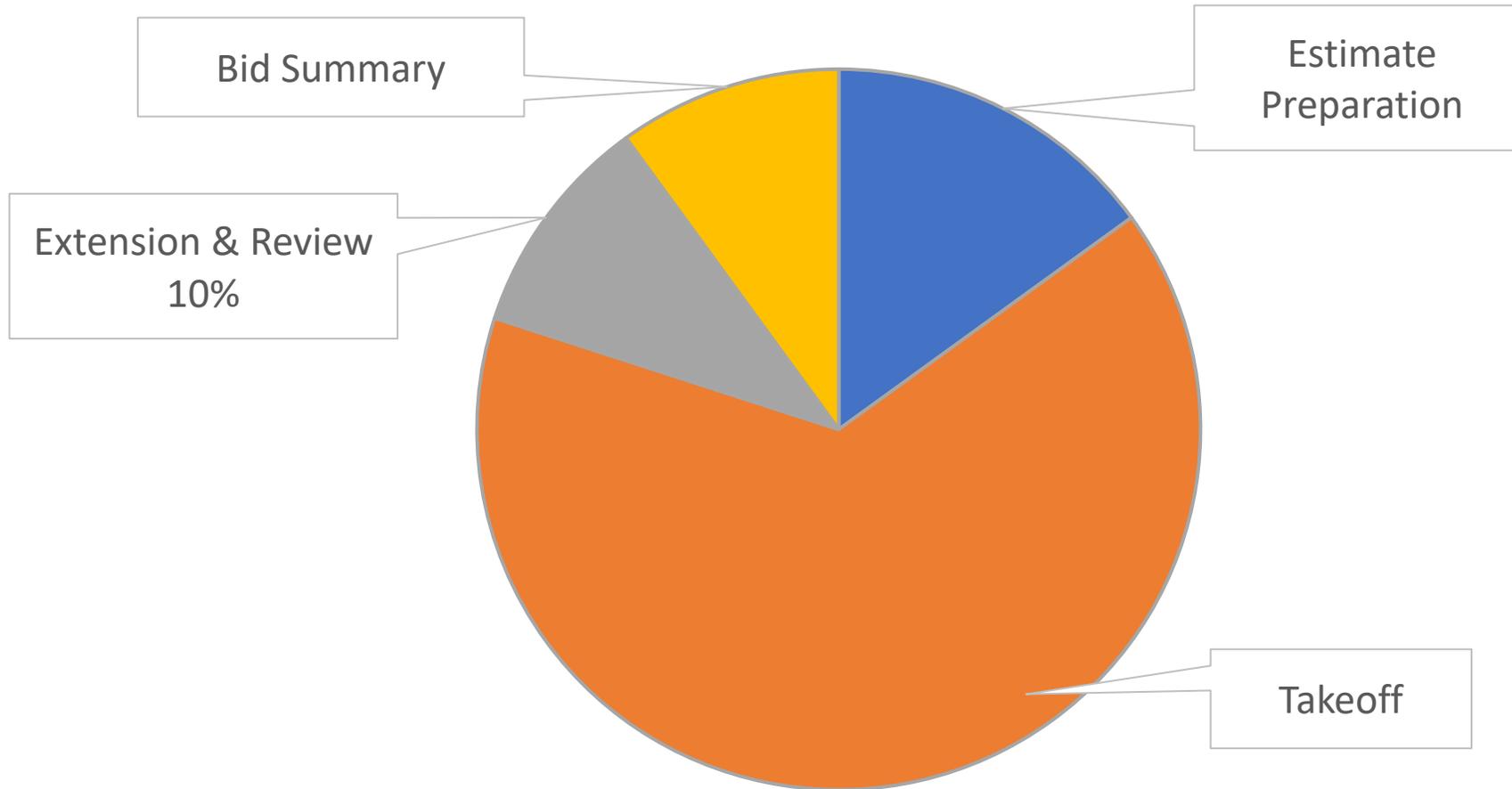


The Estimating Process in Four Steps

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**



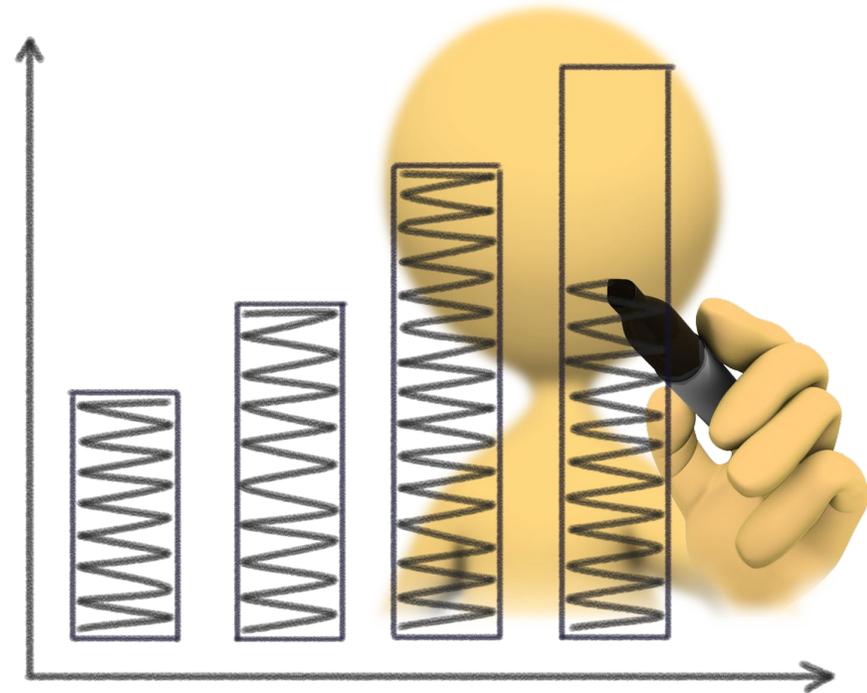
Serves as a PLAN to execute the project **PROFITABLY.**

