Electrical Material

National Electrical Contractors Association (NECA)

http://www.necanet.org/

NECA is the voice of the $171 billion electrical construction industry that brings power, light, and communication technology to buildings and communities across the U.S.

NECA Manual of Labor Units (MLU)

An estimate is only as good as the information it is based on, and the NECA Manual of Labor Units (MLU) has been the estimating resource of choice for electrical contractors since 1923. The MLU provides an experience-based reference for estimating the electrical construction labor required to install typical electrical and communications systems. The labor unit data comes directly from a national average of NECA's member contractors and is reviewed and updated bi-annually to ensure you have the best information to accurately estimate.

NECA Categories of Work

The NECA Manual of Labor Units divides electrical materials into 14 categories. Many electrical contractors use a different breakdown of electrical material for estimating purposes.

SECTION	TITLE
01	Integrated Building Systems
02	Conduit, Raceways, Fittings, & Related Items
03	Wire, Cable, Lugs, Terminations, Busway & Bus Duct
04	Switchboards, MCC's, Panelboards, & Power Equipment
05	Lighting Fixtures, Poles, Parking Lot Lighting
06	Wiring Devices
07	Hazardous Systems
08	Grounding & Lighting Protection Systems
09	Heating Equipment Connections
10	Temporary Power & Lighting
11	Outdoor Overhead and Underground Systems
12	Equipment Installation and Connections
13	Industrial Control and Instrumentation
14	Alternative Energy Systems

Labor Units

E = One or per each item
C = Per hundred items
C = Per hundred linear feet of the item
M = Per thousand linear feet of the item
LF = Linear Foot
CY = Cubic Yard

Labor Units (Installation Conditions)

NECA 1	Normal (N)
NECA 2	Difficult (D)
NECA 3	Very Difficult (VD)

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Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Rigid Steel Conduit (GRC or GRS) and fittings						
Rigid Steel Conduit with Threaded Couplings						
1/2"		5.50	6.80	8.20		C
3/4"		6.00	7.50	9.00		C
1"		7.00	8.70	10.50		C
1 1/4"		8.00	10.00	12.00		C
1 1/2"		9.00	11.20	13.50		C
2"		11.00	13.70	16.50		C
2 1/2"		15.00	18.70	22.50		C
3"		20.00	25.00	30.00		C
3 1/2"		25.00	31.20	37.50		C
4"		30.00	37.50	45.00		C
5"		38.00	47.50	57.00		C
6"		48.00	60.00	72.00		C
For Stainless Steel Conduit & Fittings Add 25%						
Rigid Steel Factory Elbows						
Add 20% For Wide Sweep Elbows						
1/2"		0.35	0.43	0.52		E
3/4"		0.40	0.50	0.60		E
1"		0.50	0.62	0.75		E
1 1/4"		0.60	0.75	0.90		E
1 1/2"		0.75	0.93	1.12		E
2"		1.00	1.25	1.50		E
2 1/2"		1.50	1.85	2.25		E
3"		2.00	2.50	3.00		E
3 1/2"		2.50	3.10	3.75		E
4"		3.00	3.75	4.50		E
5"		4.00	5.00	6.00		E
6"		5.00	6.25	7.50		E
For Stainless Steel Conduit & Fittings Add 25%						

What's the difference between the three columns in the MLU?

The NECA labor unit tables include three different labor units for each item. Users of the MLU are also encouraged to consider labor units between the columns, or even lower than or exceeding the columns when appropriate.

Normal Installation Conditions – When all of the conditions associated with the installation of an item will permit the maximum productivity of the electricians on a project, these "normal" column labor units are applicable.

Difficult Installation Conditions – When one or more of the conditions associated with the installation of an item will permit less than maximum productivity of the electricians on a typical project, these "difficult" column labor units are applicable.

Very Difficult Installation Conditions – When one or more of the conditions associated with the installation of an item will permit substantially less than maximum productivity of the electricians on a typical project, these "very difficult" column labor units are applicable.

