

4021 CSIR - SMALL MOLECULE AND BIOPHARM FACILITY  
SCIENTIA CAMPUS PRETORIA  
Electrical Installation - Biopharm Lab



09-Sep-22 REV 3

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL	LABOUR	TOTAL
<b>BILL NO.1 : PRELIMINARY AND GENERAL COSTS</b>						
<b>1.1</b>	<b><u>SITE ESTABLISHMENT</u></b>					
	Camp and fencing	sum	1			
	Office	sum	1			
	Office Equipment	sum	1			
	Store	sum	1			
	Workshop	sum	1			
	Other	sum	1			
<b>1.2</b>	<b><u>ADMINISTRATIVE</u></b>					
	Site personnel	sum	1			
	Supervisory staff	sum	1			
	Guards	sum	1			
	Transport	sum	1			
	Insurance	sum	1			
	Cost of Guarantee	sum	1			
	Financing of Retention	sum	1			
	Running costs e.g. telephone, electricity, cleaning services, printing, stationery, etc	sum	1			
<b>1.3</b>	<b><u>GENERAL COSTS</u></b>					
	Allow an amount if required for expenses incurred to tender.	sum	1			
	Loading and off loading of material and equipment	sum	1			
	Setting out of Works.	sum	1			
	Cleaning of site upon completion of Contract.	sum	1			
	Critical Path/Schedule.	sum	1			
	Marking up "As Built" drawings	sum	1			
	Issuing Cadded "As Built" drawings on completion	sum	1			
	Test and commissioning of complete Works.	sum	1			
	Inspection and handing over.	sum	1			
	Certificate of Compliance	sum	1			
	Maintenance manuals	ea	4			
<b>TOTAL BILL NO 1</b>						

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL	LABOUR	TOTAL
A	<b>INSTALLATION - GENERAL</b>					
	The following shall apply to all material and equipment supplied and installed on site and shall conform to specifications contained in the technical specification of this document.					
A.1	<b>WIRING CHANNEL</b>					
	Galvanised metal channel complete with covers fixed at intervals not exceeding 1.5m. Channel to be complete with all splices, bends, T-pieces, ends etc.					
A.2	<b>CONDUITS &amp; DRAW BOXES</b>					
	Conduits cast in concrete, chased into brickwork, fixed in partitioning, roof spaces, surface on concrete or brickwork to be complete with saddles, couplings and terminations to drawboxes. Draw boxes to be galvanised type. All cutting and terminations to be included.					
A.3	<b>LIGHT FITTINGS</b>					
	Take delivery of, store, install and connect all light fittings complete with lamps, gear, etc. as specified and indicated on the drawings. All fluorescent lamps to be Colour 840 unless indicated otherwise.					
A.4	<b>CONDUCTORS</b>					
	SABS approved PVC insulated copper conductors drawn into conduit, installed in wiring trunking or power skirting.					
A.5	<b>SOCKET OUTLETS</b>					
	16A, 3-pin switched socket outlets flush mounted in drawboxes complete with cover plates shall be of the "Crabtree" or "Clipsal" range which fit into standard outlet boxes dedicated outlets shall have a red cover plate. Floor boxes shall be of the "Cabstrut" range. or similar					
A.6	<b>LIGHT SWITCHES</b>					
	16A light switch flush mounted in draw boxes or power skirting complete with cover plates shall be of the "Crabtree" or "Clipsal" range which fit into standard outlet boxes.					
A.7	<b>DISTRIBUTION BOARDS</b>					
	Supply & Install Distribution Boards complete as in accordance with the specification and drawings					
A.8	<b>ISOLATORS</b>					
	Isolators surface/flush mounted in 100 x 100mm x 50mm draw boxes complete with coverplate as specified and indicated on drawings. All isolators installed externally shall be in weather proof enclosures					
A.9	<b>LOW VOLTAGE CABLES</b>					
	600/1000V PVC/SWA/PVC Cables with copper conductors to SABS 1507 fixed vertically or horizontally on cable trays in accordance with the specification and drawings. All fixings to be included.					
A.10	<b>TERMINATIONS</b>					
	Termination of LV cable to be as specified including connection of conductors, cable lugs, captive cone glands, shrouds, etc. for the relevant cable sizes.					

