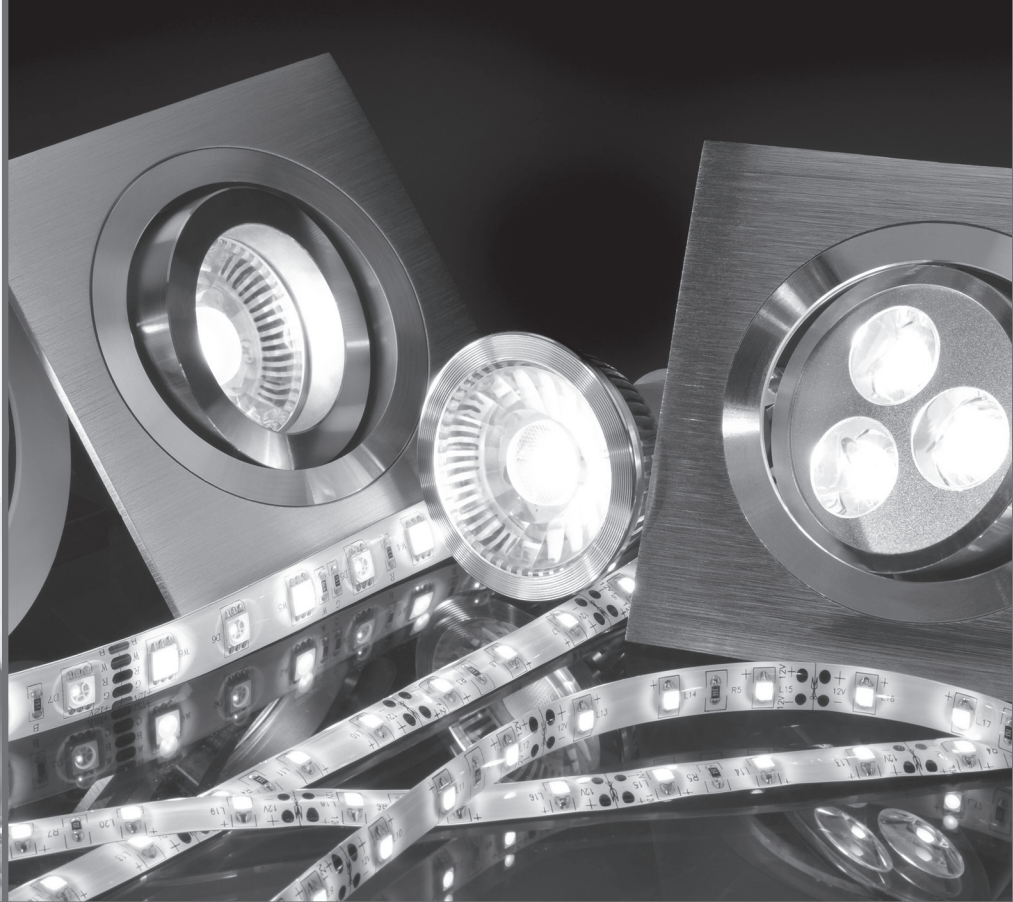




National Electrical Contractors Association

Manual of Labor Units 2015-2016



© 2015 National Electrical Contractors Association, Inc,
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Printed in the United States of America

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Within this document, select forms or tables may be replicated to perform the calculations or analysis described within. The permission to reproduce these documents will be noted and copies will be available at www.necanet.org/MLU.

This publication is intended as a reference to assist electrical contractors in identifying the duration of work tasks for the purposes of estimation. NECA makes no warranty to the accuracy of these numbers.

FOREWORD

The National Electrical Contractors Association (NECA) is the voice of the \$130 billion industry responsible for bringing electrical power, lighting, and communications to buildings and communities across the United States.

NECA members are electrical contractors who work in all aspects of electrical construction. While most qualify as small businesses, large, multi-area electrical contracting firms are also members of the association.

NECA contractors are the technical professionals responsible for the most innovative and safest electrical construction in the U.S. and they hold a high standard for superior performance and are committed to delivering quality results.

The NECA Manual of Labor Units (MLU) has been developed, published and utilized by 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 data is intended to serve as a general guide to the labor necessary for the installation of specified items under the project conditions defined in the manual. The extent of the applicability of the data to any particular project situation is entirely at the discretion of each user.

Selected sections of the manual are reviewed and updated bi-annually estimating experts chosen from among the NECA electrical contractors located across the country. These individuals represent many years of experience in estimating, tracking the applications of labor units to construction projects and the installation of materials for a broad range of conditions and locations. The resulting labor unit determinations represent a national consensus baseline of estimated labor requirements for each item under the conditions stated.

In each revision of the NECA Manual of Labor Units changes to labor unit data and material listings are indicated with an “X” in the column titled “Rev”.

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INTRODUCTION TO THE *MANUAL OF LABOR UNITS*

Purpose

The purpose of this labor unit manual is to give the user a source of labor data for estimating the labor required to install the electrical and communications systems shown on electrical construction drawings.

The NECA *Manual of Labor Units* provides the user with the national average amount of labor hours required to install a given quantity of each item under typical conditions on a typical project. The labor units in this manual are basic labor units because they represent the normal amount of labor required on a typical project under typical site conditions. These conditions are defined in the section adjusting labor units for project conditions. Suggestions are also included in that section to assist in the adjustment of the labor data in this manual for a specific project and for each project's unique site conditions.

Source of the Data in This Manual

Since 1923 this Association's member electrical contractors have been the sole source of the labor data in this manual. Bi-annually, NECA updates and revises the labor data in the manual by soliciting the latest labor units from its member contractors with the goal of providing the latest labor data, based on the average productivity being experienced in this industry.

Arrangement of the Labor Unit Tables

This manual is arranged in fourteen sections of related items. Each of the sections has a detailed table of contents at the beginning of the section. Section 11: Outdoor Overhead and Underground Systems is broken into two components, one which includes labor units for "inside" electrical contractors who install small quantities of outdoor overhead systems and one that includes labor units for "outside" or "line" electrical contractors who install substantially greater quantities of outdoor overhead systems with specially trained line electricians.

Electrical Condition of Equipment Covered By These Labor Units

The condition of these labor units are based on new material. The cost of working with used or existing equipment needs to be factored, as it usually requires additional labor steps.

The power condition that applies to these labor units is de-energized, the additional labor required to work on energized equipment is defined by NFPA 70E and OSHA. Always assess your company's policies and procedures to factor this additional labor.

Additional Information

For additional information concerning the data in this manual, estimating training courses, qualified local electrical contractors, or any other of the services provided by NECA, contact your local NECA Chapter or visit www.necanet.org.

LABOR UNITS DEFINED

All labor data in this manual are in units of man-hours. Each table of labor units indicates whether the labor units are for the installation of:

- 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

Scope of the Manual of Labor Units

All labor units in this manual include varying amounts of four basic components outlined below. These components are used in developing and evaluating each of the labor unit items published in this manual. The portion of each component in the basic labor units varies from item to item, and NECA does not attempt to quantify these portions or percentages.

It is well established that the material installation portion of some labor units represent a much larger part of some labor units than for others. For example, the actual installation portion of labor units for duplex receptacles is greater than many other items because the material handling is easy and the layout and measurement is almost non-existent. The installation of the box for the duplex receptacle usually includes all of the layout and measurement labor.

The four components included in the labor units are:

- **Normal Material Handling** – Before any electrical material is installed, it must be handled two or more times. All material must be unloaded from the delivery truck, inspected for shipping damage, carried to the storage area, transported to the floor where it will be installed, and distributed to the final installation location. Conduit bundles must be broken apart, equipment removed from cartons, lighting fixtures removed from pallets, wrappings cut from coils, etc. In addition, empty cartons, pallets, boxes, reels, skids, packing, etc., must be removed from the work area. This effort consumes labor without any electrical material actually being installed; however, this time must be included in the labor units.
- **Drawing Study, Measurement and Layout** – The installation of electrical materials cannot begin until the type and size of material is determined, the installation location is verified, the electricians are directed, the fastening devices are identified, a measurement is made to insure the proper installation location, the installation location is marked, etc. This effort consumes labor without any electrical materials being installed; however, this time must be included in the labor units.
- **Material Installation** – This effort includes both the procurement (and return) of all tools other than hand tools carried in the tool belt and the actual installation of the electrical materials. Separate labor units are necessary for the installation of all fasteners, hangers, and supports.

In the beginning of each section of this manual there is additional information regarding the scope of the labor units for particular items such as cutting, threading, bending, drilling, etc. **It is of the utmost importance that every user of this manual read the first page of each section before selecting any labor units from a particular section.**

- **Normal Non-Productive Labor** – Every labor unit in this manual includes a pro-rated amount of the normal non-productive labor. The magnitude of the non-productive labor in each labor unit is unknown.

The normal non-productive labor in the labor units includes:

- Personal comfort breaks
- Normal time to obtain drinking water
- Minimum breaks for coffee carried to the work area
- Walking time between the gang shed and the work area
- Minimal walking time to obtain tools and electrical materials
- Minimal lost time due to interference by other crafts

Some normal non-productive labor items that are not included are:

- Time waiting for material or personnel hoists or cranes
- Time due to strikes, work stoppages, or jurisdictional disputes

- Time due to egress, job site security, or physical obstructions
- Time related to safety compliance, this is to be added per contractors' experience and policies

Through good project planning and management, electrical contractors generally can keep such things as loitering, interruptions, late starting, early quitting, etc., to a minimum. When these conditions are beyond the control of the electrical contractor, then additional non-productive labor must be allowed.

Items Not Included in Labor Units

The introduction for each section notes specific items that are not included in the labor units for that section.

Throughout the entire manual, the labor units **do not include any labor for supervision of any type**. All electrical construction requires more than one level of supervision, and the magnitude of supervision depends on the complexity, type, and size of each project. In addition, many labor agreements include special requirements related to supervision. Because each project is unique, it is the opinion of most electrical contractors that the labor for supervision is best estimated as a separate cost item and that no part of the supervision labor be included in the material installation labor units. Estimating the costs of supervision is discussed in an appendix to this manual.

How to Select Basic Labor Units

Estimating electrical material installation labor is best accomplished by the application of a labor unit to each item on a list of materials prepared from the takeoff of the bid contract drawings. Along with the type and size of each item, it is essential that an abbreviated description of the installation conditions be noted. The necessity of the type and size of each item is obvious, but of equal necessity are the abbreviated notes regarding the installation conditions so that an appropriate selection may be made from a choice of labor units.

The NECA labor unit tables include three different labor units for each item:

- **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.

Examples of these normal conditions might include the installation of surface mounted items up to a height of eight feet above the floor, the use of a rolling scaffold or six-foot ladders, a repetitive layout, a minimum of required measurements, a minimum of interference by structural or mechanical obstacles, etc.

Occasionally there are unusual installation conditions when a labor unit that is less than the “normal” column labor unit is justified. For example, when an abnormally large quantity of parallel conduits, without bends or offsets, are to be installed on trapeze hangers, labor units slightly smaller than the “normal” column labor units might be more appropriate.

- **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.

Examples of the difficult conditions might include the installation of surface mounted items up to a height of twelve feet from the floor, the use of fixed scaffolding installed by others, the use of ten-foot ladders, a non-repetitive layout, a moderate amount of interference by structural or mechanical obstacles, etc.

Users of this manual are also encouraged to consider using labor units whose magnitude are somewhere between the normal column labor units and the difficult column labor units when conditions justify this consideration.

- **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.

Examples of the very difficult conditions might include the installation of surface mounted items up to a height of twenty feet above the floor, the use of fixed scaffolding installed by others, the use of eighteen-foot ladders, a single location of each item, a substantial amount of interference by structural or mechanical items, a difficult fastening method, etc.

Users of this manual are also encouraged to consider using labor units whose magnitude are somewhere between the difficult column labor units and the very difficult column labor units when the conditions justify this consideration. It is also essential that users of this manual select labor units that are greater than the very difficult column labor unit when conditions justify the need.

Increasing Estimating Accuracy

On most typical projects there are several identical items whose installation labor should be determined separately due to significantly different installation conditions. For example, different labor units should be used for estimating the installation labor for conduit located in concrete floor slabs as compared to the identical type and size of conduit installed exposed on walls or ceilings. Conduit in concrete floor slabs is usually installed by the shortest route possible and therefore requires a lesser amount for point-to-point distances. Identical exposed conduit installed on walls, on ceilings, or parallel to concrete column lines requires a greater quantity of conduit, and the labor required per foot of conduit is greater because of the additional effort to maintain the alignment, elevation, and appearance. The labor for installing identical items should be determined separately whenever a significant quantity of the item is required in situations where two or more different installation conditions exist.

The best assurance that a construction contractor will continue in business is to bid projects based on the contract documents which include the specifications and the installation drawings. A realistic evaluation of all the anticipated project conditions based on the contract documents is the only justifiable reason for modifying the estimated labor costs in the bid estimates. The adjustment of estimated labor costs based on who the competitors are and how they would estimate the project is not only foolish and unjustifiable but will, without exception, eventually lead to financial disaster.

ADJUSTING LABOR UNITS FOR PROJECT CONDITIONS

When adjusting the estimated labor for a specific project it is clearly more practical to adjust sub-totals or totals of labor man-hours for each portion of the project rather than to adjust individual labor units. The estimated labor adjusting is usually most effectively accomplished on an estimate summary sheet designed for that purpose. In computerized estimating this estimated labor adjustment is easily accomplished by appropriate programming (software) and corresponding computer operator instructions. It is the opinion of most electrical contractors that the best material and labor estimates are produced by listing every material item required, by listing the exact quantity of each item required, by applying an appropriate labor unit for each item to establish the basic quantity of labor required, and by adjusting the basic quantity of labor to reflect the specific project.

Description of a Typical Project

The following general description defines a typical project for the purposes of estimating using this manual. This description may need to be altered for electrical contractors who perform low voltage, voice-data-video, or other types of specialty electrical work.

- Building Size and Shape
 - Up to three floors above street level
 - Approximately 20,000 to 100,000 square feet per floor
 - A standard rectangular or square floor plan
 - New construction
- Location
 - In or near a metropolitan area
 - Outside of a controlled access or high security area
 - A single building, facility, or activity
 - Unused, native soil with no unforeseen obstructions
- Construction and Work Schedule
 - Standard workday hours
 - 40 hours per workweek
 - All work on daylight shift
 - Sufficient time to eliminate scheduled overtime
- Electrical and Communications Systems
 - Up to 600-volt (and Medium voltage as indicated) power distribution
 - The electrical service by the local utility company
 - All standard UL listed electrical materials
 - All layout and specifications comply with the local and National Electrical Code
 - All new material and new construction
 - All systems to be installed 20 feet or less above a solid floor

Description of Normal Project and Site Conditions

The following general description defines the typical site conditions for the purposes of estimating using this manual:

- Complete engineering, well coordinated design, drawings, and specifications
- Familiar type of building design and standard materials
- Crane furnished by owner or general contractors
- Adequate security for material and tool storage on the jobsite
- All electrical material furnished by the electrical contractor
- Sufficient supply of qualified journeymen electricians
- Overall job progress based on a realistic CPM project schedule
- Minimum quantity and magnitude of change orders
- No joint or beneficial occupancy
- All new material and new construction
- No interruptions, delays, or jurisdictional disputes
- Optimum job coordination of all crafts
- Work area temperature environment
 - Minimum equivalent temperature of plus 35 degrees Fahrenheit
 - Maximum temperature and humidity 88 degrees Fahrenheit and 50% RH or its equivalent

Adjusting Labor for Non-Typical Conditions

It is universally recognized that individual labor units should **not** be adjusted when making allowances for non-typical projects and non-typical project conditions. A faster, more accurate procedure is to make labor adjustments using percentages applied to different categories of the work. Perhaps the most difficult operation in estimating is the evaluation of the applicability and magnitude of the labor increases or decreases due to non-typical conditions. The following pages contain guidelines and references which may be helpful in selecting estimated labor adjustments due to non-typical projects and non-typical project conditions.

In order to assist the users of this manual in evaluating the impact on labor productivity due to the conditions relating to the project, the following pages describe various labor factors to be considered when evaluating the degree of difficulty for the particular project. Following the labor factor descriptions is the “Labor Factor Score Sheet” to be used by the estimator to score the various labor factors present on the project. The estimator should review each project situation and determine the category that relates best to that situation. Most projects will have job situations that fall into various categories. When those situations exist, you may want to utilize the project grading system provided in the Labor Factor Score Sheet.

Labor Adjustments Due to Working Conditions

The basic labor units in this manual are based on environmental (weather) conditions, which do not reduce the labor productivity. As a result of labor data research by NECA it was determined that electrician labor productivity does not decrease until the effective temperature (wind chill factor included) drops below 35 degrees Fahrenheit. The same research developed the combinations of high temperature and humidity limits that do not impair the productivity of installation labor. In addition, the productivity loss due to extreme environmental conditions is available.

This labor data along with the details of its development, electrician labor productivity loss percentages for extremes of environmental conditions and suggestions on how to use the data is available from NECA in the report *The Effect of Temperature on Productivity* (Index # 5072-04).

Labor Adjustments for the Type of Project

It is recognized in the construction industry that different types of buildings and projects may require either more or less labor to install identical electrical materials than the average labor units in this manual. There are many reasons for these differences in productivity, but the major reasons include:

- Structural differences
- Special requirements in the construction contract
- The magnitude of the electrical power requirements
- The quantities of identical electrical materials
- The differences in typical ceiling heights
- The differences in lighting requirements
- The complexity of the electrical systems
- The complexity of the communications systems
- The differences in the rate at which the construction can progress
- The special requirements of the National Electrical Code
- The differences in soil conditions
- Other equally important elements

Labor Adjustments Due to Building Height

The basic labor units in this manual are based on buildings and projects with up to three floors above grade or street level. For taller buildings or projects, a labor adjustment must be made to the estimated labor sub-totals developed from the labor units in this manual. To evaluate additional labor required due to the height of a building, a cumulative range of 1% to 2% per floor reflects the rate of productivity loss experienced by our member contractors.

NECA's *The Effects of Multi-Story Buildings on Productivity* (Index # 5071-04) includes a summary of the data researched to produce the findings, factors that cause the productivity loss, tables of productivity loss percentages for buildings up to 50 stories tall, and suggestions on how to use these tables.

Labor Adjustments for Project Sizes

The basic labor units in this manual are based on typical projects whose size will require the full time assignment of electricians for normal workweeks on small projects and on typical projects whose maximum electrician peak workforce will not exceed one hundred persons.

On abnormally small projects, the estimated labor based on the labor units in this manual must be substantially increased to reflect the actual labor that will be required. On abnormally large projects, the estimated labor units should be substantially increased for numerous reasons such as the additional supervision required, the additional labor for handling material or for controlling tools, time lost walking to and from assigned work areas, the additional labor required to coordinate the electrical work with other crafts, the increased difficulty in obtaining the use of hoisting equipment and in coordination of material delivery and material storage, the increased productivity loss due to personnel turnover, and the basic psychological impact of a large project.

Labor Adjustments for Hours Worked and Shifts

The basic labor units in this manual are based on projects that did not include any scheduled overtime. Occasional or unscheduled overtime of a few electricians working a minimum amount of overtime once or twice a month in support of other crafts is not unusual and is included in the scope of a typical project. However, when the contract documents require scheduled overtime, when the bid documents or project schedule suggest that scheduled overtime will be required, and when the project does not proceed as originally anticipated, there is a substantial loss of productivity if scheduled overtime is initiated. The loss of productivity is experienced not only during the overtime hours worked, but also during the normal hours preceding overtime. As a result of labor data research by NECA, it was determined that the loss of productivity due to scheduled overtime increases in magnitude as the duration of the scheduled overtime is increased.

Additional information can be found in the report *Impact of Overtime on Electrical Labor Productivity: A Measured Mile Approach* (Index # F3101).

Labor Adjustments for Crew Density

The basic labor units in this manual are based on normal peak work force of electricians. When abnormal peak work force is experienced, there is a loss of productivity. Contract bid documents and the scope of work to be completed in the time available may indicate that varying sizes of work crews will be necessary. Likewise, unanticipated changes in the progress of the construction or other changed conditions may require the use of larger than normal work crews. For estimating the impact of having to over-man a project before the work is actually completed, only the judgment of an experienced electrical contractor is reliable. In most situations, the after-the-facts labor records are the best method to assess the productivity loss due to over-manning.

To assist the industry in assessing this type of loss, the use of other than optimum crew sizes, or the use of constantly changing crew sizes, NECA developed data from the records of its member electrical contractors to establish the normal peak electrician workforce for numerous types and sizes of electrical construction projects. This normal peak workforce data is available from NECA in the report *Project Peak Workforce* (Index # 5074-04).

Labor Adjustments for Project Durations

The basic labor units in this manual are based on normal project durations. When the contract documents indicate abnormal project progress schedules, abnormal project completion dates, and when the project progress schedule is substantially revised there is a loss of productivity due to these conditions. Additionally the overall continuity of the project schedule has an effect on the production. Starting and stopping work prevents the workforce from establishing a productive workflow. The magnitude of the productivity loss is in proportion to the circumstances of the particular project involved. In most situations, the after-the-facts labor records provide the best source to assess the productivity loss. For estimating the impact of these conditions before the work is actually completed, only the judgment of an experienced electrical contractor is completely reliable.

To assist the industry in assessing the productivity loss due to abnormal project durations and productivity loss due to changed project progress schedules, NECA developed data from the records of its member electrical contractors to establish the normal project duration for numerous types and sizes of electrical construction projects. This normal project duration data is available from NECA within the report *Normal Project Duration* (Index # 5076-04).

Labor Adjustments for Non-Productive Labor

The basic labor units in this manual include a prorated amount of the normal non-productive labor experienced on a typical project. On some projects the non-productive labor is greater than the normal amount, and the estimated labor for the installation of the electrical systems must be increased accordingly. For example, the owner or general contractor may allow or require all construction crafts to take coffee breaks at a specific time and for a specific duration. Other non-productive labor to consider are mandatory stretch and flex, added safety measures required or clean-up required beyond the normal scope or work to name a few. A description of the normal non-productive labor is included in the foregoing discussion of the scope of the NECA labor units. The evaluation and determination of the magnitude of abnormal productivity is extremely difficult because there are no standard percentages, mathematical formulas, or guidelines that can be used. The evaluation of the cause and effect of abnormal non-productive situations can only be determined by the judgment of an experienced person.

In the bid estimating of the project labor requirements, the electrical contractor must evaluate all the known and anticipated project conditions that will affect the labor productivity and then adjust the estimated labor man-hours accordingly. A substantially different condition exists when estimating the labor for change orders. The electrical contractor not only must evaluate the magnitude of the non-productive labor before any change order is received, but the change order itself always increases the non-productive labor and the supervisory labor to some degree. The issuance of a single typical small change order does increase the nonproductive labor, but usually not in measurable amounts. However, after several change orders are issued, or when a single change order of substantial size is issued, the electrical contractor will always experience a major increase in lost productivity.

For additional information on cost factors involved in change orders, see *Change Order Guidelines For Electrical and Low Voltage Contractors* (Index # F3405a), *Impact of Change Orders on Labor Efficiency* (Index # F9901) and *Quantifying the Cumulative Impact of Change Orders for Electrical Contractors* (Index # F2004).

Labor Adjustments for Project Location

The basic labor units in this manual are based on typical project locations that do not include any unusual problems. When the project location creates unusual material and tool handling problems, other types of physical obstructions, or administrative obstructions, the additional labor (productivity loss) caused by these conditions must be considered. Some of the conditions that may cause productivity losses include:

- Material and tool delivery and unloading restrictions
- Material availability from local suppliers
- Material and tool storage restrictions
- Material and tool hoisting restrictions

- Material and tool security problems
- Potential flooding, fire hazards, or dust storms
- Lack of space for subcontractor field office or job shed
- Security area restrictions
- Widely dispersed work areas
- Craft parking restrictions and availability
- Disruptions due to nearby demolition, rock blasting, chemical fumes, etc.

The loss of productivity due to any of these abnormal conditions cannot be determined from any tables or charts. Each situation must be evaluated independently, and the productivity loss must be determined by judgment, logic, and common sense. The most frequent method of determining the additional labor hours which will be required as a result of the project location is to multiply the total estimated man-hours times a productivity loss percentage to produce the number of additional man-hours required.

Labor Adjustments for Project Planning and Pre-Planning

The process of planning the installation of the material prior to the actual project construction is an excellent method of reducing the labor required to perform the actual installation. Detailing the assembly of material including the method and location of the final installation will help reduce the need for layout time on the job. Some companies devote hours of drafting and research time to planning the final installation of the material. In many cases these companies find that one hour spent in pre-planning will save as many as seven hours of project installation time.

Labor Adjustments Due to the General Contractor

The basic labor units in this manual are based on the effective coordination and management of the project by the contractor or construction manager. If the project is not managed effectively, the electrical contractor experiences a loss of productivity.

Occasionally the owner's actions are the cause of the general contractor's problems, and ultimately additional electrician labor may be required to complete an installation. The owner's redesign of any part of a project after construction has started, beginning construction without complete or coordinated construction drawings, electrical materials furnished by the owner, an excessive number of change orders, delays in the project due to the lack of financing, owners accelerating the construction schedule, and other disruptive actions by owners may contribute to the general contractor's ineffectiveness.

However, there are numerous other elements that are within the control of general contractors and construction managers that have a direct impact on the loss of productivity by electricians. Some general contractors are substantially less effective in coordinating the work of the subcontractors, in sequencing the structural components, in resolving problems, in controlling the operation of material and personnel hoists, in using overtime to maintain the construction schedule, in administering change orders, and numerous other activities that directly impact the productivity of the electricians.

Electrical contractors must take the general contractor's management effectiveness into consideration when bidding each project and must include an appropriate labor adjustment when necessary. Likewise, an adjustment for the general contractor's or construction manager's effectiveness must be included, when appropriate, for estimating change orders, accelerated schedule impact costs, delay impact costs, and all other changed conditions impact costs. The magnitude of the productivity loss must be determined by an independent evaluation of the circumstances associated with each project.

Labor Adjustments for Project Work Schedules

The basic labor units in this manual are based on normal work schedules. A normal work schedule includes eight daylight hours per day, five days per week and forty total hours per week. Any deviation from the normal work schedule will have an impact on the labor productivity and the quantity of supervision necessary.

Some of the elements that may affect the productivity change due to abnormal work schedules include but are not limited to:

- Weather, climate and geographical location
- Duration of the abnormal work schedule
- Daylight versus nighttime hours
- Availability of sufficient qualified electricians
- The level of construction worker unemployment
- Type and size of project
- Project owner's special requirements
- Historical labor practices
- Other psychological influences

Labor Adjustments for Labor Availability

The basic labor units in this manual are based on having an adequate supply of qualified electricians. When an adequate supply of qualified electricians is not available during any portion of the electrical construction, there is a loss of productivity that must be taken into consideration. It is extremely difficult when preparing a bid estimate to precisely determine the loss of productivity due to a shortage of qualified electricians that may occur at some future date. However, this situation does occur frequently, and some rationale must be employed to produce the total labor required during the bid preparation process. Experience, judgment, and common sense are the only tools available to assess these situations.

In other situations, such as labor estimating for accelerated construction schedules, change orders, and after-the-fact labor cost analysis, the loss of productivity due to a shortage of qualified electricians is more easily determinable. In these situations the loss of productivity is usually estimated by multiplying the total man-hours that would have been required under normal conditions by a productivity loss percentage to produce the number of additional man-hours required. The productivity loss percentage in this calculation cannot be obtained from any published table, but must be determined by the careful analysis of all the elements for each individual situation. Electrical contractors are contractually responsible to include the productivity loss due to a shortage of qualified electricians in their original bid price based on the information available in the bid documents. However, when the project conditions change after construction has started, and for many change order situations, the electrical contractor is clearly entitled to recover the additional labor costs resulting from a shortage of qualified electricians.

In the electrical construction industry it is not the individual electrical contractor's responsibility to select and train electricians. The JATC program under the joint guidance of NECA and the IBEW makes every effort possible to anticipate the need for electricians and to train an adequate supply of qualified people in every part of the country.

Labor Adjustments for Other Factors

The users of this manual must recognize that other conditions not specifically mentioned on these pages can have a substantial impact-either positive or negative-on the productivity of electricians. Worker motivation is one example of a condition that could be either positive or negative and could change either rapidly or slowly after a project is started.

For additional information on issues of this type, see *Factors Affecting Labor Productivity for Electrical Contractors* (Index # F3000).

Another consideration is for prefabricated assemblies of electrical materials. The process of prefabricating repetitive assemblies in a controlled environment with optimum access to material and tooling is an extremely effective way of reducing the amount of labor required during construction. It is not uncommon to realize upwards of 30% labor saving when assembling the individual material items into these prefabricated units. Obviously, the greater the number of identical assemblies that are prefabricated offsite, the greater the labor savings however there may be justification for prefabricating as few as five or six when appropriate.

Summary of Labor Adjustments

It is well recognized that the most effective and least error prone method of estimating is to use a standard or basic set of labor units applied to a complete list of all materials that will be required and to adjust the total estimated electrician labor to reflect the unique conditions on each project. For budget purposes it may be necessary, because of the absence of completed installation drawings, to estimate the installed costs of electrical or communications systems using some other method of estimating cost.

It is the intent of this manual to furnish realistic labor units which represent the average amount of labor required for a typical project located anywhere in the United States. In order to tailor the estimated labor required for a specific project, the estimated labor calculated with the labor units in this manual may be adjusted either upward or downward to take into consideration all condition that would differ from a typical. The adjustment of the estimated labor for a project's special condition is not an exact science, but the experience of many electrical contractors over a long period of time has demonstrated that this manual does accurately reflect the amount of labor required for a typical project.

NECA Labor Factor Score Sheet

To assist the users of this manual in evaluating the impact on labor productivity due to the conditions relating to the project, the "Labor Factor Score Sheet" lists situations that may be encountered on projects, and must be considered when determining the degree of difficulty for that particular project. The estimator should review each project situation and determine the category that relates best to that situation. Most projects will have job situations that fall into various categories and when those situations exist, you may want to utilize the project grading system provided in the Labor Factor Score Sheet.

The purpose of the Labor Factor Score Sheet is to identify the appropriate labor column to be used due to the conditions of project. Labor adjustments will still be needed for building height, weather conditions, overtime, abnormal project durations, abnormal peak work forces, abnormal work schedules, abnormal project sizes, and shortage of qualified electricians, project location, general contractor, abnormal non-productive labor, and other conditions in addition to the selection of the correct rating column.

NECA Labor Factor Score Sheet

Within the Labor Factor Score Sheet, score each condition between 1 and 5, with 1 being normal working conditions and 5 being the most difficult working conditions. For scores between 36 and 75 use the Normal column, between 76 and 134 use the Difficult column, and use the Very Difficult column for scores between 135 and 175.

Conditions	Considerations	Score
Working conditions	Indoor, Controlled environment, Extreme conditions	
Working height	Up to 10', 10'-20', 20' +, Ladders/lifts/scaffold, Below grade	
Building height	Number of floors 1-3, 4-7, High-rise	
Building sq. ft.	Manageable, Moderate, Excessive	
Project size in dollars	Normal, Moderate, Extreme	
Site size	Urban setting, Ample laydown space	
Job conditions	New construction, Remodel, Work while occupied	
Type of construction	Frame, Block, Concrete or exposed	
Hours worked	40 hours/week; 5, 6 or 7 day work week; 8, 10 or 12 hour work day	
Shifts	Day, 2nd, 3rd	
Crew density	Normal, Moderate, Extreme	
Project duration	Normal, Compressed, Delayed, Fast track	
Safety	Standard OSHA guidelines, Customer directives, Project specific	
Clean-up	Routine, No dust, Clean room condition	
Installation	Repetitive, Moderate repetitive, No repetition	
Systems	Common systems, Special, Complex	
Conduit type	PVC, EMT, Flex or GRC, IMC, Aluminum, PVC coated GRC	
Accessibility of work area	Unlimited, Limited, Escorted	
Voltage	0-600V, 600-5Kv, Over 5Kv	
Inventory of local supplier	Adequate, Moderate, Limited	
Proximity of stored materials	On site, In general area of project, Remote	
Project continuity	Interruptions: None, Moderate, Extreme	
Construction	Standard, Poor, None	
Drawings/plans	% Complete, 100%, 95%, 50%, 35%, Less	
Information	Timely, Delayed, Limited	
Change order quantity	Minimal, Moderate, Excessive	
Craft coordination required	Minimum, Moderate, Extensive	
Authority having jurisdiction	Experience with type of project: Considerable, Moderate, Limited	
Decision making	Timely, Delayed, Limited	
Change order timing	Prior to installation, During, After	
Project schedule	As planned, Compressed/extended, Moderately, Extreme	
General contractors on same jobsite	Single prime, Two primes, Three + primes	
Job meetings	Regularly scheduled, Crisis meetings, Minimal	
Shared responsibility for project	One EC, Two EC's, Three + EC's on site	
Tools/equipment	Standard, Non-standard, Specialty	
Labor availability	Readily, Moderately, Limited, Non-available	
Total Score		

The NECA Labor Factor Score Sheet may be duplicated by purchasers of the Manual of Labor Units for the purposes of calculating project score. This document is also available online at www.necanet.org/MLU.

SECTION 1

INTEGRATED BUILDING SYSTEMS

General Information

The labor units in this section are applicable for the installation of various IBS systems including: fire alarm, security, clock, sound, audio visual, signaling, nurse call, computer, telephone and television. In addition, this section contains components of structured cabling systems including fiber optic cable and terminations, UTP cable and terminations, various electronic cable and cable terminations and other premises cabling items. See Section 13 for temperature controls.

Scope of These Labor Units

The Introduction section includes details on the scope of labor units across the manual. Some items included are:

- Material unloading, jobsite storage and delivery to the installation area
- Drawing and specification study
- Layout, measuring and marking the installation location
- Tool acquisition and return to storage
- Material assembly and installation
- Clean-up of electrical contractor furnished excess material
- Normal non-productive labor

Work Operations Not Included In These Labor Units

- Field supervision
- Programming
- Hanger or fastener installation
- Welding or painting
- Measurements and alignment more precise than normal industry standards
- Testing of any type unless specifically noted
- Cutting holes or openings in walls or floors
- Warranty

Labor Adjustments for Non-Typical Conditions

See the Introduction section for details.

Application Instructions

- Labor units under the "Normal" column are for heights up to ten feet above a smooth, hard floor. Labor units under the "Difficult" column are for heights up to twelve feet. Labor units under the "Very Difficult" column are for heights up to twenty feet.
- Labor units in this section do not include the installation of cable tray, outlet boxes, conduit, conduit connectors, supports or fasteners. See Section 2 for support, fastener and anchor labor units.
- Labor unit tables do not include every type and size of items available. When labor units are required for items not listed, an approximate labor unit may be obtained from the tables for a similar item of about the same weight, dimensions and conductor terminations.
- All the labor units in this section are based on using the most efficient tools and equipment available. When the anticipated jobsite conditions will prevent the optimum use of tools and equipment, an appropriate additional labor allowance in proportion to the anticipated difficulties is necessary.
- Labor units in this manual are for new work only and for a complete electrical installation. For remodeling or change order situations these labor units need to be substantially increased.

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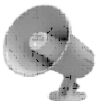
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Section 1 - Fire Alarm

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Fire Alarm Control Panels Hardwired						
	Up to 8 Zone		4.00	5.00	6.00		E
	Integrated Digital Communicator		1.00	1.25	1.50		E
	Remote Trouble Test Switch		0.30	0.35	0.40		E
	Hardwire Annunciator						
	Up to 8 Zone		4.00	5.00	6.25		E
	Addressable Control Panels - Modules Mounted in Control Panel						
	Relay Module		0.90	1.15	1.35		E
	4 Circuit Signal Module		0.90	1.15	1.35		E
	Panel Mount Control Switch		1.10	1.38	1.72		E
	Power Supply 6 Amps		2.00	2.50	3.00		E
	Voice Telephone Command		2.00	2.50	3.00		E
	Master Firefighter Telephone		2.00	2.50	3.00		E
	Amplifier		2.00	2.50	3.00		E
	Add. Address. Loop Modules		1.00	1.25	1.50		E
	Audio Message Generator		1.00	1.25	1.50		E
	Remote LCD Annunciator		2.00	2.50	3.00		E
	Fire Alarm Initiating Devices						
	Manual Station Non-Coded		0.50	0.63	0.78		E
	Manual Station Coded		0.50	0.63	0.78		E
	Manual Station Addressable		0.50	0.63	0.78		E
	Guard for Devices		0.60	0.75	0.94		E
	Detector Base		0.65	0.81	1.02		E
	Detector Head		0.20	0.25	0.31		E
	Addressable Base		0.65	0.81	1.02		E
	Addressable Head		0.20	0.25	0.31		E
	Duct Smoke Detector		2.00	2.50	3.00		E
	Duct Smoke Detector Test Station		0.80	1.00	1.20		E
	Duct Smoke Detector Remote Light		0.40	0.50	0.63		E
	Beam Detector Transmitter/Receiver		4.00	5.00	6.25		E
	Addressable Point ID Module		0.60	0.75	0.94		E
	Explosion proof Heat Detector w/Box		1.30	1.63	2.03		E
	Explosion proof Smoke Detector w/Box		1.30	1.63	2.03		E
	Explosion proof Manual Station w/Box		1.10	1.38	1.72		E
	Flow Switch, No Plumbing		1.20	1.50	1.88		E
	Tamper Switch, No Plumbing		1.20	1.50	1.88		E
	Pressure Switch, No Plumbing		1.20	1.50	1.88		E
	Fire Alarm - Signaling						
	Bell		0.75	1.00	1.25		E
	Strobe Light		0.75	1.00	1.25		E
	Bell/Strobe		0.75	1.00	1.25		E
	Chime		0.75	1.00	1.25		E
	Chime/Strobe		0.75	1.00	1.25		E
	Speaker, 8 Inch Ceiling		1.00	1.25	1.50		E
	Speaker, 4 Inch Wall		0.75	1.00	1.25		E
	Speaker/Strobe		0.75	1.00	1.25		E
	Fire Fighters Phone		1.25	1.60	2.00		E
	Fire Fighters Jack		0.50	0.75	1.00		E
	Remote Power Supply		3.00	3.75	4.50		E
	Mass Notification - Speaker / Strobe		0.75	1.00	1.25		E
	Mass Notification - Strobe		0.75	1.00	1.25		E
	Fire Alarm - Miscellaneous Devices						
	Waterproof Black box		0.50	0.63	0.75		E
	Semi-Flush Control Relay		0.75	1.00	1.25		E
	Addressable Control Relay		0.75	1.00	1.25		E
	Magnetic Door Holder		1.00	1.25	1.50		E
	4 Single Pole Double Throw Relay Surface Mtd. w/enclosure		0.90	1.15	1.35		E
	Printer		1.50	1.90	2.25		E
	Remote Power Supply		2.50	3.15	3.75		E
	Fire Alarm - Aspiring Smoke Detection	X					
	Aspiring Smoke Detector	X	4.000	5.000	6.000		E
	Aspiring Pipe 3/4"	X	5.000	6.200	7.500		C
	Aspiring Tubing 1/4"	X	14.00	17.50	21.00		M
	Aspiring Socket Coupling	X	0.050	0.060	0.070		E
	Aspiring Socket Union	X	0.050	0.060	0.070		E
	Aspiring Pipe 90 Long Radius	X	0.100	0.125	0.150		E
	Aspiring Pipe 45	X	0.100	0.125	0.150		E
	Aspiring End Cap	X	0.120	0.150	0.180		E
	Aspiring Pipe Clip	X	0.083	0.104	1.240		E
	Aspiring Pipe Entrance Point w/Label	X	0.100	0.125	0.150		E
	Aspiring Flush Sample Point Kit	X	0.25	0.31	0.38		E

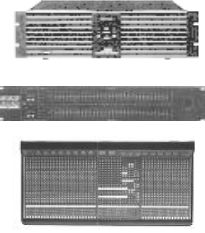
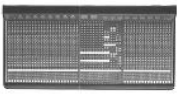


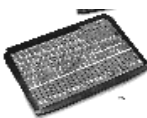
Security Systems - Control Panels

A close-up photograph of a digital clock display. The display is black with white LED segments. The time shown is 11:49. The digits are slightly blurred, suggesting motion or a shallow depth of field. The clock is mounted on a light-colored wall.

[illegible]

Section 1 - Audio Visual

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Sound Systems - Signal Generators						
	CD player		1.00	1.25	1.50		E
	AV Receiver		1.00	1.25	1.50		E
	Microphone		0.40	0.50	0.60		E
	Wireless Microphone & Rec		1.25	1.60	1.90		E
	Audio Cart Player		1.00	1.25	1.50		E
	Sound Systems - Signal Processing Equip.						
	Power Amp		2.50	3.15	3.75		E
	Pre-Amp		2.00	2.50	3.00		E
	Equalizer - Install		1.00	1.20	1.50		E
	Equalizer - Set		2.00	2.50	3.00		E
	4-12 Channel Mixer		2.00	2.50	3.00		E
	12+ Channel Mixer		4.00	5.00	6.00		E
	Volume Control		0.40	0.50	0.60		E
	Programmable Switch		0.80	1.00	1.20		E
	Speaker Selection Switch		0.80	1.00	1.20		E
	Noise Reduction Unit		2.00	2.50	3.00		E
	Filters, Various Types		0.80	1.00	1.20		E
	Delay Unit		1.00	1.25	1.50		E
	VU Meters		0.80	1.00	1.20		E
	Synch Generator		1.00	1.25	1.50		E
	Computer Interface		4.00	5.00	6.00		E
	Routing System		2.50	3.15	3.75		E
	Sound Systems - Sound Generating Equip.						
	Speaker - Ceiling (includes cutting hole)		0.75	0.95	1.15		E
	Speaker - Wall (Surface)		0.50	0.65	0.75		E
	Speaker - Wall (Flush)		0.75	0.95	1.15		E
	Speaker - Outdoor Column Mount		3.00	3.75	4.50		E
	Horn		0.50	0.65	0.75		E
	Microphone Outlet, Flush		0.80	1.00	1.20		E
	Intercom, Central Unit		8.00	10.00	12.00		E
	Intercom, Satellite Unit		0.80	1.00	1.20		E
	Wireless Speaker System		3.00	3.75	4.50		E
	Antenna		6.00	7.50	9.00		E
	19" Rack Adapter		0.50	0.65	0.75		E
	Microphone Stand		0.30	0.40	0.45		E
	Sound Systems - Pro-Sound - Theatrical Systems						
	Rack buildup, transport, seismic bracing		16.00	20.00	24.00		E
	Single channel rack-mount power amplifier		2.00	2.50	3.00		E
	Dual-channel rack-mounted power amplifier		2.25	2.80	3.40		E
	Amplifier with internal processing module		2.50	3.15	3.75		E
	Install and set up module for amplifier		0.50	0.65	0.75		E
	Wall mount amplifier with 6 input modules		4.00	5.00	6.00		E
	Production intercom master station		3.50	4.40	5.25		E
	Production intercom wall station, surface mount		1.50	1.90	2.25		E
	Production intercom belt-pack station		0.50	0.65	0.75		E
	Wireless microphone receiver, rack mount		1.50	1.90	2.25		E
	Hearing impaired transmitter, IR-based, rack mount		1.75	2.20	2.60		E
	Hearing impaired transmitter, RF-based, rack mount		1.75	2.20	2.60		E
	RF antenna for hearing impaired or wireless mic, wall mount		0.50	0.65	0.75		E
	Hearing impaired IR emitter unit with power supply		2.00	2.50	3.00		E



Section 1 - Audio Visual

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Audio Visual Systems - Programming and Switching						
	Line doubler		2.00	2.50	3.00		E
	Video distribution amp.		1.00	1.25	1.50		E
	Time code		2.00	2.50	3.00		E
	Matrix switcher programming per I/O point		2.00	2.50	3.00		E
	Matrix switcher (video) input/output per I/O point		2.00	2.50	3.00		E
	Automatic Patching		2.00	2.50	3.00		E
	Audio Visual Systems - Playback						
	13" monitor (rack)		1.00	1.25	1.50		E
	<25" monitor (wall)		2.00	2.50	3.00		E
	27" to 42" monitor (wall)		2.50	3.15	3.75		E
	42" to 60" monitor (wall)		3.00	3.75	4.50		E
	Wall Mount Monitor Bracket		2.00	2.50	3.00		E
	LCD Projector - Conference Room		2.50	3.15	4.50		E
	LCD Projector - Auditorium		8.00	10.00	12.00		E
	Audio Visual Systems - Remote Control						
	Main CPU cage		4.00	5.00	6.00		E
	Input/output cards		0.75	0.95	1.15		E
	Power supply		0.75	0.95	1.15		E
	Volume control		0.75	0.95	1.15		E
	Relay cards (4)		1.00	1.25	1.50		E
	Relay cards (8)		2.00	2.50	3.00		E
	Hard button panel (8-12)		2.00	2.50	3.00		E
	Audio Visual Systems - Interface Devices						
	Lighting (Communication Cable Connection)		1.00	1.25	1.56		E
	Lighting (relay)		2.00	2.50	3.13		E
	Dark out drapes (Communication Cable Connection)		1.00	1.25	1.56		E
	Dark out drapes (relay)		2.00	2.50	3.13		E
	Audio Visual Systems - Teleconference						
	Teleconference bridge		2.00	2.50	3.00		E
	Audio Visual Systems - Patching						
	BNC 24 port		16.00	20.00	24.00		E
	BNC 48 port		24.00	30.00	36.00		E
	BNC 96 port		48.00	60.00	72.00		E
	Twisted Pair 48 port		48.00	60.00	72.00		E
	Audio Visual Systems - Roll Down Screens						
	Manual		2.50	3.15	3.75		E
	Audio Visual Systems - Miscellaneous						
	Keyboard extender		0.50	0.65	0.75		E
	Wireless mouse		0.50	0.65	0.75		E
	Wireless keyboard		0.50	0.65	0.75		E
	Infrared repeater		1.00	1.25	1.50		E
	Electronic Equipment - Miscellaneous Components - Power Supplies						
	Power supplies 50 watt		0.40	0.50	0.60		E
	Electronic Equipment - Miscellaneous Components - Speakers						
	Speakers 18 watt		0.75	0.95	1.15		E
	Speakers 30 watt		0.75	0.95	1.15		E
	Speakers 50 watt		1.00	1.25	1.56		E
	Speakers 80 watt		2.00	2.50	3.13		E

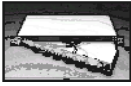
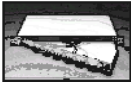
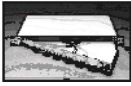
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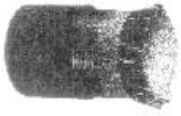
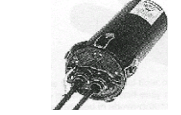
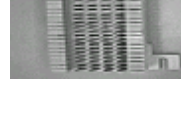
Section 1 - Cabling System

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Innerduct in Conduit - Indoor PVC/Plenum						
	1"		3.00	3.75	4.50		C
	1 1/4"		4.00	5.00	6.00		C
	1 1/2"		5.00	6.25	7.50		C
	2"		6.00	7.50	9.00		C
	Innerduct in Conduit - Outdoor PVC/Plenum						
	1"		3.00	3.75	4.50		C
	1 1/4"		4.00	5.00	6.00		C
	1 1/2"		5.00	6.25	7.50		C
	2"		6.00	7.50	9.00		C
	Innerduct: Not In Conduit - Indoor PVC / Plenum						
	1"		4.00	5.00	6.00		C
	1 1/4"		5.00	6.25	7.50		C
	1 1/2"		6.00	7.50	9.00		C
	2"		7.00	8.75	10.50		C
	Innerduct: Not In Conduit - Outdoor Buried (Reels) (Not Including Trenching)						
	1"		2.00	2.50	3.00		C
	1 1/4"		3.00	3.75	4.50		C
	1 1/2"		4.00	5.00	6.00		C
	2"		5.00	6.25	7.50		C
	Innerduct: Not In Conduit - Outdoor Aerial						
	1"		5.00	6.25	7.50		C
	1 1/4"		6.00	7.50	9.00		C
	1 1/2"		7.00	8.75	10.50		C
	2"		8.00	10.00	12.00		C
	Innerduct: Not In Conduit -Multi Duct (Not Incl. Trenching)						
	1 X 4		5.50	6.90	8.25		C
							
	Innerduct						
	1" Innerduct w/Tape - Indoor Tray		3.25	4.10	4.90		C
	1 1/4" Innerduct w/Tape - Indoor Tray		3.50	4.40	5.25		C
	1 1/2" Innerduct w/Tape - Indoor Tray		3.75	4.70	5.60		C
	2" Innerduct w/Tape - Indoor Tray		4.00	5.00	6.00		C
	1" Innerduct w/Rope - In Conduit		2.50	3.15	3.75		C
	1 1/2" Innerduct w/Tape - In Conduit		3.00	3.75	4.50		C
	Optical Fiber Cable - Indoor in Conduit						
	2-12 Strand PVC / Plenum		6.00	7.50	9.00		M
	12-96 Strand PVC / Plenum		7.00	8.75	10.50		M
	96-144 Strand PVC / Plenum		8.00	10.00	12.00		M
	Optical Fiber Cable - Indoor W/O Conduit						
	2-12 Strand PVC / Plenum		8.00	10.00	12.00		M
	12-96 Strand PVC / Plenum		9.00	11.25	13.50		M
	96-144 Strand PVC / Plenum		10.00	12.50	15.00		M
	Fabric Inter Duct						
	3" 3 cell		8.00	10.00	12.00		M
	2" 3 cell		8.00	10.00	12.00		M

Section 1 - Cabling System

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Terminations Anaerobic						
	SC		0.25	0.30	0.40		E
	ST		0.25	0.30	0.40		E
	LC		0.25	0.30	0.40		E
	MTRJ		0.25	0.30	0.40		E
	Crimp		0.25	0.30	0.40		E
							
	Hot Melt / Heat Cure / UV						
	SC		0.30	0.40	0.45		E
	ST		0.30	0.40	0.45		E
	LC		0.30	0.40	0.45		E
	MTRJ		0.40	0.50	0.60		E
	Termination Boxes / Cabinets - Wall Mounted						
	6 Port LIU		0.40	0.50	0.60		E
	8 Port LIU		0.40	0.50	0.60		E
	12 Port LIU		0.40	0.50	0.60		E
	16 Port LIU		0.40	0.50	0.60		E
	24 Port LIU		1.00	1.25	1.50		E
	48 Port LIU		1.00	1.25	1.50		E
	Termination Boxes / Cabinets - Rack Mount						
	24 Port		0.75	0.95	1.15		E
	72 Port		0.75	0.95	1.15		E
	Termination Boxes / Cabinets - Misc						
	Connector Panel		0.10	0.13	0.15		E
	Coupler		0.10	0.13	0.15		E
	Fiber Optic Cable - Patch Cords (Premade)						
	1M Simplex		0.10	0.13	0.15		E
	3M Simplex		0.10	0.13	0.15		E
	7M Simplex		0.15	0.19	0.23		E
	1MDuplex		0.10	0.13	0.15		E
	3M Duplex		0.10	0.13	0.15		E
	7M Duplex		0.15	0.19	0.23		E
	Fiber Optic Cable - Fiber Testing (one wave length)						
	Light Source / Continuity		0.20	0.25	0.30		E
	Power Meter - Single Direction		0.20	0.25	0.30		E
	Power Meter - Bi-Directional		0.30	0.40	0.45		E
	OTDR - Single Direction		0.20	0.25	0.30		E
	OTDR Bi-Directional		0.30	0.40	0.45		E
	OTDR - Single Direction W/ Documentation		0.50	0.65	0.75		E
	OTDR - Bi-Directional W/ Documentation		0.75	0.95	1.15		E
	Fiber Optic Cable - Fiber Labeling						
	(4) ID Points Per Strand		0.20	0.25	0.30		E
	Copper Cable - UTP - PVC / Plenum Indoor In Conduit						
	4 Pair *		7.00	8.75	10.50		M
	25 Pair *		8.00	10.00	12.00		M
	50 Pair		10.00	12.50	15.00		M
	100 Pair		12.00	15.00	18.00		M
	200 Pair		16.00	20.00	24.00		M
	300 Pair		24.00	30.00	36.00		M
	*Note: Includes CAT 3, 5, 5E and 6						
	*Note: Add 25% for CAT 6E, CAT 6A, CAT 9						

Section 1 - Cabling System

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Twisted Pair Cable - Riser Cable (Metal Jacket in Conduit)						
	100 Pair		16.00	20.00	24.00		M
	200 Pair		20.00	25.00	30.00		M
	300 Pair		28.00	35.00	42.00		M
	600 Pair		48.00	60.00	72.00		M
	900 Pair		96.00	120.00	144.00		M
	1200 Pair		144.00	180.00	216.00		M
	Twisted Pair Cable - Riser Cable Metal Jacket w/o Conduit						
	100 Pair		24.00	30.00	36.00		M
	200 Pair		30.00	37.50	45.00		M
	300 Pair		42.00	52.50	63.00		M
	600 Pair		72.00	90.00	108.00		M
	900 Pair		144.00	180.00	216.00		M
	1200 Pair		216.00	270.00	324.00		M
	Twisted Pair Cable - Outdoor Underground In Conduit (OSP)						
	Up to 100 Pair		14.00	17.50	21.00		M
	200 Pair		18.00	22.50	27.00		M
	300 Pair		26.00	32.50	39.00		M
	600 Pair		46.00	57.50	69.00		M
	900 Pair		92.00	115.00	138.00		M
	1200 Pair		136.00	170.00	204.00		M
	Twisted Pair Cable - Outdoor Direct Burial (OSP) Not Including Trenching						
	Up to 100 Pair		11.00	13.75	16.50		M
	200 Pair		16.00	20.00	24.00		M
	300 Pair		20.00	25.00	30.00		M
	600 Pair		24.00	30.00	36.00		M
	900 Pair		32.00	40.00	48.00		M
	1200 Pair		48.00	60.00	72.00		M
	Twisted Pair Cable - Outdoor Aerial (OSP)						
	Up to 100 Pair		40.00	50.00	60.00		M
	200 Pair		44.00	55.00	66.00		M
	300 Pair		48.00	60.00	72.00		M
	600 Pair		65.00	81.25	97.50		M
	900 Pair		70.00	87.50	105.00		M
	1200 Pair		75.00	93.75	112.50		M
	Copper Splice Enclosures						
	Pedestal		2.00	2.50	3.00		E
	Buried		4.00	5.00	6.00		E
	Aerial		4.00	5.00	6.00		E
	Underground		4.00	5.00	6.00		E
	Riser		3.00	3.75	4.50		E
	Splice Enclosures						
	710 25 Pr Module		0.50	0.65	0.75		E
	Pic-A-Bond Single Pair Module		0.25	0.30	0.40		E
	Scotch-lock Single Conductor Module		0.15	0.19	0.23		E
	Copper Termination Hardware						
	100 Pr 110 Block Mount Only		0.25	0.30	0.40		E
	300 Pr 110 Block Mount Only		0.25	0.30	0.40		E
	C4/C5 Clip		5.00	6.25	7.50		C
	110 Termination		2.00	2.50	3.00		C
	110 Designation Strip (25 Pr)		0.10	0.13	0.15		E
	66 Block Mount Only		0.25	0.30	0.40		E
	66 Termination		2.00	2.50	3.00		C
	66 Block Designation Strip		0.10	0.13	0.15		E
	89 B Bracket		0.25	0.30	0.40		E
	BIX Block Mount Only		0.25	0.30	0.40		E
	BIX Terminations		2.00	2.50	3.00		C
	BIX Block Designation Strips		0.10	0.13	0.15		E
	100 Pr Lightning Protector (Direct Termination) Mo		1.00	1.25	1.50		E
	100 Pr Lightning Protector (With Splice Tails) Mou		2.00	2.50	3.00		E
	Protector Modules		2.00	2.50	3.00		C

1-24

Section 1 - Low Voltage Lighting Control

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
           	The labor units are based on Lutron Grafik Eye, Ecosys and Quantum systems. Visit www.lutron.com for all component specifications						
	Lighting Control Systems						
	*** Note - Add additional labor to test and start-up these systems ***						
	**** Note - For Line Voltage see Section 6	X					
	Control Panel		8.00	10.00	12.50		E
	Control Panel - w/ Electric Shade Control		10.00	12.50	15.63		E
	2C #16AWG Cable (Plenum/Non-Plenum) w/o Conduit		16.00	20.00	25.00		M
	2C #18, 2#22AWG Cable (Plenum/Non-Plenum) w/o Conduit		17.00	21.25	26.56		M
	5C #22AWG Cable (Plenum/Non-Plenum) w/o Conduit		18.00	22.50	28.13		M
	2C #12, 2C #22, 1C #18, 1C #24 AWG (Plenum/Non-Plenum) w/o Conduit		20.00	25.00	31.25		M
	Termination of LV Digital Bus - Pre-Installed Ballast		0.30	0.38	0.47		E
	Termination of LV Digital Bus - Pre-Installed LED Driver		0.30	0.38	0.47		E
	Bus Supply Module		0.80	1.00	1.25		E
	Dimming Power Module for 3-wire Lutron Dimming Ballasts		0.80	1.00	1.25		E
	Emergency Lighting Interface Module		0.80	1.00	1.25		E
	Motor Group Controller		1.25	1.56	1.95		E
	Timeclock		1.50	1.88	2.34		E
	Sensor Module		0.80	1.00	1.25		E
	4-Button Wall Control with Raise/Lower		0.75	0.94	1.17		E
	Wireless Control and Mounting Accessories		0.35	0.44	0.55		E
	PicoR Wired Control		0.60	0.75	0.94		E
	Level Remote Control		0.25	0.31	0.39		E
	Fixture Mountable Infrared Sensor		0.50	0.63	0.78		E
	Fixture Mountable Daylight Sensor with IR Receiver		0.50	0.63	0.78		E
	Wireless Ceiling Mount Sensor		0.35	0.44	0.55		E
	Wireless Daylight Ceiling Mount Sensor		0.35	0.44	0.55		E
	Wireless Wall-Mount Sensor		0.35	0.44	0.55		E
	Dual Technology Ceiling Mount Sensor		0.50	0.63	0.79		E
	Infrared Ceiling Mount Sensor		0.50	0.63	0.79		E
	Ultrasonic Ceiling Mount Sensor		0.50	0.63	0.79		E
	Power Pack 120/277V-24V		0.50	0.63	0.79		E
	Auxiliary Power Pack 120/277V-24V		0.50	0.63	0.79		E
	AV Control Interface		0.80	1.00	1.25		E
	Ethernet Lighting and Shade Control Interface		0.75	0.94	1.17		E
	Lighting and Shade Control Interface		0.75	0.94	1.17		E
	Programming Control Interface		0.75	0.94	1.17		E
	DMX Control Interface		0.75	0.94	1.17		E
	DMX 512 Control Interface		1.25	1.56	1.95		E
	Control Interface for Misc Points		0.75	0.94	1.17		E
	Infrared Transmitter/Receiver Pair		1.00	1.25	1.56		E
	2-Button Scene/Pushbutton Wallstation		0.65	0.81	1.02		E
	3-Button Scene/Pushbutton Wallstation		0.85	1.06	1.33		E
	4-Button Scene/Pushbutton Wallstation		1.05	1.31	1.64		E
	5-Button Scene/Pushbutton Wallstation		1.30	1.63	2.03		E
	6-Button Scene/Pushbutton Wallstation		1.80	2.25	2.81		E
	7-Button Scene/Pushbutton Wallstation		2.00	2.50	3.13		E
	8-Button Scene/Pushbutton Wallstation		2.25	2.81	3.52		E
	10-Button Scene/Pushbutton Wallstation		2.50	3.13	3.91		E
	Keyswitch Wallstation		0.45	0.56	0.70		E
	Wall Mount 120v Main Unit - 3 Zone		4.00	5.00	6.25		E
	Wall Mount 120v Main Unit - 4 Zone		5.00	6.25	7.81		E
	Wall Mount 120v Main Unit - 6 Zone		6.00	7.50	9.38		E
	Wall Mount LV Main Unit - 2 Zone		4.00	5.00	6.25		E
	Wall Mount LV Main Unit - 3 Zone		4.00	5.00	6.25		E
	Wall Mount LV Main Unit - 4 Zone		5.00	6.25	7.81		E
	Wall Mount LV Main Unit - 6 Zone		6.00	7.50	9.38		E
	Wall Mount LV Main Unit - 8 Zone		7.00	8.75	10.94		E
	Wall Mount LV Main Unit - 16 Zone		10.00	12.50	15.63		E
	Wall Mount LV Main Unit - 24 Zone		12.00	15.00	18.75		E
	Slider Control Unit		4.00	5.00	6.25		E

SECTION 2

CONDUIT, RACEWAYS, FITTINGS AND RELATED ITEMS

General Information

This section includes labor units for conduit, conduit fittings, conduit bending, boxes, enclosures, surface metal raceways, underfloor duct, cable trays, anchors, fasteners, supports, fireproofing material and related items.

