Accubid Activity #4 Accubid Office Building – 01 SWITCHGEAR, Distribution Designations and Switchgear Takeoff

Building Distribution Designations

- 1. Start the program Accubid Pro 12 [Start, All Programs, Trimble, Classic 12, Accubid Pro 12]
- 2. Press the CAPS LOCK Key ON
- 3. From the Job Schedule Screen open the file, Accubid Office Building.
- 4. If not already selected, select the Takeoff tab at the bottom of the screen.
- 5. Make sure you are using the Database: L100 V8 US NECA IMP.
- 6. Choose DISTRIBUTION from the drop down list in the Takeoff: area of the screen.

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Takeoff: DISTRIBUTION		Job		Accubid Office Building - Lori Brown Accubid Off	ice Building						-
Designation Status		Drawing	Тур	E2.1 FIRST FLOOR PLAN - LIGHTING							-
		Area	Тур	MAIN BUILDING							-
		Phase	Тур	FIRST FLOOR							-
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Figure 1

In Accubid (Electrical) there are three systems that use **Designations**: FIXTURES HEATING DISTRIBUTION

Creating a designation involves selecting any number of different items and assemblies, and then assigning them a designation name. Once you have created the designation, you can take off all the items in the designation in a single step. Any changes you make to the designation will be automatically reflected in all takeoffs performed using that designation.

DISTRIBUTION DESIGNATIONS



Figure 2

01 SWITCHGEAR

The first designation you will build is the Main Switchboard "MDB".

From the One-Line Diagram the amperage, voltage, phase, wire numbers and AIC rating can be obtained for MDB. This information can also be found on the Panel Schedule.

The One-Line Diagram also indicates the size and number of circuit breakers (CB) in the MDB and the size and number of wires terminating at each breaker. From the One-Line Diagram complete the count for the CB's and Wire Power Term's and fill in the corresponding blank lines shown below.

MAIN SWBD MDB 1000A 277/480V 3Ø 4W 42K AIC

CB QTY 1000/3 400/3 225/3 100/3 70/3	CIRCUIT BREAKERS (CB)	3/0 Gauge	200 Amps Service entrance
WIRE POWER TERM	<u>4 QTY</u>	1/0 Gauge	Service entrance and feeder wire
#8 #6		3 Gauge	100 Amps Service entrance and feeder wire
#4 #3		6 Gauge	55 Amps Feeder and large appliance wire
#2		8 Gauge	40 Amps Feeder and large appliance wire
#1 #2/0		10 Gauge (30 Amps Dryers, appliances, and air conditioning
#4/0 #500		12 Gauge (20 Amps Appliance, laundry and bathroom circuits
#600		14 Gauge (15 Amps General lighting and recentacle circuits

- 7. Double click on Line 1 in the Takeoff area under the word Designation.
- 8. In the Create/Modify Designation Description dialog box type the designation name: MAIN SWBD MDB 1000A 277/480V 3PH 4W 42K AIC and click the OK button.
- 9. The first selection is the Distribution: Category

Takeoff	DISTRIBUTION		Ψ.
	Distribution: Category	Туре	
1	SERVICE SWITCHGEAR	С	
2	DISTRIBUTION SWITCHGEAR	С	
3	MOTOR CONTROL CENTER	С	
4	DISTRIBUTION PANEL BOARD	С	
5	BRANCH PANEL BOARD	С	_
6	BREAKERS - NEMA 1	С	=
7	TRANSFORMERS - TO 600V	С	
8	CAPACITORS	С	
9	GENERATORS	С	
10	TRANSFER SWITCHES	С	
11	MANUAL DISCONNECTS	С	
12	FUSES	С	
13	VOLTAGE REGULATORS - POWER SUPPLIES - UPS EQUIP	С	
14	SPLITTERS / SOCKETS / CABINETS	С	
15			
16	SERVICE SWITCHGEAR - 4.16KV	С	
17	SERVICE SWITCHGEAR - 13.8KV	С	
18	MOTOR CONTROL CENTER - 4.16KV	С	
19	TRANSFORMERS - HV	С	
20	CAPACITORS - HV	С	
21	FUSES - HV	С	
22			
23			

