Malaysian Standard Method of Measurement for Building Works Third Edition

SMM3

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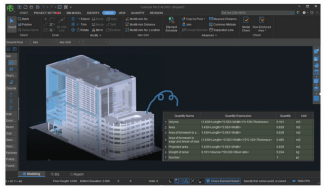
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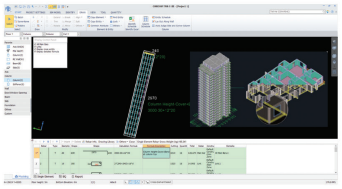
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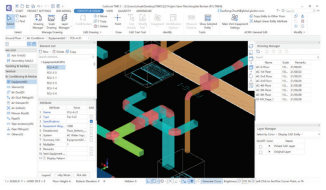
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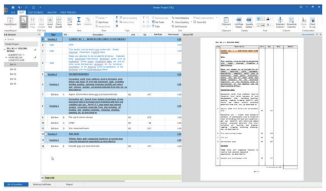
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Malaysian Standard Method of Measurement for Building Works Third Edition

SMM3

MESSAGE FROM CIDB MALAYSIA

I am delighted to extend my heartfelt congratulations to the Royal Institution of Surveyors Malaysia (RISM) on the publication of the third edition of the Standard Method of Measurement for Building Works (SMM3). This updated edition represents a significant milestone for our industry, offering a clear and practical guide to ensure that all stakeholders in the construction sector adhere to the same standards.

The construction industry is rapidly evolving, and SMM3 has transformed how we manage and measure building projects. A key enhancement in this edition is the inclusion of a provision in the Preliminaries for reporting carbon emissions alongside construction costs. It does not prescribe a specific carbon calculation method, allowing users flexibility in adopting their preferred approaches. This feature encourages global benchmarking and greater transparency in carbon life cycle assessments, which is essential for meeting sustainability objectives in the construction industry. It also aims to enhance decision-making concerning environmental impacts throughout the project lifecycle, from design to end-of-life stages.

At CIDB, we are fully committed to supporting innovation and progress within the construction industry. We believe SMM3 will not only improve project management but also elevate the overall quality of construction work in Malaysia. By embracing these new standards, we can ensure that our construction projects remain competitive, sustainable, and meet the highest standards.

This edition would not have been possible without the collaborative efforts of various organisations. I would like to express my sincere gratitude to RISM, the Public Works Department (PWD) Malaysia, Pertubuhan Akitek Malaysia (PAM), The Institution of Engineers Malaysia (IEM), and the Association of Consulting Engineers Malaysia (ACEM) for their invaluable contributions in making this SMM3 a reality.

I strongly encourage all industry professionals to adopt SMM3 and use it as a means of continually raising the bar in our field. Together, we can create a stronger, more advanced, and sustainable construction industry in Malaysia.

Best regards,

Dato' Sr Mohd Zaid Zakaria
Chief Executive, CIDB Malaysia
Adjunct Professor, UTM
Adjunct Professor, UiTM
24/10/24

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PREFACE FROM RISM VICE PRESIDENT (QS)

Assalamualaikum warahmatullahiwabarakatuh and Salam Sejahtera,

I extend my heartfelt greetings to you all. This preface serves as an introduction to the Malaysian Standard Method of Measurement of Building Works – Third Edition (SMM3).

The aim of SMM3 is to establish a consistent set of measurement rules that can be utilised in the creation of bill of quantities (BQ) and schedules of works for building projects.

Moreover, it offers a framework that can be adapted to create both specialised and standard schedules of rates.

SMM3 takes into account the advancements in construction technologies within Malaysia. It encompasses guidelines for measuring innovative technologies like IBS, diaphragm walls, reinforced earth, and more.

Furthermore, the document incorporates the latest trend of digital innovations in the construction sector, such as Building Information Modelling (BIM)-based measurement techniques.

While we encourage construction professionals to embrace BIM and other innovations, it is equally crucial for the Quantity Surveying (QS) profession to fully realise the potential of SMM3.

This edition is a significant step forward for QS practices in Malaysia, and it's essential for Quantity Surveying and Cost Engineering professionals to embrace it wholeheartedly. Incorporating BIM into project cost management enhances the professionalism of QS services and aligns with the global shift in the industry.

SMM3 includes features that are friendly to BIM practices, including streamlined measurements, reduction in measurable building components, simplified descriptions of building components/items, and clear guidelines for information to be presented in 3D models for quantities extraction.

This competitive edge makes SMM3 a valuable tool. It's vital for all construction professionals to leverage this advancement to enhance their capabilities and deliver high-quality services, especially in the global market. I would like to express my gratitude on behalf of the QS Division of RISM to all those who have contributed to the realisation of SMM3. Special thanks to the Public Works Department (PWD), Construction Industry Development Board (CIDB) Malaysia, Pertubuhan Arkitek Malaysia (PAM), The Institution of Engineers, Malaysia (IEM) and Association of Consulting Engineers Malaysia (ACEM) for their dedicated efforts. Your contributions and insightful ideas continue to enrich our profession.

The Malaysian Standard Method of Measurement of Building Works – Third Edition (SMM3) is a catalyst for increased productivity and competitiveness on the global stage, achieved through the adoption of a comprehensive standard method aligned with emerging digital technologies.

With warm regards,

Sr Nazir Muhamad Nor, CQS, FRISM
RISM Vice President (QS)
session 2025/2026
Date: 07/07/2025

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PART 1

OVERVIEW

1.0 INTRODUCTION

1.1 Malaysian Standard Method of Measurement of Building Works – Third Edition ('SMM3') provides a uniform set of measurement rules for the preparation of Bill of Quantities (BQ) and Schedules of Works for building works, and also serves as a framework for developing both bespoke and standard Schedules of Rates.

1.2 In keeping with the advancement in construction technologies in Malaysia, SMM3 includes measurement rules for such technologies such as Industrialised Building System (IBS), Crib walls, and Reinforced Earth walls.

1.3 Although SMM3 is intended for building works , it also covers the measurement rules of selected civil works such as ground remediation and soil stabilisation, road works, external sewerage and external water reticulation. This inclusion enables Quantity Surveyors (QS) to prepare BQ for such works – often part of building development project – without needing to refer to MyCESMM2.

1.4 SMM3 also sets out comprehensive rules for the measurement of Mechanical Engineering, Installations Electrical Engineering Installations and Transportation Systems. These are traditionally within the scope of the mechanical and electrical engineers but SMM3 aims to support QS professionals in taking a more prominent role in the preparation of BQ for these elements.

1.5 In alignment with the increasing adoption of Building Information Modelling (BIM) in Malaysia construction industry, SMM3 incorporates BIM-friendly features. These include simplification of measurements, a reduced number of measurable building components/items, streamlining building components/items descriptions, and guidelines on the basic information required in 3D models by the respective consultants for some basic quantity extraction by BIM software.

1.6 SMM3 also includes guidelines for drafting of the 'Preliminaries', 'Specification' and 'Preambles', all of which are integral to the procurement documentation for building works.

1.7 The core of SMM3 is presented in a structured tabulated format ('the Table') which comprise the rules of measurement for building components/items. These rules are reflected in each part of the building components/items descriptions instead of the use of descriptive rules in the Table. In essence, the Table serves as a standard library, allowing building components/items descriptions for BQ preparation to be directly created from it, and also providing a guideline for developing new building components/items descriptions not covered in the Table.

1.8 There are specific rules of measurement that cannot be inferred or covered by the component/ item descriptions and 'Preambles'. Such rules are dealt with in 'Specific Rules of Measurement' section of SMM3.

1.9 Broadly, the objectives of SMM3 are to advance the QS profession toward greater standardisation of building components/items descriptions, preliminaries items, specifications and preambles in the procurement documentation for building works. Additionally, it aims to enable early integration of QS professionals into the BIM team, guiding consultants in developing 3D models that facilitate quantity extraction.

1.10 SMM3 embodies the essentials of good practice and is understandable by all the stakeholders involved in a construction project e.g. the employer, the contractor, the project/design team, etc. and is equally applicable to both proposed and executed works.

1.11 Rules of measurement adopted for work not covered by these rules are to be stated and such rules are to as far as possible conform to those given in this SMM3 for similar work.

2.0 TABULATED RULES OF MEASUREMENT FOR BUILDING WORKS

2.1 Introduction

2.1.1 The rules comprise:

(1) the information and requirement for the main contractor's preliminaries together with the rules for preparing the preliminaries pricing schedule; and

(2) the rules of measurement for building components/items which are together with the rules for preparing the preliminaries pricing schedule categorised into 29 Work Sections.

2.2 Interpretation

2.2.1 The rules of measurement for building works are set out in tables. The tables are divided into two categories, namely those dealing with:

(1) Preliminaries; and

(2) Measurement of building components/items.

2.2.2 The rules are written in the present tense.

2.2.3 The symbol '/' used between two or more units of measurement or within the phrases, means 'or' and therefore a selection would have to be made.

2.2.4 Horizontal lines divide the tables and rules into zones to which different rules apply.

2.2.5 The use of broken lines ' – – – ' between two different supporting information in these tables means with different units of measurement but under the same level for the building components/items description.

2.2.6 The use of a hyphen ' – ' or the phrase 'to' between two dimensions in these tables or a BQ means a range of dimensions exceeding the first dimension stated but not exceeding the second.

2.2.7 Parentheses, ' ( ) ' contains an instruction as to the insertion of drawing nr, dimension, width, length, diameter, etc. with an appropriate unit e.g. . "(width) wide gap and (height) high {max. height} beam" to replace with "250mm wide gap and 3.25m high {max. high}" and is to be deleted upon such insertion while Curly brackets { } contains the additional supporting information e.g. 'measured separately', 'consolidated thickness', etc. and NOT to be deleted.

2.2.8 Symbols used for measurement:

ha	hectare	m3	cubic metre
hr	hour	mm	millimetre
kg	kilogramme	mm2	square millimetre
kN	kilonewton	mm3	cubic millimetre
kW	kilowatt	nr	number
m	linear metre	t	tonne
m2	square metre	item	lump sum item

2.2 Interpretation (Cont'd)

2.2.9 Abbreviations used in SMM3 :

S.O.	Superintendent Officer which can also mean the Architect or the Engineer or Contract Administrator or Specialist Consultant as the case may be.
BQ	Bill of Quantities
CIDB	Construction Industry Development Board
IBS	Industrialised Building System
BS	British Standard
MS	Malaysian Standard
EN	Euro Standard
C(grade)	'C' stands for 'compressive', 'grade' is the number indicating the 28-day characteristic cube crushing strength in newton per square millimetre (N/mm2) which the concrete is expected to attain.
(dia)	Diameter

2.3 Work Sections

2.3.1 Work Section 01 Preliminaries

2.3.1.1 Generally, preliminaries are the cost of administering a project and providing plant, site staff, facilities site-based services, and other items not included in the rates for measured works.

2.3.1.2 Preliminaries are divided into two discrete sections:
(1) information and requirements; and
(2) pricing schedule.

2.3.1.3 Information and requirements:

This is the descriptive part of the Preliminaries, which:

(1) sets out the project particulars (e.g. the project title, address and the names and contact details of the employer and the project team);
(2) identifies the drawings upon which the BQ was based;
(3) depicts boundary of the construction site;
(4) provides information about existing buildings and existing mains services on or adjacent to the site, and about any existing records that will inform the contractor of any known or potential hazards that need to be considered;
(5) identifies known constraints and restrictions that might impact on the contractor's methodology for constructing the building or buildings;
(6) describes the building project in general;
(7) specifies the standard form of contract, together with the contract particulars and any amendments and/or supplementary or special conditions to the standard form of contract, which are to be entered into by the contracting parties; as well as the employer's requirements for insurances, parent company guarantees, performance bonds and collateral warranties;
(8) explains the documents provided, their content and how they are to be used;
(9) confirms the method of measurement, how to interpret the BQ and any special methods of measurement (i.e. where the method of measurement has deviated from the specified rules);
(10) sets out the employer's specific requirements for:
(i) management of the works by the contractor, including progress reporting, programme management and cost reporting requirements;
(ii) quality standards to be achieved, and quality control requirements, by the contractor, including inspection, testing and commissioning requirements;
(iii) security, safety and protection measures to be provided by the contractor;
(iv) facilities, temporary works and services required by the employer;
(v) specific requirements such as advertising, provision of a marketing suite or a topping out event;
(vi) specific limitations on method, sequence, timing of the 'works' imposed by the employer, including out of normal hours working and phasing requirements;
(vii) operation and maintenance of the finished building, including operation and maintenance (O&M) manuals, familiarisation training, tools and spare parts; and
(viii) post-completion requirements such as maintenance services.

Instructions to tendering contractors and other information relating to the tender process (e.g. information required to be submitted with tender submission, site visits, confidentiality, etc) form part of the invitation documents, but may not form part of the contract documents. Therefore, these should be addressed in a separate document (e.g. Conditions of Tender).

2.3.1.4 Pricing schedule (quantification of contractor's preliminaries):

It is not possible for the quantity surveyor/cost manager to quantify the contractor's preliminaries. This is because it is for the contractor to interpret the information provided as part of the tender invitation documentation. From the information provided, the contractor will ascertain his method of working and the resources required to complete the building project, as well as identify any other cost items that are to be recovered.

The Preliminaries bill is therefore to include a pricing schedule that simply lists the headings under which the contractor is to price its preliminaries items. Template for preliminaries pricing schedule is included in Appendix A, respectively, of these rules.

The pricing schedule is a simple a list of cost centers incorporated in the BQ in the which contractor insert its charges relating to preliminaries.

The pricing schedule for contractor's preliminaries is divided into two main cost centres:
(1) employer's requirements; and
(2) contractor's cost items.

Notwithstanding this, as part of the priced BQ submitted by the contractor, it is essential that the quantity surveyor/cost manager obtains a full and detailed breakdown that clearly identifies the cost items, showing how the price for each item has been calculated, and how the total price for preliminaries has been derived.

Accordingly, as part of the conditions of tender, the quantity surveyor/cost manager should instruct the contractor to return along with its tender a full and detailed breakdown that shows how the contractor's total price for preliminaries has been calculated. The contractor is to append this information to his priced BQ. To ensure that the contractor's detailed supporting calculations are presented in an easy-to-read and logical format, the contractor should be instructed to ascertain the price for preliminaries in accordance with the rules of measurement for contractor's preliminaries

It is also essential that the quantity surveyor/cost manager makes it clear to the contractor in the preliminaries bill and/or preliminaries pricing schedule that costs relating to items that are not specifically identified by the contractor in full and detailed breakdown will be deemed to have no cost implications or have been included elsewhere within its rates and prices.

APPPENDIX A: Template for Preliminaries (main contract) pricing schedule (expanded)

Cost centre	Component	Time-related charges	Fixed charges	Total charges
		RM	RM	RM
1.1	**EMPLOYMENT REQUIREMENTS**			
1.1.1	Accommodations			
1.1.1.1	Accommodations			
1.1.1.2	Furniture and equipment			
1.1.1.3	Telecommunications and it systems			
1.1.2	Site records			
1.1.2.1	Site records documentation			
1.1.2.2	Web-based information management systems			
1.1.3	Completion and post-completion requirements			
1.1.3.1	Handover requirements			
1.1.3.2	Operation and maintenance services			
1.1.3.3	Landscape management services			
1.2	**CONTRACTOR'S COST ITEMS**			
1.2.1	Management and staff			
1.2.1.1	Project-specific management and staff			
1.2.1.2	Visiting management and staff			
1.2.1.3	Extraordinary support costs			
1.2.1.4	Staff travel			
1.2.1.5	Profit and Attendance			
1.2.2	Site establishment			
1.2.2.1	Site accommodation			
1.2.2.2	Temporary works in connection with site establishment			
1.2.2.3	Furniture and equipment			
1.2.2.4	IT systems			
1.2.2.5	Consumable and services			
1.2.2.6	Brought-in services			
1.2.2.7	Sundries			
1.2.3	Temporary services			
1.2.3.1	Temporary water supply			
1.2.3.2	Temporary gas supply			
1.2.3.3	Temporary electricity supply			
1.2.3.4	Temporary telecommunication systems			
1.2.3.5	Temporary sewerage and drainage system			
1.2.4	Security			
1.2.4.1	Security staff			
1.2.4.2	Security equipment			
1.2.4.3	Hoarding, fences and gates			
1.2.5	Safety and environmental protection			
1.2.5.1	Safety programme			
1.2.5.2	Barriers and safety scaffolding			
1.2.5.3	Environmental protection measures			
1.2.6	Control and protection			

Cost centre	Component	Time-related charges	Fixed charges	Total charges
		RM	RM	RM
1.2.6.1	Survey inspections and monitoring			
1.2.6.2	Setting out			
1.2.6.3	Protection of finished works prior to project handover			
1.2.6.4	Samples			
1.2.6.5	Environmental control of building			
1.2.7	Mechanical plant			
1.2.7.1	Generally			
1.2.7.2	Tower cranes			
1.2.7.3	Mobile cranes			
1.2.7.4	Hoists			
1.2.7.5	Access plant			
1.2.7.6	Concrete batching plant			
1.2.8	Temporary works			
1.2.8.1	Access scaffolding			
1.2.8.2	Temporary works			
1.2.9	Building Information Modelling			
1.2.9.1	Information Model Requirement			
1.2.9.2	BIM Coordinator			
1.2.9.3	Information Management			
1.2.10	Site records			
1.2.10.1	Site records			
1.2.11	Completion and post-completion requirements			
1.2.11.1	Testing and commissioning plan			
1.2.11.2	Handover			
1.2.11.3	Post-completion services			
1.2.12	Cleaning			
1.2.12.1	Site cleanliness			
1.2.12.2	Maintenance of roads, paths and pavings			
1.2.12.3	Building cleaning			
1.2.13	Fees and charges			
1.2.13.1	Fees			
1.2.13.2	Charges			
1.2.14	Site services			
1.2.14.1	Temporary works			
1.2.14.2	Multi-service gang			
1.2.15	Insurance, bonds, guarantees and warranties			
1.2.15.1	Works insurance			
1.2.15.2	Public liability insurance			
1.2.15.3	Other insurances			
1.2.15.4	Bonds			
1.2.15.5	Warranties			
1.2.15.6	Sundries			
	Totals			
	TOTAL CARRIED TO MAIN SUMMARY		**RM**	

2.3.2 Work Sections 02–29 are as follows:

02 Industrialised Building System (IBS)
03 Demolitions, alterations, repairs and conservation
04 Excavation and filling
05 Ground remediation and soil stabilisation
06 Piling
07 Diaphragm walls and underpinning
08 Crib walls, gabions and reinforced soil structure
09 In-situ concrete works
10 Prestressed works and precast concrete
11 Masonry
12 Waterproofing
13 Roofing
14 Carpentry
15 Joinery
16 Structural steelwork
17 Metalwork
18 Cladding and covering
19 Floor, wall and ceiling finishes
20 Glazing
21 Decoration
22 Drainage and piping works below ground
23 Site works
24 Fencing and landscape
25 Plumbing services
26 Mechanical engineering installations
27 Electrical engineering installations
28 Transportation systems
29 Builder's work in connection with mechanical, electrical and transportation installations

2.3.3 A tabulated format ('the Table') is created for each of the above Work Sections and are structured as follows:

(1) The Table has a Main Page with the name of the Work Section and the list of group headings (the "Group Headings") comprised therein and numbered sequentially.

(2) The first four rows of the Table are set out in the following order:

(i) **First Row** – Information to be provided in the Specification

(a) This row lists important heads of information that are required to be further elaborated and incorporated in the Specification for Work Section concerned.
(b) There are two main types of specifications used, namely, 'prescriptive specifications' and 'performance specification'.
(c) The function of the prescriptive specification is to prescribe the materials, methods of assembly and installation and workmanship required for the building components/items in as much detail as possible. Specific products may be named, and the assembly of the products may be prescribed and supported with drawn information and schedules. Where materials are not named, reference will be made to the published standards governing their make e.g. British Standards, Malaysian Standards, JKR Standards, etc.

(d) A performance specification describes the requirements of a product (e.g. curtain walls), equipment (e.g. rainwater harvesting system), system or installation in terms of the performance objectives or criteria; in which case, the contractor is responsible for the selection of materials and design development to meet the performance requirements and therefore, the design may not need to be advanced for performance-specified work before inviting tenders from contractors.
(e) If there is NO mention of 'Performance Specification' in this row, the content will be treated as 'Prescriptive Specification'.

(ii) **Second Row** – Basic information to be shown in the 2D drawings or 3D models

(a) This row gives a guideline as to the following basic information to be shown in the 2D drawings or 3D models by the respective design consultants:
- any works and materials that cannot be drawn or modelled but need to be shown or stated on the drawings or models; and
- details required to be drawn or modelled when the Items' description makes reference to any drawing/model
  i.e. '..... as shown in Drawing (drawing nr)/model' – It should be NOTED that this guideline is deemed 'default'; therefore, it is not repeated in the Table.

This is to facilitate the extraction of 'quantities' from 2D drawings or 3D models. For 3D models, it also serves as a guide in filling the required details in the Model Content Matrix in the BIM Execution Plan.

(iii) **Third Row** - Specific rules of measurement

(a) This row gives specific rules of measurement where neither the Preambles nor the building component/item description can infer such rules.

(iv) **Fourth Row** - 'Works and materials deemed to be included' which are collectively referred to as the 'Preambles'

(a) This row gives the Preambles related to the works in Work Section concerned.
(b) The Preambles in SSM3 follow the normal industrial standards but are not exhaustive. The user can extract the required 'Preambles' from SMM3 including any amendments and additions, as the case may be, to be input into the BQ document.

3) The building components/items descriptions are organised under the Group Headings, each occupying a separate row. Below each Group Heading row, there are six columns to facilitate the input of each part of the building components/items descriptions and the related information as follows:

(i) First Column ('Item or work to be measured') lists the headings that form the first part of description of the building components/items ("the Heading") and sequentially numbered;
(ii) The second column ('Unit') lists the unit of measurement for a building component/item;
(iii) Third Column ('Level One') lists the information including any dimension requirements that is to be included in the description of the building components/items and sequentially numbered;
(iv) The fourth column ('Level Two') lists the supporting information, including any additional dimension requirements, which is to be included in the description of the building components/items and sequentially numbered;

(v) Fifth Column ('Level Three') lists the further supporting information, including any additional dimension requirements, which is to be included in the description of the building components/items and sequentially numbered;

(vi) Sixth Column ('Notes, Comments, and Glossary') deals with the following, where applicable:

(a) Definitions of some generic terms and phrases used in connection with the building components/items;

(b) Additional supporting information to be added into the Heading and/or any Level to complete the description or to create an additional description to form new building component/item;

(c) 'Notes' to be added preceding the Heading (which more frequently occurs for the Item with Contractor's design); and

(d) Clarification of the approach to quantification and items deemed to be included in the description of building components/items.

(4) The information listed in each of the six columns represent the basis rules of measurement for building components/items while the combination of these information will form the building components/items descriptions with unit of measurement with the following guidelines:

(i) If the building components/items have the same 'Heading' in their descriptions, then their description should have the same number of level of information and/or supporting information. In the event that any one of them is short of one such level, then 'generally' is to be used in its place;

(ii) The first word at all levels except the last level, and at the 'Heading' is to be capitalised. In the event that the last level is of a specific installation or system, the name of such installation/system is to be capitalised accordingly (e.g. Electrical Installation, Conveyor System, etc.);

(iii) The 'Heading ' and the 'supporting information' to the 'Heading' at any level are NOT exhaustive, but they represent the ones commonly encountered in forming the building component/item descriptions;

(iv) By adding the information requested for in the bracket i.e. '( )' (as highlighted in Item 2.2.7), new building components/items can be created in some cases;

(v) In some cases, additional information has to be added as accordingly advised in the Sixth Column.

(vi) Each 'Heading' (in the First Column) and its related information contained in Second to Sixth columns are distinguished using alternating colours of 'white' and 'light blue'; if a page lacks sufficient space to accommodate any part of the information in these columns, the content is seamlessly continued onto the next page with the same color code, without requiring a repetition of the 'Heading' and its other related information from the previous page;

(vii) In principle, the Table also serves as a 'standard template' for the creation of descriptions of any building components/items that are not included in the Table.

2.4 Coding

2.4.1 A numeric coding system may be developed using the sequential numbering in the Table across Work Section, Group Heading , and description levels. Example:

(1) *Work Section* : ***09 IN-SITU CONCRETE WORKS***
Group Heading : ***04 REINFORCEMENT***
'Heading' : *02 High tensile steel bar reinforcement*
Level One : *01 In foundations*
Level Two : *03 12mm diameter; curved*

(2) This results in the following six-facet code:
*** 09 04 02 01 03 00**
*** ('00' being the sixth facet indicates no Level Three)**

(3) Every component/item description code comprises six digits. In situation where there are no Level Two and Level Three, then the fifth and sixth facet are both '00'.

(4) It is not mandatory to code each level of the component/item description in the BQ preparation given in the Table. Nevertheless, the coding system in the Table can facilitate the creation of a coded standard component/item descriptions library for integration into a user organisation's software for digitisation of BQ and other related functions.

(5) New items created through bracketed input as highlighted in Paragraph 2.3.3 (8) and 2.3.3 (9) (iv) above must be assigned new codes. For example : For the Heading with the description, 'Mass in-situ, Grade C(grade)' , the third facet of the code can vary as follows:
* '01' for Mass in-situ concrete, Grade C20
* '02' for Mass in-situ concrete, Grade C30,
* '03' for Mass in-situ concrete, Grade C40, and so on
A similar situation can also occur at other levels of supporting information, where the aforementioned coding method can likewise be applied.

(6) In BQ documentation, it is good practice to indent each part of the description as shown in Paragraph 2.4.1 (1) above.

3.0 GENERAL MEASUREMENT RULES APPLICABLE TO ALL WORK SECTIONS

3.1 Quantities

3.1.1 The general rules for quantifying building components/items are as follows:

(1) Measurement and billing:

(i) Measure the work net in its fixed position unless otherwise stated.

(ii) Net quantity measured is deemed to include all additional material required for laps, joints, seams and the like, as well as any waste material.

(iii) Dimensions are measured to the nearest 10mm. 5mm and over shall be regarded as 10mm and dimensions less than 5mm shall be disregarded.

(iv) Except for quantities measured in tonnes (t), quantities are given to the nearest whole number. Quantities of less than one unit are to be given as one unit. Quantities measured in tonnes (t) shall be given to two decimal places.

(2) Making SMM3 BIM-friendly: By simplification of measurement and reduction of measurable building components/ items with the introduction of the following rules:

(i) Use of composite building components/items : It is a combination of various components or sub-components into its description ; for example, 'flush door' item with the door itself, door frames, architrave, painting, etc., stated therein, 'tiling' item with tiles, screeded bed, mortar, etc. stated therein, and 'portal frame' item with stanchions, rafters, struts, chords, painting, etc. stated therein;

(ii) Use of generic terms : It is a word or phrase encompassed a group of similar things ; for example, "narrow width structures' encompassed skirtings, risers, treads, edges of slabs , kerbs, and the like, and 'foundation' encompassed pad footings, pile caps, raft foundations, strip footings, column stumps and the like;

(iii) Use of total depth in stages for excavation work: For example, for foundation excavation, the use of 'not exceeding 2.00m total depth', 'not exceeding 4.00m total depth' and thereafter in 2.00m stages;

(iv) Use of only two stages of strutting for formwork based on total height: For example, for formwork to soffits of slabs and beams, the use of 'strutting not exceeding 3.50m total height', and 'strutting exceeding 3.50m total height';

3.1 Quantities (Cont'd)

(v) Measurement in 'm3' without stating the thickness: This is applicable generally to in- situ concrete items ; for example, for in-situ concrete to walls, blinding, and slabs, they are to be measured in 'm3' without stating the thickness;

(vi) Measurement in 'm2' without stating the height/depth: This is applicable generally to formwork items ; for example, for formwork to sides of foundations and edges of slabs , they are to be measured in 'm2' without stating the height/depth;

(vii) Measurement of voids, curved profile and sloping surface;

The following rules apply:

(a) Voids which are defined as openings or wants within or at the boundaries at the measured work are to be deducted irrespective of size

(b) 'Curved profile' is not required to state the radius except to state 'curved' in the description; and

(c) 'Sloping surface' is not required to state the degree of slope except to state 'sloping' in the description

3.2 Descriptions

3.2.1 Each Work Section of a BQ begins with the name of the Work Section as a top heading.

3.2.2 First column, third column, fourth column and fifth column of the Table give the respective parts of each building component/item description, the combination of all of which forms a complete component/item description (in some cases, with the additional information added as advised in sixth column, and some have only two parts, namely ,one at the first column and the other at the third column) while the second column is the 'unit' of measurement. The creation of such building components/items descriptions has also to follow the guidelines stipulated in paragraph 2.3.3 (4).

3.2.3 Unless specifically stated otherwise in the BQ or any part of the SMM3, descriptions for building components/items are generally to include the:

(1) Specific type and quality of the material;

(2) Material; Critical dimension(s) of the material(s);

(3) Nature or type of background; and

(4) Goods or materials that are to be incorporated into the work which are not at the discretion of the contractor.

3.2.4 Dimensions given as parts of the description or 'dimensioned description' to be replaced with dimension as part of the description are to be:

(1) stated in the sequence: length, width and height. Where ambiguity could arise, the dimensions can be identified in the description; and

(2) the finished lengths, widths and heights as specified or shown on the drawings with no allowance made for overlaps, scarcements and the like.

3.2.5 Any thickness given as part of the description is the finished thickness of the material after compaction and excludes the thicknesses of adhesives and/or bedding materials unless otherwise stated.

3.2.6 The use of hyphen (-) or the phrase 'to' between two dimensions in a description means a range of dimensions exceeding the first dimension stated but not exceeding the second.

3.2.7 Work with a concave, convex, conical, spherical and the like shape is to be so stated without the necessity of stating the radius/radii, but such information may be given by a precise and unique cross-reference to another document e.g. to a specification, a catalogue or a drawing.

3.2.8 Similarly, when 'as shown in the Drawing (drawing nr)/model' is being used in the building components/items description, then there is no necessity to state any dimensions in the

3.2 Descriptions (Cont'd)

same unless the building components/items referred thereto has different dimensions. In addition, if the BQ is prepared based on the 2D drawings, then '/model' is to be omitted while if based on 3D, 'Drawing (drawing nr)/model' to be omitted and replaced by 'relevant model in 2D drawing (timestamp reference)' as the case may be, in the building components/items description concerned.

3.2.9 When the name of manufacturer or supplier, product name and/or code is/are required to be stated in any building component/item description, the same should NOT be treated as mandatory for the Contractor to comply with; in turn, Contractor has the option to propose alternative insofar it/they is/are of equal or better than the same but subject to the S.O.'s approval at no extra cost. Nevertheless, if no such alternative is allowed, it is to be so stated in the description.

3.2.10 Unless specifically stated otherwise in the BQ or any part of the SMM3, each building component/item is deemed to include the following:

(1) Labour and all costs in connection therewith
(2) Materials and goods together with all costs in connection therewith
(3) Assembling, installing, erecting, fixing or fitting materials or goods in position
(4) Plant and all costs in connection therewith
(5) Waste of goods or materials
(6) All rough and fair cutting unless specifically stated
(7) Otherwise establishment charge, and;
(8) Cost of compliance with all legislation in connection with the work measured including health and safety, disposal of waste and the like.

3.3 Work of special types

3.3.1 Work of each of the following special types is being separately identified:

(1) Work to existing buildings: such work is defined as work on, in or immediately under buildings or structures existing before the current building project;

(2) Work carried out and subsequently removed;

(3) Work outside the curtilage of the site;

(4) Work carried out in extraordinary conditions, including:

(i) In, on or under water, stating whether river, canal, lake or sea and, where applicable, stating the mean spring levels of high and low water;
(ii) In tidal conditions;
(iii) Underground, stating mean depth;
(iv) In compressed air, stating the pressure and means of entry and exit; and
(v) In other types of extraordinary conditions.

Specific details pertaining to work carried out in each condition shall be given at the start of each applicable work section.

3.3.2 The additional rules for special types of work are to be read in conjunction with the rules in the appropriate Work Sections.

3.3.3 Details of the additional preliminaries that are pertinent to the special types of work are to be given in the description, drawing attention to any specific requirements due to the nature of the work.

3.4 Measurable work not covered by the tabulated rules

3.4.1 Building components/items not covered by the tabulated rules are, if possible, to be measured by rules for similar types of work (measured in accordance with the appropriate

3.4 Measurable work not covered by the tabulated rules (Cont'd)

Work Section). Rules of measurement adopted for such building components/items are to be clearly stated and fully defined in either the preliminaries or in the BQ (against the building components/items or items to which the rule relates). Such rules are to, as far as possible, conform to those given in the tabulated rules of measurement for similar building components/items.

3.4.2 Where it is not possible to derive the method of measurement from the tabulated rules, the rules chosen may be bespoke. In such cases, the rule or rules derived is/are to be reiterated in full in either the preliminaries or in the BQ (above the building components/items or items to which the rule relates i.e. under 'Notes' preceding the Heading of the building components/items concerned).

3.5 Procedure where work cannot be quantified

3.5.1 For the rules relating to work that cannot be quantified and described in accordance with the tabulated rules of measurement as they cannot entirely be foreseen, defined, or detailed at the time the tender documents are prepared, they are to be given a sum called 'Provisional Sum'.

3.6 Procedure where the exact type of product or component is not specified

3.6.1 Where the exact type of product or component cannot be specified, an estimated price for the product or component is to be given in the description as a Prime Cost unit rate (P.C. unit rates). State, for example, '* at P.C. unit rate of RM * per m for the supply only by a firm to be selected by the Architect; .....'.

3.6.2 Under each of the P.C. unit rates in the BQ, the contractor must price all items as listed in paragraph 3.2.9 above plus his 'Profit and Attendance' and wastage related thereto, which are to be used as a basis for adjustments if the eventual awarded price of the P.C. unit rate item differs from that originally provided in the BQ.

3.7 Procedure where the quantity of work cannot be accurately determined

3.7.1 Where work can be described and given in items in accordance with the tabulated rules of measurement, but the quantity of work cannot be accurately determined, an estimate of the quantity shall be given and identified as a 'Provisional Quantity'.

3.7.2 Work items identified as a 'Provisional Quantity' shall be subject to remeasurement when they have been completed. The 'Provisional Quantity' is to be substituted by the 'Firm Quantity' measured, and the total price for that item adjusted to reflect the change in quantity. Unless otherwise stated, where the variance between the 'Provisional Quantity' and the 'Firm Quantity' measured is less than 20 per cent, the rate tendered by the contractor shall not be subject to review; where the variance is significant (i.e. 20 per cent or more), the rate can be reviewed to ensure that it is fair and reasonable to both the employer and contractor.

3.8 Procedure where work or services to be executed by a nominated sub-contractor, a government or a statutory authority or for materials or goods to be obtained from a nominated supplier

3.8.1 A 'Prime Cost Sum' shall be provided for such work or services or materials or goods. Such sum shall be deemed to be exclusive of any profit required and/or attendance to be provided by the main contractor and provision shall be made for the addition thereof where applicable.

PART 2

TABULATED WORK SECTIONS

01
PRELIMINARIES

PART A: INFORMATION AND REQUIREMENTS

1.1 Generally
1.2 Project Particulars
1.3 Specifications and Drawings
1.4 The Site and Existing Buildings
1.5 Description of The Works
1.6 The Conditions of Contract
1.7 Employer's Requirements: Provision, Content and Use of Documents
1.8 Employer's Requirements: Works Management
1.9 Employer's Requirements: Quality Standards and Quality Control
1.10 Employer's Requirements: Security, Safety and Protection
1.11 Employer's Requirements: Specific Limitations on Method, Sequence and Timing
1.12 Employer's Requirements: Site Accommodation/Services/Facilities/Temporary Work
1.13 Employer's Requirements: Works, Goods and Materials By Others
1.14 Employer's Requirements: Building Information Modelling (Bim)
1.15 Employer's Requirements: As-built Drawings and Operation/Maintenance of Finished Building

PART B: PRICING SCHEDULE

1.1 EMPLOYER'S REQUIREMENTS
- 1.1.1 Accommodation
- 1.1.2 Site Records
- 1.1.3 Completion and Post-Completion Requirements

1.2 CONTRACTOR'S COST ITEMS
- 1.2.1 Management and Staff
- 1.2.2 Site Establishment
- 1.2.3 Temporary Services
- 1.2.4 Security
- 1.2.5 Safety and Environmental Protection
- 1.2.6 Control and Protection
- 1.2.7 Mechanical Plant
- 1.2.8 Temporary Works
- 1.2.9 Building Information Modelling
- 1.2.10 Site Records
- 1.2.11 Completion and Post-Completion Requirements
- 1.2.12 Cleaning
- 1.2.13 Fees and Charges
- 1.2.14 Site Service
- 1.2.15 Insurance, Bonds and Warrantiess

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.1 GENERALLY			
1 General	1 Definition and Interpretation	Explain how to interpret key words, terms, phrases and synonyms used in the preliminaries and specification.	
	2 Weight and Measurement	State the units of weight and measurement to be of imperial or metric format.	
	3 Singular and Plural	State the words importing singular only also include plural and vice versa where the context requires.	
	4 Abbreviations	State in long form of any abbreviations used in the Contract Documents	
	5 Tender Pricing	State tender price basis e.g. firm price or lump sum and its meaning.	
	6 Bills of Quantities	State if any bills of quantities to be applicable, if so, whether its firm, approximate and/or provisional.	
	7 Documentation Charges	1 State any documentation charges for tender/contract documents preparation. 2 State the mode of payment.	
	8 Preliminaries	1 State the basis of pricing preliminary items 2 State the evaluation method for preliminary Items for interim/stage payment purposes. 3 State whether the preliminary items are time, quantities or fixed for any loss/expense purposes.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.2 PROJECT PARTICULARS			
1 Project particulars	1 Name of project	Brief project title to be stated.	
	2 Nature of project	Brief description to be stated.	
	3 Location of project	Full postal address to be stated.	
	4 Period of contract	Period, in weeks, or months to be stated.	Where to be stated by the contractor, insert 'To be confirmed'
	5 Names, addresses and points of contact of employer, contractor and consultants	Function (e.g. architect), name of organisation, address, point of contact, telephone number and email address to be stated To include: (1) Employer (2) Project sponsor (3) Employer's representative (4) Contract administrator (5) Project manager (if applicable) (6) Contractor (7) Person empowered by the contract to act on behalf of the employer (person's title to be given (8) Architect (9) Civil and structural engineer (10) Mechanical and electrical engineer (11) Quantity surveyor (12) Consultants (separately identified) and (13) Others (please state)	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.3 SPECIFICATIONS AND DRAWINGS			
1 Specification	1 List of specifications	(1) Provide a list of specifications from which the BQ was prepared. (2) State the document title, reference, version and author/discipline.	
	2 List of specifications relating to the project but not included in the tender documents	(1) Provide a list of specifications relating to the contract but not included in the tender documents, which may be sighted/inspected by the contractor during the tender period. (2) State the document title, reference number, version number and author/discipline, (3) State details of where documents can be sighted/inspected.	
2 Drawings	List of drawings from which the BQ was prepared	Drawing number and title, including revision and author to be stated.	Exceptions to be stated.
3 Other documents	1 Pre-construction information	Explain how pre-construction information is dealt with (i.e. within the Preliminaries bill or as a separate document). Cross-reference to pre-construction information document if separate document.	
	2 List of drawings and other documents relating to the project but not included in the tender documents	(1) Provide a list of drawings and other documents relating to the project but not included in the tender documents, which may be sighted/inspected by the contractor during the tender period. (2) State document title, reference, revision, date of issue and author to be stated. (3) State details where documents can be sighted/inspected.	

	SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.4	**THE SITE AND EXISTING BUILDINGS**			
1	The site	Site details	(1) Description of the site. (2) Reference to drawing/s, showing the site boundaries and contractor's working area(s).	
2	Existing buildings on or adjacent the to site		Description of existing buildings on or adjacent to the site, if applicable.	
3	Surrounding land/ building uses	1 Address 2 Land / Building Use	(1) To identify land or building use. (2) Use or activities carried out on the land or in building(s).	
4	Existing mains services	1 On site 2 Adjacent to the site	(1) Identify existing mains services (2) Reference to drawings and (3) Other applicable information.	
5	Soils and ground water	Site Conditions	State information provided and where included in tender documents. Cross-reference as necessary.	
6	Site investigation			
7	Health and safety	1 Health and safety prerequisites 2 Other documents	(1) Availability for inspection. (2) Arrangements for inspection.	
8	Hazard	Hazards on site	Details of hazards that are or may be present on the site.	Where information provided in the pre-construction information, cross-reference accordingly.
9	Access to the site	1 Description 2 Limitations.	(1) State means and number of access to the site. (2) State any access limitations.	
10	Parking	Parking facilities	(1) Details of employer's requirements for parking. (2) Any parking payments of fees and charges, including parking bays and parking meter.	

	SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
11	Site Use	1 Description 2 Limitations	Details of site use and any limitations.	
12	Site visits	1 Purpose 2 Site Visit Arrangements	Include where information not given in the conditions of tender.	
1.5	**DESCRIPTION OF THE WORKS**			
1	The Works		Description of the Works.	
2	Preparatory work by others		Description of any preparatory work to be carried out by others.	
3	Work by others		Description of the works by others	
4	Completion work by others			
1.6	**THE CONDITIONS OF CONTRACT**			
1	Conditions of Contract	1 Form of Contract	(1) Full title of the standard or bespoke form of contract, including edition, revision and amendments. (2) Schedule of clause/condition headings in the standard form of contract. (3) Reference to any amendments to clauses/conditions to standard form of contract (see note (1)). (4) Reference to any supplementary or special clauses/conditions to standard form of contract. (5) Any insertion relating to articles of agreement, recitals and contract particulars or abstract of particulars. (6) Employer's requirements for performance bonds.	(1) reference to the schedule of amendments is to be made in this section of the Preliminaries bill. (2) where bespoke, or uncommon, form of contract used – a copy is to be appended to the BQ or included as part of the tender.

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.6 THE CONDITIONS OF CONTRACT (CONT'D)			
1 Conditions of Contract (Cont'd)	(as above)	(7) Employer's requirements for parent company guarantees. (8) Employer's requirements for collateral warranties.	
	2 Priority Order of Documents	State priority order requirements of contractual documents.	
	3 Language	State the applicable language of the Contract Documents.	
	4 Time of Essence	State if time is the essence in the Contract.	
	5 Delays	State requirements to allow for all possible delays caused by difficulty in obtaining labour and materials or by suspension of part or whole of the Works other than exceptionally inclement weather.	
	6 Failure to Achieve Performance	State consequences/implication should the whole or any part of the Works fail to achieve the performance required, guarantee or required by the Contract Documents.	
	7 Confidentiality	State any private and confidential requirement to keep all information, documents and all other matters arising or coming to their attention in connection with the Contract.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.7 EMPLOYER'S REQUIREMENTS: PROVISION, CONTENT AND USE OF DOCUMENTS			
1 Definitions and interpretations	1 Definitions	Explain how to interpret key words, terms, phrases and synonyms used in the Preliminaries, Specification and/or BQ_.	
	2 Communication	(1) Definition and format of communications. (2) Timing of response.	
	3 Products	Definition and/or meaning.	
	4 Site equipment		
	5 Drawings		
	6 Contractor's choice		
	7 Contractor's designed work		
	8 Proposal submission		
	9 Terms used in specification	Definitions and/or meaning of key words, terms, phrases and synonyms used in the specification.	
	10 Manufacturer and product references	(1) State manufacturer. (2) Definition of product terms. (3) Manufacturer's technical literature as applicable.	
	11 Substitution of products	(1) Definition and/or meaning of substitute/alternative products. (2) Process for acceptance and rejection of substitute/alternative products.	
	12 Cross-references	Explain method of cross referencing used.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.7 EMPLOYER'S REQUIREMENTS: PROVISION, CONTENT AND USE OF DOCUMENTS (CONT'D)			
1 Definitions and interpretations (Cont'd)	13 Referenced documents	Order of precedence of referenced documents.	
	14 Equivalent products	Definition and/or meaning.	
	15 Substitution of standards	(1) Definition and/or meaning. (2) Process for acceptance and rejection of substitute standards.	
	16 Currency of documents	Published documents, including revisions/ amendments, applicable to tender and contract documents (e.g. current tender invitation date).	
	17 Product sizes	(1) General definition of product sizes. (2) Exceptions to general definition.	(1) Products to be specified by their co-ordination size. (2) Exceptions to this rule to be stated.
2 Documents provided on behalf of employer	1 Additional copies of drawings and documents	Describe procedures.	
	2 Dimensions	Explain ownership of scaled dimensions.	
	3 Measured quantities	Explain order and precedence of measured quantities.	
	4 Specification	(1) Specification/references. (2) Explain the method used to cross reference specification clauses in other tender/contract documents.	
	5 Divergence from statutory requirements	Method and/or procedures for dealing with divergence from any statutory requirements.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.7 EMPLOYER'S REQUIREMENTS: PROVISION, CONTENT AND USE OF DOCUMENTS (CONT'D)			
2 Documents provided on behalf of employer (Cont'd)	6 Employer's policy documents	Requirements for compliance with the employer's policies. Examples include: – environmental. – sustainability. – corporate social responsibilities (CSR). – health and safety.	
3 Documents provided by the contractor, subcontractors and suppliers	1 Design information and documents	(1) General requirements, including design management and programming requirements. (2) Specific requirements for design information and documents (3) Format. (4) Number of copies. (5) Submission requirements.	
	2 Production information	(1) General requirements for production information. (2) Format. (3) Number of copies. (4) Submission requirements.	
	3 As-built/as-installed drawings and information	(1) General requirements. (2) Number of copies. (3) Submission requirements	
	4 Technical literature	(1) Literature to be maintained. (2) Requirements for literature to be available on site.	
	5 Maintenance instructions and guarantees	(1) Information requirements. (2) Format. (3) Number of copies. (4) Submission requirements.	Requirements relating to 'management information systems' to be stated under storage and information management requirements.

