Electrical Estimating Homework #1 - Meeting Room

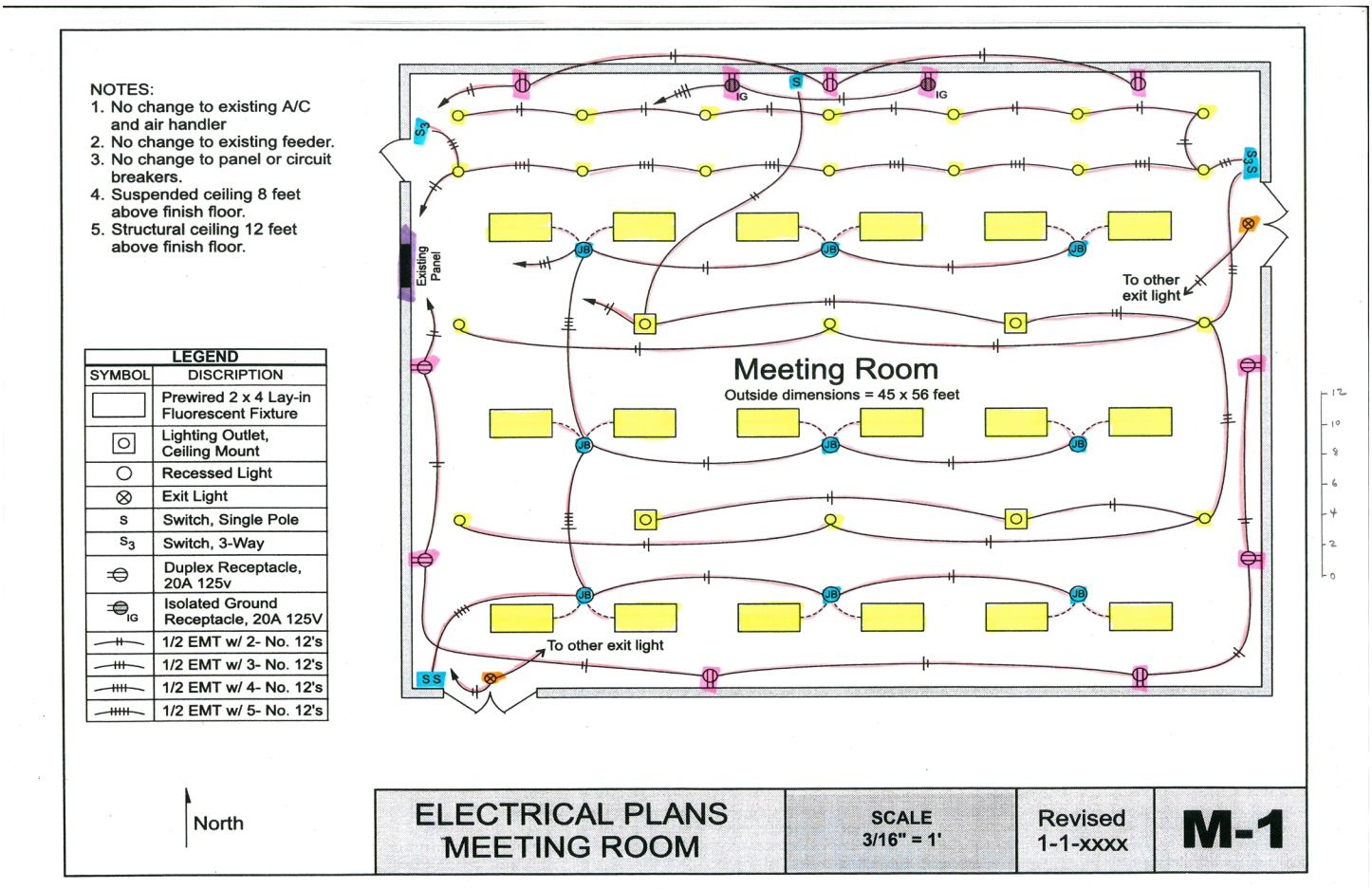
Procedure

Step 1. Using the prepared take off sheet and the drawing Meeting Room (M-1) the following systems will be counted or measured:

06 Fixtures
07 Lighting Branch
08 Devices – Lighting
12 Power Branch
13 Devices – Power

Because this is a small project a single take off sheet has been used to record the systems to be quantified. For larger jobs each system would normally have its own take off sheet. The order the systems are counted or measured does not matter. However, starting with counting the fixtures is often a good choice to help the estimator to become familiar with the scope of work for the project.

The scale drawn on the right side of the colored drawing shown below was used to "add" the vertical conduit length to the horizontal length using the ScaleMaster.



Completed Quantity Take Off Colored Drawing

Step 2. Quantity Take Off

06 Fixtures

Start with the fixtures. Using the **clicker** and a **yellow highlighter** (company takeoff standard, see handout about what color to use for what system) count the fixtures by type. For instance, start with the 2x4 lay-in. Color the fixture symbol and count with the clicker. Record the total in the correct location on the takeoff sheet. Take a look at the already colored example on the previous page to see the completed colored plan. Continue counting until all the different fixtures have been counted. At North State Electric fixtures that have a battery back-up are colored with the orange highlighter. We can assume the exit lights have battery backup.

