

EXECUTIVE SUMMARY

Labor Overruns are Costly: Understanding Labor is the Key to Estimating Accuracy

- Accurate labor hour estimates decrease costly labor overruns.
- A clear understanding of labor units and columns is key to good estimation.
- Installation labor factors increase or decrease labor units based on difficulty.
- Project labor factors identify conditions that negatively impact productivity.
- Focus on projects and categories that commonly impact estimates.
- Along with proper estimating, **ABB empower** helps improve productivity.

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Labor Overruns are Costly: Understanding Labor is the Key to Estimating Accuracy

Overview

Electrical contractors often have difficulty meeting the labor hours that they provide in an estimate. These costly labor overruns are not necessary; estimators who take the time to understand and apply fundamental principles of estimating jobs are likely to decrease or even eliminate overruns.

Estimators who understand the National Electrical Contractors Association's (NECA) labor units and columns, and how installation and project labor factors can impact tasks, can develop accurate estimates. Knowing which tasks and categories are most likely to impact costs further improves estimates.

Context

Don Kiper discussed how contractors can accurately estimate labor hours and focus on where accurate estimates matter most. Will Gunn shared how **ABB empower** can further improve productivity.

Key Takeaways

Accurate labor hour estimates decrease costly labor overruns.

Labor overruns are expensive, but overruns are often preventable through careful planning and hours estimation. Most labor overruns are caused by:

- Not including enough labor hours in the estimate
- A failure to apply installation labor factors; difficulty can increase the estimate
- A failure to calculate project labor factors; difficulty can increase the estimate

- Poor project management
- Poor labor productivity

If you are constantly going over on labor, either you're not estimating correctly and accurately, or you're not managing as efficiently as you could.

Don Kiper

Accurately estimating labor hours and keeping focus on the factors that make a difference in estimation are central to decreasing overruns.

Four Keys Concepts for Accurate Labor Hour Estimations

1. Understanding NECA labor units and columns
2. Including installation labor factors in estimate calculations
3. Including project labor factors in estimate calculations
4. Focusing on areas that commonly impact estimate overruns

A clear understanding of labor units and columns is key to good estimation.

The *NECA Manual of Labor Units (MLU)* provides an experience-based reference for estimating the electrical construction labor required to install typical electrical and communications systems. Labor unit tables include three columns used to identify the right amount of labor for a project.

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Three NECA labor columns

NECA Labor Column	Most commonly used for:
Column 1 – Normal	Residential and commercial buildings
Column 2 – Difficult	Institutions like schools and prisons
Column 3 – Very Difficult	More complex institutions and industrial buildings

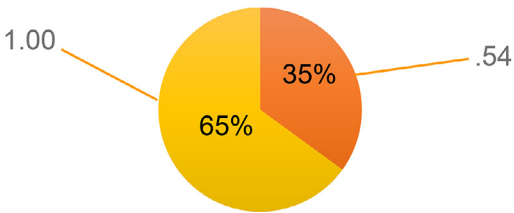
Estimators need to understand what moves a project from one column to another, and how that impacts units. While NECA provides guidance on what constitutes a normal, difficult, or very difficult project, the estimator's own experience with their crew can impact actual columns and units used.

The standard labor unit is a unit of time for the installation of the material, which typically breaks down to 65% actual installation time and 35% "non-productive" time spent on supporting tasks, like material handling, supervision, and layout. Standard labor units assume the work is being done by a skilled, qualified journeyman electrician; adjustments may be needed if less-skilled electricians do the work.

Standard labor unit – one-hour breakdown

Labor Task	Percentage	Minutes
Material handling	20%	12
Supervision/interacting	5%	3
Layout	10%	6
Installation time	65%	39
TOTAL	100%	60

For example, a project with a one-hour active installation time requires a labor unit of 1.54; 65% of 1.54 is 1.00.



Installation labor factors increase or decrease labor units based on difficulty.

The standard labor units for any labor column will change depending on the difficulty or ease of certain installation labor factors. These factors are handled during the takeoff process of estimating the task. Taking them into proper consideration improves the accuracy of the estimate and decreases the likelihood of a labor overrun.

Installation labor factors that commonly impact labor units

Installation conditions that INCREASE the labor unit	– Metal stud: Increase of 25% to labor unit
	– Masonry: Increase of 100% or more to labor unit
	– Vertical runs
	– Exposed above normal heights; increase depends on exposed height on lift
Installation conditions that DECREASE the labor unit	– Slab
	– Trench – Single runs
	– Trench – Multiple runs
	– Parallel runs

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Project labor factors identify conditions that negatively impact productivity.

