

**HALMASHAURI YA MANISPAA YA KINONDONI**



**MKATABA NA. LGA/017/2021/2022/HQ/W/92**

**UJENZI WA SOKO LA BUNJU B"**

**KATI YA**

**HALMASHAURI YA MANISPAA YA KINONDONI**

**NA**

**WEREMA MNIKO SESE**

Manispaa ya Kinondoni  
S.L.P 31902  
Dar es Salaam

**Juni 2022**

## **Yaliyomo**

1. HATI YA MAKUBALIANO YA MKATABA;
2. BARUAYA KUKUBALI KOTESHENI;
3. HATI YA KUWASILISHA KOTESHENI;
4. MASHARTI MAALUMU YA MKATABA;
5. MASHARTI YA JUMLA YA MKATABA;
6. MCHANGANUO WA MCHORO;
7. MCHANGANUO WA MAKADIRIO YA KAZI;
8. UAINISHAJI VIWANGO NA VIPIMO;
9. NYARAKA NYINGINE ZOTOTE ZINAZOUNDA SEHEMU YA MKATABA  
(KUMBUKUMBU ZA UFAFANUZI, MEMORANDA DHIDI YA RUSHWA).

## **SEHEMU I: HATI YA MAKUBALIANO YA MKATABA**

## HALMASHAURI YA MANISPAA YA KINONDONI

### MKATABA WA UJENZI WA SOKO LA BUNJU B''

#### HATI YA MAKUBALIANO YA MKATABA

Fomu ya Makubaliano ya Mkataba yanafanyika leo tarehe ~~14~~ mwezi Juni mwaka, 2022

#### KATI YA

*Halmashauri ya Manispaa ya Kinondoni, Taasisi ya Serikali za mitaa, Mamlaka za Miji iliyoanzishwa kwa Sura Na. 288 kama ilivyorekebisha mwaka 2002 yenye S.L.P 31902, Dar es salaam.* (Hapa ataitwa "Mwajiri") kwa upande mmoja

#### NA

**Werema Mniko Sese** mwenye Sanduku la Posta 1588 DAR ES SALAAM (ambaye katika Mkataba huu ataitwa **(Local Fundi)** kwa upande mwingine.

Kwa kuwa Mwajiri amekubali kutoa kazi ya Ujenzi wa Soko la Bunju B''. *katika Manispaa ya Kinondoni yenye namba ya kotesheni LGA/ 017 /2021/2022/HQ/W/92* kwa kupitia barua yake ya tarehe 12 Juni, 2022 ya kukubali zabuni ya Local Fundi kwa kutekeleza na kukamilisha kazi hiyo.

#### SASA MAKUBALIANO HAYA YAMESHUHUDIWA KAMA IFUATAVYO:

1. Katika makubaliano haya maneno na maelezo yatakuwa na maana sawa kama yalivyopewa katika Masharti ya Mkataba unaorejelewana;
2. Nyaraka zifuatazo zitachukuliwa kwa Pamoja na zisomeke na kutafsiriwa kuwa ni sehemu ya makubaliano haya, yaani
  - i. Fomu ya Makubaliano ya Mkataba;
  - ii. Barua ya Kukubali Kotesheni;
  - iii. Fomu ya Kuwasilisha Kotesheni;
  - iv. Masharti Maalumu ya Mkataba;
  - v. Masharti ya Jumla ya Mkataba;
  - vi. Mchanganuo wa Mchoro;
  - vii. Mchanganuo wa Makadirio ya Kazi;
  - viii. Uainishaji Viwango na Vipimo;
  - ix. Nyaraka nyingine ie. Barua ya Utambulisho wa Local Fundi Kutoka Serikali ya Mtaa, Vyeti Vya Elimu, Wasifu (Ikionyesha Elimu Au Ujuzi Na Uzoefu Wa Kazi).

3. Nyaraka zote zilizotajwa hapo juu zitarejelewa hapo baadae kama 'Mkataba' na zitachukuliwa kuwa zinakamilisha na zinajieleza sawa lakini ukitokea utata au uhitilafiano zitakuwa na umuhimu katika mfuatano wake kama zinavyoonyeshwa hapo juu.
4. Katika kuzingatia malipo yanayofanywa na Mwajiri kwa Local Fundi kama baadaye inavyotajwa, Local Fundi hapa anakubaliana na Mwajiri kutekeleza na kukamilisha kazi kwa kufuata makubaliano, kwa hali zote kulingana na vifungu vya mkataba.
5. Mwajiri hapa anakubali kumlipa Local Fundi kwa kuzingatia utekelezaji na ukamilishaji wa kazi Kwa jumla ya fedha za Kitanzania **Shilingi milioni mia nne arobaini na moja laki tano na elfu hamsini na sita bila senti (441,556,000.00)**. baadaye imerejelewa kama 'Bei ya Mkataba' kwa nyakati na namna iliyoelezwa katika mkataba.
6. Kazi hii itafanywa kwa muda wa **wiki sita [6]** kutoka siku mkataba ulipotiwa sahihi. Katika Kushuhudia, pande hizi zimekubaliana na kutia sahihi na muhuri katika siku na mwaka kama ulivyoandikwa hapo juu.

NA KWA NIABA YA MWAJIRI (HALMASHAURI YA MANISPAA YA KINONDONI)  
IMETIWA SAINI LEO TAREHE...../4..... MWEZI WA. JUNI, 2022

Songoro Mnyonge

Mstahiki Meya

Halmashauri Manispaa ya Kinondoni

HON. MAYOR  
KINONDONI MUNICIPAL COUNCIL  
DAR-ES-SALAAM

LOCAL FUNDI:

Saini: .....

Jina: .....

(Kazi): .....

Hanifa S. Hamza

Mkurugenzi wa Manispaa

Halmashauri ya Manispaa ya Kinondoni

Muhuri

MBELE YA SHAHIDI.

Saini: .....

Jina: .....

(Kazi): .....

## **SEHEMU II: BARUA YA KUKUBALI ZABUNI**



JAMUHURI YA MUUNGANO WA TANZANIA

OFISI YA RAIS

TAWALA ZA MIKOA NA SERIKALI ZA MITAA

**HALMASHAURI YA MANISPAA YA KINONDONI**  
(BARUA ZOTE ZIELEKEZWE KWA MKURUGENZI WA MANISPAA)



*Unapo jibu taja:*

KUMB NA. KMC/PU/HQ/L.12/76

**TAREHE: 12 JUNI, 2022**

Werema Mniko Sese  
S.L.P 1588,  
Dar es salaam.

**YAH: BARUA YA KUKUBALI ZABUNI**

Mada tajwa hapo juu yahusika

Hii ni kukutaarifu kuwa , Bodi ya zabuni kupitia kikao chake cha Tarehe 12/06/2022 kilikupendekeza na kuidhinishwa na kamati ya fedha na uongozi Kufanya kazi ya Ujenzi wa Soko la Bunju B'' Halmashauri ya Manispaa ya Kinondoni kwa fedha za kitanzania shilingi **Milioni mia nne arobaini na moja laki tano na elfu hamsini na sita (Tsh 441,556,000/=)** Kwa muda wa wiki sita (06)

Unatakiwa kuwasilisha Usalama wa Utendaji (Performance security) ambayo ni dhamana ya bima (Insurance Bond) iliyo na thamani sawa na asilimia kumi (10%) ya gharama ya Mkataba na iwasilishwe ndani ya siku mbili baada ya kupata barua hii.

Unatakiwa kuja kuchukua kablasha la Mkataba na kujiandaa na zoezi la utiaji saini mkataba

Nakutakia kazi njema.

.....  
Hanifa S Hamza  
**MKURUGENZI WA MANISPAA**  
**MANISPAA YA KINONDONI**

### **SEHEMU III: FOMU YA KUWASILISHA ZABUNI**

Manispaa ya Kinondoni



Werema Mniko Sese  
S.L. P 1588  
Dar es Salaam

09/06/2022

## FOMU YA KUWASILISHA KOTESHENI

Kwa: Mkurugenzi Mtendaji  
Manispaa ya Kinondoni  
S.L.P 31903,  
Dar es Salaam

Tunaahidi kufanya kazi ya Ujenzi **wa Soko la Bunju B''**  
**(LGA/017/2021-2022/HQ/W/92 )** kulingana na Masharti ya Mkataba  
yanayofuatana na Kotesheni hii kwa bei ya Mkataba ya Fedha za  
kitanzania **Shiling milioni mia nne arobaini na moja laki tano na elfu**  
**hamsini na sita (tsh 441,556,000/=)**


Pia tunaahidi kukamilisha huduma iliyotajwa katika kipindi cha **wiki**  
**sita (06)** ambacho kinajumuisha kipindi cha maandalizi.

Kotesheni hii pamoja na barua yako ya kukubali kwa maandishi  
vitafanya mkataba unaotufunga sisi pamoja. Tunafahamu kuwa  
hulazimiki kukubali kiwango cha chini au kotesheni yoyote kati ya  
kotesheni unazopokea.

Tunathibitisha kuwa kotesheni hii imetimiza masharti kama yanavyo  
tajwa katika Mwaliko wa Kotesheni.

Sahihi Idhinishwa: .....

Jina na Cheo cha Mweka Sahihi: .....

  
Werema Mniko Sese (Feendi)

#### **SEHEMU IV: MASHARTI YA JUMLA YA MKATABA**

## **VIFUNGU JUMLA**

### **Kifungu 1: Nyaraka za Mkataba**

Masharti ya Mkataba na fomu ya Maelezo ya mahitaji, Viwango na vipimo ni sehemu muhimu ya nyaraka za Mkataba na zinapaswa kusomwa pamoja na nyaraka nyingine zote zinazounda Mkataba. Kama ikitokea kunaonekana kuna mgogoro kipaumbele cha nyaraka kitakuwa kama ilivyoainishwa katika **Kifungu cha 6** cha Masharti ya Mkataba.

### **Kifungu 2: Tafsiri**

Katika haya Masharti ya Mkataba, maneno yafuatayo yatakuwa na maana zilizotolewa kwa maneno hayo kama ilivyo hapa chini:

**Mwajiri** *HALMASHAURI YA MANISPAA YA KINONDONI*

**Mhandisi:** Mtu aliyeteuliwa na Mwajiri na kuwa na wajibu wa usimamizi wa kazi na usimamizi wa mkataba

**Mwakilishi:** Mtu aliyeteuliwa na Mhandisi

**Mhandisi :** Mwenye wajibu wa Kusimamia Kazi.

**Local Fundi:** Mtu au watu au kampuniambayo zabuni yao imekubaliwa na

**Kazi:** Zinazotakiwa kufanywakulingana na mkataba.

### **Kifungu 3: Maelekezo**

Maelekezo yanayotolewa na Mhandisi yatakuwa kwa maandishi. Ikiwa kwa sababu nyingine yoyote ile maelekezo hayo yakatolewa kwa mdomo, Local Fundi atafuata maelekezo hayo. Katika kipindi cha **siku 7** maelekezo hayo ya mdomo yatathibitishwa kwa maandishi .

### **Kifungu 4: Lugha**

Notisi zote, maelekezo na mawasiliano au waraka wowote wa maandishi unaohusu mkataba utakuwa kwa Kiswahili kadri itakavyokubaliwa na pande zote ilimradi, nyaraka zote zinazotolewa kuhusiana na mkataba unaotekelezwa kwa ushirikiano wa fedha za mkopo au ruzuku zitaandikwa kwa Kiswahili.

**Kifungu 8: Hali Mbaya ya Ukinzani**

Iwapo wakati wa utekelezaji wa kazi Local Fundi atapambana na hali mbaya ya ukinzani ambayo haihusiani na hali ya hewa na ambayo haikuwa imetabiriwa na Local Fundi, Mhandisi atatathimini kuongeza muda ambao Fundi anastahili.

**Kifungu 9: Kutoakazikwa Local Fundi Msaidizi**

Local Fundi hatatoa kazi au sehemu ya kazi kwa Fundi msaidizi bila kibali cha maandishi cha kutoka kwa Mwajiri. Kibali kama hicho kinapotolewa hakimwondolei Local Fundi mamlaka au majukumu yake chini ya maktaba na hivyo Local Fundi atakuwa na wajibu kwa kushindwa au kuzembea kwa Fundi wasaidizi.

**Kifungu 10: Usimamizi wa Kazi Unaofanywa na Fundi Mkazi**

Local Fundi atatekeleza kazi kwa uangalifu na kwa kufuata utendaji unaotakiwa na Mhandisi ili kufikia mahitaji maalumu ya ubora, kiasi na muda uliopangwa. Kama katika wakati wowote ule Mhandisi anaona uzembe, au kubadilika sana kwa mwelekeo wa programu, hatua zinazofaa zitachukuliwa na Local Fundi ili kurekebisha hali

**Kifungu 11: Ukaguzi**

Mhandisi au mwakilishi wake aliyempa mamlaka ana haki ya kukagua kazi na Local Fundi atatoa usaidizi kwa shughuli hiyo na kwa wakati Mhandisi atakapohitaji.

**Kifungu 12: Kazi Zinazokataliwa**

Kazi ambazo hazikuzingatia masharti ya mkataba zitakataliwa. Kwa maelekezo ya Mhandisi, Local Fundi kwa gharama zake mwenyewe atatengeneza au kurekebisha au kufanya upya kazi itakayokataliwa hadi kumridhisha Mhandisi.

**Kifungu 13: Bima**

Local Fundi ataweka bima yenye jina lake na Mwajiri kwa ajili ya hasara au uharibifu wa zana za Fundi na pia kwa kufidia majeruhi au vifo.

**Kifungu 14: Wajibu wa Local Fundi**

Local Fundi hatamhusisha Mwajiri dhidi ya madai yoyote yanayotokana na hasara au uharibifu wa upande wa tatu (third party). Atamkinga kikamilifu

**Kifungu 20: Kuanza na Kukamilika kwa Kazi.**

Local Fundi ataanza na kukamilisha kazi katika muda uliyoelezwa kwenye Masharti Maalumu ya Mkataba au katika kipindi cha mkataba cha nyongeza, kama kipindi hicho kimeruhusiwa na Mwajiri.

**Kifungu 21: Mabadiliko ya Wigo wa kazi**

Kwa idhini ya Mwajiri, Mhandisi anaweza kubadilisha umbo, ubora au kiasi cha kazi na atakuwa na mamlaka ya kumwagiza Local Fundi ipasavyo. Mabadiliko hayo yatafanywa kwa agizo la Mabadiliko katika Mkataba. Mhandisi ataamua kuhusu kiasi (kama itatokea) ambacho kwa maoni yake kinapaswa kuongezwa au kupunguzwa kutoka jumla ya fedha iliyotajwa kwenye Mkataba kwa ajili ya kazi yoyote ya nyongeza iliyofanywa au iliyoachwa kwa agizo hilo. Kiasi cha fedha kitakachoamuliwa kitatokana na kiwango cha kizio au kama hakuna kiwango cha kizio kinachotumika, kiwango kingine kitatumika kama itakavyoamriwa na Mhandisi na kukubaliwa na wote, Mwajiri na Local Fundi.

**C: MALIPO**

**Kifungu 22: Kiasi**

Kiasi kilichowekwa kwenye mchanganuo wa Makadirio ya Kazi ni kiasi kilichokadiriwa kwa kazi na kisichukuliwe kuwa ndiyo kiasi halisi sahihi kitakachofanywa na Local Fundi

Mhandisi atapima thamani ya kazi halisi iliyofanyika na ataidhinisha gharama halisi ya kazi iliyofanyika kama ilivyofafanuliwa katika mkataba. Ukomo wa kiasi cha kazi unaweza kuongezeka au kupungua kwa asilimia 10 ya bei ya mkataba baada ya kupata idhini ya Bodi ya Zabuni

**Kifungu 23: Malipo**

**23.1 Malipo ya Awali**

Malipo ya Awali ya **asilimia 15** ya thamani ya mkataba **yanaweza** kutolewa kama itakuwa inaonyesha hivyo kwenye **Masharti Maalumu ya Mkataba** baada ya kuwasilisha dhamana ya malipo wali inayokubalika. Malipo ya awali yatakatwa kwama fungu katika madai yatakayowasilishwa na Mkandarasi kwa malipo, mpaka malipo ya awali yote yatakaporudishwa kikamilifu.

### **23.6 Malipo kwa Wafanyakazi**

Kama kutatokea kushindwa kulipa mishahara/ujira na fidia nyingine zinazopaswa kulipwa wafanyakazi na /au malipo ya kukodisha mitambo/zana/magari na vifaa chini ya mkataba huu, mwajiri atakuwa na haki ya kushikilia malipo ya Local Fundi.

Mwajiri atatumia fedha alizoshikilia kuwalipa wafanyakazi wa Local Fundi mishahara yao na fidia nyingine na ada za kukodisha maunzi. Malipo kama hayo yatachukuliwa kuwa ni malipo yaliyopokelewa na Local Fundi kutoka kwa Mwajiri chini ya mkataba huu.

### **Kifungu 26: Malipo ya Ucheleweshaji kazi**

Kama Local Fundi atashindwa kukamilisha kazi yake katika muda uliotajwa kwenye mkataba au katika muda wowote wa nyongeza ulioruhusiwa na Mwajiri, Local Fundi atamlipa Mwajiri malipo ya ucheleweshaji wa kazi katika kiwango cha asilimia 0.1 cha thamani ya mkataba kwa siku mpaka kiwango cha juu ch asilimia 10 ya bei ya mkataba

### **D: KUSULUHISHA MIGOGORO NA KUVUNJA MKATABA**

#### **Kifungu 27: Kusuluhisha Migogoro**

Kama migogoro ikitokea itasuluhishwa kwa majadiliano ya pande zote. Kama mazungumzo yatashindwa kuleta makubaliano, kila upande una hiari ya kwenda kwenye maamuzi kulingana na sheria za Tanzania.

### **Kifungu 28 Uvunjaji wa Mkataba**

28.1 Kama Local Fundi anashindwa kuanza kazi katika muda uliopangwa au kuna sababu ya kutosha kuwa hatakamilisha kazi katika muda uliopangwa au kuna ucheleweshaji uliokiuka tarehe ya kukamilisha kazi au hayuko makini kufuata maelekezo yanayotolewa na Mhandisi au anakuwa mufilisi, Mwajiri atakuwa na haki ya kuvunja mkataba na kumwajiri Local Fundi mwingine kufanya kazi hiyo.

28.2 Kama Mwajiri atashindwa kumlipa Local Fundi katika muda wa siku 60 tangu tarehe ya cheti cha malipo kuidhinishwa na Mhandisi, Local Fundi

**SEHEMU V: MASHARTI MAALUMU YA MKATABA;**

Taarifa maalumu ifuatayo kwa ajili ya kazi inayofanywa itakuwa nyongeza, au inaweza kurekebisha vifungu katika Masharti ya Jumla ya Mkataba. Kunapokuwa na mgogoro, vifungu katika **Masharti Maalumu ya Mkataba** vitakuwa na nguvu zaidi ya vifungu katika **Masharti ya Jumla ya Mkataba**.

| <b>Masharti Maalumu ya Mkataba Kifungu Na.</b> | <b>Masharti ya Jumla ya Mkataba Kifungu Na.</b> | <b>Marekebisho ya Nyongeza kwa vifungu katika Masharti ya Jumla ya Mkataba.</b>  |
|--|---|--|
| <b>1.</b>                                      | <b>7.0</b>                                      | Local Fundi atafanya ujenzi wa Soko pamoja na usambabazaji wa vifaa na Atafanya kazi kulingana na inavyotakiwa kwa kuzingatia dhamani ya fedha na kwa kuzingatia nyaraka za mkataba, na maelekezo ya ziada kama yatakavyotolewa mara kwa mara.   |
| <b>2.</b>                                      | <b>8.0</b>                                      | Local Fundi ataomba kuongezewa muda kwa maandishi na kueleza sababu ya kuomba muda wa nyongeza kabla muda wake wa awali kuisha.  |
| <b>3.</b>                                      | <b>13.0</b>                                     | Nyaraka zifuatazo pia zitakuwa ni sehemu ya mkataba; Nyaraka zitakazofanya mkataba ukamilike ni pamoja na:- <ul style="list-style-type: none"> <li>• Fomu ya Mkataba iliyojazwa na kusainiwa.</li> <li>• Barua ya kukubaliwa kushinda zabuni</li> <li>• Masharti ya jumla ya zabuni (General Condition).</li> </ul> Udhibiti wa mkataba <b>dhamana ya Bima (Insurance board)</b> asilimia kumi (10%) ya thamani ya zabuni, ambayo itakuwa dhamana ya zabuni hii. |
| <b>4.</b>                                      | <b>16.0</b>                                     | Local Fundi atakuwa na wajibu wa kugharimia upimaji wote utakaohitajika wa maunzi.   |



|     |      |  |
|-----|------|--|
| 10. | 23.4 | Kiwango cha riba kwa kiasi kisicholipwa 2% ni kile kiwango cha riba kwa mwezi kinachotumiwa na benki ya biashara kama kilivyopitishwa na Benki Kuu ya Tanzania tarehe ya kutia sahihi mkataba.   |
| 11. | 26.0 | Kiasi cha kulipia ucheleweshaji kazi: <i>kinahusika</i> , ambapo Fundi Mkazi atalipa 0.1% ya gharama ya mkataba kwa siku.  |
| 12. | 27.0 | <p><b>Kusuluhisha Migogoro</b></p> <p>Kama migogoro ikitokea itasuluhishwa kwa majadiliano ya pande zote. Kama mazungumzo yatashindwa kuleta makubaliano, upande ambao hautaridhika na maamuzi baada ya makubaliano utawasilisha mgogoro huo kwa mwamuzi kulingana na sheria za Tanzania.</p> <p>Mwamuzi wa kusuluhisha atakuwa ni:- Bodi ya Taifa ya wakandarasi (<b>National Construction Council of Tanzania</b>)</p> <p>Gharama za mwamuzi kwa saa ni shilingi za kitanzania:-<br/><b>100,000.00</b></p>   |
| 13  | 28.0 | <p><b>Uvunjaji wa Mkataba</b></p> <p>Kama Fundi mkuu anashindwa kuanza kazi katika muda uliopangwa au kuna sababu ya kutosha kuwa hatakamilisha kazi katika muda uliopangwa au kuna ucheleweshaji uliokiuka tarehe ya kukamilisha kazi au hayuko makini kufuata maelekezo yanayotolewa na Mhandisi au anakuwa mufilisi, Mwajiri atakuwa na haki ya kuvunja mkataba na kumwajiri Fundi mkuu mwingine kufanya kazi hiyo.</p> <p>Kama Mwajiri atashindwa kumlipa Fundi mkuu katika muda wa siku 20 tangu tarehe ya cheti cha malipo kuidhinishwa na Mhandisi, Fundi mkuu anaweza kuvunja mkataba.</p> |
| 14  | 30   | <p><b>Kipindi cha Matazamio</b></p> <p>Kipindi cha matazamio kitakuwa siku mia themanini (180) mara baada ya kumalizika kwa mkataba</p>  |

## **SEHEMU VI: MCHANGANUO WA MICHORO**

## GENERAL NOTES:



CLIENT:  
MUNICIPAL DIRECTOR  
KINONDONI MUNICIPAL COUNCIL  
P.O. BOX 31902  
DAR ES SALAAM

**PROJECT TITLE:**  
PROPOSED MARKET SHADES TO BE BUILT  
AT BUNJU IN KINONDONI MUNICIPALITY,  
DAR ES SALAAM

**DRAWING TITLE:**  
FLOOR PLAN

DESIGNED BY: Arch DEPT

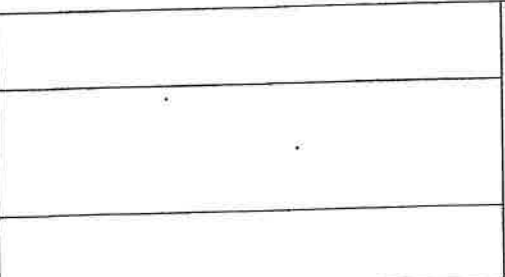
DRAWN BY: FONG A

|             |  |
|-------------|--|
| CHECKED BY: |  |
|-------------|--|

SCALE 1:350

DATE: June, 2022

**GENERAL NOTES:**



**CLIENT:** MUNICIPAL DIRECTOR  
KINODON MUNICIPAL COUNCIL  
P.O. BOX 31902  
DAR ES SALAAM

**PROJECT TITLE:**  
PROPOSED MARKET SHADES TO BE BUILT  
AT BUNJU IN KINONDONI MUNICIPALITY,  
DAR ES SALAAM

SECTION A-A

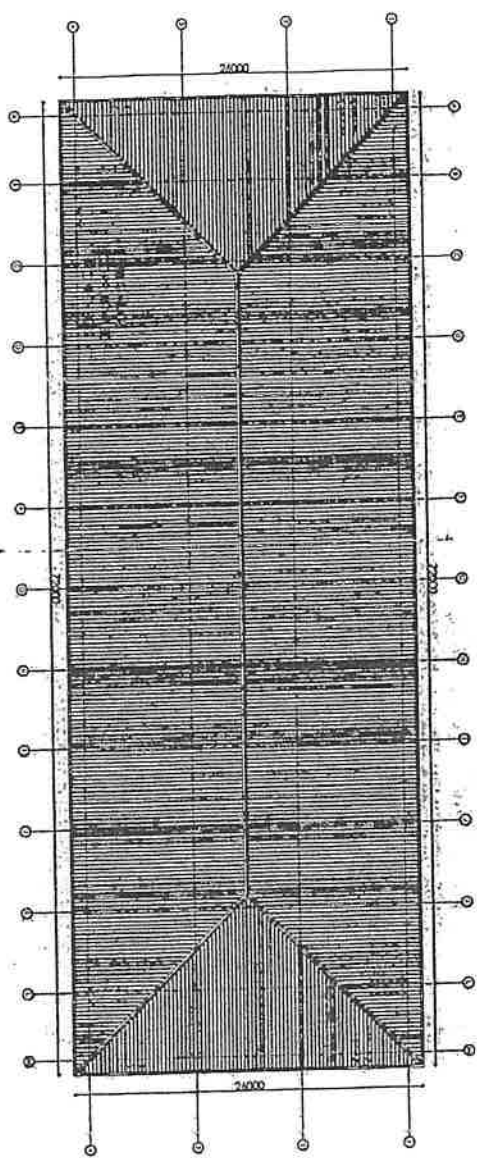
DESIGNED BY: Arch DEPT

DRAWN BY: PONGA A

CHECKED BY:

