

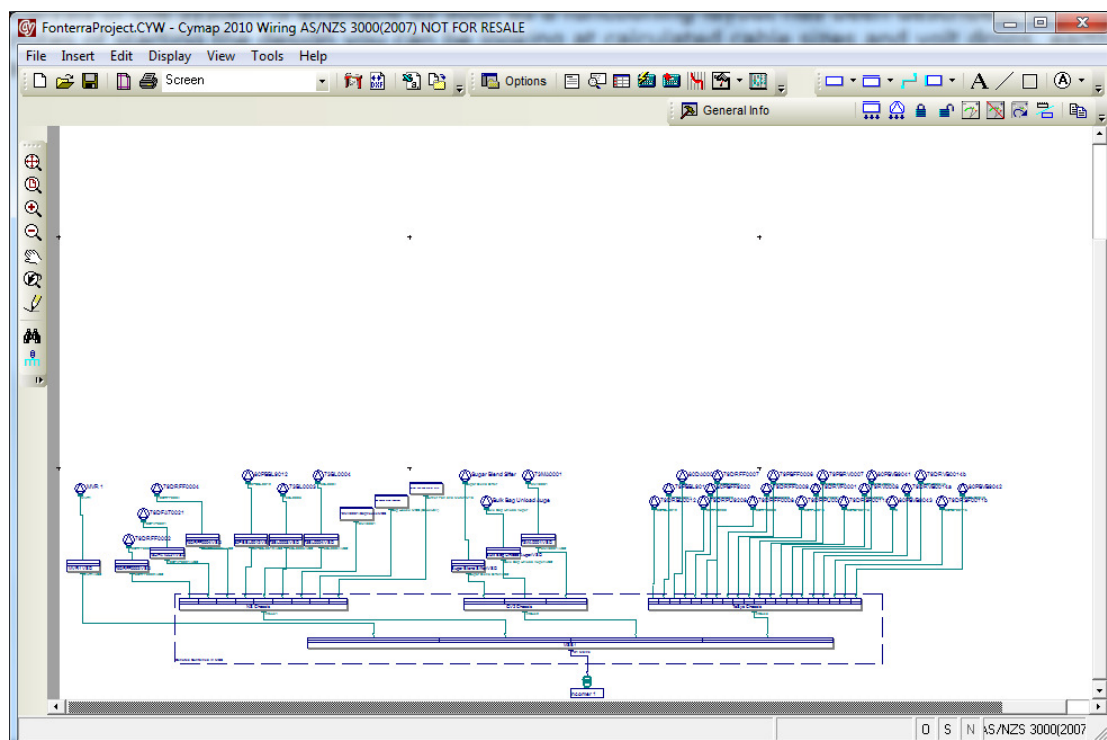
Cymap AS/NZS 3000 Edition Electrical Software

Clients and Electrical Safety rules (ESR58) now require proof that calculations have been carried out to AS NZS 3000 (2007). Wiring allows you to offer this evidence and helps ensure you produce a cost-effective and electrically efficient layout. Unlike other vendors there is no restriction to the number of boards and loads the engineer can enter.

The distribution system is built up by placing elements representing boards, loads and cables, directly onto the screen. These elements are far more than just symbols - they hold data describing their characteristics entered by you. For example, the cable type and installation method or the load on each way and phase.

The Engineer can coordinate the power distribution schematic with the floor plan based Cymap Electric program. This entails importing the distribution boards set up on the floor plan with all cable lengths and loads determined from manufacturer's Luminaires and loads placed. This saves time setting up boards in the Cymap Wiring program.

A full analysis of the system is available as soon as a functioning layout has been described, so within a few minutes of starting the design you can be looking at calculated cable sizes and volt drops, earth loop impedance checks, CPC sizing, discrimination studies and breaker sizing as well as full schedules of rates.



