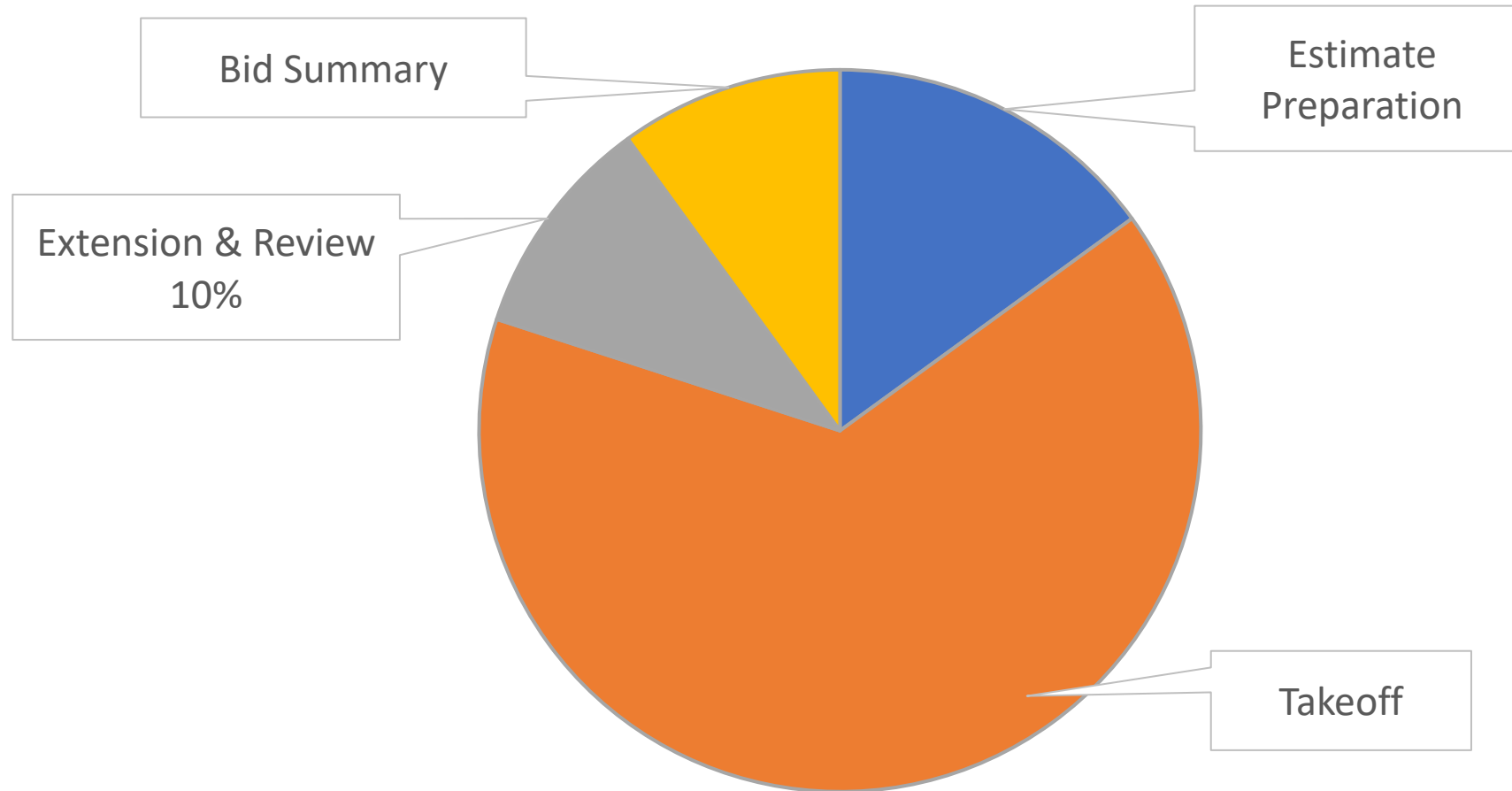


# The Estimating Process in Four Steps

# There are FOUR Steps in Estimating

1. Estimate Preparation
2. The Takeoff
3. The Extension & Review
4. Bid Summarization

## Estimate Steps Percentages in Time



## LEARNING OBJECTIVES

1. Importance of an Estimating Sequence
2. Proper Estimating Sequence Order
3. How to Check the Estimate
4. Labor Components



Estimating is LIKE  
throwing a dart!

**ACCURACY IS  
THE GOAL!**



## Purpose of the Estimate is twofold



To allow the contractor to enter into a contractual agreement with **CONFIDENCE**



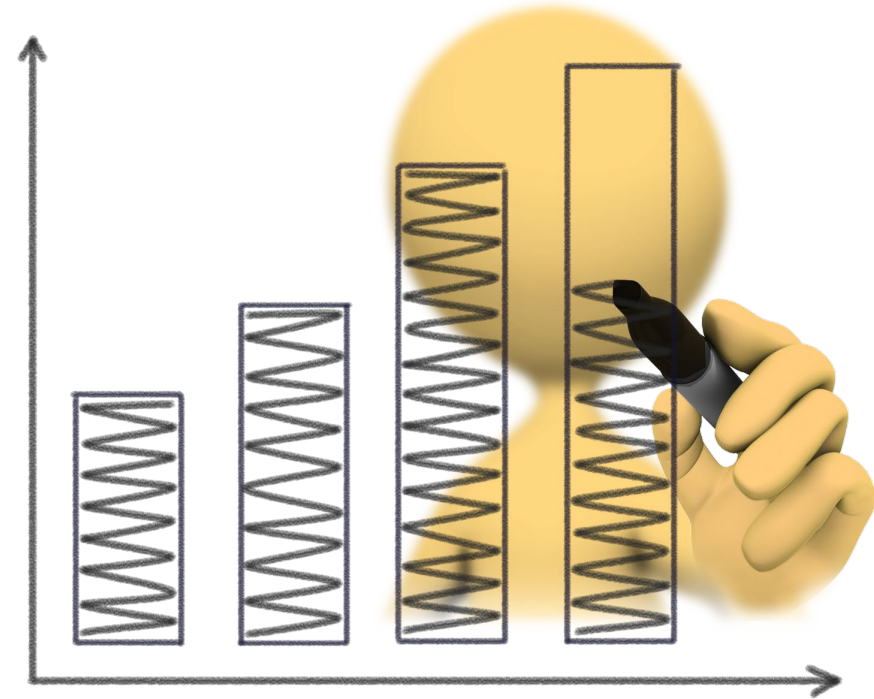
Serves as a PLAN to execute the project **PROFITABLY.**