Scope of These Labor Units

The Introduction section includes details on the scope of labor units across the manual. Some items included are:

- Material unloading, jobsite storage and delivery to the installation area
- Drawing and specification study
- Layout, measuring and marking the installation location
- Tool acquisition and return to storage
- Measuring, cutting, threading and handling conduit
- Material assembly and installation
- Conduit offset bending
- Normal non-productive labor

Work Operations Not Included In These Labor Units

- Field supervision
- Hoisting above three floors
- Welding or painting
- Fasteners for conduit (List separately and apply fastener labor units)
- Rerouting conduit due to structural or mechanical obstacles

Labor Adjustments for Non-Typical Conditions

See the Introduction section for details.

Application Instructions

- Labor units for conduit termination material include installing the locknuts and bushings as well as measuring, cutting, offset bending of sizes ½"-1", threading and installing a less than full length of conduit, which is normally required on one end of each circuit run.
- Labor for terminating conduit in threaded hub fittings and threaded hub boxes is included in the hub fitting or hub box labor units.
- The labor units for conduit terminations with ground bushings include the labor for connecting the grounding conductor.
- Labor units for conduit factory elbows include the coupling and elbow installation labor as well as the measuring, cutting, threading and installation of a less than full length of conduit, which is normally required on one end of each elbow.
- For installations more than 20 feet above a smooth hard floor, these labor units need to be increased in proportion to the additional height above 20 feet and the degree of installation difficulty.
- Labor units in this manual are for new work only and for a complete electrical installation. For remodeling or change order situations these labor units need to be substantially increased.
- Labor units for buried plastic conduit outside of buildings may be found in Section 11.
- Reducing the estimated labor due to multiple parallel runs is a common practice as installing multiple parallel runs of similar raceway material will increase efficiency and productivity. Caution should be taken and all other installation conditions should be considered before applying such factoring as there is no safe way to predict a factor amount and its relationship with the number of runs and assume that it would apply to all job conditions. Appendix E contains a chart to help address this impact.

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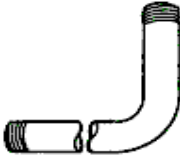
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Section 2 - Conduit, Raceways, Fittings & Related Items

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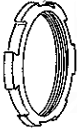
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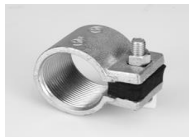
Section 2 - Conduit, Raceways, Fittings & Related Items

	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%						
	Field Bending Steel Conduit & Installation						
	Add approx 20% for each field cut & thread						
	Add 50% For Wide Sweep Segment Bend						
	1 1/4"		1.20	1.50	1.80		E
	1 1/2"		1.50	1.90	2.25		E
	2"		2.00	2.50	3.00		E
	2 1/2"		2.75	3.40	4.05		E
	3"		3.50	4.35	5.25		E
	3 1/2"		4.25	5.25	6.35		E
	4"		5.00	6.25	7.50		E
	5"		7.00	8.75	10.50		E
	6"		9.00	11.25	13.50		E
	For Stainless Steel Conduit & Fittings Add 25%						
	Lock Nut & Bushing Sets - Field Cut & Thread Included						
	1/2"		0.30	0.37	0.45		E
	3/4"		0.35	0.43	0.52		E
	1"		0.40	0.50	0.60		E
	1 1/4"		0.50	0.62	0.75		E
	1 1/2"		0.60	0.75	0.90		E
	2"		0.80	1.00	1.20		E
	2 1/2"		1.00	1.25	1.50		E
	3"		1.20	1.50	1.80		E
	3 1/2"		1.40	1.75	2.10		E
	4"		1.60	2.00	2.40		E
	5"		1.90	2.40	2.90		E
	6"		2.30	2.90	3.50		E
	For Stainless Steel Conduit & Fittings Add 25%						
	Plastic Bushing Only						
	1/2"		0.10	0.12	0.15		E
	3/4"		0.12	0.14	0.17		E
	1"		0.13	0.17	0.20		E
	1 1/4"		0.17	0.21	0.25		E
	1 1/2"		0.20	0.25	0.30		E
	2"		0.27	0.33	0.40		E
	2 1/2"		0.33	0.42	0.50		E
	3"		0.40	0.50	0.60		E
	3 1/2"		0.47	0.58	0.70		E
	4"		0.53	0.67	0.80		E
	5"		0.63	0.80	0.97		E
	6"		0.77	0.97	1.17		E

Section 2 - Conduit, Raceways, Fittings & Related Items

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	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Rigid Conduit Locknut Only						
	1/2"		0.10	0.12	0.15		E
	3/4"		0.12	0.14	0.17		E
	1"		0.13	0.17	0.20		E
	1 1/4"		0.17	0.21	0.25		E
	1 1/2"		0.20	0.25	0.30		E
	2"		0.27	0.33	0.40		E
	2 1/2"		0.33	0.42	0.50		E
	3"		0.40	0.50	0.60		E
	3 1/2"		0.47	0.58	0.70		E
	4"		0.53	0.67	0.80		E
	5"		0.63	0.80	0.97		E
	6"		0.77	0.97	1.17		E
	Lock Nut & Ground Bushing Sets						
	Field Cut & Thread Included						
	1/2"		0.40	0.50	0.60		E
	3/4"		0.45	0.56	0.67		E
	1"		0.50	0.62	0.75		E
	1 1/4"		0.60	0.75	0.90		E
	1 1/2"		0.80	1.00	1.20		E
	2"		1.00	1.25	1.50		E
	2 1/2"		1.20	1.50	1.80		E
	3"		1.40	1.75	2.10		E
	3 1/2"		1.60	2.00	2.40		E
	4"		1.90	2.35	2.85		E
	5"		2.20	2.75	3.30		E
	6"		2.70	3.40	4.00		E
	<i>For Stainless Steel Conduit & Fittings Add 25%</i>						
	Factory Cut Rigid Steel Nipples - Up to 12" Length Maximum						
	1/2"		0.25	0.31	0.37		E
	3/4"		0.30	0.37	0.45		E
	1"		0.35	0.43	0.52		E
	1 1/4"		0.40	0.50	0.60		E
	1 1/2"		0.50	0.62	0.75		E
	2"		0.60	0.75	0.90		E
	2 1/2"		0.75	0.94	1.12		E
	3"		0.90	1.12	1.35		E
	3 1/2"		1.10	1.37	1.65		E
	4"		1.30	1.62	1.95		E
	5"		1.50	1.87	2.25		E
	6"		1.80	2.25	2.70		E
	<i>For Stainless Steel Conduit & Fittings Add 25%</i>						
	Field Cut Rigid Steel Nipples & Installation						
	Up to 12" Length Maximum						
	1/2"		0.50	0.62	0.74		E
	3/4"		0.60	0.74	0.90		E
	1"		0.70	0.86	1.04		E
	1 1/4"		0.80	1.00	1.20		E
	1 1/2"		1.00	1.24	1.50		E
	2"		1.20	1.50	1.80		E
	2 1/2"		1.45	1.81	2.17		E
	3"		1.75	2.17	2.60		E
	3 1/2"		2.10	2.62	3.15		E
	4"		2.50	3.12	3.75		E
	5"		3.40	4.22	5.10		E
	6"		4.10	5.15	6.20		E
	<i>For Stainless Steel Conduit & Fittings Add 25%</i>						
	Steel Chase Nipples - Includes Locknut & Bushing						
	1/2"		0.12	0.15	0.18		E
	3/4"		0.14	0.17	0.21		E
	1"		0.17	0.21	0.25		E
	1 1/4"		0.20	0.25	0.30		E
	1 1/2"		0.25	0.31	0.37		E
	2"		0.30	0.37	0.45		E
	2 1/2"		0.35	0.43	0.52		E
	3"		0.40	0.50	0.60		E
	3 1/2"		0.45	0.56	0.67		E
	4"		0.50	0.62	0.75		E
	<i>For Stainless Steel Conduit & Fittings Add 25%</i>						
	Steel Offset Nipples - Includes Locknut & Bushings						
	1/2"		0.25	0.31	0.37		E
	3/4"		0.30	0.37	0.45		E
	1"		0.35	0.43	0.52		E
	1 1/4"		0.40	0.50	0.60		E
	1 1/2"		0.45	0.56	0.67		E
	2"		0.50	0.62	0.75		E
	<i>For Stainless Steel Conduit & Fittings Add 25%</i>						

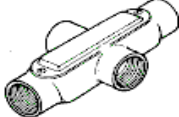


Section 2 - Conduit, Raceways, Fittings & Related Items

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	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Steel Threadless Box Connectors						
	1/2"		0.30	0.37	0.45		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"		0.70	0.85	1.00		E
	2"		0.80	1.00	1.20		E
	2 1/2"		0.90	1.10	1.35		E
	3"		1.00	1.25	1.50		E
	3 1/2"		1.10	1.35	1.60		E
	4"		1.20	1.45	1.70		E
	Steel Threaded Box Connectors (Myers Hub)						
	1/2"		0.35	0.44	0.55		E
	3/4"		0.45	0.56	0.70		E
	1"		0.55	0.69	0.86		E
	1 1/4"		0.65	0.81	1.02		E
	1 1/2"		0.75	0.94	1.17		E
	2"		0.85	1.06	1.33		E
	2 1/2"		0.95	1.19	1.48		E
	3"		1.05	1.31	1.64		E
	3 1/2"		1.15	1.44	1.80		E
	4"		1.25	1.56	1.95		E
	Steel Threaded Service Entrance Caps						
	1/2"		0.60	0.75	0.90		E
	3/4"		0.70	0.87	1.05		E
	1"		0.80	1.00	1.20		E
	1 1/4"		0.90	1.12	1.35		E
	1 1/2"		1.00	1.25	1.50		E
	2"		1.25	1.55	1.85		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
	Steel Threaded Capped Elbows						
	1/2"		0.50	0.62	0.75		E
	3/4"		0.60	0.75	0.90		E
	1"		0.70	0.87	1.05		E
	1 1/4"		0.80	1.00	1.20		E
	1 1/2"		1.00	1.25	1.50		E
	2"		1.20	1.50	1.80		E
	Steel Pipe Caps or Capped Bushings						
	1/2"		0.15	0.18	0.22		E
	3/4"		0.16	0.20	0.24		E
	1"		0.18	0.22	0.27		E
	1 1/4"		0.20	0.25	0.30		E
	1 1/2"		0.25	0.31	0.37		E
	2"		0.30	0.37	0.45		E
	2 1/2"		0.35	0.43	0.52		E
	3"		0.40	0.50	0.60		E
	3 1/2"		0.45	0.56	0.67		E
	4"		0.50	0.62	0.75		E
	5"		0.55	0.68	0.82		E
	6"		0.60	0.75	0.90		E
	Steel Threaded Conduit Bodies-One Hub						
	1/2"		0.40	0.50	0.60		E
	3/4"		0.50	0.62	0.75		E
	1"		0.60	0.75	0.90		E
	Steel Threaded Conduit Bodies-Two Hubs						
	1/2"		0.50	0.62	0.75		E
	3/4"		0.65	0.80	0.95		E
	1"		0.80	1.00	1.20		E
	1 1/4"		1.00	1.25	1.50		E
	1 1/2"		1.50	1.85	2.25		E
	2"		2.00	2.50	3.00		E
	2 1/2"		2.75	3.40	4.10		E
	3"		3.50	4.35	5.25		E
	3 1/2"		4.25	5.30	6.35		E
	4"		5.00	6.25	7.50		E

Section 2 - Conduit, Raceways, Fittings & Related Items

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Steel Threaded Conduit Bodies-Three Hubs						
	1/2"		0.80	1.00	1.20		E
	3/4"		1.00	1.25	1.50		E
	1"		1.25	1.55	1.85		E
	1 1/4"		1.50	1.85	2.25		E
	1 1/2"		2.00	2.50	3.00		E
	2"		2.75	3.40	4.10		E
	2 1/2"		3.50	4.35	5.25		E
	3"		4.50	5.60	6.75		E
	3 1/2"		5.50	6.85	8.25		E
	4"		6.50	8.10	9.75		E
	Steel Threaded Conduit Bodies-Four Hubs						
	1/2"		1.00	1.25	1.50		E
	3/4"		1.25	1.55	1.85		E
	1"		1.50	1.85	2.25		E
	1 1/4"		2.25	2.80	3.35		E
	1 1/2"		3.00	3.75	4.50		E
	2"		4.00	5.00	6.00		E
	2 1/2"		5.00	6.25	7.50		E
	3"		6.00	7.50	9.00		E
	3 1/2"		7.00	8.75	10.50		E
	4"		8.00	10.00	12.00		E
	Steel Mogul Conduit Bodies-Two Hubs						
	1"		1.00	1.25	1.50		E
	1 1/4"		1.50	1.85	2.25		E
	1 1/2"		2.00	2.50	3.00		E
	2"		2.50	3.10	3.75		E
	2 1/2"		3.00	3.75	4.50		E
	3"		3.50	4.35	5.25		E
	3 1/2"		4.25	5.30	6.35		E
	4"		5.00	6.25	7.50		E
	Steel Mogul Conduit Bodies-Three Hubs						
	1"		1.50	1.85	2.25		E
	1 1/4"		2.00	2.50	3.00		E
	1 1/2"		2.50	3.10	3.75		E
	2"		3.00	3.75	4.50		E
	2 1/2"		3.50	4.35	5.25		E
	3"		4.00	5.00	6.00		E
	3 1/2"		5.00	6.25	7.25		E
	4"		6.00	7.50	9.00		E
	Steel Mogul Conduit Bodies-Four Hubs						
	1"		2.50	3.10	3.75		E
	1 1/4"		3.00	3.75	4.50		E
	1 1/2"		3.50	4.35	5.25		E
	2"		4.00	5.00	6.00		E
	2 1/2"		4.50	5.60	6.75		E
	3"		5.00	6.25	7.50		E
	3 1/2"		6.00	7.50	9.00		E
	4"		7.00	8.75	10.50		E
	Iron FS & FD Threaded 1-Gang Boxes						
	1/2" One Hub		0.60	0.75	0.90		E
	3/4" One Hub		0.70	0.85	1.05		E
	1" One Hub		0.85	1.05	1.25		E
	1/2" Two Hubs		0.80	1.00	1.20		E
	3/4" Two Hubs		0.95	1.15	1.40		E
	1" Two Hubs		1.15	1.40	1.70		E
	1/2" Three Hubs		1.00	1.25	1.50		E
	3/4" Three Hubs		1.20	1.50	1.80		E
	1" Three Hubs		1.45	1.80	2.15		E
	1/2" Four Hubs		1.20	1.50	1.80		E
	3/4" Four Hubs		1.45	1.80	2.15		E
	1" Four Hubs		1.75	2.15	2.60		E
	Iron FS & FD Threaded 2-Gang Boxes						
	1/2" One Hub		0.65	0.80	1.00		E
	3/4" One Hub		0.75	0.90	1.10		E
	1" One Hub		0.90	1.10	1.35		E
	1/2" Two Hubs		0.85	1.05	1.25		E
	3/4" Two Hubs		1.00	1.25	1.50		E
	1" Two Hubs		1.20	1.50	1.80		E
	1/2" Three Hubs		1.05	1.30	1.55		E
	3/4" Three Hubs		1.25	1.55	1.85		E
	1" Three Hubs		1.50	1.85	2.25		E



Knockout Type Steel Boxes					
4" Square Boxes		30.00	35.00	40.00	C
4" Octagon Boxes		30.00	35.00	40.00	C
4 11/16" Square Boxes		30.00	35.00	40.00	C
4" Concrete Boxes		40.00	45.00	50.00	C
4" Handy Boxes		25.00	30.00	35.00	C
4" Switch Boxes		25.00	30.00	35.00	C
2-Gang Solid Boxes		25.00	30.00	35.00	C
3-Gang Solid Boxes		27.00	32.00	37.00	C
4-Gang Solid Boxes		30.00	35.00	40.00	C
5-Gang Solid Boxes		33.00	38.00	43.00	C
6-Gang Solid Boxes		36.00	41.00	46.00	C
7-Gang Solid Boxes		40.00	45.00	50.00	C
8-Gang Solid Boxes		45.00	50.00	55.00	C
4" Hung Ceiling Boxes		45.00	50.00	55.00	C

6" Square Boxes-Blank/Customizable	X	0.40	0.45	0.50	E
6" Square Boxes -with ko's	X	0.40	0.45	0.50	E
6" Flat cover	X	0.10	0.12	0.15	E
6" 1 Gang Mud Ring	X	0.15	0.20	0.25	E
6" 2 Gang Mud Ring	X	0.15	0.20	0.25	E
6" Three Gang Mud Ring	X	0.15	0.20	0.25	E
Add for KO in Blank Box	X				E
Ceiling Fan Box with Adjustable Stud Bracket	X	0.50	0.75	1.00	E
Ceiling Fan Box-Direct Mount to Rafter	X	0.40	0.50	0.65	E

Knockout Type Steel Boxes - Masonry					
1-Gang Masonry & Tile Boxes		35.00	40.00	45.00	C
2-Gang Masonry & Tile Boxes		37.00	42.00	47.00	C
3-Gang Masonry & Tile Boxes		40.00	45.00	50.00	C
4-Gang Masonry & Tile Boxes		45.00	50.00	55.00	C

Knockout Type Steel Boxes - Wall Boxes					
1-Gang Thru-Wall Boxes	35.00	40.00	45.00		C
2-Gang Thru-Wall Boxes	37.00	42.00	47.00		C
3-Gang Thru-Wall Boxes	40.00	45.00	50.00		C

Knockout Type Steel Boxes - Accessories					
Box Extensions-All Types		20.00	25.00	30.00	C
Plaster Rings-All Sizes		15.00	20.00	25.00	C
Tile Rings-All Sizes		17.50	22.00	27.50	C
Box Covers-All Types		8.00	9.00	10.00	C

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[illegible]

Section 2 - Conduit, Raceways, Fittings & Related Items

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	EMT Compression Couplings						
	1/2"		0.12	0.15	0.18		E
	3/4"		0.14	0.17	0.21		E
	1"		0.16	0.20	0.24		E
	1 1/4"		0.20	0.25	0.30		E
	1 1/2"		0.25	0.31	0.37		E
	2"		0.30	0.37	0.45		E
	2 1/2"		0.40	0.50	0.60		E
	3"		0.45	0.56	0.67		E
	3 1/2"		0.50	0.62	0.75		E
	4"		0.60	0.75	0.90		E
	EMT Service Elbows						
	1/2"		0.40	0.50	0.60		E
	3/4"		0.45	0.56	0.67		E
	1"		0.50	0.62	0.75		E
	1 1/4"		0.60	0.75	0.90		E
	1 1/2"		0.70	0.87	1.05		E
	2"		0.80	1.25	1.50		E
	EMT Service Entrance Caps						
	1/2"		0.50	0.62	0.75		E
	3/4"		0.55	0.68	0.82		E
	1"		0.60	0.75	0.90		E
	1 1/4"		0.70	0.87	1.05		E
	1 1/2"		0.85	1.05	1.25		E
	2"		1.00	1.25	1.50		E
	2 1/2"		1.25	1.55	1.85		E
	3"		1.50	1.85	2.25		E
	3 1/2"		1.75	2.15	2.60		E
	4"		2.00	2.50	3.00		E
	EMT to Rigid Conduit Adapters						
	1/2"		0.15	0.20	0.25		E
	3/4"		0.20	0.25	0.30		E
	1"		0.25	0.31	0.37		E
	1 1/4"		0.30	0.37	0.45		E
	1 1/2"		0.35	0.43	0.52		E
	EMT to Flexible Conduit Couplings						
	1/2"		0.12	0.15	0.18		E
	3/4"		0.15	0.18	0.22		E
	1"		0.20	0.25	0.30		E
	1 1/4"		0.25	0.31	0.37		E
	1 1/2"		0.30	0.37	0.45		E
	2"		0.40	0.50	0.60		E
	2 1/2"		0.50	0.62	0.75		E
	3"		0.60	0.75	0.90		E
	3 1/2"		0.75	0.93	1.12		E
	4"		1.00	1.25	1.50		E
	EMT to EMT Reducing Couplings						
	1/2" to 3/4"		0.06	0.07	0.08		E
	3/4" to 1"		0.08	0.09	0.10		E
	1" to 1 1/4"		0.10	0.11	0.13		E
	1 1/4" to 1 1/2"		0.12	0.14	0.16		E
	1 1/2" to 2"		0.14	0.16	0.18		E
	2" to 2 1/2"		0.16	0.18	0.20		E
	2 1/2" to 3"		0.20	0.22	0.24		E
	3" to 3 1/2"		0.22	0.24	0.26		E
	3 1/2" to 4"		0.24	0.26	0.28		E
	EMT Expansion/Deflection Coupling-Includes Bonding Jumper	X					
	1/2"	X	0.50	0.65	0.80		E
	3/4"	X	0.55	0.70	0.85		E
	1"	X	0.60	0.75	0.90		E
	1 1/4"	X	0.65	0.80	0.95		E
	1 1/2"	X	0.70	0.85	1.00		E
	2"	X	0.85	1.00	1.15		E
	2 1/2"	X	0.95	1.15	1.30		E
	3"	X	1.10	1.25	1.40		E
	3 1/2"	X	1.30	1.50	1.75		E
	4"	X	1.50	1.75	2.25		E

Section 2 - Conduit, Raceways, Fittings & Related Items

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Intermediate Metal Conduit (IMC) and Fittings						
	Intermediate Metal Conduit (IMC) with Couplings						
	1/2"		5.00	6.20	7.50		C
	3/4"		5.50	6.80	8.20		C
	1"		6.00	7.50	9.00		C
	1 1/4"		7.00	8.70	10.50		C
	1 1/2"		8.00	10.00	12.00		C
	2"		9.00	11.20	13.50		C
	2 1/2"		12.00	15.00	18.00		C
	3"		15.00	18.70	22.50		C
							
	IMC Factory Elbows						
	1/2"		0.35	0.43	0.52		E
	3/4"		0.40	0.52	0.60		E
	1"		0.50	0.60	0.75		E
	1 1/4"		0.60	0.75	0.90		E
	1 1/2"		0.75	0.93	1.15		E
	2"		0.90	1.15	1.35		E
	2 1/2"		1.30	1.60	1.95		E
	3"		1.70	2.10	2.55		E
							
	Field Bending IMC Conduit and Installation						
	Add approx 20% for each field cut & thread						
	1 1/4"		1.20	1.50	1.80		E
	1 1/2"		1.50	1.86	2.30		E
	2"		1.80	2.30	2.70		E
	2 1/2"		2.55	3.15	3.80		E
	3"		3.20	3.95	4.80		E
	3 1/2"		3.85	4.75	5.75		E
	4"		4.50	5.60	6.75		E
							
	IMC Field Cut Nipples and Installation - 12" Length Maximum						
	1/2"		0.50	0.62	0.74		E
	3/4"		0.60	0.74	0.90		E
	1"		0.70	0.86	1.04		E
	1 1/4"		0.80	1.00	1.20		E
	1 1/2"		1.00	1.24	1.50		E
	2"		1.20	1.50	1.80		E
	2 1/2"		1.45	1.81	2.17		E
	3"		1.75	2.17	2.60		E

Section 2 - Conduit, Raceways, Fittings & Related Items

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Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Rigid Aluminum Conduit and Fittings						
Rigid Aluminum Conduit with Couplings						
1/2"		5.00	6.20	7.50		C
3/4"		5.50	6.80	8.20		C
1"		6.00	7.50	9.00		C
1 1/4"		6.50	8.10	9.70		C
1 1/2"		7.00	8.70	10.50		C
2"		8.00	10.00	12.00		C
2 1/2"		10.00	12.50	15.00		C
3"		12.00	15.00	18.00		C
3 1/2"		15.00	18.70	22.50		C
4"		19.00	23.70	28.50		C
5"		24.00	30.00	36.00		C
6"		30.00	37.50	45.00		C
<i>Note: Add 25% for PVC Coated Aluminum</i>						
Rigid Aluminum Factory Elbows						
1/2"		0.25	0.31	0.37		E
3/4"		0.30	0.37	0.45		E
1"		0.35	0.43	0.52		E
1 1/4"		0.40	0.50	0.60		E
1 1/2"		0.50	0.62	0.75		E
2"		0.75	0.93	1.12		E
2 1/2"		1.00	1.25	1.50		E
3"		1.30	1.60	1.95		E
3 1/2"		1.60	2.00	2.40		E
4"		2.00	2.50	3.00		E
5"		2.50	3.10	3.75		E
6"		3.00	3.75	4.50		E
<i>Note: Add 25% for PVC Coated Aluminum</i>						
Field Bending Rigid Aluminum Conduit and Installation						
Add approx 20% for each field cut & thread						
1 1/4"		0.80	1.00	1.20		E
1 1/2"		1.00	1.24	1.50		E
2"		1.50	1.86	2.24		E
2 1/2"		2.00	2.50	3.00		E
3"		2.50	3.10	3.75		E
3 1/2"		3.00	3.75	4.50		E
4"		3.75	4.65	5.60		E
5"		4.75	5.80	7.10		E
6"		6.00	7.50	9.00		E
<i>Note: Add 25% for PVC Coated Aluminum</i>						
Aluminum Lock Nut & Bushing Sets						
Field Cut & Thread Included						
1/2"		0.30	0.37	0.45		E
3/4"		0.35	0.43	0.52		E
1"		0.40	0.50	0.60		E
1 1/4"		0.50	0.62	0.75		E
1 1/2"		0.60	0.75	0.90		E
2"		0.80	1.00	1.20		E
2 1/2"		1.00	1.25	1.50		E
3"		1.20	1.50	1.80		E
3 1/2"		1.40	1.75	2.10		E
4"		1.60	2.00	2.40		E
5"		1.80	2.25	2.70		E
6"		2.00	2.50	3.00		E
Aluminum Lock Nut & Ground Bushing Sets						
Field Cut & Thread Included						
1/2"		0.40	0.50	0.60		E
3/4"		0.45	0.56	0.67		E
1"		0.50	0.62	0.75		E
1 1/4"		0.60	0.75	0.90		E
1 1/2"		0.80	1.00	1.20		E
2"		1.00	1.25	1.50		E
2 1/2"		1.20	1.50	1.80		E
3"		1.40	1.75	2.10		E
3 1/2"		1.60	2.00	2.40		E
4"		1.80	2.25	2.70		E
5"		2.10	2.60	3.15		E
6"		2.40	3.00	3.60		E

Section 2 - Conduit, Raceways, Fittings & Related Items

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Aluminum Factory Cut Nipples - 12" Length Maximum						
	1/2"		0.25	0.31	0.37		E
	3/4"		0.30	0.37	0.45		E
	1"		0.35	0.43	0.52		E
	1 1/4"		0.40	0.50	0.60		E
	1 1/2"		0.50	0.62	0.75		E
	2"		0.60	0.75	0.90		E
	2 1/2"		0.75	0.93	1.12		E
	3"		0.90	1.12	1.35		E
	3 1/2"		1.10	1.37	1.65		E
	4"		1.30	1.62	1.95		E
	5"		1.50	1.85	2.25		E
	6"		1.80	2.25	2.70		E
	Aluminum Field Cut Nipples and Installation - 12" Length Maximum						
	1/2"		0.60	0.74	0.89		E
	3/4"		0.70	0.87	1.05		E
	1"		0.80	0.99	1.19		E
	1 1/4"		0.90	1.12	1.35		E
	1 1/2"		1.10	1.37	1.65		E
	2"		1.40	1.75	2.10		E
	2 1/2"		1.75	2.19	2.62		E
	3"		2.10	2.62	3.15		E
	3 1/2"		2.50	3.12	3.75		E
	4"		2.90	3.62	4.35		E
	5"		3.30	4.12	4.95		E
	6"		3.90	4.85	5.85		E
	Aluminum Chase Nipples - Includes Locknut & Bushing						
	1/2"		0.12	0.15	0.18		E
	3/4"		0.14	0.17	0.21		E
	1"		0.17	0.21	0.25		E
	1 1/4"		0.20	0.25	0.30		E
	1 1/2"		0.25	0.31	0.37		E
	2"		0.30	0.37	0.45		E
	2 1/2"		0.35	0.43	0.52		E
	3"		0.40	0.50	0.60		E
	3 1/2"		0.40	0.50	0.60		E
	4"		0.50	0.62	0.75		E
	Aluminum Offset Nipples - Includes Locknut & Bushings						
	1/2"		0.25	0.31	0.37		E
	3/4"		0.30	0.37	0.45		E
	1"		0.35	0.43	0.52		E
	1 1/4"		0.40	0.50	0.60		E
	1 1/2"		0.45	0.56	0.67		E
	2"		0.50	0.62	0.75		E
	Aluminum Female Threaded Reducers - Includes Locknut & Bushing						
	1/2"		0.15	0.18	0.22		E
	3/4"		0.17	0.21	0.26		E
	1"		0.20	0.25	0.30		E
	1 1/4"		0.23	0.28	0.34		E
	1 1/2"		0.25	0.32	0.39		E
	2"		0.30	0.37	0.45		E
	2 1/2"		0.35	0.43	0.52		E
	3"		0.40	0.50	0.60		E
	3 1/2"		0.45	0.56	0.67		E
	4"		0.50	0.62	0.75		E
	Aluminum Compression Couplings						
	1/2"		0.20	0.25	0.30		E
	3/4"		0.25	0.31	0.37		E
	1"		0.30	0.37	0.45		E
	1 1/4"		0.40	0.50	0.60		E
	1 1/2"		0.50	0.62	0.75		E
	2"		0.60	0.75	0.90		E
	2 1/2"		0.70	0.87	1.05		E
	3"		0.80	1.00	1.20		E
	3 1/2"		0.90	1.12	1.35		E
	4"		1.00	1.25	1.50		E



Section 2 - Conduit, Raceways, Fittings & Related Items

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Aluminum Threaded Capped Elbows						
	1/2"		0.50	0.62	0.75		E
	3/4"		0.60	0.75	0.90		E
	1"		0.70	0.87	1.05		E
	1 1/4"		0.80	1.00	1.20		E
	1 1/2"		1.00	1.25	1.50		E
	2"		1.20	1.50	1.80		E
	Aluminum Pipe Caps or Capped Bushings						
	1/2"		0.15	0.18	0.22		E
	3/4"		0.16	0.20	0.24		E
	1"		0.18	0.22	0.27		E
	1 1/4"		0.20	0.25	0.30		E
	1 1/2"		0.25	0.31	0.37		E
	2"		0.30	0.37	0.45		E
	2 1/2"		0.35	0.43	0.52		E
	3"		0.40	0.50	0.60		E
	3 1/2"		0.45	0.56	0.67		E
	4"		0.50	0.62	0.75		E
	5"		0.55	0.68	0.82		E
	6"		0.60	0.75	0.90		E
	Aluminum Threaded Conduit Bodies-One Hub						
	1/2"		0.35	0.43	0.52		E
	3/4"		0.45	0.56	0.67		E
	1"		0.60	0.75	0.90		E
	Aluminum Threaded Conduit Bodies-Two Hubs						
	1/2"		0.60	0.75	0.90		E
	3/4"		0.70	0.87	1.05		E
	1"		0.90	1.12	1.35		E
	1 1/4"		1.10	1.37	1.65		E
	1 1/2"		1.25	1.56	1.87		E
	2"		1.65	2.05	2.47		E
	2 1/2"		2.50	3.12	3.75		E
	3"		3.25	4.05	4.85		E
	3 1/2"		3.75	4.65	5.60		E
	4"		4.50	5.60	6.75		E
	Aluminum Threaded Conduit Bodies-Three Hubs						
	1/2"		0.75	0.93	1.12		E
	3/4"		0.90	1.12	1.35		E
	1"		1.15	1.43	1.72		E
	1 1/4"		1.40	1.75	2.10		E
	1 1/2"		1.65	2.05	2.47		E
	2"		2.15	2.68	3.22		E
	2 1/2"		3.25	4.05	4.85		E
	3"		4.10	5.10	6.15		E
	3 1/2"		4.90	6.15	7.35		E
	Aluminum Threaded Conduit Bodies-Four Hubs						
	1/2"		0.90	1.12	1.35		E
	3/4"		1.15	1.43	1.72		E
	1"		1.40	1.75	2.10		E
	1 1/4"		1.70	2.10	2.55		E
	1 1/2"		2.00	2.50	3.00		E
	2"		3.00	3.75	4.50		E
	2 1/2"		4.00	5.00	6.00		E
	3"		5.00	5.75	7.50		E
	4"		7.00	8.75	10.50		E
	Aluminum Mogul Conduit Bodies-Two Hubs						
	1"		0.90	1.12	1.35		E
	1 1/4"		1.20	1.50	1.80		E
	1 1/2"		1.60	2.00	2.40		E
	2"		2.00	2.50	3.00		E
	2 1/2"		2.50	3.12	3.75		E
	3"		3.00	3.75	4.50		E
	3 1/2"		3.50	4.35	5.25		E
	4"		4.00	5.00	6.00		E

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Section 2 - Conduit, Raceways, Fittings & Related Items

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Flexible Steel Conduit (FSC or Greenfield) and Fittings						
	Flexible Steel Conduit (FSC)						
	For flex Alum, reduce the Steel Labor by 10%						
	3/8"		3.50	4.30	5.20		C
	1/2"		4.00	5.00	6.00		C
	3/4"		5.00	6.20	7.50		C
	1"		7.50	9.30	11.20		C
	1 1/4"		10.00	12.50	15.00		C
	1 1/2"		15.00	18.70	22.50		C
	2"		20.00	25.00	30.00		C
	2 1/2"		25.00	31.20	37.50		C
	3"		30.00	37.50	45.00		C
	3 1/2"		40.00	50.00	60.00		C
	4"		50.00	62.00	75.00		C
	FSC to Box Connectors - Add 20% for angled fittings						
	3/8"		0.10	0.12	0.15		E
	1/2"		0.12	0.15	0.18		E
	3/4"		0.14	0.17	0.21		E
	1"		0.17	0.21	0.25		E
	1 1/4"		0.20	0.25	0.30		E
	1 1/2"		0.25	0.31	0.37		E
	2"		0.30	0.37	0.45		E
	2 1/2"		0.40	0.50	0.60		E
	3"		0.50	0.62	0.75		E
	3 1/2"		0.60	0.75	0.90		E
	4"		0.70	0.87	1.05		E
	FSC to Rigid Steel Conduit Couplings						
	1/2"		0.15	0.18	0.22		E
	3/4"		0.20	0.25	0.30		E
	1"		0.25	0.31	0.37		E
	1 1/4"		0.30	0.37	0.45		E
	1 1/2"		0.40	0.50	0.60		E
	2"		0.55	0.68	0.82		E
	2 1/2"		0.75	0.93	1.12		E
	3"		1.00	1.25	1.50		E
	3 1/2"		1.25	1.55	1.85		E
	4"		1.50	1.85	2.25		E
	FSC to EMT Couplings						
	1/2"		0.12	0.15	0.18		E
	3/4"		0.15	0.18	0.22		E
	1"		0.20	0.25	0.30		E
	1 1/4"		0.25	0.31	0.37		E
	1 1/2"		0.30	0.37	0.45		E
	2"		0.40	0.50	0.60		E
	2 1/2"		0.50	0.62	0.75		E
	3"		0.60	0.75	0.90		E
	3 1/2"		0.75	0.93	1.12		E
	4"		1.00	1.25	1.50		E
							
	FSC Duplex Box Converters						
	3/8"		0.15	0.17	0.18		E
	1/2"		0.15	0.17	0.18		E

Section 2 - Conduit, Raceways, Fittings & Related Items

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Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Sealtite Flexible Conduit and Fittings						
Liquidtight Flexible Steel Conduit (LFSC)						
3/8"		3.50	4.30	5.20		C
1/2"		4.00	5.00	6.00		C
3/4"		5.00	6.20	7.50		C
1"		7.50	9.30	11.20		C
1 1/4"		10.00	12.50	15.00		C
1 1/2"		15.00	18.70	22.50		C
2"		20.00	25.00	30.00		C
2 1/2"		25.00	31.20	37.50		C
3"		30.00	37.50	45.00		C
3 1/2"		40.00	50.00	60.00		C
4"		50.00	62.00	75.00		C
LFSC to Box Connectors - Add 20% for angled fittings						
3/8"		0.12	0.15	0.18		E
1/2"		0.15	0.18	0.22		E
3/4"		0.18	0.22	0.27		E
1"		0.24	0.30	0.36		E
1 1/4"		0.30	0.37	0.45		E
1 1/2"		0.36	0.45	0.54		E
2"		0.42	0.52	0.63		E
2 1/2"		0.48	0.60	0.72		E
3"		0.60	0.75	0.90		E
3 1/2"		0.72	0.90	1.08		E
4"		0.96	1.20	1.44		E
LFSC to Rigid Steel Conduit Couplings						
1/2"		0.20	0.25	0.30		E
3/4"		0.25	0.31	0.37		E
1"		0.30	0.37	0.45		E
1 1/4"		0.40	0.50	0.60		E
1 1/2"		0.55	0.68	0.82		E
2"		0.75	0.93	1.12		E
2 1/2"		1.00	1.25	1.50		E
3"		1.25	1.55	1.85		E
3 1/2"		1.50	1.85	2.25		E
4"		1.75	2.15	2.60		E
LFSC to EMT Couplings						
1/2"		0.16	0.20	0.24		E
3/4"		0.20	0.25	0.30		E
1"		0.25	0.31	0.37		E
1 1/4"		0.30	0.37	0.45		E
1 1/2"		0.40	0.50	0.60		E
2"		0.50	0.62	0.75		E
2 1/2"		0.65	0.80	0.95		E
3"		0.80	1.00	1.20		E
3 1/2"		1.00	1.25	1.50		E
4"		1.25	1.55	1.85		E

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit	
	PVC Coated Rigid Steel Conduit							
	PVC Coated Rigid Steel Conduit							
	1/2"		7.00	8.70	10.50		C	
	3/4"		8.00	10.00	12.00		C	
	1"		10.00	12.50	15.00		C	
	1 1/4"		12.00	15.00	18.00		C	
	1 1/2"		15.00	18.70	22.50		C	
	2"		18.00	22.50	27.00		C	
	2 1/2"		21.00	26.20	31.50		C	
	3"		26.00	32.50	39.00		C	
	3 1/2"		32.00	40.00	48.00		C	
	4"		38.00	47.00	57.00		C	
	5"		45.00	56.20	67.50		C	
	6"		60.00	75.00	90.00		C	
		<i>PVC Coating Repair Not Included.</i>						
	PVC Coated Rigid Steel Elbows							
	1/2"		0.50	0.62	0.74		E	
	3/4"		0.60	0.74	0.90		E	
	1"		0.70	0.86	1.04		E	
	1 1/4"		0.80	1.00	1.20		E	
	1 1/2"		1.00	1.24	1.50		E	
	2"		1.20	1.50	1.80		E	
	2 1/2"		1.75	2.05	2.35		E	
	3"		2.25	2.75	3.20		E	
	3 1/2"		2.75	3.25	3.75		E	
	4"		3.25	3.75	4.25		E	
	5"		4.50	5.50	6.50		E	
	6"		5.50	6.50	7.50		E	
		<i>PVC Coating Repair Not Included.</i>						
		PVC Coated Rigid Steel Elbows						
48" Radius								
1"			0.75	0.90	1.10		E	
1 1/4"			0.85	1.05	1.25		E	
1 1/2"			1.10	1.30	1.55		E	
2"			1.30	1.60	1.90		E	
2 1/2"			1.85	2.15	2.45		E	
3"			2.45	2.95	3.45		E	
3 1/2"			2.95	3.45	3.95		E	
4"			3.45	3.95	4.45		E	
5"			4.90	5.90	6.90		E	
6"			6.00	7.00	8.00		E	
		<i>PVC Coating Repair Not Included.</i>						
		PVC Coated Termination Sets						
		1/2"		0.40	0.50	0.60		E
	3/4"		0.45	0.56	0.67		E	
	1"		0.55	0.68	0.82		E	
	1 1/4"		0.65	0.81	0.97		E	
	1 1/2"		0.80	1.00	1.20		E	
	2"		1.00	1.25	1.50		E	
	2 1/2"		1.25	1.55	1.85		E	
	3"		1.50	1.85	2.25		E	
	3 1/2"		1.75	2.15	2.60		E	
	4"		2.00	2.50	3.00		E	
	5"		2.35	2.90	3.50		E	
	6"		2.70	3.35	4.00		E	
		<i>PVC Coating Repair Not Included.</i>						
		PVC Coated Steel Factory Nipples - 12" Length Maximum						
1/2"			0.25	0.31	0.37		E	
3/4"			0.30	0.37	0.45		E	
1"			0.35	0.43	0.52		E	
1 1/4"			0.40	0.50	0.60		E	
1 1/2"			0.50	0.62	0.75		E	
2"			0.60	0.75	0.90		E	
2 1/2"			0.75	0.94	1.12		E	
3"			0.90	1.12	1.35		E	
3 1/2"			1.10	1.37	1.65		E	
4"			1.30	1.62	1.95		E	
5"			1.50	1.87	2.25		E	
6"			1.80	2.25	2.70		E	
		<i>PVC Coating Repair Not Included.</i>						



	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	PVC Rigid Conduit						
	PVC Rigid Conduit - Schedule 40 with Couplings For installation in trench, see Section 11						
	1/2"		4.10	5.10	6.15		C
	3/4"		4.50	5.60	6.75		C
	1"		5.25	6.50	7.90		C
	1 1/4"		6.00	7.50	9.00		C
	1 1/2"		7.00	8.75	10.50		C
	2"		8.00	10.00	12.00		C
	2 1/2"		9.00	11.25	14.06		C
	3"		10.00	12.50	15.63		C
	3 1/2"		12.00	15.00	18.75		C
	4"		14.00	17.50	21.88		C
	5"		18.00	22.50	28.13		C
	6"		24.00	30.00	37.50		C
		PVC Factory Elbows-Sch 40 - Add 20% for Wide Sweep					
1/2"			0.20	0.25	0.30		E
3/4"			0.22	0.28	0.33		E
1"			0.25	0.31	0.38		E
1 1/4"			0.32	0.40	0.48		E
1 1/2"			0.40	0.48	0.60		E
2"			0.50	0.63	0.75		E
2 1/2"			0.60	0.75	0.90		E
3"			0.70	0.84	1.05		E
3 1/2"			0.85	1.06	1.28		E
4"			1.00	1.25	1.50		E
5"			1.25	1.56	1.88		E
6"			1.50	1.88	2.25		E
		Field Bent PVC Conduit and Installation Add approx 10% for each field cut & ream.					
	1/2"		0.40	0.50	0.60		E
	3/4"		0.50	0.63	0.75		E
	1"		0.60	0.75	0.90		E
	1 1/4"		0.65	0.81	0.98		E
	1 1/2"		0.80	1.00	1.20		E
	2"		1.00	1.25	1.50		E
	2 1/2"		1.20	1.50	1.80		E
	3"		1.40	1.75	2.10		E
	3 1/2"		1.70	2.13	2.55		E
	4"		2.00	2.50	3.00		E
	5"		3.15	3.94	4.73		E
	6"		4.20	5.25	6.30		E
		PVC Conduit Adapters-All Types					
1/2"			0.14	0.17	0.21		E
3/4"			0.16	0.20	0.24		E
1"			0.18	0.22	0.27		E
1 1/4"			0.20	0.25	0.30		E
1 1/2"			0.25	0.31	0.37		E
2"			0.30	0.37	0.45		E
2 1/2"			0.40	0.50	0.60		E
3"			0.50	0.62	0.75		E
3 1/2"			0.65	0.81	0.97		E
4"			0.80	1.00	1.20		E
5"			1.00	1.25	1.50		E
6"			1.25	1.55	1.85		E
		PVC Expansion Couplings-Sch 40					
	1/2"		0.50	0.62	0.75		E
	3/4"		0.60	0.75	0.90		E
	1"		0.70	0.87	1.05		E
	1 1/4"		0.80	1.00	1.20		E
	1 1/2"		0.90	1.12	1.35		E
	2"		1.00	1.25	1.50		E
	2 1/2"		1.15	1.43	1.72		E
	3"		1.30	1.62	1.95		E
	3 1/2"		1.50	1.85	2.25		E
	4"		1.75	2.15	2.60		E

Section 2 - Conduit, Raceways, Fittings & Related Items

2

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	PVC Bell Ends-Sch 40						
	1/2"		0.12	0.15	0.18		E
	3/4"		0.14	0.17	0.21		E
	1"		0.16	0.20	0.24		E
	1 1/4"		0.18	0.22	0.27		E
	1 1/2"		0.20	0.25	0.30		E
	2"		0.23	0.28	0.34		E
	2 1/2"		0.26	0.32	0.39		E
	3"		0.30	0.37	0.45		E
	3 1/2"		0.35	0.43	0.52		E
	4"		0.40	0.50	0.60		E
	5"		0.45	0.56	0.67		E
	6"		0.50	0.62	0.75		E
	PVC Conduit End Caps-Sch 40						
	1/2"		0.10	0.12	0.15		E
	3/4"		0.12	0.15	0.18		E
	1"		0.14	0.17	0.21		E
	1 1/4"		0.16	0.20	0.24		E
	1 1/2"		0.18	0.22	0.27		E
	2"		0.20	0.25	0.30		E
	2 1/2"		0.23	0.28	0.34		E
	3"		0.26	0.32	0.39		E
	3 1/2"		0.29	0.36	0.43		E
	4"		0.31	0.38	0.46		E
	5"		0.35	0.43	0.52		E
	6"		0.40	0.50	0.60		E
	PVC Rigid Conduit - Schedule 80 with Couplings For installation in trench, see Section 11						
	1/2"		4.90	5.90	6.90		C
	3/4"		5.40	6.40	7.40		C
	1"		6.30	7.30	8.30		C
	1 1/4"		7.20	7.70	9.20		C
	1 1/2"		8.40	9.60	10.80		C
	2"		9.60	10.80	12.80		C
	2 1/2"		10.80	12.00	14.80		C
	3"		12.00	14.50	16.50		C
	4"		16.80	20.30	24.68		C
	5"	X	21.60	27.00	33.75		C
	6"		28.80	34.80	42.30		C
	PVC Factory Elbows-Sch 80 - Add 20% for Wide Sweep						
	1/2"		0.22	0.27	0.32		E
	3/4"		0.24	0.29	0.34		E
	1"		0.28	0.33	0.38		E
	1 1/4"		0.35	0.40	0.45		E
	1 1/2"		0.46	0.56	0.66		E
	2"		0.58	0.73	0.88		E
	2 1/2"		0.69	0.89	1.09		E
	3"		0.84	1.09	1.34		E
	4"		1.20	1.70	2.20		E
	5"		1.50	2.00	2.50		E
	6"		1.80	2.30	2.80		E
	Field Bent Schedule 80 PVC Conduit and Installation Add approx 10% for each field cut & ream.						
	1/2"		0.50	0.60	0.70		E
	3/4"		0.60	0.70	0.80		E
	1"		0.70	0.85	1.00		E
	1 1/4"		0.80	0.96	1.12		E
	1 1/2"		1.00	1.20	1.40		E
	2"		1.25	1.50	1.75		E
	2 1/2"		1.50	1.75	2.00		E
	3"		1.75	2.00	2.25		E
	4"		2.00	2.25	2.50		E
	5"		2.40	2.90	3.40		E
	6"		3.65	4.44	5.23		E
	Schedule 80 PVC Conduit Adapters-All Types						
	1/2"		0.16	0.19	0.23		E
	3/4"		0.18	0.22	0.26		E
	1"		0.20	0.24	0.28		E
	1 1/4"		0.22	0.27	0.32		E
	1 1/2"		0.30	0.35	0.40		E
	2"		0.35	0.42	0.47		E
	2 1/2"		0.45	0.55	0.65		E
	3"		0.60	0.70	0.80		E
	4"		0.70	0.85	0.97		E
	5"		0.85	1.15	1.35		E
	6"		1.20	1.40	1.70		E

Description

Rev	Normal	Difficult	Difficult	Experience	Unit
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PVC Junction Boxes & Pull Boxes



Type C



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PVC Boxes

PVC Handy Boxes



PVC Handy Boxes		0.25	0.30	0.35	E
PVC Switch Boxes		0.25	0.30	0.35	E
PVC 4" Concrete Boxes		0.40	0.45	0.50	E
PVC 4" Hung Ceiling Boxes		0.45	0.50	0.55	E
PVC Floor Boxes		0.80	0.90	1.00	E
PVC Box Extensions		0.15	0.20	0.25	E
PVC Plaster Rings		0.15	0.20	0.25	E
PVC Box Covers-All Types		0.08	0.09	0.10	E



Section 2 - Conduit, Raceways, Fittings & Related Items

2

Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Fiberglass Conduit						
Fiberglass Conduit						
10Ft & 20Ft Len. w/ Glued Couplings						
3/4"		5.50	6.88	8.59		C
1"		5.75	7.19	8.98		C
1 1/4"		6.00	7.50	9.38		C
1 1/2"		6.35	7.94	9.92		C
2"		6.75	8.44	10.55		C
2 1/2"		7.10	8.88	11.09		C
3"		7.50	9.38	11.72		C
3 1/2"		7.85	9.81	12.27		C
4"		8.25	10.31	12.89		C
5"		8.60	10.75	13.44		C
6"		9.00	11.25	14.06		C
<i>Note: Reduce Labor Units for 20 ft Lengths by 10%</i>						
Fiberglass Conduit Glued Couplings						
3/4"		14.00	17.50	21.88		C
1"		15.00	18.75	23.44		C
1 1/4"		16.50	20.63	25.78		C
1 1/2"		18.00	22.50	28.13		C
2"		21.00	26.25	32.81		C
2 1/2"		25.50	31.88	39.84		C
3"		30.00	37.50	46.88		C
3 1/2"		37.50	46.88	58.59		C
4"		45.00	56.25	70.31		C
5"		52.00	65.00	81.25		C
6"		60.00	75.00	93.75		C
Fiberglass Conduit 90 Degree Elbows						
3/4"		50.00	62.50	78.13		C
1"		60.00	75.00	93.75		C
1 1/4"		63.00	78.75	98.44		C
1 1/2"		67.00	83.75	104.69		C
2"		75.00	93.75	117.19		C
2 1/2"		82.00	102.50	128.13		C
3"		90.00	112.50	140.63		C
3 1/2"		105.00	131.25	164.06		C
4"		120.00	150.00	187.50		C
5"		135.00	168.75	210.94		C
6"		150.00	187.50	234.38		C
Fiberglass Conduit Threaded Adapters						
3/4"		25.00	31.25	39.06		C
1"		30.00	37.50	46.88		C
1 1/4"		31.00	38.75	48.44		C
1 1/2"		33.00	41.25	51.56		C
2"		36.00	45.00	56.25		C
2 1/2"		40.00	50.00	62.50		C
3"		45.00	56.25	70.31		C
3 1/2"		52.00	65.00	81.25		C
4"		60.00	75.00	93.75		C
5"		67.00	83.75	104.69		C
6"		75.00	93.75	117.19		C
Fiberglass Conduit Expansion Couplings						
3/4"		1.15	1.44	1.80		E
1"		1.20	1.50	1.88		E
1 1/4"		1.23	1.54	1.92		E
1 1/2"		1.27	1.59	1.98		E
2"		1.35	1.69	2.11		E
2 1/2"		1.42	1.78	2.22		E
3"		1.50	1.88	2.34		E
3 1/2"		1.57	1.96	2.45		E
4"		1.65	2.06	2.58		E
5"		1.72	2.15	2.69		E
6"		1.80	2.25	2.81		E

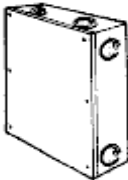
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Section 2 - Conduit, Raceways, Fittings & Related Items

2

Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
LNT Conduit						
Liquidtight Non-Metallic Flexible Tubing (LNT)						
1/2"		4.00	5.00	6.00		C
3/4"		5.00	6.25	7.50		C
1"		7.50	9.38	11.25		C
1 1/4"		10.00	12.50	15.00		C
1 1/2"		15.00	18.75	22.50		C
2"		20.00	25.00	30.00		C
LNT Box Connectors-Threaded Type						
1/2"		0.12	0.15	0.18		E
3/4"		0.14	0.18	0.21		E
1"		0.16	0.20	0.24		E
1 1/4"		0.20	0.25	0.30		E
1 1/2"		0.30	0.38	0.45		E
2"		0.40	0.50	0.60		E
LNT Box Connectors-Threaded Elbows						
1/2"		0.15	0.19	0.23		E
3/4"		0.17	0.21	0.26		E
1"		0.20	0.25	0.30		E
1 1/4"		0.25	0.31	0.38		E
1 1/2"		0.35	0.44	0.53		E
2"		0.50	0.63	0.75		E
NEMA 1 Screw cover J-Boxes & Pull Boxes with Knockouts	X					
6" x 6" x 4"	X	1.00	1.25	1.50		E
8" x 8" x 4"	X	1.10	1.35	1.80		E
10" x 8" x 4"	X	1.10	1.35	1.80		E
12" x 8" x 4"	X	1.15	1.40	1.90		E
10" x 10" x 4"	X	1.15	1.40	1.90		E
12" x 12" x 4"	X	1.25	1.60	2.15		E
16" x 12" x 4"	X	1.35	1.75	2.20		E
16" x 16" x 4"	X	1.35	1.75	2.20		E
12" x 12" x 6"	X	1.35	1.75	2.20		E
12" x 16" x 6"	X	1.50	2.00	3.00		E
16" x 16" x 6"	X	1.50	2.00	3.00		E
24" x 24" x 6"	X	2.75	3.50	4.00		E
24" x 18" x 8"	X	2.75	3.50	4.00		E
24" x 24" x 8"	X	3.00	4.00	5.00		E
30" x 30" x 8"	X	3.50	4.50	5.50		E
NEMA 3R Rain-tight J-Boxes & Pull Boxes	X					
6" x 6" x 4"	X	1.00	1.25	1.50		E
8" x 6" x 4"	X	1.10	1.35	1.80		E
10" x 8" x 4"	X	1.10	1.35	1.80		E
12" x 8" x 4"	X	1.15	1.40	1.90		E
10" x 10" x 4"	X	1.15	1.40	1.90		E
12" x 12" x 4"	X	1.25	1.60	2.15		E
8" x 8" x 6"	X	1.35	1.75	2.20		E
10" x 10" x 6"	X	1.35	1.75	2.20		E
12" x 12" x 6"	X	1.35	1.75	2.20		E
18" x 12" x 6"	X	1.50	2.00	3.00		E
24" x 12" x 6"	X	1.50	2.00	3.00		E
18" x 12" x 8"	X	2.75	3.50	4.00		E
24" x 18" x 8"	X	2.75	3.50	4.00		E
NEMA 12 Hinged Cover J-Boxes & Pull Boxes	X					
6" x 6" x 4"	X	0.70	1.00	1.15		E
8" x 6" x 4"	X	1.00	1.30	1.50		E
10" x 8" x 4"	X	1.00	1.30	1.50		E
12" x 10" x 4"	X	1.10	1.40	1.70		E
12" x 12" x 4"	X	1.10	1.40	1.70		E
18" x 12" x 4"	X	1.25	1.55	1.85		E
18" x 16" x 4"	X	1.25	1.55	1.85		E
18" x 12" x 6"	X	1.30	1.60	2.00		E
24" x 18" x 6"	X	2.25	3.00	4.10		E
NEMA 4 J-Boxes & Pull Boxes	X					
6" x 6" x 4"	X	1.25	1.50	1.75		E
8" x 6" x 4"	X	1.30	1.60	1.85		E
10" x 8" x 6"	X	1.45	1.75	2.00		E
12" x 10" x 6"	X	1.50	1.85	2.10		E
16" x 12" x 6"	X	1.50	1.85	2.10		E
16" x 14" x 6"	X	1.60	2.00	2.50		E

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Section 2 - Conduit, Raceways, Fittings & Related Items

2

Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Surface Metal Raceways						
 G3000B Raceway Base		13.00	16.25	19.50		C
G4000B Raceway Base		16.00	20.00	24.00		C
G4000C Raceway Cover		4.00	5.00	6.00		C
G4000D Raceway Divider		2.00	2.50	3.00		C
G6000B Raceway Base		18.00	22.50	27.00		C
G6000B 5 Base		17.00	21.25	25.50		C
G6000C Cover		3.00	3.75	4.50		C
G3000WC Wire Clip		5.00	6.25	7.50		C
G3001A Coupling		15.00	18.75	22.50		C
G3007C 4.5 Dev Bracket		10.00	12.50	15.00		C
G3010B Blank End Fitting		10.00	12.50	15.00		C
G3010C Entrance End Fitting		40.00	50.00	60.00		C
G3000CE Raceway Cover		3.00	3.75	4.50		C
G6001 Coupling		25.00	31.25	37.50		C
G6006 Connector Cover		5.00	6.25	7.50		C
G6007C1 1-Gang Plate		10.00	12.50	15.00		C
G6007C2 2-Gang Plate		10.00	12.50	15.00		C
G6010B Combination End Fitting		20.00	25.00	30.00		C
G6017TX Combination Elbow		50.00	62.50	75.00		C
G6011TX Combination Flat Elbow		50.00	62.50	75.00		C
G6086 Panel Connector		100.00	125.00	150.00		C
G6001TX Convert Coupling		10.00	12.50	15.00		C
G6000WC Wire Clip		5.00	6.25	7.50		C
G6008A C-Hanger Clamp		10.00	12.50	15.00		C
G4012TX 45D Elbow		40.00	50.00	60.00		C
G4000WC Wire Clip		5.00	6.25	7.50		C
G4001 Coupling		20.00	25.00	30.00		C
G4007C1 1-Gang Plate		10.00	12.50	15.00		C
G4001 D Divider Coupling		5.00	6.25	7.50		C
G4007C2 2-Gang Plate		10.00	12.50	15.00		C
G4010B Blank End		10.00	12.50	15.00		C
G4011 Flat Elbow		40.00	50.00	60.00		C
G4017 Internal Elbow		40.00	50.00	60.00		C
G4018 External Elbow		40.00	50.00	60.00		C
G4015 Tee		60.00	75.00	90.00		C
G4014A Wall Box Connector		50.00	62.50	75.00		C
G4046B Combination Cover		5.00	6.25	7.50		C
G4046T Telephone Cover		5.00	6.25	7.50		C
G4010D Entrance End Fitting		20.00	25.00	40.00		C
G4017TC Interior Corner		40.00	50.00	60.00		C
G4086A Panel Connector		100.00	125.00	150.00		C
G3010AE Entrance End Fitting		50.00	62.50	75.00		C
G3018AE Exterior Corner Coupling		5.00	6.25	7.50		C
G3011E 90D Flat Elbow		35.00	43.75	52.50		C
G3006E Cover Clip		5.00	6.25	7.50		C