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

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

The Estimating Sequence

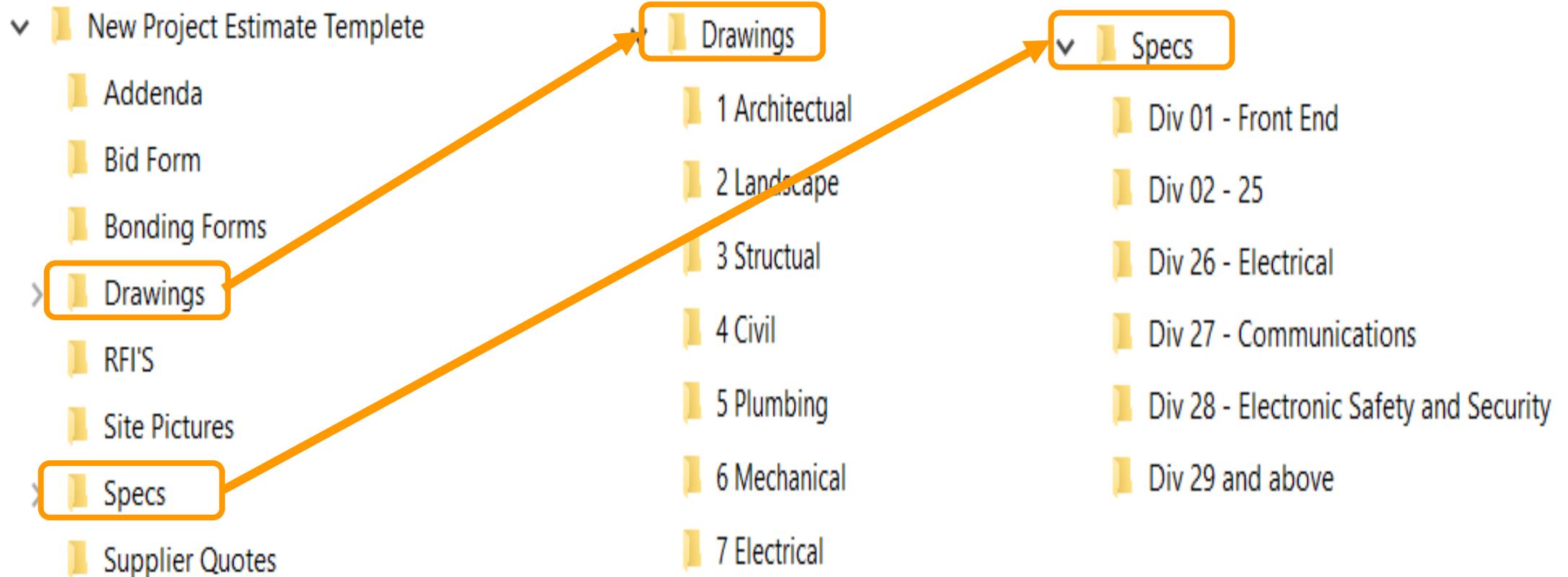
Take the suggested Estimating Sequence as a template and write one that suits your company and market.

