

The Estimating Process in Four Steps

Don Kiper, President, Estimating 101

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KEY TAKEAWAYS

- A standardized estimating sequence increases an estimator's speed, accuracy, and consistency.
- During the estimate preparation stage, estimators complete a series of foundational tasks.
- Performing takeoffs in a systematic way reduces errors and sets projects up for success.
- The goal of the extension and review phase is to check the estimate for accuracy.
- A complete bid summary is one of the best ways to minimize risk.
- When preparing a bid, estimators must consider labor units and labor adjustments.
- ReliaGear™ smart power distribution products lower installation costs, improve project efficiency, and increase profit.

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OVERVIEW

The best estimators are accurate and efficient. They generate estimates that allow contractors to enter into agreements with confidence that projects will be profitable. When estimators work in a systematic way, they reduce errors and minimize project risk. In addition to following well-defined processes, estimators must pay close attention to labor considerations and utilize products that will enhance overall project efficiency.

CONTEXT

Don Kiper discussed the four stages of estimation: estimation preparation, the takeoff, extension and review, and bid summarization. Rachelle Weiss described how ABB ReliaGear™ smart power distribution products reduce installation costs and improve project efficiency.

KEY TAKEAWAYS

A standardized estimating sequence increases an estimator's speed, accuracy, and consistency.

When estimating, accuracy is the goal. The purpose of an estimate is to:

1. Allow the contractor to enter into a contractual agreement with confidence.
2. Provide a plan that can be used to execute the project profitably.

A standardized estimating sequence helps increase the estimator's speed, accuracy, and consistency. Other benefits of an estimating sequence include increased confidence in one's work, higher levels of departmental productivity, better organization, fewer estimating omissions, and greater confidence during bid summarization.

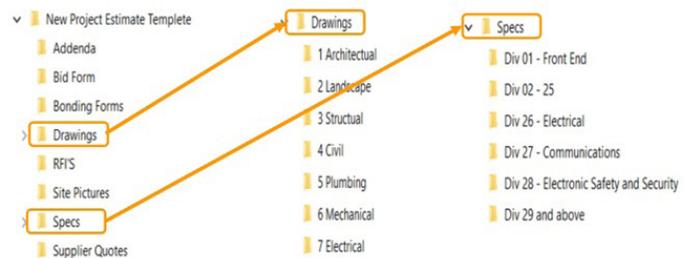
Estimating is composed of four steps: 1) estimate preparation; 2) the takeoff; 3) extension and review; and 4) bid summarization. Companies may tailor this sequence to fit their unique needs and markets.

During the estimate preparation stage, estimators complete a series of foundational tasks.

The estimate preparation phase typically takes 15% of the overall estimation time. It includes 13 steps:

1. **Create a new project folder with a new project template.** Copy and paste the template and rename the template folder. A best practice is to break projects down by addenda, bid form, bonding forms, drawings, RFIs, site pictures, specs, and supplier quotes.

Figure 1: New Project Estimate Template Example



2. **Obtain contract documents.** These may include hard copies, as well as electronic versions of plans and specs.
3. **Create an estimate number.** This may be generated from the estimating software package or it may be a numbering system created by the firm.
4. **Set up an estimate book.** This may be digital or paper-based. Don Kiper favors a three-ring binder with tabs for ITB/RFQ & Proposals, RFIs and Spec Notes, Addenda, Estimate, Bid Summary, Quotes, Takeoff Sheets, and Specs. This binder is professional, organized, and easy to bring to de-scope and bid review meetings.