# A Standardized Estimating Sequence Essential:

- Speed
- Accuracy
- Consistency

# The Estimating Sequence

Consistent Procedures  
=  
Consistent Results



## Benefits of an Estimating Sequence

- Increased confidence in your work.
- Increased speed and greater departmental production
- Increased organization
- Increased estimating accuracy
- Reduced estimating omissions
- Confidence during the bid summarization

# The Estimating Sequence Structure

<b>Steps 1 – 13</b>	<b>Estimate Preparation</b>
<b>Steps 14 – 18</b>	The Takeoff
<b>Steps 19 – 27</b>	The Extension
<b>Steps Vary</b>	Bid Summarization

## The Estimating Sequence

Take the suggested Estimating Sequence as a template and write one that suits your company and market.

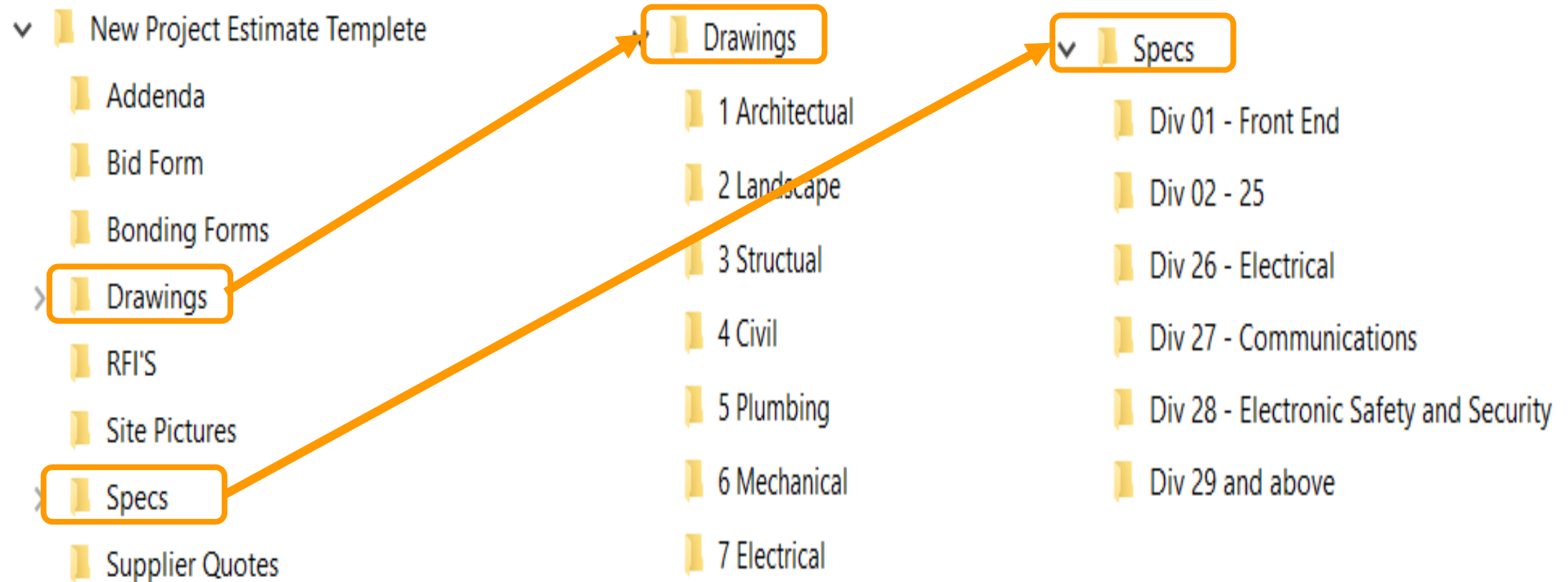
# Step 1 – Estimate Preparation



# **1. Create a new project folder on the estimating drive from the New Project Estimate Template.**

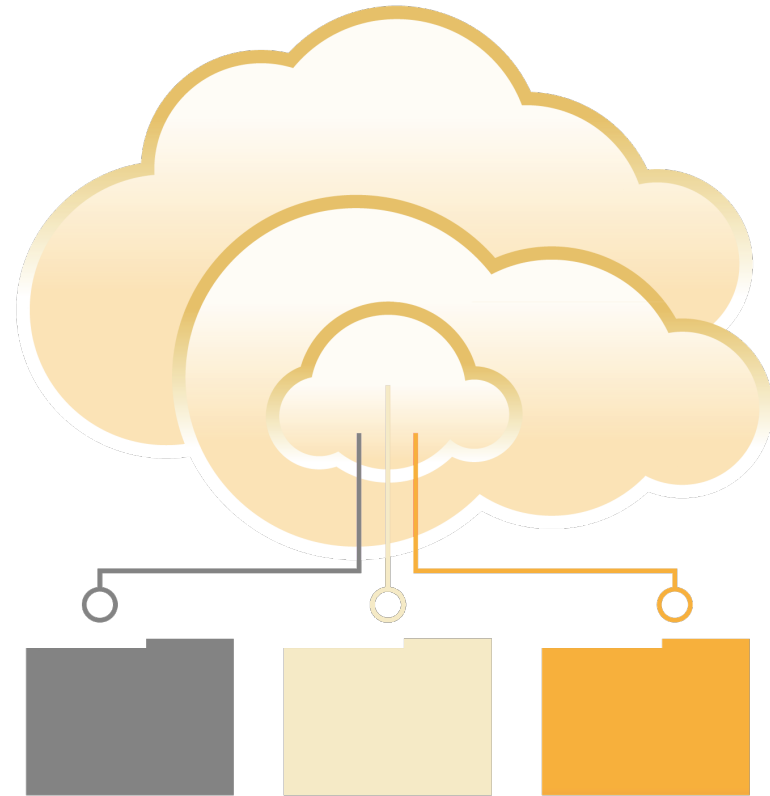
- **Copy and Paste Template**
- **Rename Template Folder to New Project**