SCALE 1:150

DATE June, 2022



**GENERAL NOTES:**

|  |  |  |
|--|--|--|
|  |  |  |
|  |  |  |
|  |  |  |

**CLIENT:**  
MUNICIPAL DIRECTOR  
KINONDONI MUNICIPAL COUNCIL  
P.O. BOX 31902  
DAR ES SALAAM

**PROJECT TITLE:**  
PROPOSED MARKET SHADES TO BE BUILT  
AT BUNJUI IN KINONDONI MUNICIPALITY,  
DAR ES SALAAM

|                               |                |
|-------------------------------|----------------|
| <b>DRAWING TITLE:</b>         | ROOF PLAN PLAN |
| <b>DESIGNED BY:</b> Arch DEFI |                |
| <b>DRAWN BY:</b> FONGA A      |                |
| <b>CHECKED BY:</b>            |                |
| <b>SCALE:</b> 1:350           |                |
| <b>DATE:</b> June, 2022       |                |

## **SEHEMU VII: MCHANGANUO WA MAKADIRIO YA KAZI**

## **SECTION VIII: BILL OF QUANTITIES**

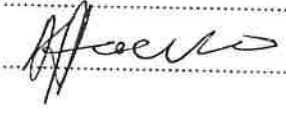
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## GENERAL SUMMARY

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## GENERAL SUMMARY

| ITEM | DESCRIPTION   | AMOUNT                 |     |
|------|---|------------------------|-----|
|      |   | TZS                    | CTS |
| A    | BILL NO. 1 PRELIMINARIES  | 11500,000              |     |
| B    | BILL NO. 2 SPECIFICATIONS   |                        |     |
| C    | BILL NO. 3 BUNJU MARKET BUILDING  | 359,856,000/-          |     |
| D    | BILL NO. 4 PRIME COST AND PROVISIONAL SUM   | 70200,000/-            |     |
|      | <b>SUB TOTAL</b>  | <b>TZS 441556000/-</b> |     |
|      | <b>INSURANCES:</b>  |                        |     |
| E    | Contractor to maintain Insurance against injury to persons and property to indemnify the Employer TZS   |                        |     |
| F    | Contractor to maintain in the joint name of the Employer and the Contractor the insurance against loss and damage to the works by fire, earthquakes, etc. TZS |                        |     |
|      | <b>PERFORMANCE BOND:</b>  |                        |     |
| G    | Contractor to secure a Surety Bond for 10% of the Contract Sum TZS  | —                      |     |
|      | <b>SUB TOTAL TZS</b>  |                        |     |
|      | <b>SUB TOTAL TZS</b>  | —                      |     |
| H    | ADD:18% VAT   |                        |     |
| J    | FIXED TENDER SUM CARRIED TO FORM OF TENDER TZS  |                        |     |
|      | Signed for and on behalf of: <u>Werner Mmilo</u>  |                        |     |
|      | <u></u>  |                        |     |
|      | Date: .....   |                        |     |

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## **BILL NUMBER ONE- PRELIMINARIES**

---

| Item | Description  |  |
|------|--|--|
|      | <p><b>PRELIMINARIES</b></p> <p><b>NOTES</b></p> <p><b>THE CONTRACTOR IS DEEMED TO HAVE PROVIDED EVERYTHING NECESSARY IN COMPLYING WITH THE REQUIREMENTS AS SET DOWN IN THESE PRELIMINARIES AND GENERAL</b></p>   |  |
| A    | <p>These Preliminaries are to be read and applied in conjunction with the Conditions of Contract, and in any conflict of meaning the contents of the said Conditions of Contract will take precedence. Where however, clearly defined additional requirements to those of the Conditions of Contract are set down in these Preliminaries, the Preliminaries will take precedence</p>   |  |
| B    | <p>The payment of Preliminaries for the purposes of Interim Payments will be set out in the following manner, and agreed with the Consultant before the first payment is certified and will be subject to continuous review by the Consultant, taking into account the progress of the Works, and such monthly amounts may be adjusted at any time to take into account any changes in the said progress of the Works whether actual or estimated.</p> |  |
| C    | <p>Payment for Preliminaries will be divided into the following categories:</p> <ul style="list-style-type: none"> <li>i. lump sum initial payment (i.e. setting up costs, insurance, etc.) Payment for such costs will only be made against bona fide costs supported by documentary evidence</li> <li>ii. monthly running costs</li> <li>iii. as a percentage of the value of work executed</li> <li>iv. lump sum payment on completion.</li> </ul>  |  |
|      | <p><b>DEFINITIONS</b></p> <p><b>DEFINITIONS</b></p>  |  |
| D    | <p>Words importing the singular only also include the plural and vice versa where the context requires</p>   |  |
| E    | <p>The term the Works shall mean the whole of the works envisaged by the Contract, including, unless expressly stated otherwise, the works of nominated sub-contractors, nominated suppliers, local authorities and public undertakings whether or not the works of the latter are represented by prime cost sums</p>  |  |
| F    | <p>The term approval, and words derived therefrom, shall mean written approval issued by the Architect unless otherwise described</p>  |  |
| G    | <p>The term or other approved shall mean the standard required and that materials or goods of equal quality and performance may be substituted with the written approval of the Consultant</p>   |  |

| Item | Description  |  |
|------|--|--|
|      | PRELIMINARIES (Cont'd)   |  |
|      | DEFINITIONS (Cont'd)   |  |
|      | DEFINITIONS (Cont'd)   |  |
| A    | The terms approval, approved by, to approval, as directed and the like, refer always to approval or directions given by the Consultant. Approval will not be valid unless given in writing. When the Contractor seeks approval for work which cannot proceed without the Architect's selection or inspection (e.g. performance tests)  |  |
| B    | The term 'the Authorities' will be held to include for all Government, Quasi-Government, City, Municipal and/or District Authorities or Departments which have jurisdiction over any section of the Works.   |  |
| C    | The Consultant may appoint a Representative, who represent the Consultant on Site and whose duties will include inspection and professional supervision of the Contractor's execution of the Works.  |  |
| D    | The Consultant will instruct the Contractor in writing from time to time, of the names and duties of such Representative on Site.  |  |
| E    | Wherever the phrase 'in accordance with the manufacturer's printed instructions' appears in the Contract Documents, the Contractor will be held to have consulted the said manufacturer's latest publications and to have allowed in his, the Contractor's Tender, for complying with all instructions, directions and recommendations contained therein.  |  |
| F    | Wherever the terms "making good" or "make good" appear in the Contract Documents, such making good will be at the Contractor's expense and is to be executed to the entire satisfaction of the Consultant  |  |
| G    | Wherever the phrase "cart (carting) (remove) off the Site appears in the Contract Documents, such carting etc, will be held to include for carting materials and goods to dumps to be found by the Contractor, depositing materials and goods thereon, and for paying all charges in connection therewith.   |  |
| H    | Where the Contractor is required under the terms of this Contract to supply copies of drawings, such drawings shall be in sizes as required by the Consultant.   |  |
| J    | Where the Contractor is required under the terms of this Contract to maintain temporary works including providing temporary services, facilities and buildings, such maintenance will apply from the Commencement Date until the issue of the Taking-Over certificate of the Works or until the date decided by the consultant that such maintenance is no longer the responsibility of the Contractor, the date for such decision not being unreasonable. |  |
| K    | The term 'current issue' will mean the latest issue or edition at the date of Tender.  |  |
| L    | The term 'Project Manager' covers the terms; the Architect, the Engineer and the Quantity surveyor, used elsewhere in tender document.   |  |

| Item | Description   |  |
|------|---|--|
| A    | <p>PRELIMINARIES (Cont'd)</p> <p>CONDITIONS OF CONTRACT</p> <p>EDITION</p> <p>The Contractor shall referred to the full text of the clauses of the Conditions of Contract. The following are highlighted in particular, and the Contractor shall price accordingly:</p> <p>Insurances</p> <p>Clause 13.1 - Insurance of Works and Contractor's Equipment.</p> <p>The minimum insurance covers shall be:</p> <p>(a) Loss of or damage to the Works, Plant, and Materials</p> <p>i. Amount: Not less than the Bid figure plus 10 percent for Professional fees.</p> <p>ii . Deductible: TSHS. N/A</p> <p>(b) Loss of or damage to Equipment: N/A</p> <p>(c) Loss of or damage to property (except the Works, Plant, Materials and Equipment) in connection with the Contract</p> <p>i. Amount: T N/A</p> <p>ii Deductible: T N/A; and</p> <p>(d) Personal injury or death</p> <p>i. Amount: N/A</p> <p>ii Deductible: N/A</p> |  |
| B    | <p>Perfomance Securities/ Guarantee</p> <p>Clause 54.0 - Performance Securities: 10% of the Contract Price</p>  |  |

| Item | Description   |
|------|---|
|      | <p><b>PRELIMINARIES (Cont'd)</b></p> <p><b>CONTRACT : OBLIGATIONS AND RESTRICTIONS IMPOSED BY THE EMPLOYER</b></p> <p><b>PROGRAMME</b></p>  |
| A    | <p>The Programme shall show every significant activity required for completion of the Contract including, but not limited to the following:</p> <p>(a) The supply of any required drawings or information by the Consultant or the Consultant's Representative.</p> <p>(b) Approvals required from Authorities.</p> <p>(c ) Appointment of Nominated Sub-Contractors and Sub-Suppliers as well as Direct Contractors.</p> <p>(d) Dates for submission and approval of shop drawings.</p> <p>(e) Supply date and duration on site of all major Plant and Equipment.</p> <p>(f) The work of the Contractor and all Nominated Sub-Contractors and Sub-Suppliers and Direct Contractors.</p> <p>(g) Any off-site activities such as the production and/or prefabrication of any components or materials. The Works Programme shall indicate the estimated duration of each activity and the precedence and relationship between activities.</p> <p>(h) The earliest and latest start and finish times for each activity and a means of relating start and finish times to calendar dates after taking account of holidays and working days per week.</p> <p>(i) The total float for each activity, which shall not exceed 30 days.</p> <p>(j) The sequence of activities which constitute the Critical Path and any other sequence of activities having less than three (3) working weeks of total float.</p> |
| B    | <p>The Programme shall be formulated in such a manner that the Contractor's intentions and sequence of work are clearly defined. No individual construction activity shall have a duration exceeding four (4) working weeks. The network shall be analysed (either manually or by computer) and the Programme must show clearly the earliest and latest start and finish times for each activity. The Contractor's execution of the actual Works shall not deviate from the order contained in the Programme without the written permission of the Consultant.</p>  |

| Item | Description   |  |
|------|---|--|
|      | <p>PRELIMINARIES (Cont'd)</p> <p>CONTRACT : OBLIGATIONS AND RESTRICTIONS IMPOSED BY THE EMPLOYER (Cont'd)</p> <p>PROGRAMME (Cont'd)</p>   |  |
| A    | <p>Together with the Programme the Contractor shall provide details of any features of the Programme that have a significant bearing on its achievement. These shall include: Estimated labour resources by trade at each stage of construction, Construction methods proposed, Plant and equipment on which the plan is based. Any temporary works. The completion times for construction of specific stages or Sections of the Works as described in the Contract Documents shall form part of the Contract. The Programme produced shall provide for completion on or within the times stated in the Contract Documents.</p> |  |
| B    | <p>The Contractor shall review the Programme with the Consultant during its preparation and the Programme produced is to be an accurate statement of the Contractor's intention and is to represent a practicable method of completing the Works by the required dates.</p>   |  |
| C    | <p>The Programme thus produced shall become the document by which the Contractor's progress towards meeting the required Contract dates is measured.</p>  |  |
| D    | <p>The Consultant will carry out regular reviews of the Programme at intervals of one month throughout the duration of the Contract. Each review will require the Contractor to provide details of all activities on the Programme which are in arrears, details of any foreseen delays to future activities on the Programme, the likely effect on the overall Programme of any actual or foreseen delays and the action proposed or recommended to compensate for the effect of any delays.</p>   |  |
| E    | <p>The Contractor shall provide the Consultant with such information on progress and intention as is necessary to produce the required progress reports throughout the duration of the Contract.</p>  |  |
| F    | <p>When required by the Consultant, an updated Programme will be prepared by the Contractor to incorporate any changes in methods, times or sequence of Construction of the works. However, the Programme will not be updated merely to absorb delays unless every possible action and effort has been taken by the Contractor to regain lost time.</p>   |  |
| G    | <p>Any approval of the Contractor's Programme by the Consultant shall not relieve the Contractor of any his duties or responsibilities under the Contract.</p>  |  |
| H    | <p>The Contractor shall submit to the Consultant with the operational network and analysis, a cash flow based on the accepted Programme. This cash flow shall be updated from time to time as required by the Consultant, to reflect actual progress, and as the programme is altered.</p>  |  |

| Item | Description  |  |
|------|--|--|
|      | <p><b>PRELIMINARIES (Cont'd)</b></p> <p><b>CONTRACT : OBLIGATIONS AND RESTRICTIONS IMPOSED BY THE EMPLOYER (Cont'd)</b></p> <p><b>SITE INSPECTION</b></p>  |  |
| A    | <p>The Contractor will be deemed to have visited the Site before tendering and to have satisfied himself as to the means of communication with, and access to, the Site, the extent and nature of the work and the Site as well as ascertaining the nature of the surroundings including buildings and structures, the nature of the sub-soil, the conditions under which the work will be carried out, conditions affecting the supply of labour and materials and/or goods, and any matters which might affect the Contractor as no claims on the grounds of lack of knowledge in these respects, will be entertained.</p> |  |
| B    | <p>The Contractor will thereafter accept the Site as found on the Commencement Date and at his own expense clear the area of the Site of any debris.</p>   |  |
| C    | <p>Immediately on taking possession of the Site, and before commencing any work, the Contractor shall carry out a site survey. This site survey is to check the actual levels and dimensions of the site against those shown on the Drawings. Such a survey shall be carried out by a Licensed Surveyor. The Licenced Surveyor shall be subject to the Consultant's approval.</p>  |  |
| D    | <p>Three (3) copies of both hard and soft on CD of the said survey drawings, signed by the Licensed Surveyor, shall be handed to the Consultant, as soon as possible after completion of the said survey.</p>  |  |
| E    | <p>It will be held that, on the Contractor commencing work, and assuming that no communication to the contrary has reached the Consultants, that the Contractor accepts as correct all levels and dimensions as shown on the drawings or included elsewhere in the Contract Documents, and no claims for extra payment due to any errors in such levels or dimensions will be entertained.</p>   |  |
| F    | <p>Before the issue of the relevant Taking-Over Certificate (Practical Completion Certificate) the Contractor is to supply the Consultant with three (3) copies of both hard and soft on CD of the Site Plan, prepared and signed by a Licensed Surveyor, including all finished levels, to a grid as approved by the Consultant.</p>  |  |
|      | <p><b>RECORD OF EXISTING STRUCTURES AND ROADS, ETC.</b></p>  |  |
| G    | <p>The Contractor shall, upon the acceptance of his tender, carry out a Pre-Construction Survey of existing buildings, structures or roads surrounding or adjoining the Works.</p>   |  |
| H    | <p>This Pre-Construction Survey shall detail all damage or defects, and will include, appropriate photographs dated and authenticated by the Consultant, and three (3) copies of both hard and soft on CD shall be passed to the Consultant for his</p>  |  |



approval.

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| Item | Description |
|------|-------------|
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**PRELIMINARIES (Cont'd)**

**CONTRACT : OBLIGATIONS AND RESTRICTIONS IMPOSED BY THE EMPLOYER (Cont'd)**

**PROTECTION OF EXISTING STRUCTURES AND ROADS, ETC**

- |   |   |
|---|---|
| A | The Contractor is to arrange for the conveyance of materials and goods and plant so as to cause a minimum of damage to existing structures, roads, services, public footpaths, kerbs, drains, culverts, etc., and at temporary crossovers.  |
| B | The Contractor is to divert, as required, all drains and other waterways encountered during the progress of the Works. Where such diversion, is temporary, the Contractor is to subsequently reinstate the foregoing to the approval of the Consultant.   |
| C | The Contractor shall be responsible for making good and damage to existing structures, roads, services public footpaths, kerbs, drains, culverts, e.c.t, and at temporary cross-overs, caused by his Work people or by his/or any vehicle or plant approaching or leaving the Site, and to maintain, repair and reinstate the aforesaid to original condition to the satisfaction of the Consultant, or alternatively to bear the cost of such maintenance and restoration as a deduction from any monies due or to become due to the Contractor under this Contract.   |
| D | The Contractor is to verify with the Authorities whether any restrictions exist on the free passage, at any time, of vehicles or plant or labour approaching or leaving the Site, and the Contractor is to provide against any limitation of such free passage.   |
| E | The Contractor shall use every reasonable means to prevent any of the roads, with services, public footpaths, kerbs, drains, culverts, etc., and all temporary crossovers, and structures adjacent thereto, or bridges, or waterways communicating with or on the routes of the Site from damage by traffic and in particular shall select routes and use vehicles for transportation on land and/or water and restrict and distribute loads of any such traffic as will inevitably arise from the moving of construction plant or equipment, materials and goods, or manufactured or fabricated articles from and to the Site, shall be limited as far as reasonably possible, and so that no unnecessary damage or injury may be occasioned to such roads, with services, public footpaths, kerbs, drains, culverts etc., and at temporary crossovers, and structures adjacent thereto, or bridges, or waterways. |

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| Item | Description  |  |
|------|--|--|
|      | PRELIMINARIES (Cont'd)   |  |
|      | CONTRACT : OBLIGATIONS AND RESTRICTIONS IMPOSED BY THE EMPLOYER (Cont'd)   |  |
|      | PROTECTION OF EXISTING STRUCTURES AND ROADS, ETC (Cont'd)  |  |
| A    | The Contractor shall be responsible for and shall pay the costs of strengthening and bridges or altering or improving any roads etc., or waterways communicating with the Site to facilitate the movement of construction plant or equipment, materials and goods, or manufactured or fabricated articles required in the execution of the Works, including temporary work, and the Contractor shall indemnify and keep indemnified the Employer against all claims for damage to any roads, with services, public footpaths, kerbs, drains, culverts, etc. and at temporary crossovers, and structures adjacent thereto, or bridges, or waterways communicating with the Site caused by such movement including against such claims as may be made by any competent Authority directly against the Employer pursuant to any Act of Parliament or other statutory instrument and shall negotiate and pay all claims arising solely out of such damage. |  |
| B    | If notwithstanding the above, any damage shall occur to any roads, with services, public footpaths, kerbs, drains, culverts, etc., and at temporary crossovers, and structures adjacent thereto, or bridges, or waterways communicating with the Site arising from the transport of construction plant or equipment, materials and goods, or manufactured or fabricated articles in the execution of the Works, including temporary works, the Contractor shall notify the Consultant as soon as he becomes aware of such damage or as soon as he receives any claim from the Authority entitled to make such claim.   |  |
| C    | Where under any Act of Parliament or other statutory instrument the hauler of such construction plant or equipment, materials and goods or manufactured or fabricated articles is required to indemnify the Authority against damage, the Employer shall not be liable for any costs, charges or expenses in respect thereof or in relation thereto.   |  |
| D    | Provided always that if and so far as any such claim or part thereof shall in the opinion of the Consultant be due to any failure on the part of the Contractor to observe and perform his obligations as above then the amount certified by the Consultant to be due to such failure shall be paid by the Contractor to the Employer or deducted from any sum due or which may become due to the Contractor.  |  |
| E    | Provided always that if and so far as any such claim or part thereof shall in the opinion of the Consultant be due to any failure on the part of the Contractor to observe and perform his obligations as above then the amount certified by the Consultant to be due to such failure shall be paid by the Contractor to the Employer or deducted from any sum due or which may become due to the Contractor.  |  |

| Item | Description  |  |
|------|--|--|
|      | <b>PRELIMINARIES (Cont'd)</b>  |  |
|      | <b>CONTRACT : OBLIGATIONS AND RESTRICTIONS IMPOSED BY THE EMPLOYER (Cont'd)</b>  |  |
|      | <b>SETTING OUT</b>   |  |
| A    | The Contractor shall allow for the employment of a Professional Licensed Surveyor to set out the Works, including setting out permanent and temporary bench marks. The Contractor shall supply the Consultant with six (6) copies of both hard and soft on CD of 'As Set-Out Drawings' signed by the said Professional Licensed Surveyor.  |  |
| B    | The Contractor shall maintain and protect all temporary and permanent bench marks throughout the course of the Works. Should any bench marks be displaced or lost, such bench marks shall be replaced entirely at the Contractor's own expense.  |  |
|      | <b>ORDER OF WORK</b>   |  |
| C    | The Contractor shall proceed with the work in such order as may be required by the Contract Documents or otherwise, in the most workmanlike manner to achieve the requirements of the Programme.   |  |
| D    | The Contractor shall arrange the order of work to avoid possible delay and expedite the completion of the Contract in making up time lost as ascertained by reference to the Programme and progress schedules prepared under the Contract, and agreed between the Contractor and the Consultant from time to time.   |  |
|      | <b>WORKING HOURS</b>   |  |
| E    | All working hours shall be in accordance with the regulations of the Authorities and the requirements of the Employer i.e 16 hours (shift, 8 hours day and 8 hours night)  |  |
| F    | At the commencement of the Works, the Contractor shall give the Consultant details of the working hours and/or shifts which he intends to operate.   |  |
| G    | Should the Contractor wishes to change these working hours at any time, he shall give the Consultant twenty-four (24) hours notice of such impending change.   |  |
|      | <b>METHOD OF CONSTRUCTION</b>  |  |
| H    | If requested by the Consultant, the Contractor shall submit at such times and in such details as the Consultant may reasonably required, such information pertaining to the methods of construction which the Contractor proposes to adopt or use, and such calculations of stresses, strains and deflections, that will arise in the permanent works or any parts thereof during construction from the use of such methods as will enable the Consultant to decide whether (if these methods are adhered to) the Works can be executed in accordance with the Contract, and |  |

without detriment to the permanent works when completed.

