled to examine, inspect, measure and test the materials and workmanship, and to check the progress of manufacture of Plant and production and manufacture of Materials.

The Contractor shall give the Employer's Personnel full opportunity to carry out these activities, including providing access, facilities, permissions and safety equipment, no such activity shall relieve the Contractor from any obligation or responsibility.

The Contractor shall give notice to the Engineer whenever any work is ready and before it is covered up, put out of sight, or packaged for storage or transport. The Engineer shall then either carry out the examination, inspection, measurement or testing without unreasonable delay, or promptly give notice to the Contractor that the Engineer does not require to do so. If the Contractor fails to give the notice, he shall, if and when required by the Engineer, uncover the work and thereafter reinstate and make good, all at the Contractor's cost.

7.4

Testing

This Sub-Clause shall apply to all tests specified in the Contract, other than the Tests after Completion (if any).

The Contractor shall provide all apparatus, assistance, documents, and other information, electricity, equipment, fuel, consumables, instruments, labour, materials, and suitably qualified and experienced staff, as are necessary to carry out the specified tests efficiently. The Contractor shall agree, with the Engineer, the time and place for the specified testing of any Plant, Materials and other parts of the Works.

The Engineer may, under Clause 13 [Variations and Adjustments], vary the location of details of specified tests, or instruct the Contractor to carry out additional tests. If these varied or additional test show that the tested Plant, Materials or workmanship is not in accordance with the Contract, the cost of carrying out this Variation shall be borne by the Contractor, notwithstanding other provisions of the Contract.

The Engineer shall give the Contractor not less than 24 hours' notice of the Engineer's intention to attend the tests. If the

Engineer does not attend at the time and place agreed, the Contractor may proceed with the tests, unless otherwise instructed by the Engineer, and the test shall then be deemed to have been made in the Engineer's presence.

If the Contractor suffers delay and/or incurs Cost from complying with these instructions or as a result of a delay for which the Employer is responsible, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost plus reasonable profit, which shall be included in the

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

The Contractor shall promptly forward to the Employer duly certified Reports of the tests. When the specified tests have been passed, the Engineer shall endorse the Contractor's test certificate, or issue a certificate to him, to that effect. If the Engineer has not attended the tests, he shall be deemed to have accepted the readings as accurate.

7.5

Rejection

If, as a result of an examination, inspection, measurement or testing, any Plant, Materials or workmanship is found to be defective or otherwise not in accordance with the Contract, the Engineer may reject the Plant, Materials or workmanship by giving notice to the Contractor, with reasons. The Contractor shall then promptly make good the defect and ensure that the rejected item complies with the Contract.

If the Employer requires this Plant, Materials or workmanship to be retested, the test shall be repeated under the same terms and conditions. If the rejection and retesting cause the Employer to incur additional cost, the Contractor shall subject to Sub-Clause 2.5 [Employer's Claims] pay these costs to the Employer.

7.6

Remedial Work

Notwithstanding any previous test or certification, the Employer may instruct the Contractor to:

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- (a) remove from the Site and replace any Plant or Materials which is not in accordance with the Contract,
- (b) remove and re-execute any other work which is not in accordance with the Contract, and
- (c) execute any work which is urgently required for the safety of the Works, whether because of an accident, unforeseeable event or otherwise.

The Contractor shall comply with the instruction within a reasonable time, which shall be the time (if any) specified in the instruction, or immediately if urgency is specified under sub-paragraph (c).

If the Contractor fails to comply with the instruction, the Employer shall be entitled to employ and pay other persons to carry out the work. Except to the extent that the Contractor would have been entitled to payment for the work, the Contractor shall subject to Sub-Clause 2.5 [Employer's Claims] pay to the Employer all costs arising from this failure.

7.7

Ownership of Plant and Materials

Each item of Plan and Materials shall, to the extent consistent with the Laws of the Country, become the property of the Employer at whichever is the earlier of the following times, free from liens and other encumbrances:

- (a) when it is delivered to the Site,
- (b) when the Contractor is entitled to payment of the value of the Plant and Materials under Sub-Clause 8.10 [*Payment for Plant and Materials in Event of Suspension*].

7.8

Royalties

Unless otherwise stated in the Specification, the Contractor shall pay all royalties, rents and other payment for:

- (a) natural Materials obtained from outside the Site, and
- (b) the disposal of material from demolitions and excavations and of other surplus material (whether natural or man-made), except to the extent that disposal areas within the Site are specified in the Contract.

8. Commencement, Delays and Suspension

8.1

Commencement of Works

The Engineer shall give the Contractor not less than 7 days' notice of the Commencement Date. Unless otherwise stated in the Particular Conditions, the Commencement Date shall be within 42 days after the Contractor receives the Letter of Acceptance.

The Contractor shall commence the execution of the Works as soon as is reasonably practicable after the Commencement Date, and shall then proceed with the Works with due expedition and without delay.

8.2

Time for Completion

The Contractor shall complete the whole of the Works, and each Section (if any), within the Time for Completion for Works or Section (as the case may be), including:

- (a) achieving the passing of the Tests on Completion, and
- (b) completing all work which is stated in the Contract as being required for the Works or Section to be considered to be completed for the purposes of taking-over under Sub-Clause 10.1 [*Taking Over of the Works and Sections*].

8.3

Programme

The Contractor shall submit a detailed time programme to the Engineer within 28 days after receiving the notice under Sub-Clause 8.1 [Commencement of Works]. The Contractor shall also submit a revised programme whenever the previous programme is inconsistent with actual progress or with the Contractor's obligations. Each programme shall include:

- (a) the order in which the Contractor intends to carry out the Works, including the anticipated timing of each stage of design (if any), Contractor's Documents, procurement, manufacture of Plant, delivery to Site, construction, erection and testing,
- (b) each of these stages for work by each nominated Subcontractor (as defined in Clause 5 [*Nominated Subcontractors*]),
- (c) the sequence and timing of inspections and test specified in the Contract, and
- (d) a supporting report which includes:

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- (i) a general description of the methods which the Contractor intends to adopt, and of the major stages, in the execution of the Works, and
- (ii) details showing the Contractor's reasonable estimate of the number of each class of Contractor's Personnel and of each type of Contractor's Equipment, required on the Site for each major stage.

Unless the Engineer, within 21 days after receiving a programme, gives notice to the Contractor stating the extent to which it does not comply with the Contract, the Contractor shall proceed in accordance with the programme, subject to his other obligations under the Contract. The Employer's Personnel shall be entitled to rely upon the programme when planning their activities.

The Contractor shall promptly give notices to the Engineer of specific probable future events or circumstances which may adversely affect the work, increase the Contract Price or delay the execution of the Works. The Engineer may require the Contractor to submit an estimate of the anticipated effect of the future event or circumstances, and/or a proposal under Sub-Clause 13.3 [*Variation Procedure*].

If, at any time, the Engineer gives notice to the Contractor that a programme fails (to the extent stated) to comply with the Contract or to be consistent with actual progress and the Contractor's stated intentions, the Contractor shall submit a revised programme to the Engineer in accordance with this Sub-Clause.

8.4

Extension of Time for Completion

The Contractor shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to an extension of the Time for Completion if and to the extent that completion for the purpose of Sub-Clause 10.1 [*Taking Over of the Works and Sections*].

- (a) a Variation (unless an adjustment to the Time for Completion has been agreed under Sub-Clause 13.3 [*Variation Procedure*] or other substantial change in the quantity of an item of work included in the Contract,
- (b) a cause of delay giving an entitlement to extension of time a Sub-Clause of these Conditions.
- (c) exceptionally adverse climatic conditions,

- (d) Unforeseeable shortages in the availability of personnel or Goods caused by epidemic or governmental actions, or
- (e) any delay, the impediment or prevention caused by or attributable to the Employer, the Employer's Personnel, or the Employer's other contractors on the Site.

If the Contractor considers himself to be entitled to an extension of the Time for Completion, the Contractor shall give notice to the Engineer in accordance with Sub-Clause 20.1 [*Contractor's Claims*]. When determining each extension of time under Sub-Clause 20.1, the Engineer shall review previous determinations and may increase, but shall not decrease, the total extension of time.

8.5

Delays Caused by Authorities

If the following conditions apply, namely:

- (a) the Contractor has diligently followed the procedures laid down by the relevant legally constituted public authorities in the Country,
- (b) these authorities delay or disrupt the Contractor's work, and
- (c) the delay or disruption was Unforeseeable.

Then this delay or disruption will be considered as a cause of delay under sub-paragraph (b) of Sub-Clause 8.4 [*Extension of Time for Completion*].

8.6

Rate of Progress

If, at any time:

- (a) actual progress is too slow to complete within the Time for Completion, and/or
- (b) progress has fallen (or will fall) behind the current programme under Sub-Clause 8.3 [*Programme*].

other than as a result of a cause listed in Sub-Clause 8.4 [*Extension of Time for Completion*], then the Engineer may instruct the Contractor to submit, under Sub-Clause 8.3 [*Programme*], a revised programme and supporting report describing the revised methods which the Contractor proposes to adopt in order to expedite progress and complete within the Time for Completion.

Unless the Engineer notifies otherwise, the Contractor shall adopt these revised methods, which may require increases in the working hours and/or in the number of Contractor's Personnel and/or Goods, at the risk and cost of the Contractor. If these revised methods cause the Employer to incur additional costs, the Contractor shall subject to Sub-Clause 2.5 [*Employer's Claims*] pay these costs to the Employer, in addition to delay damages (if any) under Sub-Clause 8.7 below.

8.7

Delay Damages

If the Contractor fails to comply with Sub-Clause 8.2 [Time of Completion], the Contractor shall subject to Sub-Clause 2.5 [*Employer's Claims*] pay delay damages to the Employer for this default. These delay damages shall be the sum stated in the Appendix to Tender, which shall be paid for every day which shall elapse between the relevant Time for Completion and the date stated in the Taking-Over Certificate. However, the total amount due under this Sub-Clause shall not exceed the maximum amount of delay damages (if any) stated in the Appendix to Tender.

These delay damages shall be the only damages due from the Contractor for such default, other than in event of termination under Sub-Clause 15.2 [*Termination by Employer*] prior to completion of the Works. These damages shall not relieve the Contractor from his obligation to complete the Works, or from any other duties, obligations or responsibilities which he may have under the Contract.

8.8

Suspension of Work

The Engineer may at any time instruct the Contractor to suspend progress of part or all of the Works. During such suspension, the Contractor shall protect, store and secure such part or the Works against any deterioration, loss or damage.

The Engineer may also notify the cause for the suspension. If and to the extent that the cause is notified and is the responsibility of the Contractor, the following Sub-Clause 8.9, 8.10 and 8.11 shall not apply.

8.9

Consequences of Suspension

If the Contractor suffers delay and/ or Incurs Cost from complying with the Engineer's Instructions under Sub-Clause 8.8 [*Suspension of Work*] and /or from resuming the work, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) an extension of time for any such delay, if completion is or will be, under Sub-Clause 8.4 [*Extension of Time for Completion*], and
- (b) payment of any such cost, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance this Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.

The Contractor shall not be entitled to an extension of time for, or to payment of the Cost incurred in, making good the consequences of the Contractor's failure to protect, store or secure in accordance with Sub-Clause 8.8 [*Suspension of Work*].

8.10

Payment for Plant and Materials in Event of Suspension

The Contractor shall be entitled to payment of the value (as at the date of suspension) of Plant and/or Materials which have not been delivered to Site, if:

- (a) the work on Plant or delivery of Plant and/or Materials has been suspended for more than 28 days, and
- (b) the Contractor has marked the Plant and /or Materials as the Employer's properly in accordance with the Engineer's instructions.

8.11

Prolonged Suspension

If the suspension under Sub-Clause 8.8 [*Suspension of Work*] has continued for more than 84 days, the Contractor may request the Engineer's permission to proceed. If the Engineer does not give permission within 28 days after being requested to do so, the Contractor may, by giving notice to the Engineer, treat the suspension as an omission under Clause 13 [*Variations and Adjustments*] of the affected part of the Works. If the suspension affects the whole of the Works, the Contractor may give notice of termination under Sub-Clause 16.2 [*Termination by Contractor*].

8.12

Resumption of Work

After the permission or instruction to proceed is given, the Contractor and the Engineer shall jointly examine the Works and the Plant and Materials affected by the suspension. The Contractor shall make good any deterioration or defect in or loss of the Works or Plant or Materials, which has occurred during the suspension.

9. Tests on Completion

9.1

Contractor's Obligations The Contractor shall carry out the Tests on Completion in accordance with Clause and Sub-Clause 7.4 [Testing], after providing the documents in accordance with sub-paragraph (d) of Sub-Clause 4.1 [Contractor's General Obligations}

The Contractor shall give to the Engineer not less than 21 days' notice of the date after which the Contractor will be ready to carry out each of the Tests on Completion. Unless otherwise agreed, Tests on Completion shall be carried out within 14 days after this date, on such day or days as the Engineer shall instruct.

In considering the results of the Tests on Completion, the Engineer shall make allowances for the effect of any use of the Works by the Employer on the performance or other characteristics of the Works. As soon as the Works, or a Section, have passed any Tests on Completion, the Contractor shall submit a certified report of the results of these Tests to the Engineer.

9.2

Delayed Tests

If the Tests on Completion are being unduly delayed by the Employer, Sub-Clause 7.4 [Testing] (fifth paragraph) and /or Sub-Clause 10.3 [Interference with Tests on Completion] shall be applicable.

If the Test on Completion are being unduly delayed by the Contractor, the Engineer may by notice require the Contractor to carry out the Tests within 21 days after receiving the notice. The Contractor shall carry out the Tests on such day or days within that period as the Contractor may fix and of which he shall give notice to the Engineer.

If the Contractor falls to carry out the Tests on Completion within the period of 21 days, the Employer's Personnel may proceed with the Tests at the risk cost of the Contractor. The Tests on Completion shall then be deemed to have been carried out in the presence of the Contractor and the results of the Tests shall be accepted as accurate.

9.3

Retesting

If the Works, or a Section, fail to pass the Tests on Completion, Sub-Clause 7.5 [Rejection] shall apply, and the Engineer or the Contractor may require the failed Tests, and Tests on Completion on any related work, to be repeated under the same terms and conditions.

9.4

Failure to Pass Tests on Completion

If the Works, or a Section, fail to pass the Tests on completion repeated under Sub-Clause 9.3 [Retesting], the Engineer shall be entitled to:

- (a) order further repetition of Tests on Completion under Sub-Clause 7.5
- (b) if the failure deprives the Employer of substantially the whole benefit of the Works or Section, reject the Works or Section (as the case may be), in which event the Employer shall have the same remedies as are provided in sub-paragraph (c) of Sub-Clause 11.4 [Failure to Remedy Defects]; or
- (c) issue a Taking-Over Certificate, if the Employer so requests.

In the event of sub-paragraph (c), the Contractor shall proceed in accordance with all other obligations under the Contract, and the Contract Price shall be reduced by such amount as shall be appropriate to cover the reduced value to the Employer as a result of this failure. Unless the relevant reduction for this failure is stated (or its method of calculation is defined) in the Contract, the Employer may reduction to be (i) agreed by both Parties (in full satisfaction of this failure only) and paid before this Taking-Over Certificate is issued, or (ii) determined and paid under |Sub-Clause 2.5 [*Employer's Claims*] and Sub-Clause 3.5 [*Determinations*].

10. Employer's Taking Over

10.1

Taking Over of the Works and Sections

Except as stated in Sub-Clause 9.4 [*Failure to Pass Tests on Completion*], the Works the Works shall be taken over by the Employer when (i) the Works have been completed in accordance with the Contract, including the matters described in Sub-Clause 8.2 [*Time for Completion*] and except as allowed in sub-paragraph (a) below, and (ii) a Taking- Over Certificate for the Works has been issued, or is deemed to have been issued in accordance with this Sub-Clause.

The Contractor may apply by notice to the Engineer for a Taking-over Certificate not earlier than 14 days before the Works will, in the Contractor's opinion, be complete and ready for taking over. If the Works are divided into Sections, the Contractor may similarly apply for Taking-Over Certificate for each Section.

Part II - Agreement and General Conditions of Contract

The Engineer shall, within 28 days after receiving the Contractor's application:

- (a) issue the Taking-Over Certificate to the Contractor, stating the date on which the Works or Section were completed in accordance with the Contract, except for any minor outstanding work and defects which will not substantially affect the use of the Works or Section for their intended purpose (either until or whilst this work is completed and these defects are remedied); or
- (b) reject the application, giving reasons and specifying the work required to be done by the Contractor to enable the Taking-Over Certificate to be issued. The Contractor shall then complete this work before issuing a further notice under this Sub-Clause.

If the Engineer fails either to issue the Taking-Over Certificate or to reject the Contractor's application within the period of 28 days, and if the Works or Section (as the case may be) are substantially in accordance with the Contract, the Taking-Over Certificate shall be deemed to have been issued on the last day of that period.

10.2

**Taking Over
of Parts of the Works**

The Engineer may, at the sole discretion of the Employer, issue a Taking-Over Certificate for any part of the Permanent Works. The Employer shall not use any part of the Works (other than as a temporary measure which is either specified in the Contract or agreed by both Parties) unless and until the Engineer has issued A Taking –Over Certificate for this part. However, if the Employer does use any part of the Works before the Taking-Over Certificate is issued:

- (a) the part which is used shall be deemed to have been taken over as from the date on which it is used,
- (b) the Contractor shall cease to be liable for the care of such part as from this date, when responsibility shall pass to the Employer, and
- (c) if requested by the Contractor, the Engineer shall issue a Taking-Over Certificate for this part.

After the Engineer has issued a Taking-Over Certificate for a part of the Works, the Contractor shall be given the earlier opportunity to take such steps as may be necessary to carry out any outstanding Tests on Completion. The Contractor shall carry out these Tests on Completion as soon as practicable before the expiry date of the relevant Defects Notification Period

If the Contractor incurs Cost as a result of the Employer taking over and/or using a part of the Works, other than such use as is specified in the Contract or agreed by the Contractor, the Contractor shall (i) give notice to the Engineer and (ii) be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to payment of any such Cost plus reasonable profit, which shall be included in the Contract Price. After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine this Cost and profit.

If a Taking-Over Certificate has been issued for a part of the Works (other than a Section), the delay damages thereafter for completion of the remainder of the Works shall be reduced. Similarly, the delay damages for the remainder of the Section (if any) in which this part is included shall also be reduced. For any period of delay after the date stated in this Taking-Over Certificate, the proportional reduction in these delay damages shall be calculated as the proportion which the value of the part so certified bears to the value of the Works or Section (as the case may be) as a whole. The Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or

determine these proportions. The provisions of this paragraph shall only apply to the daily rate of delay damages under Sub-Clause 8.7 [*Delay Damaged*], and shall not affect the maximum amount of these damages.