Figure 3

The MAIN SWBD MDB is SERVICE SWITCHGEAR

10. Double click on:

[Line 1] SERVICE SWITCHGEAR

[Line 5] 1200A

[Line 2] 1200A 2-SECTION SERVICE SWGR

(See Details E6.2)

- 11. The Measure Takeoff window opens when you select the item. Click OK.
- 12. The next window in the takeoff: area is Distribution Fittings: Type

Takeoff	DISTRIBUTION FITTINGS			Ŧ
	Distribution Fittings: Type	Туре	Cata	*
1	SWGR SET UP	А		
2	SWGR RECEIVING AND UNLOAD	1		
3	SWGR PUT INTO PLACE	I.		
4	SWGR PADS	I.		
5	SWGR LEVELING	1		_
6	SWGR TESTING	1		=
7	SWGR COMMISSIONING	1		
8	SWGR POWER SHUT DOWN	1		
9	SWGR SPARE PARTS	I.		
10	SWGR RELOCATION	I.		
11				
12				

13. Double click on [Line 1] SWGR SET UP

Measure	Takeoff											
Calcula	ator Notes				Me	easur	rement Inform	nation				
				0		M	leasurement	Variable	Value			
Prob	e Information			U .	С	ount	per Unit		1.00			
Scal Leng	le: No Scale	•	Backspace CE 7 8 9 4 5 6) C / sqrt • %								
Cour	nt:		1 2 3	- 1/x + =								
Se	end			d Value								~
			Send			(•
Takeoff Item / A	Label: ssembly Name:	MAIN SWBD ME MAIN SWBD ME	DB 1000A 277/480V 3 DB 1000A 277/480V 3	PH 4W 42 PH 4W 42	k aic K aic							
Item Info	ormation:	Material \$:	0.00 Labor Ho	ours:		0.00	Avg Len:					
		ltem Descripti	ion	Quantity	Bas	se	Fct 1	Fct 2	Catalog N	lumber		
1	SWGR RECEIV	ING AND UNLOAD)	1.00	Cnt	-	1.00	1.0				
2	SWGR PUT INT	O PLACE		1.00	Cnt		1.00	1.0				
3	SWGR LEVELI	NG		1.00	Cnt		1.00	1.0				
4	SWGR TESTING	3		1.00	Cnt		1.00	1.0				
5	SWGR COMMIS	SSIONING		1.00	Cnt		1.00	1.0				
4												-
Ac	id Del	lete									ОК	Cancel



This adds the 5 items shown in Figure 5 with NO Labor Hours. The purpose for adding these is so that they become activities when the estimate is imported into Microsoft Project.

14. Click OK in the Measure Takeoff window. Notice that the takeoff: selection stays at DISTRIBUTION FITTINGS. If you need to add additional items you can continue using this window.



Your Accubid window should look like the one shown in Figure 6 on the next page.