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1517 Internal Elbow		20.00	25.00	30.00		C
1517A Adaptor Fitting		35.00	43.75	52.50		C
1518 External Elbow		20.00	25.00	30.00		C
1524 Telephone Outlet		40.00	50.00	60.00		C
1524A Telephone Outlet		40.00	50.00	60.00		C
		40.00	50.00	60.00		C
1528 Utility Box						
1542A Narrow Junction Box		40.00	50.00	60.00		C
1542D Blank Junction Box		40.00	50.00	60.00		C
1543GL Grounded Duplex Receptacle		25.00	31.25	37.50		C
1546A Single Receptacle Box		40.00	50.00	60.00		C
		40.00	50.00	60.00		C
1546B Duplex. Receptacle Box						
1585 End Connector		20.00	25.00	30.00		C
30TP-3 Tele-Power Pole		1.25	1.56	1.88		E
ALTP-4 Tele-Power Pole		1.25	1.56	1.88		E
25TC4 Tele-Comm Pole		1.00	1.25	1.50		E
25TP4D Isolated Ground Pole		1.25	1.56	1.88		E
5700F 18' Flexible Section		40.00	50.00	60.00		C
5701 Coupling		2.50	3.13	3.75		C
5703 Support Clip		3.00	3.75	4.50		C
5711LH Internal Elbow		10.00	12.50	15.00		C
5711RH Internal Elbow		10.00	12.50	15.00		C
5715 Tee		15.00	18.75	22.50		C
5717A Internal Elbow		10.00	12.50	15.00		C
5719D Corner Box		25.00	31.25	37.50		C
5721 Utility Box		25.00	31.25	37.50		C
5733 Outlet Box		25.00	31.25	37.50		C
5734 Blank Exterior Box		20.00	25.00	30.00		C
5734A Utility Box		25.00	31.25	37.50		C
5736 Blank Cover		5.00	6.25	7.50		C
5737A Open Exterior Box		20.00	25.00	30.00		C
5738A Sol Fixture Box		20.00	25.00	30.00		C
5739 Sol Fixture Box		25.00	31.25	37.50		C
5739A Open Exterior Box		20.00	25.00	30.00		C
5744S Switch Receptacle Box		25.00	31.25	37.50		C
5745 1-3/4 Deep Combination Box		25.00	31.25	37.50		C
5747 Shallow Box		25.00	31.25	37.50		C
5747-2 Shallow Box		25.00	31.25	37.50		C
5748 1-Gang Switch Receptacle Box		25.00	31.25	37.50		C
5748-2 2-Gang Switch Receptacle Box		25.00	31.25	37.50		C
5748-3 3-Gang Switch Receptacle Box		35.00	43.75	52.50		C
5748S Switch Receptacle Box		25.00	31.25	37.50		C
5751 1-Gang Exterior Adapter		25.00	31.25	37.50		C
5751-2 2-Gang Exterior Adapter		25.00	31.25	37.50		C

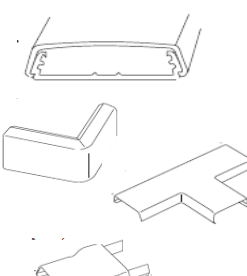
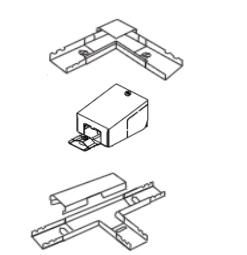
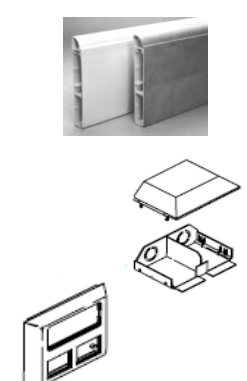


Section 2 - Conduit, Raceways, Fittings & Related Items

2

Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Nonmetallic Surface Raceways						
Wiremold Product						
Latching raceway with adhesive backing and ivory plastic finish						
Available in 6' and 8' lengths						
2700 Latching Raceway - Base and Cover		4.00	4.80	5.60		C
2706 Joint Cover		3.00	3.60	4.20		C
2710B Blank End		3.00	3.60	4.20		C
2711 Flat Elbow		10.00	12.00	14.00		C
2717 Internal Elbow		11.00	13.20	15.40		C
2718 External Elbow		11.00	13.20	15.40		C
2715 Tee		15.00	18.00	21.00		C
2786 Drop Ceiling Connector		15.00	18.00	21.00		C
Wiremold Product						
Latching raceway with adhesive backing and ivory plastic finish						
Available in 6' and 8' lengths						
2800 Latching Raceway - Base and Cover		4.50	5.40	6.30		C
2806 Joint Cover		3.00	3.60	4.20		C
2810B Blank End		3.00	3.60	4.20		C
2811 Flat Elbow		10.00	12.00	14.00		C
2817 Internal Elbow		11.00	13.20	15.40		C
2818 External Elbow		11.00	13.20	15.40		C
2815 Tee		15.00	18.00	21.00		C
2886 Drop Ceiling		15.00	18.00	21.00		C
2889 Reducing Connector		10.00	12.00	14.00		E
Wiremold Product						
Latching raceway with adhesive backing and ivory plastic finish						
Available in 6' and 8' lengths						
2900 Latching Raceway - Base and Cover		6.00	7.20	8.40		C
2906 Joint Cover		4.00	4.80	5.60		C
2910B Blank End		4.00	4.80	5.60		C
2911 Flat Elbow		11.00	13.20	15.40		C
2917 Internal Elbow		12.00	14.40	16.80		C
2918 External Elbow		12.00	14.40	16.80		C
2915 Tee		16.00	19.20	22.40		C
2986 Drop Ceiling Connector		16.00	19.20	22.40		C
2989 Reducing Connector		10.00	12.00	14.00		C
Device boxes for 2700/2800/2900						
Boxes are for mounting voice/data devices						
NM2044 1-Gang Deep Device Box		30.00	36.00	42.00		C
NM2044 2-Gang Deep Device Box		35.00	42.00	49.00		C
CM-MMB-291 One Multimedia Box		40.00	48.00	56.00		E
CM-MMB-293 Two Multimedia Box		40.00	48.00	56.00		E
CM-MMB-293 Three Multimedia Box		45.00	54.00	63.00		E
Wiremold product						
Two-Piece raceway, ivory or white plastic finish						
5' lengths only						
Supplied with wide adhesive tape along its entire length						
400BAC 2-Piece Raceway - Base and Cover		7.00	8.40	9.80		C
400WC Wire Clip		2.50	3.00	3.50		C
406 Joint Cover		4.00	4.80	5.60		C
410B Blank End		4.00	4.80	5.60		C
411 Flat Elbow		11.00	13.20	15.40		C
417 Internal Elbow		12.00	14.40	16.80		C
418 External Elbow		12.00	14.40	16.80		C
415 Tee		16.00	19.20	22.40		C
810A2 Entrance End Fitting		16.00	19.20	22.40		C
Wiremold product						
Two-Piece raceway, ivory or white plastic finish						
5' lengths only						
Supplied with wide adhesive tape along its entire length						
Requires screw fasteners in addition to the adhesive tape						
800BAC 2-Piece Raceway - Base and Cover		7.50	9.00	10.50		C
800WC Wire Clip		2.50	3.00	3.50		C
806 Joint Cover		4.00	4.80	5.60		C
810B Blank End		4.00	4.80	5.60		C
811 Flat Elbow		11.00	13.20	15.40		C
817 Internal Elbow		12.00	14.40	16.80		C
818 External Elbow		12.00	14.40	16.80		C
815 Tee		16.00	19.20	22.40		C
810A2 Entrance End		16.00	19.20	22.40		C
889A Reducing Connector		10.00	12.00	14.00		C

Section 2 - Conduit, Raceways, Fittings & Related Items

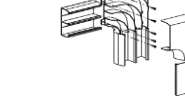
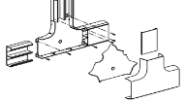
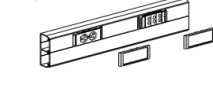
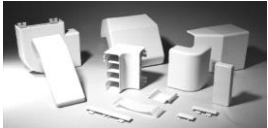
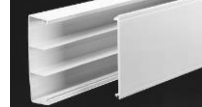
	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Wiremold product						
	Two-Piece raceway, ivory or white plastic finish						
	5' lengths only						
	Supplied with wide adhesive tape along its entire length						
	Requires screw fasteners in addition to the adhesive tape						
	2300BAC 2-Piece Raceway - Base and Cover		8.00	9.60	11.20		C
	2300WC Wire Clip		2.50	3.00	3.50		C
	2306 Joint Cover		4.00	4.80	5.60		C
	2310B Blank End		4.00	4.80	5.60		C
	2311 Flat Elbow		12.00	14.40	16.80		C
	2317 Internal Elbow		13.00	15.60	18.20		C
	2318 External Elbow		13.00	15.60	18.20		C
	2315 Tee		16.50	19.80	23.10		C
	2310A2 Entrance End Fitting		16.00	19.20	22.40		C
	889A Reducing Connector		11.00	13.20	15.40		C
	Device boxes for 400/800/2300 Selected Series						
	Boxes are for mounting voice/data devices						
	2348 1-Gang Deep Device Box		30.00	36.00	42.00		C
	2348 2-Gang Deep Device Box		35.00	42.00	49.00		C
	2348 3-Gang Deep Device Box		40.00	48.00	56.00		C
	2348S Shallow Extension Box		30.00	36.00	42.00		C
	2348AMP Magnetic Deep Device Box		30.00	36.00	42.00		C
	2338A Fixture Box		35.00	42.00	49.00		C
	2337A Round Box Extension		35.00	42.00	49.00		C
	2336 Blank Cover		15.00	18.00	21.00		C
	2333SD-2A 2-Gang Deep Box/Divider		35.00	42.00	49.00		C
	CM-MMB-231 One Multimedia Box		40.00	48.00	56.00		E
	CM-MMB-232 Two Multimedia Box		40.00	48.00	56.00		E
	CM-MMB-233 Three Multimedia Box		45.00	54.00	63.00		E
	Wiremold Product						
	Two-piece raceway, ivory plastic finish						
	8' Lengths only						
	Requires screw fasteners to mount raceway						
	NM200BC 2-Piece Raceway - Base and Cover		7.50	9.00	10.50		C
	NM200WC Wire Clip		2.50	3.00	3.50		C
	NM2006 Joint Cover		4.00	4.80	5.60		C
	NM201B Blank End		4.00	4.80	5.60		C
	NM2011 Flat Elbow		11.00	13.20	15.40		C
	NM2017 Internal Elbow		12.00	14.40	16.80		C
	NM2018 External Elbow		12.00	14.40	16.80		C
	NM2015 Tee		16.00	19.20	22.40		C
	NM2010A Entrance End Fitting		16.00	19.20	22.40		C
	NM2003 Supporting Clip		10.00	12.00	14.00		C
	NM2015H/NM2051V Wall Box Adaptor		10.00	12.00	14.00		C
	Device boxes for NM2000						
	NM2048 1-Gang Deep Device Box		30.00	36.00	42.00		C
	NM2048-2 2-Gang Deep Device Box		35.00	42.00	49.00		C
	NM2044 1-Gang Extra Deep Box		30.00	36.00	42.00		C
	NM2044 2-Gang Extra Deep Box		35.00	42.00	49.00		C
	Wiremold product						
	Two-piece raceway, white, maple & oak plastic finish						
	8' Lengths only						
	Requires screw fasteners to mount raceway						
	Integral divider, two channel for power and low voltage applications						
	5000BC 2-Piece Raceway - Base and Cover		14.60	17.52	20.44		C
	5001 Base Coupling		20.00	24.00	28.00		C
	5006AWC Wire Clip		4.00	4.80	5.60		C
	5006 Joint Cover		4.00	4.80	5.60		C
	5010R/L Blank End		8.00	9.60	11.20		C
	5017B/C Internal Elbow		32.00	38.40	44.80		C
	5018B/C External Elbow		32.00	38.40	44.80		C
	5010A Entrance End Fitting		16.00	19.20	22.40		C
	5007C Electrical Device Bracket		10.00	12.00	14.00		C
	5007C-1AWH Device Plate		10.00	12.00	14.00		C
	5007C-2AB/RT Deep Device Plate		10.00	12.00	14.00		C

Section 2 - Conduit, Raceways, Fittings & Related Items

2

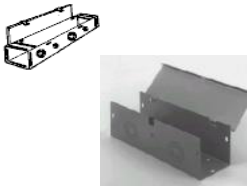
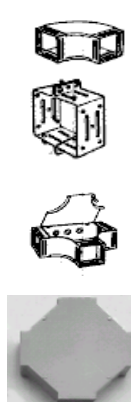
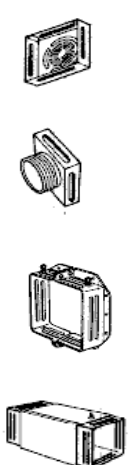
	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Wiremold product						
	Power and low voltage applications						
	2-piece raceway with adhesive backing						
	Ivory, white or fog plastic finish						
	Available in 8' and 10' lengths						
	Built-in wire retainers						
	PN05A08/10 2-Piece Raceway - Base and Cover		4.50	5.40	6.30		C
	PN05F06 Joint Cover		3.00	3.60	4.20		C
	PN05F20 Blank End		3.00	3.60	4.20		C
	PN05F11 Flat Elbow		10.00	12.00	14.00		C
	PN05F17 Internal Elbow		11.00	13.20	15.40		C
	PN05F18 External Elbow		11.00	13.20	15.40		C
	PN05F15 Tee		15.00	18.00	21.00		C
	PN05F86 Drop Ceiling Connector		15.00	18.00	21.00		C
	Wiremold product						
	Power and low voltage applications						
	2-piece raceway with adhesive backing						
	Ivory, white or fog plastic finish						
	Available in 8' and 10' lengths						
	Built-in wire retainers						
	PN10A08/10 2-Piece Raceway - Base and Cover		8.00	9.60	11.20		C
	PN10F06 Joint Cover		4.00	4.80	5.60		C
	PN10F20 Blank End		4.00	4.80	5.60		C
	PN10F11 Flat Elbow		12.00	14.40	16.80		C
	PN10F17 Internal Elbow		13.00	15.60	18.20		C
	PN10F18 External Elbow		13.00	15.60	18.20		C
	PN10F15 Tee		16.50	19.80	23.10		C
	PN10F86 Drop Ceiling Connector		16.00	19.20	22.40		C
	PN10F21 Entrance End Fitting		16.00	19.20	22.40		C
	Device boxes for PN05A/PN10A series raceways						
	Boxes are for mounting power and voice/data devices						
	PSB1 1-Gang Device Box		30.00	36.00	42.00		C
	PSB1 2-Gang Device Box		35.00	42.00	49.00		C
	PSB1 3-Gang Device Box		40.00	48.00	56.00		C
	PBB2S2 (2) Series II Data Box		30.00	36.00	42.00		C
	PBB4TJ (4) Tracjack Data Box		35.00	42.00	49.00		C
	PDB1CM (1) CM Data Box		30.00	36.00	42.00		C
	PDB1S2 (1) Series II Data Box		30.00	36.00	42.00		C
	PDB2TJ (2) Tracjack Data Box		35.00	42.00	49.00		C
	PDB2CM (2) CM Data Box		35.00	42.00	49.00		C
	PDB2S2 (2) Series II Data Box		35.00	42.00	49.00		C
	PDB4TJ (J) Tracjack Data Box		40.00	48.00	56.00		C
	Wiremold Product						
	Power and low voltage applications						
	2-piece raceway with adhesive backing						
	Ivory, white or fog plastic finish						
	Requires screw fasteners to mount raceway						
	8' lengths only						
	Integral divider, two channel for power and low voltage applications						
	Built-in wire retainers						
	PN20A08 2-Piece Raceway - Base and Cover		9.00	10.80	12.60		C
	PN20F06 Joint Cover		4.00	4.80	5.60		C
	PN20F20 Blank End		4.00	4.80	5.60		C
	PN20F11 Flat Elbow		14.00	16.80	19.60		C
	PN20F17 Internal Elbow		14.00	16.80	19.60		C
	PN20F18 External Elbow		14.00	16.80	19.60		C
	PN20F15 Tee		17.50	21.00	24.50		C
	Device boxes for PN20A series raceways						
	Boxes are for mounting power and voice/data devices						
	PIB20S2 (2) Series II Data Box		30.00	36.00	42.00		C
	PIB20CM (2) Cm Data Box		30.00	36.00	42.00		C
	PIB20TJ (4) Tracjack Data Box		35.00	42.00	49.00		C
	PIB20D Duplex Device Box		30.00	36.00	42.00		C
	PIB20R Rectangular Device Box		40.00	48.00	56.00		C
	PMBD20TJ Duplex and (4) Tracjack		40.00	48.00	56.00		C
	PMBD20S2 Duplex and (2) Series II Data		40.00	48.00	56.00		C
	PMBD20CM Duplex and (2) CM Data		40.00	48.00	56.00		C
	PMBR20S2 Rect. Device and (2) Series Data		40.00	48.00	56.00		C
	PMBR20CM Rect. Device and (4) Tracjack		40.00	48.00	56.00		C

Section 2 - Conduit, Raceways, Fittings & Related Items

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Wiremold product						
	Cablesmart series for power and low voltage applications						
	2-piece raceway with multiple channel raceways						
	Ivory or white plastic finish						
	Requires screw fasteners to mount raceway						
	8' lengths only						
	Tamper-resistant where additional security is a priority						
	40N2 2-Piece Raceway - Base and Cover		13.00	15.60	18.20		C
	40N2F06 Joint Cover		4.00	4.80	5.60		C
	40N2F20 Blank End		6.00	7.20	8.40		C
	40N2F11 Flat Elbow		24.00	28.80	33.60		C
	40N2F17 Internal Elbow		28.00	33.60	39.20		C
	40N2F19 External Elbow		28.00	33.60	39.20		C
	40N2F15 Tee		24.00	28.80	33.60		C
	40N2F74 Transition Fitting		24.00	28.80	33.60		C
	40N2F21 Entrance End Fitting		22.00	26.40	30.80		C
	40N2FWC Wire Clip		4.00	4.80	5.60		C
	40N2F31 Twin Cover Device Bracket		16.00	19.20	22.40		C
	40N2F55 High Capacity Device Box		20.00	24.00	28.00		C
	Wiremold product						
	Cablesmart series for power and low voltage applications						
	2-piece raceway with multiple channel raceways						
	Ivory or white plastic finish						
	Requires screw fasteners to mount raceway						
	8' lengths only						
	Tamper-resistant where additional security is a priority						
	60N2 2-Piece Raceway - Base and Cover		15.00	18.00	21.00		C
	60N2F06 Joint Cover		6.00	7.20	8.40		C
	60N2F20 Blank End		8.00	9.60	11.20		C
	60N2F11 Flat Elbow		26.00	31.20	36.40		C
	60N2F17 Internal Elbow		30.00	36.00	42.00		C
	60N2F18 External Elbow		30.00	36.00	42.00		C
	60N2F15 Tee		26.00	31.20	36.40		C
	60N2F74 Transition Fitting		26.00	31.20	36.40		C
	60N2F21 Entrance End Fitting		24.00	28.80	33.60		C
	60N2FWC Wire Clip		5.00	6.00	7.00		C
	60N2F31 Twin Cover Device Bracket		18.00	21.60	25.20		C
	60N2F55 High Capacity Device Box		20.00	24.00	28.00		C
	Wiremold product						
	Large cable capacity for power and low voltage applications						
	2-piece raceway with multiple channel raceways						
	Ivory or white plastic finish						
	Requires screw fasteners to mount raceway						
	8' lengths only						
	5400TB 2-Piece Raceway - Base and Cover		15.00	18.00	21.00		C
	5406TB Joint Cover		6.00	7.20	8.40		C
	5410 Blank End		8.00	9.60	11.20		C
	5411F0 Flat Elbow		26.00	31.20	36.40		C
	5417 Internal Elbow		30.00	36.00	42.00		C
	5418 External Elbow		30.00	36.00	42.00		C
	5415 Tee		26.00	31.20	36.40		C
	5474 Transition Fitting		26.00	31.20	36.40		C
	5410DF0 Entrance End Fitting		24.00	28.80	33.60		C
	5400TWC Wire Clip		5.00	6.00	7.00		C
	5450 Device Bracket		18.00	21.60	25.20		C
	5450 Orap Wireless Bracket		20.00	24.00	28.00		C
	5450T Twin Snap Cover Bracket		20.00	24.00	28.00		C
	5450A3 Three Device Bracket		22.00	26.40	30.80		C
							
	Wiremold product						
	Large cable capacity for power and low voltage applications						
	2-piece raceway with multiple channel raceways						
	Ivory or white plastic finish						
	Requires screw fasteners to mount raceway						
	8' lengths only						
	5500 2-Piece Raceway - Base and Cover		18.00	21.60	25.20		C
	5506 Joint Cover		7.00	8.40	9.80		C
	5510 Blank End		9.00	10.80	12.60		C
	5511F0 Flat Elbow		28.00	33.60	39.20		C
	5517 Internal Elbow		32.00	38.40	44.80		C
	5518 External Elbow		32.00	38.40	44.80		C
	5515 Tee		28.00	33.60	39.20		C
	5574 Transition Fitting		28.00	33.60	39.20		C
	5510D Entrance End Fitting		28.00	33.60	39.20		C
	5500WC Wire Clip		6.00	7.20	8.40		C
	5550 Device Bracket		18.00	21.60	25.20		C
	5550 Orap Offset Mounting Bracket		20.00	24.00	28.00		C
	5514A Backfeed Connector		20.00	24.00	28.00		C

Section 2 - Conduit, Raceways, Fittings & Related Items

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	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Metal Wireway						
	Hinged Cover Lay-In Wireways						
	2 1/2" x 2 1/2" Wireways		10.00	12.50	15.00		C
	4" x 4" Wireways		12.00	15.00	18.00		C
	6" x 6" Wireways		15.00	18.75	22.50		C
	8" x 8" Wireways		18.00	22.50	27.00		C
	12" x 12" Wireways		22.00	27.50	33.00		C
	Hinged Cover Lay-In Wireways -Fittings						
	2 1/2" x 2 1/2" Elbows		30.00	37.50	45.00		C
	4" x 4" Elbows		35.00	43.75	52.00		C
	6" x 6" Elbows		40.00	50.00	60.00		C
	8" x 8" Elbows		50.00	62.00	75.00		C
	12" x 12" Elbows		60.00	75.00	90.00		C
	2 1/2" x 2 1/2" Couplings		20.00	25.00	30.00		C
	4" x 4" Couplings		25.00	31.20	37.00		C
	6" x 6" Couplings		30.00	37.50	45.00		C
	8" x 8" Couplings		40.00	50.00	60.00		C
	12" x 12" Couplings		50.00	62.00	75.00		C
	2 1/2" x 2 1/2" Tees		40.00	50.00	60.00		C
	4" x 4" Tees		45.00	56.00	67.00		C
	6" x 6" Tees		50.00	62.00	75.00		C
	8" x 8" Tees		60.00	75.00	90.00		C
	12" x 12" Tees		70.00	87.00	100.00		C
	2 1/2" x 2 1/2" Crosses		50.00	62.00	75.00		C
	4" x 4" Crosses		55.00	68.00	82.00		C
	6" x 6" Crosses		60.00	75.00	90.00		C
	8" x 8" Crosses		70.00	87.00	100.00		C
	12" x 12" Crosses		80.00	100.00	120.00		C
	2 1/2" x 2 1/2" End Caps		12.00	15.00	18.00		C
	4" x 4" End Caps		15.00	18.70	22.50		C
	6" x 6" End Caps		20.00	25.00	30.00		C
	8" x 8" End Caps		25.00	31.20	37.00		C
	12" x 12" End Caps		30.00	37.50	45.00		C
	Hinged Cover Lay-In Wireways - Accessories						
	2 1/2" x 2 1/2" Adapters		20.00	25.00	30.00		C
	4" x 4" Adapters		25.00	31.20	37.00		C
	6" x 6" Adapters		30.00	37.50	45.00		C
	8" x 8" Adapters		40.00	50.00	60.00		C
	12" x 12" Adapters		50.00	62.00	75.00		C
	2 1/2" x 2 1/2" Panel Connectors		30.00	37.50	45.00		C
	4" x 4" Panel Connectors		35.00	43.70	52.50		C
	6" x 6" Panel Connectors		40.00	50.00	60.00		C
	8" x 8" Panel Connectors		50.00	62.00	75.00		C
	12" x 12" Panel Connectors		60.00	75.00	90.00		C
	2 1/2" x 2 1/2" Slip Fittings		40.00	50.00	60.00		C
	4" x 4" Slip Fittings		45.00	56.00	67.00		C
	6" x 6" Slip Fittings		50.00	62.00	75.00		C
	8" x 8" Slip Fittings		60.00	75.00	90.00		C
	12" x 12" Slip Fittings		70.00	87.00	100.00		C
	Hinged Cover Lay-In Wireways - Brackets						
	2 1/2" Wall Brackets		8.00	10.00	12.00		C
	4" Wall Brackets		10.00	12.50	15.00		C
	6" Wall Brackets		12.00	15.00	18.00		C
	8" Wall Brackets		14.00	17.50	21.00		C
	12" Wall Brackets		16.00	20.00	24.00		C
	2 1/2" Ceiling Brackets		12.00	15.00	18.00		C
	4" Ceiling Brackets		14.00	17.50	21.00		C
	6" Ceiling Brackets		16.00	20.00	24.00		C
	8" Ceiling Brackets		18.00	22.50	27.00		C
	12" Ceiling Brackets		20.00	25.00	30.00		C
	Hinged Cover Lay-In Wireways - Miscellaneous						
	4" x 4" x 2 1/2" Reducers		20.00	25.00	30.00		C
	6" x 6" x 4" Reducers		25.00	31.20	37.50		C
	8" x 8" x 6" Reducers		30.00	37.50	45.00		C
	12" x 12" x 8" Reducers		35.00	43.70	52.50		C
	7" x 7" x 7" Pull Boxes		150.00	187.00	225.00		C
	7" x 12" x 12" Pull Boxes		175.00	215.00	260.00		C
	Screwed Cover Lay-In Wireways						
	2 1/2" x 2 1/2" Wireways		10.00	12.50	15.00		C
	4" x 4" Wireways		12.00	15.00	18.00		C
	6" x 6" Wireways		14.00	17.50	21.00		C
	8" x 8" Wireways		17.00	21.20	25.50		C
	12" x 12" Wireways		20.00	25.00	30.00		C

Description

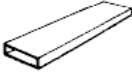
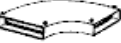
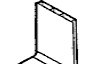
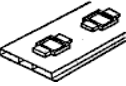
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Section 2 - Conduit, Raceways, Fittings & Related Items

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	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Underfloor Duct							
Steel Underfloor Duct & Fittings							
	3" Standard Blank Duct		4.00	5.00	6.00		C
	6" Standard blank Duct		5.00	6.20	7.50		C
	3" Standard Insert Duct		4.50	5.60	6.70		C
	6" Standard Insert Duct		5.50	6.80	8.20		C
	3" Standard Duct Couplings		10.00	12.50	15.00		C
	6" Standard Duct Couplings		10.00	12.50	15.00		C
	3" Standard Duct Elbows & Offsets		30.00	37.50	45.00		C
	6" Standard Duct Elbows & Offsets		35.00	43.70	52.00		C
	3" Standard Duct Support-Single		10.00	12.50	15.00		C
	6" Standard Duct Support-Single		11.00	13.50	16.00		C
	3" Standard Duct Support-Double		11.00	13.50	16.00		C
	6" Standard Duct Support-Double		12.00	14.50	17.00		C
	3" Standard Duct Support-Triple		12.00	14.50	17.00		C
	6" Standard Duct Support-Triple		13.00	15.50	18.00		C
	3" Duct Tee		50.00	62.00	75.00		C
	6" Duct Tee		55.00	68.00	82.00		C
	3" Duct 1-Level Cross		55.00	68.00	82.00		C
	6" Duct 1-Level Cross		60.00	75.00	90.00		C
	3" Duct 2-Level Cross		60.00	75.00	90.00		C
	6" Duct 2-Level Cross		65.00	81.00	97.00		C
	3" Duct Adapters-All Types		10.00	12.50	15.00		C
	6" Duct Adapters-All Types		12.00	15.00	18.00		C
	3" Duct Expansion Joint		50.00	62.00	75.00		C
	6" Duct Expansion Joint		55.00	68.00	82.00		C
	3" Panel Connector		50.00	62.50	75.00		C
	6" Panel Connector		50.00	62.50	75.00		C
	3" Duct End Cap		5.00	6.20	7.50		C
	6" Duct End Cap		5.50	6.80	8.20		C
	10" x 10" Junction Box		100.00	125.00	150.00		C
	12" x 12" Junction Box		140.00	165.00	190.00		C
	14" x 14" Junction Box		180.00	210.00	235.00		C
	16" x 16" Junction Box		220.00	250.00	280.00		C
	18" x 18" Junction Box		240.00	275.00	300.00		C
	24" x 24" Junction box		280.00	310.00	335.00		C
	30" x 30" Junction box		300.00	400.00	500.00		C
	Duct Marker Screw Assembly		15.00	18.70	22.50		C
	Duct Joint Spot Welding		30.00	37.50	45.00		C
Cellular Underfloor Duct-3 Cell							
	10"		7.00	8.70	10.50		C
	13"		8.00	10.00	12.00		C
	16"		9.00	11.20	13.50		C
	24"		10.00	12.50	15.00		C
3-Cell Junction Boxes							
	10"		40.00	50.00	60.00		C
	13"		50.00	62.00	75.00		C
	16"		60.00	75.00	90.00		C
	24"		70.00	87.00	105.00		C
3-Cell Elbows							
	10"		20.00	25.00	30.00		C
	13"		30.00	37.00	45.00		C
	16"		40.00	50.00	60.00		C
	24"		50.00	62.00	75.00		C
3-Cell Duct Support & Couplings							
	10"		8.00	10.00	12.00		C
	13"		9.00	11.20	13.50		C
	16"		10.00	12.50	15.00		C
	24"		12.00	15.00	18.00		C
Header Sections							
	24" x 60" Header Sections		40.00	50.00	60.00		C
	30" x 60" Header Sections		50.00	62.00	75.00		C
	36" x 60" Header Sections		60.00	75.00	90.00		C
Field Installed Preset Inserts							
	Field Install Preset Inserts		20.00	25.00	30.00		C
Duct End Closures							
	Duct End Closures		5.00	6.20	7.50		C
	J-Box Closure Caps		6.00	7.50	9.00		C

Description

Rev	Normal	Difficult	Difficult	Experience	Unit
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Section 2 - Conduit, Raceways, Fittings & Related Items

2

Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Trench Duct						
Solid Bottom Trench Duct						
9"		40.00	50.00	60.00		C
12"		45.00	56.20	67.50		C
18"		54.00	67.50	81.00		C
24"		64.00	80.00	96.00		C
27"		68.00	85.00	102.00		C
30"		72.00	90.00	108.00		C
36"		80.00	100.00	120.00		C
Cellular Trench Duct						
9"		50.00	62.00	75.00		C
12"		55.00	68.70	82.50		C
18"		65.00	81.20	97.50		C
24"		75.00	93.70	112.00		C
27"		80.00	100.00	120.00		C
30"		90.00	112.00	135.00		C
36"		100.00	125.00	150.00		C
Trench Duct Elbows						
9"		4.00	5.00	6.00		E
12"		4.50	5.60	6.70		E
18"		5.00	6.20	7.50		E
24"		5.50	6.80	8.20		E
27"		6.00	7.50	9.00		E
30"		7.00	8.70	10.50		E
36"		8.00	10.00	12.00		E
Trench Duct Tees						
9"		5.00	6.20	7.50		E
12"		5.50	6.80	8.20		E
18"		6.00	7.50	9.00		E
24"		7.00	8.70	10.50		E
27"		8.00	10.00	12.00		E
30"		9.00	11.20	13.50		E
36"		10.00	12.50	15.00		E
Trench Duct Crosses						
9"		6.00	7.50	9.00		E
12"		6.50	8.10	9.70		E
18"		7.00	8.70	10.50		E
24"		8.00	10.00	12.00		E
27"		9.00	11.20	13.50		E
30"		10.00	12.50	15.00		E
36"		12.00	15.00	18.00		E
Trench Duct Wall Elbows & Panel Risers						
9"		3.00	3.70	4.50		E
12"		3.50	4.30	5.20		E
18"		4.00	5.00	6.00		E
24"		4.50	5.60	6.70		E
27"		5.00	6.20	7.50		E
30"		6.00	7.50	9.00		E
36"		7.00	8.70	10.50		E
Trench Duct Cover Plates						
9"		4.00	5.00	6.00		C
12"		4.50	5.60	6.70		C
18"		5.00	6.20	7.50		C
24"		5.50	6.80	8.20		C
27"		6.00	7.50	9.00		C
30"		7.00	8.70	10.50		C
36"		8.00	10.00	12.00		C

Section 2 - Conduit, Raceways, Fittings & Related Items

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Cable Tray						
	Steel Tray 3" Depth						
	Steel Ladder Cable Tray - 6" Rung Spacing - 3" Depth						
	6" Wide		12.00	15.00	18.00		C
	9" Wide		13.00	16.25	19.50		C
	12" Wide		14.00	17.50	21.00		C
	18" Wide		15.00	18.75	22.50		C
	24" Wide		16.00	20.00	24.00		C
	30" Wide		18.00	22.50	27.00		C
	36" Wide		20.00	25.00	30.00		C
	Steel Ladder Cable Tray - 9" Rung Spacing - 3" Depth						
	6" Wide		11.50	14.38	17.25		C
	9" Wide		12.25	15.31	18.38		C
	12" Wide		13.00	16.25	19.50		C
	18" Wide		13.75	17.19	20.63		C
	24" Wide		14.50	18.13	21.75		C
	30" Wide		16.00	20.00	24.00		C
	36" Wide		17.50	21.88	26.25		C
	Steel Ladder Cable Tray - 12" Rung Spacing - 3" Depth						
	6" Wide		11.00	13.75	16.50		C
	9" Wide		11.50	14.38	17.25		C
	12" Wide		12.00	15.00	18.00		C
	18" Wide		12.50	15.63	18.75		C
	24" Wide		13.00	16.25	19.50		C
	30" Wide		14.00	17.50	21.00		C
	36" Wide		15.00	18.75	22.50		C
	Steel Ladder Cable Tray - 18" Rung Spacing - 3" Depth						
	6" Wide		10.70	13.38	16.05		C
	9" Wide		11.20	14.00	16.80		C
	12" Wide		11.60	14.50	17.40		C
	18" Wide		12.20	15.25	18.30		C
	24" Wide		12.60	15.75	18.90		C
	30" Wide		13.50	16.88	20.25		C
	36" Wide		14.00	17.50	21.00		C
	Steel - 45 Degree Elbow - 3" Depth						
	6" Wide		1.50	1.88	2.25		E
	9" Wide		1.65	2.06	2.48		E
	12" Wide		1.80	2.25	2.70		E
	18" Wide		2.00	2.50	3.00		E
	24" Wide		2.35	2.94	3.53		E
	30" Wide		2.65	3.31	3.98		E
	36" Wide		3.00	3.75	4.50		E
	Steel - 90 Degree Elbow - 3" Depth						
	6" Wide		2.25	2.81	3.38		E
	9" Wide		2.50	3.13	3.75		E
	12" Wide		2.75	3.44	4.13		E
	18" Wide		3.00	3.75	4.50		E
	24" Wide		3.50	4.38	5.25		E
	30" Wide		4.00	5.00	6.00		E
	36" Wide		4.50	5.63	6.75		E
	Steel - Tee - 3" Depth						
	6" Wide		4.00	5.00	6.00		E
	9" Wide		4.25	5.31	6.38		E
	12" Wide		4.50	5.63	6.75		E
	18" Wide		5.00	6.25	7.50		E
	24" Wide		5.50	6.88	8.25		E
	30" Wide		6.00	7.50	9.00		E
	36" Wide		6.50	8.13	9.75		E
	Steel - Cross - 3" Depth						
	6" Wide		5.25	6.56	7.88		E
	9" Wide		5.50	6.88	8.25		E
	12" Wide		6.00	7.50	9.00		E
	18" Wide		6.50	8.13	9.75		E
	24" Wide		7.00	8.75	10.50		E
	30" Wide		7.50	9.38	11.25		E
	36" Wide		8.00	10.00	12.00		E

A technical drawing of a bent metal profile, likely a channel or I-beam. The profile is bent into a U-shape. The overall length of the profile is labeled as L . The width of the top flange is labeled as W_1 . The width of the bottom flange is labeled as W_2 . The drawing shows the profile from a perspective view, highlighting the bend and the dimensions.

A 3D perspective diagram of a rectangular frame. The frame consists of four L-shaped members joined at their corners. The dimensions are labeled as follows: 'A' is the height of the left vertical member; 'B' is the width of the bottom horizontal member; 'C' is the depth of the front horizontal member; and 'D' is the depth of the back horizontal member. The frame is shown in an isometric view.

A 3D perspective diagram of a curved structural member, likely a bracket or a part of a machine. The member is curved in the horizontal plane. Dimension A is the vertical height from the base to the top flange. Dimension B is the horizontal distance from the vertical centerline to the outer edge of the top flange. Dimension C is the horizontal distance from the vertical centerline to the inner edge of the top flange. Dimension D is the horizontal distance from the vertical centerline to the base of the member. The member has a top flange with four holes and a base flange with four holes. Two horizontal bolts are shown passing through the member, one at the top and one at the base.

Section 2 - Conduit, Raceways, Fittings & Related Items

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Steel Tray 4" Depth						
	Steel Ladder Cable Tray - 6" Rung Spacing - 4" Depth						
	6" Wide		14.00	17.50	21.00		C
	9" Wide		15.00	18.75	22.50		C
	12" Wide		16.00	20.00	24.00		C
	18" Wide		17.00	21.25	25.50		C
	24" Wide		18.00	22.50	27.00		C
	30" Wide		20.00	25.00	30.00		C
	36" Wide		22.00	27.50	33.00		C
	Steel Ladder Cable Tray - 9" Rung Spacing - 4" Depth						
	6" Wide		13.50	16.88	20.25		C
	9" Wide		13.90	17.38	20.85		C
	12" Wide		14.70	18.38	22.05		C
	18" Wide		15.50	19.38	23.25		C
	24" Wide		16.00	20.00	24.00		C
	30" Wide		18.10	22.63	27.15		C
	Steel Ladder Cable Tray- 12" Rung Spacing - 4" Depth						
	6" Wide		13.00	16.25	19.50		C
	9" Wide		13.50	16.88	20.25		C
	12" Wide		14.00	17.50	21.00		C
	18" Wide		14.50	18.13	21.75		C
	24" Wide		15.00	18.75	22.50		C
	30" Wide		16.00	20.00	24.00		C
	Steel Ladder Cable Tray - 18" Rung Spacing - 4" Depth						
	6" Wide		12.60	15.75	18.90		C
	9" Wide		13.00	16.25	19.50		C
	12" Wide		13.60	17.00	20.40		C
	18" Wide		14.00	17.50	21.00		C
	24" Wide		14.60	18.25	21.90		C
	30" Wide		15.50	19.38	23.25		C
	Steel - 45 Degree Elbow - 4" Depth						
	6" Wide		1.75	2.19	2.63		E
	9" Wide		1.90	2.38	2.85		E
	12" Wide		2.20	2.75	3.30		E
	18" Wide		2.40	3.00	3.60		E
	24" Wide		2.70	3.38	4.05		E
	30" Wide		3.10	3.88	4.65		E
	Steel - 90 Degree Elbow - 4" Depth						
	6" Wide		2.60	3.25	3.90		E
	9" Wide		2.90	3.63	4.35		E
	12" Wide		3.15	3.94	4.73		E
	18" Wide		3.50	4.38	5.25		E
	24" Wide		4.00	5.00	6.00		E
	30" Wide		4.60	5.75	6.90		E
	Steel - Tee - 4" Depth						
	6" Wide		4.60	5.75	6.90		E
	9" Wide		4.90	6.13	7.35		E
	12" Wide		5.20	6.50	7.80		E
	18" Wide		5.80	7.25	8.70		E
	24" Wide		6.40	8.00	9.60		E
	30" Wide		7.00	8.75	10.50		E
	Steel - Cross- 4" Depth						
	6" Wide		6.10	7.63	9.15		E
	9" Wide		6.40	8.00	9.60		E
	12" Wide		7.00	8.75	10.50		E
	18" Wide		7.50	9.38	11.25		E
	24" Wide		8.20	10.25	12.30		E
	30" Wide		8.70	10.88	13.05		E
	36" Wide		9.30	11.63	13.95		E

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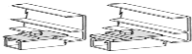
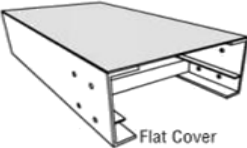
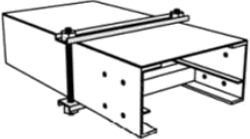
Section 2 - Conduit, Raceways, Fittings & Related Items

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Steel Tray 6" Depth						
	Steel Ladder Cable Tray - 6" Rung Spacing - 6" Depth						
	6" Wide		18.00	22.50	27.00		C
	9" Wide		19.00	23.75	28.50		C
	12" Wide		20.00	25.00	30.00		C
	18" Wide		21.00	26.25	31.50		C
	24" Wide		22.00	27.50	33.00		C
	30" Wide		24.00	30.00	36.00		C
	36" Wide		26.00	32.50	39.00		C
	Steel Ladder Cable Tray - 9" Rung Spacing - 6" Depth						
	6" Wide		17.50	21.88	26.25		C
	9" Wide		18.30	22.88	27.45		C
	12" Wide		19.00	23.75	28.50		C
	18" Wide		19.80	24.75	29.70		C
	24" Wide		20.40	25.50	30.60		C
	30" Wide		21.90	27.38	32.85		C
	36" Wide		23.50	29.38	35.25		C
	Steel Ladder Cable Tray - 12" Rung Spacing - 6" Depth						
	6" Wide		17.00	21.25	25.50		C
	9" Wide		17.50	21.88	26.25		C
	12" Wide		18.00	22.50	27.00		C
	18" Wide		18.50	23.13	27.75		C
	24" Wide		19.00	23.75	28.50		C
	30" Wide		20.00	25.00	30.00		C
	36" Wide		21.00	26.25	31.50		C
	Steel Ladder Cable Tray - 18" Rung Spacing - 6" Depth						
	6" Wide		16.50	20.63	24.75		C
	9" Wide		17.00	21.25	25.50		C
	12" Wide		17.50	21.88	26.25		C
	18" Wide		17.90	22.38	26.85		C
	24" Wide		18.40	23.00	27.60		C
	30" Wide		19.50	24.38	29.25		C
	36" Wide		20.00	25.00	30.00		C
	Steel - 45 Degree Elbow - 6" Depth						
	6" Wide		2.00	2.50	3.00		E
	9" Wide		2.20	2.75	3.30		E
	12" Wide		2.40	3.00	3.60		E
	18" Wide		2.60	3.25	3.90		E
	24" Wide		3.00	3.75	4.50		E
	30" Wide		3.50	4.38	5.25		E
	36" Wide		3.90	4.88	5.85		E
	Steel - 90 Degree Elbow - 6" Depth						
	6" Wide		3.00	3.75	4.50		E
	9" Wide		3.30	4.13	4.95		E
	12" Wide		3.80	4.75	5.70		E
	18" Wide		4.00	5.00	6.00		E
	24" Wide		4.70	5.88	7.05		E
	30" Wide		5.30	6.63	7.95		E
	36" Wide		6.00	7.50	9.00		E
	Steel - Tee - 6" Depth						
	6" Wide		5.90	7.38	8.85		E
	9" Wide		6.20	7.75	9.30		E
	12" Wide		6.60	8.25	9.90		E
	18" Wide		7.30	9.13	10.95		E
	24" Wide		8.00	10.00	12.00		E
	30" Wide		8.80	11.00	13.20		E
	36" Wide		9.50	11.88	14.25		E
	Steel - Cross - 6" Depth						
	6" Wide		7.70	9.63	11.55		E
	9" Wide		8.20	10.25	12.30		E
	12" Wide		8.80	11.00	13.20		E
	18" Wide		9.50	11.88	14.25		E
	24" Wide		10.30	12.88	15.45		E
	30" Wide		11.00	13.75	16.50		E
	36" Wide		11.80	14.75	17.70		E
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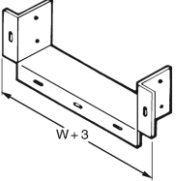
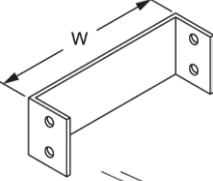
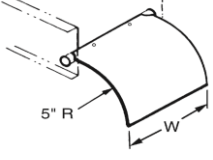
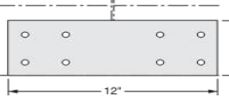
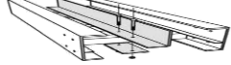
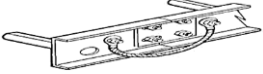
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Section 2 - Conduit, Raceways, Fittings & Related Items

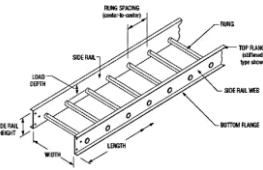
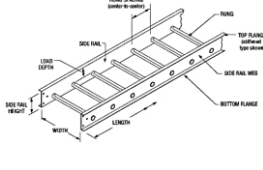
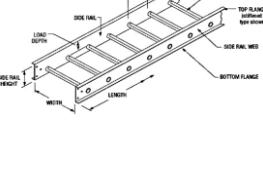
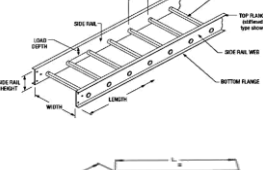
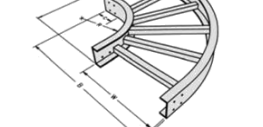
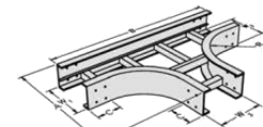
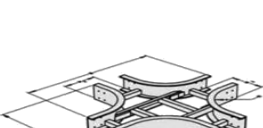
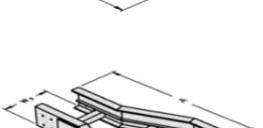
	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Steel Cable Tray Fittings & Accessories						
	Combination Hold-Down Clamp and Expansion Guide						
	Hold Down Clamp Pair		0.8	1.00	1.20		E
	Steel Cable Tray - Solid Covers						
	6" Wide		3.75	4.69	5.63		C
	9" Wide		4.25	5.31	6.38		C
	12" Wide		5.25	6.56	7.88		C
	18" Wide		6.75	8.44	10.13		C
	24" Wide		8.25	10.31	12.38		C
	30" Wide		10.25	12.81	15.38		C
	36" Wide		12.25	15.31	18.38		C
	Steel Cable Tray - Solid Cover Clamps (Per Pair)						
	6" Wide		0.50	0.63	0.75		E
	9" Wide		0.55	0.69	0.83		E
	12" Wide		0.60	0.75	0.90		E
	18" Wide		0.65	0.81	0.98		E
	24" Wide		0.70	0.88	1.05		E
	30" Wide		0.75	0.94	1.13		E
	36" Wide		0.80	1.00	1.20		E
	Steel - 45 Degree Elbow - Solid Covers						
	6" Wide		0.25	0.31	0.38		E
	9" Wide		0.30	0.38	0.45		E
	12" Wide		0.35	0.44	0.53		E
	18" Wide		0.40	0.50	0.60		E
	24" Wide		0.50	0.63	0.75		E
	30" Wide		0.60	0.75	0.90		E
	36" Wide		0.70	0.88	1.05		E
	Steel - 90 Degree Elbow - Solid Covers						
	6" Wide		0.25	0.31	0.38		E
	9" Wide		0.30	0.38	0.45		E
	12" Wide		0.35	0.44	0.53		E
	18" Wide		0.40	0.50	0.60		E
	24" Wide		0.50	0.63	0.75		E
	30" Wide		0.60	0.75	0.90		E
	36" Wide		0.70	0.88	1.05		E
	Steel - Tee - Solid Covers						
	6" Wide		0.35	0.44	0.53		E
	9" Wide		0.40	0.50	0.60		E
	12" Wide		0.45	0.56	0.68		E
	18" Wide		0.50	0.63	0.75		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.70	0.88	1.05		E
	36" Wide		0.80	1.00	1.20		E
	Steel - Cross - Solid Covers						
	6" Wide		0.45	0.56	0.68		E
	9" Wide		0.50	0.63	0.75		E
	12" Wide		0.55	0.69	0.83		E
	18" Wide		0.60	0.75	0.90		E
	24" Wide		0.70	0.88	1.05		E
	30" Wide		0.80	1.00	1.20		E
	36" Wide		0.90	1.13	1.35		E
	Steel - Reducer - Solid Covers						
	6" Wide		0.25	0.31	0.38		E
	9" Wide		0.30	0.38	0.45		E
	12" Wide		0.35	0.44	0.53		E
	18" Wide		0.40	0.50	0.60		E
	24" Wide		0.50	0.63	0.75		E
	30" Wide		0.60	0.75	0.90		E
	36" Wide		0.70	0.88	1.05		E
	Steel - Vertical 45 Degree Elbow - Solid Covers						
	6" Wide		0.35	0.44	0.53		E
	9" Wide		0.40	0.50	0.60		E
	12" Wide		0.45	0.56	0.68		E
	18" Wide		0.50	0.63	0.75		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.70	0.88	1.05		E
	36" Wide		0.80	1.00	1.20		E

Section 2 - Conduit, Raceways, Fittings & Related Items

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	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Steel - Vertical 90 Degree Elbow - Solid Covers						
	6" Wide		0.35	0.44	0.53		E
	9" Wide		0.40	0.50	0.60		E
	12" Wide		0.45	0.56	0.68		E
	18" Wide		0.50	0.63	0.75		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.70	0.88	1.05		E
	36" Wide		0.80	1.00	1.20		E
	Steel - Vertical Tee - Solid Covers						
	6" Wide		0.45	0.56	0.68		E
	9" Wide		0.50	0.63	0.75		E
	12" Wide		0.55	0.69	0.83		E
	18" Wide		0.60	0.75	0.90		E
	24" Wide		0.70	0.88	1.05		E
	30" Wide		0.80	1.00	1.20		E
	36" Wide		0.90	1.13	1.35		E
	Steel - Enclosure Connectors						
	6" Wide		2.00	2.50	3.00		E
	9" Wide		2.25	2.81	3.38		E
	12" Wide		2.60	3.25	3.90		E
	18" Wide		3.00	3.75	4.50		E
	24" Wide		3.50	4.38	5.25		E
	30" Wide		4.25	5.31	6.38		E
	36" Wide		5.00	6.25	7.50		E
	Steel - End Plates						
	6" Wide		0.40	0.50	0.60		E
	9" Wide		0.45	0.56	0.68		E
	12" Wide		0.50	0.63	0.75		E
	18" Wide		0.55	0.69	0.83		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.65	0.81	0.98		E
	36" Wide		0.70	0.88	1.05		E
	Steel - Ladder Drop-Outs						
	6" Wide		0.40	0.50	0.60		E
	9" Wide		0.45	0.56	0.68		E
	12" Wide		0.50	0.63	0.75		E
	18" Wide		0.55	0.69	0.83		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.65	0.81	0.98		E
	36" Wide		0.70	0.88	1.05		E
	Steel - Splice Plates Pair						
	6" Wide		0.80	1.00	1.20		E
	9" Wide		0.85	1.06	1.28		E
	12" Wide		0.90	1.13	1.35		E
	18" Wide		0.95	1.19	1.43		E
	24" Wide		1.00	1.25	1.50		E
	30" Wide		1.10	1.38	1.65		E
	36" Wide		1.20	1.50	1.80		E
	Steel Cable Tray Barrier Strips						
	3" Depth		6.00	7.50	9.00		C
	4" Depth		8.00	10.00	12.00		C
	6" Depth		10.00	12.50	15.00		C
	Steel Cable Tray Fitting Barrier Strips						
	3" Depth		0.60	0.75	0.90		E
	4" Depth		0.65	0.81	0.98		E
	6" Depth		0.70	0.88	1.05		E
	Steel Conduit To Cable Tray Adapters						
	1/2" Conduit		0.50	0.63	0.75		E
	3/4" Conduit		0.55	0.69	0.83		E
	1" Conduit		0.60	0.75	0.90		E
	1 1/4" Conduit		0.65	0.81	0.98		E
	1 1/2" Conduit		0.70	0.88	1.05		E
	2" Conduit		0.75	0.94	1.13		E
	2 1/2" Conduit		0.80	1.00	1.20		E
	3" Conduit		0.90	1.13	1.35		E
	3 1/2" Conduit		1.00	1.25	1.50		E
	Bonding Jumpers						
	#1/0 Copper X 15" Long		0.60	0.75	0.90		E
	#4/0 Copper X 15" Long		0.80	1.00	1.20		E
	#250 Copper X 15" Long		1.00	1.25	1.50		E

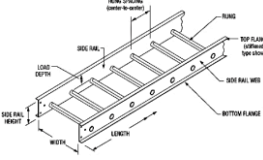
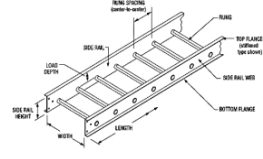
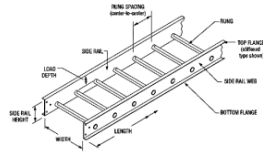
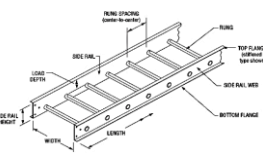
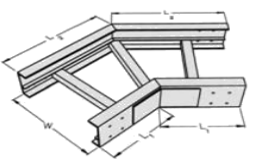
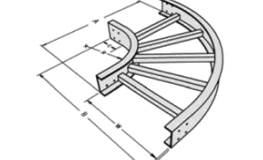
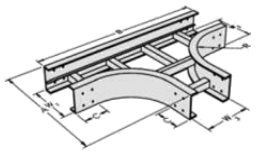
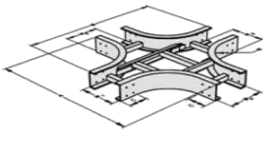
Section 2 - Conduit, Raceways, Fittings & Related Items

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Aluminum Tray 3" Depth						
	Aluminum Ladder Cable Tray - 6" Rung Spacing - 3" Depth						
	6" Wide		10.50	13.13	15.75		C
	9" Wide		11.25	14.06	16.88		C
	12" Wide		12.00	15.00	18.00		C
	18" Wide		12.75	15.94	19.13		C
	24" Wide		13.50	16.88	20.25		C
	30" Wide		15.00	18.75	22.50		C
	36" Wide		16.50	20.63	24.75		C
	Aluminum Ladder Cable Tray - 9" Rung Spacing - 3" Depth						
	6" Wide		10.20	12.75	15.30		C
	9" Wide		10.80	13.50	16.20		C
	12" Wide		11.25	14.06	16.88		C
	18" Wide		12.00	15.00	18.00		C
	24" Wide		12.75	15.94	19.13		C
	30" Wide		14.25	17.81	21.38		C
	36" Wide		15.75	19.69	23.63		C
	Aluminum Ladder Cable Tray - 12" Rung Spacing - 3" Depth						
	6" Wide		9.75	12.19	14.63		C
	9" Wide		10.20	12.75	15.30		C
	12" Wide		10.50	13.13	15.75		C
	18" Wide		10.80	13.50	16.20		C
	24" Wide		11.25	14.06	16.88		C
	30" Wide		12.00	15.00	18.00		C
	36" Wide		12.75	15.94	19.13		C
	Aluminum Ladder Cable Tray - 18" Rung Spacing - 3" Depth						
	6" Wide		9.00	11.25	13.50		C
	9" Wide		9.40	11.75	14.10		C
	12" Wide		9.75	12.19	14.63		C
	18" Wide		10.20	12.75	15.30		C
	24" Wide		10.50	13.13	15.75		C
	30" Wide		11.25	14.06	16.88		C
	36" Wide		12.00	15.00	18.00		C
	Aluminum - 45 Degree Elbow - 3" Depth						
	6" Wide		1.35	1.69	2.03		E
	9" Wide		1.50	1.88	2.25		E
	12" Wide		1.70	2.13	2.55		E
	18" Wide		1.80	2.25	2.70		E
	24" Wide		2.10	2.63	3.15		E
	30" Wide		2.40	3.00	3.60		E
	36" Wide		2.70	3.38	4.05		E
	Aluminum - 90 Degree Elbow - 3" Depth						
	6" Wide		2.00	2.50	3.00		E
	9" Wide		2.25	2.81	3.38		E
	12" Wide		2.40	3.00	3.60		E
	18" Wide		2.70	3.38	4.05		E
	24" Wide		3.20	4.00	4.80		E
	30" Wide		3.60	4.50	5.40		E
	36" Wide		4.00	5.00	6.00		E
	Aluminum - Tee - 3" Depth						
	6" Wide		3.60	4.50	5.40		E
	9" Wide		3.80	4.75	5.70		E
	12" Wide		4.00	5.00	6.00		E
	18" Wide		4.50	5.63	6.75		E
	24" Wide		5.00	6.25	7.50		E
	30" Wide		5.40	6.75	8.10		E
	36" Wide		5.90	7.38	8.85		E
	Aluminum - Cross - 3" Depth						
	6" Wide		4.70	5.88	7.05		E
	9" Wide		5.00	6.25	7.50		E
	12" Wide		5.40	6.75	8.10		E
	18" Wide		5.80	7.25	8.70		E
	24" Wide		6.30	7.88	9.45		E
	30" Wide		6.75	8.44	10.13		E
	36" Wide		7.20	9.00	10.80		E
	Aluminum - Reducer - 3" Depth						
	6" Wide		1.35	1.69	2.03		E
	9" Wide		1.50	1.88	2.25		E
	12" Wide		1.70	2.13	2.55		E
	18" Wide		1.80	2.25	2.70		E
	24" Wide		2.10	2.63	3.15		E
	30" Wide		2.40	3.00	3.60		E
	36" Wide		2.70	3.38	4.05		E

The figure contains two technical drawings of reinforcement components. Drawing (a) shows a straight reinforcement with dimensions: A (height), B (width), C (thickness), and D (length). Drawing (b) shows a curved reinforcement with dimensions: A (height), B (width), C (thickness), and D (length). Both drawings show the reinforcement is made of two parallel plates connected by a central bar.