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.7 EMPLOYER'S REQUIREMENTS: PROVISION, CONTENT AND USE OF DOCUMENTS (CONT'D)			
3 Documents provided by the contractor, subcontractors and suppliers (Cont'd)	(as above)	(5) Storage and information management. (6) Requirements for emergency and/or out of normal working call-out services, including requirements for contact details and extent of coverage.	(as above)
	6 Energy rating calculations	(1) Information requirements. (2) Number of copies. (3) Submission requirements.	
	7 Environmental assessment information	(1) Scheme type. (2) Environmental targets (for site activities and the works). (3) Information requirements. (4) Format. (5) Number of copies. (6) Submission requirements.	
	8 Documents required before Practical Completion	(1) General requirement. (2) Specific requirements.	
4 Document and data interchange	1 Electronic data interchange (EDI)	(1) EDI requirements (2) Types and classes of communication. (3) Parties communication.	
1.8 EMPLOYER'S REQUIREMENTS: WORKS MANAGEMENT			
1 Employer's requirements – generally	1 Supervision	(1) General requirements. (2) Specific requirements.	Where become property of the contractor; consider seeking credit for materials/ products arising from the works.
	2 Consider contractor scheme/s	(1) Registration requirements. (2) Contact details. (3) Compliance requirements.	
	3 Insurance	(1) Types of insurance cover. (2) Documentary evidence required. (3) When and coverage period.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.8 EMPLOYER'S REQUIREMENTS: WORKS MANAGEMENT (CONT'D)			
1 Employer's requirements – generally (Cont'd)	4 Insurance claims	(1) Requirements for notifying events. (2) Requirements for indemnifying the employer. (3) Requirements for mitigation of any damages.	(as above)
	5 Climatic conditions	(1) State climate conditions. (2) Records to be maintained by contractor.	
	6 Ownership of materials/products arising from the works	Requirements for ownership, and removal from site.	
2 Programme/progress	1 Programme	(1) Type, format and content. (2) Levels of activities/events. (3) Document control requirements. (4) Submission requirements.	
	2 Revised programme	Specific requirements for revision and reissuing programme.	
	3 Commencement of work	(1) State any commencement conditions. (2) Notice or mobilization period to be given before the commencement of site work.	
	4 Monitoring progress	(1) List and description of key performance indicators (KPIs) to be maintained by contractor. (2) Requirements for reporting against KPIs. (3) Actions to be taken if KPIs not achieved. (4) Employer's specific requirements for reporting and avoiding potential delay.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.8 EMPLOYER'S REQUIREMENTS: WORKS MANAGEMENT (CONT'D)			
2 Programme/progress (Cont'd)	5 Compensation event(s)	(1) Requirements notifying compensation events (variations, extension of time, loss/expense, LADs). (2) Requirements for submission of Particulars and supporting documents.	
	6 Project progress meetings	(1) General requirements. (2) Proposed agenda. (3) Frequency. (4) Location/Venue. (5) Facilities. (6) Attendees. (7) Chairperson.	
	7 Contractor's progress report	(1) Form and content of report. (2) Method of presentation. (3) Submission requirements.	
	8 Contractor's site meetings	(1) General requirements. (2) Specific requirements.	
	9 Photographic records	(1) Image format. (2) Frequency. (3) Number of locations. (4) Number of images from each location. (5) Other requirements.	
	10 Early possession	Employer's specific requirements for early possession and taking over parts of the works before practical completion.	
	11 Notice of completion	(1) General requirements. (2) Minimum notice period by contractor to be stated.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.8 EMPLOYER'S REQUIREMENTS: WORKS MANAGEMENT (CONT'D)			
2 Programme/progress (Cont'd)	12 Extensions of time	(1) Requirements for notification. (2) Requirements for submission of particulars and supporting documents.	
3 Cost control	1 Cash flow forecast	(1) Basis of cash flow forecast. (2) Frequency. (3) Submission requirements.	
	2 Removal/replacement and making good of existing work	(1) Location. (2) Extent. (3) Requirements for execution.	
	3 Proposed instructions	(1) Requirements for estimates. (2) Content of estimates. (3) Other requirements.	
	4 Measurement of covered work	(1) General requirements. (2) Notice period before covering works to be measured.	
	5 Daywork vouchers	(1) Notice period before commencement of any daywork. (2) Submission requirements. (3) Verification requirements.	
	6 Interim applications, valuations and payments	(1) Process for agreeing interim payments and payment dates. (2) Content and submission requirements for interim payment applications. (3) Valuation requirements. (4) Specific payment and/or related invoicing requirements.	
	7 Payment for products not incorporated into the works	Information/evidence of title requirement for products stored on-site before payment.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.8 EMPLOYER'S REQUIREMENTS: WORKS MANAGEMENT (CONT'D)			
3 Cost control (Cont'd)	8 Payment for products stored off-site	Information/evidence of title requirement for products stored off-site before payment.	
	9 Labour and equipment returns	(1) Records to be maintained. (2) Content of records. (3) Submission of records.	
4 Workmen and Labour	1 Registration of Workmen with Department of Labour	State requirements for registration of Workmen with Department of Labour.	
	2 Workmen Identification Card	State requirements for Workmen Identification card.	
	3 On-site Training Scheme	State requirements for compliance with any on-site training scheme by the Authorities and/or Government.	
	4 Employment of Labour Generally	(1) State requirements to allow for all emoluments, allowances and expenses in compliance with the Employees Provident Fund Ordinance 1951 or any other provision by Statute, Tort or Common Law or legislation concerning labour employment. (2) State requirements to employ skilled and experienced persons in their respective trades for the Works.	
	5 Employment of Foreign Workers and Specialists	(1) State requirements in conforming to rules and requirements of immigration laws of the country and Malaysia. (2) Specify any special requirements.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.8 EMPLOYER'S REQUIREMENTS: WORKS MANAGEMENT (CONT'D)			
4 Workmen and Labour (cont'd)	6 Labour on-Costs	Provision of all costs for all workmen.	
	7 Dismissal by Request	State requirements to dismiss from the Works any person employed thereon who may be incompetent or misconduct himself.	
5 Statutory Requirements and Compliance	1 Custom Restriction, Quotas and Duties	(1) State requirements for compliance to all custom restrictions, quotas and duties and bearing costs arising therefrom. (2) State requirements to bear applicable increases and/or changes in import duty, tariffs and taxes etc. that may arise.	
	2 Taxation	State any Requirements for payment of statutory taxes under the applicable laws.	
	3 Withholding Tax Legislation	Provisions for non-resident contractors shall be subjected to the Withholding Tax Legislation (under Section 107A to the Income Tax Act 1967).	
	4 Police Regulations	State requirements to comply with applicable police regulations in connection with the Works.	
	5 Construction Industry Board of Malaysia (CIDB)	(1) State requirement to comply to Part VIII of the Lembaga Pembangunan Industri Pembinaan Malaysia Act 1994 and the Construction Industry (Levy Collection) Regulations 1996.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.8 EMPLOYER'S REQUIREMENTS: WORKS MANAGEMENT (CONT'D)			
5 Statutory Requirements and Compliance (Cont'd)	(as above)	(2) State requirement for CIDB Act 520 Fourth Schedule: Perakuan Pematuhan Standard (PPS) for Construction Materials compliance. (3) State requirements for Construction Activities Risk Assessment (CARA) using Hazard Identification, Risk Analysis and Risk Control [HIRARC] (CIS 25:2018 inclusion).	
	6 Occupational Safety and Health Act	(1) State requirement for complying with the Occupational Safety and Health Act 1994. (2) Provision of all necessary safety procedures and precautions.	
	7 Permits and Licenses	State requirement for all necessary permits and licence etc. required from the relevant authorities in connection with the carrying out of the Works and pay all fees and royalties in connection therewith.	
	8 Tax Incentives Obtained by the Employer	State requirement for Employer to apply tax incentives from the Government of Malaysia for the Works (or the project for which the Works form a part) in the form of tax exemption, tax credit, tax benefits or any other form.	
6 Information	1 Neglect to obtain Reliable Information	State requirements to obtain specific information and in failing which, its consequences.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.9 EMPLOYER'S REQUIREMENTS: QUALITY STANDARDS AND QUALITY CONTROL			
1 Standards of products and executions	1 Incomplete information	(1) Requirements for dealing with products/materials are not fully specified. (2) Status of works where the extent is not fully documented. (3) Status of omissions or errors in description and/or quantity.	
	2 Workmanship skills	Requirements for: (1) Appropriateness of contractor's operatives. (2) Registration scheme of contractor's operatives (3) Evidence of scheme registration requirements. (4) Other requirements.	
	3 Quality of products	Requirements for: (1) Using new and recycled products. (2) Supply of products. (3) Tolerances. (4) Deterioration prevention. (5) Other requirements.	
	4 Quality of execution	Requirements for: (1) Fixing, application and installation of products, including alignment. (2) Colour batching. (3) Dimensions. (4) Finished work. (5) Location and fixing of products. (6) Other requirements.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.9 EMPLOYER'S REQUIREMENTS: QUALITY STANDARDS AND QUALITY CONTROL (CONT'D)			
1 Standards of products and executions (Cont'd)	5 Compliance	Requirements for: (1) Compliance with proprietary specifications. (2) Compliance with performance specifications. (3) Other requirements.	
	6 Inspections	Requirements for inspecting products and work executed.	
	7 Related work	Requirements for coordinating workmanship of trades.	
	8 Manufacturer's recommendations/ instructions	(1) Requirements for compliance. (2) Version of manufacturer's recommendations/ instructions applicable to tender and contract (e.g. invitation date).	
	9 Water for the works	General requirements.	
2 Samples/Approvals	1 Samples	Requirements for samples of products, work executed and/or mock-ups.	
	2 Approval of product samples	(1) General requirements (including programming requirements) for submission of, inspection of, and tests on samples. (2) Definition of approval in context of samples. (3) Retention of complying samples, including storage requirements. (4) Other requirements.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.9 EMPLOYER'S REQUIREMENTS: QUALITY STANDARDS AND QUALITY CONTROL (CONT'D)			
2 Samples/Approvals (cont'd)	3 Approval of work executed/mock-ups	(1) General requirements (including programming requirements) for submission of, inspection of, tests on, work executed and mock-ups. (2) Definition of approval in context of work executed and mock-ups. (3) Retention of complying work executed and mock-ups, including storage requirements. (4) Other requirements.	
3 Accuracy/Setting out	1 Accuracy of instruments	(1) General requirements. (2) Specific requirements.	
	2 Setting out	(1) Preliminary steps. (2) Tools and equipment. (3) Setting out procedures. (4) Types of setting out	
	3 Appearance and fit	Requirements for tolerances and dimensions.	
	4 Critical dimensions	Details of critical dimensions.	
	5 Levels of structural floors	Maximum tolerances for designed levels to be stated.	
	6 Record drawings	(1) Requirements for recording details of grid lines, setting-out stations, benchmarks and profiles. (2) Information retention requirements. (3) Submission requirements. (4) Other requirements.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.9 EMPLOYER'S REQUIREMENTS: QUALITY STANDARDS AND QUALITY CONTROL (CONT'D)			
4 Services	1 Services regulations	(1) General requirements. (2) Specific requirements.	
	2 Water regulations/byelaws notification	(1) Governing bodies (2) Applicable regulations (3) Requirements for byelaw notification	
	3 Water regulations/byelaws contractor's certificate	(1) Content of certificate. (2) Submission requirements. (3) Other requirements.	
	4 Electrical installation certificate	(1) Submission requirements. (2) Other requirements.	
	5 Gas, oil and solid fuel appliance installation certificate	(1) Details of critical dimensions. (2) Requirement for installation. (3) Requirement for certification.	
	6 Mechanical and electrical services	(1) Requirements for final tests and commissioning. (2) Requirements for Building Regulations notice. (3) Other requirements.	
5 Supervision/ inspection/Defective work	1 Supervision	(1) General requirements. (2) Notice period for replacement of contractor's person in charge.	
	2 Co-ordination of mechanical and electrical engineering services	(1) General requirements. (2) Requirements for documentary evidence of contractor's staff.	
	3 Overtime working	(1) General requirements. (2) Specific requirements.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.9 EMPLOYER'S REQUIREMENTS: QUALITY STANDARDS AND QUALITY CONTROL			
5 Supervision/ inspection/Defective work (Cond't)	4 Defects in existing work	(1) Process and procedures for dealing with defects. (2) Process and procedures for dealing with remedial work.	
	5 Access for inspection	(1) General requirements. (2) Specific requirements.	
	6 Tests and inspections	(1) Timing requirements. (2) Records required. (3) Submission requirements. (4) Other requirements.	
	7 Air permeability	(1) Method. (2) Performance requirements. (3) Submission requirements (results). (4) Other requirements.	
	8 Continuity of thermal insulation	(1) General requirements. (2) Content of reports. (3) Submission requirements. (4) Number of copies. (5) Other requirements.	
	9 Resistance to passage of sound	(1) Method. (2) Compliance requirements. (3) Submission requirements. (4) Other requirements.	
	10 Energy performance certificate	(1) General requirements. (2) Format of certificate and report. (3) Submission requirements. (4) Other requirements.	
	11 Proposals for rectification of defective products/works	(1) General requirements. (2) Specific requirements.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.9 EMPLOYER'S REQUIREMENTS: QUALITY STANDARDS AND QUALITY CONTROL			
5 Supervision/ inspection/Defective work (Cond't)	12 Measures to establish acceptability	(1) Measures for accepting defects rectification. (2) Measures for accepting remedial work. (3) Measures for accepting defective works and any diminution value.	
	13 Quality control	(1) Procedural requirements. (2) Records required. (3) Content of records. (4) Other requirements.	
	14 Keeping Site Dry	State requirements to keep the Works and site dry and free from flooding and stagnant water at all times to ensure that Works can be carried out and completed accordingly.	
6 Work at or after completion	1 Work before practical complection	(1) General requirements. (2) Cleaning requirements, including cleaning materials and methods of cleaning. (3) Requirements for rectifying minor faults. (4) Requirements for moving parts.	
	2 Security at Practical Completion	(1) General requirements. (2) Requirements for keys.	
	3 Making good/rectification of defects	(1) Access arrangements. (2) Notice periods. (3) Completion requirements.	
	4 Highway/sewer adoption	(1) Description of work to be adopted. (2) Requirements for work for adoption.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.10 EMPLOYER'S REQUIREMENTS: SECURITY, SAFETY AND PROTECTION			
1 Security/health and safety	1 Pre-construction information	(1) Location of information. (2) Specific and impromptu requirements.	
	2 Execution hazards	(1) Management requirements for common hazards. (2) Details of any significant hazards.	
	3 Product hazards	(1) Requirements on hazardous substances. (2) Management requirements for common hazards. (3) Details of significant hazards in specified construction materials.	
	4 Construction phase health and safety plan	(1) General requirements. (2) Plan contents. (3) Submission requirements.	
	5 Security	(1) Requirements for protecting the site, the works, products, materials, and any buildings affected by the works, from damage and theft. (2) Requirements for preventing unauthorised access to the site, the works, and adjoining property. (3) Description of any special security requirements.	
	6 Stability	Requirements for maintaining stability and structural integrity of the Works and adjoining property.	
	7 Occupied premises	(1) Extent existing buildings will be occupied and/or used. (2) Method of working. (3) Requirements for overtime working.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.10 EMPLOYER'S REQUIREMENTS: SECURITY, SAFETY AND PROTECTION (CONT'D)			
1 Security/health and safety (Cont'd)	8 Passes	(1) Details of controlled areas. (2) Procedures for obtaining and returning passes.	
	9 Occupier's rules and regulations	(1) General requirements. (2) Location of rules and regulations. (3) Arrangements for inspection.	
	10 Use of mobile telephones	Requirements for use of mobile telephones on-site.	
	11 Employer representatives site visits	(1) Safety requirements. (2) Protective clothing, PPE and/or equipment requirements.	
	12 Working precautions/restrictions	(1) Details of precautions/restrictions. (2) Working requirements.	
	13 Mosquito Prevention and Pest Control	(1) State requirements of keeping dry all excavation and parts of the site where water stagnates or accumulates by acceptable means. (2) State appropriate precautions or requirements for prevention mosquitoes breeding and pest control. (3) State any non-compliance consequences/implications.	
	14 Preservation of Earth Slope	State requirements for all necessary precautions and protection to be taken to preserve all existing and newly formed earth slopes.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.10 EMPLOYER'S REQUIREMENTS: SECURITY, SAFETY AND PROTECTION (CONT'D)			
2 Protection against	1 Explosives	(1) Type and application. (2) Handling procedures/requirements. (3) State requirement for Statutory permit and compliance.	
	2 Noise consent by local authority	(1) General requirements. (2) Statutory requirements. (3) Special requirements.	
	3 Noise control		
	4 Pollution control	(1) Types of pollution to be controlled. (2) Statutory requirements. (3) Management practice. (4) Monitoring and reporting. (5) Sustainable construction techniques.	
	5 Pesticides	(1) Use. (2) Restrictions details. (3) Disposal requirements. (4) Operatives competency requirements.	
	6 Nuisance	(1) General requirements. (2) Statutory requirements (3) Special requirements.	
	7 Asbestos containing materials (ACM)s		
	8 Antiquities	(1) Types antiquities. (2) Statutory requirements. (3) Contractor responsibilities. (4) Management practice. (5) Monitoring and reporting.	
	9 Fire prevention	(1) General requirements. (2) Details of standards to contractor required to comply.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.10 EMPLOYER'S REQUIREMENTS: SECURITY, SAFETY AND PROTECTION (CONT'D)			
2 Protection against (Cond't)	10 Smoking on-site	(1) General requirements. (2) Special requirements.	
	11 Burning on-site	(1) General requirements. (2) Statutory requirements/compliance. (3) Special requirements.	
	12 Moisture	(1) Requirements to inspect and identify moisture presence and cause. (2) Requirements for preventing wetness and dampness. (3) Requirements for drying out.	
	13 Infected timber/contaminated materials	(1) General requirements. (2) Specific requirements	
	14 Waste	(1) Definition of waste. (2) General requirements, including minimizing waste, removing waste and excluding waste from voids and cavities in the construction. (3) Requirements for 'site waste management plans' (SWMP). (4) Documentation requirements. (5) Details of any key performance indicator (KPI) data to be provided. (6) Information and documentation submission requirements.	
	15 Electromagnetic interference	(1) General requirements. (2) Specific requirements	
	16 Laser equipment		
	17 Power actuated fixing systems		

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.10 EMPLOYER'S REQUIREMENTS: SECURITY, SAFETY AND PROTECTION (CONT'D)			
2 Protection against (Cond't)	18 Invasive species	(1) General requirements for prevention of invasive species (e.g. plants and animals). (2) Details of any special precautions. (3) Requirements for discovery and reporting.	
3 Protection on existing	1 Services	(1) Requirements to notify services authorities, statutory undertakers and/or adjoining adjacent owners. (2) Requirements for identification protection and/or diversion of any existing services. (3) Implications/consequences should damage occur to existing services. (4) Other requirements/conditions.	
	2 Roads and footpaths	(1) General requirements. (2) Implications/consequences should damage occur to existing roads and/or footpaths. (3) Other requirements/conditions.	
	3 Topsoil and subsoil	(1) Requirements for existing topsoil and subsoil. (2) Protective measures and details. (3) Other requirements.	
	4 Retained trees, shrubs and grassed areas	(1) Details of protective measures. (2) Implications/consequences should damage occur. (3) Other requirements/conditions.	
	5 Areas of retained trees	(1) Requirements for tree retention. (2) Details of protective measures.	
	6 Wildlife species and habitats	(1) General requirements. (2) Details of protective measures. (3) Other requirements.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.10 EMPLOYER'S REQUIREMENTS: SECURITY, SAFETY AND PROTECTION (CONT'D)			
3 Protection on existing (Cont'd)	7 Features	(1) General requirements. (2) Details of protective measures. (3) Special requirements.	
	8 Work	(1) Requirements for protecting removing and/or replacing existing works. (2) Details of protective measures. (3) Special requirements.	
	9 Furniture, fittings and equipment	(1) General requirements. (2) Details of protective measures. (3) Special requirements.	
	10 Valuable and vulnerable items	(1) General requirements. (2) Details of protective measures. (3) Special requirements.	
	11 Adjoining property	(1) General requirements. (2) Specific requirements/conditions. (3) Precautions to be taken. (4) Restrictions to be complied. (5) Consequence of damage.	
	12 Structures	(1) General requirements. (2) Specific requirements. (3) Statutory requirements.	
	13 Materials for recycling and/or reuse	(1) Sorting and damage prevention requirements. (2) Storage requirements. (3) Recycling requirements. (4) Proceeds from recycling and/or reuse .	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.10 EMPLOYER'S REQUIREMENTS: SECURITY, SAFETY AND PROTECTION (CONT'D)			
4 Closure and Restriction	1 Road Closure	(1) State requirements for road closure. (2) Any alternative access roads. (3) Requirement for SO/consultant and/or relevant Authorities approval for any roads closure.	
	2 Road Restrictions	(1) State requirements. (2) Precautions to prevent any unauthorized persons into the site. (3) Consequences for non-compliance.	
	3 Trespass	(1) State requirements. (2) State requirements against any infringement of air space or land. (3) Consequences of trespassing.	
1.11 EMPLOYER'S REQUIREMENTS: SPECIFIC LIMITATIONS ON METHOD, SEQUENCE AND TIMING			
1 General		(1) Any general limitations. (2) Supplementary to limitations described or implicit in information given in other sections or on the drawings details.	
2 Design constraints		Details of any design constraints.	
3 Method/sequence of work		Specific limitations relating to method and sequence of working, including phasing requirements.	
4 Use or disposal of materials		Specific limitations and requirements.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.11 EMPLOYER'S REQUIREMENTS: SPECIFIC LIMITATIONS ON METHOD, SEQUENCE AND TIMING (CONT'D)			
5 Working hours		(1) Definition and limitation of working hours. (2) State any overtime working conditions/requirements. (3) Statutory requirements and compliance.	
6 IBS – Industrialised Building System for Building Construction Work (GBI-FR;SM7)		State requirement to adhere to the IBS Content Scoring system based on CIDB's CIS 18:2010 Manual for IBS Content Scoring System (IBS Score) or equivalent as a standard method of assessment to achieve the required score for components of the Work.	
7 Completion of the Works of any section or part	1 Employer requirements for sectional completion	(1) General requirements. (2) Special requirements.	
	2 Remaining Works	Requirements for: (1) Provision of services. (2) Fire precautions. (3) Means of escape and safe access. (4) Insurances (5) Protection/barrier (6) Other requirements.	
1.12 EMPLOYER'S REQUIREMENTS: SITE ACCOMMODATION/SERVICES/FACILITIES/TEMPORARY WORK			
1 General	1 Spoil heaps, temporary works and services	(1) Requirements for siting of spoil heaps. (2) Requirements for maintenance, alteration, movement and/or removal of temporary works and services.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.12 EMPLOYER'S REQUIREMENTS: SITE ACCOMMODATION/SERVICES/FACILITIES/TEMPORARY WORK(CONT'D)			
2 Site accommodation	1 Site offices	(1) Specific requirements, including furniture and equipment. (2) Cleaning and maintenance requirements.	
	2 Meeting room		
	3 Off-site office/meeting room	(1) Preparatory works, including painting, decoration and applied finishings (e.g. carpet). (2) Specific requirements, including furniture and equipment. (3) Cleaning and maintenance requirements.	
	4 Sanitary accommodation	Specific requirements, including sanitary facilities.	
	5 Use of accommodation/land not included in the site	(1) Identification and conditions of accommodation and or land for use by the contractor for the project. (2) Location of accommodation/land. (3) Limitations/restrictions on use. (4) Requirements for temporary adaptations. (5) Cleaning and maintenance requirements. (6) Reinstatement requirements on vacating the accommodation/land.	
	6 Car parking	Specific requirements for car parking provision.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.12 EMPLOYER'S REQUIREMENTS: SITE ACCOMMODATION/SERVICES/FACILITIES/TEMPORARY WORK(CONT'D)			
3 Services and facilities	1 Lighting	Specific requirements for temporary lighting.	
	2 Lighting and power	(1) Requirements for : (a) Use of employer's mains supply. (b) Responsibility for continuity of supply. (2) Metering requirements. (3) Location of supply point. (4) Available capacity, frequency, phase and current type. (5) Conditions/restrictions imposed on relevant parties.	
	3 Water	(1) Requirements for : (a) Use of employer's mains supply. (b) Responsibility for continuity of supply. (3) Source of supply. (4) Location of supply point. (5) Conditions/restrictions imposed on contractor and/or relevant parties.	
	4 Mobile telephones	Requirements for: (1) Personnel to be provided with mobile telephones. (2) Responsibility for purchase and any rental charges, including call charges. (3) Disseminating telephone numbers. (4) Other requirements.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.12 EMPLOYER'S REQUIREMENTS: SITE ACCOMMODATION/SERVICES/FACILITIES/TEMPORARY WORK(CONT'D)			
3 Services and facilities (Cont'd)	5 Computers	(1) System requirements, including handovers, software, printers, cables and consumables. (2) Responsibility for cost of consumables. (3) Date to be installed. (4) Other requirements.	
	6 Email and internet facilities	(1) System requirements. (2) Date to be installed. (3) Responsibility for installation and any rental charges. (4) Other requirements.	
	7 Photocopier	(1) Specific requirements.	
	8 Temperature and humidity	Levels and records to be maintained by the relevant parties.	
	9 Beneficial use of permanent installed systems	Details of services systems, including lifts and sanitary installations, for use to complete the Works.	
	10 Meter readings	Requirements for meter readings records and submission.	
	11 Thermometers	Requirements for providing maximum and minimum thermometers for measuring atmospheric shade temperature.	
	12 Surveying equipment	Requirements for providing surveying equipment.	
	13 Personal protective equipment	Specific requirements	
	14 Other requirements	State any other requirements.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.12 EMPLOYER'S REQUIREMENTS: SITE ACCOMMODATION/SERVICES/FACILITIES/TEMPORARY WORK(CONT'D)			
4 Temporary works	1 Roads, hard standings and footpaths	Requirements for temporary roads, hard standings and footpaths on the site, including restrictions on use, protective and/or remedial measures.	
	2 Site boundary safety protection	Specific requirements (e.g. fences, hoardings, screens and roofs).	Site boundary safety protection shall be measured if Employer's Accomodations required special protection which exclude under item 1.2.4.3 page 77
	3 Temporary protection measures to existing trees/vegetation	(1) Location of temporary protection (by reference to drawing). (2) Standards of protective barriers and any other applicable physical protection measures. (3) Design details of physical protection measures (by reference to drawing). (4) Areas of structural landscaping to be protected from construction operations. (5) Requirements for maintaining integrity of protection for the duration of the works. (6) Requirements for removing protection on completion of the works.	
	4 Silting	(1) State requirements to keep all drains, stream and waterways free from mud, silt, debris and other obstructions. (2) Make good where necessary to S.O's satisfaction.	
	5 Sign boards	(1) General requirements. (2) Statutory requirements and compliance. (3) Specific requirements.	
	6 Maintenance of access roads and pathways		

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.12 EMPLOYER'S REQUIREMENTS: SITE ACCOMMODATION/SERVICES/FACILITIES/TEMPORARY WORK(CONT'D)			
4 Temporary works (Cont'd)	7 Advertising	(1) General requirements. (2) Statutory requirements and compliance. (3) Specific requirements.	
	8 Other requirements		
1.13 EMPLOYER'S REQUIREMENTS: WORKS, GOODS AND MATERIALS BY OTHERS			
1 Works, Goods and Materials by Others	1 Works by nominated sub-contractors (NSC)	(1) Description of works. (2) Name and address of the NSC. (3) Duration of the works.	
	2 Goods and Materials from nominated suppliers	(1) Description of materials. (2) Name and address of the NS. (3) Supply requirements.	
	3 Works by government or statutory authorities	(1) Description of works. (2) Name and address of the relevant authorities. (3) Duration of the works.	
	4 Works or goods and materials by the Employer	(1) Description of works. (2) Description of goods and/or materials. (3) Name of trade contractor or supplier/s (if any).	
1.14 EMPLOYER'S REQUIREMENTS: BUILDING INFORMATION MODELLING (BIM)			
1 Information model requirements		(1) State the form of the information model. (2) State requirements for creating the information model or, identify the document containing the requirements which may include: • Procedure requirements • Model standards	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.14 EMPLOYER'S REQUIREMENTS: BUILDING INFORMATION MODELLING (BIM) (CONT'D)			
1 Information model requirements (Cont'd)	1 Level of development (LOD) 2 Model structure 3 Information requirements 4 Interoperability 5 Clash detection and coordination 6 Compliance with BIM Execution plan 7 Model uses	• Roles and responsibilities • Model use glossary • Model use requirements • Information exchange formats • Model and production standards • Survey standards • Common data environment requirements and • Deliverables	
2 BIM coordinator	1 Technical skills 2 Knowledge requirements 3 Coordination responsibility 4 Communication and collaboration	State requirements.	
3 Information management	1 Setting Project Information Rules 2 Shared Project Data Space 3 Creating and Organizing Data 4 Sharing Project Information 5 Checking and Approving Data 6 Using Information for Project Tasks 7 Keeping Information Safe and Controlled	State requirements.	
1.15 EMPLOYER'S REQUIREMENTS: AS-BUILT DRAWINGS AND OPERATION/MAINTENANCE OF FINISHED BUILDING			
1 As-Built Drawings	1 Generally	(1) Format and Software Requirements. (2) Clear Identification. (3) Accuracy. (4) Detailed Annotations. (5) Legend and Symbols. (6) Coordinate System. (7) Building Systems. (8) As-built Updates During Construction. (9) Quality Assurance. (10) Submission and Delivery.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.15 EMPLOYER'S REQUIREMENTS: AS-BUILT DRAWINGS AND OPERATION/MAINTENANCE OF FINISHED BUILDING (CONT'D)			
2 Operation and maintenance manual	1 Generally	(1) Purpose. (2) Scope. (3) Responsibility for preparation. (4) Information to be provided by others. (5) Review process. (6) Number of copies. (7) Latest date for submission of final manual. (8) As-built/as-installed drawings manual: (a) format and standard (b) number of copies	The operation and maintenance information, including health and safety, and all other information can be combined as a single document.
	2 Content	Specific requirements.	In this case, the document can be referred to as the 'building manual'.
3 Health and safety file	1 Generally	(1) Purpose. (2) Scope. (3) Responsibility for preparation. (4) Information to be provided. (5) Review process. (6) Number of copies. (7) Latest date for submission of final file.	
	2 Content	Specific requirements.	
4 Web-based information management system		Specific requirements.	
5 Presentation of documents	1 Operation and maintenance manual	Specific requirements for format and presentation.	
	2 Health and safety file		
	3 Other documents	Specific requirements.	

SUB-HEADING 1	SUB-HEADING 2	INFORMATION REQUIREMENTS	SUPPLEMENTARY INFORMATION/NOTES
1.15 EMPLOYER'S REQUIREMENTS: AS-BUILT DRAWINGS AND OPERATION/MAINTENANCE OF FINISHED BUILDING (CONT'D)			
6 Other employer specific requirements	1 Maintenance services	Specific requirements for post completion maintenance (planned and preventive).	
	2 Information for commissioning services	Specific requirements.	
	3 Training		
	4 Spare parts		
	5 Tools		
7 Other information		Specific requirements.	

PART B: PRICING SCHEDULE

1.1 EMPLOYER'S REQUIREMENTS

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.1.1 ACCOMMODATIONS					
1	Accommodations	Site accommodation for the employer its representatives for example: – site offices. – sanitary accommodation. – welfare facilities. – foundations to site accommodation. – temporary drainage to accommodation. – temporary services. – security alarms. Type and extent of accommodation to be provided to be stated; with each type separately quantified.	item	Fixed charge	All accomodations items shall be measured if the accomodations of Employer and Employer's representative measured separately from Contractor's accomodations". Site accommodation, furniture and equipment, telecommunication and IT systems for the employer and the employer representatives forming an integral part of the contractor's site accommodation (included in section 1.2: in contractor's cost items, as appropriate).
		1 Bringing to site and installing, including all temporary facilities, services and security alarms.			
		2 Adaptations/alterations during works.			
		3 Dismantle and remove from site, including to rectify any damage.			

1.1 EMPLOYER'S REQUIREMENTS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.1.1 ACCOMMODATIONS (CONT'D)					
1	Accommodations (Cont'd)	4 Maintaining.	week/ month	Time-related charge	
		5 Cleaning.			
		6 Charges.			
		7 Off-site rented temporary accommodation.			
		8 Rectify damage to off-site rented temporary accommodation.	item	Fixed charge	
2	Furniture and equipment	Furniture and equipment for the Employer and Employer's representatives for example, desks, meeting table and chairs, cupboards, kettles, coffee maker, and consumables.			
		1 Deliver to site, install, place and/or fix.	item	Fixed charge	
		2 Cleaning.	week/ month	Time-related charge	
		3 Charges.			
		4 Dismantle and remove from site.	item	Fixed charge	

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.1.1 SITE ACCOMMODATION (CONT'D)					
3	Telecommunications and IT systems	Telecommunication and IT systems including all necessary networking for the Employer and the Employer's representatives for example telephones, fax machines, photocopier, computers, printers and consumables.			
		1 Purchase charges.	nr	Fixed charge	
		2 Hire charges.	week/ month	Time-related charge	
		3 Consumables.			
1.1.2 SITE RECORDS					
1	Site records documentation	1 Daily operation and maintenance manuals.	item	Fixed charge	
		2 Health and safety file.			
2	Web-based Information Management for site operation	1 Provision of system.	week/ month	Time-related charge	
		2 Upload data.			
		3 Training of building user's staff in web-based management system operation.			

1.1 EMPLOYER'S REQUIREMENTS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.1.3 COMPLETION AND POST-COMPLETION REQUIREMENTS					
1	Handover requirements	1 Training of building user's staff in operation and maintenance of building services systems. 2 Provision of spare parts for maintenance of building services/systems. 3 Provision of tools and portable indicating instruments for operation and maintenance of building services systems. 4 Provision of keys and/or related security system, including all necessary tagging/labelling.	item	Fixed charge	
2	Operation and maintenance services	1 Operation and maintenance of building engineering services installations, mechanical plant and equipment and the like during the defects liability period, period for rectifying defects, maintenance period or other specified period (i.e. additional services).	week/ month	Time-related charge	
3	Landscape management services	1 Maintenance of internal and external landscaping.			

1.2 CONTRACTOR'S COST ITEMS

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.1 MANAGEMENT AND STAFF					
1	Project-specific management and staff	Contractor's project specific management and staff such as: 1 Project Manager/Director 2 Construction Manager 3 Works/trade package managers 4 Building services engineering managers/co-ordinators 5 Off-site production managers 6 Health and Safety Manager/ Officers 7 Commissioning Manager (building engineering services) 8 Planning/programming manager and staff 9 Senior/managing quantity surveyor 10 Project/package quantity surveyors	(nr) man-hour per week/ month	Time-related charge	1 Security staff (included in section 1.2.4: Security).
		11 Procurement manager 12 Design manager 13 Project engineers	week/ month		

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.1 MANAGEMENT AND STAFF (CONT'D)					
1	Project-specific management and staff (Cont'd)	14 Environmental manager	(as above)	(as above)	(as above)
		15 BIM Manager			
		16 BIM Co-ordinator			
		17 BIM Modeller			
		18 Temporary works design engineers			
		19 Materials management staff (e.g. storekeeper)			
		20 Supervisor			
		21 Administrative staff, including secretary, document controllers, finance clerks and the like			
		22 Other management and staff			
2	Visiting management and staff	1 Managing director, regional director, operations director, commercial director and the like			1 Visiting management and staff for which an allowance has been made within the contractor's overheads.
		2 Quality manager			
		3 Contracts/commercial manager			
		4 Health and safety manager			

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.1 MANAGEMENT AND STAFF (CONT'D)					
2	Visiting management and staff (Cond't)	4 Health and safety manager	(as above)	(as above)	(as above)
		5 Environmental manager/ consultant			
		6 Other visiting management and staff			
3	Extraordinary support costs	1 Legal advice costs (i.e. solicitors)	item	Fixed charge	1 Extraordinary support costs for which an allowance has been made within the contractor's overheads.
		2 Recruitment costs			
		3 Team building costs			
		4 Other extraordinary support costs			
		5 Day transport.	week/ months	Time-related charge	
		6 Personnel transport (i.e. transportation of workers to/ from site).			
		7 Temporary living accommodation (e.g. long/ medium term accommodation costs)	(nr) days per (nr) weeks/ months	Time-related charge	
		8 Subsistence payments			
		9 Out of normal hours working, including non-productive overtime allowances			

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.1 MANAGEMENT AND STAFF (CONT'D)					
4	Staff travel	Costs associated with off-site visits such as: 1 Visit to employer's and consultants' offices. 2 Visit to subcontractors' offices/works. 3 Overseas visit. 4 Overnight expenses.	nr (number of occasions)	Fixed charge	
5	Profit and Attendance	Costs associated with attendance of the works, goods and materials, such as: 1 Use of Contractor's temporary roads, pavings and paths, standing scaffolding, standing power operated hoisting plant, the provision of temporary lighting and water supplies, clearing away rubbish, provision of space for sub-contractor's own offices and for it's storage of plant and materials and use of messrooms, sanitary accommodation and welfare facilities, etc.	Item	Fixed charge	Profit and Attendance (P&A) priced in Preliminaries where not priced in other Work Sections.
		2 Special scaffolding or scaffolding additional to the Contractor's standing scaffolding.	week/ month	Time related	

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.1 MANAGEMENT AND STAFF (CONT'D)					
5	Profit and Attendance (Cont'd)	3 Provision of temporary access roads and hard standings in connection with structural steelwork, precast concrete components, piling, heavy items of plant and the like. 4. Unloading, distributing, hoisting, placing in position giving in the case of significant items the weight and/or size. 5 Provision of covered storage and accommodation including lighting and power thereto. 6 Maintenance of specific temperature or humidity levels.	(as above)	(as above)	
1.2.2 SITE ESTABLISHMENT					
1	Site accommodation	Provision of Contractor's and common user temporary site accommodation such as: – offices. – conference/meeting rooms. – canteens and kitchens. – drying rooms. – toilets and washrooms. – first aid room. – laboratories. – workshops.	week/ months	Time-related charge	Type and extent of all accommodation to be provided and stated; with each type separately quantified. To state details specification of an item of site establishment such as size, dominant materials, drawing number (if any), technical specifications (if any), etc.

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.2 SITE ESTABLISHMENT (CONT'D)					
1	Site accommodation (Cond't)	– secure stores. – compounds, including containers for material storage. – security control room. – stairs and office staging.	week/ months	Time-related charge	Employer's accommodation, where not an integral part of the contractor's site accommodation (included in section 1.1.1: Site accommodation). All items if measured as Time-related Charge shall include "(effective time charge)" in their description. Temporary bases, foundations and provision of drainage and services to temporary site accommodation (included in component 1.2.2.2: Temporary works in connection with site establishment). If there are long list of required items, it is necessary to provide the accomodations list and it's details in Appendix's Section within Document Tender with stated "as specified in Appendix (ref)" in item's heading. - The list under Appendix also need to provide empty space in order the contractor to add any related things that they required
		1. Purchase charges.	item	Fixed charge	
		2 Hire charges.	week	Time-related charge	
		3 Temporary accommodation made available by the employer.	week/ month	Time-related charge	
		4 Security alarms.	item	Fixed charge	
		5 Land/property rental where site accommodation located off-site.	week/ month	Time-related charge	

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.2 SITE ESTABLISHMENT (CONT'D)					
1	Site accommodation (Cont'd)	6 Alterations and adaptations to site accommodation, including partitioning, doors, painting and decorating, and the like.	item	Fixed charge	Service provider's charges for temporary services (included in section 1.2.13: Fees and charges). Rates for temporary services (included in section 1.2.13: Fees and charges).
		7 Relocation and alterations of temporary accommodation during construction stage.			
		8 Reinstating temporary site accommodation to original condition prior to removal from site.			
		9 Removal of site accommodation and temporary works in connection with site accommodation.			
2	Temporary works in connection with site establishment	1 Temporary bases and foundations for site accommodation, including maintenance and reinstatement of existing surfaces on completion of the works.	m2	1 Fixed charge 2 Time-related charge	1 Provision of temporary services to site establishment (included in section 1.2.3: Temporary services). 2 Provision of temporary drainage to site establishment (included in section 1.2.3: Temporary services).
		2 Connections to temporary service, including maintenance and removal on completion of the works.	nr		

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.2 SITE ESTABLISHMENT (CONT'D)					
2	Temporary works in connection with site establishment (Cont'd)	3 Connections to temporary drainage, in including maintenance and removal on completion of the works.	nr	(as above)	3 Hoardings, fans, fencing and the like to site boundaries and to form site compounds (included in section 1.2.4: Security (Hoardings, fences and gates).
		4. Temporary site roads, paths and pavings (including on-site car parking), including reinstatement of existing surfaces on completion of the works.	m		
		5 Temporary surface water drainage to temporary site roads, paths and pavements, including maintenance and removal on completion of the works.	m		
3	Furniture and equipment	1 Workstations for staff, including maintenance.	nr	1 Fixed charge 2 Time-related charge	1 Telephone and fax installations (included in section 1.2.3: Temporary services). 2 Computers and IT associated equipment (included in component 1.2.2.4: IT systems).
		2 General office furniture, including maintenance.	item		
		3 Conference/meeting room furniture, including maintenance.			
		4. Photocopiers, including purchase/rental, maintenance and other running costs.			
		5 Canteen furniture, including maintenance.			

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.2 SITE ESTABLISHMENT (CONT'D)					
3	Furniture and equipment (Cont'd)	6 Canteen equipment, including purchase/rental, maintenance and other running costs.	(as above)	(as above)	(as above)
		7 Floor coverings, including maintenance.			
		8 Water dispensers, including purchase/rental, maintenance and other running costs.			
		9 Air conditioning unit including, maintenance.			
		10 Other office equipment, including maintenance.			
		11 Maintenance furniture and floor covering.			
		12 Removal of furniture and equipment.			
4	IT systems	1 Computer hardware, including purchase/rental, installation, initial set up, maintenance and running costs, such as: – desktop computers and laptop computers. – CAD stations. – server and network equipment. – printers and plotters. – other computer system hardware.	item	1 Fixed charge 2 Time-related charge	1 Computer and printer consumables (included in component 1.2.2.5: Consumables and services). 2 Document management, including electronic data management systems (EDMS) (included in component 1.2.2.6: Brought in services).

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.2 SITE ESTABLISHMENT (CONT'D)					
4	IT systems	2 Software and software licences.	(as above)	(as above)	
		3 Modem lines, modems and connections (i.e. email and internet capability).			
		4 WAN lines and connections (if on WAN).			
		5 Line rental charges.	week/ month	Time-related charge	
		6 Internet/website addresses.	nr	Fixed charge	
		7 Internet service provider (ISP) charges.			
		8 Line calls charges.	week/ month	Time-related charge	
		9 IT support and maintenance.			
		10 Cloud or equivalent data storage.			
5	Consumables and services	1 Stationery.	week/ month	Time-related charge	
		2 Computer and printer consumables (e.g. ink cartridges).			
		3 Postage.			
		4 Courier charges.			

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.2 SITE ESTABLISHMENT (CONT'D)					
5	Consumables and services	5 Tea, coffee, water bottles and the like.	(as above)	(as above)	
		6 First aid consumables.			
		7 Photocopier consumables (e.g. paper and toners).			
		8 Fax consumables (e.g. paper and toners).			
		9 Drawing printer consumables (e.g. ink cartridges).			
6	Brought-in services	Services outsourced by the contractor such as:	week/ month	Time-related charge	
		1 Catering.			
		2 Equipment maintenance.			
		3 Document management, including management information systems and electronic data management systems (EDMS).			
		4 Printing (purchasing), including reports and drawings.			
		5 Staff transport.			
		6 Off-site parking charges.			

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.2 SITE ESTABLISHMENT (CONT'D)					
6	Brought-in services (Cont'd)	7 Meeting room facilities.	(as above)	(as above)	(as above)
		8 Photographic services.			
		9 Other.			
7	Sundries	1 Contractor's signboards.	item	Fixed charge	
		2 Safety and information notice boards.			
		3 Shelters.			
		4 Tool stores.			
		5 Crane signage.			
		6 Employer's composite signboards.			
1.2.3 TEMPORARY SERVICES					
1	Temporary water supply	1 Temporary connections.	nr	1 Fixed charge 2 Time-related charge	
		2 Distribution equipment, installation and adaptations.	item		
		3 Meter charges.	week/ month		

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.3 TEMPORARY SERVICES (CONT'D)					
2	Temporary gas supply	1 Gas connection.	nr	1 Fixed charge 2 Time-related charge	
		2 Distribution equipment, installation and adaptations.	item		
		3 Charges.	Week/ month		
		4 Bottled gas.			
3	Temporary electricity supply	1 Temporary connections.	nr	Fixed charge	
		2 Temporary electrical supply for tower cranes.	item		
		3 Charges – power consumption for site establishment.	item	Time-related charge	
		4 Charges – power consumption for the works.			
		5 Distribution equipment, installation and adaptations.	item	Fixed charge	
		6 Attendance.	nr	Time-related charge	
		7 Uninterrupted power supply (UPS).	item	Fixed charge	
		8 Temporary substation modifications.			

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.3 TEMPORARY SERVICES (CONT'D)					
4	Temporary telecommunication systems	1 Landlines (including connection and rental charges), including: – telephone and fax lines. – internet. – ISDN lines.	item	1 Fixed charge 2 Time-related charge	1 Fax consumables (included in component 1.2.2.5: Consumables and services).
		2 Telephone and facsimile equipment (including connection and rental charges), including: – PABX equipment. – handsets, including purchase or rental. – fax machines, including purchase or rental. – Internet supplies, including rental package. – installation of equipment. – maintenance of equipment.			
		3 Mobile (cellular) phones, including: – mobile phones, including purchase or rental and connection charges. – spare batteries. – mobile phone charges.		3 Fixed charge/ Time-related charge	
		4 Telephone charges, including: – telephone call charges. – fax charges. – fax and telephone consumables.			

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.3 TEMPORARY SERVICES (CONT'D)					
4	Temporary telecommunication systems (Cont'd)	5 Radios (including purchase or rental charges), including: – base set. – handsets and chargers. – repairs and maintenance. – licences. – spare batteries.	(as above)	(as above)	(as above)
5	Temporary sewerage and drainage system	1 Temporary mains.	item	1 Fixed charge 2 Time-related charge	
		2 Septic tanks.	nr		
		3 On-site treatment plant.	item		
		4 Holding tanks.	nr		
		5 Sewage pumping.			
		6 Distribution pipework, etc.	item		
		7 Drainage installation and adaptations.	item		
		8 Disposal charges (i.e. rates).	week/ month	Time-related charge	
		9 Disposal costs (i.e. tanker charges).			

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.4 SECURITY					
1	Security staff	1 Security guards (day and night).	nr (number of persons by number of man hours per week/ month by number of weeks/ months)	Time-related charge	
		2 Watchmen (day and night).			
2	Security equipment	1 Site pass issue equipment, including maintenance and removal.	item	1 Fixed charge 2 Time-related charge	
		2 Site pass consumables.			
		3 CCTV surveillance installation, including maintenance and removal.			
		4 Temporary vehicle control barriers, including maintenance and removal.	nr		
3	Hoardings, fences and gates	1 Perimeter hoardings and fencing and the like to site boundaries and to form site compounds.	m	1 Fixed charge 2 Time-related charge	
		2 Access gates, including frames and ironmongery.	nr		

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.4 SECURITY (CONT'D)					
3	Hoardings, fences and gates (Cont'd)	3 Painting of hoardings, fencing, gates, and the like.	m	(as above)	
		4 Temporary doors.	nr		
		5 Modification to line of hoarding and fencing during construction.			
		6 Dismantling and removal of hoarding, fencing, gates, and the like.	m		
1.2.5 SAFETY AND ENVIRONMENTAL PROTECTION					
1	Safety programme	Works required to satisfy requirements of the relevant Acts and Regulations: 1 Health and safety manager/ officers.	nr (number of persons by number of man hours per week/ month by number of weeks/ months)	Time-related charge	1 Health and safety manager/ officers (included in section 1.2.1: Management and staff). 2 Welfare facilities (included in section 1.2.2: Site establishment).
		2 Safety audits, including safety audits carried out by external consultant.	nr	1 Fixed charge. 2 Time-related charge	
		3 Staff and worker safety training	item	Fixed charge	

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.5 SAFETY AND ENVIRONMENTAL PROTECTION (CONT'D)					
1	Safety programme (Cont'd)	4 Notices and information to neighbours.	item	1 Fixed charge 2 Time-related charge	
		5 Personal protective equipment (PPE), including for employer and consultants.	nr (sets)		
		6 PPE for multi-service gangs.			
		7 Fire points.	nr		
		8 Temporary fire alarms.			
		9 Fire extinguishers.			
		10 Statutory safety signage.	item		
		11 Nurse.	nr (number of persons by number of man hours per week/ month by number of weeks/ months)	Time-related charge	
		12 Traffic marshals.			
2	Barriers and safety scaffolding	1 Guard rails and edge protection (e.g. to edges of suspended slabs and roofs).	item	1 Fixed charge 2 Time-related charge	

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.5 SAFETY AND ENVIRONMENTAL PROTECTION (CONT'D)					
2	Barriers and safety scaffolding	2 Temporary staircase balustrades (i.e. to new staircases during construction).	(as above)	(as above)	
		3 Lift shaft protection.			
		4 Protection to holes and openings in ground floor slabs, suspended slabs and the like.			
		5 Debris netting/plastic sheeting.			
		6 Fan protection.	item		
		7 Scaffold inspections.	nr		
		8 Hoist run-offs.	item		
		9 Protective walkways.			
		10 Other safety measures.			
3	Environmental protection measures	1 Control of pollution.	item	1 Fixed charge 2 Time-related charge	
		2 Residual control of noise.			
		3 Environmental monitoring.			