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| Item | Description |
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**PRELIMINARIES (Cont'd)**

**CONTRACT : OBLIGATIONS AND RESTRICTIONS IMPOSED BY THE EMPLOYER (Cont'd)**

**METHOD OF CONSTRUCTION (Cont'd)**

- |   |   |
|---|---|
| A | <p>The Consultant shall inform the Contractor in writing, after receipt of the information submitted in accordance with the previous Sub-Clause either,</p> <p>(a) that the Contractor's proposed methods have the consent of the Consultant; or</p> <p>(b) in what respects, in the opinion of the Consultant, the said methods fail to meet the requirements of the Contract or will be detrimental to the permanent works.</p>   |
| B | <p>In the latter event, the Contractor shall take such steps or make such changes in the said methods as may be necessary to meet the Consultant's requirements and to obtain his consent in this respect. The Contractor shall not change the methods which have received the Consultant's consent without the further consent in writing of the Consultant, which shall not be unreasonably withheld.</p>   |
| C | <p>The consent of the Consultant to the Contractor's proposed methods of construction shall not relieve the Contractor of any of his duties or responsibilities under the Contract.</p>   |
| D | <p>All activities connected with the Works must be confined within site boundaries. There shall be absolutely no storage of plant or equipment, materials and goods, or manufactured or fabricated articles required in the execution of the Works, including temporary work, outside the boundaries of the Site, the Contractor must plan his work such so that plant or equipment, materials and goods etc., can be stored or parked within the Site at all times.</p>      |
| E | <p>All activities connected with the Works must be confined within site boundaries. There shall be absolutely no storage of plant or equipment, materials and goods, or manufactured or fabricated articles required in the execution of the Works, including temporary work, outside the boundaries of the Site, and the Contractor must plan his work such so that plant or equipment, materials and goods, etc., can be stored or parked within the Site at all times.</p> |

**WORKS BY NOMINATED SUB-CONTRACTORS**

**NOMINATED SUB-CONTRACTORS**

- |   |   |
|---|---|
| F | <p>Tenders for specialist services to be executed by nominated sub-contractors for which prime cost sums are included in these Bills of Quantities will normally be invited by the Consultant from specialist firms and the Contractor will be instructed</p> |
|---|---|

| G           | <p>to place orders and enter into sub- contracts with the selected tenderers</p> <p>The Contractor will be responsible for the supervision and administration of all sub-contracts in accordance with the Conditions including those applicable to the work of statutory undertakings whether carried out without charge or not and will be responsible for the organization and progression of all such work</p> |  |
|-------------|---|--|
| Page : A/10 |   |  |
| Item        | Description   |  |
|             | <b>PRELIMINARIES (Cont'd)</b>   |  |
|             | <b>WORKS BY NOMINATED SUB-CONTRACTORS (Cont'd)</b>  |  |
|             | <b>NOMINATED SUB-CONTRACTORS (Cont'd)</b>   |  |
| A           | The Contractor must bear the additional costs to the sub-contract tender which he has been instructed to accept for any revisions to the sub-contractor's agreed programme which he requires for his own convenience  |  |
|             | <b>ATTENDANCE UPON SUB-CONTRACTORS</b>  |  |
| B           | The Contractor is to add to all prime cost sums for work to be executed by nominated sub-contractors for profit and general attendance and for such further works of attendance as may be specifically required   |  |
| C           | General attendance on nominated sub-contractors and statutory undertaking engineers shall include for the following:-   |  |
| D           | Use of temporary roads, pavings and paths   |  |
| E           | Use of standing scaffolding, which shall be left in position until no longer required and also altered and adapted to suit the reasonable requirements of the nominated sub-contractors, etc.   |  |
| F           | Use of hoisting facilities  |  |
| G           | Use of messrooms  |  |
| H           | Use of sanitary accommodation and welfare facilities  |  |
| J           | Providing space for office accommodation and for storage of plant and materials   |  |
| K           | Providing light including leads, lamps, fittings, etc.  |  |
| L           | Providing water supplies  |  |
| M           | Clearing away rubbish   |  |
| N           | Other attendance on nominated sub-contractors, etc., as defined in the Standard Method of Measurement of Building Works has been given where appropriate following each individual prime cost sum   |  |
| P           | Note:- Where electric power is required the Contractor is to allow for providing this supply to all floor levels and to positions convenient to nominated sub-contractors' work and shall include for all necessary leads, fittings, etc., and pay all necessary  |  |

charges

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| Item | Description |
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**PRELIMINARIES (Cont'd)**

**GOODS AND MATERIALS FROM NOMINATED SUPPLIERS**

**NOMINATED SUPPLIERS**

- |   |   |
|---|---|
| A | All articles to be supplied by nominated suppliers for which prime cost sums are included in these Bills of Quantities and which the Contractor has to fix or place in position or hand to sub-contractor for fixing will be delivered to the site unless otherwise described       |
| B | All goods and fittings delivered to the site are to be received into the charge of the Contractor who must satisfy himself that they are sound, correct and in good order and he will be required to replace at his own cost all articles lost or found to be damaged on completion |
| C | The Contractor must bear the additional costs to the supplier's tender which he has been instructed to accept for any revisions to the supplier's agreed programme which he requires for his own convenience  |
| D | The Contractor is to add to all prime cost sums for articles to be supplied by nominated suppliers for profit   |

**GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR**

**PLANT TOOLS AND EQUIPMENT**

- |   |  |
|---|--|
| E | The Contractor shall provide all necessary plant, tools and equipment required in the construction of the works and temporary works, including, but not limited to, cranes, hoists, lifts, concrete pumps, generators, compressors, welders, transformers, excavators, tractors, and all other plant, tools and equipment.   |
| F | All such plant, tools and equipment shall be maintained in proper working order and shall be regularly maintained and operated by Work people skilled in such operations.  |
| G | The location of all major items of Plant and Equipment shall be marked on drawings and submitted to the Consultant for his approval.   |
| H | Where the Contractor requires to modify the design of the structure around his plant, such as tower cranes, Work people/material hoists, etc., to provide support and stability, all additional costs of extra concrete beams, reinforcement bars, thickening of reinforced concrete beams, slabs and walls (subject to the Consultant's approval) shall be borne wholly by the Contractor. Design shall be submitted by an Registered Professional Engineer. All extra costs due to the modifications affecting other trades and mechanical, electrical and hydraulic |

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services shall also borne by the Contractor.

- J Should the Contractor make use of any explosive powered tool on the Site of the Works, the Contractor shall comply with any relevant regulations of the Authorities including obtaining all permits.

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| Item | Description |
|------|-------------|
|------|-------------|

**PRELIMINARIES (Cont'd)**

**GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)**

**DESIGN AND EXECUTION OF TEMPORARY WORKS**

- |   |   |
|---|---|
| A | As early as possible after the award of the Contract, the Contractor is to submit to the Consultant, drawings in triplicate, showing the design of all temporary work, which shall have been prepared by and signed by a Professional Engineer.   |
| B | The design drawings for the temporary work are to include, but not limited to: Formwork for the various in-situ sections of the concrete work; All props supporting formwork; Safety platforms; Propping and strutting externally and internally to existing buildings; Planking and strutting to excavations; Scaffolding; Cranes; Temporary toilets, soil pipes, water connections; Temporary water supply; Temporary lighting and power installations; All other temporary work necessary for the execution of the Contract. |
| C | The Contractor is to submit the said drawings with calculations as necessary, all properly endorsed as aforesaid, in such order as will enable the Consultant to consider simultaneously the related portions of the work. The Contractor is not to proceed with any temporary work unless and until the said drawings have been approved by the Consultant.  |
| D | No deviation from the construction procedure and temporary work for which the said drawings have been approved by the Consultant will be permitted unless revised drawings and calculations for the relevant portions of work are prepared and signed by a Professional Engineer and submitted and approved by the Consultant   |
| E | Approval by the Consultant of any drawings or documents submitted by the Contractor will not relieve the Contractor of any of his responsibilities and/or liabilities under the Contract, and the Contractor will be and will remain entirely responsible for the proper execution, completion and maintenance of the Works in accordance with the provisions of the Contract Documents.  |

**TEMPORARY HOARDING AND GANTRISES**

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| F | The Contractor shall provide and maintain all necessary temporary fencing, hoarding not less than 2.8meters high in Galvanized corrugated iron sheet, overall length of 329meters equivalent to the perimeter of the site/plot, planked footways, guardrails, gantries, fans, chutes, screens, casings, tarpaulins, dust sheets, netting and the like for protection of the Works, and the Public and the occupants |
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of adjoining properties from damage, dust and inclement weather, in accordance with the requirements of the Consultant and the Authorities, and shall alter, shift and adapt from time to time as required by the Consultant including paying for all permits, licences, etc., in connection therewith.

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| Item | Description |
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**PRELIMINARIES (Cont'd)**

**GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)**

**TEMPORARY HOARDING AND GANTRISES (Cont'd)**

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| A | All surfaces of temporary hoarding and gantries shall be painted with two coats of synthetic paint to colours, patterns and lettering, as selected by the Consultant. The Consultant reserves the right to instruct the Contractor to carry out repairs and repainting of the foregoing, as and when it is necessary entirely at the Contractor's own expense. |
| B | The Contractor shall remove such temporary fencing, hoarding, planked footways guardrails, gantries, fans, chutes, screens, casings tarpaulins, dust sheets, netting and the like, as and when directed by the Consultant and make good after.   |

**SITE NAME BOARD**

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| C | The Contractor shall provide and erect a name board complete with the names and logos of the Project, Employer, Consultant, etc., all to the approval of the Consultant. Any lettering is to be carried out by a competent sign writer. The Contractor will be required to carry out repainting and re-lettering that may be necessary throughout the duration of the Contract. The name board is to be removed on completion of the Contract or when directed by the Consultant. |
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| D | The Contractor shall allow for the necessary temporary electrical supply to, and lighting for, the signboard. |
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**TEMPORARY ROADS, ETC.**

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| E | The Contractor shall provide and maintain all temporary roads crossovers, bridges, surface water drains and culverts necessary for the Works, and remove when directed by the Consultant and make good after. |
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**TEMPORARY OFFICES FOR EMPLOYER, CONSULTANT AND CONSULTANT'S OFFICER'S SITE REPRESENTATIVES AND STAFF, ETC.**

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| F | The Contractor shall provide, equip, and maintain on Site, including paying all charges for the installation, cleaning daily, etc., the following temporary buildings and facilities, as directed by the Consultant: Site office of approximately 150m <sup>2</sup> for the exclusive use of the Employer, Consultant and the Consultant's Representatives at Site complete with Secretarial Staff and Office Cleaner. |
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Conference room shall be of a size sufficient to accommodate at least twenty persons for site meetings. Self-contained portable toilet with proper ventilation, plumbing and sanitary facilities, etc., for the exclusive use of the Employer, Consultant and the Consultant's Representatives and Staff at Site.

- G The Contractor shall provide, equip, and maintain on Site, including paying all charges for the installations, cleaning daily, etc., temporary buildings and facilities, as directed by the Consultant.

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Item Description

**PRELIMINARIES (Cont'd)**

**GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)**

**TEMPORARY OFFICES FOR EMPLOYER, CONSULTANT AND CONSULTANT'S OFFICER'S SITE REPRESENTATIVES AND STAFF, ETC. (Cont'd)**

- A The Contractor shall supply all necessary stationery, adequate A3 & A4 white papers to the Consultant's Site Staff, as and when required.
- B Key Architectural and Structural Drawings, indicating plans and elevations, are to be mounted on hard backing, protected by clear plastic sheet covering, and display within the site office.

**CONTRACTOR'S TEMPORARY BUILDINGS AND ROOMS**

- C The Contractor is to provide and maintain on Site or arrange for the use of all necessary temporary offices, sheds for storage of materials, goods, etc., shelters and latrine accommodation for his Work people, necessary for the Works, and in accordance with the requirements of the Authorities and to the Consultant's approval.
- D The temporary buildings, rooms and contents, are to be maintained in a sound clean condition, and in a constant state of repair.
- E The latrine accommodation is to have concrete floors, together with all necessary water and drainage facilities, all in accordance with the requirements of the Authorities, and the Contractor is to pay all charges in connection therewith, and keep in a constant state of cleanliness.

**ARCHITECTS AND QUANTITY SURVEYORS REGISTRATION BOARD'S LOGOS CHARGES**

- F The Contractor is responsible for and shall pay all charges in connection with the registration of the project and obtaining of logos for both Architects and Quantity Surveyors from the Architects and Quantity Surveyors Registration Board as deemed necessary.

**CONTRACTORS REGISTRATION BOARD'S LOGOS CHARGES**

- G The Contractor is responsible for and shall pay all charges in connection with the registration of the project and obtaining of logos for main contractor and

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subcontractors of all categories from the Contractor's Registration Board as deemed necessary .

#### ENGINEERS REGISTRATION BOARD'S LOGOS CHARGES

- H The Contractor is responsible for and shall pay all charges in connection with the registration of the project and obtaining of logos for all consulting Engineers of all categories from the Engineer's Registration Board as deemed necessary .

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| Item | Description |
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#### PRELIMINARIES (Cont'd)

#### GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)

#### LOCAL AUTHORITIES FEES

- A The Contractor is responsible for and shall pay all fees which may be charged by the Authorities for temporary buildings, water supply, electric lighting and power, anti-pollution measured, removal of rubbish, etc., and any other charges which the said Authorities may have power to enforce.

#### ERECTION AND REMOVAL OF TEMPORARY BUILDINGS

- B All temporary buildings are to be erected within two (2) weeks of the award of this Contract and are to be dismantled and removed, and the Site made good within one (1) week of receipt of a direction from the Architect for the removal of the said buildings. The Site must be in a clean and tidy condition, acceptable by Architect. The items of furniture and equipment provided therefore shall revert in the Contractor upon removal.
- C The Contractor is to allow for altering, shifting and adapting the temporary buildings from time to time as required by the Consultant.

#### SITE COMMUNICATION EQUIPMENT

- D The Contractor shall provide site telephones and facsimile machines for his own use, and use by the Nominated Sub-Contractors, Nominated Sub-Contractors, Nominated Sub-Suppliers, etc., including paying all fees for installation, use and removal. (The Employer shall in no way be responsible for the bills presented by the Authorities, but the Contractor may if he so wishes, arrange for the cost of the calls to be paid by the Contractor, by the person engaged on each call)

#### SITE OFFICE EQUIPMENT

- E The Contractor shall also provide the following site communication site office equipment on Site, including paying all charges for the installation, use during the Contract Period and removal, etc., for the exclusive use of the Employer, Consultant and the Consultant's Representative at Site, as directed by and to the

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approval of the Consultant:

(a) One (1) photocopy machine (for A3 & A4 size)

(b) One (1) facsimile machine and fax line

(c) Two (2) telephone lines and points

(d) Two (2) telephone sets

(e) One (1) hot and cold distilled water supplies with dispenser

(f) One (1) 300 refrigerator;

(g) Two (2) hand phones with subscription to local network, for exclusive use by

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| Item | Description |
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|  | <p>Consultant and Consultant's Representative at Site. The hand phones will revert back to the Contractor upon completion of the Works.</p> |
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|  | <p>(h) One (1) digital camera with compatible software with at least 6.0 Megapixels with anti-shake feature, 10 x optical zoom and You Tube Capture Mode, registered under the Contractor's name. The digital camera shall be handed over to the Contractor on completion of the Works;</p> |
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|  | <p>(j) One (1) Desktop High-Capacity computers, with the following key features: 'Intel® Pentium® Core i7 processors, DELL or equivalent up to 3.06GHz with hyper-threading and 7200MHz system bus; 8GB to 16GB dual channel RDRAM memory; hard drives from 2TB<sup>2</sup> to 4TB<sup>2</sup>; one 5.25" drive bays for CDRW/DVD combination drive and DVD+RW/+R drive; 'ZIP 250' drive; advanced '4X AGP' graphic cards; 42" LCD monitor; Keyboard; Kaspersky Antivirus; Microsoft Office; Internet Explorers, Autocard 2017, Archicard, Antilantis and Adobe Photoshop 6.0</p> |
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(k) One (1) Laptop High-Capacity computers, with the following key features: CPU-Intel® Duo processor U7600, memory of 4GB DDRS 8 DRAM, hard disc of 500 GB series ATA 4200rpm, 11.1 TFT colour display; 56K 'DataFax' modem for windows; Original Software of the following: 'Microsoft® Windows® Window seven (7)' operating system; current version of 'Microsoft® Office', 'Internet Explorer', 'Internet Outlook Express', 'AutoCAD 2010', 'Archicad 13', 'Atlantis' 'Norton AntiVirus' latest version', 'Adobe Photoshop 6.0';

(l) Approved colour printer, including replacement of inks, capable of printing up to A3 size.

(m) Internet connection with broad-band and router for wireless access; and one (1) e-mail account with subscription, throughout the duration of the Contract.

#### SITE VEHICLE

A The Contractor shall also provide brand new Four (4) wheel-drive double cab pick-up complete with a Driver for the Consultant's Representative on site for the supervision of the Works. The vehicle shall be reverted back to the Employer after completion of the Works and all costs shall be inclusive of the followings:

(a) Operate the vehicle for travel distance in excess of an average of 2,500km per month

(b) Operate and maintain the vehicle for an average 2,500km per month

#### TEMPORARY WATER SUPPLY

B The Contractor shall provide and maintain (or arrange for the use of existing facilities) a temporary water supply, with pipelines, storage tanks, pumps, distribution pipes, valves, meters and all temporary plumbing necessary for the Works, and pay all charges in connection therewith.

C The temporary supply is to be in accordance with the requirements of the Authorities, from whom approval is to be sought, and to be sufficient capacity for the Works, including for the needs of Nominated Sub-Contractors.

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| Item | Description            |  |
|------|------------------------|--|
|      | PRELIMINARIES (Cont'd) |  |

**GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)**

**TEMPORARY WATER SUPPLY  
(Cont'd)**

- A Clean water only is to be provided.
- B The water is to be obtained from the main supply or from other available and approved sources and the Contractor is to pay all charges for water used in the Works by the Contractor and Nominated Sub-Contractors and all charges for water used during subsequent use of the permanent sanitary installation, throughout the duration of the Contract, until the issue of the Taking-Over Certificate.
- C Where the Contractor draws water from the Employer's permanent installation, the Contractor shall install temporary meters to record such consumption, and reimburse the Employer for the amount consumed, including all taxes and levies, failing which, the Employer may deduct the cost of supplying such water from any monies due to the Contractor.
- D The Contractor shall remove the temporary installation when directed by the Consultant and make good after.

**TEMPORARY ELECTRIC LIGHTING AND POWER**

- E The Contractor shall provide and maintain a temporary electrical power supply and all wiring and accessories for the temporary electrical installation required for electric lighting and power necessary for the Works, for all trades, including that required during overtime working, and pay all charges in connection therewith.
- F Temporary electric lighting and power installations are to be provided in accordance with the requirements of the Authorities, and shall include provision of a temporary substation if such is required.
- G The Contractor shall maintain adequate illumination to all stairs, access ways, passages and temporary switchboards, at all times including outside working hours, all to the approval of the Consultant.
- H It is the responsibility of the Contractor to ensure, and to continuously maintain, the temporary electrical installation in a state which complies with the Local Electricity Regulations.
- J Nominated Sub-Contractors will require power from the permanent supply for testing well in advance of the issue of a Taking-Over Certificate for the Works, and it is the responsibility of the Contractor to ensure that this is available. No claim for delay or extra cost will be considered arising from the Contractor's failure to co-ordinate this aspect of the Works with the relevant Nominated Sub-Contractors, and to provide the necessary power.

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## PRELIMINARIES (Cont'd)

### GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)

#### TEMPORARY ELECTRIC LIGHTING AND POWER (Cont'd)

- A The temporary supply and distribution system is to be sufficient for the Works, including for the needs of Nominated Sub-Contractors, Direct Contractors, and/or Government Department Workpeople throughout the duration of the Contract. The Provision of temporary electrical outlets, shall be adequate to meet the requirements of all Nominated Sub-Contractors, Direct Contractors and Government Department Workpeople,
- B The Contractor may make use of the power supply from the permanent installation for the testing and commissioning of major equipment.
- C All electricity drawn from the permanent supply system for testing and commissioning purposes shall be paid for by the Contractor. The Contractor shall also bear all charges from 'turn on' of electrical power to the Completion Date.

#### TEMPORARY FIRE PROTECTION SERVICES

- D The Contractor shall provide for the Works under construction, all necessary temporary fire protection, fire fighting and escape facilities to comply with the requirements of the Authorities including provision of wet and dry risers and staircases, to follow permanent construction no lower than one storey below.
- E All temporary fire protection or fire fighting equipment and installations shall remain the property of the Contractor and be removed from Site upon Completion and when all permanent services are fully operational.
- F When inflammable or combustible materials are to be stored or used the Contractor shall allow for and implement appropriate fire prevention measures to the Authorities' requirements.
- G The Contractor shall provide fire extinguishers of approved type throughout the duration of the Works.

#### TEMPORARY LIGHTNING PROTECTION OF STRUCTURES

- H The Contractor shall provide an effective temporary lightning protection system for the structure during construction, and for all hoists and cranes etc. The lightning protection system is to be of a type which conveys any lightning discharge safely to ground without danger to the Building, machinery or occupants, and to the requirements of the Authorities.
- J The Contractor shall remove the temporary installation when directed by the Consultant and make good after.

| Item | Description   |           |
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|      | <b>PRELIMINARIES (Cont'd)</b>   |           |
|      | <b>GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)</b>   |           |
|      | <b>TEMPORARY SCAFFOLDING</b>  |           |
| A    | The Contractor shall provide all temporary standing scaffolding, of an approved type, and or hanging gantries, all as required by the circumstances of the Contract and the requirements of the Authorities, erected to the approval of the Consultant and the Authorities, with staging, planked footways, guardrails and the like, as required, both internally and externally to whatever height may be required; such temporary scaffolding with staging, etc., shall be made available to all Nominated Sub-Contractors, Direct Contractors and/or Government Department Workpeople. The Contractor shall include modifications and/or re-erection, or any special scaffolding, which may become necessary, throughout the duration of Contract. | 2000,000- |
| B    | If the Contractor considers that by using special methods of construction temporary scaffolding is not necessary for any section of the Works, where scaffolding would normally be necessary, this will not relieve the Contractor of his obligations to provide scaffolding for Nominated Sub-Contractors, Direct Contractors and/or Government Department Workpeople.   |           |
| C    | Irrespective of the scaffolding requirements, of the Contractor, the Contractor will be required to make scaffolding available to Nominated Sub-Contractors, Direct Contractors and/or Government Department Workpeople at such times as they may so require the facility, such requirements not being unreasonable.  |           |
| D    | The Contractor will be fully responsible for the design and safety of scaffolding and must allow for obtaining approvals from the relevant Authorities and for submitting design details if required.   |           |
|      | <b>PROTECTION OF THE WORKS, ADJOINING PROPERTIES AND ANTI-POLLUTION MEASURES</b>  |           |
| E    | The Contractor shall provide all things necessary for the protection of the Works and all unfixed materials and goods delivered upon the site of the Works, whether delivered by the Contractor, Nominated Sub-Contractors, Nominated Suppliers, Direct Contractors or the Employer, for use upon the Works, and the Contractor is to assume full responsibility for any cost and damage sustained to the foregoing from whatever cause arising, throughout the duration of the Contract.   |           |
| F    | The Contractor shall provide for covering up and protecting the Works from the weather and for suspending all operations during weather conditions which, in the Consultant's opinion, may be detrimental to the Works.   |           |
| G    | The Contractor shall provide temporary waterproof protection in lift shafts and in vertical riser shafts for air conditioning ducts, electrical riser mains and all other vertical mechanical services. The temporary protection shall be sufficient to allow Sub-Contractors to work 'in the dry' at any and all levels of the building at any time.   |           |

Such protection is to be sufficient to allow parts of the temporary and permanent electrical reticulation to be in operation during the construction of the building.

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| Item | Description |
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**PRELIMINARIES (Cont'd)**

**GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)**

**PROTECTION OF THE WORKS, ADJOINING PROPERTIES AND ANTI-POLLUTION MEASURES (Cont'd)**

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| A | The Contractor is to carry out the Works in such a manner so as to avoid causing damage to adjoining, adjacent and subject properties.   |
| B | The Contractor will be liable for and shall indemnify the Employer in respect of any claim or proceedings arising out of neglect in taking reasonable care to avoid damage to adjoining, adjacent and subject properties when carrying out the Works.  |
| C | The Contractor is to make adequate provision, by spraying, hosing, erecting screens, including providing vertical mesh screens on elevations, of the building and other suitable methods as required by the Consultant and the Authorities, against any nuisance or damage by dust or other pollution for work under this Contract and to persons or properties in the vicinity, and the Contractor will be held solely responsible for any complaint, damage or claim in this connection. |
| D | The Contractor shall provide all necessary temporary drainage facilities on the Site, including both surface water drainage and foul drainage with all necessary connections to the Authorities mains. Such temporary drainage shall be strictly in accordance with the Authorities regulations, and to the Consultant's approval.   |
| E | The Contractor shall maintain, and keep all drains, streams and waterways free from mud, silt and any other obstructions and make good where necessary, and afterwards remove.   |
| F | All wheels and tracks of vehicles approaching or leaving the Site are to be free from earth droppings, and the Contractor is to allow for all necessary hosing down of vehicles in properly constructed washing bays on Site, and for clearing any droppings deposited on any public highway or footpath, caused through his negligence.   |
| G | No storage of materials and goods and construction works shall be allowed on the beach. The Contractor shall clean up the beach, including removing away sharp and hard materials that may be found, after completion of the entire project.   |

**PROTECTION OF PUBLIC AND PRIVATE SERVICES**

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| H | The Contractor shall provide all things necessary for the protection of all pipes, ducts, sewers, service mains, overhead cables, etc., unless the foregoing are to |
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be removed or diverted, during the execution of the Works.

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| Item | Description |
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**PRELIMINARIES (Cont'd)**

**GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)**

**PROTECTION OF PUBLIC AND PRIVATE SERVICES (Cont'd)**

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| A | Before commencing any excavations for the purposes of this Contract, the Contractor is to accompany the Consultant on a Site inspection in order to consider any circumstances which may indicate the presence of underground service pipes or cables in the vicinity of such excavations. Thereafter the Contractor to carry out excavations in such manner as the Consultant directs. |
| B | If during excavations the Contractor's Workpeople uncover any service pipes or cables, work is to be stopped immediately and is not to be restarted until the matter has been reported to the Consultant who will issue whatever directions he deems appropriate.   |
| C | The Contractor is to make good any damage in this respect, due to any cause within his control, and pay all costs and charges in connection therewith.  |
| D | In cases where the services are to be temporarily terminated or diverted the Contractor is to give the necessary notices to the appropriate Authorities and arrange for the work to be carried out and pay all charges in connection therewith.   |

**MEASURES AGAINST INSECT AND PEST NUISANCE**

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| E | Pest Control measures shall comply with the requirements of the Authorities and the Contractor is required to submit a detailed pest control surveillance programme inclusive of fogging at the Site to the Authorities (if necessary) and the Consultant prior to commencement of the work. The frequency of fogging shall be at least once per week and the chemical used for fogging shall be approved by the Authorities. |
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**MEASURES AGAINST INSECT AND PEST NUISANCE**

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| F | The Contractor shall engage a Pest Control Operator to provide comprehensive pest control and surveillance work in the Site.   |
| G | The work required under this Clause shall include all necessary measures to prevent the Site from becoming conducive the breeding or harbouring of mosquitoes or other harmful insects. The Contractor shall carry out site checks at least once a week to detect and remove breeding and harbouring ground. |

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| H   | <p><b>SECURITY</b></p> <p>The Contractor shall provide all watching by day and by night necessary for the safety and security of the Works, including provision of warning lamps.</p> |  |
| Page : A/22   |   |  |
| Item  | Description   |  |
| <p><b>PRELIMINARIES (Cont'd)</b></p> <p><b>GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)</b></p> <p><b>SECURITY (Cont'd)</b></p> <p>A The Contractor shall provide and maintain shelters for watchmen and/or security guards, and remove when directed by the Consultant and make good after.</p> <p><b>SITE SAFETY</b></p> <p>B The Contractor shall comply with all regulations and recommendations of the Authorities in respect of Site safety.</p> <p>C The Contractor shall maintain the following provisions at the Site at all times in sufficient and adequate quantities to ensure Site safety:</p> <p>D The Contractor shall maintain the following provisions at the Site at all times in sufficient and adequate quantities to ensure Site safety: Signs, directions, warning notices, etc., required for the safe and efficient execution of the Works. Barricades, protection and covering to all holes and openings. Barriers, handrails and toe boards to all excavated openings and shafts. Life lines, safety belts, safety helmets, safety nets and catch platforms and other protective devices and clothing. Safety devices, guards, etc to all plant and machinery. Fully equipped first aid facilities with qualified staffing. Artificial illumination, warning lights and flashing lights where necessary. Signs, directions, warning notices, etc., required for the safe and efficient execution of the Works.</p> <p>E The Contractor shall ensure that only skilled or qualified operatives are allowed to operate construction equipment and power tools and power operated fasteners.</p> <p>F The Contractor shall appoint Accident Prevention Officers in accordance with the Authorities' regulations to be responsible for all aspects of safety in the Works.</p> <p>G The Contractor shall provide safety enclosures and screens to all hoisting and lifting equipment to ensure the safety of all personnel, including wire mesh enclosures to hoist towers, landing gates with safety switches, bells and lights, handrails to landing platforms, adequate guards and covers to machinery any mechanisms and protective covers to all operations.</p> <p>H All lifting tackle including slings, chains, ropes, hooks sheaves and jibs shall be</p> |   |  |

certified for duty and capacity, regularly inspected and maintained. If in the opinion of the Consultant any item has been subject to abuse or damage it shall be removed from use and replaced. All hoisting and lifting shall be carried out strictly in accordance with the Authorities' regulations and safe working practice.