## Step 1 – Estimate Preparation



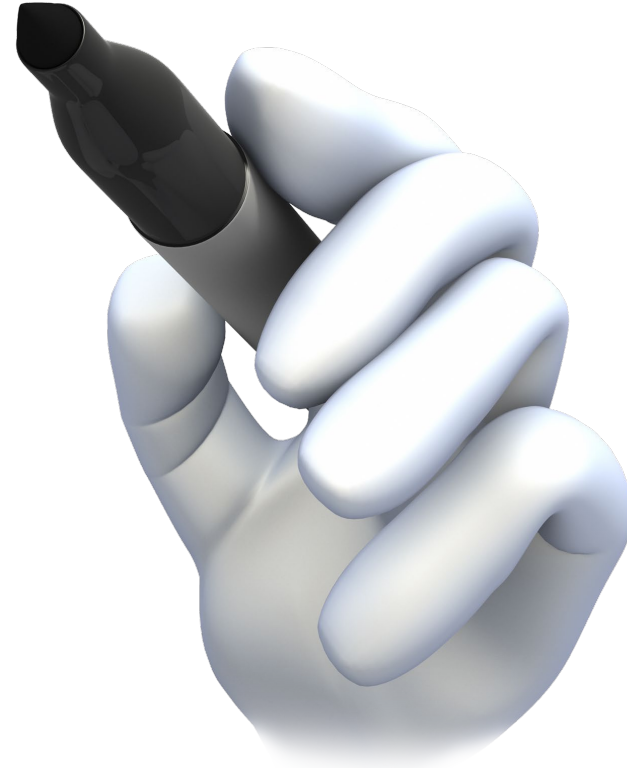
## 2. Obtain Contract Documents

- **Hard copies**
- **Download plans & specs to project folder**



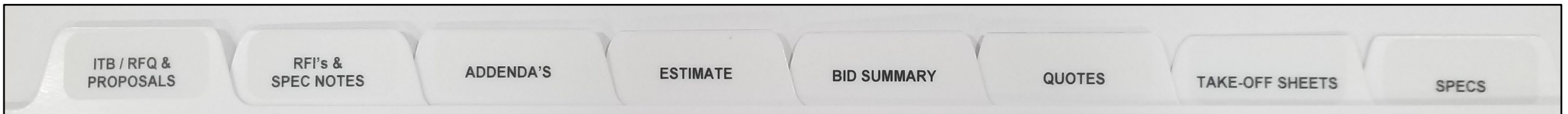
### 3. Create an estimate number

- **Estimating Software**
- **Estimate Record Log**
- **Digital File**



## 4. Set Up Estimate Book – Hardcopy or Digital

- **Three-Ring Binders with 8-Tabs**



## 5. Place Pre-Bid Meeting Date And Bid Date and Time On Your Calendar.



## 6. Submit Bonding Request, If Applicable



## 7. Review Project For Time Allowance to Perform the Estimate.

**RULE OF THUMB**  
**1 ½ - 2 hrs. per takeoff drawing**





## 8. Bid Form Review

1. Lump sum bid
2. Alternates – add or deduct
3. Allowances
4. Unit prices
5. Cost savings
6. List of subcontractors
7. List of manufacturers of supplied equipment



## 9. Review Division 1 of the Specifications

1. Summary and Scope of Work
2. Payment clause concerns
3. Accelerated Schedule
4. Phasing requirements
5. Workdays and workhours
6. Any allowances?
7. Are there any Owner Furnished Materials?



## 10. Review any concerns with the Chief Estimator

1. Payment clause concerns
2. Accelerated Schedule
3. Phasing requirements
4. Workdays and workhours



## 11. Review Divisions 26, 27, 28 of the Specifications

Contractor's work will be  
**JUDGED** by these documents



The consequences of failing to understand requirements of the contract are **SIGNIFICANT**.



# The Drawings – Outline the QUANTITY of Work



Answers – How Many?

# Project Manual – Outline the QUALITY of work

Answers – How Much?



## Spec Section Format

The section format is broken down into three sections:

- General – Industry Standards
- Products – Catalog Numbers
- Execution – Means of Installation

The contractor must install the right specified products in the right manner.



## The KEY in Specification Review

You are looking for wiring and system requirements that must be addressed during the execution of the TAKEOFF and included in the BID SUMMARY.



Any QUESTION to the intent of  
the specifications or drawings?

**SEEK CLARIFICATION**

## Request for Information

An RFI is the estimator's way of defending his estimate and his scope with the contract documents.