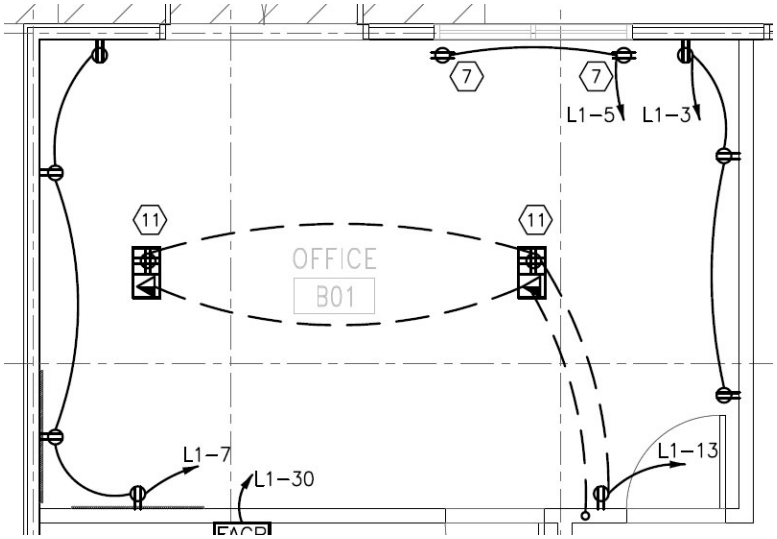
Example 1.

325 feet of 3 ½" GRC is being installed in a 5" concrete slab.

Determine the total labor.

Determine the total material cost.

Example 2.



7. PROVIDE CEILING MOUNTED RECEPTACLES IN ACCORDANCE w/ NEC 210.62.
11. PROVIDE FLOOR OUTLET w/ DATA AND DUPLEX RECEPTACLE. COORDINATE FINAL LOCATION w/ THE OWNER PRIOR TO ROUGH–IN. PROVIDE 1" PVC CONDUIT BETWEEN FLOOR BOXES, ONE FOR POWER & ONE FOR DATA. ROUTE DATA CONDUIT TO WALL AND STUB–UP INSIDE WALL TO ACCESSIBLE LOCATION ABOVE CEILING w/ STEEL CONDUIT. ROUTE POWER TO WALL RECEPTACLE.

Item	Symbol	MLU PG No.	N	D	VD	Unit
20A Duplex Receptacle		6-5	30.00	37.50	45.00	C
20A Duplex Receptacle		6-5	30.00	37.50	45.00	C
Floor Outlet w/Data and 20A Double Duplex Receptacle		6-5	30.00	37.50	45.00	C

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Duplex Receptacle - Straight Blade						
15 Amp 3 Wire		25.00	31.25	37.50		C
15 Amp GFCI or AFCI	X	30.00	37.50	45.00		C
20 Amp 3 Wire		30.00	37.50	45.00		C
20 Amp GFCI or AFCI	X	35.00	43.75	52.50		C
15 Amp 3 Wire with USB Ports	X	25.00	31.25	37.50		C
20 Amp 3 Wire with USB Ports	X	30.00	37.50	45.00		C
GFCI - Blank Face	X	30.00	37.50	45.00		C