Step 1 – Estimate Preparation

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

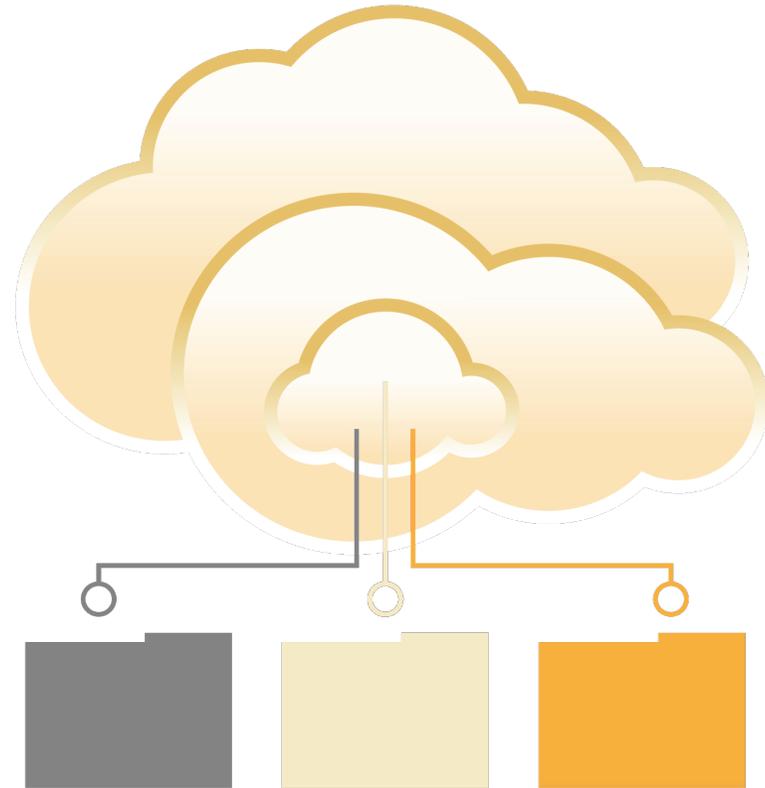
- **Copy and Paste Template**
- **Rename Template Folder to New Project**