## 12. Review Architectural Plans

- Slabs and structure
- Wall types
- Ceiling types and heights
- Distance between floors



## 13. Set Up Project In Estimating Program By Building, Floor, Area, and System.

Bid Item	System	Phase	Area	Drawing
Base Bid	Site Power	Site	Site	E001
Alt 1	Site Lighting	Basement	Elem School	E002
Alt 2	Lighting	1 <sup>st</sup> Floor	Middle School	E003
	Branch Wiring	2 <sup>nd</sup> Floor	High School	E101
	Distribution	3 <sup>rd</sup> Floor	Bus Garage	E102
	Feeders	4 <sup>th</sup> Floor		E103
	Equip Conn's	5 <sup>th</sup> Floor		E201
	Grounding	Roof		E202
	Fire Alarm			E203
	Data			E300
	Security			E400
	Generator			E500

# Step 2 – The Takeoff

## 14. Perform all counts for package quotations and send to suppliers

- Lighting Fixtures & Controls
- Distribution / Gear
- Cable Tray
- Fire Alarm
- Security

## 15. Perform takeoffs systematically

Performing takeoffs systematically will minimize mistakes. The following is a suggested protocol for system takeoffs:

- |                  |                       |
|------------------|-----------------------|
| 1. Lighting      | 7. Branch Wiring      |
| 2. Site Power    | 8. Equipment Schedule |
| 3. Site Lighting | 9. Fire Alarm         |
| 4. Demo          | 10. Security          |
| 5. Distribution  | 11. Sound             |
| 6. Feeders       | 12. Nurse Call        |



## 16. Send suppliers quantities, schedules, one-line diagrams, etc. for quoted materials.

- After completing ALL takeoffs, send suppliers final counts and project information for all quoted materials.

## 17. Send requests to subcontractors.

- Provide a detailed scope of their work.
- Provide any related drawings.
- Provide any related spec sections.

# Step 3 – The Extension

With computerized estimating, the estimator has control over the CONSOLIDATED takeoff totals.

111	BOX SUPPORT FOR 3/4 TO 2" LATH	144	388.82	559.90	22.50	22.50 C	32.40
112	T-BAR CLIP FOR STRAIGHT LIP LA'	132	43.28	57.13	7.50	7.50 C	9.90
Totals		58,768		22,395.11			1,945.17
◀							
Job Info   Notes   Takeoff <b>Extension</b> DirLb   IncLb   LbFac   LbEsc   IndLb							
For Help, press F1							

Screenshot: Trimble ACCUBID Classic Pro Software

## The Extension Screen

- Review Labor Percentage Totals
- Determine Risks
- Make Adjustments
- Mitigate Project Risks

## A proper review of the Extension will include:

1. Accurate material pricing
2. Labor units adjusted for project conditions
3. Appropriate labor column selected
4. Quoted items identified
5. Percentage breakdown by systems
6. Percentage breakdown by labor categories
7. Percentage breakdown by installation labor factors
8. Percentage breakdown by material categories

## Proper Setup Is ESSENTIAL

1. Proper Breakdown Options
2. Ability to Analyze
3. Ability to Review
4. Create Multiple Bid Summaries

## Checking the Takeoff – Five Steps

1. Document Check
2. Takeoff Check
3. Omissions Check
4. Errors Check
5. Benchmark Check





## Step 1 – Document Check

1. All drawings, sheets, and sketches issued
2. Complete specifications
3. All Addenda issued



## Step 2 – Takeoff Check

1. Proper materials used as per plans, specs, and AHJ.
2. All drawings quantified
3. Addenda addressed in takeoff
4. Factoring of labor included.
5. Hazardous locations estimated with proper materials.
6. PVC conduit labor adjustments.

## Step 3 – Omissions Check

1. Missing labor units on items
2. Items without pricing
3. Owner furnished items not included
4. Fixture hangers and stems
5. Unistrut racks for feeders
6. Coring, wall penetrations, and fireproofing

## Step 4 – Errors Check

1. Base bid and alternates not separated
2. Electrical work included not in the scope of work
3. Incorrect quantities for typical floors and units
4. Incorrect material pricing
5. Incorrect labor units

## Step 4 – Errors Check (Continued)

6. Set both material and labor unit measurements the same for each item – E,C,M.
7. Quantity errors
8. Duplicated items
9. Incorrect wiring devices

## Step 5 – Benchmark Checks

1. Average feet of conduit and wire per device in each system
2. Average labor hours per device in each system
3. Hours per square foot (commercial projects)

## Step 5 – Benchmark Checks (Continued)

4. Average number of conductors in branch wiring conduits
5. Average length of circuits for equipment connections
6. Labor percentage by system and labor codes

## Checking the Takeoff – Five Steps

1. Document Check
2. Takeoff Check
3. Omissions Check
4. Errors Check
5. Benchmark Check





# Step 4 – Bid Summarization

## 2<sup>nd</sup> Most Important Responsibility

Provide the Chief Estimator:

1. Accurate and Complete Takeoff
2. Schedule and Phasing Information
3. Project Labor Factors
4. Quoted Material Packages
5. All General Expenses
6. Equipment Rentals and Durations
7. Subcontractor Quotes

## Defense in Minimizing Risks

1<sup>st</sup> – An Accurate Detailed Takeoff

2<sup>nd</sup> – A Complete Bid Summary



## Bid Summary Labor Components

1. Direct Labor Classes – Foreman, Journeyman
2. Incidental Labor – Site Meetings, As-Built, Testing
3. Labor Escalation – Long Duration Projects
4. Indirect Labor – Project Manager, General Foreman
5. Project Labor Factors – Project Conditions that effect labor negatively



## Labor Escalation Costs

	Escalation Period	Description	% of Contract	Labor Hours	Escalation %	Escalation \$	Financing %	Total
1	2019-2020		30.000	6,600.00	3.000	1.80		11,880.00
2	2020-2021		30.000	6,600.00	6.000	3.60		23,760.00
3	2021-2022	...	10.000	2,200.00	9.000	5.40		11,880.00
4								

Screenshot: Trimble ACCUBID Classic Pro Software

## Project Labor Factor Definition

PROJECT CONDITIONS that affect labor productivity negatively.