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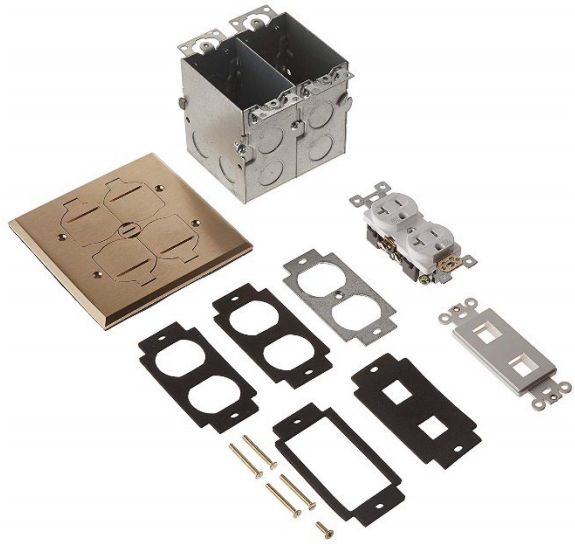
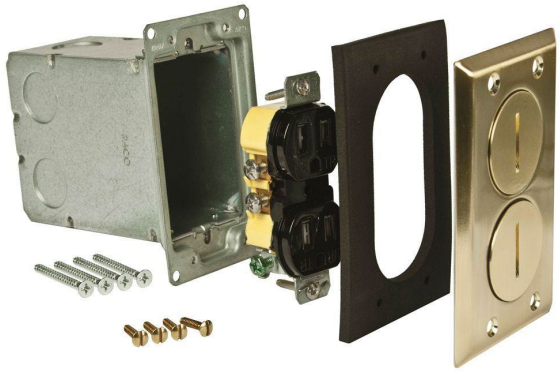
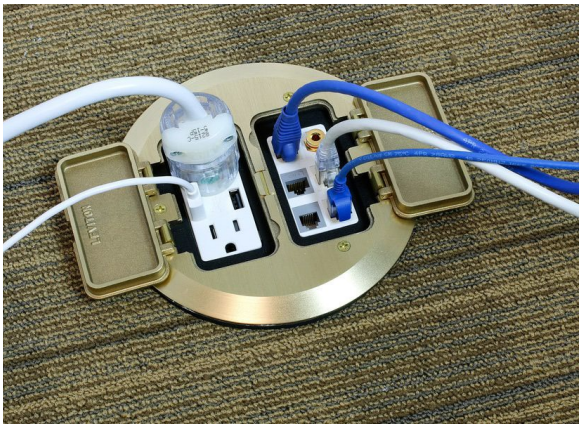
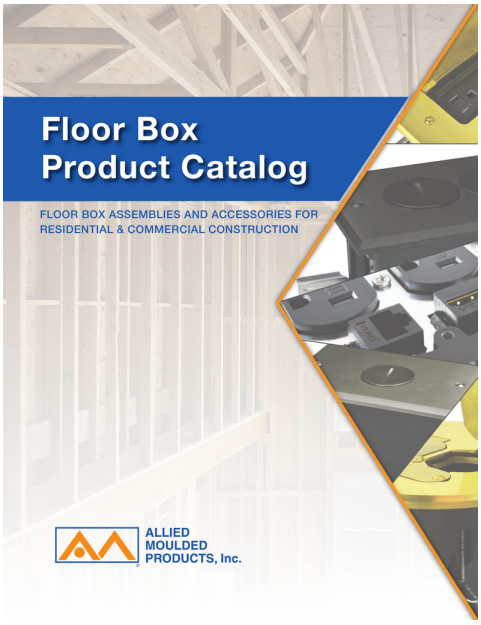
Knockout Type Steel Boxes					
Floor Boxes W/O Trim Covers					
See Section 6 for Trim Covers					
Square Floor Boxes non-adjustable	80.00	90.00	100.00		C
Octagon Floor Boxes non-adjustable	80.00	90.00	100.00		C
Square Floor Boxes adjustable	100.00	112.00	125.00		C
Octagon Floor Boxes adjustable	100.00	112.00	125.00		C
Threaded Cast Floor Boxes					
Round Boxes without Legs	1.25	1.55	1.90		E
Round Boxes with Legs	1.50	1.85	2.25		E
1-Gang with Cover	1.20	1.65	1.95		E
2-Gang with Cover	1.40	1.75	2.10		E
3-Gang with Cover	1.50	1.85	2.25		E
4-Gang with Cover	1.60	2.00	2.40		E
Floor Boxes					
Poke-Thru Floor Box Single Serv	1.00	1.50	2.00		E
Excludes Core					
Poke-Thru Floor Box Dual Service	1.25	1.75	2.25		E
Excludes Core					
P.V.C. Floor Box Cut-off type	1.00	1.50	2.00		E
Raised Floor Box	1.00	2.00	3.00		E
Cutting Raised Floor	1.50	2.00	3.00		E