Labor unit estimations also need to take into account a variety of project labor factors that can negatively impact productivity and increase hours. When including project labor factors, estimators must keep in mind:

- Labor hours are added to the direct labor hours total.
- Percentages will differ in various markets and geographic locations, and estimators need to understand their areas. What is application on the West Coast may not be applicable on the East Coast.
- Labor factor percentage adjustments are cumulative throughout the project.
- Labor factors are addressed in the bid summarization.

Estimating 101 offers a [five-page free download](#) that looks at the 24 most important project labor factors. Don Kiper shared 10 of those factors during the webinar and discussed the impact of one in particular: Overtime.

10 Critical Project Labor Factors

1. Access to the work area
2. Building construction
3. Crew size
4. Job location
5. Multistory impact
6. Occupied facility
7. Overtime impact
8. Stacking of trades
9. Staging location
10. Weather conditions

Project Labor Factor Focus: Overtime

Standard labor units are based on a standard five-day-a-week, eight-hours-per-day work week. When overtime comes into play, it has a negative effect on labor productivity, leads to decreased safety awareness, decreases work energy levels and morale, and increases absenteeism.

The cost can be significant to the project. For example, the impact of a six-day, 10-hour-per-day week over 10 weeks can lead to a 22% loss in productivity (1,320 hours). Using a \$75.00/hour blended labor rate, the overall financial impact to the project is \$99,000.

Focus on projects and categories that commonly impact estimates.

With multiple factors potentially impacting estimates, Kiper recommends that estimators focus on those areas that are known to commonly impact estimates.

Areas for focus during estimation

Area	Impact
Project type	Each type of project includes a core set of needs, which should be focused on during estimation. For example: – Commercial work: 60%-80% branch wiring – Retail space: 80%-90% branch wiring – Water treatment: 85% site power, distribution, feeders, and generation – Gas & oil: 50%-60% tray and tray cable
Labor categories (labor cost codes)	Focus on the costliest labor categories. For almost any project, the top three most common costs, making up 82% of the combined labor percentage, are: – Conduit – fittings – boxes (54%) – Wire pulling (19%) – Fixtures (8%)

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Areas for focus during estimation

Area	Impact
Systems	To understand the impact to the estimate, focus on the largest systems. For almost any project, about 65% of the total combined labor percentage comes from the following four systems: – Lighting (26%) – Site lighting (16%) – Branch wiring (13%) – Data (9%)
Material categories	Focus on the largest material categories when developing an estimate. For almost any project, 84% of total material costs are attributed to two categories: – Conduit – fittings (23%) – Wire & cable (61%)
Largest cost items	Understand which items in a project have the largest costs. This can be done in many software programs by sorting in descending cost order (so that the most expensive items are viewed at the top of the list).

Along with proper estimating, **ABB empower** helps improve productivity.

Understanding labor columns and standard labor units and focusing on how various installation and project factors can impact them are the keys to accurate estimating and reducing cost overruns. Software like **ABB empower** can further help improve productivity.

ABB empower is an online tool available to ABB customers for viewing and ordering products. The PanelScan feature, introduced in the summer of 2019, helps improve productivity by digitizing the panel takeoff process so documents can be quickly uploaded. PanelScan helps users quickly make decisions and provide quotes.

Learn more about PanelScan [here](#).

ABB empower automates the takeoff process as much as we can, ultimately making people much more productive.

– Will Gunn

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Biographies

Don Kiper, B.S. M.Ed.

President, Estimating 101

Don serves as President of Estimating 101, an electrical estimating consulting and training business. With forty-two years' experience in the electrical industry as an electrician, estimator, estimating manager, and project manager, he brings the best practices and outcomes for estimating electrical projects.

In just over three years, Don has provided training for more than 60 contractors and trained more than 170 estimators, project managers and owners. He is a published author of several books on estimating philosophy and Trimble ACCUBID Classic estimating software. He also writes the bi-monthly column "Estimating Essentials" for EC&M magazine. He is a member of ASPE, American Society for Professional Estimators.

Don holds a B.S. and a M.Ed. He currently lives in Niagara Falls, Ontario, Canada with his wife of 43 years. They have four daughters and two grandchildren.

Will Gunn

Digital Product Manager, *ABB empower*

Will Gunn has been the Digital Product Manager for *empower*-Quote since joining the team in 2015, just as Industrial Solutions was beginning its digital tools transformation; his main focus is continuous improvement of the *empower* experience.