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| Item | Description   |
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|      | <p><b>PRELIMINARIES (Cont'd)</b></p> <p><b>GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)</b></p> <p><b>SITE SAFETY (Cont'd)</b></p> <p>A The means, methods and procedures which the Contractor proposes to employ in order to maintain safety on the Site shall be submitted to the Consultant for review but this submission shall in no case be deemed to relieve the Contractor of his sole responsibility and liability under the terms of the Contract Documents. The Contractor is reminded of his obligations to provide proper means of escape from areas made inaccessible by the permanent construction, during the erection of the Works.</p> <p><b>PROTECTIVE CLOTHING AND MEDICAL FACILITIES</b></p> <p>B The Contractor is to provide suitable and adequate protective clothing and safety helmets for the use of the Consultant's Representatives at Site, and for visiting Representatives of the Employer and authorised visitors.</p> <p>C The Contractor shall arrange for medical attention to be available when necessary, and will provide dressing stations, complete with all adequate first-aid equipment within easy access to each work area in the Site. The Contractor shall display, in prominent positions, the identities of those employees who are available to render first-aid. The Contractor shall provide for the transportation of serious cases to the nearest hospital.</p> <p><b>INDUSTRIAL SAFETY AND PUBLIC HEALTH REGULATIONS</b></p> <p>D The Contractor shall provide for all costs incurred by complying with all Safety, Health and Welfare Regulations pertaining to all Workpeople (including those employed by Nominated Sub-Contractors) employed on the Site, including convening all safety meetings, etc.</p> <p>E The Contractor will be responsible for complying with all instructions given by any Inspector regarding industrial safety measured or public health and for providing all safety equipment which he may be ordered to install or supply.</p> <p><b>BUILDING AND ENGINEERING REGULATIONS</b></p> |

F The Contractor shall provide for full compliance with the current 'Building Regulations and Works of Engineering Construction Regulations' and the current 'Factories Acts' with all subsidiary legislation.

G For the purposes of this Contract the terms 'Employer' whenever used in these Regulations, shall mean the Contractor, who will be responsible for appointing and paying a 'Designated Person' or 'Professional Engineer' or 'Accident Prevention Officer' who may be required to be appointed in conformity with the requirement of these Regulations.

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| Item | Description |
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**PRELIMINARIES (Cont'd)**

**GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)**

**WORKMANSHIP**

A All workmanship related to the permanent work is to be skilled in so far as the work requires, in the opinion of the Consultant, skilled workmanship. The standard of workmanship to be at least equal to the best obtainable locally, and is to comply with the most recent rules and regulations of all Authorities, having jurisdiction over the Works.

B The Contractor is to ensure that all materials and goods which are to be assembled, are made up in unit sizes which can be taken through the size of openings provided in the works.

**CODE OF PRACTICE**

C The Contractor shall provide for all costs incurred in complying with the requirements of the current Code of Practice issue by the Authorities.

**MATERIALS AND GOODS**

D The Contractor is to place his orders for materials and goods at the earliest possible date after being awarded the Contract, and will be held responsible for any delay occasioned through any failure so to do, also for any expense incurred by that delay.

E Materials and goods used throughout the Works will be new and of the best of their respective kinds, and unless otherwise specified will conform to the relevant requirements of the British Standards Institution, British Standards House, London, etc., the latest amendment to publications being applied.

F Manufacturer's and catalogue references quoted in the Contract Documents are indicative of type and quality only. Other manufacturers' products may be accepted provided these are equal in all respects to those specified and approved by the Consultant.

## SUBSTITUTION OF ALTERNATE MATERIALS OR GOODS

- G If the Contractor desires to use alternative materials or goods to those specified in Contract Documents, the Contractor shall make application to the Consultant, in writing in sufficient time having regard to the progress of the Works and the period of delivery of the materials or goods concerned, stating his intention and submitting samples and brochures concerning the alternatives proposed.
- H It shall be the Contractor's responsibility to provide sufficient evidence, by tests or other means, to support any such request for the approval of alternative materials or goods.
- J Prior to any proposals for the use of alternative materials or goods the Contractor shall satisfy himself that the item he proposes, is equal to that specified and that the substitution is in the Employer's interest.

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| Item | Description |
|------|-------------|
|------|-------------|

### PRELIMINARIES (Cont'd)

### GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)

### SUBSTITUTION OF ALTERNATE MATERIALS OR GOODS (Cont'd)

- A The onus of proof in this respect is upon the Contractor, who shall support his request with sufficient test data and other means to permit the Consultant to make a decision on the merits of the proposal.
- B Any material or goods other than those cited in the Contract Documents, or brand name or model number of generic species, other than those cited in the Contract Documents will be considered an alternative. The Consultant will be the sole judge of whether or not the substitution is equal in quality, utility and economy to that specified.
- C Where the Consultant approves of such substitution, this approval will be on the understanding that there is no financial adjustment of the Contract Price, upwards.
- D However, if the substitution is cheaper than the material specified in the Contract Documents and receives the Consultant's approval, the Contract Price shall be adjusted downwards in favour of the Employer.
- E The Contractor shall be responsible, at his own expense, for the costs of any changes in other parts of the work, caused by the adoption of alternative materials or goods.
- F If the Contractor fails to order materials or goods specifically selected by the Consultant in ample time to avoid delays in construction, these materials or goods may be substituted at the Consultant's discretion, at no extra cost, or and only upon written agreement by the Contractor to remove such substitute material or goods at a later date agreeable to the Employer, and then replace such at the Contractor's own expense with the materials or goods originally specified, if so required by the

|   |   |  |
|---|---|--|
|   | Consultant.   |  |
| G | Any delays resulting from the foregoing will be the Contractor's responsibility and no claims for extensions of time in this respect will be entertained.   |  |
|   | <b>SAMPLES</b>  |  |
| H | The Contractor is to submit samples, free of charge, of materials and goods to be incorporated into the permanent work, whenever called for by the Consultant, and all materials and goods delivered to the Site are to be identical to the samples approved by the Consultant. |  |
| J | All approved samples shall be kept in the conference room attached to the Site offices.   |  |
| K | The Contractor shall allow for delivering all samples to the conference room, together with displaying samples as required by the Consultant  |  |

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| Item | Description   |  |
|------|---|--|
|      | <p><b>PRELIMINARIES (Cont'd)</b></p> <p><b>GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)</b></p> <p><b>SAMPLES (Cont'd)</b></p> <p>A All samples shall be delivered in such time as to give the Consultant reasonable time in which to make decisions regarding choice.</p> <p>B The quantity of the samples provided shall be sufficient for the Consultant to determine whether or not the sample/samples comply with the standard required.</p> <p>C Each sample shall be labelled indicating the generic name of the sample, the manufacturer's name and the model number, brand name and supplier's name, and any other relevant data.</p> <p>D With each delivery of samples the Contractor shall provide a transmittal voucher, listing the sample data enumerated above, for each sample transmitted, and referencing each sample to the appropriate Contract Drawing, sheet and detail, and to the respective item in the Specification and the Bills of Quantities.</p> <p><b>MATERIALS AND GOODS FROM NOMINATED SUPPLIERS AND/OR FROM EMPLOYER</b></p> <p>E The unit rates for 'fix only' items supplied by Nominated Suppliers and/or Employer will be held to include for taking delivery, unloading, carrying in, sorting, storing, stripping or removing protective warpping or covering, checking, assembling, returning packaging cases and the like if required, handling, hoisting and placing or lowering, or fitting and fixing materials and goods in position, adjusting, refixing, narrow widths, small quantities, and for cutting away and making good, including all fitting round pipes, etc., levelling, packing, grouting, providing templates and</p> |  |

plugged grounds, puttying and touching up, all in accordance with the generally accepted requirements of the specified item, including safeguarding the work until the issue of the Taking-Over Certificate of the Works.

#### **SITE LAYOUT AND ORGANISATION**

- F The Contractor shall submit to the Consultant his proposed Site Layout Plan, which shall include positions of all temporary buildings, temporary services and plant, storage areas for materials and goods, including cement silos and formwork, and areas for the temporary dumping of rubbish and used formwork, are to be located in positions to be approved by the Consultant, and are in no way to interfere with or create nuisance to adjoining properties, including road reserves.
- G The Contractor's proposed Site Layout Plan shall also include positions of major plant and equipment, temporary access, bridges, etc., hoists, cranes and the like.

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| Item | Description |
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#### **PRELIMINARIES (Cont'd)**

#### **GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)**

#### **SITE LAYOUT AND ORGANISATION (Cont'd)**

- A The Contractor shall provide all necessary full-time site staff including but not limited to Consultant, qualified and competent Structural Engineer and Mechanical & Electrical Engineer, Foremen, Sub-Foremen, and all other staff including clerical staff required.
- B All such staff shall be fluent in the English or Swahili Language and shall be to the Consultants approval.
- C Such members of the Contractor's staff are to be in possession of a minimum qualification in Engineering or Building Technology acceptable to the Consultant
- D Completed floors may be used as storage and working space by the Contractor only when approved by the Consultant. The Contractor shall be responsible for making good any damage caused to the floors used as stores and working space and shall make good at his own cost to the Consultant's satisfaction.
- E Any re-positioning of the aforementioned temporary building, etc., which may be required by the Consultant due to the Contractor's failure to observe the contents of this Clause will be entirely at the Contractor's own expense, including any making good.

#### **VISITORS**

- F The Contractor shall not allow unauthorised visitors access to the Works. All authorised visitors' identities shall be entered into a visitors' book, and such

visitors' book will be available for inspection by the Consultant at all times.

- G Authorised visitors shall be directed to the Contractor's site office, on arrival, for identification, before being allowed on to the Works.

#### SITE INSTRUMENTS VISITORS

- H The Contractor shall keep and maintain on Site, suitable and accurate instruments including but not limited to, theodolites, levels, levelling staffs, steel measuring tapes and any other instrument which may be required by the Consultant, throughout the duration of the Contract.

#### SITE MEETINGS

- J The Consultant will hold regular site meetings, which may be held at weekly, fortnightly or monthly intervals. Such meetings will be attended by such members of the Contractor's and Nominated Sub-Contractors' organisations as the Consultant may require.
- K Persons attending Site Meetings will not be permitted to use pagers or hand phones during the course of the meeting.

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| Item | Description |
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#### PRELIMINARIES (Cont'd)

#### GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)

#### SITE ASSISTANCE

- A Contractor is to make available such messengers, chainmen and other site personnel, for the assistance of the Consultant and his representatives, at all times, as required.

#### PROGRESS REPORTS

- B The Contractor is to submit to the Consultant, Progress Reports of the Works, at intervals as required by the Consultant, by Elements and/or by Trades, indicating the number of Workpeople employed, materials and goods delivered, the extent and type of plant employed, weather conditions and generally the progress of the Works.

#### PROGRESS PHOTOGRAPHS

- C The Contractor is to provide the Consultant monthly throughout the duration of the Contract with three (3) sets of printed digitised photographs and one (1) soft copy of the digitised photographs in CD-ROM, each set consisting of adequate numbers photographs taken at different locations of the Works to be agreed by the Consultant. Each photograph is to be dated and marked with the description of the content of the photograph and location from which it was taken.

#### TESTS

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D The cost of carrying out and arranging for all tests and submission of test certificates/reports called for in the Specification shall be borne by the Contractor.

E The Contractor shall allow for the cost of complying with all testing and re-testing methods, procedures and requirements to the approval of the Consultant unless otherwise specifically stated.

**CO-ORDINATION DRAWINGS FOR MECHANICAL AND ELECTRICAL INSTALLATIONS**

F Before the work is put in hand, the Contractor with the assistance of the respective Nominated Sub-Contractors shall prepare co-ordination drawings of all works for entire typical floors as well as for all areas where the mechanical and electrical services have to be installed within confined and congested spaces, or where accurate co-ordination is deemed necessary by the Consultant

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**Item Description**

**PRELIMINARIES (Cont'd)**

**GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)**

**CO-ORDINATION DRAWINGS FOR MECHANICAL AND ELECTRICAL INSTALLATIONS (Cont'd)**

A The co-ordination drawings shall show all works including the building structure, penetrations, ceiling and associated support systems, mechanical and electrical services, lighting fittings, etc. The drawings shall include plans and section details. Copies of the co-ordination drawings in AutoCAD 2015 format (i.e. \*.dwg) and Adobe Reader version 8.0 or latest version format (i.e. \*.pdf) shall be submitted electronically (by email) to the Consultant for their review and in any case in sufficient time to permit modifications to be made if such are deemed necessary by the Consultant without delaying the progress of the works. For each submission of drawings, a minimum time of two (2) weeks shall be allowed for review by the Consultant. The Consultant's review of drawings does not relieve the Contractor or the respective Nominated Sub-Contractors from any responsibility under the Contract.

B Approval of such drawings shall not constitute approval of additional costs to the Employer, unless highlighted in writing by the Contractor at the time of submitting such drawings.

## SHOP DRAWINGS, WORKING DRAWINGS AND DETAILS

- C The Contractor shall submit copies of the shop, working drawings in AutoCAD 2015 format (i.e..\*dwg) and Adobe Reader version 8.0 or latest version format (i.e. \*.pdf) electronically (by email) to the Consultant for Inspection.
- D Inspection of shop and working drawings is not to be considered as a guarantee of measurements or building conditions. Where drawings are inspected, the said inspection does not in any way relieve the Contractor from his responsibility or from the necessity of furnishing material or performing work required by the Contract Drawings and Specification which shall, in the event of a dispute, take precedence over shop drawings.
- E The submission of shop and working drawings (in either the original submission or re-submitted with corrections) constitutes evidence that the Contractor has checked all information thereon and that he accepts and is willing to perform the work as shown in a workmanlike manner and in accordance with the best standard practice.
- F No claims for extra payment based on work shown on shop and working drawings shall be subsequently considered by the Consultant unless such claims are so noted on the Contractor's transmittal letter accompanying the drawings, and then only after the approval of the Consultant of such claims.
- G All drawings submitted, including those by suppliers, shall be signed by a responsible person of the Contractor's staff.

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| Item | Description |
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### PRELIMINARIES (Cont'd)

### GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)

### SHOP DRAWINGS, WORKING DRAWINGS AND DETAILS (Cont'd)

- A The Contractor shall submit for examination by the Consultant, within twenty-eight (28) days of the Contract being awarded, a schedule of future shop drawings for the Works showing the Drawing Number; Title; Planned Date of Submission; Plan Date of Examination.
- B The failure of the Contractor to include all shop drawings on his schedule shall not relieve the Contractor of his responsibility to submit all required shop drawings in time to permit correct processing as specified.

### SHOP DRAWINGS, WORKING DRAWINGS AND DETAILS

- C Before the commencement of the Works, the Consultant will issue a procedure for

the submission, examination and approval of shop drawings. Each drawing will be examined and commented on by Consultant and will be returned to the Contractor, who shall then print the necessary copies of each drawing requiring no correction for distribution.

#### AS-BUILT DRAWINGS

- D During construction, the Contractor shall keep accurate records of all details of the construction including the location of all penetrations of the building fabric, etc., and within one (1) month on completion of the Works, the Contractor shall prepare and submit the said construction details on his 'As-Built Drawings' to the Consultant for approval.
- E At the same time the Contractor will also convey to the Consultant all information regarding changes to the Works which have been authorised by the Consultant or his Representatives, other than by written instructions, and the Consultant will be the sole judge as to whether such details should be incorporated on the 'As-Built Drawings'.
- F The Contractor shall pay all charges for producing four (4) copies of 'As-Built Drawings' and one (1) copy in canvass all in hard copies, seven (7) copies of CD-ROM and to be produced in AutoCAD 2015 format (i.e. \*.dwg) and Adobe Reader version 8.0 format (i.e. \*.pdf) in soft copies, and subsequently submitting to Consultant for final approval.
- G The inclusion of such details will not necessarily imply that the Contractor is reimbursed for such work, and the Consultant will utilise As-Built Drawings as the basis of his calculations, and no work which is not illustrated on the said As-Built Drawings will be included in the Final Account, unless so authorised in writing by the Consultant
- H As-Built Drawings for Nominated Sub-Contract Works and Specialist Works shall be provided by the Nominated Sub- Contractors and Specialist Contractors and submitted to the Consultant. The Contractor shall ensure that these requirements are observed.

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| Item | Description |
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#### PRELIMINARIES (Cont'd)

#### GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)

#### CLEARING RUBBISH

- A The Contractor shall as directed by the Consultant clear away all rubbish from the Works, including that produced by Nominated Sub-Contractors, Direct Contractors and Government Department Workpeople, and remove to dumps to be found by the Contractor, including paying all charges, and maintain the areas surrounding the works in a reasonable condition, at all times.
- B The Contractor is to keep the Site in a constant state of cleanliness at all times.
- C The term 'rubbish' will be held to include all debris and waste incurred in the

execution of the Works.

D The Contractor where necessary shall allow for providing a properly enclosed rubbish chute attached as necessary to the structure, complete with all necessary openings at each floor.

E The Contractor is to include for the use of plant in the loading of rubbish, where necessary.

#### CLEANING THE WORKS

F On completion of the Works, and before the issue of the Completion Certificate of the Works, the Contractor shall: Remove all remaining debris and rubbish from the Building and the Site. Such removal to be carried out continuously, so that the Building under construction will at all times be maintained in a tidy condition. Clean all exposed concrete, brick and timber, etc., surfaces. Leave all roofs watertight and clean. Wash, clean and dry and polish all floor finishes (in addition to any previous polishing required by the Specification). Ease all doors, windows, cupboard doors and drawers, and leave free to move. Check and adjust all locks. Hand over keys of all doors to the Consultant. Keys are to have identifying tags attached. Cut out cracks in plaster, etc., and make good. Clean and polish all glass, glazed tiles and metal surfaces. Touch up all paint finishes. Remove all paint spots from floors, walls hardware, sanitary fittings, glass, etc. Ensure that all services and equipment are functioning efficiently and to the approval of the Consultant. Clean drains of all obstructions. Leave the building and areas of the Site clean and orderly, and to the satisfaction of the Consultant ready for immediate occupation.

G The Contractor will be solely responsible for the implementation of the requirements of this Clause, and is to ensure that the work of Nominated Sub-Contractors is handed over in a like condition.

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| Item | Description |
|------|-------------|
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#### PRELIMINARIES (Cont'd)

#### GENERAL FACILITIES AND OBLIGATIONS: IMPLICIT IN THE CONTRACT AND AT THE DISCRETION AND RISK OF THE CONTRACTOR (Cont'd)

#### COMPLETION AND DEFECTS

A The Consultant will not issue a Completion Certificate in accordance with the Conditions of Contract until, All parts of the Works are, in the Consultant's opinion, ready for occupation and/or use; All mechanical and electrical services are tested and operating satisfactorily as specified in the Contract or relevant Sub-Contracts. All works included in the Contract are performed, including such rectification of defects as may be required to bring the Work to total completion and standards acceptable to the Consultant

- B The Contractor shall programme to complete the Works, including those works of the Designated Sub-Contractors and Nominated Sub-Contractors and assist the Consultant in the application of all necessary permits for occupation and other certificates of compliance issued by the relevant Authorities which are necessary to demonstrate completion of the Works to the extent that such certificates are required under the Terms and Conditions of Contract.
- C Whenever the Consultant consider such application necessary, prior to the anticipated date for Completion of the Works, the Consultant will commence inspections and issue to the Contractor, schedules of work not in compliance with the Contract Documents, and of uncompleted work. Such scheduled work will be required to be rectified, completed and/or made good prior to the issue of a Taking-Over Certificate of the Works.
- D Following the issue of a Taking-Over Certificate of the Works, the Consultant will issue further schedules of uncompleted work, and will nominate times for the completion of such work during the Defects Liability Period.

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**Description**

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**Description**

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BILL NO.1 PRELIMINARIES AND GENERAL

11500,000/-

**BILL NUMBER THREE - MEASURED WORK**



| ELEMENT NR. 01 - SUBSTRUCTURE                                 |   |      |                |                     |
|---|---|------|----------------|---------------------|
| (PROVISIONAL)   |   |      |                |                     |
| <u>SITE PREPARATION</u>                                       |   |      |                |                     |
| A   | Clearing site of bushes, scrub, undergrowth and the like and grubbing up roots and demolition of buildings (Bandas) | 2400 | m <sup>2</sup> | 3,000/- 7200,000/-  |
| <u>Removing vegetable soil</u>                                |   |      |                |                     |
| Average 150mm deep  |   |      |                |                     |
| B   | removing from site  | 2400 | m <sup>2</sup> | 2,000/- 4,800,000/- |
| <u>EXCAVATION AND EARTHWORK</u>                               |   |      |                |                     |
| <u>Excavating</u>   |   |      |                |                     |
| foundation trenches   |   |      |                |                     |
| C   | not exceeding 1.50m deep  | 281  | m <sup>3</sup> | 5,000/- 1405,000/-  |
| Pits to receive   |   |      |                |                     |
| Column Bases  |   |      |                |                     |
| D   | not exceeding 1.50m deep  | 19   | m <sup>3</sup> | 5000/- 95,000/-     |
| Extra over all kinds of excavations irrespective of depth for |   |      |                |                     |
| F   | breaking up rocks (Provisional)   | 1    | item           | 30,000/- 30,000/-   |
| <u>Disposal</u>   |   |      |                |                     |
| Excavated material  |   |      |                |                     |
| G   | backfilling; around foundation maximum 250mm thick with importated suitable and approved materials                  | 504  | m <sup>3</sup> | 15,000/- 7560,000/- |
| Surplus excavated material                                    |   |      |                |                     |
| H   | removing from site  | 519  | m <sup>3</sup> | 5000/- 2,595,000/-  |
| TO COLLECTION   |   |      | TZS            |                     |

|  |  |     |                |                 |
|--|--|-----|----------------|-----------------|
| Surface treatments                       |  |     |                |                 |
| Bottoms of excavations in natural ground |  |     |                |                 |
| B  | trimming and compacting to slopes exceeding 45 degrees from horizontal | 420 | m <sup>2</sup> | 8000 3360,000/- |
| <u>DISPOSAL OF WATER</u>                 |  |     |                |                 |

*[Handwritten signature]*

|   |   |      |                |         |              |
|---|---|------|----------------|---------|--------------|
| <u>Generally</u>  |   |      |                |         |              |
| C   | general water   | 1    | Item           | 2,000   | 2,000/-      |
| <u>PLANKING AND STRUTTING</u>   |   |      |                |         |              |
| <u>Generally</u>  |   |      |                |         |              |
| Sides of excavations  |   |      |                |         |              |
| D   | generally   | 1    | Item           | 100,000 | 100,000/-    |
| Hardcore  |   |      |                |         |              |
| E   | 150mm compacted crushed approved rock aggregate in layer in bed levelled and 75mm thick blinded to receive polythene membrane (measured separately) | 1680 | m <sup>2</sup> | 25,000  | 42,000,000   |
| Filling in making up levels under floors with approved river sand Over 200mm thick, depositing and compacting in layers maximum 250mm thick |   |      |                |         |              |
| F   | Imported sand   | 336  | m <sup>3</sup> | 30,000  | 10,080,000/- |
| <u>ANTI-TERMITE TREATMENT</u>   |   |      |                |         |              |
| <u>Gamalin 20EC solution</u>  |   |      |                |         |              |
| G   | Aldrin 0.50% solution applied at a rate of 7 litres per square metre to hardcore bed  | 1680 | m <sup>2</sup> | 2,000   | 3,360,000/-  |
| H   | Ditto applied at rate of 8 litres per linear metre per 300mm depth per 235mm width to backfilling to one side of wall foundations                   | 188  | m              | 3,000   | 564,000/-    |
| TO COLLECTION   |   |      |                | TZS     |              |