Floor Box



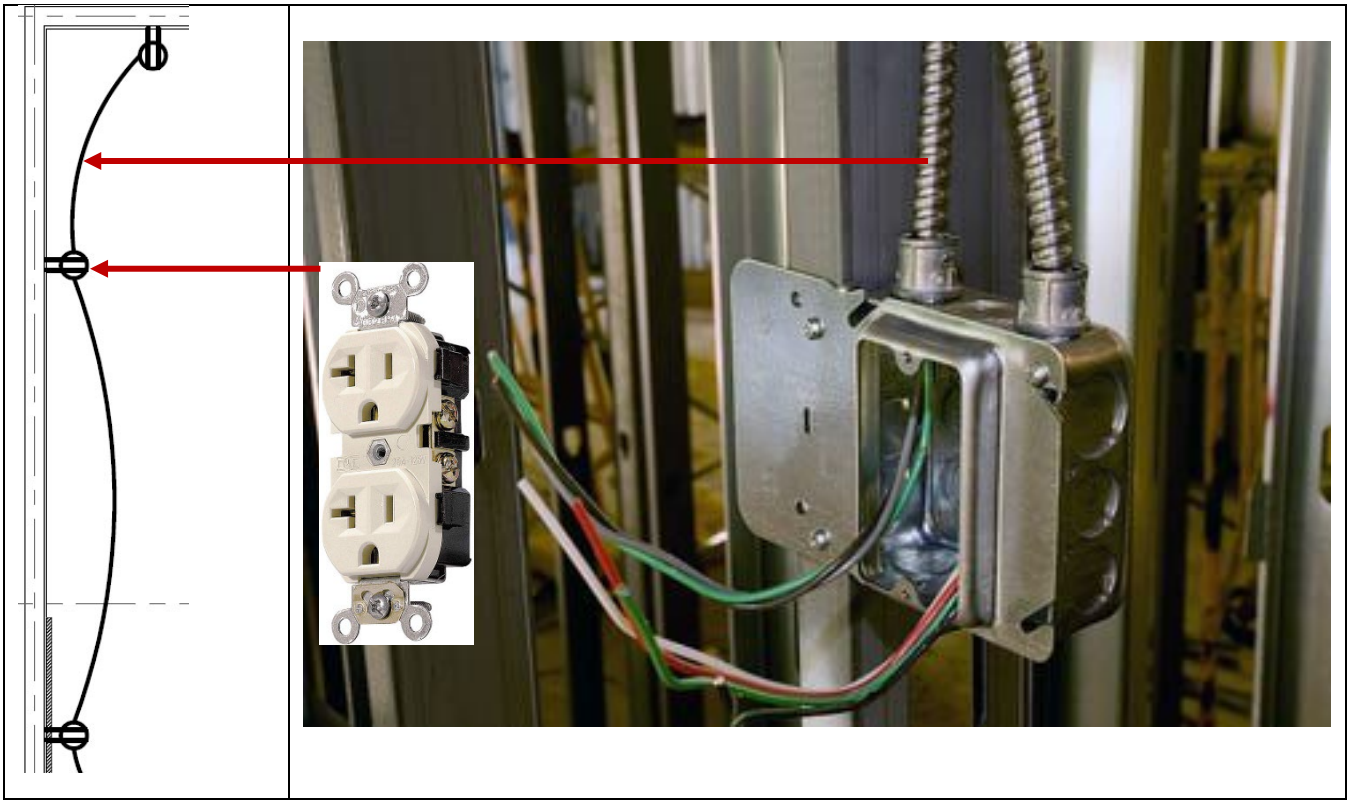





Floor Box
Product Catalog
FLOOR BOX ASSEMBLIES AND ACCESSORIES FOR
RESIDENTIAL & COMMERCIAL CONSTRUCTION
ALLIED
MOULDED
PRODUCTS, Inc.

Branch Wiring

- ☐ Branch wiring refers to the conduit and conductors or cable that runs power to each device (receptacles, switches, floor boxes).
- ☐ Electrical drawings indicate the branch using either solid or dashed lines. Often the lines are left off the drawings and it is up to the electrical estimator to sketch the branch onto the drawing.
- ☐ Most commercial buildings have:
  - Power Branch
  - Lighting Branch
  - Fire Alarm Branch



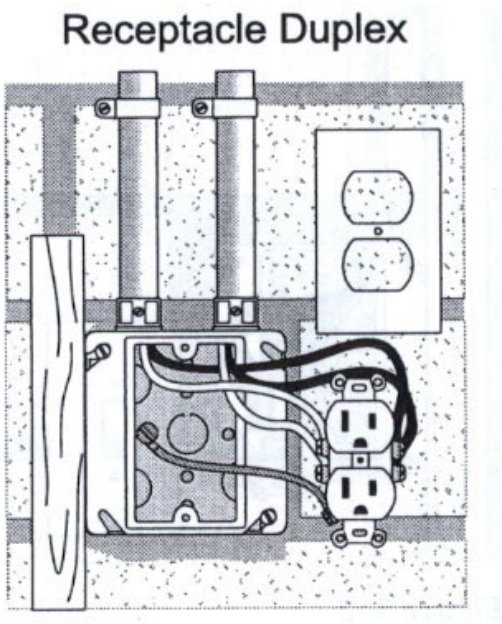
Material Items

4S Box
Box Holder
Box Connectors
MC Cable

Power Branch

20A Duplex Receptacle
Receptacle Plate

Wiring Device



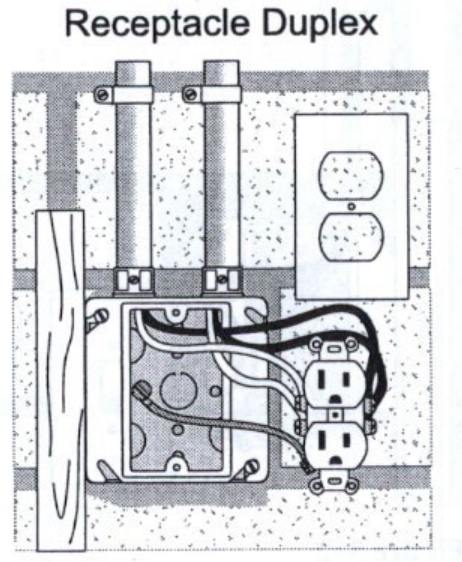
Groups of items that make up the installation are called an assembly.