10.3

Interference with Tests on Completion

If the Contractor is prevented, for more than 14 days, from carrying out the Tests on Completion by a cause for which the Employer is responsible, the Employer shall be deemed to have taken over the Works or Section (as the case may be) on the date when the Tests on Completion would otherwise have been completed.

The Engineer shall then issue a Taking-Over Certificate accordingly, and the Contractor shall carry out the Tests on Completion as soon as practicable, before the expiry date of the Defects Notification Period. The Engineer shall require the Test on Completion to be carried out by giving 14 days' notice and in accordance with the relevant provisions of the Contract.

If the Contractor suffers delay and /or incurs Cost as a result of this delay in carrying out the Tests on Completion, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) an extension of time for any such delay, if completion is our will be delayed, under Sub-Clause 8.4 [Extension of Time for Completion], and
- (b) payment of any such Cost plus reasonable profit, which shall be included in the Contract Price.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

10.4

Surface Requiring Reinstatement

Except as otherwise stated in a Taking-Over Certificate, a certificate for a Section or part of the Works shall not be deemed to certify completion of any ground or other surfaces requiring reinstatement.

11. Defects Liability

11.1

Completion of Outstanding Work and

In order that the Works are Contractor's Documents, and each Section, shall be in the condition required by

Remedying Defects

the Contract (fair wear and tear excepted) by the expiry date of the relevant Defects Notification Period or as soon as practicable thereafter, the Contractor shall:

- (a) complete any work which is outstanding on the date stated in a Taking-Over Certificate, within such reasonable time as is instructed by the Engineer, and
- (b) execute all work required to remedy defects or damage, as may be notified by (or on behalf of) the Employer on or before the expiry date of the Defects Notification Period for the Works or Section (as the case may be).

If a defect appears or damage occurs, the Contractor shall be notified accordingly, by (or on behalf of) the Employer.

11.2

Cost of Remedying Defects

All work referred to in sub-paragraph (b) of Sub - Clause 11.1 [*Completion of Outstanding Work and Remedying Defects*] shall be executed at the risk and cost of the Contractor, if and to the extent that the work is attributable to:

- (a) any design for which the Contractor is responsible,
- (b) Plant, Materials or workmanship not being in accordance with the Contract, or
- (c) Failure by the Contractor to comply with any other obligation.

If and to the extent that such work is attributable to any other cause, the Contractor shall be notified promptly by (or on behalf of) the Employer, and Sub-Clause 13.3 [Variation Procedure] shall apply.

11.3

Extension of Defects Notification Period

The Employer shall be entitled subject to Sub-Clause 2.5 [*Employer Claims*] to an extension of the Defects Notification Period for the Works or a Section if and to the extent that the Works, Section or a major item of Plant (as the case may be, and after taking over) cannot be used for the purposes for which they are intended by reason of a defect or damage. However, a Defects Notification Period shall not be extended by more than two years.

If delivery and/or erection of Plant and /or Materials was suspended under Sub-Clause 8.8 [*Suspension of Work*] or Sub-Clause 16.1 [*Contractor's Entitlement to Suspend Work*], the Contractor's obligations under this Clause shall not apply to any defects or damage occurring more than two years after the Defects Notification Period for the Plant and /or Materials would otherwise have expired.

11.4

Failure to Remedy Defects

If the Contractor fails to remedy any defect or damage within a reasonable time, a date may be fixed by (or on behalf of) the Employer, on or by which the defect or damage is to be remedied. The Contractor shall be given reasonable notice of this date.

If the Contractor fails to remedy the defect or damage by this notified date and this remedial work was to be executed at the cost of the Contractor under Sub-Clause 11.2 [*Cost of Remedying Defects*], the Employer may (at his option):

- (a) carry out the work himself or by others, in a reasonable manner and at the Contractor's cost, but the Contractor shall have no responsibility for this work: and the Contractor shall subject to Sub-Clause 2.5 [*Employer's Claims*] pay to the Employer the costs reasonably incurred by the Employer in remedying the defect or damage,
- (b) require the Engineer to agree or determine a reasonable reduction in the Contract Price in accordance with Sub-Clause 3.5 [*Determinations*]; or
- (c) if the defect or damage deprives the Employer of substantially the whole benefit of the Works or any major part of the Works, terminate the Contract as a whole, or in respect of such major part which cannot be put to the intended use. Without prejudice to any other rights, under the Contract or otherwise, the Employer

shall then be entitled to recover all sums paid for the Works or for such part (as the case may be), plus financing costs and the cost of dismantling the same, clearing the Site and returning Plant and Materials to the Contractor.

11.5

Removal of Defective Work

If the defect or damage cannot be remedied expeditiously on the Site and the Employer gives consent, the Contractor may remove from the Site for the purposes of repair such items of Plant as are defective or damaged. This consent may require the Contractor to increase the amount of the Performance Security by the full replacement cost of these items, or to provide other appropriate security.

11.6

Further Tests

If the work of remedying of any defect or damage may affect the performance of the Works, the Engineer may require the repetition of any of the tests described in the Contract. The requirement shall be made by notice within 28 days after the defect or damage is remedied.

These tests shall be carried out in accordance with the terms applicable to the previous tests, except that they shall be carried out at the risk and cost of the Party liable, under Sub-Clause 11.2 [*Cost of Remedying Defects*], for the cost of the remedial work.

11.7

Right of Access

Until the Performance Certificate has been issued, the Contractor shall have such right of access to the Works as is reasonably required in order to comply with this Clause, except as may be inconsistent with the Employer's reasonable security restrictions.

11.8

Contractor to Search

The Contractor shall, if required by the Engineer, search for the cause of any defect under the direction of the Engineer. Unless the defect is to be remedied at the cost of the Contractor under Sub-Clause 11.2 [Cost of Remedying Defects], the Cost of the search plus reasonable profit shall be agreed or determined by the Engineer in accordance with Sub-Clause 3.5 [*Determinations*] and shall be included in the Contract Price.

11.9

Performance Certificate

Performance of the Contractor's obligations shall not be considered to have been completed until the Engineer has

issued the Performance Certificate to the Contractor, stating the date on which the Contractor completed his obligations under the Contract.

The Engineer shall issue the Performance Certificate within 28 days after the latest of the expiry dates of the Defects Notification Periods, or as soon thereafter as the Contractor has supplied all the Contractor's Documents and completed and tested all the Works, including remedying any defects. A copy of the Performance Certificate shall be issued to the Employer.

Only the Performance Certificate shall be deemed to constitute acceptance of the Works.

11.10

Unfulfilled Obligations

After the Performance Certificate has been issued, each Party shall remain liable for the fulfillment of any obligation which remains unperformed at that time. For the purposes of determining the nature and extent of unperformed obligations, the Contract shall be deemed to remain in force.

11.11

Clearance of Site

Upon receiving the Performance Certificate, the Contractor shall remove any remaining Contractor's Equipment, surplus material, wreckage, rubbish and Temporary Works from the Site.

If all these items have not been removed within 28 days after the Employer receives a copy of the Performance Certificate, the Employer may sell or otherwise dispose of any remaining items.

The Employer shall be entitled to be paid the costs incurred in connection with, or attributable to, such sale or disposal and restoring the Site.

Any balance of the moneys from the sale shall be paid to the Contractor. If these moneys are less than the Employer's costs, the Contractor shall pay the outstanding balance to the Employer.

12. Measurement and Evaluation

12.1

Works to be Measured

The Works shall be measured, and valued for payment, in accordance with this Clause.

Whenever the Engineer requires any part of the Works to be measured, reasonable notice shall be given to the Contractor's Representative, who shall:

- (a) promptly either attend or send another qualified representative to assist the Engineer in making the measurement, and
- (b) supply any particulars requested by the Engineer.

If the Contractor fails to attend or send a representative, the measurement made by (or on behalf of) the Engineer shall be accepted as accurate.

Except as otherwise stated in the Contract, wherever any Permanent Works are to be measured from records, these shall be prepared by the Engineer. The Contractor shall, as and when requested, attend to examine and agree the records with the Engineer, and shall sign the same when agreed. If the Contractor does not attend, the records shall be accepted as accurate.

If the Contractor examines and disagrees the records, and/or does not sign them as agreed, then the Contractor shall give notice to the Engineer of the respects in which the records are asserted to be inaccurate. After receiving this notice, the Engineer shall review the records and either confirm or vary them. If the Contractor does not so give notice to the Engineer within 14 days after being requested to examine the records, they shall be accepted as accurate.

12.2

Method of Measurement

Except as otherwise stated in the Contract and notwithstanding local practice:

- (a) measurement shall be made of the net actual quantity of each item of the Permanent Works, and
- (b) the method of measurement shall be in accordance with the Bill of Quantities or other applicable Schedules.

12.3

Evaluation

Except as otherwise stated in the Contract, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine the Contract Price by evaluating each item of work, applying the measurement agreed or determined in accordance with the above Sub-Clauses 12.1 and 12.2 and the appropriate rate or price for the item.

For each item of work, the appropriate rate or price for the item shall be the rate or price specified for such item in the Contract or, if there is no such item, specified for similar work. However, a new rate or price shall be appropriate for an item of work, if:

(i) the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25 percent, provided the change exceeds 1 percent of the Initial Contract Price, the Project Manager shall adjust the rate to allow for the change. The Project Manager shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 15 percent, except with the prior approval of the Employer.

(ii) If requested by the Project Manager, the Contractor shall provide the Project Manager with a detailed cost breakdown of any rate in the Bill of Quantities.

**12.4
Omissions**

Whenever the omission of any work forms part (or all) of a Variation, the value of which has not been agreed, if:

- (a) the Contractor will incur (or has incurred) cost which, if the work had not been omitted, would have been deemed to be covered by a sum forming part of the Accepted Contract Amount,
- (b) the omissions of the work will result (or has resulted) in this sum not forming part of the Contract Price,
- (c) this cost is not deemed to be included in the evaluation of any substituted work.

Then the Contractor shall give notice to the Engineer accordingly, with supporting particulars. Upon receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine this cost, which shall be included in the Contract Price.

13. Variations and Adjustments

13.1

Right to Vary

Variations may be initiated by the Engineer at any time prior to issuing the Taking-Over Certificate for the Works, either by an instruction or by a request for the Contractor to submit a proposal.

The Contractor shall execute and be bound by each Variation, unless the Contractor promptly gives notice to the Engineer stating (with supporting particulars) that the Contractor cannot readily obtain the Goods required for the Variation. Upon receiving this notice, the Engineer shall cancel, confirm or vary the instruction.

Each Valuation may include:

- (a) changes to be quantities of any item of work included in the Contract (however, such changes do not necessarily constitute a Variation),
- (b) changes to the quality and other characteristics of any item of work,
- (c) changes to the levels, positions and/or dimensions of any part of the Works,
- (d) omission of any work unless it is to be carried out by others,
- (e) any additional work, Plant, Materials or services necessary for the Permanent Works, including any associated Tests on Completion, boreholes and other testing and exploratory work, or
- (f) changes to the sequence or timing of the execution of the Works.

The Contractor shall not make any alteration and/or modification of the Permanent Works, unless and until the Engineer instructs or approves a Variation.

13.2

Value Engineering

The Contractor may, at any time, submit to the Engineer a written proposal which (in the Contractor's opinion) will, if adopted, (i) accelerate completion, (ii) reduce the cost to the

Employer of executing, maintaining or operating the Works (iii) improve the efficiency or value to the Employer of the completed Works, or (iv) otherwise be of benefit to the Employer.

The proposal shall be prepared at the cost of the Contractor and shall include the items listed in Sub-Clause 13.3 [*Variation Procedure*].

If a proposal, which is approved by the Employer, includes a change in the design of part of the Permanent Works, then unless otherwise agreed by both Parties.

- (a) the Contractor shall design this part,
- (b) sub-paragraph (a) to (d) of Sub-Clause 4.1 [*Contractor's General Obligations*] shall apply, and
- (c) if this change results in a reduction in the contract value of this part, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine a fee, which shall be included in the Contract Price. This fee shall be half (50%) of the difference between the following amounts:
 - (i) such reduction in contract value, resulting from the change, excluding adjustments under Sub-Clause 13.7 [*Adjustments for Changes in Legislation*] and Sub-Clause 13.8 [*Adjustments for Changes in Cost*], and
 - (ii) the reduction (if any) in the value to the Employer of the varied works, taking account of any reductions in quality, anticipated life or operational efficiencies.

However, if amount (i) is less than amount (ii), there shall be a fee.

13.3

Variation Procedure

If the Engineer requests a proposal, prior to instructing a Variation, the Contractor shall respond in writing as soon as practicable, either by giving reasons why he cannot comply (if this is the case) or by submitting:

- (a) a description of the proposed work to be performed and a programme for its execution,
- (b) the Contractor's proposal for any necessary modifications to the programme according to Sub-

Clause 8.3 [*Programme*] and to the Time for Completion, and

(c) the Contractor's proposal for evaluation of the Variation.

The Engineer shall, as soon as practicable after receiving such proposal (under Sub-Clause 13.2 [*Value Engineering*] or otherwise), respond with approval, disapproval or comments. The Contractor shall not delay any work whilst awaiting a response.

Each instruction to execute a Variation, with any requirements for the recording of Costs, shall be issued by the Engineer to the Contractor, who shall acknowledge receipt.

Each Variation shall be evaluated in accordance with Clause 12 [*Measurement and Evaluation*], unless the Engineer instructs or approves otherwise in accordance with this Clause.

13.4

Payment in Applicable Currencies

If the Contract provides for payment of the Contract Price in more than one currency then whenever an adjustment is agreed, approved or determined as stated above, the amount payable in each of the applicable currencies shall be specified. For this purpose, reference shall be made to the actual or expected currency proportions of the Cost of the varied work and to proportions of various currencies specified for payment of the Contract Price.

13.5

Provisional Sums

Each Provisional Sum shall only be used, in whole or in part, in accordance with the Engineer's instructions, and the Contract Price shall be adjusted accordingly. The total sum paid to the Contractor shall include only such amounts, for the work, supplies or services to which the Provisional Sum relates, as the Engineer shall have instructed. For each Provisional Sum, the Engineer may instruct.

- (a) work to be executed (including Plant, Materials or services to be supplied) by the Contractor and valued under Sub-Clause 13.3 [*Variation Procedure*]; and /or
- (b) Plant, Materials or services to be purchased by the Contractor, from a nominated Subcontractor (as defined in Clause 5 [*Nominated Subcontractors*]) or otherwise; and for which there shall be included in the Contract Price:

- (i) the actual amounts paid (or due to be paid) by the Contractor, and
- (ii) a sum for overhead charges and profit, calculated as a percentage of these actual amounts by applying the relevant percentage rate (if any) stated in the appropriate Schedule. If there is no such rate, the percentage rate stated in the Appendix to Tender shall be applied.

The Contractor shall, when required by the Engineer, produce quotations, invoices, vouchers and accounts or receipts in substantiation.

13.6

Daywork

For work of a minor or incidental nature, the Employer may instruct that a Variation shall be executed on a daywork basis. The work shall then be valued in accordance with the Daywork Schedule included in the Contract, and the following procedure shall apply. If a Daywork Schedule is not included in the Contract, this Sub-Clause not apply.

Before ordering Goods for the work, the Contractor shall submit quotations to the Engineer. When applying for payment, the Contractor shall submit invoices, vouchers and accounts or receipts for any Goods.

Except for any items for which the Daywork Schedule specifies that payment is not due, the Contractor shall deliver each day to the Engineer accurate statements in duplicate which shall include the following details of the resources used in executing the previous day's work:

- (a) the names, occupations and time of Contractor's Personnel,
- (b) the identification, type and time of Contractor's Equipment and Temporary Works, and
- (c) the quantities and types of Plant and Materials used.

One copy of each statement will, if correct, or when agreed, be signed by the Engineer and returned to the Contractor. The Contractor shall then submit priced statements of these resources to the Engineer, prior to their inclusion in the next Statement under Sub-Clause 14.3 [*Application for Interim Payment Certificate*].

13.7

**Adjustments for
Changes in Legislation**

The Contract Price shall be adjusted to take account of any increase or decrease in Cost resulting from a change in the Laws of the Country (including the introduction of new Laws and the repeal or modification of existing Laws) or in the judicial or official governmental interpretation of such Laws, made after the Base Date, which affect the Contractor in the performance of obligations under the Contract.

13.8

**Adjustments for
Changes in Cost**

In this Sub-Clause, “table of adjustment data” means the completed table of adjustment data included in the Appendix to Tender. If there is no such table of adjustment data, the Sub-Clause shall not apply.

If this Sub-Clause applies, the amounts payable to the Contractor shall be adjusted for rises or falls in the cost of labour, Goods and other inputs to the Works, by the addition or deduction of the amounts determined by the formulae prescribed in this Sub-Clause. To the extent that full compensation for any rise or fall in Costs is not covered by the provisions of this or other Clauses, the Accepted Contract Amount shall be deemed to have included amounts to cover the contingency of other rises and falls in costs.

The adjustment to be applied to the amount otherwise payable to the Contractor, as valued in accordance with the appropriate Schedule and certified in Payment Certificates, shall be determined from formulae for each of the currencies in which the Contract Price is payable. No adjustment is to be applied to work valued on the basis of Cost or current prices. The formulae shall be of the following general type:

$$P_n = a + b \frac{L_n}{L_o} + c \frac{E_n}{E_o} + d \frac{M_n}{M_o} + \dots$$

where:

“**P_n**” is the adjustment multiplier to be applied to the estimated contract value in the relevant currency of the work carried out in period “**n**”, this period being a month unless otherwise stated in the Appendix to Tender,

“**a**” is a fixed coefficient, stated in the relevant table of adjustment data, representing the non-adjustable portion in contractual payments,

“**b**”, “**c**”, “**d**”, ...are coefficients representing the estimated proportion of each cost element related to the execution of the Works, as stated in the relevant table of adjustment data; such tabulated cost elements may be

indicative of resources such as labour, equipment and materials,

“**Ln**”, “**En**”, “**Mn**”, ... are the base cost indices or reference prices, for period “n”, expressed in the relevant currency of payment, each of which is applicable to the relevant tabulated cost element on the date 49 days prior to the last day of the period (to which the particular Payment Certificate relates), and

“**Lo**”, “**EO**”, “**Mo**”, ... are the base cost indices or reference prices, expressed in the relevant currency of payment, each of which is applicable to the relevant tabulated cost element on the Base Date.

