Materials Takeoff-Residential Lab

Program: Electrician Technician

Course: EL110 Basic Safety

Objectives: Under the supervision of your instructor, you should be able perform and complete a basic material "Takeoff" from a Set of Residential Electrical Floor Plans.

Lab Equipment:

- One set of residential electrical floor plans provided by instructor or Figure 2

Required Tools:

- Material takeoff form (Figure 1)
- Pencil and paper
- Highlighters (optional)
- Calculator

Materials: N/A

Safety (PPE): N/A

Resources: N/A

Required Time: 120 Minutes

Shop Maintenance:

- All work will cease 20 minutes prior to the end of class.
- All work areas must be cleaned.
- Tools and equipment must be cleaned and returned to the designated areas (cage, tool room, cabinets etc.)
- Any broken or missing tools must be reported immediately.
- Tools and equipment are students' responsibility

Procedures:

This performance project requires you to review a set of residential electrical floor plans and perform a device material takeoff based on a list provided (*Figure 1*). Additional takeoff requirements are at the discretion of the instructor.

1. Familiarize yourself with a set of residential electrical floor plans provided to you by your instructor (or *Figure 2*).
2. Review the material takeoff form provided as *Figure 1* in this project.
3. Make sure you refer to the legend on the plans.

4. If the residential electrical floor plan includes more than one sheet, start with the first sheet before moving on.
5. Count each device using the color-coding system and enter the total for each device type in the appropriate box on your material takeoff form (*Figure 1*).
6. Recheck your count at least three times, or until your total count numbers are consistent.
7. Have your instructor check your material takeoff.

*A **takeoff** is simply measuring blueprints to determine the quantities of materials needed to finish any given job. As you may have experienced for yourself, making an accurate takeoff by hand can be difficult and somewhat tedious.*

Receptacles and Outlets

Typical Outlet Notations:

"a"	=	Switched outlet, "a"—indicates switch control.
"B"	=	Pedestal mounted on bench top.
"BF"	=	Below floor.
"C"	=	Mounted 6" above counter of 42" AFF. Coordinate exact mounting height with architectural drawings.
"CLG"	=	Ceiling mounted.
"D"	=	Dedicated device on individual branch circuit.
"E"	=	Emergency.
"EXIST."	=	Existing device/equipment.
"F"	=	Flush floor box with fire/smoke rated penetration.
"GFCI"	=	Ground fault circuit interupter, personal protection.
"GFPE"	=	Ground fault protection of equipment.
"H"	=	Horizontally mounted.
"IG"	=	Isolated ground receptacle with separate green ground conductor to isolated ground bus in panel.
"M"	=	Modular furniture service—provide flexible connection, coordinate exact location with furniture plans.
"PED"	=	Pedestal mounted with two hour fire/smoke rated penetration.
"PT"	=	Poke thru with two hour fire/smoke rated penetration.
"S"	=	Surface mounted floor box.
"SP"	=	Surge protection receptacle.
"T"	=	Tamper resistant safety receptacle.
"TL"	=	Twist-lock.
"W"	=	Wall mounted device at 48" AFF unless otherwise indicated.
"WP"	=	Weatherproof receptacle with "NRTL" listed coverplate for wet location with plug installed. MTD. 48" AFF unless otherwise indicated.
+XX	=	Dimensioned height.

Outlets and Receptacles	Switches and Sensors

Preferred Symbol	Description
F	Floor duplex receptacle. F=flush MTD. S=surface MTD.
	Duplex convenience receptacle. 20A 125V.
EP–2 CKT.1	Duplex convenience receptacle on emergency/stand-by circuit. Specify panelboard and circuit.
	Single convenience receptacle.
EP–2 CKT.3	Single convenience receptacle on emergency/stand-by circuit. Specify panelboard and circuit.
	Double duplex convenience receptacle.
EP–2 CKT.5	Double duplex convenience receptacle on emergency/standby circuit. Specify panelboard and circuit.
A	Multi-outlet assembly with outlets on centers as indicated on the drawings and in the specifications, mounted 6" above counter or at height as directed, A - indicates type.
1	Multioutlet assembly, devices as indicated.
1 OR 1	Special receptacle - typical notation: 1— indicates example "1" = __A, ___/___V., _ Pole, _ Wire, _ NEMA __-__ "2" = __A, ___/___V., _ Pole, _ Wire, _ NEMA __-__ "3" = __A, ___/___V., _ Pole, _ Wire, _ NEMA __-__
	Clock hanger outlet recessed mounted 8'-0" AFF or 8" below ceiling as appropriate and as directed.
F	Flush mounted floor box, adjustable, with both power and voice/data receptacles.
J AxBxC	Junction box. "AxBxC" indicates dimensions of junction box in either inches or centimeters.
	Duples receptacle ceiling mounted 20A 125V.
	Double duplex receptacle—ceiling mounted.