To modify the system simply click on the item to alter and enter the revised values. Recalculation is instant, with cable sizes and other results displayed either directly on the layout or in easy to read schedules. Cable schedules can be viewed on screen or simply exported to spreadsheet programs such as Microsoft Excel

Display Schedule

Display Type: Cable & Volt/Drops Vd%

Cable Reference	Cable Type	Core	Size mm ² /A	CPC Type / Size mm ²	Length m	Conn. From	Conn. To	CPD Size	CPD Type	Amps	CableVD%	System VD%	Maximum Allowable Z _s	Z _s
780FA10021	Cu-XLPE NS	4C	25	25	60.0	780FA10021/VSD	780FA10021	---	None	73.0	1.6335	3.0157	0.365	0.189
780FA10021/VSD	Cu-XLPE NS	4C	25	25	15.0	NS Chassis	780FA10021/VSD	80A	NS100N TM-D	73.0	0.4012	---	0.364	0.065
780RFF0004/VSD	Cu-PVC NS	4C	16	2.5	15.0	NS Chassis	780RFF0004/VSD	63A	NS100N TM-D	56.0	0.4408	---	0.676	0.218
780RFF0004	Cu-PVC NS	4C	16	4	45.0	780RFF0004/VSD	780RFF0004	---	None	56.0	1.3677	2.7294	0.676	0.587
Sugar Blend Sifter	Cu-PVC NS	4C	6	6	25.0	Sugar Blend Sifter/VSD	Sugar Blend Sifter	---	None	28.5	1.0165	2.2937	0.359	0.443
Bulk Bag Unload Auger	Cu-PVC NS	4C	4	4	30.0	Bulk Bag Unload Auger/VSD	Bulk Bag Unload Auger	---	None	21.5	1.3162	2.6445	0.46	0.64
80PBL9012	Cu-PVC NS	4C	16	4	45.0	80PBL9012/VSD	80PBL9012	---	None	57.0	1.5551	2.9301	0.676	0.507
MVR1	Cu-XLPE NS	4C x2	120	25	25.0	MVR1 VSD	MVR 1	---	None	320.0	0.3381	1.1362	0.083	0.052
80PBL9012/VSD	Cu-PVC NS	4C	16	2.5	15.0	NS Chassis	80PBL9012/VSD	63A	NS100N TM-D	57.0	0.5041	---	0.676	0.218
79MA0001	Cu-PVC NS	4C	16	4	55.0	NS Chassis	79MA0001/BaghouseMCC	63A	NS100N TM-D	63.0	2.14	3.0809	0.676	0.485
Bag House MCC (Backwall)	Cu-XLPE NS	4C	25	25	55.0	NS Chassis	Bag House MCC (Backwall)	80A	NS180N TM-D	75.0	1.5513	2.4722	0.23	0.148
Burner Fan and Motor M16	Cu-PVC NS	4C	6	2.5	30.0	NS Chassis	Burner Fan and Motor M16	32A	NS100N TM-D	32.0	1.5562	2.4771	1.329	0.475
79810001/VSD	Cu-XLPE NS	4C	36	36	15.0	NS Chassis	79810001/VSD	63A	NS100N TM-D	54.0	0.3514	---	0.676	0.062