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5. **Place the pre-bid meeting date and bid date/time on your calendar.** Identify these dates immediately so you can plan accordingly.
6. **Submit bonding request, if applicable.** It is advisable to submit these requests as early as possible.
7. **Review the project for the time needed to create the estimate.** Skilled estimators understand how long it will take to estimate projects of different types. They often track how long it takes to perform estimates per drawing and use that as a reference. A rule of thumb for estimating is 1.5 to 2 hours per takeoff drawing.
8. **Review the bid form.** Check to see if the project is a lump sum bid. Other things to review include add or deduct alternates, allowances, unit prices, cost savings, the list of subcontractors, and the list of manufacturers of supplied equipment.
9. **Review Division 1 of the specification.** It is important to look at the summary and scope of work, as well as payment clause concerns. You may also want to check to see whether there is an accelerated schedule, phasing requirements, requirements related to workdays and workhours, any allowances, or owner-furnished materials.
10. **Discuss concerns with the chief estimator.** Issues of concern may relate to the payment clause, accelerated schedules, phasing requirements, and workdays and workhours. With these pieces of information, the company can decide whether to proceed with the estimate.
11. **Review Divisions 26, 27, and 28 of the specifications.** A contractor's work is judged by these documents. The consequences of failing to understand contract requirements are significant.
 - Drawings outline the quantity of work and answer "How many?"
 - The project manual outlines the quality of the work and answers "How much?"
 - The Spec section format is broken into three sections: 1) General – Industry Standards; 2) Products – Catalog Numbers; and 3) Execution – Means of Installation.

Contractors must install the right specified products in the right manner. The key in specification review is looking for wiring and system requirements that must be addressed during the execution of the takeoff and included in the bid summary. If you have any question about the intent of specifications or drawings, you must seek clarification. A request for information (RFI) is the estimator's way of defending his or her estimate and scope with the contract documents.
12. **Review architectural plans.** Look at the slabs and structure, wall types, ceiling types and heights, and distance between floors.
13. **Set up the project in the estimating program.** It can be helpful to organize projects by building, floor, area, and system.

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Performing takeoffs in a systematic way reduces errors and sets projects up for success.

The takeoff phase consumes the greatest amount of time—around 65% of estimation time. It includes:

1. **Perform all counts for package quotations and send to suppliers.** This includes lighting fixtures and controls, distribution/gear, cable trays, fire alarms, and security.
2. **Perform takeoffs in a systematic manner.** This will minimize mistakes. A suggested protocol for system takeoffs includes lighting, site power, site lighting, demo, distribution, feeders, branch wiring, equipment schedule, fire alarm, security, sound, and nurse call.
3. **Send suppliers quantities, schedules, one-line diagrams, etc.** for quoted materials. After completing all takeoffs, send suppliers the final counts and project information for all quoted materials.
4. **Send requests to subcontractors.** Be sure to provide a detailed scope of their work, any related drawings, and any related spec sections.

The goal of the extension and review phase is to check the estimate for accuracy.

The extension and review phase occurs after estimators have quantified everything for the project. This typically takes 10% of the estimation time.

Computerized estimating software gives estimators control over consolidated takeoff totals and enables them to analyze estimates in real time. On the extension screen, estimators can review labor percentage totals, determine risks, make adjustments, and mitigate project risks.

A proper review of the extension includes accurate material pricing, labor units adjusted for project conditions, appropriate labor column selected, quoted items identified, and percentage breakdown by systems, labor categories, installation labor factors, and material categories. The proper setup is essential for correct breakdown options. It also enables estimators to analyze, review, and create multiple bid summaries.

Checking the takeoff has five steps:

1. **Document check.** This includes all drawings, sheets, and sketches, as well as specifications and addenda.
2. **Takeoff check.** During this step, check that proper materials are used per plans, specs, and authority having jurisdiction. It is also important to check that all drawings are quantified, addenda have been addressed, factoring of labor is included, hazardous locations have been estimated with the proper materials, and labor adjustments have been made for PVC conduit.
3. **Omissions check.** Look for missing labor units on items, items without pricing, owner furnished items not included, fixture hangers and stems, unistrut racks for feeders, and coring, wall penetrations, and fireproofing.
4. **Errors check.** Be sure that the base bid and alternates aren't separated and that electrical work isn't included in the scope of work. It is also important to check for quantity errors for typical floors and units, material pricing, and labor units. Keep an eye out for duplicated items and incorrect wiring devices. Set both labor and unit measurements the same for each item.
5. **Benchmark check.** Check the average feet of conduit and wire per device in each system, the average labor hours per device in each system, the hours per square foot in commercial projects, the average number of conductors in branch wiring conduits, the average length of circuits for equipment connections, and the labor percentage by system and labor codes.