Step 1 – Estimate Preparation



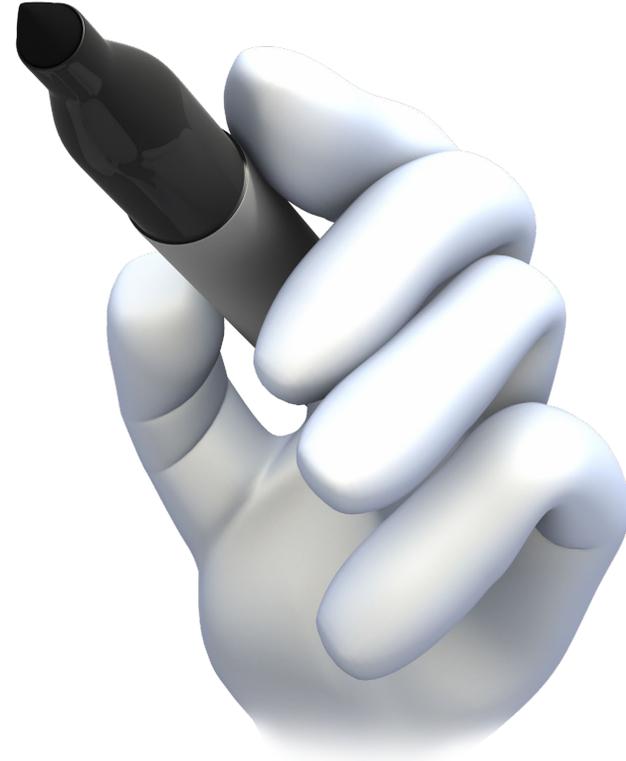
2. Obtain Contract Documents

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



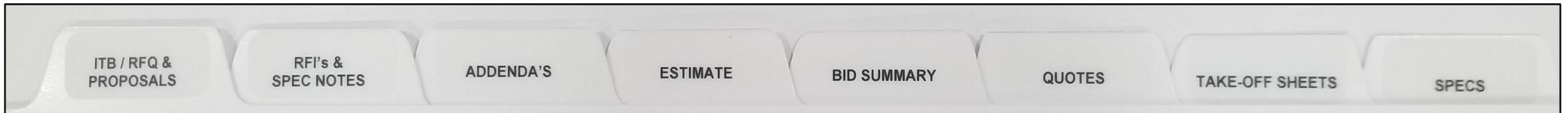
3. Create an estimate number

- **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 st Floor	Middle School	E003
	Branch Wiring	2 nd Floor	High School	E101
	Distribution	3 rd Floor	Bus Garage	E102
	Feeders	4 th Floor		E103
	Equip Conn's	5 th 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
2. Site Power
3. Site Lighting
4. Demo
5. Distribution
6. Feeders
7. Branch Wiring
8. Equipment Schedule
9. Fire Alarm
10. Security
11. Sound
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

Step 3 – The Extension & Review

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 | **Extension** | 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

2nd 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

1st – An Accurate Detailed Takeoff

2nd – A Complete Bid Summary



Bid Summary Labor Components

1. Direct Labor Classes – Foreman, Journeyman
2. Incidental Labor – Site Meetings, As-Builts, 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

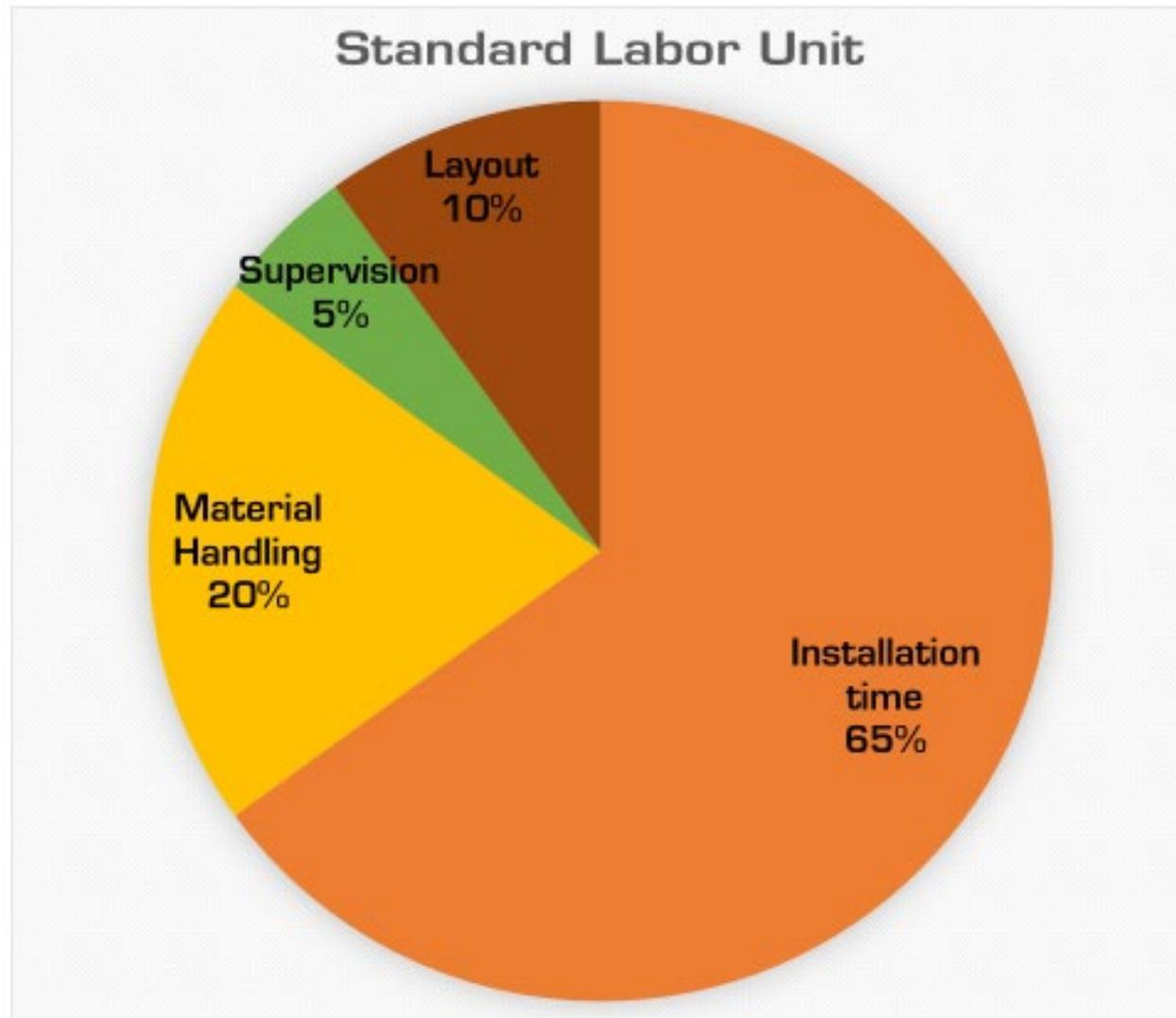
Labor Hours Are Derived By The Following