## Important Project Labor Factors

1. Access to work area
2. Accelerated schedule
3. Building construction
4. Crew size
5. Multi-story Impact
6. Poor electrical design
7. Stacking of trades
8. Staging location
9. Weather

## Bid Summary Expense Components

1. Sub-contractors
2. General Job Expenses
3. Equipment Rentals
4. Quoted Packages





## Subcontractors

1. Excavation / backfill
2. Rock removal
3. Horizontal boring
4. BIM Modeling
5. Coring & concrete cutting
6. Concrete X-raying
7. Rigging

## General Job Expenses

1. Permit and inspections
2. Consumables
3. Per diem and travel
4. Temporary power
5. Site office and storage
6. Allowances
7. Tools

## Every quotation should be reviewed for the following:

1. Completeness
2. Specified or substitute items
3. Freight charges
4. Delivery dates – important for short duration projects
5. Cut charges – if speciality or high voltage wire
6. Off loading – ie: transformers, generators
7. Sales tax
8. Payment terms

A major mistake in the  
BID SUMMARY, could be  
fatal.



## The Final Price

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.



The final price  
should never be a  
**MOVING TARGET.**



# Labor Summary and Costs

## Labor Hours Are Derived By The Following

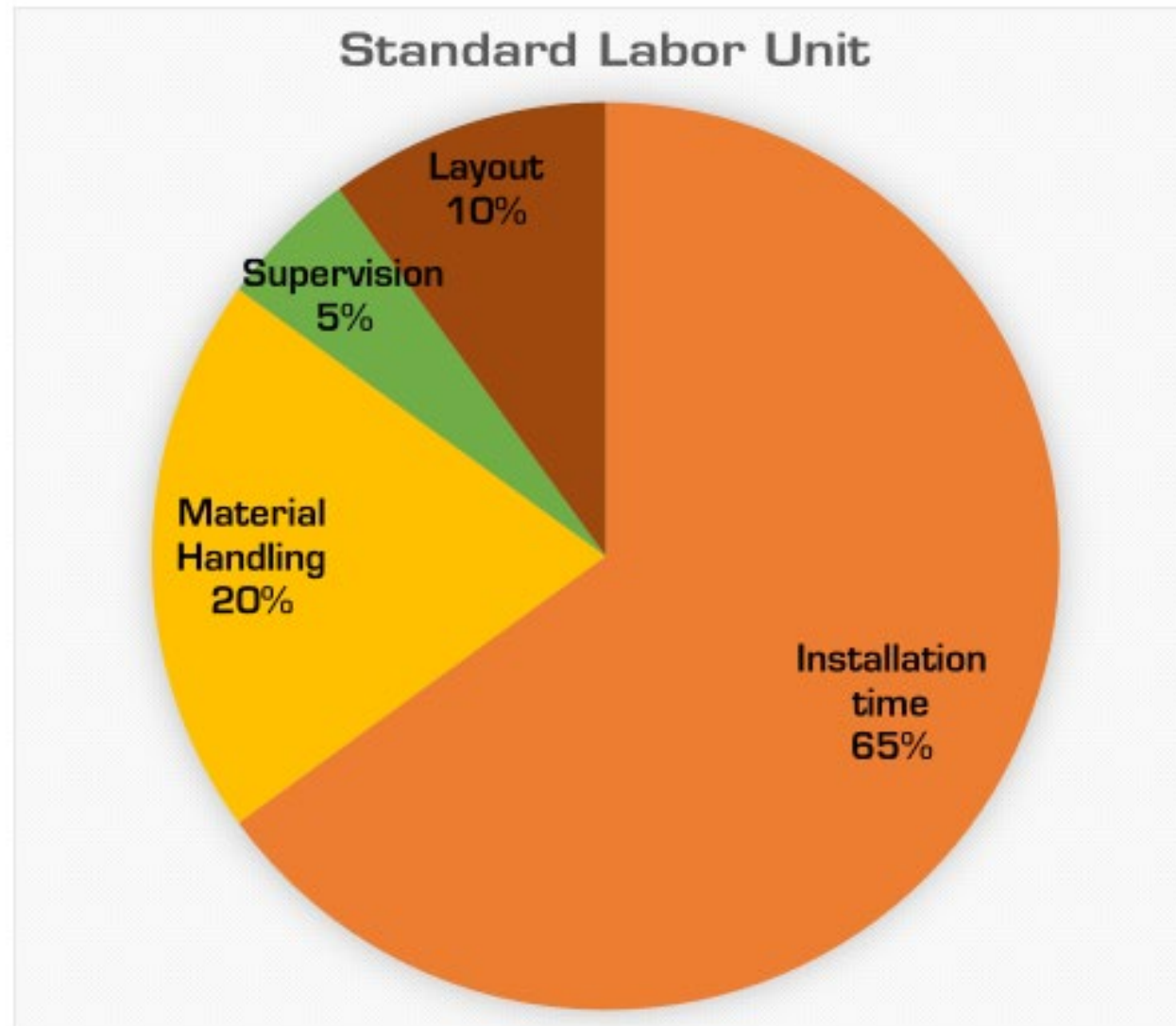
1. Labor units or columns
2. Installation Labor Factors
3. Project Labor Factors
4. Incidental Labor
5. Indirect Labor

## NECA Labor Columns

In the NECA Manual of Labor Units, there are three labor unit benchmarks. They are:

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





## NECA 1 Labor Column Description

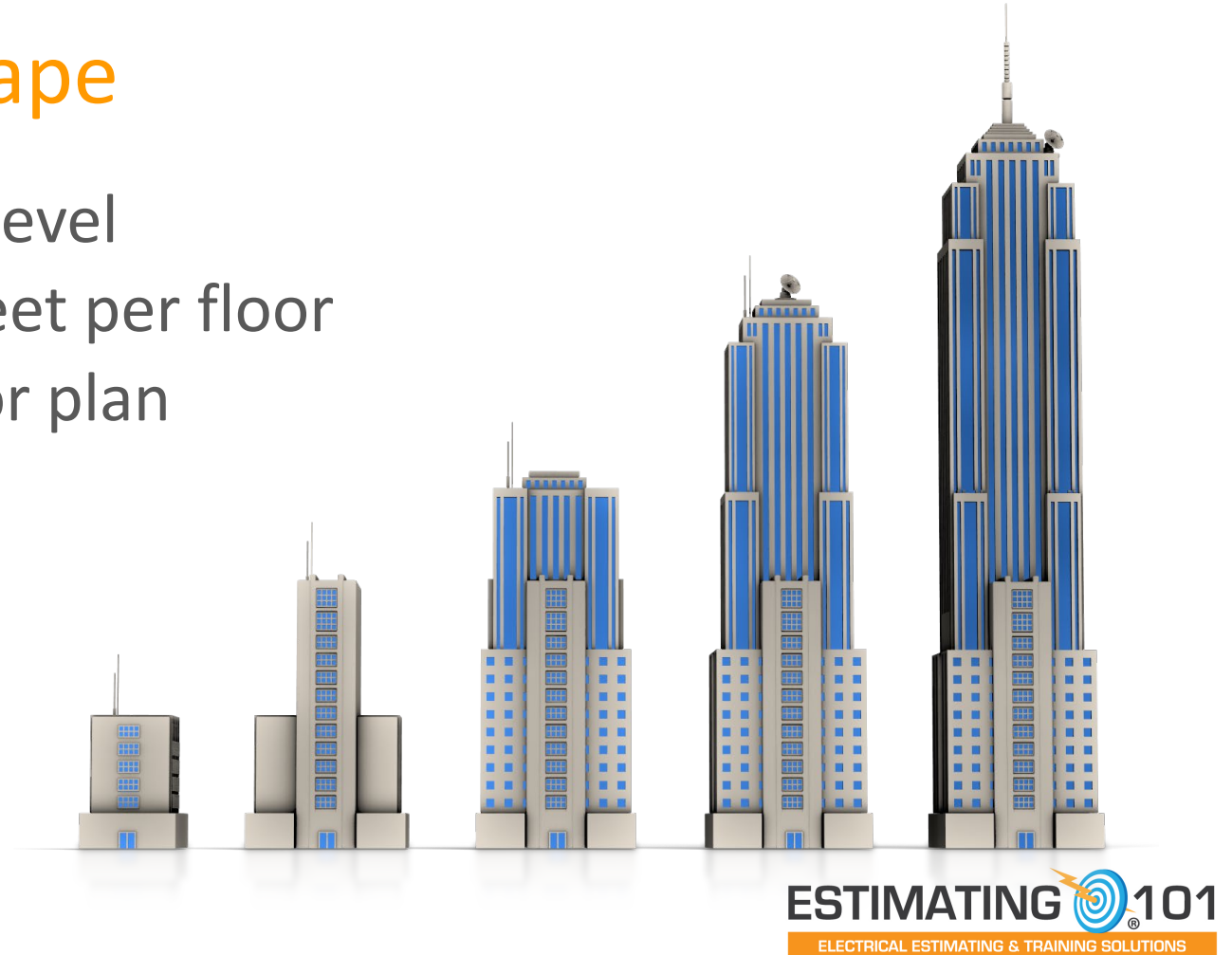
Labor units are applied based on:

1. Project Size
2. Floors
3. Square Feet
4. Specific Site Conditions



## Building Size & Shape

- Up to 3 floors above street level
- 20,000 to 100,000 square feet per floor
- A rectangular or square floor plan



## Building Location

- In or near a metropolitan area
- Outside of a controlled access area
- A single building or facility



## Construction & Work Schedule

- 8 hours per workday
- 40-hour work week
- All work on one daytime shift
- No overtime



## Electrical & Communications Systems

- Up to 600-volt power distribution
- Local utility company
- Standard UL listed materials
- All systems installed 16 ft. or less above a solid floor



## Typical Site Conditions

- Good engineering and design
- Complete drawings and specifications
- Realistic schedule
- Electrical material furnished by electrical contractor