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL	LABOUR	TOTAL
	<b>BILL NO 2:</b>					
	<b>Small Power &amp; Lighting - BioPharm Facility</b>					
	<b>NOTE:</b>					
	<b>All clean room penetrations must be sealed with anti-bacterial silicone</b>					
<b>3.1</b>	<b><u>LV CABLES</u></b>					
	Supply and installation of the following PVC armoured SWA copper cables to SANS 1507, installed on cable Trays vertically and horizontally.					
	95mm <sup>2</sup> x 4-core	m	20			
	10mm <sup>2</sup> x 4-core	m	50			
<b>3.2</b>	<b><u>TERMINATIONS</u></b>					
	Termination of LV cable as specified including connection of conductors, cable lugs, captive glands, shrouds, etc. for the following cable sizes					
	95mm <sup>2</sup> x 4-core	ea	2			
	10mm <sup>2</sup> x 4-core	ea	2			
<b>3.3</b>	<b><u>EARTHING</u></b>					
	Supply and install the following bare copper earth conductors					
	50mm <sup>2</sup> bare earth conductor	m	20			
	6mm <sup>2</sup> bare earth conductor	m	50			
<b>3.4</b>	<b><u>TERMINATION OF EARTH CONDUCTORS</u></b>					
	50mm <sup>2</sup> bare earth conductor	ea	2			
	10mm <sup>2</sup> bare earth conductor	ea	2			
<b>3.5</b>	<b><u>DISTRIBUTION BOARDS &amp; SWITCH GEAR</u></b>					
	Provide an infra red scan to check all terminations in the distribution board and replace missing blank circuit breaker covers. Ensure that all labelling is complete and legend cards are provided and updated. Ensure that all warning signs are provided. Test the earthing of DB. Ensure that cover plates are properly secured. Provide a Certificate of compliance for the distribution board in accordance with SANS 10142.					
	<b>LIST OF DISTRIBUTION BOARDS</b>					
	SDB - BPG (New)	ea	1			
	SDB - BPF (New)	ea	1			
<b>3.6</b>	<b><u>STRIP OUT EXISTING ELECTRICAL SERVICES</u></b>					
	Strip out existing electrical services BioPharm facility 327m <sup>2</sup>	sum	1			
<b>3.7</b>	<b><u>UPS</u></b>					
	Supply and install an Eaton 20 kVA UPS and associated batteries for 10 min back-up	sum	1			
<b>3.8</b>	<b><u>Cable Trays</u></b>					
	Heavy Duty, hot dipped galvanised Return Flange cable tray (RFHD) complete with splices, nuts, bolts and washers fixed horizontally on hangers or vertically up walls and risers.					
	150 mm wide x 50 mm HD cable ladder	m	60			
	Horizontal bends	ea	3			
	Tee Piece	ea	1			
	External Elbow	ea	2			
	Cable ladder fixings	ea	40			

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL	LABOUR	TOTAL
	200mm Wire Mesh tray	m	92			
	Horizontal Bends	ea	5			
	Vertical Bend	ea	2			
	Tee pieces	ea	10			
	Cable Tray Hanger	ea	62			
	100mm Wire Mesh tray	m	92			
	Horizontal Bends	ea	5			
	Vertical Bend	ea	2			
	Tee pieces	ea	10			
	Cable Tray Hanger	ea	62			
	100mm Perforated tray	m	0			
	Horizontal Bends	ea	0			
	Vertical Bend	ea	0			
	Tee pieces	ea	0			
	Perforated Tray fixings	ea	0			
<b>3.9</b>	<b>Supply and Installation of the Following Circuit Breakers</b>					
	15Amp Circuit Breaker - 5kA	ea	1			
	20Amp Circuit Breaker - 5kA	ea	0			
	40Amp Circuit Breaker - 5kA	ea	0			
	63Amp Trip Pole Circuit Breaker - 10kA	ea	0			
	80Amp Trip Pole Circuit Breaker - 10kA	ea	0			
	160Amp Trip Pole Circuit Breaker - 15kA	ea	0			
	250Amp Trip Pole Circuit Breaker - 15kA	ea	0			
	60Amp Earth Leakage Circuit Breaker rate at 30mA	ea	0			
	40 Amp 3 pole AC3 Duty Contactor	ea	0			
<b>3.10</b>	<b><u>WIRING CHANNEL</u></b>					
	Galvanised steel channel complete with covers fixed at intervals not exceeding 1.5m. Channel to be complete with all splices, bends, T-pieces, ends etc.					
	(Type OL or similar manufactured channel).					
	<b><u>Supply &amp; Install</u></b>					
	P9000 + Cover - suspended / in celing void for electrical services	m	132			
	P9000 - Tee Piece	ea	11			
	P9000 Horizontal Bend	ea	5			
	P9000 Vertical Bend	ea	1			
	End Caps	ea	2			
	Cross Piece	ea	1			
	Hangers	ea	62			
	P8000 + Cover - suspended / in celing void for electrical services	m	132			
	P8000 - Tee Piece	ea	11			
	P8000 Horizontal Bend	ea	5			
	P8000 Vertical Bend	ea	1			
	Cross Pieces	ea	1			
	End Caps	ea	2			
	Hangers	ea	62			
	P2000 + Cover - suspended / in celing void for electrical services	m	132			
	P2000 - Tee Piece	ea	11			
	P2000 Horizontal Bend	ea	5			
	P2000 Vertical Bend	ea	1			
	Cross Pieces	ea	11			
	Hangers	ea	62			