The cost indices or reference prices stated in the table of adjustment data shall be used. If their source is in doubt, it shall be determined by the Engineer. For this purpose, reference shall be made to the values of the indices at stated dates (quoted in the fourth and fifth columns respectively of the table) for the purposes of clarification of the source; although these dates (and thus these values) may not correspond to the base cost indices.

In cases where the “currency of index” (stated in the table) is not the relevant currency of payment, each index shall be converted into the relevant currency of payment at the selling rate, established by the central bank of the Country, of this relevant currency on the above date for which the index is required to be applicable.

Until such time as each current cost index is available, the Engineer shall determine a provisional index for the issue of Interim Payment Certificates. When a current cost index is available, the adjustment shall be recalculated accordingly.

If the Contractor fails to complete the Works within the Time for Completion, adjustment of prices thereafter shall be made using either (i) each index or price applicable on the date 49 days prior to the expiry of the Time for Completion of the Works, or (ii) the current index or price: whichever is more favourable to the Employer.

The weightings (coefficients) for each of the factors of cost stated in the table(s) of adjustment data shall only be adjusted if they have been rendered unreasonable, unbalanced or inapplicable, as a result of Variations.

14. Contract Price and Payment

14.1

The Contract Price

Unless otherwise stated in the Particular Conditions:

- (a) the Contract Price shall be agreed or determined under Sub-Clause 12.3 and be subject to adjustments in accordance with the Contract,
- (b) the Contractor shall pay all taxes, duties and fees required to be paid by him under the Contract, and the Contract Price shall not be adjusted for any of these costs except as stated in Sub-Clause 13.7 [*Adjustments for Changes in Legislation*],
- (c) any quantities which may be set out in the Bill of Quantities or other Schedule are estimated quantities and are not to be taken as the actual and correct quantities:
 - (i) of the Works which the Contractor is required to execute, or
 - (ii) for the purposes of Clause 12 [*Measurement and Evaluation*], and
- (d) the Contractor shall submit to the Engineer, within 28 days after the Commencement Date, a proposed breakdown of each lump sum price in the Schedules. The Engineer may take account of the breakdown when preparing Payment Certificates, but shall not be bound by it.

14.2

Advance Payment

The Employer shall make an advance payment, as an interest-free loan for mobilization, when the Contractor submits a guarantee in accordance with this Sub-Clause. The total advance payment, the number and timing of installments (if more than one), and the applicable currencies and proportions, shall be as stated in the Appendix to Tender.

Unless and until the Employer receives this guarantee, or if the total advance payment is not stated in the Appendix to Tender, the Sub-Clause shall not apply.

The Engineer shall issue an Interim Payment Certificate for the first instalment after receiving a Statement (under Sub-Clause 14.3 [*Application for Interim Payment Certificate*]) and after the Employer receives (i) the Performance Security in accordance

with Sub-Clause 4.2 [*Performance Security*] and (ii) a guarantee in amounts and currencies equal to the advance payment. This guarantee shall be issued by an entity and from with a country (or other jurisdiction) approved by the Employer, and shall be in the form annexed to the Particular Conditions or in another form approved by the Employer.

The Contractor shall ensure that the guarantee is valid and enforceable until the advance payment has been repaid, but its amount may be progressively reduced by the amount repaid by the Contractor as indicated in the Payment Certificates. If the terms of the guarantee specify its expiry date, and the advance payment has not been repaid by the date 28 days prior to the expiry date, the Contractor shall extend the validity of the guarantee until the advance payment has been repaid.

The advance payment shall be repaid through percentage deductions in Payment Certificates. Unless other percentages are stated in the Appendix to Tender.

- (a) deductions shall commence in the Payment Certificate in which the total of all certified interim payments (excluding the advance payment and deductions and repayments of retention) exceeds ten per cent (10%) of the Accepted Contract Amount less Provisional Sums, and
- (b) deductions shall be made at the amortization rate of one quarter (25%) of the amount of each Payment Certificate (excluding the advance payment and deductions and repayments of retention) in the currencies and proportions of the advance payment, until time as the advance payment has been repaid.

If the advance payment has not been repaid prior to the issue of the Taking-Over Certificate for the Works or prior to termination under Clause 15 [*Termination by Employer*], Clause 16 [*Suspension and Termination by Contractor*] or Clause 19 [*Force Majeure*] (as the case may be), the whole of the balance then outstanding shall immediately become due and payable by the Contractor to the Employer.

14.3

Application for Interim Payment Certificates

The Contractor shall submit a Statement in six copies to the Engineer after the end of each month, in a form approved by the Engineer, showing in detail the amounts to when the Contract considers himself to be entitled, together with supporting documents which shall include the report on the

progress during this month in accordance with Sub-Clause 4.21 [*Progress Report*].

The Statement shall include the following items, as applicable, which shall be expressed in the various currencies in which the Contract Price is payable, in the sequence listed:

- (a) the estimated contract value of the Works executed and the Contractor's Documents produced up to the end of the month (including Variations but excluding items described in sub-paragraphs (b) to (g) below);
- (b) any amounts to be added and deducted for changes in legislation and changes in cost, in accordance with Sub-Clause 13.7 [*Adjustments for Changes in Legislation*] and Sub-Clause 13.8 [*Adjustments for Changes in Cost*];
- (c) any amount to be deducted for retention, calculated by applying the percentage of retention stated in the Appendix to Tender to the total of the above amounts, until the amount so retained by the Employer reaches the limit of Retention Money (if any) stated in the Appendix to Tender;
- (d) any amounts to be added and deducted for the advance payment and repayments in accordance with Sub-Clause 14.2 [*Advance Payment*];
- (e) any amounts to be added and deducted for Plant and Materials in accordance with Sub-Clause 14.5 [*Plant and Materials intended for the Works*];
- (f) any other additions or deductions which may have become due under the Contract or otherwise, including those under Clause 20 [*Claims, Disputes and Arbitration*]; and
- (g) the deduction of amounts certified in all previous Payment Certificate.

14.4
Schedule of Payments

If the Contract includes a schedule of payments specifying the installments in which the Contract Price will be paid, then unless otherwise stated in this schedule:

- (a) the installments quoted in this schedule of payment shall be the estimated contract values for the purposes of sub-paragraph (a) of Sub-Clause 14.3 [*Application for Interim Payment Certificates*],

- (b) Sub-Clause 14.5 [Plant and Materials intended for the Works] shall not apply; and
- (c) if these installments are not defined by reference to the actual progress achieved in executing the Works, and if actual progress is found to be less than that on which this schedule of payments was based, then the Engineer may proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine revised installments, which shall take account of the extent to which progress is less than that on which the installments were previously based.

If the Contract does not include a schedule of payments, the Contractor shall submit non-binding estimates of the payments which he expects to become due during each quarterly period. The first estimate shall be submitted within 42 days after the Commencement Date. Revised estimates shall be submitted at quarterly intervals, until the Taking-Over Certificate has been issued for the Works.

14.5

Plant and Materials intended for the Works

If this Sub-Clause applies, Interim Payment Certificates shall include, under sub-paragraph (e) of Sub-Clause 14.3, (i) an amount for Plant and Materials which have been sent to the Site for incorporation in the Permanent Works, and (ii) a reduction when the contract value of such Plant and Materials is included as part of the Permanent Works under sub-paragraph (a) of Sub-Clause 14.3 [*Application for Interim Payment Certificates*].

If the lists referred to in sub-paragraphs (b) (i) or (c) (i) below are not included in the Appendix to Tender, this Sub-Clause shall not apply.

The Engineer shall determine and certify each addition if the following conditions are satisfied:

- (a) the Contractor has:
 - (i) kept satisfactory records (including the orders, receipts, Costs and use of Plant and Materials) which are available for inspection, and
 - (ii) submitted a statement of the Cost of acquiring and delivering the Plant and Materials to the Site, supported by satisfactory evidence.

and either:

- (b) then relevant Plant and Materials:
 - (i) are those listed in the Appendix to Tender for payment when shipped,
 - (ii) have been shipped to the Country, en route to the Site, in accordance with the Contract; and
 - (iii) are described in a clean shipped bill of lading or other evidence of shipment, which has been submitted to the Engineer together with evidence of payment of freight and insurance, any other documents reasonably required, and a bank guarantee in a form and issued by an entity approved by the Employer in amounts and currencies equal to the amount due under this Sub-Clause: this guarantee may be in a similar form to the form referred to in Sub-Clause 14.2 [Advance Payment] and shall be valid until the Plant and Materials are properly stored on Site and protected against loss, damage or deterioration;
or
- (c) the relevant Plant and Materials
 - (i) are those listed in the Appendix to Tender for payment when delivered to the Site, and
 - (ii) have been delivered to and are properly stored on the Site, are protected against loss, damage or deterioration, and appear to be in accordance with the Contract.

The additional amount to be certified shall be the equivalent of eighty percent of the Engineer's determination of the cost of the Plant and Materials (including delivery to Site), taking account of the documents mentioned in this Sub-Clause and of the contract value of the Plant and Materials.

The currencies for this additional amount shall be the same as those in which payment will become due when the contract value of included under sub-paragraph (a) of Sub-Clause 14.3 [*Application for Interim Payment Certificates*]. At that time, the Payment Certificates shall include the applicable reduction which shall be equivalent to, and in the same currencies and proportions as, this additional amount for the relevant Plant and Materials.

14.6

Issue of Interim Payment Certificates

No amount will be certified or paid until the Employer has received and approved the Performance Security. Thereafter, the Engineer shall, within 28 days after receiving a Statement and supporting documents, issue to the Employer an Interim Payment Certificate which shall state the amount which the Engineer fairly determines to be due, with supporting particulars.

However, prior to issuing the Taking-Over Certificate for the Works, the Engineer shall not be bound to issue an Interim Payment Certificate in an amount which would (after retention and other deductions) be less than the minimum amount of Interim Payment Certificates (if any) stated in the Appendix to Tender. In this event, the Engineer shall give notice to the contractor accordingly.

An Interim Payment Certificate shall not be withheld for any other reason, although:

- (a) if anything supplied or work done by the Contractor is not in accordance with the Contract, the cost of rectification or replacement may be withheld until rectification or replacement has been completed, and /or
- (b) if the Contractor was or is failing to perform any work or obligation in accordance with the Contract, and had been so notified by the Engineer, the value of this work or obligation may be withheld until the work or obligation has been performed.

The Employer may in any Payment Certificates make any correction or modification that should properly be made to any previous Payment Certificate. A Payment Certificate shall not be deemed to indicate the Engineer's acceptance, approval, consent or satisfaction.

14.7

Payment

The Employer shall pay to the Contractor:

- (a) the first instalment of the advance payment within 42 days after issuing the

Letter of Acceptance or within 21 days after receiving the documents in accordance with Sub-Clause 4.2 [Performance Security] and Sub-Clause 14.2 [*Advance Payment*], whichever is later;

- (b) the amount certified in each Interim Payment Certificate

within 56 days after the Engineer receives the Statement and supporting documents; and

- (c) the amount certified in the Final Payment Certificate within 56 days after the Employer receives this Payment Certificate.

Payment of the amount due in each currency shall be made into the bank account, nominated by the Contractor, in the payment country (for this currency) specified in the Contract.

14.8

Delayed Payment

If the Contractor does not receive payment in accordance with Sub-Clause 14.7 [*Payment*], the Contractor shall be entitled to receive financing charges compounded monthly on the amount unpaid during the period of delay. This period shall be deemed to commence on the date for payment specified in Sub-Clause 14.7 [*Payment*], irrespective (in the case of its sub-paragraph (b) of the date on which any Interim Payment Certificate is issued.

Unless otherwise stated in the Particular Conditions, these financing charges shall be calculated at the annual rate of three percentage points above the discount rate of the central bank in the country of the currency of payment, and shall be paid in such currency.

The Contractor shall be entitled to this payment without formal notice or certification, and without prejudice to any other right or remedy.

14.9

Payment of Retention Money

When the Taking-Over Certificate has been issued for the Works, the first half of the Retention Money shall be certified by the Engineer for payment to the Contractor. If a Taking-Over Certificate is issued for a Section or part of the Works, a proportion of the Retention Money shall be certified and paid. This proportion shall be two-fifths (40%) of the proportion calculated by dividing the estimated contract value of the Section or part, by the estimated final Contract Price.

Promptly after the latest of the expiry dates of the Defects Notification Periods, the outstanding balance of the Retention Money shall be certified by the Engineer for payment to the Contractor. If a Taking-Over Certificate was issued for a Section, a proportion of the second half of the Retention Money shall be certified and paid promptly after the expiry date of the Defects Notification Period for the Section. This proportion shall be two-fifths (40% of the proportion calculated by dividing the estimated contract value of the Section by the estimated final Contract Price.

However, if any work remains to be executed under Clause 11 [*Defects*

Liability], the Engineer shall be entitled to withhold certification of the estimated cost of this work until it has been executed.

When calculating these remains to be executed under Clause 11 [*Defects Liability*], the under Sub-Clause 13.7 [*Adjustments for Changes in Legislation*] and Sub-Clause 13.8 [*Adjustments for Changes in Cost*].

14.10

Statement at Completion Within 84 days after receiving the Taking-Over Certificate for the Works, the Contractor shall submit to the Engineer six copies of a Statement at completion with supporting documents, in accordance with Sub-Clause 14.3 [*Application for Interim Payment Certificates*], showing:

- (a) the value of all work done in accordance with the Contract up to the date stated in the Taking-Over Certificate for the Works,
- (b) any further sums which the Contractor considers to be due, and
- (d) an estimate of any other amounts which the Contractor considers will become due to him under the Contract, Estimated amounts shall be shown separately in this Statement at completion.

The Engineer shall then certify in accordance with Sub-Clause 14.6 [*Issue of Interim Payment Certificates*].

14.11

Application for Final Payment Certificate Within 56 days after receiving the Performance Certificate, the Contractor shall submit, to the Engineer, six copies of a draft final statement with supporting documents showing in detail in a form approved by the Engineer.

- (a) the value of all work done in accordance with the Contract, and
- (b) any further sums which the Contractor considers to be due to him under the Contract or otherwise.

If the Engineer disagrees with or cannot verify any part of the draft final statement, the Contractor shall submit such further information as the Engineer may reasonably require and shall make such changes in the draft as may be agreed between them. The Contractor shall then prepare and submit to the Engineer the final statement as agreed. This agreed statement is referred to in these Conditions as the “Final Statement”.

However if, following discussions between the Engineer and the Contractor and any changes to the draft final statement which are agreed, it becomes evident that a dispute exists, the Engineer shall deliver to the Employer (with a copy to the Contractor) and Interim Payment Certificate for the agreed parts of the draft final statement. Thereafter, if the dispute is finally resolved under Sub-Clause 20.4 [*Obtaining Dispute Adjudication Board's Decision*] or Sub-Clause 20.5 [*Amicable Settlement*], the Contractor shall then prepare and submit to the Employer (with a copy to the Employer) a Final Statement.

14.12

Discharge

When submitting the Final Statement, the Contractor shall submit a written discharge which confirms that the total of the Final Statement represents full and final settlement of all moneys due to the Contractor under or in connection with the Contract. This discharge may state that it becomes effective when the Contractor has received the Performance Security and the outstanding balance of this total, in which event the discharge shall be effective on such date.

14.13

Issue of Final Payment Certificate

Within 28 days after receiving the Final Statement and written discharge in accordance with Sub-Clause 14.11 [*Application for Final Payment Certificate*] and Sub-Clause 14.12 [*Discharge*], the Engineer shall issue, to the Employer, the Final Payment Certificate which shall state:

- (a) the amount which is finally due, and
- (b) after giving credit to the Employer for all amounts previously paid by the Employer and for all sums to which the Employer is entitled, the balance (if any) due from the Employer to the Contractor or from the Contractor to the Employer, as the case may be.

If the Contractor has not applied for a Final Payment Certificate in accordance with Sub-Clause 14.11 [*Application for Final Payment Certificate*] and Sub-Clause 14.12 [*Discharge*], the Engineer shall request the Contractor to do so. If the Contractor fails to submit an application within a period of 28 days, the Engineer shall issue the Final Payment Certificate for such amount as he fairly determines to be due.

14.14

Cessation of Employer's Liability

The Employer shall not be liable to the Contractor for any matter or thing under or in connection with the Contract or

execution of the Works, except to the extent that the Contractor shall have included an amount expressly for it:

- (a) in the Final Statement and also
- (b) (except for matters or things arising after the issue of the Taking-Over Certificate for the Works) in the Statement at completion described in Sub-Clause 14.10 [*Statement at Completion*].

However, this Sub-Clause shall not limit the Employer's liability under his indemnification obligations, or the Employer's liability in any case of fraud, deliberate default or reckless misconduct by the Employer.

14.15

Currencies of Payment

The Contract Price shall be paid in the currency or currencies name in the Appendix to Tender. Unless otherwise stated in the Particular Conditions, if more than one currency is so named, payments shall be made as follows:

- (a) if the Accepted Contract Amount was expressed in Local Currency only:
 - (i) the proportions or amounts of the Local and Foreign Currencies, and the fixed rates of exchange to be used for calculating the payments, shall be as stated in the Appendix to Tender, except as otherwise agreed by both Parties.
 - (ii) payments and deduction under Sub-Clause 13.5 [*Provisional Sums*] and Sub-Clause 13.7 [*Adjustments for Changes in Legislation*] shall be made in the applicable currencies and proportion; and
 - (ii) other payments and deductions under sub-paragraphs (a) to (b) of Sub-Clause 14.3 [*Application for Interim Payment Certificates*] shall be made in the currencies and proportions specified in sub-paragraph (a)(i) above;
- (b) Payment of the damages specified in the Appendix to Tender Shall be made in the currencies and proportions specified in the Appendix to Tender;
- (c) Other payments to the Employer by the Contractor shall be made in the currency in which the sum was expended by the Employer, or in such currency as may be agreed

by both Parties;

- (d) If any amount payable by the Contractor to the Employer in a particular currency exceeds the sum payable by the Employer to the Contractor in that currency, the Employer may recover the balance of this amount from the sums otherwise payable to the Contractor in other currencies; and
 - (e) If no rates of exchange are stated in the Appendix to Tender, they shall be those prevailing on the Base Date and determined by the central bank of the Country.
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15. Termination by Employer

15.1

Notice to Contract

If the Contractor fails to carry out any obligation under the Contract, the Engineer may by notice require the Contractor to make good the failure and to remedy it within a specified reasonable time.