3/1/2

|   |  |       |                |         |              |
|---|--|-------|----------------|---------|--------------|
| <u>INSITU CONCRETE; PLAIN</u><br><u>Normal; grade 15; granite or basalt aggregates</u>                    |  |       |                |         |              |
|   | Strip footing  |       |                |         |              |
| B   | irrespective of thickness  | 96    | m <sup>3</sup> | 250,000 | 24,000,000/- |
| <u>Normal; grade 20; granite or basalt aggregates</u>   |  |       |                |         |              |
| C   | 100mm Thick bed; oversite concrete   | 1680  | m <sup>2</sup> | 25,000  | 42,000/-     |
| <u>INSITU CONCRETE; REINFORCED</u><br><u>Normal; mix Grade 20; granite or basalt aggregates; vibrated</u> |  |       |                |         |              |
| D   | Column Bases   | 17    | m <sup>3</sup> | 380,000 | 64,60,000/-  |
|   | Plinth beam or the like  |       |                |         |              |
| F   | irrespective of thickness  | 21    | m <sup>3</sup> | 320,000 | 67,20,000/-  |
| G   | Steps  | 2     | m <sup>3</sup> | 320,000 | 64,00,000/-  |
| H   | Ramp   | 2     | m <sup>3</sup> | 320,000 | 64,00,000/-  |
| <u>REINFORCEMENT (provisional)</u><br><u>Bars; high yield steel; cold worked; B.S.500</u>                 |  |       |                |         |              |
|   | Straight or bent General   |       |                |         |              |
| J   | Irrespective of diameter;  | 2100  | kg             | 3500    | 7,35,000/-   |
|   | Straight or bent   |       |                |         |              |
| F   | Irrespective of diameter; generally General; 25mm, 20mm, 16mm, 12mm, 10mm, 8mm diameter bars | #REF! | kg             |         |              |
| <u>SAWN FORMWORK TO REINFORCED IN-SITU CONCRETE</u><br><u>Fair face formwork; generally</u>               |  |       |                |         |              |
| A   | column Bases   | 112   | m <sup>2</sup> | 30,000  | 33,60,000/-  |
|   | Edges of bed   |       |                |         |              |
|   | Sides or risers of steps   |       |                |         |              |
| D   | 75 to 150mm high   | 250   | m              | 10,000  | 25,00,000/-  |
| TO COLLECTION   |  |       |                | TZS     |              |

|  |  |       |                |        |              |
|--|--|-------|----------------|--------|--------------|
|  |  | 3/1/2 |                |        |              |
| E  | <u>BLOCKWORK</u><br><br>Concrete blocks; B.S. 6073; type A; 7.0N per square millimetre; solid; in cement mortar (1:4)<br><br>Walls<br><br>230mm thick  | 502   | m <sup>2</sup> | 36,000 | 15,060,000/- |
|  | <u>DAMP PROOF COURSES</u><br><br>B.S. 743; type A; bitumen hessian base; 150mm laps<br><br>Horizontal<br><br>230mm wide  | 188   | m              | 2800   | 479,000      |
| F  | <u>DAMP PROOF MEMBRANE</u><br><br>500 Gauge polythene sheet laying on blinded hardcore with 150mm sides and end laps   | 1680  | m <sup>2</sup> | 5000   | 8,400,000/-  |
|  | <u>INSITU FINISHING</u><br><br>Rendering; 12mm first coat of cement and sand (1:6); 3mm second coat of gypsum powdered skimming; steel trowelled<br><br>15mm two coat work; to concrete or blockwork base; generally to<br><br>Walls | 195   | m <sup>2</sup> | 10000  | 1950,000/-   |
| H  | <u>THREE COATS WEATHER GUARD PAINT</u><br><br>Wood floated rendered surfaces; external<br><br>Walls<br><br>over 300mm girth  | 195   | m <sup>2</sup> | 8000   | 1560,000/-   |
| TO COLLECTION  |  |       | TZS            |        |              |
| COLLECTION   |  |       |                |        |              |
| Page 3/1/1   |  |       |                |        |              |
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| TOTAL SUBSTRUCTURE CARRIED SUMMARY OF BILL NR. THREE |  |       | TZS            |        |              |
| 3/1/5  |  |       |                |        |              |

BT

|   |  |    |    |         |              |
|---|--|----|----|---------|--------------|
|   | ELEMENT NR. 02 - FRAME<br>(PROVISIONAL)  |    |    |         |              |
|   | STEEL WORK<br><br>Supply and fix Black Pipe Class B 6" 5.7M long with all associated accessories; red oxide painted and Black paint as finishing coat, site welded and connected | 66 | no | 659,000 | 42,000,000/- |
| TOTAL FRAME CARRIED SUMMARY OF BILL NR. THREE |  |    |    | TZS     |              |

3/2/2

|   |   |     |                |       |            |
|---|---|-----|----------------|-------|------------|
|   | ELEMENT NR. 03 - WALLS<br>(PROVISIONAL)   |     |                |       |            |
|   | BLOCKWORK<br><br>Blockwork: concrete blocks, BS 6073 Parts 1 and 2, solid, dense aggregate, average compressive strength 5N/mm <sup>2</sup> -7N/mm <sup>2</sup> : in cement mortar (1:4)<br><br>Walls or partitions for Market building |     |                |       |            |
| C   | 230mm thick (Provisionally)   | 188 | m <sup>2</sup> | 30000 | 5640,000/- |
| TOTAL WALLS CARRIED SUMMARY OF BILL NR. THREE |   |     |                | TZS   |            |

3/3/1

|               |  |      |                |          |              |
|---------------|--|------|----------------|----------|--------------|
|               | ELEMENT NR. 04 - ROOF<br><br>PITCHED ROOF  |      |                |          |              |
|               | ROOF COVERING<br>28 Gauge; C.I.S. Roof covering Type as per manufacturer's specification with 150mm side and end laps (as manufactured by Alaf or equal and approved). |      |                |          |              |
| A             | Roof covering sloping not exceeding 45 degrees from horizontal   | 2410 | m <sup>2</sup> | 27,000/- | 65,570,000/- |
| TO COLLECTION |  |      |                | TZS      |              |

3/1/2

|               |   |      |   |       |              |
|---------------|---|------|---|-------|--------------|
|               | ROOF STRUCTURE (Provisional)<br>The following are the 30 No. Treated Soft wood roof truss, spanning not exceeding 12m made from soft wood pressure impregnated with preservatives |      |   |       |              |
| B             | 150 x 50 mm Trusses   | 2811 | m | 6000  | 16,866,000/- |
| D             | 100 x 50 timber struts and bottom chord   | 2696 | m | 4000  | 10,784,000/- |
| E             | 50 x 50 mm Purlins  | 2710 | m | 4000  | 10,840,000/- |
| F             | Prime Quality Softwood : Podo<br>250 x 25mm Fascia and Barge boards.  | 233  | m | 15000 | 3,495,000/-  |
| TO COLLECTION |   |      |   | TZS   |              |

|   |  |  |  |     |  |
|---|--|--|--|-----|--|
| COLLECTION                                      |  |  |  |     |  |
| Page 3/1/1                                      |  |  |  |     |  |
| Page 3/1/2                                      |  |  |  |     |  |
| TOTAL ROOF CARRIED TO SUMMARY OF BILL NR. THREE |  |  |  | TZS |  |

3/4/1

|                               |  |  |       |               |            |
|-------------------------------|--|--|-------|---------------|------------|
| GENERAL SUMMARY               |  |  |       |               |            |
| ELEMENT NR. 1 - SUBSTRUCTURES |  |  | 3/1/4 | 204,261,000/- |            |
| ELEMENT NR. 2 - FRAMES        |  |  | 3/2/1 | 42,909,000/-  |            |
| ELEMENT NR. 3- WALLS          |  |  | 3/3/2 | 5640,000/-    |            |
| ELEMENT NR. 4- ROOF           |  |  | 3/4/1 | 118,555,000/- |            |
| TOTAL 1                       |  |  |       |               |            |
| TOTAL CARRIED GENERAL SUMMARY |  |  |       | TZS           | 371,86,000 |

*Heck*

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**BILL NUMBER FOUR - PRIME COST AND  
PROVISIONAL SUMS**

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| ITEM | DESCRIPTION   | QTY  | UNIT | RATE  | AMOUNT          |
|------|---|------|------|-------|-----------------|
|      | PRIME COST AND PROVISION SUMS   |      |      |       |                 |
|      | The following Prime cost sums are for the works to be carried out by statutory Authority                  |      |      |       |                 |
| A    | Install electical facilities to the market shade  | Prov |      |       | 1,000,000.00    |
| B    | Add for Profit  |      | 5%   | 50000 | 50000           |
| C    | Add for General attendance  |      | 5%   | 50000 | 50000           |
| D    | Connection of clean water mains supply and provision of meters by DAWASA                                  | Prov |      |       | 1,000,000.00    |
| E    | Add for Profit  | 5    | %    |       | 50000           |
| F    | Add for General attendance  | 5    | %    |       | 50000           |
|      |   |      |      |       |                 |
|      | The following Prime cost sums are for the works to be carried out by Domestic or Nominated Sub contractor |      |      |       |                 |
| A    | Allow for Electrical installation and all associated fitting  | Sum  |      |       | 3,000,000.00    |
|      |   |      |      |       |                 |
|      | Allow sum for construction of concrete pad for whole sale venders   | prov |      |       | 65,000,000.00   |
|      |   |      |      |       |                 |
|      |   |      |      |       |                 |
|      |   |      |      |       |                 |
|      |   |      |      |       |                 |
|      |   |      |      |       |                 |
|      | PC AND PROVISIONAL SUMS CARRIED TO GENERAL SUMMARY  |      |      |       | 44,155,600.00 - |

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(ii) Workability

The total water content in the mixture determines its consistency and once a consistency of a trial mix has been approved it must remain constant throughout the Contract. In order to help the concrete maintain the desired consistence the slump of an approved trial, mix shall be measured, thereafter all mixes must give the slump as the approved trial mix. The slump shall be determined by test as described in B.S 1881 Parts 102-104, 106, 107 and DD 83 mm Part 2. In general the approved slump shall be in the order of 75 mm for hand compacted concrete and 35 mm for vibrated concrete. The slump test shall be made on concrete actually being placed in the works at the commencement of each period of concrete and at such other times as instructed.

(iii) Testing specimens

The moulds for test cubes shall be of metal and true to shape to give a 150mm and shall be oiled before filling. The mould shall be filled with concrete taken from that actually placed in the works, the concrete being selected by the Engineer from a point as near as possible to the position of placing. The filling of the moulds shall be done immediately after the selection of the sample concrete and in such a way that the concrete in the moulds be truly representative of that in the works.

The concrete shall be placed in the moulds in three layers of equal thickness, each layer being rammed with 25 strokes of a steel bar 40 mm diameter, (or equivalent), weighing 2 kg. If the concrete in the works be consolidated by mechanical vibration, the test cube moulds shall be likewise vibrated after filling. Each cube shall be inscribed with the date of manufacture and identification mark.

A record shall be kept for each batch of cubes showing the position in the works which the concrete represents, the date of manufacture, the mixture and slump of the concrete, particulars of the cement and aggregate used, a statement of whether or not the cubes are vibrated and other information relating to the subsequent history of the cubes.

The moulds containing the test cubes shall be stored for 24 hours on the site in a damp place free from vibration. At the end of this period the cubes shall be taken from the moulds and stored in damp sand for 20 days if they are to be tested at 28 days or for 4 days if they are to be tested at 7 days.

The Contractor shall be instructed about the dispatch of the cubes to an approved laboratory and will pay all costs relating to the tests. A set of four cubes will be required for not more than every 60 cubic metres of concrete placed in the works.

(iv) Quality of specimens

The test specimens shall have the compressive strength specified for each quality of cement at the appropriate age as given herein.

If the required strength is not obtained at 28 days, the Contractor will be required to cut out and reconstruct all work represented by the test specimen at his own expense with all dispatch, always provided that the Engineer may first permit further tests, at the Contractor's expense, to prove the quality of the deposited concrete.

In the case of seven day works cube tests proving unsatisfactory, the work may be stopped, but shall not be liable to rejection until the result of the twenty eight day test is known.

In the event of the results of the twenty eight day works Cube Tests proving unsatisfactory, the work represented shall be immediately liable to rejection. The contractor may, however, be given the option of cutting three specimens from the completed work subject to the direction of the engineer, and preparing there from test cubes or cores which shall be sent to the Testing Laboratory for testing as for works cube tests

Should the average strength of these specimens attain the specified minimum twenty eight day strength, the work will, subject to the Engineer's discretion, be accepted. (Cont'd.)

It is the Contractor's responsibility to ensure that the subsequent deliveries of aggregate conform to the grading analysis of the approved samples.

The proportions of materials to be used for the preliminary cube tests, and subsequent batching, shall be ascertained by calculation from the results of the aggregate grading tests carried out by the Nominated Testing Authority.

Preliminary concrete cubes shall be made by the Contractor on site, as required by the Engineer, and tested by the Nominated Testing Authority. As a result of these definite weights of each material for batching shall be ascertained and agreed with the Engineer. Thereafter these proportions shall be adhered to throughout the works and may be varied only by instructions given by the Engineer.

The weights of damp aggregates must be adjusted to take into account the weight of water in the aggregates, and this in turn will affect the amount of water to be added to the mix.

Through the carrying out of the Contract, "Works Cube Tests" are to be made from concrete drawn from newly laid concrete or concrete about to be placed in position, such cubes being made when directed by the Engineer and in his presence. Such cubes shall be made in 150 mm cube steel or cast iron moulds and shall be marked and cured strictly in accordance with the Appendices of the code of practice, and shall be forwarded carriage paid in time for testing at the required age to a testing laboratory to be nominated by the Engineer. Four cubes shall be made on each occasion, concrete for each cube being from a different batch. Two cubes shall be forwarded in time for testing at the age of seven days from casting and two cubes in time for testing in twenty eight days.

Each cubes shall be marked with the date of casting and a distinctive reference number in accordance with a system agreed by the Engineer. A record shall be kept of the position from which the concrete for each set of cubes was drawn, or to which it was about to be placed

At least three sets of cubes shall be cast during each week concrete is being cast including sets of cubes for each quality of concrete used during the period

Concrete is required to have the properties and give the strength in Newton per square millimeter as follows:-

| Class           | Quality              | Max. size of coarse Aggregate | Max water cement ration by Weight | Min crushing strength of Works Test Cubes |         |
|-----------------|----------------------|-------------------------------|-----------------------------------|---|---------|
|                 |                      |                               |                                   | 7 days                                    | 28 days |
| 31.5/20 1:1:2   | 20 mm                | 0.45                          | 23                                |   | 31.5    |
| 26.5/20 1:1.5:3 | 20 mm                | 0.50                          | 19                                |   | 26.5    |
| 21./20 1:2:4    | 20 mm                | 0.58                          | 15.5                              |   | 21      |
| 21/13 1:2:4     | 13 mm                | 0.58                          | 15.5                              |   | 21      |
| 13.5/25 1:3:6   | 25 mm                | 0.60                          | 9                                 |   | 13.50   |
| 1:4:8 1:4:8     | 40 mm                | 0.60                          | -                                 |   | -       |
| 1:10 1:10       | "All – in" aggregate |                               | -                                 |   | -       |

#### F.13 Cement (Contd)

Any cement, which has failed to pass the tests or has been damaged by water or contaminated in any way on site, shall immediately be put into bags and removed from the site.

#### F.14 Aggregates

Aggregate shall comply with British Standard as follows:

|          |   |                                    |
|----------|---|------------------------------------|
| Fine     | - | B.S. 882 Table 2 Zones 1 to 3 only |
| Coarse   | - | B.S. 882 Table 1                   |
| "All in" | - | B.S. 882 Tables 3                  |

Each type of aggregate shall be obtained from one approved source, capable of maintaining adequate supplies of consistently graded material throughout the Contract. Aggregates for exposed concrete shall be free from all impurities likely to cause discoloration and shall be on consistent colour throughout the work.

Fine aggregates and sand shall be clean, sharp, coarse, hard material and equal at all times to the samples, which shall be deposited with and approved by the Engineer. The caustic soda test for organic impurities shall show a colour not deeper than that of the standard solution. The settling test for natural sand shall be made and after being allowed to settle for three hours the layer of silt deposit on the coarse material shall not exceed 10%.

The Contractor shall supply all necessary equipment for the testing of fine aggregates and sand for the use of the Engineer.

Coarse aggregates shall be hard, clean gravel or broken stone from approved quarries and shall be free from earth, decomposed stone, and extraneous matter. They shall conform to B.S. 882 Table 1 and shall be "Grade Aggregate" 19 mm to 5 mm. Thin, elongated, friable, flaky or laminated pieces; mica or shale shall only be present in such small quantities as not to affect adversely the strength and durability of the concrete. The amount of fine particles occurring in a free state or as loose adherent shall not exceed 1% when determined by the laboratory sedimentation test. After twenty-four hours in water, a previously dried sample shall not gain more than 10% in weight.

Each grade of aggregate shall be stored in the works in separate heaps so that there shall be no possibility of any inter-mixing. Any materials which have become inter-mixed shall be removed from the site forthwith by the Contractor.

If, in the opinion of the Engineer, the aggregate is dirty or adulterated in any manner, it shall be washed and/or screened by the Contractor to the satisfaction of the Engineer.

#### F.15 Reinforcement

Reinforcement shall comply with the following standards:

- a. Mild steel rod reinforcement shall be hot rolled grade 250 complying with B.S.4466 and B.S.4449
- b. (i) hot rolled deformed high tensile bars having a guaranteed minimum yield stress of 460 N/mm<sup>2</sup> and other physical properties complying with B.S. 4466 and B.S.4449.

Or

- (ii) Cold worked steel bars complying with B.S.4466 and B.S. 4449
- c. Welded steel fabric reinforcement shall comply with B.S.4483

All reinforcement shall be in the "diameter" and metric range and the substitution of "square twisted" or imperial range shall be allowed but only at no extra cost to the Employer

## CONCRETE WORK

### QUALIFICATIONS OF THE RULES OF THE SMM

#### F.1 Beds or the like laid in bays

Notwithstanding the provisions of SMM Clause F.5 (c) the descriptions of work laid in bays shall be deemed to include formwork between the bays.

#### F.2 Steel bar reinforcement

Notwithstanding the nomenclature of SMM Clauses F.16 (b) and F.17 (a), the description of steel bar and fabric reinforcement shall be deemed to include bends, hooks, tying wire, distance blocks and ordinary spacers, unless otherwise described.

#### F.3 Wrought formwork

Notwithstanding the nomenclatures of SMM Clause F.19 (f), formwork required to produce fair concrete surface is herein qualified by a description of the finish required.

#### F.4 Formwork to grooves chases, chamfers and moldings

Notwithstanding the provisions of SMM Clause F.23 (b), the descriptions of formwork shall be deemed to include forming chamfers not exceeding 50 mm wide and forming splayed internal angle not exceeding 25 mm wide.

#### F.5 Making good

Withstanding the provisions of SMM Clause F.50 the descriptions of holes and mortises shall be deemed to include making good concrete.

### DEFINITIONS

#### F.6 Designations of concrete mixes

The various mixes of concrete are designated in the subsequent measured items by the following criteria:-

Nominal mixes: By the weight proportions of whole bags of ordinary Portland cement to fine and coarse aggregates and by the maximum size of coarse aggregate. The Contractor shall regularly submit details giving specific gravities and moisture content of aggregate.

#### F.7 Tamping

The term "tamping" as used herein in conjunction with the phrase "treating surfaces of unset concrete" shall mean the final compaction and surface finish to be applied to unset concrete beds, or the like, with a steel shod beam tamper, either manually or mechanically operated unless otherwise stated. The resulting surface finish shall have a slightly ribbed appearance.

#### F.8 Keying

The term "keying" as used herein in conjunction with the phrase "treating surfaces of unset concrete" shall mean the preparation of beds, or the like to receive insitu pavings by raking with a standard horticultural rake whilst the concrete is still green and when the concrete is set and cured, protecting the raked surfaces with a layer of clean sand and removing the sand immediately before the insitu paving is laid.

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(ii) Workability

The total water content in the mixture determines its consistency and once a consistency of a trial mix has been approved it must remain constant throughout the Contract. In order to help the concrete maintain the desired consistence the slump of an approved trial, mix shall be measured, thereafter all mixes must give the slump as the approved trial mix. The slump shall be determined by test as described in B.S 1881 Parts 102-104, 106, 107 and DD 83 mm Part 2. In general the approved slump shall be in the order of 75 mm for hand compacted concrete and 35 mm for vibrated concrete. The slump test shall be made on concrete actually being placed in the works at the commencement of each period of concrete and at such other times as instructed.

(iii) Testing specimens

The moulds for test cubes shall be of metal and true to shape to give a 150mm and shall be oiled before filling. The mould shall be filled with concrete taken from that actually placed in the works, the concrete being selected by the Engineer from a point as near as possible to the position of placing. The filling of the moulds shall be done immediately after the selection of the sample concrete and in such a way that the concrete in the moulds be truly representative of that in the works.

The concrete shall be placed in the moulds in three layers of equal thickness, each layer being rammed with 25 strokes of a steel bar 40 mm diameter, (or equivalent), weighing 2 kg. If the concrete in the works be consolidated by mechanical vibration, the test cube moulds shall be likewise vibrated after filling. Each cube shall be inscribed with the date of manufacture and identification mark.

A record shall be kept for each batch of cubes showing the position in the works which the concrete represents, the date of manufacture, the mixture and slump of the concrete, particulars of the cement and aggregate used, a statement of whether or not the cubes are vibrated and other information relating to the subsequent history of the cubes.

The moulds containing the test cubes shall be stored for 24 hours on the site in a damp place free from vibration. At the end of this period the cubes shall be taken from the moulds and stored in damp sand for 20 days if they are to be tested at 28 days or for 4 days if they are to be tested at 7 days.

The Contractor shall be instructed about the dispatch of the cubes to an approved laboratory and will pay all costs relating to the tests. A set of four cubes will be required for not more than every 60 cubic metres of concrete placed in the works.

(iv) Quality of specimens

The test specimens shall have the compressive strength specified for each quality of cement at the appropriate age as given herein.

If the required strength is not obtained at 28 days, the Contractor will be required to cut out and reconstruct all work represented by the test specimen at his own expense with all dispatch, always provided that the Engineer may first permit further tests, at the Contractor's expense, to prove the quality of the deposited concrete.

In the case of seven day works cube tests proving unsatisfactory, the work may be stopped, but shall not be liable to rejection until the result of the twenty eight day test is known.

In the event of the results of the twenty eight day works Cube Tests proving unsatisfactory, the work represented shall be immediately liable to rejection. The contractor may, however, be given the option of cutting three specimens from the completed work subject to the direction of the engineer, and preparing there from test cubes or cores which shall be sent to the Testing Laboratory for testing as for works cube tests

Should the average strength of these specimens attain the specified minimum twenty eight day strength, the work will, subject to the Engineer's discretion, be accepted. (Cont'd.)

It is the Contractor's responsibility to ensure that the subsequent deliveries of aggregate conform to the grading analysis of the approved samples.

The proportions of materials to be used for the preliminary cube tests, and subsequent batching, shall be ascertained by calculation from the results of the aggregate grading tests carried out by the Nominated Testing Authority.

Preliminary concrete cubes shall be made by the Contractor on site, as required by the Engineer, and tested by the Nominated Testing Authority. As a result of these definite weights of each material for batching shall be ascertained and agreed with the Engineer. Thereafter these proportions shall be adhered to throughout the works and may be varied only by instructions given by the Engineer.

The weights of damp aggregates must be adjusted to take into account the weight of water in the aggregates, and this in turn will affect the amount of water to be added to the mix.

Through the carrying out of the Contract, "Works Cube Tests" are to be made from concrete drawn from newly laid concrete or concrete about to be placed in position, such cubes being made when directed by the Engineer and in his presence. Such cubes shall be made in 150 mm cube steel or cast iron moulds and shall be marked and cured strictly in accordance with the Appendices of the code of practice, and shall be forwarded carriage paid in time for testing at the required age to a testing laboratory to be nominated by the Engineer. Four cubes shall be made on each occasion, concrete for each cube being from a different batch. Two cubes shall be forwarded in time for testing at the age of seven days from casting and two cubes in time for testing in twenty eight days.

Each cubes shall be marked with the date of casting and a distinctive reference number in accordance with a system agreed by the Engineer. A record shall be kept of the position from which the concrete for each set of cubes was drawn, or to which it was about to be placed

At least three sets of cubes shall be cast during each week concrete is being cast including sets of cubes for each quality of concrete used during the period

Concrete is required to have the properties and give the strength in Newton per square millimeter as follows:-

| Class           | Quality              | Max. size of coarse Aggregate | Max water cement ration by Weight | Min crushing strength of Works Test Cubes |         |
|-----------------|----------------------|-------------------------------|-----------------------------------|---|---------|
|                 |                      |                               |                                   | 7 days                                    | 28 days |
| 31.5/20 1:1:2   | 20 mm                | 0.45                          | 23                                |   | 31.5    |
| 26.5/20 1:1.5:3 | 20 mm                | 0.50                          | 19                                |   | 26.5    |
| 21./20 1:2:4    | 20 mm                | 0.58                          | 15.5                              |   | 21      |
| 21/13 1:2:4     | 13 mm                | 0.58                          | 15.5                              |   | 21      |
| 13.5/25 1:3:6   | 25 mm                | 0.60                          | 9                                 |   | 13.50   |
| 1:4:8 1:4:8     | 40 mm                | 0.60                          | -                                 |   | -       |
| 1:10 1:10       | "All – in" aggregate |                               | -                                 |   | -       |



#### F.13 Cement (Contd)

Any cement, which has failed to pass the tests or has been damaged by water or contaminated in any way on site, shall immediately be put into bags and removed from the site.