NORTH STATE ELECTRIC

JOB Meeti

ESTIMATED BY

SYMBOL	▭	⊡	◯	⊗
DESCRIPTION	2X4 FL LAY-IN 4L w/whip	Lighting outlet ceiling	6" DWN Light INC REC	Exit Light SURF
M-1	18	4	20	2

08 Devices - Lighting

Use the clicker and a blue highlighter color and count each switch by type and gang.

13 Devices - Receptacles

Use the clicker and a pink highlighter color and count each receptacle by type.

S	S_3	SS	S_3S		⏚	⏚ IG
20A SPSW	20A 3WSW	20A SPSW 2-Gang	20A 3WSW SPSW 2-GANG		20A DPLX RECEP	20A DPLX RECEP Isolated Gnd
1	1	1	1		9	2

07 Lighting Branch

12 Power Branch

Lighting Branch and Power Branch are measured separately. When taking off branch you must first set the Scalemaster to the correct scale. Not only is branch "rolled out" each section (run) between a fixture or device must also be counted. The Scalemaster has a count button to help you keep track of the number of runs. The total length of conduit includes the horizontal length and vertical length.

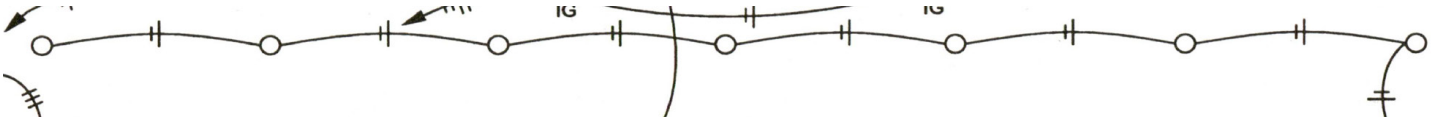
½" EMT 2 #12 THHN	½" EMT 3 #12 THHN	½" EMT 4 #12 THHN	½" EMT 5 #12 THHN	JB J-Box ceiling		½" EMT 2 #12 THHN	½" EMT 4 #12 THHN
Lighting Branch						PWR Branch	
LEN / RUNS	LEN / RUNS	LEN / RUNS	LEN / RUNS			LEN / RUNS	LEN / RUNS
455 / 24	115 / 7	86 / 8	10 / 1	9		220 / 10	30 / 1

The process is:
Each section of branch is measured by the type of conduit (EMT, GRS, PVC) and the number of conductors. The take off sheet has an area to record the length and the runs. The number of runs are needed to estimate the number of box connectors needed. For each run two box connectors will be required.

Isolated Ground (IG)

An isolated ground receptacle (IG) helps prevent electrical noise from interfering with the performance of electrical equipment. From hospitals to recording studios, there are many places where reducing interference may be beneficial or even necessary.

07 Lighting Branch
Start with the ½″ EMT with 2 #12



Roll the Scalemaster over the line between two fixtures, press the count button, color the line with a red pencil.

Between two fixtures the conduit is installed horizontally. It's drawn curved to account for adding a little extra length. The conduits with 2 #12's shown as arrows coming from a J-Box are called homeruns. They go back to the panel. A length of vertical drop must be added to each in order to run the conduit to the panel. Adding 10 feet (1 piece of conduit) is good coverage. Some jobs you might want to take the homeruns off separately. This can be helpful to adjust your takeoff values if the panel is moved during the estimating period. You can add the vertical length by rolling over a scale drawn out on the plan, roll extra, or add using the Scalemaster feature that adds a fixed amount you set it to when it is pressed. (Mine is set to add 5 feet).

The conduit to the switches requires a vertical drop and that length must be added to the horizontal length. For this job adding 10 feet of conduit for each drop to the switch box would be a good add.