15.2

Termination by Employer

The Employer shall be entitled to terminate the Contract if the Contractor:

- (a) fails to comply with Sub-Clause 4.2 [*Performance Security*] or with a notice under Sub-Clause 15.1 [*Notice to Correct*],
- (b) Abandons the Works or otherwise plainly demonstrates the intention not to continue performance of his obligations under the Contract.
- (c) Without reasonable excuse fails:
 - (i) to proceed with the Works in accordance with clause 8 [*Commencement, Delays and Suspension*], or
 - (ii) to comply with a notice issued under Sub-Clause 7.5 [*Rejection*] or Sub-Clause 7.6 [*Remedial Work*], within 28 days after receiving it,
- (d) subcontracts the whole of the Works or assigns the Contract without the required agreement,

Part II - Agreement and General Conditions of Contract

- (e) becomes bankrupt or insolvent, goes into liquidation, has a receiving or administration order made against him, compounds with his creditors, or carries on business under a receiver, trustee or manager for the benefit of his creditors, or if any act is done or event occurs which (under applicable Laws) has a similar effect to any of these acts or events, or
- (f) gives or offers to give (directly or indirectly) to any person any bribe, gift, gratuity, commission or other thing of value, as an inducement or reward:
 - (i) for doing or forbearing to do any action in relation to the Contract, or
 - (ii) for showing or forbearing to show favour or disfavor to any person in relation to the Contract,

or if any of the Contractor's Personnel, agents or Subcontractors gives or offers to give (directly or indirectly) to any person any such inducement or reward as is described in this sub-paragraph (f). However, lawful inducements and rewards to Contractor's Personnel shall not entitle termination.

In any of these events or circumstances, the Employer may, upon giving 14 days' notice to the Contractor, terminate the Contract and expel the Contractor from the terminate the Contract immediately.

The Employer's election to terminate the Contract shall not prejudice any other rights of the Employer, under the Contract or otherwise.

The Contractor shall then leave the Site and deliver any required Goods, all Contractors' Documents, and other design documents made by or for him, to the Engineer. However, the Contractor shall use his best efforts to comply immediately with any reasonable instructions included in the notice (i) for assignment of any subcontract, and (ii) for the protection of life or property or for the safety of the Works.

After terminate, the Employer may complete the Works and /or arrange for any other entities may then use any Goods, Contractor's and other design documents made by or on behalf of the Contractor.

Part II - Agreement and General Conditions of Contract

The Employer shall then give notice that the Contractor's Equipment and Temporary Works will be released to the Contractor at or near the Site. The Contractor shall promptly arrange their removal, at the risk and cost of the Contractor. However, if by this time the Contractor has failed to make a payment due to the Employer, these items may be sold by the Employer in order to recover this payment. Any balance of the proceeds shall then be paid to the Contractor.

15.3

Valuation at Date of Termination

As soon as practicable after a notice of termination under Sub-Clause 15.2 [*Termination by Employer*] has taken effect, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determination*] to agree or determine the value of the works,

Goods and Contractor's Documents, and any other sums due to the Contractor for work executed in accordance with the Contract.

15.4

Payment after Termination

After a notice of termination under Sub-Clause 15.2 [*Termination by Employer*] may:

- (a) proceed in accordance with Sub-Clause 2.5 [*Employer's Claims*],
- (b) withhold further payments to the Contractor until the costs of execution, completion and remedying of any defects, damages for delay in completion (if any), and all other costs incurred by the Employer, have been established, and/or
- (c) recover from the Contractor any losses and damages incurred by the Employer and any extra costs of completing the Works, after allowing for any sum due to the Contractor under Sub-Clause 15.3 [*Valuation at Date of Termination*]. After recovering any such losses, damages and extra costs, the Employer shall pay any balance to the Contractor.

15.5

Employer's Entitlement to Termination

The Employer shall be entitled to terminate the Contract, at any time for the Employer's convenience, by giving notice of such termination to the Contractor. The termination shall take effect 28 days after the later of the dates on which the Contractor receives this notice or the Employer returns the Performance Security. The Employer shall not terminate the Contract under this Sub-Clause in order to execute the works himself or

to arrange for the Works to be executed by another contractor.

After this termination, the Contractor shall proceed in accordance with Sub-Clause 156.3 [*Cessation of Work and Removal of Contractor's Equipment*] and shall be paid in accordance with Sub-Clause 19.6 [*Optional Termination, Payment and Release*].

16. Suspension and Termination by Contractor

16.1

Contractor's Entitlement to Suspend Works

If the Engineer fails to certify in accordance with Sub-Clause 14.6 [*Issue of Interim Payment Certificates*] or the Employer fails to comply with Sub-Clause 2.4 [*Employer's Financial Arrangements*] or Sub-Clause 14.7 [*Payment*], the Contractor may, after giving not less than 21 days' notice to the Employer, suspend work (or reduce the rate of work) unless and until the Contractor has received the Payment Certificate, reasonable evidence or payment, as the case may be and as described in the notice.

The Contractor's action shall not prejudice his entitlements to financing charges under Sub-Clause 14.8 [Delayed Payment] and to termination under Sub-clause 16.2 [Termination by Contractor].

If the Contractor subsequently receives such Payment Certificate, evidence or payment (as described in the relevant Sub-Clause and in the above notice) before giving a notice of termination, the Contractor shall resume normal working as soon as is reasonably practicable.

If the Contractor suffers delay and /or incurs Cost as a result of suspending work (or reducing the rate of work) in accordance with this Sub-Clause, the Contractor shall give notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [Contractor's Claims] to:

- (a) an extension of time for any such delay, if completion is or will be delayed under Sub-Clause 8.4 [Extension of Time for Completion], and*
- (b) payment of any such Cost plus reasonable profit, which shall be included in the Contract Price.*

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine these matters.

16.2

Termination by Contractor

The Contractor shall be entitled to terminate the Contract if:

- (a) the Contractor does not receive the reasonable evidence within 42 days after giving notice under Sub-Clause 16.1 [*Contractor's Entitlement to Suspend Work*] in respect of a failure to comply with Sub-Clause 2.4 [*Employer's Financial Arrangements*],
- (b) the Engineer fails, within 56 days after receiving a Statement and supporting documents, to issue the relevant Payment Certificate,
- (c) the Contractor does not receive the amount due under Interim Payment Certificate within 42 days after the expiry of the time stated in Sub-Clause 14.7 [Payment] within which payment is to be made (except for deductions in accordance with Sub-Clause 2.5 [Employer's Claims],
- (d) the Employer substantially fails to perform his obligations under the Contract,
- (e) the Employer fails to comply with Sub-Clause 1.6 [Contract Agreement] or Sub-Clause 1.7 [Assignment].
- (f) prolonged suspension affects the whole of the Works as described in Sub-Clause 8.11 [Prolonged Suspension], or
- (g) the Employer becomes bankrupt or insolvent, goes into liquidation, has a receiving or administration order made against him, compounds with his creditors, or carries on business under a receiver, trustee or manager for the benefit of his creditors, or if any act is done or event occurs which (under applicable Laws) has a similar effect to any of these acts or events.

In any of these events or circumstances, the Contractor may, upon giving 14 days' notice to the Employer, terminate the Contract. However, in the case of subparagraph (f) or (g), the Contractor may be notice terminate the Contract immediately.

The Contractor's election to terminate the Contract shall not prejudice any other rights of the Contractor, under the Contract or otherwise.

16.3

Cessation Work and Contractor's Equipment

After a notice of termination under Sub-Clause 15.5 [*Employer's Removal of Entitlement to Termination*], Sub-Clause 16.2 [*Termination by Contractor*] or Sub-Clause 19.6 [*Optional Termination, Payment and Release*] has taken effect, the Contractor shall promptly.

- (a) cease all further work, except for such work as may have been instructed by the Engineer for the protection of life or property or for the safety of the Works,
- (b) hand over Contractor's Documents, Plant, Materials and other work, for which the Contractor has received payment, and
- (c) remove all other Goods from the Site, except as necessary for safety, and leave the Site.

16.4

Payment on Termination

After a notice of termination under Sub-Clause 16.2 [*Termination by Contractor*] has taken effect, the Employer shall promptly:

- (a) return the Performance Security to the Contractor,
 - (b) pay the Contractor in accordance with Sub-Clause 19.6 [Optional Termination, Payment and Release], and
 - (c) pay to the Contractor the amount of any loss of profit or other loss or damage sustained by the Contractor as a result of this termination.
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17. Risk and Responsibility

17.1

Indemnities

The Contractor shall indemnify and hold harmless the Employer, the Employer's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of:

- (a) bodily injury, sickness, disease or death, of any person whatsoever arising out of or in the course of or by reason of the Contractor's design (if any), the execution and completion of the Works and the remedying of any defects, unless attributable to any negligence, willful act or breach of the Contract by the Employer, the Employer's Personnel, or any of their respective agents, and
- (b) damage to or loss of any property, real or personal (other than the Works), to the extent that such damage or loss:
 - (i) arises out of or in the course of or by reason of the Contractor's design (if any), the execution and completion of the Works and the remedying of any defects, and
 - (ii) is attributable to any negligence, willful act or breach of the Contract by the Contractor, the Contractor's Personnel, their respective agents, or anyone

directly or indirectly employed by any of them.

The Employer shall indemnify and hold harmless the Contractor, the Contractor's Personnel, and their respective agents, against and from all claims, damages, losses and expenses (including legal fees and expenses) in respect of (1) bodily injury, sickness, disease or death, which is attributable to any negligence, willful act or breach of the Contract by the Employer, the

Employer's Personnel, or any of their respective agents, and (2) the matters for which liability may be excluded from insurance cover, as described in sub-paragraphs (d)(i), (ii) and (iii) of Sub-Clause 18.3 [*Insurance Against Injury to Persons and Damage to Property*].

17.2

Contractor's Care of the Works

The Contractor shall take full responsibility for the care of the Works and Goods from the Commencement Date until the until the Taking Over Certificate is issued (or is deemed to be issued under Sub-Clause 10.1 [*Taking-Over of Works and Sections*]) for the Works, when responsibility for the care of the Works shall pass to the Employer. If a Taking-Over Certificate is issued (or is so deemed to be issued) for any Section or part of the Works, responsibility for the care of the Section or part shall the pass to the Employer.

After responsibility has accordingly passed to the Employer, the Contractor shall take responsibility for the care of any work which is outstanding on the date stated in a Taking-Over Certificate, until this outstanding work has been completed.

If any loss or damage happens to the Works, Goods or Contractor's Documents during the period when the Contractor is responsible for their care, from any cause not listed in Sub- Clause 17.3 [*Employer's Risks*], The Contractor shall rectify the loss or damage at the Contractor's risk and cost, so that the Works, Goods and Contractor's Documents conform with the Contract.

The Contractor shall be liable for any loss or damage caused by any actions performed by the Contractor after a Taking-Over Certificate has been issued. The Contractor shall also be liable for any loss or damage which occurs after a Taking-Over Certificate has been issued and which arose from a previous event for which the Contractor was liable.

17.3

Employer's Risks

The risks referred to in Sub-Clause 17.4 below are:

- (a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies,
- (b) Rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war, within the Country,
- (c) Riot, commotion or disorder within the Country by persons other than the Contractor's Personnel and other employees of the Contractor and Subcontractors,
- (d) Munitions of war, explosive materials, ionizing radiation or contamination by radio-activity, within the Country, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity,
- (e) Pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds,
- (f) Use or occupation by the Employer of any part of the Permanent Works, except as may be specified in the Contract,
- (g) Design of any part of the Works by the Employer's Personnel or by others for whom the Employer is responsible, and
- (h) Any operation of the forces of nature which is Unforeseeable or against which an experienced contractor could not reasonably have been expected to have taken adequate preventative precautions.

17.4

Consequences of Employer's Risk

If and to the extent that any of the risks listed in Sub-Clause 17.3 above results in loss or damage to the Works, Goods or Contractor's Documents, the Contractor shall promptly give notice to the Engineer and shall rectify this loss or damage to the extent required by the Engineer.

If the Contractor suffers delay and /or incurs Cost from rectifying this loss or damage the Contractor shall give

a further notice to the Engineer and shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) an extension of time for any such delay, if completion is or will be delayed under Sub-Clause 8.4 [*Extension of Time for Completion*], and
- (b) payment of any such Cost, which shall be included in the Contract Price. In the case of sub-paragraphs (f) and (g) of Sub-Clause 17.3 [*Employer's Risks*], reasonable profit on the Cost shall also be included.

After receiving this further notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.

17.5

**Intellectual and Industrial
Property Rights**

In this Sub-Clause, “infringement” means and infringement (or alleged infringement) of any patent, registered design, copyright, trade mark, trade name, trade secret or other intellectual or industrial property right relating to the Works; and “claim” means a claim (or proceedings pursuing a claim) alleging an infringement.

Whenever a Party does not give notice to the other Party of any claim within 28 days of receiving the claim, the first Party shall be deemed to have waived any right to indemnity under this Sub-Clause.

The Employer shall indemnify and hold the Contractor harmless against and from any claim alleging an infringement which is or was:

- (a) an unavoidable result of the Contractor's compliance with the Contract, or
- (b) a result of any Works being used by the Employer:
 - (i) for a purpose other than indicated by, or reasonably to be inferred from, the Contract, or
 - (ii) in conjunction with anything not supplied

by the Contractor, unless such use was disclosed to the Contractor prior to the Base Date or is stated in the Contract.

The Contractor shall indemnify and hold the Employer harmless against and from any other claim which arises out of or in relation to (i) the manufacture, use, sale or import of any Goods, or (ii) any design for which the Contractor is responsible.

If a Party is entitled to be indemnified under this Sub-Clause, the indemnifying Party may (at its cost) conduct negotiations for the settlement of the claim, and any litigation or arbitration which may arise from it. The other Party shall, at the request and cost of the indemnifying Party, assist in contesting the claim. This other Party (and its Personnel) shall not make any admission which might be prejudicial to the indemnifying Party, unless the indemnifying Party failed to take over the conduct of any negotiations, litigation or arbitration upon being requested to do so by such other Party.

17.6

Limitation of Liability

Neither Party shall be liable to the other Party for loss of use of any Works, loss of profit, loss of any contract or for any indirect or consequential loss or damage which may be suffered by the other Party in connection with the Contract, other than under Sub-Clause 16.4 [*Payment on Termination*] and Sub-Clause 17.1 [*Indemnities*].

The total liability of the Contractor to the Employer, under or in connection with the Contract other than under Sub-Clause 4.19 [*Electricity, Water and Gas*], Sub-Clause 4.20 [*Employer's Equipment and Free-Issue Material*], Sub-Clause 17.1 [*Indemnities*] and Sub-Clause 17.5 [*Intellectual and Industrial Property Rights*], shall not exceed the sum stated in the Particular Conditions of (if a sum is not so stated) the Accepted Contract Amount.

This Sub-Clause shall not limit liability in any case of fraud, deliberate default or reckless misconduct by the defaulting Party.

18. Insurance

18.1

**General Requirements
for Insurances**

In this Clause, “insuring Party” means, for each type of insurance, the Party responsible for effecting and maintaining the insurance specified in the relevant Sub-Clause.

Whenever the Contractor is the insuring Party, each insurance shall be effected with insures and in terms approved by the Employer. These terms shall be consistent with any terms agreed by both Parties before the date of the Letter of Acceptance. This agreement of terms shall take precedence over the provisions of this Clause.

Whenever the Employer is the insuring Party, each insurance shall be effected with insures and in terms consistent with the details annexed to the Particular Conditions.

If a policy is required to indemnify joint insured, the cover shall apply separately to each insured as though a separate policy had been issued for each of the joint insured. If a policy indemnifies additional joint insured, namely in addition to the insured specified in this Clause, (i) the Contractor shall act under the policy on behalf of these additional joint insured except that the Employer shall act for Employer’s Personnel, (ii) additional joint insured shall not be entitled to receive payments directly from the insurer or to have any other direct dealings with the insurer, and (iii) the insuring Party shall require all additional joint insured to comply with the conditions stipulated in the policy.

Each policy insuring against loss or damage shall provide for payments to be made in the currencies required to rectify the loss or damage. Payments received from insurers shall be used for the rectification of the loss or damage.

The relevant insuring Party shall, within the respective periods stated in the Appendix to Tender (calculated from the Commencement Date), submit to the other Party:

- (a) evidence that the insurances described in this Clause have been effected, and
- (b) copies of the policies for the insurances described in Sub-Clause 18.2 [insurance for Works and Contractor’s Equipment] and Sub-

Clause 18.3 [*Insurance against injury to Persons and Damage to Property*].

When each premium is paid, insuring Party shall submit evidence of payment to the other Party. Whenever evidence or policies are submitted, the insuring Party shall also give notice to the Engineer.

Each Party shall comply with the conditions stipulated in each of the insurance policies. The insuring Party shall keep the insurers informed of any relevant changes to the execution of the Works and ensure that insurance is maintained in accordance with this Clause.

Neither Party shall make any material alteration to the terms of the insurance without the prior approval of the other Party. If an insurer makes (or attempts to make) any alteration, the Party first notified by the insurer shall promptly give notice to the other Party.

If the insuring Party fails to effect and keep in force any of the insurances it is required to effect and maintain under the Contract, or fails to provide satisfactory evidence and copies of policies in accordance with this Sub-Clause, the other Party may (at its option and without prejudice to any other right or remedy) effect insurance for the relevant coverage and pay the premiums due. The insuring Party shall pay the amount of these premiums to the other Party, and the Contract Price shall be adjusted accordingly.

Nothing in this Clause limits the obligations, liabilities or responsibilities of the amounts or the Employer, under the other terms of the Contract or otherwise. Any amounts not insured or not recovered from the insures shall be borne by the Contractor and /or the Employer in accordance with these obligations, liabilities or responsibilities. However, if the insuring Party fails to effect and keep in force an insurance which is available and which it is required to effect and maintain under the Contract, and the other Party neither approves the omission nor effects insurance for the coverage relevant to this default, any moneys which should have been recoverable under this insurance shall be paid by the insuring Party.

Payments by one Party to the other Party shall be subject to Sub-Clause 2.5 [*Employer's Claims*] or Sub-Clause 20.1 [*Contractor's Claims*], as applicable.

18.2

Insurance for Works and Contractor's Equipment

The insuring Party shall insure the Works, Plant, Materials and Contractor's Documents for not less than the full reinstatement cost including the costs of demolition, removal of debris and professional fees and profit. This insurance shall be effective from the date by which the evidence is to be submitted under sub-paragraph (a) of Sub-Clause 18.1 [*General Requirements for Insurances*], until the date of issue of the Taking-Over Certificate for the Works.

The insuring Party shall maintain this insurance to provide cover until the date of issue of the Performance Certificate, for loss or damage for which the Contractor is liable arising from a cause occurring prior to the issue of the Taking-Over Certificate, and for loss or damage caused by the Contractor in the course of any other operations (including those under Clause 11 [*Defects Liability*]).