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

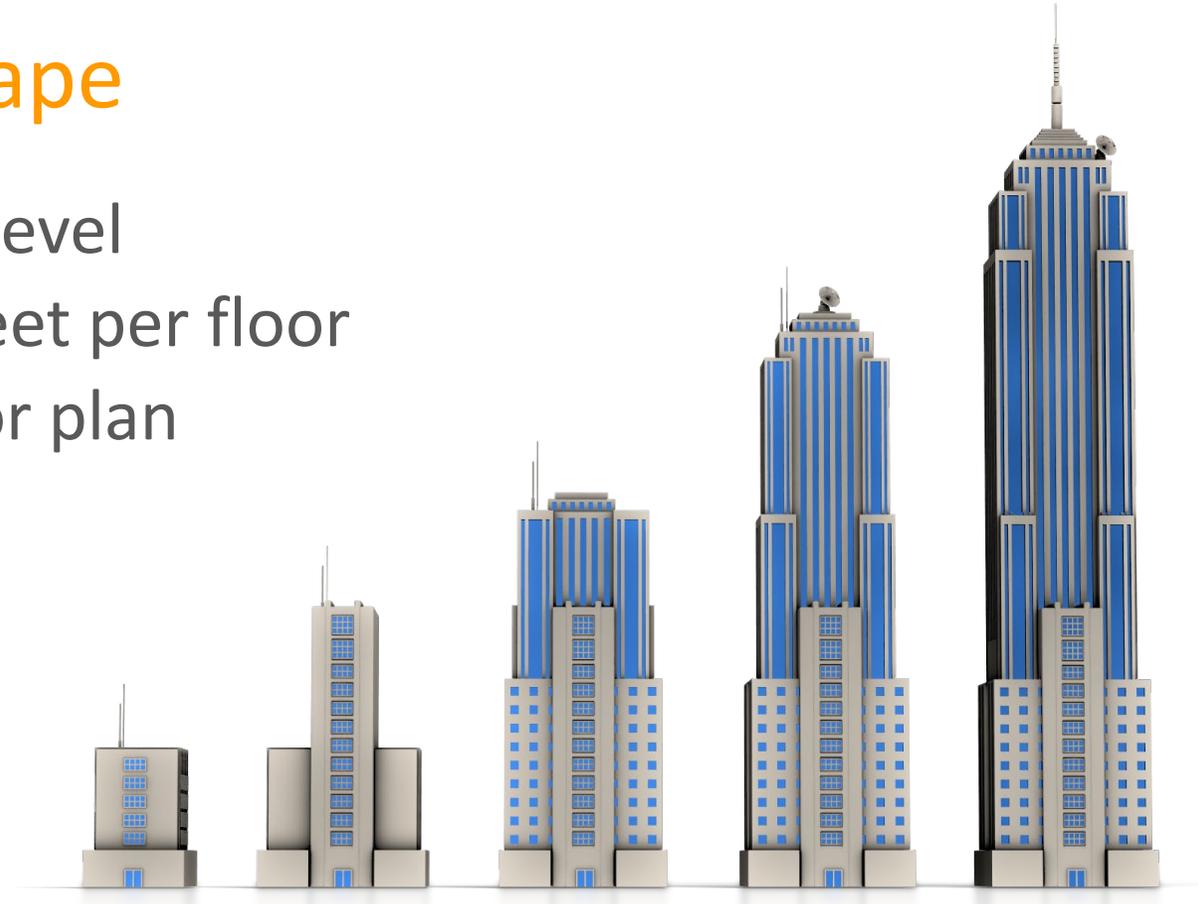
Labor units are applied based on:

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



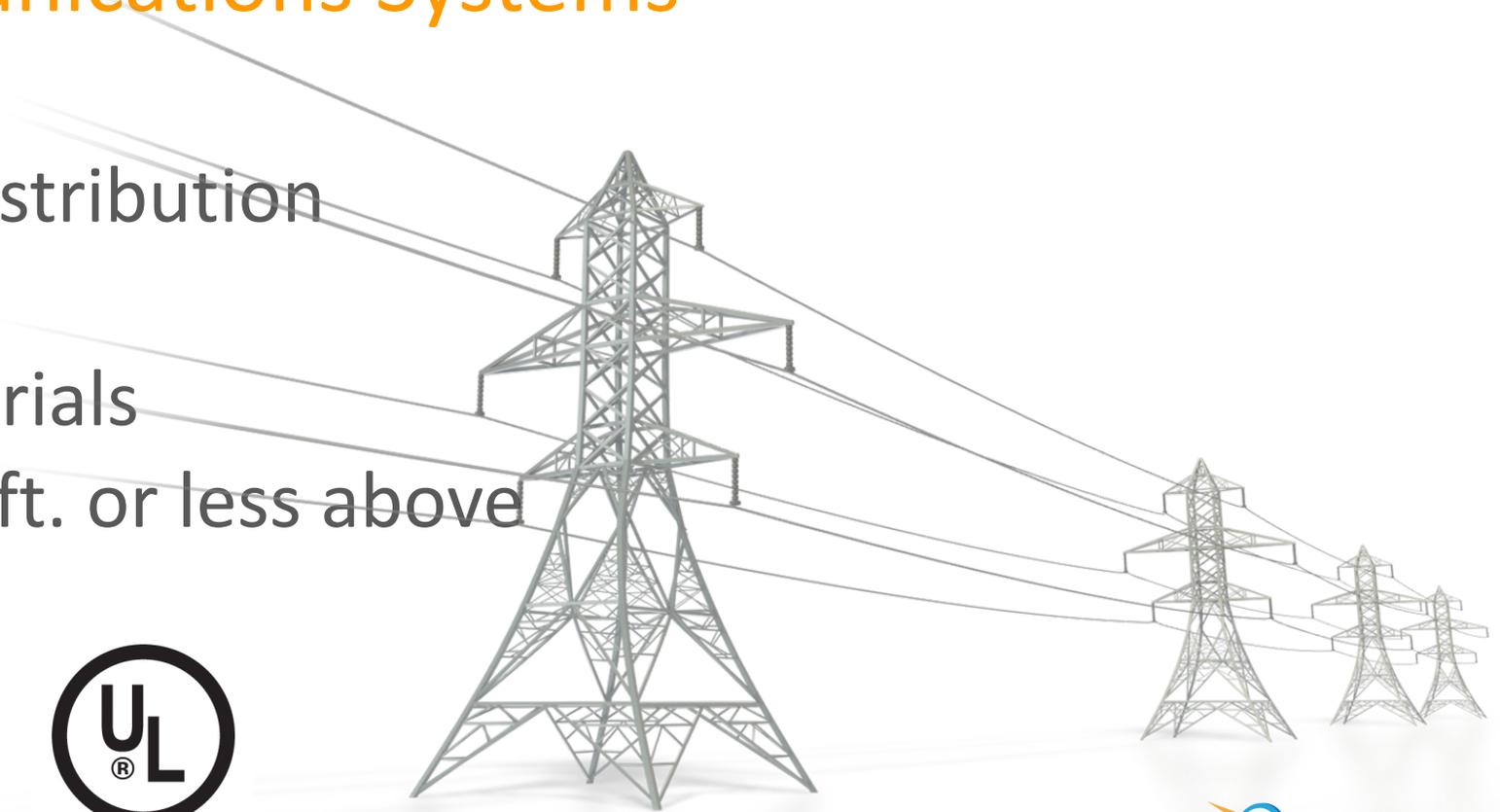
Construction & Work Schedule

- 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

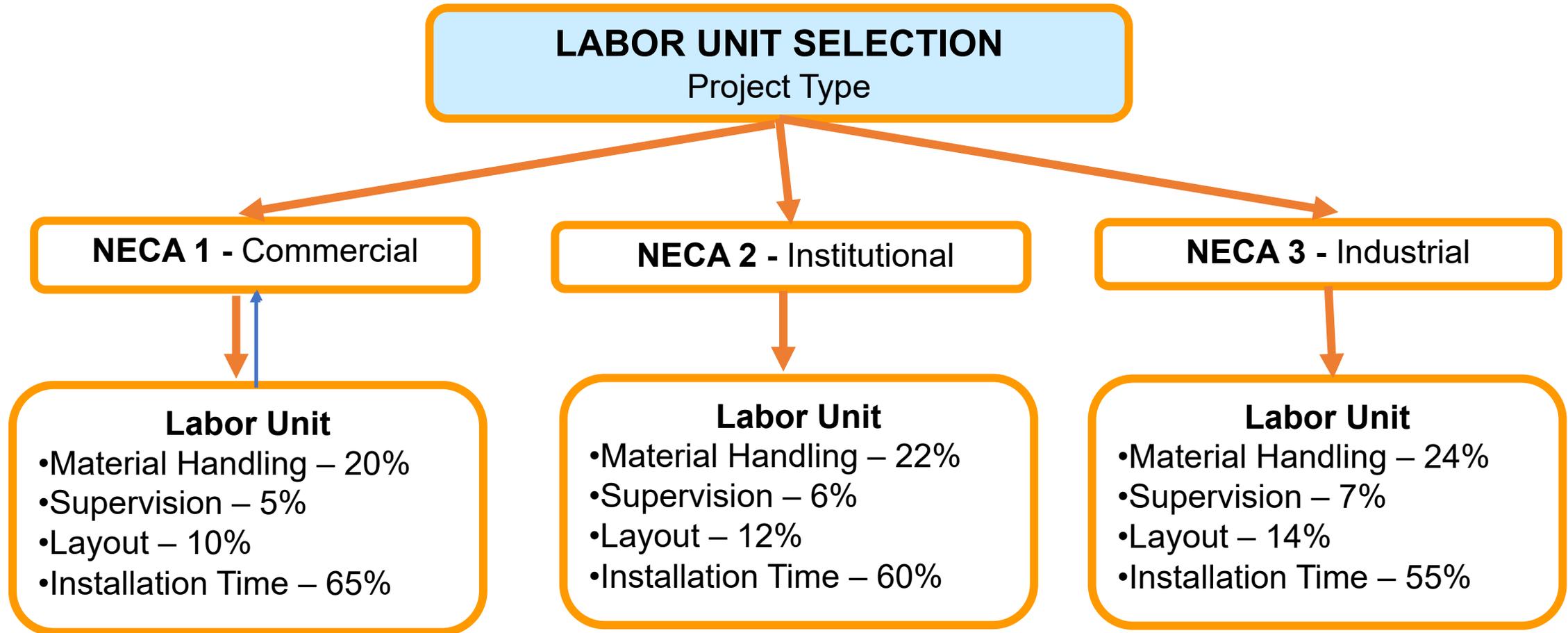
- Good engineering and design
- Complete drawings and specifications
- Realistic schedule
- Electrical material furnished by electrical contractor

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
- 4th year apprentice
- 3rd year apprentice
- 2nd year apprentice
- 1st 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!