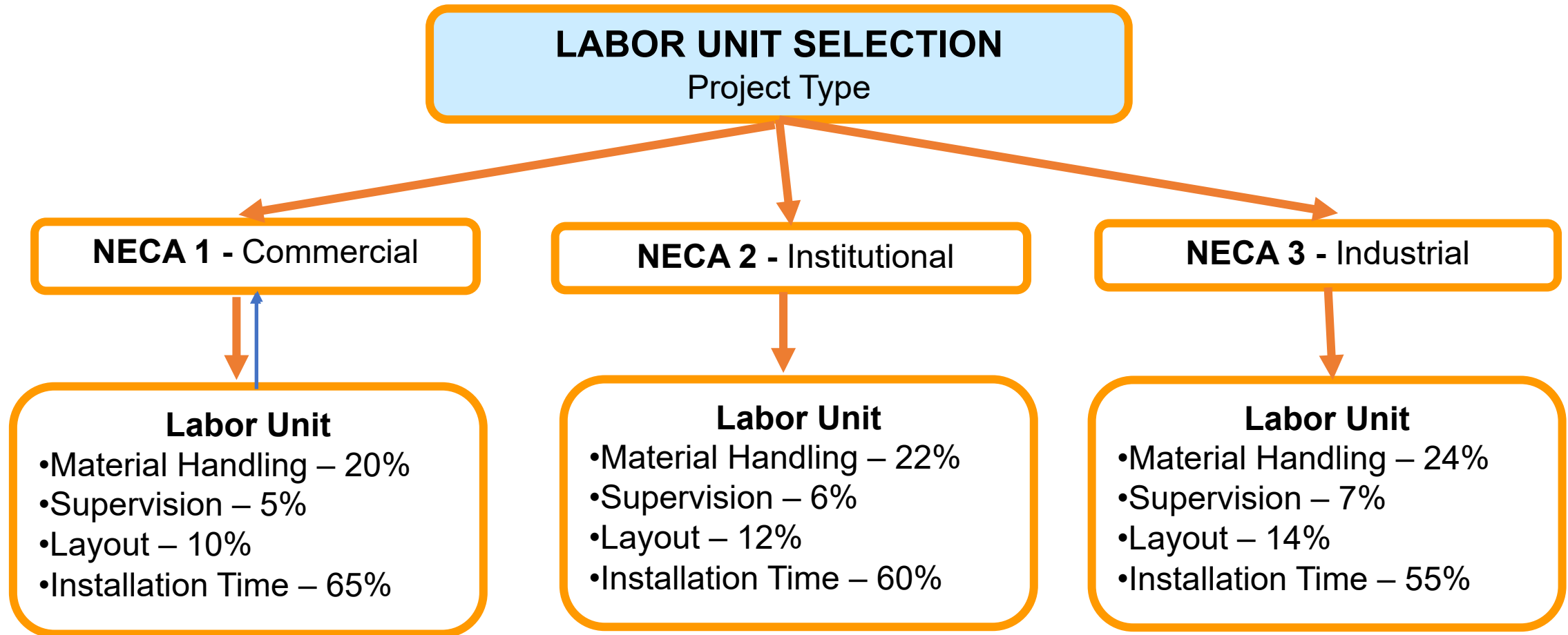
## Typical Site Conditions

- Sufficient supply of qualified journeyman electricians
- All new materials
- No interruptions or delays or jurisdictional disputes
- No harsh weather elements – above 35 degrees F and less than 88 degrees and 50% RH



## Labor Columns Choice

When project is not characterized as noted by project this description, then the estimator must select an appropriate labor unit or column taking into consideration any labor factors.



## **INSTALLATION LABOR FACTORS**

Applied during Takeoff

### **Installation Labor Factors**

- Metal stud
- Masonry
- Slab
- Vertical runs
- Parallel runs
- Trench
- Trench – multiple runs
- Exposed above normal height

**INSTALLATION LABOR FACTORS** are the application of adjustments based on the difficulty or ease of installation.

## Installation Labor Factor Definition

Adjustments to labor units based on the difficulty or ease of installation.

1/2" EMT Labor		
Installation Labor Factors	Adjustment %	Hours Per C
Standard	100%	2.88
Metal Stud	125%	3.60
Masonry	200%	5.76
Branch Exposed @ 40 ft.	150%	4.32

**DIRECT LABOR HOURS**  
Extension Screen Hours

**Labor Classes**

- General foreman
- Foreman
- Sub-foreman
- Journeyman
- 4<sup>th</sup> year apprentice
- 3<sup>rd</sup> year apprentice
- 2<sup>nd</sup> year apprentice
- 1<sup>st</sup> year apprentice
- Laborer / Helper

## **PROJECT LABOR FACTORS**

Percentages added to Direct Labor Hrs.

**PROJECT LABOR FACTORS** are project conditions that effect labor productivity.

Some labor factors may be a percentage of 100% of the direct hours and some may be less. ie: cold weather

### **Selected Labor Factors**

- Access to Work Area / Job Location
- Accelerated Schedule
- Addenda Factoring
- Building Construction
- Crew Size / Stacking of Trades
- GC Capability / Experience
- Multistory Impact
- Non-Local Manpower
- Occupied Facility
- Overtime Impact / Shift Work Impact
- Phasing by area, floor, or building
- Poor Electrical Design
- Renovation
- Staging Location
- Weather Conditions

## Labor Summary and Costs

	Labor Factoring	Factor	% of Direct Hrs	Hours	Rate \$	SubTotal	Brdn %	Frng \$	Brdn Tot.	Frng Tot.	Total	Full Ra
1	Lost Time	15.000	100.000	392.96	35.19	13,828.26	29.014	23.21	4,012.13	9,120.60	26,960.99	68.
2	Weather Conditions	20.000	40.000	209.58	35.19	7,375.12	29.014	23.21	2,139.82	4,864.35	14,379.29	68.
3	Work Conditions		100.000		35.19		29.014	23.21				
4	Multi-Story Environment		100.000		35.19		29.014	23.21				
5	Occupied Premises	10.000	100.000	261.97	35.19	9,218.72	29.014	23.21	2,674.72	6,080.32	17,973.76	68.
6	Shift Work Impact		100.000		35.19		29.014	23.21				
7	Overtime Impact		100.000		35.19		29.014	23.21				
8	Crew Size Factoring		100.000		35.19		29.014	23.21				
9	Building Construction		100.000		35.19		29.014	23.21				
10	GC Capability		100.000		35.19		29.014	23.21				
11	Accelerated Schedule		100.000		35.19		29.014	23.21				
12												

## **INCIDENTAL LABOR HOURS**

The appropriate labor rate should be used for each labor task. The blended rate should be used for lost time

### **Incidental Labor Tasks**

- Non-working foreman
- Lost time
- Installation drawings
- Travel time
- Site meetings
- Job scheduling
- Testing / Verification
- Commissioning
- As built drawings
- Deficiencies



### INDIRECT LABOR HOURS

The appropriate labor rate should be used for each labor task.

#### Indirect Labor Tasks

- Project manager
- General foreman
- Design engineer
- Cost control engineer
- Draftsman
- CAD Designer
- Stockman

**LABOR UNIT SELECTION**  
Project Type



**OR**



**INSTALLATION LABOR FACTORS**  
Applied during Takeoff



**DIRECT LABOR HOURS**

## Labor Summary and Costs

---

**DIRECT LABOR HOURS**

+

**Incidental Labor Hours**

+

**Indirect Labor Hours**

+

**Project Labor Factor Hours**

=

**TOTAL LABOR HOURS**

## LABOR COST

Having enough LABOR DOLLARS  
is more important than labor  
hours.