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL	LABOUR	TOTAL
	<b><u>SMALL POWER INSTALLATION</u></b>					
3.11	<b><u>Conduit</u></b>					
	<b><u>Supply and Install</u></b>					
	PVC conduit installed chased in walls and in open roof spaces in the following sizes					
	20mm PVC	m	196			
	25mm PVC	m	0			
	32mm PVC	m	0			
	50mm PVC	m	0			
	Bosal conduit, installed chased in walls, surface mounted and in open roof spaces on the following sizes					
	25mm Bosal	m	100			
	25mm metal Sprague (500mm)	m	0			
	25mm Bosal Threaded Dome Lid	ea	0			
3.12	<b><u>Outlet Boxes</u></b>					
	<b><u>Supply and Install</u></b>					
	Galvanised steel draw and outlet boxes installed surface, in ceiling spaces or chased into brickwalls, in the following sizes					
	100mm x 100mm x 50mm deep	ea	70			
	100mm x 50mm x 50mm deep	ea	2			
	100mm x 75mm x 50mm deep	ea	0			
	60mm round , 2-way	ea	12			
	Wonderboxes with cover plate	ea	1			
3.13	<b><u>SOCKET OUTLETS</u></b>					
	<b><u>Supply and Install</u></b>					
	16A SSO - Flush in draw box	ea	17			
	16A Double SSO - Flush in draw box	ea	0			
	16A SSO + 2 x Switched ZA sockets	ea	20			
	16A SSO with half-round earth pin and red face plate in draw box	ea	1			
	16A Double SSO with half-round earth pin and red face plate in draw box	ea	0			
	16A SSO - Flush in powerskirting normal	ea	0			
	16A SSO - Flush in powerskirting dedicated	ea	20			
	ZA Socket outlet in power skirting	ea	14			
	16A SSO - Flush in powerskirting dedicated	ea	9			
	RJ45 data outlet in power skirting	ea	1			
	RJ45 data outlet in power skirting	ea	0			
	RJ45 data outlet flush in drawbox	ea	0			
	RJ45 data outlet in power pole enclosure	ea	0			
	16A SSO - Dedicated mounted in power pole enclosure with face plate	ea	6			
	ZA Socket outlet in power pole with cover plate	ea	6			
	Data outlet RJ45 in power pole with cover plate	ea	6			
	16A SSO - In weatherproof yolk box built in to the wall (for garden equipment)	ea	0			
	mounted	ea	0			
	RJ11 Telephone outlets in power skirting	ea	0			
	RJ11 Telephone outlets in drawbox with cover plate	ea	0			
	RJ11 Telephone outlets in power pole enclosure	ea	0			
	Stainless Steel Power Pole c/w baseplate and ceiling fixings	ea	3			

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL	LABOUR	TOTAL
<b>3.14</b>	<b><u>ISOLATORS</u></b>					
	Isolators mounted complete with backbox on 100x100 outlet boxes or power skirting.					
	Supply & Install the following sizes:					
	20A 2-pole	ea	9			
	32A 2-pole	ea	0			
	60A 2-pole	ea	0			
	20A 3-pole	ea	0			
	32A 3-pole	ea	0			
	40A 3-pole	ea	1			
	63A 3-pole	ea	0			
	80A 3-pole	ea	0			
	125A 3-pole	ea	0			
	20A 2-pole IP65	ea	0			
	20A 3-pole IP65 (Welding socket)	ea	2			
	32A 3-pole IP65 (Welding socket)	ea	0			
	63A 3-pole IP65 (Welding socket)	ea	1			
<b>3.15</b>	<b><u>CONDUCTORS</u></b>					
	<b><u>Supply and Install</u></b>					
	2.5mm <sup>2</sup> stranded PVC insulated copper conductors	m	3 750			
	4mm <sup>2</sup> stranded PVC insulated with copper conductors	m	25			
	6mm <sup>2</sup> stranded PVC insulated with copper conductors	m	0			
	10mm <sup>2</sup> stranded PVC insulated with copper conductors	m	0			
	16mm <sup>2</sup> stranded PVC insulated with copper conductors	m	0			
	25mm <sup>2</sup> stranded PVC insulated with copper conductors	m	0			
	35mm <sup>2</sup> stranded PVC insulated with copper conductors (rate only)	m	0			
<b>3.16</b>	<b><u>INNOVATIVE WIRING</u></b>					
	<b><u>Supply and Install</u></b>					
	2.5mm <sup>2</sup> Twin & Earth	m	0			
	4.0 mm <sup>2</sup> Twin & Earth	m	0			
	6mm <sup>2</sup> x 4 core surfix	m	0			
<b>3.17</b>	<b><u>POWER SKIRTING</u></b>					
	<b><u>Supply and Install</u></b>					
	2-Compartment, 2-Cover Steel powder coated power skirting	m	54			
	Cover only for power skirting	m	54			
	Corner - 90deg. Internal	ea	16			
	Corner - 90deg. External	ea	7			
	End Caps	ea	10			
	Horizontal bend	ea	0			

