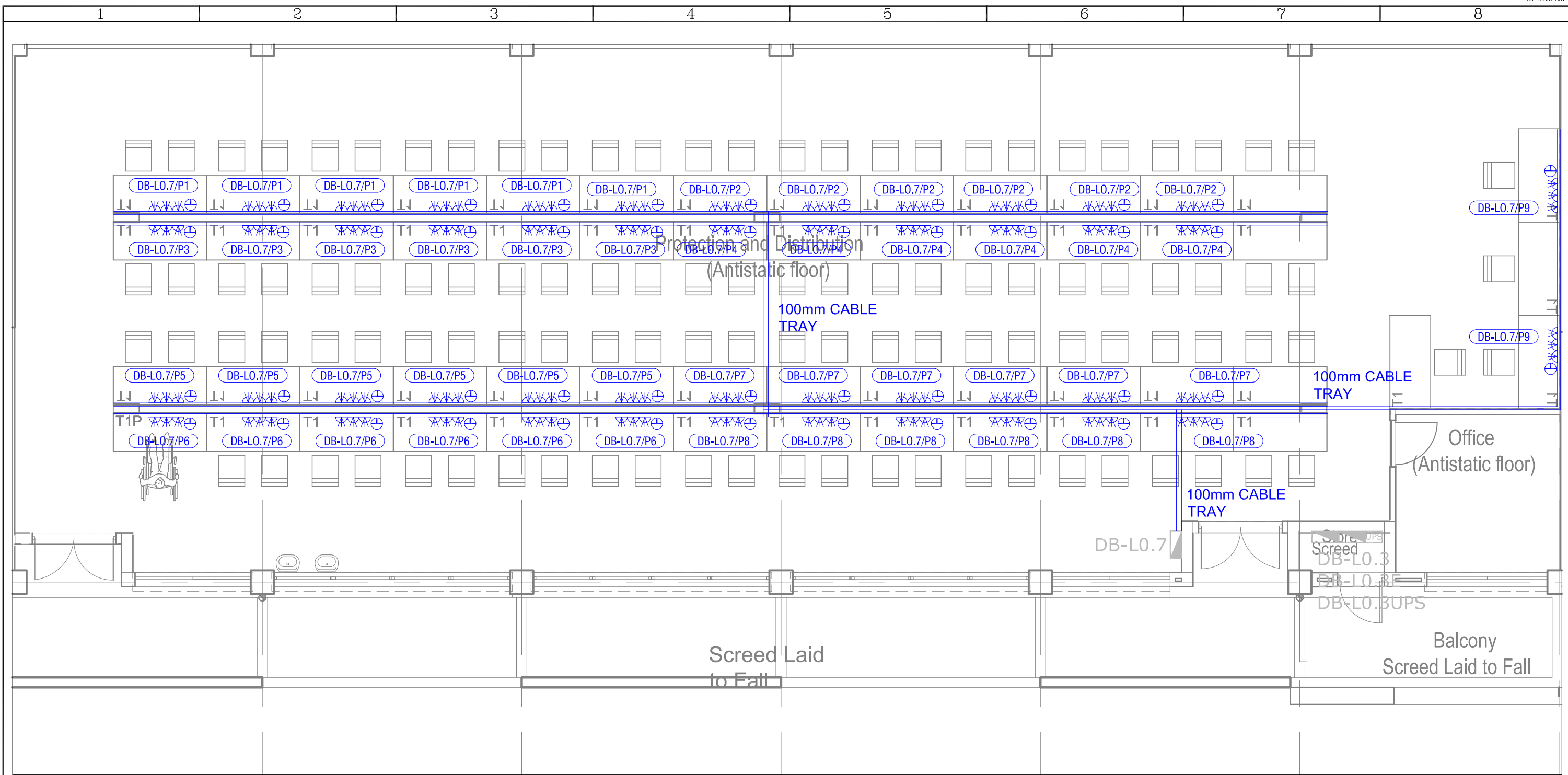


(1) - Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) - Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) - All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) - Cast in conduits to be spaced 35mm. minimum.

<ul style="list-style-type: none"> <li>100x100 CONDUIT BOX.</li> <li>100x100 CONDUIT BOX AT 500AFL.</li> <li>100x100 CONDUIT BOX AT 1400AFL.</li> <li>100x50 CONDUIT BOX</li> <li>100x50 CONDUIT BOX AT 300AFL.</li> <li>100x50 CONDUIT BOX AT 1400AFL.</li> <li>ROUND CONDUIT BOX.</li> <li>ROUND DRAW BOX</li> <li>100x100 DRAW BOX</li> </ul>	<ul style="list-style-type: none"> <li>100x50 BOX BEHIND POWER SKIRTING</li> <li>ROUND CONDUIT BOX FOR:                     <ul style="list-style-type: none"> <li>DM - DOOR MONITOR</li> <li>CAM - CAMERA</li> <li>etc.</li> </ul> </li> <li>AA - ACCESS ALARM</li> <li>AC - ACCESS CONTROL</li> <li>CR - CARD READER</li> <li>COM - COMMUNICATION/INTERCOM</li> <li>BGM - BACK GROUND MUSIC</li> <li>EL - ELECTRIC LOCK/STRIKE</li> </ul>	<ul style="list-style-type: none"> <li>CONDUIT TURNED UP ("D" FOR DOWN)</li> <li>DOWN CONDUCTOR TO EARTH OR EARTH TIE.</li> <li>20mm, DIA. CONDUIT.</li> <li>25mm, DIA. CONDUIT.</li> <li>32mm, DIA. CONDUIT.</li> <li>50mm, DIA. CONDUIT.</li> <li>SECTION OF CONDUIT OMITTED FOR CLARITY.</li> <li>SURFIX</li> </ul>	<ul style="list-style-type: none"> <li>TWIN AND EARTH POWER CABLE</li> <li>OC OVERHEAD CAST-IN</li> <li>OS OVERHEAD ON SURFACE OR LAID ON CEILING.</li> <li>FC FLOOR SLAB CAST-IN.</li> <li>POWER SKIRTING</li> <li>TRUNKING</li> <li>CABLE SLEEVE.</li> <li>CABLE TRAY/LADDER</li> </ul>	<ul style="list-style-type: none"> <li>150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.</li> <li>TELEPHONE JUNCTION BOX.</li> <li>INTERCOM JUNCTION BOX.</li> <li>DATA/COMMS JUNCTION BOX.</li> <li>SECURITY, ETC. JUNCTION BOX</li> <li>DISTRIBUTION BOARD POSITION.</li> <li>DB-1 BOARD DESIGNATION NUMBER.</li> </ul>	<ul style="list-style-type: none"> <li>16AMP. SWITCHED SOCKET OUTLET (SSO).</li> <li>DOUBLE 16AMP. SSO.</li> <li>16AMP. SSO ON PEDESTAL.</li> <li>3 PHASE SSO.</li> <li>13AMP. SQUARE PIN SSO.</li> <li>5AMP. 3 PIN UNSWITCHED SOCKET OUTLET.</li> <li>16AMP. CLEAN SSO WITH RED COVER PLATE, SQUARE EARTH AND PLUG TOP ON PEDESTAL</li> </ul>	<ul style="list-style-type: none"> <li>INTERMEDIATE LIGHT SWITCH</li> <li>SINGLE LEVER ONE WAY LIGHT SWITCH.</li> <li>TWO WAY LIGHT SWITCH</li> <li>FLUORESCENT LUMINAIRE</li> <li>BULKHEAD/DOWNLIGHTER, ETC.</li> <li>WALL MOUNTED LUMINAIRE.</li> <li>POLE MOUNTED LUMINAIRE.</li> </ul>	<ul style="list-style-type: none"> <li>TWO POLE ISOLATOR.</li> <li>THREE POLE ISOLATOR.</li> <li>FOUR POLE ISOLATOR.</li> <li>TELEPHONE POINT.</li> <li>TELEPHONE POINT ON PEDESTAL.</li> <li>DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).</li> <li>TV OUTLET.</li> </ul>	<ul style="list-style-type: none"> <li>DATA/COMMS OUTLET.</li> <li>INTERCOM REDIFFUSION SPEAKER POSITION.</li> <li>BELL PUSH.</li> <li>BELL OUTLET.</li> <li>SIGN POINT.</li> <li>CLOCK OUTLET.</li> <li>PHOTOCELL</li> <li>LUMINAIRE TYPE "B" - REFER LUMINAIRE SCHEDULE.</li> </ul>	<ul style="list-style-type: none"> <li>REFERENCE TO QUANTITY i.e. 3No.</li> <li>REFERENCE TO A DETAIL i.e. DETAIL 2.</li> <li>REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.</li> <li>REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34</li> <li>CABLE NUMBER - REFER TO SCHEDULE FOR DETAILS</li> </ul>
--	---	--	---	--	--	--	--	---	--

NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTALLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

A Issue for Tender		RM	11/0723	MH	ENGINEER	DRAWN	DATE:	SCALE:	CHKD.	TITLE			FIRST FLOOR BAKER TILLY HOUSE 18 WESTVILLE ROAD WESTVILLE, 3629 PO BOX 1469 WESTVILLE, 3630  TEL: +27 (031) 2667332 E-mail: ibuya@ibuya.co.za
0 Original Issue		RM	14/06/23	MH	MH	RM	Jun '23	1:50 A3	MH	MUT New Eng Building 3 Phase Power Supply			
REV	DESCRIPTION	BY	DATE	CHKD.	PROJECT No.	DRAWING No.	SHEET:		REV.	DRAWING TITLE:			
					23051	200			A	Power Electronics Lab 3 Phase Power Layout			
					File Name :	Lyr:							

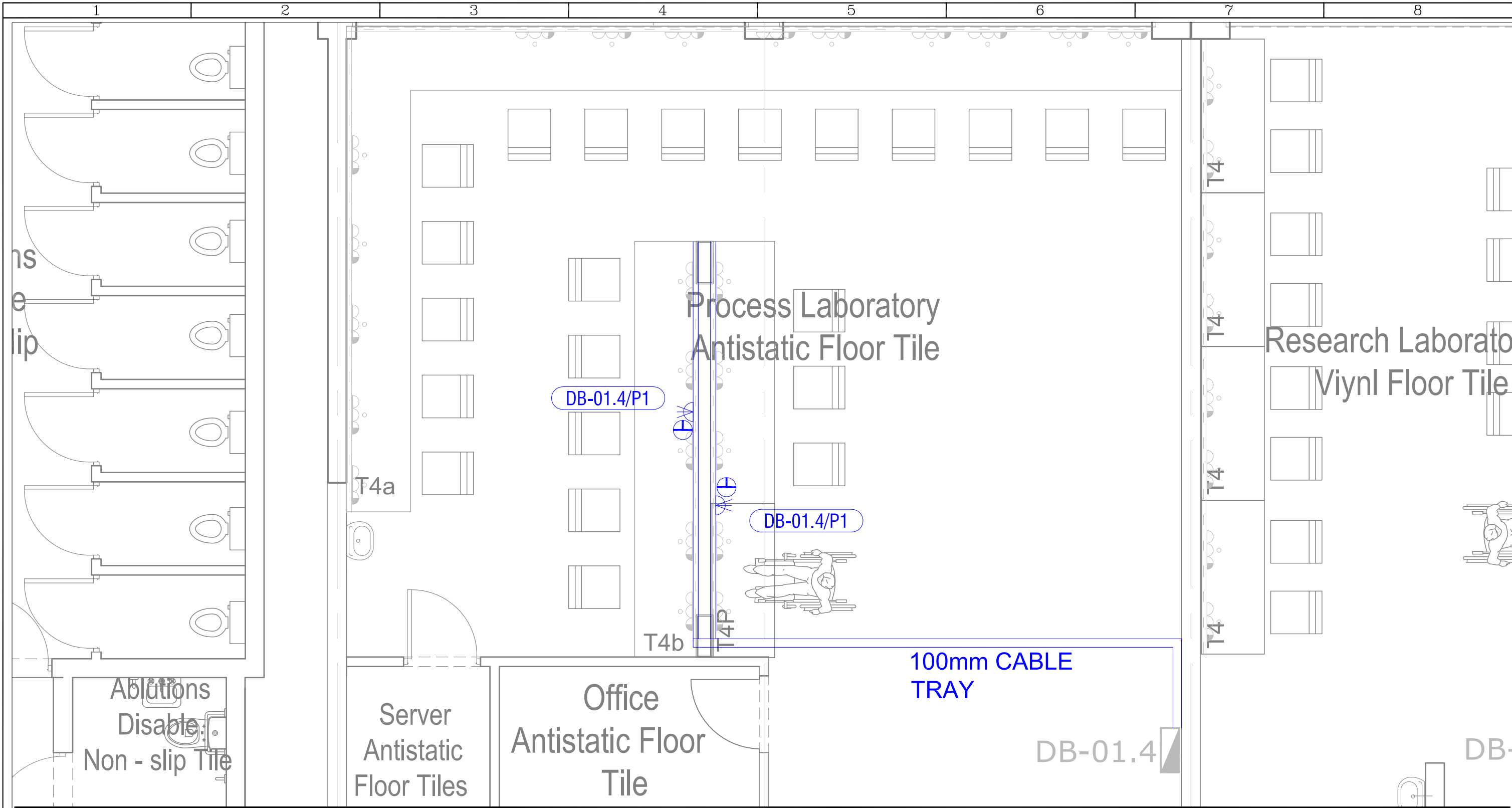


(1) - Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) - Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) - All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) - Cast in conduits to be spaced 35mm. minimum.

<ul style="list-style-type: none"> <li>100x100 CONDUIT BOX.</li> <li>100x100 CONDUIT BOX AT 500AFFL.</li> <li>100x100 CONDUIT BOX AT 1400AFFL.</li> <li>100x50 CONDUIT BOX</li> <li>100x50 CONDUIT BOX AT 300AFFL.</li> <li>100x50 CONDUIT BOX AT 1400AFFL.</li> <li>ROUND CONDUIT BOX.</li> <li>ROUND DRAW BOX</li> <li>100x100 DRAW BOX</li> </ul>	<ul style="list-style-type: none"> <li>100x50 BOX BEHIND POWER SKIRTING</li> <li>ROUND CONDUIT BOX FOR:                     <ul style="list-style-type: none"> <li>DM - DOOR MONITOR</li> <li>CAM - CAMERA</li> <li>AA - ACCESS ALARM</li> <li>AC - ACCESS CONTROL</li> <li>CR - CARD READER</li> <li>COM - COMMUNICATION/INTERCOM</li> <li>BGM - BACK GROUND MUSIC</li> <li>EL - ELECTRIC LOCK/STRIKE</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>CONDUIT TURNED UP ("D" FOR DOWN)</li> <li>DOWN CONDUCTOR TO EARTH OR EARTH TIE.</li> <li>20mm. DIA. CONDUIT.</li> <li>25mm. DIA. CONDUIT.</li> <li>32mm. DIA. CONDUIT.</li> <li>50mm. DIA. CONDUIT.</li> <li>SECTION OF CONDUIT OMITTED FOR CLARITY.</li> <li>SURFIX</li> </ul>	<ul style="list-style-type: none"> <li>TWIN AND EARTH POWER CABLE</li> <li>OC OVERHEAD CAST-IN</li> <li>OS OVERHEAD ON SURFACE OR LAID ON CEILING.</li> <li>FC FLOOR SLAB CAST-IN.</li> <li>POWER SKIRTING</li> <li>TRUNKING</li> <li>CABLE SLEEVE.</li> <li>CABLE TRAY/LADDER</li> </ul>	<ul style="list-style-type: none"> <li>150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.</li> <li>TELEPHONE JUNCTION BOX.</li> <li>INTERCOM JUNCTION BOX.</li> <li>DATA/COMMS JUNCTION BOX.</li> <li>SECURITY, ETC. JUNCTION BOX</li> <li>DISTRIBUTION BOARD POSITION.</li> <li>DB-1 BOARD DESIGNATION NUMBER.</li> </ul>	<ul style="list-style-type: none"> <li>16AMP. SWITCHED SOCKET OUTLET (SSO).</li> <li>DOUBLE 16AMP. SSO.</li> <li>16AMP. SSO ON PEDESTAL.</li> <li>3 PHASE SSO.</li> <li>13AMP. SQUARE PIN SSO.</li> <li>5AMP. 3 PIN UNSWITCHED SOCKET OUTLET.</li> <li>16AMP. CLEAN SSO WITH RED COVER PLATE, SQUARE EARTH AND PLUG TOP ON PEDESTAL.</li> </ul>	<ul style="list-style-type: none"> <li>INTERMEDIATE LIGHT SWITCH</li> <li>SINGLE LEVER ONE WAY LIGHT SWITCH.</li> <li>TWO WAY LIGHT SWITCH</li> <li>FLUORESCENT LUMINAIRE</li> <li>BULKHEAD/DOWNLIGHTER, ETC.</li> <li>WALL MOUNTED LUMINAIRE.</li> <li>POLE MOUNTED LUMINAIRE.</li> </ul>	<ul style="list-style-type: none"> <li>TWO POLE ISOLATOR.</li> <li>THREE POLE ISOLATOR.</li> <li>FOUR POLE ISOLATOR.</li> <li>TELEPHONE POINT.</li> <li>TELEPHONE POINT ON PEDESTAL.</li> <li>DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).</li> <li>TV OUTLET.</li> </ul>	<ul style="list-style-type: none"> <li>DATA/COMMS OUTLET.</li> <li>INTERCOM REDIFFUSION SPEAKER POSITION.</li> <li>BELL PUSH.</li> <li>BELL OUTLET.</li> <li>SIGN POINT.</li> <li>CLOCK OUTLET.</li> <li>PHOTOCELL</li> </ul>	<ul style="list-style-type: none"> <li>REFERENCE TO QUANTITY i.e. 3No.</li> <li>REFERENCE TO A DETAIL i.e. DETAIL 2.</li> <li>REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.</li> <li>REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34</li> <li>CABLE NUMBER - REFER TO SCHEDULE FOR DETAILS</li> <li>LUMINAIRE TYPE "B" - REFER LUMINAIRE SCHEDULE.</li> </ul>
--	---	--	---	--	---	--	--	---	--

NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

<table border="1"> <tr> <td>ENGINEER</td> <td>DRAWN</td> <td>DATE:</td> <td>SCALE:</td> <td>CHKD.</td> <td>TITLE</td> </tr> <tr> <td>MH</td> <td>RM</td> <td>Jun '23</td> <td>1:50</td> <td>MH</td> <td>MUT New Eng Building 3 Phase Power Supply</td> </tr> <tr> <td>PROJECT No.</td> <td>DRAWING No.</td> <td>SHEET:</td> <td>PAPER SIZE:</td> <td>REV.</td> <td>DRAWING TITLE:</td> </tr> <tr> <td>23051</td> <td>201</td> <td></td> <td>A3</td> <td>A</td> <td>Distribution and Protection Lab 3 Phase Power Layout</td> </tr> </table>	ENGINEER	DRAWN	DATE:	SCALE:	CHKD.	TITLE	MH	RM	Jun '23	1:50	MH	MUT New Eng Building 3 Phase Power Supply	PROJECT No.	DRAWING No.	SHEET:	PAPER SIZE:	REV.	DRAWING TITLE:	23051	201		A3	A	Distribution and Protection Lab 3 Phase Power Layout	<table border="1"> <tr> <td>DESCRIPTION</td> <td>BY</td> <td>DATE</td> <td>CHKD.</td> <td>File Name :</td> <td>Lyr:</td> </tr> <tr> <td>A Issue for Tender</td> <td>RM</td> <td>11/0723</td> <td>MH</td> <td></td> <td></td> </tr> <tr> <td>0 Original Issue</td> <td>RM</td> <td>14/06/23</td> <td>MH</td> <td></td> <td></td> </tr> </table>	DESCRIPTION	BY	DATE	CHKD.	File Name :	Lyr:	A Issue for Tender	RM	11/0723	MH			0 Original Issue	RM	14/06/23	MH					<p>FIRST FLOOR BAKER TILLY HOUSE 18 WESTVILLE ROAD WESTVILLE, 3629 PO BOX 1469 WESTVILLE, 3630</p> <p>TEL: +27 (031) 2667332 E-mail: ibuya@ibuya.co.za</p>
ENGINEER	DRAWN	DATE:	SCALE:	CHKD.	TITLE																																									
MH	RM	Jun '23	1:50	MH	MUT New Eng Building 3 Phase Power Supply																																									
PROJECT No.	DRAWING No.	SHEET:	PAPER SIZE:	REV.	DRAWING TITLE:																																									
23051	201		A3	A	Distribution and Protection Lab 3 Phase Power Layout																																									
DESCRIPTION	BY	DATE	CHKD.	File Name :	Lyr:																																									
A Issue for Tender	RM	11/0723	MH																																											
0 Original Issue	RM	14/06/23	MH																																											

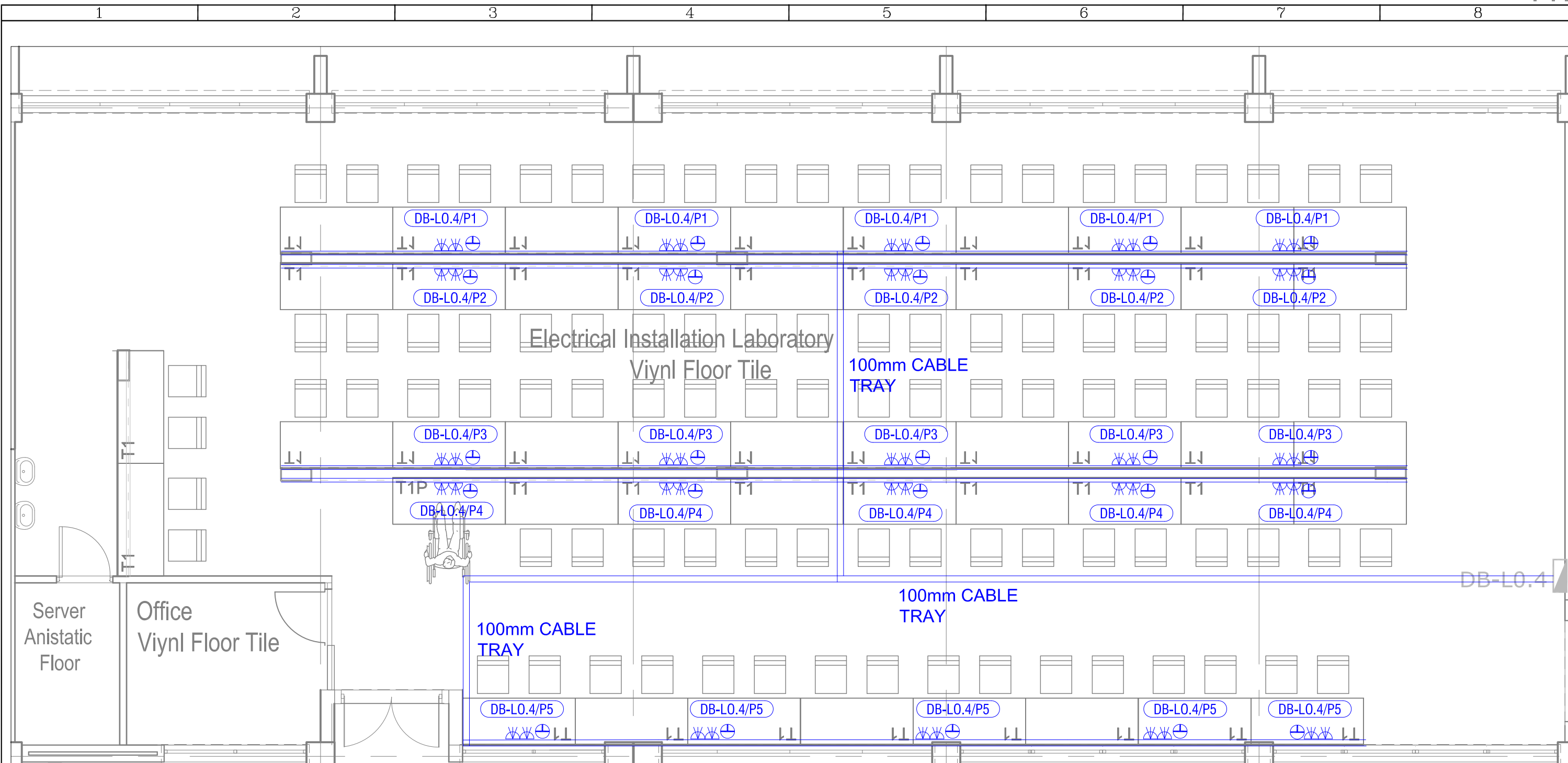


(1) - Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) - Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) - All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) - Cast in conduits to be spaced 35mm. minimum.