#### F.14 Aggregates

Aggregate shall comply with British Standard as follows:

|          |   |                                    |
|----------|---|------------------------------------|
| Fine     | - | B.S. 882 Table 2 Zones 1 to 3 only |
| Coarse   | - | B.S. 882 Table 1                   |
| "All in" | - | B.S. 882 Tables 3                  |

Each type of aggregate shall be obtained from one approved source, capable of maintaining adequate supplies of consistently graded material throughout the Contract. Aggregates for exposed concrete shall be free from all impurities likely to cause discoloration and shall be on consistent colour throughout the work.

Fine aggregates and sand shall be clean, sharp, coarse, hard material and equal at all times to the samples, which shall be deposited with and approved by the Engineer. The caustic soda test for organic impurities shall show a colour not deeper than that of the standard solution. The settling test for natural sand shall be made and after being allowed to settle for three hours the layer of silt deposit on the coarse material shall not exceed 10%.

The Contractor shall supply all necessary equipment for the testing of fine aggregates and sand for the use of the Engineer.

Coarse aggregates shall be hard, clean gravel or broken stone from approved quarries and shall be free from earth, decomposed stone, and extraneous matter. They shall conform to B.S. 882 Table 1 and shall be "Grade Aggregate" 19 mm to 5 mm. Thin, elongated, friable, flaky or laminated pieces; mica or shale shall only be present in such small quantities as not to affect adversely the strength and durability of the concrete. The amount of fine particles occurring in a free state or as loose adherent shall not exceed 1% when determined by the laboratory sedimentation test. After twenty-four hours in water, a previously dried sample shall not gain more than 10% in weight.

Each grade of aggregate shall be stored in the works in separate heaps so that there shall be no possibility of any inter-mixing. Any materials which have become inter-mixed shall be removed from the site forthwith by the Contractor.

If, in the opinion of the Engineer, the aggregate is dirty or adulterated in any manner, it shall be washed and/or screened by the Contractor to the satisfaction of the Engineer.

#### F.15 Reinforcement

Reinforcement shall comply with the following standards:

- a. Mild steel rod reinforcement shall be hot rolled grade 250 complying with B.S.4466 and B.S.4449
- b. (i) hot rolled deformed high tensile bars having a guaranteed minimum yield stress of 460 N/mm<sup>2</sup> and other physical properties complying with B.S. 4466 and B.S.4449.

Or

- (ii) Cold worked steel bars complying with B.S.4466 and B.S. 4449
- c. Welded steel fabric reinforcement shall comply with B.S.4483

All reinforcement shall be in the "diameter" and metric range and the substitution of "square twisted" or imperial range shall be allowed but only at no extra cost to the Employer

## CONCRETE WORK

### QUALIFICATIONS OF THE RULES OF THE SMM

#### F.1 Beds or the like laid in bays

Notwithstanding the provisions of SMM Clause F.5 (c) the descriptions of work laid in bays shall be deemed to include formwork between the bays.

#### F.2 Steel bar reinforcement

Notwithstanding the nomenclature of SMM Clauses F.16 (b) and F.17 (a), the description of steel bar and fabric reinforcement shall be deemed to include bends, hooks, tying wire, distance blocks and ordinary spacers, unless otherwise described.

#### F.3 Wrought formwork

Notwithstanding the nomenclatures of SMM Clause F.19 (f), formwork required to produce fair concrete surface is herein qualified by a description of the finish required.

#### F.4 Formwork to grooves chases, chamfers and moldings

Notwithstanding the provisions of SMM Clause F.23 (b), the descriptions of formwork shall be deemed to include forming chamfers not exceeding 50 mm wide and forming splayed internal angle not exceeding 25 mm wide.

#### F.5 Making good

Withstanding the provisions of SMM Clause F.50 the descriptions of holes and mortises shall be deemed to include making good concrete.

### DEFINITIONS

#### F.6 Designations of concrete mixes

The various mixes of concrete are designated in the subsequent measured items by the following criteria:-

Nominal mixes: By the weight proportions of whole bags of ordinary Portland cement to fine and coarse aggregates and by the maximum size of coarse aggregate. The Contractor shall regularly submit details giving specific gravities and moisture content of aggregate.

#### F.7 Tamping

The term "tamping" as used herein in conjunction with the phrase "treating surfaces of unset concrete" shall mean the final compaction and surface finish to be applied to unset concrete beds, or the like, with a steel shod beam tamper, either manually or mechanically operated unless otherwise stated. The resulting surface finish shall have a slightly ribbed appearance.

#### F.8 Keying

The term "keying" as used herein in conjunction with the phrase "treating surfaces of unset concrete" shall mean the preparation of beds, or the like to receive insitu pavings by raking with a standard horticultural rake whilst the concrete is still green and when the concrete is set and cured, protecting the raked surfaces with a layer of clean sand and removing the sand immediately before the insitu paving is laid.

## CONCRETE WORK

### LIST OF CLAUSES

#### QUALIFICATIONS OF THE RULES OF THE SMM

- F.1 Beds or the like laid in bays
- F.2 Steel bar reinforcement
- F.3 Wrought formwork
- F.4 Formwork to grooves, chases, chamfers and mould
- F.5 Making good

#### DEFINITIONS

- F.6 Designations of concrete mixes
- F.7 Tamping
- F.8 keying
- F.9 Precast concrete units

#### GENERALLY

- F.10 Standards
- F.11 Bar bending schedules

#### MATERIALS

- F.12 Samples
- F.13 Cement
- F.14 Aggregates
- F.15 Reinforcement
- F.16 Expansion joint material
- F.17 Expansion joint sealer
- F.18 Wall ties
- F.19 Water
- F.20 Storage of materials
- F.21 Proportions of concrete mix
- F.22 Testing of materials generally

ROOFING  
LIST OF CLAUSES

TILE ROOFING

- K.1 Bituminous felt underlay
- K.2 Saflok700 metal sheets
- K.3 Mbezi interlocking tiles
- K.4 Examine roof coverings

ORRUGATED OR TROUGHED SHEET ROOFING

- K.5 Sheet roofing generally
- K.6 Profiled aluminium sheet roofing
- K.7 Asbestos cement sheet roofing

BITUMINOUS FELT ROOFING

- K.8 Approved subcontractor
- K.9 Guarantee
- K.10 Samples
- K.11 Preparations of surfaces
- K.12 Pipes to be laid beforehand
- K.13 Built – in roofing
- K.14 Air pockets and stains
- K.15 Test for falls
- K.16 Protection

G.18 Generally (Cont'd.)

All walls built in hollow concrete blocks, where finishing with an open top edge, (i.e. not against ceiling, beam, etc.), or at the underside of sills, shall be finished with a solid concrete block top course.

Where walling is to be fair faced in blocks, the blocks shall be selected and shall all have clean arrises.

G.19 Wall reinforcement

Where so specified hollow block walls shall be reinforced vertically with 10 mm diameter mild steel bars or 6 mm square twisted bars at 450 mm centres unless otherwise specified, the bars being tied in with the reinforcement of the floors at the top and bottom in an approved manner.

No scheduled for steel in walls will be provided.

G.20 Mortar mixing

All materials shall be accurately gauged by gauge boxes and mechanically mixed and used within 30 minutes of first mixing. Proportions shall be cement and sand (1:6) by volume.

Re-tempering of mortar will not be permitted. Gauge boxes and mixers shall be kept clean.

G.21 Bedding and pointing

All blocks shall be bedded on a solid bed of mortar; vertical faces of all blocks shall be well buttered before being laid and the whole well grouted at each course. Joints to blockwork to be plastered shall be roughly raked out to form a key. Joints to fair face blockwork shall be either finished flush or finished recessed 6 mm as hereafter specified.

G.22 Laying louver or screen blocks

Louver or screen blocks shall be built in mortar with all joints flushed up, surplus mortar wiped from the face of the blocks and finished fair.

G.23 Filling of blockwork cavities

All cavities where specified and shown above ground and all cavities below ground level shall be filled in solid with concrete of the mix described and placed and consolidated in sections not exceeding 1125 mm in height.

G.24 Stone pitching

The ground to receive pitching shall be well compacted and the stone; which shall be flat bedded and not less than 230 mm either way along the bearing surface, shall be punned to the required falls and inclinations so that neither wedges nor spalls are required to keep the pitching rigidly in place. The joints shall be no more than 13 mm thick solidly filled with 1:3 cement mortar and pointed.

G.25 Stone walling

The stone shall be well bonded with a minimum of one good bond or through stone evenly spaced to each square metre. All cavities and joints in stonework are to be filled in and flushed up solid with mortar.

Jointing and pointing is as detailed or instructed.

G.26 Putlog holes

Putlog holes shall be carefully, properly and completely filled up on completion of walling work.

G.8 Concrete blocks (Cont'd.)

Blocks shall be solid or two-hole type as specified and are to be made under sheds erected by the Contractor to the directions and approval of the Architect. Samples shall be approved by the Architect before any walling work is commenced.

The compressive strength of Type A blocks (non loading bearing) shall be not less than:-

|                         |                       |
|-------------------------|-----------------------|
| Average of 10 blocks    | 3.5 N/sq.m gross area |
| Lowest individual block | 2.8 N/sq.m gross area |

When load bearing, the compressive strength of blocks shall be:-

|                         |                       |
|-------------------------|-----------------------|
| Average of 10 blocks    | 7.0 N/sq.m gross area |
| Lowest individual block | 5.6 N/sq.m gross area |

All testing shall be in accordance with B.S. 6073.

The concrete is to be put into the machine's moulds in thin layers and all properly tamped therein. On removal from the machines the blocks are to be carefully deposited on racks under sheds erected by the Contractor to the direction and approval of the Architect and there left for three days and kept thoroughly wet the whole time, after which they shall be put out in the open on racks and protected with approved matting, sacking or straw and kept wet for a further five days, then kept in the same position and under same mat cover, but without wetting, for a further two days and then left in the open without matting or wetting for a further seven days to season.

The blocks must be left with good sharp edges. The blocks for use in the works shall be 225 mm high and may vary in length from 300 mm to 450 mm and no variation above or below these lengths will be allowed except where required to form proper bonding at corners, around openings, sills, lintels, beams, etc., and the like positions and the Contractor must make or cut blocks to all the varying sizes required for these purpose and include this in his price.

Blocks to be subsequently covered with an insitu finishing may be slightly rough in texture. Fair face blocks shall be perfectly smooth.

G.9 Load bearing hollow concrete blocks

All load-bearing hollow concrete blocks shall be 225 mm thick x 450 mm long of the two hole type of approved manufacture. The blocks are to have a minimum resistance to crushing at twenty eight days of 4 Newton per square millimetre on their net area.

The volume of the cavities shall be not less than 45% and not more than 50% of the gross volume, and the dimensions of the cavities arranged so that each cavity is vertically continuous when the blocks are bonded.

G.10 Precast concrete louver or screen blocks

Precast concrete louver or screen blocks shall comply in all respects with the specification for precast items contained in the preambles to 'Concrete Work', and shall be constructed to the dimensions and form shown in the drawings.

G.11 Clay Bricks

All clay bricks shall be obtained from a manufacturing source specified by the Architect in writing, or where not so specified, approved by him in writing, and complying with BS 3921.

All bricks incorporated into the works shall be properly burnt, clean, and hard, of well defined arris, uniform in shape and as near uniform in colour as possible. Bricks to be used for face work shall be selected to the Architect's approval.

- G.24 Stone pitching
- G.25 Stone walling
- G.26 Putting holes
- G.27 Chases
- G.28 Method of measurement

(d) Board marked finish (Contd)

Such formwork to column faces shall be continuous length boards between construction joints.

End joints will be permitted to beam faces, etc. and shall be tongued, staggered and well distributed.

The resulting concrete shall clearly show grain and individual board marks, be free from honey-combing and excessive air holes, of uniform colour and to the entire satisfaction of the Architect.

F.46 Method of measurement

Prices are to include for working concrete around pipes and electric conduits or cable, including provision for support of same while concrete is placed.

The prices for insitu work are to include for filling into, or on to, formwork where necessary, and where concrete is described as reinforced for well tamping reinforcement. Unless otherwise described, all formwork and reinforcement are measured separately.

Prices for precast concrete work; including items described as precast or insitu, shall include for all moulds, for hoisting and for placing in position, bedding, jointing or building in with cement mortar.

All reinforcing bars are of round section unless otherwise stated and no allowance has, or will be, made for rolling margin.

Prices for holes shall include for them being on racks where so required and shall include the necessary holes through formwork.

The cost of all construction joints, as described herein and not specifically shown on the drawings and measured separately in this Document, shall be deemed to be included in the rates set against the other items in this Document.

The cost of providing all samples described herein shall be deemed to be included in the contract sum.

The cost of performing all tests described herein shall be deemed to be included in the contract sum except the net invoiced cost of testing items or samples at authorized testing laboratories as instructed by the Architect or Engineer, which costs will be reimbursed from the Provisional Sum included elsewhere in this document.

Timber purchased for the fabrication of formwork will be regarded as construction plant and will not be paid for as materials on site.



#### F.42 Tests of completed structural members

The engineer shall instruct that a loading test be made on the works, or any part thereof, if in his opinion such a test be deemed necessary for one or more of the following reasons:-

- (a) the site-made concrete test cubes failing to attain the specified strength
- (b) the shuttering being prematurely removed
- (c) overloading during construction of the works, or part thereof.
- (d) Concrete improperly cured.
- (e) Any other circumstances attributable to alleged negligence on the part of the Contractor which, in the opinion of the Engineer, may result in the works, or part thereof, being less than the required strength.

If the loading test be instructed to be made solely, or in part, for one or more of the reasons mentioned above, the test shall be made at the Contractor's own cost. If a test be instructed to be made for any other reason than specifically stated above, the contractor shall make the test and shall be reimbursed for all costs relating thereto.

Loading tests are to be in conformity with clause 605 of British Standard Code of practice CP114/1969.

If the result of the loading test be not satisfactory, the engineer shall instruct that the part of the works concerned shall be taken down or removed and reconstructed to comply with this specification, or that such other remedial measures shall be taken as to make the works secure.

If the test be instructed to be made for one or more of the reasons (a) to (e) inclusive as hereinbefore specified, the contractor shall take down or remove and reconstruct the defective work, or shall take the remedial measure instructed, all at his own cost.

#### F.43 Protection

All insitu and precast concrete shall be protected from rain and during hot, dry and windy weather approved Hessian covering kept constantly damp shall be used to prevent premature drying out. All insitu and precast concrete shall be protected from damage by disturbance, shock vibrations, early loading or overloading. In addition, all exposed finishes shall be constantly protected from mechanical damage to arises or face and damage due to dropping, splashing and staining from any source including rusty scaffolding or reinforcement.

No materials or equipment of any kind shall be stored or stacked on suspended floors without the Engineer's prior approve.

#### F.44 Precast concrete

Concrete shall all be cast in properly made strong moulds to form shapes required. For work described as "finished fair" the moulds shall be lined with sheet iron or other approved materials.

The coarse aggregate for precast concrete shall be of the sizes described.

The concrete shall be of the mixes described and shall be thoroughly tamped in the moulds and shall not be removed from them until seven days after placing the concrete, but the sides may be removed after three days providing the moulds are such that the sides are easily removable without damaging the concrete.

The precast work shall be cast under sheds and shall remain under same for seven days in the moulds and a further seven days after removal from the moulds. During the whole of this period the concrete shall be shielded by sacking or other approved material kept wet. It shall then be removed from the sheds and stacked in the open for at least seven days to seasons. (Cont'd.)

#### F.37 Waterproof concrete (Cont'd.)

All permanent construction joints shall be constructed in accordance with the drawings and specifications to achieve complete water tightness.

It shall be the Contractor's responsibility to ensure that all structures required to be constructed in waterproof concrete are completely watertight and any work found to be defective shall be made good to the Architect's satisfaction at the Contractor's expenses.

- Where waterproof concrete forms a water retaining structure it is to be tested by filling with water for a period of not less than four days. Any percolation or porous concrete or leaking joint is to be made good at the Contractor's expense. Tanks and pools constructed below ground level are not to be backfilled prior to the satisfactory completion of this test.

#### F.38 Construction joints

All contraction joints shall be straight, truly vertical or level, as the cast may be, of the profile shown and formed in the exact positions shown on drawings or if not shown on the drawings, with prior approval of the Engineer. Vertical joints shall be formed against adequately secured rigid stop boards having splayed fillets, designed to pass the continuous steel reinforcement without temporary bending or displacement.

The rate and method of placing concrete and the arrangement of construction joints shall be placed in a continuous operation.

Joints in reinforced slabs, joists and beams, shall be perpendicular to the axis or surface of the member jointed and at the center of the span. If an intersecting member occurs at that point, the joint shall be located at a point of minimum shear.

Construction joints in columns shall be as shown on the drawings. Whenever it becomes necessary to stop work, such stops shall be located at center of slabs and of beams or as directed by the Engineer.

An adequate and acceptable key for succeeding work shall be formed by using stop boards which shall be constructed tightly to prevent any grout leak. As early as possible boards shall be removed and the surface thoroughly hacked and brushed to remove all laitance. Any leakage past stop boards shall be hacked off as soon as the concrete has set. The surface shall be left clean and dry. Immediately prior to further concreting the joint face shall be soaked with water and covered with sand cement mortar of proportions identical to that in the concrete to be placed, punned into the body of the set concrete.

For exposed finishes, care shall be exercised to preserve an unbroken line at the exposed edge of the joint.

In no circumstances shall the concrete be allowed to finish at a break running down a rough slope. Such cases, if found, will be treated as contrary to the specification and the Contractor will be required to cut out the member and re-cast. In the case of horizontal joints, any excess water and laitance shall be removed from the surface after the concrete is deposited and before it has set.

Before casting slabs the haunching or seating for the slab shall be thoroughly hacked, sourced and washed and covered with at least 5 mm of mortar immediately before the slab is cast.

Any necessary construction joints in foundations shall be stepped and lapped 600 mm. Joint faces shall be prepared and treated as described, above

### F.33 Tolerances

The maximum tolerances within concrete work shall be constructed are as follows:-

- |  |           |
|--|-----------|
| 1. All setting out dimensions, and dimensions<br>Horizontally and vertically | +/- 5 mm  |
| 2. Sections of concrete member   | +/- 3 mm  |
| 3. Levels of floor slabs, beams, lintels etc<br>(top and bottom)             | +/- 5 mm  |
| 4. Plumb of columns and walls in storey height                               | +/- 5 mm  |
| 5. Plumb of columns and walls in full building<br>Height                     | +/- 20 mm |
| 6. Inside faces of lift shafts in storey height                              | +/- 5 mm  |
| 7. Inside faces of lifts in full building<br>Height.                         | +/- 15 mm |
| 8. Concrete cover to reinforcement   | +/- 3 mm  |

No surface intended to be horizontal or vertical shall slope more than 2 mm in 1 meter.

Any rectification of work not constructed to the tolerance set out above, shall be entirely at the responsibility and expense of the contractor.

### F.34 Placing and compaction

No traffic whatsoever, wheeled or foot, shall take place over reinforcement or placed concrete and the contractor shall provide all necessary stools, walkways, platforms and barrow runs. Concrete shall be placed in its final position as rapidly as practicable by methods which preclude segregation or loss of ingredients and in any case, within 30 minutes from the time that water is added to the mix; compaction shall be completed before initial set commences. Partially set concrete shall not be re-worked or used. "Flowing" in formwork shall be avoided by placing and compacting in shallow layers in quick succession.

Concrete shall be placed into the forms as less a height as possible and shall in no case be dropped from a height of more than 1500 mm except with the approval of the Engineer.

When chuting is used, the inclination of the chute must be such as to allow the concrete to flow without the use of excessive water and without segregation or loss of the ingredients. Details of any proposed chuting plant must be approved by the Engineer before the plant is delivered to the site.

If the contractor wishes to distribute concrete by means of pumps, full details of the system must be made available to the Engineer for approval.

Concrete shall be thoroughly compacted and carefully worked, with suitable tools, into formwork and round reinforcement and fixtures so as to avoid displacement. A competent steel fixer shall attend throughout concreting to correct any unavoidable displacement.

Compaction shall be by means of vibrations, these shall be of an approved pattern, of the immersion type, and clamp-on external vibrators in adequate numbers shall be used only where the density of reinforcement precludes immersion.

Attachment to reinforcement is expressly forbidden and accidental contact with reinforcement (Cont'd.)

The amount of water shall be the minimum required to produce a dense cohesive concrete of adequate workability, to be determined by trial mixes. This amount shall be accurately gauged and adjusted from time to time to compensate for variations in moisture content of the aggregate by an approved method.

All concrete shall be mixed in a batch type mechanical mixer of approved type having a drum rotating about a horizontal or inclined axis. The speed of the drum is to be not more than twenty and not less than fourteen revolutions per minute.

Each mixer is to be fitted with a water measuring device capable of accurate measurement to five litres for one cubic meter mixers and proportionate for smaller sizes and so arranged that the accuracy is not affected by variations in the pressure of the water supply line. The fine and coarse aggregate and the cement shall be mixed for at least four turns, after which the required amount of water shall be added gradually while the mixer is in motion and the concrete mixed for not less than one and a half minutes to uniform colour and consistency.

The volume of concrete mixed in any one batch is not to exceed the rated capacity of the mixer.

The whole of the mixed batch is to be removed before materials for a fresh batch enter the drum.

Concrete as mixed in accordance with the foregoing shall not be modified by the addition of further water or in any other manner. On the cessation of work, including all stoppages exceeding twenty minutes, or any change of type of cement used in the mix, the mixer and all handling plant shall be washed out with clean water.

At least one slump test shall be made each day concreting is in progress, under the supervision of the Engineer.

### F.30 Reinforcement

Reinforcement shall be free from all loose mill scale, loose rust, oil, grease or similar defects, immediately before placing the concrete. It shall be bent cold exactly to detail using an approved bending machine. Hooks, bobs, bends, etc. where not, specifically detailed, and are to be in accordance with B.S. 4466 and B.S. 4449. Each bundle of bent bars shall be clearly tagged with the bar list number.

Reinforcement shall be placed in the exact position shown on drawings with all inter-sections tack welded or securely tied with 16 gauge soft iron tying wire. The designated cover shall be maintained by approved spacers, chairs, bolsters or ties fixed to the reinforcement. These shall be dense concrete left with a wire brushed surface or be dipped in grout before fixing. These blocks are particularly important where the surface of the concrete is exposed to the weather or dampness. The contractor must ensure that the bars are securely fixed so as to maintain their indicated positions during the progress of pouring, tamping or vibration of concrete. Six chairs are to be provided around each column to hold top steel in position and chairs are to be made up of mild steel bars of adequate diameter. The cost of providing and fixing these steel chairs must be allowed for by the contractor in his rates for reinforcement generally. No laps or splices in bars shall be made except for those detailed on the drawings without prior approval of the Engineer.

The size and position of the reinforcing bars or mesh shall be approved by the Engineer before concreting commence. The insertion of reinforcement into concrete already placed the lengthening of bars by welding and the rebinding of incorrectly bent bars will not be permitted.

For concrete having exposed surfaces, reinforcement shall be assembled and placed in such a manner as to avoid any damage to formwork faces.

Where reinforced concrete slabs or walls are constructed against tanking, care shall be taken in positioning reinforcement to avoid damage to tanking.

Unless otherwise shown upon the Engineer's drawings, or specified in BS 8110, the reinforcement bars shall be given the following cover to concrete. (Cont'd.)

## STRUCTURAL STEELWORK

### GENERALLY

#### N.1 Standard of construction

The whole of the structural steelwork and testing shall comply with the relevant clauses of B.S. 449 and B.S 5950.

#### N.2 Fabrication by specialist firm

The steelwork shall be fabricated by a specialist firm and, before an order is placed by the Contractor; such specialist firm shall be approved by the Architect.

#### N.3 Contractor to submit drawings

The Contractor shall include for the preparation of all shop details from the drawings supplied by the Architect. All such details shall be approved in writing by the Architect before the work is put in hand. Every drawing shall show the number and sizes of all bolts, complete details of welds, and type of electrodes, welding procedure, whether the welds are to be made in the shop or elsewhere and any other relevant information.

#### N.4 Accuracy of drawings

The Contractor shall be responsible for the correctness of his shop details, for shop fittings and site connections.

#### N.5 Erection scheme

The Contractor shall submit to the Architect for approval, drawings showing the proposed erection scheme, together with all calculation for erection stresses, etc. The approval by the Architect will not absolve the Contractor in any way from responsibility.

#### N.6 Dimensions to be verified

The Contractor shall take the dimensions from the site or buildings and shall verify all dimensions given on the drawings before the work is put in hand.

#### N.7 Copies of orders

A copy of all orders for materials shall be supplied by the Contractor to the Architect at the time of ordering, for identification purposes.

#### N.8 Damage

Any damage to materials on the site due to inadequate precautions being taken during the erection of the steelwork shall be made good to the satisfaction of the Architect at the Contractor's expense.

N.17 Generally -

The whole of the fabrication and erection of the steelwork shall be carried out in accordance with B.S 449 Part 2.

The welding of steel to B.S. 4360 Part 2 must conform to:

B.S. 5135 - "General requirements for the metal - arc welding of mild steel" as applicable.