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL	LABOUR	TOTAL
3.18	<b>LIGHTING INSTALLATION</b>					
	<b>Conduit</b>					
	<b>Supply and Install</b>					
	PVC conduit, installed chased in walls and in open roof spaces in the following sizes					
	20mm	m	140			
	25mm	m	0			
	Bosal conduit, installed chased in walls, surface mounted and in open roof spaces on the following sizes					
	20mm Bosal	m	100			
	25mm Bosal	m	0			
	25mm metal Sprague	m	0			
	25mm Bosal Threaded Dome Lid	ea	0			
3.19	<b>Outlet Boxes</b>					
	<b>Supply and Install</b>					
	Galvanised steel draw and outlet boxes installed surface , Brass bushes & locknuts in ceiling spaces or chased into Brickwalls, in the following sizes					
	100mm x 50mm x 50mm deep	ea	13			
	60mm round , 1,2 or 3-way	ea	2			
	100mm x 100mm x 50mm deep	ea	2			
3.20	<b>Light Switches(Complete with Cover Plates)</b>					
	<b>Supply and Install</b>					
	16A 1 - Lever ; 1 - Way switch - flush in draw box	ea	9			
	16A 1 - Way ; dimmer switch - flush in draw box	ea	0			
	16A 1- Lever, 2-Way switch - flush in draw box	ea	0			
	16A 1- Lever, Intermediate switch - flush in draw box	ea	0			
	16A 2 - Lever ; 1 - Way switch - flush in draw box	ea	2			
	16A 2 - Lever, 2-Way switch - flush in draw box	ea	0			
	16A 3 - Lever ; 1 - Way switch - flush in draw box	ea	0			
	16A 3 - Lever ; 2 - Way switch - flush in draw box	ea	0			
	5Amp unswitched socket outlets complete with ROUND Box	ea	136			

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL	LABOUR	TOTAL
<b>3.21</b>	<b><u>LIGHT FITTINGS</u></b>					
	Supply,take delivery, store, install the following light fittings with lamps & including the necessary supports etc. As specified and indicated on drawings. All fluorescent lamps to be either Osram or Phillips lamps. Colour 840. LED lamps to be neutral white unless otherwise stated. All fluorescent light fittings to have electronic control ballast.					
TYPE	<b><u>Supply &amp; Install</u></b>					
A	600 x 600 Recessed panel luminaire white 30W LED luminaire with opal diffuser. Similar and equal to Province/RubiconTHEIA 4000K c/w 3m lead and 5A plugtop	ea	69			
Ae	Same as Type A but with 1 hour emergency control gear and 2x 3m lead with 5A plugtop	ea	5			
B	600 x 600 Recessed panel luminaire white 40W LED luminaire with opal diffuser. Similar and equal to Province/Rubicon HELLAS 4000K c/w 3m lead and 5A plugtop	ea	24			
Be	Same as Type B but with 1 hour emergency control gear c/w 2 x 3m lead and 5A plugtop	ea	2			
C	Explosion proof luminaire Class 1 Div 1 Similar and equal to Province/Rubicon CHADD 67W 4000K		0			
D	Surface mounted vapour proof luminaire Province/Rubicon Metropolis 47W 4000K	ea	12			
De	Same as type D but with emergency 1 hr control gear.	ea	2			
E	Recessed downlight Province/Rubicon MARIA 80 10W 4000K c/w 3m lead and 5 A plugtop.	ea	14			
F	Recessed downlight Province/Rubicon MARIA 110 15W 4000K c/w 3m lead and 5 A plugtop.	ea	0			
G	2.8m LED Strip light LF 45 600 lm/m in 45 deg aluminium channel. c/w LED 60W Driver	ea	2			
Ge	Same as Type G but with emergency control gear 1Hr.	ea	0			
	Photo cell. Similar and equal to Major Tech DNS6	ea	0			
<b>3.22</b>	<b><u>CONDUCTORS</u></b>					
	2.5mm² stranded insulated PVC with copper conductors	m	1 540			
	4mm² stranded insulated PVC with copper conductors	m	0			
	2.5mm² Twin & Earth	m	0			
<b>3.23</b>	<b><u>SENSORS</u></b>					
	Ceiling mounted 360deg occupancy sensors 1000W Major Tech PIR 45	ea	0			
	<b>TOTAL FOR BILL NO 2</b>					-

CSIR - BIOPHARM FACILITY - Summary						
	Bill no. 1 Preliminary & General					-
	Bill no. 2 Small Power & Lighting - BioPharm Facility					-
	Provisional Amount for power supply to HVAC & Ventilation					60 000.00
					Sub Total	
	<b>TOTAL CARRIED FORWARD TO MAIN CONTRACTORS BILL OF QUANTITIES (excl VAT)</b>					