<ul style="list-style-type: none"> <li>100x100 CONDUIT BOX.</li> <li>100x100 CONDUIT BOX AT 500AFFL.</li> <li>100x100 CONDUIT BOX AT 1400AFFL.</li> <li>100x50 CONDUIT BOX</li> <li>100x50 CONDUIT BOX AT 300AFFL.</li> <li>100x50 CONDUIT BOX AT 1400AFFL.</li> <li>ROUND CONDUIT BOX.</li> <li>ROUND DRAW BOX</li> <li>100x100 DRAW BOX</li> </ul>	<ul style="list-style-type: none"> <li>100x50 BOX BEHIND POWER SKIRTING</li> <li>ROUND CONDUIT BOX FOR:                     <ul style="list-style-type: none"> <li>DM - DOOR MONITOR</li> <li>CAM - CAMERA</li> <li>AA - ACCESS ALARM</li> <li>AC - ACCESS CONTROL</li> <li>CR - CARD READER</li> <li>COM - COMMUNICATION/INTERCOM</li> <li>BGM - BACK GROUND MUSIC</li> <li>EL - ELECTRIC LOCK/STRIKE</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>CONDUIT TURNED UP ("D" FOR DOWN)</li> <li>DOWN CONDUCTOR TO EARTH OR EARTH TIE.</li> <li>20mm. DIA. CONDUIT.</li> <li>25mm. DIA. CONDUIT.</li> <li>32mm. DIA. CONDUIT.</li> <li>50mm. DIA. CONDUIT.</li> <li>SECTION OF CONDUIT OMITTED FOR CLARITY.</li> <li>SURFIX</li> </ul>	<ul style="list-style-type: none"> <li>TWIN AND EARTH POWER CABLE</li> <li>OC OVERHEAD CAST-IN</li> <li>OS OVERHEAD ON SURFACE OR LAID ON CEILING.</li> <li>FC FLOOR SLAB CAST-IN.</li> <li>POWER SKIRTING</li> <li>TRUNKING</li> <li>CABLE SLEEVE.</li> <li>CABLE TRAY/LADDER</li> </ul>	<ul style="list-style-type: none"> <li>150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN.</li> <li>TELEPHONE JUNCTION BOX.</li> <li>INTERCOM JUNCTION BOX.</li> <li>DATA/COMMS JUNCTION BOX.</li> <li>SECURITY, ETC. JUNCTION BOX</li> <li>DISTRIBUTION BOARD POSITION.</li> <li>DB-1 BOARD DESIGNATION NUMBER.</li> </ul>	<ul style="list-style-type: none"> <li>16AMP. SWITCHED SOCKET OUTLET (SSO).</li> <li>DOUBLE 16AMP. SSO.</li> <li>16AMP. SSO ON PEDESTAL.</li> <li>3 PHASE SSO.</li> <li>13AMP. SQUARE PIN SSO.</li> <li>5AMP. 3 PIN UNSWITCHED SOCKET OUTLET.</li> <li>16AMP. CLEAN SSO WITH RED COVER PLATE, SQUARE EARTH AND PLUG TOP ON PEDESTAL</li> </ul>	<ul style="list-style-type: none"> <li>INTERMEDIATE LIGHT SWITCH</li> <li>SINGLE LEVER ONE WAY LIGHT SWITCH.</li> <li>TWO WAY LIGHT SWITCH</li> <li>FLUORESCENT LUMINAIRE</li> <li>BULKHEAD/DOWNLIGHTER, ETC.</li> <li>WALL MOUNTED LUMINAIRE.</li> <li>POLE MOUNTED LUMINAIRE.</li> </ul>	<ul style="list-style-type: none"> <li>TWO POLE ISOLATOR.</li> <li>THREE POLE ISOLATOR.</li> <li>FOUR POLE ISOLATOR.</li> <li>TELEPHONE POINT.</li> <li>TELEPHONE POINT ON PEDESTAL.</li> <li>DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).</li> <li>TV OUTLET.</li> </ul>	<ul style="list-style-type: none"> <li>DATA/COMMS OUTLET.</li> <li>INTERCOM REDIFFUSION SPEAKER POSITION.</li> <li>BELL PUSH.</li> <li>BELL OUTLET.</li> <li>SIGN POINT.</li> <li>CLOCK OUTLET.</li> <li>PHOTOCELL</li> </ul>	<ul style="list-style-type: none"> <li>REFERENCE TO QUANTITY I.e. 3No.</li> <li>REFERENCE TO A DETAIL I.e. DETAIL 2.</li> <li>REFERENCE TO AN ELECTRICAL NOTE I.e. NOTE 4.</li> <li>REFERENCE TO A STANDARD DRAWING I.e. STANDARD DRAWING No.34</li> <li>CABLE NUMBER - REFER TO SCHEDULE FOR DETAILS</li> <li>LUMINAIRE TYPE "B" - REFER LUMINAIRE SCHEDULE.</li> </ul>
--	---	--	---	--	--	--	--	---	--

NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

<p>ENGINEER: MH</p> <p>DRAWN: RM</p> <p>DATE: Jun '23</p> <p>SCALE: 1:50</p> <p>PAPER SIZE: A3</p> <p>CHKD.: MH</p>		<p>TITLE: MUT New Eng Building 3 Phase Power Supply</p>	
<p>PROJECT No.: 23051</p> <p>DRAWING No.: 202</p> <p>SHEET: A</p>		<p>REV. A</p> <p>DRAWING TITLE: Process Lab 3 Phase Power Layout</p>	
<p>REV: A</p> <p>DESCRIPTION: Issue for Tender</p> <p>BY: RM</p> <p>DATE: 11/0723</p> <p>CHKD.: MH</p>	<p>REV: 0</p> <p>DESCRIPTION: Original Issue</p> <p>BY: RM</p> <p>DATE: 14/06/23</p> <p>CHKD.: MH</p>	<p>File Name :</p> <p>Lyr:</p>	<p>MUT MANGOSUTHU UNIVERSITY OF TECHNOLOGY</p> <p>IBUYA Consulting Engineers "POWERING DEVELOPMENT"</p> <p>FIRST FLOOR BAKER TILLY HOUSE 18 WESTVILLE ROAD WESTVILLE, 3629 PO BOX 1469 WESTVILLE, 3630</p> <p>TEL: +27 (031) 2667332 E-mail: ibuya@ibuya.co.za</p>




(1) - Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) - Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) - All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) - Cast in conduits to be spaced 35mm. minimum.


<ul style="list-style-type: none"> <li>100x100 CONDUIT BOX.</li> <li>100x100 CONDUIT BOX AT 500AFL.</li> <li>100x100 CONDUIT BOX AT 1400AFL.</li> <li>100x50 CONDUIT BOX</li> <li>100x50 CONDUIT BOX AT 300AFL.</li> <li>100x50 CONDUIT BOX AT 1400AFL.</li> <li>ROUND CONDUIT BOX.</li> <li>ROUND DRAW BOX</li> <li>100x100 DRAW BOX</li> </ul>	<ul style="list-style-type: none"> <li>100x50 BOX BEHIND POWER SKIRTING</li> <li>ROUND CONDUIT BOX FOR:                     <ul style="list-style-type: none"> <li>DM - DOOR MONITOR</li> <li>CAM - CAMERA</li> <li>AA - ACCESS ALARM</li> <li>AC - ACCESS CONTROL</li> <li>CR - CARD READER</li> <li>COM - COMMUNICATION/INTERCOM</li> <li>BGM - BACK GROUND MUSIC</li> <li>EL - ELECTRIC LOCK/STRIKE</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>CONDUIT TURNED UP ("D" FOR DOWN)</li> <li>DOWN CONDUCTOR TO EARTH OR EARTH TIE.</li> <li>20mm. DIA. CONDUIT.</li> <li>25mm. DIA. CONDUIT.</li> <li>32mm. DIA. CONDUIT.</li> <li>50mm. DIA. CONDUIT.</li> <li>SECTION OF CONDUIT OMITTED FOR CLARITY. SURFIX</li> </ul>	<ul style="list-style-type: none"> <li>TWIN AND EARTH POWER CABLE</li> <li>OC OVERHEAD CAST-IN</li> <li>OS OVERHEAD ON SURFACE OR LAID ON CEILING.</li> <li>FC FLOOR SLAB CAST-IN.</li> <li>POWER SKIRTING</li> <li>TRUNKING</li> <li>CABLE SLEEVE.</li> <li>CABLE TRAY/LADDER</li> </ul>	<ul style="list-style-type: none"> <li>150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN.</li> <li>TELEPHONE JUNCTION BOX.</li> <li>INTERCOM JUNCTION BOX.</li> <li>DATA/COMMS JUNCTION BOX.</li> <li>SECURITY, ETC. JUNCTION BOX</li> <li>DISTRIBUTION BOARD POSITION.</li> <li>DB-1 BOARD DESIGNATION NUMBER.</li> </ul>	<ul style="list-style-type: none"> <li>16AMP. SWITCHED SOCKET OUTLET (SSO).</li> <li>DOUBLE 16AMP. SSO.</li> <li>16AMP. SSO ON PEDESTAL.</li> <li>3 PHASE SSO.</li> <li>13AMP. SQUARE PIN SSO.</li> <li>5AMP. 3 PIN UNSWITCHED SOCKET OUTLET.</li> <li>16AMP. CLEAN SSO WITH RED COVER PLATE, SQUARE EARTH AND PLUG TOP ON PEDESTAL</li> </ul>	<ul style="list-style-type: none"> <li>INTERMEDIATE LIGHT SWITCH</li> <li>SINGLE LEVER ONE WAY LIGHT SWITCH.</li> <li>TWO WAY LIGHT SWITCH</li> <li>FLUORESCENT LUMINAIRE</li> <li>BULKHEAD/DOWNLIGHTER, ETC.</li> <li>WALL MOUNTED LUMINAIRE.</li> <li>POLE MOUNTED LUMINAIRE.</li> </ul>	<ul style="list-style-type: none"> <li>TWO POLE ISOLATOR.</li> <li>THREE POLE ISOLATOR.</li> <li>FOUR POLE ISOLATOR.</li> <li>TELEPHONE POINT.</li> <li>TELEPHONE POINT ON PEDESTAL.</li> <li>DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).</li> <li>TV OUTLET.</li> </ul>	<ul style="list-style-type: none"> <li>DATA/COMMS OUTLET.</li> <li>INTERCOM REDIFFUSION SPEAKER POSITION.</li> <li>BELL PUSH.</li> <li>BELL OUTLET.</li> <li>SIGN POINT.</li> <li>CLOCK OUTLET.</li> <li>PHOTOCCELL</li> </ul>	<ul style="list-style-type: none"> <li>REFERENCE TO QUANTITY i.e. 3No.</li> <li>REFERENCE TO A DETAIL i.e. DETAIL 2.</li> <li>REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.</li> <li>REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34</li> <li>CABLE NUMBER - REFER TO SCHEDULE FOR DETAILS</li> <li>LUMINAIRE TYPE "B" - REFER LUMINAIRE SCHEDULE.</li> </ul>
--	---	---	---	--	--	--	--	--	--

NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

ENGINEER	DRAWN	DATE:	SCALE:	CHKD.	TITLE
MH	RM	Jun '23	1:50	MH	MUT New Eng Building 3 Phase Power Supply
PROJECT No.	DRAWING No.	SHEET:	PAPER SIZE:	REV.	DRAWING TITLE:
23051	203		A3	A	Installation Lab 3 Phase Power Layout
REV	DESCRIPTION	BY	DATE	CHKD.	File Name : Lyr:
A	Issue for Tender	RM	11/0723	MH	
0	Original Issue	RM	14/06/23	MH	



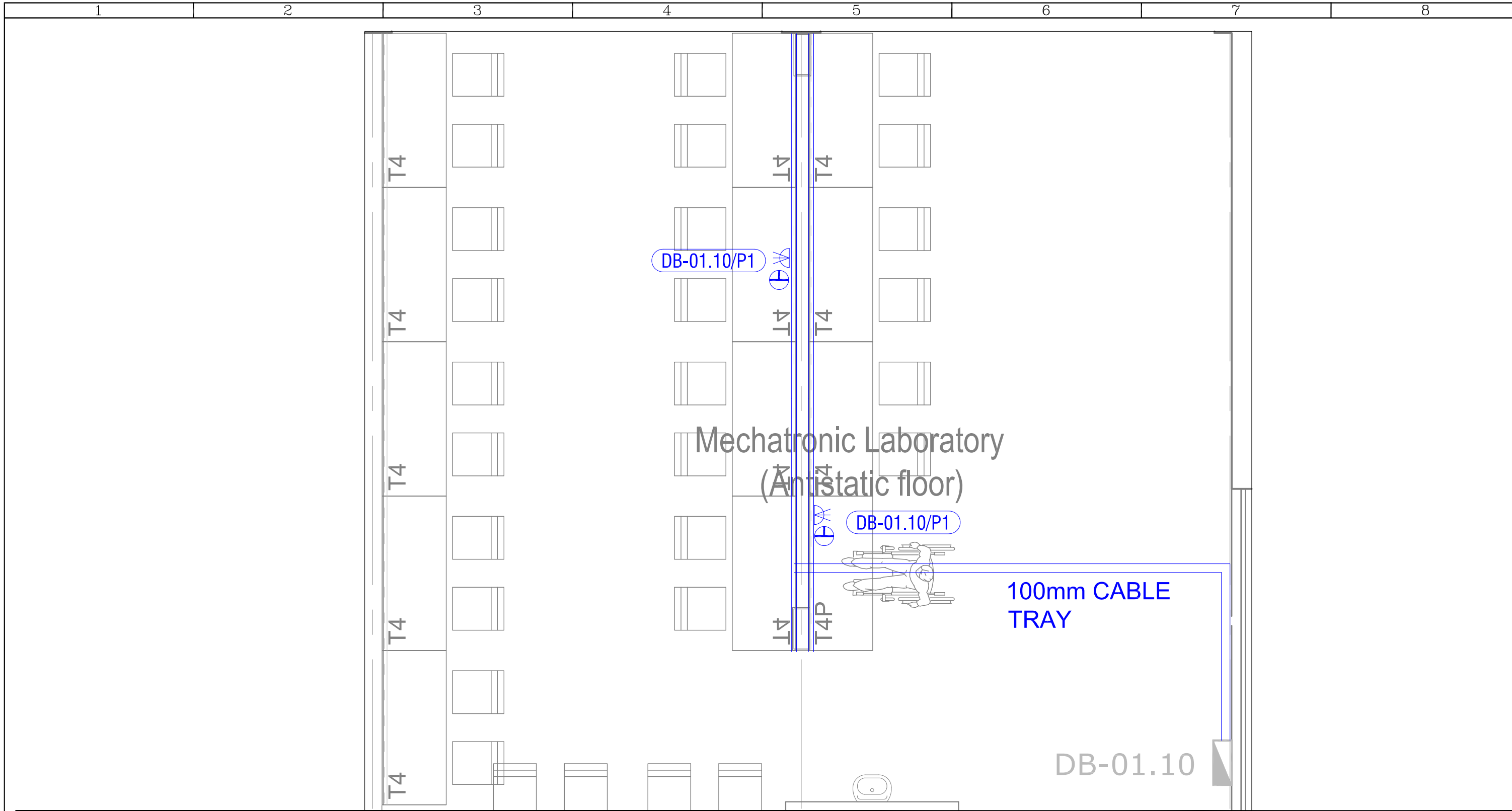
**MUT**  
MANGOSUTHU  
UNIVERSITY OF TECHNOLOGY



**IBUYA** Consulting Engineers  
"POWERING DEVELOPMENT"

FIRST FLOOR  
BAKER TILLY HOUSE  
18 WESTVILLE ROAD  
WESTVILLE, 3629  
PO BOX 1469  
WESTVILLE, 3630

TEL: +27 (031) 2667332  
E-mail: ibuya@ibuya.co.za




(1) - Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) - Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) - All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) - Cast in conduits to be spaced 35mm. minimum.


<ul style="list-style-type: none"> <li>100x100 CONDUIT BOX.</li> <li>100x100 CONDUIT BOX AT 500AFL.</li> <li>100x100 CONDUIT BOX AT 1400AFL.</li> <li>100x50 CONDUIT BOX</li> <li>100x50 CONDUIT BOX AT 300AFL.</li> <li>100x50 CONDUIT BOX AT 1400AFL.</li> <li>ROUND CONDUIT BOX.</li> <li>ROUND DRAW BOX</li> <li>100x100 DRAW BOX</li> </ul>	<ul style="list-style-type: none"> <li>100x50 BOX BEHIND POWER SKIRTING</li> <li>ROUND CONDUIT BOX FOR:                     <ul style="list-style-type: none"> <li>DM - DOOR MONITOR</li> <li>CAM - CAMERA</li> <li>AA - ACCESS ALARM</li> <li>AC - ACCESS CONTROL</li> <li>CR - CARD READER</li> <li>COM - COMMUNICATION/INTERCOM</li> <li>BGM - BACK GROUND MUSIC</li> <li>EL - ELECTRIC LOCK/STRIKE</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>CONDUIT TURNED UP ("D" FOR DOWN)</li> <li>DOWN CONDUCTOR TO EARTH OR EARTH TIE.</li> <li>20mm. DIA. CONDUIT.</li> <li>25mm. DIA. CONDUIT.</li> <li>32mm. DIA. CONDUIT.</li> <li>50mm. DIA. CONDUIT.</li> <li>SECTION OF CONDUIT OMITTED FOR CLARITY.</li> <li>SURFIX</li> </ul>	<ul style="list-style-type: none"> <li>TWIN AND EARTH POWER CABLE</li> <li>OC OVERHEAD CAST-IN</li> <li>OS OVERHEAD ON SURFACE OR LAID ON CEILING.</li> <li>FC FLOOR SLAB CAST-IN.</li> <li>POWER SKIRTING</li> <li>TRUNKING</li> <li>CABLE SLEEVE.</li> <li>CABLE TRAY/LADDER</li> </ul>	<ul style="list-style-type: none"> <li>150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.</li> <li>TELEPHONE JUNCTION BOX.</li> <li>INTERCOM JUNCTION BOX.</li> <li>DATA/COMMS JUNCTION BOX.</li> <li>SECURITY, ETC. JUNCTION BOX</li> <li>DISTRIBUTION BOARD POSITION.</li> <li>DB-1 BOARD DESIGNATION NUMBER.</li> </ul>	<ul style="list-style-type: none"> <li>16AMP. SWITCHED SOCKET OUTLET (SSO).</li> <li>DOUBLE 16AMP. SSO.</li> <li>16AMP. SSO ON PEDESTAL.</li> <li>3 PHASE SSO.</li> <li>13AMP. SQUARE PIN SSO.</li> <li>5AMP. 3 PIN UNSWITCHED SOCKET OUTLET.</li> <li>16AMP. CLEAN SSO WITH RED COVER PLATE, SQUARE EARTH AND PLUG TOP ON PEDESTAL</li> </ul>	<ul style="list-style-type: none"> <li>INTERMEDIATE LIGHT SWITCH</li> <li>SINGLE LEVER ONE WAY LIGHT SWITCH.</li> <li>TWO WAY LIGHT SWITCH</li> <li>FLUORESCENT LUMINAIRE</li> <li>BULKHEAD/DOWNLIGHTER, ETC.</li> <li>WALL MOUNTED LUMINAIRE.</li> <li>POLE MOUNTED LUMINAIRE.</li> </ul>	<ul style="list-style-type: none"> <li>TWO POLE ISOLATOR.</li> <li>THREE POLE ISOLATOR.</li> <li>FOUR POLE ISOLATOR.</li> <li>TELEPHONE POINT.</li> <li>TELEPHONE POINT ON PEDESTAL.</li> <li>DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).</li> <li>TV OUTLET.</li> </ul>	<ul style="list-style-type: none"> <li>DATA/COMMS OUTLET.</li> <li>INTERCOM REDIFFUSION SPEAKER POSITION.</li> <li>BELL PUSH.</li> <li>BELL OUTLET.</li> <li>SIGN POINT.</li> <li>CLOCK OUTLET.</li> <li>PHOTOCELL</li> </ul>	<ul style="list-style-type: none"> <li>REFERENCE TO QUANTITY i.e. 3No.</li> <li>REFERENCE TO A DETAIL i.e. DETAIL 2.</li> <li>REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.</li> <li>REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34</li> <li>CABLE NUMBER - REFER TO SCHEDULE FOR DETAILS</li> <li>LUMINAIRE TYPE "B" - REFER LUMINAIRE SCHEDULE.</li> </ul>
--	---	--	---	--	--	--	--	---	--

NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

				ENGINEER	DRAWN	DATE:	SCALE:	CHKD.	TITLE		
				MH	RM	Jun '23	1:50	MH	MUT New Eng Building 3 Phase Power Supply		
				PROJECT No.	DRAWING No.	SHEET:	PAPER SIZE:	REV.	DRAWING TITLE:		
				23051	204		A3	A	Mechatronics Lab 3 Phase Power Layout		
REV	DESCRIPTION	BY	DATE	CHKD.	File Name :	Lyr:					



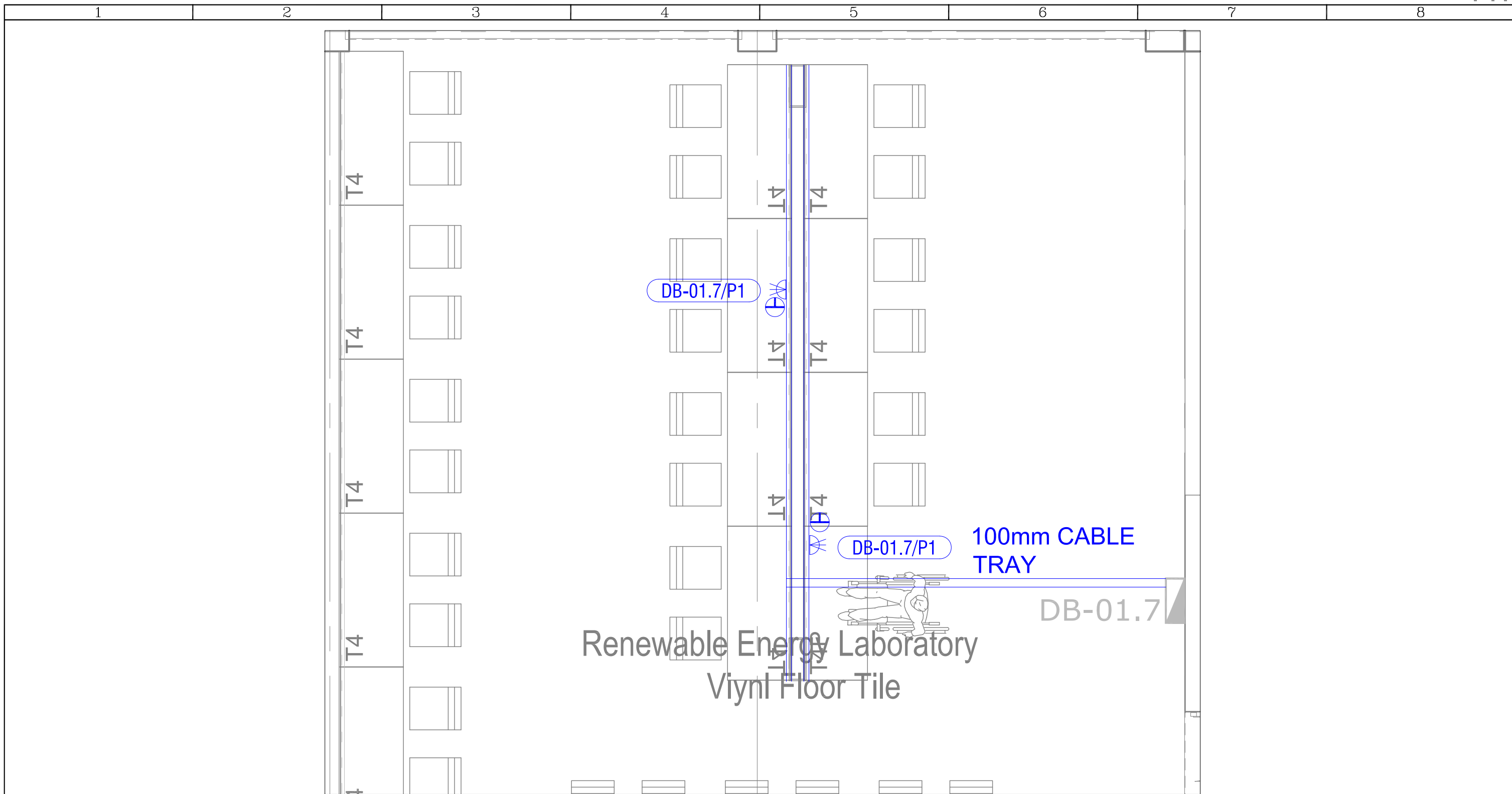
**MUT**  
MANGOSUTHU  
UNIVERSITY OF TECHNOLOGY



**IBUYA** Consulting Engineers  
"POWERING DEVELOPMENT"

FIRST FLOOR  
BAKER TILLY HOUSE  
18 WESTVILLE ROAD  
WESTVILLE, 3629  
PO BOX 1469  
WESTVILLE, 3630

TEL: +27 (031) 2667332  
E-mail: [ibuya@ibuya.co.za](mailto:ibuya@ibuya.co.za)




Renewable Energy Laboratory  
Vinyl Floor Tile

(1) - Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) - Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) - All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) - Cast in conduits to be spaced 35mm. minimum.


<ul style="list-style-type: none"> <li>100x100 CONDUIT BOX.</li> <li>100x100 CONDUIT BOX AT 500AFL.</li> <li>100x100 CONDUIT BOX AT 1400AFL.</li> <li>100x50 CONDUIT BOX</li> <li>100x50 CONDUIT BOX AT 300AFL.</li> <li>100x50 CONDUIT BOX AT 1400AFL.</li> <li>ROUND CONDUIT BOX.</li> <li>ROUND DRAW BOX</li> <li>100x100 DRAW BOX</li> </ul>	<ul style="list-style-type: none"> <li>100x50 BOX BEHIND POWER SKIRTING</li> <li>ROUND CONDUIT BOX FOR:                     <ul style="list-style-type: none"> <li>DM - DOOR MONITOR</li> <li>CAM - CAMERA</li> <li>AA - ACCESS ALARM</li> <li>AC - ACCESS CONTROL</li> <li>CR - CARD READER</li> <li>COM - COMMUNICATION/INTERCOM</li> <li>BGM - BACK GROUND MUSIC</li> <li>EL - ELECTRIC LOCK/STRIKE</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>CONDUIT TURNED UP ("D" FOR DOWN)</li> <li>DOWN CONDUCTOR TO EARTH OR EARTH TIE.</li> <li>20mm. DIA. CONDUIT.</li> <li>25mm. DIA. CONDUIT.</li> <li>32mm. DIA. CONDUIT.</li> <li>50mm. DIA. CONDUIT.</li> <li>SECTION OF CONDUIT OMITTED FOR CLARITY. SURFIX</li> </ul>	<ul style="list-style-type: none"> <li>TWIN AND EARTH POWER CABLE</li> <li>OC OVERHEAD CAST-IN</li> <li>OS OVERHEAD ON SURFACE OR LAID ON CEILING.</li> <li>FC FLOOR SLAB CAST-IN.</li> <li>POWER SKIRTING</li> <li>TRUNKING</li> <li>CABLE SLEEVE.</li> <li>CABLE TRAY/LADDER</li> </ul>	<ul style="list-style-type: none"> <li>150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.</li> <li>TELEPHONE JUNCTION BOX.</li> <li>INTERCOM JUNCTION BOX.</li> <li>DATA/COMMS JUNCTION BOX.</li> <li>SECURITY, ETC. JUNCTION BOX</li> <li>DISTRIBUTION BOARD POSITION.</li> <li>DB-1 BOARD DESIGNATION NUMBER.</li> </ul>	<ul style="list-style-type: none"> <li>16AMP. SWITCHED SOCKET OUTLET (SSO).</li> <li>DOUBLE 16AMP. SSO.</li> <li>16AMP. SSO ON PEDESTAL.</li> <li>3 PHASE SSO.</li> <li>13AMP. SQUARE PIN SSO.</li> <li>5AMP. 3 PIN UNSWITCHED SOCKET OUTLET.</li> <li>16AMP. CLEAN SSO WITH RED COVER PLATE, SQUARE EARTH AND PLUG TOP ON PEDESTAL</li> </ul>	<ul style="list-style-type: none"> <li>INTERMEDIATE LIGHT SWITCH</li> <li>SINGLE LEVER ONE WAY LIGHT SWITCH.</li> <li>TWO WAY LIGHT SWITCH</li> <li>FLUORESCENT LUMINAIRE</li> <li>BULKHEAD/DOWNLIGHTER, ETC.</li> <li>WALL MOUNTED LUMINAIRE.</li> <li>POLE MOUNTED LUMINAIRE.</li> </ul>	<ul style="list-style-type: none"> <li>TWO POLE ISOLATOR.</li> <li>THREE POLE ISOLATOR.</li> <li>FOUR POLE ISOLATOR.</li> <li>TELEPHONE POINT.</li> <li>TELEPHONE POINT ON PEDESTAL.</li> <li>DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).</li> <li>TV OUTLET.</li> </ul>	<ul style="list-style-type: none"> <li>DATA/COMMS OUTLET.</li> <li>INTERCOM REDIFFUSION SPEAKER POSITION.</li> <li>BELL PUSH.</li> <li>BELL OUTLET.</li> <li>SIGN POINT.</li> <li>CLOCK OUTLET.</li> <li>PHOTOCELL</li> </ul>	<ul style="list-style-type: none"> <li>REFERENCE TO QUANTITY i.e. 3No.</li> <li>REFERENCE TO A DETAIL i.e. DETAIL 2.</li> <li>REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.</li> <li>REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34</li> <li>CABLE NUMBER - REFER TO SCHEDULE FOR DETAILS</li> <li>LUMINAIRE TYPE "B" - REFER LUMINAIRE SCHEDULE.</li> </ul>
--	---	---	---	--	--	--	--	---	--

NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

				ENGINEER	DRAWN	DATE:	SCALE:	CHKD.	TITLE		
				MH	RM	Jun '23	1:50	MH	MUT New Eng Building 3 Phase Power Supply		
				PROJECT No.	DRAWING No.	SHEET:	PAPER SIZE:	REV.	DRAWING TITLE:		
				23051	205		A3	A	Renewable Energy Lab 3 Phase Power Layout		
REV	DESCRIPTION	BY	DATE	CHKD.	File Name :	Lyr:					



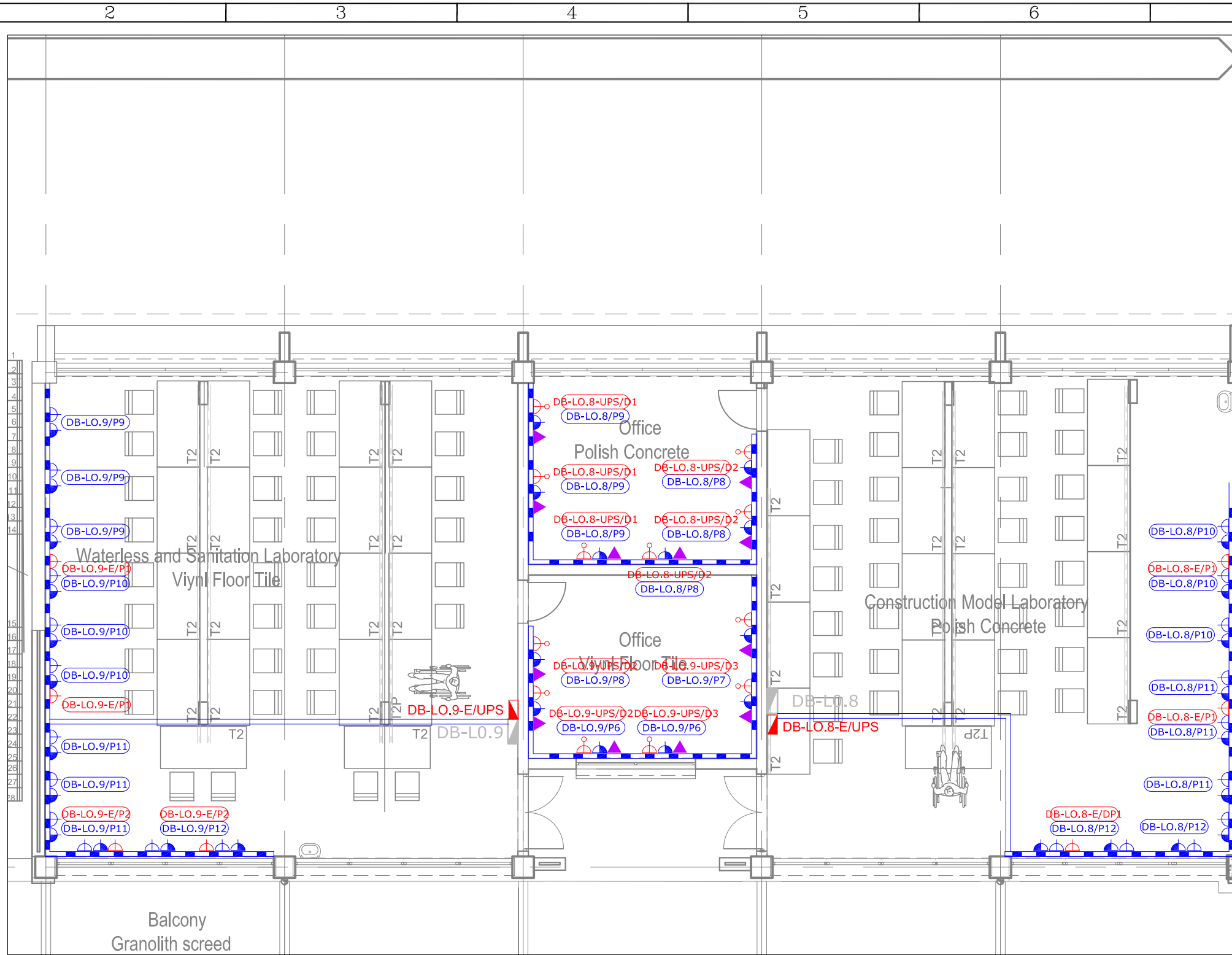
**MUT**  
MANGOSUTHU  
UNIVERSITY OF TECHNOLOGY



**IBUYA** Consulting Engineers  
"POWERING DEVELOPMENT"

FIRST FLOOR  
BAKER TILLY HOUSE  
18 WESTVILLE ROAD  
WESTVILLE, 3629  
PO BOX 1469  
WESTVILLE, 3630

TEL: +27 (031) 2667332  
E-mail: ibuya@ibuya.co.za



(1) - Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) - Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) - All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) - Cast in conduits to be spaced 35mm. minimum.

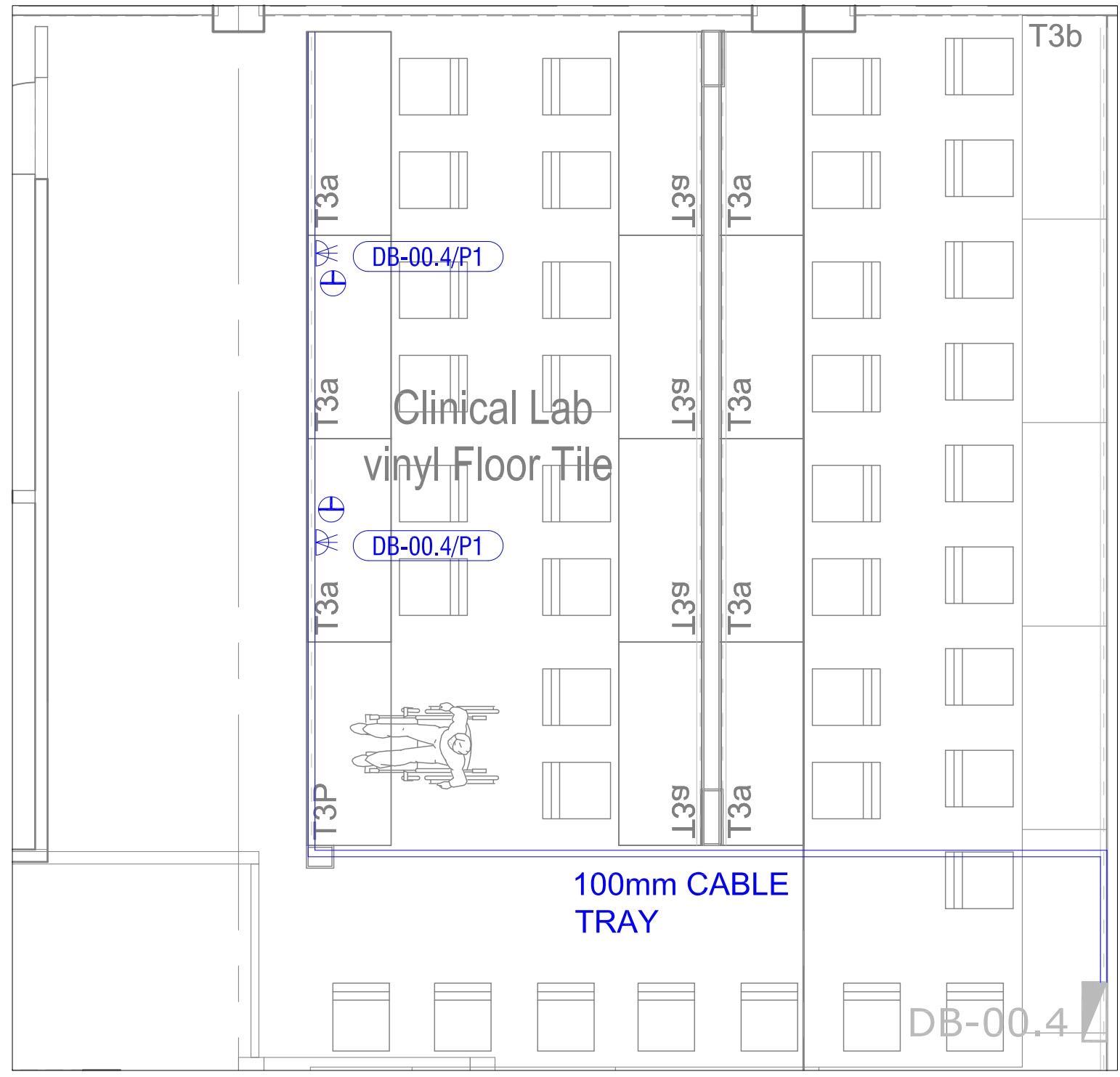
<ul style="list-style-type: none"> <li>100x100 CONDUIT BOX.</li> <li>100x100 CONDUIT BOX AT 500AFFL.</li> <li>100x100 CONDUIT BOX AT 1400AFFL.</li> <li>100x50 CONDUIT BOX</li> <li>100x50 CONDUIT BOX AT 300AFFL.</li> <li>100x50 CONDUIT BOX AT 1400AFFL.</li> <li>ROUND CONDUIT BOX.</li> <li>ROUND DRAW BOX</li> <li>100x100 DRAW BOX</li> </ul>	<ul style="list-style-type: none"> <li>100x50 BOX BEHIND POWER SKIRTING</li> <li>ROUND CONDUIT BOX FOR:                     <ul style="list-style-type: none"> <li>DM - DOOR MONITOR</li> <li>CAM - CAMERA</li> <li>AA - ACCESS ALARM</li> <li>AC - ACCESS CONTROL</li> <li>CR - CARD READER</li> <li>COM - COMMUNICATION/INTERCOM</li> <li>BGM - BACK GROUND MUSIC</li> <li>EL - ELECTRIC LOCK/STRIKE</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>CONDUIT TURNED UP ("D" FOR DOWN)</li> <li>DOWN CONDUCTOR TO EARTH OR EARTH TIE.</li> <li>20mm. DIA. CONDUIT.</li> <li>25mm. DIA. CONDUIT.</li> <li>32mm. DIA. CONDUIT.</li> <li>50mm. DIA. CONDUIT.</li> <li>SECTION OF CONDUIT OMITTED FOR CLARITY.</li> <li>SURFIX</li> </ul>	<ul style="list-style-type: none"> <li>TWIN AND EARTH POWER CABLE</li> <li>OC OVERHEAD CAST-IN</li> <li>OS OVERHEAD ON SURFACE OR LAID ON CEILING.</li> <li>FC FLOOR SLAB CAST-IN.</li> <li>POWER SKIRTING</li> <li>TRUNKING</li> <li>CABLE SLEEVE.</li> <li>CABLE TRAY/LADDER</li> </ul>	<ul style="list-style-type: none"> <li>150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.</li> <li>TELEPHONE JUNCTION BOX.</li> <li>INTERCOM JUNCTION BOX.</li> <li>DATA/COMMS JUNCTION BOX.</li> <li>SECURITY, ETC. JUNCTION BOX</li> <li>DISTRIBUTION BOARD POSITION.</li> <li>DB-1 BOARD DESIGNATION NUMBER.</li> </ul>	<ul style="list-style-type: none"> <li>16AMP. SWITCHED SOCKET OUTLET (SSO).</li> <li>DOUBLE 16AMP. SSO.</li> <li>16AMP. SSO ON PEDESTAL.</li> <li>3 PHASE SSO.</li> <li>13AMP. SQUARE PIN SSO.</li> <li>5AMP. 3 PIN UNSWITCHED SOCKET OUTLET.</li> <li>16AMP. CLEAN SSO WITH RED COVER PLATE, SQUARE EARTH AND PLUG TOP ON PEDESTAL.</li> </ul>	<ul style="list-style-type: none"> <li>INTERMEDIATE LIGHT SWITCH</li> <li>SINGLE LEVER ONE WAY LIGHT SWITCH.</li> <li>TWO WAY LIGHT SWITCH</li> <li>FLUORESCENT LUMINAIRE</li> <li>BULKHEAD/DOWNLIGHTER, ETC.</li> <li>WALL MOUNTED LUMINAIRE.</li> <li>POLE MOUNTED LUMINAIRE.</li> </ul>	<ul style="list-style-type: none"> <li>TWO POLE ISOLATOR.</li> <li>THREE POLE ISOLATOR.</li> <li>FOUR POLE ISOLATOR.</li> <li>TELEPHONE POINT.</li> <li>TELEPHONE POINT ON PEDESTAL.</li> <li>DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).</li> <li>TV OUTLET.</li> </ul>	<ul style="list-style-type: none"> <li>DATA/COMMS OUTLET.</li> <li>INTERCOM REDIFFUSION SPEAKER POSITION.</li> <li>BELL PUSH.</li> <li>BELL OUTLET.</li> <li>SIGN POINT.</li> <li>CLOCK OUTLET.</li> <li>PHOTOCELL</li> </ul>	<ul style="list-style-type: none"> <li>REFERENCE TO QUANTITY i.e. 3No.</li> <li>REFERENCE TO A DETAIL i.e. DETAIL 2.</li> <li>REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.</li> <li>REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34</li> <li>CABLE NUMBER - REFER TO SCHEDULE FOR DETAILS</li> <li>LUMINAIRE TYPE "B" - REFER LUMINAIRE SCHEDULE.</li> </ul>
--	---	--	---	--	---	--	--	---	--

NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

ENGINEER	DRAWN	DATE:	SCALE:	CHKD.	TITLE
MH	RM	Jun '23	1:50	MH	MUT New Eng Building 3 Phase Power Supply
PROJECT No.	DRAWING No.	SHEET:	PAPER SIZE:	REV.	DRAWING TITLE:
23051	206		A3	0	Waterless Sani. Lab & Construction Model Lab & Offices 3 Phase Power Layout
REV	DESCRIPTION	BY	DATE	CHKD.	File Name : Lyr:
0	Original Issue	RM	22/06/23	MH	



FIRST FLOOR  
BAKER TILLY HOUSE  
18 WESTVILLE ROAD  
WESTVILLE, 3629  
PO BOX 1469  
WESTVILLE, 3630  
TEL: +27 (031) 2667332  
E-mail: ibuya@ibuya.co.za




NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPIING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.