—

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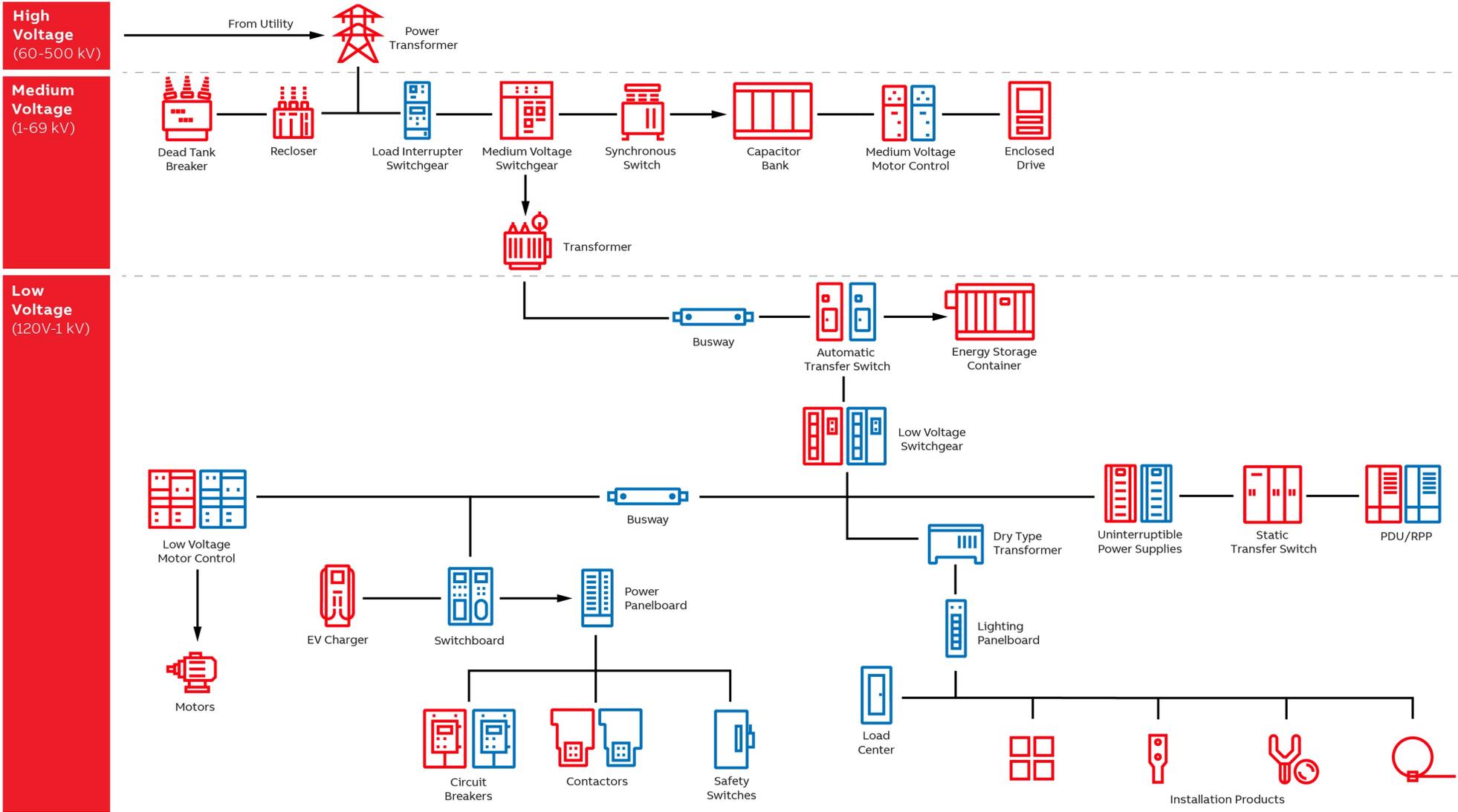


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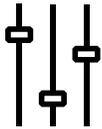
ReliaGear® LV
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ReliaGear™ LV Motor Control
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ReliaGear™ product portfolio

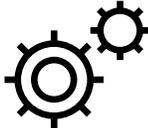
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