4021 CSIR - SMALL MOLECULE AND BIOPHARM FACILITY  
SCIENTIA CAMPUS PRETORIA  
Electrical Installation - Small Molecule Facility



09-Sep-22 REV 3

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL	LABOUR	TOTAL
<b>BILL NO.1 : PRELIMINARY AND GENERAL COSTS</b>						
<b>1.1</b>	<b><u>SITE ESTABLISHMENT</u></b>					
	Camp and fencing	sum	1			
	Office	sum	1			
	Office Equipment	sum	1			
	Store	sum	1			
	Workshop	sum	1			
	Other	sum	1			
<b>1.2</b>	<b><u>ADMINISTRATIVE</u></b>					
	Site personnel	sum	1			
	Supervisory staff	sum	1			
	Guards	sum	1			
	Transport	sum	1			
	Insurance	sum	1			
	Cost of Guarantee	sum	1			
	Financing of Retention	sum	1			
	Running costs e.g. telephone, electricity, cleaning services, printing, stationery, etc	sum	1			
<b>1.3</b>	<b><u>GENERAL COSTS</u></b>					
	Allow an amount if required for expenses incurred to tender.	sum	1			
	Loading and off loading of material and equipment	sum	1			
	Setting out of Works.	sum	1			
	Cleaning of site upon completion of Contract.	sum	1			
	Critical Path/Schedule.	sum	1			
	Marking up "As Built" drawings	sum	1			
	Issuing Cadded "As Built" drawings on completion	sum	1			
	Test and commissioning of complete Works.	sum	1			
	Inspection and handing over.	sum	1			
	Certificate of Compliance	sum	1			
	Maintenance manuals	ea	4			
<b>TOTAL BILL NO 1</b>						

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL	LABOUR	TOTAL
A	<b>INSTALLATION - GENERAL</b>					
	The following shall apply to all material and equipment supplied and installed on site and shall conform to specifications contained in the technical specification of this document.					
A.1	<b>WIRING CHANNEL</b>					
	Galvanised metal channel complete with covers fixed at intervals not exceeding 1.5m. Channel to be complete with all splices, bends, T-pieces, ends etc.					
A.2	<b>CONDUITS &amp; DRAW BOXES</b>					
	Conduits cast in concrete, chased into brickwork, fixed in partitioning, roof spaces, surface on concrete or brickwork to be complete with saddles, couplings and terminations to drawboxes. Draw boxes to be galvanised type. All cutting and terminations to be included.					
A.3	<b>LIGHT FITTINGS</b>					
	Take delivery of, store, install and connect all light fittings complete with lamps, gear, etc. as specified and indicated on the drawings. All fluorescent lamps to be Colour 840 unless indicated otherwise.					
A.4	<b>CONDUCTORS</b>					
	SABS approved PVC insulated copper conductors drawn into conduit, installed in wiring trunking or power skirting.					
A.5	<b>SOCKET OUTLETS</b>					
	16A, 3-pin switched socket outlets flush mounted in drawboxes complete with cover plates shall be of the "Crabtree" or "Clipsal" range which fit into standard outlet boxes dedicated outlets shall have a red cover plate. Floor boxes shall be of the "Cabstrut" range. or similar					
A.6	<b>LIGHT SWITCHES</b>					
	16A light switch flush mounted in draw boxes or power skirting complete with cover plates shall be of the "Crabtree" or "Clipsal" range which fit into standard outlet boxes.					
A.7	<b>DISTRIBUTION BOARDS</b>					
	Supply & Install Distribution Boards complete as in accordance with the specification and drawings					
A.8	<b>ISOLATORS</b>					
	Isolators surface/flush mounted in 100 x 100mm x 50mm draw boxes complete with coverplate as specified and indicated on drawings. All isolators installed externally shall be in weather proof enclosures					
A.9	<b>LOW VOLTAGE CABLES</b>					
	600/1000V PVC/SWA/PVC Cables with copper conductors to SABS 1507 fixed vertically or horizontally on cable trays in accordance with the specification and drawings. All fixings to be included.					
A.10	<b>TERMINATIONS</b>					
	Termination of LV cable to be as specified including connection of conductors, cable lugs, captive cone glands, shrouds, etc. for the relevant cable sizes.					