The insuring Party shall insure the Contractor's Equipment for not less than the full replacement value, including delivery to Site. For each item of Contractor's Equipment, the insurance shall be effective while it is being transported to the Site and until it is no longer required as Contractor's Equipment.

Unless otherwise stated in the Particular conditions, insurances under this Sub-Clause:

- (a) shall be effected and maintained by the Contractor as insuring Party,
- (b) shall be in the joint names of the Parties, who shall be jointly entitled to receive payments from the insurers, payments being held or allocated between the Parties for the sole purpose of rectifying the loss or damage,
- (c) shall cover all loss and damage from any cause not listed in Sub-Clause 17.3 [*Employer's Risks*],
- (d) shall also cover loss or damage to a part of the Works which is attributable to the use or occupation by the Employer of another part of the Works, and loss or damage from the risks listed in sub-paragraph (c), (g) and (h) of Sub-Clause 17.3 [*Employer's Risks*], excluding (in each case) risks which are not insurable at

commercially reasonable terms, with deductibles per occurrence of not more than the amount stated in the Appendix to Tender (if a amount is not so stated, this sub-paragraph (d) shall not apply), and

- (e) may however exclude loss of, damage to, and reinstatement of:
 - (i) a part of the Works which is in a defective condition due to a defect in its design, materials or workmanship (but cover shall include any other parts which are lost or damaged as a direct result of this defective condition and not as described in sub-paragraph (ii) below),
 - (ii) a part of the Works which is lost or damaged in order to reinstate any other part of the Works if this other part is in a defective condition due to a defect in its design, materials or workmanship,
 - (iii) a part of the Works which has been taken over by the Employer, except to the extent that the Contractor is liable for the loss or damage, and
 - (iv) Goods while they are not in the Country, subject to Sub-Clause 14.5 [*Plant and Materials interned for the Works*].

If, more than one year after the Base Date, the cover described in sub-paragraph (d) above ceases to be available at commercially reasonable terms, the Contractor shall (as insuring Party) give notice to the Employer, with supporting particulars. The Employer shall then (i) be entitled subject to Sub-Clause 2.5 [*Employer's Claims*] to payment of an amount equivalent to such commercially reasonable terms as the Contractor should have expected to have paid for such cover, and (ii) be deemed, unless he obtains the cover at commercially reasonable terms, to have approved the omission under Sub-Clause 18.1 [*General Requirements for Insurances*].

18.3

Insurance against Injury to Persons and Damage

The insuring Party shall insure against each Party's liability for any loss, property damage, death or bodily

to Property

injury which may occur to any physical property (except things insured under Sub-Clause 18.2 [Insurance for Works and Contractor's Equipment]) or to any person (except persons insured under Sub-Clause 18.4 [*Insurance for Contractor's Personnel*]), which may arise out of the Contractor's performance of the Contract and occurring before the issue of the Performance Certificate.

This insurance shall be for a limit per occurrence of not less than the amount stated in the Appendix to Tender, with no limit on the number of occurrences. If an amount is not stated in the Appendix to Tender, this Sub-Clause shall not apply.

Unless otherwise stated in the Particular Conditions, the insurances specified in this Sub-Clause.

- (a) shall be effected and maintained by the Contractor as insuring Party,
- (c) shall be in the joint names of the Parties,
- (c) shall be extended to cover liability for all loss and damage to the Employer's property (except things insured under Sub-Clause 18.2) arising out of the Contractor's performance of the Contract, and
- (d) may however exclude liability to the extent that it arises from:
 - (i) the Employer's right to have the Permanent Works executed on, over, under, in or through any land, and to occupy this land for the Permanent Works,
 - (ii) damage which is an unavoidable result of the Contractor's obligations to execute the Works and remedy any defects, and
 - (iii) a cause listed in Sub-Clause 17.3 [*Employer's Risks*], except to the extent that cover is available at commercially reasonable terms.

18.4

Insurance for

The Contractor shall effect and maintain insurance against

Contractor's Personnel

liability for claims damages, losses and expenses (including legal fees and expenses) arising from injury, sickness, disease or death of any person employed by the Contractor or any other of the Contractor's Personnel.

The Employer and the Engineer shall also be indemnified under the policy of insurance, except that this insurance may exclude losses and claims to the extent that they arise from any act or neglect of the Employer or of the Employer's Personnel.

The insurance shall be maintained in full force and effect during the whole time that these personnel are assisting in the execution of the Works. For a Subcontractor's employees, the insurance may be effected by the Subcontractor, but the Contractor shall be responsible for compliance with this Clause.

19. Force Majeure

19.1

Definition of Force Majeure

In this Clause, "Force Majeure" means an exceptional event or circumstance:

- (a) which is beyond a Party's control,
- (b) which such Party could not reasonably have provided against before entering into the Contract,
- (c) which, having arisen, such Party could not reasonably have avoided or overcome, and
- (d) which is not substantially attributable to the other Party.

Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as conditions (a) to (d) above are satisfied:

- (i) war, hostilities (whether war be declared or not), invasion, act of foreign enemies,
- (ii) rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war,
- (iii) riot, commotion, disorder, strike or lockout by persons other than the Contractor's Personnel and other

employees of the Contract and Subcontractors,

- (v) munitions of war, explosive materials, ionizing radiation or contamination by radio-activity, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity, and
- (vi) natural catastrophes such as earthquake, hurricane, typhoon or volcanic activity.

19.2

Notice of Force Majeure

If a Party is or will be prevented from performing any of its obligations under the Contract by Force Majeure, then it shall give notice to the other Party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented. The notice shall be given within 14 days after the Party became aware, or should have become aware, of the relevant event or circumstance constituting Force Majeure.

The Party shall, having given notice, be excused performance of such obligations for so long as such Force Majeure prevents it from performing them.

Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either Party to make payments to the other Party under the Contract.

19.3

Duty to Minimize Delay

Each Party shall at all times use all reasonable endeavours to minimize any delay in the performance of the Contract as a result of Force Majeure.

A Party shall give notice to the other Party when it ceases to be affected by the Force Majeure.

19.4

Consequences of Force Majeure

If the Contractor is prevented from performing any of his obligation under the Contract by Force Majeure of which notice has been given under Sub-Clause 19.2 [*Notice of Force Majeure*], and suffers delay and /or incurs Cost by reason of such Force Majeure, the Contractor shall be entitled subject to Sub-Clause 20.1 [*Contractor's Claims*] to:

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 [*Extension of Time for Completion*], and
- (b) if the event or circumstance is of the kind described in sub-paragraphs (i) to (iv) of Sub-Clause 19.1 [*Definition of Force Majeure*] and, in the case of sub-paragraphs (ii) to (iv), occurs in the Country, payment of any such Cost.

After receiving this notice, the Engineer shall proceed in accordance with Sub-Clause 3.5 [*Determinations*] to agree or determine these matters.

19.5

Force Majeure Affecting Subcontractor

If the Subcontractor is entitled under any contract or agreement relating to the Works to relief from force majeure on terms additional to or broader than those specified in this Clause, such additional or broader force majeure events or circumstances shall not excuse the Contractor's non-performance or entitle him to relief under this Clause.

19.6

Optional Termination

If the execution of substantially all the Works in progress is prevented for a continuous period of 84 days by reason of Force Majeure of which notice has been given under Sub-Clause 19.2 [*Notice of Force Majeure*], or of multiple periods which total more than 140 days due to the same notified Force Majeure, then either Party may give to the other Party a notice of termination of the Contract. In this event, the termination shall take effect 7 days after the notice is given, and the Contractor shall proceed in accordance with Sub-Clause 16.3 [*Cessation of Work and Removal of Contractor's Equipment*].

Payment and Release

Upon such termination, the Engineer shall determine the Value of work done and issue a Payment Certificate which shall include:

- (a) the amounts payable for any work carried out for which a price is stated in the Contract;
- (b) the Cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the Contractor is liable

to accept delivery: this Plant and Materials shall become the property of (and be at the risk of) the Employer when paid for by the Employer, and the Contractor shall place the same at the Employer's disposal;

- (c) any other Cost or liability which in the circumstances was reasonably incurred by the Contractor in the expectation of completion the Works;
- (d) the Cost of removal of Temporary Works and Contractor's Equipment from the Site and the return of these items to the Contractor's works in his country (or to any other destination at no greater cost); and
- (e) the Cost of repatriation of the Contractors' staff and labour employed wholly in connection with the Works at the date of termination.

19.7

**Release from
Performance
Under the Law**

Notwithstanding any other provision of this Clause, if any event or circumstance outside the control of the Parties (including, but not limited to, Force Majeure) arises which makes it impossible or unlawful for either or both Parties to fulfill its or their contractual obligations or which, under the law governing the Contract, entitles the Parties to be released from further performance of the Contract, then upon notice by either Party to the other Party of such event or circumstances:

- (a) the Parties shall be discharged from further performance, without prejudice to the rights of either Party in respect of any previous breach of the Contract, and
 - (b) the sum payable by the Employer to the Contractor shall be the same as would have been payable under Sub-Clause 19.6 [Optional Termination, Payment and Release] if the Contract had been terminated under Sub-Clause 19.6.
-

20. Claims, Disputes and Arbitration

20.1

Contractor's Claims

If the Contractor considers himself to be entitled to any extension of the Time for Completion and /or any additional payment, under any Clause of these Conditions or otherwise in connection with the Contract, the Contractor shall give notice to the Engineer, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than 28 days after the Contractor became aware, or should have become aware, of the event or circumstance.

If the Contractor fails to give notice of a claim within such period of 28 days, the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Employer shall be discharged from all liability in connection with the claim. Otherwise, the following provisions of this Sub-Clause shall apply.

The Contractor shall also submit any other notices which are required by the Contract, and supporting particulars for the claim, all as relevant to such event or circumstance.

The Contractor shall keep such contemporary records as may be necessary to substantiate any claim, either on the Site or at another location acceptable to the Engineer. Without admitting the Employer's liability, the Engineer may, after receiving any notice under this Sub-Clause, monitor the record-keeping and/or instruct the Contractor to keep further contemporary records. The Contractor shall permit the Engineer to inspect all these records, and shall (if instructed) submit copies to the Engineer.

Within 42 days after the Contractor became aware (or should have become aware) of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Contractor and approved by the Engineer, the Contractor shall send to the Engineer a fully detailed claim which includes full supporting particulars of the basis of the claim and of the extension of time and/or additional payment claimed. If the event or circumstance giving rise to the claim has a continuing effect:

- (a) this fully detailed claim shall be considered as interim;

- (b) the Contractor shall send further interim claims at monthly intervals, giving the accumulated delay and/or amount claimed, and such further particulars as the Engineer may reasonably require; and
- (c) the Contractor shall send a final claim within 28 days after the end of the effects resulting from the event or circumstance, or within such other period as may be proposed by the Contractor and approved by the Engineer.

Within 42 days after receiving a claim or any further particulars supporting a previous claim, or within such other period as may be proposed by the Engineer and approved by the Contractor, the Engineer shall respond with approval, or with disapproval and detailed comments. He may also request any necessary further particular, but shall nevertheless give his response on the principles of the claim within such time.

Each Payment Certificate shall include such amounts for any claim as have been reasonably substantiated as due under the relevant provision of the Contract. Unless and until the particulars supplied are sufficient to substantiate the whole of the claim, the Contractor shall only be entitled to payment for such part of the claim as he has been able to substantiate.

The Engineer shall proceed in accordance with Sub-Clause 3.5 [Determinations] to agree or determine (i) the extension (if any) of the Time for Completion (before or after its expiry) in accordance with Sub-Clause 8.4 [Extension of Time for Completion], and/or (ii) the additional payment (if any) to which the Contractor is entitled under the Contract.

The requirements of this Sub-Clause are in addition to those of any other Sub-Clause which may apply to a claim. If the Contractor fails to comply with this or another Sub-Clause in relation to any claim, any extension of time and/or additional payment shall take account of the extent (if any) to which the failure has prevented or prejudiced proper investigation of the claim, unless the claim is excluded under the second paragraph of this Sub-Clause.

20.2

**Appointment of the
with**

Disputes shall be adjudicated by a DAB in accordance

Dispute Adjudication Board

Sub-Clause 20.4 [*Obtaining Dispute Adjudication Board's Decision*]. The Parties shall jointly appoint a DAB by the date stated in the Appendix to Tender. The DAB shall comprise, as stated in the Appendix to Tender, either one or three suitably qualified persons ("the members"). If the number is not so stated and the Parties do not agree otherwise, the DAB shall comprise three persons.

If the DAB is to comprise three persons, each Party shall nominate one member for the approval of the other Party. The Parties shall consult both these members and shall agree upon the third member, who shall be appointed to act as chairman.

However, if a list of potential members is included in the Contract, the members shall be selected from those on the list, other than anyone who is unable or unwilling to accept appointment to the DAB.

The agreement between the Parties and either the sole member ("adjudicator") or each of the three members shall incorporate by reference the General Conditions of Dispute Adjudication Agreement contained in the Appendix to these General Conditions, with such amendments as are agreed between them.

The terms of the remuneration of either the sole member or each of the three members, including the remuneration of any expert whom the DAB consults, shall be mutually agreed upon by the Parties when agreeing the terms of appointment. Each Party shall be responsible for paying one-half of this remuneration.

If at any time the Parties so agree, they may jointly refer a matter to the DAB for it to give its opinion. Neither Party shall consult the DAB on any matter without the agreement of the other Party.

If at any time the Parties so agree, they may appoint a suitably qualified person or persons to replace (or to be available to replace) any one or more members of the DAB. Unless the Parties agree otherwise, the appointment will come into effect if a member declines to act or is unable to act as a result of death, disability, resignation or termination of appointment.

If any of these circumstances occurs and no such replacement is available, a replacement shall be appointed in the same manner as the replaced person

was required to have been nominated or agreed upon, as described in this Sub-Clause.

The appointment of any member may be terminated by mutual agreement of both Parties, but not by the Employer or the Contractor acting alone. Unless otherwise agreed by both Parties, the appointment of the DAB (including each member) shall expire when the discharge referred to in Sub-Clause 14.12 [*Discharge*] shall have become effective.

20.3

Failure to Agree Dispute Adjudication Board

If any of the following conditions apply, namely:

- (a) the Parties fail to agree upon the appointment of the sole member of the DAB by the date stated in the first paragraph of Sub-Clause 20.2 [*Appointment of the Dispute Adjudication Board*],
- (b) either Party fails to nominate a member (for approval by the other Party) of a DAB of three persons by such date,
- (c) the Parties fail to agree upon the appointment of the third member (to act as chairman) of the DAB such date, or
- (d) the Parties fail to agree upon the appointment of a replacement person within 42 days after the date on which the sole member or one of the three members declines to act or is unable to act as a result of death, disability, resignation or termination of appointment,

then the appointing entity or official named in the Appendix to Tender shall, upon the request of either or both of the Parties and after due consultation with both Parties, appoint this member of the DAB. This appointment shall be final and conclusive. Each Party shall be reasonable for paying one-half of the remuneration of the appointing entity or official.

20.4

Obtaining Dispute Adjudication Board's Decision

If a dispute (or any kind whatsoever) arises between the Parties in connection with, or arising out of, the Contractor the execution of the Works, including any dispute as to any certificate, determination, instruction, opinion or valuation of the Engineer, either Party may

refer the dispute in writing to the DAB for its decision, with copies to the other Party and the Engineer. Such reference shall state that it is given under this Sub-Clause.

For a DAB of three persons, the DAB shall be deemed to have received such reference on the date when it is received by the chairman of the DAB.

Both Parties shall promptly make available to the DAB all such additional information, further access to the Site, and appropriate facilities, as the DAB may require for the purposes of making a decision on such dispute. The DAB shall be deemed to be not acting as arbitrator(s).

Within 84 days after receiving such reference, or within such other period as may be proposed by the DAB and approved by the Parties, the DAB shall give its decision, which shall be reasoned and shall state that it is given under this Sub-Clause. The decision shall be binding on both Parties, who shall promptly give effect to it unless and until it shall be revised in an amicable settlement or an arbitral award as described below. Unless the Contract has already been abandoned, repudiated or terminated, the Contractor shall continue to proceed with the Works in accordance with the Contract.

If either Party is dissatisfied with the DAB's decision, then either Party may, within 28 days after receiving the decision, given notice to the other Party of its dissatisfaction. If the DAB fails to give its decision within the period of 84 days (or as otherwise approved) after receiving such reference, then either Party may, within 28 days after this period has expired, give notice to the other Party of its dissatisfaction.

In either event, this notice of dissatisfaction shall state that it is given under this Sub-Clause, and shall set out the matter in dispute and the reason(s) for dissatisfaction. Except as stated in Sub-Clause 20.7 [Failure to Comply with Dispute Adjudication Board's Decision] and Sub-Clause 20.8 [Expiry of Dispute Adjudication Board's Appointment], neither Party shall be entitled to commence arbitration of a dispute unless a notice of dissatisfaction has been given in accordance with this Sub-Clause.

If the DAB has given its decision as to a matter in dispute to both Parties, and no notice of dissatisfaction has been given by either Party within 28 days after it received the DAB's decision, then the decision shall become final and binding upon both Parties.

20.5

Amicable Settlement

Where notice of dissatisfaction has been given under Sub-Clause 20.4 above, both Parties shall attempt to settle the dispute amicably before the commencement of arbitration. However, unless both Parties agree otherwise, arbitration may be commenced on or after the fifty-sixth day after the day on which notice of dissatisfaction was given, even if no attempt at amicable settlement has been made.

20.6

Arbitration

Unless settled amicably, any dispute in respect of which the DAB's decision (if any) has not become final and binding shall be finally settled by international arbitration. Unless otherwise agreed by both Parties:

- (a) the dispute shall be finally settled under the Rules of Arbitration of the International Chamber of Commerce,
- (b) the dispute shall be settled by three arbitrators appointed in accordance with these Rules, and
- (c) the arbitration shall be conducted in the language for communications defined in Sub-Clause 1.4 [*Law and Language*].

The arbitrator(s) shall have full power to open up, review and revise any certificate determination, instruction, opinion or valuation of the Engineer, and any decision of the DAB, relevant to the dispute. Nothing shall disqualify the Engineer from being called as a witness and giving evidence before the arbitrator(s) on any matter whatsoever relevant to the dispute.

Neither Party shall be limited in the proceedings before the arbitrator(s) to the evidence or arguments previously put before the DAB to obtain its decision, or to the reasons for dissatisfaction given in its notice of dissatisfaction. Any decision of the DAB shall be admissible in evidence in the arbitration.

Arbitration may be commenced prior to or after completion of the Works. The obligations of the Parties, the Engineer and the DAB shall not be altered by reason of any arbitration being conducted during the progress of the Works.