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A complete bid summary is one of the best ways to minimize risk.

The bid summarization phase typically takes around 10% of the estimation time. In this stage, estimators provide the chief estimator with an accurate and complete takeoff, schedule and phasing information, project labor factors, quoted material packages, all general expenses, equipment rentals and durations, and subcontractor quotes.

Bid summary labor components include direct labor classes, incidental labor, labor escalation, indirect labor, and project labor factors. Every quotation should be reviewed for completeness, specified or substitute items, freight charges, delivery dates, cut charges, offloading, sales tax, and payment terms.

You should be in business to make money, not win bids. Be sure the final price is an amount that you believe that money can be made.

Don Kiper, Estimating 101

When preparing a bid, estimators must consider labor units and labor adjustments.

The National Electrical Contractors Association (NECA) Manual of Labor Units includes three labor unit benchmarks:

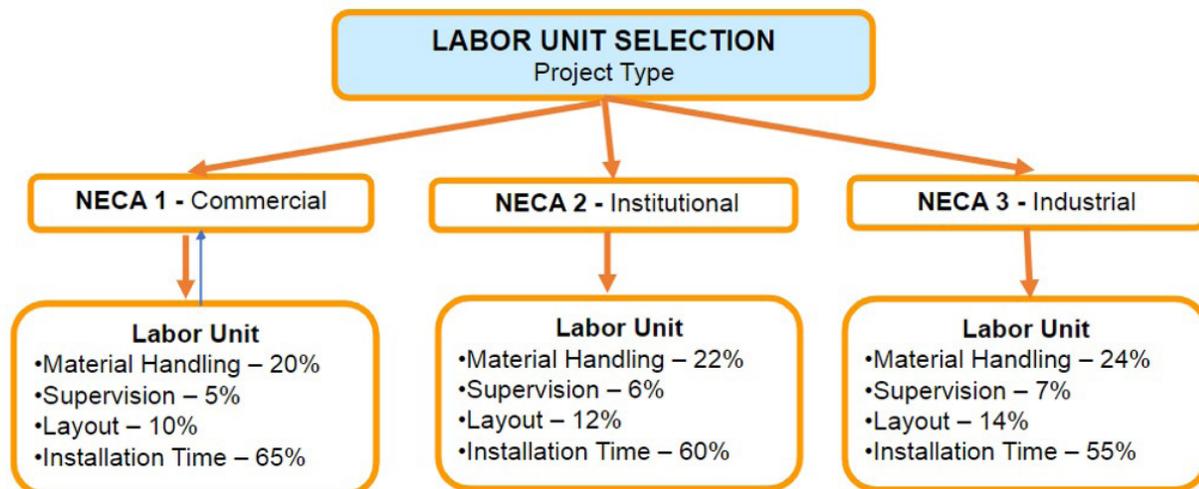
1. **Normal.** Column 1 – Residential, Commercial
2. **Difficult.** Column 2 – Institutional
3. **Very Difficult.** Column 3 – Industrial, Water Treatment

Labor units are applied based on project size, floors, square feet, and specific site conditions.

Direct labor hours are calculated based on the labor unit selection for the project type and installation labor factors applied during takeoff. Installation labor factors are adjustments based on the ease or difficulty of installation.

Total labor hours are calculated by adding direct labor hours, incidental labor hours, indirect labor hours, and project labor factor hours.

Figure 2: Labor Unit Selection by Project Type



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I'm not here to tell you which labor column to use. I'm here to tell you if it's a complex job and you're bidding at a very competitive labor unit, you may run out of labor before the project's over.

Don Kiper, Estimating 101

ReliaGear™ smart power distribution products lower installation costs, improve project efficiency, and increase profit.

ABB acquired the GE Industrial Solutions business in 2018 and has invested over \$120 million in US manufacturing, logistics, and product development. During the integration, ABB has combined the best of ABB and GE Industrial Solutions into an all-new lineup: the ReliaGear™ family of smart power distribution products.