IF MC Cable is not allowed or the specs call for conduit and Conductors (pipe and wire) the most commonly used conduit For indoor receptacles is EMT.

Example 3. 20A Duplex Receptacle w/ 1/2" EMT

20A 125 Volt Duplex Receptacle with ½" EMT							
MATERIAL	QUANTITY	MATERIAL PRICE	PER	MATERIAL EXTENSION	LABOR UNIT	PER	LABOR EXTENSION
4S BOX 3/4" K.O.							
4S SG P-RING							
1/2" EMT							
1/2" EMT CPLG SS							
1/2" EMT CONN SS							
1/2" LN & PB SET							
1/2" 1-H STRAP							
3/8" SELF DRILL ANCHOR							
#12 THHN WIRE							
20A DPLX RECEP							
1-G PLATE							
Total							

Labor Cost at $25.00		$
Material Cost + 15%		$
Total Prime Cost	Σ	$
Overhead at $15.00 Per hour		$
Break Even Cost	Σ	$
Profit, +15%		$
Unit Price		



Locknut and Plastic Bushing Set (LN & PB Set)



Coupling EMT CPLG SS

Connector EMT CONN SS

1-Hole Strap 1-H Strap

Anchor

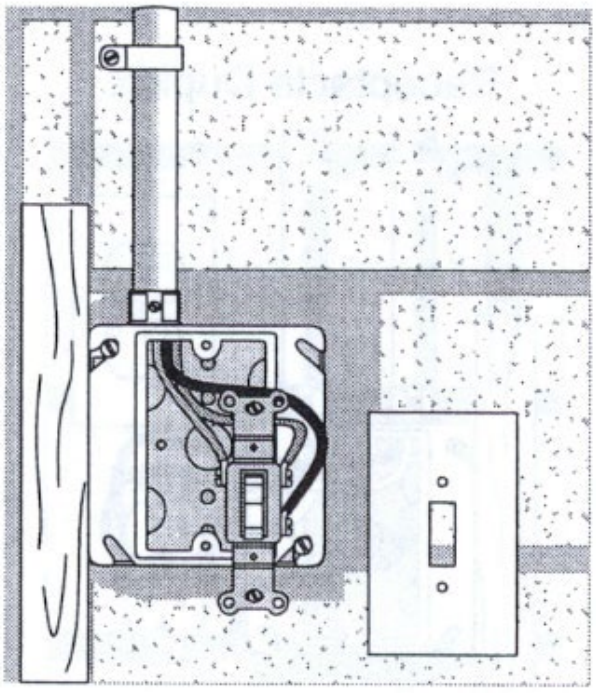
Example 4. 20A Single Pole Switch w/ 1/2" EMT

20A SINGLE POLE SWITCH w/ 1/2" EMT							
MATERIAL	QUANTITY	MATERIAL PRICE	PER	MATERIAL EXTENSION	LABOR UNIT	PER	LABOR EXTENSION
4S BOX 3/4" K.O.							
4S SG P-RING							
1/2" EMT							
1/2" EMT CPLG SS							
1/2" EMT CONN SS							
1/2" LN & PB SET							
1/2" 1-H STRAP							
3/8" SELF DRILL ANCHOR							
#12 THHN WIRE							
20A SP SW							
1-G PLATE							
Total							

Labor Cost at $25.00		$
Material Cost + 15%		$
Total Prime Cost	Σ	$
Overhead at $15.00 Per hour		$
Break Even Cost	Σ	$
Profit, +15%		$
Unit Price		

One Gang Switch

$ S



Example 5. 2x4 FL 4L Lay-In Fixture

2X4 FL 4L LAY-IN FIXTURE							
MATERIAL	QUANTITY	MATERIAL PRICE	PER	MATERIAL EXTENSION	LABOR UNIT	PER	LABOR EXTENSION
4S BOX 3/4" K.O.							
4S COVER							
1/2" EMT							
1/2" EMT CPLG SS							
1/2" EMT CONN SS							
1/2" LN & PB SET							
1/2" 1-H STRAP							
3/8" SELF DRILL ANCHOR							
#12 THHN WIRE							
Total							
2X4 FL 4L LAY-IN FIXTURE							
WHIP FL							
WIRE CONN YELLOW							
CEILING CLIPS							
SEISMIC WIRE							
T-BAR FIXTURE CLIPS							
48” 3500K 78 CRI 32W LAMP (T8)							
Total							

Lighting Branch

Fixture

Labor Cost at $25.00		$
Material Cost + 15%		$
Total Prime Cost	Σ	$
Overhead at $15.00 Per hour		$
Break Even Cost	Σ	$
Profit, +15%		$
Unit Price