20.7

**Failure to Comply with
Dispute Adjudication
Board's Decision**

In the event that:

- (a) neither Party has given notice of dissatisfaction within the period stated in Sub-Clause 20.4 [*Obtaining Dispute Adjudication Board's Decision*],

- (b) the DAB's related decision (if any) has become final and binding, and
- (c) a Party fails to comply with this decision,

then the other Party may, without prejudice to any other right it may have, refer the failure itself to arbitration under Sub-Clause 20.6 [Arbitration]. Sub-Clause 20/4 [*Obtaining Dispute Adjudication Board's Decision*] and Sub-Clause 20.5 [*Amicable Settlement*] shall not apply to this reference.

20.8

**Expiry of Dispute
Adjudication Board's
Appointment**

If a dispute arises between the Parties in connection with, or arising out of, the Contractor the execution of the Works and there is no DAB in place, whether by reason of the expiry of the DAB's appointment or otherwise.

- (a) Sub-Clause 20.4 [*Obtaining Dispute Adjudication Board's Decision*] and Sub-Clause 20.5 [*Amicable Settlement*] shall not apply, and
 - (b) the dispute may be referred directly to arbitration under Sub-Clause 20.6 [*Arbitration*].
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PART III. SPECIAL CONDITIONS OF CONTRACT

Part III. Special Conditions of Contract

The following Special Conditions of Contract (SCC) shall supplement and/or amend the General Conditions of Contract (GCC). Whenever there is a conflict, the provisions herein shall prevail over those in the GCC.

A. General	
GCC 1.1.2.2	The Employer is: University of Cape Coast
GCC 1.1.2.11	The Funding Agency is: Government of Ghana/World Bank
GCC 1.1.2.4	The Engineer is: FAS CONSULT LIMITED P. O. Box GP 17494, Accra 0302632270 info@fasconsultgh.com
GCC 1.1.3.2	The Start Date shall be: 21 calendar days after site possession
GCC 1.1.3.3	The Intended Completion Date for the whole of the Works shall be 12 calendar months from the date of commencement.
GCC 1.1.6.7	The Site is located at University of Cape Coast, Old Site, Behind UCC Water Production Unit and opposite the sea and is defined in drawing No. A 01
GCC 1.1.5.8	The Works consist of: Construction of Earthworks, Concrete, Masonry, Roofing, Doors/Windows, Plastering, Tiling and other finishes, Mechanical, Electrical and plumbing works and External works.
GCC 1.1.5.6	Sectional Completions [N/A]
GCC 1.3	The Employer's address for the purpose of communications shall be: The Director, Directorate of Physical Development and Estate Management The Contractor's address for the purpose of communications shall be: Antartic Limited P. O. Box 15703, Accra 0302223674
GCC 1.4	The governing law is that of the Republic of Ghana. The ruling language for communication shall be English Language. This Contract shall be executed in the English language.
GCC 1.5	The following documents also form an integral part of this Contract: Bills of Quantities.
GCC 1.6	The Parties shall enter into contract within 42 days after the Contractor receives the Letter of Acceptance.
GCC 1.14	The individuals of firms in a joint venture, consortium or association shall be jointly and severally liable
GCC 2.1	The Site Possession Date(s) shall be: 16th May, 2022
GCC 2.2	Permits, approvals and / or licenses, or public service undertakings to be acquired by the Employer: EPA Permit, Building permit, fire permit etc.
GCC 18. 2, 18.3, 18.4	The minimum insurance amounts and deductibles shall be: i. Contractors All Risks Insurance This means insurance submitted must satisfy and cover the insurances as stated in GCC 18.2, 18.3, and 18.4
GCC 20.2	Appointing Authority for the Adjudicator: Ghana Institution of Surveyors
GCC 20.6	i) <u>For Domestic Contractors</u> The applicable rules to govern any arbitration shall be the Ghana Alternative Dispute Resolution Act, 2010 (ACT 798)
B. Time Control	
	The Contractor shall submit for approval a Programme for the Works within 14 days from

Part III – Special Conditions of Contract

	the date of the contract.
GCC 8.3	The period between Program updates is 30 calendar days.
	The amount to be withheld for late submission of an updated Program is: 2% of the Interim Payment Certificate for the period determined for the preparation of certificates.
	The Contractor shall warn the Engineer copied to the Employer at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of work, increase the Contract Price, or delay the execution of the Works.
C. Quality Control	
GCC 4.2	The Performance Security shall be: 10% of the contract price from a reputable bank or 30% from a reputable Insurance Company acceptable to Employer, denominated in Ghana cedis
GCC 8.7	The liquidated damages for the whole of the Works are: 0.1% of the Contract Price per day.
	The maximum amount of liquidated damages for the whole of the Works is: 5% of the Contract Price.
GCC 11	The Defects Liability Period is: 6 months from the date of Taking-Over of Works by the Employer
D. Cost Control	
GCC 12.3	GCC Clause 12.3(i) is not applicable
GCC 13.4	The currency of the Contract is: Ghanaian Cedis (GH¢)
GCC 13.8	This Contract shall be subject to price adjustment in accordance with GCC Clause 13.8 of the Conditions of contract, and the following information regarding coefficients does apply: <ul style="list-style-type: none"> i. 15% non-adjustable element (coefficient a) ii. 85% adjustable element (coefficient b, c, d, Sources of Cost Indices shall be as published by the Ghana Statistical Service (GSS) <p>If the Contractor fails to complete the Works within the Time for Completion, adjustment for prices thereafter shall be made using (i) each index or price applicable on the date 49 days prior to the expiry of the Time for Completion of the Works, or (ii) the current index price, whichever is more favourable to the Employer.</p>
GCC 14.2	Total Advance Payments shall be: 15% of the Contract Price subject to the provision of advance payment guarantee from a reputable Bank by the contractor.
GCC 14.3	The proportion of payments retained is: 10% of the value of Works at the time of preparation of Payment Certificates. The maximum cumulative payments retained shall be 5% of the final Contract Price
E. Finishing the Contract	
GCC 4.1d	The date by which “as built” Drawings are required is: 1 calendar month from the date of Taking-Over of Works by the Employer
GCC 4.1d	The date by which operating and maintenance manuals are required is: 1 calendar month from the date of Taking-Over of Works by the Employer
GCC 8.7	The maximum number of days for which Liquidated Damages will apply is: 100 Calendar days
GCC 9.4	The percentage to apply to the value of the work not completed, representing the Employer’s additional cost for completing the Works, shall be: 20%
GCC 10.1	The Employer shall take over the site and the Works immediately after the Project Manager’s issues a Certificate of Completion.

PART IV. SPECIFICATIONS

Specifications

1. GENERAL

1.01 The terms “British Standards” (B.S.) and “British Standard Codes of Practice” (B.S.C.P.) shall refer to those documents published or issued by the British Standards Institute.

*Standard and
Standard Codes of
Practice*

All such Standards and Codes of Practice referred to in the Specification or in the Bill of quantities or in any Drawings or instructions forming part of the Contract or issued under the provisions of the Contract shall refer to the current editions including all amendments published up to date.

Materials and work to other Standards and Codes of Practice are admitted, provided that in the opinion of the Engineer, their requirements are not lower than those of B.S. & B.S.C.P., as referred to in the Contract Documents.

1.02 The Contractor’s Plant Yard or Quarries shall be used by the Contractor for his offices, stores, plant, workshops, latrines and messing accommodation; and the erection of temporary buildings or structures on the Site will not be allowed without the permission of the Engineer.

*Contractor’s Plant
Yard*

At the beginning of the contract the plant yard or quarry shall be fenced off. By the end of the Period of Maintenance the area and its environs shall be cleared of all construction equipment, materials, buildings and the like and shall be regarded and reinstated as directed by the Engineer.

1.03 Before entering into any sub-contract for the supply of any materials or goods the Contractor shall obtain the Engineer’s approval in writing of the Sub-contractor from whom he proposes to obtain such materials or goods. Should the Engineer at any time be dissatisfied with such materials or goods or with the method or operations carried out by such Sub-contractor’s work or place of business, the Engineer shall be empowered to cancel his previously given approval of such Sub-contractor.

*Approval of
Suppliers of
Materials and
Goods*

The contractor shall then obtain such said materials or goods from such other supplier as may be approved by the Engineer and shall bear any additional cost thereof.

Part IV – Specifications

1.04 The Contractor and Sub-contractor shall provide the Engineer with copies of all orders, which they may place, for the supply of materials or goods required in connection with the works.

Copies of Orders

1.05 In addition to any special provisions herein for the sampling and testing of materials, the contractor shall submit to the Engineer as he may require, samples of all materials and goods which he proposes to use or employ in or for the Works. Such samples, if approved, will be retained by the Engineer, and no materials or goods of which samples have been submitted shall be used on the Permanent Works unless and until such samples have been approved in writing by the Engineer. Notwithstanding the Engineer's approval as provided for herein the Contractor shall be solely responsible for the quality of all materials and goods supplied.

Samples

The cost of supplying all such samples and of conveying the same to such place of inspection or testing as the Engineer may designate within the country of origin and of complying with the requirements of this clause shall be deemed to be included in the tendered rates and prices.

1.06 Should the Engineer not inspect any materials or goods at the place of manufacture and Contractor shall obtain Certificates of Test from the suppliers of such goods and shall send such certificates to the Engineer. Such Certificates shall certify that the materials or goods concerned have been tested in accordance with the requirements of the Specification and shall give the results of all the test carried out. The Contractor shall provide adequate means of identifying the materials and goods delivered to the Site with the corresponding Certificates.

Test Certificates

All costs incurred in complying with this Clause shall be deemed to be included in the tendered rates and prices.

1.07 The Contractor shall, if directed, provide a monthly photographic record of the execution of the Works with the photographs taken by an approved photographer at such places as the Engineer may determine. The Contractor will supply the Engineer with such proofs as he may require and three prints of each selected photograph together with the negative. The prints are to be processed by an approved professional and shall be in colour, full plate size on heavy weight gloss paper.

***Progress
Photographs***

1.08 Survey Markers shall where possible be preserved or else be relocated. Where survey markers will be destroyed, they shall be accurately referenced to permanent concrete markers before work is commenced.

***Preservations of
Survey Markers***

1.09 Where dimensions and levels are shown on the Drawings or mentioned in the documents forming part of or issued under

***Dimensions and
Levels***

Part IV – Specifications

the Contract these shall be verified by the Contractor on the site and he will be held responsible for pointing out promptly any errors or discrepancies in such dimensions or levels.

1.10 Further to Clauses 8.3 of the Conditions of Contract, the Contractor shall provide with his tender a detailed programme of the order and the manner in which it is proposed to execute the Works. The programme shall include time and progress charts so that the actual progress of each operation can be shown against anticipated progress.

Programme

Once approved by the Engineer the Programme shall be adhere to unless such alterations as are found to be necessary during the construction of the work are confirmed in writing by the Engineer. The Programme shall take into account the fluctuating seasonal rainfall.

2. SITE DETAILS

2.01 Details of the scope of the Works to be carried out under the Contract will be given in Section 1.1 of the Contract Documents.

Scope of the Works

2.02 The precise location of the Works to be carried out under the Contract will be given in Section 1.1 of the Contract Documents.

Site of Works

2.03 The employer shall make available free of charge to the Contractor the land on which the Works are to be executed or carried out.

Land Available

Land required by the Contractor for his own camps, offices, houses, temporary works, spoil dumps, and the Engineer's Office and Laboratory shall not be provided by the Employer and the Contractor shall provide such land at his own cost.

2.04 Possession of the Site will be given in accordance with Clause 11 of the Conditions of Contract.

Possession of Site

2.05 From the date of such possession of the Site until a certificate of completion has been given the Contractor shall be responsible for maintaining the Site in a satisfactory condition.

Maintenance of Works Site

3. SURVEY AND SETTING OUT

3.01 In accordance with Clause 17.1 of the conditions of

Setting Out

Contract, the Contractor shall be responsible for the accurate setting out of the works in relation to original points, lines and levels of reference given by the Engineer in writing.

4. MATERIAL TESTING

4.01 When instructed by the Engineer, the Contractor shall submit to him Certificates of Test from the Suppliers of materials and manufactured articles to be used for the Contract. Such Certificates shall certify that the materials and manufactured articles concerned have been tested in accordance with the requirements of the Specification and shall give the results of all the tests carried out. The Contractor shall provide adequate means of identifying the materials and manufactured articles delivered to the Site with the corresponding Certificates. Where such Certificate is not available a representative sample of the material shall be tested by an approved Laboratory or, subject to the approval of the Engineer, by the Contractor and a copy of the test results submitted to the Engineer who shall decide whether the material conforms to the required standards.

*Test Certificates for
Materials and
Manufactured
Items Delivered to
Site*

4.02 All testing carried out by the Contractor shall be undertaken at an approved Laboratory manned by qualified staff.

Laboratory Testing

All samples and records shall be preserved for as long as the Engineer may direct and they shall be kept and identified in an orderly manner to his satisfaction. The laboratories, their equipment and all samples and records shall be open to inspection by the Engineer during normal working hours.

No separate payment shall be made to the Contractor in respect of his compliance with the requirements of this clause. The costs of undertaking all laboratory tests shall be deemed to have been included in the various rates and prices entered by the Contractor in the Bill of Quantities.

4.03 Should the Engineer decide that the results of any specified or instructed testing are unsatisfactory, he may order the stoppage of the work affected pending his further instruction. Work in respect of which test results are unsatisfactory shall be liable to rejection and if so directed by the Engineer, such work shall be cut out and re-executed to the satisfaction of the Engineer. The cost of all such

*Unsatisfactory Test
Results*

Part IV – Specifications

stoppage, cutting out, making good and re-testing of the works affected shall be borne by the Contractor.

5. DEMOLITION AND SITE CLEARANCE

5.01 No clearance of or alteration to any main service or apparatus shall be done unless specifically ordered by the Engineer.

General Clearance

The Contractor shall grub up and remove all bushes undergrowth, trees, stumps, roots, anthills, ant's nests, fences, rubbish, debris and other deleterious matter occurring within the Site of the Works or as otherwise directed by the Engineer.

5.02 Structures to be demolished shall be broken up and removed. Prior to demolition the Contractor shall ensure that services have been disconnected to the satisfaction of the appropriate authorities and/or owners.

Demolition of Structures

5.03 The Contractor shall prevent damage to trees, which the Engineer may designate to be preserved. Such designated trees shall be protected from injury during continuance of the Contract.

Protection of Designated Trees

6. EXCAVATION AND FILLING

6.01 Excavations

Excavations

(a) Material whose strength is inadequate in relation to its

Depth below formation level shall be excavated from below formation level in cutting over such areas and such depth as directed by the Engineer.

(b) Where any material below original surface level beneath embankment is required to be excavated, it shall be removed to such depth and over such areas as are shown on the Drawings or as the Engineer shall direct and be disposed of in a manner depending on its nature and condition at the time.

(c) The method adopted by the Contractor for excavating soft materials below water in swamp areas shall be subject to the approval of the Engineer.

Part IV – Specifications

- (d) Where embankments are to be constructed on steeply sloping ground, including the side slopes of existing embankments, existing sloping surfaces shall be excavated to form benching as directed by the Engineer.

6.02 Unsuitable material may be used, where directed by the Engineer, for flattening side slopes, filling depressions beyond the sides of embankments and in similar locations.

Use of Excavated Materials

6.03 The Contractor shall make arrangements for and provide such spoil dumps as may be required for the disposal of excavation of materials which are not to be incorporated in the Works.

Spoil Dumps

7. CONCRETE

7.01 At the end of each day the Contractor shall give the Engineer a realistic concreting programme for the next day. Also notice shall be given to the Engineer when formwork and reinforcement are complete and ready to receive concrete at least six working hours before concrete is to be placed.

Inspection before Concreting

Before placing any concrete all shavings, loose binding wires, soil, rubbish and all foreign matter shall be removed from the formwork and the formwork shall carefully and thoroughly washed with water. No concrete shall be placed until the Engineer has accepted the formwork and reinforcement.

7.02 Ordinary Portland Cement and Rapid Hardening Portland Cement shall comply with B.S. 12, Sulphate resisting cement B.S. 4027

Cement

RECOMMENDED MIX RATIOS OF POZZOLANA AND CEMENT FOR HOUSING

PRODUCT	POZZOLAN A	CEMENT	TREAT AS
Blocks	1 bag	2 bags	3 bags
Plastering	1 bag	2 bags	3 bags
Concrete	1 bag	3 bags	4 bags
Drains & Culverts	1 bag	3 bags	4 bags

7.03 Cement shall be stored in dry waterproof stores clear of the ground or in dry waterproof silos.

Storage of Cement

Part IV – Specifications

7.04 Cement shall be tested sufficiently to ensure that it complies with the Specification.

Works Testing of Cement

7.05 Aggregates for concrete shall comply with B.S. 882.

Aggregates

7.06 Each size of aggregate shall be stored separately and in such a way that it shall not become contaminated with any deleterious and extraneous matter. The aggregates shall be delivered to each concrete mixing plant and used in an unsegregated condition.

Storage of Aggregates

The storage methods adopted shall allow the aggregates to drain freely.

7.07 Tests on the aggregates shall be carried out in accordance with B.S. 812. In addition the moisture content of the aggregates shall be determined.

Works Testing of Aggregates

7.08 Water for concrete shall be clean, fresh and free from deleterious and extraneous matter, which in the opinion of the Engineer shall have a harmful effect on the Works.

Water for Concrete

As and when directed by the Engineer water for concrete will be tested in accordance with B.S. 3148.

7.09 Concrete mixes shall be of the classes shown in the following table: -

Concrete

Class of concrete	Characteristic cylinder strength (N/mm ²)	Characteristic cube strength (N/mm ²)	Maximum water/cement ratio		Minimum cement content (kg/m ³)
			A	B	
C20/25	20	25	0.7	0.65	260
C25/30	25	30	0.6	0.55	280
C30/37	30	37	0.55	0.5	300
C35/45	35	45	0.5	0.45	320
C40/50	40	50	0.45	0.4	340

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C45/55	45	55	0.45	0.4	360
C50/60	50	60	0.45	0.4	360
NOTE: Under water/cement ratio, column A applies to moderate and intermediate exposure, and column B to severe exposure.					

The cement content in any mix shall not exceed 540 kg/m³ unless agreed by the Engineer.

The concrete mixes to be used in the various parts of the Works shall be as stated in the Drawings or in the Specification or as otherwise directed by the Engineer.

The limits for salt contents of aggregates are subject to the overriding requirements tabulated in the following table: -

Type of Mix	Total Soluble Chloride (as NaCl) (% by weight of cement)	Total Acid Sulphate (as SO ₃) (% by weight of cement)*	Soluble Chloride (% by weight of cement)
Reinforced Concrete	0.15%		2.5%
Mass Concrete	1.00%		2.5%

* Excluding the sulphate present in the cement.