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Distribution A conservation Trans	Ture									
Distribution Accessories: Type	iype									
3 TERMINATIONS - POWER	С									
4 TERMINATIONS - CONTROL	C									
5										
6 BREAKER 1 POLE - OPEN	С									
7 BREAKER 2 POLE - OPEN	С									
8 BREAKER 3 POLE - OPEN	С									
9 MCB 1 POLE - OPEN	С									
10 MCB 2 POLE - OPEN	С		Item Descriptio	n	Quantity					<u> </u>
11 MCB 3 POLE - OPEN	С	1	1200A 2-SECTION SERVICE	SWGR	1.00					
12 DPB FUSIBLE CELLS	С	2	SWGR RECEIVING AND UNLO	DAD	1.00					
13 AIR CIRCUIT BREAKERS - OPEN	С	3	SWGR PUT INTO PLACE		1.00					
14		4	SWGR LEVELING		1.00					
15 250V RK1 ONE TIME FUSES	C	6	SWOR LESTING		1.00					
16 250V RK1 TIME DELAY FUSES	C	7	SWGR COMMISSIONING		1.00					
17 600V RK1 ONE TIME FUSES	C									
10 250V RKT TIME DELAT FUSES	C									
200 RODV RKS TIME DELAT FUSES	C									
21 600V HRC-I ONE TIME FUSES	C									
22 600V HRC-J TIME DELAY FUSES	C									
23 600V HRC-L ONE TIME FUSES	C									
24 600V HRC-L 4SEC DELAY FUSES	С									
25 600V HRC-L 10SEC DELAY FUSES	С									
26										
27										
28										
29	-									~
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Job Info Notes Takeoff Extension DirLb	IncLb	LbFac	LbEsc IndLb	Subs	GenExp Eqpmt	QtMat	FnPrc Key	/Ind Brkdn	Graph	QPad
or Help, press F1 Col 1 Labor CAP NUM SCRL										

Figure 6

All of the AOB switchgear and panels will be fastened to concrete using strut supports.

16. To add the strut and misc material to the designation double click on: [Line 1] HANGERS AND FASTENERS [Line 1] 2X2' STRUT CONC SUPPORT

Leave the Count per Unit Value as 1.00 and click the OK button in the Measure Takeoff window to add the strut material to the designation.

17. Right click in the takeoff: area to go back one level (Distribution Accessories: Type)

18. Double click:

[Line 3] TERMINATIONS – POWER

Add the WIRE POWER TERMS by wire size and quantity (see page 2 of this activity) i.e.

Double click:

[Line 6] #8 WIRE POWER TERM and leave the Count per Unit as 1.00 and click OK to add (1.00) #8 WIRE POWER TERM to the designation.

Double click:

[Line 7] #6 WIRE POWER TERM and change the count per unit to 3.00 and click OK to add (3.00) #6 WIRE POWER TERM to the designation.

When completed your designation should look like the one shown in Figure 7 on the next page.

	Item Description	Quantity
1	1200A 2-SECTION SERVICE SWGR	1.00
2	SWGR RECEIVING AND UNLOAD	1.00
3	SWGR PUT INTO PLACE	1.00
4	SWGR LEVELING	1.00
5	SWGR TESTING	1.00
6	SWGR COMMISSIONING	1.00
7	1 5/8x 1 5/8x 14G STRUT GALV	4.00
8	3/8-16x 2 1/4 WEDGE ANCHOR - 1 1/2" MIN D	4.00
9	3/8-16 SPRING NUT 1 3/8 OR 1 5/8" STRUT	4.00
10	3/8-16x 1 1/2 HEX HEAD BOLT - PLTD STL	4.00
11	3/8" FLAT WASHER - PLTD STL	4.00
12	3/8" LOCK WASHER - PLTD STL	4.00
13	# 8 WIRE POWER TERM	1.00
14	# 6 WIRE POWER TERM	3.00
15	# 4 WIRE POWER TERM	3.00
16	# 3 WIRE POWER TERM	5.00
17	# 2 WIRE POWER TERM	5.00
18	# 1 WIRE POWER TERM	9.00
19	#2/0 WIRE POWER TERM	1.00
20	#4/0 WIRE POWER TERM	12.00
21	#500 WIRE POWER TERM	4.00
22	#600 WIRE POWER TERM	12.00
-		

Figure 7

19. Right click in the Designation window and click on Finish to complete the designation.



Figure 8

Note: To modify a Designation, right click on the designation name and click on <u>M</u>odify. Right click and select Abort to cancel.