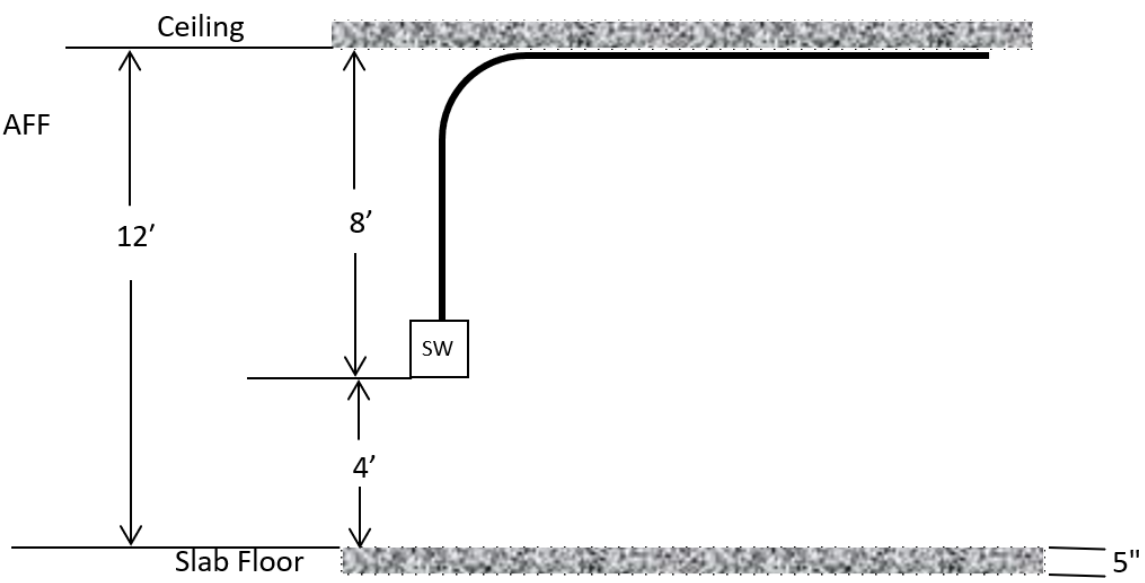
Continue rolling, coloring, and counting until all lines with two hash marks for the fixtures have been rolled, counted, and colored. Record the length and number of runs on the take off sheet.

Repeat for the ½″ EMT with 3 #12, ½″ EMT with 4 #12, and ½″ EMT with 5#12. Record the length and number of runs on the take off sheet.

<u>Conduit on the Ceiling</u>

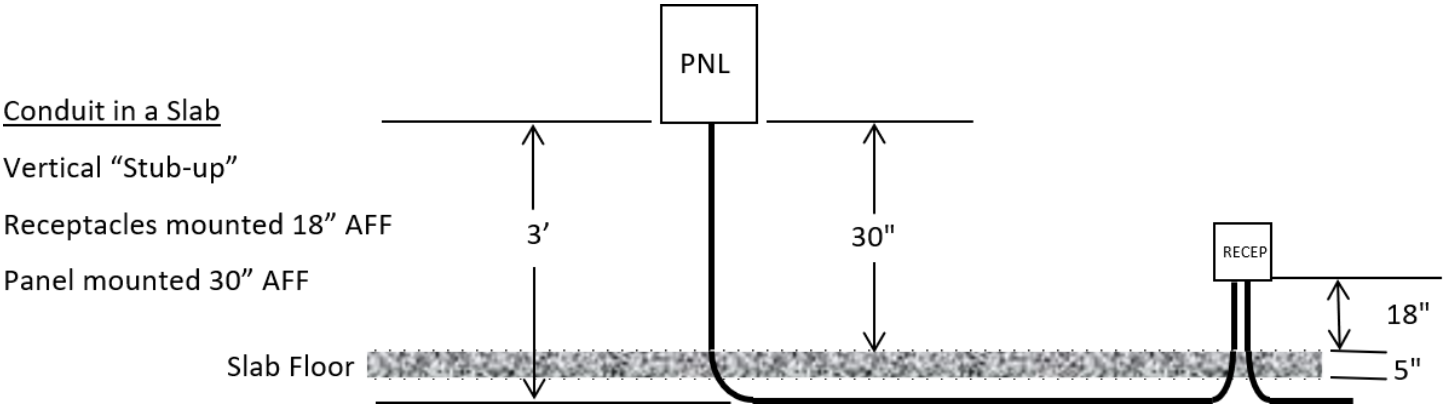
Vertical "Drop"

Switches mounted 48" AFF

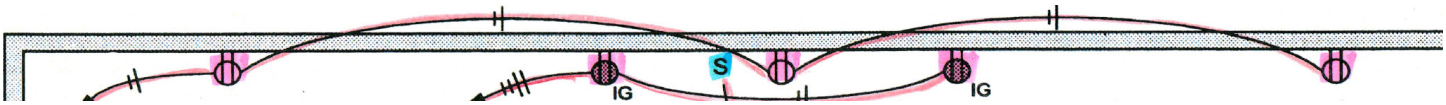


12 Power Branch

The Receptacles require horizontally installed conduit and vertical "stub-ups". Generally, all the receptacle boxes have two stub-ups except for the device at the end of the run has one.



Start with the ½" EMT with 2 #12



Roll the scalemaster over the line between two receptacles, press the count button, color the line with a red pencil. Record the length and number of runs on the take off sheet.

How the vertical length is accounted for is up to you. You could roll an extra amount to cover the stub-ups, use the add button on the Scalemaster, or add 10 feet times the number of receptacles in the branch circuit.

One 10-foot piece of ½"EMT for each receptacle is good coverage for the vertical length.

Measure and count the ½" EMT with 4 #12. Add the stub-up to the panel for the homerun. Record the length and number of runs on the take off sheet.

This is a nice simple plan for getting started on the process of hand takeoff for electrical estimating. Taking it off as face value and not trying to over think things is how I use it.