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.5 SAFETY AND ENVIRONMENTAL PROTECTION (CONT'D)					
3	Environmental protection measures (Cont'd)	4 Environmental manager/ consultant.	nr (number of persons by number of man hours per week/ month by number of weeks/ months)	Time-related charge	
		5 Environmental audits, including safety audits carried out by external consultant.	nr	1 Fixed charge 2 Time-related charge	
1.2.6 CONTROL AND PROTECTION					
1	Survey, inspections and monitoring	1 Surveys. 2 Topographical survey. 3 Non-employer dilapidation survey. 4 Structural/dilapidations survey adjoining buildings. 5 Environmental surveys. 6 Movement monitoring. 7 Maintenance and inspection costs.	item	1 Fixed charge 2 Time-related charge 3 Per visit/survey	Environmental monitoring (included in section 1.2.5: Safety and environmental protection).

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.6 CONTROL AND PROTECTION (CONT'D)					
2	Setting out	1 Setting out primary grids. 2 Grid transfers and level checks. 3 Maintenance of grids. 4 Take over control and independent checks (i.e. on change of subcontractors). 5 Instruments for setting out.	item	1 Fixed charge 2 Time-related charge	
3	Protection of finished works prior to project handover	1 Protection of finished works. 2 Protection of stairs, balustrades and the like works. 3 Protection of fittings and furnishings works. 4 Protection of entrance doors and frames works. 5 Protection of lift cars and doors works. 6 Protection of specifically vulnerable products. 7 Protection of all sundry items.	item	1 Fixed charge 2 Time-related charge	

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.6 CONTROL AND PROTECTION (CONT'D)					
4	Samples	1 Provision of samples. 2 Provision of sample room. 3 Mock-ups and sample panels. 4 Testing of samples/mock-ups, including testing fees. 5 On-site laboratory equipment. 6 Mock-ups of prefabricated units (e.g. residential units, student accommodation units, hotel accommodation and the like).	nr	1 Fixed charge 2 Time-related charge	
5	Environmental control of building	1 Dry out building. 2 Temporary heating/cooling. 3 Temporary waterproofing, i ncluding over roofs 4 Temporary enclosures.	item	1 Fixed charge 2 Time-related charge	
1.2.7 MECHANICAL PLANT					
1	Generally	Common user mechanical plant and equipment used in construction operations.	week/ month	Time-related charge	Plant and equipment used for specific construction operations, such as:

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.7 MECHANICAL PLANT (CONT'D)					
1	Generally (Cont'd)	(as above)	(as above)	(as above)	1 Earthmoving plant. 2 Piling plant. 3 Paving and surfacing plant. 4 Road sweepers (included in section 1.2.11: Cleaning). 5 Access scaffolding (included in section 1.2.8: Temporary works).
2	Tower cranes	Type of craneage to be provided shall be stated; with each type separately quantified. 1 Hire charges.	week/ month	Time-related charge	1 Temporary electrical supply to tower crane (included in section 1.2.3: Temporary services).
		2 Crane operator. 3 Overtime for crane and operator.	week/ month (number of staff by number of man hours per week/ month by number of weeks/ months)		
		4 Piles for tower crane bases, including maintenance removal.	nr	1 Fixed charge 2 Time-related charge	1 details specification for piling shall be described.

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.7 MECHANICAL PLANT (CONT'D)					
2	Tower cranes (Cont'd)	5 Temporary bases for tower cranes, including anchors, maintenance; removal and reinstatement on completion (size, in m2, to be stated).	(as above)	(as above)	2 Piling maintenance means all works pertaining to "pre-installation check", regular inspection, load monitoring, corrosion and water protection, structural integrity check, documentation, etc.
		6 Structural ties.	week/ month	Time-related charge	
		7 Connections to temporary electrical supply.	nr	Fixed charge	
		8 Deliver to site, erection, test and commission.			
		9 Periodic safety checks/ inspections.	week/ month	Time-related charge	
		10 Dismantle and remove from site.	nr	Fixed charge	
		11 Other costs specific to tower crane such as: – chain pack and sundries – relief operator – banksman – man cage.	item	1 Fixed charge 2 Time-related charge	
		12 Temporary voids in building structure for craneage, hoists and the like including filling voids after removal.	nr	Fixed charge	

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.7 MECHANICAL PLANT (CONT'D)					
3	Mobile cranes	Type of craneage to be provided shall be stated; with each type separately quantified.			
		1 Provision of mobile crane including operator.	week/ month	1 Fixed charge 2 Time-related charge	
		2 Attendance.	nr (number of man hours per visit by number of visits)		
		3 Other costs specific to mobile crane hire.	item		
4	Hoists	Type of hoist to be provided shall be stated; with each type separately quantified. 1 Goods and passenger hoists, including protection cages and embedment frames.	week/ month	Time-related charge	1 Temporary services to hoist installations (included in section 1.2.3: Temporary services).
		2 Hoist bases.	nr	1 Fixed charge 2 Time-related charge	
		3 Bringing to site, erecting, testing and commissioning.	nr	Fixed charge	
		4 Dismantling and removing from site.			

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.7 MECHANICAL PLANT (CONT'D)					
4	Hoists (Cont'd)	5 Protection systems.	item	1 Fixed charge 2 Time-related charge	(as above)
		6 Hoist operator, including overtime.	week/ month (number of persons by number of man hours per week/ month by number of weeks/ months)	Time-related charge	
		7 Beam hoists.	nr	1 Fixed charge 2 Time-related charge	
		8 Periodic safety checks/ inspections.	month		
		9 Other costs specific to temporary hoist installations.	item	1 Fixed charge 2 Time-related charge	
5	Access plant	1 Folk lifts.	week/ month	1 Fixed charge 2 Time-related charge	
		2 Scissor lifts.			
		3 Loading platforms.			
		4 Maintenance of mechanical access equipment.			
		5 Other costs specific to mechanical access equipment.	item		

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.7 MECHANICAL PLANT (CONT'D)					
6	Concrete batching plant	1 Concrete batching plant	week/ month	1 Fixed charge 2 Time-related charge	1 Temporary service to concrete plant (included in section 1.2.3: Temporary services).
		2 Plant operator.	week/ month (number of persons by number of man hours per week/ month by number of weeks/ months)	Time-related charge	
		3 Overtime for plant and operator.			
		4 Bases for concrete plant.	nr	1 Fixed charge 2 Time-related charge	
		5 Power connections, including cabling and statutory undertaker's charges for temporary connection to their supply.	nr	1 Fixed charge 2 Time-related charge	
		6 Bring to site, erection, test and commission.	nr	Fixed charge	
		7 Maintenance of concrete plant.	week/ month	Time-related charge	
		8 Dismantle and remove from site.	nr	Fixed charge	

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.8 TEMPORARY WORKS					
1	Access scaffolding	Common user access scaffolding (type of access scaffolding to be specified): – access scaffolding to elevations, lift shafts and the like, including: fans and mesh screens. – structural scaffolding (e.g. to party walls). – birdcage scaffolding. – cantilever access scaffolding. – staircase platforms. – primary loading platforms. – travelling access platforms.			1 Scaffolding specific to works packages (included in appropriate element or sub-element). 2 Scaffold inspections (included in sub-element 1.2.5: Safety and environmental protection).
		1 Deliver to site, erect and initial safety checks.	nr	Fixed charge	
		2 Hire charges.	week/ month	Time-related charge	
		3 Altering and adapting during construction.	nr	Fixed charge	
		4 Dismantle and remove from site.			
2	Temporary works	Common user temporary works: – support scaffolding and propping. – crash decks. – temporary protection to existing trees and/or vegetation.	nr	Fixed charge	1 Temporary works design (included in section 1.1.1: Management and staff). 2 Temporary bases, drainage and services to site accommodation (included in section 1.2.2:

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.8 TEMPORARY WORKS (CONT'D)					
2	Temporary works (Cont'd)	1 Deliver to site, erect and initial safety checks.	(as above)	(as above)	Site establishment). 3 Temporary roads, paths and pavement, including on-site car parking (included in section 1.2.2: Site establishment (i.e. Builder's work in connection with site accommodation)). 4 Hoardings, fans, fencing and the like to site boundaries and to form site compounds (included in section 1.2.4: Security (hoardings, fences and gates). 5 Temporary earthwork support basement excavations. 6 Temporary props and walings to support contiguous bored pile wall of basement excavations. 7 Traffic management, including traffic marshals and temporary traffic lights (included in section 1.2.5: Safety and environmental protection).
		2 Hire charges.	week/ month	Time-related charge	
		3 Altering and adapting during construction.	nr	Fixed charge	
		4 Dismantle and remove from site.			
1.2.9 BUILDING INFORMATION MODELLING					
1	Information model requirement	Refer to Employer's requirements for BIM in Part A	nr	Fixed charge	Producing 3D BIM models

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.9 BUILDING INFORMATION MODELLING (CONT'D)					
2	BIM coordinator	Shall have relevant experience in BIM environment	week/ month	Time-related charge	(as above)
3	Information management	Software, hardware and technical personnel included	nr	Fixed charge	
1.2.10 SITE RECORDS					
1	Site records	Unless otherwise indicated, costs associated with the following shall be deemed to be included in management and staff costs: 1 Photography: – camera purchase. – consumables. – printing and presentation.	item	1 Fixed charge 2 Time-related charge	
		2 Works records: – progress reporting. – site setting out drawings. – condition surveys and reports. – operation and maintenance manuals. – as-built/installed drawings and schedules. – co-ordinating, gathering and compiling health and safety information and presentation to the Consultants. – compilation of health and safety file (if required).	item	1 Fixed charge 2 Time-related charge	

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.11 COMPLETION AND POST-COMPLETION REQUIREMENTS					
1	Testing and commissioning plan	Costs associated with the following shall be deemed to be included in section 1.2.1: Management and staff costs: 1 Preparation of testing and Commissioning Plan.	item	1 Fixed charge 2 Time-related charge	1 Testing and commissioning of services.
2	Handover	Unless otherwise indicated, costs associated with the following shall be deemed to be included in section 1.2.1: Management and staff costs: 1 Preparation of Handover Plan. 2 Training of building user's staff in the operation and maintenance of the building engineering services systems. 3 Provision of spare parts for maintenance of building engineering services. 4 Provision of tools and portable indicating instruments for the operation and maintenance of building engineering services systems. 5 Provision of keys and related security system, including necessary tagging/labelling.			

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.11 COMPLETION AND POST-COMPLETION REQUIREMENTS					
2	Handover {Cont'd)	6 Pre-completion inspections.	(as above)	(as above)	
		7 Final inspections.			
3	Post-completion services	1 Supervisory staff (employer/ tenant care).	Week/ month (number of persons by number of man hours per week/ month by number of weeks/ months)	Time-related charge	
		2 Handyman.			
		3 Minor materials and sundry items.	item	Fixed charge	
		4 Insurances.			
		5 Other post-construction staff.	week/ month (number of persons by number of man hours per week/ month by number of weeks/ months)	Time-related charge	

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.12 CLEANING					
1	Site cleanliness	1 Cleaning site accommodation – internal, including cleaning telephone handsets, other office furniture and equipment and window cleaning.	week/ month	Time-related charge	
		2 Periodic maintenance of site accommodation, including redecoration (internal and external).			
		3 Waste management, including rubbish disposal (including compactor visits; skips and waste bins; roll-off, roll-on waste bins) and other disposal.			
		4 Pest control.			
2	Maintenance of roads, paths and pavings	1 Maintenance of temporary site roads, paths, and pavements.	week/ month	Time-related charge	
		2 Maintenance of public and private roads, including wheel spinners and road sweepers.			
3	Building cleaning	1 Final builder's clean.	item	Fixed charge	
		2 Specific cleaning requirements			
1.2.13 FEES AND CHARGES					
1	Fees	1 Building control fees, where not paid by the employer.	item	1 Fixed charge 2 Time-related charge	1 Building control fees, where paid by the employer.

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.13 FEES AND CHARGES (CONT'D)					
1	Fees (Cont'd)	2 Other fees, where not paid by the employer. 3 Consider Contractor's Scheme fees (or alternative scheme operated by local authority). 4 Scheme registration fees or similar fees, where not paid by the employer.	(as above)	(as above)	2 Oversailing fees, where paid by the employer. 3 Scheme registration fees or similar fees, where paid by the employer.
2	Charges	1 Rates on temporary accommodation.	week/ month	Time-related charge	1 Statutory charges in connection with permanent services to the building. 2 Statutory charges in connection with temporary services.
		2 Licences in connection with hoardings, scaffolding, gantries and the like. 3 Licences in connection with crossovers, parking permits, parking bay suspensions and the like.	item	1 Fixed charge 2 Time-related charge	
1.2.14 SITE SERVICES					
1	Temporary works (Cont'd)	1 Temporary works that are not specific to an element.	item/ nr/m/ m2/m3	1 Fixed charge 2 Time-related charge	1 Temporary screens in connection with minor demolition works and alteration works. 2 Supports to small openings cut into existing walls or after removal of internal walls or the like in connection with minor

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.14 SITE SERVICES (CONT'D)					
1	Temporary works	(as above)	(as above)	(as above)	demolition works and alteration works. 3 Temporary or semipermanent support for unstable structures or facades – facade retention works (i.e. structures not to be demolished).
2	Multi-service gang	1 Ganger. 2 Labour. 3 Fork lift driver. 4 Service gang plant and transport.	week/ month (number of persons by number of man hours per week/ month by number of weeks/ months)	Time-related charge	
1.2.15 INSURANCE, BONDS, GUARANTEES AND WARRANTIES					
1	Works insurance	1 Contractor's 'all risks' (CAR) insurance. 1.1 Works (Material Damage) 1.2 Third Party Liability 1.3 Advance Loss of Profit (if applicable) 2 Workmen's Compensation Insurance. 3 Decennial Insurance (if any). 4 Principal Existing Property Insurance.	item	1 Fixed charge 2 Time-related charge	

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.15 INSURANCE, BONDS, GUARANTEES AND WARRANTIES (CONT'D)					
1	Works insurance (Cont'd)	5 Other insurances in connection with the works. 6 Insurance premium tax (IPT). 7 Allowance for recovery of all or part of insurance premium excess. 8 Allowance for Price Escalation Clause and Designer Risk Clause (if applicable)	(as above)	(as above)	
2	Public liability insurance	1 Non-negligence insurance. 2 Professional indemnity insurance. 3 Insurance premium tax (IPT). 4 Allowance for recovery of all or part of insurance premium excess.	item	1 Fixed charge 2 Time-related charge	
3	Other insurances	1 Motor vehicles. 2 Other insurances. 3 Insurance premium tax (IPT). 4 Allowance for recovery of all or part of insurance premium excess.	item	1 Fixed charge 2 Time-related charge	

1.2 CONTRACTOR'S COST ITEMS (CONT'D)

ITEM	DESCRIPTION	INCLUSION/PRICING NOTES	UNIT	PRICING METHOD	EXCLUSION
1.2.15 INSURANCE, BONDS, GUARANTEES AND WARRANTIES (CONT'D)					
4	Bonds	1 Tender bonds (if applicable). 2 Performance bonds. 3 Advance Payment Bond. 4 Retention Bond.	item	1 Fixed charge 2 Time-related charge	
5	Warranties	1 Collateral warranties. 2 Funder's warranties (if applicable). 3 Purchaser's and tenant's warranties (if applicable). 4 Other warranties.	item	1 Fixed charge 2 Time-related charge	
6	Sundries	1 Carbon impact calculation. 2 Others (please state).	item	1 Fixed charge 2 Time-related charge	

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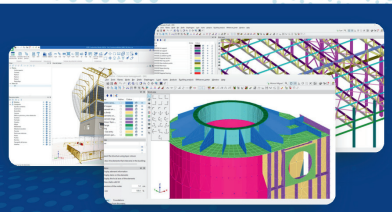
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02

INDUSTRIALISED BUILDING SYSTEM (IBS)

01 PRECAST CONCRETE

02 FORMWORK

03 STEEL AND METAL FRAME TRUSS

04 TIMBER FRAME

05 BLOCKWORK

06 INNOVATIVE

Information to be provided in the Specification

01 Precast concrete (if CIDB catalogue is used)
- a. CIBD's user guide: IBS catalogue for Precast Building System and user manual for components selection.

02 Blockwork
- a. Refer to Work Section 11: Masonry.

03 Proprietary Systems i.e. 'Steel and Metal Frame Truss', 'Timber Frame' and 'Innovative'
- a. Performance Specification covering the following:
  - i. Scope of work.
  - ii. Submittals.
  - iii. Codes and standards.
  - iv. Design requirements.
  - v. Testing.
  - vi. Performance criteria.
  - vii. Delivery, storage and handling.
  - viii. Materials.
  - ix. Fabrication and installation.
  - x. Warranties.

Basic information to be shown in the 2D drawings or 3D models

01 Precast concrete
- a. Various precast concrete components with the respective codes extracted from an approved IBS catalogue selected to be used for the different structural parts of the building/structure.
- b. Grade of concrete topping.
- c. For Precast Concrete, if any mass or reinforced in-situ concrete which form part of IBS system is not allowed hereunder, such work is to be measured in accordance with Work Section 09: In-situ concrete works.

02 Formwork, steel and metal frame truss, timber frame and blockwork
- a. Refer to Work Section 09: In-situ concrete works, Work Section 16: Structural metalwork, Work Section 14: Carpentry and Work Section 11: Masonry, respectively.

Specific rules of measurement

01 Provision of tower cranes, crawler cranes, mobile cranes, etc. and other plant and equipment necessary for the installation of IBS system are described in the 'Preliminaries' Bill.

02 For Precast concrete, if any mass or reinforced in-situ concrete which forms part of the IBS system is not allowed hereunder, such work is to be measured in accordance with Work Section 09: In-situ concrete works.

'Works and materials deemed to be included' which are collectively referred to as 'Preambles'

01 The following are generally deemed to be included in any IBS construction:
- a. The Contractor is deemed to have examined the drawings, visited the site inspected the existing premises and satisfied himself as to the extent and/or nature of pre-casting, transportation, double handling, hoisting, erecting equipment, fixing, etc. and fully acquainted and conversant with all requirements.
- b. If in the opinion of the Contractor, the precast items may be cast into smaller/gigger units, he should forthwith seek clarification and approval from the S.O. All costs in connection with any amendments to the precast items are to be borne by the Contractor.
- c. All unplastered surfaces to the precast concrete components are to be finished smooth.

02 Precast concrete components are deemed to include the following:
- a. Reinforcements and projecting reinforcements for lapping into the main structure.
- b. Lifting hooks.
- c. Moulds and casting.
- d. Keyed finish to external surfaces to receive tiling and fair finish to all other surfaces.
- e. Cast-in accessories such as brackets, plates, U-bars, stainless steel bolts washers and brackets, etc. welded or built into the main structure.
- f. Holes, sleeves, rebates, notching, sinking, mortices and the like.
- g. Hoisting, placing in position, setting, bedding, jointing and pointing in cement mortar and/or grouting with non-shrink cement and sand mortar including cutting-off lifting hooks.
- h. Temporary supports, ties, etc.
- i. Concrete packing before fixing of precast units in position.
- j. Neoprene or plastic spacer tubes and applying silicone sealant to all joints.
- k. All making good after casting works.
- l. Casting in conduits, forming chases, opening, holes and the likes for Mechanical and Electrical installation.
- m. Adjustments to the precast components to suit the Architectural design and profiles.
- n. Supply which is to include delivery transportation, protection, unloading to site for storage and double handling.
- o. Pre-tensioning and post-tensioning materials, spacing and stresses.

03 When IBS is based on 'Design and Build', the following are to be included as 'Notes' preceding the price breakdown:
- a. The design shall in all respect adequate, accurate, sufficient and fit for its purpose.
- b. Submittal of all shop drawings and design calculations endorsed by Professional Engineer with Practising Certificate (PEPC) registered with the Board of Engineers Malaysia (BEM) for the S.O.'s approval prior to commencement of the Works; it should also be noted that unless otherwise stated, all designs shall be compliance with the current MS/BS/EN Code Standard Practice where applicable and shall be produced by a CIDB approved IBS Manufacturer.
- c. The grid references and dimensions given by the S.O. are to be served only as a guide in tendering. Site measurement is required. No Claim will be entertained for any discrepancy between the Drawings, the Bill of Quantities and site measurement.
- d. The pricing is to be in a breakdown following the rules and the descriptions of components/item descriptions relevant to each type of IBS system but on lump-sum basis for each item;
- e. Other requirements (if any).

04 For concrete items, refer to 'Preambles' in Work Section 09: In-situ concrete works.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 PRECAST CONCRETE					
01 Precast concrete frame structures	nr	01 Columns (code nr); as shown in Drawing (drawing nr)/model 02 Beams (code nr); as shown in Drawing (drawing nr)/ model	01 (dimensioned description)		1 Sloping beams are to be so described in Level Two. 2 'Code nr' is obtained from the selected IBS catalogue.
02 Precast concrete deckings	m2	01 Hollow Core Slabs 02 Precast Concrete Half Slabs	01 (thickness) thick; (code nr); as shown in Drawing (drawing nr)/ model		1 Sloping slabs are to be so described in Level Two. 2 'Code nr' is obtained from the selected IBS catalogue.
	m3	03 Vibrated reinforced in-situ concrete; Grade C(grade) in	01 make-up strip to edge of Hollow Core Slabs and perimeter beams 02 (thickness) thick concrete topping 03 (width) wide gap and (height) high {max. height} beam infill		1 All necessary formwork is deemed to be included.
	kg	04 High tensile steel bar reinforcement	01 in concrete topping slab 02 in make-up strip		1 The diameters of various steel reinforcement to be used are to be referred to the relevant drawings.
	m2	05 Fabric reinforcement BRC (ref nr) cut to size well lapped at joints and embedded	01 in concrete topping slab		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 Precast concrete walls, partitions and panels	nr	01 Cladding panels 02 Wall panels	01 Panels (code nr); as shown in Drawing (drawing nr)/model	01 (dimensioned description)	1 Horizontal, vertical or sloping is to be so described in Level Two. 2 'Code nr' is obtained from the selected IBS catalogue.
04 Precast staircase	nr	01 Straight flights (code nr)	01 (height) high risers and (width) wide treads; (height) overall high; as shown in Drawing (drawing nr)/model		1 Unit 'nr' means flight of stairs. 2 'Height' means the vertical height between the underside of the first riser and the top of the last riser when erected. 3 'Code nr' is obtained from the selected IBS catalogue.
	nr	02 Spiral (code nr)	01 overall (height) high; as shown in Drawing (drawing nr)/model		1 Unit 'nr' means the whole spiral staircase. 2 'Code nr' is obtained from the selected IBS catalogue.
	nr	03 Landing slabs (code nr)	01 (dimensioned description)		1 Unit 'nr' means number of landing slabs. 2 'Code nr' is obtained from the selected IBS catalogue.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 FORMWORK					
For the use of 'Formwork' which can be classified as an IBS, refer to the relevant parts of 'Formwork' under Work Section 09: In-situ concrete					
03 STEEL AND METAL FRAME TRUSS					
For the use of 'Steel and Metal Frame Truss' which can be classified as an IBS, refer to the relevant parts of Work Section 16: Structural metalwork.					
04 TIMBER FRAME					
For the use of 'Timber Frame' which can be classified as an IBS, refer to Work Section 14: Carpentry.					
05 BLOCKWORK					
For the use of 'Blockwork' which can be classified as an IBS, refer to the relevant parts of Work Section 11: Masonry.					
06 INNOVATIVE					
Generally, these are Proprietary Systems but do not fall under the above groupings.					

03 DEMOLITIONS, ALTERATIONS, REPAIRS AND CONSERVATION

01 DEMOLITIONS

02 ALTERATION WORKS TO EXISTING BUILDINGS

03 REPAIRS/CLEANING/RENOVATING AND CONSERVING

Information to be provided in the Specification	01 General. 02 Demolition works. 03 Alteration and repair works. 04 Conservation works. 05 Removal of debris or rubbish. 06 Overload existing structure. 07 Protection works. 08 Trees protection. 09 Defect survey and mapping. 10 New works.
Basic information to be shown in the 2D drawings or 3D models	01 Demolitions a. Approximate size and the number of storeys of existing buildings to be demolished. b. Whether including the lowest ground floor slab and foundation. 02 Partial demolitions a. Types of structures and/or finishes and/or the mechanical and plumbing services and electrical services, etc. to be demolished and at which levels. b. Listing of salvaged materials which have credit values. 03 Alteration Works to the existing building a. 'Removing', 'cutting and forming', 'cutting back projections', 'cutting back to reduce thickness', 'filling in existing openings' and/or any other type to be shown on the parts of the building where they are required. 04 Repairs/cleaning/renovating/conserving a. 'Repairing', 'repointing', 'resin impregnation/injection', 'cement impregnation/injection', 're-dressing existing flashings' and the like. b. 'Damp proof course renewal/insertion', 'cleaning surfaces', 'renovating and conserving'. c. Any other type to be shown on the parts of the building where they are required.
Specific rules of measurement	01 All measurements do not include any additional area required for working space, etc. 02 The lowest floor level will include basements. 03 If a floor slab is to be removed, then the lowest floor level which can be the ground floor or the lowest basement level (as the case may be) must be stated as to the underside of that slab. 04 The rules within this Work Section do not apply to temporary works.

'Works and materials deemed to be included' which are collectively referred to as 'Preambles'	01 General a. The Contractor is deemed to have satisfied himself as to the nature of works and to make good all works disturbed as necessary. b. The Contractor is required to repair or replace at his own expense any parts or completed items which in the opinion of the S.O. have been damaged as a result of insufficient care in removing, handling and protecting. c. The demolition, alterations, repairs and/or conservation works are to be executed in such a manner that there is to be a minimum of inconvenience and noise and dust pollution to occupants or to the public. d. The Contractor is deemed to have examined the drawings, visited the site, inspected the existing premises and satisfied himself as to the nature and extent of the work to be demolished, altered, repaired and/or conserved and to have allowed for accordingly. 02 Demolitions a. Providing, erecting, altering, adapting and maintaining and removing on completion to the satisfaction of the S.O. all necessary shoring, needling and strutting, watering to lay the dust, providing dust sheets, tarpaulin, temporary roof covering, water, chutes, screen sand and any other protection necessary to safeguard the existing and adjoining works and clearing away all rubbish and making good all works disturbed. b. Temporarily diverting, maintaining or sealing off existing services (where necessary). c. 'Remove' is to include cutting out or taking apart as may be necessary for the removal of the items described, drawing all screws, nails, hooks, clips, bolts and other fastenings including grounds, hackings and the like and making good surfaces where applicable. d. Demolition of walls, partitions, ceilings, floor slabs and the like is to include for all associated finishes, pipework and cabling, etc. whether concealed or surface mounted, switches, sockets, etc. e. 'Making good' is meant to reinstate to as close to its original conditions as possible and to match existing works so as to avoid visible junction. f. Compliance with the Dilapidation Survey, Historical Architecture Building Survey (HABS) (if applicable), Drawings, MS 2318:2012 and Specification. 03 Alteration work to existing building a. Removal of sanitary fittings is deemed to include removing traps and temporarily capping off pipework or removing associated traps and pipework back to wall or floor and terminating connections as the case may be. b. Removal of existing plumbing, mechanical and electrical installations are deemed to include for the whole building unless otherwise stated and making good all work disturbed, disconnecting and if required, subsequent re-connection of plumbing and electrical or other services installations. 04 Repairs/Cleaning/Renovating and Conserving a. The rates for repairing items are deemed to include preparing surface, applying painting system and formwork (if required). b. Repointing is deemed to include removal of existing joint material and preparation of exposed surfaces.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 DEMOLITIONS					
01 Demolishing	item	01 Whole buildings as listed below and as shown in Drawing (drawing nr)/model: (to list the approximate dimension and number of storeys of the buildings to be demolished)	01 Down to the level of the top surfaces of the lowest ground slab including breaking up the lowest ground floor slab and foundations	01 removing all debris from site 02 setting aside the following materials as the property of Employer: (to list) 03 setting aside the following materials for re-use at the designated area within the site: (to list)	1 If there is any temporarily diverting, maintaining or sealing off existing services, etc, it is to be so described in Level Two.
	item --- m2 --- m --- nr	02 Parts of structures	01 In-situ reinforced concrete flat roof (thickness) thick 02 In-situ reinforced concrete upper floor (thickness) thick 03 Precast concrete plank upper floor (thickness) thick 04 Reinforced concrete staircase (nr) total rise, (width) wide, in (nr) flight with (nr) half landing 05 Pitched roof, timber construction (dimensioned description) {measured on plan} 06 Brick/block internal walls (thickness) thick 07 Floor finishes; (type) 08 Ceiling finishes; (type) 09 Wall finishes; (type) 10 Brick/block external walls (thickness) thick 11 Doors, windows and the like 12 Sanitary fittings; (type) 13 Structural steel works; (type)		1 The surveyor is to choose the most suitable unit for the type of work being removed. 2 If the unit 'item' is used, then only floors affected are to be identified in Level Two.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 Credit	item	01 Credit for salvaged materials which become the property of the Contractor	01 (list all items which have a credit value)		
02 ALTERATION WORKS TO EXISTING BUILDING					
01 Removing	item --- m2 --- m --- nr	01 Existing floor finishes	01 Granolithic paving 02 Mosaic tiles 03 Ceramic/porcelain tiles 04 Terrazzo tiles 05 Marble tiles 06 Granite tiles 07 Carpet flooring/tiles 08 Vinyl tiles 09 Parquet/timber flooring	01 removing all debris from site 02 setting aside the following materials as the property of Employer: (to list) 03 setting aside the following materials for re-use at the designated area within the site: (to list)	1 The surveyor is to choose the most suitable 'unit' for the type of work being removed. 2 If removal of screed under the finishes/ coverings is required, it is to be so described in Level Two. 3 If there are skirtings, their removal is deemed to be included. 4 If the unit 'item' is used, then only floors affected are to be identified in Level Two. 5 'Making good structures and preparing surface to receive new finishes' is deemed to be included. 6 If there are cornices, their removal is deemed to be included.
		02 Existing wall finishes	01 Mosaic tiles 02 Ceramic tiles 03 Marble tiles 04 Granite tiles 05 Plaster 06 Wallpaper		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
	item --- m2 --- m --- nr	03 Existing ceiling finishes	01 Mineral fibre ceiling boards including metal suspension system 02 Gypsum board ceiling including metal suspension system		
		04 Existing coverings	01 Membrane/felt 02 Metal roofing including purlins/cladding rails 03 Roofing tiles including battens and felt and sisalation under		
		05 Existing doors, windows and the like	01 Timber doors and frames 02 Metal doors and frames 03 Roller shutters 04 Roller grilles 05 Timber windows and frames 06 Metal windows and frames 07 Doors 08 Windows		
		06 Existing balustrades, railings and handrailings	01 Balustrades including handrails 02 Railings including handrails 03 Handrails		
		07 Existing fixtures and fittings	01 Timber counters; overall (dimensioned description) 02 Timber cupboards/ wardrobes; overall (dimensioned description)		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
	item --- m2 --- m --- nr	08 Existing sanitary fittings	01 Water closets 02 Wall hung wash hand basins 03 Countertop hand basins 04 Sinks 05 Urinals 06 Long baths		
		09 Existing plumbing, mechanical and electrical installations	01 Hot and cold-water plumbing installation 02 Rainwater plumbing installation 03 Soil and waste plumbing installation 04 Mechanical ventilation installation 05 Air conditioning installation 06 Fire protection installation 07 Electrical installation 08 Telephone installation 09 Communication installation 10 Lift installation 11 Escalators installation		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 Cutting and forming	nr	01 Door openings 02 Window openings	01 In (thickness) thick reinforced concrete wall 02 In (thickness) thick brick/block wall 03 In (thickness) thick drywall	01 (dimensioned description)	1 'Extending and making good plaster' are deemed to be included. 2 If provision of lintel over the opening is required, it is to be so described in Level Two. 3 'Making good plaster or preparing surfaces to receive new' is deemed to be included.
		03 Blank openings 04 Recesses	01 In (thickness) thick reinforced concrete floors 02 In (thickness) thick timber floors		
03 Cutting back projections	nr	01 On concrete piers/walls 02 On brick piers/walls	01 (dimensioned description)		
04 Cutting back to reduce thickness	nr	01 On brick/block walls	01 (area) wall; cutting back by (width)		
05 Filling in existing openings	nr	01 Door openings 02 Window openings	01 In (thickness) thick reinforced concrete walls 02 In (thickness) thick timber partitions	01 (dimensioned description)	
	nr	03 Blank openings	01 In (thickness) thick reinforced concrete floors	01 generally	
	nr	04 Recesses	01 In (thickness) thick brick/block wall		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 REPAIRS/CLEANING/RENOVATING AND CONSERVING					
01 Repairing	m	01 Timber fascia boards 02 Timber balustrades 03 Chain link fencing	01 (height) high; replacing with new materials to match existing		1 Making good is deemed to be included to all work disturbed
	nr	04 Timber flush doors 05 Timber panelled doors 06 Timber casement window; easing and adjusting 07 Timber composite window; easing and adjusting	01 replacing loose ironmongery 02 replacing damaged with new materials to match existing		
02 Repointing	m	01 With cement-lime (1:1:6); including raking out joints (width) wide x (depth) deep	01 on brick/block walls 02 on facing brick walls 03 on natural stone walls		
03 Resin impregnation/ injection 04 Cement impregnation/ injection	m2 --- m	01 To concrete walls 02 To brick/block walls 03 To stonework walls 04 To concrete floor 05 To concrete roof 06 To concrete column 07 To concrete beam	01 (thickness) thick; drilling holes at (centre) centres		1 The surveyor is to choose the most suitable 'unit' for the type of work. 2 Type of resin is to be so described in the 'Heading'. 3 Method of impregnation/injection is to be so described in the Heading.
05 Re-dressing existing flashings and the like	m	01 With cement-lime (1:1:6); including taking out existing joints	01 (girth) girth		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
06 Damp proof course renewal/insertion	m2	01 Injected chemical damp proof courses 02 Injected mortar damp proof courses 03 Electro-osmosis damp proof course 04 Inserted mechanical damp proof courses	01 To brick/block walls 02 To stonework walls 03 To concrete walls 04 To concrete floors	01 (thickness) thick; drilling holes at (centre) centres 02 (thickness) thick; removing finishes and drilling holes at (centre) centres	1 Product name of damp proof course is to be so described in the 'Heading'.
07 Cleaning surfaces	m2	01 using an abrasive approved method to get rid of all dirt, grease and other contaminants to fully expose concrete surface 02 using waterjet to get rid of all dirt, grease and other contaminants to fully expose concrete surface			
08 Renovating and conserving	item --- m2 --- m --- nr	01 Concrete	01 Cutting out defective concrete and replacing with new; bonding new to existing with bonding agent	01 (dimensioned description) 02 to a minimum depth of (depth) 03 to a minimum depth of (depth) and (width) wide 04 to a minimum depth of (depth), (width) wide and (length) long	1 The unit of measurement is left to the discretion of the surveyor but shall reflect the size and extent of the work. 2 If the unit 'item' is used, then only floors affected are to be identified in Level One.
		02 Brickwork/blockwork 03 Engineering brickwork 04 Facing brickwork 05 Natural stonework	01 Cutting out decayed, defective and cracked work; replacing with materials to match existing; bonding to existing with mortar		

04 EXCAVATION AND FILLING

01 SITE CLEARANCE
02 BULK EXCAVATION
03 FOUNDATION EXCAVATION
04 FILLING
05 SUNDRIES

Information to be provided in the Specification

01 General.
02 Site clearing.
03 Preservation of existing trees.
04 Demolition of existing structures.
05 Relocations of existing utilities and services.
06 General excavation.
07 Excavations for foundations, pits and trenches.
08 Sides of excavation.
09 Excavation to be kept dry.
10 Bottom of excavation.
11 Inspection.
12 Backfilling.
13 Anti-termite treatment.
14 Cut and fill to formation level.
15 Filling under floors, aprons, etc.
16 Temporary drainage channels and bunds.
17 Clearing of existing ditches, rivers, etc.
18 Protection and maintenance of earthworks.
19 Hardcore.

Basic information to be shown in the 2D drawings or 3D models

01 Site clearance
- a. Area to be cleared.
- b. Extent of lifting turf for preservation.
- c. Number and location of existing trees to be relocated.

02 Bulk excavation
- a. Rock levels or estimated quantity of rock.
- b. Hard material levels or estimated quantity of hard material.
- c. Unsuitable material levels or estimated quantity of unsuitable material.

03 Foundation excavation
- a. Rock levels or estimated quantity of rock.
- b. Hard material levels or estimated quantity of hard material.
- c. Unsuitable material levels or estimated quantity of unsuitable material.

04 Filling
- a. Source and type.

05 Sundries
- a. Thickness of moisture barriers.
- b. Thickness and anchoring method of geotextile fabric.

Specific rules of measurement

01 The measurement for excavation and disposal is to be those before excavation i.e. measured nett. No allowance is to be made to any subsequent variations to bulk or any extra space required to accommodate earthwork support, formwork and working space.

02 The measurement of filling is to be volume or thickness after consolidation. All extra fill materials required due to consolidation and penetration into the subsoil are deemed to be included.

03 Unless otherwise stated, depths of excavation are measured from the general formation levels to the bottom of the excavations.

04 Definition of rock, hard material and unsuitable material are to be based on that defined in the 'Specification'.

'Works and materials deemed to be included' which are collectively referred to as the 'Preambles'

01 General
- a. Excavating in whatever type of material except in rock, hard material and unsuitable material discovered on the surface or in the excavations.
- b. Disposal of surplus excavated materials (the balance after backfilling) is to include multiple handling and transportation around the site as may be necessary prior to disposal.
- c. Excavation below the water table.
- d. Upholding and maintaining sides of the excavation by whatever means necessary including the use of bentonite and any special shoring or sheet piling etc. as may be necessary but which do not form a permanent part of the works to be executed, but excluding any planking and strutting to be left in or any sheet piling, etc. which form a permanent part of the work to be executed.

02 Bulk excavation
- a. Formation and trimming of slopes in inclined surfaces.
- b. All necessary compaction testing.
- c. Transporting imported earth deemed to include for all plant, machinery, labour, idling time, temporary access road or hardstanding to area of unloading at site, obtaining all necessary approval from and payment of all royalties to the relevant Authorities.
- d. Removing earth from site deemed to include for all plant, machinery, labour, idling time, temporary access road or hardstanding to area of unloading at site, obtaining all necessary approval from and payment of all royalties to the relevant Authorities.

03 Foundation excavation
- a. Getting the material out of the excavation
- b. Levelling bottoms of the excavations to falls or cambers and compacting the same.
- c. Trimming sides of the excavations to form vertical, battering or sloping faces.
- d. Backfilling of selected excavated materials into the excavation and compaction as specified in the Specification.

e. Deposit, spread and level in making up levels with surplus excavated materials within the site.
f. In between and around the piles.

04 Filling, beds, blinding and the like
a. Earth, sand, quarry dust, and other similar materials used for filling, beds, blinding, and the like are to include levelling and grading the surfaces to falls or cambers, trimming the sides to form vertical, battering, or sloping surfaces, and any temporary retaining boards that may be required.
b. Hardcore, crusher run and other similar materials used for filling, beds and the like are to include for hand packing the same to form vertical, battering or sloping surface and any temporary retaining boards as may be required.
c. Hardcore, crusher run, and other similar materials used for filling, beds, and the like to receive concrete or paving must also include blinding the same with sand or quarry dust, and levelling or grading the surfaces to falls or cambers.