Export Close

The design process

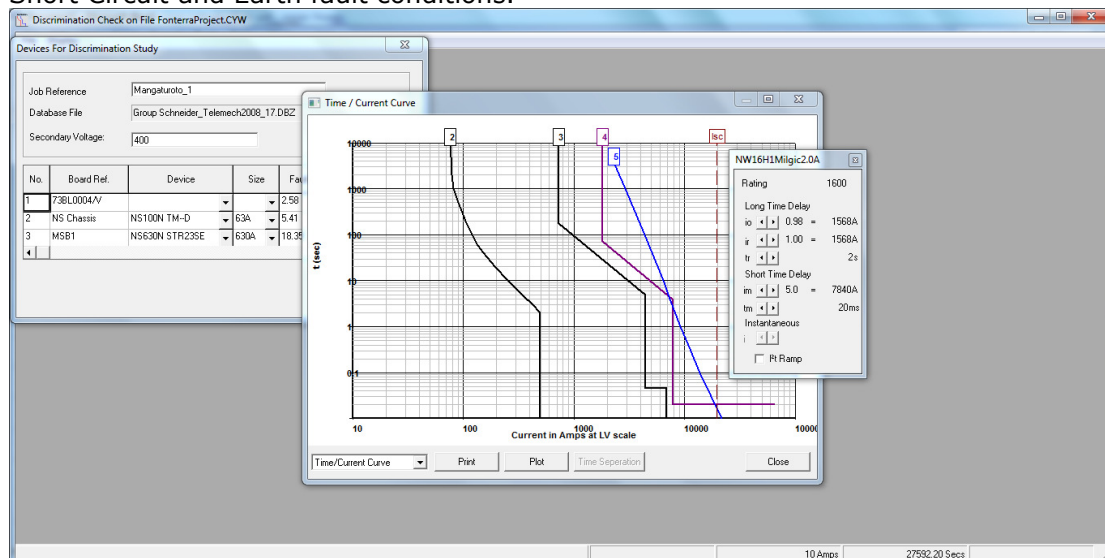
Cables design can be controlled in various ways:

The size may be fixed (if desired). cables can be set in parallel, and the required de-rating factors can be selected. Hundreds of standard cable types are available in the provided AS/NZS 3008 cable database provided, and database tools are also provided to make adding additional items a simple task.

Size mm ²	Current Amps	Volt Drop r	mV/A/m x	CPC Size mm ²	Imp. r	Ohms/km x	Cable Cost \$/m	Gland/End Cost \$
25	121	1.606	0.140	250	0.884	0.074	0	0
35	149	1.157	0.136	350	0.638	0.073	0	0
50	187	0.856	0.120	500	0.471	0.069	0	0
70	237	0.592	0.118	700	0.327	0.068	0	0
95	292	0.428	0.116	950	0.236	0.067	0	0
120	336	0.341	0.114	1200	0.187	0.066	0	0
150	0	0.000	0.000	0	0.000	0.000	0	0
185	0	0.000	0.000	0	0.000	0.000	0	0
240	0	0.000	0.000	0	0.000	0.000	0	0
300	0	0.000	0.000	0	0.000	0.000	0	0
400	0	0.000	0.000	0	0.000	0.000	0	0
500	0	0.000	0.000	0	0.000	0.000	0	0
630	0	0.000	0.000	0	0.000	0.000	0	0

Protective Earthing Conductors PECs can take various forms: core in cable, using the armouring or the conduit (if modelling older installations). Alternatively you can choose to run an entirely separate earth. The system will automatically evaluate the most efficient sizes, and highlight any issues.