(1) - Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) - Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) - All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) - Cast in conduits to be spaced 35mm. minimum.

<ul style="list-style-type: none"> <li>100x100 CONDUIT BOX.</li> <li>100x100 CONDUIT BOX AT 500AFFL.</li> <li>100x100 CONDUIT BOX AT 1400AFFL.</li> <li>100x50 CONDUIT BOX</li> <li>100x50 CONDUIT BOX AT 300AFFL.</li> <li>100x50 CONDUIT BOX AT 1400AFFL.</li> <li>ROUND CONDUIT BOX.</li> <li>ROUND DRAW BOX</li> <li>100x100 DRAW BOX</li> </ul>	<ul style="list-style-type: none"> <li>100x50 BOX BEHIND POWER SKIRTING</li> <li>ROUND CONDUIT BOX FOR:                     <ul style="list-style-type: none"> <li>DM - DOOR MONITOR</li> <li>CAM - CAMERA</li> <li>AA - ACCESS ALARM</li> <li>AC - ACCESS CONTROL</li> <li>CR - CARD READER</li> <li>COM - COMMUNICATION/INTERCOM</li> <li>BGM - BACK GROUND MUSIC</li> <li>EL - ELECTRIC LOCK/STRIKE</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>CONDUIT TURNED UP ("D" FOR DOWN)</li> <li>DOWN CONDUCTOR TO EARTH OR EARTH TIE.</li> <li>20mm. DIA. CONDUIT.</li> <li>25mm. DIA. CONDUIT.</li> <li>32mm. DIA. CONDUIT.</li> <li>50mm. DIA. CONDUIT.</li> <li>SECTION OF CONDUIT OMITTED FOR CLARITY.</li> <li>SURFIX</li> </ul>	<ul style="list-style-type: none"> <li>TWIN AND EARTH POWER CABLE</li> <li>OC OVERHEAD CAST-IN</li> <li>OS OVERHEAD ON SURFACE OR LAID ON CEILING.</li> <li>FC FLOOR SLAB CAST-IN.</li> <li>POWER SKIRTING</li> <li>TRUNKING</li> <li>CABLE SLEEVE.</li> <li>CABLE TRAY/LADDER</li> </ul>	<ul style="list-style-type: none"> <li>150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN.</li> <li>TELEPHONE JUNCTION BOX.</li> <li>INTERCOM JUNCTION BOX.</li> <li>DATA/COMMS JUNCTION BOX.</li> <li>SECURITY, ETC. JUNCTION BOX</li> <li>DISTRIBUTION BOARD POSITION.</li> <li>DB-1 BOARD DESIGNATION NUMBER.</li> </ul>	<ul style="list-style-type: none"> <li>16AMP. SWITCHED SOCKET OUTLET (SSO).</li> <li>DOUBLE 16AMP. SSO.</li> <li>16AMP. SSO ON PEDESTAL.</li> <li>3 PHASE SSO.</li> <li>13AMP. SQUARE PIN SSO.</li> <li>5AMP. 3 PIN UNSWITCHED SOCKET OUTLET.</li> <li>16AMP. CLEAN SSO WITH RED COVER PLATE, SQUARE EARTH AND PLUG TOP ON PEDESTAL</li> </ul>	<ul style="list-style-type: none"> <li>INTERMEDIATE LIGHT SWITCH</li> <li>SINGLE LEVER ONE WAY LIGHT SWITCH.</li> <li>TWO WAY LIGHT SWITCH</li> <li>FLUORESCENT LUMINAIRE</li> <li>BULKHEAD/DOWNLIGHTER, ETC.</li> <li>WALL MOUNTED LUMINAIRE.</li> <li>POLE MOUNTED LUMINAIRE.</li> </ul>	<ul style="list-style-type: none"> <li>TWO POLE ISOLATOR.</li> <li>THREE POLE ISOLATOR.</li> <li>FOUR POLE ISOLATOR.</li> <li>TELEPHONE POINT.</li> <li>TELEPHONE POINT ON PEDESTAL.</li> <li>DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).</li> <li>TV OUTLET.</li> </ul>	<ul style="list-style-type: none"> <li>DATA/COMMS OUTLET.</li> <li>INTERCOM REDIFFUSION SPEAKER POSITION.</li> <li>BELL PUSH.</li> <li>BELL OUTLET.</li> <li>SIGN POINT.</li> <li>CLOCK OUTLET.</li> <li>PHOTOCELL</li> </ul>	<ul style="list-style-type: none"> <li>REFERENCE TO QUANTITY I.e. 3No.</li> <li>REFERENCE TO A DETAIL I.e. DETAIL 2. I.e. NOTE 4.</li> <li>REFERENCE TO A STANDARD DRAWING I.e. STANDARD DRAWING No.34</li> <li>CABLE NUMBER - REFER TO SCHEDULE FOR DETAILS</li> <li>LUMINAIRE TYPE "B" - REFER LUMINAIRE SCHEDULE.</li> </ul>
--	---	--	---	--	--	--	--	---	---

ENGINEER	DRAWN	DATE:	SCALE:	CHKD.	TITLE
MH	RM	Jun '23	1:50	MH	MUT New Eng Building 3 Phase Power Supply
PROJECT No.	DRAWING No.	SHEET:	PAPER SIZE:	REV.	DRAWING TITLE:
23051	207		A3	A	Clinical Lab 3 Phase Power Layout
REV	DESCRIPTION	BY	DATE	CHKD.	File Name : Lyr:
A	Issue for Tender	RM	11/0723	MH	
0	Original Issue	RM	22/06/23	MH	



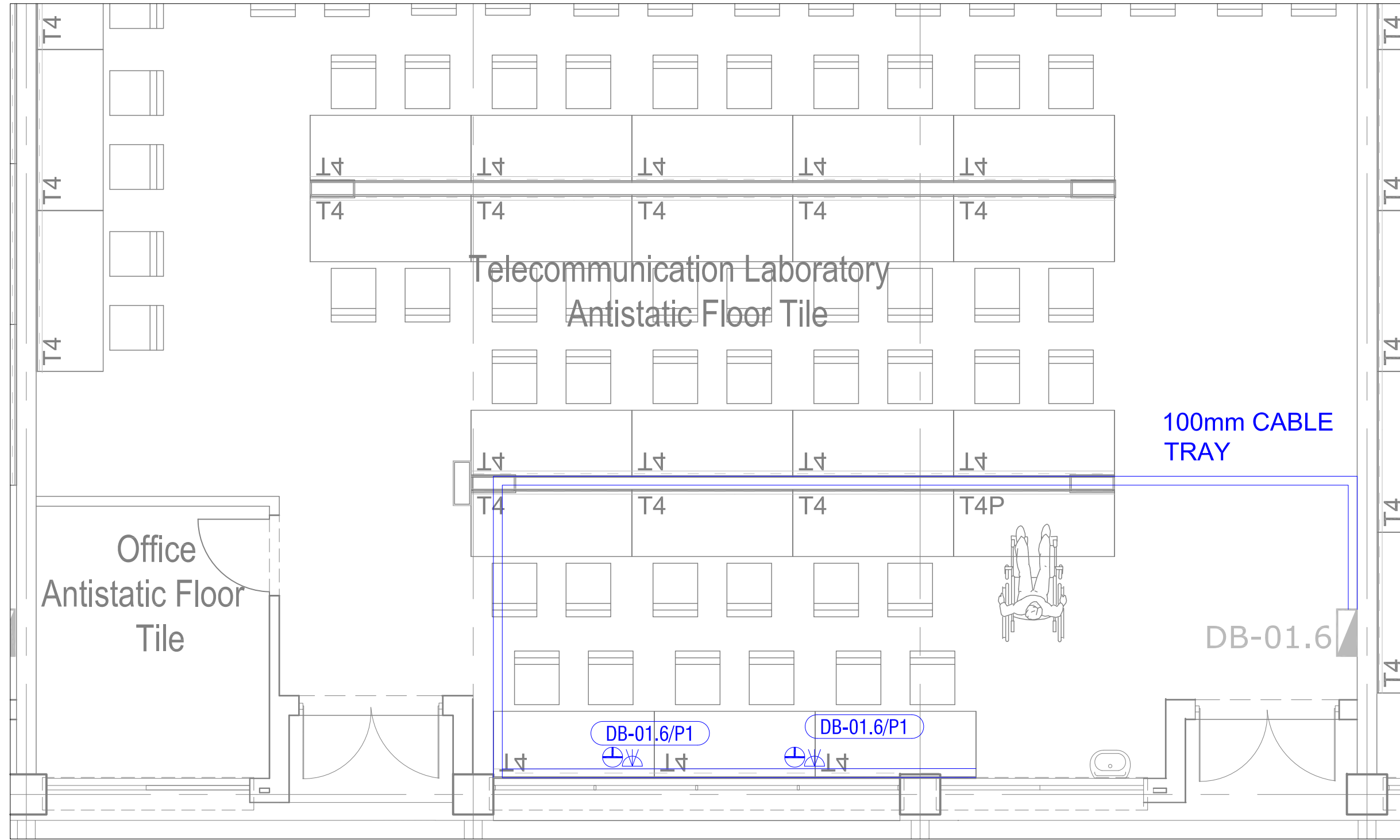
**MUT**  
MANGOSUTHU  
UNIVERSITY OF TECHNOLOGY



**IBUYA** Consulting Engineers  
"POWERING DEVELOPMENT"

FIRST FLOOR  
BAKER TILLY HOUSE  
18 WESTVILLE ROAD  
WESTVILLE, 3629  
PO BOX 1469  
WESTVILLE, 3630

TEL: +27 (031) 2667332  
E-mail: ibuya@ibuya.co.za



(1) - Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) - Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) - All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) - Cast in conduits to be spaced 35mm. minimum.

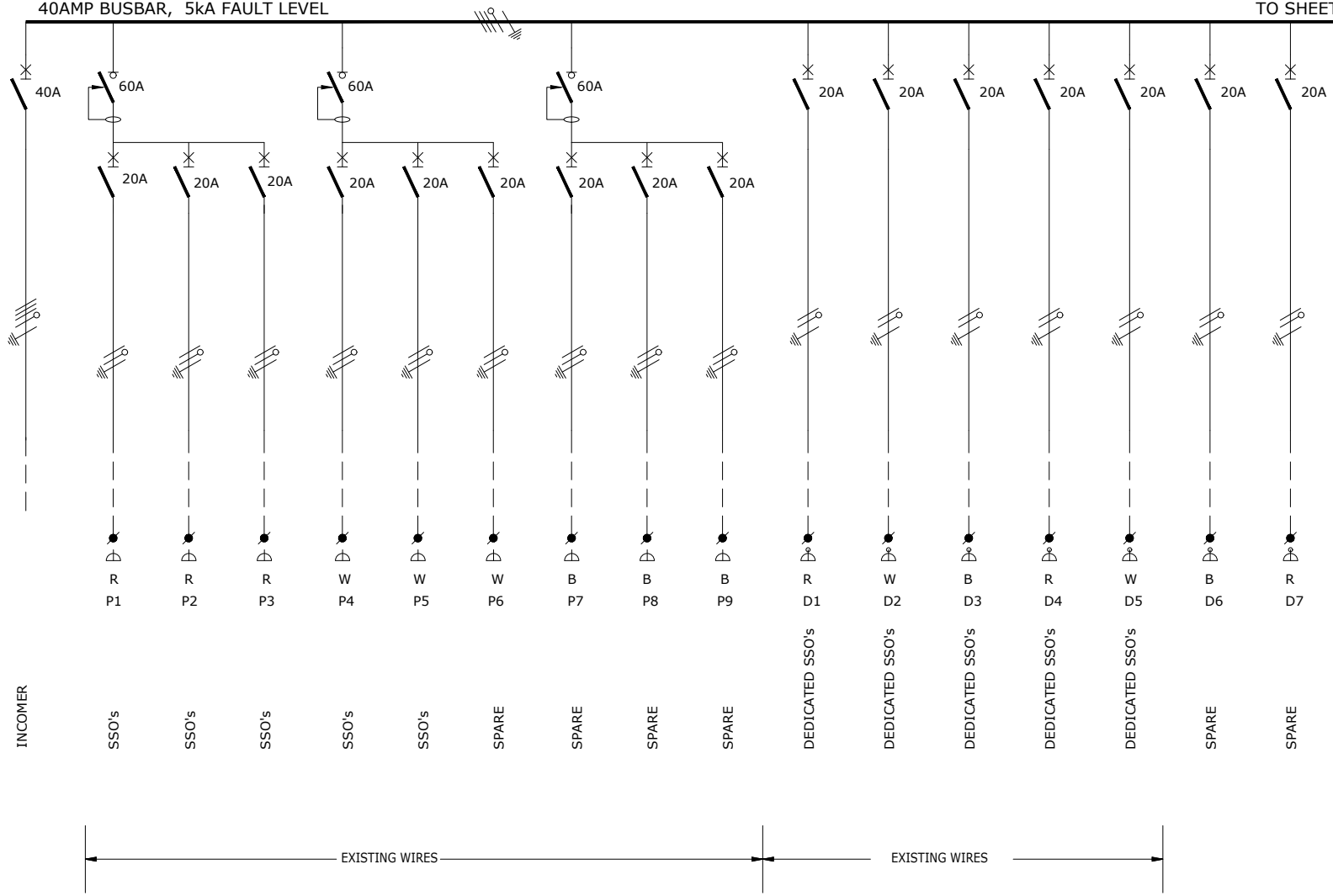
<ul style="list-style-type: none"> <li>100x100 CONDUIT BOX.</li> <li>100x100 CONDUIT BOX AT 500AFL.</li> <li>100x100 CONDUIT BOX AT 1400AFL.</li> <li>100x50 CONDUIT BOX</li> <li>100x50 CONDUIT BOX AT 300AFL.</li> <li>100x50 CONDUIT BOX AT 1400AFL.</li> <li>ROUND CONDUIT BOX.</li> <li>ROUND DRAW BOX</li> <li>100x100 DRAW BOX</li> </ul>	<ul style="list-style-type: none"> <li>100x50 BOX BEHIND POWER SKIRTING</li> <li>ROUND CONDUIT BOX FOR:                     <ul style="list-style-type: none"> <li>DM - DOOR MONITOR</li> <li>CAM - CAMERA</li> <li>AA - ACCESS ALARM</li> <li>AC - ACCESS CONTROL</li> <li>CR - CARD READER</li> <li>COM - COMMUNICATION/INTERCOM</li> <li>BGM - BACK GROUND MUSIC</li> <li>EL - ELECTRIC LOCK/STRIKE</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>CONDUIT TURNED UP ("D" FOR DOWN)</li> <li>DOWN CONDUCTOR TO EARTH OR EARTH TIE.</li> <li>20mm. DIA. CONDUIT.</li> <li>25mm. DIA. CONDUIT.</li> <li>32mm. DIA. CONDUIT.</li> <li>50mm. DIA. CONDUIT.</li> <li>SECTION OF CONDUIT OMITTED FOR CLARITY. SURFIX</li> </ul>	<ul style="list-style-type: none"> <li>TWIN AND EARTH POWER CABLE</li> <li>OC OVERHEAD CAST-IN</li> <li>OS OVERHEAD ON SURFACE OR LAID ON CEILING.</li> <li>FC FLOOR SLAB CAST-IN.</li> <li>POWER SKIRTING</li> <li>TRUNKING</li> <li>CABLE SLEEVE.</li> <li>CABLE TRAY/LADDER</li> </ul>	<ul style="list-style-type: none"> <li>150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.</li> <li>TELEPHONE JUNCTION BOX.</li> <li>INTERCOM JUNCTION BOX.</li> <li>DATA/COMMS JUNCTION BOX.</li> <li>SECURITY, ETC. JUNCTION BOX</li> <li>DISTRIBUTION BOARD POSITION.</li> <li>DB-1 BOARD DESIGNATION NUMBER.</li> </ul>	<ul style="list-style-type: none"> <li>16AMP. SWITCHED SOCKET OUTLET (SSO).</li> <li>DOUBLE 16AMP. SSO.</li> <li>16AMP. SSO ON PEDESTAL.</li> <li>3 PHASE SSO.</li> <li>13AMP. SQUARE PIN SSO.</li> <li>5AMP. 3 PIN UNSWITCHED SOCKET OUTLET.</li> <li>16AMP. CLEAN SSO WITH RED COVER PLATE, SQUARE EARTH AND PLUG TOP ON PEDESTAL</li> </ul>	<ul style="list-style-type: none"> <li>INTERMEDIATE LIGHT SWITCH</li> <li>SINGLE LEVER ONE WAY LIGHT SWITCH.</li> <li>TWO WAY LIGHT SWITCH</li> <li>FLUORESCENT LUMINAIRE</li> <li>BULKHEAD/DOWNLIGHTER, ETC.</li> <li>WALL MOUNTED LUMINAIRE.</li> <li>POLE MOUNTED LUMINAIRE.</li> </ul>	<ul style="list-style-type: none"> <li>TWO POLE ISOLATOR.</li> <li>THREE POLE ISOLATOR.</li> <li>FOUR POLE ISOLATOR.</li> <li>TELEPHONE POINT.</li> <li>TELEPHONE POINT ON PEDESTAL.</li> <li>DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).</li> <li>TV OUTLET.</li> </ul>	<ul style="list-style-type: none"> <li>DATA/COMMS OUTLET.</li> <li>INTERCOM REDIFFUSION SPEAKER POSITION.</li> <li>BELL PUSH.</li> <li>BELL OUTLET.</li> <li>SIGN POINT.</li> <li>CLOCK OUTLET.</li> <li>PHOTOCELL</li> </ul>	<ul style="list-style-type: none"> <li>REFERENCE TO QUANTITY i.e. 3No.</li> <li>REFERENCE TO A DETAIL i.e. DETAIL 2.</li> <li>REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.</li> <li>REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34</li> <li>CABLE NUMBER - REFER TO SCHEDULE FOR DETAILS</li> <li>LUMINAIRE TYPE "B" - REFER LUMINAIRE SCHEDULE.</li> </ul>
--	---	---	---	--	--	--	--	---	--

NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

ENGINEER	DRAWN	DATE:	SCALE:	CHKD.	TITLE	<p>FIRST FLOOR BAKER TILLY HOUSE 18 WESTVILLE ROAD WESTVILLE, 3629 PO BOX 1469 WESTVILLE, 3630</p> <p>TEL: +27 (031) 2667332 E-mail: ibuya@ibuya.co.za</p>
MH	RM	Jun '23	1:50 PAPER SIZE: A3	MH	MUT New Eng Building 3 Phase Power Supply	
PROJECT No.	DRAWING No.	SHEET:	REV.	DRAWING TITLE:	Telecommunications Lab 3 Phase Power Layout	
REV	DESCRIPTION	BY	DATE	CHKD.	File Name :	Lyr:
A	Issue for Tender	RM	11/07/23	MH		
0	Original Issue	RM	22/06/23	MH	23051	208

40AMP BUSBAR, 5kA FAULT LEVEL

TO SHEET 2



PHASE CIRCUIT No.  
DESIGNATION  
WIRING  
CABLE No.  
LOAD (AMPS)  
No. OF POINTS

INCOMER  
SSO's  
SSO's  
SSO's  
SSO's  
SSO's  
SPARE  
SPARE  
SPARE  
SPARE  
DEDICATED SSO's  
DEDICATED SSO's  
DEDICATED SSO's  
DEDICATED SSO's  
DEDICATED SSO's  
SPARE  
SPARE

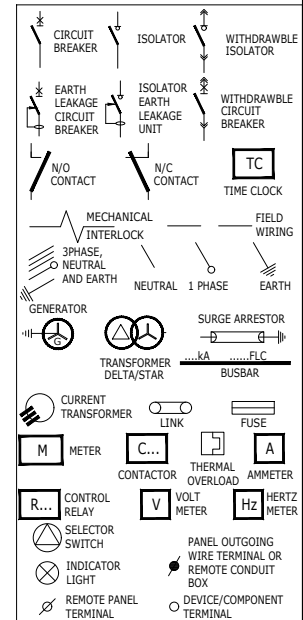
R P1 P2 P3 W P4 P5 W P6 B P7 P8 B P9 R D1 W D2 B D3 R D4 W D5 B D6 R D7



- NOTES**
- 1) DROPPERS/TAILS TO BE RATED FOR FULL I<sub>p</sub> LET THROUGH.
  - 2) HARNESSED WIRING TO BE DERATED.
  - 3) TUFFNOL BRACES ARE NOT TO BE USED ABOVE 10kA.
  - 4) COPPER BUSBARS TO BE CONTINUOUS RATED.
  - 5) ALL OUTGOING CIRCUIT BREAKERS TO BE FITTED WITH COPPER TAILS TO FACILITATE CABLE TERMINATIONS IN THE CABLE CHAMBER AND NOT ON THE CIRCUIT BREAKER.
  - 6) COPPER TAILS FROM DROPPER BUSBAR AND OUTGOING COPPER TAILS TO BE ADEQUATELY BRACED FOR FAULT LEVEL AND SHROUDED WITH HEAT SHRINK.
  - 7) ALL CIRCUIT BREAKERS TO BE FITTED WITH TERMINAL SHIELD ON LIVE AND LOAD SIDES.
  - 8) ENCLOSURE TO BE IP54.
  - 9) PHASING RWB, TOP TO BOTTOM, LEFT TO RIGHT, BACK TO FRONT.
  - 10) INTERNAL TEMP TO BE LIMITED TO 5° ABOVE AMBIANT, MAX 40°C.
  - 11) ALL CIRCUITS TO BE LABELED.
  - 12) 25% SPARE SPACE. SPARE SPACES ARE TO BE FITTED WITH COPPER BUSBAR TAILS CONNECTED TO DROPPER BUSBARS TO ALLOW INSTALLATION OF CIRCUIT BREAKERS WITH A MINIMAL SHUTDOWN PERIOD.
  - 13) CHANGEOVER TO BE CONTROLLED BY STANDBY GENERATOR CONTROLLER.