05 Sundries e.g. moisture barrier and geotextile fabric.
a. All turn-ups, turn-downs, laps and joints.
b. Forming holes.
c. Narrow widths and small quantities.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 SITE CLEARANCE					
01 Clear the entire site within the Contract Boundary	item	01 of trees {irrespective of tree girth}, vegetation, crops, loose vegetable matter, rubbish, debris, unwanted materials, disused structures, etc. and remove from site; as directed by S.O. {approximate (area)}			1 Removing trees is deemed to include removing the stump and roots unless otherwise stated.
02 Lifting turf for preservation	m2	01 Stacking and preserving for replanting	01 on site 02 off site		
03 Relocating existing trees	nr	01 Carefully dig up existing tree as shown in Drawing (drawing nr)/model; store at approved nursery for a duration of (nr of months) months	01 Replant as directed by the S.O. on site; including digging pit, disposal of soil off site, backfilling with imported topsoil, fertiliser, herbicides, watering in, stakes and other supports as necessary		
04 Topsoil excavation commencing from the existing levels	m2	01 Get out, load and deposit in temporary spoil heaps on site for preservation 02 Get out, load and cart away surplus excavated materials	01 average (depth) deep 02 using a tractor unit of minimum weight of 37 tonnes and 303 BHP rating and a ripper attached; removing from site		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
			03 using a track excavator exceeding a mass of 41.5 tonnes and 321 BHP rating; removing from site		
02 BULK EXCAVATION					
01 Bulk excavation to the required platform levels	m3	01 Fill in and spread the excavated materials to area of filling 02 Remove unsuitable material from site contractor's own dumping area and backfill with imported earth	01 compact to the required platform levels all within the boundary of the site and including the formation of slopes		1 Platform levels are defined as the levels of earthwork achieved by bulk excavations which comprise cut and/or fill in accordance with the design.
	m3	03 Remove surplus excavated materials to 04 Fill in and spread surplus excavated materials to	01 within site 02 designated dumping area within the site 03 the contractor's own dumping area		
	m3	05 Extra-over for breaking up rock material at any depth 06 Extra-over for breaking up hard material at any depth	01 using a tractor unit of minimum weight of 37 tonnes and 303 BHP rating and a ripper attached; removing from site 02 using a track excavator exceeding a mass of 41.5 tonnes and 321 BHP rating; removing from site		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
			03 using pneumatic tools/hydraulic rock breaker removing from site 04 using chemical means; subject to Authorities' approval and by licenced specialist; removing from site 05 using control blasting; subject to Authorities' approval and by licenced specialist; removing from site 06 using open blasting; subject to Authorities' approval and by licenced specialist; removing from site		
02 Removal unsuitable material to approved contractor's own dumping area and backfill with suitable material	m3	01 generally			
03 FOUNDATION EXCAVATION					
01 Excavation	m3	01 For reduced level 02 For foundations 03 For basements 04 For lift pits 05 For beams 06 For retaining walls and bases	01 not exceeding 2.00m total depth 02 not exceeding 4.00m total depth 03 (thereafter in 2.00m stages)		1 Curved profile (if any) is to be so described in Level One.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
		07 Extra-over for breaking up rock material at any depth for all types of excavation 08 Extra-over for breaking up hard material at any depth for all types of excavation	01 using pneumatic tools/hydraulic rock breaker removing from site 02 using chemical means; subject to Authorities' approval and by licenced specialist; removing from site 03 using control blasting; subject to Authorities' approval and by licenced specialist; removing from site 04 using open blasting; subject to Authorities' approval and by licenced specialist; removing from site		2 Foundation excavations include excavating for pad footings, pile caps, raft foundations, strip footings and all other types of foundations. 3 Commencing level is to be so described in the 'Heading'.
04 FILLING					
01 Filling	m3	01 With imported selected material and subject to the S.O.'s approval 02 With suitable material excavated from the borrow pits within (distance)km from the site 03 With selected granular material subject to the S.O.'s approval 04 With hardcore	01 Compact to the required levels including the formation of slopes 02 To beds	01 to areas of fill (thickness) thick 02 {consolidated thickness}	1 Material of hardcore is to be so described in Level One.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
05 SUNDRIES					
01 Anti-termite treatment	item	01 anti-termite treatment to areas underneath surrounding area of the foundation, ground floor, apron, terrace and the like to form a chemically impregnated unbroken barrier in (nr) stages; to be executed by approved specialist who is to give (nr) years warranty upon completion of the works {approximate (area)}			
02 Moisture barrier	m2	01 (nr) layer (thickness) thick polythene sheet moisture barrier	01 laid on concrete surface		
03 Geotextile fabric	m2	01 Supply and lay Type (type) (weight)/ m2 geotextile fabric; including laps and anchoring with (type), all in accordance with Drawing (drawing nr)/ model	01 horizontal 02 sloping 03 vertical		
04 Silt traps	nr	01 Construct sediment basin; complete with gabion embankment, emergency spillway, mild steel riser perforated pipes at top filled with anti-vortex plate and	01 overall size (dimensioned description)		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
		trash rack, reinforced concrete discharge pipe; including maintenance throughout the contract period and remove and make good upon completion; including all accessories; as detailed in Drawing (drawing nr)/ model			
05 Berm drains, slope embankments and sumps	item	01 construct berm drains, slope embankments and sumps; including all necessary excavation, concrete lining, formwork, fabric reinforcement and close turfing to sloping surfaces; as detailed in Drawing (drawing nr)/ model			
06 Earth drains	item	01 construct earth drains overall size (dimensioned description) including the formation of slope and remove excavated material to and including spreading over an area of fill; as detailed in Drawing (drawing nr)/model			

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05
GROUND REMEDIATION AND SOIL STABILISATION

01 GROUND REMEDIATION

02 SOIL STABILISATION

03 INSTRUMENTATION

Information to be provided in the Specification	01	Soil investigation report.
	02	Ground conditions.
	03	Ground water level and date established.
	04	Original and proposed ground levels.
	05	Any item that must remain on site during the works and be protected from damage.
	06	Any item adjacent to site that may impact on the works.
	07	Nature of any known non-hazardous or hazardous contamination on the site or in the ground.
	08	Starting level of each type of excavation.
	09	Preparation prior works being carried out.
	10	Details of trial pits or boreholes including their location.
	11	Details of live over or underground services including their location.
	12	Pile sizes and their locations where applicable.
	13	Type of testing and compliance.
	14	Type of instrumentation.
Basic information to be shown in the 2D drawings or 3D models	01	Ground Remediation
		a. Type and details and locations.
	02	Soil Stabilisation
		a. Type and details and locations.
		b. Requirement for pull out test.
	03	Instrumentation
		a. Type, numbers and locations to be installed and for monitoring.
		b. Frequency of reporting.
Specific rules of measurement	01	All measurements of area are measured nett and do not include for any additional area required for working space, safety measures and the like.
'Works and materials deemed to be included' which are collectively referred to as 'Preambles'	01	Ground remediation and soil stabilisation
		a. Disposal off site of all surplus excavated materials.
		b. Disposal of all surface water.
		c. Support to faces of excavation unless not at the discretion of the contractor.
		d. Working space.
		e. Excavation and filling for temporary works unless not at the discretion of the contractor.
		f. Levelling, grading, trimming and compacting surfaces exposed by the excavations.
		g. Curved work.
		h. Multiple handling of excavated materials on site.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 GROUND REMEDIATION					
01 Mobilisation	item	01 allow for the provision of necessary equipment, plant, tools and ancillary and for their transportation to the site, handling, assembling, erecting, dismantling, moving within site during the works and any idle standing item and demobilisation upon completion, including any excavation, filling earth to make up levels and staging required for moving of plant from differing levels on site			
02 Geotextile separators	m2	01 Supply and lay Type (type) (weight)/m2 geotextile separator; including laps {measured net-no allowance made for laps} all in accordance with Drawing (drawing nr)/model	01 horizontal 02 sloping 03 vertical		
03 Vertical drains	m	01 supply and install (type) (dimensioned description) prefabricated tubes wrapped with filter fabric including punching through geotextile separator; all in accordance with Drawing (drawing nr)/ model			1 If vacuum consolidation technique is to be used, it is to be so described in Level One.
04 Perforated subsoil pipes	m	01 supply and install (dia) diameter horizontal (type) perforated subsoil pipe wrapped with filter fabric including all necessary jointing as shown in Drawing (drawing nr)/ model			
05 Surcharge	m3	01 Fill to the required levels including the formation of slopes to surcharge area; including removal from the site upon the expiry of the surcharge period of (months) months	01 with imported selected material and subject to the S.O.'s approval 02 with suitable material excavated from the borrow pits from the adjacent land and subject to the S.O.'s approval 03 with imported common filter sand and subject to the S.O.'s approval		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
06 Dynamic compaction	nr	01 using (weight) tonnes drop hammer with (nr) drops at height of (height) and (nr) number of drops			
02 SOIL STABILISATION					
01 Mobilisation	item	01 allow for the provision of necessary equipment, plant, tools and ancillary and for their transportation to the site, handling, assembling, erecting, dismantling, moving within site during the works and any idle standing item and demobilisation upon completion, including any excavation, filling earth to make up levels and staging required for moving of plant from differing levels on site			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 Soil nailing	nr	01 Galvanised deformed bar Grade C(grade) complete with head assembly and approved centralisers at spacing; including drilling hole through whatever material; grouting with non-shrink grout Grade C(grade); as shown in Drawing (drawing nr)/ model	01 (dia) diameter, (length) long		
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	m		02 extra-over for drilling minimum (dia) diameter hole through rock or hard material		
	nr	02 Vibrated reinforced in-situ concrete Grade C(grade) soil nail pad; including BRC mesh (ref nr) and formwork; as shown in Drawing (drawing nr)/model	01 (dimensioned description)		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
	m2	03 Supply, spray and cure shotcrete facing, Grade C(grade); including BRC mesh (ref nr), preparing surface to receive the same, (dia) diameter perforated PVC Class (class) weep holes complete with endcap and geotextile filter fabric, polyfoam and accessories at spacing including drilling holes through whatever material; anchored by shotcrete Grade C(grade) cast into holes at spacing horizontally and vertically throughout the facing including all drilling through whatever material and anchored bars; as shown in Drawing (drawing nr)/ model	01 (thickness) thick		
	nr	04 Pull out test on soil nail	01 to (nr) times the (load) working load		
03 Ground anchors	nr	01 (Load) working load strands; covered with PVC sheath and grease; including strand holding head, drilling and cement grout as shown in Drawing (drawing nr)/model	01 to earth 02 to natural hard material 03 to rock 04 to artificial hard material 05 to unsuitable material		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
	nr	02 Pull out test on ground anchors	01 to (nr) times the (load) working load		
04 Rock bolts	nr	01 (Type); including drilling as shown in Drawing (drawing nr)/ model	01 (length) long		
		02 Pull out test on rock bolt	01 to (nr) times the (load) working load		
05 Horizontal drains	nr	01 Supply and install horizontal perforated drain wrapped with filler fabric including all necessary jointing as shown in Drawing (drawing nr)/model	01 To earth 02 To natural hard material 03 To rock 04 To artificial hard material 05 To unsuitable material	01 (length) long	
06 Pressure grouting/ ground permeation	nr	01 Drillings (dia) diameter to a (depth) deep	01 To earth 02 To natural hard material 03 To rock 04 To artificial hard material to unsuitable material	01 grouting using (nr) N/ mm water/cement grout	
07 Surface protection	m2	01 (thickness) thick Grade C(grade) guniting 02 Rock netting with (type) wire gauge size of (gauge) SWG			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 INSTRUMENTATION					
01 Supply and install piezometer for monitoring porewater pressure response 02 Supply and install settlement marker for monitoring ground displacement 03 Supply and install inclinometer for monitoring angles of slope and elevation 04 Supply and install of settlement plate	Item	01 allow			
05 Monitoring and reporting on a weekly/ forthnightly/monthly basis from the date of installation of the same until the expiry of the (nr) week/month period	Item	01 piezometer 02 settlement marker 03 inclinometer 04 settlement plate			

06 PILING WORKS

01 BAKAU PILES
02 TIMBER PILES
03 PRECAST CONCRETE PILES
04 PRECAST PRESTRESSED CONCRETE SPUN PILES
05 PRECAST PRESTRESSED CONCRETE PILES
06 CAST-IN-PLACE BORED PILES
07 CONTIGUOUS BORED PILES
08 BARRETTE PILES
09 MICRO PILES
10 CAISSON PILES
11 INTERLOCKING STEEL SHEET PILES
12 ISOLATED STEEL PILES
13 SOLDIER PILES
14 TESTING

Information to be provided in the Specification

01 General requirements applicable to all types of piling systems e.g. soil investigation reports, tolerances, piling program, records, nuisance and damage, damage to piles, safety precautions, definition, etc.
02 Specification for the following: (to group those applicable to each type of piling system)
- a. General.
- b. Materials.
- c. Stacking and storing.
- d. Pitching and driving.
- e. Pile extension.
- f. Cut-off level of piles.
- g. Obstruction to piles driving.
- h. Heave.
- i. Workmanship.
- j. Defects on piles while driving.
- k. Code of Practice.
- l. Plant and equipment
- m. Site condition.
- n. Ground condition.
- o. Site surface, etc.
- p. Boring pile shafts.
- q. Underground services.
- r. Pile shoes.
- s. Supply of piles.
- t. Production of piles at site.
- u. Making, handling, and storage of piles.
- v. Tolerances in pile dimensions.
- w. Repair and lengthening of pile.
- x. Cutting and stripping of pile heads.
- y. Straightness of piles.
- z. Grout and grouting.
- aa. Reinforcement.
- ab. All types of pile testing.

Basic information to be shown in the 2D drawings or 3D models

01 Bakau piles and timber piles
- a. Length and diameter/cross sectional dimension of the piles.
- b. Total penetration depth and jointing details.
- c. Cut-off level.

02 Preformed piles e.g. precast concrete piles, precast concrete spun piles, precast prestressed concrete piles, etc.
- a. Diameter and pre-bored length (if any).
- b. Type, number, length and diameter/size of preformed piles.
- c. Commencement level, total penetration depth and jointing details.
- d. Pile shoe (if any).
- e. Cut-off level.

03 Cast-in-place bored piles, contiguous bored piles and micro piles
- a. Type and diameter of bored piles.
- b. Commencement level, total penetration depth and allowance for boring through rock.
- c. Type and grade of concrete and reinforcement detail.
- d. Permanent casing (if required).
- e. Detail design of structural steel supports.
- f. Cut-off level.

04 Interlocking steel sheet piles
- a. Type and mass (kg/m2) of steel piles.
- b. Permanent or temporary.
- c. Area and maximum length of sheet piles.
- d. Detail design of structural steel supports.
- e. Cut-off level.

05 Isolated steel piles
- a. Type and cross-sectional dimension and mass (kg/m).
- b. Commencement level and total penetration depth and jointing details.
- c. Toe and capping plates detail (if any).
- d. Cut-off level.

06 Soldier piles
- a. Type and cross-sectional dimension and mass (kg/m).
- b. Commencement level and total penetration depth and jointing details.
- c. Group of sawn timber boarding; Consultant's design or Contractor's design of structural steel supports.
- d. Cut-off level.

07 Testing
- a. Types of load tests with loading requirement and the number of piles to be tested for each type of piling system.

Specific rules of measurement

01 Timber piles, preformed piles and isolated steel piles
- a. Unless otherwise stated, supply of the piles are to be the actual length of pile installed i.e. from designed cut-off level to toe of the pile driven to termination.
- b. Unless otherwise stated, driving of piles is to be the length of pile measured from the toe of the pile when pitched to the toe of the pile when driven to termination.
- c. Unless otherwise stated, the cut-off level is at 75mm above the bottom level of the pile cap.

02 Cast-in-place bored piles, contiguous bored piles and micro piles
- a. Unless otherwise stated, boring is to be measured from platform level or reduced level or basement level to the top of founding bedrock/design founding level to as the case may be.
- b. Unless otherwise stated, reinforced concrete in bored pile is to be measured from cut-off level while reinforcement is to be the full length to toe as shown in the Engineer's drawings.
- c. Unless otherwise stated, permanent casing is to be measured as the actual depth of the casing.

03 Interlocking steel sheet piles
- a. Unless otherwise stated, total driven area is the area of the penetration of the sheet piles calculating from the cut-off level to bottom of the pile.

'Works and materials deemed to be included' which are collectively referred to as 'Preambles'

01 General
- a. Breaking pile head is to be deemed to include cutting, trimming, stripping, dressing for key, straightening and bending bars as necessary for pile cap connection and dispose surplus pile of varying length off site.
- b. The services of a Licenced Surveyor include carrying out the setting out of all piles position and being responsible to install all piles accurately to the lines and levels required.
- c. Accurate setting out of the whole of the Works and making good to the satisfaction of the S.O. any errors in the positioning which may arise from any cause.
- d. Piling records of all piles driven including final reports for all piles duly tested signed by the Contractor and Engineer's or S.O.'s representative as work proceeds.

e. Temporary works design to address matters of safety, security and stability of the strutting if deemed necessary by the Engineer.

02 Bakau piles, timber piles and preformed piles
- a. Piling
  - i. All labour and materials for complete pile installation inclusive of wastage.
  - ii. All necessary excavation works incidental to piling.
  - iii. Driving piles singly or in cluster.
  - iv. Re-driving of upheaved pile (if any).
  - v. Replacement of damaged pile and any pile which failed under tests.
  - vi. Filling up with approved fill materials any gap appearing between pile and ground due to displacement of ground on completion of piling.
  - vii. Normal wet weather delays.
  - viii. Standing time for equipment and labour due to all the foregoing circumstances.
  - ix. Staging and platform for the installation of piles on embankments and slopes.
- b. Handling, transporting, pitching and driving
  - i. All labour and materials for complete pile installation inclusive of wastage.
  - ii. All necessary excavation works incidental to piling.
  - iii. Driving piles singly or in cluster.
  - iv. Re-driving of upheaved pile (if any).
  - v. Replacement of damaged pile and any pile which failed under tests.
  - vi. Filling up with approved fill materials any gap appearing between pile and ground due to displacement of ground on completion of piling.
  - vii. Normal wet weather delays.
  - viii. Standing time for equipment and labour due to all the foregoing circumstances.
  - ix. Staging and platform for the installation of piles on embankments and slopes.

03 Cast-in-place bored piles, contiguous bored piles, barrette piles and micropiles
- a. Boring
  - i. Disposal of excavated materials off the site including the use of temporary casing and/or the use of stabilising agent e.g. bentonite for stabilising the pile boring.
  - ii. Suitable type of construction to suit dry, wet or cased depending on soil conditions.
  - iii. All necessary excavation works incidental to piling.
  - iv. Installing, coring, boring, etc. in all soil (excluding solid rock) to the given level including all labour, equipment, plant and tools and disposal of excavated materials off the site to Contractor's own dump.
  - v. Empty bores and filling empty bores with sand or other suitable material.
  - vi. Providing pile shoes or formation of enlarged bases.
  - vii. Normal wet weather delays.
  - viii. Replacement of any pile that fail under test.
  - ix. Standing time for equipment and labour due to all the foregoing circumstances.
  - x. Staging and platform for the installation of piles on embankments and slopes.

- b. The rate for pre-boring is deemed to include backfilling, hoisting, pitching and driving of pre-bored machine/tool and its mobilisation and demobilisation.
- c. The rate for permanent casing is deemed to include the supply, jointing of casings, driving heads and shoes where applicable.
- d. The rate for 'breaking pile head' is to be deemed to include cutting, trimming, stripping, dressing for key, straightening and bending bars as necessary for pile cap connection and dispose surplus pile of varying length off site; it is also applicable to 'preformed' piles.
- e. Excavations, in-situ concrete and reinforcement
  - i. Refer to those as stated under Work Section 04: Excavating and Filling, and Work Section 09: In-situ Concrete Works.

04 Interlocking steel sheet piles
- a. Supply and install
  - i. Supply and install for extra material at laps, corners, junctions, closure and the like, welding along interlocks and coating with approved anti-rust paint.
- b. Handling, transporting, pitching and driving
  - i. Refer to the same heading for Precast concrete piles above.

05 Structural Steel Supports
- a. Submittal of all shop drawings to be endorsed by Professional Engineer with Practising Certificate (PEPC) registered with the Board of Engineers Malaysia (BEM) and the method statement for the approval of the S.O./Engineer.

06 Testing
- a. Testing of piles is deemed to include for the provision of monitoring details with calculated movements to the bored piles installed and also movements to existing structure above and below the ground.
- b. Static Load Test is deemed to include mobilisation and demobilisation upon completion of all necessary equipment, calibration, kentledge, etc. preparing pile heads to the required level and attendance of Surveyors and supervision during the test.
- c. PDA test is deemed to include provision and setting up the necessary equipment, plant and tool including preparing pile heads, the provision of temporary works and staging and manpower to carry out Dynamic Load Tests using a Pile Driving Analyser complete with CAPWAP analysis.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 BAKAU PILES					
01 Mobilisation	item	01 allow for the provision of necessary equipment, plant, tools and ancillary and for their transportation to the site, handling, assembling, erecting, dismantling, moving within site during the works and any idle standing item and demobilisation upon completion, including any excavation, filling earth to make up levels and staging required for moving of plant from differing levels on site			
02 Supply, deliver to site, handle, pitch and drive commencing from (level) level bakau piles including cutting off at required level	nr	01 (dia) diameter average (length) long each			
03 Supply, transport, pitch and drive bakau piles in two lengths including approved mild steel sleeve joint with bituminous paint and cutting off at required level	nr	01 (dia) diameter average (length) long each			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 TIMBER PILES					
01 Mobilisation	item	01 allow for the provision of necessary equipment, plant, tools and ancillary and for their transportation to the site, handling, assembling, erecting, dismantling, moving within site during the works and any idle standing item and demobilisation upon completion, including any excavation, filling earth to make up levels and staging required for moving of plant from differing levels on site			
02 Supply, deliver to site, handle and pitch pressure treated timber piles	m	01 (cross-sectional dimension); average (length) long each			1 If specific species or type of timber piles is to be used, it is to be so described in the 'Heading'.
03 Drive only singly or in cluster; commencing from (level) level with the use of appropriate approved equipment	m	01 (cross-sectional dimension) with (depth) penetration depth {in (nr) number}			1 If the piles are raked and/or in water, it is to be so described in Level One.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
04 Jointing with fillet weld all round edges of mild steel plate; including two coats of epoxy paint to the exposed surfaces of welded plate	nr	01 (cross-sectional dimension)			
05 Cut-off to the required level; including applying (type of tantalised compound) to cut off area	nr	01 (cross-sectional dimension)			
03 PRECAST CONCRETE PILES **04 PRECAST PRESTRESSED CONCRETE SPUN PILES** **05 PRECAST PRESTRESSED CONCRETE PILES**					
01 Mobilisation	item	01 allow for the provision of necessary equipment, plant, tools and ancillary and for their transportation to the site, handling, assembling, erecting, dismantling, moving within site during the works and any idle standing item and demobilisation upon completion, including any excavation, filling earth to make up levels and staging required for moving of plant from differing levels on site			
02 Pre-boring commencing from (level) level	nr	01 Bore vertical hole at any depth and through whatever soil strata	01 (dia) diameter bored (length) length		
03 Supply, deliver to site, handle and pitch	nr	01 Precast Concrete Piles (Grade C(grade) and Class (class) 02 Precast Prestressed Concrete Spun Piles (Grade C(grade) and Class (class) 03 Precast Prestressed Concrete Piles (Grade C(grade) and Class (class)	01 (cross-sectional dimension/diameter) initial piles (length) long 02 (cross-sectional dimension/diameter) extension piles (length) long		1 If the initial pile comes with the pile shoe , it is to be so described in Level One with the type stated. Alternatively, the pile shoe is to be measured separately.
04 Drive only singly or in cluster; commencing from (level) level	m	01 With the use of hydraulic hummer 02 With use of Jack-in machine	01 Precast Concrete Piles (Grade C(grade) and Class (class)) 02 Precast Prestressed Concrete Spun Piles (Grade C(grade) and Class (class)) 03 Precast Prestressed Concrete Piles (Grade C(grade) and Class (class))	01 (cross-sectional dimension/diameter piles)	1 If the piles are raked and/or in water, it is to be so described in Level One.
05 Jointing with fillet weld all round edges of mild steel plate; including two coats of epoxy paint to the exposed surfaces of welded plate for	nr	01 (cross-sectional dimension/diameter) piles			
06 Break up and cut off to the required level for	nr	01 (cross-sectional dimension/diameter) piles			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
07 Supply and install mild steel pile-plug with starter bars as basket to receive and including concrete infill as shown in Drawing (drawing nr)/model to	nr	01 Precast Prestressed Concrete Grade C(grade) Spun Piles	01 (dia) diameter piles		1 For precast concrete spun piles only.
08 Approved mild steel pile shoe splayed pointed on four faces comprising (thickness) thick mild steel plate secured for 09 Approved flat ended mild steel shoe for 10 Approved rock shoe (oslo point) for	nr	01 (cross-sectional dimension/diameter) piles			
06 CAST-IN-PLACE BORED PILES **07 CONTIGUOUS BORED PILES** **08 BARRETTE PILES** **09 MICRO PILES**					
01 Mobilisation	item	01 allow for the provision of necessary equipment, plant, tools and ancillary and for their transportation to the site, handling, assembling, erecting, dismantling, moving about site during the works and any idle standing item and demobilisation upon completion, including any excavation, filling earth to make up levels			1 Applicable to the four types of piles.
02 Pre-boring	m	01 Bore vertical hole at any depth commencing from (level) level and through whatever soil strata (except bedrock)	01 (dia) diameter bored piles {in (nr) number} 02 Extra-over for boring (dia) diameter hole through solid rock		
		02 Bore vertical hole through bedrock	01 (dia) diameter bored piles {in (nr) number}		
03 Cast-in-place concrete	m	01 Vibrated reinforced in-situ concrete; Tremie (method) {Grade C(grade)}; including working around reinforcement and poured at (rate) speed and cured in (type) method to	01 (dia) diameter bored piles {in (nr) number}		
04 Reinforcement	kg	01 Mild steel bar reinforcement 02 High tensile steel bar reinforcement	01 (dia) diameter as main bars 02 (dia) diameter as helical links		1 Applicable to cast-in-place bored piles and contiguous bored piles.
05 Breaking and cut off to the required level	nr	01 (Cross-sectional dimension) piles heads	01 (dia) diameter pile head		1 Applicable to the four types of piles.
06 Grouting	m	01 Cement grout {Grade C(grade)}	01 (dia) diameter micropiles		1 Applicable to micro piles only.
	m3	02 Cement grout {Grade C(grade)}	01 to limestones cavities		1 Applicable to the four types of piles.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
07 API pipes	m	01 Supply and install pipe N80 used API pile	01 (dia) diameter (OD), (thickness) thick in (dia) diameter micropiles {(t) tonnes}		1 Applicable to micro piles only.
08 Permanent casings; (type)	m	01 Supply and install (thickness) thick with (types treatment and coating) permanent casings through limestone cavity	01 (dia) diameter piles		1 Applicable to cast-in-place bored piles and contiguous bored piles.
09 Structural steel supports	item	01 design, supply and install temporary internal strutting for contiguous bored piles including subsequent removal from site and closing of openings, etc.			1 Applicable to contiguous bored piles only.
10 CAISSON PILES					
01 Mobilisation	item	01 allow for the provision of necessary equipment, plant, tools and ancillary and for their transportation to the site, handling, assembling, erecting, dismantling, moving about site during the works and any idle standing item and demobilisation upon completion, including			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
		any excavation, filling earth to make up levels and staging required for moving of plant from differing levels on site			
02 Temporary works	item	01 allow for providing all necessary precaution for the safety of workmen and pay particular attention to caisson shafts, ventilation, lighting, water in shafts, access to and communication in shafts, removal of persons in shafts, lifting appliances, oxygen supply and access during concreting etc. 02 allow for dewatering and keeping shafts free from storm and percolating water by pumping 03 allow for providing all necessary temporary props and strutting between columns and concrete lining of caisson by means of in-situ concrete props or struts or any other method approved by the S.O.			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 Excavation	m3	01 For caisson shaft in whatever soil strata except rock/hard material 02 Extra-over for breaking up rock material excavation 03 Extra-over for breaking up hard material excavation	01 (dia)diameter caisson piles using controlled blasting; subject to Authorities approval and by licenced specialist; removing from site 02 using pneumatic tools/ hydraulic rock breaker removing from site 03 using chemical means; subject to Authorities approval and by licenced specialist; removing from site		1 Commencing level is to be so described in the 'Heading'
04 Concrete lining ring	m	01 Construction of compacted reinforced in-situ concrete; Grade C(grade); including all necessary reinforcement formwork and filling any voids between lining and face of excavation in	01 (dia) diameter caisson piles as shown in Drawing (drawing nr)/ model		
05 Cast-in-concrete	m	01 Vibrated reinforced in-situ concrete; Tremie (method) {Grade C(grade) including working around reinforcement in	01 (dia) diameter caisson piles {in (nr)number}		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
06 Reinforcement	kg	01 High tensile steel bar reinforcement	01 (dia) diameter as main bars 02 (dia) diameter as helical links		
07 Breaking caisson lining cores from top of caisson pile to the required cut off level	nr	01 (dia) diameter caisson pile head			
11 INTERLOCKING STEEL SHEET PILES					
01 Mobilisation	item	01 allow for the provision of necessary equipment, plant, tools and ancillary and for their transportation to the site, handling, assembling, erecting, dismantling, moving about site during the works and any idle standing item and demobilisation upon completion, including any excavation, filling earth to make up levels and staging required for moving of plant from differing levels on site			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 Supply, transport, and pitch (type of steel) (mass) /m2 interlocking steel sheet piles; commencing from (level) level	m2	01 total driven area; maximum length (length)			1 If the interlocking steel sheet piles are used on a rental basis, it is to be so described in the 'Heading'. If the piles are raked and/or in water, it is to be so described in Level One. 2 Type of treatment, coating or cathodic protection (if any) is to be stated in Level One.
03 Drive only (type of steel) (mass) kg/ m2 interlocking steel piles, commencing from (level) level	m2	01 With the use of hydraulic hammer 02 With use of vibratory hammer 03 With the use of Jack-in machine	01 total driven area; maximum length (length)		
04 Cut-off steel sheet piles to the required level	m	01 in varying length			
05 Structural steel supports	item	01 design, supply and install temporary internal strutting including subsequent removal from site and closing of openings, etc.			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
06 Extracting and removing temporary interlocking steel sheet piles and making good all work disturbed upon completion	item	01 allow			
12 ISOLATED STEEL PILES					
01 Mobilisation	item	01 allow for the provision of necessary equipment, plant, tools and ancillary and for their transportation to the site, handling, assembling, erecting, dismantling, moving about site during the works and any idle standing item and demobilisation upon completion, including any excavation, filling earth to make up levels and staging required for moving of plant from differing levels on site			
02 Supply, deliver to site, handle and pitch isolated steel piles	m	01 Steel H-section piles 02 Steel pipe piles	01 (cross-sectional dimension) x (mass)/m		1 Type of treatment, coating or cathodic protection (if any) is to be described in Level One.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 Drive only isolated steel piles singly or in cluster; commencing from (level) level steel piles singly or in cluster	m	01 With the use of hydraulic hammer 02 With use of vibratory hammer 03 With the use of Jack-in machine	01 total driven area; maximum length (length)		1 If the piles are rake and/or in water, it is to be so described in Level Two.
04 Form toe with and including Grade C(grade) plate welded on as shown in Drawing (drawing nr)/model	nr	01 To steel H-section piles 02 To steel pipe piles	01 (cross-sectional dimension) x (mass)/m		
05 Jointing of extension piles including all necessary mild steel plates and welding; as shown in Drawing (drawing nr)/model	nr	01 To steel H-section piles 02 To steel pipe piles	01 (cross-sectional dimension) x (mass)/m		
06 Cut-off tops of piles to the required level	nr	01 For steel H-section piles 02 For steel pipe piles	01 (cross-sectional dimension) x (mass)/m		
07 Capping plates Grade (grade) plate welded with and including high tensile U-bar as shown in Drawing (drawing nr)/ model	nr	01 For steel H-section piles 02 For steel pipe piles	01 (cross-sectional dimension) x (mass)/m		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
13 SOLDIER PILES					
01 Mobilisation	item	01 allow for the provision of necessary equipment, plant, tools and ancillary and for their transportation to the site, handling, assembling, erecting, dismantling, moving within site during the works and any idle standing item and demobilisation upon completion, including any excavation, filling earth to make up levels and staging required for moving of plant from differing levels on site			1 To add 'Notes' preceding the 'Heading' as follows: (a) The Contractor is to note that the soldier pile system is a temporary work. Its purpose is to act as planking and strutting to the sides of the basement excavation and will be removed as soon as the basement walls are constructed. (b) Any other requirements.
02 Supply, deliver to site, handle and pitch soldier piles	m	01 To steel H-section piles 02 To steel pipe piles	01 (cross-sectional dimension) x (mass)/m		
03 Drive only soldier piles; commencing from (level) level	m	01 With the use of hydraulic hammer 02 With use of vibratory hammer 03 With the use of Jack-in machine	01 total driven area; maximum length (length)		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
04 Jointing of extension piles including all necessary mild steel plates and welding; as shown in Drawing (drawing nr)/model	m	01 To steel H-section piles 02 To steel pipe piles	01 (cross-sectional dimension) x (mass)/m		
05 Cut-off tops of piles to the required level	nr	01 For steel H-section piles 02 For steel pipe piles	01 (cross-sectional dimension) x (mass)/m		
06 Timber boarding	m2	01 Supply and install sawn Group (group) pressure- treated timber	01 (dimensioned description) boards		
07 Structural steel supports	item	01 design, supply and install temporary internal strutting including subsequent removal from site and closing of openings, etc.			
08 Removing soldier piling upon completion	item	01 extracting piles, removing boarding, strutting and waling from site; making good all work disturbed			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
14 TESTING					
01 Static load test 02 Pile dynamic analyser (PDA) test 03 Statnamic test	nr	01 working test piles of (cross-section dimension) tested to (nr) times design working load 02 preliminary/ultimate test pile (cross-section dimension) tested to (nr) of times design working load section piles			
04 Pile integrity test 05 Sonic logging test as described 06 Lateral test 07 Bi-directional static load 08 Global strain extensometer static load 09 Shaft friction test	nr	01 on (cross-section dimension) piles			
10 Proof coring	nr	01 Allow for proof coring to a required depth from the pile head and to pressure grout with an approved material the cored hole after completion	01 on (cross-section dimension) piles		
11 Rock probing	m	01 Allow for rock probing using percussion actuated rock drill boring into rock inside a pile boring	01 on (cross-section dimension) piles {in (nr) number}		

07 DIAPHRAGM WALLS AND UNDERPINNING

01 DIAPHRAGM WALLS
02 UNDERPINNING

Information to be provided in the Specification	01 General requirements are applicable to all types of diaphragm wall and underpinning structure e.g. soil investigation reports, layout and detail drawing, limit of works, method of work, commencing level of excavation, etc. 02 Specification for the following: (to group those applicable to diaphragm wall and underpinning structure) a. General. b. Definition of retaining structure. c. Dimension. d. Code of Practice. e. Submittal design for approval. f. Design criteria. g. Materials. h. Execution. i. Geosynthetic quality assurance requirement. j. Bedding and slope protection. k. Separation and stabilisation. l. Drainage. m. Installation. n. Construction. o. Testing of fill material. p. Testing of reinforcing elements.
Basic information to be shown in the 2D drawings or 3D models	01 Diaphragm walls a. Type and grade of concrete for diaphragm walls and capping beams. b. Product name of the water stop joints. c. Ground anchors details (permanent or temporary) or temporary internal strutting. 02 Underpinning a. Method of underpinning. b. Depth and maximum width.
Specific rules of measurement	01 General a. Specific rules of measurement related to 'Excavation', 'In-situ Concrete', 'Reinforcement' and 'Formwork' items under this Work Section are to be in accordance with those as stated in the appropriate Work Sections to which they correspond. 02 Diaphragm walls a. If a top-down construction method is not adopted in the basement construction, then either temporary structural steel supports or ground anchors (temporary or permanent) to diaphragm walls are required to be measured or itemised. 03 Underpinning a. In the event that the underpinning is of such an extent that it cannot easily be measured in accordance with these rules, the works are to be measured in detail in accordance with the rules for the relevant trades required. In this case, the work is to be described as 'In works of underpinning'.

'Works and materials deemed to be included' which are collectively referred to as 'Preambles'	01 General a. Excavation and disposal of surplus excavated material. b. Earthwork support. c. Preliminary trenching. d. All working space. e. Disposal of ground and surface water. f. Backfilling. g. All making good if specified. 02 Diaphragm walls a. Surface treatments e.g. filling excavated trench with bentonite slurry. b. Vertical check including labour test equipment and submission of records. c. Multiple handling of excavated materials and transporting about the site. 03 Underpinning a. Temporary support of existing structures. b. Cutting away existing foundations and footings and disposal. c. Preparing the underside of existing work. d. Surface treatment. e. All new work associated with the process of underpinning. 04 'Preambles' related to 'Excavation', 'In-situ Concrete', 'Reinforcement' and 'Formwork' items under this Work Section is to be in accordance with those as stated in the appropriate Work Sections to which they correspond.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 DIAPHRAGM WALLS					
01 Mobilisation	item	01 allow for the provision of necessary equipment, plant, tools and ancillary and for their transportation to the site, handling, assembling, erecting, dismantling, moving within the site during the works and any idle standing item and demobilisation upon completion, including any excavation, filling earth to make up levels and staging required for moving of plant from differing levels on site			
02 Diaphragm wall records	item	01 allow for the submission of records duly signed by relevant parties as work proceeds			
03 Verticality check	item	01 allow for carrying out vertically check to diaphragm wall inclusive of labour, test equipment for the completion of the tests and submission of records			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
04 Excavation	m3	01 For diaphragm wall in alternate sections or other methods approved by the S.O. in whatever soil strata	01 (width) wide; (depth) maximum depth		1 Commencing level is to be so described in the 'Heading'.
		02 Extra-over for rock excavation	01 using controlled blasting;subject to authorities' approval and by licensed specialist; removing from site 02 using pneumatic tools/hydraulic rock breaker removing from site. 03 using chemical means; subject to authorities' approval and by licenced specialist; removing from site		
05 Concrete	m3	01 Vibrated reinforced in-situ concrete; Tremie (method) Grade C(grade); with (Product name/code) waterproofing admixture or other equal and approved; including vibrating and working around reinforcement and other sundry work in	01 (thickness) thick diaphragm walls		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
		02 Vibrated reinforced in-situ concrete; Grade (grade) in	01 capping beam		
		03 Mass in-situ concrete; Grade (grade) in	01 blinding		
06 Waterstop joints	m	01 (Product name/code) or other equal and approved PVC water stop; embedded in concrete; including special welded, purpose-made or special angles, intersections and connectors {measured net-no allowance made for laps}	01 (width) wide horizontally; in diaphragm wall 02 (width) wide vertically; in diaphragm wall		
07 Mild steel bar reinforcement 08 High tensile steel bar reinforcement	kg	01 In diaphragm walls 02 In capping beams	01 (dia) diameter; straight and bent 02 (dia) diameter; links, stirrups, binders and the like 03 (dia) diameter; curved		
09 Fabric reinforcement	m2	01 In diaphragm walls	01 BRC (ref nr)		
10 Formwork; class (class) to	m2	01 Sides of capping beams			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
11 Temporary internal strutting	item	01 Design, supply and install temporary king post and internal strutting for diaphragm walls including provision of all necessary piling equipment to drive in king post and the subsequent removal of all temporary king post and internal strutting			1 If the Consultant Engineer designs such temporary internal strutting system, then such work is to be measured in accordance with the rules of the Work Section 16: Structural Metalwork.
12 Cutting off diaphragm wall heads	m	01 Cut-off to the required level; including cleaning off and removal of debris from the site and preparing reinforcement for capping beam	01 (thickness) thick diaphragm walls		
13 Ground anchors	nr	01 (Load) working load strands; covered with PVC sheath and grease; including strand holding head, drilling and cement grout; as shown in Drawing(drawing nr)/ model	01 Through (width) wide diaphragm walls; to whatever soil strata	01 (length) long	1 Permanent or temporary ground anchors are to be described in the 'Heading'.
14 Withdrawing ground anchors, removing from the site; making good all work disturbed	item	01 Allow			1 This item is only required if the ground anchors are temporary.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 UNDERPINNING					
01 Underpinning	m nr	01 (Brief description of work); (depth) deep, maximum (width) wide; (method of underpinning)	01 foundations 02 walls 03 bases		
02 Concrete	m3				1 Measured in accordance with the rules of the appropriate Work Sections stating that the work is 'in underpinning'.
03 Formwork	m2				
04 Reinforcement	kg				
05 Brickwork or blockwork	m2				
06 Tanking	m2				

08

CRIB WALLS, GABIONS AND REINFORCED SOIL STRUCTURE

01 CRIB WALLS

02 GABIONS

03 REINFORCED SOIL STRUCTURE

Information to be provided in the Specification

01 General requirements e.g. soil investigation reports, tolerances, records, nuisance and damage, damage to structure, safety precautions, definition, etc.

02 Performance Specification for Contractor Designed Crib Wall and Contractor Designed Reinforced Earth Wall covering the following:
- a. Scope of work.
- b. Submittals.
- c. Codes and standards.
- d. Design requirements.
- e. Testing.
- f. Performance criteria.
- g. Delivery, storage and handling.
- h. Materials.
- i. Fabrication.
- j. Warranties.

03 For gabion, the detail specification for the type of fill to baskets, specified treatment of basket fill and the specified handling details.

Basicinformation to be shown in the 2D drawings or 3D models

01 Gabions
- a. Type and dimension (including the gauge) of gabions.

Specific rules of measurement

01 Contractor designed Crib walls and Contractor designed Reinforced Earth walls (R.E. walls)
- a. As these are contractor designed items, they are priced as 'lump sum' items with the cost breakdown given and in the event of any variation which does not affect the overall design, it would be evaluated based on the unit rate derived from dividing the 'lump sum' price by the approximate area (measured on front face).

02 Gabions
- a. Area is measured on the front face.

'Works and materials deemed to be included' which are collectively referred to as 'Preambles'

01 Contractor designed Crib walls and Contractor designed R.E. walls
- a. All ancillary and other works and expenditures whether or not separately mentioned or described in the Performance Specification or in the Bill which are indispensably necessary to carry out and bring to completion of the Works or which may contingently become necessary to overcome difficulties before completion.
- b. Engagement of a Specialist Sub-Contractor who has the expertise and experience to design, supply and install such wall in accordance with the Performance Specification in the Specification and the relevant drawings and the approval of the S.O.
- c. The Contractor and his Specialist Sub-Contractor are to be jointly responsible to ensure that such walls are in all respect adequate, accurate, sufficient and fit for its purpose.
- d. Submittal of all shop drawings and samples as per requirements stated in the Performance Specification and be endorsed by a Professional Engineer with Practicing Certificate (PEPC) registered with the Board of Engineers Malaysia (BEM).
- e. Before pricing, the Contractor is required to visit the site and refer to the drawings for the extent, the location and the varying heights shown therein to satisfy himself as regards to facilities for transport and plant movement, means of access, removal of debris, working space, existing services, storage of materials and goods and other contingencies liable to affect the pricing as no claim for extra payments in this connection will be entertained.
- f. Any other requirements (if any).

02 Gabions
- a. Gabion baskets are deemed to include assembling, tying, fixing, bracing and tying lids.
- b. Filling of gabion baskets are deemed to include compaction and overfilling of fill material.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 CRIB WALLS					
01 Contractor designed Crib walls	item	01 Design, manufacture, supply and install Crib wall {approximate area (area)}; as shown in Drawing (drawing nr)/ model	01 breakdown cost i design fee ii investigation works iii excavation work to facilitate the construction of crib wall iv manufacture, supply and deliver to site crib wall components v piling (if any) vi erection and installation of crib wall vii supply and install mass concrete levelling pad viii supply, fill, spread, level and compact granular backfill ix. filter layer/ separator x. other works to be listed by the contractor that are necessary to ensure completion of the crib wall		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 GABIONS					
01 Gabion basket walls	m2	01 Rock-filled gabion with PVC-coated wire; as shown in Drawing (drawing nr)/mode	01 (Width) wide walls	01 vertical 02 battering 03 curved on plan 04 sloping 05 stepped on face	
02 Geotextile fabric	m2	01 Supply and lay Type (type)(weight)/m2 geotextile fabric; including laps and anchoring with (type); all in accordance with Drawing (drawing nr)/ model	01 horizontal 02 sloping 03 vertical		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 REINFORCED SOIL STRUCTURE					
01 Contractor designed reinforced soil structure	item	01 Design, manufacture, supply and install reinforced soil structure {approximate area (area)}; as shown in Drawing (drawing nr)/ model	01 breakdown cost i design fee ii investigation works iii excavation work to facilitate the construction of reinforced soil structure components iv manufacture, supply and deliver to site the reinforced soil structure components v piling (if any) vi erection and installation of reinforced soil structure vii supply and install mass concrete levelling pad viii supply, fill, spread, level and compact granular backfill ix other works to be listed by the contractor that are necessary to ensure completion of the reinforced soil structure		

Southern Steel

Southern Steel Berhad proudly marked our 60th anniversary in 2023. We are a Malaysian steel mill group that is committed to and diligently pursuing our long-term sustainable growth. We take pride in our various management system certifications, such as ISO 9001, ISO 14001, ISO 45001, and ISO 37001, which serve as a solid foundation for our way forward. Our wide range of products complies with both local and international standards. We embrace our environmentally friendly Electric Arc Furnace technology for steelmaking to reduce our environmental footprint. Our Easy Drawing Continuous (EDC) and TEMPCORE technologies achieve product qualities that meet the expectations of our valuable customers. Moving forward, we endeavour to continually improve and innovate to contribute to lowering the environmental footprint of the Malaysian steel industry.

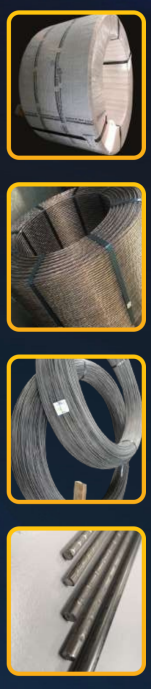


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09
IN-SITU CONCRETE WORKS

01 IN-SITU CONCRETE

02 SURFACE FINISHES TO IN-SITU CONCRETE

03 FORMWORK

04 REINFORCEMENT

05 DESIGNED JOINTS

06 CAST IN ACCESSORIES

07 SUNDRIES

Information to be provided in the Specification

01 Detailed specification of materials.
02 Classification of concrete mixes.
03 Concrete compressive strength tests and compliance.
04 Production of concrete.
05 Construction with concrete.
06 Reinforcement.
07 Formwork and surface finishes for structure.
08 Mass and lean concrete.
09 Building accuracy.
10 Apparatus.
11 Performance Specification for Slipform.

Basic information to be shown in the 2D drawings or 3D models

01 Type and strength requirement or mix of the in-situ concrete for each structural or non-structural member including one or more of the following requirements (if required).
   a. Any limitation on the method, sequence and speed of the pouring and/or compacted or cured in a particular way.
   b. Watertight works with the use of waterproofing admixture with the product name stated.
   c. Specially designed mix and/or any special type of cement e.g. rapid hardening cement, sulphur-resistant cement, etc.
02 Type of surface finishes to concrete surface.
03 No specific information as formwork is NOT drawn or modelled.
04 Reinforcement steel bars exceeding 12 metres in length.
05 Specific product name/code of the type of designed joints in in-situ concrete from the manufacturer.
06 Type of cast in accessories.
07 Mix of grouting.
08 Where the length of column is four times larger than its width, it is to be named as 'wall' instead of column.

Specific rules of measurement

01 In-situ concrete
   a. Concrete volume is measured nett.
   b. No allowance is made in volume for deflection of formwork.
   c. No deduction is made for reinforcement, steel sections and cast in accessories.
   d. Concrete is deemed to be cast into formwork unless otherwise described.
   e. Concrete is deemed to be finished as struck from basic finished formwork.
   f. All top surfaces and soffits are deemed to be finished horizontally unless otherwise described.
   g. All top surfaces are deemed to be finished tamped.
   h. 'Poured against faces of excavation', 'laid in bays', 'laid to falls, crossfalls, cambers and/or slopes irrespective of any degree from horizontal', etc. need not to be mentioned in the item descriptions but are deemed to have been observed from the drawings or models and allowed accordingly.
   i. Where length of column is four times greater than width, it is measured as 'wall'.
   j. Webs/ribs of coffered/waffled slab are measured as part of coffered/waffled slab.
   k. No deduction is made for all Mechanical and Electrical (M&E) opening.

02 Reinforcement
- a. All mild steel and high tensile steel bar reinforcement are to be in lengths not exceeding 12 metres unless otherwise stated.
- b. No allowance is made for the weight of steel reinforcement for tying wires, spacers, chairs, rolling margin or weld metal.
- c. Fabric reinforcement is deemed to be cut to size, well lapped at joints as shown in the drawings and embedded and measured nett (no allowance shall be made for laps).

03 Formwork
- a. No allowance is made in volume for deflection of formwork.
- b. 'Left-in' formwork means the formwork which will form a permanent part of the work.
- c. No deduction is to be made for beam intersections.
- d. Formwork to secondary beams are to be measured up to the sides of main beams. No deduction is to be made from the formwork of the main beam where the secondary beams intersect with the main beam.
- e. Formwork to beams that intersect with stanchion casings or columns is to be measured up to stanchion casings or columns from all sides. No deduction is to be made from the formwork of stanchion casings or columns at these intersections.
- f. Strutting height 'exceed 3.50m' means any height as shown in the relevant drawing above 3.50m.
- g. Any sloping surface of concrete more than 15 degree from horizontal requires formwork to its top surface.
- h. Formwork to ribs of coffered/waffled slabs is to be included in the measurement of 'soffits of coffered/waffled slabs'.
- i. Sloping surface means the surface with an angle between 15 degrees to 85 degrees.

'Works and materials deemed to be included' which are collectively referred to as 'Preambles'

01 In-situ concrete
- a. Providing preliminary trial mixes, tests on cement, sand, aggregate, water and mixed concrete.
- b. Hoisting or pumping and placing in position.
- c. Tamping and/or vibrating to give thorough compaction.
- d. Working between and around reinforcement.
- e. Laying on any type of sub-base and preparing and leaving surfaces to receive structural topping, screeds, paving, rendering and the like.
- f. All construction joints to the discretion of the Contractor.
- g. Curing of concrete.
- h. Continuous pours of large quantities.
- i. Forming and cutting and subsequent making good of:
  - i. Grooves, chases, rebates and the like.
  - ii. Mortices, holes and the like.
  - iii. Opening in walls, floors, roof slabs and the like.

02 Reinforcement
- a. Reinforcement bar
  - i. Allowance for rolling margin and weight of welds.
  - ii. Cutting the length.
  - iii. Hooked ends and bends including large radius.
  - iv. Brushing, cleaning and fixing in position.
  - v. Providing and fixing annealed iron tying wires at all intersections.
  - vi. Distance blocks and ordinary chairs and spacers unless not at the discretion of the Contractor.
- b. Fabric reinforcement
  - i. Allowance for rolling margin and the weight of welds.
  - ii. Allowance for laps.
  - iii. Bendings.
  - iv. Straight, circular and raking cutting and notching.
  - v. Brushing, cleaning and fixing in position.
  - vi. Providing and fixing annealed iron tying wires at all intersection.
  - vii. Distance blocks and ordinary chairs and spacers unless not at the discretion of the Contractor.

03 Formwork
- a. Erecting.
- b. Raking and curved cutting.
- c. Splayed edges.
- d. Notching.
- e. Allowance for overlaps, waste and passing at angles.
- f. Batten.
- g. Filleting to form chamfered edges or splayed angles.
- h. Bolting, wedging, easing, striking and removing.
- i. Oiling or lime washing surfaces in contact with concrete.
- j Strutting to any required height for formwork to vertical surfaces e.g. column, walls, etc.
- k. For a fair faced concrete finish, stopping all holes, cracks and the like in cement mortar and rubbing down with a carborundum stone immediately upon removal of the formwork to remove fins, board and other irregularities

04 Expansion joints
- a. All formwork.
- b. All reinforcement, moulds and casting.
- c. Finishing fair on all exposed faces.
- d. All holes, rebates, notching, sinkings, mortices, and the like.
- e. Hoisting, placing in position, setting, bedding, jointing and pointing in cement mortar (1:3) unless otherwise described.