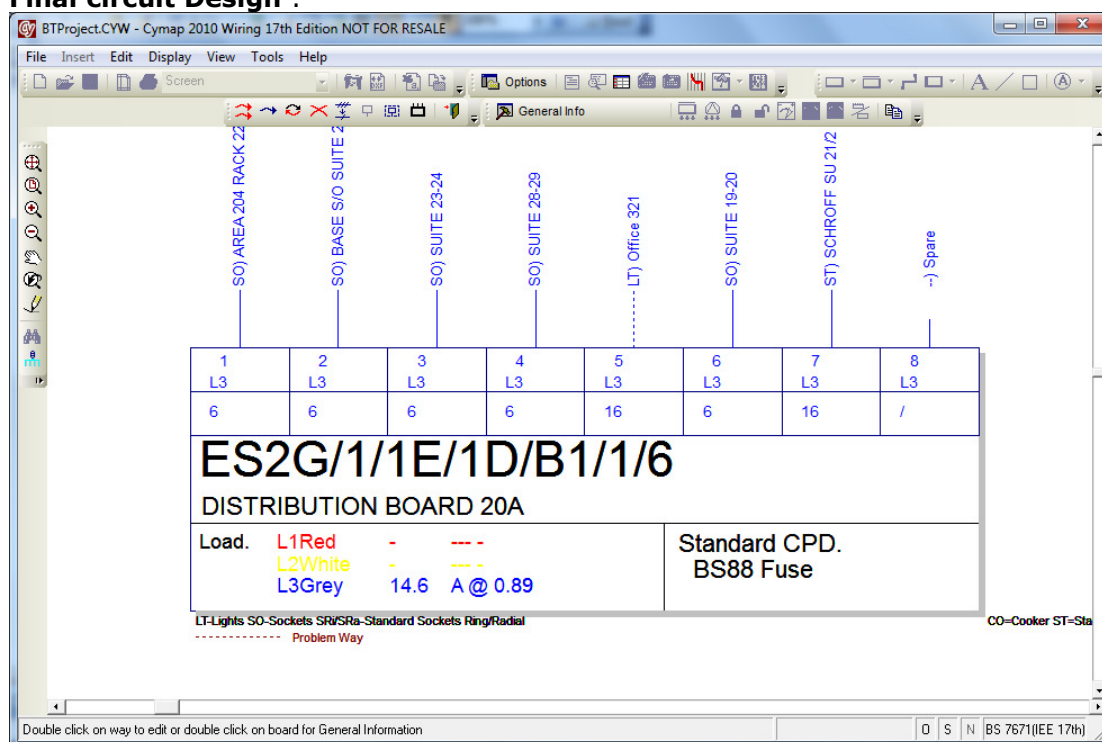
Circuit Protective devices (CPD's), including HV Static Relays, HV Mechanical Relays, HV Fuses, MCBs, MCCBs, air circuit breakers ACB's and microprocessor controlled MCCB's are available from many manufacturers and can be modified or added to by the user. RCDs and Earth Fault trip units can be included and either fixed in size or sized automatically by the program to ensure discrimination. On Screen protection discrimination studies can be shown @ any point in your network, for both Short Circuit and Earth fault conditions.



Diversity can be entered at any point in the system.

Loads, cable sizes, protection device sizes, volt drops, short circuit fault levels and earth loop impedances are calculated for every point in the system. In addition, disconnection times are calculated, adiabatic and other checks are made to help ensure compliance with the regulations. Full de-rating and single cable sizing form part of the minor suite of programs included.

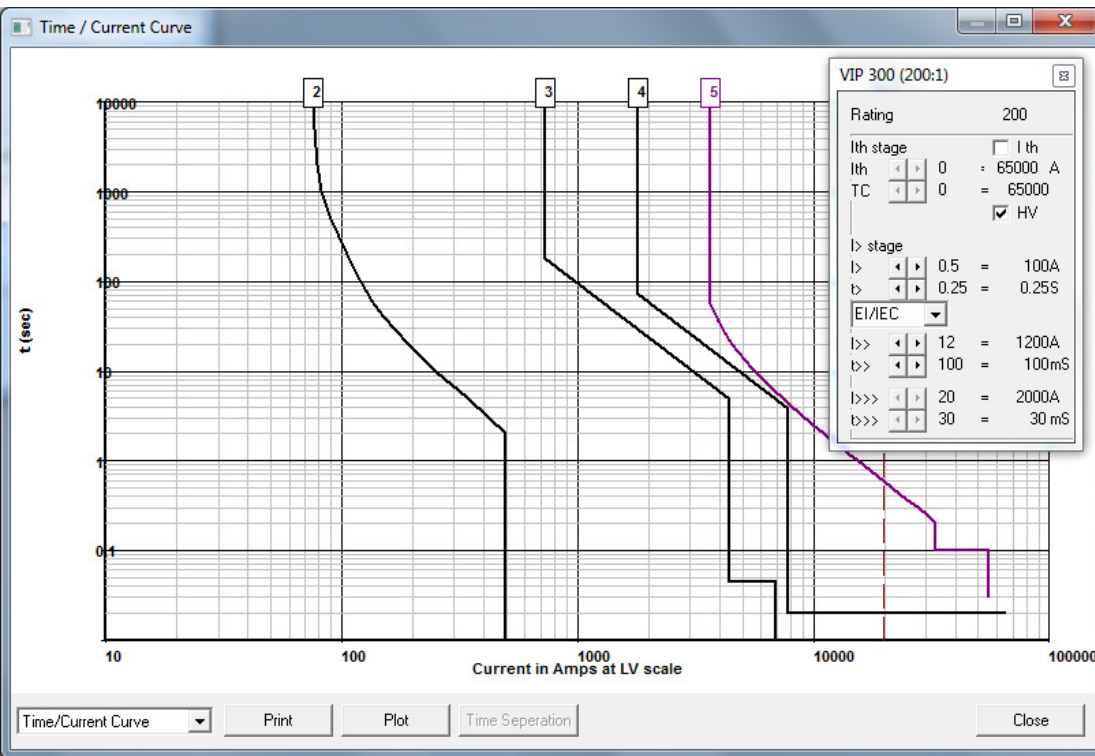
Final circuit Design :