For welding any particular type of joint the contractor shall provide evidence acceptable to the Architect that the welder has satisfactorily completed the appropriate tests as described in B.S. 449, Part 2. Any welder's tests shall be made at the Contractor's expense and shall include the cost of any fees incurred by the Employer for witnessing of, or making such tests. The right is reserved to make non-destructive tests on the welding to determine if the welding conforms to the standards laid down in B.S 5135 as applicable.

N.18 Rejection

Any portion of the work which, in the opinion of the Architect is not in accordance with the drawings or specification shall be rejected whether before or after delivery and must be removed, from the site if delivered, within 24 hours from receipt of such notice of rejection at the Contractor's expense. Any delay caused by such rejection will not in any way relieve the Contractor from his responsibility with regard to the provisions of the Contract. If any welding is found to be defective the cost of all remedial measures shall be borne by the Contractor, including the cost of re-testing. The contractor is responsible for the good quality of all welding work and no exceptions to be made on the grounds that the Architect or his representative have inspected any part or parts of work at some stage during production.

N.19 Fabrication

As much of the work of fabrication of the steelwork as is reasonable practicable shall be completed in the manufacturer's works. Field connection shall be made in accordance with the approved drawings. The Contractor shall give four days clear notice of steelwork ready for inspection at the manufacturer's works, to facilitate inspection before delivery.

N.20 Cost of temporary erection, etc

Trial erection of principal or other units may be called for at the discretion of the Architect or his representative.

The cost of any necessary temporary erection, testing, packing, marking, carriage and delivery, is deemed to be included by the Contractor in the tender price.

N.21 Joints and connection

No variation of the number, type or position of the joints or connections shown on the drawings shall be made without the consent of the Architect. If such consent is desired the Contractor shall submit detailed drawings of the proposed joints for the approval of the Architect and no extra cost incurred by reason of such additions or alterations will be allowed to the Contractor.

## METALWORK

### LIST OF CLAUSES

#### QUALIFICATIONS OF THE RULES OF THE SMM

- P.1 Backgrounds
- P.2 Preparation for welding
- P.3 Fixing by bolting, etc.

#### DEFINITIONS

- P.4 Holes for attachments
- P.5 Welding

#### GENERALLY

- P.6 Shop drawings
- P.7 Standard of construction for structural work
- P.8 Fabrication of structural metalwork
- P.9 Shop details for structural work
- P.10 Accuracy of drawings
- P.11 Dimensions to be verified

#### MATERIALS

- P.12 Steel for general metalwork
- P.13 Steel for structural metalwork
- P.14 Cast iron
- P.15 Galvanized work
- P.16 Bolts and nuts
- P.17 Aluminium

#### WORKMANSHIP

- P.18 Smithing, etc,
- P.19 Forging
- P.20 Welding
- P.21 Structural work generally
- P.22 Rejection

## METALWORK

### QUALIFICATION OF THE RULES OF THE SMM

#### P.1 Backgrounds

Notwithstanding the provisions SMM Clause P.1 (a) (iii) the background or support to which metalwork is fixed shall be deemed to be any background compatible with the method of fixing given in the descriptions.

#### P.2 Preparation for welding

Notwithstanding the provisions of SMM Clause P.1 (d) (iii), description of work required to be welded and ground to smooth finish shall be deemed to include the preparation of the members.

#### P.3 Fixing by bolting, etc.

Notwithstanding the provisions of S.M.M. Clause A.3 (b) (iii), the term 'fixing by' used in conjunction with any method of fixing shall not be deemed to include any fixing materials but shall be interpreted as a definition of fixing method only.

### DEFINITIONS

#### P.4 Holes for attachments

Where lugs or other subsidiary members are given in the description of main members of plates, bars, holes required for the screws, bolts or rivets by which the subsidiary members are attached to the main members shall be deemed to be included.

#### P.5 Welding

In the absence of specific requirements the techniques and materials employed in welding shall be selected with due regard to the character of the work and the metals being connected.

### GENERALLY

#### P.6 Shop drawings

The Contractor shall submit complete shop drawings as and when required by the Architect for his approval.

#### P.7 Standard of construction for structural work

Structural metalwork and testing shall comply with the relevant clauses of B.S. 449.

#### P.8 Fabrication of structural metalwork

Structural metalwork shall be fabricated by a specialist firms and, before an order is placed by the Contractor such specialist firm shall be approved in writing by the Architect.

#### P.9 Shop details for structural work

The Contractor shall include for the preparation of all shop details for structural work from the drawings supplied by the Architect. All such details shall be approved in writing, by the Architect before the work is put in hand. Every drawing shall show the number and sizes of all rivets and bolts, complete details of welds, type of electrodes, welding procedure, whether the welds are to be made in the shop or elsewhere and other relevant information.



P.17 Aluminium

Wrought aluminium shall be of the alloys described and shall comply with the following:-

|                                  |             |
|----------------------------------|-------------|
| Plate, sheet and strip           | - B.S. 1470 |
| Drawn tube                       | - B.S. 1471 |
| Extruded round tube and          |             |
| Hollow sections, bars and rods - | B.S. 1474   |

WORKMANSHIP

P.18 Smithing, etc

All smithing and bending shall be soundly and neatly executed, care being taken not to overheat.

P.19 Forging

All straps, bolts and similar work shall be forged neat and clean from the anvil.

P.29 Welding

The work 'welded' is to be understood to include the normal trade methods of jointing metals using an oxyacetylene torch, rod and flux. The joints shall be made so that they will transmit the loads and resist the stresses to which they will be subjected. All excess metal is to be filed down and smoothed off to a workmanlike finish to the approval of the Architect. The materials employed in welding shall be selected with due regard to the character of the work and the metals being connected.

P.21 Structural work generally

The whole of the fabrication and erection of the structural metalwork shall be carried out in accordance with B.S. 4360 Part 2. The welding of steel to B.S. 4360 must conform to :-

B.S. 1140 - "Resistance spot welding of uncoated and coated low carbon steel"

Or

B.S. 5135 - "metal arc welding of carbon and carbon manganese steels" as applicable.

For welding any particular type of joints the Contractor shall provide evidence acceptable to the Architect that the welder has satisfactorily completed the appropriate tests as described in B.S. 449, Part 2, Chapter 6. Any welder's tests shall be made at the Contractor's expenses and shall include the cost of any fees incurred by the Employer for witnessing of, or making such tests.

P.22 Rejection

Any portion of the work which, in the opinion of the Architect is not in accordance with the drawings or specification shall be rejected whether before or after delivery and must be removed from the site if delivered, within 24 hours from receipt of such notice of rejection at the Contractor's expense. Any delay caused by such rejection will not in any way relieve the Contractor from his responsibility with regard to the provisions of the Contract.

# PLUMBING INSTALLATIONS

## LIST OF CLAUSES

### QUALIFICATIONS OF THE RULES OF THE SMM

- Q.1 Jointing pipes
- Q.2 Provision of holes

### DEFINITIONS

- Q.3 Painting
- Q.4 Welding
- Q.5 Backgrounds requiring plugging
- Q.6 Plugging
- Q.7 Surface finishes
- Q.8 Pipe sizes

### GENERALLY

- Q. 9 Execution of plumbing work

### RAINWATER INSTALLATION

- Q.10 Plastic pipes and fittings
- Q.11 Galvanized steel tubes and fittings
- Q.12 Rainwater outlets
- Q.13 Testing

### SANITARY INSTALLATION

- Q.14 Bye-Laws
- Q.15 Setting out
- Q.16 Spun-cast iron pipes, cast iron fittings and accessories
- Q.17 Galvanized steel tubes and fittings
- Q.18 Plastic pipes and fittings
- Q.19 Sleeves
- Q.20 Brackets and hangers
- Q.21 Wire balloons
- Q.22 Appliances

Specification  
Plumbing Installation

## PLUMBING INSTALLATIONS

### QUALIFICATIONS OF THE RULES OF THE SMM

#### Q.1 Joining pipes

Notwithstanding the provisions of SMM Clause Q.9 (b), the prices for all galvanized steel screwed pipes shall be deemed to include for joining with hemp and red lead or 'Boss' white unless otherwise described and the prices for all cast iron pipes shall be deemed to include for joining with a gasket of hemp and cold caulking compound unless otherwise described.

#### Q.2 Provision of holes

Notwithstanding the provision of SMM Clause Q.1 (g), the provision of holes shall be deemed to be included in the description of fixing.

### DEFINITIONS

#### Q.3 Painting

The preparation of surfaces shall be deemed to be included with the description for painting. Specific requirements relating to the preparation of surfaces are given in the WORKMANSHIP section or these Preambles. In the absence of specific requirement surfaces shall be prepared in the manner recommended by the manufacturer of the paint being used.

#### Q.4 Welding

In the absence of specific requirements the techniques and material the work and the metals being connected.

#### Q.5 Backgrounds requiring plugging

The term 'backgrounds requiring plugging' shall mean any or all of the backgrounds described in SMM Clause Q.1 (h)(iv), and shall be deemed to include the associated plugging.

#### Q.6 Plugging

The term 'plugging' shall mean provision and fixing of hardwood or approved proprietary plugs, or, at the Contractor's option, fixing by means of a cartridge operated rivet gun or other approved mechanical means.

#### Q.7 Surface finishes

In the absence of specific requirements, the treatment and finish of pipe fittings shall be appropriate to finish of the pipes with which they are associated."

#### Q.8 Pipes sizes

The sizes of the pipe shall be the diameter of the bore.

### GENERALLY

#### Q.9 Execution of plumbing work

All plumbing work shall be executed in accordance with the best principles of modern practice by a firm of fully qualified and registered plumbers. The Contractor shall obtain the Architect written approval to the firm he proposed to employ before the plumbing works are commenced. (Cont'd.)

## SANITARY INSTALLATION

### Q.14 Bye-Laws

All the work shall comply with the requirements of the Local Council Bye-Laws and drainage regulations, and shall be executed to the satisfaction of the Architect and the Local Authority.

### Q.15 Setting-out

The position of all pipe runs, including joints and connections, holes and the like, shall be agreed with the Architect before work is commenced.

### Q.16 Spun cast iron pipes, cast iron fittings and accessories

Spun cast iron pipes and sand cast iron fittings shall comply with B.S. 416 for medium grade coated pipes and fittings. Sockets and spigots shall be type B on pipes and type A on fittings.

Access – doors shall be oval type with asbestos washers and manganese bronze bolts.

Jointing - pipes and fittings shall be jointed with a gasket of hemp and tightly caulked cold caulking compound.

Fixing – except where adequately restrained and supported by being built in, all pipes and fittings shall be fixed with one holderbat to each socket. Pipes less than 75 mm diameter shall be fixed 25 mm clear of walls and those 75 mm diameter and over 40 mm clear of walls. Holderbats shall comply with B.S. 416 Table 21.

### Q.17 Galvanized steel tubes and fittings

Galvanized steel tubing shall comply with B.S. 1387 "medium" grade with galvanized reinforced malleable cast iron fittings complying with B.S. 143 and 1256, with B.S. 1256 threads.

Jointing - tubing and fittings shall be seam-jointed using hemp and red lead putty or 'Boss' white.

Fixing - tubes shall be fixed clear of walls or soffits, with galvanized malleable iron brackets complying with B.S. 1494 Table 6a (or with hangers or special fixing where so described), spaced at not more than 3 metre centers.

### Q.18 Plastic pipes and fittings

Soil, waste and ventilating pipes, fittings and accessories shall be obtained from manufacturing source approved by the Architect in writing to comply with B.S. 4514 in manufacturer screwed to hardwood plugs with galvanized screws and jointed in accordance with the manufacturer's instructions.

Waste and ant-syphonage pipes below 54 mm in diameter shall comply with B.S. 5255.

### Q.19 Sleeves

All drains passing through walls or foundations shall have sleeves of cast iron pipe of sufficient size to allow a 3 mm clearance round the drain.

### Q.20 Brackets and hangers

Brackets for supporting horizontal drains from walls or beams, shall be of 75 mm x 75 mm x 10 mm coated steel tee with one end rounded up and of sufficient for the other end to be built in for a depth of 225 mm. (contd)

Q.26 Galvanized steel tubes and fittings (Cont'd.)

Spacing of fixing

| <u>Size of pipe</u> | <u>Maximum spacing in meter</u> |
|---------------------|---------------------------------|
| 13 mm               | 2.00                            |
| 19 mm               | 2.50                            |
| 25 mm to 50 mm      | 3.00                            |
| over to 50 mm       | 3.50                            |

Q.27 Pipe work generally

Pipes shall be the maximum lengths possible to avoid unnecessary jointing. Pipes shall be fixed to sufficient falls to prevent air locks and to enable the system to be drained.

Q.28 Sleeves

Where sleeves are required for pipes passing through concrete, or block work, they shall be of galvanized steel tube of sufficient diameter to give at least 3 mm clearance around the pipe.

Q.29 Pipe work ancillaries

Drainage taps with loose keys shall comply with B.S. 2879.

Ball valves shall be 'Portsmouth' type complying with B.S 1212 for high or low pressure as described fitted with a silence tube drilled with a 6 mm hole above the level of the overflow warning pipe. Floats not exceeding 150 mm diameter shall be plastic type complying with B.S 1968 Clause.

Bib-taps shall comply with B.S. 1010 and shall be of brass with fixed jumpers and where so described shall be chromium plated or shall have nozzle screwed for hose union and locking arm.

Stop valves shall comply with B.S 1010 and shall be of brass with crutch handles or loose key where as described. Those in exposed positions shall have polished brass bodies.

Gate, check and globe valves shall comply with B.S 5154 and shall be of plate of approved manufacture complete with cover with inspection manhole. Tanks shall be assembled entirely in accordance with the manufacturer's written instructions.

Storage cisterns shall comply with B.S.417, Part 2, Grade A, galvanized with one piece galvanized covers.

Q.31 Testing

Clean out storage cisterns and tanks, including removal of all swarf, fill and test the whole of the hot and cold water installations, rectify all defects, drain and leave in a clean, serviceable condition.

## GENERALLY

### R.1 Bye – laws

The entire installations are to be carried out in accordance with the latest edition of "Regulations for the Electrical Equipment of Buildings published by the Institution of Electrical Engineers (I.E.E.), London and TANESCO special regulations.

The entire installations shall conform in every respect with the regulations and requirements of TANESCO, as applied to the present electrical installation and of the P. & T. and all other Public Authorities having jurisdiction in respect of these installations.

### R.2 Inspection of the site of the works

The Contractor shall be deemed to have inspected the site of the works to completely ascertain the nature of, and the particular conditions under which, the Electrical Works shall be carried out and shall be further deemed to have obtained all other information required for the proper carrying out of the said works to the approval of TANESCO.

### R.3 Definitions

Definitions of terms used herein: "Work": labour, materials, equipment, controls, accessories and all other items customarily furnished and/or required for proper and complete installation and testing of work.

"Wiring": conduit, fittings, wire, junctions, connections, pull and outlet boxes, switches, motor starters, cut-outs and sockets and all items necessary or required in connection with, or relating to, such wiring. "Concealed": embedded or closed masonry, concrete or other construction as approved.

"Exposed": not installed underground or "concealed".

"Noted": as indicated on drawings and/or specified.

"Indicated" or "Shown": as revealed on the drawings

"Similar" or "Equal": equal in kind, quality and function and of approved manufacturer.

### R.4 Earthing

Provide earthing for the entire electrical installation as indicated on the drawings and specified herein.

Include, but not necessarily limited to, requiring earthing are the followings:

- (i) Conductor enclosures.
- (ii) Panel boards
- (iii) Non-current-carrying metal parts of fixed equipments such as motor starters and instrument cases,
- (iv) Water piping.

Install earthing conductor and earthing electrodes of approved type, size, number, depth and location so that resistance to ground shall not exceed two (2) Ohms.

Size and type of earthing conductors, earthing wires (in the plastic conduits), earthing clamps, bonding jumpers, conduit, fittings as well as methods of fixing same to obtain electrical continuity and effective earthing shall be as per section 4 of "Regular for the Electrical Equipment of Building" of the I.E.E. (Contd)



R.9 Wires and cables (Cont'd.)

Conductor for wiring throughout the building shall be copper single core, P.V.C. (polyvinyl chloride) insulated, 660 v grades, conduit type, in form of single core or multicore as shown on drawings.

Earthing conductors shall be insulated copper, standard soft annealed.

Main feeder cables shall be Cooper PVC SWA PVC 600 v grade.

Cable lugs: Solder less pressure, single or multiple conductor straight or angle type, as required.

Feeder cables and conductors shall have size not less than 2.5 sq.m for circuits 35 m. Or less and not less than 4.00 sq.m for circuits more than 35 m. Long, or where specially indicated that Long, or where specially indicated.

R.10 Handling

Cables shall at all times be handled with care and every effort made to avoid damage.

Unloading, rolling to position and mounting of cable drums shall be carried out efficiently and carefully in the recognized manner and cable shall be pulled from the top of drum and twisting shall at all times be avoided.

Adequate provision of drum jacks, rollers and other handling accessories shall be used and make-shift arrangements will not be tolerated. In all cases care shall be taken to break the rotation of the drum and cable shall not be dragged over loose earth, concrete or any surface but shall be adequately supported on rollers or man-handled into position.

The contractor shall take particular care to avoid damage to other services which may run adjacent to or across the route of the cable being installed.

R.11 Clearance to other equipment

Cables shall be installed within a minimum of 200 mm clearance of any equipment or pipe work including lagging associated with other services. Where this condition is unavoidable or difficult to maintain, the engineers shall be informed prior to the installation being commenced, otherwise the Contractor may be called upon to divert or adjust the route of any cable so affected.

Cables in trenches are to be laid at a minimum depth of 0.6 m for main cables and 0.75 m for 11 KV cables and are to be on a 100 mm bed of sifted soil or sand and a further 100 mm shall be added before laying cable covers in position. The sand bedding and covering will be carried out by the Contractor.

When laid in trenches the cables are to be completely protected by interlocking concrete or other approved cable covers.

R.12 Distributions panel boards

Automatic circuit breaker panel boards, complete with their enclosing cabinets shall be installed conforming to detailed specifications as hereinafter listed.

The enclosing cabinet shall be manufactured from code gauge, galvanized sheet steel, with corners lapped and riveted, or fastened by other approved standard methods. Trims and doors shall be manufactured from one piece of full finished sheet steel not less than 12 s.w.g. not galvanized. Panel boards shall be surface- mounted or recess- mounted as indicated on the drawings.

Directory card with frame and transparent cover on each panel board to indicate designation or the circuits.  
(Cont'd.)

## R.19 Switches and socket outlets

Fasten switches and socket outlets to boxes firmly so that they do not depend on cover plates to pull them tight.

Light switches to be located near the door on side opposite hinge except where otherwise indicated. Wherever possible to be grouped in a gang cover plate. Verify final door hinge location in field prior to switch boxes installation.

Socket outlet circuits shall be independent of light circuits.

Mounting height: Unless otherwise noted on the drawings electric devices shall be located with their center line at the following elevations above finished floor:

|                     |                      |
|---------------------|----------------------|
| Light switches      | 1.20 m               |
| Socket outlets      | 0.45 m               |
| Water heater switch | 1.80 m               |
| Lighting fixtures   | as shown on drawings |
| Wall brackets       | 2.10 m               |

## R.20 Panel boards

Install where shown on drawings automatic circuit breaker panel boards complete with their enclosing cabinet.

All cabinets shall be painted with one primer coat and at least one finish coat.

All panel boards shall be earthed.

## R.21 Lighting fittings

Install lighting fittings complete with lamps as scheduled on drawings. The contractor shall be responsible for all fitting, wiring, hanging, connecting up and making ready to operate.

The lighting fittings as shown on schedule are listed by manufacturer's catalogue not for the purpose of indicating by general type, style and quality required. Similar from other manufactures may be provided by the Client.

Where manufacturer's catalogue numbers are not noted the Contractor shall propose lighting fitting, of design shown, for the Client's procurement.

Fluorescent type fixtures shall be provided with single or double lamp ballasts of the high power factor type and low level sound.

Incandescent light fixtures shall be equipped with English bayonet lamp holders, heavy duty type.

Flexi glass and similar plastic diffusing material shall be guaranteed against cracking, marring and discoloration for five years.

## R.22 Telephone system

Install required network of empty conduit, terminating in the telephone outlet box as shown on the drawings.

Contractor shall be responsible for coordinating this installation with the TTCL.



## FLOOR, WALL & CEILING FINISHING

### LIST OF CLAUSES

#### PLASTERWORK

- S.1 Generally
- S.2 Cement
- S.3 Lime putty
- S.4 Sands
- S.5 Water
- S.6 Storage of materials
- S.7 Testing
- S.8 Preparation of surfaces
- S.9 Dubbing out
- S.10 Mixing of materials
- S.11 Period between coats
- S.12 Finish
- S.13 Junctions of wall and ceiling
- S.14 Arrises

#### BEDS AND BACKINGS

- S.15 Materials, storage, testing and mixing of materials
- S.16 Light weight roof screed
- S.17 Cement and sand proportions
- S.18 Preparation of surfaces
- S.19 Laying
- S.20 Surfaces of beds and backings

#### OTHER INSITU FINISHING

- S.21 Materials, storage, testing and fixing of materials
- S.22 Water proofers
- S.23 Integral hardeners

#### Specification

#### Floor, Wall & Ceiling finishings

PLASTERWORK

S.1 Generally

Render, both internal and external shall be cement and sand in the proportions 1:4 finished to thickness specified.

Plaster shall consist of an undercoat of 1 part cement to 4 parts sand by volume and 5% lime putty, and a finishing coat of 1 part cement to 1 part sand to 5 parts lime putty. Each coat shall be finished to the thickness specified.

S.2 Cement

Cement shall be ordinary Portland cement and shall comply with B.S 12. White and coloured cements shall comply with B.S 12 and be obtained from an approved manufacturer.

S.3 Lime putty

Lime putty shall be prepared from hydrated lime complying with B.S 890.

Hydrated lime shall be added to water, stirred to a creamy consistency and left to mature for at least 16 hours before use.

Alternatively, ready slaked lime may be obtained from an approved source.

The lime putty shall be protected from drying out.

S.5 Sands

Sand for cement and lime mixes shall comply with B.S 1199. Table I.

Sand for use with white Portland cement shall be silver sand and that for use in coloured cement mixes shall be of a suitable colour.

S.6 Storage of materials

All plasters, lime and cement, shall be stored in a properly roofed, weatherproof, dry, well ventilated shed, use exclusively for this purpose, with a wood floor not less than 150 mm clear above the ground. All sands shall be stored separately, according to type, on clear, hard, dry standing and shall be protected from contamination.

S.7 Testing

Samples of all materials, as directed, shall be taken from time to time as required by the Architect.

All defective materials shall be removed from the site without delay, at the Contractor's expense.

#### S.16 Light weight roof screed

Light weight roof screed shall consist of one part cement to eight parts vermiculite aggregate, laid to falls as necessary and shall be covered with a minimum of 12 mm cement and sand (1:4) screed finished to suit the requirements of the particular finishing.

All junctions between horizontal and vertical surfaces to roofs shall be finished with a triangular angle fillet of the sizes described.

Light weight roof screen shall be cured properly for 7 days, and shall be thoroughly and completely dry before any finishing are applied.

#### S.17 Cement and sand proportions

Cement and sand shall be in the proportions of 1:3 or 1:4, as specified by volume.

#### S.18 Preparation of surfaces

Walls shall be prepared as described for 'Plasterwork' concrete floors or roofs to receive screeds or paving shall be hacked where necessary to remove concrete mortar or plaster droppings and to expose the coarse aggregate and well brushed to remove all loose particles and dirt.

Concrete floors and roofs shall be wetted before screeds or paving are laid, with a cement sand slurry (1:1) being scrubbed into the surface in front of the screed or paving laying.

#### S.19 Laying

Beds and backings shall be laid in bays of suitable lengths and widths and to falls where so shown with proper screeds and shall be kept wet and protected until set hard.

#### S.20 Surface of beds and backings

Screeded beds for insitu floor finishings or floor finishings bedded in mortar shall be left rough from the screeding boards.

Floated beds for inflexible floor finishings bedded in mastic, shall be left with a plain un-textured surface.

Trowelled backings for finishing by specialists shall be to the approval of the specialist Sub-Contractor

#### OTHER INSITU FINISHING

#### S.21 Materials, storage, testing and mixing of materials

Cement, sand, water, etc., storage, testing and mixing of materials, shall be as described for 'Plasterwork'.

#### S.22 Water roofers

Water roofers shall be 'Sealocrete' double strength premix, or other approved integral waterproofed, used in accordance with the manufacturers' instructions.

#### S.23 Integral hardeners

Integral hardener shall be 'Febspeed Plus' or other approved, used in accordance with the manufacturers' instructions.

#### Specification

#### Floor, Wall & Ceiling Finishing

#### S.29 Tyrolean finish

Tyrolean finish shall be applied by machine in accordance with the instructions issued by the Cement Marketing Company. The colour of the cement shall be as selected by the Architect. If required to do so by the Architect, the Contractor shall provide a sample panel or panels of Tyrolean finish the cost of which shall be deemed to be included in the Contract Sum. All adjoining areas and finishing shall be masked and protected so as to prevent staining whilst applying the Tyrolean finish.

#### TILE, SLAB AND BLOCK FINISHING

#### S.30 Mortar for bedding and pointing

All materials for mortar, their storage, testing and mixing shall be as described in 'Plasterwork'.

#### S.31 Preparation of surfaces

All surfaces to receive the finishing in this section shall be thoroughly cleaned; screeds to receive finishing bedded in mortar shall be well wetted before laying is commenced.