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To add a Designation to your estimate as "takeoff", FIRST SET THE BREAKDOWN, then, double click on the Designation name. In the Designation Count Window change the quantity to the number you want to add to the estimate and click on the OK button. For now, click Cancel if you opened the Designation Count window. (Takeoff will be done later.)



Figure 10

- 20. The next DISTRIBUTION DESIGNATION we will build is TVSS. To start a new designation Double click on the next blank line (Line 2) in the Designation window.
- 21. In the Create/Modify Designation Description dialog box type: TVSS TG2000 277/480V 20KVAR 3PH and click the OK button.
- 22. Double click:
 - [Line 8] CAPACITORS [Line 2] 480 VOLT 3PH [Line 22] 20KVAR CAPACITOR 480V 3PH - NEMA 3R Click OK in the Measure Takeoff window.
- 23. Double Click [Line 1] CAPACITOR SET UP click OK
- 24. Click the Next button on the Toolbar. Add the strut: [Line 1] HANGERS & FASTENERS [Line 1] 2X2' STRUT CONC SUPPORT Click OK in the Measure Takeoff window.
- 25. Right click in the takeoff: window to go back one level. Add the WIRE POWER TERMs [Line 3] TERMINATIONS – POWER[Line 10] #2 WIRE POWER TERM Change the count per unit to 5 and click OK
- 26. Right click in the designation area and click finish.



Figure 11

Distribution Designations Panel Board (PNL) & Transformer (XFMR)

Step 1	Double click on the next blank line in the Takeoff:	DISTRIBUTION Designation area					
Step 2	Type the Designation name in the Create/Modify di	alog box:					
_	PNL HB1 100A 277/480V 3PH 4W MCB 24 CKT						
	Click OK						
Step 3	Distribution: Category						
	[Line 5] BRANCH PANEL BOARD						
	[Line 1] 100 AMP						
	[Line 25] 100A 4W-24CCT RCSD BREAKER BP	B - MAIN BRKR					
	Click OK						
Step 4	Distribution Fittings: Type						
	[Line 1] BPB SET UP						
	Click OK						
Step 5	Click the Next button on the Toolbar						
	Distribution Accessories: Type						
	[Line 1] FASTENERS & HANGERS						
	[Line 1] 2X2' STRUT CONC SUPPORT 1.00						
	Click OK						
Step 6	Right click in the takeoff area to go back one level						
	[Line 3] TERMINATIONS – POWER						
	FEEDERS						
	[Line 6] # 8 WIRE POWER TERM 1.00	Click OK					
	[Line 9] # 3 WIRE POWER TERM 4.00	Click OK					
	BRANCH CKTS & MOTOR/EQUIP						
	[Line 4] #12 WIRE POWER TERM 10.00	Click OK					
	[Line 5] #10 WIRE POWER TERM 3.00	Click OK					
Step 7	Right click in the Designation area						
	Click Finish						
Step 8	Repeat for the remaining Panel Boards (see below)						

Steps for creating Panel Board Designations:

PNL H1 400A 277/480V 3PH 4W MCB 42 CKT

ITEM	QTY
400A 4W-42CCT RCSD BREAKER BPB - MAIN BRKR	1.00
BPB RECEIVING AND UNLOAD	1.00
BPB PUT INTO PLACE	1.00
BPB LEVELING	1.00
BPB TESTING	1.00
1 5/8x 1 5/8x 14G STRUT GALV	4.00
3/8-16x 2 1/4 WEDGE ANCHOR - 1 1/2" MIN DEPTH	4.00
3/8-16 SPRING NUT 1 3/8 OR 1 5/8" STRUT	4.00
3/8-16x 1 1/2 HEX HEAD BOLT - PLTD STL	4.00
3/8" FLAT WASHER - PLTD STL	4.00
3/8" LOCK WASHER - PLTD STL	4.00
# 8 WIRE POWER TERM	1.00
# 3 WIRE POWER TERM	1.00
# 2 WIRE POWER TERM	3.00
#500 WIRE POWER TERM	4.00
#12 WIRE POWER TERM	22.00
#10 WIRE POWER TERM	27.00