Is an integral part of the Wiring package. As each load is entered the total load on the way is updated, the protection device size is calculated and the numerous checks required by the regulations are carried out. Six major types of final circuit are identified cover the most common types: lighting, standard sockets, special sockets, cooking, stationary equipment and spare capacity. Loads may be either single phase or three phase. Discrimination between final circuits, LV sub mains and even the HV supply is available from every single final circuit

Where there are a number of similar Final boards for example on each floor of an office block - the complete contents of one board can be copied to another. This is in addition to being able to copy, move and swap individual ways within a board. The ability to select whole sections of one project and paste them into another is also a useful feature.

Device Co-Ordination



A full co-ordination study can also be carried out, taking into account the tolerances of the device and enabling you to alter the settings of adjustable devices, while viewing the fault/time curves on screen. HV devices can be included on the upstream HV side of the power distribution network. Full adjustment of all devices is possible by

selecting the appropriate device and changing the device settings. A full database of manufacturer's devices is included along with impulse voltages which can be used for analysis of protection of atmospheric or otherwise over voltages which require surge protection.

A separate Selectivity/Discrimination Co-ordination package forms part of the extensive range of circuit protective devices enabling engineers to create a simple discrimination study by selecting devices on a tabular format and viewing the results. This is particularly suitable for existing networks where obsolete breakers need replacing without resorting to a complete modelling of the power distribution network.

Motor Protection/Harmonic

Circuit protection to DOL & VSD motors can be evaluated and tripleN & higher order harmonics modelled for use in today's electrical environment at a distribution board level.

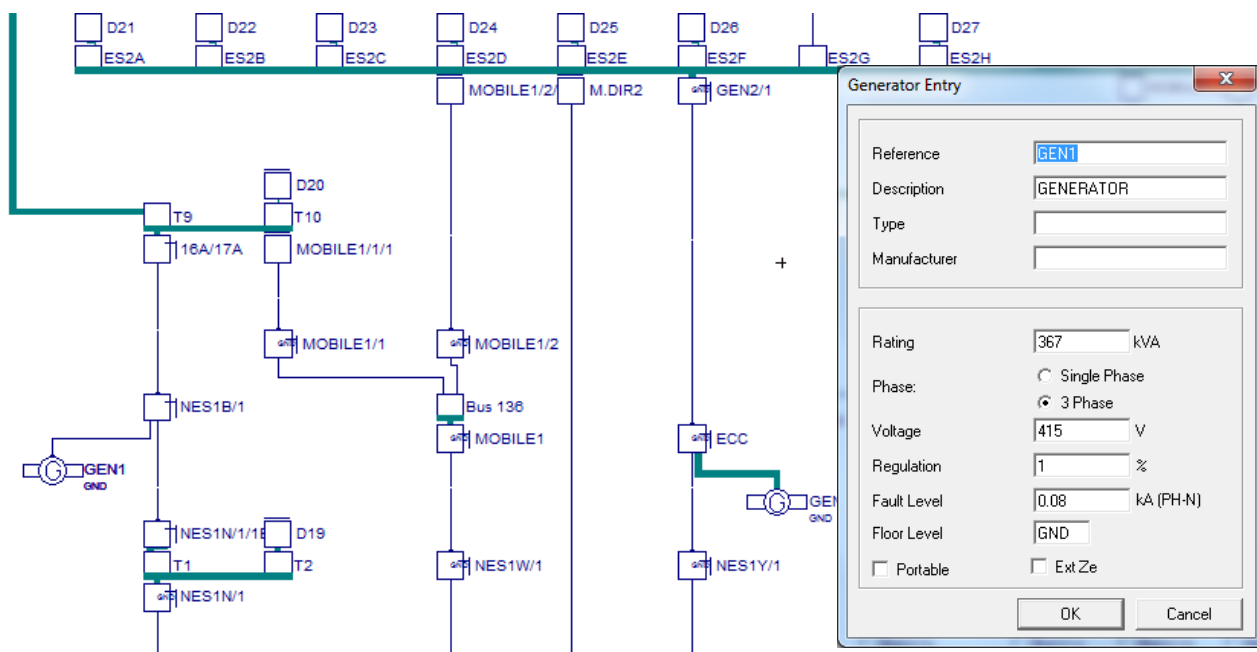
The image shows two overlapping software windows. The background window is 'Motor Entry' with 'Using Cymap Provided Data' selected. It has tabs for 'Details' and 'Search'. Under 'Motor', the 'Reference' is '73BL0004' and 'MA200L4/General'. Under 'Starter', 'Variable Speed Drive' is selected, and 'VSD Harmonics' is checked. The foreground window is 'Harmonic Load' with a 'Harmonic Profile' tab. It contains a table of harmonic data and summary statistics.