# Thank You!



—

**Introducing**  
**ReliaGear™** smart power distribution  
Smart Design.  
Smart Technology.



# ReliaGear™ smart power distribution



## SMART DESIGN

simplify installation and maintenance and promote a safer work environment.

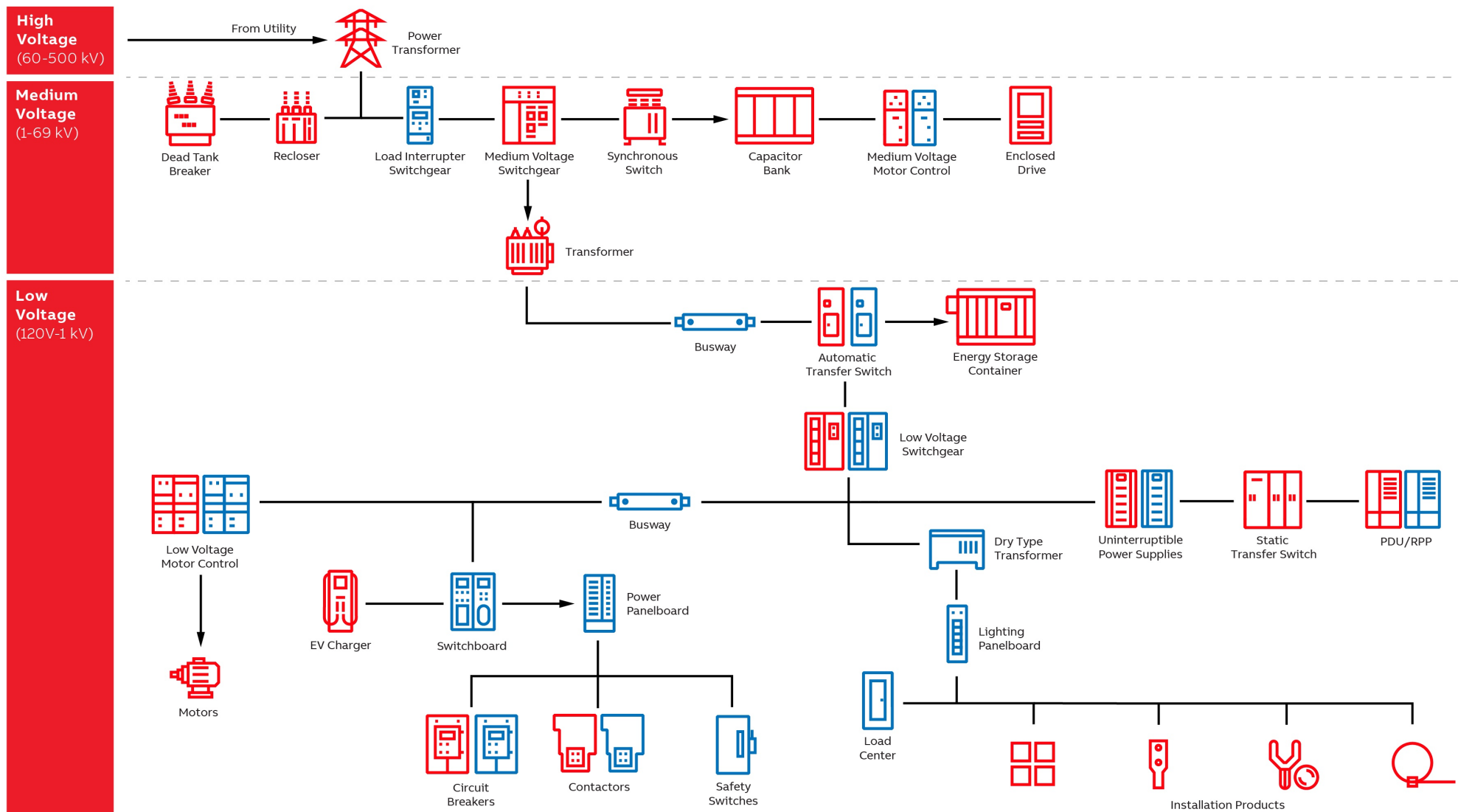


## SMART TECHNOLOGY

ABB's all-in-one advanced breaker technology simplifies the way you deploy electrical protection, measurement and control.



# Comprehensive one-line construction package



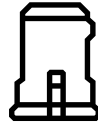


# ReliaGear™ product portfolio

The future of digital technology, today.



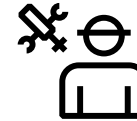
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fast.



Reliable, competitive  
value.



The next level of  
protection.



Support you need, when  
you need it.



ReliaGear™ Lighting  
Panelboard



ReliaGear™ neXT  
Power Panelboard



ReliaGear™ SB  
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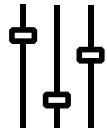
ReliaGear® LV  
Switchgear



ReliaGear™ LV Motor Control  
Center

# ReliaGear™ product portfolio

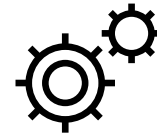
The future of digital technology, today.



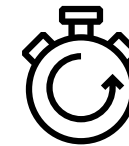
Technology and performance.



Easy device monitoring



Smart breakers with built-in functions.



Simple, fast commissioning



ReliaGear™ Lighting  
Panelboard



ReliaGear™ neXT  
Power Panelboard



ReliaGear™ SB  
Switchboard



ReliaGear® LV  
Switchgear



ReliaGear™ LV Motor Control  
Center



For more information on ReliaGear™ smart power distribution visit us on  
[electrification.us.abb.com/products](http://electrification.us.abb.com/products)