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Section 2 - Conduit, Raceways, Fittings & Related Items

Description		Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Aluminum Tray 4" Depth							
	Aluminum Ladder Cable Tray - 6" Rung Spacing - 4" Depth						
	6" Wide		12.75	15.94	19.13		C
	9" Wide		13.50	16.88	20.25		C
	12" Wide		14.25	17.81	21.38		C
	18" Wide		15.00	18.75	22.50		C
	24" Wide		16.50	20.63	24.75		C
	30" Wide		18.00	22.50	27.00		C
	36" Wide		19.50	24.38	29.25		C
	Aluminum Ladder Cable Tray - 9" Rung Spacing - 4" Depth						
	6" Wide		12.20	15.25	18.30		C
	9" Wide		12.75	15.94	19.13		C
	12" Wide		13.40	16.75	20.10		C
	18" Wide		14.00	17.50	21.00		C
	24" Wide		15.00	18.75	22.50		C
	30" Wide		16.20	20.25	24.30		C
	36" Wide		17.40	21.75	26.10		C
	Aluminum Ladder Cable Tray - 12" Rung Spacing - 4" Depth						
	6" Wide		11.60	14.50	17.40		C
	9" Wide		12.00	15.00	18.00		C
	12" Wide		12.60	15.75	18.90		C
	18" Wide		13.00	16.25	19.50		C
	24" Wide		13.50	16.88	20.25		C
	30" Wide		14.40	18.00	21.60		C
	36" Wide		15.30	19.13	22.95		C
	Aluminum Ladder Cable Tray - 18" Rung Spacing - 4" Depth						
	6" Wide		11.25	14.06	16.88		C
	9" Wide		11.70	14.63	17.55		C
	12" Wide		12.30	15.38	18.45		C
	18" Wide		12.60	15.75	18.90		C
	24" Wide		13.10	16.38	19.65		C
	30" Wide		14.00	17.50	21.00		C
	36" Wide		14.40	18.00	21.60		C
	Aluminum - 45 Degree Elbow - 4" Depth						
	6" Wide		1.40	1.75	2.10		E
	9" Wide		1.55	1.94	2.33		E
	12" Wide		1.75	2.19	2.63		E
	18" Wide		1.85	2.31	2.78		E
	24" Wide		2.20	2.75	3.30		E
	30" Wide		2.50	3.13	3.75		E
	36" Wide		2.80	3.50	4.20		E
	Aluminum - 90 Degree Elbow - 4" Depth						
	6" Wide		2.10	2.63	3.15		E
	9" Wide		2.35	2.94	3.53		E
	12" Wide		2.50	3.13	3.75		E
	18" Wide		2.80	3.50	4.20		E
	24" Wide		3.30	4.13	4.95		E
	30" Wide		3.75	4.69	5.63		E
	36" Wide		4.15	5.19	6.23		E
	Aluminum - Tee - 4" Depth						
	6" Wide		3.75	4.69	5.63		E
	9" Wide		3.95	4.94	5.93		E
	12" Wide		4.15	5.19	6.23		E
	18" Wide		4.65	5.81	6.98		E
	24" Wide		5.15	6.44	7.73		E
	30" Wide		5.60	7.00	8.40		E
	36" Wide		6.10	7.63	9.15		E
	Aluminum- Cross - 4" Depth						
	6" Wide		4.90	6.13	7.35		E
	9" Wide		5.20	6.50	7.80		E
	12" Wide		5.60	7.00	8.40		E
	18" Wide		6.00	7.50	9.00		E
	24" Wide		6.55	8.19	9.83		E
	30" Wide		7.00	8.75	10.50		E
	36" Wide		7.50	9.38	11.25		E

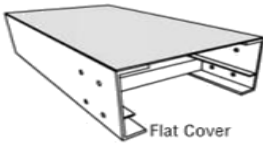
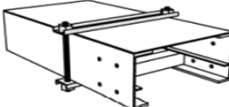
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Section 2 - Conduit, Raceways, Fittings & Related Items

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Aluminum Tray 6" Depth						
	Aluminum Ladder Cable Tray - 6" Rung Spacing - 6" Depth						
	6" Wide		16.50	20.63	24.75		C
	9" Wide		17.25	21.56	25.88		C
	12" Wide		18.00	22.50	27.00		C
	18" Wide		18.75	23.44	28.13		C
	24" Wide		20.25	25.31	30.38		C
	30" Wide		21.75	27.19	32.63		C
	36" Wide		23.25	29.06	34.88		C
	Aluminum Ladder Cable Tray - 9" Rung Spacing - 6" Depth						
	6" Wide		16.00	20.00	24.00		C
	9" Wide		16.50	20.63	24.75		C
	12" Wide		17.10	21.38	25.65		C
	18" Wide		17.70	22.13	26.55		C
	24" Wide		18.70	23.38	28.05		C
	30" Wide		19.80	24.75	29.70		C
	36" Wide		21.00	26.25	31.50		C
	Aluminum Ladder Cable Tray - 12" Rung Spacing - 6" Depth						
	6" Wide		15.40	19.25	23.10		C
	9" Wide		15.75	19.69	23.63		C
	12" Wide		16.20	20.25	24.30		C
	18" Wide		16.60	20.75	24.90		C
	24" Wide		17.10	21.38	25.65		C
	30" Wide		18.00	22.50	27.00		C
	36" Wide		18.90	23.63	28.35		C
	Aluminum Ladder Cable Tray - 18" Rung Spacing - 6" Depth						
	6" Wide		14.60	18.25	21.90		C
	9" Wide		15.30	19.13	22.95		C
	12" Wide		15.75	19.69	23.63		C
	18" Wide		16.10	20.13	24.15		C
	24" Wide		16.50	20.63	24.75		C
	30" Wide		17.60	22.00	26.40		C
	36" Wide		18.00	22.50	27.00		C
	Aluminum - 45 Degree Elbow - 6" Depth						
	6" Wide		1.50	1.88	2.25		E
	9" Wide		1.60	2.00	2.40		E
	12" Wide		1.80	2.25	2.70		E
	18" Wide		1.90	2.38	2.85		E
	24" Wide		2.40	3.00	3.60		E
	30" Wide		2.75	3.44	4.13		E
	36" Wide		3.00	3.75	4.50		E
	Aluminum - 90 Degree Elbow - 6" Depth						
	6" Wide		2.30	2.88	3.45		E
	9" Wide		2.60	3.25	3.90		E
	12" Wide		2.75	3.44	4.13		E
	18" Wide		3.00	3.75	4.50		E
	24" Wide		3.80	4.75	5.70		E
	30" Wide		4.30	5.38	6.45		E
	36" Wide		4.80	6.00	7.20		E
	Aluminum - Tee - 6" Depth						
	6" Wide		4.30	5.38	6.45		E
	9" Wide		4.50	5.63	6.75		E
	12" Wide		4.80	6.00	7.20		E
	18" Wide		5.40	6.75	8.10		E
	24" Wide		5.90	7.38	8.85		E
	30" Wide		6.40	8.00	9.60		E
	36" Wide		6.90	8.63	10.35		E
	Aluminum - Cross - 6" Depth						
	6" Wide		5.60	7.00	8.40		E
	9" Wide		6.00	7.50	9.00		E
	12" Wide		6.40	8.00	9.60		E
	18" Wide		6.90	8.63	10.35		E
	24" Wide		7.50	9.38	11.25		E
	30" Wide		8.00	10.00	12.00		E
	36" Wide		8.60	10.75	12.90		E

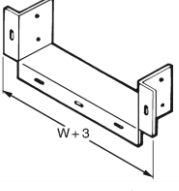
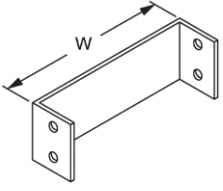
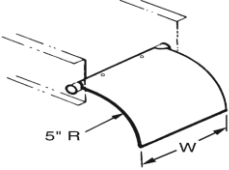
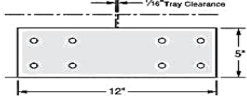
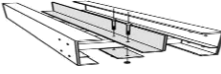
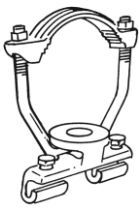
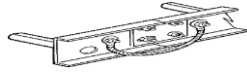
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Section 2 - Conduit, Raceways, Fittings & Related Items

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Aluminum Cable Tray Fittings & Accessories						
	Combination Hold - Down Clamp and Expansion Guide						
	Hold Down Clamp Pair		0.8	1.00	1.20		E
	Aluminum Cable Tray - Solid Covers						
	6" Wide		3.50	4.38	5.25		C
	9" Wide		4.00	5.00	6.00		C
	12" Wide		5.00	6.25	7.50		C
	18" Wide		6.50	8.13	9.75		C
	24" Wide		8.00	10.00	12.00		C
	30" Wide		10.00	12.50	15.00		C
	36" Wide		12.00	15.00	18.00		C
	Aluminum Cable Tray - Solid Cover Clamps (Per Pair)						
	6" Wide		0.50	0.63	0.75		E
	9" Wide		0.55	0.69	0.83		E
	12" Wide		0.60	0.75	0.90		E
	18" Wide		0.65	0.81	0.98		E
	24" Wide		0.70	0.88	1.05		E
	30" Wide		0.75	0.94	1.13		E
	36" Wide		0.80	1.00	1.20		E
	Aluminum - 45 Degree Elbow - Solid Covers						
	6" Wide		0.25	0.31	0.38		E
	9" Wide		0.30	0.38	0.45		E
	12" Wide		0.35	0.44	0.53		E
	18" Wide		0.40	0.50	0.60		E
	24" Wide		0.50	0.63	0.75		E
	30" Wide		0.60	0.75	0.90		E
	36" Wide		0.70	0.88	1.05		E
	Aluminum - 90 Degree Elbow - Solid Covers						
	6" Wide		0.25	0.31	0.38		E
	9" Wide		0.30	0.38	0.45		E
	12" Wide		0.35	0.44	0.53		E
	18" Wide		0.40	0.50	0.60		E
	24" Wide		0.50	0.63	0.75		E
	30" Wide		0.60	0.75	0.90		E
	36" Wide		0.70	0.88	1.05		E
	Aluminum - Tee - Solid Covers						
	6" Wide		0.35	0.44	0.53		E
	9" Wide		0.40	0.50	0.60		E
	12" Wide		0.45	0.56	0.68		E
	18" Wide		0.50	0.63	0.75		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.70	0.88	1.05		E
	36" Wide		0.80	1.00	1.20		E
	Aluminum - Cross - Solid Covers						
	6" Wide		0.45	0.56	0.68		E
	9" Wide		0.50	0.63	0.75		E
	12" Wide		0.55	0.69	0.83		E
	18" Wide		0.60	0.75	0.90		E
	24" Wide		0.70	0.88	1.05		E
	30" Wide		0.80	1.00	1.20		E
	36" Wide		0.90	1.13	1.35		E
	Aluminum - Reducer - Solid Covers						
	6" Wide		0.25	0.31	0.38		E
	9" Wide		0.30	0.38	0.45		E
	12" Wide		0.35	0.44	0.53		E
	18" Wide		0.40	0.50	0.60		E
	24" Wide		0.50	0.63	0.75		E
	30" Wide		0.60	0.75	0.90		E
	36" Wide		0.70	0.88	1.05		E
	Aluminum - Vertical 45 Degree Elbow - Solid Covers						
	6" Wide		0.35	0.44	0.53		E
	9" Wide		0.40	0.50	0.60		E
	12" Wide		0.45	0.56	0.68		E
	18" Wide		0.50	0.63	0.75		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.70	0.88	1.05		E
	36" Wide		0.80	1.00	1.20		E

Section 2 - Conduit, Raceways, Fittings & Related Items

2

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Aluminum - Vertical 90 Degree Elbow - Solid Covers						
	6" Wide		0.35	0.44	0.53		E
	9" Wide		0.40	0.50	0.60		E
	12" Wide		0.45	0.56	0.68		E
	18" Wide		0.50	0.63	0.75		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.70	0.88	1.05		E
	36" Wide		0.80	1.00	1.20		E
	Aluminum - Vertical Tee - Solid Covers						
	6" Wide		0.45	0.56	0.68		E
	9" Wide		0.50	0.63	0.75		E
	12" Wide		0.55	0.69	0.83		E
	18" Wide		0.60	0.75	0.90		E
	24" Wide		0.70	0.88	1.05		E
	30" Wide		0.80	1.00	1.20		E
	36" Wide		0.90	1.13	1.35		E
	Aluminum - Enclosure Connectors						
	6" Wide		2.00	2.50	3.00		E
	9" Wide		2.25	2.81	3.38		E
	12" Wide		2.60	3.25	3.90		E
	18" Wide		3.00	3.75	4.50		E
	24" Wide		3.50	4.38	5.25		E
	30" Wide		4.25	5.31	6.38		E
	36" Wide		5.00	6.25	7.50		E
	Aluminum - End Plates						
	6" Wide		0.40	0.50	0.60		E
	9" Wide		0.45	0.56	0.68		E
	12" Wide		0.50	0.63	0.75		E
	18" Wide		0.55	0.69	0.83		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.65	0.81	0.98		E
	36" Wide		0.70	0.88	1.05		E
	Aluminum - Ladder Drop-Outs						
	6" Wide		0.80	1.00	1.20		E
	9" Wide		0.85	1.06	1.28		E
	12" Wide		0.90	1.13	1.35		E
	18" Wide		0.95	1.19	1.43		E
	24" Wide		1.00	1.25	1.50		E
	30" Wide		1.10	1.38	1.65		E
	36" Wide		1.20	1.50	1.80		E
	Aluminum - Splice Plates Pair						
	6" Depth		6.00	7.50	9.00		C
	4" Depth		8.00	10.00	12.00		C
	6" Depth		10.00	12.50	15.00		C
	Aluminum Cable Tray Barrier Strips						
	3" depth		0.60	0.75	0.90		E
	4" depth		0.65	0.81	0.98		E
	6" depth		0.70	0.88	1.05		E
	Aluminum Cable Tray Fitting Barrier Strips						
	3" depth		0.60	0.75	0.90		E
	4" depth		0.65	0.81	0.98		E
	6" depth		0.70	0.88	1.05		E
	Aluminum Conduit To Cable Tray Adapters						
	1/2" Conduit		0.50	0.63	0.75		E
	3/4" Conduit		0.55	0.69	0.83		E
	1" Conduit		0.60	0.75	0.90		E
	1 1/4" Conduit		0.65	0.81	0.98		E
	1 1/2" Conduit		0.70	0.88	1.05		E
	2" Conduit		0.75	0.94	1.13		E
	2 1/2" Conduit		0.80	1.00	1.20		E
	3" Conduit		0.90	1.13	1.35		E
	3 1/2" Conduit		1.00	1.25	1.50		E
	4" Conduit		1.20	1.50	1.80		E
	Bonding Jumpers						
	#1/0 Copper X 15" Long		0.60	0.75	0.90		E
	#4/0 Copper X 15" Long		0.80	1.00	1.20		E
	#250 Copper X 15" Long		1.00	1.25	1.50		E

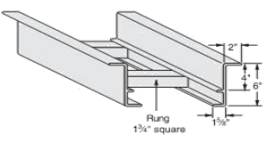
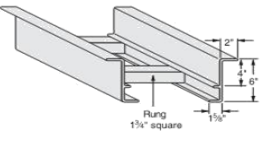
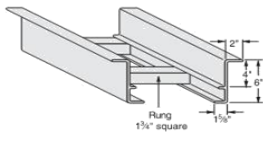
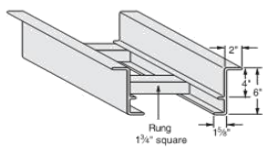
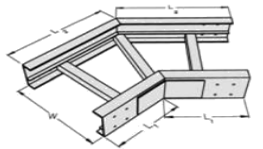
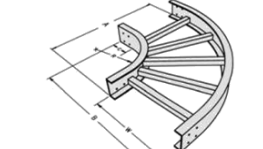
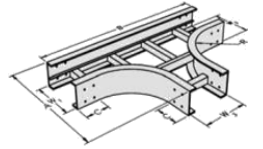
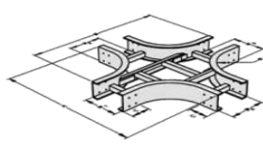
Section 2 - Conduit, Raceways, Fittings & Related Items

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Fiberglass Tray 3" Depth						
	Fiberglass Cable Tray - 6" Rung Spacing - 3" Depth						
	6" Wide		14.00	17.50	21.00		C
	9" Wide		15.00	18.75	22.50		C
	12" Wide		16.00	20.00	24.00		C
	18" Wide		17.00	21.25	25.50		C
	24" Wide		18.00	22.50	27.00		C
	30" Wide		20.00	25.00	30.00		C
	36" Wide		22.00	27.50	33.00		C
	Fiberglass Cable Tray - 6" Rung Spacing - 3" Depth						
	6" Wide		13.50	16.88	20.25		C
	9" Wide		14.50	18.13	21.75		C
	12" Wide		15.00	18.75	22.50		C
	18" Wide		16.00	20.00	24.00		C
	24" Wide		17.00	21.25	25.50		C
	30" Wide		19.00	23.75	28.50		C
	36" Wide		21.00	26.25	31.50		C
	Fiberglass Cable Tray - 12" Rung Spacing - 3" Depth						
	6" Wide		13.00	16.25	19.50		C
	9" Wide		13.50	16.88	20.25		C
	12" Wide		14.00	17.50	21.00		C
	18" Wide		14.50	18.13	21.75		C
	24" Wide		15.00	18.75	22.50		C
	30" Wide		16.00	20.00	24.00		C
	36" Wide		17.00	21.25	25.50		C
	Fiberglass Cable Tray - 18" Rung Spacing - 3" Depth						
	6" Wide		12.00	15.00	18.00		C
	9" Wide		12.50	15.63	18.75		C
	12" Wide		13.00	16.25	19.50		C
	18" Wide		13.50	16.88	20.25		C
	24" Wide		14.00	17.50	21.00		C
	30" Wide		15.00	18.75	22.50		C
	36" Wide		16.00	20.00	24.00		C
	Fiberglass - 45 Degree Elbow - 3" Depth						
	6" Wide		1.80	2.25	2.70		E
	9" Wide		2.00	2.50	3.00		E
	12" Wide		2.25	2.81	3.38		E
	18" Wide		2.50	3.13	3.75		E
	24" Wide		2.80	3.50	4.20		E
	30" Wide		3.25	4.06	4.88		E
	36" Wide		3.60	4.50	5.40		E
	Fiberglass - 90 Degree Elbow - 3" Depth						
	6" Wide		2.70	3.38	4.05		E
	9" Wide		3.00	3.75	4.50		E
	12" Wide		3.30	4.13	4.95		E
	18" Wide		3.60	4.50	5.40		E
	24" Wide		4.20	5.25	6.30		E
	30" Wide		4.80	6.00	7.20		E
	36" Wide		5.40	6.75	8.10		E
	Fiberglass - Tee - 3" Depth						
	6" Wide		4.80	6.00	7.20		E
	9" Wide		5.10	6.38	7.65		E
	12" Wide		5.40	6.75	8.10		E
	18" Wide		6.00	7.50	9.00		E
	24" Wide		6.60	8.25	9.90		E
	30" Wide		7.20	9.00	10.80		E
	36" Wide		7.80	9.75	11.70		E
	Fiberglass - Cross - 3" Depth						
	6" Wide		6.30	7.88	9.45		E
	9" Wide		6.60	8.25	9.90		E
	12" Wide		7.20	9.00	10.80		E
	18" Wide		7.80	9.75	11.70		E
	24" Wide		8.40	10.50	12.60		E
	30" Wide		9.00	11.25	13.50		E
	36" Wide		9.60	12.00	14.40		E

2

2

Section 2 - Conduit, Raceways, Fittings & Related Items

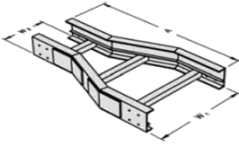
Description		Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Fiberglass Tray 4" Depth							
Fiberglass Cable Tray- 6" Rung Spacing - 4" Depth							
	6" Wide		17.00	21.25	25.50		C
	9" Wide		18.00	22.50	27.00		C
	12" Wide		19.00	23.75	28.50		C
	18" Wide		20.00	25.00	30.00		C
	24" Wide		22.00	27.50	33.00		C
	30" Wide		24.00	30.00	36.00		C
	36" Wide		26.00	32.50	39.00		C
Fiberglass Cable Tray- 9" Rung Spacing - 4" Depth							
	6" Wide		16.25	20.31	24.38		C
	9" Wide		17.00	21.25	25.50		C
	12" Wide		17.90	22.38	26.85		C
	18" Wide		18.70	23.38	28.05		C
	24" Wide		20.00	25.00	30.00		C
	30" Wide		21.60	27.00	32.40		C
	36" Wide		23.20	29.00	34.80		C
Fiberglass Cable Tray- 12" Rung Spacing - 4" Depth							
	6" Wide		15.50	19.38	23.25		C
	9" Wide		16.00	20.00	24.00		C
	12" Wide		16.80	21.00	25.20		C
	18" Wide		17.40	21.75	26.10		C
	24" Wide		18.00	22.50	27.00		C
	30" Wide		19.20	24.00	28.80		C
	36" Wide		20.40	25.50	30.60		C
Fiberglass Cable Tray- 18" Rung Spacing - 4" Depth							
	6" Wide		15.00	18.75	22.50		C
	9" Wide		15.60	19.50	23.40		C
	12" Wide		16.40	20.50	24.60		C
	18" Wide		16.80	21.00	25.20		C
	24" Wide		17.50	21.88	26.25		C
	30" Wide		18.60	23.25	27.90		C
	36" Wide		19.20	24.00	28.80		C
Fiberglass - 45 Degree Elbow - 4" Depth							
	6" Wide		2.10	2.63	3.15		E
	9" Wide		2.30	2.88	3.45		E
	12" Wide		2.60	3.25	3.90		E
	18" Wide		2.90	3.63	4.35		E
	24" Wide		3.20	4.00	4.80		E
	30" Wide		3.70	4.63	5.55		E
	36" Wide		4.20	5.25	6.30		E
Fiberglass - 90 Degree Elbow - 4" Depth							
	6" Wide		3.10	3.88	4.65		E
	9" Wide		3.45	4.31	5.18		E
	12" Wide		3.80	4.75	5.70		E
	18" Wide		4.20	5.25	6.30		E
	24" Wide		4.80	6.00	7.20		E
	30" Wide		5.50	6.88	8.25		E
	36" Wide		6.20	7.75	9.30		E
Fiberglass - Tee - 4" Depth							
	6" Wide		5.50	6.88	8.25		E
	9" Wide		5.90	7.38	8.85		E
	12" Wide		6.20	7.75	9.30		E
	18" Wide		6.90	8.63	10.35		E
	24" Wide		7.60	9.50	11.40		E
	30" Wide		8.30	10.38	12.45		E
	36" Wide		9.00	11.25	13.50		E
Fiberglass - Cross - 4" Depth							
	6" Wide		7.30	9.13	10.95		E
	9" Wide		7.60	9.50	11.40		E
	12" Wide		8.30	10.38	12.45		E
	18" Wide		9.00	11.25	13.50		E
	24" Wide		9.70	12.13	14.55		E
	30" Wide		10.40	13.00	15.60		E
	36" Wide		11.00	13.75	16.50		E

Description

Rev	Normal	Difficult	Difficult	Experience	Unit
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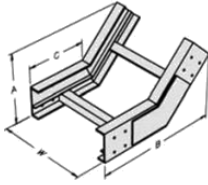
Fiberglass - Reducer - 4" Depth

6" Wide		2.10	2.63	3.15	E
9" Wide		2.30	2.88	3.45	E
12" Wide		2.60	3.25	3.90	E
18" Wide		2.90	3.63	4.35	E
24" Wide		3.20	4.00	4.80	E
30" Wide		3.70	4.63	5.55	E
36" Wide		4.10	5.13	6.15	E



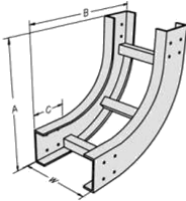
Fiberglass - Vertical 45 Degree Elbow - 4" Depth

6" Wide		2.40	3.00	3.60	E
9" Wide		2.60	3.25	3.90	E
12" Wide		3.00	3.75	4.50	E
18" Wide		3.30	4.13	4.95	E
24" Wide		3.70	4.63	5.55	E
30" Wide		4.30	5.38	6.45	E
36" Wide		4.70	5.88	7.05	E



Fiberglass - Vertical 90 Degree Elbow - 4" Depth

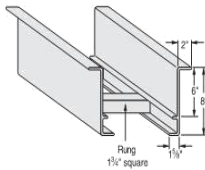
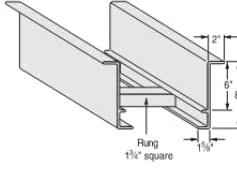
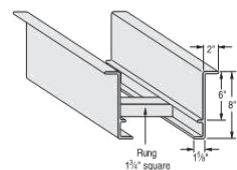
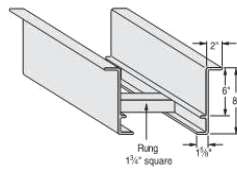
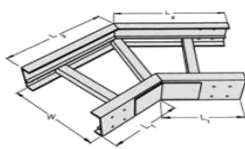
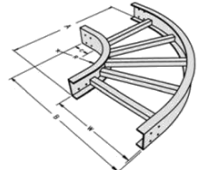
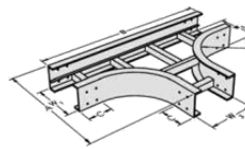
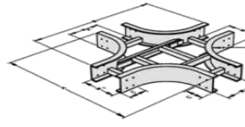
6" Wide		3.70	4.63	5.55	E
9" Wide		4.20	5.25	6.30	E
12" Wide		4.60	5.75	6.90	E
18" Wide		5.00	6.25	7.50	E
24" Wide		5.75	7.19	8.63	E
30" Wide		6.70	8.38	10.05	E
36" Wide		7.50	9.38	11.25	E



Fiberglass - Vertical Tee - 4" Depth

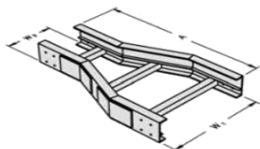
6" Wide		6.90	8.63	10.35	E
9" Wide		7.40	9.25	11.10	E
12" Wide		7.80	9.75	11.70	E
18" Wide		8.60	10.75	12.90	E
24" Wide		9.50	11.88	14.25	E
30" Wide		10.40	13.00	15.60	E
36" Wide		11.20	14.00	16.80	E

Section 2 - Conduit, Raceways, Fittings & Related Items

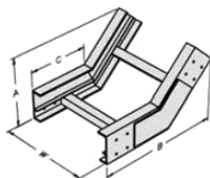
Description		Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Fiberglass Tray 6" Depth							
Fiberglass Cable Tray - 6" Rung Spacing - 6" Depth							
	6" Wide		22.00	27.50	33.00		C
	9" Wide		23.00	28.75	34.50		C
	12" Wide		24.00	30.00	36.00		C
	18" Wide		25.00	31.25	37.50		C
	24" Wide		27.00	33.75	40.50		C
	30" Wide		29.00	36.25	43.50		C
	36" Wide		31.00	38.75	46.50		C
Fiberglass Cable Tray - 9" Rung Spacing - 6" Depth							
	6" Wide		21.25	26.56	31.88		C
	9" Wide		22.00	27.50	33.00		C
	12" Wide		22.80	28.50	34.20		C
	18" Wide		23.60	29.50	35.40		C
	24" Wide		24.90	31.13	37.35		C
	30" Wide		26.50	33.13	39.75		C
	36" Wide		28.10	35.13	42.15		C
Fiberglass Cable Tray - 12" Rung Spacing - 6" Depth							
	6" Wide		20.50	25.63	30.75		C
	9" Wide		21.00	26.25	31.50		C
	12" Wide		21.60	27.00	32.40		C
	18" Wide		22.20	27.75	33.30		C
	24" Wide		22.80	28.50	34.20		C
	30" Wide		24.00	30.00	36.00		C
	36" Wide		25.20	31.50	37.80		C
Fiberglass Cable Tray - 18" Rung Spacing - 6" Depth							
	6" Wide		19.80	24.75	29.70		C
	9" Wide		20.40	25.50	30.60		C
	12" Wide		21.00	26.25	31.50		C
	18" Wide		21.50	26.88	32.25		C
	24" Wide		22.00	27.50	33.00		C
	30" Wide		23.40	29.25	35.10		C
	36" Wide		24.00	30.00	36.00		C
Fiberglass - 45 Degree Elbow - 6" Depth							
	6" Wide		2.40	3.00	3.60		E
	9" Wide		2.70	3.38	4.05		E
	12" Wide		3.00	3.75	4.50		E
	18" Wide		3.30	4.13	4.95		E
	24" Wide		3.70	4.63	5.55		E
	30" Wide		4.30	5.38	6.45		E
	36" Wide		4.80	6.00	7.20		E
Fiberglass - 90 Degree Elbow - 6" Depth							
	6" Wide		3.60	4.50	5.40		E
	9" Wide		4.00	5.00	6.00		E
	12" Wide		4.40	5.50	6.60		E
	18" Wide		4.80	6.00	7.20		E
	24" Wide		5.50	6.88	8.25		E
	30" Wide		6.30	7.88	9.45		E
	36" Wide		7.20	9.00	10.80		E
Fiberglass - Tee - 6" Depth							
	6" Wide		6.30	7.88	9.45		E
	9" Wide		6.70	8.38	10.05		E
	12" Wide		7.10	8.88	10.65		E
	18" Wide		7.90	9.88	11.85		E
	24" Wide		8.70	10.88	13.05		E
	30" Wide		9.50	11.88	14.25		E
	36" Wide		10.40	13.00	15.60		E
Fiberglass - Cross - 6" Depth							
	6" Wide		8.40	10.50	12.60		E
	9" Wide		8.80	11.00	13.20		E
	12" Wide		9.50	11.88	14.25		E
	18" Wide		10.40	13.00	15.60		E
	24" Wide		11.20	14.00	16.80		E
	30" Wide		12.00	15.00	18.00		E
	36" Wide		12.70	15.88	19.05		E

Description

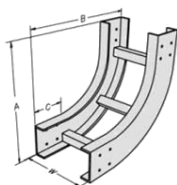
Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
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Fiberglass - Reducer - 6" Depth

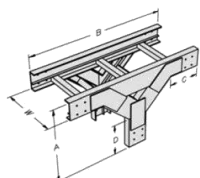
6" Wide		2.40	3.00	3.60	E
9" Wide		2.60	3.25	3.90	E
12" Wide		3.00	3.75	4.50	E
18" Wide		3.40	4.25	5.10	E
24" Wide		3.70	4.63	5.55	E
30" Wide		4.30	5.38	6.45	E
36" Wide		4.70	5.88	7.05	E



Fiberglass - Vertical 45 Degree Elbow - 6" Depth					
6" Wide		2.80	3.50	4.20	E
9" Wide		3.00	3.75	4.50	E
12" Wide		3.50	4.38	5.25	E
18" Wide		3.80	4.75	5.70	E
24" Wide		4.30	5.38	6.45	E
30" Wide		5.00	6.25	7.50	E
36" Wide		5.40	6.75	8.10	E

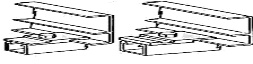
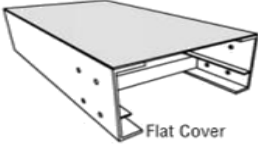
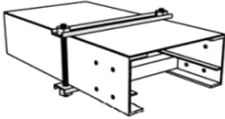


Fiberglass - Vertical 90 Degree Elbow - 6" Depth					
6" Wide		4.30	5.38	6.45	E
9" Wide		4.80	6.00	7.20	E
12" Wide		5.30	6.63	7.95	E
18" Wide		5.80	7.25	8.70	E
24" Wide		6.60	8.25	9.90	E
30" Wide		7.70	9.63	11.55	E
36" Wide		8.60	10.75	12.90	E



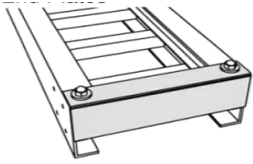
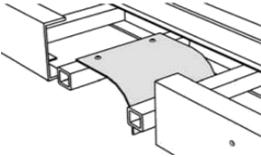
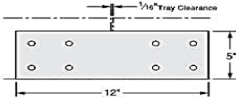
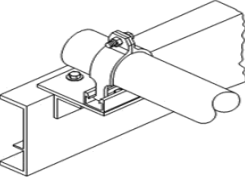
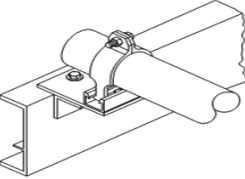
Fiberglass - Vertical Tee - 6" Depth					
6" Wide		7.90	9.88	11.85	E
9" Wide		8.50	10.63	12.75	E
12" Wide		9.00	11.25	13.50	E
18" Wide		9.90	12.38	14.85	E
24" Wide		10.90	13.63	16.35	E
30" Wide		12.00	15.00	18.00	E
36" Wide		12.90	16.13	19.35	E

Section 2 - Conduit, Raceways, Fittings & Related Items

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Fiberglass Cable Tray Fittings & Accessories						
	Combination Hold-Down Clamp and Expansion Guide						
	Hold Down Clamp Pair		0.8	1.00	1.20		E
	Fiberglass Cable Tray - Solid Covers						
	6" Wide		4.00	5.00	6.00		C
	9" Wide		4.50	5.63	6.75		C
	12" Wide		5.50	6.88	8.25		C
	18" Wide		7.00	8.75	10.50		C
	24" Wide		8.50	10.63	12.75		C
	30" Wide		10.50	13.13	15.75		C
	36" Wide		12.50	15.63	18.75		C
	Fiberglass Cable Tray - Solid Covers Clamps (Per Pair)						
	6" Wide		0.50	0.63	0.75		E
	9" Wide		0.55	0.69	0.83		E
	12" Wide		0.60	0.75	0.90		E
	18" Wide		0.65	0.81	0.98		E
	24" Wide		0.70	0.88	1.05		E
	30" Wide		0.75	0.94	1.13		E
	36" Wide		0.80	1.00	1.20		E
	Fiberglass - 45 Degree Elbow - Solid Covers						
	6" Wide		0.25	0.31	0.38		E
	9" Wide		0.30	0.38	0.45		E
	12" Wide		0.35	0.44	0.53		E
	18" Wide		0.40	0.50	0.60		E
	24" Wide		0.50	0.63	0.75		E
	30" Wide		0.60	0.75	0.90		E
	36" Wide		0.70	0.88	1.05		E
	Fiberglass - 90 Degree Elbow - Solid Covers						
	6" Wide		0.25	0.31	0.38		E
	9" Wide		0.30	0.38	0.45		E
	12" Wide		0.35	0.44	0.53		E
	18" Wide		0.40	0.50	0.60		E
	24" Wide		0.50	0.63	0.75		E
	30" Wide		0.60	0.75	0.90		E
	36" Wide		0.70	0.88	1.05		E
	Fiberglass - Tee - Solid Covers						
	6" Wide		0.35	0.44	0.53		E
	9" Wide		0.40	0.50	0.60		E
	12" Wide		0.45	0.56	0.68		E
	18" Wide		0.50	0.63	0.75		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.70	0.88	1.05		E
	36" Wide		0.80	1.00	1.20		E
	Fiberglass - Cross - Solid Covers						
	6" Wide		0.45	0.56	0.68		E
	9" Wide		0.50	0.63	0.75		E
	12" Wide		0.55	0.69	0.83		E
	18" Wide		0.60	0.75	0.90		E
	24" Wide		0.70	0.88	1.05		E
	30" Wide		0.80	1.00	1.20		E
	36" Wide		0.90	1.13	1.35		E
	Fiberglass - Reducer - Solid Covers						
	6" Wide		0.25	0.31	0.38		E
	9" Wide		0.30	0.38	0.45		E
	12" Wide		0.35	0.44	0.53		E
	18" Wide		0.40	0.50	0.60		E
	24" Wide		0.50	0.63	0.75		E
	30" Wide		0.60	0.75	0.90		E
	36" Wide		0.70	0.88	1.05		E
	Fiberglass - Vertical 45 Degree Elbow - Solid Covers						
	6" Wide		0.35	0.44	0.53		E
	9" Wide		0.40	0.50	0.60		E
	12" Wide		0.45	0.56	0.68		E
	18" Wide		0.50	0.63	0.75		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.70	0.88	1.05		E
	36" Wide		0.80	1.00	1.20		E

Section 2 - Conduit, Raceways, Fittings & Related Items

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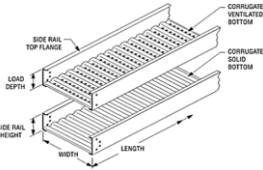
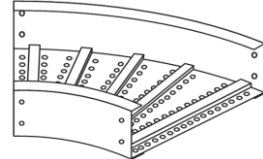
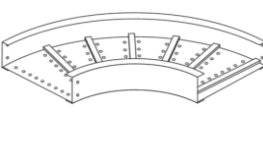
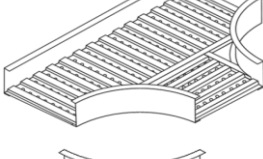
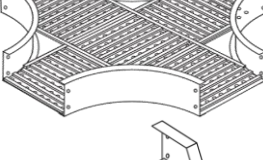
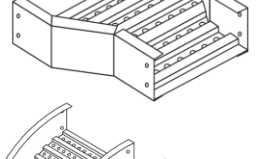
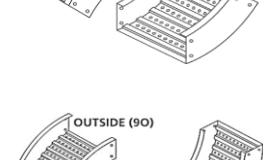
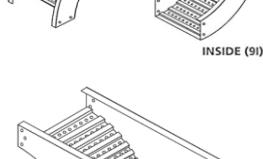
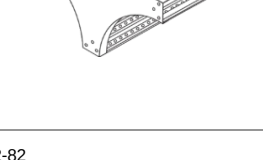
	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Fiberglass - Vertical 90 Degree Elbow - Solid Covers						
	6" Wide		0.35	0.44	0.53		E
	9" Wide		0.40	0.50	0.60		E
	12" Wide		0.45	0.56	0.68		E
	18" Wide		0.50	0.63	0.75		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.70	0.88	1.05		E
	36" Wide		0.80	1.00	1.20		E
	Fiberglass - Vertical Tee - Solid Covers						
	6" Wide		0.45	0.56	0.68		E
	9" Wide		0.50	0.63	0.75		E
	12" Wide		0.55	0.69	0.83		E
	18" Wide		0.60	0.75	0.90		E
	24" Wide		0.70	0.88	1.05		E
	30" Wide		0.80	1.00	1.20		E
	36" Wide		0.90	1.13	1.35		E
	Fiberglass - End Plates						
	6" Wide		0.40	0.50	0.60		E
	9" Wide		0.45	0.56	0.68		E
	12" Wide		0.50	0.63	0.75		E
	18" Wide		0.55	0.69	0.83		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.65	0.81	0.98		E
	36" Wide		0.70	0.88	1.05		E
	Fiberglass - Ladder Drop-Outs						
	6" Wide		0.40	0.50	0.60		E
	9" Wide		0.45	0.56	0.68		E
	12" Wide		0.50	0.63	0.75		E
	18" Wide		0.55	0.69	0.83		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.65	0.81	0.98		E
	36" Wide		0.70	0.88	1.05		E
	Fiberglass - Splice Plates Pair						
	6" Wide		0.80	1.00	1.20		E
	9" Wide		0.85	1.06	1.28		E
	12" Wide		0.90	1.13	1.35		E
	18" Wide		0.95	1.19	1.43		E
	24" Wide		1.00	1.25	1.50		E
	30" Wide		1.10	1.38	1.65		E
	36" Wide		1.20	1.50	1.80		E
	Fiberglass Cable Tray Barrier Strips						
	3" Depth		6.00	7.50	9.00		C
	4" Depth		8.00	10.00	12.00		C
	6" Depth		10.00	12.50	15.00		C
	Fiberglass Cable Tray Fitting Barrier Strips						
	3" Depth		0.60	0.75	0.90		E
	4" Depth		0.65	0.81	0.98		E
	6" Depth		0.70	0.88	1.05		E
	Fiberglass Conduit to Cable Tray Adapters						
	1/2" Conduit		0.50	0.63	0.75		E
	3/4" Conduit		0.55	0.69	0.83		E
	1" Conduit		0.60	0.75	0.90		E
	1 1/4" Conduit		0.65	0.81	0.98		E
	1 1/2" Conduit		0.70	0.88	1.05		E
	2" Conduit		0.75	0.94	1.13		E
	2 1/2" Conduit		0.80	1.00	1.20		E
	3" Conduit		0.90	1.13	1.35		E
	3 1/2" Conduit		1.00	1.25	1.50		E
	4" Conduit		1.20	1.50	1.80		E

2

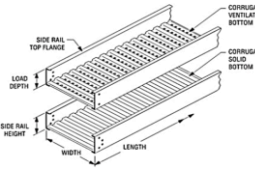
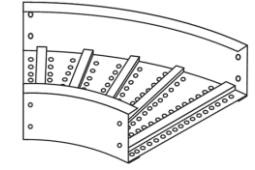
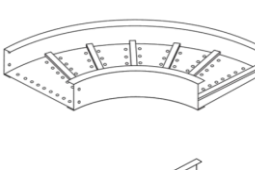
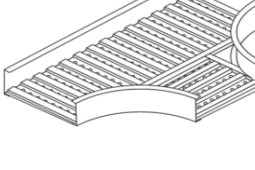
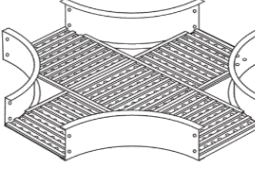
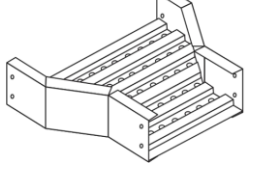
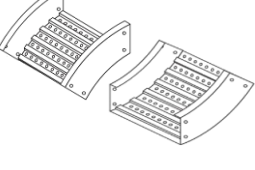
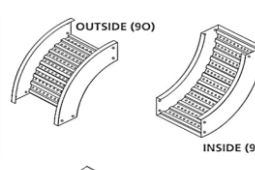
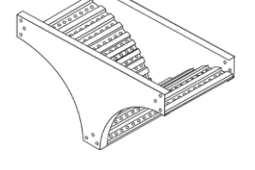
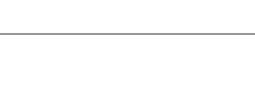
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Section 2 - Conduit, Raceways, Fittings & Related Items

2

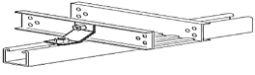
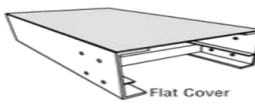
	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Solid/Ventilated Steel Tray 4" Depth						
	Solid/Ventilated Steel- Cable Tray - 4" Depth						
	6" Wide		18.00	22.50	27.00		C
	9" Wide		19.00	23.75	28.50		C
	12" Wide		22.00	27.50	33.00		C
	18" Wide		25.00	31.25	37.50		C
	24" Wide		31.00	38.75	46.50		C
	30" Wide		37.00	46.25	55.50		C
	36" Wide		43.00	53.75	64.50		C
	Solid/Ventilated Steel - 45 Degree Elbow - 4" Depth						
	6" Wide		2.10	2.63	3.15		E
	9" Wide		2.30	2.88	3.45		E
	12" Wide		2.60	3.25	3.90		E
	18" Wide		2.90	3.63	4.35		E
	24" Wide		3.50	4.38	5.25		E
	30" Wide		4.00	5.00	6.00		E
	36" Wide		4.60	5.75	6.90		E
	Solid/Ventilated Steel - 90 Degree Elbow - 4" Depth						
	6" Wide		3.10	3.88	4.65		E
	9" Wide		3.50	4.38	5.25		E
	12" Wide		3.80	4.75	5.70		E
	18" Wide		4.30	5.38	6.45		E
	24" Wide		5.20	6.50	7.80		E
	30" Wide		6.20	7.75	9.30		E
	36" Wide		7.80	9.75	11.70		E
	Solid/Ventilated Steel - Tee - 4" Depth						
	6" Wide		5.50	6.88	8.25		E
	9" Wide		5.90	7.38	8.85		E
	12" Wide		6.20	7.75	9.30		E
	18" Wide		8.00	10.00	12.00		E
	24" Wide		9.20	11.50	13.80		E
	30" Wide		11.50	14.38	17.25		E
	36" Wide		13.80	17.25	20.70		E
	Solid/Ventilated Steel - Cross - 4" Depth						
	6" Wide		7.20	9.00	10.80		E
	9" Wide		7.60	9.50	11.40		E
	12" Wide		8.30	10.38	12.45		E
	18" Wide		9.20	11.50	13.80		E
	24" Wide		10.40	13.00	15.60		E
	30" Wide		12.70	15.88	19.05		E
	36" Wide		15.00	18.75	22.50		E
	Solid/Ventilated Steel - Reducer - 4" Depth						
	6" Wide		2.10	2.63	3.15		E
	9" Wide		2.30	2.88	3.45		E
	12" Wide		2.60	3.25	3.90		E
	18" Wide		2.90	3.63	4.35		E
	24" Wide		3.50	4.38	5.25		E
	30" Wide		4.00	5.00	6.00		E
	36" Wide		4.60	5.75	6.90		E
	Solid/Ventilated Steel - Vertical 45 Degree Elbow - 4" Depth						
	6" Wide		2.40	3.00	3.60		E
	9" Wide		2.60	3.25	3.90		E
	12" Wide		3.00	3.75	4.50		E
	18" Wide		3.50	4.38	5.25		E
	24" Wide		4.00	5.00	6.00		E
	30" Wide		4.60	5.75	6.90		E
	36" Wide		5.30	6.63	7.95		E
	Solid/Ventilated Steel - Vertical 90 Degree Elbow - 4" Depth						
	6" Wide		3.70	4.63	5.55		E
	9" Wide		4.10	5.13	6.15		E
	12" Wide		4.60	5.75	6.90		E
	18" Wide		5.20	6.50	7.80		E
	24" Wide		6.00	7.50	9.00		E
	30" Wide		7.10	8.88	10.65		E
	36" Wide		9.00	11.25	13.50		E
	Solid/Ventilated Steel - Vertical Tee - 4" Depth						
	6" Wide		6.90	8.63	10.35		E
	9" Wide		7.40	9.25	11.10		E
	12" Wide		7.80	9.75	11.70		E
	18" Wide		9.20	11.50	13.80		E
	24" Wide		10.60	13.25	15.90		E
	30" Wide		13.20	16.50	19.80		E
	36" Wide		15.50	19.38	23.25		E

Section 2 - Conduit, Raceways, Fittings & Related Items

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Solid/Ventilated Steel Tray 6" Depth						
	Solid/Ventilated Steel - Cable Tray - 6" Depth						
	6" Wide		23.00	28.75	34.50		C
	9" Wide		25.00	31.25	37.50		C
	12" Wide		29.00	36.25	43.50		C
	18" Wide		33.00	41.25	49.50		C
	24" Wide		40.00	50.00	60.00		C
	30" Wide		48.00	60.00	72.00		C
	36" Wide		56.00	70.00	84.00		C
	Solid/Ventilated Steel - 45 Degree Elbow - 6" Depth						
	6" Wide		2.40	3.00	3.60		E
	9" Wide		2.60	3.25	3.90		E
	12" Wide		3.00	3.75	4.50		E
	18" Wide		3.30	4.13	4.95		E
	24" Wide		4.00	5.00	6.00		E
	30" Wide		4.60	5.75	6.90		E
	36" Wide		5.30	6.63	7.95		E
	Solid/Ventilated Steel - 90 Degree Elbow - 6" Depth						
	6" Wide		3.60	4.50	5.40		E
	9" Wide		4.00	5.00	6.00		E
	12" Wide		4.40	5.50	6.60		E
	18" Wide		4.90	6.13	7.35		E
	24" Wide		6.00	7.50	9.00		E
	30" Wide		7.10	8.88	10.65		E
	36" Wide		9.00	11.25	13.50		E
	Solid/Ventilated Steel - Tee - 6" Depth						
	6" Wide		6.30	7.88	9.45		E
	9" Wide		6.80	8.50	10.20		E
	12" Wide		7.10	8.88	10.65		E
	18" Wide		9.20	11.50	13.80		E
	24" Wide		10.60	13.25	15.90		E
	30" Wide		13.20	16.50	19.80		E
	36" Wide		15.90	19.88	23.85		E
	Solid/Ventilated Steel - Cross - 6" Depth						
	6" Wide		8.30	10.38	12.45		E
	9" Wide		8.70	10.88	13.05		E
	12" Wide		9.50	11.88	14.25		E
	18" Wide		10.60	13.25	15.90		E
	24" Wide		12.00	15.00	18.00		E
	30" Wide		14.60	18.25	21.90		E
	36" Wide		17.30	21.63	25.95		E
	Solid/Ventilated Steel - Reducer - 6" Depth						
	6" Wide		2.40	3.00	3.60		E
	9" Wide		2.60	3.25	3.90		E
	12" Wide		3.00	3.75	4.50		E
	18" Wide		3.30	4.13	4.95		E
	24" Wide		4.00	5.00	6.00		E
	30" Wide		4.60	5.75	6.90		E
	36" Wide		5.30	6.63	7.95		E
	Solid/Ventilated Steel - Vertical 45 Degree Elbow - 6" Depth						
	6" Wide		2.80	3.50	4.20		E
	9" Wide		3.00	3.75	4.50		E
	12" Wide		3.50	4.38	5.25		E
	18" Wide		4.00	5.00	6.00		E
	24" Wide		4.60	5.75	6.90		E
	30" Wide		5.30	6.63	7.95		E
	36" Wide		6.10	7.63	9.15		E
	Solid/Ventilated Steel - Vertical 90 Degree Elbow - 6" Depth						
	6" Wide		4.30	5.38	6.45		E
	9" Wide		4.70	5.88	7.05		E
	12" Wide		5.30	6.63	7.95		E
	18" Wide		6.00	7.50	9.00		E
	24" Wide		6.90	8.63	10.35		E
	30" Wide		8.20	10.25	12.30		E
	36" Wide		10.40	13.00	15.60		E
	Solid/Ventilated Steel - Vertical Tee - 6" Depth						
	6" Wide		7.90	9.88	11.85		E
	9" Wide		8.50	10.63	12.75		E
	12" Wide		9.00	11.25	13.50		E
	18" Wide		10.60	13.25	15.90		E
	24" Wide		12.20	15.25	18.30		E
	30" Wide		15.20	19.00	22.80		E
	36" Wide		17.80	22.25	26.70		E

Section 2 - Conduit, Raceways, Fittings & Related Items

2

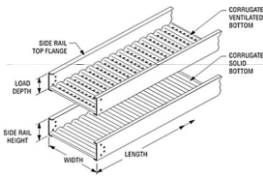
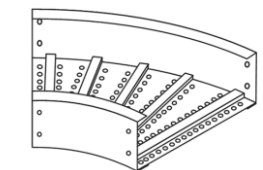
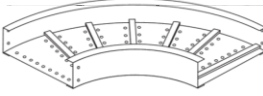
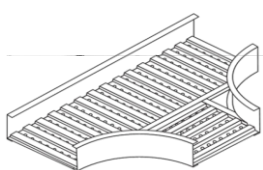
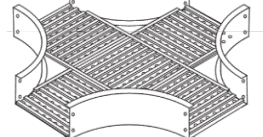
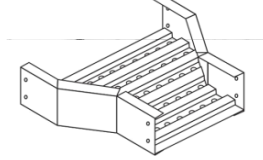
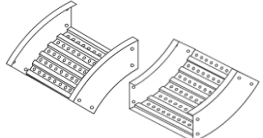
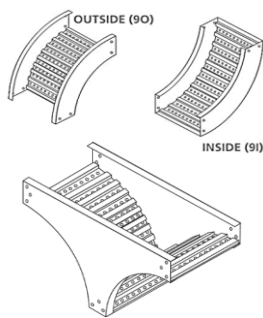
	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Solid/Ventilated Steel Cable Tray Fittings & Accessories						
	Seismic Hold-Down Clamp and Expansion Guide						
	Hold Down Clamp Pair		1.00	1.25	1.50		E
	Solid/Ventilated Steel Cable Tray - Solid Covers						
	6" Wide		3.75	4.69	5.63		C
	9" Wide		4.25	5.31	6.38		C
	12" Wide		5.25	6.56	7.88		C
	18" Wide		6.75	8.44	10.13		C
	24" Wide		8.25	10.31	12.38		C
	30" Wide		10.25	12.81	15.38		C
	36" Wide		12.25	15.31	18.38		C
	Solid/Ventilated Steel Cable Tray - Solid Cover Clamps (Per Pair)						
	6" Wide		0.50	0.63	0.75		E
	9" Wide		0.55	0.69	0.83		E
	12" Wide		0.60	0.75	0.90		E
	18" Wide		0.65	0.81	0.98		E
	24" Wide		0.70	0.88	1.05		E
	30" Wide		0.75	0.94	1.13		E
	36" Wide		0.80	1.00	1.20		E
	Solid/Ventilated Steel - 45 Degree Elbow - Solid Covers						
	6" Wide		0.25	0.31	0.38		E
	9" Wide		0.30	0.38	0.45		E
	12" Wide		0.35	0.44	0.53		E
	18" Wide		0.40	0.50	0.60		E
	24" Wide		0.50	0.63	0.75		E
	30" Wide		0.60	0.75	0.90		E
	36" Wide		0.70	0.88	1.05		E
	Solid/Ventilated Steel - 90 Degree Elbow - Solid Covers						
	6" Wide		0.25	0.31	0.38		E
	9" Wide		0.30	0.38	0.45		E
	12" Wide		0.35	0.44	0.53		E
	18" Wide		0.40	0.50	0.60		E
	24" Wide		0.50	0.63	0.75		E
	30" Wide		0.60	0.75	0.90		E
	36" Wide		0.70	0.88	1.05		E
	Solid/Ventilated Steel - Tee - Solid Covers						
	6" Wide		0.35	0.44	0.53		E
	9" Wide		0.40	0.50	0.60		E
	12" Wide		0.45	0.56	0.68		E
	18" Wide		0.50	0.63	0.75		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.70	0.88	1.05		E
	36" Wide		0.80	1.00	1.20		E
	Solid/Ventilated Steel - Cross - Solid Covers						
	6" Wide		0.45	0.56	0.68		E
	9" Wide		0.50	0.63	0.75		E
	12" Wide		0.55	0.69	0.83		E
	18" Wide		0.60	0.75	0.90		E
	24" Wide		0.70	0.88	1.05		E
	30" Wide		0.80	1.00	1.20		E
	36" Wide		0.90	1.13	1.35		E
	Solid/Ventilated Steel - Reducer - Solid Covers						
	6" Wide		0.25	0.31	0.38		E
	9" Wide		0.30	0.38	0.45		E
	12" Wide		0.35	0.44	0.53		E
	18" Wide		0.40	0.50	0.60		E
	24" Wide		0.50	0.63	0.75		E
	30" Wide		0.60	0.75	0.90		E
	36" Wide		0.70	0.88	1.05		E
	Solid/Ventilated Steel - Vertical 45 Degree Elbow - Solid Covers						
	6" Wide		0.35	0.44	0.53		E
	9" Wide		0.40	0.50	0.60		E
	12" Wide		0.45	0.56	0.68		E
	18" Wide		0.50	0.63	0.75		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.70	0.88	1.05		E
	36" Wide		0.80	1.00	1.20		E
	Solid/Ventilated Steel - Vertical 90 Degree Elbow - Solid Covers						
	6" Wide		0.35	0.44	0.53		E
	9" Wide		0.40	0.50	0.60		E
	12" Wide		0.45	0.56	0.68		E
	18" Wide		0.50	0.63	0.75		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.70	0.88	1.05		E
	36" Wide		0.80	1.00	1.20		E

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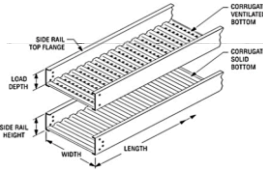
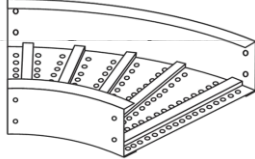
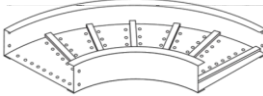
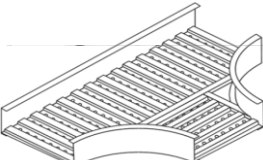
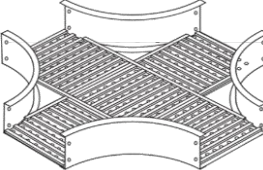
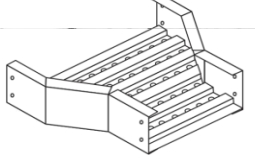
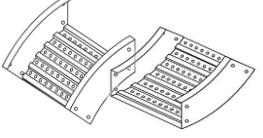
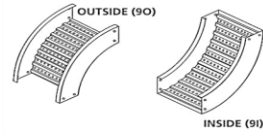
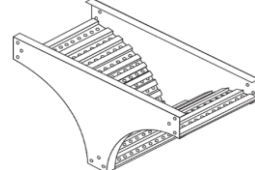
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Section 2 - Conduit, Raceways, Fittings & Related Items

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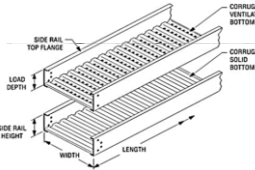
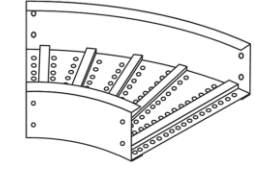
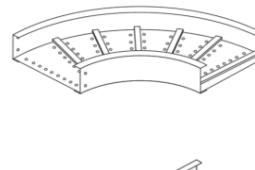
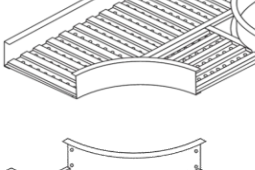
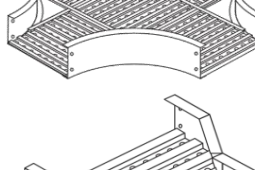
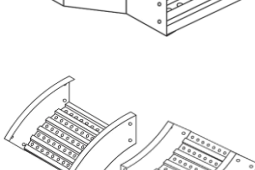
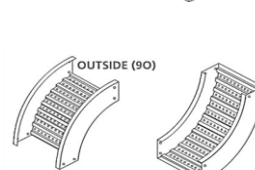
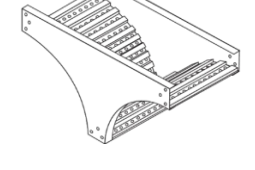
	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Solid/Ventilated Aluminum Tray 3" Depth						
	Solid/Ventilated Aluminum - Cable Tray - 3" Depth						
	6" Wide		11.30	14.13	16.95		C
	9" Wide		12.00	15.00	18.00		C
	12" Wide		13.50	16.88	20.25		C
	18" Wide		15.80	19.75	23.70		C
	24" Wide		19.50	24.38	29.25		C
	30" Wide		23.30	29.13	34.95		C
	36" Wide		27.00	33.75	40.50		C
	Solid/Ventilated Aluminum - 45 Degree Elbow - 3" Depth						
	6" Wide		1.40	1.75	2.10		E
	9" Wide		1.50	1.88	2.25		E
	12" Wide		1.70	2.13	2.55		E
	18" Wide		1.90	2.38	2.85		E
	24" Wide		2.30	2.88	3.45		E
	30" Wide		2.60	3.25	3.90		E
	36" Wide		3.00	3.75	4.50		E
	Solid/Ventilated Aluminum - 90 Degree Elbow - 3" Depth						
	6" Wide		2.00	2.50	3.00		E
	9" Wide		2.30	2.88	3.45		E
	12" Wide		2.50	3.13	3.75		E
	18" Wide		2.80	3.50	4.20		E
	24" Wide		3.40	4.25	5.10		E
	30" Wide		4.00	5.00	6.00		E
	36" Wide		5.00	6.25	7.50		E
	Solid/Ventilated Aluminum - Tee - 3" Depth						
	6" Wide		3.60	4.50	5.40		E
	9" Wide		3.80	4.75	5.70		E
	12" Wide		4.00	5.00	6.00		E
	18" Wide		5.30	6.63	7.95		E
	24" Wide		6.00	7.50	9.00		E
	30" Wide		7.50	9.38	11.25		E
	36" Wide		9.00	11.25	13.50		E
	Solid/Ventilated Aluminum - Cross - 3" Depth						
	6" Wide		4.70	5.88	7.05		E
	9" Wide		5.00	6.25	7.50		E
	12" Wide		5.40	6.75	8.10		E
	18" Wide		6.00	7.50	9.00		E
	24" Wide		6.80	8.50	10.20		E
	30" Wide		8.30	10.38	12.45		E
	36" Wide		9.80	12.25	14.70		E
	Solid/Ventilated Aluminum - Reducer - 3" Depth						
	6" Wide		1.40	1.75	2.10		E
	9" Wide		1.50	1.88	2.25		E
	12" Wide		1.70	2.13	2.55		E
	18" Wide		1.90	2.38	2.85		E
	24" Wide		2.30	2.88	3.45		E
	30" Wide		2.60	3.25	3.90		E
	36" Wide		3.00	3.75	4.50		E
	Solid/Ventilated Aluminum - Vertical 45 Degree Elbow - 3" Depth						
	6" Wide		1.60	2.00	2.40		E
	9" Wide		1.70	2.13	2.55		E
	12" Wide		2.00	2.50	3.00		E
	18" Wide		2.30	2.88	3.45		E
	24" Wide		2.60	3.25	3.90		E
	30" Wide		3.00	3.75	4.50		E
	36" Wide		3.50	4.38	5.25		E
	Solid/Ventilated Aluminum - Vertical 90 Degree Elbow - 3" Depth						
	6" Wide		2.40	3.00	3.60		E
	9" Wide		2.70	3.38	4.05		E
	12" Wide		3.00	3.75	4.50		E
	18" Wide		3.40	4.25	5.10		E
	24" Wide		3.90	4.88	5.85		E
	30" Wide		4.50	5.63	6.75		E
	36" Wide		5.90	7.38	8.85		E
	Solid/Ventilated Aluminum - Vertical Tee - 3" Depth						
	6" Wide		4.50	5.63	6.75		E
	9" Wide		4.80	6.00	7.20		E
	12" Wide		5.00	6.25	7.50		E
	18" Wide		6.00	7.50	9.00		E
	24" Wide		6.90	8.63	10.35		E
	30" Wide		8.60	10.75	12.90		E
	36" Wide		10.00	12.50	15.00		E