Harmonic	Freq	Distortion%(I)	Pk Harmonic Current
1	50		80.61
2	100		
3	150	33	26.60
4	200		
5	250	22	17.73
6	300		
7	350	11	8.87
8	400		
9	450	5	4.03
10	500		
11	550		

Summary statistics from the Harmonic Load window:
 RMS: 61.74 A, THDi: 042%, I1(rms)/Ito(rms): 0.923
 Sized on Phase: TripleN Iz: 66.27907, Appx 11 CF >5: 1.03

Alternative Arrangements:

Supply



Systems containing standby Generation can easily be modelled in the Wiring Package, and what if scenarios modelled with differing supply conditions along with Essential/Non Essential systems

There are virtually no limits to the number of boards and loads added to the schematic system, so the software can be used to cover the vast majority of projects from domestic to major commercial and industrial projects.

Reports and drawings

Cymap

Project No.: Mangaturoto_1
Project Ref.: Mangaturoto_1
Client: Mangaturoto_1
Bill of Quantities
Tuesday, 12 October 2010

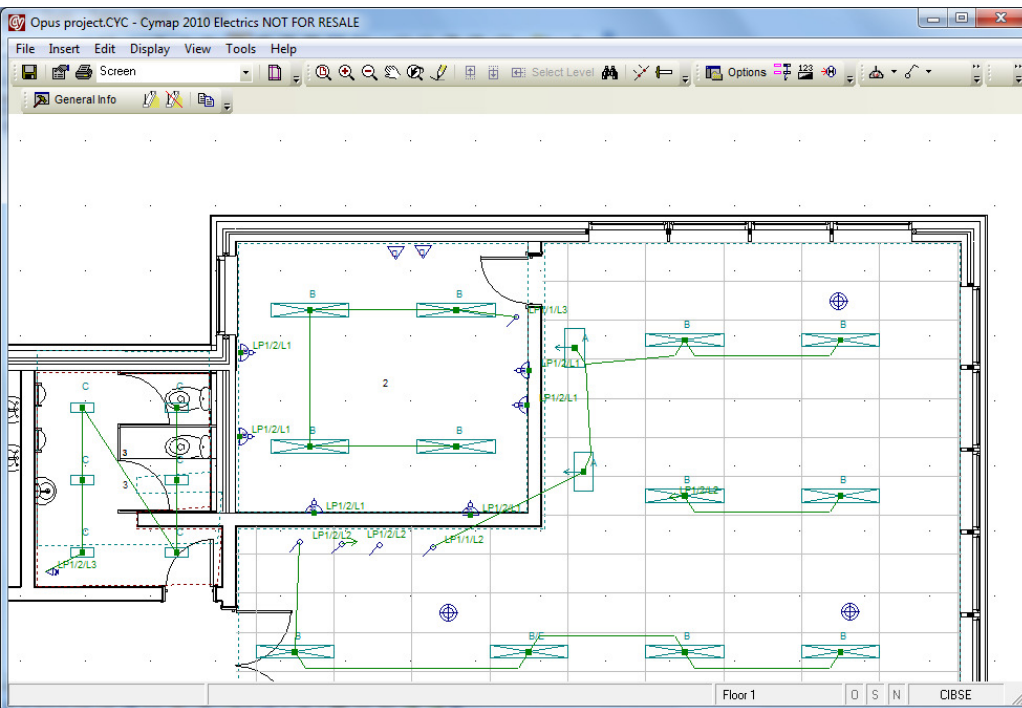
Part Number	Manufacturer	Description	Size	Units	Quantity	Unit Price	Totals
Wiring							
Wiring Boards							
N/A	N/A	TP&N Board: Dryer		Ways	1.00	\$0.00	\$0.00
N/A	N/A	Evap MVR 1 VSD		Ways	1.00	\$0.00	\$0.00
N/A	N/A	VSD		Ways	7.00	\$0.00	\$0.00
N/A	N/A			Ways	1.00	\$0.00	\$0.00
N/A	N/A	MainDB11		Ways	1.00	\$0.00	\$0.00
N/A	N/A	MSB1		Ways	1.00	\$0.00	\$0.00
N/A	N/A	MSB1		Ways	20	\$0.00	\$0.00
N/A	N/A	MSB1		Ways	3	\$0.00	\$0.00
N/A	N/A	MainDB 1		Ways	4	\$0.00	\$0.00
N/A	N/A	MSB1		Ways	9	\$0.00	\$0.00
Totals for:					Wiring Boards	15.00	\$0.00
Wiring Cable Glands							
N/A	N/A	4 Core: PVC Circular Neutral Screen (2.5-16sqmm)	10 mm ²		1	2.00	\$0.00