#### S.32 Glazed ceramic wall tiles

Glazed ceramic wall tiles shall comply with B.S. 6431 and shall be of the sizes and colours described, and having cushion edges.

The tiles shall be soaked in clean water for at least half an hour before fixing, stacked on edge tightly together and end tiles turned glaze outwards and fixed as soon as the surface water has gone. The tiles shall be bedded in cement and sand, (1:3), with straight joints 1.5 mm wide pointed in white cement, after scratching the surface of the backing screed to form a key.

Alternatively, tiles shall be wiped clean and fixed dry with 'Richafix', or other approved adhesive, all in accordance with the manufacturers' recommendations with straight joints 1.5 mm wide pointed in white cement.

#### S.33 Concrete tiles

Concrete tiles shall comply with B.S. 1197, shall be thoroughly soaked in water and allowed to drain before laying and shall be bedded and pointed in cement and sand (1:3), laid true and level or to even falls as specified.

#### S.34 Terrazzo tiles

Terrazzo tiles shall be laid by a specialist approved by the Architect in writing, and shall be supplied from an approved source. The precast terrazzo shall consist of a backing of Portland cement and washed sand graded from coarse to fine in the proportions of 1:3 and a terrazzo finish not less than 12 mm thick consisting of coloured cement and marble aggregate free from dust in the proportions of 1:2. The colour of the cement and the colour and grading of the aggregate shall be as selected by the Architect.

Tiles shall be hydraulically pressed during manufacturing to produce a non-absorbent surface and shall be polished on the exposed surface.

Tiles shall be thoroughly soaked in water and drained off so that no free water remains on the surface before laying and shall be bedded in cement and sharp sand (1:3) with straight joints 3 mm wide and pointed in coloured cement, to match the colour of the tile, and sand (1:2). The surface of the paving shall finish true and level. All cement stains shall be carefully removed. Sawdust shall not be used as a protection before joints are set.

## LIST OF C CLAUSES

### DEFINITIONS

T.1 Method of glazing

### MATERIALS

T.2 Glass generally

T.3 Putty for glazing to wood

T.4 Putty for glazing to metal

T.5 Samples

### WORKMANSHIP

T.6 Glass to be kept free from moisture

T.7 Rebates and beads

T.8 Edges of glass

T.9 Beads glazing

T.10 Putty glazing

T.11 Wired glass

T.12 Method of measurement

Also at page 100 of the code of practice

T.10 Putty glazing

Glazing in putty shall be executed in proper bed and back putties, sprigs, clips and splayed and mitred front putties. The back putties shall be trimmed off flush with the top of the rebate and the splayed front putties shall be finished 3 mm back from site line to allow for sealing between glass and putty with paint.

T.11 Wired glass

The wire in wired glass shall extend to the edges and be free from rust etc, and be parallel to the framing.

T.12 Method of measurement

Beads and sealing strips have been measured separately. Prices for glazing with beads are to include for taking out and re-fixing beads as required, which shall be deemed to be bradded unless otherwise described.

- U.26 Oil paints
- U.27 Polyurethane lacquer
- U.28 Decorative wood stain

#### PREPARATION OF SURFACES

- U.29 Approval
- U.30 Stopping
- U.31 Plastering, rendering, concrete, blockwork and brickwork
- U.32 Asbestos cement
- U.33 Lead and copper
- U.34 aluminium
- U.35 Iron and steel
- U.36 Zinc and galvanized surfaces
- U.37 Hardboard
- U.38 Fibreboard
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- U.40 Woodwork to be painted
- U.41 Woodwork to receive clear finish

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- U.42 Standard of workmanship
- U.43 Storing of materials
- U.44 Manufacturers instructions
- U.45 Brush work
- U.46 Priming of joinery
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- U.48 Coatings to be dry
- U.49 Rubbing down
- U.50 Differing colours of undercoats
- U.51 Painting in unsuitable conditions
- U.52 Protection of wet surfaces

#### Specification Painting and Decorating

MATERIALS

U.1 Colour range

Painting and decorative schemes shall be carried out in colours selected by the Architect from the approved range of colours.

U.2 Approval of brands

The Contractor shall seek, in writing, approval from the Architect for all brands of paint he wishes to use.

U.3 Quality of products

Where a type of paint is produced by the manufacturer in more than one quality, only paints and materials of the first or best quality shall be used in the works. The Container label shall indicate clearly the quality of the paint used.

Where it is not evident that the first or best quality of paint is being used, the Architect will order the removal of such materials from site and rectification of any work executed with those materials, all at the Contractors expense

U.4 Delivery

All paints, varnishes, distempers and other surface coatings shall be delivered in sound, sealed containers labeled clearly by the manufacturer, the label or decorated container stating:-

- (a) the type of products
- (b) the brand name, if any
- (c) the use for which it is intended
- (d) the manufacturers batch number
- (e) the quality of the contents where more than one quality is available.

The label shall be a printed label; typewritten labels will not be accepted.

The batch deliveries shall be dated and used strictly in order of delivery.

No paint, other than water based paints and bituminous paint shall be delivered in containers exceeding 5 litres capacity.

U.5 Same makers materials used for coatings

While materials for the works may be obtained from several makers, undercoats and finishing coats for a particular surface must be (obtained from the same maker, (i.e. one maker's finishing coat must be applied over another maker's undercoat)

U.6 Information and facilities to suppliers

The Contractor shall supply the paint manufacturers with all relevant details of the materials required to comply with the descriptions in this Document and the manufacturers shall be given every facility for inspecting the work during progress in order to ascertain that the materials are being used in accordance with their instructions, and they are to take samples of their products from the site if they so desire.



U.16 Black bituminous paint

Black bituminous paint shall comply with B.S. 3416 Type 1 for general use, type 2 for drinking water tanks.

U.17 Primer for alkaline surfaces

Primer for alkaline surfaces shall be a special primer obtained from the maker of the undercoat and finishing coat.

U.18 Primer for aluminium

Primer for new or weathered aluminium shall be zinc chromate priming paint in accordance with DEF 1039.

U.19 Primer for bituminous surfaces

Primer for bituminous surfaces to be finished with oil paint shall contain leafing aluminium flake.

U.20 Primer for iron and steelwork

Primer for iron and steelwork shall be:-

- (a) lead based priming paint complying with B.S. 2523
- (b) calcium plumbate priming paint complying with B.S 3698 Type A

U.21 Primer for zinc or galvanized steel

Primer for weathered or new zinc and galvanized surfaces shall be calcium plumbate paint complying with B.S. 3698 Type.

U.22 Creosote type preservative

Creosote type preservative shall comply with B.S 144 or 3051.

U.23 Non creosote type preservative

Non creosote type preservative shall be 'Brunophen No. 2', 'Rentokil QD' or other approved.

U.24 Primer for hardboard

Primer for hardboard, not factory primed or sealed, shall be a suitable primer obtained from the maker undercoat and finishing coat.

U.25 Primer for woodwork

Primer for woodwork, other than the internal surfaces of external doors, windows and their frames and the backs of frames and linings, etc, in contact with masonry concrete or plaster, shall be leadless white or light grey priming paint not darker than colour 0-093 of B.S. 4800 which shall be compatible with the subsequent coats and obtained from the same maker.

Primer for external woodwork and the internal surfaces of external doors, windows, and their frames, and the backs of all frames linings, etc., in contact with masonry, concrete or plaster shall be lead based pink priming paint complying with B.S. 2523.

#### U.36 Zinc and galvanized surfaces

Zinc and galvanized surfaces shall be washed with white spirit.

#### U.37 Hardboard

All dirt and grease shall be removed from hardboard surfaces. After priming, all nail holes and other imperfections shall be stopped.

#### U.38 Fibreboard

All dust shall be brushed off from fibreboard surfaces, after priming, all nail holes and other imperfections shall be stopped.

#### U.39 Plywood

Surfaces of plywood to be painted shall be as required with a plaster based filler for internal work, and a filler, as described in clause U.10 (e), for external work, and then rubbed down and all dust and loose materials brushed off.

After priming, all imperfections shall be stopped rubbed down and brushed off

#### U.40 Woodwork to be painted

Before fixing woodwork, all surfaces which will be visible after fixing, shall be rubbed down and all knots and resin pockets shall be scorched back and coated with knotting.

After priming and fixing, all nail holes and other imperfections shall be stopped and the whole surface shall be rubbed down and all dust brushed off.

#### U.41 Woodwork to receive clear finish

All holes and other imperfections in surfaces to receive a clear finish, shall be stopped and the whole surface shall be rubbed down and all dust brushed off.

#### WORKMANSHIP

#### U.42 Standard of workmanship

Prior to the commencement of internal or external decoration, areas not exceeding 50 square metres in total area, and designated by the Architect, shall be completely decorated, and after approval shall be used as a standard for the whole of the works. Any additional cost involved in carrying out such decoration in advance of the general work shall be deemed to be included in the Contract Sum. Such decorated surfaces shall be made good and touched up as necessary prior to the handing over of the works.

#### U.43 Stirring of materials

The contents of all cans and containers of all materials must be properly and thoroughly stirred before and during use and shall be suitably strained as and when necessary.

#### U.44 Manufacturers instructions

All materials shall be used strictly in accordance with instructions, issued by the manufacturers concerned. The addition of thinners, driers or other materials will only be permitted when specially required by the maker and as when the procedure is approved by the Architect.

#### Specification

#### Painting and Decorating

## U.54 Cleanliness (Contd)

The contractor shall provide a suitable moveable receptacle, into which are to be placed all the liquids, slop washings, etc., which are on no account to be thrown down any of the gullies, manholes, sinks, lavatories, W.C.'s or any other sanitary fittings. All solid refuse or inflammable residues must be removed from the site, or burned.

U.55 Removal of ironmongery, etc.

All surface fixed ironmongery fittings, etc., except hinges, shall be removed before painting and re-fixed on completion.

#### U.56 Method of measurement

One coat of lead based pink primer has been measured to the backs of all timber frames, etc., which will ultimately be fixed in contact with concrete, block work, rendered or plastered surfaces.

[illegible]

V.22 Bedding and sealing covers and frames

- V.23 Testing

V.24 Clean and flush all drains

V.25 Method of measurement

(b) concrete base and bed

(c) drains and coverings

and no further work shall be required and each of the above shall be completed

levels of existing drains

The contractor shall check the invert levels of existing drains, sewers, and manholes before laying new drains and shall notify the Architect immediately if the existing invert levels are found to be inaccurate.

MATERIALS

Drain pipes and fittings shall be supplied from a manufacturer who is approved by the Engineer. All pipes and fittings shall comply with B.S. 2481 in ungalvanized form. With approved sockets and for joints which are to be joined by rubber gasket joints, fittings shall be finished painted. Fittings fabricated on site will not be used unless approved by the Engineer.

Drain covers shall be supplied from a manufacturer who is approved by the Engineer.

Drain covers shall be supplied from a manufacturer who is approved by the Engineer.

Fittings, gaskets, etc. shall be of correct size and shall be of correct material.

Drain pipes and fittings

Drain pipes and fittings shall comply with B.S. 2481 and shall be finished painted. Fittings fabricated on site will not be used unless approved by the Engineer.

## V.9 Manhole covers and road gratings

Manhole covers and road gratings and frames shall comply with B.S. 497

## V.10 Step irons

Step iron shall be galvanized malleable cast iron complying with B.S. 1247.

## WORKMANSHIP

## V.11 Setting out

The Contractor shall set out all drains in accordance with the drawings, and provide all profiles, etc., necessary for the execution of the work.

## V.12 Excavation

The bottoms of all excavations shall be trimmed and consolidated to the correct levels. Unauthorized excavations below the required levels shall be filled with concrete of the same composition as for drain beds, at the Contractor's expense.

Where the bottom is insufficiently firm, the Contractor shall excavate until, in the Architect's opinion, a firm bottom is obtained and the level shall be made up with concrete of the same composition as for drain beds. Particulars of such additional work shall be agreed with the Architect's representative before the work is covered up, otherwise no claim in this respect will be entertained.

## V.13 Planking and strutting

Care shall be taken not to undermine the foundation of the buildings and, if so directed by the Architect, planking and strutting shall be left in, or other means adopted to protect the foundations. Details of such additional items shall be agreed with the Architect's representative before the work is covered up, otherwise no claim in this respect will be entertained.

## V.14 Backfilling

Trenches for plastic pipes shall first be filled with selected screened excavated material carefully hand-tamped between the pipe and sides of the trench, followed by 150 mm- 200 mm of similar material before the general filling is carried out.

Trenches for concrete or cast iron drains shall first be filled to a depth of 300 mm with selected fine material carefully hand-packed around the pipe. On no account shall materials be tipped into the trench until the first 300 mm has been completed.

Filling shall be continued in layers not exceeding 300 mm thick well rammed and, if necessary, watered.

## V.15 Laying drains

Drains shall be laid truly straight on line and gradient with sockets upstream and the full bore shall be unobstructed.

## V.16 Plastic drains

Plastic drain pipes shall be laid and jointed with solvent welded joints entirely in accordance with the manufacturers instructions.

Pipes shall be bedded in sand after all hard obstructions have been removed from trench bottoms.

## V.23 Testing (Cont'd.)

- (ii) after haunching and backfilling
- (iii) after completion of the works

The Contractor shall provide all necessary testing apparatus and shall carry out such other tests as are required by the Architect and the Local Authority.

## V.24 Clean and flush all drains

All drains, gullies, manholes, etc., shall be cored, and flushed on completion.

## V.25 Method of measurement

Where not otherwise stated, the starting level for trench and manhole excavation shall be:-

- (i) the formation level in areas where the site is excavated to reduce levels
- (ii) existing ground level in areas where no excavation is required, or where filling is required.

The depth of all the trenches in the following description lie within the same 1.50 metre stages as the average depths stated.

Prices for excavating pipe trenches shall be deemed to include keeping them free from general water (i.e. all water except spring or running water).

Notwithstanding the provisions of SMM Clause V7 (a) to (c) the descriptions of excavating manholes, yard gullies, septic tanks and soakpits shall be deemed to include grading bottoms, planking and strutting, return filling and compacting, disposal of surplus soil and keeping excavations free from water.

Prices for building pipes into manholes shall include for building-in on rake where necessary.

Prices for concrete beds, benching and coverings for pipes laid in trenches, shall be deemed to include for any necessary formwork. Formwork required for beds, etc., for pipes above ground, and for casing to vertical pipes, is referred to in the descriptions of such items.

Prices for all gullies shall be deemed to include for all necessary excavation, return filling, disposal of surplus excavated material, planking and strutting, and trimming and ramming bottoms.

W.24 Diversion of water

W.25 Testing

W.26 Soiling on slopes and verges

W.27 Base, sub-base and surfacing or granular materials

W.28 Macadam

W.29 Prime coat

W.30 First seal coat

W.31 Second seal coat

W.32 Premix bitumen macadam surfacing

W.33 General remarks on surfacing

W.34 Tolerances for thickness of pavements

W.35 Laying pre-cast paving slabs

W.36 Grassing

#### W.5 Granular materials for sub-base, base and surfacing (Contd)

Not less than 10% should be retained between each pair of successive sieves, excepting the largest pair.

Furthermore the materials shall fulfill the following requirements.

#### W.6 Base

The CBR value shall not be less than 80% when tested at B.S. Heavy compaction (soaked condition).

Plasticity index : 0-6%  
Liquid limit : 0-25%  
Linear Shrinkage : 0-4 %

#### W.7 Sub-base

The CBR value shall not be less than 25% when tested at B.S. Heavy Compaction (soaked condition).

Plasticity index : 0-15%  
Liquid limit : 0-35%  
Linear Shrinkage : 0-8 %

#### W.8 Surfacing

| Climate      | Plasticity Index | Liquid Limit | Linear Shrinkage |
|--------------|------------------|--------------|------------------|
| Wet          | 4 - 9%           | 0 - 35%      | 2 - 4%           |
| Seasonal wet | 6 - 15%          | 0 - 40%      | 3 - 7%           |

This specification shall also apply to materials for shoulders

In case the gravel surfacing is a temporary surface only, and the layer at a later stage shall constitute sub-base in a bitumen surfaced road, then the material shall meet the CBR requirement to sub-base material.

#### W.9 Macadam

The material shall consist of coarse and fine aggregate derived from crushed hard rock of approved quality.

The coarse aggregate for macadam shall comply with the 50 mm or 40 mm nominal sizes of B.S. 63. The fine aggregate shall all pass the 5 mm sieve.

The coarse aggregate shall be of approximately cubic shape, have at least one fractured face and with an insignificant amount of elongated or flaky particles.

The flakiness index must not exceed 40; the aggregate crushing value must not exceed 35%.

#### W.10 Aggregate for premix macadam surfacing

Aggregate for premix bitumen macadam surfacing shall consist of natural rock aggregate complying with B.S. 1621.

#### W.11 Chippings

Chippings for blinding, 1st and 2nd seal-coat shall be single sized road stones conforming to B.S. 63 - Single sized (Cont'd.)



#### W.18 Surveying (Cont'd.)

The Contractor shall make all necessary surveys using given bench marks as reference points. These bench marks shall carefully be preserved.

The Contractor shall draft, in accordance with these surveys, all plans and drawings which are necessary for the completion of the work, and shall submit these plans and drawings to the Architect for approval in writing.

#### W.19 Levels, falls, cross falls and cambers

The works shall be executed to the levels, falls, cross falls and cambers shown on the drawings.

#### W.20 Tolerances

The finished sub-grade and shoulder levels shall at no place vary more than 15 mm above or below the levels shown on the Drawings. Deviations shall not be one sided.

Sub-grade that does not conform to the above requirements shall be reshaped to conform to the specified tolerances and re-compacted, at the contractor's expense.

Invert levels to ditches shall not vary more 50mm from the levels shown on the drawing. The deviation from the gradient specified on the drawing shall not exceed 0.2 times the gradient specified.

On slopes irregularities shall not exceed 100 mm.

The Contractor shall establish 25 mm x 25 mm x 100 mm timber pegs outside the carriageway each 20 m on both sides painted with the chainage, and giving the level to the finished road surface. The pegs shall be preserved until the Architect has approved the completion of the road.

The contractor shall provide one accurate straightedge. The straight edge shall be constructed of stout timber, angle iron or metal tubes so as to span 3metres without deflection. If of timber, the edge shall be shod with steel plate in the width of the timber and at least 5 mm thick.

#### W.21 Preparing ground surfaces under embankments

The Contractor shall ensure that the natural ground is cleared of vegetation rubbish and soft and wet materials unsuitable for embankments construction.

All necessary work to drain the natural ground shall be executed. Slopes greater than 1 in 3 shall be formed into horizontal terraces not less than 2 m wide.

#### W.22 Construction of embankments

Embankment material shall be placed in successive layers not exceeding 150 mm after compaction unless the contractor proves by testing to the Engineer's satisfaction that his compaction equipment is able to compact in greater layers. Each layer shall extend over the full width of the embankment and shall be compacted according to requirements before the next layer is placed.

It is the Contractor's responsibility that only approved materials are incorporated in the embankments. If any unsuitable or oversize material or materials is included it shall be removed and replaced with suitable material.

In forming embankments, the Contractor shall make due allowance in height and width for consolidation and shrinkage. On the completion of the Contract, the level, widths and dimensions of the finished surface of the carriageway or embankment shall correspond to the levels and dimensions shown on the Drawings. (Cont'd.)

#### W.26 Soiling on slopes or verges

Where it is directed and/or shown on the Drawings that the slopes of embankments, slopes of cuttings and verges shall be covered with a layer of top soil, such top soil shall be laid to a compacted thickness of 100 mm or as specified by the Architect.

#### W.27 Base, sub-base and surfacing of granular materials

The spreading and compaction of material must be carried out in such a manner that segregation is avoided. The layer must be uniformly compacted to at least 100% of the maximum dry density obtained at the B.S. Heavy Compaction Test.

Compaction should be done with a vibrating roller having a mass of at least 1800 kg per meter width of vibrating roll and finished to a smooth even surface with a static smooth-wheel roller.

The Contractor shall set out sufficiently leveling points, each 20 m. On both sides of the road for the control of the thickness of the layer.

Simultaneously with compaction the layer must be made true to shape and level so that no point of the finished layer deviates more than 15 mm from the stipulated levels. Deviation shall not be considered.

Filling in of depressions must only be done through previous scarification and re-compaction to a homogenous layer.

#### W.28 Macadam

The course aggregate shall be laid by mechanical plant to a thickness within the range 75-100 mm and given by a smooth-wheeled roller having a mass per meter of at least 2500 kg on at least one roll. The fine aggregate shall then be spread on it to a thickness of approximately 25 mm by a suitable spreading machine and vibrated into the voids of the course aggregate by a vibrating plate compactor having a mass per unit area of the base plate of at least 1400 kg/sq.m. or a vibrating roller having a mass per metre width of vibrating roll of at least 1800 kg.

The operation of spreading and vibrating the fine aggregate shall be repeated as necessary until no more will penetrate into the layer of coarse aggregate and no hungry patches are visible on the surface, when it shall be brushed to remove the excess fines and leave the coarse aggregate standing 3-6 mm proud. The layer shall then be rolled with a smooth-wheeled roller having a mass per metre width of at least 5000 kg on at least one roll.

The whole operation shall be repeated as necessary to provide the full specified thickness of road base.

#### W.29 Prime coat

Before application of bitumen prime coat, the base course shall be inspected and approved by the Architect. Any discrepancies shall be made good to the Engineer's approval before any work on the wearing course may start.

Prior to the application of the prime coat the surface of the base shall be swept clean of loose sand and dust and other foreign matter.

Bitumen for the prime coat shall be applied at a rate of approximately 0.8 litres/sq.m. in one even layer. After the prime coat has been applied the stretch of road shall be closed to traffic for 24 hours to allow the primer to soak into the surface.

In case it is not possible to close the primed stretch of road the prime coat shall be blinded with sand or Crusher fines at a rate of approximately 5kg/sq.m.

W.33 General remarks on surfacing (Cont'd.)

Application of bitumen for prime coat or wearing coats must not take place when the road is wet after rain, while it is raining or when rain is likely to be expected shortly after the surface dressing is finished.

Measurements shall be taken to prevent overlapping of surface dressing at both transversal and longitudinal joints. At longitudinal joints either blinding off the already treated surface or by blocking off the distribution aggregate to the required width. At transversal joints the already treated surface shall be blinded off so that the spreading of bitumen can be started at the exact right moment, and when the spreading unit operates at the correct speed.

Hand spreading of bitumen shall be employed to touch up areas unavoidably missed by distributor.

W.34 Tolerances for thickness of pavements

The nominal thickness of surface dressing is for practical purpose assumed to be zero.

No layer in the pavement shall deviate more than 10% from the nominal thickness. The total pavement thickness shall not deviate more than 5% from that specified.

Deviation shall not be one sided.

W.35 Laying precast paving slabs

Precast paving slabs shall be bedded on a sand bed compacted to the thickness specified with 6 mm wide joints, filled and pointed with cement mortar coloured to match the colour of the slabs and recessed 5 mm deep. The paving shall finish true and even to the falls shown on the drawings with no surface irregularities.

W.36 Grassing

Grassing shall be carried out by a Specialist using approved local grass. Prices for grass shall include for tending, watering, cutting and keeping weed free for a period of six months, to produce a dense and healthy "weed" free grass carpet.

## TERMITE TREATMENT OF EXISTING DWELLINGS

### GENERALLY

#### X.1 Engineers requirements

The Engineer shall require the termite treatment to be carried out in accordance with accepted good practice. Additional detail concerning method of treatment shall be provided by the Engineer upon request. The Main Contractor shall be required to employ a competent sub-contractor to be approved by the Engineer to carry out the application of chemicals used in termite treatment.

### MATERIALS

#### X.2 Anti-termite treatment

Refer to General Specification (2/D/6) item D.24 for specification of materials and mix proportions.

The Contractor shall comply with all recommendations and instructions of the manufacturer with respect to safe mixing and application of proprietary anti-termite treatment chemicals.

The Engineer shall approve all proposed substitute or alternative materials prior to application by the Contractor.

### WORKMANSHIP

#### X.3 Treatment to termite infestation on existing houses

Any doubt or obscurity concerning method of treatment described below or elsewhere in this document shall be referred to the Engineer who shall provide the necessary clarification to permit compliance herewith.

#### X.4 Method of treatment

Operation 1. Excavate trench at perimeter of building 300 mm wide x 300 mm deep position 300 mm from face of external walls.

Operation 2. Penetrate bottom of trench to a depth of 400 mm at 300 mm centres using 30 mm diameter bar, auger or similar implement.

Treat and hole with minimum 2 litres of prepared chemicals ("Gladiator TC 10% solution" or similar).

Operation 3. Treat all earth removed from the trench with minimum 80 litres of prepared chemicals ("Gladiator TC 10% solution" or similar) per cubic metre prior to using the same material for backfilling of the trench.

Operation 4. Treat surface of 300 mm wide earth strip adjacent external walls by soaking with 3 litres of prepared chemicals ("Gladiator TC 10% solution" or similar) per linear metre. At locations where pipes protrude from the surface of the ground, soak with additional 3 litres of prepared chemicals ("Gladiator TC 10% solution" or similar) at location of each pipe.

#### X.5 Inspection

Upon completion of excavation and forming of holes in trench bottom, the Contractor shall notify the Engineer who shall then be permitted to inspect the completed work prior to application of chemicals.

**SEHEMU IX: NYARAKA NYINGINE ZOZOTE ZINAZOUNDA  
SEHEMU YA MKATABA (KUMBUKUMBU ZA UFAFANUZI,  
MEMORANDA DHIDI YA RUSHWA)**