7.10 The Contractor shall design the mixes to comply with

the Specification and shall submit to the Engineer his proposed designs for provisional agreement. The Contractor shall also submit to the Engineer samples (each weighing about 13 kg) of the fine and coarse aggregates he proposed to use.

DESIGN OF MIXES

7.11 Following approval of the mix design of each class of concrete by the engineer the Contractor shall prepare a trial mix of each class of concrete in the presence of the Engineer. Each trial mix shall comprise not less than half a cubic metre of concrete and shall be mixed in a mechanical mixer of a type approved by the Engineer.

Trial Mixes

The quantities of all the ingredients of each trail mix including water shall be carefully determined by weight according to the approved mix design and sieve analysis and shall be made by the method described in B.S. 812.

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Six 150mm test cubes shall be made by the Contractor in the presence of the Engineer from each trial mix. The cubes shall be made, cured, stored and tested for their compressive strength at 28 days after manufacture, all according to the method described in B.S. 1881. The Contractor shall redesign the mix and make a further trial mix and test cubes: -

- (a) If the value of the ultimate compressive strengths of any of the mix cubes is less than the appropriate design strength, or
- (b) If the difference between the greatest and least Compressive strengths of a set is greater than 15% of the Average compressive strength of the six cubes, the Contractor shall allow ample time in his programme for Designing and making trial mixes and the preparation and Testing of compressive strength test cubes obtained Therefrom.

7.12 Cement shall be measured by weight either by using a weighing machine or by making the size of each batch of concrete such as to require an integral number of bags of cement.

**Measuring
Materials for
Concrete**

Coarse and fine aggregates shall be measured separately by volume of weight.

Water shall be measured by volume.

7.13 The water/cement ratios shall not be varied from the values which have been accepted by the Engineer and shall be such that the concrete is just sufficiently workable to allow it to be compacted in accordance with the Specification.

**Water/Cement
Ratio**

7.14 Samples of concrete shall be taken, from which the works test cubes shall be made, as and where directed by the Engineer.

**Works Test
Cubes**

From each sample of concrete and at the place where the sample was taken, six test cubes shall be made; 3 shall be tested at the age of 7 and 3 at the age of 28 days.

The test cubes shall be made, cured and tested in accordance with B.S. 1881. The test cubes shall be tested at a laboratory approved by the Engineer or at the site laboratory.

Part IV – Specifications

If the results of the cube tests do not comply with the Specifications such remedial works as the Engineer may accept or direct shall be carried out.

Testing of Concrete for Consistency

7.15 Slump tests shall be carried out in accordance with B.S. 1881.

7.16 Concrete shall be mixed in a power driven concrete mixer/ concrete plant, of the type stated in the contractor's mix design proposals, until such time as there is a uniform distribution of materials throughout the mix is uniform in colour and consistency. Notwithstanding the foregoing the mixing time shall not be less than that recommended by the manufacturer of the concrete mixer. The concrete mixer shall revolve at the speed recommended by the manufacturer.

Mixing of Concrete

7.17 Concrete which has commenced to set shall not be re-mixed, either with or without additional water and in no case shall such concrete be used in the Works.

Remixing of Concrete

7.18 Placing and compaction of concrete shall be completed within 20 minutes of its leaving the mixer unless the concrete is transported in a revolving agitating drum kept continuously in motion, when the concrete shall be placed and compacted within 20 minutes of it leaving the agitator. Concrete shall be placed within 2 hours of the cement being introduced into the mix.

Placing of Concrete

Concrete shall be handled so that segregation of the constituent materials does not occur.

7.19 As concrete is placed in position it shall be compacted by using mechanical vibrators in such a manner as to produce a dense, uniform and homogeneous mass free from voids and other imperfections.

Compaction Concrete

Ample numbers of serviceable vibrators shall be available so as to ensure that the Specifications is complied with even if vibrators failures occur.

During the placing and compaction of concrete for reinforced work a competent steel fixer and a carpenter shall be in constant attendance to adjust and correct, if necessary, the positions of the reinforcement of formwork.

Part IV – Specifications

Freshly placed concrete shall not be vibrated in such a manner as to cause damage to concrete in other parts of the Works which has already taken its initial set. Concrete shall not be compacted to such an extent that segregation of the constituent materials occurs.

Concrete shall be placed in its final position and vibration shall not be used to facilitate spreading of concrete.

- 7.20 Immediately after placing, concrete shall be protected from the effects of adverse weather.

Protection and Curing of Concrete

Concrete shall be cured for a period of not less than 7 days after placing by being kept constantly wet with water which is free from deleterious and extraneous matter.

- 7.21 Cement mortar shall consist of 1 part by volume of Portland Cement to 3 parts of volume of fine aggregate, unless otherwise specified, with a plasticising agent and just sufficient water to make the mortar workable consistent with its purpose.

Cement Mortar

- 7.22 All vertical construction joints in all classes of work shall be formed by inserting temporary stopping-off boards to form a tongue and groove joint against which the concrete can be properly compacted. When work is resumed against a vertical concrete surfaces which has hardened or commenced to harden all laitance, porous and loose material and badly compacted concrete shall be removed from the old surface which shall then be brushed with a steel wire brush and thoroughly wetted. The new concrete shall be thoroughly compacted against the old.

Construction Joints

When work is resumed against a horizontal concrete surface which has hardened or commenced to harden the surface of the old concrete shall be roughened by hacking and all laitance shall be removed from it together with the porous layer below the laitance.

The surface shall then be swept clean and brushed, with a steel brush to remove all loose material, thoroughly wetted and covered with a layer of grout. The grout material shall consist of cement mixed with sufficient water to give cement slurry. The new concrete shall then be well compacted on top of the old.

Part IV – Specifications

7.23 Immediately after the removal of formwork all exposed bars or bolts passing through the reinforced concrete member and used for shuttering or any other purpose shall be cut to a depth of at least 25mm below the surface of the concrete. All fins caused by form joints, all cavities produced by the removal of form ties and all other holes and depressions, broken edges or corners, and other defects shall be thoroughly cleaned, saturated with water, and carefully pointed and rendered true with mortar of cement and fine aggregate mixed in the same proportions as the grade of concrete which is being finished and of as dry a consistency as is compatible with its use. Sufficient pressure shall be applied in filling and pointing to ensure thoroughly filling of all voids. Surfaces which have been pointed shall be kept moist for a period of 24 hours. Small areas of honeycombed concrete shall be cut out to a sufficient depth to expose solid concrete before being finished.

If honeycombing, in the opinion of the Engineer is of such an extent or character as to affect the strength of the structure materially or to endanger the life of the steel reinforcement, he may declare the concrete defective and require the removal and replacement of the portions of the structure affected.

Where shown on the Drawings exposed concrete shall be rubbed down to a smooth finish with a Carborundum stone dipped in cement grout. Such work must be commenced within one hour of removing the formwork and completed in one operation. Rubdown surfaces shall be fair faced, true to form and free from all board marks, joint marks, honeycombing, jutting etc. The contractor is permitted at his own expense to provide smooth lining to the forms which will achieve this without rubbing down. Rendering or cement washing on rub-down surfaces is not permitted.

8. FORMWORK

8.01 Formwork shall mean the moulds for forming the concrete to the required shape together with the temporary construction required for the support of such moulds.

Formwork

Formwork shall be constructed of materials of such quality and strength as to ensure rigidity throughout the placing, vibration, compaction, setting and hardening of the concrete such that there is no deflection which would damage the concrete or result in the finished line of the concrete not complying with the Drawings.

Part IV – Specifications

Formwork shall be sufficiently watertight to prevent any loss of liquid from the concrete and shall be capable of being removed without shock, vibration or damage to the concrete. It shall be adequately propped and braced to resist any distortion by the pressure of the wet concrete.

Fair-faced formwork shall be used for exposed surfaces and shall be planed smooth and true, to form the surfaces, curves or shapes specified and joints shall be planed and perfectly watertight.

Rough formwork shall be used for unexposed surfaces and the timber may have a sawn finish but joints must be true and perfectly tight.

Should the Contractor wish to erect the formwork by passing ties through the work or embedding bolts therein, he must first obtain the approval of the Engineer's Representative and when seeking such approval shall forward full details of the type of fitting proposed for the tie, and show how it will be employed in the work, no type of fitting will be permitted which cannot be removed easily after use and which does not allow easy and effective making good of the concrete surfaces. The use of wires requiring subsequent cutting into and plastering over the concrete will not be permitted.

Notwithstanding the foregoing, concrete surface finishes specified in the Drawings or this Specification shall also be subject to the following requirements: -

(1) (a) *Class F1 Finish*

This finish is for surfaces against which backfill or further concrete will be placed. Formwork may be sawn boards, sheet metal or any other suitable material, which will prevent the loss of fine material from the concrete being placed.

**Classes of Finish
for Formed
Surfaces**

(b) *Class F2 Finish*

The irregularities in finish shall be no greater than those obtained from the use of wrought thickened square-edged boards arranged in a uniform pattern. The finish is intended to be left as struck but imperfections such as fine and surface discolouration shall be made good to the satisfaction of the Engineer.

(c) *Class F3 Finish*

The resulting finish shall be smooth and of uniform texture and appearance. The formwork lining shall leave no stain on the concrete and shall be so joined and fixed to its

Part IV – Specifications

backing that it imparts no blemishes. It shall be of the same type and obtained from only one source throughout any one structure. The Contractor shall make good any imperfections in the finish to the satisfaction of the Engineer. Internal ties and embedded metal parts will not be allowed.

(d) *Class F4 Finish*

The requirements for Class F4 Finish are as for Class F3 except the internal ties and embedded metal parts will be permitted. The ties shall be positioned only in rebates or in other positions as described in the Contract or as agreed by the Engineer.

(e) *General Comments on Classes F2 – F4*

Permanent exposed concrete surfaces to Classes F2, F3 and F4 Finish shall be protected from rust marks and stains of all kinds.

Unless otherwise described in the Contract, all formwork for exposed surfaces of concrete to Class F2, F3, and F4 Finish shall form a regular pattern agreed by the Engineer with horizontal and vertical lines continuous throughout each structure and all construction joints shall coincide with these horizontal or vertical lines.

(2) *Class of Finish for Unformed Surfaces* (i.e. horizontal or nearly horizontal surfaces, and all other surfaces which are not cast against formwork.

(a) *Class UF1 Finish*

The concrete shall be uniformly levelled and screeded in an approved manner by means of a steel-shod screed to produce a plain, texture or ridged surface as described in the Contract, and dense finish. Care shall be taken to ensure that the surface of the concrete is properly “closed”. No further work shall be

applied to the surface unless it is used as the first stage for Class UF2 or Class UF3 Finish.

(b) *Class UF2 Finish*

After the concrete has hardened sufficiently, the concrete Class UF1 surface shall be floated by hand or machine sufficient only to produce a uniform surface free from screed marks.

(c) *Class UF3 Finish*

When the moisture film has disappeared and the concrete

Classes of Finish for Formed Surfaces

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has hardened sufficiently to prevent laitance from being worked to the surface, a Class UF1 surface shall be lightly steel-trowelled under firm pressure to produce a dense, smooth uniform surface free from trowel marks.

- 8.02 The maximum permissible formwork tolerance shall be such as to ensure deviation of the concrete surface not greater than 3mm in 3 metres for permanently exposed surface and 12mm in 3 metres for surfaces not permanently exposed. These tolerances shall not be cumulative.

Formwork Tolerance

- 8.03 The class of finish for exposed surfaces shall be class F2. The irregularities in the finish shall be no greater than those obtained from the use of wrought thickened square edge boards arranged in a uniform pattern. The finish is intended to be left as struck but imperfections such as fins and surfaces discolouration shall if required, be made good by methods approved by the Engineer's Representative.

Class of Finish

- 8.04 No formwork shall be removed without the Engineer's prior approval and in no case shall any shuttering or props be removed until the under-mentioned times have elapsed after placing the concrete: -

Formwork Stripping Times

Location of Formwork Period	Minimum
Beams sides, columns and walls	2 days
Beams Soffits (props left under)	7 days
Beam Props	14 days
Slab Soffits (Props left under)	4 days
Slab Props	10 days

- 8.05 All formwork for new lifts of concrete shall be tightly and accurately fitted against the concrete already cast to ensure that the surface of the new work will be flush and in line with that of the old. All formwork for exposed concrete surfaces shall be painted with an approved mould oil to prevent adhesion between concrete and formwork.

Formwork Treatment

Part IV – Specifications

The mould shall be non-staining, insoluble in water, unarmful to the concrete, non-flaking and shall not be removable by rain or washwater. The Contractor shall ensure that the oil shall be kept from contact with the reinforcement or embedded fittings.

9. REINFORCEMENT

9.01 The reinforcement bars shall be mild or high tensile steel conforming to B.S. 4449. Reinforcement mesh shall be mild steel welded mesh complying with B.S. 4483.

Reinforcement

9.02 The Engineer will provide the Contractor with bending schedules showing the location, types sizes, bending dimensions and cut lengths of the reinforcement required to be fixed in the Works.

Bending of Schedules

The Contractor shall check each being schedule against the relevant drawing and shall notify the Engineer that the bending schedule is correct, or inform him of any discrepancies. In particular the Contractor may be required to modify the schedules with respect to any reinforcement starting bars he may consider necessary after obtaining the Engineer's approval.

9.03 Reinforcement shall be cut and bent to the shapes and dimensions shown on the finally agreed bending schedules. All reinforcement shall be carefully bent to the correct dimension in a manner, which will not injure the material. In particular, no reinforcement shall be heated before bending. Unless stated otherwise in the schedules, all bends and bending shall be in accordance with B.S. 4466.

Bending of Reinforcement

Where laps are required in reinforcement bars they should be staggered so that only 1 bar in 5 is lapped at a particular section. The length of laps will be determined by the Engineer based on the requirements of BSCP. 114. Reinforcement shall not be welded.

9.04 All reinforcement shall be rigidly fixed in position to the spacing, cover or other dimensions indicated on the Drawings. To prevent displacement before and during concreting the bars shall be bound together at all intersections with soft iron wire and the ends of the wire shall be turned inwards away from the surface of the structure, or with steel wire clips acceptable to the Engineer.

Fixing of Reinforcement

Part IV – Specifications

All reinforcement shall be perfectly clean and free from loose scale, rust, oil, grease and other matter, which might reduce the bond between the steel and the concrete. Loose pieces of bending wire, timber and other foreign matter shall be removed.

9.05 Spacer blocks shall be provided to ensure that the reinforcement is correctly positioned in the Works and shall be as small as possible consistent with their purpose. Such blocks shall not exceed 50mm in length and their thickness shall be exactly that required to give cover specified on the Drawings. Each spacer block shall be made of concrete class 37.5/10 and binding wire shall be securely embedded into each block to permit adequate fastening to the reinforcement bars.

Spacer Blocks

10. PRECAST CONCRETE

10.01 Precast concrete covers all precast units for use in the Works, whether instructed under the Contract or proposed by the Contractor.

Precast Concrete

10.02 Formwork and reinforcement for precast concrete shall comply with the Specifications for insitu concrete.

Formwork and Reinforcement for Precast Concrete

10.03 Concrete for precast units shall comply with the Specifications for insitu concrete using the class of concrete specified in the Drawings.

Casting of Precast Units

10.04 Requirements for curing shall be generally as for insitu concrete. The contractor shall ensure that units do not suffer any loss of moisture or sudden changes of temperature for at least four days after casting. If a water spray is used for curing, the water shall be at a temperature within 5°C of the temperature of the unit being cured.

Curing of Precast Units

10.05 Units shall be accurately formed to the dimensions shown in the Drawings and within the tolerances set out in B.S.C.P. 110.

Dimensional Tolerances on Precast Units

10.06 The formed faces of precast units shall be finished to

Surface Finish on Precast Units

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class F3. Free faces shall be finished to class UF2 unless another class of finish is specified on the Drawings.

10.07 Precast units shall be handled and stored in a manner which will not cause damage of any kind and shall be stored on a hard impermeable base.

Handling and Storage of Precast Units

10.08 Precast units shall be capable of safely sustaining the loads, which they have been designed to carry. The Contractor shall subject units selected by the Engineer to load tests simulating the working conditions.

Testing of Precast Units

Details of such tests shall be agreed between the Engineer and the Contractor.

11. MISCELLANEOUS STRUCTURES

11.01 Where concrete surfaces are required to be rendered in the finished works, the concrete surface shall be scared or hacked to provide a key for the render.

Miscellaneous Structures

11.02 The formwork for all suspended slabs and beams shall be constructed with an upward camber as follows:

Surface Finish to In-situ Concrete Camber

Roof slabs and beams having two or more supports:
6mm at mid-span for each 3m of clear span.

Other slabs and beams having two or more supports:
3mm at mid-span for each 3m of clear span.

Cantilever slabs and beams:
6mm at the unsupported end for each 3m projection.

11.03 The Contractor shall incorporate in concrete members all electrical conduit pipes, fixing blocks, chases, holes, etc. required by any sub-contractor. The Contractor shall obtain from the sub-contractor full details of his requirements and shall submit details to the Engineer for approval before work is put in hand. All fixing blocks, chases, holes etc. shall be accurately set out and cast into the concrete. Neither holes nor chases shall be out in the hardened concrete without the prior approval of the Engineer.

Inserts

11.04 Before reinforcement is placed, the internal faces of the formwork may be coated with an approved preparation to

Preparation to Prevent Adhesion

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prevent adhesion of the concrete to the forms. This preparation shall not be allowed to touch the reinforcement.

Immediately before placing concrete all extraneous materials shall be removed from the interior of the formwork. Each section of the formwork shall be inspected immediately before concreting commences.

12. BLOCK WORK

12.01 Block work Materials

- | | |
|---------|---|
| Cement: | Cement shall be as specified in “Concrete Works” |
| Sand: | Sand for mortar shall be as specified under Fine Aggregates for concrete works. |
| Water: | Water shall be as specified in concrete works. |

Blockwork Materials

12.02 Cement mortar shall be composed of one part of Cement to four parts of sand (1:4). Mortar may be mixed by hand or mechanically. Hand mixed shall be carried out on a clean watertight platform. The ingredients shall be mixed thoroughly in the required proportions, first dry and then with the addition of water until a uniform consistency is obtained. The mortar should be used within one hour of the addition of the mixing water and any mortar not used shall be discarded.