- INCOMING CABLE** -TOP/BOTTOM  
**OUTGOING CIRCUITS** -TOP/BOTTOM  
**COLOUR** -WHITE (NON-ESS)  
-RED (ESS)  
-BLUE (UPS)  
**MOUNTING** -SURFACE  
**ACCESS** -FRONT  
**PROTECTIVE DEVICES** -SCHNIEDER BREAKERS  
**CONTACTORS** -AC3 HEAVY DUTY

**CASCADED SYSTEM**



NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTALLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

ENGINEER	DRAWN	DATE:	SCALE:	CHKD.	TITLE
MH	RM	Jun '23	1:50	MH	MUT New Eng Building 3 Phase Power Supply
PAPER SIZE:			A3		
PROJECT No.	DRAWING No.	SHEET:	REV.	DRAWING TITLE:	
23051	401	1 of 2	0	Process Lab DB-01.4	
File Name :	Lyr:			Single Line Diagram	

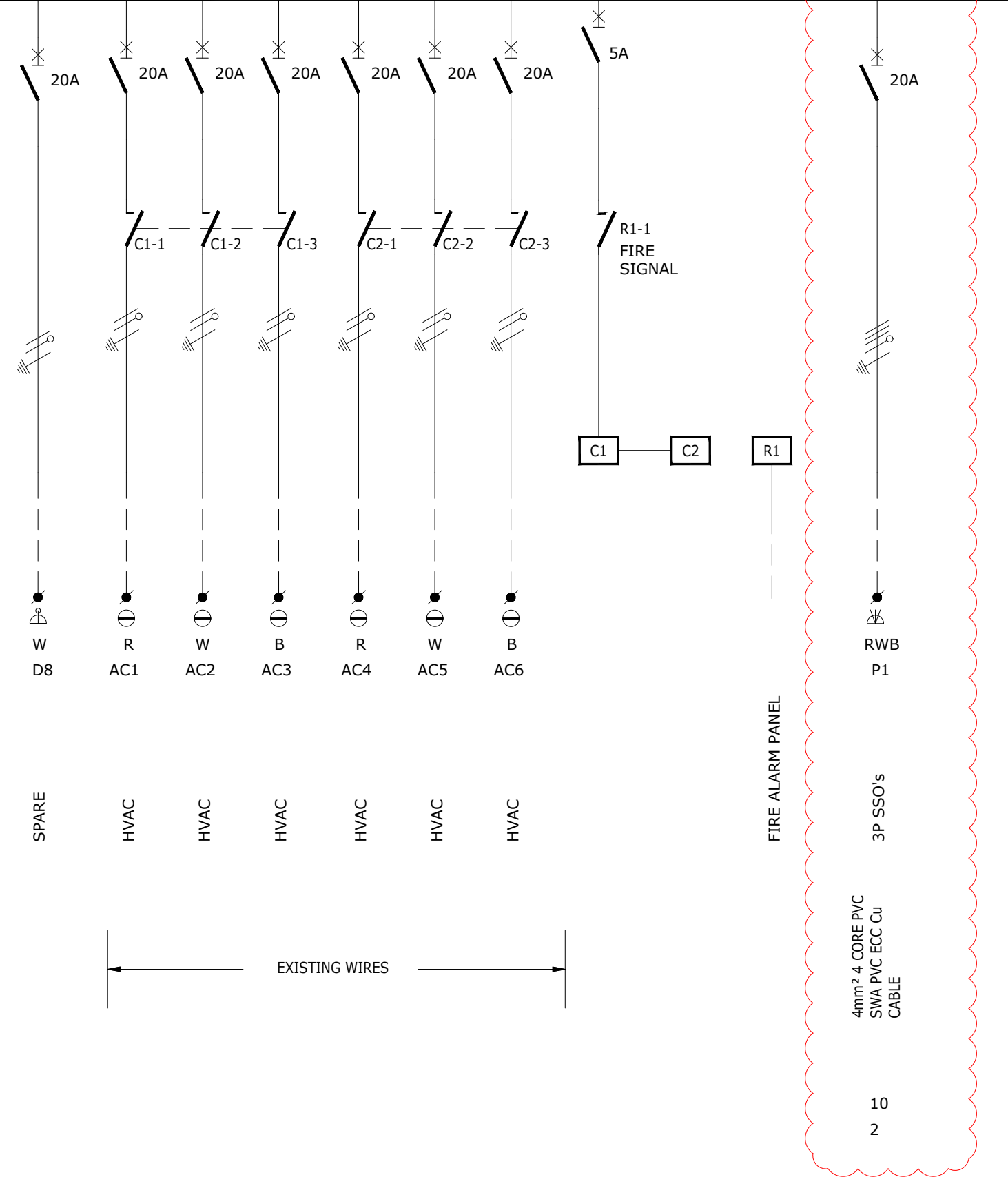


**IBUYA** Consulting Engineers  
POWERING DEVELOPMENT™  
FIRST FLOOR  
BAKER TILLY HOUSE  
18 WESTVILLE ROAD  
WESTVILLE, 3629  
PO BOX 1469  
WESTVILLE, 3630

TEL: +27 (031) 2667332  
E-mail: ibuya@ibuya.co.za

0	Original Issue	RM	14/06/23	MH
REV	DESCRIPTION	BY	DATE	CHKD.

FROM SHEET 1 40AMP BUSBAR, 5kA FAULT LEVEL



PHASE  
CIRCUIT No.

DESIGNATION

WIRING

CABLE No.  
LOAD (AMPS)  
No. OF POINTS

W D8  
R AC1  
W AC2  
B AC3  
R AC4  
W AC5  
B AC6  
RWB P1

SPARE  
HVAC  
HVAC  
HVAC  
HVAC  
HVAC  
HVAC  
FIRE ALARM PANEL  
3P SSO's

EXISTING WIRES

4mm<sup>2</sup> 4 CORE PVC  
SWA PVC ECC CU  
CABLE

10  
2

NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

ENGINEER	DRAWN	DATE:	SCALE:	CHKD.	TITLE
MH	RM	Jun '23	1:50	MH	MUT New Eng Building 3 Phase Power Supply
PAPER SIZE:	PROJECT No.	DRAWING No.	SHEET:	REV.	DRAWING TITLE:
A3	23051	401	2 of 2	0	Process Lab DB-01.4 Single Line Diagram
REV	DESCRIPTION	BY	DATE	CHKD.	File Name :
0	Original Issue	RM	14/06/23	MH	Lyr:

**IBUYA** Consulting Engineers  
"POWERING DEVELOPMENT"

FIRST FLOOR  
BAKER TILLY HOUSE  
18 WESTVILLE ROAD  
WESTVILLE, 3629  
PO BOX 1469  
WESTVILLE, 3630

TEL: +27 (031) 2667332  
E-mail: ibuya@ibuya.co.za

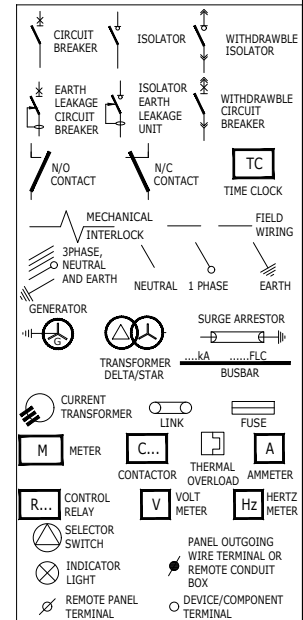
60AMP BUSBAR, 5ka FAULT LEVEL (DB-00.4)

TO SHEET 2

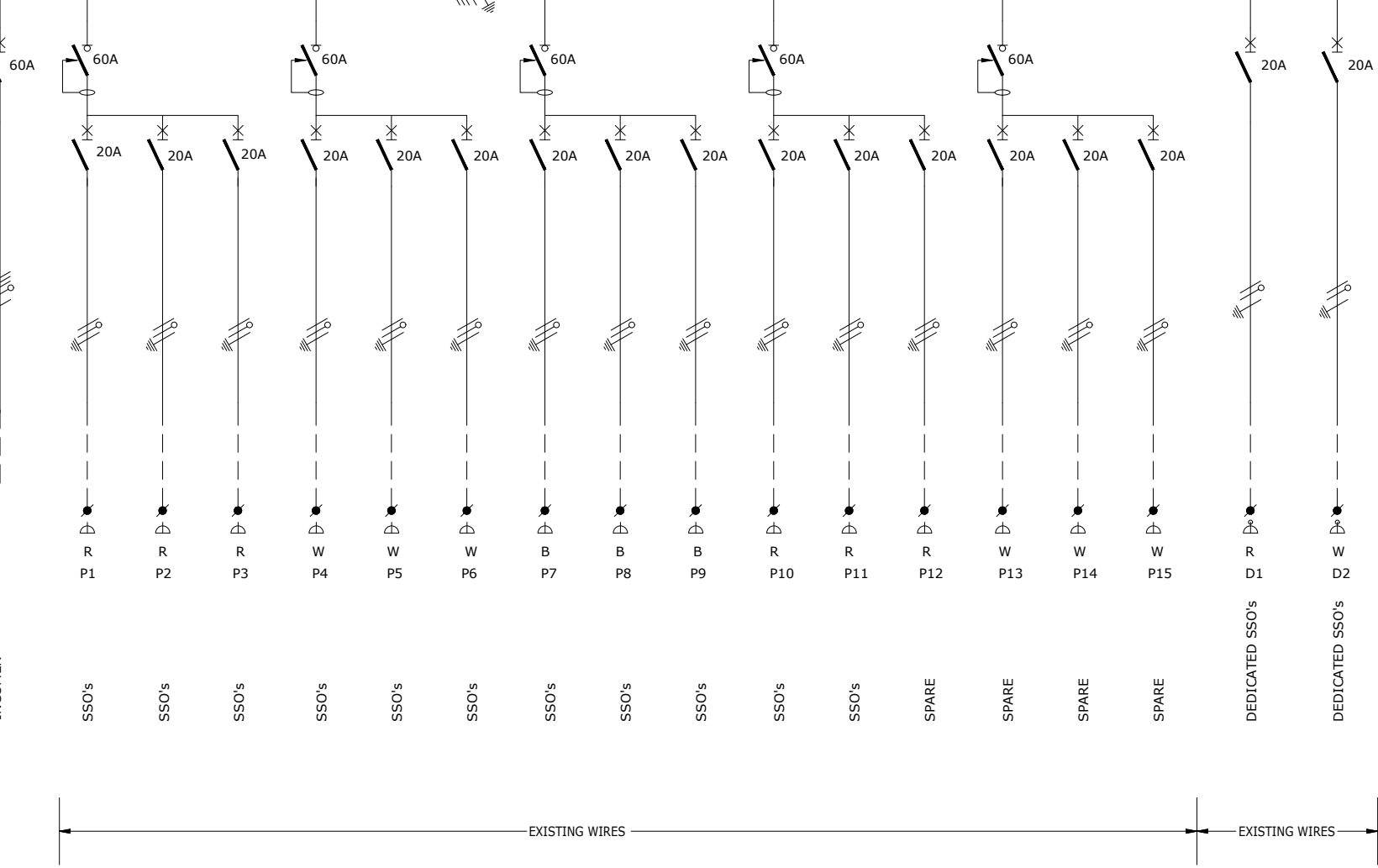
- NOTES**
- 1) DROPPERS/TAILS TO BE RATED FOR FULL I<sub>pk</sub> LET THROUGH.
  - 2) HARNESSED WIRING TO BE DERATED.
  - 3) TUFFNOL BRACES ARE NOT TO BE USED ABOVE 10kA.
  - 4) COPPER BUSBARS TO BE CONTINUOUS RATED.
  - 5) ALL OUTGOING CIRCUIT BREAKERS TO BE FITTED WITH COPPER TAILS TO FACILITATE CABLE TERMINATIONS IN THE CABLE CHAMBER AND NOT ON THE CIRCUIT BREAKER.
  - 6) COPPER TAILS FROM DROPPER BUSBAR AND OUTGOING COPPER TAILS TO BE ADEQUATELY BRACED FOR FAULT LEVEL AND SHROUDED WITH HEAT SHRINK.
  - 7) ALL CIRCUIT BREAKERS TO BE FITTED WITH TERMINAL SHIELD ON LIVE AND LOAD SIDES.
  - 8) ENCLOSURE TO BE IP54.
  - 9) PHASING RWB, TOP TO BOTTOM, LEFT TO RIGHT, BACK TO FRONT.
  - 10) INTERNAL TEMP TO BE LIMITED TO 5° ABOVE AMBIANT, MAX 40°C.
  - 11) ALL CIRCUITS TO BE LABELED.
  - 12) 25% SPARE SPACE. SPARE SPACES ARE TO BE FITTED WITH COPPER BUSBAR TAILS CONNECTED TO DROPPER BUSBARS TO ALLOW INSTALLATION OF CIRCUIT BREAKERS WITH A MINIMAL SHUTDOWN PERIOD.
  - 13) CHANGEOVER TO BE CONTROLLED BY STANDBY GENERATOR CONTROLLER.

- INCOMING CABLE** -TOP/BOTTOM  
**OUTGOING CIRCUITS** -TOP/BOTTOM  
**COLOUR** -WHITE (NON-ESS)  
 -RED (ESS)  
 -BLUE (UPS)  
**MOUNTING ACCESS** -SURFACE  
 -FRONT  
**PROTECTIVE DEVICES** -SCHNIEDER BREAKERS  
 CONTACTORS -AC3 HEAVY DUTY

**CASCADED SYSTEM**



PHASE CIRCUIT No.  
 DESIGNATION  
 WIRING  
 CABLE No. P  
 LOAD (AMPS)  
 No. OF POINTS



NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTALLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

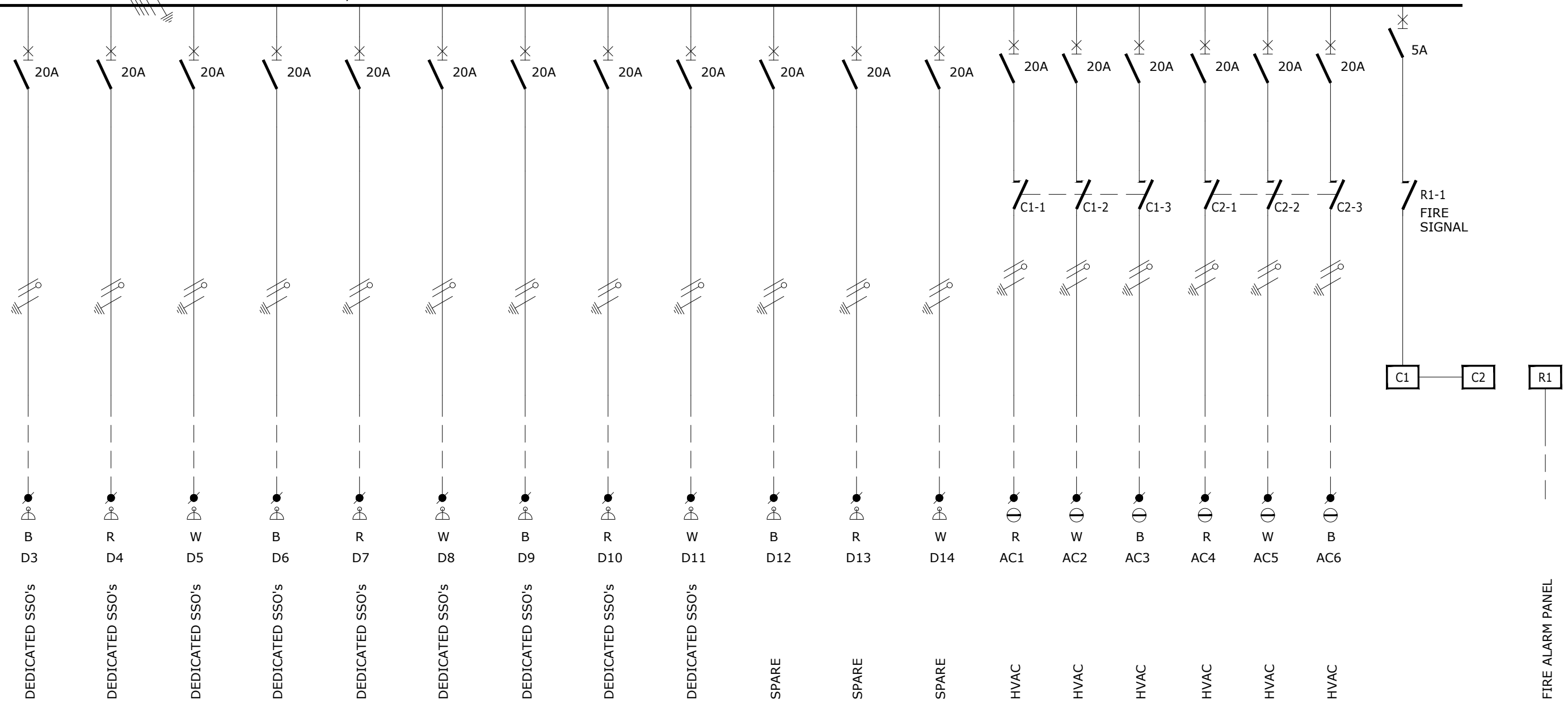
B	General Revision	RM	11/07/23	MH	ENGINEER	DRAWN	DATE:	SCALE:	CHKD.	TITLE
A	General Revision	RM	22/06/23	MH	MH	RM	Jun '23	1:50	MH	
0	Original Issue	RM	14/06/23	MH	PROJECT No.	DRAWING No.	SHEET:	PAPER SIZE:	REV.	DRAWING TITLE:
REV	DESCRIPTION	BY	DATE	CHKD.	File Name :	Lyr:	1 of 3	A3	B	Installation Lab DB-L0.4 Single Line Diagram



**IBUYA** Consulting Engineers  
 "POWERING DEVELOPMENT"  
 FIRST FLOOR  
 BAKER TILLY HOUSE  
 18 WESTVILLE ROAD  
 WESTVILLE, 3629  
 PO BOX 1469  
 WESTVILLE, 3630

TEL: +27 (031) 2667332  
 E-mail: ibuya@ibuya.co.za

FROM SHEET 1 60AMP BUSBAR, 5KA FAULT LEVEL TO SHEET 3



PHASE  
CIRCUIT No.  
  
DESIGNATION

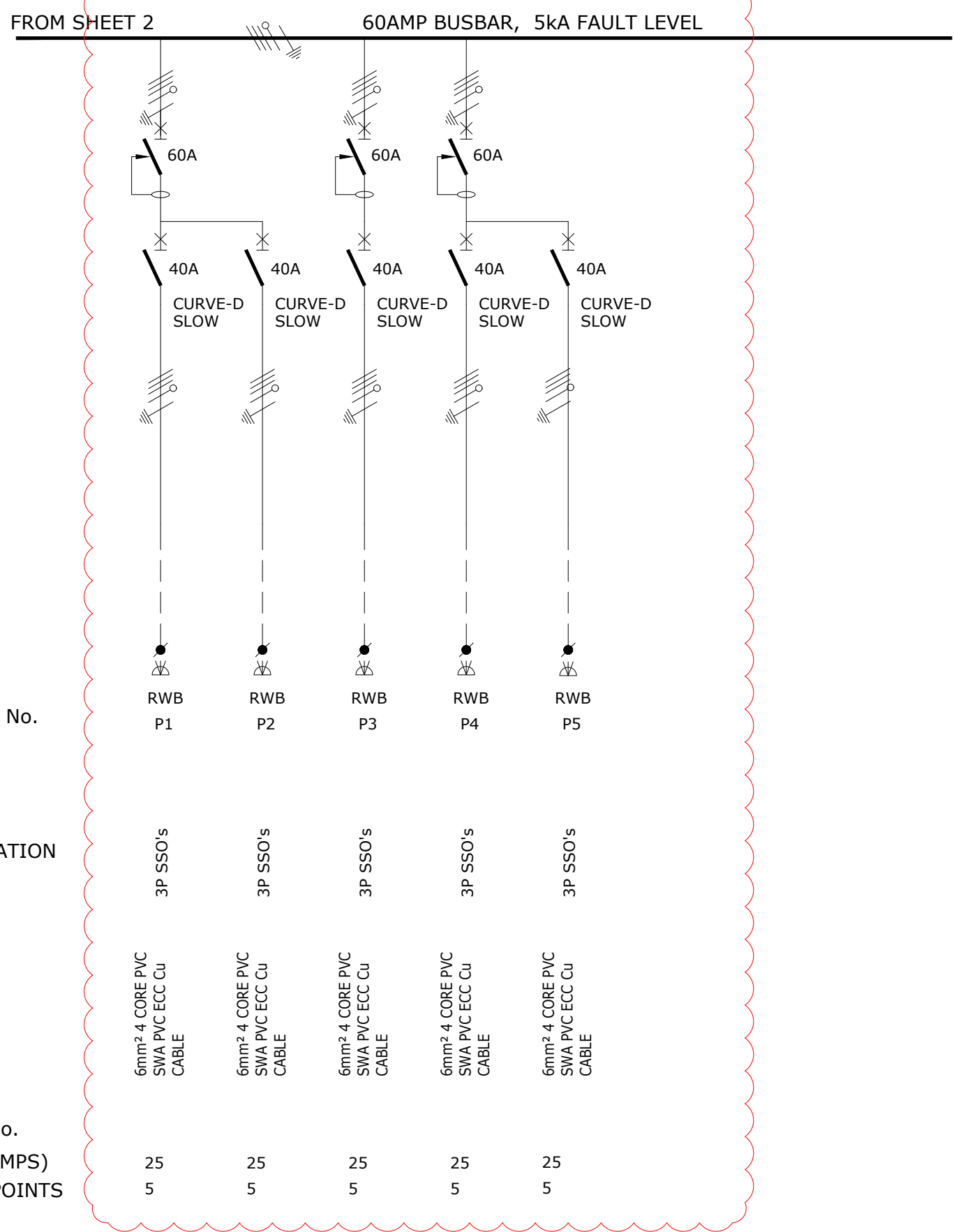
WIRING  
  
CABLE No.  
LOAD (AMPS)  
No. OF POINTS

NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

B	General Revision	RM	11/07/23	MH	ENGINEER	DRAWN	DATE:	SCALE:	CHKD.	TITLE <b>MUT New Eng Building 3 Phase Power Supply</b>
A	General Revision	RM	22/06/23	MH	MH	RM	Jun '23	PAPER SIZE:	MH	
0	Original Issue	RM	14/06/23	MH	PROJECT No.	DRAWING No.	SHEET:	REV.	B	
REV	DESCRIPTION	BY	DATE	CHKD.	File Name :	Lyr:		DRAWING TITLE: <b>Installation Lab DB-L0.4 Single Line Diagram</b>		