N/A	N/A	4 Core: XLPE Shaped Neutral Screen (25-120sqmm)	120 mm ²		1	4.00	\$0.00
N/A	N/A	4 Core: PVC Circular Neutral Screen (2.5-16sqmm)	16 mm ²		1	12.00	\$0.00
N/A	N/A	4 Single: 90 C Thermoplastic PVC Singles (Sep PEC)	185 mm ²		1	4.00	\$0.00
N/A	N/A	4 Core: PVC Circular Neutral Screen (2.5-16sqmm)	2.5 mm ²		1	38.00	\$0.00
N/A	N/A	4 Core: XLPE Shaped Neutral Screen (25-120sqmm)	25 mm ²		1	10.00	\$0.00
N/A	N/A	4 Single: 90 C Thermoplastic PVC Singles (Sep PEC)	300 mm ²		1	2.00	\$0.00
N/A	N/A	4 Core: PVC Circular Neutral Screen (2.5-16sqmm)	4 mm ²		1	8.00	\$0.00
N/A	N/A	4 Core: XLPE Shaped Neutral Screen (25-120sqmm)	50 mm ²		1	4.00	\$0.00

A wide range of reports can be printed, including all aspects of design and schematics, final board diagrams, a bill of quantities, and commissioning testing & commissioning sheets.

Single line diagrams can be printed, plotted directly or exported to a draughting system such as AutoCAD for further enhancement. System details can be exported in a format suitable for spreadsheets, word processors, and estimating systems.

Integration

Wiring integrates with our other Electrical Packages such as our 'Lighting & Electrics' packages. Allowing you to do detailed lighting design using (DXF Based) CAD floor plans, assign Luminaires to distribution boards, show small power distribution, draw cable supports, and evaluate cable lengths. Boards placed in "CAD" can then be later imported into Wiring and will automatically contain the correct cable lengths and loads



from your small power distribution drawings.