05 Waterstops
- a. Forming all joints and junctions in accordance with the manufacturer's instructions.
- b. Forming joints in the concrete walls and slabs.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 IN-SITU CONCRETE					
01 Mass in-situ concrete; Grade C(grade) 02 Vibrated reinforced in-situ concrete; Grade C(grade)	m3	01 In filling 02 In blinding 03 In foundations 04 In machine bases, plinths, casings to steel grillages and the like 05 In beams 06 In transfer beams 07 In columns 08 In slabs 09 In transfer slabs 10 In coffered/waffle slabs 11 In structural toppings 12 In walls 13 In shear walls 14 In steps, staircase and strings and the like	01 generally		1. When any of the following is being used, it is to be so incorporated in the 'Heading': a) waterproofing admixture. b) designed mix minimum cement content (kg)/m3 and maximum water-cement ratio (ratio) to replace. 'Grade C(grade)'. c) rapid hardening cement. d) sulphur-resistant cement; and the like. 2 'Filling' includes voids, trench, hollow piles and the like. 3 'Foundations' include pad footings, pile caps, raft foundations, strip footings, column stumps and the like.
	m3 --- m	15 In footpaths,paving, apron slab, road and the like	01 generally --- 02 extra-over for forming thickening to underside including all necessary excavation, sawn formwork, sand blinding and hand packing hardcore to slopes		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
	m	16 In copings, kerbs, upstands, sills, lintels, fascias, fins, countertops and the like; including formwork and/or reinforcement; finished fair to exposed surfaces	01 (dimensioned description) as shown in Drawing (drawing nr/model) 02 irregular shaped as shown in Drawing (drawing nr/model)		4 'Slabs' includes ground slabs and beds, lift pit slabs, basement slabs, retaining wall slabs, suspended floor slabs (except transfer slabs), suspended roof slabs, suspended landing slabs, suspended ramp slabs, suspended gutter slabs and the like. 5 'Walls' includes attached columns and pilasters basement walls, retaining walls, lift walls and all types of walls (except shear walls). 6 'Beams' includes ground beams, floor beams (except transfer floor beams), ramp beams, roof beams, landing beams, staircase beams, arch beams and the like. 7 'Columns' includes attached columns, isolated columns and pilasters, piers and stiffeners.
	m	17 In vehicular speed humps; including formwork and/or reinforcement 18 In padstones, cappings and the like; including formwork and/or reinforcement; finished fair to exposed surfaces 19 In isolated ventilation grilles; including formwork and/or reinforcement; finished fair to exposed surfaces 20 In cover slabs; including formwork and/or reinforcement; finished fair to exposed surfaces			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 SURFACE FINISHES TO IN-SITU CONCRETE					
01 Troweling smooth 02 Power floating 03 Power floating; with (type of hardener, dust proofing, waterproofing, carborundum grains or the like) 04 Brushed finish	m2	01 To horizontal surfaces 02 To sloping surfaces 03 To vertical surfaces 04 To surfaces of fall or fall and crossfall 05 To surfaces forming (dimensioned description) anti-slip grooves at (centre) centre			
03 FORMWORK					
01 Formwork; sawn class F1 to 02 Formwork; wrot/steel/aluminium/plastic class F2 to 03 Formwork; steel/aluminium class F3 to 04 Formwork; steel/aluminium class F4 to	m2	01 Sides of foundations 02 Sides of machine bases, plinths, casings to steel grillages and the like 03 Sides of columns 04 Sides of beams 05 Faces of walls 06 Faces of shear walls	01 vertical 02 sloping 03 curved 04 battered on one side 05 profile as shown in (drawing nr/model)		1 'Left-in' formwork is to be so described in the 'Heading'.
	m2	07 Sides and soffits of beams 08 Sides and soffits of sloping beams 09 Sides and soffits of transfer beams 10 Soffits of slabs 11 Soffits of sloping slabs 12 Soffits of coffered/waffle slabs 13 Soffits of transfer slabs 14 Sloping soffits of staircases and strings	01 strutting not exceeding 3.50m total height 02 strutting exceeding 3.50m total height		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
	m2	15 Top surfaces 16 Edges of beds 17 Edges of slabs 18 Edges of coffered/waffle slabs 19 Edges of structural toppings 20 Edges of staircases and strings; cutting to the profile of treads and risers 21 Edges of steps/undercut risers	01 generally		
	nr	22 Extra-over for door opening and the like in walls (thickness) thick	01 (dimensioned description) as shown in Drawing (drawing nr)/model		
	nr	23 Irregular shapes			
05 Permanent formwork; (thickness) thick (product name) (type) sheet; including welding to structural steelwork as supports	m2	01 Soffits of slabs 02 Soffits of transfer slabs	01 strutting not exceeding 3.50m total height 02 strutting exceeding 3.50m total height		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
06 Contractor's Designed Slipform system 07 Contractor's Designed Table Form system	item	01 Design, manufacture, supply and install the system and use the formwork system in accordance with the Performance Specification in the Specification	01 breakdown cost {Contractor is required to give a breakdown cost for the use of the system which, among other things, is to include the supply cost of all components of the system e.g. hydraulic pump components, yoke legs, walkaway brackets, lifting jacks, strand rods, etc, and installation cost, usage cost, design fees and dismantle cost}		1 To add 'NOTES' after the 'Heading' as follows: a. The Contractor is responsible to study the structural design and determine as to whether it is suitable to use the Slipform system or Table Form system and also to ensure that the system is in all respect adequate, accurate, sufficient and fit for its purpose. b. The Contractor is to submit all shop drawings and method statement for the system work including any change in the concrete mix for the approval of the S.O. before the commencement of the works. c. (Any other requirements)

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
04 REINFORCEMENT					
01 Mild steel bar reinforcement 02 High tensile steel bar reinforcement	kg	01 In foundations 02 In machine bases, plinths, casings to steel grillages and the like 03 In beams 04 In columns 05 In slabs 06 In coffered/waffle slabs 07 In structural toppings 08 In walls 09 In steps, staircase and strings and the like 10 In footpaths, pavings, road and the like	01 (dia) diameter; straight and bent 02 (dia) diameter; links, stirrups, binders and the like 03 (dia) diameter; curved 04 (dia) diameter; helical 05 (dia) diameter; as chairs or stools 06 (dia) diameter; splice connectors, sleeves and wedges 07 (dia) diameter; welded joints		1 The use of mild steel/ high tensile steel bar reinforcement exceeding 12 metres length (if required) is to be described in Level Two.
03 Fabric reinforcement	m2	01 In foundations 02 In slabs 03 In coffered/waffle slabs 04 In structural toppings 05 In walls 06 In steps, staircase and strings and the like 07 In footpaths, pavings, road and the like	01 BRC (ref)		
05 DESIGNED JOINTS					
01 Expansion joints 02 Waterstops	m	01 In slabs or beds 02 In walls 03 In intersection between slabs and walls	01 (width) wide horizontally; as shown in Drawing (drawing nr/ model) 02 (width) wide vertically; as shown in Drawing (drawing nr)/model		1 Temporary formwork to form joggled joints and cleaning and preparing for subsequent pours are deemed to be included.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
					2 Product name/code (if any) is to be so described in the 'Heading'. 3 Curved profile (if any) is to be described in Level Two.
06 CAST IN ACCESSORIES					
01 uPVC spout pipes with splayed end 02 uPVC weep pipes with splayed end	nr	01 Cast into in-situ concrete structures	01 (dimensioned description)		
03 Mild steel angle painted with (painting system) column guards with mild steel holdfast; as shown in Drawing (drawing nr/model*)	nr	01 Cast into in-situ concrete column	01 (dimensioned description)		
07 SUNDRIES					
01 Forming scupper drain	m	01 On slab; including extra reinforcement, formwork and waterproofing system	01 (dimensioned description)		
02 Grouting; cement and sand (1:3)	nr	01 Stanchion and grillages bases	01 (dimensioned description)		

10 PRESTRESS WORKS AND PRECAST CONCRETE

01 PRESTRESS WORKS
02 PRECAST CONCRETE
03 COMPOSITE CONCRETE

Information to be provided in the Specification	01 Manufacture off-site. 02 Storage. 03 Handling and transport. 04 Assembly and erection. 05 Forming structural connections. 06 Protection. 07 Testing.
Basic information to be shown in the 2D drawings or 3D models	01 Strength or mix of concrete of in-situ concrete (if in-situ concrete is required). 02 If proprietary precast component is to be used, name of manufacturers/source catalogue and respective code number.
Specific rules of measurement	01 No deduction is to be made for reinforcement, cast-in accessories, conduits, etc. 02 Fabric reinforcement is to be measured as the area covered. No allowance is to be made for laps.
'Works and materials deemed to be included' which are collectively referred to as 'Preambles'	01 Post-tension/Pre-stressed Work a. Providing, assembling, moving about the site and subsequently removing all necessary tensioning equipment, plant, tools and the like, including spare/standby units. b. Submitting method statements with calculations, preliminary drawings and specification, details of proposed additional reinforcement or modifications to reinforcement shown on the drawings, shop drawings accompanied by outlines of construction procedures, stressing sequences, expected friction and other losses, stressing and anchoring forces, etc., manufacturer's mill certificates, test certificates and stress/strain, curves, results of laboratory tests and certified calibration curves for each jack including providing the requisite number of copies of the foregoing to all concerned and to be executed by an approved specialist. c. Taking all necessary field measurements. d. All tendons, sheath, duct, anchor blocks, grout hose, wedges, formwork for pour strip and all necessary grouting, blockouts and making good works upon completion and to be executed by an approved specialist. e. Wrapping prestressing steel in suitable paper covering before dispatch from the manufacturer. f. Tagging all wire or strand and anchorage assemblies for identification purposes. g. Forming ducts or grooves including the provision of straight or curved sleeves on sheathing and temporary supports and examining ducts for punctures and leaks. h. Forming air holes at the ends or sides of ducts and subsequently grouting. i. Forming anchoring and jacking recesses. j. Forming temporary openings in slabs for jacking purposes. k. Forming temporary construction joints between sections. l. Degreasing, straightening, cutting to length and assembling wires and cables. m. Cleaning tendons, cleaning and drying out ducts. n. Providing adequate protection against corrosion for all tendons, anchorages and ducts. o. Cones, wedges, anchor plates, spacers or chairs, distance pieces and the like expandable items. p. Tensioning in a sequence recommended by the prestressing specialist and approved by the Architect. q. Providing facilities for measuring the extension of tendons and movement of tendons in gripping devices.
	r. Allowances in lengths of tendons for ends of tendons projecting beyond anchorages and jacking equipment for method of stressing and for initial slip in the gripping devices. s. Cutting the ends of wires and cables, together with sealing and treatment after tensioning. t. Grouting including grout hose, and sealing ducts including expanding additives to grout. u. Filling in the jacking or anchoring recesses and pour strip including all necessary formwork and making good after excess strands have been cut off and grouted. v. Drilling of edge boards for anchorage fixing. w. Special strutting and supports. x. Temporary restraints for tensioning. y. Edge scaffolding and access to stressing and grouting points. z. Taking all necessary precautions and providing protective barriers for use behind anchorage for safety reasons. aa. Temporary fencing around stressing areas including altering, adapting, moving, etc. from time to time in sequence with stressing operations. ab. Any other equipment, materials or items required but not specifically mentioned above for the proper and efficient execution and completion of the prestressed concrete work. 02 Precast concrete surfaces water drain is deemed to include excavation, all moulds, finishing fair on exposed faces, hoisting, bedding and pointing in cement mortar (1:3), all ends, angles and all necessary formwork and reinforcement laid to falls. 03 All precast concrete components are deemed to include: a. Reinforcements and projecting reinforcements for lapping into the main structure. b. Lifting hooks. c. Moulds and casting. d. Keyed finish to external surfaces to receive tiling and fair finish to all other surfaces. e. Cast-in brackets, plates, U-bars, stainless steel bolts washers and brackets, etc., welded or built into the main structure. f. Holes, sleeves, rebates, notchings, sinkings, mortices and the like. g. Hoisting, placing in position, setting, bedding, jointing and pointing in cement mortar and/or grouting with non-shrink cement and sand mortar including cutting-off lifting hooks. h. Temporary supports, ties, etc. i. Concrete packing before fixing of precast units in position. j. Neoprene or plastic spacer tubes and applying silicone sealant to all joints. k. All making good after casting work. l. Casting in conduits, forming chases, opening, holes and the like for Mechanical and Electrical Installation. m. Supply to include delivery transportation, protection, and unloading to the site for storage. 04 For concrete items, refer to 'Preambles' of Work Section 09: In-situ Concrete Works.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 PRESTRESS WORKS					
01 Post-tensioning work	item	01 Mobilisation	01 allow for the provision of necessary equipment, plant, tools and ancillary and their transportation to the site, handling, assembling, erecting, dismantling, moving about the site and up the floors during the works and any idle standing time and demobilisation upon completion		
	nr	02 Post-tension work	01 to post-tension beam to provide an effective force of (nr) kN over a length of (length) and (width) wide; all as shown in Drawing (drawing nr)/model 02 to post-tension slab to provide an effective force of (nr) kN over a length of (length) and an effective force of (nr) kN over a width of (width); all as shown in Drawing (drawing nr)/ model		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 PRECAST CONCRETE					
01 Precast concrete frame structures	nr	01 Columns; as shown in Drawing (drawing nr)/ model 02 Beams; as shown in Drawing (drawing nr)/ model	01 (dimensioned description)		1 Corbel at the column head (if any) is to be so described in Level Two. 2 'Sloping beams' (if any) is to be so described in Level Two. 3 If proprietary frame is to be used, the respective code nr of such frames is to be extracted from the selected manufacturer's/ supplier's/other source's catalogue and it is to be so described in Level Two.
02 Hollow-core slabs 03 Half slabs	m2	01 (thickness) thick			1 If proprietary slabs are to be used, the respective code nr of such slabs is to be extracted from the selected manufacturer's/ supplier's/other source's catalogue and it is to be so described in the 'Heading'.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
04 Precast concrete walls, partitions and panels	m2	01 Cladding panels; as shown in Drawing (drawing nr)/model 02 Wall units; as shown in Drawing (drawing nr)/model	01 (thickness) thick		1 Horizontal, vertical or sloping are to be so described in Level One. 2 If proprietary walls, partition and panels are to be used, the respective code nr of such panels is to be extracted from the selected manufacturer's/supplier's/other source's catalogue and it is to be so described in Level One.
05 Precast staircase	nr	01 Straight flights	01 (height) high risers and (width) wide treads; (height) overall high; as shown in drawing (drawing nr)/model		1 'nr' means flight of stairs/whole spiral staircase/nr of landing slabs. 2 'Height' means the vertical height between the underside of the first riser and the top of the last riser when erected. 3 If proprietary staircase is used, the code nr of such staircase is to be extracted from the selected manufacturer's/supplier's/other source's catalogue and it is to be so described in Level One.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
	nr	02 Spiral flights	01 overall (height) high; as shown in Drawing (drawing nr)/model		
	nr	03 Landing slabs	01 (dimensioned description)		
06 Precast concrete	nr	01 Narrow width structures	01 (dimensioned description)		1 Curved profile (if any) is to be described in Level One. 2 Narrow width structures includes sills, caping, coves, comices, fascias, architraves, molding and the like
	m	02 Precast concrete halfround precast concrete surface water drains/channels	01 (dia) diameter {internal}		
03 COMPOSITE CONCRETE					
01 Precast concrete decking	m2	01 Hollow-core slabs 02 Half slabs	1 (dimensioned description) {Type (code type)} as shown in Drawing (drawing number)/mod		1 If proprietary slabs and/or beams are used, the respective code nr of such slabs and/or beams are extracted from the selected manufacturer's/supplier's/other source's catalogue and it is to be described in Level One.
	nr	03 Precast floor beams	01 (dimensioned description) {Type (code type)} as shown in Drawing (drawing number)/model		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 In-situ concrete decking	m3	04 Vibrated reinforced in-situ concrete; Grade C(grade) including all necessary formwork in	01 (thickness) thick concrete topping 02 (width) gap and (height) max. height beam infill		
	kg	05 High tensile steel bar reinforcement	01 in concrete topping slab 02 in make-up strip		
	m2	06 Fabric reinforcement BRC (ref nr) cut to size well lapped at joints and embedded	01 in concrete topping slab		

11 MASONRY

01 BRICK AND BLOCK WORKS
02 GLASS BLOCK WORKS
03 NATURAL STONE RUBBLE WORKS
04 SUNDRIES

Information to be provided in the Specification	01 Cement, sand and mortar. 02 Types of bricks, blocks and glass block. 03 Types of walling and stonework. 04 Types of bond. 05 Damp proof course. 06 Bonding to other work. 07 Workmanship and construction.
Basic information to be shown in the 2D drawings or 3D models	01 Brick/block works. a. Type of brick/block. 02 Glass block walls and natural stone rubble walls. a. Name of manufacturer/supplier (if required) and curved profile (if any). 03 Sundries. a. Type of material for each 'Sundries' item where required. 04 For 3D model, to identify 'internal' and 'external' masonry work
Specific rules of measurement	01 Walls are measured on the centre line of the material unless otherwise stated. 02 No deduction is made for stiffeners and lintels for the measurement of wall area. 03 No allowance is made for laps for damp proof courses. 04 Thicknesses stated are nominal. 05 Attached projections (measured beyond the face of the wall) of attached piers (whose length on plan is not exceeding four times its thickness). 06 All wall dimensions exclude applied finishes.
'Works and materials deemed to be included' which are collectively referred to as 'Preambles'	01 Brick/blockwork and glass block works. a. All rough and fair cutting. b. Oversailing and receding courses. c. Rough relieving and discharging arches. d. Wedging and pinning. e. Raking out joints for flashing, roof coverings, etc. and pointing with mortar. f. Bedding plates. g. Bedding and pointing frames. h. Parging and coring flues. i. Labour eaves filling. j. Plumbing. k. Angles. l. Forming square and rebated reveals, cut squint or birdsmouth. m. Forming, leaving or cutting chases, holes and mortices. n. Cutting and pinning and/or building in. o. All making good. p A layer of 'Exmet' at every fourth course for half-brick wall only. q. Cement mortar (1:3) with plasticiser. r. Mild steel bonding ties.

	s. Reinforced precast concrete lintel or reinforced in-situ concrete lintel including all necessary formwork and reinforcement over doors/windows/opening where necessary as shown in Drawing. t. Vibrated reinforced in-situ concrete Grade C25 stiffeners including all necessary formwork and reinforcement as shown in drawing. u. Sundry items of alike nature. 02 Natural stone rubble works. a. All specially made block (or brickwork and/or in-situ concrete in lieu) or selected stone rubble. b. All rough and fair cutting. c. Oversailing and receding courses. d. Plumbing. e. Edges. f. Forming square and rebated reveals. g. Notches. h. Cutting and pinning at top. i. Cutting at ends and around openings. j. Cutting and bonding at intersections, angles and irregular angles. k. Raking out joints for flashing, roof coverings, etc. and pointing with mortar. l. Bedding plates. m. Bedding and pointing frames. n. Parging and coring flues. o. Labour eaves filling. p Forming, leaving or cutting notches, chases, holes and mortices. q. Cutting and pinning and/or building in. r. All making good. s. Sundry items of a like nature. 03 Sundries a. Damp proof courses i. Forming laps, ends and angles. ii. Pointing exposed edges. iii. Bonding to damp-proof membranes and the like. iv. Cement mortar (1:3) mortar.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 BRICK AND BLOCK WORKS					
01 Common clay brick 02 Facing brick 03 Engineering brick 04 Cement and sand brick 05 Solid concrete block 06 Lightweight aerated core block 07 Hollow-core block 08 Precast concrete vent block 09 Concrete Masonry Units (CMU)	m2 --- m	01 Walls 02 Walls; skin of hollow walls 03 Walls; built against other work 04 Walls; used as formwork 05 Walls; bonding to other work 06 Walls; battered 07 Walls; tapering one side 08 Walls; tapering both sides 09 Columns 10 Columns; battered	01 Half brick thick 02 One brick thick 03 One and a half brick thick 04 Brick on edge (thickness) thick 05 (thickness) thick 06 Average (thickess) thick --------- 07 Extra-over for walls for perimeter and abutments	01 generally 02 finished fair on both sides and pointed with a neat recessed joint as the works proceeds 03 finished fair on one side and pointed with a neat recessed joint as the works proceed	1 For CMU, whether integrated, tongue end groove or normal type is to be so described in the 'Heading'. 2 If 'Walls' or 'Columns' are laid to curved profile, it is to be so described in Level One. 3 For sills, steps, coping thresholds and the like, if bullnose bricks or bricks with one bevelled edge or the like are used and/or laid to curved profile, it is to be so described in Level Two. 4 "Walls" or 'Columns' includes stump.
	m	11 Attached projection; finished fair and pointed with a neat recessed joint on exposed faces	01 Vertical 02 Horizontal 03 Raking 04 Curved	01 overall size (dimensioned description)	
	m	12 Sills, steps, coping, thresholds and the like; finished fair face and painting to exposed faces.	01 Brick-on-edge 02 Brick-on-end 03 Brick laid flat	01 overall size (dimensioned description	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
	m	13 Arches; including centring; flat 14 Arches; including centring; segmented 15 Arches; including centring; semi-circular 16 Arches; including centring; bullseye	01 Brick-on-edge; overall (dimensioned description) 02 Brick-on-end; overall (dimensioned description)	01 forming arch; overall (dimensioned description); finished fair face and pointing to exposed faces	
	m	17 Flush plain bands; with contrasting facing bricks 18 Sunk plain bands; (length) set back 19 Projection plain bands; (length) projection	01 (Width) wide; horizontal 02 (Width) wide; raking 03 (Width) wide; curved 04 (Width) wide; vertical	01 generally	
	nr	20 Capping to piers and pilasters 21 Base to pilasters 22 Corbels 23 Key blocks	01 Brick on edge; (dimensioned description); finished fair face and pointing to exposed faces		
10 Vibrated reinforced in-situ concrete; Grade C(grade); including all necessary reinforcement bars	item	01 In infill; well compacted to	01 Concrete Masonry Units (CMU)	01 (thickness) thick wall	01 The 'quantity' of the infill and reinforcement bars are to be computed by referring to the CMU catalogue/ details.
02 GLASS BLOCK WORKS					
01 (dimension description) Hollow glass block with (type) surface finish; pointing both sides as works proceed with (colour) cement mortar	m2	01 Walls	01 (dimensioned description) (type faces)		01 Curved profile or other profile (if any) is to be described in Level Two. 02 If it is to be from a specific manufacturer, it is to be so described in the 'Heading'.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 NATURAL STONE RUBBLE WORKS					
01 Stone rubble work; random stones from an approved source; built dry; uncoursed	m2	01 Walls 02 Walls; tapering one side; 03 Walls; tapering both sides;	01 (average thickness) thick		01 Curved profile (if any) is to be so described in Level Two.
	m	04 Extra over for capping; formed of rough stones	01 Overall (dimensioned description)		
04 SUNDRIES					
01 Forming cavity	m2	01 Cavity and building in ends of wall ties	01 (width) wide		
02 Cavity insulation	m2	01 Expanded polystyrene board; all in accordance with the manufacturer's instructions 02 Rockwool insulation slab; all in accordance with the manufacturer's instruction	01 (thickness) thick		
03 Damp proof courses	m	01 Hessian reinforced bituminous felt 02 Polymer-based bituminous felt	01 (width) wide		
04 Weep and spout pipe	nr	01 uPVC pipe; built into bricks or block walls	01 (dimensioned description)		
05 Galvanised steel lintels	nr	01 (dimensioned description)			

12 WATERPROOFING

01 WATERPROOFING AND ASPHALT WORK

Information to be provided in the Specification	01 Cementitious system. 02 Membrane system. 03 Polythene moisture vapour barrier. 04 Liquid applied roofing system.
Basic information to be shown in the 2D drawings or 3D models	01 The system and selected manufacturer's brief specification to each area.
Specific rules of measurement	01 The area is measured flat; no allowance for upturns, skirting, etc. unless otherwise stated and without differentiation as to the size of the area being waterproofed. 02 All the waterproofing area measured in area irrespective of the width.
'Works and materials deemed to be included' which are collectively referred to as 'Preambles'	01 All types of waterproofing and asphalt work a. Narrow widths. b. Forming arises, fair edges, butt joints, angles, ends, outlets and any other sundry items of a like nature. c. All surface preparation work and waterproofing treatment to the area around pipes, outlets, corners, ends, angles, junctions, upturn, etc.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 WATERPROOFING AND ASPHALT WORK					
01 (System from selected waterproofing manufacturer) cementitious system 02 (System from selected waterproofing manufacturer) membrane system 03 (System from selected waterproofing manufacturer) polythene moisture vapour barrier 04 (System from selected waterproofing manufacturer) liquid applied roofing system	m2 --- m	01 Covering; to concrete/ brickwork base --- 02 Skirtings; to concrete/ brickwork base 03 Skirtings to brickwork base; turning into groove at top and pointing with approved sealant 04 Fascias; to concrete/ brickwork base 05 Gutters; to concrete/ brickwork base 06 Channels; to concrete/ brickwork base 07 Valleys of roof; to concrete/brickwork base 08 Kerbs; to concrete/ brickwork base	01 generally --- 02 (girth/height) girth/ high		1 'Covering' is deemed to include horizontal, sloping, vertical, raking and the like except stepped or curved profile (if any) which is to be so described in Level One.
05 Testing	item	01 Allow for watertightness and ponding test to the waterproofed areas for 48 hours including temporarily plugging of outlets, and all necessary works			

13 ROOFING

01 ROOFING TILES
02 METAL ROOFING
03 INSULATIONS
04 FLASHING AND RAINWATER GOODS
05 ROOF-LIGHTS AND SPECIAL SHEETS

Information to be provided in the Specification	01 General – pitch and laps for each type of roof covering are to be strictly in accordance with the manufacturer's instructions and all roof covering accessories are to be of the same material as the general covering. 02 Types of roofing tiles and their respective MS/BS/EN code and the requirements for laying of tiles and their accessories in accordance with manufacturer's instructions. 03 Types of metal roofing and their respective MS/EN code and the detailed specification of surface finish, the composition of the metal, the fixing requirements and the accessories and the warranty required, all in accordance with manufacturer's instructions. 04 Types of insulations and the respective MS/BS/EN code and detailed specification.
Basic information to be shown in the 2D drawings or 3D models	01 Roofing tiles and metal roofing a. Quality, profile, type, name of the manufacturer/supplier and product series code and pitch. 02 Insulations a. Number of layers and whether single-sided or double-sided. b. Pitch of insulation. c. Rock wool and glass fibres labs, the thickness and weight per m3. 03 Flashing, rain water goods and the like a. Type and gauge and the type of joints. b. Outlet at gutters. 04 Roof-lights and special sheets a. Type and profile.
Specific rules of measurement	01 Slate or tile roofing and roof decking are to be measured as the area of the finished surface. 02 Bitumen-felt or other types of waterproofing membrane to roofing are measured under the Work Section 12: Waterproofing. 03 Sheet metal roofing and rain water goods are to be measured as the area of the finished surface. 04 When the word 'on' or 'fixed to' followed by a sub-component in Level One or Level Two, it is assumed that the provision of such sub-component is excluded in the building component/item unless stated otherwise.
'Works and materials deemed to be included 'which are collectively referred to as 'Preambles'	01 Roofing tiles and metal roofing a. Laps. b. All straight, skew and circular cutting at eaves, verges, top edges, abutments, valleys, hips and the like. c. Forming holes for pipes and the like. d. Bedding, pointing, finishing with mortar fill etc. 02 Insulations a. Laps. b. All straight, skew and circular cutting at eaves, verges, top edges, abutments, valleys, hips and the like. c. Forming holes for pipes and the like. 03 Flashing, rainwater goods and the like a. Laps, bents, passing in the running lengths, fixing and pointing of edges. b. Types used either shown in the drawings or in accordance with the manufacturer's recommendation.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 ROOFING TILES					
01 Clay roofing tiles 02 Concrete roofing tiles 03 Shingle tiles 04 Slate tiles 05 Non-asbestos corrugated roofing sheet	m2 --- m --- nr	01 On and including (dimensioned description) sawn pressure treated Grade (grade) timber battens at (length) centres; in accordance with the manufacturer's instructions 02 On and including metal purlins at (length) centres; in accordance with the manufacturer's instructions	01 Pitch (nr) degree 02 Vertical coverings 03 Conical; as shown in Drawing (drawing nr)/ model 04 Elliptical; as shown in Drawing (drawing nr)/ model	01 generally 02 complete with one layer of (single/double) sided aluminium foil sisalation 03 complete with one layer of (single/double) sided aluminium foil sisalation and (thickness) mm thick (type) slab with galvanised chicken wire net --- 04 extra-over for ridge tiles 05 extra-over for hip tiles 06 extra-over for valley tiles 07 extra-over for verge tiles --- 08 extra-over for verge end cappings 09 extra-over for (nr) ways presses round apexes 10 extra-over for vent	1 Quality, profile and type are to be so described at the 'Heading'. When the name of the particular series from the manufacturer is stated in the 'Heading', then the aforesaid information is not required. 2 Curved profile (if any) is to be so described in Level Two.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 METAL ROOFING					
01 Tile-effect metal decking 02 Profiled steel decking 03 Profiled aluminium alloy decking	m2 --- m --- nr	01 On and including metal purlins at (length) centres with self-tapping screws and other fixing accessories in accordance with the manufacturer's instructions 02 On and including (dimensioned description) sawn pressure treated Group (A/B/etc) timber battens at (length) centres; in accordance with the manufacturer's instructions	01 Pitch (nr) degree 02 Vertical coverings 03 Conical; as shown in Drawing (drawing nr)/ model 04 Elliptical; as shown in Drawing (drawing nr)/ model	01 generally 02 complete with one layer of (single/double) sided aluminium foil sisalation 03 complete with one layer of (single/double) sided aluminium foil sisalation and (thickness) mm thick (type) slab with galvanised chicken wire net --- 04 extra-over for ridge cappings 05 extra-over for hip cappings 06 extra-over for valleys --- 07 extra-over for verges 08 extra-over for verge end capping 09 extra-over for hip end cappings 10 extra-over for vent cappings	1 Quality, profile and type are to be so described at the 'Heading'. When the name of the particular series from the manufacturer is stated in the 'Heading', then the aforesaid information is not required. 2 Curved profile (if any) is to be so described in Level Two.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 INSULATIONS					
01 Aluminium foil insulation	m2	01 One layer of single-sided; on timber/metal battens 02 One layer double-sided; on timber/metal battens	01 pitch (nr) degree 02 vertical coverings 03 conical; as shown in Drawing (drawing nr)/model 04 elliptical; as shown in Drawing (drawing nr)/model		1 Curved profile (if any) is to be so described in Level Two.
02 Rockwool slabs 03 Glass fibre slabs	m2	01 (Thickness) thick; and (weightage) kg/m3; on and including galvanised chicken wire mesh net			
04 FLASHINGS AND RAINWATER GOODS					
01 Galvanised steel sheeting 02 Zincalume sheeting 03 Stainless steel sheeting 04 uPVC; (MS/EN code)	m	01 (ref nr) gauge; with water-tight soldered seams and joints;	01 box gutters; (girth) girth; fixing with and including approved galvanised mild steel brackets; including extra for stop ends and rain water pipe outlets 02 half-round gutters; (dia) diameter; fixing with and including approved galvanised mild steel brackets; including extra for stop ends and rain water pipe outlets 03 rain water downpipes; (dia) diameter; fixing with and including approved galvanised mild steel brackets including extra bends and shoe		1 If painting to expose metal surface is required, it is to be so described stating the painting system. 2 Flashing is deemed to include stepped, raking, curved and the like except if flashing is one end tucked into brickwall and the other over the roofing, it is to be so described.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
			04 rain water downpipes; (dia) diameter; cast in concrete column including extra bend sand shoe 05 rain water downpipes; (dia) diameter; build in trench; including all necessary excavation 06 vent pipes (dia) diameter; fixing with approved galvanised mild steel brackets; with mosquito proof wire mesh; (dia) diameter 07 flashings; (girth) girth		
05 Sundries	nr	01 Galvanised steel	01 grating and frame; to suit (dia) mm diameter rain water outlet 02 dome shaped grating and frame; to suit (dia) mm diameter rain water outlet 03 spout pipe; (dia) mm diameter; (length) mm long; cast in concrete		
05 ROOF-LIGHTS AND SPECIAL SHEETS					
01 Skylights 02 Dead roof lights 03 Opening roof lights	nr	01 Extra-over (type) roofing for extruded acrylic 02 Extra-over (type) for polycarbonate	01 pyramid shaped 02 dome shaped 03 flat panels	01 fixed to (type) roofing; including all necessary accessories for complete installation; as shown in Drawing (drawing nr)/model	

14 CARPENTRY

01 TIMBER FRAMING AND PREFABRICATED STRUCTURES
02 BOARDING, PANELLING, DECKING, CASINGS AND LININGS
03 PROPRIETARY TIMBER ROOF TRUSS SYSTEM
04 METAL ACCESSORIES

Information to be provided in the Specification	01 Schedule of timber grouping and usage. 02 Schedule of timber species in relation to strength grouping in accordance with MS 544. 03 Schedule of moisture contents (M.C.) of timber for various positions in the building. 04 Timber grades and size tolerance. 05 Treatment of timber. 06 Moisture content and storage. 07 Structural assemblies of timber. 08 Timber joints. 09 Glued laminated timber for structures. 10 Products and materials. 11 Carpentry works (generally). 12 Performance specification for proprietary timber roof truss system.
Basic information to be shown in the 2D drawings or 3D models	01 Timber framing a. Specific type of timber e.g. resak, balau, etc. or 'Group' of timber e.g. Group A, B, etc. b. Sawn or wrot timber. c. Treatment of timber. 02 Prefabricated structures a. Specific type of timber e.g. resak, balau, etc. or 'Group' of timber e.g. Group A, B, etc. b. Sawn or wrot timber. c. Treatment of timber. 03 Boarding, panelling, decking, casings and lining material a. Types of material e.g. medium density fibreboard (MDF), cement fibre sheet, structural floor (SF), magnesium board, plywood moisture resistance (MR) bonded, water boiled proof (WBP) bonded and the like. 04 Proprietary Timber Roof Truss System a. Type of roofing and ceiling that it supports. 05 Metal accessories a. Type of material for each type of metal accessories.
Specific rules of measurement	01 Length of members is the overall length with no deduction for splay cut or mitred ends. 02 Strutting is measured through the structural members being stiffened. 03 The length of a bolt is measured over the head. 04 No allowance is made for the mass of welds, bolts, nuts, washers, rivets and protective coatings.
'Works and materials deemed to be included' which are collectively referred to as 'Preambles'	01 Timber framing, prefabricated structures and boarding, panelling, decking, casings and linings a. Short lengths. b. Cutting, notching, boring, sinking, pelleting, fitting, rimming, mitring, halving, morticing, tenoning, dovetailing, scarfing and wedging. c. All ends.

d. Splayed edges.
e. Temporary supports.
f. Fixing with nails and glue.
g. Sundry items of a like nature.
h. Insulating board, wood wool board, etc., are to include:
i. Narrow widths and small quantities.
j. Cutting and boring holes for pipes, etc.
k. Setting out the ceiling as shown in the drawings with equal margins all around.

02 Timber framing is deemed to include fixing and connecting with bolts, gang nails, slicing plates, gussets, webs,etc. on-site and any type of joint e.g. tongued and grooved joint, tongued, grooved and V-jointed, rebated joints, butt joints, etc.

03 Prefabricated structures, e.g. roof trusses, portal frames, etc. are deemed to include:
a. All rafters, top and bottom chords, ties, struts, etc.
b. All fabricating off-site; cutting, fixing and connecting with bolts, gang nails, slicing plates, gussets, webs, etc.
c. Its erection on-site including delivery to site, hoisting and site bolting/gang nailing.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 TIMBER FRAMING AND PREFABRICATED STRUCTURES					
01 Timber framing	m	01 Sawn 'Pressure Treated' timber 02 Sawn timber 03 Wrot 'Pressure Treated' timber 04 Wrot timber	01 Rafters, purlins, roof joists, wall plates and all associated roof timbers 02 Floor joists, ceiling joists, beams, strutting, ties, collars, grounds, battens and all associated floor and ceiling timbers 03 Posts, columns, partition wall members and all associated wall and columns timbers 04 Kerbs, bearers, grounds, packing pieces and the like	01 nominal (dimensioned description)	1 Specific type of timber e.g. resak, balau, etc. or 'Group' of timber e.g. Group A, B, etc. is to be described in Level One. 2 Curved profile (if any) is to be so described in Level Three.
	m2		05 Battening plugged to walls and columns 06 Battening plugged to ceiling and beams 07 Framework to eaves soffits 08 Framework to ducts and pipe casings 09 Framework to false beams 10 Framework to cornices	01 nominal (dimensioned description) members; at (width) wide centres	
02 Prefabricated structures	nr	01 Sawn 'Pressure Treated' timber 02 Sawn timber	01 Roof trusses; Type (type) as shown in Drawing (drawing nr)/ model	01 (type) pitch at (degree) degree; (length) span over wall plates; (length) overhang	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
		03 Wrot 'Pressure Treated' timber 04 Wrot timber	02 Portal frames; Type (type) as shown in Drawing (drawing nr)/ model	02 (height) high from base to apex; (span) overall span; approximately (height) high from ground to eaves	
02 BOARDING, PANELLING, DECKING, CASINGS AND LININGS					
01 Medium density fibreboard (MDF) 02 Cement fibre sheet 03 Structural floor (SF) magnesium board 04 Plywood; moisture resistance (MR) bonded 05 Plywood; water boiled proof (WBP) bonded 06 Laminated plastic sheet 07 Melamine board	m2	01 Decking	01 To floors 02 To landings	01 plugged to concrete 02 plugged on and including (dimensioned description) grounds; at (width) centres; plugged to concrete	1 Curved profile (if any) is to be so described in Level Three.
		02 Panelling	01 To walls and columns		
		03 Casing	01 To pipe casings		
		04 Boarding	01 To ceilings and beams 02 To soffits of staircases 03 To sloping roofs 04 To flat roofs 05 To gutter soffits and sides		
	m	05 Lining	01 To treads; (width) wide 02 To risers; (width) wide 03 To fascias, verge and barge; (width) wide 04 To eaves soffits; (width) wide	01 generally	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 PROPRIETARY TIMBER ROOF TRUSS SYSTEM					
01 Design, fabrication, deliver to site and installation of metal roof trusses to support (the type of roofing sheet/tiles) {'measured separately'} and at various heights up to a maximum of approximately (height) high above ground level (approximate roof area)	item	01 allow			1 To add 'NOTES' preceding the Heading as follows: (a) Design, fabricate to site and furnish all materials, tools, hoists, stagings, temporary bracings, etc. for the safe and proper erection of fabricated metal trusses (with the type of metal to be stated) which are deemed to include all rafters, top and bottom chords, ties, struts, bearers, wall plates, bolts and nuts, site welding, holding down bolts, and other associated items required for the works to the satisfaction of the S.O. In addition,the design is to also suit the type of ceiling to be installed at the bottom chords; if additional bearers, tie beams, ceiling joists, etc., to be added arising therefrom, they are also deemed to be included.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
					(b) Overall, the design is to be adequate, accurate and fit for its purpose. (c) Submission of all shop drawings and samples as per requirements stated in the Performance Specification and to be endorsed by Professional Engineer with Practising Certificate (PEPC) registered with the Board of Engineers Malaysia (BEM). (d) If painting is required, it is to be done before erection. (e) Any other requirements (if any).
04 METAL ACCESSORIES					
01 Mild steel; including priming and painting 02 Galvanised mild steel	nr	01 Tie rod 02 Bolts	01 (dimensioned description)		
		03 Strips and clips	01 (dimensioned description); nailed one end		
		04 Joist hangers	01 (dimensioned description)		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
		05 Nail plates	01 (dimensioned description); fixed with nails		
		06 Connectors	01 (dimensioned description) single sided round tooth plate		

pkt
QUANTITY SURVEYORS

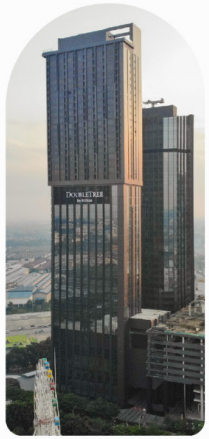
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15 JOINERY

01 FRAMES AND FINISHINGS
02 DOORS
03 WINDOWS
04 SKYLIGHTS
05 STAIRCASES AND STEPS
06 BALUSTRADES, RAILINGS AND HANDRAILS
07 PROPRIETARY OPERABLE WALL SYSTEM
08 TOILET CUBICLE SYSTEM
09 GYPSUM BOARD PARTITIONS
10 FURNITURE AND FITTINGS
11 IRONMONGERY
12 SIGNAGE

Information to be provided in the Specification	01 Refer to 'Information to be provided in the Specification' in 'Carpentry' where applicable. 02 Joinery works (generally). 03 Doors. 04 Ironmongery. 05 Signage: a. Types and quality of material b. Method of fixing c. Compliance with relevant Authority guidelines d. Compliance with relevant ISO
Basic information to be shown in the 2D drawings or 3D models	01 Frames and finishings, doors, windows, skylights, staircase and steps, balustrades, railing and handrails a. Type of timber (e.g. nyatoh, resak, etc. or 'Group' of timber, e.g. Group A, B, etc.). b. Where items or proprietary items are required to be supplied by a specific manufacturer/supplier, the name of the manufacturer/supplier together with the product name/code. 02 Proprietary Operable Wall System a. Whether acoustic wall or other special requirements. 03 Toilet cubicle system a. Product name/code and name of the manufacturer. b. Thickness and type of board. 04 Gypsum board partitions a. Thickness of boards. b. Finishing to the boards. c. Thickness and type of glass (if with glazing). d. Type of insulation (if with insulation). e. Product name/code and name of the manufacturer (if a specific type is required). 05 Furniture and fittings a. Specific types of timber (e.g. nyatoh, resak, etc. or 'group' of timber, e.g. Group A, B, etc. 06 Ironmongery a. Types of ironmongery and product name/code and name of the manufacturer (where necessary). 07 Signage a. The location, lettering, colour code, and dimension and other incidental features
Specific rules of measurement	01 Length of members is the overall length with no deduction for a splay cut or mitred ends.