FIRST FLOOR  
BAKER TILLY HOUSE  
18 WESTVILLE ROAD  
WESTVILLE, 3629  
PO BOX 1469  
WESTVILLE, 3630

TEL: +27 (031) 2667332  
E-mail: ibuya@ibuya.co.za



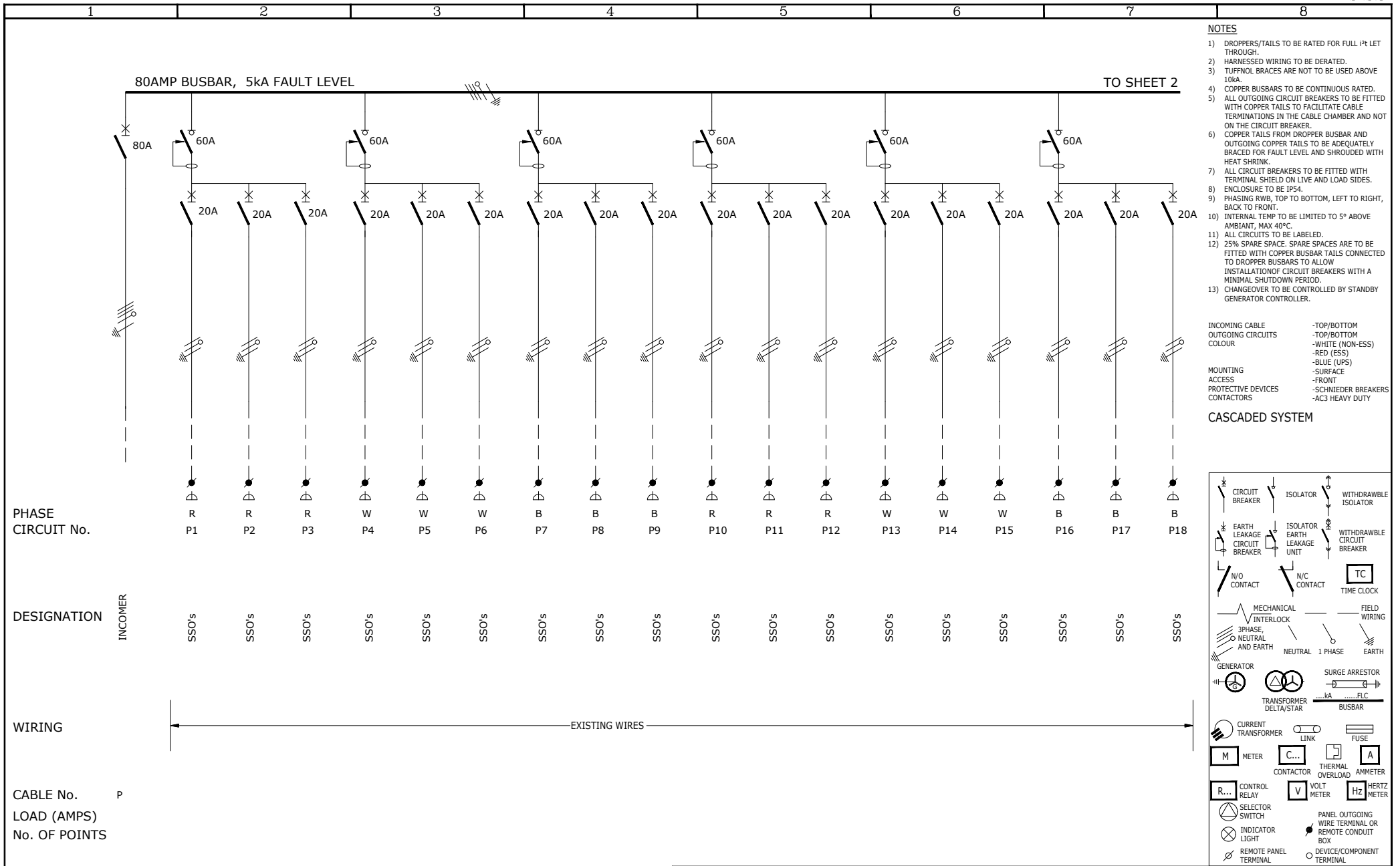
PHASE CIRCUIT No.	RWB P1	RWB P2	RWB P3	RWB P4	RWB P5
DESIGNATION	3P SSO's	3P SSO's	3P SSO's	3P SSO's	3P SSO's
WIRING	6mm <sup>2</sup> 4 CORE PVC SWA PVC ECC Cu CABLE	6mm <sup>2</sup> 4 CORE PVC SWA PVC ECC Cu CABLE	6mm <sup>2</sup> 4 CORE PVC SWA PVC ECC Cu CABLE	6mm <sup>2</sup> 4 CORE PVC SWA PVC ECC Cu CABLE	6mm <sup>2</sup> 4 CORE PVC SWA PVC ECC Cu CABLE
CABLE No.					
LOAD (AMPS)	25	25	25	25	25
No. OF POINTS	5	5	5	5	5

NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

B	General Revision	RM	11/07/23	MH	ENGINEER	DRAWN	DATE:	SCALE:	CHKD.
A	General Revision	RM	22/06/23	MH	MH	RM	Jun '23	1:50	MH
0	Original Issue	RM	14/06/23	MH	PROJECT No.	DRAWING No.	SHEET:	PAPER SIZE:	REV.
REV	DESCRIPTION	BY	DATE	CHKD.	23051	404	3 of 3	A3	B
					File Name :	Lyr:			

TITLE	MUT New Eng Building 3 Phase Power Supply
DRAWING TITLE:	Installation Lab DB-L0.4 Single Line Diagram

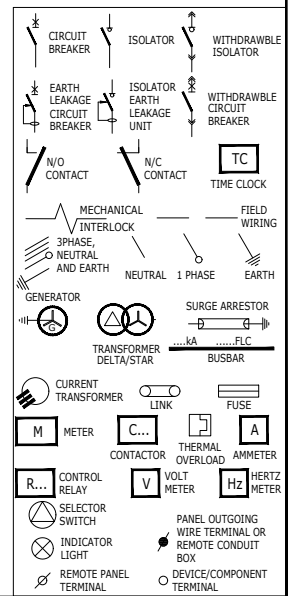
		FIRST FLOOR BAKER TILLY HOUSE 18 WESTVILLE ROAD WESTVILLE, 3629 PO BOX 1469 WESTVILLE, 3630  TEL: +27 (031) 2667332 E-mail: ibuya@ibuya.co.za
--	--	---



- NOTES**
- 1) DROPPERS/TAILS TO BE RATED FOR FULL IP LET THROUGH.
  - 2) HARNESSED WIRING TO BE DERATED.
  - 3) TUFFNOL BRACES ARE NOT TO BE USED ABOVE 10KA.
  - 4) COPPER BUSBARS TO BE CONTINUOUS RATED.
  - 5) ALL OUTGOING CIRCUIT BREAKERS TO BE FITTED WITH COPPER TAILS TO FACILITATE CABLE TERMINATIONS IN THE CABLE CHAMBER AND NOT ON THE CIRCUIT BREAKER.
  - 6) COPPER TAILS FROM DROPPER BUSBAR AND OUTGOING COPPER TAILS TO BE ADEQUATELY BRACED FOR FAULT LEVEL AND SHROUDED WITH HEAT SHRINK.
  - 7) ALL CIRCUIT BREAKERS TO BE FITTED WITH TERMINAL SHIELD ON LIVE AND LOAD SIDES.
  - 8) ENCLOSURE TO BE IP54.
  - 9) PHASING RWB, TOP TO BOTTOM, LEFT TO RIGHT, BACK TO FRONT.
  - 10) INTERNAL TEMP TO BE LIMITED TO 5° ABOVE AMBIANT, MAX 40°C.
  - 11) ALL CIRCUITS TO BE LABELED.
  - 12) 25% SPARE SPACE. SPARE SPACES ARE TO BE FITTED WITH COPPER BUSBAR TAILS CONNECTED TO DROPPER BUSBARS TO ALLOW INSTALLATION OF CIRCUIT BREAKERS WITH A MINIMAL SHUTDOWN PERIOD.
  - 13) CHANGEOVER TO BE CONTROLLED BY STANDBY GENERATOR CONTROLLER.

- INCOMING CABLE** -TOP/BOTTOM  
**OUTGOING CIRCUITS** -TOP/BOTTOM  
**COLOUR**  
 -WHITE (NON-ESS)  
 -RED (ESS)  
 -BLUE (UPS)  
**MOUNTING** -SURFACE  
**ACCESS** -FRONT  
**PROTECTIVE DEVICES** -SCHNIEDER BREAKERS  
**CONTACTORS** -AC3 HEAVY DUTY

**CASCADED SYSTEM**



PHASE	R	R	R	W	W	W	B	B	B	R	R	R	W	W	W	B	B	B
CIRCUIT No.	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18
DESIGNATION	INCOMER	SSO's	SSO's	SSO's	SSO's	SSO's	SSO's	SSO's	SSO's	SSO's	SSO's	SSO's	SSO's	SSO's	SSO's	SSO's	SSO's	SSO's
WIRING		←----- EXISTING WIRES -----→																
CABLE No.	P																	
LOAD (AMPS)																		
No. OF POINTS																		

NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPIING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTALLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

B	General Revision	RM	11/07/23	MH	ENGINEER	DATE:	SCALE:	CHKD.	TITLE
A	General Revision	RM	22/06/23	MH	MH	Jun '23	1:50	MH	MUT New Eng Building 3 Phase Power Supply
0	Original Issue	RM	14/06/23	MH	PROJECT No.	DRAWING No.	SHEET:	REV.	DRAWING TITLE:
					23051	406	1 of 4	B	Distribution and Protection Lab DB-L0.7 Single Line Diagram
REV	DESCRIPTION	BY	DATE	CHKD.	File Name :	Lyr:			

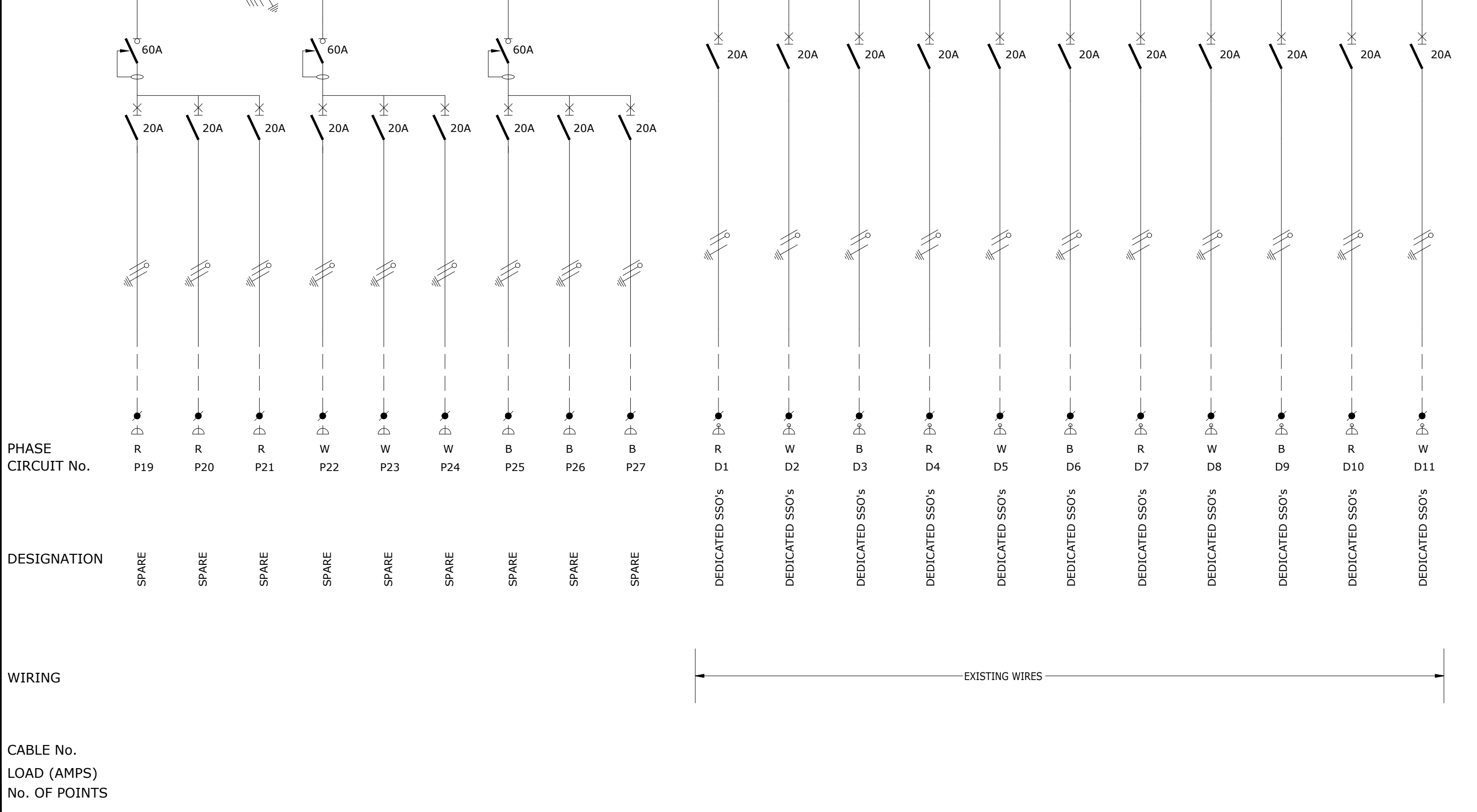
**MUT**  
MANGOSUTHU  
UNIVERSITY OF TECHNOLOGY

**IBUYA**  
Consulting Engineers  
"POWERING DEVELOPMENT"

FIRST FLOOR  
BAKER TILLY HOUSE  
18 WESTVILLE ROAD  
WESTVILLE, 3629  
PO BOX 1469  
WESTVILLE, 3630

TEL: +27 (031) 2667332  
E-mail: ibuya@ibuya.co.za

FROM SHEET 1 80AMP BUSBAR, 5kA FAULT LEVEL TO SHEET 3



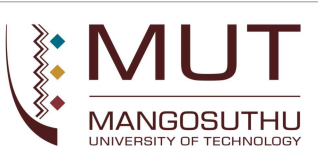
	PHASE	CIRCUIT No.	DESIGNATION	WIRING	CABLE No.	LOAD (AMPS)	No. OF POINTS
	R	P19	SPARE				
	R	P20	SPARE				
	R	P21	SPARE				
	W	P22	SPARE				
	W	P23	SPARE				
	W	P24	SPARE				
	B	P25	SPARE				
	B	P26	SPARE				
	B	P27	SPARE				
	R	D1	DEDICATED SSO's	←-----EXISTING WIRES-----→			
	W	D2	DEDICATED SSO's				
	B	D3	DEDICATED SSO's				
	R	D4	DEDICATED SSO's				
	W	D5	DEDICATED SSO's				
	B	D6	DEDICATED SSO's				
	R	D7	DEDICATED SSO's				
	W	D8	DEDICATED SSO's				
	B	D9	DEDICATED SSO's				
	R	D10	DEDICATED SSO's				
	W	D11	DEDICATED SSO's				

NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.


REV	DESCRIPTION	BY	DATE	CHKD.	File Name :	Lyr:
B	General Revision	RM	11/07/23	MH	ENGINEER	DRAWN
A	General Revision	RM	22/06/23	MH	MH	RM
0	Original Issue	RM	14/06/23	MH	PROJECT No.	DRAWING No.
					23051	406
					SHEET:	2 of 4
					SCALE:	1:50
					PAPER SIZE:	A3
					CHKD.	MH
					REV.	B

TITLE  
**MUT New Eng Building 3 Phase Power Supply**

DRAWING TITLE:  
**Distribution and Protection Lab  
 DB-L0.7  
 Single Line Diagram**



**MUT**  
MANGOSUTHU  
UNIVERSITY OF TECHNOLOGY

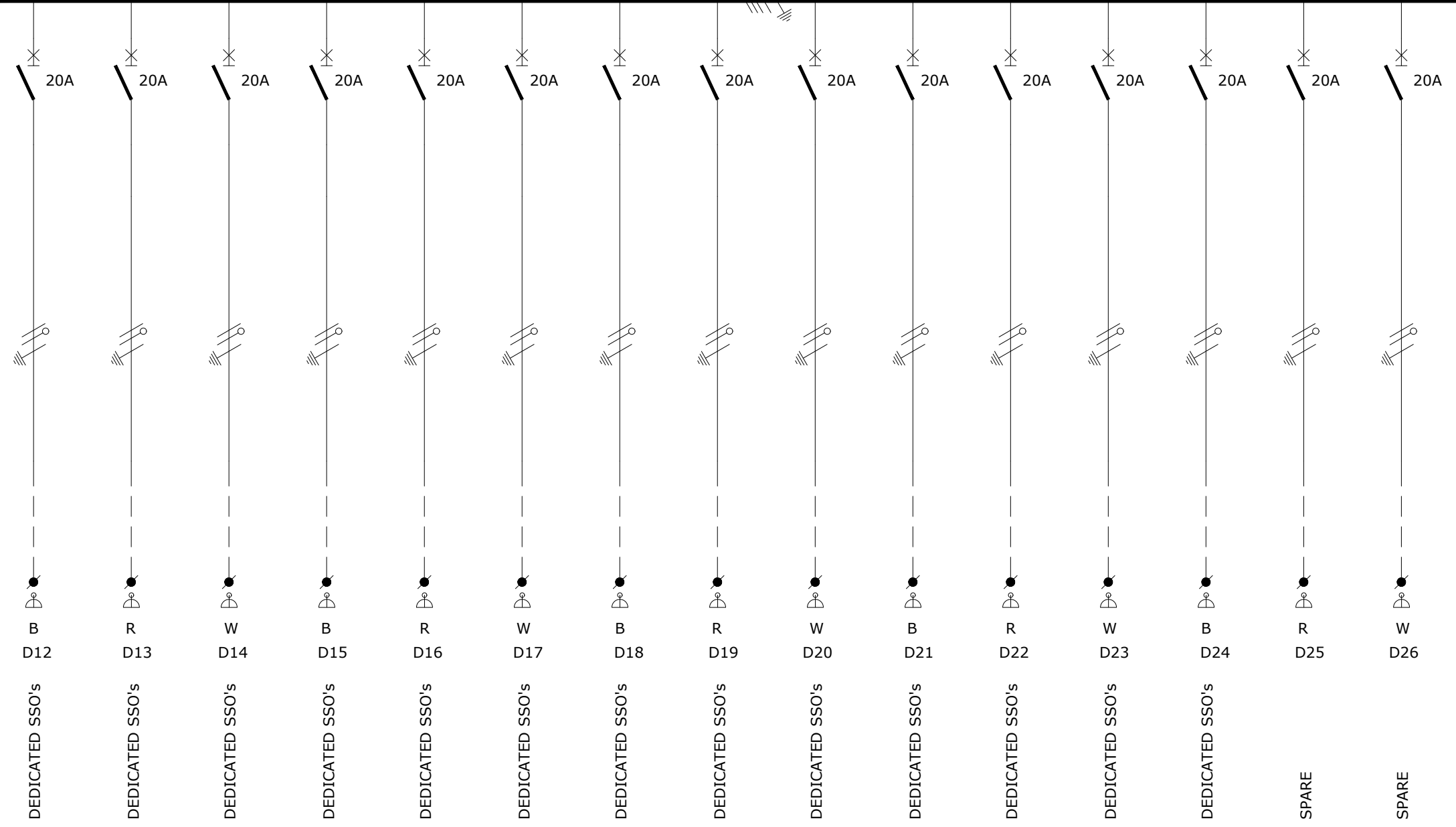


**IBUYA** Consulting Engineers  
"POWERING DEVELOPMENT"

FIRST FLOOR  
 BAKER TILLY HOUSE  
 18 WESTVILLE ROAD  
 WESTVILLE, 3629  
 PO BOX 1469  
 WESTVILLE, 3630

TEL: +27 (031) 2667332  
 E-mail: ibuya@ibuya.co.za

FROM SHEET 2 80AMP BUSBAR, 5kA FAULT LEVEL TO SHEET 4



PHASE  
CIRCUIT No.