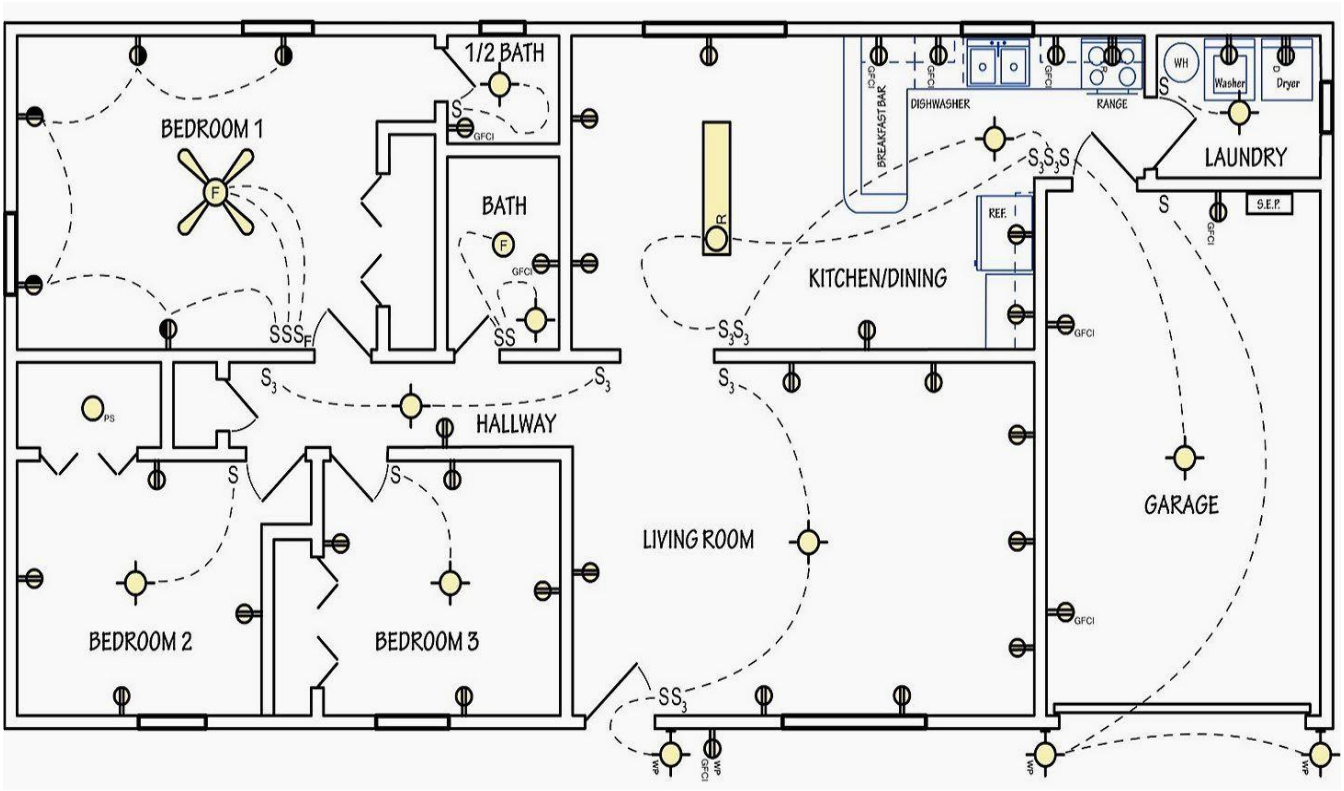
Preferred Symbol	Description
$ or S	Single pole switch.
$$_2$$ or S_2	Double pole switch.
$$_3$$ or S_3	Three way switch.
$$_4$$ or S_4	Four way switch.
$$_a$$ or S_a	Switch control (lower case letter).
$$_{CB}$$ or S_{CB}	Circuit breaker switch.
$$_{DT}$$ or S_{DT}	Single pole/double throw switch.
$$_G$$ or S_G	Glow switch toggle, glows in off position.
$$_H$$ or S_H	Horizontally mounted—with on position to the left.
$$_K$$ or S_K	Key operated switch.
$$_{KP}$$ or S_{KP}	Key operated switch with pilot light on when switch is on.
$$_{LV}$$ or S_{LV}	Low voltage switch.
$$_{LM}$$ or S_{LM}	Low voltage master switch.

Figure: 1

Material Take-Off Form				
Device	**Count**	**Notes/Description**	**Device Box**	**Count**
Single pole switch			1-gang	
3-way switch			2-gang	
4-way switch			3-gang	
GFCI			4-gang	
Duplex receptacle			5-gang	
240V receptacle			4/0 side nail box	

Smoke detector			4/0 hanger light box	
Pendant light				
Wall mount Light				
Recessed light				
Ceiling fan				
Exhaust fan				

Figure 2


1/2 BATH
BEDROOM 1
BATH
KITCHEN/DINING
DISHWASHER
BREAKFAST BAR
RANGE
WH
Washer
Dryer
LAUNDRY
S.E.P.
REF.
HALLWAY
LIVING ROOM
GARAGE
BEDROOM 2
BEDROOM 3
GFCI