'Works and materials deemed to be included' which are collectively referred to as 'Preambles'	01 Frames, finishings, skylights, balustrades, railings and handrails a. Short lengths and small quantities. b. Narrow widths of boarding. c. Cutting and notching. d. Holes. e. Fair, fitted, returned, shaped and housed ends. f. Regular and irregular mitres. g. Angles, junctions and heading joints. h. Planting on with nails or beads and the like punched in. i. Fixing with glue or other adhesive. j. Sundry items of a like nature. k. Rebated, grooved, bevelled and the like frames. l. Ground or packing piece. 02 Plywood, hardboard and any other sheet materials of a like nature a. All necessary cutting of holes, notches, etc. 03 Furniture and fittings a. Bearers, grounds, battens and all components forming the assembly including ironmongery, glazing, type of surface finishing and painting system as stated in the drawings. 04 Staircases and steps a. Bearers, grounds, battens, bolts and all other supports and fixing. 05 Toilet cubicle system a. Lockset with indicator, hinges, coat hook with rubber bumper and all necessary fittings all in accordance with the manufacturer's instructions. 06 Ironmongery a. Fixing with screws of the same finish as the ironmongery to timber unless otherwise stated. b. Cutting, sinking, boring and morticing as required. c. Oiling, easing and adjusting all moving parts. d. Taking out and refixing after painting where necessary. e. Leaving in perfect working order. f. Handing the keys should be properly labelled to the Architect on completion. 07 Signage a. Fixing with screws or any other method of fixing as recommended by the supplier/manufacturer b. Submission of all shop drawings showing the location, number of signages, lettering, colour code, material samples, dimension and other incidental features for approval of the S.O. before proceeding with the work.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 FRAMES AND FINISHING					
01 Wrot and framed 'Pressure Treated' timber	nr	01 Door framesets; comprising frames; fixing in position; prepare and apply (painting system) to all exposed timber surfaces after fixing 02 Window framesets; comprising frames and sills; fixing in position; prepare and apply (painting system) to all exposed timber surfaces after fixing 03 Window framesets; comprising frames, mullions, transoms and sills; fixing in position; prepare and apply (painting system) to all exposed timber after fixing 04 Fixed louvred window framesets; comprising frames with grooves; fixing in position; prepare and apply (painting system) to all exposed timber surfaces after fixing 05 Adjustable louvred window framesets; comprising frames, mullions and sills; fixing in position; prepare and apply (painting system) to all exposed timber surfaces after fixing	01 to overall size (dimensioned description) door opening; as shown in Drawing (drawing nr)/ model		1 Specific type of timber (e.g. nyatoh, resak, etc. or 'Group' of timber, e.g. Group A, B, etc.) is to be described in the 'Heading'. 2 If there are security bars in the window framesets, they are to be so described in Level One including their painting system. 3 Curved profile (if any) is to be so described in Level Two. 4 'Fixing in position' is deemed to include mild steel holdfast, infill, fixing cramps, dowels, etc. 5 Painting to door and window frames includes 'prepare and prime' back of frames before fixing.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 Wrot and framed 'Pressure Treated' timber	m	01 Architraves; prepare and apply (painting system) to all exposed timber surfaces 02 Cornices; prepare and apply (painting system) to all exposed timber surfaces 03 Mouldings, dado rails and the like; prepare and apply (painting system) to all exposed surfaces 04 Window boards; prepare and apply (painting system) to all exposed surfaces 05 Skirtings; prepare and apply (painting system) to all exposed surfaces 06 Nosings and the like; prepare and apply (painting system) to all exposed surfaces 07 Cappings; prepare and apply (painting system) to all exposed surfaces	01 (cross-sectional dimension) 02 irregular shaped as shown in Drawing (drawing nr)/model		1 Specific type of timber (e.g. nyatoh, resak, etc. or 'Group' of timber, e.g. Group A, B, etc.) is to be described in the 'Heading'. 2 Curved profile (if any) is to be so described in Level Two.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 DOORS					
01 Wrot and framed 'Pressure Treated' timber	nr	01 Flush door; hollow core construction; with plywood on both sides and timber lipping all round; complete with door frames; fixing in position; prepare and apply (painting system) to all exposed timber surfaces after fixing; hanging {butt measured separately}; 02 Flush door; solid core construction; with plywood on both sides and timber lipping all round; complete with door frames; fixing in position; prepare and apply (painting system) to all exposed timber surfaces after fixing; hanging {butt measured separately}; as shown in Drawing (drawing nr)/model	01 overall size (dimensioned description); (nr) hour rated {Type (code type)} as shown in Drawing (drawing nr)/ model 02 pair overall size (dimensioned description); (nr) hour rated; including labour for forming rebated meeting stiles {Type (code type)} as shown in Drawing (drawing nr)/model 03 rebated meeting stiles overall size (dimensioned description); in (nr) nr equal panels; on sliding track {measured separately} as shown in Drawing (drawing nr)/ model 04 sliding; overall size (dimensioned description); in equal panels including sliding track; {Type (code type)} as shown in Drawing (drawing nr)/ model		1 Specific type of timber (e.g. nyatoh, resak, etc. or 'Group' of timber, e.g. Group A, B, etc.) is to be described in the 'Heading'. 2 Waterproof plywood, veneer plywood, zinc sheet and any other surface finishes to one side or both sides of the flush door (if any) are to be so described in Level One. 3 If there is architrave, it is to be so described in Level One. 4 Where door frames, architrave and the like are measured separately from the door leave itself, then 'complete with door frame' described in '01', '02' and '03' of Level One is to be omitted to form the component / item description for the same. 5 If there is 'heel stone', it is to be so described in Level Two.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
		03 Panelled door; solid (nr) panels; complete with door frames; fixing in position; prepare and apply (painting system) to all exposed timber surfaces after fixing; hanging {butt measured separately}; as shown in Drawing (drawing nr)/model 04 Fire-rated door to Bomba's approval; covered both sides with paint grade plywood with intumescent strips; (cross-section dimension) (type) timber door frame; prepare and apply (painting system) to all exposed timber surfaces; including butt hinges and ironmongeries	05 folding; overall size (dimensioned description); in equal panels including folding track; {Type (code type)} as shown in Drawing (drawing nr)/ model		6 If there is 'glazed single panel and the like' as part of the door, it is to be so described in Level One. 7 If there is any moulding to the panel, it is to be so described in Level One. 8 If there is opening infilled with wired glass with timber beadings as observation panel or infilled with louvres covered one side with anti-vermin wire netting and the like to the door, they are to be so described in Level Two. 9 'Fixing in position' is deemed to include mild steel holdfast, infill, fixing cramps, dowels, etc. 10 Painting to door frames includes 'prepare and prime' back of frames before fixing. 11 If the 'door' is identified by 'type' in the drawing/model, then such information is to be stated in 'Level One'

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 WINDOWS					
01 Wrot and framed 'Pressure Treated' timber	nr	01 Casement window; opened in (nr) panels infilled with (type) glass with glazing beads; complete with window frames; fixing in position; prepare and apply (painting system) to all exposed timber surfaces after fixing; 02 Sliding windows; comprising (nr) nr.equal sliding panels; each opened in (nr) panes and infilled with (type) glass with glazing beads; complete with window frames; fixed in position; including approved ironmongery and sliding track; prepare and apply (painting system) to all exposed timber surfaces after fixing;	01 overall size (dimensioned description)) {Type (code type)} as shown in Drawing (drawing nr)/model		1 Specific type of timber, e.g. nyatoh, resak, etc. or 'Group' of timber, e.g. Group A, B, etc. is to be described in the 'Heading'. 2 'window frames' is deemed to include mullions, transoms and/or sills (if required). 3 Whether top-hung or side-hung or fixed is to be described in Level One. 4 'Fixing in position' is deemed to include mild steel holdfast, infill, fixing cramps, dowels, etc. 5 If the 'window' is identified by 'type' in the drawing/model, then such information is to be stated in 'Level One'.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
		03 Composite window comprising (nr) equal side-hung; complete with window frames; and fixing in position; each panel infilled with (type) glass with glazing beads; prepare and apply (painting system) to all exposed timber surfaces after fixing; 04 Fixed louvre window; complete with window frames with grooves; infilled with (type) glass louvres; complete with window frames fixing in position; prepare and apply (painting system) to all exposed timber surfaces after fixing;			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
		05 Adjustable louvre window; complete with frames (and mullions) fixing in position; infilled with (type) glass louvres fixed to and (type) including (Product name/code) a set of (single/dual control) galvanised steel aluminium lacquered finished adjustable louvre frames comprising jambs, clips and operating handle fixed to frames with all necessary screws and accessories; prepare and apply (painting system) to all exposed timber surfaces after fixing;			
02 Sundries	m	01 Security bars	01 Mild steel; both ends fixed through timber frame; including (painting system)	01 (dia) diameter	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
04 SKYLIGHTS					
01 Wrot and framed 'Pressure Treated' timber	nr	01 Skylights; complete with frame; and fixing in position; opened in panels infilled with (type) glass with glazing beads; including all ironmongery; prepare and apply (painting system) to all exposed timber surfaces after fixing;	01 overall size (dimensioned description) {Type (code type)} as shown in Drawing (drawing nr)/model		1 Specific type of timber (e.g. nyatoh, resak, etc. or 'Group' of timber, e.g. Group A, B, etc.) is to be described in the 'Heading'.
05 STAIRCASES AND STEPS					
01 Wrot and framed 'Pressure Treated' timber	nr	01 Single flight staircases; prepare and apply (painting system) to all exposed timber surfaces after fixing; as shown in Drawing (drawing nr)/model 02 Two straight flights staircases and one intermediate landing; prepare and apply (painting system) to all exposed timber surfaces after fixing;	01 (dimensioned description) on plan and (height) high {Type (code type)} as shown in Drawing (drawing nr)/model		1 Specific type of timber (e.g. nyatoh, resak, etc. or 'Group' of timber, e.g. Group A, B, etc.) is to be described in the 'Heading'. 2 If the staircases are spiral, it is to be so described in Level One.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
06 BALUSTRADES, RAILINGS AND HANDRAILS					
01 Wrot and framed 'Pressure Treated' timber	m	01 Handrail; including associated balustrade (height) and all components forming the assembly; prepare and apply (painting system) to all exposed timber surfaces; as shown in Drawing (drawing nr)/ model 02 Handrail; (height) high; including associated mild steel balustrade (height) and all components forming the assembly; prepare and apply (painting system) to all exposed timber surfaces; as shown in Drawing (drawing nr)/model 03 Handrails; including (thickness) thick timber panel (height) high and all components forming the assembly; prepare and apply (painting system) to all exposed timber surfaces; as shown in Drawing (drawing nr)/model	01 horizontal 02 raking 03 curved 04 raking and curved		1 Specific type of timber (e.g. nyatoh, resak, etc. or 'Group' of timber, e.g. Group A, B, etc.) is to be described in the 'Heading'. 2 All ornamental ends, ramps, quadrants and the like are deemed to be included.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
07 PROPRIETARY OPERABLE WALL SYSTEM					
01 Design, supply, fabricate and install Proprietary Operable Wall System; as shown in Drawing (drawing nr)/model	nr	01 overall size (dimensioned description)			1 The number of panels (if any) is to be so described in Level One. 2 If the acoustic wall system or other special requirement is required, it is to be so described in the 'Heading'. 3 To add 'Notes' preceding the 'Heading' comprising the following: (a) Design, supply, install and commission are to be from approved manufacturers. The design is to be adequate, accurate and fit for its purpose. (b) Submittal of all shop drawings indicating the System supplier's detailed material and fabrication specifications and installation instructions together with catalogues, hardware, fastenings and other dates as required and to relevant approval before proceeding with the work.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
					(c) Submittal of a warranty(to state the validity period) on the materials and workmanship according to an approved format. (d) Any other requirements (if any).
08 TOILET CUBICLE SYSTEM					
01 Toilet cubicles system	nr	01 Constructed of (thickness) thick (type) boards;	01 overall (length) front length, (depth) wall depth and (height) wall height; in (nr) cubicles with doors {Type (code type)} as shown in Drawing (drawing nr)/ model		1 If specific 'brand' is required, it is to be so described in the 'Heading'.
09 GYPSUM BOARD PARTITIONS					
01 Full partitions	m2	01 Constructed of two skins of gypsum board in taped and flushed joint complete with (type) framing and other necessary accessories	01 painted on both sides with (painting system) {Type (code type)} as shown in Drawing (drawing nr)/model 02 finished on both sides with veneer wallpaper of 'standard' colour {Type (code type)} as shown in Drawing (drawing nr)/model		1 If there is a door in the partition, it is to be so described as 'opened for door' in Level one and also to state the type of framing for the door but the door is measured separately. 2 If a specific 'product name' of gypsum board is to be used, it is to be so described in Level One.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
					3 If there is any infill, e.g. rock wool insulation, fibreglass insulation, etc.,it is to be described in Level One. 4 Curved profile is to be so described in Level Two. 5 If veneer wallpaper is of special colour, it is to be so described in Level Two.
02 Partially glazed partitions	m2	01 Constructed of two skins of gypsum board in taped and flushed joint complete with (type) framing and other necessary accessories; opened for and including (type) glass panels with glazing gasket	01 painted on both sides with (painting system) 02 finished on both sides with veneer wallpaper of 'standard' colour		
03 (nr) hour Fire Rated Proprietary Partitions to Bomba's approval	m2	01 Constructed of two skins of fireproof boards in taped and flushed joint; complete with a (type) framing system and other necessary accessories; all in accordance with manufacturer's instruction	01 painted on both sides with (painting system) 02 finished on both sides with veneer wallpaper of 'standard' colour		
10 FURNITURE AND FITTINGS					
01 Wrot and framed 'Pressure Treated' timber	nr	01 (Type) Counters 02 (Type) Shelving 03 (Type) Wardrobes 04 (Type) Cupboards/ Cabinets	01 overall size (dimensioned description); as shown in Drawing (drawing nr)/model		1 Specific type of timber (e.g. nyatoh, resak, etc. or 'Group' of timber, e.g. Group A, B, etc.) is to be described in the 'Heading'.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
					2 For any lockable furniture and fittings, the lockset with keys is deemed to be included. described in Level Two. 3 Compartments details if necessary are to be described in Level Two.
11 IRONMONGERY					
01 Supply and Fix 02 Fix only	nr	01 nylon ring butt hinges 02 stainless steel hinges 03 cylindrical locksets 04 mortice locksets 05 barrel bolts 06 flush bolts 07 cylindrical padlocks 08 door selectors 09 recessed flush pulls 10 push plates 11 doorstops 12 set of sliding gears; comprising track, brackets, hangers, floor channels and all other accessories; fixing in position to suit (dimensioned description) sliding doors 13 casement window stays; (length) long 14 casement window handles and fasteners 15 master keying system for various locksets			1 Product name from the manufacturer (if any) and the type of material are to be so described in Level One. 2 Dimension (if any) is to be so described in Level One.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
12 SIGNAGE					
01 Supply and Fix 02 Fix Only	nr	01 (Thickness) thick clear acrylic panel signage; with reverse silk screen or inject reverse print lettering stick on spray base colour finished door/wall mounted fin and approve pictogram; including all necessary fixing accessories for 02 (Thickness) thick high impact polystyrene sheet; with spray base colour complete with sticker cut-out lettering and approved pictogram; including all necessary fixing accessories for	01 Stair signage 02 Fire door signage 03 Warning signage 04 Exit signage 05 MDF room signage 06 Mail room signage 07 Refuse chamber signage 08 Female toilet signage 09 Male toilet signage 10 Electrical riser signage 11 Pump room signage 12 Carpark lift lobby signage	01 overall size (dimensioned description)	
	nr	03 (Thickness) thick clear acrylic panel signage; with inject reserved stick on mounted wall fin and approved pictogram ; including all necessary fixing accessories for	01 Mimic plan	01 overall size (dimensioned description)	

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STRUCTURAL STEELWORK

01 STRUCTURAL STEELWORK
02 PRESSED STEELWORK
03 PROPRIETARY ROOF TRUSS SYSTEM

Information to be provided in the Specification

01 The relevant Malaysian Standard or British Standard or European Code (MS/BS/EC) for which each of type and grade of structural steel framework including bolts, washers, surface preparation, priming, etc. have to comply with.
02 Clearance and tolerances.
03 Connections, bolting, holes and welding.
04 Handling, delivery to site and storage.
05 Erection.
06 Bedding and grouting.
07 Testing on-site.
08 Painting steelwork.
09 Fire protection of structural steelwork.
10 Shop drawings.
11 Performance specification for proprietary timber roof truss system.

Basic information to be shown in the 2D drawings or 3D models

01 Structural steelwork (generally)
a. MS/BS/EN code and grade of steel.
b. Type of surface preparation e.g. wire brush, sandblasting to a required standard, etc.
c. Type of paint and number of coats.
02 Unfabricated steelwork, in addition to those stated in 'Structural steelwork' above
a. Type of structure and their respective structural steel sections with nominal sizes.
03 Fabricated steelwork, in addition to those stated in 'Structural steelwork' above
a. Type of fabricated steelwork.
04 Pressed steel
a. Type of steel and gauge.
b. Type of section.

Specific rules of measurement

01 Length of members is measured overall length with no deduction for splay cut or mitred ends.
02 In computing the weight of steelwork, no deduction is made for splay cuts, mitres, notches, holes and slots.
03 The weight of irregularly shaped plates is computed net.
04 No allowance is made for the mass of welds, bolts, nuts, washers, rivets and protective coatings.

'Works and materials deemed to be included' which are collectively referred to as 'Preambles'

01 General
a. The mass of framing is deemed to include all components.
02 Fabricated steelwork e.g. portal frames, roof trusses, girder trusses, lattice trusses
a. All stanchions, rafters, struts, top chords, bottom chords, etc. making up the trusses/frames and all welding, fabricating, cutting, fixing and shop bolting off-site or on-site and its erection on-site including delivery to site, hoisting, site bolting and/or welding, etc.
03 Fittings
a. The painting system to the fittings which forms part of the fabricated or unfabricated steelwork is deemed to be included.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 STRUCTURAL STEELWORK					
01 Hot rolled unfabricated steelwork 02 Cold formed unfabricated steelwork	t	01 Stanchions and columns 02 Beams and girders 03 Rafters 04 Struts	01 Universal columns 02 Universal beams 03 Castellated universal beams 04 Lip channel 05 Angles 06 Joists 07 Square hollow sections 08 Rectangular hollow sections 09 Circular hollow section 10 Universal structural tees	01 (dimensioned description) x (weight) /m	1 The MS/BS/EN code and grade of steel and the type of surface preparation work e.g. wire brush, sandblasting to a required standard, etc. and the type of paint and number of coats are to be described at the 'Heading'. 2 Curved, chambered, cranked members and the like (if any) are to be so described in Level Three. 3 Weight per cubic metre for mild steel where it is not specified, it is assumed for the purpose of calculation to be 7.85 tonnes per m3.
03 Hot rolled fabricated steelwork 04 Cold formed fabricated steelwork	nr	01 Portal frames; Type (reference) as shown in Drawing (drawing nr)/ model 02 Roof trusses; Type (reference) as shown in Drawing (drawing nr)/ model	01 (span) overall span; approximately (height) high from ground to eaves		1 The MS/BS/EN code and grade of steel and the type of surface preparation work e.g. wire brush, sandblasting to a required standard, etc. and the type of paint and number of coats are to be described at the 'Heading'.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
	nr	03 Girder trusses; Type (reference) as shown in Drawing (drawing nr)/ model 04 Lattice trusses; Type (reference) as shown in Drawing (drawing nr)/ model	01 (span) overall span; approximately (height) high from ground to eaves		1 The MS/BS/EN code and grade of steel and the type of surface preparation work e.g. wire brush, sandblasting to a required standard, etc. and the type of paint and number of coats are to be described at the 'Heading'.
05 Fittings	nr	01 Plates, cleats, brackets, stiffeners, packing pieces, gussets, shear connectors and the like 02 Anchor bolts 03 High strength friction grip bolts 04 Expansion bolts 05 Tie rods 06 Anti-sag rods	1 (dimensioned description)		1 Fittings are items which form part of the unfabricated steelwork.
06 Wedging and grouting with non-shrink grout	nr	01 (dimensioned description) stanchion bases			
02 PRESSED STEELWORK					
01 Pressed steel purlins and rails	m	01 Zincalume 02 Electro galvanised steel	01 (ref nr) gauge; (type) section; screwed with self-tapping screws to steel		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 PROPRIETARY METAL ROOF TRUSS SYSTEM					
01 Design, fabrication, deliver to site and installation of proprietary metal roof trusses to support (the type of roofing sheet/tiles) {'measured separately'} and at various heights up to maximum of approximately (height) above ground level (approximate roof area)	item	01 allow			1 To add 'NOTES' preceding the 'Heading' as follows: (a) Design, fabricate to site and furnish all materials, tools, hoists, staging, temporary bracings, etc. for the safe and proper erection of fabricated metal trusses (with the type of metal to be stated) which are deemed to include all rafters, top and bottom chord, ties, struts, bearers, wall plates, bolts and nuts, site welding, holding down bolt, and other associated items required for the Works to the satisfaction of the S.O. In addition,the design is to also suit the type of ceiling to be installed at the bottom chord; if additional bearers, tie beams, ceiling joist, etc., to be added arising there from, they are also deemed to be included.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
					(b) Overall, the design is to be adequate, accurate and fit for its purpose. (c) Submission of all shop drawings and samples as per requirements stated in the Performance Specification and to be endorsed by Professional Engineer with Practising Certificate (PEPC) registered with the Board of Engineers Malaysia (BEM). (d) If painting is required, it is to be done before erection (e) Any other requirements (if any).

17
METALWORK

01 DOORS

02 WINDOWS

03 PROPRIETARY DOOR FRAMES

04 ADJUSTABLE GLASS LOUVRE FRAMES

05 ROLLER SHUTTERS

06 ROLLER GRILLES

07 BALUSTRADES, RAILINGS AND HANDRAILS

08 STAIRCASES

09 FLOOR PLATES

10 FURNITURE AND FITTINGS

11 SUNDRIES

12 SIGNAGE

Information to be provided in the Specification	01 Mild steel and fabricated mild steel. 02 Galvanising. 03 Stainless steel. 04 Aluminium. 05 Zincalume and zincanneal steel. 06 Electro galvanised steel. 07 Wrought iron. 08 Roller shutters, roller grilles and the like. 09 Balustrades, railings and handrails. 10 Staircases. 11 Furniture and fittings. 12 Signage: a. Types and quality of material b. Method of fixing c. Compliance with relevant Authority guidelines d. Compliance with relevant ISO
Basic information to be shown in the 2D drawings or 3D models	01 Doors a. Type of ironmongery. b. Type of material and the metal thickness. c. Type of door e.g. flush door, Louvred door, proprietary door (to state supplier/manufacturer's name and the type), etc. d. Type and thickness of glass if there is glazing. 02 Windows a. Type of ironmongery. b. Type of material and the metal thickness. c. Type of window e.g. Louvred window, Side hung window, Composite window, etc. d. Type and thickness of glass. 03 Proprietary door frames a. Type of material. b. Supplier/manufacturer's name or brand. 04 Adjustable glass louvre frames a. Type of material. b. Whether single or dual control. 05 Roller shutters a. Type of material, and the metal thickness. b. Model from supplier/manufacturer, whether lightweight, heavyweight or fire-rated, whether manual or motor-operated and with perforation holes or other features. 06 Roller grilles a. Type of material. b. Model from supplier/manufacturer and whether manual or motor-operated. 07 Balustrades, railing and handrails a. Type of material and the metal thickness. b. If with glass panels, type e.g. tempered, laminated, etc. and its thickness. 08 Staircases a. Type of material and the metal thickness. 09 Furniture and fittings a. Type of furniture and fittings and type of material, dimensions and the metal thickness. 10 Painting system to any of the above.

	11 Signages a. The location, lettering, colour code, and dimension and other incidental features
Specific rules of measurement	01 Length of members is measured overall length with no deduction for splay cut or mitred ends. 02 The size given for irregular panes is to be the smallest rectangular size from which the pane can be obtained. 03 Sizes of door framing and frames, window framing and constituent of balustrades, railing and handrail are to be referred to the drawings as stated.
'Works and materials deemed to be included' which are collectively referred to as 'Preambles'	01 Metalwork a. Weight of weld metal and rolling margin. b. All straight, raking, bevel and splay cutting and notching. c. All shop and site drilling, holes and openings (no deduction of weight to be made for the same). d. Marking, hoisting and erecting including temporary braces and supports. e. Setting out, levelling and plumbing. f. All welding and making smooth welded parts exposed to view. 02 'Fixing in position' is deemed to include mild steel holdfast, infill, fixing cramps, dowel, etc. 03 'Balustrades, railings and handrails', 'Staircases' and 'Furniture and fittings' a. All accessories that are required for the completion of the assembly of the same. 04 a. Fixing with screws or any other method of fixing as recommended by the supplier/manufacturer b. Submission of all shop drawings showing the location, number of signages, lettering, colour code, material samples, dimension and other incidental features for approval of the S.O before proceeding with the work. 05 Signage a. Fixing with screws or any other method of fixing as recommended by the supplier/manufacturer b. Submission of all shop drawings showing the location, number of signages, lettering, colour code, material samples, dimension and other incidental features for approval of the S.O. before proceeding with the work.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 DOORS					
01 Mild steel; including prepare and apply (painting system) to all exposed surfaces after fixing 02 Galvanised mild steel 03 Powder-coated mild steel 04 Stainless steel 05 Aluminium; natural anodised 06 Aluminium; bronze anodised 07 Aluminium; powder-coated 08 Zincalume 09 Electro galvanised steel 10 Zincanneal 11 PVC 12 Proprietary; (Product name/code); (type of material) 13 Mild steel powder coated 14 Proprietary; (Product name/code);	nr	01 Constructed of rectangular hollow section framing infilled with and including vertical railing; fixing in position and including purpose made ironmongery 02 Flush doors; complete with framing and door frame; fixing in position and including approved ironmongery 03 Ribbed flush doors; complete with framing and door frame; fixing in position and including approved ironmongery 04 Louvred doors; complete with framing and door frame and louvre infills; fixing in position and including approved ironmongery 05 Glazed doors; opened in (nr) panes and infilled with and including (type) glass with glazing gasket and sealant; complete with framing; fixing in position and including approved ironmongery	01 single-leaf; overall size (dimensioned description); as shown in Drawing (drawing nr/model) 02 pair; overall size, (dimensioned description); including labour for forming rebated meeting stiles; as shown in Drawing (drawing nr)/model 03 sliding; overall size (dimensioned description); in equal panels including Sliding track; as shown in Drawing (drawing nr)/model 04 folding; overall size (dimensioned description); in equal panels including folding track; {type (code type)} as shown in Drawing (drawing nr)/ model		1 If the door is 'Contractor designed doors', it is to be so described in Level One. 2 If there is glazing, it is to be so described stating the glazing gasket and sealant in Level One. 3 If there is any anti-vermin wire netting to louvered doors, it is to be so described in Level One. 4 (Type and product name/code) of ironmongery are to be described in Level One unless shown on drawings.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 WINDOWS					
01 Mild steel; including prepare and apply (painting system) to all exposed surfaces after fixing 02 Galvanised mild steel 03 Powder-coated mild steel 04 Stainless steel 05 Aluminium; natural anodised 06 Aluminium; bronze anodised 07 Aluminium; powder-coated 08 Zincalume 09 Electro galvanised steel 10 Zincanneal	nr	01 Casement windows; opened in panes; infilled with and including (thickness) thick, (type) glass with glazing gasket and sealant; complete with framing; fixing in position and including approved ironmongery 02 Fixed louvred windows; complete with framing and clips; infilled with and including (type) glass louvres; fixing in position 03 Adjustable louvred window; complete with framing and clips; infilled with and including (thickness) thick, (type) glass louvres and operated by a set of single/ dual control operating handle; fixing in position 04 Sliding windows; comprising nr equal sliding panels; each opened in panes and infilled with and including (type) glass with glazing gasket and sealant; complete with framing; fixing in	01 overall size (dimensioned description); as shown in Drawing (drawing nr)/model		1 If the windows are 'Contractor designed windows', it is to be so described in Level One. 2 Whether top-hung/ side-hung fixed casement windows' is to be described in Level One. 3 If the windows are 'double-glazed', it is to be so described in Level One stating also the airspace width and the gas filling in between. 4 If sub-frame is required, it is to be so described in Level One. 5 Type and product name/code of ironmongeries are to be described in Level One unless shown on drawings or 'Contractor designed windows'. 6 If there are security bars in the louvered windows, it is to be so described in Level One including their (painting system) with both ends fixed through framing stating the diameter.
11 Proprietary; (Product name code); (type of material	nr	position and including approved ironmongery and sliding track 05 Composite windows; comprising (nr) equal side-hung panels and (nr) equal fixed panels; each opened in panes and infilled with and including (thickness) thick, (type) glass with glazing gasket and sealant; complete with framing (and sub-frame); fixed in position and including (approved ironmongery/ ironmongery comprising (type and product name/code)			7 If there is any anti- vermin wire netting to louvered windows, it is to be so described in Level One.
03 PROPRIETARY DOOR FRAMES					
01 Zincalume 02 Electro galvanised steel 03 Zincanneal; (thickness) metal thickness	nr	01 Door frames	01 overall opening (dimensioned description)		1 Name of manufacturer is to be described in Level One. 2 Door frames are deemed to include butt hinges, striker plate, wire ties and primer and infilling back of the frame with cement mortar.
04 ADJUSTABLE GLASS LOUVRE FRAMES					
01 Galvanised steel aluminium lacquered finished adjustable louvre frame	nr	01 Set of single control 02 Set of dual control	01 for (nr) of louvre blades		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
05 ROLLER SHUTTERS					
01 Galvanised mild steel 02 Mild steel; including prepare and apply (painting system) to all exposed surfaces after fixing 03 Extruded aluminium 04 BHP Zincalume steel 05 UV protected polycarbonate multiple panels 06 Fire-rated steel	nr	01 (Model from the selected supplier/manufacturer) lightweight/ heavyweight roller shutters; fixing in position 02 (Model from the selected supplier/manufacturer) heavyweight roller shutters; fixing in position	01 to suit opening (dimensioned description)		1 If the surface is 'colourbond', 'powder-coated', 'anodised', etc. and/or with perforation holes' it is to be so described in the 'Heading'. 2 For 'fire-rated steel', the fire-rated hour is to be so described in the 'Heading'. 3 Whether roller shutter is 'Manual spring operated' (including all accessories) or 'motor operated' (including motor, shutter box, push button switch, guide rails and all accessories) is to be so described in Level One.
06 ROLLER GRILLES					
01 Aluminium 02 Hairline Finishing Stainless steel	nr	01 (Model from the selected supplier/manufacturer) roller grilles; fitting in position	01 to suit opening (dimensioned description)		1 For aluminium, type of coating e.g. natural anodised, bronze anodised, powder-coated, etc. is to be added in the 'Heading'.
07 BALUSTRADES, RAILINGS AND HANDRAILS					
01 Mild steel; including prepare and apply (painting system) to all exposed surfaces after fixing		01 Balustrades; (height) mm high; including associated handrails and all components forming the assembly; as shown	01 horizontal 02 raking 03 curved 04 raking and curved		1 If there are tempered glass panels or other types of panels comprised in the 'balustrades or railings handrails', they are to be

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 Galvanised mild steel 03 Powder-coated mild steel 04 Stainless steel 05 Aluminium; natural anodised; 06 Aluminium; bronze anodised 07 Aluminium; powder-coated; 08 Wrought iron; (type of Finish)	m	in Drawing (drawing nr)/model 02 Balustrades; (height) mm high; including wrot 'Pressure Treated' Group A timber and prepare and apply (painting system) handrails and all components forming the assembly; as shown in Drawing (drawing nr)/model 03 Railings; (height) mm high; including associated handrails and all components forming the assembly; as shown in Drawing (drawing nr)/model 04 Railing; (height) mm high; including wrot 'Pressure Treated' group A timber and prepare and apply (painting system) handrails and all components forming the assembly; as shown in Drawing (drawing nr)/model 05 Handrails; including necessary brackets and accessories; as shown in Drawing (drawing nr)/ model			so described stating the thickness in Level One. 2 If there is a specific type of timber handrail eg. nyatoh, resak, etc to be used, then it is to be to be described in Level One.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
08 STAIRCASES					
01 Mild steel; including prepare and apply (painting system) to all exposed surfaces after fixing 02 Galvanised mild steel 03 Powder-coated mild steel 04 Stainless steel	nr	01 Single flight staircase 02 Staircase comprising two straight flights of stairs and one intermediate landing	01 overall size (dimensioned description); as shown in Drawing (drawing nr)/model		1 If there are balustrades and handrails and accessories, they are to be so described in Level One. 2 If the staircases are made of mainly structural steel, they are to be measured under Work Section 16: Structural metalwork.
09 FLOOR PLATES					
01 Mild steel; including prepare and apply (painting system) to all exposed surfaces after fixing 02 Galvanised mild steel 03 Powder-coated mild steel 04 Stainless steel	nr	01 Plain 02 Chequered 03 Perforated	01 (dimensioned description); including frame supports; as shown in Drawing (drawing nr)/model		
10 FURNITURE AND FITTINGS					
01 Purpose made furniture and fittings	nr	01 Mild steel; including prepare and apply (painting system) to all surfaces 02 Galvanised mild steel; 03 Stainless steel	01 (Type) Cupboards/ Cabinets 02 (Type) Shelving 03 (Type)Wardrobes 04 Lockers	01 (dimensioned description); as shown in Drawing (drawing nr)/model	1 For any lockable furniture and fittings, the lockset with keys is deemed to be included. 2 Additional accessories (if any) are to be described in Level Two.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 Proprietary furniture and fittings; from (name of manufacturer/supplier and product name/ code)	nr	04 Aluminium; natural anodised; (thickness) metal thickness 05 Aluminium; bronze anodised; (thickness) metal thickness 06 Aluminium; powder-coated; (thickness) metal thickness			3 Compartments details if necessary are to be described in Level Two.
11 SUNDRIES					
01 Mild steel; including prepare and apply (painting system) to all exposed surfaces after fixing 02 Galvanised mild steel; 03 Powder-coated mild steel; 04 Stainless steel; 05 Aluminium; natural anodised; 06 Aluminium; bronze anodised; 07 Aluminium; powder-coated; 08 Wrought iron; (type of finish)	nr	01 Gratings 02 Grilles 03 Cat ladders 04 Brackets	01 (dimensioned description); as shown in Drawing (drawing nr)/model		1 Grating to drains are measured in Work Section 22 : Drainage and piping works below ground. 2 If there are any fixing accessories required, they are to be so described in Level Two.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
12 SIGNAGE					
01 Supply and Fix 02 Fix Only	nr	01 (Thickness) thick x (thickness of steel in mm) stainless steel 3D box up lettering; mounted on wall with approved font and size; including all necessary fixing accessories for	01 Double digit level indicator signage	01 (height) high	
		02 (Thickness) thick black stainless steel plate with hairline finish; including all necessary fixing accessories for	01 Number indicator signage	01 overall size (dimensioned) description)	
		03 (Thickness) thick ACM panel; with and including mild steel structure support framed with spray colour base with reflective sticker laminate on ceiling mounted/r.c beam and approved pictogram; including all necessary fixing	01 Carpark direction signage	01 overall size (dimensioned) description)	

18 CLADDING AND COVERING

01 CONTRACTOR DESIGNED CLADDING
02 CONTRACTOR DESIGNED CURTAIN WALLING
03 PERFORATED PANELS

Information to be provided in the Specification	01 Contractor designed cladding's Performance Specification a. General i. Scope of work. ii. Design concept/system. iii. Submittals. b. Design criteria/requirement i. Design wind loading. ii. Deflection. iii. Expansion and contraction. iv. Flatness. v. Acoustic treatment. vi. Fire rating. c. Material specifications and finishes requirements i. Delivery, storage and handling. ii. The material is to be aluminium composite panel of required thickness stating its composition, mechanical properties, vibration and noise damping, thermal transmittance, the moment of inertia, panel weight, finish and colour. iii. The type of aluminium extrusions, fixing requirements and type of weather seal. d. Fabrication and installation i. Installation requirements. ii. Care and protection. iii. Warranties. iv. Verification which includes visual mock-up unit and performance mock-up unit and performance testing. 02 Contractor designed curtain walling's Performance Specification a. General i. Scope of work. ii. Submittals. b. Design criteria/requirement i. Codes and standards. ii. Design requirements. iii. Design concept. c. Material specifications and finishes requirements i. Delivery, storage, and handling. ii. Materials for the framing. iii. Types of glass and glazing material. iv. Fire rating. v. Fire stop insulation.
	03 Perforated panels a. Thickness of metal. b. Type, spacing, pattern of perforations. c. Margin. d. Flatness of sheets and plates. e. Fitting details.
Basic information to be shown in the 2D drawings or 3D models	01 Contractor designed cladding a. Material specification. b. Type of finishing. c. Type of system. 02 Contractor designed curtain walling a. Type of system. b. Type and thickness of the glazing. 03 Perforated panel a. Type and thickness of the panel.
Specific rules of measurement	01 As cladding/walling is a contractor designed work, the items related thereto are either measured nett area or nett length. 02 No allowance made for boundary work i.e. work associated with closing off or finishing off claddings or covering at the external perimeter and at the abutment with different materials and opening work i.e. work associated with closing off or finishing off claddings and coverings at the perimeter of an opening or a void. 03 These items would mean to be inclusive of all ancillary and other works and expenditure whether or not separately mentioned or described in the Specification or in the Bill which are indispensably necessary to carry out and bring to completion of the cladding/walling works or which may contingently become necessary to overcome difficulties before completion.
'Works and materials deemed to be included' which are collectively referred to as 'Preambles'	01 Contractor designed cladding's components: a. Aluminium composite panel i. all aluminium runner sub-frames. ii. non-magnetic stainless steel fasteners. iii. neoprene/ethylene propylene diene monomer (EPDM) gasket fixing anchors. iv. aluminium brackets. v. stainless steel mandrel blind rivets. vi. weather seal sealant. vii. all necessary accessories.

b. Aluminium fins
   i. galvanised mild steel bracketing.
   ii. silicone sealant.
   iii. bracket rod infill.
c. Aluminium sunshade
   i. fixing screws, bolts, nuts, etc.
   ii. other accessories.

02 Contractor designed curtain walling
a. fixed and openable top hung panels or any type of panels formed by transoms, mullion, and fins.
b. steel support structures.
c. glazing material, neoprene/EPDM glazing gasket, and structural sealant.
d. two hours fire stop rockwool insulation.
e. aluminium bend sheet capping and flashing.
f. flame barrier.
g. brackets, bolts and nuts, weep holes, lockset and all other necessary accessories.
h. cleaning upon completion.

03 Perforated panel :
a. the support system.
b. all necessary channel, angle bars, fixing anchors, fixing brackets, metal screws, bolts and nuts, support plates and other accessories.
c. painting systems related thereto.

04 For both Contractor designed cladding and Contractor designed curtain walling, 'Design fee' is deemed to include:a. Design, supply and install the cladding/walling are to be in accordance with the Performance Specification in the Specification and the relevant drawings and to the relevant approval.
b. The design is to be in all respect adequate, accurate, sufficient and fit for its purpose.
c. Submittal of all shop drawings and sample as per requirements stated in the Performance Specification and to be endorsed by Professional Engineer with Practising Certificate (PEPC) registered with the Board of Engineers Malaysia (BEM).
d. All laboratory testing by an accredited laboratory.
e. Any other requirements (if any).

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 CONTRACTOR DESIGNED CLADDING					
01 Design fee	item	01 Allow			
02 Aluminium composite panels make another column	m2	01 (Product name/code) in pre-coated PVDF finish; complete with open joint cassette system; all in strict accordance with the manufacturer's instruction	01 cladding to plastered surface; as shown in the Drawing (drawing nr)/model 02 cladding to concrete surface; as shown in the Drawing (drawing nr)/model		
03 Aluminium fins	m	01 (Product name/code); all in strict accordance with the manufacturer's instruction	01 vertical; overall (dimensioned description) 02 horizontal; overall (dimensioned description)		
04 Aluminium sunshades	m	01 (Product name/ code) in powder coated corro-coat PE-F façade metallic finish; complete with aerofoil-shaped profile extrusion; all in strict accordance with the manufacturer's instruction	01 (width) wide		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 CONTRACTOR DESIGNED CURTAIN WALLING					
01 Design fee	item	01 Allow			1 Curved profile is to be so described in Level Two.
02 Aluminium curtain walling	m2	01 Unitised system in powder coated corro-coat PE-F façade metallic finish; all in strict accordance with the manufacturer's instruction 02 Stick system in powder coated corro-coat PE-F façade metallic finish; all in strict accordance with the manufacturer's instruction	01 glazing with ASG Synergy dark blue laminated annealed glass comprising clear annealed float glass, clear PVB and Synergy Dark Blue annealed hard coated Low-E #4; as shown in Drawing (drawing nr)/model		
03 PERFORATED PANELS					
01 Aluminium perforated panels 02 Powder coated perforated metal panels 03 Expanded metal lathing panels	m2	01 (Thickness) thick in approved pattern; as shown in Drawing (drawing nr)/model	01 cladding to plastered walls 02 cladding to concrete walls 03 cladding to columns 04 cladding to openings		1 Curved profile is to be so described in Level Two.

19 FLOOR, WALL AND CEILING FINISHES

01 FINISHES TO FLOORS
02 RAISED ACCESS FLOORS
03 FINISHES TO WALLS AND CEILINGS
04 SUSPENDED CEILINGS
05 ACCESSORIES

Information to be provided in the Specification

01 General specification and requirements of the components of the finishing.
02 Types of plaster work and their respective composition, mix and application.
03 Types of paving work and their respective composition, mix and application.
04 Types of tiling work and their respective compliance with MS and application.
05 Types of ceiling work including compliance with MS and the specification of the suspension systems.
06 Types of granite and marble slabs and their respective source of supply and method of fixing.
07 Types of impregnators used and requirement for dry-lay, etc.
08 Performance specification for raised access floors
   a. Scope of work.
   b. Submittals.
   c. Codes and standards.
   d. Design requirements.
   e. Materials for panels and supports.
   f. Fire barriers (if any).
   g. Installation requirements.
   h. Warranties.

Basic information to be shown in the 2D drawings or 3D models

01 Finishes to floors
   a. Total thickness and surface treatment e.g. wood trowelled, steel trowelled, power-floated or the use of hardener, dust proofers, carborundum grains or the like.
   b. Laid 'level', 'falls' or 'falls and crossfalls'.
   c. Type, size, name of the manufacturers/suppliers (if required), the product series code (if required) and total thickness.
   d. Use of waterproofing admixture (if required).
   e. Laid pattern, laying in more than one colour, laying with underlay, sanding requirement and floor dressing.
02 Raised access floor
   a. Type of panels, height, panels with service outlet boxes and fire barrier (if any).
   b. For proprietary system, the type and name of manufacturer/supplier in addition to the aforesaid.
03 Plaster/skim coat
   a. Type and thickness.
04 Suspended ceiling
   a. Types and thickness of panels.
   b. Product name and series code of the panels/board (if required).
05 For 3D model, to identify 'internal' and 'external' finishes

Specific rules of measurement

01 Area is measured nett in contact with base.
02 Widths or thicknesses stated are the width or thickness of each finished face.
03 No measurement allowance is to be made in nett area for laps, dressings or any other labour.
04 No deduction from the areas of finishing is made for grounds.
05 'Width' is meant as the 'extreme' width where applicable.
06 'High or Height' is meant from the structural floor level to ceiling level or soffit of slab.

'Works and materials deemed to be included' which are collectively referred to as 'Preambles'

01 Finishes to floors and Finishes to walls and ceilings
   a. Temporary rules, temporary screeds, temporary supports and template.
   b. Cleaning, raking out joints, hacking, slurrying and wetting the base to form a key.
   c. All notching and holes.
   d. Straight, raking and curved cutting.
   e. Working or fitting up to and making good around frames, light fittings, grilles, air bricks, sanitary fittings, switches, sockets, pipes, brackets and the like.
   f. Joints between different types of finishes.
   g. Joints between new and old finishes.
   h. Dubbing out to achieve the nominal thickness stated.
   i. Grain point and other intersections of curved surfaces.
   j. In respect of linear items: short lengths, formed, cut or purpose-made angles, junctions and ends.
   k. In respect of in-situ finishes; internal angles, arises, rounded edges, quirks, throats, rounded coves and external angles of any radius.
   l. In respect of mosaic: setting one row of tesserae at an angle of 45 degrees at junctions of horizontal and vertical surfaces.
   m. In respect of carpeting: sewn and taped seams in carpets and underlays; matching patterns in patterned carpets; stair rods, carpet clips and the like; ends, angles and intersections; square cutting, raking cutting, curved cutting, notches, rounded corners, cutting around profiles of steps and the like.
   n. In respect of granite and marble slabs to walls and ceilings: metal anchorages and all necessary fixing accessories; application of impregnator to all sides except the exposed surfaces.
   o. Masking of adjacent work.
   p. All other sundry items of a like nature.
02 Raised access floors
   a. The provision of fire barriers is deemed to include all support works, scribing or forming to fit, angles, ends and working around structures, support work and services.
   b. The system is deemed to include the pedestal panels, grid system support and all necessary fixing accessories.
03 Suspended ceilings
   a. Cutting or leaving openings for light fittings, air-conditioning grilles, etc. are payable separately only where special members and extra hangers are required to support the fittings, grilles, etc. In all other cases, they are deemed to be included in the rates for general ceilings.
   b. Cutting of tiles or panels.
   c. Forming small perforation in tiles or panels.
   d. Suspension system including edge framings and hangers.
   e. Narrow widths and small quantities.
   f. Trimming around isolated columns, unless special members are required.
04 Accessories
   a. Fixing ties.
   b. Temporary means of support.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 FINISHES TO FLOORS					
01 Cement paving 02 Granolithic paving 03 Self-levelling paving 04 Epoxy paving	m2	01 To floors 02 To ramps 03 To landings	01 level; (thickness) thick 02 falls; average (thickness) thick 03 falls and crossfalls; average (thickness) thick		1 Mix ratio or composition of the various type of paving is to be so described in the 'Heading'. 2 Watertight work with the use of waterproofing admixture (if any) is to be so described in the 'Heading'. 3 Nature of surface treatment e.g. wood trowelled, steel trowelled, power-floated or the use of hardener, dust proofers, carborundum grains or the like is to be so described in Level One. 4 Curved profile, forming anti-slip grooves, etc. (if any) is to be so described in Level Two. 5 Narrow-width structures include skirtings, risers, treads, edges of slabs, wall string to stairs, open strings, kerbs, scupper drains and the like.
	m	04 To narrow-width structures	01 (dimensioned description)		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
05 Carpet tiles flooring 06 Machine tufted carpet flooring 07 Laminated strip flooring 08 Engineered timber flooring 09 Bamboo flooring 10 Vinyl flooring 11 Parquet flooring	m2	01 To trowelled smooth screeded bed; (thickness) total thickness with approved adhesive 02 To trowelled smooth surface; (thickness) total thickness with approved adhesive	01 To floors 02 To ramps 03 To landings	01 generally	1 The size and name of the manufacturer/ supplier and the product code, if required, are to be so described in the 'Heading'. 2 Watertight work with the use of waterproofing admixture (if any) is to be so described in Level One. 3 Laying in a pattern or more than one colour or with underlay or sanding and floor dressing (if required) is to be so described in Level One. 4 'Total thickness' is the thickness of finishes, inclusive of the screed adhesives, backing mortar, keys, grooves and the like. 5 'Narrow-width structures' include skirtings, risers, treads, edges of slabs, wall string to stairs, open strings, kerbs, scupper drains and the like. 6 Curved profile (if any) is to be so described in Level Three.
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	m		04 To narrow-width structures	01 (dimensioned description)	
12 Ceramic tiles 13 Polished porcelain tiles 14 Homogenous tiles 15 Terrazzo tiles 16 Glass mosaic tiles	m2	01 To screeded bed (thickness) total thickness; with mortar; pointed with matching colour 02 To trowelled smooth screeded bed; (thickness) total thickness with approved adhesive; pointed with matching colour	01 To floors 02 To ramps 03 To landings	01 level 02 falls 03 falls and crossfalls	
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	m2		04 Extra-over for coved tiles 05 Extra-over for nosing tiles	10 generally	
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	m		06 To narrow-width structures	01 (dimensioned description)	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
17 Marble tiles/slabs 18 Granite tiles/slabs	m2	01 To trowelled smooth screeded bed; (thickness) total thickness with approved adhesive; pointed with approved cementitious grout; ground with an approved machine; coated with a coat of approved masonry water repellent impregnator after grinding; all in accordance with the specialist's recommendation and S.O.'s approval	01 To floors 02 To ramps 03 To landings	01 level 02 falls 03 falls and crossfalls	7 Characteristic of tile i.e: glazed, strength, etc. is to be described in the heading.
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	m2		04 Extra-over for coved edge slabs; as shown in the Drawing (drawing nr)/model 05 Extra-over for nosing edge slabs; as shown in the Drawing (drawing nr)/model	01 generally	
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	m		06 To narrow-width structures	01 (dimensioned description)	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 RAISED ACCESS FLOORS					
01 Contractor Designed Raised Floor System 02 Proprietary system; (Product name/code) from (manufacturer's name)	m2	01 (Dimensioned description) (type and finish) panel;	01 to floors; (height) high		1 If any fire barriers within void below the raised floor are required, they are to be so described in Level One. 2 To add 'Notes' preceding the first 'Heading' as follows: a. Design, supply and install Contractor Designed Raised Floor System is to be in accordance with the Performance Specification in the Specification and the relevant drawings and to the relevant approval. b. The design shall be in all respect adequate, accurate, sufficient and fit for its purpose. c. Submittal of all shop drawings and sample of all materials as per requirements stated in the Performance Specification for the S.O.'s approval before commencement of physical work. d. Any other requirements.
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	nr		02 extra-over for panels with proprietary service outlet boxes; (dimensioned description)		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 FINISHES TO WALLS AND CEILINGS					
01 Plain plaster 02 Granolithic plaster 03 Shanghai plaster 04 Textured finish plaster 05 Lath plaster 06 Barium plaster 07 Skim coat	m2	01 To walls and columns	01 (thickness) thick		1 The size and name of the manufacturer/ supplier and the product code (if required) are to be so described in the 'Heading'. 2 Wood trowelled or steel trowelled or the like and the use of plasticiser for 'Plain plaster' are to be so described in the 'Heading'. 3 'Narrow-width structures' includes sills, capping, coves, cornices, fascias, architraves, mouldings and the like. 4 Curved profile, forming grooves, sloping and the like (if any) are to be so described in Level One or Level Two. 5 Laying to patterned or more than one colour (if required) is to be so described in Level One. 6 Watertight work with the use of waterproofing admixture (if any) is to be so described in Level One.
		02 To ceilings and beams 03 To soffits of staircases	01 (thickness) thick; not exceeding 3.50m high 02 (thickness) thick; exceeding 3.50m high		
	m	04 To narrow-width structures	01 (thickness) thick and (girth) girth		
08 Ceramic tiles 09 Porcelain tiles 10 Homogenous tiles 11 Terrazzo tiles 12 Glass mosaic tiles	m2	01 To screeded backing (thickness) total thickness; with mortar; pointed with matching colour 02 To trowelled smooth screeded backing; (thickness) total thickness with approved adhesive; pointed with matching colour	01 To walls and columns	01 generally	
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	m		02 To narrow-width structures	01 (dimensioned description)	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
13 Marble tiles/slabs 14 Granite tiles/slabs	m2	01 To a metal support system; (thickness) total thickness; pointed with approved sealants; coated with a coat of approved masonry water repellent impregnator 02 To screeded backing (thickness) total thickness; with mortar; pointed with approved sealants; coated with a coat of approved masonry water repellent impregnator 03 To trowelled smooth screeded backing; (thickness) total thickness with approved adhesive; pointed with approved sealants; coated with a coat of approved masonry water repellent impregnator	01 To walls and columns	01 generally	7 Characteristic of tile i.e: glazed, strength, etc. is to be described in the heading.
			02 To ceilings and beams 03 To soffits of staircases	01 not exceeding 3.5m high 02 exceeding 3.5m high	
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	m		04 To narrow- width structures	01 (dimensioned description)	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
04 SUSPENDED CEILINGS					
01 Metal panel ceiling 02 Linear strip ceiling 03 Gypsum fibrous plaster ceiling 04 Gypsum fibrous plaster boards ceiling 05 Mineral Fibre boards ceiling panels 06 Fibre cement boards ceiling 07 Acoustic mineral fibre boards ceiling 08 Calcium silicate boards ceiling 09 Cellulose fibre cement boards ceiling	m2 ---- nr m	01 On aluminium grid suspension system; all in accordance with the manufacturer's instruction 02 On hot-dipped galvanised support system; all in accordance with the manufacturer's instruction 03 On timber framing; as shown in the Drawing (drawing nr)/model	01 Ceilings; not exceeding 3.50m high 02 Ceilings exceeding 3.50m high	01 generally --------- 02 extra-over for light troughs; dimensioned description) 03 extra-over for bulkheads; (dimensioned description) 04 extra-over for access panels; (dimensioned description) 05 extra-over for arches, domes and the like; (dimensioned description) 06 extra-over for troughs; (dimensioned description)	1 The product name and/or series code, if required, is to be so described in the 'Heading'. 2 'Exposed' or 'concealed' suspension/ support system is to be so described in Level One. 3 Curved profile, sloping and the like (if any) are to be so described in Level Three. 4 Dimensioned description of the board (if any) is to be so described in the 'Heading'. 5 Materials used for 'Linear Strip Ceiling' and 'Metal Panels Ceiling' are to be so described in the heading. 6 If any fire resistance system used, it is to be described in the 'Heading'.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
05 ACCESSORIES					
01 Metal lathing 02 PVC corner strips	m	01 To walls and columns	01 (width/girth/length) width/girth/ long		1 The product name and series code (if any) are to be so described in the 'Heading'.
03 Aluminium dividing strips 04 Brass dividing strips 05 Movement joints	m	01 Setting in beds	01 (dimensioned description)		

20 GLAZING

01 GLAZING
02 CONTRACTOR DESIGNED GLASS SYSTEM

Information to be provided in the Specification	01 Glass. 02 Sealants. 03 Glazing to timber windows. 04 Glazing to metal windows. 05 Glazing to louvred windows. 06 Glazing to patented windows, doors, panels, sky lights, etc. 07 Fixing of glass blocks. 08 Cleaning on completion. 09 Performance specification for frameless glass shopfront and the like. a. General i. Scope of work. ii. Submittals. b. Design criteria/requirement i. Codes and standards. ii. Design requirements. iii. Design concept. c. Material specifications and finishes requirements i. Delivery, storage, and handling. ii. Materials for the framing. iii. Types of glass and glazing material. d. Fabrication and installation i. Installation requirements. ii. Care and protection. iii. Warranties.
Basic information to be shown in the 2D drawings or 3D models	01 Glazing a. Type and thickness of the glass. b. Area where the glazing work is needed other than at the windows, doors and other components. 02 Contractor designed frameless glass a. Type and thickness of the glass. b. Area where such glazing work is needed and other components which form part thereof e.g. doors.