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL	LABOUR	TOTAL
	<b>BILL NO 2: Small Molecule Facility</b>					
	<b>Small Power &amp; Lighting</b>					
<b>2.1</b>	<b>LV cables</b>					
	Supply and installation of the following PVC armoured SWA copper cables to SANS 1507, installed on cable Trays vertically and horizontally.					
	25mm <sup>2</sup> x 4-core	m	74			
<b>2.2</b>	<b>TERMINATIONS</b>					
	Termination of LV cable as specified including connection of conductors, cable lugs, captive glands, shrouds, etc. for the following cable sizes					
	25mm <sup>2</sup> x 4-core	ea	2			
<b>2.3</b>	<b>EARTHING</b>					
	Supply and install the following bare copper earth conductors					
	16mm <sup>2</sup> bare earth conductor	m	74			
<b>2.4</b>	<b>TERMINATION OF EARTH CONDUCTORS</b>					
	16mm <sup>2</sup> bare earth conductor	ea	2			
<b>2.5</b>	<b>DISTRIBUTION BOARDS &amp; SWITCH GEAR</b>					
	Provide an infra red scan to check all terminations in the distribution board and replace missing blank circuit breaker covers. Ensure that all labelling is complete and legend cards are provided and updated. Ensure that all warning signs are provided. Test the earthing of DB. Ensure that cover plates are properly secured. Provide a Certificate of compliance for the distribution board in accordance with SANS 10142.					
	<b>LIST OF DISTRIBUTION BOARDS</b>					
	SDB - 13 (Retrofit as per single line diagram)	ea	1			
	SDB - DB UPS (New)	ea	1			
	SDB on First Floor small molecule (alterations)	ea	1			
<b>2.6</b>	<b>STRIP OUT EXISTING ELECTRICAL SERVICES</b>					
	Strip out existing electrical services small molecule facility 507m <sup>2</sup>	sum	1			
<b>2.7</b>	<b>UPS</b>					
	Supply and install an Eaton 40 kVA UPS and associated batteries for 10 min back-up	sum	1			
<b>2.8</b>	<b>Cable Trays</b>					
	Heavy Duty, hot dipped galvanised Return Flange cable tray (RFHD) complete with splices, nuts, bolts and washers fixed horizontally on hangers or vertically up walls and risers.					
	100 mm wide x 50 mm HD cable ladder	m	5			
	Horizontal bends	ea	1			
	Tee Piece	ea	0			
	External Elbow	ea	1			
	Cable ladder fixings	ea	5			
	200mm Wire Mesh tray	m	145			
	Horizontal Bends	ea	8			
	Vertical Bend	ea	1			
	Cross pieces		8			
	Tee pieces	ea	8			
	Cable Tray Hanger	ea	98			

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL	LABOUR	TOTAL
	100mm Wire Mesh tray	m	145			
	Horizontal Bends	ea	8			
	Vertical Bend	ea	1			
	Cross pieces	ea	8			
	Tee pieces	ea	8			
	Cable Tray Hanger	ea	98			
	200mm Perforated tray	m	10			
	Horizontal Bends	ea	1			
	Vertical Bend	ea	1			
	Tee pieces	ea	0			
	Perforated Tray fixings	ea	10			
	100mm Perforated tray	m	70			
	Horizontal Bends	ea	4			
	Vertical Bend	ea	2			
	Tee pieces	ea	0			
	Perforated Tray fixings	ea	47			
<b>2.9</b>	<b>Supply and Installation of the Following Circuit Breakers</b>					
	15Amp Circuit Breaker - 5kA	ea	0			
	20Amp Circuit Breaker - 5kA	ea	0			
	40Amp Circuit Breaker - 5kA	ea	0			
	63Amp Trip Pole Circuit Breaker - 5kA	ea	1			
	80Amp Trip Pole Circuit Breaker - 10kA	ea	0			
	160Amp Trip Pole Circuit Breaker - 15kA	ea	0			
	60Amp Earth Leakage Circuit Breaker rate at 30mA	ea	0			
	40 Amp 3 pole AC3 Duty Contactor	ea	0			
<b>2.10</b>	<b><u>WIRING CHANNEL</u></b>					
	Galvanised steel channel complete with covers fixed at intervals not exceeding 1.5m. Channel to be complete with all splices, bends, T-pieces, ends etc.					
	(Type OL or similar manufactured channel).					
	<b><u>Supply &amp; Install</u></b>					
	P9000 + Cover - suspended / in celing void for electrical services	m	145			
	P9000 - Tee Piece	ea	8			
	P9000 Horizontal Bend	ea	1			
	P9000 Vertical Bend	ea	0			
	P9000 Cross Piece	ea	8			
	End Caps	ea	0			
	Hangers	ea	98			
	P8000 + Cover - suspended / in celing void for electrical services	m	145			
	P8000 - Tee Piece	ea	8			
	P8000 Horizontal Bend	ea	1			
	P8000 Vertical Bend	ea	1			
	Cross Pieces	ea	8			
	End Caps	ea	0			
	Hangers	ea	98			
	P2000 + Cover - suspended / in celing void for electrical services	m	145			
	P2000 - Tee Piece	ea	8			
	P2000 Horizontal Bend	ea	4			
	P2000 Vertical Bend	ea	1			
	P2000 Cross piece	ea	8			
	Hangers	ea	98			