DESIGNATION

WIRING



CABLE No.  
LOAD (AMPS)  
No. OF POINTS

NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

B	General Revision	RM	11/07/23	MH	ENGINEER	DRAWN	DATE:	SCALE:	CHKD.
A	General Revision	RM	22/06/23	MH	MH	RM	Jun '23	1:50	MH
0	Original Issue	RM	14/06/23	MH	PROJECT No.	DRAWING No.	SHEET:	PAPER SIZE:	REV.
REV	DESCRIPTION	BY	DATE	CHKD.	23051	406	3 of 4	A3	B
					File Name :		Lyr:		

TITLE  
**MUT New Eng Building 3 Phase Power Supply**

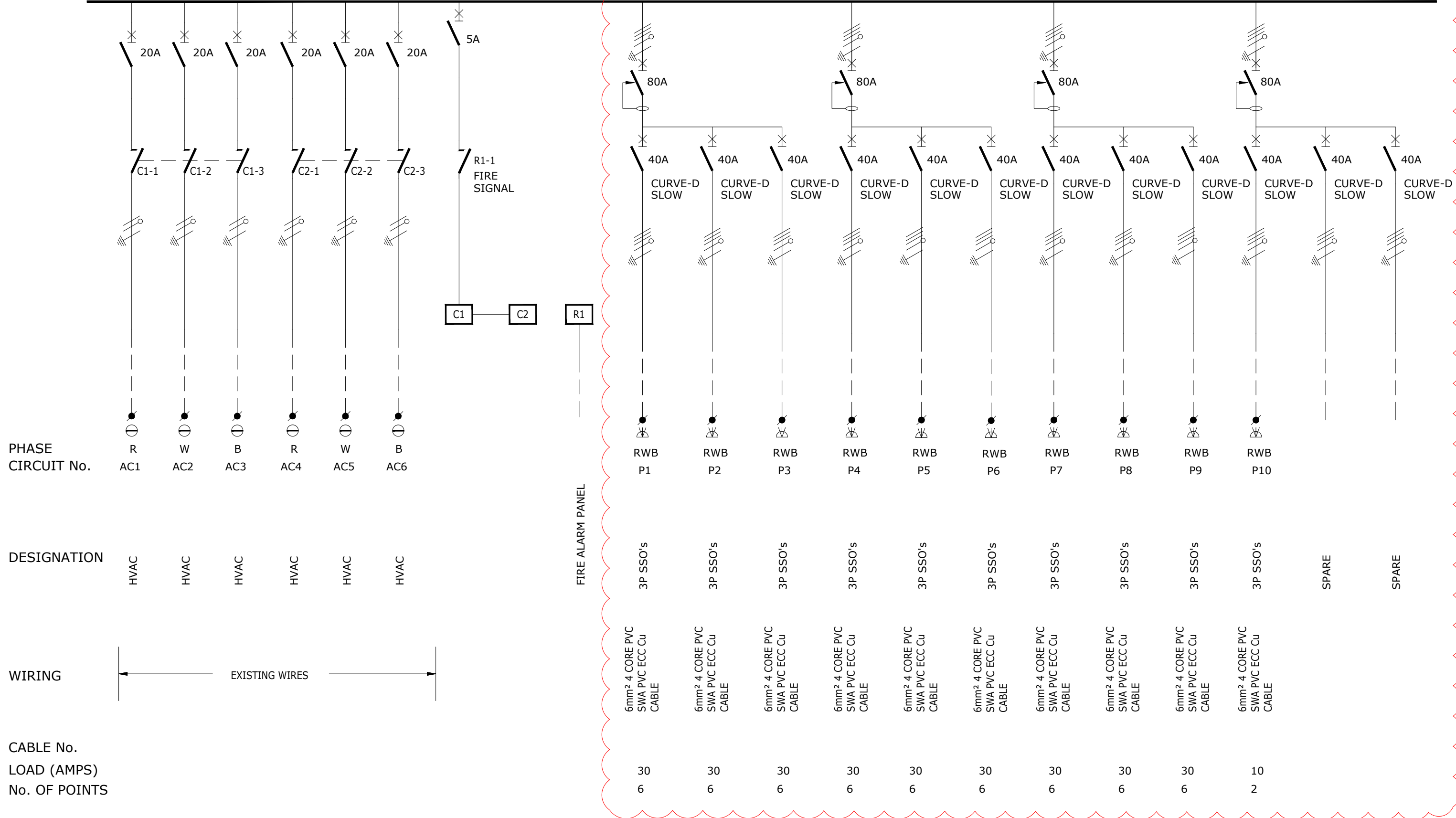
DRAWING TITLE:  
**Distribution and Protection Lab  
DB-L0.7  
Single Line Diagram**



FIRST FLOOR  
BAKER TILLY HOUSE  
18 WESTVILLE ROAD  
WESTVILLE, 3629  
PO BOX 1469  
WESTVILLE, 3630

TEL: +27 (031) 2667332  
E-mail: ibuya@ibuya.co.za


FROM SHEET 3 80AMP BUSBAR, 5KA FAULT LEVEL



NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTALLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

ENGINEER	DRAWN	DATE:	SCALE:	CHKD.
MH	RM	Jun '23	1:50	MH
PROJECT No.	DRAWING No.	SHEET:	PAPER SIZE:	REV.
23051	406	4 of 4	A3	B
REV	DESCRIPTION	BY	DATE	CHKD.

TITLE
MUT New Eng Building 3 Phase Power Supply
DRAWING TITLE:
Distribution and Protection Lab DB-L0.7
Single Line Diagram



**MUT**  
MANGOSUTHU  
UNIVERSITY OF TECHNOLOGY



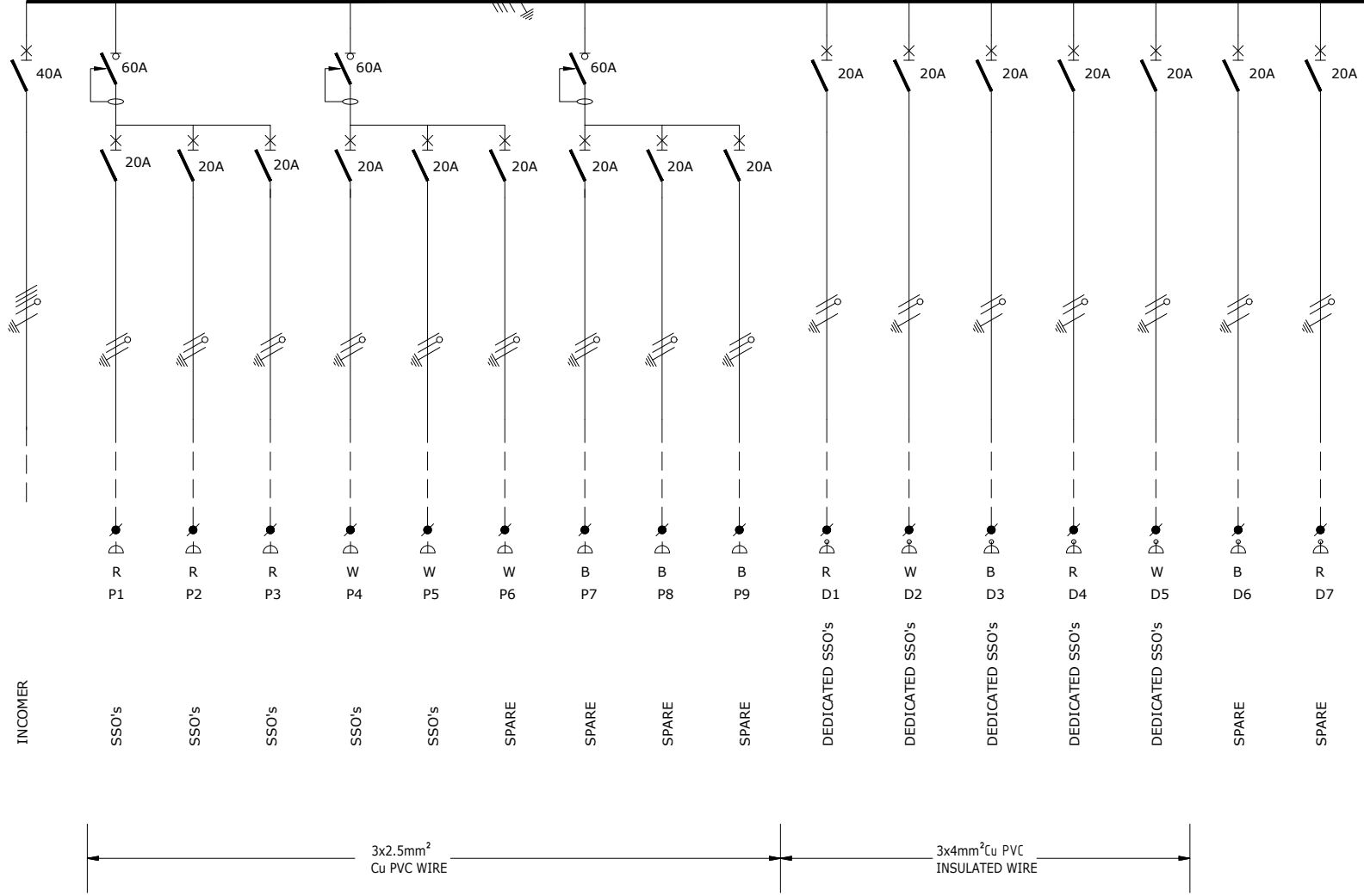
**IBUYA**  
Consulting  
Engineers  
"POWERING DEVELOPMENT"

FIRST FLOOR  
BAKER TILLY HOUSE  
18 WESTVILLE ROAD  
WESTVILLE, 3629  
PO BOX 1469  
WESTVILLE, 3630

TEL: +27 (031) 2667332  
E-mail: ibuya@ibuya.co.za

40AMP BUSBAR, 5kA FAULT LEVEL (DB-00.4)

TO SHEET 2



PHASE CIRCUIT No.  
DESIGNATION  
WIRING  
CABLE No.  
LOAD (AMPS)  
No. OF POINTS

INCOMER  
SSO's  
SSO's  
SSO's  
SSO's  
SSO's  
SPARE  
SPARE  
SPARE  
SPARE  
DEDICATED SSO's  
DEDICATED SSO's  
DEDICATED SSO's  
DEDICATED SSO's  
DEDICATED SSO's  
SPARE  
SPARE

R P1 R P2 R P3 W P4 W P5 W P6 B P7 B P8 B P9 R D1 W D2 B D3 R D4 W D5 B D6 R D7

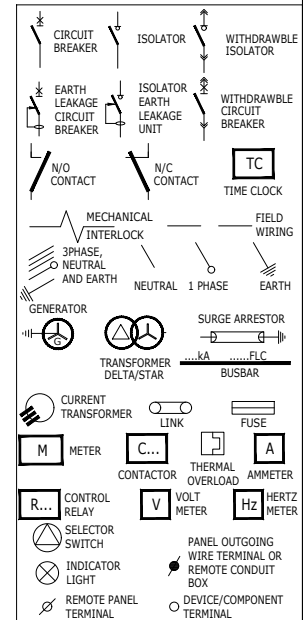
3x2.5mm<sup>2</sup> Cu PVC WIRE  
3x4mm<sup>2</sup> Cu PVC INSULATED WIRE

NOTES

- 1) DROPPERS/TAILS TO BE RATED FOR FULL I<sub>p</sub>t LET THROUGH.
- 2) HARNESSED WIRING TO BE DERATED.
- 3) TUFFNOL BRACES ARE NOT TO BE USED ABOVE 10kA.
- 4) COPPER BUSBARS TO BE CONTINUOUS RATED.
- 5) ALL OUTGOING CIRCUIT BREAKERS TO BE FITTED WITH COPPER TAILS TO FACILITATE CABLE TERMINATIONS IN THE CABLE CHAMBER AND NOT ON THE CIRCUIT BREAKER.
- 6) COPPER TAILS FROM DROPPER BUSBAR AND OUTGOING COPPER TAILS TO BE ADEQUATELY BRACED FOR FAULT LEVEL AND SHROUDED WITH HEAT SHRINK.
- 7) ALL CIRCUIT BREAKERS TO BE FITTED WITH TERMINAL SHIELD ON LIVE AND LOAD SIDES.
- 8) ENCLOSURE TO BE IP54.
- 9) PHASING RWB, TOP TO BOTTOM, LEFT TO RIGHT, BACK TO FRONT.
- 10) INTERNAL TEMP TO BE LIMITED TO 5° ABOVE AMBIANT, MAX 40°C.
- 11) ALL CIRCUITS TO BE LABELED.
- 12) 25% SPARE SPACE. SPARE SPACES ARE TO BE FITTED WITH COPPER BUSBAR TAILS CONNECTED TO DROPPER BUSBARS TO ALLOW INSTALLATION OF CIRCUIT BREAKERS WITH A MINIMAL SHUTDOWN PERIOD.
- 13) CHANGEOVER TO BE CONTROLLED BY STANDBY GENERATOR CONTROLLER.

INCOMING CABLE -TOP/BOTTOM  
OUTGOING CIRCUITS -TOP/BOTTOM  
COLOUR -WHITE (NON-ESS)  
-RED (ESS)  
-BLUE (UPS)  
MOUNTING -SURFACE  
ACCESS -FRONT  
PROTECTIVE DEVICES -SCHNIEDER BREAKERS  
CONTACTORS -AC3 HEAVY DUTY

CASCADED SYSTEM



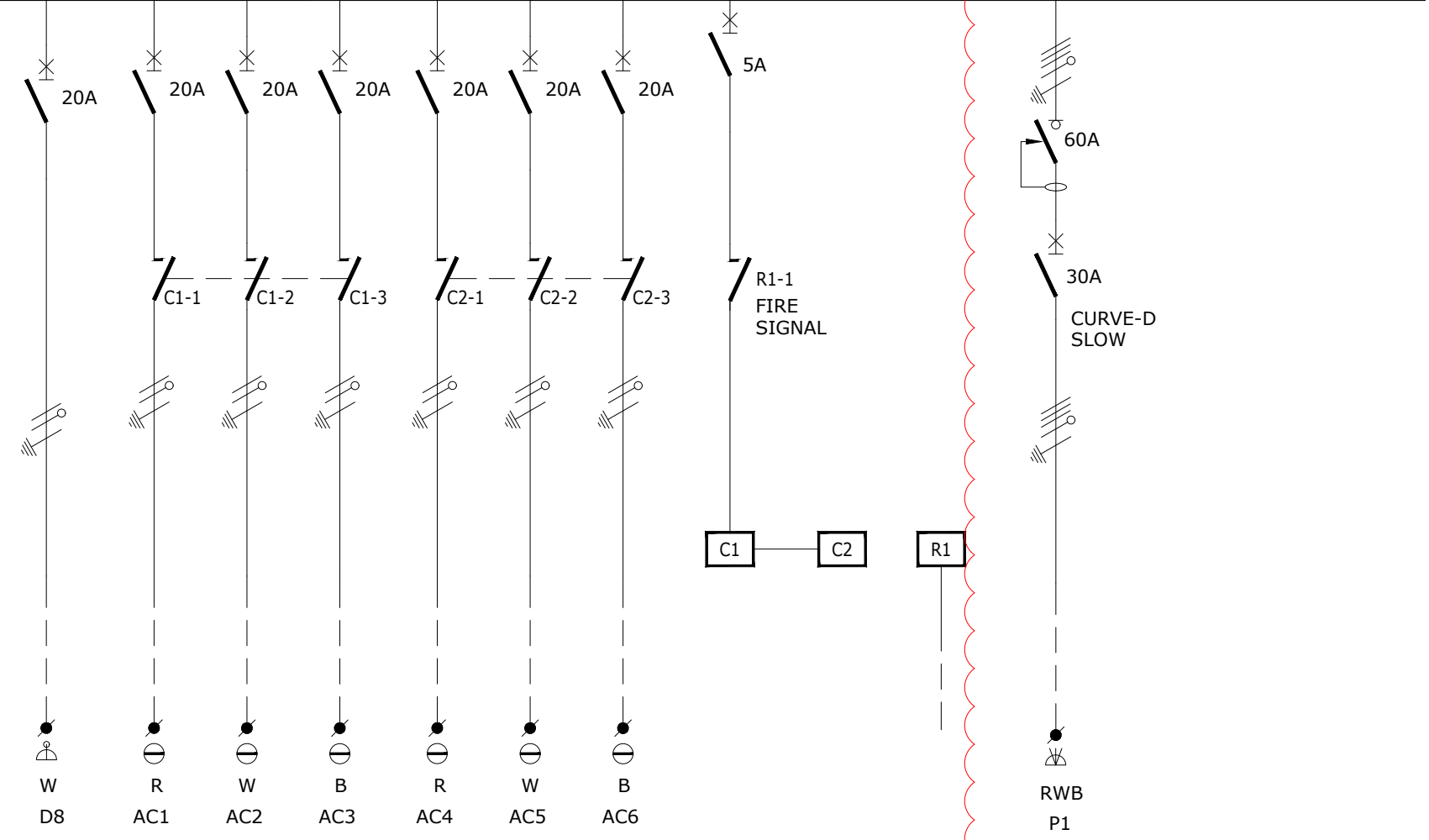
NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPIING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTALLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

ENGINEER	DRAWN	DATE:	SCALE:	CHKD.	TITLE
MH	RM	Jun '23	1:50	MH	MUT New Eng Building 3 Phase Power Supply
PROJECT No.	DRAWING No.	SHEET:	PAPER SIZE:	REV.	DRAWING TITLE:
23051	407	1 of 2	A3	A	Clinical Lab DB-00.4 Single Line Diagram
REV	DESCRIPTION	BY	DATE	CHKD.	File Name : Lyr:
A	General Revision	RM	11/07/23	MH	
0	Original Issue	RM	22/06/23	MH	



IBUYA Consulting Engineers  
POWERING DEVELOPMENT™  
FIRST FLOOR  
BAKER TILLY HOUSE  
18 WESTVILLE ROAD  
WESTVILLE, 3629  
PO BOX 1469  
WESTVILLE, 3630  
TEL: +27 (031) 2667332  
E-mail: ibuya@ibuya.co.za

FROM SHEET 1 40AMP BUSBAR, 5kA FAULT LEVEL (DB-00.4)



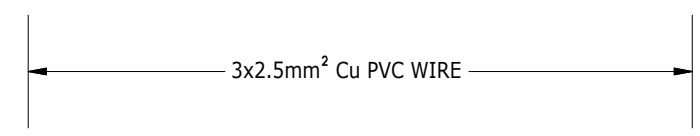
PHASE  
CIRCUIT No.

W D8  
R AC1  
W AC2  
B AC3  
R AC4  
W AC5  
B AC6  
RWB P1

DESIGNATION

SPARE  
HVAC  
HVAC  
HVAC  
HVAC  
HVAC  
HVAC  
FIRE ALARM PANEL  
3P SSO's

WIRING



CABLE No.  
LOAD (AMPS)  
No. OF POINTS

6mm² 4 CORE PVC  
SWA PVC ECC Cu  
CABLE  
10  
2

NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

ENGINEER	DRAWN	DATE:	SCALE:	CHKD.	TITLE
MH	RM	Jun '23	1:50	MH	MUT New Eng Building 3 Phase Power Supply
PROJECT No.	DRAWING No.	SHEET:	PAPER SIZE:	REV.	DRAWING TITLE:
23051	407	2 of 2	A3	A	Clinical Lab DB-00.4 Single Line Diagram
REV	DESCRIPTION	BY	DATE	CHKD.	File Name : Lyr:
A	General Revision	RM	11/07/23	MH	
0	Original Issue	RM	22/06/23	MH	

FIRST FLOOR  
BAKER TILLY HOUSE  
18 WESTVILLE ROAD  
WESTVILLE, 3629  
PO BOX 1469  
WESTVILLE, 3630

TEL: +27 (031) 2667332  
E-mail: ibuya@ibuya.co.za

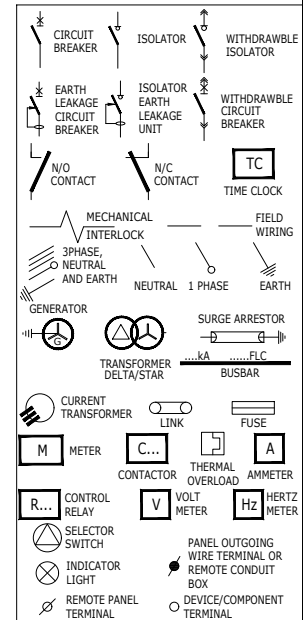
60AMP BUSBAR, 5ka FAULT LEVEL (DB-01.6)

TO SHEET 2

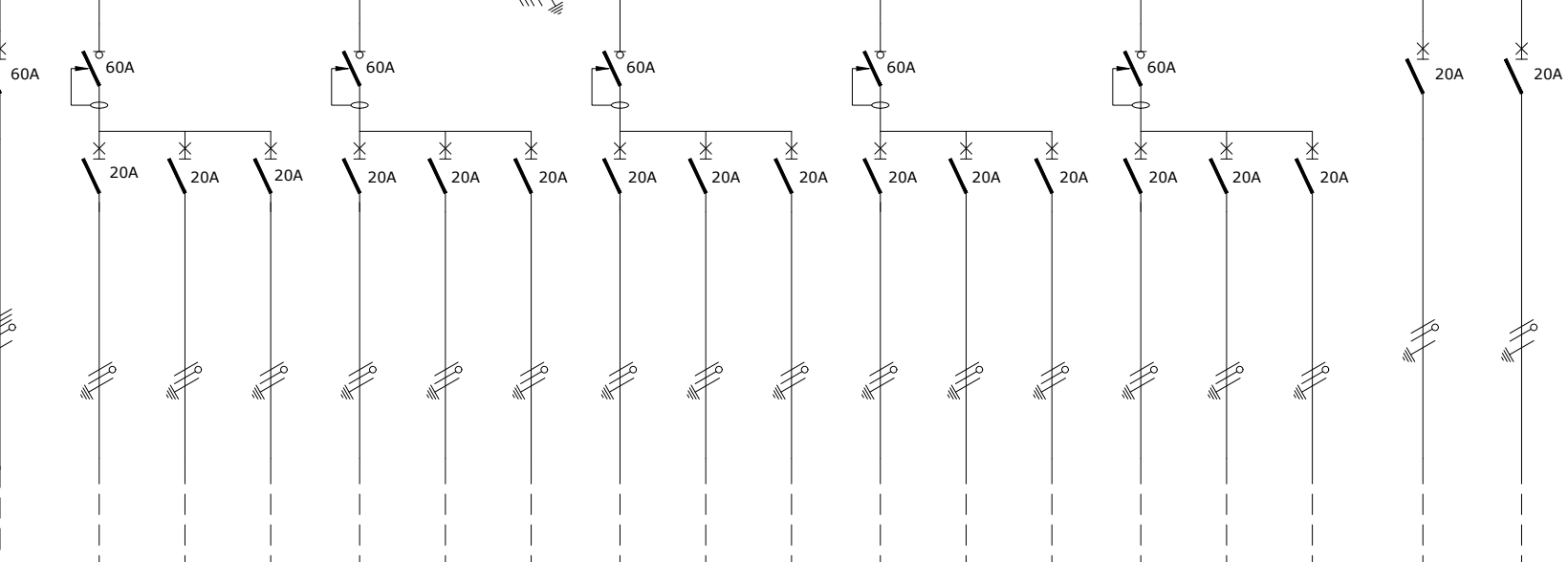
- NOTES**
- 1) DROPPERS/TAILS TO BE RATED FOR FULL I<sub>p</sub>t LET THROUGH.
  - 2) HARNESSED WIRING TO BE DERATED.
  - 3) TUFFNOL BRACES ARE NOT TO BE USED ABOVE 10kA.
  - 4) COPPER BUSBARS TO BE CONTINUOUS RATED.
  - 5) ALL OUTGOING CIRCUIT BREAKERS TO BE FITTED WITH COPPER TAILS TO FACILITATE CABLE TERMINATIONS IN THE CABLE CHAMBER AND NOT ON THE CIRCUIT BREAKER.
  - 6) COPPER TAILS FROM DROPPER BUSBAR AND OUTGOING COPPER TAILS TO BE ADEQUATELY BRACED FOR FAULT LEVEL AND SHROUDED WITH HEAT SHRINK.
  - 7) ALL CIRCUIT BREAKERS TO BE FITTED WITH TERMINAL SHIELD ON LIVE AND LOAD SIDES.
  - 8) ENCLOSURE TO BE IP54.
  - 9) PHASING RWB, TOP TO BOTTOM, LEFT TO RIGHT, BACK TO FRONT.
  - 10) INTERNAL TEMP TO BE LIMITED TO 5° ABOVE AMBIANT, MAX 40°C.
  - 11) ALL CIRCUITS TO BE LABELED.
  - 12) 25% SPARE SPACE. SPARE SPACES ARE TO BE FITTED WITH COPPER BUSBAR TAILS CONNECTED TO DROPPER BUSBARS TO ALLOW INSTALLATION OF CIRCUIT BREAKERS WITH A MINIMAL SHUTDOWN PERIOD.
  - 13) CHANGEOVER TO BE CONTROLLED BY STANDBY GENERATOR CONTROLLER.