Section 2 - Conduit, Raceways, Fittings & Related Items

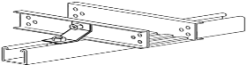
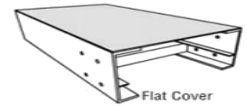
Description		Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Solid/Ventilated Aluminum Tray 4" Depth							
Solid/Ventilated Aluminum - Cable Tray - 4" Depth							
	6" Wide		13.50	16.88	20.25		C
	9" Wide		14.30	17.88	21.45		C
	12" Wide		16.50	20.63	24.75		C
	18" Wide		18.80	23.50	28.20		C
	24" Wide		23.30	29.13	34.95		C
	30" Wide		27.80	34.75	41.70		C
	36" Wide		32.30	40.38	48.45		C
Solid/Ventilated Aluminum - 45 Degree Elbow - 4" Depth							
	6" Wide		1.60	2.00	2.40		E
	9" Wide		1.70	2.13	2.55		E
	12" Wide		2.00	2.50	3.00		E
	18" Wide		2.20	2.75	3.30		E
	24" Wide		2.60	3.25	3.90		E
	30" Wide		3.00	3.75	4.50		E
	36" Wide		3.50	4.38	5.25		E
Solid/Ventilated Aluminum - 90 Degree Elbow - 4" Depth							
	6" Wide		2.30	2.88	3.45		E
	9" Wide		2.60	3.25	3.90		E
	12" Wide		2.90	3.63	4.35		E
	18" Wide		3.20	4.00	4.80		E
	24" Wide		3.90	4.88	5.85		E
	30" Wide		4.70	5.88	7.05		E
	36" Wide		5.90	7.38	8.85		E
Solid/Ventilated Aluminum - Tee - 4" Depth							
	6" Wide		4.00	5.00	6.00		E
	9" Wide		4.40	5.50	6.60		E
	12" Wide		4.60	5.75	6.90		E
	18" Wide		6.00	7.50	9.00		E
	24" Wide		6.90	8.63	10.35		E
	30" Wide		8.60	10.75	12.90		E
	36" Wide		10.40	13.00	15.60		E
Solid/Ventilated Aluminum - Cross - 4" Depth							
	6" Wide		5.40	6.75	8.10		E
	9" Wide		5.70	7.13	8.55		E
	12" Wide		6.20	7.75	9.30		E
	18" Wide		6.90	8.63	10.35		E
	24" Wide		7.80	9.75	11.70		E
	30" Wide		9.50	11.88	14.25		E
	36" Wide		11.30	14.13	16.95		E
Solid/Ventilated Aluminum - Reducer - 4" Depth							
	6" Wide		1.60	2.00	2.40		E
	9" Wide		1.70	2.13	2.55		E
	12" Wide		2.00	2.50	3.00		E
	18" Wide		2.20	2.75	3.30		E
	24" Wide		2.60	3.25	3.90		E
	30" Wide		3.00	3.75	4.50		E
	36" Wide		3.50	4.38	5.25		E
Solid/Ventilated Aluminum - Vertical 45 Degree Elbow - 4" Depth							
	6" Wide		1.80	2.25	2.70		E
	9" Wide		2.00	2.50	3.00		E
	12" Wide		2.30	2.88	3.45		E
	18" Wide		2.60	3.25	3.90		E
	24" Wide		3.00	3.75	4.50		E
	30" Wide		3.50	4.38	5.25		E
	36" Wide		4.00	5.00	6.00		E
Solid/Ventilated Aluminum - Vertical 90 Degree Elbow - 4" Depth							
	6" Wide		2.80	3.50	4.20		E
	9" Wide		3.00	3.75	4.50		E
	12" Wide		3.50	4.38	5.25		E
	18" Wide		3.90	4.88	5.85		E
	24" Wide		4.50	5.63	6.75		E
	30" Wide		5.30	6.63	7.95		E
	36" Wide		6.80	8.50	10.20		E
Solid/Ventilated Aluminum - Vertical Tee - 4" Depth							
	6" Wide		5.20	6.50	7.80		E
	9" Wide		5.60	7.00	8.40		E
	12" Wide		5.80	7.25	8.70		E
	18" Wide		6.90	8.63	10.35		E
	24" Wide		8.00	10.00	12.00		E
	30" Wide		9.90	12.38	14.85		E
	36" Wide		11.60	14.50	17.40		E

Section 2 - Conduit, Raceways, Fittings & Related Items

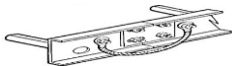
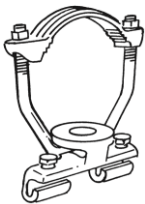
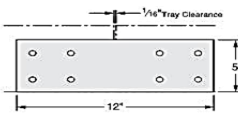
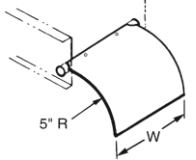
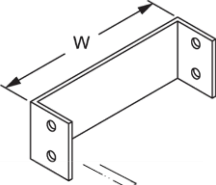
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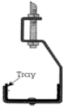
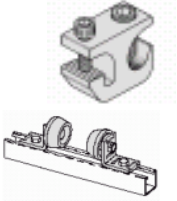
	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Solid/Ventilated Aluminum Tray 6" Depth						
	Solid/Ventilated Aluminum - Cable Tray - 6" Depth						
	6" Wide		17.30	21.63	25.95		C
	9" Wide		18.80	23.50	28.20		C
	12" Wide		21.80	27.25	32.70		C
	18" Wide		24.80	31.00	37.20		C
	24" Wide		30.00	37.50	45.00		C
	30" Wide		36.00	45.00	54.00		C
	36" Wide		42.00	52.50	63.00		C
	Solid/Ventilated Aluminum - 45 Degree Elbow - 6" Depth						
	6" Wide		1.80	2.25	2.70		E
	9" Wide		2.00	2.50	3.00		E
	12" Wide		2.30	2.88	3.45		E
	18" Wide		2.50	3.13	3.75		E
	24" Wide		3.00	3.75	4.50		E
	30" Wide		3.50	4.38	5.25		E
	36" Wide		4.00	5.00	6.00		E
	Solid/Ventilated Aluminum - 90 Degree Elbow - 6" Depth						
	6" Wide		2.70	3.38	4.05		E
	9" Wide		3.00	3.75	4.50		E
	12" Wide		3.30	4.13	4.95		E
	18" Wide		3.70	4.63	5.55		E
	24" Wide		4.50	5.63	6.75		E
	30" Wide		5.30	6.63	7.95		E
	36" Wide		6.80	8.50	10.20		E
	Solid/Ventilated Aluminum - Tee - 6" Depth						
	6" Wide		4.70	5.88	7.05		E
	9" Wide		5.10	6.38	7.65		E
	12" Wide		5.30	6.63	7.95		E
	18" Wide		6.90	8.63	10.35		E
	24" Wide		8.00	10.00	12.00		E
	30" Wide		9.90	12.38	14.85		E
	36" Wide		12.00	15.00	18.00		E
	Solid/Ventilated Aluminum - Cross - 6" Depth						
	6" Wide		6.20	7.75	9.30		E
	9" Wide		6.50	8.13	9.75		E
	12" Wide		7.20	9.00	10.80		E
	18" Wide		8.00	10.00	12.00		E
	24" Wide		9.00	11.25	13.50		E
	30" Wide		11.00	13.75	16.50		E
	36" Wide		13.00	16.25	19.50		E
	Solid/Ventilated Aluminum - Reducer - 6" Depth						
	6" Wide		1.80	2.25	2.70		E
	9" Wide		2.00	2.50	3.00		E
	12" Wide		2.30	2.88	3.45		E
	18" Wide		2.50	3.13	3.75		E
	24" Wide		3.00	3.75	4.50		E
	30" Wide		3.50	4.38	5.25		E
	36" Wide		4.00	5.00	6.00		E
	Solid/Ventilated Aluminum - Vertical 45 Degree Elbow - 6" Depth						
	6" Wide		2.10	2.63	3.15		E
	9" Wide		2.30	2.88	3.45		E
	12" Wide		2.60	3.25	3.90		E
	18" Wide		3.00	3.75	4.50		E
	24" Wide		3.50	4.38	5.25		E
	30" Wide		4.00	5.00	6.00		E
	36" Wide		4.60	5.75	6.90		E
	Solid/Ventilated Aluminum - Vertical 90 Degree Elbow - 6" Depth						
	6" Wide		3.20	4.00	4.80		E
	9" Wide		3.50	4.38	5.25		E
	12" Wide		4.00	5.00	6.00		E
	18" Wide		4.50	5.63	6.75		E
	24" Wide		5.20	6.50	7.80		E
	30" Wide		6.20	7.75	9.30		E
	36" Wide		7.80	9.75	11.70		E
	Solid/Ventilated Aluminum - Vertical Tee - 6" Depth						
	6" Wide		5.90	7.38	8.85		E
	9" Wide		6.40	8.00	9.60		E
	12" Wide		6.80	8.50	10.20		E
	18" Wide		8.00	10.00	12.00		E
	24" Wide		9.20	11.50	13.80		E
	30" Wide		11.40	14.25	17.10		E
	36" Wide		13.40	16.75	20.10		E

Section 2 - Conduit, Raceways, Fittings & Related Items

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
 	Solid/Ventilated Aluminum Cable Tray Fittings & Accessories						
	Seismic Hold-Down Clamp and Expansion Guide						
	Hold Down Clamp Pair		1.00	1.25	1.50		E
	Solid/Ventilated Aluminum Cable Tray - Solid Covers						
	6" Wide		3.50	4.38	5.25		C
	9" Wide		4.00	5.00	6.00		C
	12" Wide		5.00	6.25	7.50		C
	18" Wide		6.50	8.13	9.75		C
	24" Wide		8.00	10.00	12.00		C
	30" Wide		10.00	12.50	15.00		C
	36" Wide		12.00	15.00	18.00		C
	Solid/Ventilated Aluminum Cable Tray - Solid Cover Clamps (Per Pair)						
	6" Wide		0.50	0.63	0.75		E
	9" Wide		0.55	0.69	0.83		E
	12" Wide		0.60	0.75	0.90		E
	18" Wide		0.65	0.81	0.98		E
	24" Wide		0.70	0.88	1.05		E
	30" Wide		0.75	0.94	1.13		E
	36" Wide		0.80	1.00	1.20		E
	Solid/Ventilated Aluminum - 45 Degree Elbow - Solid Covers						
	6" Wide		0.25	0.31	0.38		E
	9" Wide		0.30	0.38	0.45		E
	12" Wide		0.35	0.44	0.53		E
	18" Wide		0.40	0.50	0.60		E
	24" Wide		0.50	0.63	0.75		E
	30" Wide		0.60	0.75	0.90		E
	36" Wide		0.70	0.88	1.05		E
	Solid/Ventilated Aluminum - 90 Degree Elbow - Solid Covers						
	6" Wide		0.25	0.31	0.38		E
	9" Wide		0.30	0.38	0.45		E
	12" Wide		0.35	0.44	0.53		E
	18" Wide		0.40	0.50	0.60		E
	24" Wide		0.50	0.63	0.75		E
	30" Wide		0.60	0.75	0.90		E
	36" Wide		0.70	0.88	1.05		E
	Solid/Ventilated Aluminum - Tee - Solid Covers						
	6" Wide		0.35	0.44	0.53		E
	9" Wide		0.40	0.50	0.60		E
	12" Wide		0.45	0.56	0.68		E
	18" Wide		0.50	0.63	0.75		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.70	0.88	1.05		E
	36" Wide		0.80	1.00	1.20		E
	Solid/Ventilated Aluminum - Cross - Solid Covers						
	6" Wide		0.45	0.56	0.68		E
	9" Wide		0.50	0.63	0.75		E
	12" Wide		0.55	0.69	0.83		E
	18" Wide		0.60	0.75	0.90		E
	24" Wide		0.70	0.88	1.05		E
	30" Wide		0.80	1.00	1.20		E
	36" Wide		0.90	1.13	1.35		E
	Solid/Ventilated Aluminum - Reducer - Solid Covers						
	6" Wide		0.25	0.31	0.38		E
	9" Wide		0.30	0.38	0.45		E
	12" Wide		0.35	0.44	0.53		E
	18" Wide		0.40	0.50	0.60		E
	24" Wide		0.50	0.63	0.75		E
	30" Wide		0.60	0.75	0.90		E
	36" Wide		0.70	0.88	1.05		E
	Solid/Ventilated Aluminum - Vertical 45 Degree Elbow - Solid Covers						
	6" Wide		0.35	0.44	0.53		E
	9" Wide		0.40	0.50	0.60		E
	12" Wide		0.45	0.56	0.68		E
	18" Wide		0.50	0.63	0.75		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.70	0.88	1.05		E
	36" Wide		0.80	1.00	1.20		E
	Solid/Ventilated Aluminum - Vertical 90 Degree Elbow - Solid Covers						
	6" Wide		0.35	0.44	0.53		E
	9" Wide		0.40	0.50	0.60		E
	12" Wide		0.45	0.56	0.68		E
	18" Wide		0.50	0.63	0.75		E
	24" Wide		0.60	0.75	0.90		E
	30" Wide		0.70	0.88	1.05		E
	36" Wide		0.80	1.00	1.20		E

A diagram of a U-channel section. A dimension line below the channel indicates a width of $W+3$.

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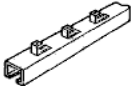
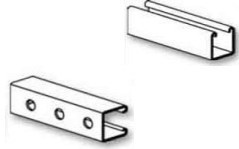
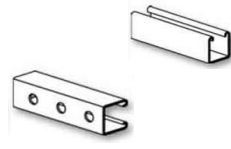


Section 2 - Conduit, Raceways, Fittings & Related Items

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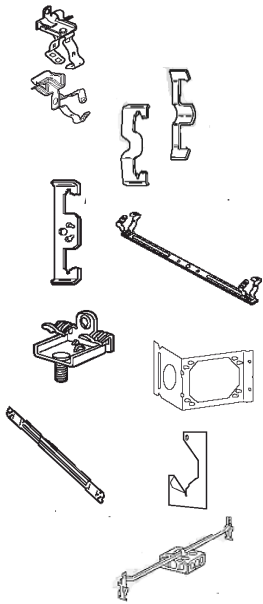
Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Fasteners / Hangers / Supports						
Toggle Bolts						
1/4"		12.00	15.00	18.00		C
3/8"		13.00	16.20	19.50		C
1/2"		15.00	18.70	22.50		C
5/8"		17.00	21.20	25.00		C
3/4"		20.00	25.00	30.00		C
7/8"		24.00	30.00	36.00		C
Drop-in Anchors						
1/4"		16.00	20.00	24.00		C
3/8"		18.00	22.50	27.00		C
1/2"		20.00	25.00	30.00		C
5/8"		23.00	28.70	34.50		C
3/4"		26.00	32.50	39.00		C
7/8"		30.00	37.50	45.00		C
Expansion Shields						
1/4"		18.00	22.50	27.00		C
3/8"		20.00	25.00	30.00		C
1/2"		22.00	27.50	33.00		C
5/8"		25.00	31.20	37.50		C
3/4"		28.00	35.00	42.00		C
7/8"		32.00	40.00	48.00		C
Self Drill Anchors						
1/4"		20.00	25.00	30.00		C
3/8"		22.00	27.50	33.00		C
1/2"		24.00	30.00	36.00		C
5/8"		27.00	33.70	40.00		C
3/4"		30.00	37.50	45.00		C
7/8"		35.00	43.70	52.00		C
Concrete Anchor Bolts						
1/4"		16.00	20.00	24.00		C
3/8"		18.00	22.50	27.00		C
1/2"		20.00	25.00	30.00		C
5/8"		23.00	28.70	34.50		C
3/4"		26.00	32.50	39.00		C
1"		30.00	37.50	45.00		C
Hollow Wall Anchors						
3/16"		10.00	12.50	15.00		C
1/4"		12.00	15.00	18.00		C
5/16"		14.00	17.50	21.00		C
Fiber & Plastic Anchors						
#8		14.00	17.50	21.00		C
#10		15.00	18.70	22.50		C
#12		16.00	20.00	24.00		C
#14		18.00	22.50	27.00		C
#16		21.00	26.20	31.50		C
#20		24.00	30.00	36.00		C
Powder Activated Fasteners - All Types						
Powder Activated Fasteners-All Types		8.00	10.00	12.00		C
Hammer Drive Anchors						
1/4"		16.00	20.00	24.00		C
3/8"		18.00	22.50	27.00		C
1/2"		20.00	25.00	30.00		C
5/8"		23.00	28.70	34.50		C
Anchor Bolts Set in Concrete						
1/2" x 4"		25.00	31.25	37.50		C
5/8" x 6"		30.00	37.50	45.00		C
3/4" x 8"		35.00	43.75	52.50		C
1" x 10"		40.00	50.00	60.00		C
1 1/4" x 12"		45.00	56.25	67.50		C

Section 2 - Conduit, Raceways, Fittings & Related Items

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Concrete Channel Inserts						
	1 Ft Long		30.00	37.50	45.00		C
	2 Ft Long		40.00	50.00	60.00		C
	4 Ft Long		50.00	62.00	75.00		C
	6 Ft Long		60.00	75.00	90.00		C
	8 Ft Long		75.00	93.00	110.00		C
	10 Ft Long		90.00	112.00	135.00		C
	Threaded Concrete Inserts						
	Threaded Concrete Inserts		30.00	37.50	45.00		C
	Concrete Channel End Plates						
	Concrete Channel End Plates		8.00	10.00	12.00		C
	Concrete Channel Nuts						
	Concrete Channel Nuts with Springs		6.00	7.50	9.00		C
	Concrete Channel Nuts without Springs		7.00	8.50	10.00		C
	Concrete Channel Studs						
	Concrete Channel Studs with Springs		5.00	6.20	7.50		C
	Concrete Channel Studs without Springs		6.00	7.50	9.00		C
	Pre-cut Strut Hanger Channels	X					
	6" Long		10.00	12.50	15.00		C
	12" Long		11.00	13.70	16.50		C
	18" Long		12.00	15.00	18.00		C
	24" Long		14.00	17.50	21.00		C
	36" Long		16.00	20.00	24.00		C
	48" Long		18.00	22.50	27.00		C
	Field Cut Strut Hanger Channels	X					
	6" Long		14.00	17.50	21.00		C
	12" Long		15.00	18.70	22.50		C
	18" Long		16.00	20.00	24.00		C
	24" Long		18.00	22.50	27.00		C
	36" Long		21.00	26.20	31.50		C
	48" Long		24.00	30.00	36.00		C
	Pre-cut Hanger Rods						
	6" long		8.00	10.00	12.00		C
	12" Long		9.00	11.20	13.50		C
	18" Long		10.00	12.50	15.00		C
	24" Long		11.00	13.70	16.50		C
	36" Long		13.00	16.20	19.50		C
	48" Long		15.00	18.70	22.50		C
	Field-cut All-thread Hanger Rods						
	6" Long		10.00	12.50	15.00		C
	12" Long		11.00	13.70	16.50		C
	18" Long		12.00	15.00	18.00		C
	24" Long		14.00	17.50	21.00		C
	36" Long		16.00	20.00	24.00		C
	48" Long		18.00	22.50	27.00		C
	Hanger Channel Conduit Clamps						
	Up to 1" Dia		3.00	3.75	4.50		C
	Up to 2" Dia		4.00	5.00	6.00		C
	Up to 3" Dia		5.00	6.25	7.50		C
	Up to 4" Dia		6.00	7.50	9.00		C
	Up to 6" Dia		8.00	10.00	12.00		C
	One Hole Conduit Straps						
	Up to 1"		4.00	5.00	6.00		C
	Up to 2"		4.25	5.30	6.35		C
	Up to 3"		4.50	5.60	6.75		C
	Up to 4"		5.00	6.25	7.50		C
	Up to 6"		6.00	7.50	9.00		C
	Two Hole Conduit Straps						
	Up to 1"		4.50	5.60	6.75		C
	Up to 2"		5.00	6.25	7.50		C
	Up to 3"		5.50	6.85	8.25		C
	Up to 4"		6.25	7.80	9.35		C
	Up to 6"		7.00	8.75	10.50		C

Section 2 - Conduit, Raceways, Fittings & Related Items

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	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Conduit Ring Hangers						
	Up to 1"		25.00	31.20	37.50		C
	Up to 2"		27.50	34.30	41.20		C
	Up to 3"		30.00	37.50	45.00		C
	Up to 4"		35.00	43.70	52.50		C
	Up to 6"		40.00	50.00	60.00		C
	Adjustable Ring Hangers						
	Up to 1"		22.50	28.10	33.70		C
	Up to 2"		25.00	31.20	37.50		C
	Up to 3"		27.50	34.30	41.20		C
	Up to 4"		30.00	37.50	45.00		C
	Up to 6"		35.00	43.70	52.50		C
	Conduit Clamps						
	Up to 1"		30.00	37.50	45.00		C
	Up to 2"		35.00	43.70	52.50		C
	Up to 3"		40.00	50.00	60.00		C
	Up to 4"		45.00	56.20	67.50		C
	Up to 6"		50.00	62.50	75.00		C
	Minerallic Straps						
	Up to 1"		12.50	15.63	19.53		C
	Up to 2"		13.75	17.19	21.48		C
	Up to 3"		15.00	18.75	23.44		C
	Up to 4"		17.50	21.88	27.34		C
	Up to 6"		20.00	25.00	31.25		C
	Clevis Ring Hangers						
	Up to 1"		25.00	31.25	37.50		C
	Up to 2"		27.50	34.40	41.25		C
	Up to 3"		30.00	37.50	45.00		C
	Up to 4"		35.00	41.00	52.50		C
	Up to 6"		40.00	50.00	60.00		C
	Conduit Riser Clamps						
	Up to 1"		27.50	34.30	41.20		C
	Up to 2"		30.00	37.50	45.00		C
	Up to 3"		35.00	43.70	52.50		C
	Up to 4"		40.00	50.00	60.00		C
	Up to 6"		45.00	56.20	67.50		C
	U-Bolts						
	Up to 1"		25.00	31.20	37.50		C
	Up to 2"		27.50	34.30	41.20		C
	Up to 3"		30.00	37.50	45.00		C
	Up to 4"		35.00	43.70	52.50		C
	Up to 6"		40.00	50.00	60.00		C
	Conduit and Box Supports						
	Flange Mount Conduit and Cable Clip 3/8"		4.00	5.00	6.00		C
	Flange Mount Conduit and Cable Clip 1/2"		5.00	6.25	7.50		C
	Flange Mount Conduit and Cable Clip 1"		6.00	7.50	9.00		C
	Flange Mount Conduit and Cable Clip 1 1/4"		7.00	8.75	10.50		C
	Flange Mount Conduit and Cable Clip 1 1/2"		8.00	10.00	12.00		C
	Flange Mount Conduit and Cable Clip 2"		9.00	11.25	13.50		C
	Conduit Hangers 1/2"		5.00	6.25	7.50		C
	Conduit Hangers 3/4"		6.00	7.50	9.00		C
	Conduit Hangers 1"		7.00	8.75	10.50		C
	Conduit Hangers 1 1/4"		8.00	10.00	12.00		C
	Multi-Function Clip		9.00	11.25	13.50		C
	Combination Box/Conduit Hangers 1/2"		6.00	7.50	9.00		C
	Combination Box/Conduit Hangers 3/4"		7.00	8.75	10.50		C
	Hammer-on Flange Clip 1/8" - 1/4"		5.00	6.25	7.50		C
	Hammer-on Flange Clip 5/16" - 1/2"		6.00	7.50	9.00		C
	Hammer-on Flange Clip 9/16" - 3/4"		7.00	8.75	10.50		C
	Box Mounting Bracket		6.00	7.50	9.00		C
	Screw Gun Box Bracket		6.00	7.50	9.00		C
	Anti-Rattle Support		4.50	5.63	6.75		C
	Snap-On Fixture Box Hanger		9.50	11.88	14.25		C
	Stud Grommet for conduit, MC or NM		0.10	0.12	0.15		E

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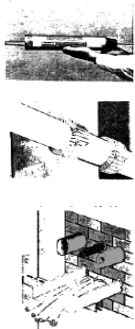
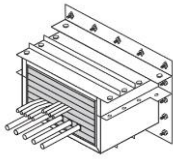
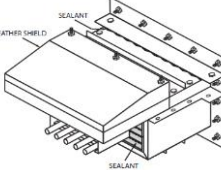
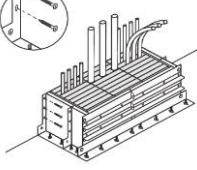
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Section 2 - Conduit, Raceways, Fittings & Related Items

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	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Hole Drilling and Coring						
	Roto-Hammer Concrete						
	3/4" x 8"		0.50	0.75	1.00		E
	1" x 8"		0.60	0.90	1.30		E
	1 1/4" x 8"		1.00	1.50	2.00		E
	Core-Drill Concrete With Lay-out						
	3/4" x 8"		1.00	1.25	1.75		E
	1" x 8"	X	1.00	1.25	1.75		E
	1 1/4" x 8"		1.00	1.30	1.75		E
	1 1/2" x 8"		1.10	1.35	1.85		E
	2" x 8"		1.15	1.50	1.90		E
	2 1/2" x 8"		1.50	1.75	2.00		E
	3" x 8"		1.75	2.00	2.50		E
	4" x 8"		2.00	2.50	3.00		E
	5" x 8"		2.50	3.00	3.50		E
	6" x 8"		3.00	3.50	4.00		E
	Firestop Material						
	Fire Stop Pillows						
	Pillow Installation		10.00	12.00	15.00		C
	Fire Proof Wall Penetrations						
	FP-Wall Seal 1/2"		0.85	0.95	1.15		E
	FP-Wall Seal 3/4"		0.95	1.15	1.35		E
	FP-Wall Seal 1"		1.10	1.20	1.40		E
	FP-Wall Seal 1 1/4"		1.50	1.60	1.80		E
	FP-Wall Seal 1 1/2"		1.50	1.85	2.05		E
	FP-Wall Seal 2"		2.00	2.10	2.30		E
	FP-Wall Seal 2 1/2"		2.50	2.60	2.80		E
	FP-Wall Seal 3"		3.00	3.10	3.30		E
	FP-Wall Seal 3 1/2"		3.40	3.50	3.70		E
	FP-Wall Seal 4"		3.75	3.85	4.05		E
	FP-Wall Seal 5"		4.00	4.10	4.30		E
	FP-Wall Seal 6"		4.50	4.60	4.80		E
	Prepare Opening		1.00	2.00	3.00		E
	Install Device		0.50	0.65	0.75		E
	Fit To Conduit		0.75	0.85	0.95		E
	Finish Seal		1.00	2.00	3.00		E
	Multi Cable/Tray Firestop						
	Multi-cable and cable tray firestop penetration.						
	Wall opening is not included in labor units.						
	Fire pads are installed after cable installation.						
	Installation Labor		2.50	2.70	2.90		E
	Fire Pad Installation		1.00	1.20	1.40		E
	Speed Sleeve						
	Wall penetrations not included in labor units.						
	Low voltage cable application.						
	Wall and floor applications.						
	Seal sleeve before installing flange.						
	Seal occurs by rotating the sleeve clockwise.						
	Speed sleeve can be re-opened for additional cable and re-sealed.						
	2" Sleeve		1.00	1.20	1.40		E
	4" Sleeve		1.50	1.70	1.90		E
	Firestop Collar						
	Wall penetrations not included in labor units.						
	Adjustable position tabs for fastening.						
	Fastening hooks used to fasten collar to wall.						
	1 1/2" Collar		1.00	1.20	1.40		E
	2" Collar		1.15	1.17	1.19		E
	3" Collar		1.30	1.50	1.70		E
	4" Collar		1.50	1.70	1.90		E
	6" Collar		1.90	2.10	2.30		E
	Floor Firestop						
	Floor penetration not included in labor units.						
	Mount on metal decks.						
	Moisture and smoke seal						
	2" Cast-In-Device		1.00	1.20	1.40		E
	3" Cast-In-Device		1.15	1.17	1.19		E
	4" Cast-In-Device		1.25	1.27	1.29		E
	6" Cast-In-Device		1.50	1.70	1.90		E

SECTION 3

WIRE, CABLE, LUGS, TERMINATIONS, BUSWAY AND BUS DUCT

General Information

This section includes labor units for building wire, power cable plenum cable, control cable, tray cable, undercarpet cable, lugs, stress relief cones, pot heads, cable terminators, busway and bus duct.

3

Scope of These Labor Units

The Introduction section includes details on the scope of labor units across the manual. Some items included are:

- Material unloading, jobsite storage and delivery to the installation area
- Drawing and specification study
- Layout, measuring and marking the installation location
- Tool acquisition and return to storage
- Set-up and removing jacks, sheaves and cable pullers
- Pulling cable
- Testing circuits for continuity only
- Clean-up of electrical contractor furnished excess materials
- Normal non-productive labor

Work Operations Not Included In These Labor Units

- Field supervision
- Conductor terminations are not included in the wire pulling labor units
- Lugs, splices, cable terminators labor must be estimated separately
- Cable labor units do not include fasteners or supports
- Busway and bus duct labor units do not include fasteners or supports
- All testing except circuit continuity

Labor Adjustments for Non-Typical Conditions

See the Introduction section for details.

Application Instructions

- Labor units for conduit termination material include installing the locknuts and bushings as well
- All conductor termination labor in this manual is included with the wiring device, fixture, motor, panelboard, safety switch, etc. labor units unless noted otherwise.
- Labor units in this section should not be reduced for paralleled conductor installation situations unless the quantity of parallel conduits with paralleled conductors is unusually large. Even then, each installation condition should be evaluated critically before factoring the labor units.
- Wire and cable installed in cable tray generally require larger than normal labor units because the pulling equipment (including the sheaves) set-up time and the pulling equipment removal time are usually included in the conductor pulling labor units.
- Some electrical safety codes may require cables to be tied or laced within the cable tray enclosure. An additional allowance for installation labor must be made to meet such requirements.
- Bus duct labor unit tables in this section are for copper bus duct.
 - For aluminum bus duct labor units, deduct approximately 15% from the labor units in these tables due to the lighter weight of the material.
 - Labor unit tables are based on 3 Phase 3 Pole duct and fittings.
 - For 3 Phase 4 Pole (1/2 Neutral) bus duct installations add 15% to these duct and fitting labor units.
 - For 3 Phase 4 Pole (Full Neutral) bus duct installations add 20%.

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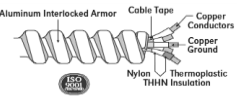
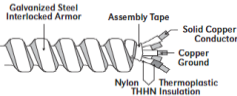


Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

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Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
5 KV Power Cable-Shielded- 1/C Copper - XLP Insulated - PVC Jacketed						
#10		10.00	12.50	15.00		M
#8		12.00	15.00	18.00		M
#6		14.00	17.50	21.00		M
#4		16.00	20.00	24.00		M
#3		18.00	22.50	27.00		M
#2		20.00	25.00	30.00		M
#1		22.00	27.50	33.00		M
1/0		24.00	30.00	36.00		M
2/0		27.00	33.75	40.50		M
3/0		30.00	37.50	45.00		M
4/0		33.00	41.25	49.50		M
250 kcmil		36.00	45.00	54.00		M
300 kcmil		40.00	50.00	60.00		M
350 kcmil		44.00	55.00	66.00		M
400 kcmil		48.00	60.00	72.00		M
500 kcmil		52.00	65.00	78.00		M
600 kcmil		60.00	75.00	90.00		M
750 kcmil		66.00	82.50	99.00		M
1000 kcmil		74.00	92.50	111.00		M
5 KV Power Cable-3/C- w/o Ground Shielded Copper - XLP - PVC Jacketed						
#8		25.00	31.20	37.50		M
#6		30.00	37.50	45.00		M
#4		35.00	43.70	52.50		M
#2		40.00	50.00	60.00		M
#1		45.00	56.00	67.00		M
1/0		50.00	62.00	75.00		M
2/0		55.00	68.00	82.00		M
3/0		60.00	75.00	90.00		M
4/0		65.00	81.00	97.00		M
250 kcmil		70.00	87.00	105.00		M
300 kcmil		75.00	93.00	112.00		M
350 kcmil		80.00	100.00	120.00		M
400 kcmil		85.00	106.00	127.00		M
500 kcmil		90.00	112.00	135.00		M
600 kcmil		100.00	125.00	150.00		M
750 kcmil		110.00	137.00	165.00		M
5 KV Power Cable-3/C- with Ground Shielded - Copper - XLP - PVC Jacketed						
#8		30.00	37.50	45.00		M
#6		35.00	43.70	52.50		M
#4		40.00	50.00	60.00		M
#2		45.00	56.00	67.00		M
#1		50.00	62.00	75.00		M
1/0		55.00	68.00	82.00		M
2/0		60.00	75.00	90.00		M
3/0		65.00	81.00	97.00		M
4/0		70.00	87.00	105.00		M
250 kcmil		75.00	93.00	112.00		M
300 kcmil		80.00	100.00	120.00		M
350 kcmil		85.00	106.00	127.00		M
400 kcmil		90.00	112.00	135.00		M
500 kcmil		100.00	125.00	150.00		M
600 kcmil		110.00	137.00	165.00		M
750 kcmil		120.00	150.00	180.00		M
1000 kcmil		135.00	165.00	200.00		M
15 KV Power Cable-1/C Shielded - Copper - XLP - PVC Jacketed						
#6		20.00	25.00	30.00		M
#4		22.00	27.50	33.00		M
#2		26.00	32.50	39.00		M
#1		28.00	35.00	42.00		M
1/0		30.00	37.50	45.00		M
2/0		32.00	40.00	48.00		M
3/0		35.00	43.75	52.50		M
4/0		38.00	47.50	57.00		M
250 kcmil		41.00	51.25	61.50		M
300 kcmil		44.00	55.00	66.00		M
350 kcmil		48.00	60.00	72.00		M
400 kcmil		52.00	65.00	78.00		M
500 kcmil		58.00	72.50	87.00		M
600 kcmil		64.00	80.00	96.00		M
750 kcmil		70.00	87.50	105.00		M
1000 kcmil		80.00	100.00	120.00		M

Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	15 KV Power Cable-3/C- w/o ground Shielded - Copper - XLP PVC Jacketed						
	#6		40.00	50.00	60.00		M
	#4		45.00	56.00	67.00		M
	#2		50.00	62.00	75.00		M
	#1		55.00	68.00	82.00		M
	1/0		60.00	75.00	90.00		M
	2/0		65.00	81.00	97.00		M
	3/0		70.00	87.00	105.00		M
	4/0		75.00	93.00	112.00		M
	250 kcmil		80.00	100.00	120.00		M
	300 kcmil		85.00	106.00	127.00		M
	350 kcmil		90.00	112.00	135.00		M
	400 kcmil		100.00	125.00	150.00		M
	500 kcmil		110.00	137.00	165.00		M
	600 kcmil		120.00	150.00	180.00		M
	750 kcmil		135.00	165.00	200.00		M
	1000 kcmil		150.00	185.00	225.00		M
	600 Volt MC Cable with Alum. or Steel Armor - Copper						
	Cable available in 120/208V and 277/480V Colors						
	#14-2-G Solid		25.00	31.25	39.06		M
	#14-3-G Solid		27.00	33.75	42.19		M
	#14-4-G Solid		29.00	36.25	45.31		M
	#12-2-G Solid		26.00	32.50	40.63		M
	#12-3-G Solid		28.00	35.00	43.75		M
	#12-4-G Solid		30.00	37.50	46.88		M
	#10-2-G Solid		29.00	36.25	45.31		M
	#10-3-G Solid		32.00	40.00	50.00		M
	#10-4-G Solid		35.00	43.75	54.69		M
	#14-2-G Stranded		25.00	31.25	39.06		M
	#14-3-G Stranded		27.00	33.75	42.19		M
	#14-4-G Stranded		29.00	36.25	45.31		M
	#12-2-G Stranded		26.00	32.50	40.63		M
	#12-3-G Stranded		28.00	35.00	43.75		M
	#12-4-G Stranded		30.00	37.50	46.88		M
	#10-2-G Stranded		28.50	35.63	44.53		M
	#10-3-G Stranded		31.50	39.38	49.22		M
	#10-4-G Stranded		34.50	43.13	53.91		M
	#8-2-10 GRD Stranded		33.00	41.25	51.56		M
	#8-3-10 GRD Stranded		36.00	45.00	56.25		M
	#8-4-10 GRD Stranded		41.00	51.25	64.06		M
	#6-2-8 GRD Stranded		37.00	46.25	57.81		M
	#6-3-8 GRD Stranded		41.00	51.25	64.06		M
	#6-4-8 GRD Stranded		45.00	56.25	70.31		M
	#4-2-8 GRD Stranded		41.00	51.25	64.06		M
	#4-3-8 GRD Stranded		45.00	56.25	70.31		M
	#4-4-8 GRD Stranded		49.00	61.25	76.56		M
	#3-2-6 GRD Stranded		44.00	55.00	68.75		M
	#3-3-6 GRD Stranded		48.00	60.00	75.00		M
	#3-4-6 GRD Stranded		52.00	65.00	81.25		M
	#2-3-6 GRD Stranded		48.00	60.00	75.00		M
	#2-4-6 GRD Stranded		52.00	65.00	81.25		M
	#1-3-6 GRD Stranded		56.00	70.00	87.50		M
	600 Volt MC Cable - Homerun Cables - Copper						
	#12-6-G Solid		36.00	45.00	56.25		M
	#12-8-G Solid		40.00	50.00	62.50		M
	#12-12-G Solid		48.00	60.00	75.00		M
	#12-16-G Solid		56.00	70.00	87.50		M
	#10-6-G Solid		41.00	51.25	64.06		M
	#10-8-G Solid		47.00	58.75	73.44		M
	#10-12-G Solid		56.00	70.00	87.50		M
	#10-16-G Solid		68.00	85.00	106.25		M
	#12-6-G Stranded		36.00	45.00	56.25		M
	#12-8-G Stranded		40.00	50.00	62.50		M
	#12-12-G Stranded		48.00	60.00	75.00		M
	#12-16-G Stranded		56.00	70.00	87.50		M
	#10-6-G Stranded		40.00	50.00	62.50		M
	#10-8-G Stranded		46.00	57.50	71.88		M
	#10-12-G Stranded		55.00	68.75	85.94		M
	#10-16-G Stranded		67.00	83.75	104.69		M
	600 Volt AC Cable with Alum. or Steel Armor - Copper						
	AC Cable has #16 aluminum bonding inside metal armor						
	Metal armor provides equipment ground						
	Health Care Facilities Cable (HCF)						
	Cable includes the #16 bonding strip plus a full size grounding conductor						
	Combination provides redundant ground or isolated ground						
	Cables available in 120/208V and 277/480V colors						
	#12-2-G Solid		26.50	33.13	41.41		M
	#12-3-G Solid		28.50	35.63	44.53		M
	#12-4-G Solid		30.50	38.13	47.66		M
	#10-2-G Solid		29.50	36.88	46.09		M
	#10-3-G Solid		32.50	40.63	50.78		M
	#10-4-G Solid		35.50	44.38	55.47		M
	#12-2-G Stranded		26.50	33.13	41.41		M
	#12-3-G Stranded		28.50	35.63	44.53		M
	#12-4-G Stranded		30.50	38.13	47.66		M
	#10-2-G Stranded		29.00	36.25	45.31		M
	#10-3-G Stranded		32.00	40.00	50.00		M
	#10-4-G Stranded		35.00	43.75	54.69		M
	600 Volt AC Cable with Alum. or Steel Armor - Copper						
	AC Cable has #16 aluminum bonding inside metal armor						
	Metal armor provides equipment ground						
	Health Care Facilities Cable (HCF)						
	Cable includes the #16 bonding strip plus a full size grounding conductor						
	Combination provides redundant ground or isolated ground						
	Cables available in 120/208V and 277/480V colors						
	#12-2-G Solid		26.50	33.13	41.41		M
	#12-3-G Solid		28.50	35.63	44.53		M
	#12-4-G Solid		30.50	38.13	47.66		M
	#10-2-G Solid		29.50	36.88	46.09		M
	#10-3-G Solid		32.50	40.63	50.78		M
	#10-4-G Solid		35.50	44.38	55.47		M
	#12-2-G Stranded		26.50	33.13	41.41		M
	#12-3-G Stranded		28.50	35.63	44.53		M
	#12-4-G Stranded		30.50	38.13	47.66		M
	#10-2-G Stranded		29.00	36.25	45.31		M
	#10-3-G Stranded		32.00	40.00	50.00		M
	#10-4-G Stranded		35.00	43.75	54.69		M

Galvanized Steel Interlocked Armor (Color-Coded Red)

Assembly Tape

Copper Conductors

Copper Ground

Nylon TFN or THHN Insulation

ISO 9001

A detailed cross-sectional diagram of the cable armor assembly. It shows a central core with four conductors: two solid copper conductors, a copper ground, and THHN insulation. This core is surrounded by a layer of Nylon THHN insulation. The entire assembly is encased in a thick, multi-layered armor consisting of galvanized steel interlocked armor and assembly tape. Labels with leader lines point to the following components: Galvanized Steel Interlocked Armor, Assembly Tape, Solid Copper Conductors, Copper Ground, Nylon THHN Insulation, and Thermoplastic THHN Insulation.

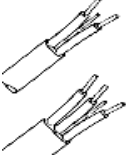
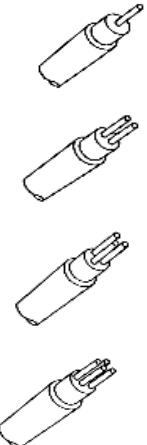
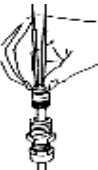
A detailed cross-sectional diagram of a cable assembly. The diagram shows a central core of 'Solid Copper Conductors' surrounded by 'Copper Ground'. This core is encased in 'Thermoplastic THHN Insulation'. The entire assembly is wrapped in 'Nylon THHN Insulation'. An 'Assembly Tape' is shown wrapping around the insulation. The outermost layer is 'Galvanized Steel Interlocked Armor', depicted as a series of overlapping, diamond-shaped segments.

Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	MC Connector for Copper MC - General Duty						
	1/2" MC Conn = 14-2, 12-2, 10-2, 14-3, 12-3, 10-3, 14-4, 12-4, 10-4						
	(All cables have a grd cond)						
	3/4" MC Conn = 8-3, 8-4 (Cables have a #10 grd)						
	1" MC Conn = 6-3, 4-3, 2-3, 6-7, 4-4						
	(#6, 4 cables have a #8 grd, #2 cable has a #6 grd)						
	1 1/4" MC Conn = 1-3, 1/0-3, 2/0-3, 3/0-3, 2-4, 1-4, 1/0-4						
	(#1, 2, 1, 1/0, 2/0 cables have a #6 grd, #3/0 cable has a #4 grd)						
	1 1/2" MC Conn = 4/0-3, 2/0-4, 3/0-4, 4/0-4						
	(#2 cable has a #6 grd, #3/0, 4/0 cables have a #4 grd)						
	2" MC Conn = 250-3, 350-3, 250-4, 350-4						
	(#250 cables have a #4 grd, #350 cables have #3 grd)						
	2 1/2" MC Conn = 500-3, 750-3, 500-4, 600-4						
	(#500, 600 cables have a #2 grd, #750 cable has a #4/0 grd)						
	3" MC Conn = #750-4 (#750 cable has a #1/0 grd)						
	MC Connector for Aluminum MC - General Duty						
	1" MC Conn = 6-3, 4-3, 2-3, 6-4, 4-4, 2-4						
	(#6, 4 cables have a #6 grd, #2 cables has a #4 grd)						
	1 1/4" MC Conn = 1-3, 1/0-3, 2/0-3, 3/0-3, 1-4, 1/0-4						
	(#1, 1/0, 2/0 cables have a #4 grd)						
	1 1/2" MC Conn = 4/0-3, 250-3, 2/0-4, 3/0-4, 4/0-4						
	(#2/0, 3/0 cables have a #4 grd, #4/0, 250 cables have a #2 grd)						
	2" MC Conn = 300-3, 350-3, 400-3, 250-4, 300-4, 350-4						
	(#250, 300, 400 cables have a #1 grd, #350-4 cable has a #1/0 grd)						
	2 1/2" MC Conn = 500-3, 600-3, 750-3, 400-4, 500-4, 600-4						
	(#500-3=#1 grd, #600-3; 750-3=#1/0 grd; 400-4, 500-4, 600-4=#3/0 grd)						
	3" MC Conn K= 750-3, 900-3 (#750-4 has #3/0 grd. #900 has a #250 grd)						
	1/2" MC Connector		0.12	0.15	0.19		E
	3/4" MC Connector		0.14	0.18	0.22		E
	1" MC Connector		0.16	0.20	0.25		E
	1 1/4" MC Connector		0.18	0.23	0.28		E
	1 1/2" MC Connector		0.25	0.31	0.39		E
	2" MC Connector		0.30	0.38	0.47		E
	2 1/2" MC Connector		0.35	0.44	0.55		E
	3" MC Connector		0.45	0.56	0.70		E
	Straps for MC Cable						
	3/4" and larger straps are EMT 1-hole straps						
	3/8" = 14-2, 12-2						
	3/8" = 14-3, 12-3						
	1/2" = 12-4, 10-2, 10-3						
	3/4" = 8-3, 8-4						
	1" = 6-3, 4-3, 2-3, 6-4, 4-4						
	1 1/4" = 1-3, 1/0-3, 2/0-3, 3/0-3, 2-4, 1-4, 1/0-4						
	1 1/2" = 4/0-3, 2/0-4, 3/0-4, 4/0-4						
	2" = 250-3, 350-3, 250-4, 350-4						
	2 1/2" = 500-3, 750-3, 500-4, 600-4						
	3" = #750-4						
	14-2, 12-2 One Hole Strap		0.03	0.04	0.05		E
	14-3, 12-3 One Hole Strap		0.03	0.04	0.05		E
	3/8" One Hole Strap		0.03	0.04	0.05		E
	3/4" One Hole Strap		0.04	0.05	0.06		E
	1" One Hole Strap		0.04	0.05	0.06		E
	1 1/4" One Hole Strap		0.05	0.06	0.08		E
	1 1/2" One Hole Strap		0.06	0.08	0.09		E
	2" One Hole Strap		0.10	0.13	0.16		E
	2 1/2" One Hole Strap		0.11	0.14	0.17		E
	3" One Hole Strap		0.12	0.15	0.19		E
	600 Volt Non-Metallic Sheathed Cable Copper -						
	Type NM and UF w/o Ground						
	1/C #12		25.00	31.20	37.50		M
	1/C #10		30.00	37.50	45.00		M
	1/C #8		35.00	43.70	52.50		M
	1/C #6		40.00	50.00	60.00		M
	2/C #14		30.00	37.50	45.00		M
	2/C #12		35.00	43.70	52.70		M
	2/C #10		40.00	50.00	60.00		M
	2/C #8		45.00	56.20	67.50		M
	2/C #6		55.00	68.70	82.50		M
	3/C #14		40.00	50.00	60.00		M
	3/C #12		45.00	56.20	67.50		M
	3/C #10		50.00	62.50	75.00		M
	3/C #8		60.00	75.00	90.00		M
	3/C #6		70.00	87.00	105.00		M
	Deduct 10% for U.F. Cable Installed in a trench.						

Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

3

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	600 Volt Non-Metallic Sheathed Cable Copper -						
	Type NM and UF with Ground						
	2/C #14		30.00	37.50	45.00		M
	2/C #12		35.00	43.75	52.50		M
	2/C #10		40.00	50.00	60.00		M
	2/C #8		45.00	56.25	67.50		M
	2/C #6		50.00	62.50	75.00		M
	3/C #14		35.00	43.75	52.50		M
	3/C #12		40.00	50.00	60.00		M
	3/C #10		45.00	56.25	67.50		M
	3/C #8		50.00	62.50	75.00		M
	3/C #6		60.00	75.00	90.00		M
	3/C #4		70.00	81.00	98.00		M
	3/C #2		80.00	92.00	105.00		M
	4/C #14		35.00	44.00	53.00		M
	4/C #12		40.00	50.00	60.00		M
	4/C #10		45.00	56.00	68.00		M
	Deduct 10% for U.F. Cable Installed in a trench.						
	600 Volt Mineral Insulated Cable Type MI Non-Heating						
	#16 1/C		35.00	43.75	52.50		M
	#16 2/C		40.00	50.00	60.00		M
	#16 3/C		45.00	56.25	67.50		M
	#16 4/C		50.00	62.50	75.00		M
	#16 7/C		55.00	68.75	82.50		M
	#14 1/C		40.00	50.00	60.00		M
	#14 2/C		45.00	56.25	67.50		M
	#14 3/C		50.00	62.50	75.00		M
	#14 4/C		55.00	68.75	82.50		M
	#14 7/C		60.00	75.00	90.00		M
	#12 1/C		45.00	56.25	67.50		M
	#12 2/C		50.00	62.50	75.00		M
	#12 3/C		55.00	68.75	82.50		M
	#12 4/C		60.00	75.00	90.00		M
	#12 7/C		65.00	81.25	97.50		M
	#10 1/C		50.00	62.50	75.00		M
	#10 2/C		60.00	75.00	90.00		M
	#10 3/C		70.00	87.50	105.00		M
	#10 4/C		80.00	100.00	120.00		M
	#10 7/C		90.00	112.50	135.00		M
	#8 1/C		60.00	75.00	90.00		M
	#8 2/C		70.00	87.50	105.00		M
	#8 3/C		80.00	100.00	120.00		M
	#8 4/C		90.00	112.50	135.00		M
	#6 1/C		70.00	87.50	105.00		M
	#6 2/C		80.00	100.00	120.00		M
	#6 3/C		90.00	112.50	135.00		M
	#6 4/C		100.00	125.00	150.00		M
	#4 1/C		80.00	100.00	120.00		M
	#4 2/C		90.00	112.50	135.00		M
	#4 3/C		100.00	125.00	150.00		M
	#4 4/C		110.00	137.50	165.00		M
	#3 1/C		80.00	100.00	120.00		M
	#2 1/C		85.00	106.25	127.50		M
	#1 1/C		90.00	112.50	135.00		M
	1/0 1/C		95.00	118.75	142.50		M
	2/0 1/C		100.00	125.00	150.00		M
	3/0 1/C		105.00	131.25	157.50		M
	4/0 1/C		110.00	137.50	165.00		M
	600 Volt Mineral Insulated Cable Terminators						
	#12 1/C		0.40	0.50	0.60		E
	#12 2/C		0.50	0.60	0.75		E
	#12 3/C		0.60	0.75	0.90		E
	#12 4/C		0.70	0.90	1.05		E
	#12 7/C		0.80	1.00	1.20		E
	#10 1/C		0.50	0.60	0.75		E
	#10 2/C		0.60	0.75	0.90		E
	#10 3/C		0.70	0.90	1.05		E
	#10 4/C		0.80	1.00	1.20		E
	#10 7/C		0.90	1.10	1.35		E
	#8 1/C		0.60	0.75	0.90		E
	#8 2/C		0.70	0.90	1.05		E
	#8 3/C		0.80	1.00	1.20		E
	#8 4/C		0.90	1.10	1.35		E
	#6 1/C		0.70	0.90	1.05		E
	#6 2/C		0.80	1.00	1.20		E
	#6 3/C		0.90	1.10	1.35		E
	#6 4/C		1.00	1.25	1.50		E
	#4 1/C		0.80	1.00	1.20		E
	#4 2/C		0.90	1.10	1.35		E
	#4 3/C		1.00	1.25	1.50		E
	#4 4/C		1.10	1.40	1.65		E
	#3 1/C		0.90	1.10	1.35		E
	#2 1/C		1.00	1.25	1.50		E
	#1 1/C		1.10	1.40	1.65		E
	1/0 1/C		1.25	1.60	1.90		E
	2/0 1/C		1.40	1.75	2.10		E
	3/0 1/C		1.60	2.00	2.40		E
	4/0 1/C		1.80	2.25	2.70		E

[illegible]

Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Wire Connectors (Wire Nuts)						
	Orange Wire Connector		0.04	0.06	0.08		E
	Yellow Wire Connector		0.05	0.07	0.09		E
	Red Wire Connector		0.06	0.08	0.10		E
	Gray Wire Connector		0.07	0.09	0.11		E
	Blue Wire Connector		0.08	0.10	0.12		E
	Crimp Terminations - Spade Type						
	#22 to #18		0.08	0.10	0.12		E
	#16 TO #14		0.10	0.13	0.15		E
	#12 TO #10		0.12	0.15	0.18		E
	Crimp Terminations - Ring Type						
	#22 to # 18		0.10	0.13	0.15		E
	#16 to #14		0.12	0.15	0.18		E
	#12 to #10		0.14	0.17	0.21		E
	Wire Identification						
	Brady Marker - Per Digit		0.02	0.03	0.04		E
	Clear Wrap Tape		0.02	0.03	0.04		E
	Machine Coded Sleeve		0.05	0.08	0.10		E
	Phase Tape - Per Phase		0.02	0.03	0.04		E
	Feeder Designation Tag		0.10	0.15	0.20		E
	Terminal Blocks - Excludes Terminations						
	Mounting Channel - Per Foot		0.10	0.12	0.15		E
	End Plate		0.03	0.04	0.05		E
	Terminal Block		0.02	0.03	0.04		E
	Plastic Wire Trough		0.10	0.12	0.15		LF
	Cover		0.02	0.03	0.04		E
	600 Volt Type FCC Flat Under Carpet Wiring						
	Junction Box						
	New Construction		0.25	0.31	0.38		E
	Utilize Existing Box		0.20	0.25	0.30		E
	Retro-Fit Existing Construction		0.50	0.63	0.75		E
	Install Round To Flat Cable						
	Transition Block						
	In Junction Box		0.50	0.63	0.75		E
	3 Conductor # 10 Cable		7.50	9.38	11.25		C
	5 Conductor # 10 Cable		7.50	9.38	11.25		C
	<i>Includes: Clean Concrete Floor</i>						
	<i>Moisture Barrier Tape</i>						
	<i>Power cable</i>						
	<i>Hold-down Tape</i>						
	Flat Undercarpet						
	Tee-Tap / X Tap / Change of direction						
	3 Conductor # 10 Cable		0.25	0.31	0.38		E
	5 Conductor # 10 Cable		0.50	0.63	0.75		E
	<i>One Splice Per Conductor</i>						
	<i>Requires Special Crimp Tool</i>						
	<i>Insulator Kit For Ea Crimp Splice</i>						
	Floor Mount Power Pedestal						
	Single or Double Duplex						
	Mount Pedestal and Terminate						
	3 Conductor # 10 Cable		0.50	0.63	0.75		E
	5 Conductor # 10 Cable		0.50	0.63	0.75		E
	Remove and Replace Carpet Tile		3.30	4.13	4.95		C
	Undercarpet Telephone and Data Flat Cable						
	Junction Box						
	New Construction		0.25	0.31	0.38		E
	Utilize Existing Box		0.20	0.25	0.30		E
	Retro-Fit Existing Box		0.50	0.63	0.75		E
	Install Flat To Round						
	Cable Transition Block in						
	Junction Box - All Types						
	Single Conductor		0.25	0.31	0.38		E
	Multi-Conductor		0.40	0.50	0.60		E



Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

3



Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
600 Volt Interlocked Armor Cable 3/C Copper						
#12		28.00	35.00	42.00		M
#10		31.00	38.70	46.50		M
#8		34.00	42.50	51.00		M
#6		38.00	47.50	57.00		M
#4		42.00	52.00	63.00		M
#3		46.00	57.50	69.00		M
#2		50.00	62.50	75.00		M
#1		55.00	68.70	82.00		M
1/0		60.00	75.00	90.00		M
2/0		65.00	81.00	97.00		M
3/0		70.00	87.00	105.00		M
4/0		75.00	93.00	112.00		M
250 kcmil		80.00	100.00	120.00		M
300 MC		90.00	112.00	135.00		M
350 kcmil		100.00	125.00	150.00		M
500 kcmil		110.00	137.00	165.00		M
600 kcmil		120.00	150.00	180.00		M
750 kcmil		130.00	162.00	195.00		M
1000 kcmil		150.00	187.00	225.00		M
600 Volt Interlocked Armored Cable 3/C Aluminum						
#12		24.00	30.00	36.00		M
#10		27.00	33.70	40.50		M
#8		30.00	37.50	45.00		M
#6		34.00	42.50	51.00		M
#4		38.00	47.50	57.00		M
#3		42.00	52.00	63.00		M
#2		46.00	57.50	69.00		M
#1		50.00	62.50	75.00		M
1/0		55.00	68.70	82.00		M
2/0		60.00	75.00	90.00		M
3/0		65.00	81.00	97.00		M
4/0		70.00	87.00	105.00		M
250 kcmil		75.00	93.00	112.00		M
300 kcmil		80.00	100.00	120.00		M
350 kcmil		90.00	112.00	135.00		M
500 kcmil		100.00	125.00	150.00		M
600 kcmil		110.00	137.00	165.00		M
750 kcmil		120.00	150.00	180.00		M
1000 kcmil		140.00	175.00	210.00		M
5 KV Interlocked Armored Cable 3/C Copper						
#12		32.00	40.00	48.00		M
#10		35.00	43.70	52.50		M
#8		38.00	47.50	57.00		M
#6		42.00	52.50	63.00		M
#4		46.00	57.50	69.00		M
#3		50.00	62.50	75.00		M
#2		55.00	68.70	82.00		M
#1		60.00	75.00	90.00		M
1/0		65.00	81.00	97.00		M
2/0		70.00	87.00	105.00		M
3/0		75.00	93.00	112.00		M
4/0		80.00	100.00	120.00		M
250 kcmil		90.00	112.00	135.00		M
300 kcmil		100.00	125.00	150.00		M
350 kcmil		110.00	137.00	165.00		M
500 kcmil		120.00	150.00	180.00		M
600 kcmil		130.00	162.00	195.00		M
750 kcmil		140.00	175.00	210.00		M
1000 kcmil		160.00	200.00	240.00		M
5 KV Interlocked Armored Cable 3/C Aluminum						
#12		30.00	37.50	45.00		M
#10		32.00	40.00	48.00		M
#8		34.00	42.50	51.00		M
#6		36.00	45.00	54.00		M
#4		38.00	47.50	57.00		M
#3		41.00	51.20	61.50		M
#2		45.00	56.20	67.50		M
#1		50.00	62.50	75.00		M
1/0		55.00	68.70	82.50		M
2/0		60.00	75.00	90.00		M
3/0		65.00	81.00	97.00		M
4/0		70.00	87.00	105.00		M
250 kcmil		80.00	100.00	120.00		M
300 kcmil		90.00	112.00	135.00		M
350 kcmil		100.00	125.00	150.00		M
500 kcmil		110.00	137.00	165.00		M
600 kcmil		120.00	150.00	180.00		M
750 kcmil		130.00	162.00	195.00		M
1000 kcmil		150.00	187.00	225.00		M

Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	15 KV Interlocked Armored Cable						
	3/C Shielded - Copper Conductors						
	#8		40.00	50.00	60.00		M
	#6		45.00	56.20	67.50		M
	#4		50.00	62.50	75.00		M
	#3		55.00	68.70	82.50		M
	#2		60.00	75.00	90.00		M
	#1		65.00	81.00	97.00		M
	1/0		70.00	87.00	105.00		M
	2/0		75.00	93.00	112.00		M
	3/0		80.00	100.00	120.00		M
	4/0		90.00	112.00	135.00		M
	250 kcmil		100.00	125.00	150.00		M
	300 kcmil		110.00	137.00	165.00		M
	350 kcmil		120.00	150.00	180.00		M
	500 kcmil		130.00	162.00	195.00		M
	600 kcmil		140.00	175.00	210.00		M
	750 kcmil		155.00	193.00	232.00		M
	1000 kcmil		170.00	212.00	255.00		M
	15 KV Interlocked Armored Cable						
	3/C Shielded - Aluminum Conductors						
	#8		35.00	43.70	52.50		M
	#6		40.00	50.00	60.00		M
	#4		45.00	56.20	67.50		M
	#3		50.00	62.50	75.00		M
	#2		55.00	68.70	82.50		M
	#1		60.00	75.00	90.00		M
	1/0		65.00	81.00	97.00		M
	2/0		70.00	87.00	105.00		M
	3/0		75.00	93.00	112.00		M
	4/0		80.00	100.00	120.00		M
	250 kcmil		90.00	112.00	135.00		M
	300 kcmil		100.00	125.00	150.00		M
	350 kcmil		110.00	137.00	165.00		M
	500 kcmil		120.00	150.00	180.00		M
	600 kcmil		120.00	150.00	180.00		M
	750 kcmil		145.00	181.00	217.00		M
	1000 kcmil		160.00	200.00	240.00		M
	300 Volt Service Entrance Cable						
	Type SEU 3/C Copper Conductors						
	#8		36.00	45.00	54.00		M
	#6		42.00	52.50	63.00		M
	#4		48.00	60.00	72.00		M
	#3		56.00	70.00	84.00		M
	#2		64.00	80.00	96.00		M
	#1		72.00	90.00	108.00		M
	1/0		82.00	102.50	123.00		M
	2/0		94.00	117.50	141.00		M
	3/0		106.00	132.50	159.00		M
	4/0		125.00	156.25	187.50		M
	300 Volt Service Entrance Cable						
	Type SEU 3/C Aluminum Conductors						
	#8		33.00	41.25	49.50		M
	#6		39.00	48.75	58.50		M
	#4		45.00	56.25	67.50		M
	#3		53.00	66.25	79.50		M
	#2		61.00	76.25	91.50		M
	#1		69.00	86.25	103.50		M
	1/0		79.00	98.75	118.50		M
	2/0		90.00	112.50	135.00		M
	3/0		100.00	125.00	150.00		M
	4/0		110.00	137.50	165.00		M
	600 Volt Service Entrance Cable						
	Type SER 3/C Copper Conductors						
	#8		40.00	50.00	60.00		M
	#6		46.00	57.50	69.00		M
	#4		52.00	65.00	78.00		M
	#3		60.00	75.00	90.00		M
	#2		68.00	85.00	102.00		M
	#1		76.00	95.00	114.00		M
	1/0		86.00	107.50	129.00		M
	2/0		98.00	122.50	147.00		M
	3/0		110.00	137.50	165.00		M
	4/0		130.00	162.50	195.00		M
	600 Volt Service Entrance Cable						
	Type SER 3/C Aluminum Conductors						
	#8		36.00	45.00	54.00		M
	#6		42.00	52.50	63.00		M
	#4		48.00	60.00	72.00		M
	#3		56.00	70.00	84.00		M
	#2		64.00	80.00	96.00		M
	#1		72.00	90.00	108.00		M
	1/0		82.00	102.50	123.00		M
	2/0		92.00	115.00	138.00		M
	3/0		104.00	130.00	156.00		M
	4/0		124.00	155.00	186.00		M



A diagram showing a cable with a connector. The connector is a small, rectangular device with a circular opening on one end and a flat, rectangular base on the other. The cable is shown entering the circular opening from the left.