ReliaGear is a game changer for the industry. It delivers smart design and technology, while lowering installation costs, improving project efficiency, and increasing profit.

The products simplify installation and maintenance while promoting a safer work environment.

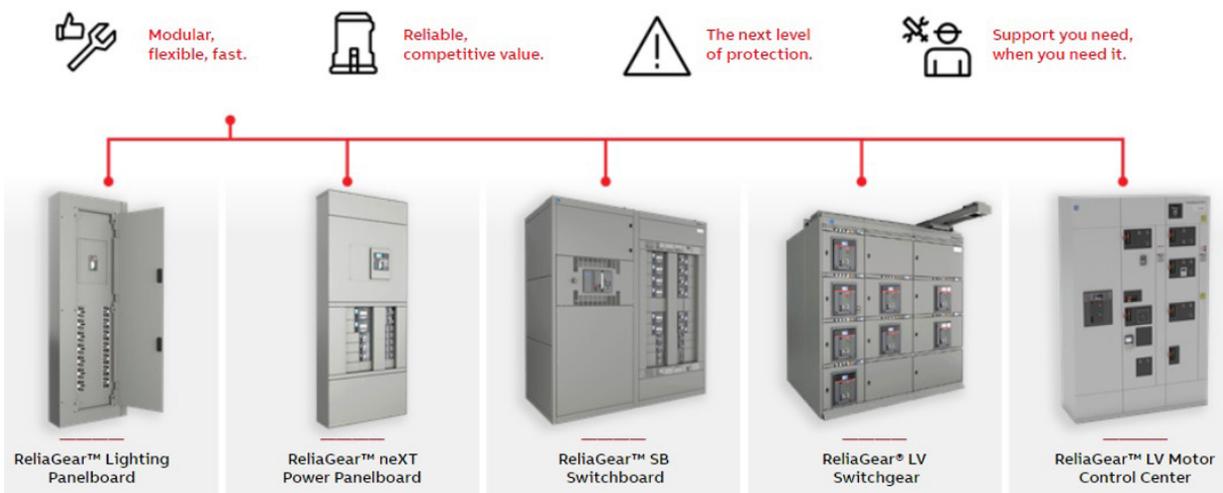
There are three ways that [ABB products](#) can help companies be more competitive:

1. ABB offers the most advanced and comprehensive one-line construction package.
2. ReliaGear's modular equipment is designed for single-person installation. This reduces labor expenses.
3. Advanced circuit breakers are integrated across the ReliaGear portfolio. For retrofit projects in GE's vast installed base, it is possible to upgrade facilities without installing new equipment.

ABB's ReliaGear family of smart power distribution products simplifies the way companies deploy electrical protection, measurement, and control.

Rachelle Weiss, ABB

Figure 3: The ReliaGear™ Product Portfolio



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BIOGRAPHIES

Don Kiper

President, Estimating 101

Don serves as President of Estimating 101, an electrical estimating consulting and training business. With 42 years' experience in 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 four years, Don has provided training for more than 80 contractors and trained over 225 estimators, project managers, and owners. Don is a published author of several books about estimating philosophy and Trimble ACCUBID Classic estimating software. He recently co-authored a six-volume set of estimating manuals with Giovanni Marcelli, founder of ACCUBID Systems, now Trimble MEP. 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 with his wife of 44 years. They have four daughters and three grandchildren.

Rachelle Weiss

M&S Integration Process Manager – US, ABB Inc.

Rachelle is the Marketing and Sales Integration Process Manager for the GE Industrial Solutions acquisition. In this role she plays a key part in creating the best portfolio and sales tools to support the U.S. electrical market.

Rachelle has been with ABB for over 10 years. She joined ABB as the Sr. Product Manager for Ty-Rap Cable Ties through the Thomas & Betts acquisition. She has over 20 years of experience in product development and management in the electrical industry. She has a strong passion for solution-based product development and a commitment to customer service.

Rachelle holds a B.S.-Mechanical Engineering from the University of Wisconsin. She currently lives in Memphis, Tennessee with her husband and three daughters.