PNL L1 225A 120/208V 3PH 4W 84 CKT	
ITEM	QTY
225A 4W-84CCT RCSD BREAKER BPB - DBL TUB	1.00
BPB RECEIVING AND UNLOAD	1.00
BPB PUT INTO PLACE	1.00
BPB LEVELING	1.00
BPB TESTING	1.00
1 5/8x 1 5/8x 14G STRUT GALV	4.00
3/8-16x 2 1/4 WEDGE ANCHOR - 1 1/2" MIN DEPTH	4.00
3/8-16 SPRING NUT 1 3/8 OR 1 5/8" STRUT	4.00
3/8-16x 1 1/2 HEX HEAD BOLT - PLTD STL	4.00
3/8" FLAT WASHER - PLTD STL	4.00
3/8" LOCK WASHER - PLTD STL	4.00
# 4 WIRE POWER TERM	1.00
#4/0 WIRE POWER TERM	4.00
#12 WIRE POWER TERM	50.00
#10 WIKE FOWER TERM	17.00
# 0 WIRE FOWER TERM # 4 WIDE DOWED TEDM	3.00
#4 WIKE FOWER TERM	2.00
PNL HT 225A 277/480V 3PH 4W MCB 42 CKT	
ITEM	QTY
225A 4W-42CCT RCSD BREAKER BPB - MAIN BRKR	1.00
BPB RECEIVING AND UNLOAD	1.00
BPB PUT INTO PLACE	1.00
BPB LEVELING	1.00
BPB TESTING	1.00
1 5/8x 1 5/8x 14G STRUT GALV	4.00
3/8-16x 2 1/4 WEDGE ANCHOR - 1 1/2" MIN DEPTH	4.00
3/8-16 SPRING NUT 1 3/8 OR 1 5/8" STRUT	4.00
3/8-16x 1 1/2 HEX HEAD BOLT - PLTD STL	4.00
3/8" FLAT WASHER - PLTD STL	4.00
3/8" LOCK WASHER - PLTD STL	4.00
# 8 WIRE POWER TERM	1.00
# 4 WIRE POWER TERM	4.00
#4/0 WIRE POWER TERM	4.00
#12 WIRE POWER TERM	17.00
#10 WIRE POWER TERM	23.00
PNL LT 225A 120/208V 3PH 4W MCB 84 CKT	
ITEM	QTY
225A 4W-84CCT RCSD BREAKER BPB - DBL TUB	1.00
BPB RECEIVING AND UNLOAD	1.00
BPB PUT INTO PLACE	1.00
BPB LEVELING	1.00
BPB TESTING	1.00
1 5/8x 1 5/8x 14G STRUT GALV	4.00
3/8-16x 2 1/4 WEDGE ANCHOR - 1 1/2" MIN DEPTH	4.00
3/8-16 SPRING NUT 1 3/8 OR 1 5/8" STRUT	4.00
3/8-16x 1 1/2 HEX HEAD BOLT - PLTD STL	4.00
3/8" FLAT WASHER - PLTD STL	4.00
3/8" LOCK WASHER - PLTD STL	4.00
# 6 WIRE POWER TERM	1.00
#1/0 WIRE POWER TERM	4.00
#12 WIRE POWER TERM	16.00
#10 WIKE POWER TERM	4.00

Steps for creating Transformer Designations:

Step 1	Double click on the next blank line in the Takeoff: DISTRIBUTION Designation area							
Step 2	Type the Designation name in the Create/Modify dialog box:							
	XFMR TL1 75KVA 480 - 120/208V 3PH 4W							
	Click OK							
Step 3	Distribution: Category							
	[Line 7] TRANSFORMERS – TO 600V							
	[Line 1] 3 PHASE TRANSFORMER - GENERAL PURPOSE							
	[Line 12] 75KVA 3PH TRANSFORMER - GP - FLOOR MNT							
	Click OK							
Step 4	Distribution Fittings: Type							
	[Line 1] TFMR LUG TO #2	3.00 Click OK						
	[Line 4] TFRM LUG TO #250	4.00 Click OK						
	[Line 21] TRANSFORMER SET UP	1.00 Click OK						
	[Line 22] TRANSFORMER NEOPRENE PADS	4.00 Click OK						
Step 5	Click the Next button on the Toolbar							
	Distribution Accessories: Type							
	[Line 1] FASTENERS & HANGERS							
	[Line 1] 2X2' STRUT CONC SUPPORT 1.00							
	Click OK							
Step 6	Right click in the takeoff area to go back one level							
	[Line 3] TERMINATIONS – POWER							
	FEEDERS							
	[Line 6] # 8 WIRE POWER TERM 1.00	Click OK						
	[Line 7] # 6 WIRE POWER TERM 1.00	Click OK						
	[Line 8] # 4 WIRE POWER TERM 1.00	Click OK						
	[Line 10] # 2 WIRE POWER TERM 3.00	Click OK						
	[Line 15] # 4/0 WIRE POWER TERM 4.00	Click OK						
Step 7	Right click in the Designation area							
	Click Finish							
Step 8	Repeat for the remaining Transformer							

XFMR TLT 45KVA 480 - 120/208V 3PH 4W ITEM

ITEM	QTY
45KVA 3PH TRANSFORMER - GP - FLOOR MNT	1.00
TFMR LUG TO # 2	3.00
TFMR LUG TO #1/0	4.00
TRANSFORMER NEOPRENE PADS	4.00
TRANSFORMER RECEIVE AND UNLOAD	1.00
TRANSFORMER PUT INTO PLACE	1.00
1 5/8x 1 5/8x 14G STRUT GALV	4.00
3/8-16x 2 1/4 WEDGE ANCHOR - 1 1/2" MIN DEPTH	4.00
3/8-16 SPRING NUT 1 3/8 OR 1 5/8" STRUT	4.00
3/8-16x 1 1/2 HEX HEAD BOLT - PLTD STL	4.00
3/8" FLAT WASHER - PLTD STL	4.00
3/8" LOCK WASHER - PLTD STL	4.00
# 8 WIRE POWER TERM	1.00
# 6 WIRE POWER TERM	2.00
# 4 WIRE POWER TERM	3.00
#1/0 WIRE POWER TERM	4.00

SYS 01 SWITCHGEAR Takeoff

Once all of the Distribution Designations have been built, the estimator is now ready to begin entering the quantities of each designation. Typically, SWITCHGEAR counts are entered by Drawing, Phase (floor) and by System.

1. Complete the 01 SWITCHGEAR takeoff (count) using the pricing sheets provided in class.

Note: Set the correct Breakdown Labels BEFORE taking off the switchgear.

2. Using the 01 SWITCHGEAR pricing sheet take off your 01 SWITCHGEAR counts under the correct Breakdown labels. After entering the 01 SWITCHGEAR count in Accubid, using a red pencil, line through the 01 SWITCHGEAR count on your pricing sheet.

For Example:

- 1. To takeoff the designation MAIN SWBD MDB 1000A 277/480V 3PH 4W 42K AIC set the breakdown as shown in Figure 12.
- Double click on the distribution designation: [Line 1] MAIN SWBD MDB 1000A 277/480V 3PH 4W 42K AIC
- 3. Enter in the quantity and click on OK
- 4. Continue taking off all of the distribution designations **changing the breakdown** as needed.
- 5. Print the Distribution Designations (Job Info and Current Designations)
- 6. Save your estimate
- 7. Close Accubid
- 8. Copy your file to your own USB drive before leaving the lab.



Figure 12