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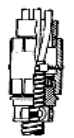
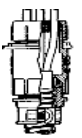
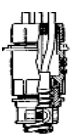
Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Compression Tails - Copper to Aluminum						
	Up to #8		0.25	0.31	0.37		E
	#6		0.30	0.37	0.45		E
	#4		0.35	0.43	0.52		E
	#3		0.40	0.50	0.60		E
	#2		0.45	0.56	0.67		E
	#1		0.50	0.62	0.75		E
	1/0		0.60	0.75	0.90		E
	2/0		0.70	0.87	1.05		E
	3/0		0.80	1.00	1.20		E
	4/0		0.90	1.12	1.35		E
	250 kcmil		1.10	1.37	1.65		E
	350 kcmil		1.30	1.62	1.95		E
	500 kcmil		1.50	1.85	2.25		E
	750 kcmil		1.75	2.15	2.60		E
	1000 kcmil		2.00	2.50	3.00		E
	Metallic Sheathed Cable Box Connectors						
	1/2"		0.18	0.22	0.27		E
	3/4"		0.19	0.23	0.28		E
	1"		0.20	0.25	0.30		E
	1 1/4"		0.22	0.27	0.33		E
	1 1/2"		0.25	0.31	0.37		E
	Non-Metallic Sheathed Cable Box Connectors						
	3/8"		0.10	0.12	0.15		E
	1/2"		0.11	0.13	0.16		E
	5/8"		0.12	0.15	0.18		E
	3/4"		0.13	0.17	0.20		E
	7/8"		0.15	0.19	0.22		E
	1"		0.17	0.21	0.25		E
	1 1/4"		0.20	0.25	0.30		E
	1 1/2"		0.24	0.30	0.36		E
	2/C Armored Sheathed Cable Terminators With Sealing Bushing						
	Up to #4		1.00	1.25	1.50		E
	#3		1.10	1.37	1.65		E
	#2		1.20	1.50	1.80		E
	#1		1.30	1.68	2.00		E
	1/0		1.50	1.87	2.25		E
	2/0		1.75	2.18	2.60		E
	3/0		2.00	2.50	3.00		E
	4/0		2.25	2.80	3.35		E
	250 kcmil		2.50	3.10	3.75		E
	350 kcmil		2.75	3.40	4.10		E
	500 kcmil		3.00	3.75	4.50		E
	3/C Armored Sheathed Cable Terminators With Sealing Bushings						
	Up to #3		1.00	1.25	1.50		E
	#2		1.25	1.55	1.85		E
	#1		1.50	1.85	2.25		E
	1/0		1.75	2.15	2.60		E
	2/0		2.00	2.50	3.00		E
	3/0		2.25	2.80	3.35		E
	4/0		2.50	3.10	3.75		E
	250 kcmil		2.75	3.40	4.10		E
	350 kcmil		3.00	3.75	4.50		E
	500 kcmil		3.50	4.35	5.25		E
	750 kcmil		4.00	5.00	6.00		E
	1000 kcmil		4.50	5.60	6.75		E
	4/C Armored Sheathed Cable Terminators with Sealing Bushings						
	Up to #3		1.25	1.55	1.85		E
	#2		1.50	1.85	2.25		E
	#1		1.75	2.15	2.60		E
	1/0		2.00	2.50	3.00		E
	2/0		2.25	2.80	3.35		E
	3/0		2.50	3.10	3.75		E
	4/0		2.75	3.40	4.10		E
	250 kcmil		3.00	3.75	4.50		E
	350 kcmil		3.50	4.35	5.25		E
	500 kcmil		4.00	5.00	6.00		E
	750 kcmil		4.50	5.60	6.75		E
	1000 kcmil		5.00	6.25	7.50		E
	2/C Jacketed Cable to Conduit Terminators With Sealing Bushings						
	Up to 1 1/2" Conduit		1.00	1.25	1.50		E
	2" Conduit		1.25	1.55	1.85		E
	2 1/2" Conduit		1.50	1.85	2.25		E
	3" Conduit		1.75	2.15	2.60		E
	3 1/2" Conduit		2.00	2.50	3.00		E
	4" Conduit		2.25	2.80	3.35		E
	5" Conduit		2.50	3.10	3.75		E
	6" Conduit		3.00	3.75	4.50		E

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Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	4/C Wire Armored Cable Terminators - Compound Filled						
	Up to #1		2.50	3.10	3.75		E
	1/0		2.75	3.40	4.10		E
	2/0		3.00	3.75	4.50		E
	3/0		3.25	4.05	4.90		E
	4/0		3.50	4.35	5.25		E
	250 kcmil		4.00	5.00	6.00		E
	350 kcmil		4.50	5.60	6.75		E
	500 kcmil		5.50	6.85	8.25		E
	750 kcmil		6.50	8.10	9.75		E
	2/C Sheathed Armored Cable Terminators - Compound Filled						
	Up to #1		4.00	5.00	6.00		E
	1/0		4.50	5.60	6.75		E
	2/0		5.00	6.25	7.50		E
	3/0		5.50	6.85	8.25		E
	4/0		6.00	7.50	9.00		E
	250 kcmil		6.50	8.10	9.75		E
	350 kcmil		7.00	8.75	10.50		E
	500 kcmil		7.50	9.35	11.25		E
	750 kcmil		8.00	10.00	12.00		E
	3/C Sheathed Armored Cable Terminators - Compound Filled						
	Up to #1		4.50	5.60	6.75		E
	1/0		5.00	6.25	7.50		E
	2/0		5.50	6.85	8.25		E
	3/0		6.00	7.50	9.00		E
	4/0		6.50	8.10	9.75		E
	250 kcmil		7.00	8.75	10.50		E
	350 kcmil		7.50	9.35	11.25		E
	500 kcmil		8.00	10.00	12.00		E
	750 kcmil		8.50	10.60	12.75		E
	4/C Sheathed Armored Cable Terminators - Compound Filled						
	Up to #1		5.00	6.25	7.50		E
	1/0		5.50	6.85	8.25		E
	2/0		6.00	7.50	9.00		E
	3/0		6.50	8.10	9.75		E
	4/0		7.00	8.75	10.50		E
	250 kcmil		7.50	9.35	11.25		E
	350 kcmil		8.00	10.00	12.00		E
	500 kcmil		8.50	10.60	12.75		E
	750 kcmil		9.00	11.25	13.50		E
	2/C Armored Cable Terminators - Weatherproof - Gland Type						
	Up to #1		2.00	2.50	3.00		E
	1/0		2.25	2.80	3.35		E
	2/0		2.50	3.10	3.75		E
	3/0		2.75	3.40	4.10		E
	4/0		3.00	3.75	4.50		E
	250 kcmil		3.50	4.35	5.25		E
	350 kcmil		4.00	5.00	6.00		E
	500 kcmil		4.50	5.60	6.75		E
	750 kcmil		5.00	6.25	7.50		E
	3/C Armored Cable Terminators - Weatherproof - Gland Type						
	Up to #1		2.25	2.80	3.35		E
	1/0		2.50	3.10	3.75		E
	2/0		2.75	3.40	4.10		E
	3/0		3.00	3.75	4.50		E
	4/0		3.25	4.05	4.90		E
	250 kcmil		3.75	4.65	5.60		E
	350 kcmil		4.25	5.30	6.35		E
	500 kcmil		4.75	5.90	7.10		E
	750 kcmil		5.25	6.55	7.85		E
	4/C Armored Cable Terminators - Weatherproof - Gland Type						
	Up to #1		2.50	3.10	3.75		E
	1/0		2.75	3.40	4.10		E
	2/0		3.00	3.75	4.50		E
	3/0		3.25	4.05	4.90		E
	4/0		3.50	4.35	5.25		E
	250 kcmil		4.00	5.00	6.00		E
	350 kcmil		4.50	5.60	6.75		E
	500 kcmil		5.00	6.25	7.50		E
	750 kcmil		5.50	6.85	8.25		E

Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	2/C Armored Cable to Conduit Terminators - Compound Filled						
	Up to #1		5.00	6.25	7.50		E
	1/0		5.50	6.85	8.25		E
	2/0		6.00	7.50	9.00		E
	3/0		6.50	8.10	9.75		E
	4/0		7.00	8.75	10.50		E
	250 kcmil		7.50	9.35	11.25		E
	350 kcmil		8.00	10.00	12.00		E
	500 kcmil		8.50	10.60	12.75		E
	750 kcmil		9.00	11.25	13.50		E
	3/C Armored Cable to Conduit Terminators - Compound Filled						
	Up to #1		5.50	6.85	8.25		E
	1/0		6.00	7.50	9.00		E
	2/0		6.50	8.10	9.75		E
	3/0		7.00	8.75	10.50		E
	4/0		7.50	9.35	11.25		E
	250 kcmil		8.00	10.00	12.00		E
	350 kcmil		8.50	10.60	12.75		E
	500 kcmil		9.00	11.25	13.50		E
	750 kcmil		9.50	11.85	14.25		E
	4/C Armored Cable to Conduit Terminators - Compound Filled						
	Up to #1		6.00	7.50	9.00		E
	1/0		6.50	8.10	9.75		E
	2/0		7.00	8.75	10.50		E
	3/0		7.50	9.35	11.25		E
	4/0		8.00	10.00	12.00		E
	250 kcmil		8.50	10.60	12.75		E
	350 kcmil		9.00	11.25	13.50		E
	500 kcmil		9.50	11.85	14.25		E
	750 kcmil		10.00	12.50	15.00		E
	5 KV Porcelain Terminators						
	Up to #2		3.00	3.75	4.50		E
	#1		3.20	4.00	4.80		E
	1/0		3.40	4.25	5.10		E
	2/0		3.60	4.50	5.40		E
	3/0		3.80	4.75	5.70		E
	4/0		4.00	5.00	6.00		E
	250 kcmil		4.30	5.35	6.45		E
	350 kcmil		4.60	5.75	6.90		E
	500 kcmil		5.00	6.25	7.50		E
	750 kcmil		5.50	6.85	8.25		E
	1000 kcmil		6.00	7.50	9.00		E
	15 KV Porcelain Terminators						
	Up to #2		4.00	5.00	6.00		E
	#1		4.25	5.30	6.35		E
	1/0		4.50	5.60	6.75		E
	2/0		4.80	6.00	7.20		E
	3/0		5.20	6.50	7.80		E
	4/0		5.60	7.00	8.40		E
	250 kcmil		6.00	7.50	9.00		E
	350 kcmil		6.50	8.10	9.75		E
	500 kcmil		7.00	8.75	10.50		E
	750 kcmil		7.50	9.35	11.25		E
	1000 kcmil		8.00	10.00	12.00		E
	25 KV Porcelain Terminators						
	Up to #2		5.00	6.25	7.50		E
	#1		5.30	6.60	7.90		E
	1/0		5.60	7.00	8.40		E
	2/0		6.00	7.50	9.00		E
	3/0		6.50	8.10	9.75		E
	4/0		7.00	8.75	10.50		E
	250 kcmil		7.50	9.35	11.25		E
	350 kcmil		8.00	10.00	12.00		E
	500 kcmil		8.50	10.60	12.75		E
	750 kcmil		9.25	11.60	13.90		E
	1000 kcmil		10.00	12.50	15.00		E
	1/C Hand Wrapped Stress Relief Cones 5KV						
	Up to 1/0		2.00	2.50	3.00		E
	2/0		2.25	2.80	3.35		E
	3/0		2.50	3.10	3.75		E
	4/0		2.75	3.40	4.10		E
	250 kcmil		3.00	3.75	4.50		E
	350 kcmil		3.25	4.05	4.85		E
	500 kcmil		3.40	4.35	5.25		E
	750 kcmil		3.75	4.65	5.60		E
	1000 kcmil		4.00	5.00	6.00		E

Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

3

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	1/C Hand Wrapped Stress Relief Cones 15KV						
	Up to 1/0		2.50	3.10	3.75		E
	2/0		2.75	3.40	4.10		E
	3/0		3.00	3.75	4.50		E
	4/0		3.25	4.05	4.85		E
	250 kcmil		3.50	4.35	5.25		E
	350 kcmil		3.75	4.65	5.60		E
	500 kcmil		4.00	5.00	6.00		E
	750 kcmil		4.50	5.60	6.75		E
	1000 kcmil		5.00	6.25	7.50		E
	1/C Hand Wrapped Stress Relief Cones 25KV						
	Up to 1/0		3.00	3.75	4.50		E
	2/0		3.25	4.05	4.85		E
	3/0		3.50	4.35	5.25		E
	4/0		3.75	4.65	5.60		E
	250 kcmil		4.00	5.00	6.00		E
	350 kcmil		4.50	5.60	6.75		E
	500 kcmil		5.00	6.25	7.50		E
	750 kcmil		5.50	6.85	8.25		E
	1000 kcmil		6.00	7.50	9.00		E
	3/C Hand Wrapped Stress Relief Cones 5 KV						
	Up to 1/0		4.00	5.00	6.00		E
	2/0		4.50	5.60	6.75		E
	3/0		5.00	6.25	7.50		E
	4/0		5.50	6.85	8.25		E
	250 kcmil		6.00	7.50	9.00		E
	350 kcmil		6.50	8.10	9.75		E
	500 kcmil		7.00	8.75	10.50		E
	750 kcmil		7.50	9.35	11.25		E
	1000 kcmil		8.00	10.00	12.00		E
	3/C Hand Wrapped Stress Relief Cones 15KV						
	Up to 1/0		5.00	6.25	7.50		E
	2/0		5.50	6.85	8.25		E
	3/0		6.00	7.50	9.00		E
	4/0		6.50	8.10	9.75		E
	250 kcmil		7.00	8.75	10.50		E
	350 kcmil		7.50	9.35	11.25		E
	500 kcmil		8.00	10.00	12.00		E
	750 kcmil		9.00	11.25	13.50		E
	1000 kcmil		10.00	12.50	15.00		E
	3/C Hand Wrapped Stress Relief Cones 25 KV						
	Up to 1/0		6.00	7.50	9.00		E
	2/0		6.50	8.10	9.75		E
	3/0		7.00	8.75	10.50		E
	4/0		7.50	9.35	11.25		E
	250 kcmil		8.00	10.00	12.00		E
	350 kcmil		9.00	11.25	13.50		E
	500 kcmil		10.00	12.50	15.00		E
	750 kcmil		11.00	13.75	16.50		E
	1000 kcmil		12.00	15.00	18.00		E
	Heat Shrink Cable Termination with 5 KV Stress Cone and Compression Lug						
	Up to #2		2.50	3.10	3.75		E
	#1		2.75	3.40	4.10		E
	1/0		3.00	3.75	4.50		E
	2/0		3.25	4.05	4.85		E
	3/0		3.50	4.35	5.25		E
	4/0		3.75	4.65	5.60		E
	250 kcmil		4.00	5.00	6.00		E
	350 kcmil		4.50	5.60	6.75		E
	500 kcmil		5.00	6.25	7.50		E
	750 kcmil		5.50	6.85	8.25		E
	1000 kcmil		6.00	7.50	9.00		E
	Heat Shrink Cable Termination with 15KV Stress Cone and Compression Lug						
	Up to #2		3.00	3.75	4.50		E
	#1		3.25	4.05	4.85		E
	1/0		3.50	4.35	5.25		E
	2/0		3.50	4.65	5.60		E
	3/0		4.00	5.00	6.00		E
	4/0		4.50	5.60	6.75		E
	250 kcmil		5.00	6.25	7.50		E
	350 kcmil		5.50	6.85	7.50		E
	500 kcmil		6.00	7.50	9.00		E
	750 kcmil		6.50	8.10	9.75		E
	1000 kcmil		7.00	8.75	10.50		E

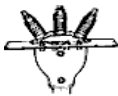
Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Heat Shrink Cable Termination with 25 KV Stress Cone and Compression Lug						
	Up to #2		3.50	4.35	5.25		E
	#1		3.75	4.65	5.60		E
	1/0		4.00	5.00	6.00		E
	2/0		4.25	5.30	6.35		E
	3/0		4.50	5.60	6.75		E
	4/0		5.00	6.25	7.50		E
	250 kcmil		5.50	6.85	8.25		E
	350 kcmil		6.00	7.50	9.00		E
	500 kcmil		6.50	8.10	9.75		E
	750 kcmil		7.00	8.75	10.50		E
	1000 kcmil		8.00	10.00	12.00		E
	Cold Shrink Cable Termination with 5 KV Stress Cone and Compression Lug						
	Up to #2		1.80	2.25	2.70		E
	#1		2.00	2.50	3.00		E
	1/0		2.25	2.81	3.38		E
	2/0		2.40	3.00	3.60		E
	3/0		2.60	3.25	3.90		E
	4/0		2.80	3.50	4.20		E
	250 kcmil		3.00	3.75	4.50		E
	350 kcmil		3.40	4.25	5.10		E
	500 kcmil		3.75	4.69	5.63		E
	750 kcmil		4.10	5.13	6.15		E
	1000 kcmil		4.50	5.63	6.75		E
	Cold Shrink Cable Termination with 15 KV Stress Cone and Compression Lug						
	Up to #2		2.25	2.81	3.38		E
	#1		2.40	3.00	3.60		E
	1/0		2.60	3.25	3.90		E
	2/0		2.60	3.25	3.90		E
	3/0		3.00	3.75	4.50		E
	4/0		3.40	4.25	5.10		E
	250 kcmil		3.75	4.69	5.63		E
	350 kcmil		4.10	5.13	6.15		E
	500 kcmil		4.50	5.63	6.75		E
	750 kcmil		4.80	6.00	7.20		E
	1000 kcmil		5.25	6.56	7.88		E
	Cold Shrink Cable Termination with 25 KV Stress Cone and Compression Lug						
	Up to #2		2.60	3.25	3.90		E
	#1		2.80	3.50	4.20		E
	1/0		3.00	3.75	4.50		E
	2/0		3.20	4.00	4.80		E
	3/0		3.40	4.25	5.10		E
	4/0		3.75	4.69	5.63		E
	250 kcmil		4.10	5.13	6.15		E
	350 kcmil		4.50	5.63	6.75		E
	500 kcmil		4.80	6.00	7.20		E
	750 kcmil		5.25	6.56	7.88		E
	1000 kcmil		6.00	7.50	9.00		E
	5KV Single Conductor Potheads						
	Up to #2		5.00	6.25	7.50		E
	#1		5.30	6.60	7.95		E
	1/0		5.60	7.00	8.40		E
	2/0		6.00	7.50	9.00		E
	3/0		6.50	8.10	9.75		E
	4/0		7.00	8.75	10.50		E
	250 kcmil		7.50	9.35	11.25		E
	350 kcmil		8.00	10.00	12.00		E
	500 kcmil		8.50	10.60	12.75		E
	750 kcmil		9.00	11.25	13.50		E
	1000 kcmil		10.00	12.50	15.00		E
	15 KV Single Conductor Potheads						
	Up to #2		6.00	7.50	9.00		E
	#1		6.30	7.85	9.50		E
	1/0		6.60	8.25	10.00		E
	2/0		7.00	8.75	10.50		E
	3/0		7.50	9.35	11.25		E
	4/0		8.00	10.00	12.00		E
	250 kcmil		8.50	10.60	12.75		E
	350 kcmil		9.00	11.25	13.50		E
	500 kcmil		10.00	12.50	15.00		E
	750 kcmil		11.00	13.25	16.50		E
	1000 kcmil		12.00	15.00	18.00		E

Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	25 KV Single Conductor Potheads						
	Up to #2		8.00	10.00	12.00		E
	#1		8.50	10.60	12.75		E
	1/0		9.00	11.25	13.50		E
	2/0		9.50	11.85	14.25		E
	3/0		10.00	12.50	15.00		E
	4/0		11.00	13.75	16.50		E
	250 kcmil		12.00	15.00	18.00		E
	350 kcmil		13.00	16.25	19.50		E
	500 kcmil		14.00	17.50	21.00		E
	750 kcmil		15.00	18.75	22.50		E
	1000 kcmil		16.00	20.00	24.00		E
	5KV Two Conductor Potheads						
	Up to #2		8.00	10.00	12.00		E
	#1		8.50	10.60	12.75		E
	1/0		9.00	11.25	13.50		E
	2/0		9.50	11.85	14.25		E
	3/0		10.00	12.50	15.00		E
	4/0		11.00	13.75	16.50		E
	250 kcmil		12.00	15.00	18.00		E
	350 kcmil		13.00	16.25	19.50		E
	500 kcmil		14.00	17.50	21.00		E
	750 kcmil		15.00	18.75	22.50		E
	1000 kcmil		16.00	20.00	24.00		E
	15KV Two Conductor Potheads						
	Up to #2		10.00	12.50	15.00		E
	#1		11.00	13.75	16.50		E
	1/0		12.00	15.00	18.00		E
	2/0		13.00	16.25	19.50		E
	3/0		14.00	17.50	21.00		E
	4/0		15.00	18.75	22.50		E
	250 kcmil		16.00	20.00	24.00		E
	350 kcmil		17.00	21.25	25.50		E
	500 kcmil		18.00	22.50	27.00		E
	750 kcmil		19.00	23.75	28.50		E
	1000 kcmil		20.00	25.00	30.00		E
	25KV Two Conductor Potheads						
	Up to #2		12.00	15.00	18.00		E
	#1		13.00	16.25	19.50		E
	1/0		14.00	17.50	21.00		E
	2/0		15.00	18.75	22.50		E
	3/0		16.00	20.00	24.00		E
	4/0		17.00	21.25	25.50		E
	250 kcmil		18.00	22.50	27.00		E
	350 kcmil		19.00	23.75	28.50		E
	500 kcmil		20.00	25.00	30.00		E
	750 kcmil		22.00	27.50	33.00		E
	1000 kcmil		24.00	30.00	36.00		E
	5KV Three Conductor Potheads						
	Up to #2		10.00	12.50	15.00		E
	#1		11.00	13.75	16.50		E
	1/0		12.00	15.00	18.00		E
	2/0		13.00	16.25	19.50		E
	3/0		14.00	17.50	21.00		E
	4/0		15.00	18.75	22.50		E
	250 kcmil		16.00	20.00	24.00		E
	350 kcmil		17.00	21.25	25.50		E
	500 kcmil		18.00	22.50	27.00		E
	750 kcmil		19.00	23.75	28.50		E
	1000 kcmil		20.00	25.00	30.00		E
	15KV Three Conductor Potheads						
	Up to #2		12.00	15.00	18.00		E
	#1		13.00	16.25	19.50		E
	1/0		14.00	17.50	21.00		E
	2/0		15.00	18.75	22.50		E
	3/0		16.00	20.00	24.00		E
	4/0		17.00	21.25	25.50		E
	250 kcmil		18.00	22.50	27.00		E
	350 kcmil		19.00	23.75	28.50		E
	500 kcmil		20.00	25.00	30.00		E
	750 kcmil		22.00	27.50	33.00		E
	1000 kcmil		24.00	30.00	36.00		E

Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	25KV Three Conductor Pothead						
	Up to #2		16.00	20.00	24.00		E
	#1		17.00	21.25	25.50		E
	1/0		18.00	22.50	26.00		E
	2/0		19.00	23.75	28.50		E
	3/0		20.00	25.00	30.00		E
	4/0		22.00	27.50	33.00		E
	250 kcmil		24.00	30.00	36.00		E
	350 kcmil		26.00	32.50	39.00		E
	500 kcmil		28.00	35.00	42.00		E
	750 kcmil		30.00	37.50	45.00		E
	1000 kcmil		32.00	40.00	48.00		E
	15KV Loadbreak Cable Elbows						
	Up to #2		3.00	3.75	4.50		E
	#1		3.20	4.00	4.80		E
	1/0		3.40	4.25	5.10		E
	2/0		3.60	4.50	5.60		E
	3/0		3.75	4.70	5.60		E
	4/0		4.00	5.00	6.00		E
	250 kcmil		4.20	5.25	6.30		E
	350 kcmil		4.50	5.60	6.75		E
	500 kcmil		4.90	6.10	7.35		E
	750 kcmil		5.25	6.60	7.90		E
	1000 kcmil		6.00	7.50	9.00		E
	Ground Strap for Load Break Included		0.00	0.00	0.00		
	25KV Loadbreak Cable Elbows						
	Up to #2		3.75	4.70	5.60		E
	#1		4.00	5.00	6.00		E
	1/0		4.20	5.25	6.30		E
	2/0		4.30	5.40	6.45		E
	3/0		4.50	5.60	6.75		E
	4/0		4.90	6.10	7.35		E
	250 kcmil		5.25	6.60	7.90		E
	350 kcmil		5.60	7.00	8.40		E
	500 kcmil		6.00	7.50	9.00		E
	750 kcmil		6.75	8.40	10.00		E
	1000 kcmil		7.50	9.40	11.25		E
	Ground Strap for Load Break Included		0.00	0.00	0.00		
	600 Volt Tape Wrapped Cable Splices 1/C						
	Up to #6		2.10	2.60	3.15		E
	#4		2.10	2.60	3.15		E
	#3		2.10	2.60	3.15		E
	#2		2.10	2.60	3.15		E
	#1		2.40	3.00	3.60		E
	1/0		2.50	3.10	3.75		E
	2/0		2.80	3.50	4.20		E
	3/0		3.00	3.75	4.50		E
	4/0		3.00	3.75	4.50		E
	250 kcmil		3.50	4.40	5.25		E
	350 kcmil		3.60	4.50	5.40		E
	500 kcmil		4.00	5.00	6.00		E
	750 kcmil		4.50	5.60	6.75		E
	1000 kcmil		5.00	6.25	7.50		E
	600 Volt Tape Wrapped Cable Splices 2/C						
	Up to #6		4.00	5.00	6.00		E
	#4		4.10	5.10	6.15		E
	#3		4.20	5.25	6.30		E
	#2		4.35	5.40	6.50		E
	#1		4.50	5.60	6.75		E
	1/0		4.75	5.90	7.10		E
	2/0		5.00	6.25	7.50		E
	3/0		5.30	6.60	7.90		E
	4/0		5.60	7.00	8.40		E
	250 kcmil		6.00	7.50	9.00		E
	350 kcmil		6.50	8.10	9.75		E
	500 kcmil		7.00	8.75	10.50		E
	750 kcmil		7.50	9.35	11.25		E
	1000 kcmil		8.00	10.00	12.00		E
	600 Volt Tape Wrapped Cable Splices 3/C						
	Up to #6		5.00	6.25	7.50		E
	#4		5.10	6.35	7.65		E
	#3		5.20	6.50	7.80		E
	#2		5.40	6.75	8.10		E
	#1		5.60	7.00	8.40		E
	1/0		5.90	7.35	8.85		E
	2/0		6.20	7.75	9.30		E
	3/0		6.50	8.30	9.75		E
	4/0		7.00	8.75	10.50		E
	250 kcmil		7.50	9.35	11.25		E
	350 kcmil		8.00	10.00	12.00		E
	500 kcmil		8.50	10.60	12.75		E
	750 kcmil		9.00	11.25	13.50		E
	1000 kcmil		10.00	12.50	15.00		E

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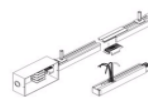
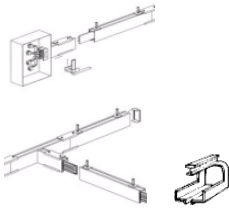
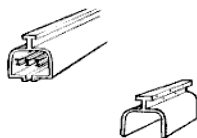
Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	3/C Cable Splices-25KV Cold Shrink						
	Up to #6		12.00	15.00	18.00		E
	#4		12.50	15.60	18.75		E
	#3		13.00	16.25	19.50		E
	#2		13.50	16.85	20.25		E
	#1		14.00	17.50	21.00		E
	1/0		14.50	18.10	21.75		E
	2/0		15.00	18.75	22.50		E
	3/0		16.00	20.00	24.00		E
	4/0		17.00	21.25	25.50		E
	250 kcmil		18.00	22.50	27.00		E
	350 kcmil		19.00	23.75	28.50		E
	500 kcmil		20.00	25.00	30.00		E
	750 kcmil		22.00	27.50	33.00		E
	1000 kcmil		24.00	30.00	36.00		E
	1/C Heat Shrink & Premolded Shielded Cable Splices - 5KV						
	Up to #6		5.00	6.25	7.50		E
	#4		5.10	6.40	7.70		E
	#3		5.20	6.50	7.80		E
	#2		5.35	6.70	8.00		E
	#1		5.50	6.90	8.25		E
	1/0		6.00	7.50	9.00		E
	2/0		6.25	7.80	9.40		E
	3/0		6.60	8.25	9.90		E
	4/0		7.00	8.75	10.50		E
	250 kcmil		7.50	9.40	11.25		E
	350 kcmil		8.10	10.00	12.15		E
	500 kcmil		8.70	10.90	13.00		E
	750 kcmil		9.30	11.60	14.00		E
	1000 kcmil		10.00	12.50	15.00		E
	1/C Heat Shrink & Premolded Shielded Cable Splices - 15KV						
	Up to #6		6.25	7.80	9.40		E
	#4		6.40	8.00	9.60		E
	#3		6.50	8.20	9.75		E
	#2		6.75	8.40	10.00		E
	#1		7.00	8.75	10.50		E
	1/0		7.40	9.25	11.00		E
	2/0		7.75	9.70	11.60		E
	3/0		8.10	10.00	12.00		E
	4/0		8.75	10.90	13.00		E
	250 kcmil		9.40	11.75	14.00		E
	350 kcmil		10.00	12.50	15.00		E
	500 kcmil		10.60	13.25	15.90		E
	750 kcmil		11.25	14.00	16.90		E
	1000 kcmil		12.50	15.60	18.80		E
	1/C Heat Shrink & Premolded Shielded Cable Splices - 25KV						
	Up to #6		7.50	9.40	11.25		E
	#4		7.60	9.50	11.40		E
	#3		7.75	9.70	11.60		E
	#2		7.90	9.90	11.85		E
	#1		8.12	10.00	12.20		E
	1/0		8.75	10.90	13.00		E
	2/0		9.37	11.70	14.00		E
	3/0		10.00	12.50	15.00		E
	4/0		10.60	13.25	15.90		E
	250 kcmil		11.25	14.00	16.90		E
	350 kcmil		11.90	14.90	17.90		E
	500 kcmil		12.50	15.60	18.75		E
	750 kcmil		13.75	17.00	20.60		E
	1000 kcmil		15.00	18.75	22.50		E
	3/C Heat Shrink Cable Splices - 5KV						
	Up to #6		10.00	12.50	15.00		E
	#4		10.30	12.90	15.45		E
	#3		10.50	13.00	15.75		E
	#2		10.90	13.60	16.35		E
	#1		11.25	14.00	16.90		E
	1/0		11.70	14.60	17.60		E
	2/0		12.00	15.00	18.00		E
	3/0		12.50	15.60	18.75		E
	4/0		12.75	15.90	19.00		E
	250 kcmil		15.00	18.75	22.50		E
	350 kcmil		16.25	20.30	24.00		E
	500 kcmil		17.50	21.90	26.00		E
	750 kcmil		18.75	23.40	28.00		E
	1000 kcmil		20.00	25.00	30.00		E

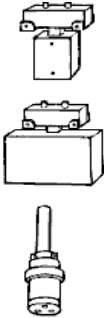
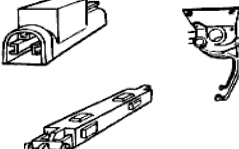
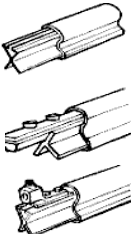
Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	3/C Heat Shrink Cable Splices - 15KV						
	Up to #6	X	12.50	15.60	18.75		E
	#4		12.80	16.00	19.20		E
	#3		13.10	16.40	19.70		E
	#2		13.40	16.75	20.00		E
	#1		13.75	17.00	20.60		E
	1/0		14.40	18.00	21.60		E
	2/0		15.00	18.75	22.50		E
	3/0		16.25	20.00	24.40		E
	4/0		17.50	21.90	26.25		E
	250 kcmil		18.75	23.40	28.00		E
	350 kcmil		20.00	25.00	30.00		E
	500 kcmil		21.25	26.60	31.90		E
	750 kcmil		22.50	28.00	33.75		E
	1000 kcmil		25.00	31.25	37.50		E
	3/C Heat Shrink Cable Splices - 25KV						
	Up to #6		15.00	18.75	22.50		E
	#4		15.60	19.50	23.40		E
	#3		16.25	20.30	24.40		E
	#2		16.90	21.00	25.40		E
	#1		17.50	21.90	26.25		E
	1/0		18.10	22.60	27.00		E
	2/0		18.75	23.40	28.00		E
	3/0		20.00	25.00	30.00		E
	4/0		21.25	26.60	31.90		E
	250 kcmil		22.50	28.00	33.75		E
	350 kcmil		23.75	29.70	35.60		E
	500 kcmil		25.00	31.25	37.50		E
	750 kcmil		27.50	34.40	41.25		E
	1000 kcmil		30.00	37.50	45.00		E
	3/C Interlocked Armored Cable Splices-5KV						
	Up to #6		10.00	12.50	15.00		E
	#4		10.25	12.80	15.35		E
	#3		10.50	13.10	15.75		E
	#2		10.75	13.40	16.10		E
	#1		11.00	13.75	16.50		E
	1/0		11.50	14.35	17.25		E
	2/0		12.00	15.00	18.00		E
	3/0		13.00	16.25	19.50		E
	4/0		14.00	17.50	21.00		E
	250 kcmil		15.00	18.75	22.50		E
	350 kcmil		16.00	20.00	24.00		E
	500 kcmil		17.00	21.25	25.50		E
	750 kcmil		18.00	22.50	27.00		E
	1000 kcmil		20.00	25.00	30.00		E
	3/C Interlocked Armored Cable Splices 15KV						
	Up to #6		12.00	15.00	18.00		E
	#4		12.50	15.60	18.75		E
	#3		13.00	16.25	20.25		E
	#2		13.50	16.85	20.25		E
	#1		14.00	17.50	21.00		E
	1/0		14.50	18.10	21.75		E
	2/0		15.00	18.75	22.50		E
	3/0		16.00	20.00	24.00		E
	4/0		17.00	21.25	25.50		E
	250 kcmil		18.00	22.50	27.00		E
	350 kcmil		19.00	23.75	28.50		E
	500 kcmil		20.00	25.00	30.00		E
	750 kcmil		22.00	27.50	33.00		E
	1000 kcmil		24.00	30.00	36.00		E
	3/C Interlocked Armored Cable Splices 25KV						
	Up to #6		14.00	17.50	21.00		E
	#4		14.50	18.10	21.75		E
	#3		15.00	18.75	22.50		E
	#2		15.50	19.35	23.25		E
	#1		16.00	20.00	24.00		E
	1/0		16.50	20.60	24.75		E
	2/0		17.00	21.25	25.50		E
	3/0		18.00	22.50	27.00		E
	4/0		19.00	23.75	28.50		E
	250 kcmil		20.00	25.00	30.00		E
	350 kcmil		22.00	27.50	33.00		E
	500 kcmil		24.00	30.00	36.00		E
	750 kcmil		26.00	32.50	39.00		E
	1000 kcmil		28.00	35.00	42.00		E

Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	3/C I.A.C. Splices-5KV-Compound Filled						
	Up to #6		11.00	13.75	16.50		E
	#4		11.50	14.35	17.25		E
	#3		12.00	15.00	18.00		E
	#2		12.50	15.60	18.75		E
	#1		13.00	16.25	19.50		E
	1/0		13.50	16.85	20.25		E
	2/0		14.00	17.50	21.00		E
	3/0		15.00	18.75	22.50		E
	4/0		16.00	20.00	24.00		E
	250 kcmil		17.00	21.25	25.50		E
	350 kcmil		18.00	22.50	27.00		E
	500 kcmil		19.00	23.75	28.50		E
	750 kcmil		20.00	25.00	30.00		E
	1000 kcmil		22.00	27.50	33.00		E
	3/C I.A.C. Splices-15KV-Compound Filled						
	Up to #6		13.00	16.25	19.50		E
	#4		13.50	16.85	20.25		E
	#3		14.00	17.50	21.00		E
	#2		14.50	18.10	21.75		E
	#1		15.00	18.75	22.50		E
	1/0		15.50	19.35	23.25		E
	2/0		16.00	20.00	24.00		E
	3/0		17.00	21.25	25.50		E
	4/0		18.00	22.50	27.00		E
	250 kcmil		19.00	23.75	28.00		E
	350 kcmil		20.00	25.00	30.00		E
	500 kcmil		22.00	27.50	33.00		E
	750 kcmil		24.00	30.00	36.00		E
	1000 kcmil		26.00	32.50	39.00		E
	Fire Proof Tape						
	1 1/2" X 20' Tape		0.50	0.63	0.75		E
	3" X 20' Tape		0.50	0.63	0.75		E
	2 Pole Ltg & Motor Busway up to 240 Volt						
	30 Amp Busway		8.00	10.00	12.00		C
	60 Amp Busway		9.00	11.25	13.50		C
	100 Amp Busway		10.00	12.50	15.00		C
	225 Amp Busway		12.00	15.00	18.00		C
	30 Amp 90 Degree Elbow		0.40	0.50	0.60		E
	60 Amp 90 Degree Elbow		0.45	0.56	0.68		E
	100 Amp 90 Degree Elbow		0.55	0.69	0.83		E
	225 Amp 90 Degree Elbow		0.65	0.81	0.98		E
	30 Amp End Feed Boxes		0.40	0.50	0.60		E
	60 Amp End Feed Boxes		0.50	0.63	0.75		E
	100 Amp End Feed Boxes		0.65	0.81	0.98		E
	225 Amp End Feed Boxes		0.75	0.94	1.13		E
	30 Amp Center Feed Boxes		0.50	0.63	0.75		E
	60 Amp Center Feed Boxes		0.60	0.75	0.90		E
	100 Amp Center Feed Boxes		0.75	0.94	1.13		E
	225 Amp Center Feed Boxes		0.85	1.06	1.28		E
	Plugin Device to 30 Amp		0.25	0.31	0.38		E
	Plugin Device to 100 Amp		0.40	0.50	0.60		E
	Plugin Device to 225 Amp		0.50	0.63	0.75		E
	2 Pole End Cap		0.05	0.06	0.08		E
	3 Pole Ltg & Motor Busway up to 480 Volt						
	30 Amp Busway		8.00	10.00	12.00		C
	60 Amp Busway		9.00	11.25	13.50		C
	100 Amp Busway		10.00	12.50	15.00		C
	225 Amp Busway		12.00	15.00	18.00		C
	30 Amp 90 Degree Elbow		0.40	0.50	0.60		E
	60 Amp 90 Degree Elbow		0.45	0.56	0.68		E
	100 Amp 90 Degree Elbow		0.55	0.69	0.83		E
	225 Amp 90 Degree Elbow		0.65	0.81	0.98		E
	30 Amp End Feed Boxes		0.40	0.50	0.60		E
	60 Amp End Feed Boxes		0.50	0.63	0.75		E
	100 Amp End Feed Boxes		0.65	0.81	0.98		E
	225 Amp End Feed Boxes		0.75	0.94	1.13		E
	30 Amp Center Feed Boxes		0.50	0.63	0.75		E
	60 Amp Center Feed Boxes		0.60	0.75	0.90		E
	100 Amp Center Feed Boxes		0.75	0.94	1.13		E
	225 Amp Center Feed Boxes		0.85	1.06	1.28		E
	Plugin Device to 30 Amp		0.25	0.31	0.38		E
	Plugin Device to 100 Amp		0.40	0.50	0.60		E
	Plugin Device to 225 Amp		0.50	0.63	0.75		E
	3 Pole End Cap		0.05	0.06	0.08		E
	Trolley Busway						
	2-Pole - 100 Ampere		8.00	10.00	12.00		C
	3-Pole - 100 Ampere		10.00	12.50	15.00		C
	4-Pole - 100 Ampere		12.00	15.00	18.00		C
	5-Pole - 100 Ampere		14.00	17.50	21.00		C
	10 Ft Section without Bus Bars		1.00	1.25	1.50		E
	Trolley Busway Couplings		0.50	0.60	0.75		E
	Trolley Busway End Caps		0.10	0.12	0.15		E

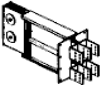
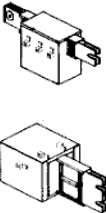
Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Trolley Busway Feed Boxes						
	#10 Wire		0.70	0.85	1.00		E
	#8 Wire		0.75	0.90	1.10		E
	#6 wire		0.80	1.00	1.20		E
	#4 Wire		0.90	1.10	1.35		E
	#2 Wire		1.00	1.25	1.50		E
	Trolley Busway Curve Sections						
	2-Pole		0.40	0.50	0.60		E
	3-Pole		0.45	0.55	0.70		E
	4-Pole		0.50	0.60	0.80		E
	5-Pole		0.60	0.75	0.90		E
	Trolley Busway Track Switches						
	2-Pole		0.50	0.60	0.75		E
	3-Pole		0.55	0.65	0.80		E
	4-Pole		0.60	0.75	0.90		E
	5-Pole		0.70	0.85	1.00		E
	2-Pole Trolleys						
	15 Amp		0.40	0.50	0.60		E
	20 Amp		0.45	0.55	0.65		E
	30 Amp		0.50	0.60	0.75		E
	40 Amp		0.60	0.75	0.85		E
	60 Amp		0.70	0.85	1.00		E
	100 Amp		0.90	1.10	1.35		E
	3-Pole Trolleys						
	15 Amp		0.45	0.55	0.65		E
	20 Amp		0.50	0.60	0.75		E
	30 Amp		0.60	0.70	0.85		E
	40 Amp		0.70	0.85	1.00		E
	60 Amp		0.80	1.00	1.20		E
	100 Amp		1.00	1.25	1.50		E
	4-Pole 15 amp Trolleys		0.50	0.60	0.75		E
	5-Pole 15 Amp Trolleys		0.60	0.70	0.85		E
	2-Pole 15 Amp Receptacles		0.20	0.25	0.30		E
	2-Pole 30 Amp Receptacles		0.30	0.35	0.45		E
	3-Pole 15 Amp Receptacles		0.25	0.30	0.35		E
	3-Pole 30 Amp Receptacles		0.35	0.40	0.50		E
	2-Pole Fusible Jacks		0.35	0.40	0.50		E
	3-pole Fusible Jacks		0.40	0.50	0.60		E
	6 Ft Cord & 20 Amp Wiring devices		0.50	0.60	0.75		E
	6 Ft Cord & 30 Amp Wiring Devices		0.60	0.75	0.90		E
	6 Ft Cord & 50 Amp Wiring Devices		0.75	0.90	1.10		E
	6 Ft Cord & 60 Amp Wiring Devices		0.90	1.10	1.35		E
	Three Pole Heavy Duty Trolley Busway						
	250 Amp Busway		14.00	17.50	21.00		C
	350 Amp Busway		16.00	20.00	24.00		C
	450 Amp Busway		18.00	22.00	27.00		C
	Busway Couplings		1.00	1.25	1.50		E
	Busway End Power Feeds						
	250 Amp		0.90	1.10	1.35		E
	350 Amp		1.00	1.25	1.50		E
	450 Amp		1.10	1.40	1.65		E
	Busway Center Power Feeds						
	250 Amp		1.40	1.75	2.10		E
	350 Amp		1.50	1.85	2.25		E
	450 Amp		1.60	2.00	2.40		E
	Busway End Caps		0.20	0.25	0.30		E
	Collector Arms		2.00	2.50	3.00		E
	Heavy Duty Trolleys		1.00	1.25	1.50		E
	Busway Hangers		0.10	0.12	0.15		E
	One Pole Crane Hoist & Monorail Busway						
	90 Amp Aluminum Busway		4.00	5.00	6.00		C
	350 Amp Aluminum Busway		5.00	6.20	7.50		C
	350 Amp Bronze or Copper Busway		6.00	7.50	9.00		C
	450 Amp Bronze or Copper Busway		7.00	8.70	10.50		C
	550 Amp Bronze or Copper Busway		8.00	10.00	12.00		C
	Busway Splice Joints		0.20	0.25	0.30		E
	90 Amp Feeder Lugs		0.60	0.75	0.90		E
	350 Amp Feeder Lugs		0.80	1.00	1.20		E
	450 Amp Feeder Lugs		0.90	1.10	1.35		E
	550 Amp Feeder Lugs		1.00	1.25	1.50		E

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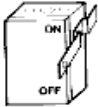
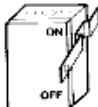
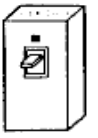
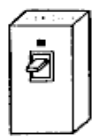
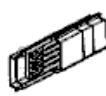
Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	3 Phase 3P Copper Bus Duct-End Closures						
	225 Amp		0.30	0.37	0.45		E
	400 Amp		0.35	0.43	0.52		E
	600 Amp		0.40	0.50	0.60		E
	800 Amp		0.45	0.56	0.67		E
	1000 Amp		0.50	0.62	0.75		E
	1200 Amp		0.55	0.68	0.82		E
	1350 Amp		0.60	0.75	0.90		E
	1600 Amp		0.65	0.81	0.97		E
	2000 Amp		0.70	0.87	1.05		E
	2500 Amp		0.80	1.00	1.20		E
	3000 Amp		0.90	1.12	1.35		E
	4000 Amp		1.00	1.25	1.50		E
	3 Phase 3P Copper Bus Duct-Unfused Reducers						
	225 Amp		3.00	3.70	4.50		E
	400 Amp		3.50	4.30	5.20		E
	600 Amp		4.00	5.00	6.00		E
	800 Amp		4.50	5.60	6.70		E
	1000 Amp		5.00	6.20	7.50		E
	1200 Amp		5.50	6.80	8.20		E
	1350 Amp		6.00	7.50	9.00		E
	1600 Amp		6.50	8.10	9.70		E
	2000 Amp		7.00	8.70	10.50		E
	2500 Amp		8.00	10.00	12.00		E
	3000 Amp		9.00	11.20	13.50		E
	4000 Amp		11.00	13.70	16.50		E
	3 Phase 3P Copper Bus Duct-Offset Elbows						
	225 Amp		4.00	5.00	6.00		E
	400 Amp		4.50	5.60	6.70		E
	600 Amp		5.00	6.20	7.50		E
	800 Amp		5.50	6.80	8.20		E
	1000 Amp		6.00	7.50	9.00		E
	1200 Amp		7.00	8.70	10.50		E
	1350 Amp		8.00	10.00	12.00		E
	1600 Amp		9.00	11.20	13.50		E
	2000 Amp		10.00	12.50	15.00		E
	2500 Amp		12.00	15.00	18.00		E
	3000 Amp		14.00	17.50	21.00		E
	4000 Amp		16.00	20.00	24.00		E
	3 Phase 3P Copper Bus Duct-Expansion Fittings						
	225 Amp		4.00	5.00	6.00		E
	400 Amp		4.50	5.60	6.70		E
	600 Amp		5.00	6.20	7.50		E
	800 Amp		5.50	6.80	8.20		E
	1000 Amp		6.00	7.50	9.00		E
	1200 Amp		7.00	8.70	10.50		E
	1350 Amp		8.00	10.00	12.00		E
	1600 Amp		9.00	11.20	13.50		E
	2000 Amp		10.00	12.50	15.00		E
	2500 Amp		12.00	15.00	18.00		E
	3000 Amp		14.00	17.50	21.00		E
	4000 Amp		16.00	20.00	24.00		E
	3 Phase 3P Copper Bus Duct-Panelboard Fittings						
	225 Amp		2.00	2.50	3.00		E
	400 Amp		2.20	2.70	3.30		E
	600 Amp		2.40	3.00	3.60		E
	800 Amp		2.70	3.30	4.00		E
	1000 Amp		3.00	3.70	4.50		E
	1200 Amp		3.50	4.40	5.20		E
	1600 Amp		4.50	5.60	6.70		E
	2000 Amp		5.00	6.20	7.50		E
	2500 Amp		6.00	7.50	9.00		E
	3000 Amp		7.00	8.70	10.50		E
	4000 Amp		8.00	10.00	12.00		E
	3 Phase 3P Copper Bus Duct-Cable Tap Boxes						
	225 Amp		5.00	6.20	7.50		E
	400 Amp		5.50	6.80	8.20		E
	600 Amp		6.00	7.50	9.00		E
	800 Amp		6.50	8.10	9.70		E
	1000 Amp		7.00	8.70	10.50		E
	1200 Amp		8.00	10.00	12.00		E
	1350 Amp		9.00	11.20	13.50		E
	1600 Amp		10.00	12.50	15.00		E
	2000 Amp		12.00	15.00	18.00		E
	2500 Amp		14.00	17.50	21.00		E
	3000 Amp		16.00	20.00	24.00		E
	4000 Amp		20.00	25.00	30.00		E

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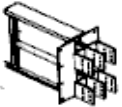
Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Bus Duct-3P3W Fusible Switches						
	30 Amp		1.60	2.00	2.40		E
	60 Amp		2.00	2.50	3.00		E
	100 Amp		3.00	3.70	4.50		E
	200 Amp		6.00	7.50	9.00		E
	400 Amp		10.00	12.50	15.00		E
	600 Amp		16.00	20.00	24.00		E
	800 Amp		23.00	28.00	34.00		E
	1000 Amp		28.00	35.00	42.00		E
	1200 Amp		34.00	42.00	50.00		E
	Bus Duct 3P4W Fusible Switches						
	30 Amp		1.80	2.20	2.70		E
	60 Amp		2.20	2.70	3.30		E
	100 Amp		3.40	4.20	5.10		E
	200 Amp		6.50	8.10	9.70		E
	400 Amp		11.00	13.70	16.50		E
	600 Amp		17.00	21.00	25.00		E
	800 Amp		24.00	30.00	36.00		E
	1000 Amp		30.00	37.00	45.00		E
	1200 Amp		36.00	45.00	54.00		E
	Bus Duct-2P2W Molded Case Circuit Breakers						
	Up to 30 Amp		1.55	1.85	2.25		E
	Up to 60 Amp		2.35	2.85	3.45		E
	Up to 100 Amp		4.50	4.85	5.85		E
	Up to 200 Amp		7.00	8.40	10.10		E
	Up to 400 Amp		12.50	15.00	18.00		E
	Up to 600 Amp		18.00	22.50	27.00		E
	Up to 800 Amp		23.00	28.70	34.00		E
	Up to 1200 Amp		30.00	36.00	43.20		E
	Up to 1600 Amp		35.00	42.00	50.40		E
	Up to 2000 Amp		45.00	54.00	64.00		E
	Bus Duct-2P3W Molded Case Circuit Breakers						
	Up to 30 Amp		1.50	1.85	2.25		E
	Up to 60 Amp		2.35	2.85	3.45		E
	Up to 100 Amp		4.05	4.85	5.85		E
	Up to 200 Amp		7.00	8.40	10.10		E
	Up to 400 Amp		12.50	15.00	18.00		E
	Up to 600 Amp		18.00	22.50	27.00		E
	Up to 800 Amp		23.00	28.70	34.00		E
	Up to 1200 Amp		30.00	36.00	43.70		E
	Up to 1600 Amp		35.00	42.00	50.40		E
	Up to 2000 Amp		45.00	54.00	64.00		E
	Bus Duct-3P3W Molded Case Circuit Breakers						
	Up to 30 Amp		1.55	1.85	2.25		E
	Up to 60 Amp		2.35	2.85	3.45		E
	Up to 100 Amp		4.05	4.85	5.85		E
	Up to 200 Amp		7.00	8.40	10.10		E
	Up to 400 Amp		12.50	15.00	18.00		E
	Up to 600 Amp		18.00	22.50	27.00		E
	Up to 800 Amp		23.00	28.70	34.00		E
	Up to 1200 Amp		30.00	36.00	43.20		E
	Up to 1600 Amp		35.00	42.00	50.40		E
	Up to 2000 Amp		45.00	54.00	64.00		E
	3 Phase 3P Copper Bus Duct-Feeder Type						
	600 Amp		45.00	56.00	67.00		C
	800 Amp		50.00	62.00	75.00		C
	1000 Amp		55.00	68.00	82.00		C
	1200 Amp		60.00	75.00	90.00		C
	1350 Amp		65.00	81.00	97.00		C
	1600 Amp		75.00	93.00	112.00		C
	2000 Amp		85.00	106.00	127.00		C
	2500 Amp		100.00	125.00	150.00		C
	3000 Amp		115.00	143.00	172.00		C
	4000 Amp		140.00	175.00	210.00		C
	5000 Amp		160.00	200.00	240.00		C
	3 Phase 3P Feeder Bus Duct-Elbows						
	600 Amp		4.50	5.60	6.70		E
	800 Amp		5.00	6.20	7.50		E
	1000 Amp		5.50	6.80	8.20		E
	1200 Amp		6.00	7.50	9.00		E
	1350 Amp		6.50	8.10	9.70		E
	1600 Amp		7.50	9.30	11.20		E
	2000 Amp		8.50	10.60	12.70		E
	2500 Amp		10.00	13.00	15.00		E
	3000 Amp		12.00	15.00	18.00		E
	4000 Amp		14.00	17.50	21.00		E
	5000 Amp		16.00	20.00	24.00		E

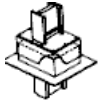
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Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	3 Phase 3P Feeder Bus Duct-Panelboard Fittings						
	600 Amp		2.40	3.00	3.60		E
	800 Amp		2.70	3.40	4.00		E
	1000 Amp		3.00	3.75	4.50		E
	1200 Amp		3.50	4.40	5.25		E
	1350 Amp		4.00	5.00	6.00		E
	1600 Amp		4.50	5.60	6.75		E
	2000 Amp		5.00	6.20	7.50		E
	2500 Amp		6.00	7.50	9.00		E
	3000 Amp		7.00	8.70	10.50		E
	4000 Amp		8.00	10.00	12.00		E
	5000 Amp		9.00	11.25	13.50		E
	3 Phase 3P Feeder Bus Duct-End Closures						
	600 Amp		0.40	0.50	0.60		E
	800 Amp		0.45	0.56	0.67		E
	1000 Amp		0.50	0.62	0.75		E
	1200 Amp		0.55	0.68	0.82		E
	1350 Amp		0.60	0.75	0.90		E
	1600 Amp		0.65	0.82	1.00		E
	2000 Amp		0.70	0.90	1.10		E
	3000 Amp		0.80	1.00	1.20		E
	4000 Amp		0.90	1.12	1.35		E
	5000 Amp		1.00	1.25	1.50		E
	3 Phase 3P Feeder Bus Duct-Cable Tap Boxes						
	600 Amp		6.00	7.50	9.00		E
	800 Amp		6.50	8.10	9.70		E
	1000 Amp		7.00	8.70	10.50		E
	1200 Amp		8.00	10.00	12.00		E
	1350 Amp		9.00	11.20	13.50		E
	1600 Amp		10.00	12.50	15.00		E
	2000 Amp		12.00	15.00	18.00		E
	2500 Amp		14.00	17.50	21.00		E
	3000 Amp		16.00	20.00	24.00		E
	4000 Amp		20.00	25.00	30.00		E
	5000 Amp		24.00	30.00	36.00		E
	3 Phase 3P Feeder Bus Duct-Transformer Fittings						
	600 Amp		5.00	6.20	7.50		E
	800 Amp		5.50	6.80	8.20		E
	1000 Amp		6.00	7.50	9.00		E
	1200 Amp		7.00	8.70	10.50		E
	1350 Amp		8.00	10.00	12.00		E
	1600 Amp		9.00	11.20	13.50		E
	2000 Amp		10.00	12.50	15.00		E
	2500 Amp		12.00	15.00	18.00		E
	3000 Amp		14.00	17.50	21.00		E
	4000 Amp		16.00	20.00	24.00		E
	5000 Amp		18.00	22.50	27.00		E
	Three Phase 3P Feeder Bus Duct - Service Heads						
	600 Amp		6.00	7.50	9.00		E
	800 Amp		7.00	8.70	10.50		E
	1000 Amp		8.00	10.00	12.00		E
	1200 Amp		9.00	11.20	13.50		E
	1350 Amp		10.00	12.50	15.00		E
	1600 Amp		12.00	15.00	18.00		E
	2000 Amp		14.00	17.50	21.00		E
	2500 Amp		16.00	20.00	24.00		E
	3000 Amp		18.00	22.50	27.00		E
	4000 Amp		20.00	25.00	30.00		E
	5000 Amp		24.00	30.00	36.00		E
	3 Phase 3P Bus Duct-Wall & Floor Flanges						
	600 Amp		2.00	2.50	3.00		E
	800 Amp		2.30	2.80	3.40		E
	1000 Amp		2.60	3.20	3.90		E
	1200 Amp		3.00	3.70	4.50		E
	1350 Amp		3.50	4.30	5.20		E
	1600 Amp		4.00	5.00	6.00		E
	2000 Amp		4.50	5.60	6.70		E
	2500 Amp		5.00	6.20	7.50		E
	3000 Amp		6.00	7.50	9.00		E
	4000 Amp		7.00	8.70	10.50		E
	5000 Amp		8.00	10.00	12.00		E