Specific rules of measurement	01 Glazing supplied as part of a window, door or other component is measured elsewhere with those components. 02 Measurement of irregular shape glazing is to be based on the smallest rectangular area from which it can be obtained.
'Works and materials deemed to be included' which are collectively referred to as 'Preambles'	01 Glazing a. All raking and curved cutting. b. All polished and bevelled edges unless given in the description. c. Aligning patterned and wired glass. d. Drilling holes and the like through glass. e. Cleaning off protective wax or tape coating in rebates prior to glazing windows, screens and door. f. Gasket and glazing compounds recommended by glass manufacturers. g. Additional costs involved in using sheets, which are larger than the manufacturer's standard stock sizes. h. Cleaning off protective wax or tape coating in rebates prior to glazing windows, screens and doors.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 GLAZING					
01 Float glass 02 Obscured glass 03 Georgian wired glass 04 Tempered glass 05 Laminated glass 06 Tempered laminated glass 07 Acrylic panel 08 Polycarbonate panel 09 Tinted glass	m2	01 To wood with wood beads 02 To metal rebates with metal beads 03 To double glazing; hermetically sealed; infilled (thickness) airspace with gas	01 generally		1 Thickness of glass is to be described in the 'Heading'. 2 'Clear', 'obsecured', 'tinted', tempered glass, 'acid embossed surface one side', etc., are to be so described in the 'Heading'. 3 'Glazing compound', 'neoprene gaskets', etc., are to be so described in Level One. 4 Glass blocks are measured in accordance with the rules of Work Section 11: Masonry. 5 'Irregular in shape' other than square or rectangular is to be so described in Level One.
	nr	04 Louvre blades; to a slotted metal frame 05 Louvre blades; to a slotted wooden frame	01 (dimensioned description)		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 CONTRACTOR DESIGNED GLASS SYSTEM					
01 Design fee	item	01 allow			1 To add 'Notes' preceding the first 'Heading' as follows: (a) The design is to be in all respect adequate, accurate, sufficient and fit for its purpose. (b) Design, supply and installation of theglass system are to be in accordance with the Performance Specification in the Specification and the relevant drawings and to the relevant approval. (c) Submittal of all shop drawings and sample are as per requirements stated in the Performance Specification and to be endorsed by Professional Engineer with Practising Certificate (PEPC) registered with the Board of Engineers Malaysia (BEM).
02 Contractor designed frameless glass shopfront	nr	01 Contractor designed frameless glass assemblies; as shown in Drawing (drawing nr)/ model	01 (thickness) thick (type) glass; overall size (length) long x (height) high 02 extra-over the (type) doors; (dimensioned description); including (type) floor springs, (type) patch fittings, (height) hight (type) pull handles and other necessary ironmongery		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
					(d) All laboratory testing by an accredited laboratory. (e) Any other requirements (if any). 2 The 'assemblies' is deemed to include the glass fins and stiffeners, suspension and fixing accessories, stabilisers, silicon sealants, gaskets, bedding strips, all jointing and glazing accessories and all other work necessary to complete the installation. 3 Curved profile is to be so described in Level Two.

21 DECORATION

01 PAINTING TO ALL TYPES OF SURFACES

02 DECORATIVE PAPERS OR FABRICS

Information to be provided in the Specification	01 General. 02 Painting to timberwork. 03 Painting to metalwork. 04 Painting to masonry works. 05 Treatment to fair surfaces. 06 Painting to timber-based products. 07 Painting to work tops. 08 Varnishing. 09 Completion of painting work.
Basic information to be shown in the 2D drawings or 3D models	01 Painting to all types of surfaces a. Painting system to each type of surfaces from a selected manufacturer. b. For 3D model, to identify 'external' and 'internal' painting system. 02 Decorative papers or fabric a. 'Product name' for the type of decorative papers or fabric from a selected manufacturer to each area.
Specific rules of measurement	01 The area or girth is measured based on the covered painted area. 02 The girth of frames and the like are calculated from one edge to the other covering trims, architraves, stops and the like. 03 Painting to all types of doors, windows, grilles and the like is measured flat on both sides which is assumed to include painting to the edges.
'Works and materials deemed to be included' which are collectively referred to as 'Preambles'	01 Painting to all types of surfaces a. All cutting to the line. b. Multi-coloured work on differing surfaces. c. All cutting to papers and fabric. d. Use of different colours to walls, ceiling, rubbing down, knotting, filling, stopping and the like. e. Rubbing down between coats. f. In respect of pipes and gutters, painting all tracks, wall hooks, holderbats, brackets, ears and the like. g. In respect of external paintwork, additional scaffolding and staging.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 PAINTING TO ALL TYPES OF SURFACES					
01 Prepare and apply (masonry surfaces)	m2	01 One coat of (Product name/code) wall sealer and two coats of (Product name/code) emulsion paint from (manufacturer's name)	01 Plastered walls and columns 02 Skim-coated walls and columns 03 Fair face concrete vent block wall 04 Gypsum board wall	01 generally	1 Painting by 'spraying method' (if required) is to be so described in Level One. 2 Painting to sloping surface is to be so described'. 3 'Narrow width structures' include sills, cappings, coves, cornices, fascias, architraves, mouldings, skirting, dado rails, bands, balustrades, railings, handrails, door frames, edge of slabs, kerbs, security bars and the like.
	m2	02 Two coats of (Product name/code) emulsion paint from (manufacturer's name) 03 Two coats of (Product name/code) textured spray paint from (manufacturer's name)	05 Cellulose fibre cement board wall 06 Plastered ceilings and beams 07 Gypsum plasterboard ceilings 08 Mineral fibre board ceilings 09 Cellulose fibre cement board ceilings	01 not exceeding 3.50m high above finished level 02 exceeding 3.50m high above finished floor level	
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	m		10 Narrow-width structures	01 (dimensioned description)	
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	m		11 Plastered open stringer of the staircase	01 (width) wide {extreme} including working to the profile of tread and undercut riser	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 Prepare and apply (timber surfaces)	m2	01 One coat of (Product name/code) primer, one coat of (product name) undercoat and two coats of (product name) enamel paint from (manufacturer's name) 02 (nr) coats of (Product name/code) varnish from (manufacturer's name) 03 (nr) coats of (Product name/code) stain and (nr) coats of (Product name/code) lacquer from (manufacturer's name)	01 Flush doors 02 Glazed doors 03 Louvred doors 04 Panelled doors 05 Glazed casement windows 06 Composite casement windows 07 Timber floors 08 Timber walls 09 Skylights	01 generally	
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	m		10 Narrow-width structures	01 (girth) girth	
03 Prepare and apply (metal surfaces)	m2	01 One coat of (Product name/code) primer, one coat of (Product name/code) undercoat and two coats of (Product name/code) enamel paint from (manufacturer's name)	01 Metal doors 02 Mild steel grille doors 03 Mild steel louvred doors 04 Glazed metal casement windows 05 Composite metal casement windows 06 Metal skylights	01 generally	
	---		---	---	
	m		07 Narrow width structures	01 (dimensioned description/girth)	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
	m2	02 One coat of (Product name/code) undercoat and one coat of (Product name/ code) undercoat and two coats of (Product name/code) enamel paint from (manufacturer's name)	01 Gutters 02 Flashings 03 Pipes	01 girth not exceeding 300mm 02 girth exceeding 300mm	
	kg	03 One coat of (Product name/code) primer, one coat of (Product name/code) undercoat and, two coats of (Product name/code) enamel paint from (manufacturer's name)	01 Structural steelwork	01 generally	
02 DECORATIVE PAPERS OR FABRICS					
01 Preparing, sizing and hanging with approved adhesive	m2 --- m	01 (Product name/code) (type) decorative paper from (manufacturer's name)	01 Walls and columns 02 Ceilings and beams --------- 03 Narrow width structures	01 generally --------- 01 (dimensioned description/girth)	1 'Walls and columns' and 'Ceilings and beams' can be of any type of surfaces e.g. plastered surfaces, gypsum board surfaces, steel surfaces, etc.

22 DRAINAGE AND PIPING WORKS BELOW GROUND

01 PRIMARY STORMWATER DRAINAGE AND CULVERTS
02 PRIMARY SOIL DRAINAGE
03 PRIMARY WATER RETICULATION

Information to be provided in the Specification

01 Primary stormwater drainage and culverts
- a. Excavation.
- b. Surface water drains.
- c. Pipe/Box culvert.
- d. Wingwalls and river protection.
- e. Drain and culvert laying.
- f. Backfilling of trench.
- g. Outflow structure.
- h. Authorities' approval.
- i. As-Built drawings.
- j. Clean-up.
- k. Maintenance.

02 Primary soil drainage
- a. Scope of works.
- b. Definitions.
- c. Kind and quality of materials.
- d. Trench excavation.
- e. Shop drawings and layout diagrams.
- f. Bedding and pipe laying.
- g. Handling and storage of pipes.
- h. Specialists, inspection and testing.
- i. Surface reinstatement in asphalt roads.
- j. Reinstatement of surfaces other than roads.
- k. Authorities' approval.
- l. As-Built drawings.
- m. Clean-up.
- n. Maintenance.

03 Water reticulation and fire hydrants
- a. Excavation.
- b. Pipes, specials, valves and fire hydrants.
- c. Valve chambers.
- d. Handling, laying and pipe testing.
- e. Marker post.

Basic information to be shown in the 2D drawings or 3D models

01 Primary Stormwater Drainage and Culverts
- a. Type of pre-cast culvert and its 'Class' and 'Brand'.
- b. Type of brick for drain walls.

02 Primary Soil Drainage
- a. Type of material for pipes and its MS/BS/EN code.

03 Primary Water Reticulation
- a. Type of material for the pipes and its MS/BS/EN code.
- b. Type of fire hydrants and its MS/BS/EN code.
- c. Type of valve, fittings and its MS/BS/EN code.

Specific rules of measurement

01 The depth for excavation is to the invert depth of the pipe/drain; therefore, the actual depth of excavation is to add on the bed that the pipe/drain laid on.

02 Drains and pipes are measured from the external face of a manhole to the external face of manhole or accessory.

03 For stormwater drains, soil pipes and water reticulation pipes, trench excavation and brickworks associated therewith are each measured separately while for sumps, manholes, pipe culverts, box culverts and the like, such items associated therewith are included in the measurement for the same.

'Works and materials deemed to be included' which are collectively referred to as 'Preambles'

01 General trench excavation
- a. Excavating in whatever type of material excluding rock as defined in the Specification discovered on the surface or in the excavations.
- b. Getting the material out of the excavations.
- c. Levelling bottoms of the excavations to falls or cambers and compacting the same.
- d. Trimming sides of the excavations from vertical, battering or sloping faces.
- e. Upholding and maintaining sides of the excavations by whatever means necessary including the use of bentonite and any special shoring or sheet piling etc. as may be necessary but which do not form a permanent part of the works to be executed, but excluding any planking and strutting to be left in or any sheet piling etc. which form a permanent part of the work to be executed.
- f. Backfilling of selected excavated materials into the excavations and compacting the same by methods and in the manners as specified in the Specification.
- g. Multiple handling and transporting above the site.
- h. Depositing, spreading and levelling in making up levels of surplus excavated materials within the site.
- i. Keeping the excavations free from the storm, percolating or spring water by pumping or whatever other means necessary.
- j. Disposal of surplus excavated materials (the balance after backfilling) is to include for multiple handling of the materials or transporting the material about the site as may be necessary prior to disposal.

02 Primary Stormwater Drainage and Culverts
- a. Setting out the stormwater drainage work.
- b. All short lengths.
- c. Jointing and bedding and making smooth running joints.
- d. Building in ends of drain or culvert pipes into sumps.
- e. Cutting culvert pipes for chamfers, ends, junction and for jointing.
- f. Additional beds and surrounds at junctions, beds, cascades, ends, etc.

03 Primary Soil Drainage
- a. Pipework and Fitting Generally
  - i. Setting out the primary soil drainage works.
  - ii. All necessary supports, saddles, slings, fixing bolts, foundation bolts for supporting pipework and equipment during installation.
  - iii. All short lengths.
  - iv. Running Joints.
  - v. Deflecting Joints.
  - vi. Site tests and CCTV inspection on pipework including providing test certificates and carrying out tests on samples.
  - vii. Temporary stoppers or plugs for closing ends of uncompleted pipelines during the progress of works.
  - viii. Forming permanent vertical joints along with concrete pipe bedding as required.
  - ix. Purpose-made brackets and hangers within chambers, etc.
  - x. Building in ends of pipes into or concrete chambers including providing brick-on-edge arch and concrete lintels over pipes and making good works around.
  - xi. Cleaning out the interior of pipes and preparing ends of pipes for pipe joints and jointing.
  - xii. Cutting pipes for chamfers, bends, junctions and for jointing, etc.

b. All mechanical and flexible couplings and such like joints :
   i. All nut, bolts, plain and spring washers, gaskets, etc. for making the complete connection.
   ii. External protection on all flanged joints and flexible couplings.
c. All exposed cast iron or steel pipes in chambers or above ground etc.:
   i. Painting with three coats of bituminous paint.
d. Pipe fittings
   i. Bends, junctions, inspection pipes, rodding eyes and the like.

04 Testing and Commissioning of Pipelines and Manholesa.
a. The provision of all plant and equipment comprising portable hydraulic pumps, etc..
b. Blank, flanges, caps and plugs, pressure gauges, pipe connections, corks, hoses, struts, thrust blocks.
c. All labour and everything else necessary as described in the Specification.

05 Water Reticulation and Fire Hydrants
a. Water Reticulation and Fitting
   i. Setting out the water reticulation works.
   ii. Deflecting joints.
   iii. Site tests and works tests on pipework, mechanical couplings, etc. including providing test certificate and carrying out tests on samples.
   iv. Temporary plugs or stoppers for closing cut ends of uncompleted pipelines during progress of works.
   v. Building in ends of the pipe into the concrete structure and making good works around.
   vi. Cutting pipes for chamfers, bends, junctions and for jointing.
   vii. Cleaning out the interior of pipes and preparing ends for pipe joints and jointing.
   viii. External protection on all running joints, flanged joints and flexible couplings.
   ix. Painting all uncoated surfaces of pipework, valves and fittings, etc. with two coats of bituminous paint before or after laying and jointing.
   x. Flanges and unions for erection purposes.
b. Valve, hydrants, fittings, thrust blocks, chambers and such as specials :
   i. All component pipes necessary for the complete installation including all fixing accessories.
   ii. Extra joints to pipes.
c. Galvanised mile steel pipes.
   i. All running joints, short lengths, sockets, connectors, back nuts, elbows, bends, tees, diminishing pieces, joints of a special or ornamental character, plugs and such like items.

06 Testing and Commissioning of Water Reticulation System
a. The provision of all plant and equipment comprising portable hydraulic pumps, etc.
b. Blank, flange, caps and plugs, pressure gauges, pipe connectors, corks, hoses, struts, thrust blocks etc.
c. All labour and everything else necessary as described in the Specification.

07 Precast Concrete Items
a. All moulds, reinforcement and finished fair on exposed faces.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 PRIMARY STORMWATER DRAINAGE AND CULVERTS **02 PRIMARY SOIL DRAINAGE** **03 PRIMARY WATER RETICULATION**					
01 Excavation trenches	m3	01 For pipes and beds	01 (dia) diameter pipes; (depth) average deep		1 To add 'NOTES' preceding the 'Heading' as follows: (a) All excavation items are to be deemed to commence from platform level unless otherwise shown in the drawings. (b) Any other requirements.
		02 For precast concrete drains and beds	01 (depth) average deep		
	m3	03 Extra-over for breaking up rock at any depth and all types of excavation	01 using pneumatic tools/ hydraulic rock breaker; removing from site 02 using chemical means; subject to authorities approval and by licenced specialist; removing from site 03 using control blasting; subject to authority's approval and by the licensed specialist; removing from site		
02 Imported (material type) 03 Mass in-situ concrete; Grade C(grade) including formwork 04 Reinforced in-situ concrete; Grade C(grade); including reinforcement and formwork	m	01 Beds to pipes 02 Beds and haunching to (dia) diameter pipes 03 Beds and surrounds to (dia) diameter pipes 04 Vertical casings to (dia) diameter pipes 05 Beds and surrounds on both sides of precast concrete block drain; including blinding	01 (dimensioned description)		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
05 Precast concrete (type) drains 06 Half-round precast concrete drains 07 Half-round glazed ware drain	m --- nr	01 Laid to falls on and including mass in-situ Grade C(grade) concrete beds and surrounds on both sides including formwork and blinding; in (length) length	01 (width) internal width x (depth) deep to invert --------- 02 extra-over for (height) high cascades; including all necessary concrete, formwork and excavation		01 All these items are for the stormwater drainage.
08 Precast concrete struts; as shown in Drawing (drawing nr)/model	nr	01 Laid in between brick wall	01 (dimensioned description)		
09 Precast concrete slabs; as shown in Drawing (drawing nr)/model	nr	01 To open drain; fair finished to top 02 To sump; fair finished to top	01 (dimensioned description)		
10 Gratings	nr	01 Constructed of medium duty mild steel and frame; infilled with mild steel (m.s.) plates; anchored in position including m.s. fish tails; including prepare and apply (painting system) to all exposed surfaces after fixing top 02 Constructed of medium duty galvanised iron (G.I.) frame; infilled with G.I plates; anchored in position including G.I. fish tails	01 To open drains 02 To sump	01 overall size (dimensioned description); as shown in Drawing (drawing nr)/model	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
11 Cement and sand bricks 12 Common clay bricks	m2	01 Drain walls; including (thickness) cement and sand rendering with an approved plasticiser finished with steel trowel on the exposed surfaces; complete with (diameter) diameter PVC as weep holes with stone aggregate wrapped with a wire mesh filter	01 half brick thick 02 one-brick thick 03 (thickness) thick		1 Refer to 'Preambles' for Work Section 11: Masonry which is applicable to these items. 2 These drain walls are for stormwater drainage.
13 Vitrified clay pipes and fittings 14 uPVC pipes and fittings 15 Cast iron pipes and fittings 16 Precast concrete pipes and fittings 17 Porous pipes (passing rate) % and fittings	m	01 Laid in trenches; embedded in hand compacted granular bedding extending halfway up the side of the pipe; the remainder side fill with selected backfill carefully compacted; including all necessary aggregate, bends and other accessories; all in accordance with S.O.'s approval; as shown in Drawing (drawing nr)/ model	01 (diameter) diameter {nominal}		1 The MS/BS/EN code and the type of joints are to be described in the 'Heading'. 2 These pipes are mainly used for soil drainage. 3 Brand and grade of pipes (if necessary) are to be described in Level 'Heading' unless shown on drawings.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
18 Mild steel pipes and fittings cement-lined internally and externally wrapped with bitumen impregnated Hessian or other equal 19 Heavy duty polyethylene (HDPE) pipes and fittings	m	01 Laid in trenches; including all necessary bends, junctions, tees, end caps and the like; supported and including precast concrete thrust block of appropriate sizes; all in accordance with S.O's approval; as shown in Drawing (drawing nr)/ model	01 (diameter) diameter {nominal}		1 The MS/BS/EN code and the type of joints are to be described in the 'Heading'. 2 These pipes are mainly used for water reticulation.
20 Precast concrete box culverts	m	01 (Product name) Class (class) with dry weather flow; jointed with cement and sand (1:3) mortar laid in trenches; including concrete blinding, vibrated reinforced in-situ Grade C(grade)concrete Grade C(grade) bed with BRC (ref nr) including all necessary excavation, backfilling, formwork, planking and strutting; complete with precast concrete lids; all in accordance with the manufacturer's instructions; as shown in Drawing (drawing nr)/model	01 (dimensioned description) {nominal}		1 These items are mainly for stormwater drainage.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
21 Precast concrete pipe culverts	m	01 (Product name) Class (class) ; jointed with and including precast concrete socket and spigot joints in cement and sand (1:3) mortar laid and jointed in trenches; including concrete blinding and vibrated reinforced in-situ Grade C(grade) bed with BRC (ref nr); including all necessary excavation, backfilling, formwork, planking and strutting; all in accordance with the manufacturer's instructions; as shown in Drawing (drawing nr)/ model	01 (diameter) diameter {nominal}; average		
22 Brick manholes	nr	01 Constructed of (size) brick thick (type) brick wall in cement and mortar (1:3); plastered internally with high alumina cement; including concrete blinding and vibrated reinforced in-situ concrete Grade C(grade) bed with BRC (ref nr); including all necessary excavation, backfilling, formwork, planking and strutting; as shown in Drawing (drawing nr)/model	01 (dimensioned description) {internal}		1 If there are mild steel or stainless-steel steps, they are to be so described in Level One. 2 These items are mainly for soil drainage.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
23 Precast manholes	nr	01 constructed of precast reinforced concrete rings and eccentric cone; plastered internally with high alumina cement; precast reinforced cover slab; on and including vibrated reinforced in-situ Grade C(grade) bed with BRC (ref nr) with blinding; raised with concrete surround encasement; complete with stainless steel steps at spacing; approved heavy duty ductile iron manhole cover and frame to manufacturer's detail; including all necessary excavation, formwork, planking and strutting; all in accordance with the manufacturer's instructions			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
24 Brick sumps	nr	01 Constructed of (type) brick walls in cement and mortar (1:3); plastered internally with cement and sand (1:6) plaster; on and including vibrated reinforced in-situ Grade C(grade) bed with BRC (ref nr) with blinding; complete with concrete benching, uPVC half-round main channel and (type) grating to suit opening; including all necessary excavation, formwork and concrete surround; as shown in Drawing (drawing nr)/model	01 (dimensioned description) {internal}		1 This item is mainly for stormwater drainage.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
25 Precast sumps	nr	01 Constructed of precast reinforced concrete sump; precast reinforced cover slab; on and including vibrated reinforced in-situ concrete Grade C(grade) bed with BRC (ref nr) with blinding; complete with concrete benching, uPVC half-round main channel and (type) grating to suit opening; including all necessary excavation, formwork and concrete surround; as shown in Drawing (drawing nr)/model	01 (dimensioned description)		
26 Fire hydrants	nr	01 double outlet pillar type; complete with landing valve, mild steel chain and caps, duct foot bend and thrust block; all subject to the approval of water authority and Bomba; including jointing to pipe, all necessary excavation, concrete and formwork; as shown in Drawing (drawing nr)/ model			1 These items are mainly for water reticulation.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
27 Precast concrete valve chambers to Local Authority standard	nr	01 complete with (type) valves to (MS/BS code); set in concrete blocks; including valve flange, (brand) flange adopter and all necessary excavation, backfilling and formwork; all in accordance with S.O.'s approval; as shown in Drawing (drawing nr)/model			1 This item is mainly for stormwater drainage.
28 Approved Water Authority marker posts	nr	01 precast reinforced concrete; complete with letters incised on surface of marker; including planting in ground and painting exposed surfaces with three costs of white cement base paint and letter and signs with red paint and all necessary excavation and making good surround; as shown in Drawing (drawing nr)/model			
29 Connections	item	01 from water reticulation main to individual unit tap off point at water meter (water for authority's) approval; including all necessary joints, bends, junctions and accessories, excavation, backfilling, hacking and making good work			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
	item	02 from sewer main to individual house manholes; including all necessary joints, bends, junctions and accessories, excavation, backfilling, hacking and making good work			
	item	03 allow for locating, arranging, attending, liaising and obtaining approval from (water authority) for temporary water shut-off, cutting off from existing water mains and hot tapping to existing (dia) diameter pipe mains including all necessary fittings, excavation, planking and strutting and other associated works			
	item	04 allow for connection to existing manhole outside the site boundaries including paying all necessary charges, all necessary joint fittings, formwork, excavation and any other associated works and making good all works disturbed			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
30 Testing and commissioning	item	01 testing the whole of the primary soil drainage during laying and on completion, making good any defects and leaving everything in perfect working order to the entire satisfaction and acceptance of the S.O. and IWK 02 testing upon completion the primary water reticulation, all fittings for water tightness, making good all defects and leave everything in perfect working order to the entire satisfaction and acceptance of the S.O. and water authority 03 sterilisation, flushing and scouring of primary water reticulation			1 These items are mainly for water reticulation.

23 SITE WORKS

01 ROADS, DRIVEWAYS AND CARPARKS
02 ROAD SIGNAGES
03 SPORTS SURFACING
04 RESURFACING EXISTING ROAD

Information to be provided in the Specification	01 General. 02 Subgrade. 03 Subbase. 04 Crushed aggregate base course. 05 Binder and wearing course. 06 Road kerbs, channels, edgings and the like. 07 Various sport surfacing materials. 08 Various road markings.
Basic information to be shown in the 2D drawings or 3D models	01 Roads, driveways and carparks a. Details of the Roads, driveways and carparks, road kerbs, channels, edgings and the road marking. b. Material for road marking. 02 Resurfacing the existing roads a. Area for such work. b. Thickness of the premix. c. Area where cutting and bonding to the existing roads. 03 Sport surfacing materials a. Types. b. Product names.
Special rules of measurement	01 Unless stated as deemed to be included all associated excavations, disposal and fillings are measured in accordance with Work Section 4: Excavating And Filling.
'Works and materials deemed to be included' which are collectively referred to as 'Preambles'	01 Roads, driveways, carparks and pavings a. All cutting and fitting. b. Sampling and testing of aggregates and bituminous mixtures as specified. c. Protecting mixed material in transit and while awaiting tipping. d. Trimming, levelling and grading formation to the required cambers, gradients, falls and crossfalls sub-base. e. Laying, rolling and consolidating sub-base, base course, binder and wearing course in layers or sequence as required. f. Laying by the hand of narrow strips remaining alongside machine work. g. Making joints, working around manhole covers and other like projections. h. Finishing surfaces to gradient and falls. i. Added fillers to a bituminous mixture. j. Maintenance of surfaces as work progresses. k. Ends, angles, outlets and intersections. l. Setting pavings into recessed manhole covers. 02 Road kerbs a. Road kerbs are deemed to include all necessary excavation, backfilling, formwork, mitres, bends, circular section, etc.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 ROADS, DRIVEWAYS AND CARPARKS					
01 Roads, driveways and carparks	m2	01 Grade road formation level to gradient and crossfall; well rolled	01 on subgrade		
	m2	02 Sand blinding; spread and levelled to fall, well rolled and compacted 03 Crusher run; spread and levelled to fall, well compacted	01 (thickness) thick {consolidated thickness}		
	m2	04 Prepare, apply and spread a layer of approved bituminous prime coat on binder course surface	01 at a rate of (nr) litre/ m2		
	m2	05 Asphaltic concrete binder course; laid on crusher run to gradient and crossfall, well rolled and compacted	01 (thickness) thick {consolidated thickness}		
	m2	06 Prepare, apply and spread a layer of approved bituminous tack coat on crusher run surface	01 at a rate of (nr) litre/ m2		
	m2	07 Asphaltic concrete wearing course; laid on binder course to gradient and crossfall, well rolled and compacted	01 (thickness) thick {consolidated thickness}		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
	m	08 Prepare and apply (nr) coats of thermoplastic reflective paint on the surface of premix; as shown in Drawing (drawing nr)/model	01 (width) wide edge lines 02 (width) wide stop lines 03 (width) wide centre lines at (length) spacing 04 (width) wide parking lines 05 straight directional arrows 06 turning directional arrows; 07 numbering for parking lots		
	m	09 Cast-in-situ extruded kerbs; laid on and plain in-situ concrete Grade C(grade) bed; forming outlet opening at centre; painting with approved (colour scheme) emulsion paint in (nr) layers on exposed surface; as shown in Drawing (drawing nr)/ model 10 Precast concrete kerbs with one side battered and rounded on one edge cost in convenient length and jointed in cement mortar (1:3); laid on and including plain in-situ Grade C(grade) bed; forming outlet opening at centre; painting with approved black and	01 overall size, (width) wide x (height) high		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
		white emulsion paint in (nr) layers on exposed surface; as shown in Drawing (drawing nr)/ model			
02 ROAD SIGNAGES					
01 Supply and install road signage	nr	01 Supported by mild street post with one end embedded in mass concrete footing: including all necessary excavation, formwork, welding and fittings; painting to the exposed surfaces	01 The other end mounted with non-illuminated retro-reflective aluminium sheet; as shown in the Drawing (drawing nr/model) for	01 'BERHENTI' sign 01 'NO ENTRY' sign 01 'NO LEFT/RIGHT TURN' sign 01 'NO THROUGH ROAD' sign 01 'ROAD INTERSECTION' sign	
03 SPORT SURFACING					
01 Seamless, water impermeable synthetic running track system	nr	01 Comprising prefabricated based layer, pore sealer and wear cost broadcasted with EPDM granules	01 For 400m track with 8 lanes; completed with lined marking with weather resistant paint; all in compliance with the International Association of Athletics Federation's (IAAF's) guidelines	01 on subgrade; all in accordance with the approved manufacturer's instructions and specification	
02 Cushion-backed indoor PVC synthetic badminton court mat	nr	01 For both double and single matches; 6.1m wide x 13.4m long; complete with court lines; all in compliance with the Badminton World Federation's (BWF's) guidelines	01 on concrete; all in accordance with to the approved manufacturer's instructions and specification		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 Acrylic rubberised tennis court; made of acrylic resin coats	nr	01 For Principal Play Area (PPA), 23.77m x 10.97m and the surrounds or run- offs; complete with court lines; all in compliance with the International Tennis Federation (ITF) guidelines	01 on concrete; all in accordance with the approved manufacturer's instructions and specification		
04 RESURFACING EXISTING ROADS					
01 Resurfacing existing roads	m2	01 Scarifying existing road surface	011 to receive a new wearing course {measured separately}		1 Method of scarifying surface is to be described in Level One.
	m2	02 Prepare, apply and spread a layer of approved bituminous tack coat on scarified surface	01 at a rate of (nr) litre/m2		
	m2	03 Asphalt concrete wearing course; laid on scarified surfaces to gradient and crossfall, well rolled and compacted	01 (thickness) thick {consolidated thickness}		
	item	04 Cutting in and bonding of new/resurfaced premix/existing road; including making good	01 allow		

24 LANDSCAPING

01 FENCING
02 SOFTSCAPE
03 HARDSCAPE
04 MAINTENANCE

Information to be provided in the Specification	01 Fencing a. General. b. Kind and quality of materials for fencing and gates. c. Types of painting system for fence and gates. 02 Softscape a. General i. Classifications and characteristics of plants. ii. Size of plants. iii. Handling and planting. iv. Soil mixture, soil conditioners and chemical fertilisers. v. Turfing. vi. Football and playing fields. vii. Maintenance of plant and turf. viii. Final handing over. 03 Hardscape a. Types and Product names. b. Performance Specification of Contractor Designed Keystone Retaining Wall: i. Scope of work. ii. Submittals. iii. Codes and standards. iv. Design requirements. v. Testing. vi. Performance criteria. vii. Delivery, storage and handling. viii. Materials. ix. Fabrication. x. Warranties.
Basic information to be shown in the 2D drawings or 3D models	01 Fencing a. Type of fencing and gates. 02 Softscape a. Botanical name of turf, seeding, trees, shrubs, bulbs and/or tubers.
Special rules of measurement	01 Fencing a. Fencing is measured over post, strut and other supports. b. The height of fencing is measured from the finished surface of the ground to the top of the posts. 02 Softscape a. The areas measured are those in contact with the base. b. All thickness stated are nominal or finished after laying and compacting.

	03 Hardscape (Contractor Designed Keystone) a. Retaining Wall i. As these are contractor designed items, they are priced as 'lump sum' items with the cost breakdown given and in the event of any variation which does not affect the overall design, it would be evaluated based on the unit rate derived from dividing the 'lump sum' price by the approximate area (measured on front face). b. Others i. The areas measured are those in contact with the base. ii. All thickness stated are nominal or finished after laying and compacting.
'Works and materials deemed to be included' which are collectively referred to as the 'Preambles'	01 Fencing and hardscape a. The provisions of the Preambles for 'Excavation and Filling', 'Piling', 'In-situ concrete works', 'Masonry', 'Metalwork', and such other Work Sections as may be applicable are applied to the respective works related to Fencing and hardscape. 02 Softscape a. All work is deemed external unless described as internal. b. Carrying out of the Works in such sequence or section as the S.O's instruction. c. Preparatory work in forking and loosening ground surface. d. Dressing with fertiliser, tending, pruning, watering, covering with wet sacking, supports, labelling, ties, guards, root barrier etc., until well-established, and moving and protection of newly turfed areas. e. Raking in, harrowing and rolling for seeding.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 FENCING					
01 PVC coated chain link fencing	m	01 Supported by mild steel angle post with one end embedded into concrete Grade C(Grade) footing at spacing including all excavation and formwork; prepare and apply (painting system); complete with PVC coated galvanised straining wire thread and mesh; as shown in Drawing (drawing nr)/ model	01 overall (height) high		1 Fencing 'to sloping ground', 'to set out to curve but straight between posts' or 'to set out to curve between posts' (if required) is to be so described in Level Two.
02 Brick fencing with a mild steel grille 03 Brick refuse bin/letter box	m	01 Constructed of brick post with half brick thick (type) brick; complete with plastering on both sides and laid on and including vibrated reinforced in-situ concrete Grade C(grade) strip foundation with one layer of BRC (ref nr) including all excavation, blinding; prepare and apply (painting system); as shown in Drawing (drawing nr)/model	01 overall (height) high with (height) high mild steel grille at the upper half 02 overall size (dimensioned description)		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
04 (Brand name and material type) anti-climb fence (series nr) or other equal and approved	m	01 Constructed of high tensile steel wire finished in hot-dipped galvanised; complete with posts with one end embedded into mass in-situ Grade C(grade) footing at (length) centre-to-centre including all excavation and formwork and all accessories; all in accordance with the manufacturer's instructions	01 overall (height) high		1 Fencing 'to sloping ground', 'to set out to curve but straight between posts' or 'to set out to curve between posts' (if required) is to be so described in Level Two.
05 Mild steel gates	nr	01 Complete with gate post, 1 pair purpose made hinges, drop bolt, locking plate and other necessary accessories; prepare and apply (painting system) as shown in Drawing (drawing nr)/ model	01 overall size (dimensioned description) 02 pair; overall size (dimensioned description)		1 Type of operating is to be so described in the 'Heading'.
06 Mild steel auto sliding gates	nr	01 Complete with all necessary frames, transom, fixing screws and ironmongery; electric operated complete with roller drum, casing and sliding tract; prepare and apply (painting system) as shown in Drawing (drawing nr)/ model	01 overall (dimensioned description) 02 pair; overall (dimensioned description)		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 SOFTSCAPE					
01 Close turfing 02 Spot turfing 03 Grass seeding	m2	01 Preparing ground; including all necessary excavation, backfilling, trimming and (thickness) thick of black vegetable solid	01 with (botanical name) grass 02 applied at the rate of (nr) per m2		1 Grass which 'laid on sloping surfaces; including securing turfs with pegs' (if required) is to be so described in Level Two.
04 Trees 05 Shrubs 06 Bulbs and tubers 07 Climbers	m --- nr	01 Preparing ground; including all necessary excavation, backfilling, trimming and black vegetable soil	01 (botanical name); (girth) girth; (height) high trunk		
03 HARDSCAPE					
01 Contractor Designed Keystone Retaining Walls	item	01 Design, manufacture, supply and install Keystone Retaining Walls {approximate area (area) m2}; as shown in Drawing (drawing nr)/ model	01 breakdown cost i. design fee ii. investigation works iii. excavation work to facilitate the construction of keystone retaining wall iv. manufacture, supply and deliver to site keystone retaining wall components v. piling (if any) erection and installation of keystone retaining wall		1 To add 'NOTES' preceding the Level One as follows: (a) The Contractor is to engage a Specialist Sub-Contractor who has the expertise and experience to design, supply and install such wall in accordance with the Performance Specification in the Specification and the relevant drawings and the approval of the S.O.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
			vi. supply and install mass concrete levelling pad viii. supply, fill, spread, level and compact granular backfill ix. geogrids as reinforcing elements x. other works to be listed by the Contractor that are necessary to ensure completion of the Keystone Retaining Wall		(b) The Contractor and his Specialist Sub-Contractor are to be jointly responsible to ensure that such walls are in all respect adequate, accurate, sufficient and fit for its purpose. (c) The Contractor is to submit all shop drawings and sample as per requirements stated in the Performance Specification and be endorsed by Professional Engineer with Practising Certificate (PEPC) registered with the Board of Engineers Malaysia (BEM).

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
					(d) Before pricing, the Contractor is required to visit the site and refer to the drawings for the extent, the location and the varying heights shown therein so as to satisfy himself as regards to facilities for transport and plant movement, means of access, removal of debris, working space, existing services, storage of materials and goods and other contingencies liable to affect his pricing as no claim for extra payments in this connection will be entertained. (e) Other requirements (if any).
02 Seating	nr	01 Seats; precast concrete; Grade C(grade); finished with (type) plaster; including foundation, (type) supports plastered on all exposed sides; as shown in Drawing (drawing nr)/model	01 overall size; (dimensioned description)		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 Steps	m2	01 (Type) brick steps; comprising risers and threads; jointing in cement and sand mortar (1:3) and finished with (type) paving; as shown in Drawing (drawing nr)/ model	01 overall width (width)		
04 Pavings	m2	01 (Product name) stamped concrete pavings; finished with bull floating and embossed to the required pattern and colour as selected by the S.O.; finished with a protective coating; including all necessary expansion joints with approved sealant; all in accordance with the manufacturer's instruction and S.O.'s approval; as shown in Drawing (drawing nr)/ model	01 on compacted subgrade 02 on concrete base		
	m2	02 (Product name) interlocking concrete pavers; laid on and including sand bedding to the required pattern and colour as selected by the S.O with concrete edge.; all in accordance with	01 on compacted crusher run 02 on concrete base 03 on compacted subgrade		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
	m2	03 Footpaths; reinforced concrete Grade C(grade) slabs with (nr) layer of BRC (ref nr); laid on and including lean concrete and hardcore; including all necessary excavation and formwork; as shown in Drawing (drawing nr)/ model	01 finished with (type) paving		
04 MAINTENANCE					
01 Maintenance of turfs 02 Maintenance of trees and plants	item	01 Watering, pruning, replacing damaged or defective trees and plants, applying fertilisers and weed killers and all other maintenance as specified	01 until the issuance of the Certificate of Practical Completion 02 from the issuance of the Certificate of Practical Completion until the issuance of the Certificate of Making Good Defects		
03 Litter bin	nr	01 Ground-mounted 02 Demountable	01 overall size (dimensioned description)		1 Type of material is to be describe in Level One

25 PLUMBING SERVICES

01 COLD/HOT WATER INSTALLATION
02 SANITARY PIPEWORK INSTALLATION
03 SANITARY FITTINGS

Information to be provided in the Specification	01 General, regulations and requirements. 02 Scope of Work. 03 Technical specification.
Basic information to be shown in the 2D drawings or 3D models	01 Cold/hot water installation a. Pipe: type, material, diameter and Class and 'MS/BS/EN Code'. b. Taps and valves: type of taps and valves, their respective types of material and ' MS/BS/EN Code'. c. Water tank: type of material and capacity. d. Insulation: type of material and area that required insulation. 02 Sanitary pipework installation a. Pipe: type, material and 'MS/BS/EN Code'. b. Pipe joints: type. 03 Sanitary fitting a. Schedule of sanitary fittings with the product names/codes and details (where necessary). 04 Builder's Work in connection with sanitary fittings a. The detail of the Builder's work in connection with sanitary fittings.
Special rules of measurement	01 All piped works are measured over pipe fittings. 02 Flexible pipes and extensible pipes are measured when they are not extended. 03 All taps and fittings are measured separately unless otherwise stated.
'Works and materials deemed to be included' which are collectively referred to as 'Preambles'	01 Pipeworks a. Running joints, connectors, elbows and bends, sockets, backnuts, fire bends, tees, diminishing pieces, plugs, brackets, offsets, beaded ends, ornamental ends and the like. b. Joints of a special or ornamental character. c. Fittings involving a change of direction of piping. d. All short lengths. e. Sundry items of a like nature. f. For concealed pipework, all cutting to form chases and holes and subsequent making good of all works disturbed. 02 Sanitary fittings a. General i. All fixing is in accordance with the manufacturer's instruction and S.O.'s approval. b. Wash-hand basins i. Plugged and screwed to tiled wall with fixing bolts for wall hang type. c. Water closets i. Plugged and secured closet to tiled concrete floor and jointing pan to soil pipe complete with all necessary fixing and making good all connections. d. Other fittings i. All necessary fixing and making good all connections.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 COLD/HOT WATER INSTALLATION					
01 Coated ductile pipe and fittings; mechanical coupling plain-end joints 02 Steel pipe and fittings; mechanical coupling plain-end joints 03 Medium-density polyethylene pipe and fittings; plastic compression fittings and joints 04 High-density polyethylene (HDPE) pipe and fittings; plastic compression fittings and joints 05 Asbestos cement pipe and fittings; rubber ring coupling plain-end joints 06 Galvanised mild steel pipe and fittings; screwed socketed joints 07 uPVC pipe and fittings; solvent welded joints 08 Copper pipe and fittings compression fittings and joints 09 Acrylonitrile butadiene styrene (ABC) pipe and fittings; solvent welded joints	m	01 Laid in trenches; including necessary excavation and reinstatement 02 Fixed on vertical surface 03 Fixed on horizontal surface 04 Embedded in wall/ floor	01 (dia) diameter		1 MS/BS/EN Code and 'Class' are to be described in the 'Heading'.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
10 Stopcocks, valves and the like	nr	01 Bib taps 02 Stop valves 03 Gate valves 04 Butterfly valves	01 jointing to (type) pipes; (dia) diameter		1 Type of material e.g. chrome plated, copper, brass, acrylic, etc. and MS/BS/EN Code are to be described in Level One.
11 Water tank	nr	01 Galvanised pressed steel sectional water tank 02 Galvanised steel water tank 03 Glass fibre reinforced plastic sectional water tank 04 Polyethylene water tank	01 Complete with covers, float operated ball valves with union connections to pipes; including bearers and supports of any kind	01 (dimensioned description) 02 (litre) litres nominal capacity	
12 Insulation	m	01 Preformed sectional pipe insulation; (thickness) thick and (type) type; including (thickness) thick protective covering	01 To pipes and supports 02 To flanged pipework and supports 03 To boilers, cylinder, tanks and the like	01 (dia) diameter pipes overall size; 02 (dimensioned description)	
13 Testing and commissioning	item	01 allow for testing the whole of the cold/ hot water installation system during laying and on completion; making good any defects and leaving everything in perfect working order to the entire satisfaction of the S.O. and Local Authority			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
14 Sundries	nr	01 (Product name and model) electrical booster pump; including valves, pipes, fittings weather proof starter panels, reinforced concrete plinth, anti-vibration installation and all requisite accessories 02 supply and install local authority approved consumer water meter including all necessary piping and lockable valve, stopcock and the like			
	item	03 allow for painting and labelling works; complete with accessories 04 allow for liaison with (water authority) including assisting the Employer on submission of application forms and obtaining the water meters from them and installing the same			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 SANITARY PIPEWORK INSTALLATION					
01 Soil and vent pipe 02 Waste and vent pipe	m	01 Cast iron pipes and fittings; (MS/BS/EN code); with caulked lead joints 02 Cast iron pipe and fittings; (MS/BS/EN code); with flexible joints 03 uPVC pipes and fittings; (MS/BS/EN code); with rubber ring joints	01 Laid in trenches including necessary excavation and reinstatement; 02 Fixed to vertical surface; 03 Fixed to horizontal surface;	01 (dia) diameter	
	--- nr	04 uPVC pipes and fittings; (MS/BS/EN code); with solvent welded joints	--------- 04 Extra-over for reducers 05 Extra-over for caps 06 Extra-over for access pipes; complete with inspection door		
03 Accessories	nr	01 Approved floor trap	01 Complete with PVC floor grating setting in concrete slab 02 Complete with approved stainless steel floor grating setting in concrete slab 03 Complete with stop-cockroach device setting in concrete slab	01 overall size (dia) diameter 02 overall size (dimensioned description)	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
		02 Approved PVC gully trap	01 complete with half-brick wall with 20mm thick high alumina cement rendering, concrete base, concrete cover slab and stainless steel floor grating; as shown in Drawing (drawing nr)/ model		
		03 Grease trap	01 complete with half-brick wall with 20mm thick high alumina cement rendering, mild steel chequer plate and stainless steel strainer bracket; as shown in Drawing (drawing nr)/ model		
		04 Balloon gratings	01 galvanised wire balloon grating; to suit (dia) diameter pipes		
04 Testing and commissioning	item	01 allow for testing the whole of the soil, waste and ventilation pipe system during laying and on completion; making good any defects and leaving everything in perfect working order to the entire satisfaction of the S.O. and Indah Water.			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 SANITARY FITTINGS					
01 Supply and fix the following sanitary fittings; including connections to pipes with adaptors as necessary jointing and sealing compounds and all necessary accessories	nr	01 Wash basins; wall hung 02 Wash basins; pedestal 03 Vanity basins; above counter type 04 Vanity basins; below counter type	01 (Product name/code); complete with punched tap holes; waste fittings, bottle trap and (type) tap;as shown in the Drawing (drawing nr)/model	01 generally	1 Name of manufacturer and type of material e.g. vitreous china, stainless steel, acrylic, pressed steel, etc. are to be described in Level One. 2 Colour (if any) is to be described in Level One.
	nr	05 Water closets; closed coupled washdown pedestal	01 (Product name/code); complete with trap; flush cistern and lid; angle valve, hose and seat and cover; as shown in Drawing (drawing nr)/ model	01 generally	
	nr	06 Water closets; squatting	01 (Product name/code); complete with trap; high level plastic cistern with accessories flush pipe; as shown in Drawing (drawing nr)/model	01 generally	
	nr	07 Urinal bowls	01 (Product name/code); wall hung top inlet; complete with ceramic waste, plastic flange, screws,washer and mastic, light urinal hangers, fixing bolts and cleansing nozzle; top inlet flush meter, straight flush pipe and inlet pipe; as shown in Drawing (drawing nr)/ model	01 generally	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
	nr	08 Long baths	01 (Product name/code); complete with waste fitting, overflow, and trap;	01 overall size (dimensioned description);	
	nr	09 Kitchen sinks	01 (Product name/code); complete with bottle trap and waste fittings; as shown in Drawing (drawing nr)/model	01 overall size (dimensioned description); single bowl single drainer 02 overall size (dimensioned description); double bowl double drainer	
	nr	10 Hand bidet	01 (Product name/code); complete with screw down stopcock and shower rose arm and flange; as shown in Drawing (drawing nr)/ model	01 generally	
	nr	11 Shower-head	01 (Product name/code); complete with delayed shut-off valve and all accessories and concrete infill; as shown in Drawing (drawing nr)/model	01 generally	
02 Supply and fix the following sanitary fittings; including connections to pipes	nr	01 Bib taps 02 Pillar taps 03 Kitchen taps 04 Basin mixer taps 05 Bath mixer taps 06 Kitchen mixer taps	01 (Product name/code); with single level(valve type); as shown in Drawing (drawing nr)/ model	01 (dia) diameter	Types of material for example chrome plated, copper, brass, acrylic, etc. are to be described in Level One

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 Supply and fix the following sanitary fittings	nr	01 Shower trays	01 (Product name/code); complete with traps; as shown in Drawing (drawing nr)/model	01 (dimensioned description)	1 Enclosure partition system for shower tray is to be describe in Level One
	nr	02 Soap holders	01 (Product name/code); semi-recessed soap dish; as shown in Drawing (drawing nr)/ model 02 (Product name/code); semi-recessed soap and sponge holder; as shown in Drawing (drawing nr)/ model		
	nr	03 Toilet roll holders 04 Tissue dispenser	01 (Product name/code) semi-recessed toilet roll holder; as shown in Drawing (drawing nr)/ model 02 (Product name/code) roll holder; as shown in Drawing (drawing nr)/ model	01 generally	
	nr	05 Urinal stalls	01 (Product name/ code); complete with all accessories and concrete infill; as shown in Drawing (drawing nr)/model	01 overall size (dimensioned description)	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
	nr	06 'First quality' polished float glass mirror	01 (Product name/ code); complete with aluminium edges and waterproofed plywood backing; plugged and four times screwed to tiled/plastered wall; including chromium dome capping to screws; as shown in Drawing (drawing nr)/ model	01 (dimensioned description)	
	nr	07 Robe hook 08 Liquid soap dispenser with touch bottom type valve 09 Paper towel dispenser 10 Electronic hot air hand dryer with hygienic auto sensor operator; including all necessary fixing accessories and connection on/off switch	01 (Product name/code); fixed to wall; as shown in Drawing (drawing nr)/model	01 generally	
	nr	11 Wall to wall grab rail	01 (Product name/code); comprising stainless steel angled grab rail and stainless steel straight grab rail; plugged and screwed to tiled wall; as shown in Drawing (drawing nr)/model	01 (dimensioned description)	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
04 Builder's Work in Connection with Sanitary Fittings	nr	01 Mass concrete stool	01 Constructed of vibrated reinforced in-situ concrete Grade C(grade) to receive water closet; including all necessary formwork; finished on all exposed surface with tiles bedded and jointed in cement and sand (1:3) screeded bed pointed in matching colour cement mortar and other necessary works; as shown in Drawing (drawing nr)/ model	01 overall size (dimensioned description)	
	nr	02 Vanity countertop	01 Constructed of vibrated reinforced in-situ concrete Grade C(grade); including all necessary formwork and reinforcement; forming the opening to receive vanity basin {measured separately} finished on the exposed surface with tiles bedded and jointed in cement and sand (1:3) screeded bed pointed in matching colour cement mortar and other necessary works; as shown in Drawing (drawing nr)/ model	01 overall size (dimensioned description)	

26
MECHANICAL ENGINEERING INSTALLATIONS

01 PRIMARY EQUIPMENT

02 DUCTING

03 PIPEWORK

04 INSULATION TO DUCTWORK

05 INSULATION TO PIPEWORK AND EQUIPMENT

06 DUCTING ACCESSORIES

07 ANTI-VIBRATION

08 SUNDRIES

Information to be provided in the Specification

01 Type, quality and size or thickness of materials.
02 Regulations, standard of compliance, etc.
03 Gauge, thickness or substance of the material.
04 Performance test, witness test, specific test, factory acceptance test and the like.
05 Capacities, running condition, operational and static load, etc. for main services installation.
06 Technical Specifications
   a. Ductwork support (e.g. type, material, finish, shape, dimensions and the like).
   b. Pipework (e.g. normal size, MS/BS/EN quality standard, materials and internal lining materials and the like).
   c. Ductwork (e.g. normal thickness, MS/BS/EN quality standard, materials, the finish of material and internal lining materials and the like).
   d. Types of insulations and anti-vibration material.