Mortar

12.03 The whole of the blocks required shall be in an approved machine to be provided by the Contractor and shall have a minimum crushing strength of 2.5N/Sq.mm of gross area at 28 days. The blocks shall be composed of 1:6 cement and sand measured by volume unless otherwise specified or directed on the site, turned three times dry until an even colour and consistency throughout. Water shall then be added gently from watering can through a hose, the quantity of water added being just sufficient to secure adhesion. After wetting the mixture shall be turned over three times and well rammed into moulds and smoothed off with a steel faced tool. After removal from the machine on pallets, the blocks shall be matured under shade in separate rows one block high with a space between each block, and for at least 24 hours. They shall then be removed from the pallets, but shall not be stacked up or removed from shade for at least a further seven days, then stacked not more than 5 blocks high in shade for a

Workmanship

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minimum of 14 days and kept well watered all the time.

Alternatively blocks may be obtained from an approved supplier. Blocks so obtained shall conform in all respects to above specifications.

No blocks shall be built into any part of the building until they have been matured for at least fourteen days. The faces of blocks except where otherwise described shall be left rough for plastering or rendering.

The foundation blocks shall be 450mm by 225mm deep and shall be solid. All shall be cast true to shape, even in size, square and free from flaws or blow holes with clean and sharp arises and equal to a sample approved by the Engineer. All blocks shall be carefully handled. Blocks with broken arises shall not be used.

12.04 Block Laying: The blockwork shall be carried up in a uniform manner. No one portion shall be raised more than 900mm above another at any time. The work shall be carried up course by course and the height of four courses when laid shall be 900mm.

Workmanship

All perpend and quoins shall be kept strictly true and square and all work properly bonded together and carefully levelled through every second course. All corners, cross wall junctions and reveals shall be properly bonded. Special care shall be taken that all vertical joints are filled with mortar.

All internal faces and external faces shall have raked out joints for plaster unless otherwise specified.

All blockwork finished fair faced shall have true and even face and all vertical and horizontal mortar joints shall be finished flush with the face of the blockwork.

All blocks shall be well wetted before being laid or built on.

Any defective blocks found in the work shall be cut out and replaced by sound ones at the Contractor's expense.

12.05 Where required, walls shall be plastered externally with 19mm thick cement and sand (1:4) plaster to an even but rough finish. When rough fixture in plaster is required it shall be rough cast plaster sprayed on internal walls and underside of flat slabs shall be rendered with sand – cement plaster to a smooth but level finish with 12mm thick cement-sand.

Wall Plaster

13. ROOFING

13.01 Aluminium Sheet Roofing

(i) Aluminium sheets for roofing shall be 22 or 24 (S.W.G) corrugated aluminium sheets depending upon the spacing of the purlins and laid all as hereinafter described for corrugated sheet iron roofing except that side laps shall be not less than two and a half corrugations.

Aluminium Sheet Roofing

(ii) Hips, ridges and valleys shall be formed with 20 or 22 (S.W.G) flat aluminium sheeting, machine bent, and fixed all as hereafter described for sheet iron hips, ridges and valleys.

Aluminium Hips, Ridges and Valleys

All aluminium in contact with concrete or masonry, shall be given one coat bituminous paint before fixing.

13.02 Galvanized Corrugated Iron Roofing

(i) Corrugated iron roofing shall be 24 (S.W.G.) galvanized corrugated iron sheets in accordance with B.S. 3083 and obtained from an approved manufacturer. Sheets shall be of the sizes indicated on the drawings and laid with side laps of not less than one and a half corrugations. Side laps shall be turned from the prevailing wind. End laps shall be not less than 150mm. Sheets shall be fixed to metal purlins with 8mm galvanized hook bolts, washers and nuts and to wood purlins with 62mm galvanized drive screws with an approved composition washer. Screws shall be fixed through the ridges of the corrugation on each purlin. Holes for screws shall be punched from the underside to the outside of the sheets.

Galvanized Corrugated Iron Roofing

(ii) Hips, ridges and valleys to corrugated iron roofs shall be formed with lengths of 24 (S.W.G) flat galvanized iron sheet 375mm wide shaped as required to fit the profile of ridges, hips and valleys and in lengths not less than \pm .80m sheets shall be lapped 100mm at the junctions of hips, ridges, passings, etc. and fixed with the same screws and

Sheet Iron Hips, Ridges, and Valleys

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washers as these holding the upper ends of the roofing sheets on both sides.

13.03 The whole of the roof coverings shall be left clean, sound, wind and water-tight on completion to the satisfaction of the Engineer.

Leave Watertight

13.04 Fixing Details for Sheeting

Fixing Details for Sheeting

(i) Timber or similar

The sheeting to be fixed securely to timber or similar roofs by means of drive screws, or by aluminium nails in the case of thinner gauges of sheet in agricultural applications. All timber surfaces which contact the sheetings shall be painted with aluminium paint or creosote, or in severe conditions overlaid with a heavy-grade inodorous roofing felt. All exposed nails heads in timber to be hammered and punched well below the surface of the timber.

(ii) Fixing Accessories

All fixing to be in accordance with the recommendations laid down in B.S. CP143, Part 1, 1958, and manufactured to standards laid down by B.S. 1494: 1951 (Fixing Accessories for Building Purposes) and by B.S. 2465; 1954 (Aluminium Fixing Accessories for Building Purposes). All fixings to be spaced at a maximum of 375mm centres to every purling or side rail, allowing at least one fastening in addition to those of side laps and edges. Patent plastic washers of approved design may be used instead of the metal and bitumen felt washers recommended by Clause 405 of B.S. CP143 of 1958. All holes for fixing shall be 0.8mm diameter larger than the thread of the bolt, care being taken to avoid burrs or dishings of the sheet.

(a) Method of laying

Sheets shall, where possible, be laid from that end of the building away from the prevailing wind, so that exposed edges face downwind

(c) Storage

Sheets are to be stored in a dry place. They shall be stacked in such a way as to prevent moisture becoming entrapped between the sheets. Contact with other materials such as fertilizer, lime and cement is to be avoided.

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14. STRUCTURAL TIMBER **Structural Timber**

14.01 (I) Structural Timber

All structural timber shall comply with the requirements of B.S. 5268 Part 2.

(ii) **Stability**
The Contractor is responsible for ensuring the stability of the works at all stages during construction. **Stability**

(iii) **Timber**
Structural timber shall be well seasoned Timber free from all defects and complying with the current B.S. 112. The Contractor shall visually grade the timber using suitably qualified staff. **Timber**

In addition the limits of warping as defined in B.S. 656 shall be:

(a) Cup - no cup is allowed on faces of 100mm or less, cut on faces greater than 100mm shall not be more than 2mm / 100mm.

(b) Spring – maximum allowed shall be 5mm per 3 linear metre.

(c) Bow – maximum bow allowed shall be 10mm per 3 linear metre.

(d) Twist – 3 degrees per 3 linear metre.

(iv) **Workmanship:
Nails**
Nails shall be made from steel and comply with B.S. 12.2 Part 1 table 2 and be galvanized to B.S. 2989 **Workmanship:
Nails**

(v) **Joist Hangers**
Joist Hangers shall be made from 1mm mild steel plate and galvanized to B.S. 2989 after punching of nail holes. **Joist Hangers**

(vi) **Assembly of Structural Units**
Full size templates shall be used wherever possible to achieve uniformity and accuracy in setting out of structural elements. **Assembly of
Structural Units**

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(vii) Tolerances

Tolerances for fabrication, assembly and erection shall be such that the dimensions achieved shall comply with B.S. 5606, Table 3.

Tolerance

(viii) Storage on and off Site

All timber components shall be stored so that they are protected against exposure to the weather, wetting, damage decay and insect attack.

Storage

(ix) Transport and Lifting

All materials and assemblies shall be protected from the weather and suitable measures should be taken to protect the surfaces during hoisting, transporting and erection. Over stressing of members during handling and transportation shall be avoided by the provision of adequate support and the use of approved lifting methods.

Transport and Lifting

15. PAINTING AND DECORATION

15.01 All paints, including priming, undercoats and finishings shall be obtained from approved manufacturers.

Approved Suppliers

15.02 All paints shall be used exactly as received from manufacturers and according to their directions. In no circumstances will the addition of thinners, dryers or other materials be permitted without the written consent of the Engineer.

General Provisions

All oil shall be of the best linseed.

Turpentine shall be of the best quality and the use of substitutes will not be permitted.

The knotting shall be the best shellac knotting.

White lead for stopping, etc. shall be of the best quality delivered on the site in maker's containers.

15.03 All materials shall be applied strictly in accordance with the manufacturer's instructions. The work must be executed in the best manner and each coat is carried round the building the next coat is applied. The work must be thoroughly prepared and

Workmanship

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cleaned down before the priming of first coat of paint is applied and between each coat.

Before any part of the painting is commenced and Contractor is to be careful to remove all dust and dirt from the surrounding part of the premises and shall take all necessary steps to minimize nuisance from dust during painting operations.

Cutting-in shall be neatly and accurately performed.

The contents of the cans shall be thoroughly stirred prior to pouring into kettles.

On completion of the works all floors are to be twice washed. All marks on paints are to be sponged off, the work generally to be touched up after all other workmen have left and the whole of the works left clean and perfect on completion, to the satisfaction of the Engineer.

15.04 All surfaces to be painted shall be prepared as follows:

(a) Block and Concrete

Preparation of Surfaces

All blocks and concrete surfaces shall be rendered and plasterwork shall be carefully cut out, stopped and made good and plasterwork shall be rubbed smooth.

Block and Concrete

(b) Iron and Steel

Iron and Steel

Iron and steel work, whether delivered primed or unprimed shall be thoroughly scraped, wire brushed or otherwise cleaned down to remove all rust and loose scale and primed on site before or after fixing, as directed. All open joints shall be stopped with red or white lead putty.

(c) Woodwork

Woodwork

The knots in all woodwork shall be knotted with shellac but black and projecting knots shall be cut out and the holes filled in with hard stopping of dry white lead and gold size. The woodwork shall be well pumiced down and brought to be a smooth surface.

Priming of woodwork before delivery shall not be carried out until after the Engineer's inspection. Priming paint should comply with B.S. 2521.

All hidden portions of woodwork, including backs of door frames, shall be primed before the work is fixed and all glazing rebates shall be primed before glazing and front putties primed before painting.

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15.05 All work shall be rubbed down between each coat and stopped or faced up as necessary.

Rubbing Down

15.06 All coats of paint shall be thoroughly dry before the application of another coat.

Surface to be Dry

15.07 Each coat shall be of different tint.

Tints of Metal Primers

16. FENCING

16.01 Where shown in the Drawings or directed the Engineer the Contractor shall provide and erect fences, including excavation and backfilling, which fencing shall comply with the details shown in the drawings.

All timber for fencing shall be well-seasoned straight Grained hardwood to the approval of the Engineer. After all cutting and drilling has been completed the timber shall be impregnated by the vacuum/pressure process with a copper / chrome composition preservative approved by the Engineer in accordance with B.S. 4072 to achieve an anticipated average dry salt retention of 12 kg/m³. Prior to delivery of materials to the site samples shall be submitted by the Contractor to the Engineer for testing to ensure that the correct treatment has been applied.

Galvanizing of fencing wire shall be in accordance with BS 443.

7.24

COMPACTION OF EMBANKMENTS

Test for Quality of Materials and Control of Construction

Before any section of the embankment is commenced and during its construction, tests as required by the Engineer shall be carried out in order to determine the quality of materials and the required degree of compaction in the fills. The engineer may make use of the following tests:

- (i) Plasticity Index Tests
- (ii) Grading Tests

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- (iii) Moisture Content Tests
- (iv) In-situ dry density measurements
- (v) Compaction Tests
- (vi) In-situ and Laboratory C.B.R. Tests.

Test (i),(ii), and (iv) shall be carried out in accordance with BS 1377, 1961, the sand replacement method being used for the measurement of dry density in-situ equivalent. The compacted tests shall be carried out in a mould 150mm internal diameter and 125mm internal height. The mould shall be filled in equal layers, each layer being given 25blows or 4.5kg hammer falling freely 450mm (Ghana Compaction Standard: Modified A.A.S.H.T.O. compaction rammer). The condition of tests for laboratory C.B.R. tests shall be agreed upon by the Consultant before commencement of the Works. Failing this, laboratory C.B.R. tests shall be carried out on materials at the optimum moisture content given by

Compaction tests.

Preparation of Ground placing Embankments. Before placing embankments and where required by the Consultant, the topsoil shall be stripped to a depth of 150mm as directed. If after the soil has been stripped the ground in any area is a suitable in the opinion of the areas to such additional depth has directed by the Consultant and shall dispose of the excavated materials as directed.

Compaction

The imported material shall be dug, spread and compacted a minimum of delay so that the material is compacted at its natural moisture content without being allowed to dry or wet up. Compaction shall be carried out by means approved by the Consultant. Irrespective of compaction carried out by the especial equipment, maximum use shall be made of all construction traffic to assist in the compaction of all earthworks. All construction equipment must operate over the whole area to ensure uniform compaction. All filling shall be deposited in layers of not greater than 225mm loose depth. Longitudinal and transverse joints in any two successive layers shall be staggered by a minimum distance of three metres.

Compaction of Rockfill Embankment

The rock shall be placed in level layers approximately 600mm in thickness. The material shall be reasonably graded to prevent the Occurrence of large air voids in the finished work. Each layer shall be thoroughly rolled and sluiced with water. The quantity of sludging water shall be not less than twice the volume of rock in the layer and under sufficient pressure to ensure that all fines will be washed down to filled interstice amongst the large stones.

Fill on Steep Slopes

Where embankments are to be placed on side slopes steeper than 1.5 provision shall be made to ensure a bond between them and the old ground by ploughing furrows at least 225mm deep and 600mm apart, parallel to the centre-line of the road or as directed by the Consultant.

Fill Adjacent Culverts

Special attention shall be paid to the compaction of filling material placed over a distance of 7.5 metres or three times the depth of fill whichever is greater, measured from culverts. Compaction shall be carried out if necessary by suitable punners or other approved means so that a wedge of material tapering to zero depth or such other depth as may be directed by the Consultant at the above distance from the culverts, shall have a compaction of 100% of the maximum dry density. The Consultant may direct that the filling of this wedge shall be carried out with laterite gravel or other specially selected materials.

Fill Material for Top 600mm Earth Embankments

Materials for the top 600mm of earth embankments shall be free from clay lumps and reasonably free from vegetable matter and perishable material. Lumps of rock or earthy material shall be broken down to such a size that they will not interfere with the compaction of the material.

The material shall be approved by the Consultant and when compacted in the laboratory at the maximum dry density and optimum moisture content shall have a C.B.R. of not less than 10% (determined after 48 hours soaking). The fill material shall be compacted in layers not exceeding 225mm loose depth or 150mm compacted.

ROADS, PAVINGS AND SURFACING

‘PAVING’ shall include for supply of all materials, labour, machinery and any other incidental and shall include for carrying out the Works in accordance with the Specifications and to the complete satisfaction of the Consultant. Preparation of Formation (road and Yard). Excavation or filling for road works shall in the first instance be carried out to a level 300mm below the base of the road or to any such depth as directed by the Consultant.

The 300mm below the base shall be filled as follows:

- (a) 150mm consolidated sub-base material as specified below on prepared formation.
- (b) 150mm consolidated base materials as specified below.

A10 - 20 tonne roller shall be used for compaction.

Sub-base and Base

The sub-base shall be gravel or other approved material. Material for the base shall be naturally occurring gravels or crushed rock and its quality grading shall be

Part IV – Specifications

approved by the Consultant. Where the base material is gravel, it shall normally comply with the condition of grading and plasticity given below.

BS Sieve Size Nominal Maximum Size	Percentage passing		
	76mm	38mm	19mm
76mm	100	80- 100	-
38mm	80 - 100	80-100	-100
19mm	60 - 80	55-80	80 - 100
10mm	45 - 65	40 - 60	59 - 75
5mm	30 - 50	30 - 50	35 - 60
No.7	-	-	-
No.14	10 - 30	15 - 30	15 - 35
No.25	-	-	-
No. 52	0 - 10	0 - 10	0 - 10
No.200			

- (i) Not less than 100% should be retained on each successive pair of sieves specified for use, except the largest pair.
- (ii) The material passing No.36 sieve shall have the following characteristic:
 - (a) Liquid limit not exceeding 25%
 - (b) Plasticity index not exceeding 6%

The sub-base and base material shall be spread longitudinally in uniform layers not

exceeding 200mm loose or 150mm compacted and be compacted to 100% maximum density.

In no circumstances shall sub-base material be laid if the previous surface has been affected by rain until it has been made good to the satisfaction of the Consultant.

Sub- Base and (Cont'd)

The C.B.R. value of the sub-base measured in-standard conditions shall not be less than 35% and C.B.R. value of the base measure in-situ shall not be less than 80% when the materials are tested in the laboratory at the maximum dry density these values shall be normally obtained after 24 hours soaking.

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Prime Coat

The laying of the prime coat shall follow immediately after the base has been compacted as specified and approved by the Consultant.

If dry the base shall be slightly dampened (not wetted) as directed by the Consultant. The prime coat shall be M.C.2 bitumen and spread at the rate of 5 litres per four (4) square metres at a temperature of 126oC or higher.

After not less than three hours it shall be blinded with 6mm chippings or sand at the rate of One cubic metre per square metre at such rate as may be found necessary to secure adequate coverage. The sand or chippings shall be brushed if necessary to ensure even coverage.

The chippings or sand be thoroughly rolled with a light roller (4-6 tonne) and allowed to start overnight. Further rolling shall be carried out the next day.

Wearing Coat

- (a) First Coat: After a period of not less than fourteen (14) days or as long as required by the Consultant to allow for consolidation the surface shall be swept clean of all loose material.

Shelmac S. 125 or similar approved cut-back bitumen having viscosity of 100-150 seconds at 19oC shall be applied at the rate of 5 litres per 2 ½ square metres of rod surface at a temperature of 127oC to 150oC and blinded immediately with 20mm chippings applied at the rate of 50 square metres per cubic metre or at such other rate as may be found necessary to ensure adequate coverage. The chippings shall be brushed to ensure even coverage and hen be thoroughly rolled with a light roller (4-6 tonne) and allowed to stand overnight. Further rolling shall be carried out the following day.

- (b) Second Coat: after a period of not less than fourteen (14) days or as long as required by the Consultant, the surface shall be swept clean or loose chippings and other materials. Shelmac S.125 or similar viscosity as for the first coat shall be applied at the rate of 50 square metres per cubic metre or at such other rate as may be found necessary to ensure adequate coverage.

The chippings shall be brushed to ensure even coverage and then thoroughly rolled with a light roller (4-6 tonne) and allowed to stand overnight. Further rolling shall be carried out before the surface is opened to traffic.

PART V. DRAWINGS

Part V – Drawings

PART VI. PRICED BILLS OF QUANTITIES