Section 3 - Wire, Cable, Lugs, Terminations, Busway & Bus Duct

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	3 Phase 3P Bus Duct-Fire & Weather Stops						
	600 Amp		3.00	3.70	4.50		E
	800 Amp		3.50	4.30	5.20		E
	1000 Amp		4.00	5.00	6.00		E
	1200 Amp		4.50	5.60	6.70		E
	1350 Amp		5.00	6.20	7.50		E
	1600 Amp		6.00	7.50	9.00		E
	2000 Amp		7.00	8.70	10.50		E
	2500 Amp		8.00	10.00	12.00		E
	3000 Amp		9.00	11.20	13.50		E
	4000 Amp		10.00	12.50	15.00		E
	5000 Amp		12.00	15.00	18.00		E
	<i>Does not include Fire Stop Material.</i>						
	Floor Springload Factory Hanger						
	600 Amp		3.00	3.70	4.50		E
	800 Amp		3.50	4.30	5.20		E
	1000 Amp		4.00	5.00	6.00		E
	1200 Amp		4.50	5.60	6.70		E
	1350 Amp		5.00	6.20	7.50		E
	1600 Amp		6.00	7.50	9.00		E
	2000 Amp		7.00	8.70	10.50		E
	2500 Amp		8.00	10.00	12.00		E
	3000 Amp		9.00	11.20	13.50		E
	4000 Amp		10.00	12.50	15.00		E
	5000 Amp		12.00	15.00	18.00		E
	Teck Cable 5Kv 3c						
	8		46.60	59.20	71.80		M
	6		50.40	64.00	77.60		M
	4		52.90	67.20	81.50		M
	3		55.40	70.40	85.40		M
	2		59.20	75.20	91.20		M
	1		63.00	80.00	97.00		M
	1/0		68.00	86.40	104.80		M
	2/0		73.10	92.80	112.50		M
	3/0		76.90	97.60	118.30		M
	4/0		81.90	104.00	126.10		M
	250		86.90	110.40	133.90		M
	300		93.20	118.40	143.60		M
	350		100.80	128.00	155.20		M
	500		113.40	144.00	174.60		M
	Teck Cable 1Kv 3C						
	12		30.20	38.40	46.60		M
	10		35.30	44.80	54.30		M
	8		40.30	51.20	62.10		M
	6		45.40	57.60	69.80		M
	4		49.10	62.40	75.70		M
	3		52.90	67.20	81.50		M
	2		55.40	70.40	85.40		M
	1		60.50	76.80	93.10		M
	1/0		65.50	83.20	100.90		M
	2/0		70.60	89.60	108.60		M
	3/0		74.30	94.40	114.50		M
	4/0		78.10	99.20	120.30		M
	250		84.40	107.20	130.00		M
	300		90.70	115.20	139.70		M
	Teck Cable 1Kv 4C						
	12		32.80	41.60	50.40		M
	10		37.80	48.00	58.20		M
	8		42.80	54.40	66.00		M
	6		47.90	60.80	73.70		M
	4		52.90	67.20	81.50		M
	3		58.00	73.60	89.20		M
	2		65.50	83.20	100.90		M
	1		70.60	89.60	108.60		M
	1/0		75.60	96.00	116.40		M
	2/0		80.60	102.40	124.20		M
	3/0		85.70	108.80	131.90		M
	4/0		90.70	115.20	139.70		M
	250		95.80	121.60	147.40		M
	300		102.10	129.60	157.10		M
	350		108.40	137.60	166.80		M
	500		118.40	150.40	182.40		M
	600		123.50	156.80	190.10		M
	750		131.00	166.40	201.80		M
	1000		163.80	208.00	252.20		M

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Teck Cable 1Kv 1C						
	6		31.50	40.00	48.50		M
	4		34.00	43.20	52.40		M
	3		36.50	46.40	56.30		M
	2		39.10	49.60	60.10		M
	1		41.60	52.80	64.00		M
	1/0		44.10	56.00	67.90		M
	2/0		47.90	60.80	73.70		M
	3/0		51.70	65.60	79.50		M
	4/0		55.40	70.40	85.40		M
	250		59.20	75.20	91.20		M
	300		63.00	80.00	97.00		M
	350		68.00	86.40	104.80		M
	500		73.10	92.80	112.50		M
	600		75.60	96.00	116.40		M
	750		81.90	104.00	126.10		M
	1000		90.70	115.20	139.70		M
	Teck Cable 600v mh/1000 FT						
	10 / 2		30.20	38.40	46.60		M
	10 / 3		32.80	41.60	50.40		M
	10 / 4		35.30	44.80	54.30		M
	10 / 5		37.80	48.00	58.20		M
	10 / 6		40.30	51.20	62.10		M
	10 / 7		42.80	54.40	66.00		M
	10 / 8		45.40	57.60	69.80		M
	10 / 9		46.60	59.20	71.80		M
	10 / 10		47.90	60.80	73.70		M
	10 / 11		49.10	62.40	75.70		M
	10 / 12		50.40	64.00	77.60		M
	10 / 13		51.70	65.60	79.50		M
	10 / 14		52.90	67.20	81.50		M
	10 / 15		54.20	68.80	83.40		M
	10 / 16		55.40	70.40	85.40		M
	10 / 17		56.70	72.00	87.30		M
	10 / 18		58.00	73.60	89.20		M
	10 / 19		59.20	75.20	91.20		M
	10 / 20		60.50	76.80	93.10		M
	10 / 25		63.00	80.00	97.00		M
10 / 30		68.00	86.40	104.80		M	
10 / 40		73.10	92.80	112.50		M	
10 / 50		75.60	96.00	116.40		M	
	Teck Cable 600v 12AWG						
	12 / 2		23.90	30.40	36.90		M
	12 / 3		25.20	32.00	38.80		M
	12 / 4		27.70	35.20	42.70		M
	12 / 5		31.50	40.00	48.50		M
	12 / 6		34.00	43.20	52.40		M
	12 / 7		36.50	46.40	56.30		M
	12 / 8		39.10	49.60	60.10		M
	12 / 9		41.60	52.80	64.00		M
	12 / 10		42.80	54.40	66.00		M
	12 / 11		45.40	57.60	69.80		M
	12 / 12		46.60	59.20	71.80		M
	12 / 13		47.90	60.80	73.70		M
	12 / 14		49.10	62.40	75.70		M
	12 / 15		50.40	64.00	77.60		M
	12 / 16		51.70	65.60	79.50		M
	12 / 17		52.90	67.20	81.50		M
	12 / 18		54.20	68.80	83.40		M
	12 / 19		55.40	70.40	85.40		M
	12 / 20		56.70	72.00	87.30		M
	12 / 25		58.00	73.60	89.20		M
	12 / 30		60.50	76.80	93.10		M
	12 / 40		63.00	80.00	97.00		M
	12 / 50		68.00	86.40	104.80		M
	12 / 60		70.60	89.60	108.60		M
	12 / 70		73.10	92.80	112.50		M
	12 / 80		75.60	96.00	116.40		M
	12 / 90		83.20	105.60	128.00		M
	12 / 100		85.70	108.80	131.90		M
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	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Teck Cable 18AWG						
	1pr 18		20.00	25.30	30.70		M
	1tr 18		21.10	26.80	32.40		M
	2pr 18		22.20	28.20	34.10		M
	3pr 18		26.60	33.80	41.00		M
	2tr 18		26.60	33.80	41.00		M
	4pr 18		29.90	38.00	46.10		M
	3tr 18		31.00	39.40	47.80		M
	5pr 18		33.30	42.20	51.20		M
	4tr 18		35.50	45.10	54.60		M
	6pr 18		35.50	45.10	54.60		M
	7pr 18		37.70	47.90	58.00		M
	5tr 18		38.80	49.30	59.80		M
	8pr 18		39.90	50.70	61.50		M
	9pr 18		42.10	53.50	64.90		M
	10pr 18		44.40	56.30	68.30		M
	11pr 18		44.80	56.90	69.00		M
	12pr 18		45.20	57.40	69.70		M
	14pr 18		46.10	58.60	71.00		M
	15pr 18		46.60	59.10	71.70		M
	16pr 18		47.00	59.70	72.40		M
	18pr 18		47.90	60.80	73.80		M
	20pr 18		48.80	62.00	75.10		M
	22pr 18		50.60	64.20	77.80		M
	24pr 18		52.30	66.50	80.60		M
	25pr 18		53.20	67.60	81.90		M
	26pr 18		54.10	68.70	83.30		M
	28pr 18		55.90	71.00	86.00		M
	30pr 18		57.70	73.20	88.80		M
	32pr 18		58.50	74.30	90.10		M
	35pr 18		59.90	76.00	92.20		M
	36pr 18		60.30	76.60	92.90		M
40pr 18		62.10	78.80	95.60		M	
42pr 18		63.00	80.00	97.00		M	
45pr 18		64.30	81.70	99.00		M	
48pr 18		65.60	83.40	101.10		M	
50pr 18		66.50	84.50	102.40		M	
	Teck Cable 20AWG						
	1pr 20		18.60	23.60	28.60		M
	1tr 20		19.60	24.90	30.20		M
	2pr 20		20.70	26.20	31.80		M
	3pr 20		24.80	31.50	38.20		M
	2tr 20		24.80	31.50	38.20		M
	4pr 20		27.90	35.40	43.00		M
	3tr 20		28.90	36.70	44.50		M
	5pr 20		31.00	39.40	47.70		M
	4tr 20		33.10	42.00	50.90		M
	6pr 20		33.10	42.00	50.90		M
	7pr 20		35.10	44.60	54.10		M
	5tr 20		36.20	45.90	55.70		M
	8pr 20		37.20	47.20	57.30		M
	9pr 20		39.30	49.90	60.50		M
	10pr 20		41.30	52.50	63.60		M
	11pr 20		41.70	53.00	64.30		M
	12pr 20		42.20	53.50	64.90		M
	14pr 20		43.00	54.60	66.20		M
	15pr 20		43.40	55.10	66.80		M
	16pr 20		43.80	55.60	67.40		M
	18pr 20		44.60	56.70	68.70		M
	20pr 20		45.50	57.70	70.00		M
	22pr 20		47.10	59.80	72.50		M
	24pr 20		48.80	61.90	75.10		M
	25pr 20		49.60	63.00	76.40		M
	26pr 20		50.40	64.00	77.60		M
	28pr 20		52.10	66.10	80.20		M
	30pr 20		53.70	68.20	82.70		M
	32pr 20		54.60	69.30	84.00		M
	35pr 20		55.80	70.80	85.90		M
	36pr 20		56.20	71.40	86.50		M
40pr 20		57.90	73.50	89.10		M	
42pr 20		58.70	74.50	90.40		M	
45pr 20		59.90	76.10	92.30		M	
48pr 20		61.20	77.70	94.20		M	
50pr 20		62.00	78.70	95.40		M	

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SECTION 4

SWITCHBOARDS, MCC'S, PANELBOARDS AND POWER EQUIPMENT

General Information

Several pages in this section contain labor units for handling electrical equipment and exclude the labor for conductor terminations. The labor for conductor terminations must be added separately for these items. When labor units in this section do include the conductor terminations, the labor units are based on the minimum sizes of copper conductors allowed by the National Electrical Code.

4

Scope of These Labor Units

The Introduction section includes details on the scope of labor units across the manual. Some items included are:

- Labor units are intended for new construction, de-energized in compliance with NFPA 70E
- Safety measures indicated in NFPA 70E will need to be factored by contractor's resources
- Drawing and specification study
- Layout, measuring and marking installation location
- Material unloading, storage and delivery to the installation area
- Tool acquisition and return to storage
- Uncrating and shipping support removal
- Inspection for shipping damage
- Rigging for lifting and hoisting
- Moving, handling, placing in position, bolting sections/bussing together and factory harness wiring for fans, heaters and controls.
- Removal of trash

Work Operations Not Included In These Labor Units

- Field supervision
- Raceway terminations
- Grounding systems
- Bonding systems
- Welding
- Painting
- Coordination studies, including fuse and circuit breaker sizing and settings, arc hazard analysis and fault current analysis
- Testing or commissioning of any type
- Terminations unless stated
- Grouting or anchoring
- Cutting holes or openings in walls, floors, cabinets, or panels
- Heavy equipment (crane) operators' time
- High Altitude Electromagnetic Pulse HEMP or Electro Magnetic Pulse EMP Shielding

Labor Adjustments for Non-Typical Conditions

See the Introduction section for details.

Application Instructions

- Labor units for switchboards and MCC's are based on NEMA Class 2 equipment, which includes the electrical interlocking, interwiring between units and the control circuitry.
 - When NEMA Class 1 equipment is used, the electrical contractor must include a substantial amount of additional labor for the interlocking, interwiring and control circuitry.

- For switchboard mounted “draw-out” type circuit breakers the labor units shown must be doubled.
- When lugs, stress cones, pre-molded termination insulation or hand wrapped termination insulation are required on equipment conductor terminations, an additional labor allowance must be added for these items.
- Labor units for panelboard empty enclosure mounting include the labor for installing the empty enclosure, interior components, circuit breakers, trim and the preparation of the directory, but exclude all conductor terminations.
- Labor units for installing limit switches do not include the labor for the FS box, flexible conduit and flexible fittings that are usually required.

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(Updated)

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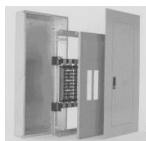
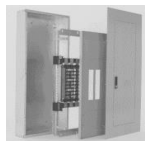
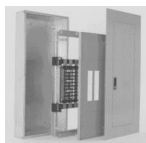
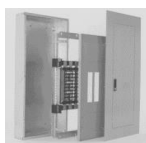
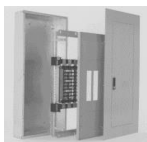
	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Switchboard Section Handling Labor Only						
	200 Lbs		8.00	10.00	12.00		E
	300 Lbs		9.00	11.25	13.50		E
	400 Lbs		10.00	12.50	15.00		E
	500 Lbs		11.00	13.75	16.50		E
	600 Lbs		12.00	15.00	18.00		E
	700 Lbs		13.00	16.25	19.50		E
	800 Lbs		14.00	17.50	21.00		E
	900 Lbs		15.00	18.75	22.50		E
	1000 Lbs		16.00	20.00	24.00		E
	1200 Lbs		18.00	22.50	27.00		E
	1400 Lbs		20.00	25.00	30.00		E
	1600 Lbs		22.00	27.50	33.00		E
	1800 Lbs		24.00	30.00	36.00		E
	2000 Lbs		26.00	32.50	39.00		E
	2500 Lbs		29.00	36.25	43.50		E
	3000 Lbs		32.00	40.00	48.00		E
	3500 Lbs		36.00	45.00	54.00		E
	4000 Lbs		40.00	50.00	60.00		E
	5000 Lbs		46.00	57.50	69.00		E
	6000 Lbs		52.00	65.00	78.00		E
	7000 Lbs		58.00	72.50	87.00		E
	8000 Lbs		64.00	80.00	96.00		E
	9000 Lbs		72.00	90.00	108.00		E
	10000 Lbs		80.00	100.00	120.00		E
	Switchboard/Gear Sections						
	200A 1-Section Distrib Swbd		8.00	10.00	12.00		E
	200A 2-Section Distrib Swbd		14.40	18.00	21.60		E
	400A 1-Section Distrib Swbd		10.00	12.50	15.00		E
	400A 2-Section Distrib Swbd		18.00	22.50	27.00		E
	400A 3-Section Distrib Swbd		27.00	33.75	40.50		E
	600A 1-Section Distrib Swbd		12.00	15.00	18.00		E
	600A 2-Section Distrib Swbd		21.60	27.00	32.40		E
	600A 3-Section Distrib Swbd		32.40	40.50	48.60		E
	800A 1-Section Distrib Swbd		14.00	17.50	21.00		E
	800A 2-Section Distrib Swbd		25.20	31.50	37.80		E
	800A 3-Section Distrib Swbd		37.80	47.25	56.70		E
	1200A 1-Section Distrib Swbd		18.00	22.50	27.00		E
	1200A 2-Section Distrib Swbd		32.40	40.50	48.60		E
	1200A 3-Section Distrib Swbd		48.60	60.75	72.90		E
	1200A 4-Section Distrib Swbd		64.80	81.00	97.20		E
	1600A 1-Section Distrib Swbd		22.00	27.50	33.00		E
	1600A 2-Section Distrib Swbd		39.60	49.50	59.40		E
	1600A 3-Section Distrib Swbd		59.40	74.25	89.10		E
	1600A 4-Section Distrib Swbd		79.20	99.00	118.80		E
	1600A 5-Section Distrib Swbd		99.00	123.75	148.50		E
	2000A 1-Section Distrib Swbd		26.00	32.50	39.00		E
	2000A 2-Section Distrib Swbd		46.80	58.50	70.20		E
	2000A 3-Section Distrib Swbd		70.20	87.75	105.30		E
	2000A 4-Section Distrib Swbd		93.60	117.00	140.40		E
	2000A 5-Section Distrib Swbd		117.00	146.25	175.50		E
	2000A 6-Section Distrib Swbd		140.40	175.50	210.60		E
	2500A 1-Section Distrib Swbd		30.00	37.50	45.00		E
	2500A 2-Section Distrib Swbd		54.00	67.50	81.00		E
	2500A 3-Section Distrib Swbd		81.00	101.25	121.50		E
	2500A 4-Section Distrib Swbd		108.00	135.00	162.00		E
	2500A 5-Section Distrib Swbd		135.00	168.75	202.50		E
	2500A 6-Section Distrib Swbd		162.00	202.50	243.00		E
	2500A 7-Section Distrib Swbd		189.00	236.25	283.50		E
	2500A 8-Section Distrib Swbd		216.00	270.00	324.00		E
	3000A 1-Section Distrib Swbd		34.00	42.50	51.00		E
	3000A 2-Section Distrib Swbd		61.20	76.50	91.80		E
	3000A 3-Section Distrib Swbd		91.80	114.75	137.70		E
	3000A 4-Section Distrib Swbd		122.40	153.00	183.60		E
	3000A 5-Section Distrib Swbd		153.00	191.25	229.50		E
	3000A 6-Section Distrib Swbd		183.60	229.50	275.40		E
	3000A 7-Section Distrib Swbd		214.20	267.75	321.30		E
	3000A 8-Section Distrib Swbd		244.80	306.00	367.20		E
	3000A 9-Section Distrib Swbd		275.40	344.25	413.10		E

Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	3000A 10-Section Distrib Swbd		306.00	382.50	459.00		E
	4000A 1-Section Distrib Swbd		40.00	50.00	60.00		E
	4000A 2-Section Distrib Swbd		72.00	90.00	108.00		E
	4000A 3-Section Distrib Swbd		108.00	135.00	162.00		E
	4000A 4-Section Distrib Swbd		144.00	180.00	216.00		E
	4000A 5-Section Distrib Swbd		180.00	225.00	270.00		E
	4000A 6-Section Distrib Swbd		216.00	270.00	324.00		E
	4000A 7-Section Distrib Swbd		252.00	315.00	378.00		E
	4000A 8-Section Distrib Swbd		288.00	360.00	432.00		E
	4000A 9-Section Distrib Swbd		324.00	405.00	486.00		E
	4000A 10-Section Distrib Swbd		360.00	450.00	540.00		E
	5000A 1-Section Distrib Swbd		48.00	60.00	72.00		E
	5000A 2-Section Distrib Swbd		86.40	108.00	129.60		E
	5000A 3-Section Distrib Swbd		129.60	162.00	194.40		E
	5000A 4-Section Distrib Swbd		172.80	216.00	259.20		E
	5000A 5-Section Distrib Swbd		216.00	270.00	324.00		E
	5000A 6-Section Distrib Swbd		259.20	324.00	388.80		E
	5000A 7-Section Distrib Swbd		302.40	378.00	453.60		E
	5000A 8-Section Distrib Swbd		345.60	432.00	518.40		E
	5000A 9-Section Distrib Swbd		388.80	486.00	583.20		E
	5000A 10-Section Distrib Swbd		432.00	540.00	648.00		E
	Switchboard Heater	X					
	Switchboard heater	X					
	120V or 250V	X	0.50	0.75	1.00		E
	Switchboard 600 Volt Feed Conductor Terminations						
	#12		0.15	0.19	0.23		E
	#10		0.16	0.20	0.24		E
	#8		0.18	0.23	0.27		E
	#6		0.20	0.25	0.30		E
	#4		0.22	0.27	0.33		E
	#3		0.24	0.30	0.36		E
	#2		0.27	0.33	0.40		E
	#1		0.30	0.37	0.45		E
	1/0		0.33	0.41	0.50		E
	2/0		0.36	0.45	0.55		E
	3/0		0.40	0.50	0.60		E
	4/0		0.45	0.56	0.67		E
	250 kcmil		0.50	0.62	0.75		E
	300 kcmil		0.55	0.68	0.82		E
	350 kcmil		0.60	0.75	0.90		E
	400 kcmil		0.65	0.81	0.97		E
	500 kcmil		0.70	0.87	1.05		E
	600 kcmil		0.80	1.00	1.20		E
	750 kcmil		0.90	1.12	1.35		E
	1000 kcmil		1.00	1.25	1.50		E
	Switchboard Grounding Conductor Terminations						
	#12		0.15	0.19	0.23		E
	#10		0.16	0.20	0.24		E
	#8		0.18	0.23	0.27		E
	#6		0.20	0.25	0.30		E
	#4		0.22	0.28	0.33		E
	#3		0.24	0.30	0.36		E
	#2		0.27	0.34	0.41		E
	#1		0.30	0.38	0.45		E
	1/0		0.33	0.41	0.50		E
	2/0		0.36	0.45	0.54		E
	3/0		0.40	0.50	0.60		E
	4/0		0.45	0.56	0.68		E
	250 kcmil		0.50	0.63	0.75		E
	300 kcmil		0.53	0.66	0.80		E
	350 kcmil		0.55	0.69	0.83		E
	400 kcmil		0.60	0.75	0.90		E
	500 kcmil		0.70	0.88	1.05		E

Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Switchboard 2 Pole Copper Cond. Term. On Circuit Breakers & Switches (Includes labor for terminating neutrals)						
	20 Amp #12		0.50	0.63	0.75		E
	30 Amp #10		0.55	0.69	0.83		E
	60 Amp #8		0.60	0.75	0.90		E
	80 Amp #6		0.70	0.88	1.05		E
	100 Amp #4		0.80	1.00	1.20		E
	125 Amp #2		1.00	1.25	1.50		E
	150 Amp #1		1.10	1.38	1.65		E
	175 Amp 1/0		1.20	1.50	1.80		E
	200 Amp 2/0		1.40	1.75	2.10		E
	225 Amp 3/0		1.60	2.00	2.40		E
	250 Amp 4/0		1.80	2.25	2.70		E
	300 Amp 250 kcmil		2.00	2.50	3.00		E
	350 Amp 350 kcmil		2.50	3.13	3.75		E
	400 Amp 500 kcmil		3.00	3.75	4.50		E
	600 Amp 750 kcmil		4.00	5.00	6.00		E
	800 Amp 1000 kcmil		5.25	6.56	7.88		E
	1000 Amp		7.25	9.06	10.88		E
	1200 Amp		8.25	10.31	12.38		E
	Add For Shunt Trip	X	1.00	1.25	1.50		E
	Switchboard 3 Pole Copper Cond. Term. On Circuit Breakers & Switches (Includes labor for terminating neutrals)						
	20 Amp #12		0.70	0.88	1.05		E
	30 Amp #10		0.80	1.00	1.20		E
	60 Amp #8		0.90	1.13	1.35		E
	80 Amp #6		1.00	1.25	1.50		E
	100 Amp #4		1.20	1.50	1.80		E
	125 Amp #2		1.50	1.88	2.25		E
	150 Amp #1		1.65	2.06	2.48		E
	175 Amp 1/0		1.80	2.25	2.70		E
	200 Amp 2/0		2.10	2.63	3.15		E
	225 Amp 3/0		2.40	3.00	3.60		E
	250 Amp 4/0		2.70	3.38	4.05		E
	300 Amp 250 kcmil		3.00	3.75	4.50		E
	350 Amp 350 kcmil		4.00	5.00	6.00		E
	400 Amp 500 kcmil		5.00	6.25	7.50		E
	600 Amp 750 kcmil		6.00	7.50	9.00		E
	800 Amp 1000 kcmil		7.25	9.06	10.88		E
	1000 Amp		9.25	11.56	13.88		E
	1200 Amp		10.25	12.81	15.38		E
	Add for Shunt Trip	X	1.00	1.25	1.50		E
	Switchboard Bus Bar Splice Connections						
	3 Phase 4 Wire W/ Copper Ground						
	400 Amp		4.00	5.00	6.00		E
	800 Amp		6.00	7.50	9.00		E
	1000 Amp		8.00	10.00	12.00		E
	1200 Amp		10.00	12.50	15.00		E
	Steel Channels Embedded in Concrete						
	4 Ft Long		1.00	1.25	1.50		E
	6 Ft Long		1.25	1.56	1.88		E
	8 Ft Long		1.50	1.88	2.25		E
	10 Ft Long		1.75	2.19	2.63		E
	Custom Made Steel Pull Boxes						
	Bolted To Switchboards or Motor Control Center						
	"Top Hat" or "Pull Section"						
	12" x 24" x 72" 140 lb		8.00	10.00	12.00		E
	12" x 24" x 96" 170 lb		10.00	12.50	15.00		E
	12" x 24" x 120" 200 lb		12.00	15.00	18.00		E
	12" x 24" x 144" 230 LB		14.00	17.50	21.00		E
	12" x 36" x 72" 170 lb		10.00	12.50	15.00		E
	12" x 36" x 96" 205 lb		12.00	15.00	18.00		E
	12" x 36" x 120" 240 lb		14.00	17.50	21.00		E
	12" x 36" x 144" 275 lb		16.00	20.00	24.00		E
	12" x 48" x 72" 200 lb		12.00	15.00	18.00		E
	12" x 48" x 96" 240 lb		14.00	17.50	21.00		E
	12" x 48" x 120" 280 lb		16.00	20.00	24.00		E
	12" x 48" x 144" 320 lb		18.00	22.50	27.00		E
	18" x 36" x 72" 230 lb		14.00	17.50	21.00		E
	18" x 36" x 96" 280 lb		16.00	20.00	24.00		E
	18" x 36" x 120" 330 lb		19.00	23.75	28.50		E
	18" x 36" x 144" 380 lb		22.00	27.50	33.00		E
	24" x 24" x 72" 260 lb		16.00	20.00	24.00		E
	24" x 24" x 96" 300 lb		18.00	22.50	27.00		E
	24" x 24" x 120" 350 lb		21.00	26.25	31.50		E
	24" x 24" x 144" 400 lb		24.00	30.00	36.00		E
	24" x 36" x 72" 460 lb		26.00	32.50	39.00		E
	24" x 36" x 96" 540 lb		30.00	37.50	45.00		E
	24" x 36" x 120" 620 lb		35.00	43.75	52.50		E
	24" x 36" x 144" 700 lb		40.00	50.00	60.00		E



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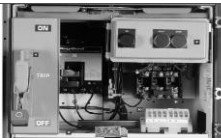
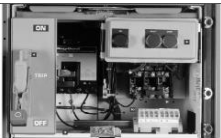
Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Panelboard Terminations: Single Pole Circuit Breaker						
	Copper Conductor Termination Including Neutral						
	15 Amp		0.32	0.40	0.48		E
	20 Amp		0.34	0.43	0.51		E
	30 Amp		0.38	0.48	0.57		E
	50 Amp		0.42	0.53	0.63		E
	60 Amp		0.47	0.59	0.71		E
	70 Amp		0.53	0.66	0.80		E
	90 Amp		0.58	0.73	0.87		E
	100 Amp		0.61	0.76	0.92		E
	125 Amp		0.69	0.86	1.04		E
	150 Amp		0.80	1.00	1.20		E
	175 Amp		0.90	1.13	1.35		E
	200 Amp		1.00	1.25	1.50		E
	225 Amp		1.10	1.38	1.65		E
	250 Amp		1.20	1.50	1.80		E
	300 Amp		1.35	1.69	2.03		E
	Add for Special Purpose Breakers (Arc-Fault, GFI, Shunt Trip)	X	0.15	0.25	0.35		E
	Panelboard Terminations: Two Pole Circuit Breaker						
	Copper Conductor Termination Including Neutral						
	15 Amp		0.48	0.60	0.72		E
	20 Amp		0.52	0.65	0.78		E
	30 Amp		0.58	0.73	0.87		E
	50 Amp		0.64	0.80	0.96		E
	60 Amp		0.72	0.90	1.08		E
	70 Amp		0.81	1.01	1.22		E
	90 Amp		0.88	1.10	1.32		E
	100 Amp		0.94	1.18	1.41		E
	125 Amp		1.05	1.31	1.58		E
	150 Amp		1.20	1.50	1.80		E
	175 Amp		1.35	1.69	2.03		E
	200 Amp		1.50	1.88	2.25		E
	225 Amp		1.65	2.06	2.48		E
	250 Amp		1.85	2.31	2.78		E
	300 Amp		2.05	2.56	3.08		E
	400 Amp		2.25	2.81	3.38		E
	600 Amp		2.50	3.13	3.75		E
	800 Amp		2.75	3.44	4.13		E
	Add for Special Purpose Breakers (Arc-Fault, GFI, Shunt Trip)	X	0.15	0.25	0.35		E
	Panelboard Terminations: Three Pole Circuit Breaker						
	Copper Conductor Termination Including Neutral						
	15 Amp		0.66	0.83	0.99		E
	20 Amp		0.71	0.89	1.07		E
	30 Amp		0.78	0.98	1.17		E
	40 Amp	X	0.82	1.00	1.22		E
	50 Amp		0.85	1.06	1.28		E
	60 Amp		0.92	1.15	1.38		E
	70 Amp		1.05	1.31	1.58		E
	90 Amp		1.18	1.48	1.77		E
	100 Amp		1.28	1.60	1.92		E
	125 Amp		1.43	1.79	2.15		E
	150 Amp		1.60	2.00	2.40		E
	175 Amp		1.80	2.25	2.70		E
	200 Amp		2.00	2.50	3.00		E
	225 Amp		2.25	2.81	3.38		E
	250 Amp		2.50	3.13	3.75		E
	300 Amp		2.75	3.44	4.13		E
	400 Amp		3.00	3.75	4.50		E
	600 Amp		3.25	4.06	4.88		E
	800 Amp		3.50	4.38	5.25		E
	Add for Special Purpose Breakers (Arc-Fault, GFI, Shunt Trip)	X	0.15	0.25	0.35		E
	Motor Control Centers: Receiving, Handling and Set In Place						
	1 Section		6.00	7.50	9.00		E
	2 Sections		12.00	15.00	18.00		E
	3 Sections		18.00	22.50	27.00		E
	<i>Note: Labor Units Do Not Include:</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	<i>Note: For MCC's with More Than 3 Sections,</i>						
	<i>Add Appropriate Section Labor To the 3 Section Total</i>						
	<i>Additional Items To Consider:</i>						
	1) Re-Torque Lugs/Inspection						
	2) Rigging Equipment						
	3) Provisions For Concrete Pad						
	4) Commissioning and Testing						

Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	MCC: Anchoring to Concrete Pad						
	1 Section		1.25	1.56	1.88		E
	2 Sections		2.50	3.13	3.75		E
	3 Sections		3.75	4.69	5.63		E
	<i>Note: For MCC's with More Than 3 Sections, Add Appropriate Section Labor To the 3 Section Total</i>						
	<i>Note: Add Local Seismic Zone Anchoring Requirements</i>						
	MCC: Multiple Section Bolting Connections						
	Per Splice Point		1.50	1.88	2.25		E
	MCC: Multiple Section Bus Bar Connections - Per Bus Bar						
	200 A		0.50	0.63	0.75		E
	400 A		0.50	0.63	0.75		E
	600 A		0.75	0.94	1.13		E
	800 A		0.75	0.94	1.13		E
	1200 A		1.50	1.88	2.25		E
	Motor Starters Mounted in MCC's						
	Single Speed Non-Reversing 2-Pole						
	NEMA 00		0.90	1.13	1.35		E
	NEMA 0		1.00	1.25	1.50		E
	NEMA 1		1.10	1.38	1.65		E
	NEMA 2		1.35	1.69	2.03		E
	Motor Starters Mounted in MCC's						
	Single Speed Non-Reversing 3-Pole						
	NEMA 00		1.00	1.25	1.50		E
	NEMA 0		1.10	1.38	1.65		E
	NEMA 1		1.20	1.50	1.80		E
	NEMA 2		1.50	1.88	2.25		E
	NEMA 3		2.00	2.50	3.00		E
	NEMA 4		3.00	3.75	4.50		E
	NEMA 5		4.00	5.00	6.00		E
	NEMA 6		6.00	7.50	9.00		E
	Motor Starters Mounted in MCC's						
	Single Speed Non-Reversing 4-Pole						
	NEMA 00		1.10	1.38	1.65		E
	NEMA 0		1.20	1.50	1.80		E
	NEMA 1		1.30	1.63	1.95		E
	NEMA 2		1.70	2.13	2.55		E
	NEMA 3		2.20	2.75	3.30		E
	Motor Starters Mounted in MCC's						
	Single Speed Reversing 2-Pole						
	NEMA 00		1.00	1.25	1.50		E
	NEMA 0		1.10	1.38	1.65		E
	NEMA 1		1.20	1.50	1.80		E
	NEMA 2		1.45	1.81	2.18		E
	<i>Note: Reversing Motors are Assumed To Be Factory Wired</i>						
	Motor Starters Mounted in MCC's						
	Single Speed Reversing 3-Pole						
	NEMA 00		1.10	1.38	1.65		E
	NEMA 0		1.20	1.50	1.80		E
	NEMA 1		1.30	1.63	1.95		E
	NEMA 2		1.60	2.00	2.40		E
	NEMA 3		2.10	2.63	3.15		E
	NEMA 4		3.10	3.88	4.65		E
	NEMA 5		4.10	5.13	6.15		E
	NEMA 6		6.10	7.63	9.15		E
	Motor Starters Mounted in MCC's						
	Single Speed Reversing 4-Pole						
	NEMA 00		1.20	1.50	1.80		E
	NEMA 0		1.30	1.63	1.95		E
	NEMA 1		1.40	1.75	2.10		E
	NEMA 2		1.80	2.25	2.70		E
	NEMA 3		2.30	2.88	3.45		E
	<i>Note: Reversing Motors are Assumed To Be Factory Wired</i>						
	Motor Starters Mounted in MCC's						
	Multi - Speed Non-Reversing 2-Pole						
	NEMA 00		1.80	2.25	2.70		E
	NEMA 0		2.00	2.50	3.00		E
	NEMA 1		2.25	2.81	3.38		E
	NEMA 2		2.75	3.44	4.13		E

Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Motor Starters Mounted in MCC's						
	Multi - Speed Non-Reversing 3-Pole						
	NEMA 00		2.00	2.50	3.00		E
	NEMA 0		2.20	2.75	3.30		E
	NEMA 1		2.40	3.00	3.60		E
	NEMA 2		3.00	3.75	4.50		E
	NEMA 3		4.00	5.00	6.00		E
	NEMA 4		5.00	6.25	7.50		E
	NEMA 5		6.00	7.50	9.00		E
	NEMA 6		8.00	10.00	12.00		E
	Motor Starters Mounted in MCC's						
	Multi - Speed Non-Reversing 4-Pole						
	NEMA 00		2.20	2.75	3.30		E
	NEMA 0		2.40	3.00	3.60		E
	NEMA 1		2.60	3.25	3.90		E
	NEMA 2		3.30	4.13	4.95		E
	NEMA 3		4.40	5.50	6.60		E
	Motor Starters Mounted in MCC's						
	Multi - Multi Speed Reversing 2-Pole						
	NEMA 00		2.80	3.50	4.20		E
	NEMA 0		3.00	3.75	4.50		E
	NEMA 1		3.40	4.25	5.10		E
	Motor Starters Mounted in MCC's						
	Multi - Multi Speed Reversing 3-Pole						
	NEMA 00		3.00	3.75	4.50		E
	NEMA 0		3.20	4.00	4.80		E
	NEMA 1		3.60	4.50	5.40		E
	NEMA 2		4.40	5.50	6.60		E
	NEMA 3		5.00	6.25	7.50		E
	NEMA 4		6.00	7.50	9.00		E
	NEMA 5		8.00	10.00	12.00		E
	NEMA 6		10.00	12.50	15.00		E
	Motor Starters Mounted in MCC's						
	Multi - Multi Speed Reversing 4-Pole						
	NEMA 00		3.40	4.25	5.10		E
	NEMA 0		3.60	4.50	5.40		E
	NEMA 1		4.00	5.00	6.00		E
	NEMA 2		5.00	6.25	7.50		E
	NEMA 3		6.00	7.50	9.00		E
	Factory Mounted Disconnect/Circuit Breaker - Termination Labor Only						
	30 A		1.75	2.19	2.63		E
	60 A		1.90	2.38	2.85		E
	100 A		2.25	2.81	3.38		E
	200 A		2.75	3.44	4.13		E
	400 A		3.50	4.38	5.25		E
	600 A		4.00	5.00	6.00		E
	800 A		5.00	6.25	7.50		E
	Factory Mounted Variable Frequency Drive - Termination Labor Only						
	5 HP		1.00	1.25	1.50		E
	7.5 HP		1.25	1.56	1.88		E
	10 HP		1.50	1.88	2.25		E
	15 HP		2.00	2.50	3.00		E
	20 HP		2.50	3.13	3.75		E
	25 HP		3.00	3.75	4.50		E
	Control Transformer Termination - Factory Mounted in MCC's						
	Size 1		0.80	1.00	1.20		E
	Size 2		0.90	1.13	1.35		E
	Size 3		1.00	1.25	1.50		E
	Size 4		1.15	1.44	1.73		E
	Size 5		1.30	1.63	1.95		E
	MCC Control Relay Termination - Factory Mounted in MCC's						
	MCC 4-Pole Control relay		1.60	2.00	2.40		E
	MCC 8-Pole Control Relay		2.00	2.50	3.00		E
	Auxiliary Contacts NO/NC						
	Auxiliary Contacts NO/NC		0.50	0.63	0.75		E

Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Control Wire Terminations						
	#14 AWG Control Wire Terminations		0.20	0.25	0.30		E
	Control Switch Factory Mounted						
	Control Switch - 2 Position		0.50	0.63	0.75		E
	Control Switch-3 position		0.60	0.75	0.90		E
	Control Switch-4 position		0.70	0.88	1.05		E
	Factory Mounted Push Button Stations						
	1 Button		0.40	0.50	0.60		E
	2 Button		0.50	0.63	0.75		E
	3 Button		0.60	0.75	0.90		E
	4 Button		0.70	0.88	1.05		E
	Field Mounted in MCC's -						
	Single Speed Non-Reversing 2-Pole						
	NEMA 00		1.80	2.25	2.70		E
	NEMA 0		2.00	2.50	3.00		E
	NEMA 1		2.20	2.75	3.30		E
	NEMA 2		2.70	3.38	4.05		E
	<i>Note: Installing a brand or type of starting equipment in a different brand or type of Motor Control Center could void the U.L. Label of the MCC</i>						
	Field Mounted in MCC's -						
	Single Speed Non-Reversing 3-Pole						
	NEMA 00		2.00	2.50	3.00		E
	NEMA 0		2.20	2.75	3.30		E
	NEMA 1		2.40	3.00	3.60		E
	NEMA 2		3.00	3.75	4.50		E
	NEMA 3		4.00	5.00	6.00		E
	NEMA 4		6.00	7.50	9.00		E
	NEMA 5		8.00	10.00	12.00		E
	NEMA 6		12.00	15.00	18.00		E
	<i>Note: Installing a brand or type of starting equipment in a different brand or type of Motor Control Center could void the U.L. Label of the MCC</i>						
	Field Mounted in MCC's -						
	Single Speed Non-Reversing 4-Pole						
	NEMA 00		2.20	2.75	3.30		E
	NEMA 0		2.40	3.00	3.60		E
	NEMA 1		2.60	3.25	3.90		E
	NEMA 2		3.40	4.25	5.10		E
	NEMA 3		4.40	5.50	6.60		E
	<i>Note: Installing a brand or type of starting equipment in a different brand or type of Motor Control Center could void the U.L. Label of the MCC</i>						
	Field Mounted in MCC's - Single Speed Reversing 2-Pole						
	NEMA 00		2.00	2.50	3.00		E
	NEMA 0		2.20	2.75	3.30		E
	NEMA 1		2.40	3.00	3.60		E
	NEMA 2		2.90	3.63	4.35		E
	<i>Note: Installing a brand or type of starting equipment in a different brand or type of Motor Control Center could void the U.L. Label of the MCC</i>						
	Field Mounted in MCC's - Single Speed Reversing 3-Pole						
	NEMA 00		2.20	2.75	3.30		E
	NEMA 0		2.40	3.00	3.60		E
	NEMA 1		2.60	3.25	3.90		E
	NEMA 2		3.20	4.00	4.80		E
	NEMA 3		4.20	5.25	6.30		E
	NEMA 4		6.20	7.75	9.30		E
	NEMA 5		9.20	11.50	13.80		E
	NEMA 6		12.20	15.25	18.30		E
	<i>Note: Installing a brand or type of starting equipment in a different brand or type of Motor Control Center could void the U.L. Label of the MCC</i>						
							
	Field Mounted in MCC's - Single Speed Reversing 4-Pole						
	NEMA 00		2.40	3.00	3.60		E
	NEMA 0		2.60	3.25	3.90		E
	NEMA 1		2.80	3.50	4.20		E
	NEMA 2		3.60	4.50	5.40		E
	NEMA 3		4.60	5.75	6.90		E
	<i>Note: Installing a brand or type of starting equipment in a different brand or type of Motor Control Center could void the U.L. Label of the MCC</i>						
	<i>Motor Control Center could void the U.L. Label of the MCC</i>						

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Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Integrated Power Centers						
	Integrated Power Centers (IPC) bundles distribution equipment into a single factory assembled and wired integrated system, eliminating the traditional method of independently mounting each component separately.						
	The IPC allows for the integration of a variety of components including panelboards, transformers, surge suppression, lighting controls, metering, etc., pending on the project requirements.						
	The IPC concept also save space, which is always a premium on most projects.						
	The following are basic units consisting of 277/480V panelboards, transformers, and 120/208V panelboards.						
	Labor includes receiving, moving to the installation location, securing in place, and termination of the line side of the IPC.						
	Labor does not include KO's, conduit connectors or terminations, trans. grounding or wire terminations, of the load side of the panelboards.						
	Integrated Power Center						
	Input = 125A / 3 Ph 277/480V						
	Transformer = 30 KVA						
	Output = 100A / 3 Ph 120/208V						
	Weight = 800 lbs						
	Dimensions = 42" Wide X 91 1/2" High X 24" Deep						
	Labor		15.50	18.50	21.50		E
	Integrated Power Center						
	Input = 125A / 3Ph 277/480V						
	Transformer = 45 KVA						
	Output = 125A / 3Ph 120/208V						
	Weight = 900 lbs						
	Dimensions = 42" Wide X 91 1/2" High X 24" Deep						
	Labor		16.50	19.50	22.50		E
	Integrated Power Center						
	Input = 225A / 3Ph 277/480V						
	Transformer = 75 KVA						
	Output = 255A / 3Ph 120/208V						
	Weight = 1,150 lbs						
	Dimensions = 42" Wide X 91 1/2" High X 24" Deep						
	Labor		20.00	24.00	28.00		E
	Integrated Power Center						
	Input = 400A / 3Ph 277/480V						
	Transformer = 75 KVA						
	Output = 255A / 3Ph 120/208V						
	Weight = 1,150 lbs						
	Dimensions = 42" Wide X 91 1/2" High X 24" Deep						
	Labor		21.50	25.50	29.50		E
	Integrated Power Center						
	Input = 400A / 3Ph 277/480V						
	Transformer = 112.5 KVA						
	Output = 400A / 3Ph 120/208V						
	Weight = 1,385 lbs						
	Dimensions = 42" Wide X 91 1/2" High X 24" Deep						
	Labor		23.50	27.50	31.50		E
	Fuse Installation in Fused Switch in Safety Switches and MCC's - Cartridge Fuse (250 V or 600V)						
	1 Amp to 100 Amp		0.04	0.05	0.06		E
	110 Amp to 200 Amp		0.10	0.13	0.15		E
	210 Amp to 400 Amp		0.17	0.21	0.26		E
	410 Amp to 600 Amp		0.20	0.25	0.30		E
	Bolt-On Fuse 600V						
	600 Amp - 1800 Amp		0.30	0.38	0.45		E
	2000 Amp - 6000 Amp		0.50	0.63	0.75		E
	Fuse Reducers		0.15	0.19	0.23		E
	Fuse Cabinet		1.00	1.25	1.50		E
	Free Standing Bolted Press. Switches - Installation & 2P3W Conductor Term. (Includes labor for terminating neutrals)						
	800 Amp		20.00	25.00	30.00		E
	1200 Amp		24.00	30.00	36.00		E
	1600 Amp		28.00	35.00	42.00		E
	2000 Amp		32.00	40.00	48.00		E
	2500 Amp		36.00	45.00	54.00		E
	3000 Amp		40.00	50.00	60.00		E
	4000 Amp		48.00	60.00	72.00		E
	Free Standing Bolted Press. Switches - Installation & 3P4W Conductor Term. (Includes labor for terminating neutrals)						
	800 Amp		24.00	30.00	36.00		E
	1200 Amp		28.00	35.00	42.00		E
	1600 Amp		33.00	41.25	49.50		E
	2000 Amp		38.00	47.50	57.00		E
	2500 Amp		43.00	53.75	64.50		E
	3000 Amp		48.00	60.00	72.00		E
	4000 Amp		56.00	70.00	84.00		E

Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

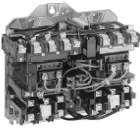
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	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Disconnect Safety Switches - Nonfused 2-Pole						
	30 Amp		1.70	2.13	2.55		E
	60 Amp		2.50	3.13	3.75		E
	100 Amp		3.50	4.38	5.25		E
	200 Amp		5.50	6.88	8.25		E
	400 Amp		8.00	10.00	12.00		E
	600 Amp		12.00	15.00	18.00		E
	800 Amp		16.00	20.00	24.00		E
	1200 Amp		20.00	25.00	30.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%. For Stainless Steel Enclosures add 20%</i>						
	Disconnect Safety Switches - Nonfused 3-Pole						
	30 Amp		2.00	2.50	3.00		E
	60 Amp		3.00	3.75	4.50		E
	100 Amp		4.00	5.00	6.00		E
	200 Amp		7.00	8.75	10.50		E
	400 Amp		10.00	12.50	15.00		E
	600 Amp		14.00	17.50	21.00		E
	800 Amp		18.00	22.50	27.00		E
	1200 Amp		22.00	27.50	33.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%. For Stainless Steel Enclosures add 20%</i>						
	Disconnect Safety Switches - Nonfused 4-Pole						
	30 Amp		2.50	3.13	3.75		E
	60 Amp		3.50	4.38	5.25		E
	100 Amp		5.00	6.25	7.50		E
	200 Amp		8.00	10.00	12.00		E
	400 Amp		12.00	15.00	18.00		E
	600 Amp		16.00	20.00	24.00		E
	800 Amp		20.00	25.00	30.00		E
	1200 Amp		24.00	30.00	36.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%. For Stainless Steel Enclosures add 20%</i>						
	Disconnect Safety Switches - Fused 2-Pole						
	30 Amp		2.00	2.50	3.00		E
	60 Amp		2.70	3.38	4.05		E
	100 Amp		3.80	4.75	5.70		E
	200 Amp		6.00	7.50	9.00		E
	400 Amp		8.80	11.00	13.20		E
	600 Amp		13.00	16.25	19.50		E
	800 Amp		17.00	21.25	25.50		E
	1200 Amp		22.00	27.50	33.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%. For Stainless Steel Enclosures add 20%</i>						
	Disconnect Safety Switches - Fused 3-Pole						
	30 Amp		2.20	2.75	3.30		E
	60 Amp		3.30	4.13	4.95		E
	100 Amp		4.40	5.50	6.60		E
	200 Amp		7.70	9.63	11.55		E
	400 Amp		11.00	13.75	16.50		E
	600 Amp		15.00	18.75	22.50		E
	800 Amp		20.00	25.00	30.00		E
	1200 Amp		24.00	30.00	36.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%. For Stainless Steel Enclosures add 20%</i>						
	Disconnect Safety Switches - Fused 4-Pole						
	30 Amp		2.70	3.38	4.05		E
	60 Amp		3.80	4.75	5.70		E
	100 Amp		5.50	6.88	8.25		E
	200 Amp		9.00	11.25	13.50		E
	400 Amp		13.00	16.25	19.50		E
	600 Amp		17.00	21.25	25.50		E
	800 Amp		22.00	27.50	33.00		E
	1200 Amp		26.00	32.50	39.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%. For Stainless Steel Enclosures add 20%</i>						

Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Enclosed Circuit Breakers, Wall Mounted						
	2-Pole (or 1-Pole and Neutral)						
	20 Amp		1.60	2.00	2.40		E
	30 Amp		1.80	2.25	2.70		E
	50 Amp		2.00	2.50	3.00		E
	60 Amp		2.30	2.88	3.45		E
	80 Amp		2.70	3.38	4.05		E
	100 Amp		3.10	3.88	4.65		E
	125 Amp		3.60	4.50	5.40		E
	150 Amp		4.00	5.00	6.00		E
	175 Amp		4.50	5.63	6.75		E
	200 Amp		5.00	6.25	7.50		E
	225 Amp		5.50	6.88	8.25		E
	250 Amp		6.00	7.50	9.00		E
	300 Amp		7.00	8.75	10.50		E
	400 Amp		8.00	10.00	12.00		E
	500 Amp		9.00	11.25	13.50		E
	600 Amp		11.00	13.75	16.50		E
	800 Amp		14.00	17.50	21.00		E
	1000 Amp		18.00	22.50	27.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%. For Stainless Steel Enclosures add 20%</i>						
	Enclosed Circuit Breakers, Wall Mounted						
	3-Pole (or 2-Pole and Neutral)						
	20 Amp		1.80	2.25	2.70		E
	30 Amp		2.00	2.50	3.00		E
	50 Amp		2.30	2.88	3.45		E
	60 Amp		2.70	3.38	4.05		E
	80 Amp		3.10	3.88	4.65		E
	100 Amp		3.60	4.50	5.40		E
	125 Amp		4.00	5.00	6.00		E
	150 Amp		4.50	5.63	6.75		E
	175 Amp		5.00	6.25	7.50		E
	200 Amp		5.50	6.88	8.25		E
	225 Amp		6.00	7.50	9.00		E
	250 Amp		7.00	8.75	10.50		E
	300 Amp		8.00	10.00	12.00		E
	400 Amp		9.00	11.25	13.50		E
	500 Amp		10.00	12.50	15.00		E
	600 Amp		12.00	15.00	18.00		E
	800 Amp		16.00	20.00	24.00		E
	1000 Amp		20.00	25.00	30.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%. For Stainless Steel Enclosures add 20%</i>						
	Enclosed Circuit Breakers, Wall Mounted						
	4-Pole (or 3-Pole and Neutral)						
	20 Amp		2.00	2.50	3.00		E
	30 Amp		2.20	2.75	3.30		E
	50 Amp		2.50	3.13	3.75		E
	60 Amp		3.00	3.75	4.50		E
	80 Amp		3.50	4.38	5.25		E
	100 Amp		4.00	5.00	6.00		E
	125 Amp		4.50	5.63	6.75		E
	150 Amp		5.00	6.25	7.50		E
	175 Amp		5.50	6.88	8.25		E
	200 Amp		6.00	7.50	9.00		E
	225 Amp		7.00	8.75	10.50		E
	250 Amp		8.00	10.00	12.00		E
	300 Amp		9.00	11.25	13.50		E
	400 Amp		10.00	12.50	15.00		E
	500 Amp		11.00	13.75	16.50		E
	600 Amp		13.00	16.25	19.50		E
	800 Amp		17.00	21.25	25.50		E
	1000 Amp		22.00	27.50	33.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%. For Stainless Steel Enclosures add 20%</i>						
	Enclosed Magnetic Motor Starter,						
	Wall Mounted, Non-Reversing 2-Pole						
	NEMA 00		2.00	2.50	3.00		E
	NEMA 0		2.20	2.75	3.30		E
	NEMA 1		2.40	3.00	3.60		E
	NEMA 2		2.70	3.38	4.05		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%</i>						
	<i>For NEMA 4 Add 15%</i>						
	<i>For NEMA 12 Add 20%</i>						

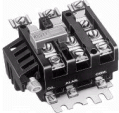
Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Enclosed Magnetic Motor Starter, Wall Mounted, Non-Reversing 3-Pole						
	NEMA 00		2.20	2.75	3.30		E
	NEMA 0		2.40	3.00	3.60		E
	NEMA 1		2.60	3.25	3.90		E
	NEMA 2		3.00	3.75	4.50		E
	NEMA 3		4.00	5.00	6.00		E
	NEMA 4		6.00	7.50	9.00		E
	NEMA 5		8.00	10.00	12.00		E
	NEMA 6		12.00	15.00	18.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%</i>						
	<i>For NEMA 4 Add 15%</i>						
	<i>For NEMA 12 Add 20%</i>						
	Enclosed Magnetic Motor Starter, Wall Mounted, Non-Reversing 4-Pole						
	NEMA 00		2.50	3.13	3.75		E
	NEMA 0		3.00	3.75	4.50		E
	NEMA 1		3.50	4.38	5.25		E
	NEMA 2		4.00	5.00	6.00		E
	NEMA 3		5.00	6.25	7.50		E
	NEMA 4		7.00	8.75	10.50		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%</i>						
	<i>For NEMA 4 Add 15%</i>						
	<i>For NEMA 12 Add 20%</i>						
	Enclosed Magnetic Motor Starter, Wall Mounted, Reversing 2-Pole						
	NEMA 00		2.40	3.00	3.60		E
	NEMA 0		2.80	3.50	4.20		E
	NEMA 1		3.20	4.00	4.80		E
	NEMA 2		3.60	4.50	5.40		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%</i>						
	<i>For NEMA 4 Add 15%</i>						
	<i>For NEMA 12 Add 20%</i>						
	Enclosed Magnetic Motor Starter, Wall Mounted, Reversing 3-Pole						
	NEMA 00		2.60	3.25	3.90		E
	NEMA 0		3.00	3.75	4.50		E
	NEMA 1		3.50	4.38	5.25		E
	NEMA 2		4.00	5.00	6.00		E
	NEMA 3		6.00	7.50	9.00		E
	NEMA 4		9.00	11.25	13.50		E
	NEMA 5		12.00	15.00	18.00		E
	NEMA 6		16.00	20.00	24.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%</i>						
	<i>For NEMA 4 Add 15%</i>						
	<i>For NEMA 12 Add 20%</i>						
	Enclosed Magnetic Motor Starter, Wall Mounted, Reversing 4-Pole						
	NEMA 00		3.00	3.75	4.50		E
	NEMA 0		3.50	4.38	5.25		E
	NEMA 1		4.00	5.00	6.00		E
	NEMA 2		5.00	6.25	7.50		E
	NEMA 3		7.00	8.75	10.50		E
	NEMA 4		10.00	12.50	15.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%</i>						
	<i>For NEMA 4 Add 15%</i>						
	<i>For NEMA 12 Add 20%</i>						
	Enclosed Multi-Speed Magnetic Motor Starter, Wall Mounted, Non-Reversing 2-Pole						
	NEMA 00		3.60	4.50	5.40		E
	NEMA 0		4.00	5.00	6.00		E
	NEMA 1		4.50	5.63	6.75		E
	NEMA 1		4.50	5.63	6.75		E
	NEMA 2		5.00	6.25	7.50		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%</i>						
	<i>For NEMA 4 Add 15%</i>						
	<i>For NEMA 12 Add 20%</i>						