Basic information to be shown in the 2D drawings or 3D models

01 Air Conditioning System
   a. Type of cooling capacity.
   b. Type of gas used.
   c. Type of pipe.
   d. MS/BS/EN code.
   e. Type of accessories, etc.
02 Gas Supply System, Refrigeration Installations and Chemical Installations
   a. Type of system.
   b. Tank capacity.
   c. Size of pipe.
   d. MS/BS code.
   e. Special fittings and accessories.
03 Fire Fighting System
   a. Type of system.
   b. Tank capacity.
   c. Size of pipe.
   d. MS/BS/EN code.
   e. Brass works for fittings and accessories.
04 Medical Suction Installations, Pneumatic Tube Installations, Refuse Disposal Installations and Automatic Control System
   a. Type of system.
   b. Size of pipe or ducting.
   c. MS/BS/EN code.
   d. Special fitting and accessories.

Special rules of measurement

01 Primary Equipment
   a. Items of equipment and ancillaries are to be referred to in the manufacturer's detailed specification.
02 Pipework
   a. Pipes are measured over all pipe fittings, short running lengths and branches.
   b. Flexible pipes and extensible pipes are measured when they are not extended.
03 Ductwork
   a. Ducting is measured over all duct fittings, short running lengths and branches.
   b. Flexible ducting and extensible ducting are measured as fully extended.
04 All associated wiring, cabling, trunking and conduit are measured in accordance with Work Section 27: Electrical Engineering Installations.

'Works and materials deemed to be included' which are collectively referred to as 'Preambles'

01 Air Conditioning System
   a. General
      i. All installation including coring, hacking, punching of holes in walls or floors, making good and painting,
      ii. All metalwork, supports and the like.
   b. Air Cooled Split System
      i. Indoor and outdoor units, wiring, starter brackets, switchboard and vibration isolator.
      ii. Main switchboard complete with test certificate, control wiring.
      iii. Auto change over control panel complete with interlocking, timer, relay, push button, incoming supply.
   c. Air Cooled Chiller
      i. Refrigeration circuit, compressor, condenser coil, fan motor, cooler, electronic expansion valve, built-in control panel base plate, starters, vibration control equipment and other accessories.
   d. Condenser Unit
      i. Condensers coils, condenser fan motors, compressors, inverter(s), filter driers, slight glass, crank case heaters, accumulators, header, controller cards, base plate, starters, vibration control equipment, dries, accumulator and oil separator.
   e. Fan Coil Unit
      i. Wired remote control for each indoor unit, starter, wireless controller for temperature
      ii. Fan speed settings, brackets, motors compressors, fans and valves.
   f. Air Handling Unit (AHU) and Fan Coil Units (FCUs) Double Skin Chilled Water AHU/FCU
      i. Cooling coils, evaporator fans, motor, filters and soft starter.
      ii. Automatic balancing valve, 3 way valves/2 way modulating valve complete with actuator, thermostat, pressure gauge, gate valves, strainers, flexible connection, base plate, plinth and all other accessories.
      iii. Switchboard for all AHU/FCU complete with soft starter, relays, control wiring, PF devices, under voltage protection, fire alarm trip from fire alarm panel to individual AHUs.
   g. Main Switchboard or Switchboard for Chiller System
      i. Test certificate, distribution board for AHU and chiller.
      ii. Starter board for chiller and water pumps complete with motorised isolating valve.
      iii. Remote starter board for all AHU.
   h. Switchboard for AHU/FCU
      i. Soft starter, relays, control wiring, PF devices.
      ii. Fire alarm trip from fire alarm panel to individual AHUs, under voltage protection.
      iii. Other necessary accessories.
   i. Switchboard for Digital Scroll Multi Split
      i. Switchboard for Digital Scroll Multi Split.
   j. Chilled/Condenser Water Pumps
      i. High efficiency (HE) EFF1 motor, couplings and jacketing.
      ii. Gate valve, strainer, flexible coupling, check valve, pressure gauge, pressure switch, thermometer and test pipe.
      iii. Baseplate, inertia block, starters, vibration control equipment and other accessories.
   k. Water Cooled Chiller System
      i. Compressors, motor, starter, condenser tube, cooler tube and display control microprocessor based diagnostic system.
      ii. Valves, insulation, oil, base plate, vibration control equipment and other necessary accessories (The selection is based on the best COP).
   l. Cooling Tower
      i. Fan, fan motor , hot water, basin, drain sump, infill, float valve, cat ladder and door access.
      ii. Motorised valves, water pipe supply and return, overflow pipe and valves.
      iii. Chemical dosage metering pump complete with chemical, water treatment system and base plate.
      iv. All other necessary accessories.
   m. Chilled Water FCU
      i. Cooling coils, evaporator fans, motors, filters, soft starter and control panel board.
      ii. Automatic balancing valve, 3 way valves/2 way modulating, valve complete with actuator, thermostat.
      iii. Pressure gauge, gate valves and strainers.
      iv. Flexible connection, base plate, plinth and all other accessories.
   n. Water Cooled Package System
      i. Condensers, cooling coil, blower fan motors, compressors, filter driers, sight glass, isolation valves and crank case heaters.
      ii. Controller cards, base plate, vibration isolator and other accessories.
      iii. Switchboard for AHU's, FCU's and CE complete with test certificate, relays, control wiring, PF devices and under voltage protection.

o. Precision Air Conditioning System
   i. Indoor and outdoor units, interlock wiring, monitoring and controlling system, controller for temperature
   ii. Fan speed settings, brackets, motors compressors, fans and vibration control equipment.
   iii. Switchboard complete with test certificate.
   iv. Auto change over control panel complete with interlocking, timer, relay, pushbutton, incoming supply indicating light and starter.
p. Dehumidifier System
   i. Honeycomb desiccant rotary wheel, drying rotor, drive motor, reactivation air fans, filters, valves, electric heaters, starter and control panel.
q. Cold Room System
   i. Indoor and outdoor units.
   ii. Acoustic insulation for room, interlock wiring, starter, wireless controller for temperature.
   iii. Fan speed settings, brackets, motors compressors, fans, valves and switchboard.
r. Fan System
   i. Bracket, support bracket, control wiring, conduit, starter and control panel and installation.
s. Air Curtain System
   i. Blower fan, motor, starter and controller.
t. Smoke Spill System
   i. Adjustable Impeller Fan, enclosure, vibration isolators, motor, shutters, withstand temperature, acoustic treatment, support bracket, hanger, control panel and installation.
u. Pressurisation Fan System
   i. Fan, enclosure, vibration isolators, motor, shutters, withstand temperature, duct, acoustic treatment, support bracket, hanger, starter, control panel and installation.
v. Jet Fan System
   i. Motor, blower, fan, withstand temperature, support bracket, vibration isolators, starter, control panel and installation.
w. Diffuser
   i. Control dampers, hangers and other necessary accessories.
x. Gas Storage Vessels
   i. All necessary functional components and safety devices.

02 Pipeworks
a. Labours for forming bends, springs, offsets, beaded ends, ornamental ends and the like.
b. Joints of a special or ornamental character.
c. Cutting and forming openings and jointing piping to fitting.
d. Fittings involving a change of direction of piping.
e. Testing procedure, capacity and method.

03 Ductworks
a. Cutting and forming openings and jointing ducting to fitting.
b. Fittings involving a change of direction of ducting.
c. Special connection and special joints in ducting.
d. Labours for forming bends, springs, offsets, beaded ends, ornamental ends and the like.
e. Duct service openings, ceiling opening and the like.
f. Fire damper, electronic filter, Hepa Filter.
g. Ducting fittings e.g. heat, bolts nut and washers.
h. Testing procedure, testing capacity, testing method etc.

04 Equipment to ducting
a. Type, size and method of fixing.
b. All connections and jointing to the ducting works.

05 Insulation to Ducting, Piping and Equipment
a. Working insulation around ducting fittings, special fittings and ancillaries.
b. Includes smoothing the material and working around supports.
c. Working insulation over flanges and pipe fittings.
d. Working insulation around ancillaries.
e. Providing detachable mattresses and working insulation around special fittings and ancillaries.
f. Room Sound Insulation (if required).

06 Sundries
a. Plates, discs, labels, symbols or numbers, bends, charts or diagrams and the like.

07 Unless stated as deemed to be included all associated excavations, disposal and fillings are measured in accordance with Work Section 4: Excavating And Filling.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 PRIMARY EQUIPMENT					
01 Air Conditioning Installations	nr	01 Single Split Unit 02 Single Split Package/ ducted (fan coil unit) system double skin type 03 Single Split Package/ ducted (air handling unit)system double skin type	01 Air Cooled with (Product name/code) or other equal and approved, in (capacity) btu/hr. with (type) refrigerant and (type) remote control	01 wall mounted to (type) surface 02 ceiling mounted to (type) surface 03 floor standing to (type) surface	
		04 Multi Split Unit System Digital Scroll 05 Multi Split Unit System Inverter	01 Condenser Unit (outdoor) Air Cooled with (Product name/ code) or other equal and approved, in (capacity) btu/hr. with (type) refrigerant and (type) remote control 02 Fan Coil Unit (FCU) (indoor) Air Cooled with (Product name/ code) or other equal and approved, in (capacity) btu/hr. with (type) refrigerant and (type) remote control		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
	nr	06 Central system	01 Air Cooled Chiller	01 with scroll compressor 02 with screw 03 with reciprocating compressor	
			02 Water Cooled Chiller	01 with centrifugal compressor 02 with screw compressor	
			03 Air Handling Unit	01 with pre-insulate/pipe (AHU)/Fan Coil Unit (FCU) jacket 02 double Skin Chilled water AHU/FCU	
			04 Main Switchboard/ Switchboard	01 for Air Cooled Chiller 02 for AHU/FCU 03 for Chiller System 04 for Digital Scroll Multi Split	
			05 Chilled water FCU with (pre-insulate/jacketing pipe	01 wall mounted to (type) surface 02 ceiling mounted to (type) surface 03 floor standing to (type) surface	
			06 Chilled Water Pumps 07 Condenser Water Pump	01 with horizontal split casing 02 with end suction	
			08 Cooling Tower	01 counter flow 02 cross flow single cell	1 Number of cell shall be stated in the Level Three
			09 Water Cooled Package System	01 double skin water cooled package units	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
	set	07 Special system	01 (Product name/ code), Precision Air Conditioning System (capacity) btu/hr 02 (Product name/code), Dehumidifier System (capacity) kg/hr 03 (Product name/code), Cold Room System (capacity) btu/hr	01 generally 02 chiller 03 freezer	
02 Gas Supply System	nr	01 Bulk tank storage vessels 02 Cylinder manifold storage 03 Drain connection 04 Regulator 05 Meter 06 Excess flow valve	01 (Product name/code), (dimensioned description), (capacity) tonne, (load) rating, associated integrated/ remote ancillaries, controls and indicators or components	01 vapour draw system Installation; 02 liquid draw system installation	
03 Fire Protection Services	nr	01 Sprinklers 02 Drenchers	01 Wet pipe system 02 Dry pipe system	01 hanged to roof structure 02 hanged to floor slab	
		03 Hose reel 04 Hydrant	01 Wet standpipe 02 Dry standpipe	01 wall mounted to (type) surface 02 ceiling mounted to (type) surface 03 floor standing to (type) surface	
		05 Portable extinguisher	01 (Type); (capacity) kg		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
		06 Fire alarm	01 Control gear 02 Junction box 03 Manual break-glass	01 (Product name/ code) (dimensioned description)	
		07 Smoke, fire and heat	01 (Product name/ code) (dimensioned description)	01 generally	
	m3	08 Total flooding system/ fire suppression	01 (Product name/ code) by mixture of the natural gases of nitrogen and argon 02 (Product name/code) Extinguishing gases by chemical means	01 automatically operated 02 manually operated	1 Unit 'm3' means the volume of space required 'Total Flooding System'. 2 The system is deemed to include the agent, agent storage containers, agent release valves, agent delivery piping and agent dispersion nozzles.
04 Chemical Installations	nr	01 Filling station, inducting pump, single/double wall filling and storage tank type 02 Wall filling 03 Storage Tank	01 (Product name/ code) (dimensioned description), (capacity) tonne, (load) rating, associated integrated or remote ancillaries, controls and indicators or components	01 wall mounted to (type) surface 02 ceiling mounted to (type) surface 03 floor standing to (type) surface	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
05 Medical Suction Installations	nr	01 Medical gas source 02 Medical gas supply system 03 Secondary equipment 04 Modular operating theatre 05 Nurse call system			
06 Pneumatic Tube Installations	nr	01 Hospitals Installations; (type) 02 Cash-handling 03 Pharmacies 04 Material-logistic 05 Sample-logistic 06 Autobank			
07 Refuse Disposal System 08 Vacuum Installations	nr	01 Refuse chute system 02 Inlet hopper 03 Collection chamber 04 Tower control panel 05 Tower recycling system			
09 Cleanroom Installations	nr	01 Filters 02 Pass through 03 Curtains and plastic strip doors 04 Talk through windows			
10 Ventilation Fan System	nr	01 Exhaust fan (capacity) cfm 02 Air Curtain System (capacity) cfm 03 Smoke Spill System (capacity) cfm 04 Pressurisation Fan System (capacity) cfm 05 Jet Fan System (capacity) cfm	01 (Product name/code)	01 wall mounted to (type) surface 02 ceiling mounted to (type) surface 03 heavy duty/industrial	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
11 Pump Installations	nr	01 Booster 02 Positive displacement 03 Dynamic 04 Special 05 Diesel 06 Motor	01 (Product name/code), (capacity) lps/gpm	01 wall mounted to (type) surface 02 ceiling mounted to (type) surface 03 floor standing to (type) surface	
02 DUCTING					
01 Air Conditioning Installations 02 Gas Supply System 03 Fire Protection Services 04 Chemical Installations 05 Medical Suction Installations 06 Pneumatic Tube Installations 07 Refuse Disposal System 08 Vacuum Installations 09 Cleanroom Installations 10 Ventilation Fan System 11 Pump Installations	m	01 Galvanised steel sheet metal duct 02 Metal duct 03 Fibre glass duct 04 Polymer duct 05 PVC duct 06 Aluminium duct 07 Fibre reinforced plastic duct 08 Stainless steel duct 09 Fire rated duct	01 Fixed to horizontal (type) surface; (flexible and extensible ducting profile/curved) 02 Fixed to vertical (type) surface; (flexible and extensible ducting profile/curved)	01 (dia) diameter/ (cross-sectional dimension)	1 Thickness of the ducting shall be stated in the Level One
12 Duct supports	nr	01 Hanger; (dimensioned description) 02 Spring hanger; (dimensioned description) 03 Special hanger; (dimensioned description)	01 Single run ducting 02 Multiple runs ducting 03 Combined ducting and pipework		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 PIPEWORK					
01 Air Conditioning Installations 02 Gas Supply System 03 Fire Protection Services 04 Chemical Installations 05 Medical Suction Installations 06 Pneumatic Tube Installations 07 Refuse Disposal System 08 Vacuum Installations 09 Cleanroom Installations 10 Ventilation Fan System 11 Pump Installations	m	01 Copper tube pipe including fittings. 02 Copper tube refrigerant piping complete with fittings, gauges, valves, trunking 03 PVC pipe Class 'C' complete with fittings 04 PVC pipe Class 'C' complete with fittings and trunking 05 ABS pipe complete with fittings 06 Galvanised steel pipe Class 'C' complete with fittings 07 Unplasticsed Polyvinyl Chloride (uPVC) complete with fittings 08 Polyethylene (PE) complete with fittings	01 Fixed to horizontal (type) surface 02 Fixed to vertical (type) Surface 03 Fixed through wall/ floor including sleeves 04 Embedded in brick wall 05 Embedded in concrete 06 Laid in risers or service duct 07 Laid in trench, including necessary excavation and reinstatement	01 (dia) diameter/ (cross-sectional dimension)	1 Flexible and extensible pipe (if any) profile are to be described in Level Three. 2 MS/BS/EN code and Class are to be stated Level One.
	--- nr		--------- 08 Extra-over for reducers 09 Extra-over for tee		
12 Duct supports	nr	01 Standard 02 Non-standard	01 Hanged horizontally 02 Hanged vertically (type) surface	01 (dimensioned description)	1 The lengths of the hangers are of varying lengths depending on the structure of the building.
04 INSULATION TO DUCTWORK					
01 Air Conditioning Installations	m	01 Fibreglass insulation, (Product name/code)	01 to main duct (cross-sectional dimension)/ (dia) diameter		1 Whether insulation for ductwork or pipework,

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 Gas Supply System 03 Fire Protection Services 04 Chemical Installations 05 Medical Suction Installations 06 Pneumatic Tube Installations 07 Refuse Disposal System 08 Vacuum Installations 09 Cleanroom Installations 10 Ventilation Fan System 11 Pump Installations	m	02 Spray insulation, (Product name/code) 03 Rockwool insulation, (Product name/code) 04 Rockwool with perforated G.I sheet, (Product name/code) 05 Expanded rubber compound, (Product name/code) 06 Trocellen insulation, (Product name/code) 07 Special green insulation (type), (Product name/ code)	02 to branch duct (cross-sectional dimension)/ (dia) diameter		it is to be so described in Level One. 2 Thickness and weight per m3 are to be described in Level One. 3 Internal, external and expose to weather insulation type describe in Level One
05 INSULATION TO PIPEWORK AND EQUIPMENT					
01 Air Conditioning Installations 02 Gas Supply System 03 Fire Protection Services 04 Chemical Installations 05 Medical Suction Installations 06 Pneumatic Tube Installations 07 Refuse Disposal System 08 Vacuum Installations 09 Cleanroom Installations 10 Ventilation Fan System 11 Pump Installations	m	01 Fibreglass insulation, (Product name/code) 02 Spray insulation, (Product name/code) 03 Rockwool insulation, (Product name/code) 04 Rockwool with perforated G.I sheet, (Product name/code) 05 Expanded rubber compound, (Product name/code) 06 Trocellen insulation, (Product Name/Code) 07 Special green insulation (type), (Product Name/ Code)	01 to pipework (dia) diameter 02 to equipment		1 Whether insulation for ductwork or pipework, it is to be so described in Level One. 2 Thickness and weight per m3 are to be described in Level One. 3 Providing detachable mattresses and working insulation around special fittings and ancillaries are deemed to be included. 4 Internal, external and expose to weather insulation type describe in Level One.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
06 DUCTING ACCESSORIES					
01 Air Conditioning Installations 02 Gas Supply System 03 Fire Protection Services 04 Chemical Installations 05 Medical Suction Installations 06 Pneumatic Tube Installations 07 Refuse Disposal System 08 Vacuum Installations 09 Cleanroom Installations 10 Ventilation Fan System 11 Pump Installations	nr	01 Fire damper 02 Air diffuser 03 Air grille 04 Access door 05 Special equipment	01 Fixed to horizontal (type) surface 02 Fixed to vertical (type) Surface	01 (dimensioned description)	1 As shown in Drawing (drawing nr)/model and in accordance with approved manufacturer's specification and details which are to be stated in Level One.
07 ANTI-VIBRATION					
01 Air Conditioning Installations 02 Gas Supply System 03 Fire Protection Services 04 Chemical Installations 05 Medical Suction Installations 06 Pneumatic Tube Installations 07 Refuse Disposal System 08 Vacuum Installations 09 Cleanroom Installations 10 Ventilation Fan System 11 Pump Installations	nr	01 Rubber mounts/pad 02 Base spring mounts/pads 03 Air spring mounts/pads 04 Seismic resistance 05 Neoprene base mounts/pads 06 Special base mounts/pads 07 Clamps 08 Pipe joints 09 Flange flexible hose pipe 10 Pipe bracing 11 Flexible connectors 12 Hanger and spring	01 Generally 02 Fixed to horizontal (type) surface 03 Fixed to vertical (type) Surface	01 (dimensioned description)	1 MS/BS/EN code and Class are to be stated at Level One. 2 Product name/code or equal approved of the material is to be so described in Level One.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
08 SUNDRIES					
01 Sundries	item	01 Air Conditioning Installations 02 Gas Supply System 03 Fire Protection Services 04 Chemical Installations 05 Medical Suction Installations 06 Pneumatic Tube Installations 07 Refuse Disposal System 08 Vacuum Installations 09 Cleanroom Installations 10 Ventilation Fan System 11 Pump Installations	01 Identification and diagram; as shown in Drawing (drawing nr)/model	01 plates 02 discs 03 labels 04 tapes 05 symbols or numbers 06 bands 07 charts or diagrams 08 other: type stated	
02 Testing and Commissioning for 03 System Validation for 04 Operation and Maintenance Manuals for 05 Training for	item	01 Air Conditioning Installations 02 Gas Supply System 03 Fire Protection Services 04 Chemical Installations 05 Medical Suction Installations 06 Pneumatic Tube Installations 07 Refuse Disposal System 08 Vacuum Installations 09 Cleanroom Installations 10 Ventilation Fan System 11 Pump Installations			1 Chemical treatment, purging, sterilisation and pressure testing are deemed to be included.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
06 As-Built Drawing preparation	item	01 Schematic drawings 02 Floor plan drawings 03 Sectional drawings 04 Elevation drawings	01 Air Conditioning Installations 02 Gas Supply System 03 Fire Protection Services 04 Chemical Installations 05 Medical Suction Installations 06 Pneumatic Tube Installations 07 Refuse Disposal System 08 Vacuum Installations 09 Cleanroom Installations 10 Ventilation Fan System 11 Pump Installations		
07 Loose ancillaries	item	01 Keys, tools, spares, chemical and the like for			
08 Post-completion services	item	01 Maintenance, adjustments, servicing and the like for			

27 ELECTRICAL ENGINEERING INSTALLATIONS

01 PRIMARY EQUIPMENT
02 EQUIPMENT AND FITTINGS
03 ELECTRICAL CABLE
04 TELECOMMUNICATION CABLE
05 FINAL SUB-CIRCUIT
06 BUSBAR
07 CABLE CONTAINMENT
08 LIGHTNING PROTECTION SYSTEM
09 SUNDRIES

Information to be provided in the Specification	01 Any regulations, by-laws and the like. 02 Kind and quality of material. 03 Thickness of material. 04 Any tests of materials, equipment, system, etc. 05 Type and electrical rating. 06 Method of fixing. 07 Location. 08 Technical Specifications for conduit, trunking and cable tray (e.g. normal size, MS/BS/EN quality standard and internal lining materials etc.)
Basic information to be shown in the 2D drawings or 3D models	01 Main installation a. Type. b. Electrical rating. c. Meter. d. Main switch. e. Residual current circuit breaker (RCCB) and related accessories. 02 Power installation a. Type of switch socket. b. Number of a gang. c. Rating capacity. 03 Lighting installation a. Types of lighting. b. Lumen and related accessories. 04 Electrical appliances a. Types and size of appliances including related accessories. 05 Conduit and fittings a. Type, size and method of fixing. 06 Cables a. Type, size and classification of the installation. 07 Lightning protection system a. Type and size of tapes. b. Test clamps. c. Air terminal. d. Electrode chamber.

Specific rules of measurement	01 Primary Equipment Items of equipment and ancillaries are to be referred to in the manufacturer's detailed specification. 02 Main Installation Packaged items of equipment and control gear are to be described in conjunction with the manufacturer's. 03 Cabling Works Incoming cable is to be measured from Power Utility Provider's main cable to distribution board. Distribution cable is to be measured from distribution board to fitting, power point and electrical appliances.
'Works and materials deemed to be included' which are collectively referred to as 'Preambles'	01 Primary Equipment a. All metalwork, supports and the like. 02 Main installation a. Connecting cable end or cable-tails to connector-blocks and all connections inside primary equipment. 03 Cable containment a. Bending, cutting, screwing, jointing and providing all cable containment fitting e.g. junction boxes, connectors, flanges, bends, tees, terminations, pots, seals, glands, lugs, connector blocks, shrouds, reducers, spigots, fire barriers and the like. b. Providing all cable containment fittings. c. Forming holes for cable containment entry into other items of equipment. d. Components for earth-continuity. e. Fixing to chases, surface or suspended from soffits. 04 Lightning Protection System, battery, fluorescent light and all necessary accessories for emergency light. a. Cables for earthing as shown in related drawings. b. Connecting electrodes to conductors. c. All connections, joins, test, clamps and bimetallic. 05 Cables a. Determining circuits and providing draw-wires, draw-cables and the like. b. Colouring coding cables or otherwise marked for identification. c. Allowance for cable entering fitting, accessories, equipment and control gear. d. Removing and replacing existing covers, existing inspection lids and the like. e. Materials and heat for making the joint. f. Providing insulating material, jointing material, lock-nuts, bushes and the like. g. Connecting cable-tails to connector-blocks. h. All necessary hacking for forming groove, holes or pocket on concrete or brickwall surface and including making good. i. Excavation, disposal of excavated material and backfilling for cables laid in trench. j. Plates, discs and labels for the identification of plants, cables, switches and the like to include with the item concerned.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 PRIMARY EQUIPMENT					
01 Electrical Installations	nr	01 Main switchboard	01 (Product name/code) or other equal approved, rating volt and including necessary accessories	01 fixed as floor standing to (type) surface 02 fixed as wall mounted to (type) surface	1 Primary equipment is defined as plant or equipment from which a system originates, e.g. main switchboard, distribution board, main control box and the like.
		02 Distribution board	01 (Product name/code) amp circuit breaker, rating amp (nr) MCB and rating amp (nr) RCCB (if any) and including all necessary accessories	01 generally	
		03 Meter	01 (Name of service provider) meter board with rating amp cutout fuse and neutral link including all necessary accessories	01 generally	
		04 Generator 05 Motor	01 (Product name/code) or other equal approved, rating volt and including all necessary accessories	01 fixed as floor standing to (type) surface	
		06 Transformer	01 (Product name/code) or other equal approved, rating volt and including all necessary accessories		
		07 Switch gear	01 (Product name/code) amp circuit breaker, rating amp (nr) fuses and (nr) switches and including all necessary accessories	01 fixed as floor standing to (type) surface 02 fixed as wall mounted to (type) surface	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
02 Telephone Installations	nr	01 Main board/PABX 02 Micro filter	01 (Product name/code) or other equal approved, rating volt and including necessary accessories	01 fixed to horizontal (type) surface 02 fixed to a vertical (type) surface	
03 Network System Installations	nr	01 Host computer 02 Modem/router 03 Switches 04 Software	01 (Product name/code) or other equal approved	01 generally	1 Details specification of each device is to be so described in Level One.
04 Sound Distribution System	nr	01 Microphone 02 Mixer 03 Primer amplifier 04 Loud speaker	01 (Product name/code) or other equal approved	01 generally	
05 Alarm System Installations	nr	01 Main board/panel 02 Glass break detector 03 Doors and windows sensor 04 Smoke detector 05 Carbon monoxide detector 06 Motion detector 07 Horn/siren 08 Strobe light 09 Keypad	01 (Product name/code) or other equal approved, rating volt and including necessary accessories	01 fixed to horizontal (type) surface 02 fixed to vertical (type) surface 03 fixed to roof top 04 fixed to soffit of ceiling	
06 Clock System Installations	nr	01 Clock station 02 Secondary clock 03 Radio time signal receiver 04 Antenna for receiving time signal			1 Main or primary clock station is to be so described in Level One. 2 Analogue or digital secondary clock is to be so described in Level One. 3 Wired or wireless channel radio time signal receiver is to be so described in Level One.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
07 CCTV System Installations	nr	01 Recording system 02 Visual monitor 03 Camera 04 Ethernet network 05 Central server	01 (Product name/ code) or other equal approved, rating volt and including necessary accessories 02 (Product name/ code) or other equal approved and including necessary accessories	01 fixed to horizontal (type) surface 02 fixed to vertical (type) surface	
08 Building Automation System (BAS)	nr	01 Hardware 02 Software 03 Networking protocols			1 BAS installation whether during building construction or through a 'retrofitting' process is to be so described in Level One. 2 Types of BAS are to be so described in Level One. 3 Details specification of each component or sub component of BAS is to be so described in Level One.
09 Door Access Control System	nr	01 Traditional wired 02 Stand alone 03 Single door wired stand alone	01 Locking device 02 Access cards 03 Card readers 04 Access control keypads 05 Electronic lock hardware and software 06 Access control panel 07 Override device 08 Emergency exit device	01 fixed to horizontal (type) surface 02 fixed to a vertical (type) surface	1 Product name and code are to be so described in Level one.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
10 Renewable Energy/ SCADA System/ Telemetry	nr	01 Solar module 02 Charge controller 03 Battery 04 Inverter/charge 05 Generator/Biogas Engine 06 Meter	01 generally 02 fixed to roof surface 03 fixed as roof covering 04 fixed to wall		1 Size and number of solar module zre to be so described in Level One. 2 Product name and code is to be so described in Level One.
02 EQUIPMENT AND FITTINGS					
01 Power	nr	01 Switch socket 02 Isolator	01 (nr) gang, rating amp and (type of finish) face plate	01 fixed to floor 02 fixed to wall, (height) high above floor finish level	
02 Lighting	nr	01 Down light 02 High bay light 03 Spotlight 04 Wall light 05 Compound light 06 Fluorescent light 07 Decorative light 08 Advertising light 09 'KELUAR' sign lettering 10 Emergency lighting 11 Pendant light 12 Strip light	01 Rating amp and all necessary accessories 02 Rating watt/(nr) tube and all necessary 03 Rating watt/(nr) including (capacity) amp battery and all necessary accessories	01 fixed to horizontal (type) surface 02 fixed to vertical (type) surface 03 fixed to top pole suspended to floor soffit	1 Terminal equipment and fittings are defined as any item to which a system is distributed to, (e.g. luminaries, switches, actuators and the like.) 2 Regular or Light-emitting diode (LED) type of light is to be so described in Level One.
03 Electrical appliances	nr	01 Ceiling fan 02 Wall mounted fan 03 Floor fan 04 Pedestal fan 05 Tower fan 06 Bladeless fan	01 (dia) diameter and including necessary accessories		1 Product Name/Code is to be described in Level One.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 ELECTRICAL CABLE					
01 Electrical cable	m	01 Polyvinyl chloride (PVC) cable 02 Unplasticized polyvinyl chloride (uPVC) cable 03 Steel wire armoured (SWA) cable 04 Crossed linked polyethylene (XLPE) cable	01 Chased in brickwall 02 Laid in suspended ceiling 03 Fixed to wall 04 Laid in trench, including necessary excavation and reinstatement 05 Embedded in concrete/drywall	01 (dia) Diameter/(nr) core in conduit (m/s)	1 Incoming and/or distributed cable is to be so described in Level One.
04 TELECOMMUNICATION CABLE					
01 Telephone cable 02 Network cable	m	01 Coaxial 02 Twisted pair 03 Fiber optic 04 Jelly-filled 05 Ribbon 06 Null modem	01 Chased in brickwall 02 Laid in suspended ceiling 03 Fixed to wall 04 Laid in trench, including necessary excavation and reinstatement 05 Embedded in concrete/drywall	01 (dia) diameter/(nr) core in conduit (m/s)	
05 FINAL SUB-CIRCUIT					
01 Final sub-circuit for lighting 02 Final sub-circuit for electrical appliances	nr	01 (Rating) amp, (nr) number of points and/(nr) and (nr)/(dia) diameter cable	01 drawn into pvc conduit 02 drawn into metal conduit		

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
06 BUSBAR					
01 Flat strip 02 Solid bar 03 Rod	m	01 Copper 02 Brass 03 Aluminium	01 Fixed to horizontal (type) surface 02 Fixed to vertical (type) surface	01 (dia) Diameter/(cross-sectional dimension)	
07 CABLE CONTAINMENT					
01 Conduit 02 Trunking 03 Cable tray	m --- nr	01 Galvanised iron 02 Metal 03 Fibre glass 04 Polymer 05 PVC 06 uPVC	01 Fixed to horizontal (type) surface 02 Fixed to vertical (type) surface --------- 08 Extra-over for reducers 09 Extra-over for tee	01 (dia) Diameter/(cross-sectional dimension)	
08 LIGHTNING PROTECTION SYSTEM					
01 Earthing electrodes/ground rods	nr	01 Precast 02 PVC 03 uPVC 04 Mild steel	01 (Cross-sectional dimension), (nr) number of electrode and (depth) mm depth of electrode	01 copper 02 copper-clad steel (bonded steel-cored) 03 stainless steel 04 galvanised steel	1 Method of covering top of rods or exposed rod is to be so described in Level One.
02 Air termination or lightning rods	nr	01 (dia) diameter copper/aluminium air terminal and all necessary accessories			1 All connections, joints, test and clamps are deemed to be included.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
03 Conductor cables	m	01 (dia) diameter copper/ aluminium air terminal and all necessary accessories			
04 Test clamp	nr	01 (nr) number of clamps including bracket and fixed to wall			
05 Surge protection devices (SPDs)	item	01 Electrical Installations 02 Telephone Installations 03 Network System Installations 04 Sound Distribution System 05 Alarm System Installations 06 Clock System Installations 07 CCTV System Installations 08 Building Automation System (BAS) 09 Door Access Control System 10 Renewable Energy/ SCADA System / Telemetry			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
09 SUNDRIES					
01 Electrical Installations 02 Telephone Installations 03 Network System Installations 04 Sound Distribution System 05 Alarm System Installations 06 Clock System Installations 07 CCTV System Installations 08 Building Automation System (BAS) 09 Door Access Control System 10 Renewable Energy/ SCADA System	item	01 Identification and diagram	01 plates 02 discs 03 labels 04 tapes 05 symbols or numbers 06 bands 07 charts or diagrams		
11 Testing and Commissioning for 12 System validation for 13 Operation and maintenance manuals for 14 Training for	item	01 Electrical Installations 02 Telephone Installations 03 Network System Installations 04 Sound Distribution System 05 Alarm System Installations 06 Clock System Installations 07 CCTV System Installations 08 Building Automation System (BAS) 09 Door Access Control System 10 Renewable Energy/ SCADA System			

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
15 As-Built Drawing preparation	item	01 Schematic drawings 02 Floor plan drawings 03 Sectional drawings 04 Elevation drawings 05 Detailed drawings	01 Electrical Installations 02 Telephone Installations 03 Network System Installations 04 Sound Distribution System 05 Alarm System Installations 06 Clock System Installations 07 CCTV System Installations 08 Building Automation System (BAS) 09 Door Access Control System 10 Renewable Energy/ SCADA System		
16 Loose ancillaries	item	01 Keys, tools, spares, chemical and the like for	01 Electrical Installations 02 Telephone Installations 03 Network System Installations 04 Sound Distribution System 05 Alarm System Installations 06 Clock System Installations 07 CCTV System Installations 08 Building Automation System (BAS) 09 Door Access Control System 10 Renewable Energy/ SCADA System/ Telemetry		
17 Post-completion services	item	01 Maintenance, adjustments, servicing and the like for			

28 TRANSPORTATION SYSTEMS

01 LIFT INSTALLATIONS, ESCALATOR INSTALLATIONS, CONVEYOR INSTALLATIONS AND GANTRY CRANE INSTALLATIONS

Information to be provided in the Specification	01 Equipment schedules. 02 Type, quality and size or thickness of materials. 03 Regulations, Standard of Compliance etc. 04 Gauge, thickness or substance of the material. 05 Performance test, witness test, specific test and the like. 06 Capacities, running condition, operational and static load etc. 07 Mobilisation of the equipment. 08 Fire stopping. 09 Warranty/guarantee requirement. 10 Post-completion services requirements. 11 Any other special requirements.
Basic information to be shown in the 2D drawings or 3D models	01 Lift, conveyor and escalator system a. Overall dimension of the system. b. Location of the item. 02 Assembly of composite items of primary equipment or system a. The dimension and location of the item location of the item. 03 Fire stopping and other associated fire protection work a. Dimension and type of fire stopping with the requirement of MS/BS.
Specific rules of measurement	01 Packaged items of equipment and ancillaries are to be described in conjunction with the manufacturer's detailed specification. 02 Size of equipment are given any limiting dimension. 03 Electrical connection is measured in accordance with the Works Section No.27: Electrical Engineering installations. 04 Platework and supporting steelwork is measured in accordance with Work Section No 16: Structural metalwork. 05 Cross-referenced to drawings and/or a full specification detailing finishes are measured in accordance with Work Section No.9: In-situ Concrete Works, Work Section No.18: Cladding And Covering And Work Section No.19: Floor, Wall And Ceiling Finishes.
'Works and materials deemed to be included' which are collectively referred to as 'Preambles'	01 Lift and Escalator a. Associated integrated or remote accessories, controls and indicators or components. b. Sheave and motor, control panel and counterweight and guard rails. 02 Sensors and Direct Digital Control a. Input or Output Points to control major high energy usage equipment such as main switchboard, generators, lift and escalator etc. b. Special sensors and controller. c. Electrical connections. 03 Sundries a. Keys, tools, spares, chemical and the like for loose sundries. b. Chemical treatment, purging, sterilisation and pressure testing for testing and commissioning.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 LIFT INSTALLATIONS, ESCALATOR INSTALLATIONS, CONVEYOR INSTALLATIONS AND GANTRY CRANE INSTALLATIONS					
01 Primary equipment	nr	01 Lift Installations 02 Escalator Installations 03 Conveyor Installations 04 Gantry Crane Installations 05 Travelator Installations 06 Dumbwaiter Installations 07 Gondola Installations 08 Waste Disposal Installations	01 Lift car 02 Lift door 03 Lift cabin operating panel (COP) 04 Lift indicator panel	01 (Product name/ code), (dimension description), (capacity) kg lift capacity, (height) meter storey height to a total storey height of (height) including required car specification and associated integrated ancillaries, control and indicators or component	1 Total storey height is defined from floor finish to the underside of the roof beam. 2 Type of each lift, escalator, conveyor and etc., is to be so described in Level One. 3 Horizontal or inclined plane travelator is to be so described in Level One.
02 Fire stopping system installation	m	01 Permanent forming/ damming/backing materials 02 Temporary forming materials 03 Substrate primers 04 Steel sleeves	01 To vertical surface 02 To horizontal surface 03 To fill voids 04 To around pipes	01 (cross-sectional dimension and depth)	1 Technical Specification includes approved product name/code, normal size, areas of fixing and is to be so described in Level One.
03 Sundries	item	01 Lift Installations 02 Escalator Installations 03 Conveyor Installations 04 Gantry Crane Installations 05 Travelator Installations 06 Dumbwaiter Installations 07 Gondola Installations 08 Waste Disposal Installations	01 Identification and diagram	01 plates 02 discs 03 labels 04 tapes 05 symbols or numbers 06 bands 07 charts or diagrams 08 other: type stated	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
04 As-Built Drawing preparation	item	01 Schematic drawings 02 Floor plan drawings 03 Sectional drawings 04 Elevation drawings Installations	01 Lift Installations 02 Escalator System 03 Conveyor System 04 Gantry Crane Installations 05 Travelator Installations 06 Dumbwaiter Installations 07 Gondola Installations 08 Waste Disposal		
05 Loose ancillaries	item	01 Keys, tools, spares, chemical and the like for			
06 Testing and Commissioning for 07 System Validation for 08 Operation and Maintenance Manuals for 09 Training for	item	01 Lift Installations 02 Escalator System 03 Conveyor System 04 Gantry Crane Installations 05 Travelator Installations 06 Dumbwaiter Installations 07 Gondola Installations 08 Waste Disposal			
10 Post-completion services	item	01 Maintenance, adjustments, servicing and the like for	01 Lift Installations 02 Escalator System 03 Conveyor System 04 Gantry Crane Installations 05 Travelator Installations 06 Dumbwaiter Installations 07 Gondola Installations 08 Waste Disposal		

29 BUILDER'S WORK IN CONNECTION WITH MECHANICAL, ELECTRICAL AND TRANSPORTATION INSTALLATIONS

01 BUILDER'S WORK IN CONNECTION WITH MECHANICAL, ELECTRICAL AND TRANSPORTATION INSTALLATIONS

Information to be provided in the Specification	01 Type of materials. 02 Quality of materials. 03 Dimensions of material. 04 Regulations, Standard of Compliance etc.
Basic information to be shown in the 2D drawings or 3D models	01 Type, location and dimensions of items related to Builder's work in connection with the respective installations.
Specific rules of measurement	01 Catenary cables are measured net with no allowance made for sag.
'Works and materials deemed to be included' which are collectively referred to as 'Preambles'	01 Preambles for excavation items, in-situ concrete items, precast concrete items, metal items, etc. under this Work Section are to follow the Preambles of the respective Work Sections where they belong.

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
01 BUILDER'S WORK IN CONNECTION WITH MECHANICAL, ELECTRICAL AND TRANSPORTATION INSTALLATIONS					
01 Marking position of holes, mortices and chases in the structure	item	01 For mechanical engineering installation 02 For electrical services installation 03 For transportation system			
02 Pipes and duct sleeves	nr	01 Galvanised mild steel 02 Copper 03 PVC 04 HDPE 05 Special made 06 Pre-insulated G.I. 07 Metal duct 08 Fibre glass duct 09 Polymer duct	01 Casting into reinforced concrete 02 Building into brick/ block walls	01 (dimensioned description)	
03 Fixing supports	nr	01 Pylons 02 Poles 03 Piperack	01 With one end embedded into concrete grade C(grade) footing; including all excavation and formwork	01 (dimensioned description)	1 Type of material is to be so described in Level One.
		04 Wall brackets 05 Pole-brackets 06 Pole stays 07 Soffit brackets 08 Proprietary support components	01 Cutting and pinning to masonry; including all making good	01 (dimensioned description)	

ITEM OR WORK TO BE MEASURED	UNIT	LEVEL ONE	LEVEL TWO	LEVEL THREE	NOTES, COMMENTS AND GLOSSARY
04 Catenary cables	m	01 Lazy wave 02 Free hanging 03 Steep wave 04 U-shape	01 (dia) diameter		1 This item is for Transportation Installations only.
05 Bedding and pointing/ units of equipment, ancillaries	nr	01 Grouting with cement and sand (1:3)	01 To landing lift door jamb 02 To special opening	01 (dimensioned description)	
06 Bases, plinths and the like	nr	01 Constructed of in-situ concrete Grade C(grade); including all necessary formwork 02 Constructed of pre-cast concrete 03 Anti-vibration pads (type) 04 Acoustic pads (type)	01 (dimensioned description)		

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