- INCOMING CABLE** -TOP/BOTTOM  
**OUTGOING CIRCUITS** -TOP/BOTTOM  
**COLOUR** -WHITE (NON-ESS)  
 -RED (ESS)  
 -BLUE (UPS)  
**MOUNTING** -SURFACE  
**ACCESS** -FRONT  
**PROTECTIVE DEVICES** -SCHNIEDER BREAKERS  
**CONTACTORS** -AC3 HEAVY DUTY

**CASCADED SYSTEM**

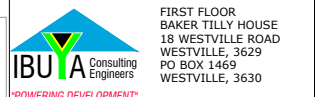


PHASE CIRCUIT No.  
 DESIGNATION  
 WIRING  
 CABLE No. P  
 LOAD (AMPS)  
 No. OF POINTS



NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTALLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

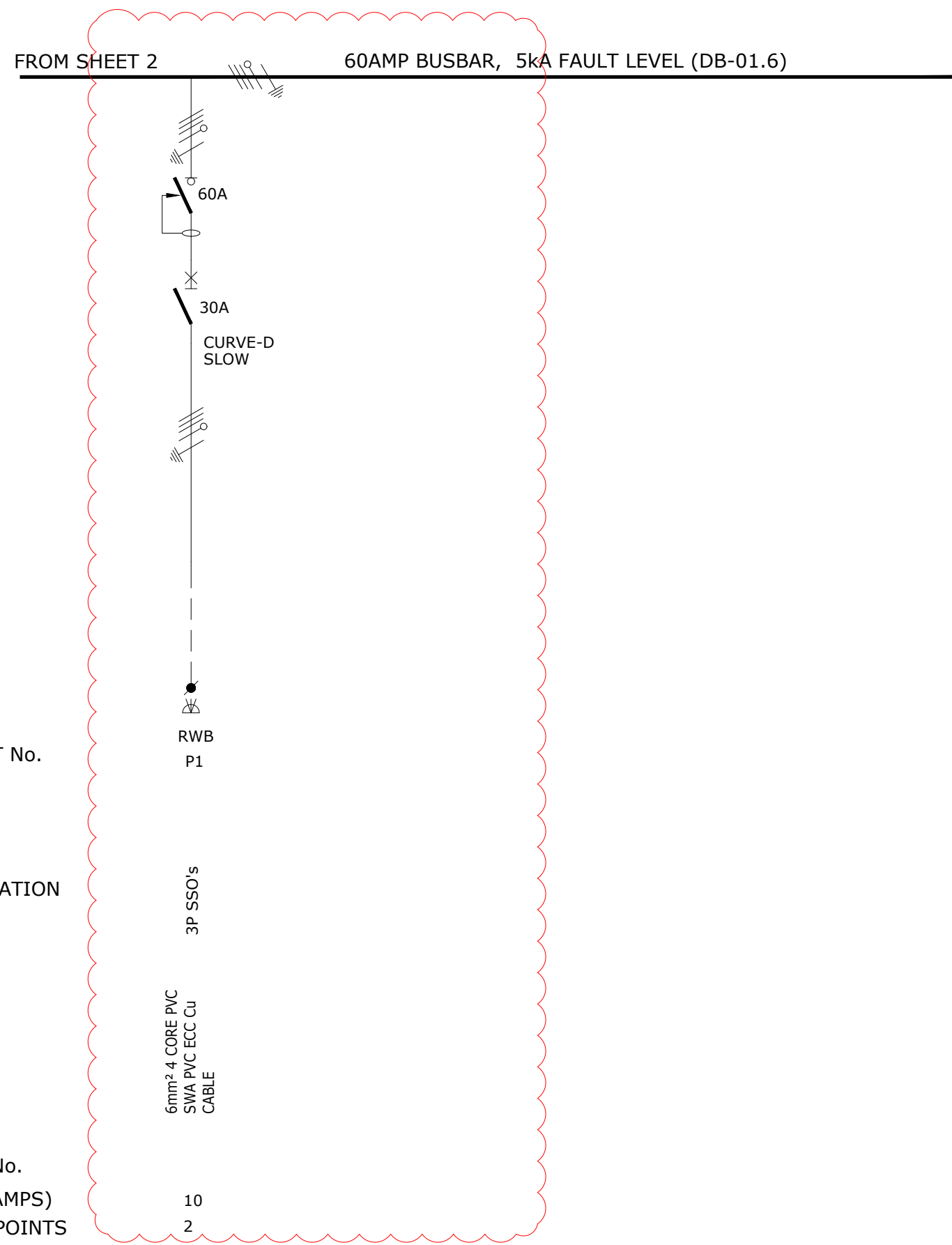
ENGINEER	DRAWN	DATE:	SCALE:	CHKD.	TITLE
MH	RM	Jun '23	1:50	MH	MUT New Eng Building 3 Phase Power Supply
PAPER SIZE:			A3		
PROJECT No.	DRAWING No.	SHEET:	REV.	DRAWING TITLE:	
23051	408	1 of 3	A	Telecommunications Lab DB-01.6 Single Line Diagram	
REV	DESCRIPTION	BY	DATE	CHKD.	File Name :
A	General Revision	RM	11/07/23	MH	Lyr:
0	Original Issue	RM	22/06/23	MH	



FIRST FLOOR  
 BAKER TILLY HOUSE  
 18 WESTVILLE ROAD  
 WESTVILLE, 3629  
 PO BOX 1469  
 WESTVILLE, 3630

TEL: +27 (031) 2667332  
 E-mail: ibuya@ibuya.co.za





PHASE  
CIRCUIT No.

DESIGNATION

WIRING

CABLE No.

LOAD (AMPS)

No. OF POINTS

NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

REV	DESCRIPTION	BY	DATE	CHKD.	File Name :	Lyr:
A	General Revision	RM	11/07/23	MH		
0	Original Issue	RM	22/06/23	MH		

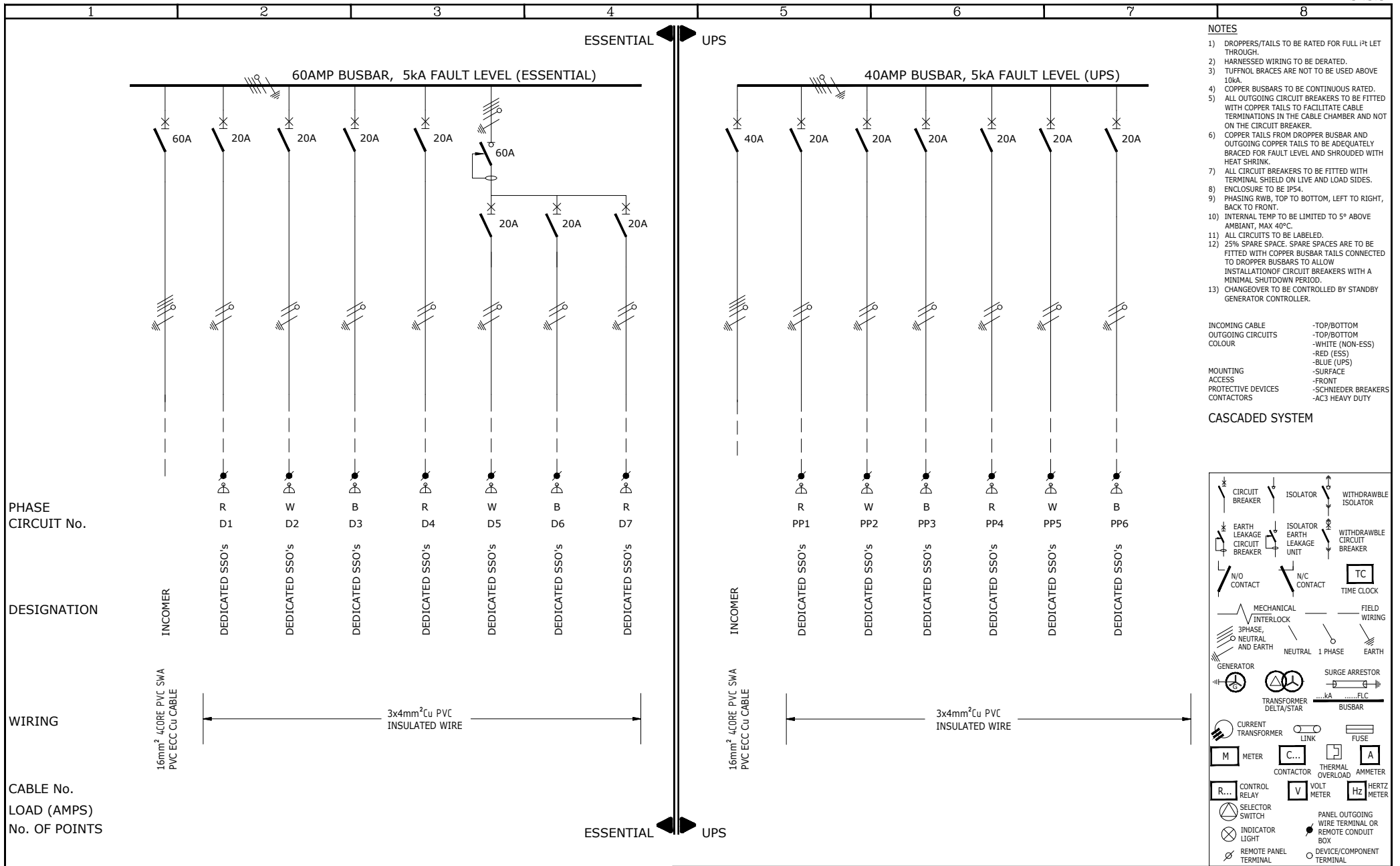
ENGINEER	DRAWN	DATE:	SCALE:	CHKD.
MH	RM	Jun '23	1:50	MH
PROJECT No.	DRAWING No.	SHEET:	PAPER SIZE:	REV.
23051	408	3 of 3	A3	A

TITLE	MUT New Eng Building 3 Phase Power Supply
DRAWING TITLE:	Telecommunications Lab DB-01.6 Single Line Diagram

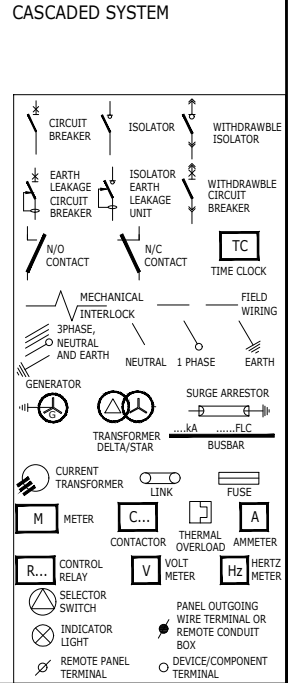


FIRST FLOOR  
BAKER TILLY HOUSE  
18 WESTVILLE ROAD  
WESTVILLE, 3629  
PO BOX 1469  
WESTVILLE, 3630

TEL: +27 (031) 2667332  
E-mail: ibuya@ibuya.co.za



- NOTES**
- 1) DROPPERS/TAILS TO BE RATED FOR FULL IP LET THROUGH.
  - 2) HARNESSED WIRING TO BE DERATED.
  - 3) TUFFNOL BRACES ARE NOT TO BE USED ABOVE 10KA.
  - 4) COPPER BUSBARS TO BE CONTINUOUS RATED.
  - 5) ALL OUTGOING CIRCUIT BREAKERS TO BE FITTED WITH COPPER TAILS TO FACILITATE CABLE TERMINATIONS IN THE CABLE CHAMBER AND NOT ON THE CIRCUIT BREAKER.
  - 6) COPPER TAILS FROM DROPPER BUSBAR AND OUTGOING COPPER TAILS TO BE ADEQUATELY BRACED FOR FAULT LEVEL AND SHROUDED WITH HEAT SHRINK.
  - 7) ALL CIRCUIT BREAKERS TO BE FITTED WITH TERMINAL SHIELD ON LIVE AND LOAD SIDES.
  - 8) ENCLOSURE TO BE IP54.
  - 9) PHASING RWB, TOP TO BOTTOM, LEFT TO RIGHT, BACK TO FRONT.
  - 10) INTERNAL TEMP TO BE LIMITED TO 5° ABOVE AMBIANT, MAX 40°C.
  - 11) ALL CIRCUITS TO BE LABELED.
  - 12) 25% SPARE SPACE. SPARE SPACES ARE TO BE FITTED WITH COPPER BUSBAR TAILS CONNECTED TO DROPPER BUSBARS TO ALLOW INSTALLATION OF CIRCUIT BREAKERS WITH A MINIMAL SHUTDOWN PERIOD.
  - 13) CHANGEOVER TO BE CONTROLLED BY STANDBY GENERATOR CONTROLLER.
- INCOMING CABLE**  
 -TOP/BOTTOM  
**OUTGOING CIRCUITS**  
 -TOP/BOTTOM  
**COLOUR**  
 -WHITE (NON-ESS)  
 -RED (ESS)  
 -BLUE (UPS)  
 -SURFACE  
**MOUNTING**  
 -FRONT  
**ACCESS**  
 -SCHNIEDER BREAKERS  
**PROTECTIVE DEVICES**  
 -AC3 HEAVY DUTY  
**CONTACTORS**



NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPIING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

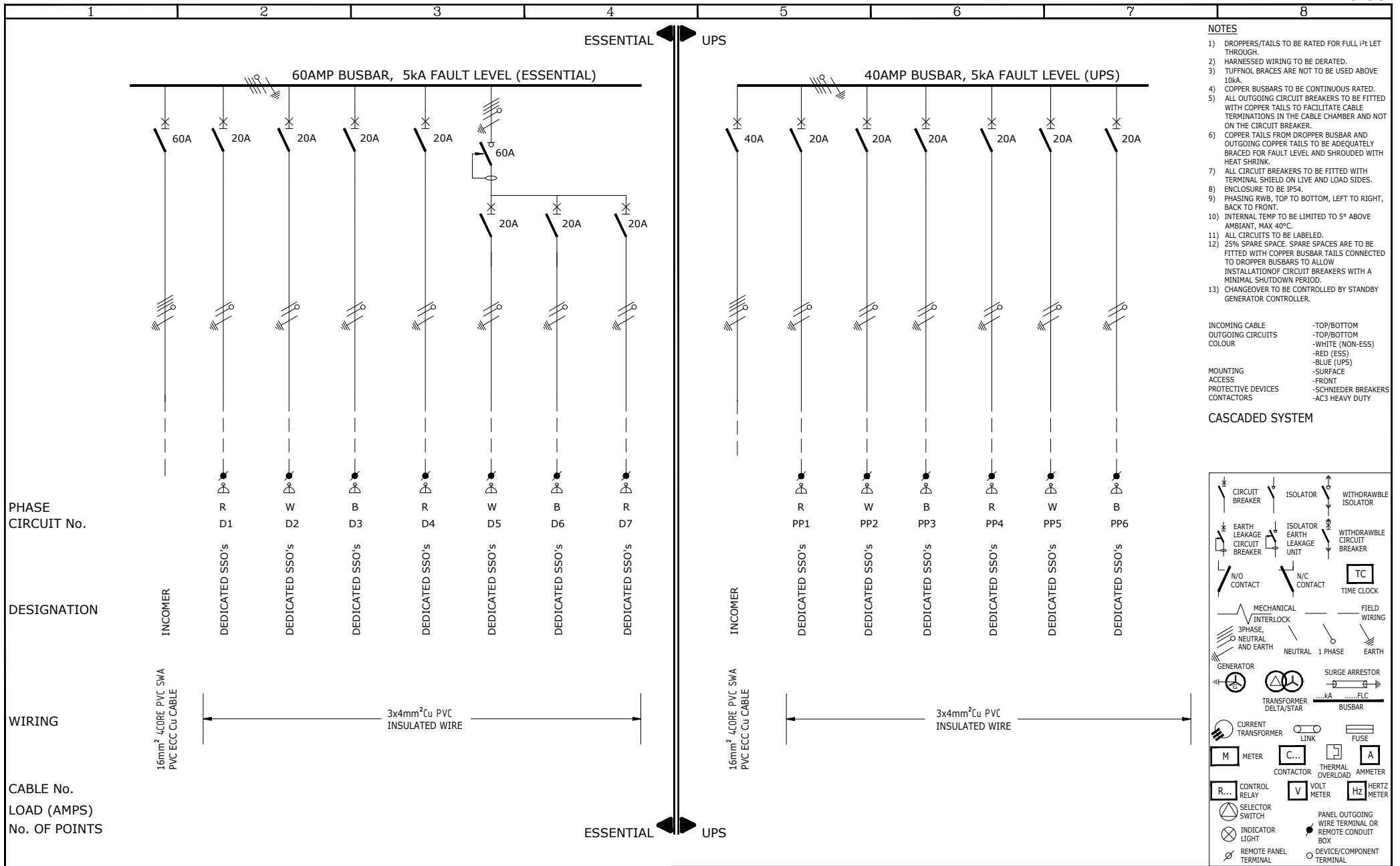
ENGINEER	DRAWN	DATE:	SCALE:	CHKD.	TITLE
MH	RM	11/07/23	NTS	MH	MUT NEW ENG BUILDING 3 PHASE POWER SUPPLY
PROJECT No.	DRAWING No.	SHEET:	REV.	DRAWING TITLE:	
23051	409	1 of 1	0	WATER & SANITATION ESSENTIAL/UPS PANEL SINGLE LINE DIAGRAM	
REV	DESCRIPTION	BY	DATE	CHKD.	File Name : Lyr:
0	ORIGINAL ISSUE	RM	11/07/23	MH	

**MUT**  
MANGOSUTHU  
UNIVERSITY OF TECHNOLOGY

**IBUYA**  
Consulting  
Engineers  
*"POWERING DEVELOPMENT"*

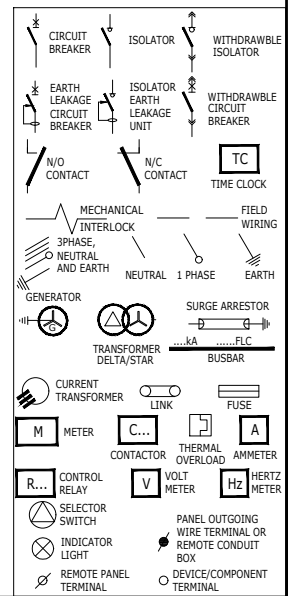
FIRST FLOOR  
BAKER TILLY HOUSE  
18 WESTVILLE ROAD  
WESTVILLE, 3629  
PO BOX 1469  
WESTVILLE, 3630

TEL: +27 (031) 2667332  
E-mail: ibuya@ibuya.co.za



- NOTES**
- 1) DROPPERS/TAILS TO BE RATED FOR FULL IP LET THROUGH.
  - 2) HARNESSED WIRING TO BE DERATED.
  - 3) TUFFNOL BRACES ARE NOT TO BE USED ABOVE 10KA.
  - 4) COPPER BUSBARS TO BE CONTINUOUS RATED.
  - 5) ALL OUTGOING CIRCUIT BREAKERS TO BE FITTED WITH COPPER TAILS TO FACILITATE CABLE TERMINATIONS IN THE CABLE CHAMBER AND NOT ON THE CIRCUIT BREAKER.
  - 6) COPPER TAILS FROM DROPPER BUSBAR AND OUTGOING COPPER TAILS TO BE ADEQUATELY BRACED FOR FAULT LEVEL AND SHROUDED WITH HEAT SHRINK.
  - 7) ALL CIRCUIT BREAKERS TO BE FITTED WITH TERMINAL SHIELD ON LIVE AND LOAD SIDES.
  - 8) ENCLOSURE TO BE IP54.
  - 9) PHASING RWB, TOP TO BOTTOM, LEFT TO RIGHT, BACK TO FRONT.
  - 10) INTERNAL TEMP TO BE LIMITED TO 5° ABOVE AMBIANT, MAX 40°C.
  - 11) ALL CIRCUITS TO BE LABELED.
  - 12) 25% SPARE SPACE. SPARE SPACES ARE TO BE FITTED WITH COPPER BUSBAR TAILS CONNECTED TO DROPPER BUSBARS TO ALLOW INSTALLATION OF CIRCUIT BREAKERS WITH A MINIMAL SHUTDOWN PERIOD.
  - 13) CHANGEOVER TO BE CONTROLLED BY STANDBY GENERATOR CONTROLLER.
- INCOMING CABLE** -TOP/BOTTOM  
**OUTGOING CIRCUITS COLOUR** -TOP/BOTTOM  
 -WHITE (NON-ESS)  
 -RED (ESS)  
 -BLUE (UPS)  
**MOUNTING ACCESS** -SURFACE  
**PROTECTIVE DEVICES** -FRONT  
 -SCHNIEDER BREAKERS  
 CONTACTORS -AC3 HEAVY DUTY

**CASCADED SYSTEM**



NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPIING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF IBUYA CONSULTING ENGINEERS.

ENGINEER: MH		DRAWN: RM		DATE: 11/07/23		SCALE: NTS		CHKD: MH		TITLE: MUT NEW ENG BUILDING 3 PHASE POWER SUPPLY	
PROJECT No. 23051		DRAWING No. 410		SHEET: 1 of 1		PAPER SIZE: A3		REV. 0		DRAWING TITLE: CONSTRUCTION MODEL LAB ESSENTIAL/UPS PANEL SINGLE LINE DIAGRAM	
0	ORIGINAL ISSUE	RM	11/07/23	MH							
REV	DESCRIPTION	BY	DATE	CHKD.	File Name :	Lyr:					



**IBUYA** Consulting Engineers  
 "POWERING DEVELOPMENT"  
 FIRST FLOOR  
 BAKER TILLY HOUSE  
 18 WESTVILLE ROAD  
 WESTVILLE, 3629  
 PO BOX 1469  
 WESTVILLE, 3630

TEL: +27 (031) 2667332  
 E-mail: ibuya@ibuya.co.za