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL	LABOUR	TOTAL
	<b>SMALL POWER INSTALLATION</b>					
2.11	<b>Conduit</b>					
	<b>Supply and Install</b>					
	PVC conduit installed chased in walls and in open roof spaces in the following sizes					
	20mm PVC	m	215			
	25mm PVC	m	10			
	32mm PVC	m	0			
	50mm PVC	m	0			
	Bosal conduit, installed chased in walls, surface mounted and in open roof spaces on the following sizes					
	25mm Bosal	m	100			
	25mm metal Sprague (500mm)	m	0			
	25mm Bosal Threaded Dome Lid	ea	0			
2.12	<b>Outlet Boxes</b>					
	<b>Supply and Install</b>					
	Galvanised steel draw and outlet boxes installed surface, in ceiling spaces or chased into brickwalls, in the following sizes					
	100mm x 100mm x 50mm deep	ea	84			
	100mm x 50mm x 50mm deep	ea	0			
	100mm x 75mm x 50mm deep	ea	0			
	60mm round , 2-way	ea	12			
	Wonderboxes with cover plate	ea	0			
2.13	<b>SOCKET OUTLETS</b>					
	<b>Supply and Install</b>					
	16A SSO - Flush in draw box	ea	0			
	16A Double SSO - Flush in draw box	ea	0			
	16A SSO + 2 x Switched ZA sockets	ea	41			
	16A SSO with half-round earth pin and red face plate in draw box	ea	18			
	16A Double SSO with half-round earth pin and red face plate in draw box	ea	0			
	16A SSO - Flush in powerskirting normal	ea	30			
	ZA Socket outlet in power skirting	ea	14			
	16A SSO - Flush in powerskirting dedicated	ea	9			
	RJ45 data outlet in power skirting	ea	1			
	RJ45 data outlet flush in drawbox	ea	1			
	RJ45 data outlet in power pole enclosure	ea	0			
	16A SSO - Normal mounted in power pole enclosure with face plate	ea	0			
	16A SSO - ZA socket mounted in power pole enclosure with face plate	ea	0			
	16A SSO - Dedicated mounted in power pole enclosure with face plate	ea	0			
	Data outlet mounted in power pole enclosure with face plate	ea	0			
	16A SSO - In weatherproof yolk box built in to the wall (for garden equipment)	ea	0			
	mounted	ea	0			
	RJ11 Telephone outlets in power skirting	ea	0			
	RJ11 Telephone outlets in drawbox with cover plate	ea	0			
	RJ11 Telephone outlets in power pole enclosure	ea	0			
	UK Socket to South African socket adaptor	ea	20			
2.14	<b>ISOLATORS</b>					
	Isolators mounted complete with backbox on 100x100 outlet boxes or power skirting.					
	Supply & Install the following sizes:					
	20A 2-pole	ea	15			
	32A 2-pole	ea	0			
	60A 2-pole	ea	0			
	20A 3-pole	ea	1			
	32A 3-pole	ea	3			
	40A 3-pole	ea	0			
	63A 3-pole	ea	0			
	80A 3-pole	ea	0			
	125A 3-pole	ea	0			
	20A 2-pole IP65	ea	0			
	20A 3-pole IP65 (Welding socket)	ea	1			
	32A 3-pole IP65 (Welding socket)	ea	0			
	63A 3-pole IP65 (Welding socket)	ea	1			

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL	LABOUR	TOTAL
2.15	<b>CONDUCTORS</b>					
	<b>Supply and Install</b>					
	2.5mm <sup>2</sup> stranded PVC insulated copper conductors	m	5 560			
	4mm <sup>2</sup> stranded PVC insulated with copper conductors	m	20			
	6mm <sup>2</sup> stranded PVC insulated with copper conductors	m	0			
	10mm <sup>2</sup> stranded PVC insulated with copper conductors	m	0			
	16mm <sup>2</sup> stranded PVC insulated with copper conductors	m	0			
	25mm <sup>2</sup> stranded PVC insulated with copper conductors	m	0			
	35mm <sup>2</sup> stranded PVC insulated with copper conductors (rate only)	m	0			
2.16	<b>INNOVATIVE WIRING</b>					
	<b>Supply and Install</b>					
	2.5mm <sup>2</sup> Twin & Earth	m	0			
	4.0 mm <sup>2</sup> Twin & Earth	m	0			
	6mm <sup>2</sup> x 4 core surfix	m	0			
2.17	<b>POWER SKIRTING</b>					
	<b>Supply and Install</b>					
	2-Compartment, 2-Cover Steel powder coated power skirting	m	44			
	Cover only for power skirting	m	44			
	Corner - 90deg. Internal	ea	3			
	Corner - 90deg. External	ea	1			
	End Caps	ea	14			
	Horizontal bend	ea	0			
2.18	<b>LIGHTING INSTALLATION</b>					
	<b>Conduit</b>					
	<b>Supply and Install</b>					
	PVC conduit, installed chased in walls and in open roof spaces in the following sizes					
	20mm	m	65			
	25mm	m	0			
	Bosal conduit, installed chased in walls, surface mounted and in open roof spaces on the following sizes					
	20mm Bosal	m	100			
	25mm Bosal	m	0			
	25mm metal Sprague	m	0			
	25mm Bosal Threaded Dome Lid	ea	0			
2.19	<b>Outlet Boxes</b>					
	<b>Supply and Install</b>					
	Galvanised steel draw and outlet boxes installed surface , Brass bushes & locknuts in ceiling spaces or chased into Brickwalls, in the following sizes					
	100mm x 50mm x 50mm deep	ea	15			
	60mm round , 1,2 or 3-way	ea	4			
	100mm x 100mm x 50mm deep	ea	0			
2.20	<b>Light Switches(Complete with Cover Plates)</b>					
	<b>Supply and Install</b>					
	16A 1 - Lever ; 1 - Way switch - flush in draw box	ea	13			
	16A 1 - Way ; dimmer switch - flush in draw box	ea	0			
	16A 1- Lever, 2-Way switch - flush in draw box	ea	0			
	16A 1- Lever, Intermediate switch - flush in draw box	ea	0			
	16A 2 - Lever ; 1 - Way switch - flush in draw box	ea	0			
	16A 2 - Lever, 2-Way switch - flush in draw box	ea	0			
	16A 3 - Lever ; 1 - Way switch - flush in draw box	ea	0			
	16A 3 - Lever ; 2 - Way switch - flush in draw box	ea	0			
	5Amp unswitched socket outlets complete with ROUND Box mounted to trunking	ea	135			

ITEM	DESCRIPTION	UNIT	QTY	MATERIAL	LABOUR	TOTAL
<b>2.21</b>	<b><u>LIGHT FITTINGS</u></b>					
	Supply,take delivery, store, install the following light fittings with lamps & including the necessary supports etc. As specified and indicated on drawings. All luminaires shall be equipped with LED lamps 4000K unless otherwise specified.					
TYPE	<b><u>Supply &amp; Install</u></b>					
A	600 x 600 Recessed panel luminaire white 30W LED luminaire with opal diffuser. Similar and equal to Province/RubiconTHEIA 4000K c/w 3m lead and 5A plugtop	ea	83			
Ae	Same as Type A but with 1 hour emergency control gear and 2x 3m lead with 5A plugtop	ea	10			
B	600 x 600 Recessed panel luminaire white 40W LED luminaire with opal diffuser. Similar and equal to Province/Rubicon HELLAS 4000K c/w 3m lead and 5A plugtop	ea	0			
Be	Same as Type B but with 1 hour emergency control gear c/w 2 x 3m lead and 5A plugtop	ea	0			
C	Explosion proof luminaire Class 1 Div 1 Similar and equal to Province/Rubicon CHADD 67W 4000K		6			
D	Surface mounted vapour proof luminaire Province/Rubicon Metropolis 47W 4000K	ea	19			
De	Same as type D but with emergency 1 hr control gear.	ea	3			
E	Recessed downlight Province/Rubicon MARIA 80 10W 4000K c/w 3m lead and 5 A plugtop.	ea	0			
F	Recessed downlight Province/Rubicon MARIA 110 15W 4000K c/w 3m lead and 5 A plugtop.	ea	0			
	Photo cell. Similar and equal to Major Tech DNS6	ea	0			
<b>2.22</b>	<b><u>CONDUCTORS</u></b>					
	2.5mm² stranded insulated PVC with copper conductors	m	1 992			
	4mm² stranded insulated PVC with copper conductors	m	0			
	2.5mm² Twin & Earth	m	0			
<b>2.23</b>	<b><u>SENSORS</u></b>					
	Ceiling mounted 360deg occupancy sensors 1000W Major Tech PIR 45	ea	0			
	<b>TOTAL FOR BILL NO 2</b>					-

CSIR - SMALL MOLECULE AND BIOPHARM FACILITY - Summary						
	Bill no. 1 Preliminary & General					-
	Bill no. 2 Small Power & Lighting - Small Molecule Facility					-
	Provisional Amount for Earthing of Reactor Bay					8 000.00
	Provisional Amount for power supply to HVAC & Ventilation					180 000.00
					Sub Total	
	<b>TOTAL CARRIED FORWARD TO MAIN CONTRACTORS BILL OF QUANTITIES (excl VAT)</b>					



**Bill  
No**

Amount

## 5.4 Electrical Bills of Quantities

R

Main Contractors percentage for all mark-ups, attendance, etc on specialist domestic contractor

R

**Carried Forward To Section 5.10 : Final Summary**

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## CSIR Future PHARMA Facility