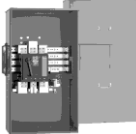
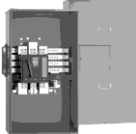
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Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Limit Switch						
	NEMA-1 Plunger Limit Switch 2 Circuit		1.00	1.25	1.50		E
	NEMA-1 Plunger Limit Switch 4 Circuit		1.50	1.88	2.25		E
	NEMA-3 Plunger Limit Switch 2 Circuit		1.25	1.56	1.88		E
	NEMA-3 Plunger Limit Switch 4 Circuit		1.75	2.19	2.63		E
	NEMA-1 Rotary Limit Switch 2 Blocks		1.50	1.88	2.25		E
	NEMA-1 Rotary Limit Switch 3 Blocks		1.75	2.19	2.63		E
	NEMA-1 Rotary Limit Switch 4 Blocks		2.00	2.50	3.00		E
	Manual Motor Starter 115/230 Volt AC						
	NEMA-1 Enclosure Toggle Switch						
	1P NEMA 00		0.80	1.00	1.20		E
	1P NEMA 0		0.90	1.13	1.35		E
	1P NEMA 1		1.00	1.25	1.50		E
	2P NEMA 00		1.10	1.38	1.65		E
	2P NEMA 0		1.20	1.50	1.80		E
	2P NEMA 1		1.30	1.63	1.95		E
	3P NEMA 00		1.40	1.75	2.10		E
	3P NEMA 0		1.50	1.88	2.25		E
	3P NEMA 1		1.60	2.00	2.40		E
	Enclosed Lighting & Heating Contactors						
	NEMA 1 Enclosure up to 600 Volt AC						
	20 Amp 2 Pole		1.60	2.00	2.40		E
	20 Amp 3 Pole		1.80	2.25	2.70		E
	20 Amp 4 Pole		2.00	2.50	3.00		E
	20 Amp 6 pole		2.40	3.00	3.60		E
	20 Amp 8 Pole		2.80	3.50	4.20		E
	30 Amp 2 Pole		1.80	2.25	2.70		E
	30 Amp 3 Pole		2.00	2.50	3.00		E
	30 Amp 4 Pole		2.20	2.75	3.30		E
	30 Amp 6 Pole		2.60	3.25	3.90		E
	30 Amp 8 Pole		3.00	3.75	4.50		E
	60 Amp 2 Pole		2.80	3.50	4.20		E
	60 Amp 3 Pole		3.20	4.00	4.80		E
	60 Amp 4 Pole		3.60	4.50	5.40		E
	60 Amp 8 Pole		4.00	5.00	6.00		E
	100 Amp 2 Pole		3.80	4.75	5.70		E
	100 Amp 3 Pole		4.20	5.25	6.30		E
	100 Amp 4 Pole		4.60	5.75	6.90		E
	200 Amp 2 Pole		5.00	6.25	7.50		E
	200 Amp 3 Pole		5.50	6.88	8.25		E
	200 Amp 4 Pole		6.00	7.50	9.00		E
	300 Amp 2 Pole		7.00	8.75	10.50		E
	300 Amp 3 Pole		8.00	10.00	12.00		E
	400 Amp 2 Pole		9.00	11.25	13.50		E
	400 Amp 3 Pole		10.00	12.50	15.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%. For Stainless Steel Enclosures add 20%</i>						
	Enclosed 600 Volt Overload Relays						
	NEMA 1 Enclosure 600 Volt						
	15 Amp NEMA 00		2.00	2.50	3.00		E
	20 Amp NEMA 00		2.25	2.81	3.38		E
	25 Amp NEMA 00		2.50	3.13	3.75		E
	30 Amp NEMA 00		3.00	3.75	4.50		E
	40 Amp NEMA 0		3.50	4.38	5.25		E
	50 Amp NEMA 1		4.00	5.00	6.00		E
	60 Amp NEMA 2		5.00	6.25	7.50		E
	80 Amp NEMA 3		6.00	7.50	9.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	Fuse Installation in Fused Switch in Safety Switches and MCC's - Cartridge Fuse (250 V or 600V)						
	1 Amp to 100 Amp		0.04	0.05	0.06		E
	110 Amp to 200 Amp		0.10	0.13	0.15		E
	210 Amp to 400 Amp		0.17	0.21	0.26		E
	410 Amp to 600 Amp		0.20	0.25	0.30		E
	Bolt-On Fuse 600V						
	600 Amp - 1800 Amp		0.30	0.38	0.45		E
	2000 Amp - 6000 Amp		0.50	0.63	0.75		E
	Fuse Reducers		0.15	0.19	0.23		E
	Fuse Cabinet		1.00	1.25	1.50		E

Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Meter Center NEMA 1 & 3R (Typ) Enclosure						
	3 Wire Solid Neutral MLO or Tap Box Module						
	400 Amp		16.00	20.00	24.00		E
	600 Amp		18.00	22.50	27.00		E
	800 Amp		21.00	26.25	31.50		E
	1000 Amp		24.00	30.00	36.00		E
	1200 Amp		28.00	35.00	42.00		E
	1600 Amp		32.00	40.00	48.00		E
	2000 Amp		36.00	45.00	54.00		E
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	Meter Center NEMA 1 & 3R (Typ) Enclosure						
	3 Wire Solid Neutral Main Circuit Breaker or Fused Switch						
	400 Amp		20.00	25.00	30.00		E
	600 Amp		22.00	27.50	33.00		E
	800 Amp		25.00	31.25	37.50		E
	1000 Amp		28.00	35.00	42.00		E
	1200 Amp		32.00	40.00	48.00		E
	1600 Amp		36.00	45.00	54.00		E
	2000 Amp		40.00	50.00	60.00		E
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	Meter Center NEMA 1 & 3R (Typ) Enclosure						
	4 Wire Solid Neutral MLO or Tap Box Module						
	400 Amp		18.00	22.50	27.00		E
	600 Amp		20.00	25.00	30.00		E
	800 Amp		23.00	28.75	34.50		E
	1000 Amp		26.00	32.50	39.00		E
	1200 Amp		30.00	37.50	45.00		E
	1600 Amp		34.00	42.50	51.00		E
	2000 Amp		38.00	47.50	57.00		E
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	Meter Center NEMA 1 & 3R (Typ) Enclosure						
	4 Wire Solid Neutral Main Circuit Breaker or Fused Switch						
	400 Amp		22.00	27.50	33.00		E
	600 Amp		24.00	30.00	36.00		E
	800 Amp		28.00	35.00	42.00		E
	1000 Amp		32.00	40.00	48.00		E
	1200 Amp		36.00	45.00	54.00		E
	1600 Amp		40.00	50.00	60.00		E
	2000 Amp		44.00	55.00	66.00		E
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	Meter Center NEMA 1 & 3R Single Phase						
	125 Amp Meter Socket Modules						
	2 Meters		4.00	5.00	6.00		E
	3 Meters		4.60	5.75	6.90		E
	4 Meters		5.20	6.50	7.80		E
	5 Meters		6.00	7.50	9.00		E
	6 Meters		6.80	8.50	10.20		E
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	Meter Center NEMA 1 & 3R Single Phase						
	200 Amp Meter Socket Modules						
	2 Meters		4.40	5.50	6.60		E
	3 Meters		5.00	6.25	7.50		E
	4 Meters		5.60	7.00	8.40		E
	5 Meters		6.40	8.00	9.60		E
	6 Meters		7.25	9.06	10.88		E
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	Meter Center NEMA 1 & 3R Three Phase						
	125 Amp Meter Socket Modules						
	2 Meters		4.80	6.00	7.20		E
	3 Meters		5.20	6.50	7.80		E
	4 Meters		5.80	7.25	8.70		E
	5 Meters		6.60	8.25	9.90		E
	6 Meters		7.75	9.69	11.63		E
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						

Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Meter Center NEMA 1 & 3R Three Phase						
	200 Amp Meter Socket Modules						
	2 Meters		5.20	6.50	7.80		E
	3 Meters		5.60	7.00	8.40		E
	4 Meters		6.20	7.75	9.30		E
	5 meters		7.00	8.75	10.50		E
	6 Meters		7.95	9.94	11.93		E
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	240/120 Volt Meter Socket						
	100 Amp 240/120 Volt Meter Socket		2.25	2.81	3.38		E
	200 Amp 240/120 Volt Meter Socket		3.25	4.06	4.88		E
	400 Amp 240/120 Volt Meter Socket		8.50	10.63	12.75		E
	PT/CT Components						
	36 x 36 PT/CT Cabinet		3.50	4.38	5.25		E
	40 x 48 PT/CT Cabinet		4.00	5.00	6.00		E
	Meter Socket PT/CT Rated		3.50	4.38	5.25		E
	240/120 Volt Meter Socket						
	100 Amp 240/120 Volt Meter Socket		2.25	2.81	3.38		E
	200 Amp 240/120 Volt Meter Socket		3.25	4.06	4.88		E
	400 Amp 240/120 Volt Meter Socket		8.50	10.63	12.75		E
	PT/CT Components						
	36 x 36 PT/CT Cabinet		3.50	4.38	5.25		E
	40 x 48 PT/CT Cabinet		4.00	5.00	6.00		E
	Meter Socket PT/CT Rated		3.50	4.38	5.25		E
	Fire Pump Controller, Free Standing NEMA 1 Enclosure						
	208 to 240 Volt Full Voltage Starting						
	25 HP - Full Voltage Starting		10.00	12.50	15.00		E
	50 HP - Full Voltage Starting		12.00	15.00	18.00		E
	75 HP - Full Voltage Starting		15.00	18.75	22.50		E
	100 HP - Full Voltage Starting		19.00	23.75	28.50		E
	150 HP - Full Voltage Starting		24.00	30.00	36.00		E
	200 HP - Full Voltage Starting		30.00	37.50	45.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%</i>						
	<i>For NEMA 12 Add 20%</i>						
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	Fire Pump Controller, Free Standing NEMA 1 Enclosure						
	208 to 240 Volt Part Winding Starting						
	25 HP - Part Winding Starting		12.00	15.00	18.00		E
	50 HP - Part Winding Starting		15.00	18.75	22.50		E
	75 HP - Part Winding Starting		18.00	22.50	27.00		E
	100 HP - Part Winding Starting		23.00	28.75	34.50		E
	150 HP - Part Winding Starting		29.00	36.25	43.50		E
	200 HP - Part Winding Starting		36.00	45.00	54.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%</i>						
	<i>For NEMA 12 Add 20%</i>						
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	Fire Pump Controller, Free Standing NEMA 1 Enclosure						
	208 to 240 Wye Delta Starting						
	25 HP - Wye Delta Starting		13.00	16.25	19.50		E
	50 HP - Wye Delta Starting		16.00	20.00	24.00		E
	75 HP - Wye Delta Starting		20.00	25.00	30.00		E
	100 HP - Wye Delta Starting		26.00	32.50	39.00		E
	150 HP - Wye Delta Starting		33.00	41.25	49.50		E
	200 HP - Wye Delta Starting		40.00	50.00	60.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%</i>						
	<i>For NEMA 12 Add 20%</i>						
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	Fire Pump Controller, Free Standing NEMA 1 Enclosure						
	208 to 240 Volt Reduced Voltage Starting						
	25 HP - Reduced Voltage Starting		16.00	20.00	24.00		E
	50 HP - Reduced Voltage Starting		21.00	26.25	31.50		E
	75 HP - Reduced Voltage Starting		26.00	32.50	39.00		E
	100 HP - Reduced Voltage Starting		33.00	41.25	49.50		E
	150 HP - Reduced Voltage Starting		40.00	50.00	60.00		E
	200 HP - Reduced Voltage Starting		48.00	60.00	72.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%</i>						
	<i>For NEMA 12 Add 20%</i>						
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	Fire Pump Controller, Free Standing NEMA 1 Enclosure						
	208 to 240 Volt Reduced Voltage Starting						
	25 HP - Reduced Voltage Starting		16.00	20.00	24.00		E
	50 HP - Reduced Voltage Starting		21.00	26.25	31.50		E
	75 HP - Reduced Voltage Starting		26.00	32.50	39.00		E
	100 HP - Reduced Voltage Starting		33.00	41.25	49.50		E
	150 HP - Reduced Voltage Starting		40.00	50.00	60.00		E
	200 HP - Reduced Voltage Starting		48.00	60.00	72.00		E
	<i>Note: These labor Units Apply to NEMA 1 Enclosures Only</i>						
	<i>For NEMA 3R Add 10%</i>						
	<i>For NEMA 12 Add 20%</i>						
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						

Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Fire Pump Controller, Free Standing NEMA 1 Enclosure						
	380 to 600 Volt Full Voltage Starting						
	25 HP - Full Voltage Starting		7.00	8.75	10.50		E
	50 HP - Full Voltage Starting		9.00	11.25	13.50		E
	75 HP - Full Voltage Starting		11.00	13.75	16.50		E
	100 HP - Full Voltage Starting		14.00	17.50	21.00		E
	150 HP - Full Voltage Starting		18.00	22.50	27.00		E
	200 HP - Full Voltage Starting		22.00	27.50	33.00		E
	Note: These labor Units Apply to NEMA 1 Enclosures Only						
	For NEMA 3R Add 10%						
	For NEMA 12 Add 20%						
	Note: Labor Units Do Not Include						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	Fire Pump Controller, Free Standing NEMA 1 Enclosure						
	380 to 600 Volt Part Winding Starting						
	25 HP - Part Winding Starting		9.00	11.25	13.50		E
	50 HP - Part Winding Starting		11.00	13.75	16.50		E
	75 HP - Part Winding Starting		14.00	17.50	21.00		E
	100 HP - Part Winding Starting		18.00	22.50	27.00		E
	150 HP - Part Winding Starting		22.00	27.50	33.00		E
	200 HP - Part Winding Starting		27.00	33.75	40.50		E
	Note: These labor Units Apply to NEMA 1 Enclosures Only						
	For NEMA 3R Add 10%						
	For NEMA 12 Add 20%						
	Note: Labor Units Do Not Include						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	Fire Pump Controller, Free Standing NEMA 1 Enclosure						
	380 to 600 Volt Wye Delta Starting						
	25 HP - Wye Delta Starting		10.00	12.50	15.00		E
	50 HP - Wye Delta Starting		13.00	16.25	19.50		E
	75 HP - Wye Delta Starting		16.00	20.00	24.00		E
	100 HP - Wye Delta Starting		20.00	25.00	30.00		E
	150 HP - Wye Delta Starting		25.00	31.25	37.50		E
	200 HP - Wye Delta Starting		30.00	37.50	45.00		E
	Note: These labor Units Apply to NEMA 1 Enclosures Only						
	For NEMA 3R Add 10%						
	For NEMA 12 Add 20%						
	Note: Labor Units Do Not Include						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	Fire Pump Controller, Free Standing NEMA 1 Enclosure						
	380 to 600 Volt Reduced Voltage Starting						
	25 HP - Reduced Voltage Starting		13.00	16.25	19.50		E
	50 HP - Reduced Voltage Starting		16.00	20.00	24.00		E
	75 HP - Reduced Voltage Starting		20.00	25.00	30.00		E
	100 HP - Reduced Voltage Starting		26.00	32.50	39.00		E
	150 HP - Reduced Voltage Starting		33.00	41.25	49.50		E
	200 HP - Reduced Voltage Starting		40.00	50.00	60.00		E
	Note: These labor Units Apply to NEMA 1 Enclosures Only						
	For NEMA 3R Add 10%						
	For NEMA 12 Add 20%						
	Note: Labor Units Do Not Include						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						

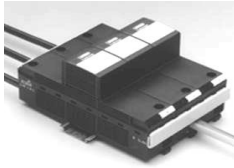


Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Transformers Outdoor Type Up to 15 KV Primary, Unload, Inspect and Handling Labor Only						
25 KVA		6.00	7.50	9.00		E
50 KVA		7.00	8.75	10.50		E
75 KVA		8.00	10.00	12.00		E
100 KVA		9.00	11.25	13.50		E
150 KVA		10.00	12.50	15.00		E
200 KVA		11.00	13.75	16.50		E
225 KVA		12.00	15.00	18.00		E
250 KVA		13.00	16.25	19.50		E
300 KVA		14.00	17.50	21.00		E
400 KVA		15.00	18.75	22.50		E
500 KVA		16.00	20.00	24.00		E
600 KVA		18.00	22.50	27.00		E
750 KVA		20.00	25.00	30.00		E
1000 KVA		22.00	27.50	33.00		E
1500 KVA		24.00	30.00	36.00		E
2000 KVA		26.00	32.50	39.00		E
2500 KVA		29.00	36.25	43.50		E
3000 KVA		32.00	40.00	48.00		E
Note: Labor Units Do Not Include						
1) Housekeeping Pad						
2) Vibration Isolator						
3) Seismic Supports						
4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						
Transformers Indoor Type Up to 15 KV Primary, Unload, Inspect and Handling Labor Only						
25 KVA		14.00	17.50	21.00		E
50 KVA		16.00	20.00	24.00		E
75 KVA		18.00	22.50	27.00		E
100 KVA		20.00	25.00	30.00		E
150 KVA		24.00	30.00	36.00		E
200 KVA		28.00	35.00	42.00		E
225 KVA		32.00	40.00	48.00		E
250 KVA		36.00	45.00	54.00		E
300 KVA		40.00	50.00	60.00		E
400 KVA		44.00	55.00	66.00		E
500 KVA		48.00	60.00	72.00		E
600 KVA		52.00	65.00	78.00		E
750 KVA		56.00	70.00	84.00		E
1000 KVA		60.00	75.00	90.00		E
1500 KVA		65.00	81.25	97.50		E
2000 KVA		70.00	87.50	105.00		E
2500 KVA		75.00	93.75	112.50		E
3000 KVA		80.00	100.00	120.00		E
Note: Labor Units Do Not Include						
1) Housekeeping Pad						
2) Vibration Isolator						
3) Seismic Supports						
4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						
Transformers Indoor Type Up to 600 V Primary, Unload, Inspect and Handling Labor Only						
10 KVA		4.00	6.00	8.00		E
15 KVA		6.00	8.00	10.00		E
25 KVA		8.00	10.00	12.00		E
37.5 KVA		9.00	11.00	13.00		E
45 KVA		10.00	12.00	15.00		E
50 KVA		10.00	12.50	15.00		E
75 KVA		12.00	15.00	18.00		E
100 KVA		14.00	17.50	21.00		E
150 KVA		16.00	20.00	24.00		E
167.5 KVA		17.00	21.00	25.00		E
200 KVA		18.00	22.50	27.00		E
225 KVA		20.00	25.00	30.00		E
250 KVA		22.00	27.50	33.00		E
300 KVA		24.00	30.00	36.00		E
400 KVA		28.00	35.00	42.00		E
500 KVA		32.00	40.00	48.00		E
600 KVA		36.00	45.00	54.00		E
750 KVA		40.00	50.00	60.00		E
1000 KVA		45.00	56.25	67.50		E
1500 KVA		50.00	62.50	75.00		E
2000 KVA		55.00	68.75	82.50		E
2500 KVA		60.00	75.00	90.00		E
3000 KVA		66.00	82.50	99.00		E
Note: Labor Units Do Not Include						
1) Housekeeping Pad						
2) Vibration Isolator						
3) Seismic Supports						
4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						

Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Transformers Single Phase Floor Mounted						
	Up to 600 V Primary - Install & Connect						
	15 KVA		8.00	10.00	12.00		E
	25 KVA		9.00	11.25	13.50		E
	37 1/2 KVA		10.00	12.50	15.00		E
	50 KVA		11.00	13.75	16.50		E
	75 KVA		12.00	15.00	18.00		E
	100 KVA		14.00	17.50	21.00		E
	150 KVA		16.00	20.00	24.00		E
	167 KVA		18.00	22.50	27.00		E
	200 KVA		20.00	25.00	30.00		E
	225 KVA		22.00	27.50	33.00		E
	250 KVA		24.00	30.00	36.00		E
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						
	Transformers Three Phase Floor Mounted						
	Up to 600 V Primary - Install & Connect						
	15 KVA		9.00	11.25	13.50		E
	25 KVA		10.00	12.50	15.00		E
	30 KVA		11.00	13.75	16.50		E
	37 1/2 KVA		12.00	15.00	18.00		E
	45 KVA		13.00	16.25	19.50		E
	50 KVA		14.00	17.50	21.00		E
	75 KVA		15.00	18.75	22.50		E
	100 KVA		16.00	20.00	24.00		E
	112 1/2 KVA		18.00	22.50	27.00		E
	150 KVA		20.00	25.00	30.00		E
	200 KVA		22.00	27.50	33.00		E
	225 KVA		25.00	31.25	37.50		E
	250 KVA		28.00	35.00	42.00		E
	300 KVA		31.00	38.75	46.50		E
	400 KVA		34.00	42.50	51.00		E
	500 KVA		38.00	47.50	57.00		E
	600 KVA		42.00	52.50	63.00		E
	750 KVA		46.00	57.50	69.00		E
	1000 KVA		50.00	62.50	75.00		E
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						
							
	Transformers Single Phase Wall Mounted						
	Up to 600 V Primary - Install & Connect						
	1/2 KVA		4.00	5.00	6.00		E
	3/4 KVA		4.20	5.25	6.30		E
	1 KVA		4.40	5.50	6.60		E
	1 1/2 KVA		4.60	5.75	6.90		E
	2 KVA		5.00	6.25	7.50		E
	3 KVA		5.40	6.75	8.10		E
	5 KVA		6.00	7.50	9.00		E
	7 1/2 KVA		7.00	8.75	10.50		E
	10 KVA		8.00	10.00	12.00		E
	15 KVA		10.00	12.50	15.00		E
	25 KVA		12.00	15.00	18.00		E
	<i>Note: Labor Units Do Not Include</i>						
	1) Fabrication of Wall Bracket						
	2) Vibration Isolation						
	3) Seismic Bracing						
	4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						
							
	Transformers Three Phase Wall Mounted						
	Up to 600 V Primary - Install & Connect						
	1 KVA		5.00	6.25	7.50		E
	2 KVA		5.50	6.88	8.25		E
	3 KVA		6.00	7.50	9.00		E
	6 KVA		7.00	8.75	10.50		E
	9 KVA		8.00	10.00	12.00		E
	15 KVA		10.00	12.50	15.00		E
	25 KVA		12.00	15.00	18.00		E
	30 KVA		14.00	17.50	21.00		E
	45 KVA		16.00	20.00	24.00		E
	50 KVA		18.00	22.50	27.00		E
	60 KVA		20.00	25.00	30.00		E
	<i>Note: Labor Units Do Not Include</i>						
	1) Fabrication of Wall Bracket						
	2) Vibration Isolation						
	3) Seismic Bracing						
	4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						

Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Transformer Lightning Arrestors - Install and Terminate						
	3 KV		4.00	5.00	6.00		E
	6 KV		4.20	5.25	6.30		E
	9 KV		4.40	5.50	6.60		E
	12 KV		4.60	5.75	6.90		E
	15 KV		4.80	6.00	7.20		E
	20 KV		5.00	6.25	7.50		E
	25 KV		5.20	6.50	7.80		E
	30 KV		5.40	6.75	8.10		E
	35 KV		5.60	7.00	8.40		E
	40 KV		6.00	7.50	9.00		E
	50 KV		6.50	8.13	9.75		E
	60 KV		7.00	8.75	10.50		E
	70 KV		7.50	9.38	11.25		E
	80 KV		8.00	10.00	12.00		E
	90 KV		8.50	10.63	12.75		E
	100 KV		9.00	11.25	13.50		E
	120 KV		10.00	12.50	15.00		E
	140 KV		11.00	13.75	16.50		E
	160 KV		12.00	15.00	18.00		E
	180 KV		13.00	16.25	19.50		E
	200 KV		14.00	17.50	21.00		E
	250 KV		16.00	20.00	24.00		E
	300 KV		18.00	22.50	27.00		E
	Flexible Steel Conduit 30" to 60" Long - Attached to Transformers						
	3/4"		1.00	1.25	1.50		E
	1"		1.10	1.38	1.65		E
	1 1/4"		1.20	1.50	1.80		E
	1 1/2"		1.30	1.63	1.95		E
	2"		1.40	1.75	2.10		E
	2 1/2"		2.00	2.50	3.00		E
	3"		2.25	2.81	3.38		E
	3 1/2"		3.50	4.38	5.25		E
	4"		3.75	4.69	5.63		E
	Liquid-Tight Steel Conduit 30" to 60" Long - Attached to Transformers						
	3/4"		1.50	1.88	2.25		E
	1"		1.60	2.00	2.40		E
	1 1/4"		1.70	2.13	2.55		E
	1 1/2"		1.80	2.25	2.70		E
	2"		1.90	2.38	2.85		E
	2 1/2"		2.25	2.81	3.38		E
	3"		2.50	3.13	3.75		E
	3 1/2"		3.75	4.69	5.63		E
	4"		4.00	5.00	6.00		E
	Flexible Braid Connectors						
	Up to 100 Amp		1.00	1.25	1.50		E
	200 Amp		1.10	1.38	1.65		E
	300 Amp		1.20	1.50	1.80		E
	500 Amp		1.35	1.69	2.03		E
	800 Amp		1.50	1.88	2.25		E
	1000 Amp		1.75	2.19	2.63		E
	1600 Amp		2.00	2.50	3.00		E
	208 & 240 Volt 3 Phase Power Capacitors - Install and Terminate						
	2 KVAR		3.00	3.75	4.50		E
	4 KVAR		3.20	4.00	4.80		E
	6 KVAR		3.50	4.38	5.25		E
	8 KVAR		3.70	4.63	5.55		E
	10 KVAR		4.00	5.00	6.00		E
	12 KVAR		4.50	5.63	6.75		E
	15 KVAR		5.00	6.25	7.50		E
	20 KVAR		6.00	7.50	9.00		E
	25 KVAR		7.00	8.75	10.50		E
	30 KVAR		8.00	10.00	12.00		E
	35 KVAR		9.00	11.25	13.50		E
	40 KVAR		10.00	12.50	15.00		E
	50 KVAR		11.00	13.75	16.50		E
	60 KVAR		12.00	15.00	18.00		E
	70 KVAR		13.00	16.25	19.50		E
	80 KVAR		14.00	17.50	21.00		E
	90 KVAR		15.00	18.75	22.50		E
	100 KVAR		16.00	20.00	24.00		E
	110 KVAR		17.00	21.25	25.50		E
	125 KVAR		18.00	22.50	27.00		E
	150 KVAR		20.00	25.00	30.00		E

A grey metal electrical control box, likely a motor starter or relay, with a black handle on the right side. The box has a label on the front door and a small black label at the top left. The handle has a vertical switch mechanism with 'ON' and 'OFF' markings.

Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

4



Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Manual Transfer Switch: Enclosed						
600 Volt 4 Pole Double Throw Wall Mounted						
100 Amp		7.00	8.75	10.50		E
150 Amp		8.00	10.00	12.00		E
225 Amp		9.00	11.25	13.50		E
260 Amp		10.00	12.50	15.00		E
400 Amp		13.00	16.25	19.50		E
600 Amp		16.00	20.00	24.00		E
800 Amp		20.00	25.00	30.00		E
1000 Amp (Free Standing Only)		26.00	32.50	39.00		E
1200 Amp (Free Standing Only)		28.00	35.00	42.00		E
1600 Amp (Free Standing Only)		32.00	40.00	48.00		E
2000 Amp (Free Standing Only)		36.00	45.00	54.00		E
3000 Amp (Free Standing Only)		44.00	55.00	66.00		E
4000 Amp (Free Standing Only)		52.00	65.00	78.00		E
Note: These labor Units Apply to NEMA 1 Enclosures Only						
For NEMA 3R Add 10%						
For NEMA 12 Add 20%						
Note: Labor Units Do Not Include						
1) Housekeeping Pad						
2) Vibration Isolator						
3) Seismic Supports						
4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						
Automatic Transfer Switch: Enclosed						
600 Volt 2 Pole Double Throw Wall Mounted						
100 Amp		6.00	7.50	9.00		E
150 Amp		7.00	8.75	10.50		E
225 Amp		8.00	10.00	12.00		E
260 Amp		9.00	11.25	13.50		E
400 Amp		11.00	13.75	16.50		E
600 Amp		13.00	16.25	19.50		E
800 Amp		16.00	20.00	24.00		E
1000 Amp (Free Standing Only)		22.00	27.50	33.00		E
1200 Amp (Free Standing Only)		24.00	30.00	36.00		E
1600 Amp (Free Standing Only)		27.00	33.75	40.50		E
2000 Amp (Free Standing Only)		32.00	40.00	48.00		E
Note: These labor Units Apply to NEMA 1 Enclosures Only						
For NEMA 3R Add 10%						
For NEMA 12 Add 20%						
Note: Labor Units Do Not Include						
1) Housekeeping Pad						
2) Vibration Isolator						
3) Seismic Supports						
4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						
Automatic Transfer Switch: Enclosed						
600 Volt 3 Pole Double Throw Wall Mounted						
225 Amp		9.00	11.25	13.50		E
260 Amp		10.00	12.50	15.00		E
400 Amp		12.00	15.00	18.00		E
600 Amp		15.00	18.75	22.50		E
800 Amp		18.00	22.50	27.00		E
1000 Amp (Free Standing Only)		24.00	30.00	36.00		E
1200 Amp (Free Standing Only)		26.00	32.50	39.00		E
1600 Amp (Free Standing Only)		30.00	37.50	45.00		E
2000 Amp (free standing only)		34.00	42.50	51.00		E
3000 Amp (Free Standing Only)		42.00	52.50	63.00		E
4000 Amp (Free Standing Only)		50.00	62.50	75.00		E
Note: These labor Units Apply to NEMA 1 Enclosures Only						
For NEMA 3R Add 10%						
For NEMA 12 Add 20%						
Note: Labor Units Do Not Include						
1) Housekeeping Pad						
2) Vibration Isolator						
3) Seismic Supports						
4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						
Automatic Transfer Switch: Enclosed						
600 Volt 4 Pole Double Throw Wall Mounted						
100 Amp		8.00	10.00	12.00		E
150 Amp		9.00	11.25	13.50		E
225 Amp		10.00	12.50	15.00		E
260 Amp		12.00	15.00	18.00		E
400 Amp		14.00	17.50	21.00		E
600 Amp		18.00	22.50	27.00		E
800 Amp		22.00	27.50	33.00		E
1000 Amp (Free Standing Only)		28.00	35.00	42.00		E
1200 Amp (free standing only)		31.00	38.75	46.50		E
1600 Amp (Free Standing Only)		35.00	43.75	52.50		E
2000 Amp (Free Standing Only)		40.00	50.00	60.00		E
3000 Amp (Free Standing Only)		50.00	62.50	75.00		E
4000 Amp (Free Standing Only)		60.00	75.00	90.00		E
Note: These labor Units Apply to NEMA 1 Enclosures Only						
For NEMA 3R Add 10%						
For NEMA 12 Add 20%						
Note: Labor Units Do Not Include						
1) Housekeeping Pad						
2) Vibration Isolator						
3) Seismic Supports						
4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						

4

4

Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

4

Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Generator Sets						
Items to consider when generator sets are outdoors:						
1) Concrete curb or pad						
2) Structural engineering drawings						
3) Unload/Unpack Unit and Accessories						
4) Rigging and setting in place						
5) Bolt and Shim in place						
6) Remove Annunciator Panel						
7) Fuel						
8) Fuel Tank and Fuel Piping						
9) Exhaust System						
10) Load Testing						
11) Commissioning						
Items to consider when generator sets are indoors:						
1) Hoisting to Basement or Penthouse						
2) All above items relating to outdoor units						
3) Fuel Tank Fill, Vent and Fuel Piping						
4) Exhaust Piping to Exterior						
5) Ductwork and Dampers for Intake, Exhaust and Combustion Air						
Emergency Generator & 2-Source Auto Transfer Switch in Single Enclosure - 208 Volt Service						
260 Amp		20.00	25.00	30.00		E
400 Amp		22.00	27.50	33.00		E
600 Amp		24.00	30.00	36.00		E
800 Amp		26.00	32.50	39.00		E
1000 Amp		28.00	35.00	42.00		E
1200 Amp		30.00	37.50	45.00		E
Note: Labor Units Do Not Include						
1) Housekeeping Pad						
2) Vibration Isolator						
3) Seismic Supports						
4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						
Emergency Generator & 2-Source Auto Transfer Switch in Single Enclosure - 220 Volt Service						
260 Amp		19.00	23.75	28.50		E
400 Amp		21.00	26.25	31.50		E
600 Amp		23.00	28.75	34.50		E
800 Amp		25.00	31.25	37.50		E
1000 Amp		27.00	33.75	40.50		E
1200 Amp		29.00	36.25	43.50		E
Note: Labor Units Do Not Include						
1) Housekeeping Pad						
2) Vibration Isolator						
3) Seismic Supports						
4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						
Emergency Generator & 2-Source Auto Transfer Switch in Single Enclosure - 480 Volt Service						
260 Amp		18.00	22.50	27.00		E
400 Amp		20.00	25.00	30.00		E
600 Amp		22.00	27.50	33.00		E
800 Amp		24.00	30.00	36.00		E
1000 Amp		26.00	32.50	39.00		E
1200 Amp		28.00	35.00	42.00		E
Note: Labor Units Do Not Include						
1) Housekeeping Pad						
2) Vibration Isolator						
3) Seismic Supports						
4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						
Emergency Generator & 2-Source Auto Transfer Switch in Single Enclosure - 600 Volt Service						
260 Amp		17.00	21.25	25.50		E
400 Amp		19.00	23.75	28.50		E
600 Amp		21.00	26.25	31.50		E
800 Amp		23.00	28.75	34.50		E
1000 Amp		25.00	31.25	37.50		E
1200 Amp		27.00	33.75	40.50		E
Note: Labor Units Do Not Include						
1) Housekeeping Pad						
2) Vibration Isolator						
3) Seismic Supports						
4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						

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Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Emergency Generator & 3-Source Auto Transfer Switch in Four Enclosures - 480 Volt Service						
	260 Amp		56.00	70.00	84.00		E
	400 Amp		61.00	76.25	91.50		E
	600 Amp		66.00	82.50	99.00		E
	800 Amp		72.00	90.00	108.00		E
	1000 Amp		78.00	97.50	117.00		E
	1200 Amp		86.00	107.50	129.00		E
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						
	Emergency Generator & 3-Source Auto Transfer Switch in Four Enclosures - 600 Volt Service						
	260 Amp		54.00	67.50	81.00		E
	400 Amp		59.00	73.75	88.50		E
	600 Amp		64.00	80.00	96.00		E
	800 Amp		70.00	87.50	105.00		E
	1000 Amp		76.00	95.00	114.00		E
	1200 Amp		84.00	105.00	126.00		E
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						
	Emergency Generator Fused 2-Pole Switch Distribution Section in Single Enclosure						
	200 Amp		12.00	15.00	18.00		E
	260 Amp		13.00	16.25	19.50		E
	400 Amp		14.00	17.50	21.00		E
	600 Amp		15.00	18.75	22.50		E
	800 Amp		16.00	20.00	24.00		E
	1200 Amp		20.00	25.00	30.00		E
	1600 Amp		22.00	27.50	33.00		E
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						
	Emergency Generator Fused 3-Pole Switch Distribution Section in Single Enclosure						
	200 Amp		14.00	17.50	21.00		E
	260 Amp		15.00	18.75	22.50		E
	400 Amp		16.00	20.00	24.00		E
	600 Amp		17.00	21.25	25.50		E
	800 Amp		19.00	23.75	28.50		E
	1000 Amp		21.00	26.25	31.50		E
	1200 Amp		23.00	28.75	34.50		E
	1600 Amp		25.00	31.25	37.50		E
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						
	Emergency Generator Fused 4-Pole Switch Distribution Section in Single Enclosure						
	200 Amp		16.00	20.00	24.00		E
	260 Amp		17.00	21.25	25.50		E
	400 Amp		18.00	22.50	27.00		E
	600 Amp		19.00	23.75	28.50		E
	800 Amp		21.00	26.25	31.50		E
	1000 Amp		23.00	28.75	34.50		E
	1200 Amp		25.00	31.25	37.50		E
	1600 Amp		28.00	35.00	42.00		E
	<i>Note: Labor Units Do Not Include</i>						
	1) Housekeeping Pad						
	2) Vibration Isolator						
	3) Seismic Supports						
	4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						

4

4

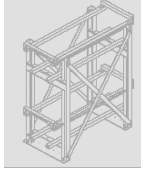
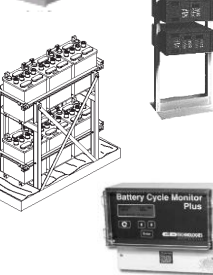
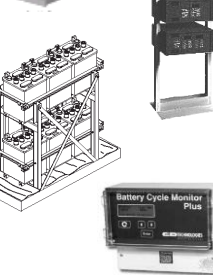
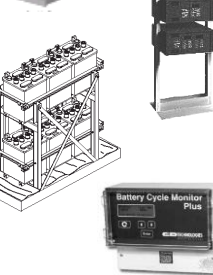
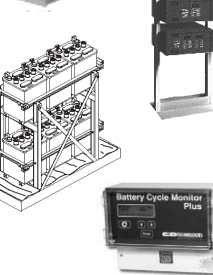
Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Generator w/o Fuel Tank - Over 60KW						
	70 KW		21.00	26.25	31.50		E
	75 KW		23.00	28.75	34.50		E
	85 KW		25.00	31.25	37.50		E
	90 KW		26.50	33.13	39.75		E
	100 KW		27.50	34.38	41.25		E
	115 KW		30.00	37.50	45.00		E
	125 KW		31.00	38.75	46.50		E
	150 KW		32.50	40.63	48.75		E
	170 KW		33.50	41.88	50.25		E
	175 KW		34.00	42.50	51.00		E
	200 KW		34.50	43.13	51.75		E
	230 KW		35.00	43.75	52.50		E
	250 KW		36.00	45.00	54.00		E
	300 KW		38.00	47.50	57.00		E
	350 KW		41.50	51.88	62.25		E
	400 KW		43.50	54.38	65.25		E
	450 KW		45.00	56.25	67.50		E
	500 KW		46.00	57.50	69.00		E
	600 KW		48.00	60.00	72.00		E
	750 KW		52.00	65.00	78.00		E
	900 KW		60.00	75.00	90.00		E
	1000 KW		68.50	85.63	102.75		E
	<i>Items to consider when generator sets are outdoors:</i>						
	1) Concrete curb or pad						
	2) Structural engineering drawings						
	3) Unload/Unpack Unit and Accessories						
	4) Rigging and setting in place						
	5) Bolt and Shim in place						
	6) Remove Annunciator Panel						
	7) Fuel						
	8) Fuel Tank and Fuel Piping						
	9) Exhaust System						
	10) Load Testing						
	11) Commissioning						
	<i>Items to consider when generator sets are indoors:</i>						
	1) Hoisting to Basement or Penthouse						
	2) All above items relating to outdoor units						
	3) Fuel Tank Fill, Vent and Fuel Piping						
	4) Exhaust Piping to Exterior						
	5) Ductwork and Dampers for Intake, Exhaust and Combustion Air						
	Generator Accessories - Install & Terminate						
	Generator Battery Rack		1.20	1.50	1.80		E
	Generator Battery Charger		1.20	1.50	1.80		E
	Controls						
	Generator Control Panel		14.40	18.00	21.60		E
	Generator Remote Annunciator		1.80	2.25	2.70		E
	Generator Fuel Gauge Connect		1.20	1.50	1.80		E
	Remote Fuel Indicator		1.20	1.50	1.80		E
	Generator Muffler		2.40	3.00	3.60		E
	Generator Flexible Exhaust Pipe		0.24	0.30	0.36		E
	Generator Exhaust Rain Cap		0.24	0.30	0.36		E
	Insulate Exhaust		1.20	1.50	1.80		E
	Muffler Hanger		1.20	1.50	1.80		E
	Water Radiator						
	Generator Remote Radiator		1.80	2.25	2.70		E
	Generator Flex Radiator Adapter		0.60	0.75	0.90		E
	Generator Louver/Radiator Duct		1.50	1.88	2.25		E
	Generator Louver Electrical Connect		0.60	0.75	0.90		E
	Generator Wall Louver Connect		0.60	0.75	0.90		E
	Generator Block Heater Connect		0.15	0.19	0.23		E
	Miscellaneous						
	WP Generator Housing		7.20	9.00	10.80		E
	Form Lumber for Generator Pad		3.60	4.50	5.40		E
	Generator Anchor Bolts		0.06	0.08	0.09		E
	Generator Vibration Isolators		2.40	3.00	3.60		E
	Test Generator		1.20	1.50	1.80		E
	Fuel for Testing		1.20	1.50	1.80		E
	Test Fuel Piping		3.60	4.50	5.40		E
	55 Gal Fuel Tank Installation		2.40	3.00	3.60		E
	75 - 500 Gal Fuel Tank Installation		5.20	6.50	7.80		E
	650 - 1000 Gal Fuel Tank Installation		9.60	12.00	14.40		E
	1000 - 1500 Gal Fuel Tank Installation		12.00	15.00	18.00		E
	1500 - 2500 Gal Fuel Tank Installation		14.40	18.00	21.60		E
	3000 - 5000 Gal Fuel Tank Installation		19.20	24.00	28.80		E

Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Generator Flexible Fuel Hoses		0.30	0.38	0.45		LF
	Generator Day Tank Connect		0.60	0.75	0.90		E
	Generator Fuel Solenoid Connect		0.60	0.75	0.90		E
	Fuel Tank Hold Down Straps		0.30	0.38	0.45		E
	Fuel Tank Turnbuckle		0.30	0.38	0.45		E
	Fuel Level Mechanical Indicator		1.20	1.50	1.80		E
	TVSS Self Contained Unit - Lug Type						
	200kAIC - 120/208V - 277/480V		2.50	3.13	3.75		E
	TVSS Includes Nipples/Knock Outs/ Mounting Brackets/Terminations						
	Category B - 400 A & Less		3.00	3.75	4.50		E
	Category C - Greater Than 400 A		6.00	7.50	9.00		E
	TVSS - Serviceable Unit - Lug Type						
	16kA - 25kA - 120/208V - 277/480V		4.00	5.00	6.00		E
	32kA - 50kA - 120/208V - 277/480V		5.00	6.25	7.50		E
	60kA - 75kA - 120/208V - 277/480V		7.00	8.75	10.50		E
	1000kA - 120/208V - 277/480V		8.00	10.00	12.00		E
	TVSS - Serviceable Unit - Disconnect Type						
	16kA - 25kA - 120/208V - 277/480V		5.00	6.25	7.50		E
	32kA - 50kA - 120/208V - 277/480V		6.00	7.50	9.00		E
	60kA - 75kA - 120/208V - 277/480V		8.00	10.00	12.00		E
	1000kA - 120/208V - 277/480V		9.00	11.25	13.50		E
	EPO Emergency Power Off Systems						
	Emergency Power-Off Push button		1.00	1.25	1.50		E
	Uninterruptible Power Supply Up to 600 Volt Self Contained						
	1.0 KVA		4.00	5.00	6.00		E
	1.5 KVA		4.50	5.63	6.75		E
	2 KVA		5.00	6.25	7.50		E
	2.5 KVA		6.00	7.50	9.00		E
	3.0 KVA		7.00	8.75	10.50		E
	5.0 KVA		8.00	10.00	12.00		E
	7.5 KVA		10.00	12.50	15.00		E
	10 KVA		12.00	15.00	18.00		E
	15 KVA		16.00	20.00	24.00		E
	20 KVA		20.00	25.00	30.00		E
	30.0 KVA		26.00	32.50	39.00		E
	40.0 KVA		32.00	40.00	48.00		E
	50.0 KVA		40.00	50.00	60.00		E
	UPS Systems - Single Phase 120V						
	Up to 650 VA		1.25	1.56	1.88		E
	Up to 3000 VA		1.30	1.63	1.95		E
	UPS Systems - Three Phase 208V						
	System Control Cabinet w/o Internal Batteries						
	10 - 30KVA - 120/208V - Size 24x32x64 (up to 550 lbs)		16.00	20.00	24.00		E
	UPS Systems - Three Phase 120/208V with Internal batteries						
	10 - 15KVA - Size 24x24x64 (550 lbs) 15 Min Backup		12.00	15.00	18.00		E
	15 - 20KVA - Size 24x24x64 (700 lbs) 15 Min Backup		16.00	20.00	24.00		E
	30 KVA - Size 24x24x64 (700 lbs) 8 Min Backup		16.00	20.00	24.00		E
	UPS Systems - Three Phase System Control Cabinets - 208V or 480V (excluding MBC or Battery Cabinet)						
	30 KVA - Size 32x32x71 (Up to 2100 lbs)*		36.00	45.00	54.00		E
	40 KVA - Size 32x32x71 (Up to 2200 lbs)*		38.00	47.50	57.00		E
	50 KVA - Size 32x32x71 (Up to 2200 lbs)*		38.00	47.50	57.00		E
	65 KVA - Size 40x32x71 (Up to 2500 lbs)*		44.00	55.00	66.00		E
	80 KVA - Size 40x32x71 (Up to 2500 lbs)*		48.00	60.00	72.00		E
	100 KVA - Size 50x32x71 (Up to 3350 lbs)*		58.00	72.50	87.00		E
	130 KVA - Size 50x32x71 (Up to 3350 lbs)*		60.00	75.00	90.00		E
	UPS Systems - Three Phase Maintenance Bypass Cabinet (MBC)						
	30 - 50 KVA - Size 25x32x71 (660 lbs)		16.00	20.00	24.00		E
	65 - 80 KVA - Size 32x32x71 (750 lbs)		17.50	21.88	26.25		E
	100 - 130 KVA - Size 32x32x71 (800 lbs)		19.00	23.75	28.50		E

Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	UPS Systems - Three Phase Sealed Battery Cabinets on a maximum battery time of 30 minutes						
	30 - 50 KVA - Size 25x32x71 (2350-3000 lbs)*		40.00	50.00	60.00		E
	50 - 65 KVA - Size 25x32x71 (3000-4250 lbs)*		56.00	70.00	84.00		E
	65 - 80 KVA - Size 49x32x71 (4250-5420 lbs)*		72.00	90.00	108.00		E
	100 - 130 KVA - Size 49x32x71 (7800-8500 lbs)*		112.00	140.00	168.00		E
	*This equipment will require special handling and/or rigging equipment.						
	UPS Systems - Three Phase Single Module Systems						
	150 KVA 208V or 480V Batt. - Size 56x33x78 (Up to 3300 lbs)*		48.00	60.00	72.00		E
	225 KVA 208V or 480V Batt. - Size 56x33x78 (Up to 3800 lbs)*		56.00	70.00	84.00		E
	300 KVA 208V or 480V Batt. - Size 72x35x78 (Up to 5400 lbs)*		78.00	97.50	117.00		E
	400 KVA 208V or 480V Batt. - Size 72x35x78 (Up to 8400 lbs)*		120.00	150.00	180.00		E
	500 KVA 480V Batt. - Size 96x39x78 (Up to 8700 lbs)*		130.00	162.50	195.00		E
	750 KVA 480V Batt. - Size 120x39x78 (Up to 11800 lbs)*		176.00	220.00	264.00		E
	1000 KVA 480V Batt. - Size 177x44x82 (Up to 16500 lbs)*		240.00	300.00	360.00		E
	*This equipment will require special handling and/or rigging equipment.						
	(1) Multi-Module Systems require additional labor based on number of modules in the line-up						
	UPS Systems - Control Cabinet The System Control Cabinet (SCC) can be configured in many ways based on the number of modules in a system. This effects the size and weight of the unit. The estimator has to evaluate the system being installed from the information provided and determine the labor hours accordingly. (To Be Determined)						
	Battery Spacesaver System Set & bolt 3-wide Base Mounting Plate		1.50	1.88	2.25		E
	Set single 3-wide Battery Pallet (Weight 750lbs) including unpacking, terminal polishing and interconnecting *		5.40	6.75	8.10		E
	3- Wide Pallets are stackable up to (8) high						
	Accessories						
	3-wide front protective shield		0.30	0.38	0.45		E
	Top mounting plate for electronics		0.50	0.63	0.75		E
	Battery Test Kit		0.75	0.94	1.13		E
	Floor Loading Plate - For even weight distribution		1.00	1.25	1.50		E
	*Special lifting equipment is necessary						
	UPS Systems - Battery Racks Single Tier Rack - Up to 6 Batteries		3.60	4.50	5.40		E
	Note: Add 20 % additional labor for Seismic braced racks						
	UPS Systems - Wet-Cell Battery Wet Cell "Flooded" Battery Installation and conn <= 150Lbs		3.50	4.38	5.25		E
	Wet Cell "Flooded" Battery Installation and conn <= 300Lbs		4.25	5.31	6.38		E
	Wet Cell "Flooded" Battery Installation and conn <= 600Lbs		5.00	6.25	7.50		E
	Wet Cell "Flooded" Battery Installation and conn <= 700Lbs		5.50	6.88	8.25		E
	UPS Systems - Battery Disconnect Switch 1200 A		24.00	30.00	36.00		E
	1600 A		26.00	32.50	39.00		E
	2000 A		28.00	35.00	42.00		E
	2500 A		32.00	40.00	48.00		E
	UPS Systems - Battery Charging Unit - Rack Mounted Charger - Up to 12 Batteries		4.00	5.00	6.00		E
	Charger - Up to 24 Batteries		5.00	6.25	7.50		E
	Charger - Up to 48 Batteries		6.00	7.50	9.00		E
	Charger - Up to 120 Batteries		8.00	10.00	12.00		E
	UPS Systems - Spill Containment System 4" Perimeter Barrier (Floor) - up to 6 Batteries		2.50	3.13	3.75		E
	UPS Systems - Battery Cycle Monitor Battery Cycle Monitor		4.00	5.00	6.00		E

Section 4 - Switchboards, MCC's, Panelboards & Power Equipment

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	UPS Systems - Battery Monitoring System						
	Battery Monitoring Panel (for up to 256 Batteries)		8.00	10.00	12.00		E
	Voltage Sensing Lead/Cell - Install and Connect		0.75	0.94	1.13		E
	Current Sensing Lead/Cell - Install and Connect		0.75	0.94	1.13		E
	UPS Systems - Remote Status Panel						
	Remote Status Panel - Size 20"x20"x8" (48lbs)		4.00	5.00	6.00		E
	UPS Systems - Static Transfer Switches						
	100A - Size 30"x32"x77" (up to 880 lbs)		18.00	22.50	27.00		E
	300A - Size 30"x32"x77" (up to 880 lbs)		20.00	25.00	30.00		E
	400A - Size 38"x32"x77" (up to 1300 lbs)		24.00	30.00	36.00		E
	600A - Size 38"x32"x77" (up to 1300 lbs)		24.00	30.00	36.00		E
	* 800A - Size 84"x32"x77" (up to 2600 lbs)		40.00	50.00	60.00		E
	* 1000A - Size 84"x32"x77" (up to 2600 lbs)		40.00	50.00	60.00		E
	<i>*This equipment will require special handling and/or rigging equipment.</i>						
	UPS Systems - Power Distribution Units - PDU's 208/480V Input						
	15KVA - 42 Pole - Size 30x32x68 (600lbs)		16.00	20.00	24.00		E
	30KVA - 42 Pole - Size 42x32x68 (750lbs)		18.00	22.50	27.00		E
	50KVA - 84 Pole - Size 44x32x68 (900lbs)		20.00	25.00	30.00		E
	75KVA - 84 Pole - Size 44x32x68 (1100lbs)		22.00	27.50	33.00		E
	100KVA - 84 Pole - Size 44x32x68 (1325lbs)		24.00	30.00	36.00		E
	125KVA - 84 Pole - Size 44x32x68 (1500lbs)		26.00	32.50	39.00		E
	150KVA - 84 Pole - Size 44x32x68 (1750lbs)		30.00	37.50	45.00		E
	<i>Branch Circuit termination labor additional</i>						
	<i>Labor to assemble and install PDU Stand additional</i>						
	UPS Systems - Remote Distribution Cabinets - RDC's / RPP's						
	4 Section - 168 Pole - Size 24x26x78 (750 lbs)		18.00	22.50	27.00		E
	<i>Branch Circuit termination labor additional</i>						
	UPS Systems - Static Transfer Switch & PDU Combined						
	* 250KVA - Size 77x32x77 (3730 lbs)		56.00	70.00	84.00		E
	* 400KVA - Size 77x49x77 (4700 lbs)		60.00	75.00	90.00		E
	* 600KVA - Size 77x49x77 (5400 lbs)		78.00	97.50	117.00		E
	* 1200KVA - Size 97x49x77 (8400 lbs)		120.00	150.00	180.00		E
	<i>*This equipment will require special handling and/or rigging equipment.</i>						
	Emergency Power Off System						
	EPO Relay Cabinet	x	5.00	6.25	7.50		E
	EPO Pushbutton	x	1.40	1.88	2.25		E
	UPS Systems - Hydrogen Detection System						
	Gas Detection Controller N4X - Handles up to 4 heads		4.60	5.75	6.90		E
	Gas Detection Head N4X		1.80	2.25	2.70		E
	Remote Horn - NEMA 4X		1.80	2.25	2.70		E
	Remote Light - NEMA 4X		1.80	2.25	2.70		E
	Remote Horn - NEMA 1		1.00	1.25	1.50		E
	Remote Light - NEMA 1		1.00	1.25	1.50		E
	Generators - Permanent Outdoor Loadbank Units - Installed on Grade Level						
	50-150KW - Size 48x27x35 (Up to 500lbs)		20.00	25.00	30.00		E
	200-500KW - Size 69x47x52 (Up to 900lbs)		24.00	30.00	36.00		E
	* 750-1000KW - Size 40x59x138 (Up to 2000lbs)		36.00	45.00	54.00		E
	* 1500-2000KW - Size 80x59x156 (Up to 4000 lbs)		48.00	60.00	72.00		E
	* 2500-3000KW - Size 120x59x156 (Up to 6000lbs)		80.00	100.00	120.00		E
	<i>*This equipment will require special handling and/or rigging equipment.</i>						
	Generators - Portable Loadbank Units - Installed on Grade Level						
	100KW - Size 25x16x29 (Up to 300lbs)		6.00	7.50	9.00		E
	200KW - Size 47x34x52 (Up to 650lbs)		8.00	10.00	12.00		E
	400KW - Size 56x34x52 (Up to 800lbs)		12.00	15.00	18.00		E
	500-750KW - Size 61x34x75 (Up to 1150lbs)		16.00	20.00	24.00		E
	* 1000-1250KW - Size 208x93x84 w/trailer (Up to 4000lbs)		24.00	30.00	36.00		E
	* 1500-2000KW - Size 188x93x118 w/trailer (Up to 5500lbs)		24.00	30.00	36.00		E
	* 2500-3000KW - Size 208x93x118 w/trailer (Up to 7000lbs)		24.00	30.00	36.00		E
	<i>Note: (1) Portable Loadbank removal requires additional labor</i>						
	<i>(2) Cable terminations and removal requires additional labor</i>						

SECTION 5

LIGHTING FIXTURES, POLES AND PARKING LOT LIGHTING

General Information

This section includes labor units for the installation of incandescent fixtures, metal halide, multi-vapor HID indoor and outdoor fixtures, fluorescent fixtures, LED fixtures, exit fixtures, chandeliers, showroom, stage and auditorium fixtures, airport lighting fixtures and parking lot lighting.

Scope of These Labor Units

The Introduction section includes details on the scope of labor units across the manual. Some items included are:

- Material unloading, jobsite storage and delivery to the installation area
- Drawing and specification study
- Layout, measuring and marking the installation location
- Tool acquisition and return to storage
- Fixture installation
- Power and grounding conductor terminations
- Original installation of lamps and fluorescent tubes
- Cover and lens installation
- Verification of fixture operation
- Removal of shipping cartons and excess contractor furnished materials
- Normal non-productive labor

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Work Operations Not Included In These Labor Units

- Field supervision
- Hoisting above three floors
- Conduit terminations
- Cable connections
- Installation or replacement of ballasts
- Installing mounting brackets or supports
- Assembling fixtures
- Measurement and alignment more precise than normal industry standards

Labor Adjustments for Non-Typical Conditions

See the Introduction section for details.

Application Instructions

- Labor units under the “Normal” column may apply to mounting heights up to ten feet above a smooth hard floor. Labor units under the “Difficult” column may apply to mounting heights up to 12 feet. Labor units under the “Very Difficult” column may apply to mounting heights up to 20 feet.
- When ceiling mounted recessed fixtures require plaster rings, a separate labor allowance must be added for those items.
- Labor units for all indoor fixture installations are based on the use of rolling scaffolds and step ladders on commercial projects. Labor units for fixture installations in warehouses, auditoriums, showrooms, etc., are based on the use of mechanical personnel lifts.
- Labor units in this section are for new work only with electrical contractor purchased fixtures. For remodeling or change order situations these labor units must be substantially increased when the type or quantity of fixtures is changed.
- Clarification on Evolving Led Technology: Due the rapidly evolving product base for LED lighting fixtures, for products not explicitly described within this manual the contractor shall use a fixture of similar design, size and function to extrapolate a labor units to be used for the installation of the fixture type.

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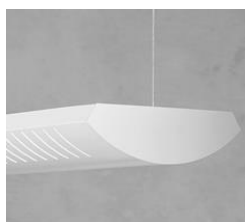
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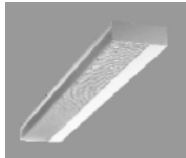
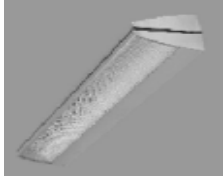
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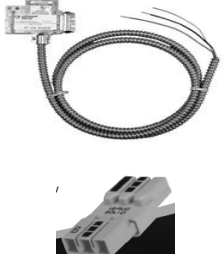
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Section 5 - Lighting Fixtures, Poles and Parking Lot Lighting

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Industrial - Chain Hung Suspended from Ceiling						
	24" Long 1-Lamp		0.60	0.75	0.94		E
	24" Long 2-Lamp		0.65	0.81	1.02		E
	36" Long 1-Lamp		0.70	0.88	1.09		E
	36" Long 2-Lamp		0.75	0.94	1.17		E
	48" Long 1-Lamp		0.80	1.00	1.25		E
	48" Long 2-Lamp		0.85	1.06	1.33		E
	48" Long 3-Lamp		0.90	1.13	1.41		E
	48" Long 4-Lamp		0.95	1.19	1.48		E
	72" Long 1-Lamp		1.00	1.25	1.56		E
	72" Long 2-Lamp		1.05	1.31	1.64		E
	72" Long 3-Lamp		1.10	1.38	1.72		E
	72" Long 4-Lamp		1.15	1.44	1.80		E
	96" Long 1-Lamp		1.15	1.44	1.80		E
	96" Long 2-Lamp		1.20	1.50	1.88		E
	96" Long 3-Lamp		1.25	1.56	1.95		E
	96" Long 4-Lamp		1.30	1.63	2.03		E
	24" Long - LED	X	0.65	0.81	1.02		E
	48" Long - LED	X	0.85	1.06	1.33		E
	96" Long - LED	X	1.20	1.50	1.88		E
	24" Wire Guard		0.10	0.13	0.16		E
	36" Wire Guard		0.12	0.15	0.19		E
	48" Wire Guard		0.15	0.19	0.23		E
	72" Wire Guard		0.18	0.23	0.28		E
	96" Wire Guard		0.20	0.25	0.31		E
	Stem Mounted Vaportite						
	Suspended from Ceiling (Includes Labor for Stems with Fixtures)						
	24" Long 1-Lamp		1.15	1.44	1.80		E
	24" Long 2-Lamp		1.20	1.50	1.88		E
	36" Long 1-Lamp		1.25	1.56	1.95		E
	36" Long 2-Lamp		1.30	1.63	2.03		E
	48" Long 1-Lamp		1.35	1.69	2.11		E
	48" Long 2-Lamp		1.40	1.75	2.19		E
	48" Long 3-Lamp		1.45	1.81	2.27		E
	48" Long 4-Lamp		1.50	1.88	2.34		E
	72" Long 1-Lamp		1.55	1.94	2.42		E
	72" Long 2-Lamp		1.60	2.00	2.50		E
	72" Long 3-Lamp		1.65	2.06	2.58		E
	72" Long 4-Lamp		1.70	2.13	2.66		E
	96" Long 1-Lamp		1.60	2.00	2.50		E
	96" Long 2-Lamp		1.65	2.06	2.58		E
	96" Long 3-Lamp		1.70	2.13	2.66		E
	96" Long 4-Lamp		1.75	2.19	2.73		E
	24" Long - LED	X	1.20	1.50	1.88		E
	48" Long - LED	X	1.40	1.75	2.19		E
	98" Long - LED	X	1.65	2.06	2.58		E
	Under Counter Lights						
	18" - Fluorescent		0.80	1.00	1.25		E
	24" - Fluorescent		0.80	1.00	1.25		E
	36" - Fluorescent		0.90	1.13	1.41		E
	48" - Fluorescent		0.90	1.13	1.41		E
	18" - LED	X	0.80	1.00	1.25		E
	24" - LED	X	0.80	1.00	1.25		E
	36" - LED	X	0.90	1.13	1.41		E
	48" - LED	X	0.90	1.13	1.41		E
	LED Remote Driver	X	0.50	0.63	0.78		E
	Commercial Grade Wall or Cove Mounted						
	18" Long 1-Lamp		0.65	0.81	1.02		E
	18" Long 2-Lamp		0.70	0.88	1.09		E
	24" Long 1-Lamp		0.75	0.94	1.17		E
	24" Long 2-Lamp		0.80	1.00	1.25		E
	36" Long 1-Lamp		0.85	1.06	1.33		E
	36" Long 2-Lamp		0.90	1.13	1.41		E
	48" Long 1-Lamp		0.95	1.19	1.48		E
	48" Long 2-Lamp		1.00	1.25	1.56		E
	48" Long 3-Lamp		1.05	1.31	1.64		E
	48" Long 4-Lamp		1.10	1.38	1.72		E
	72" Long 1-Lamp		1.10	1.38	1.72		E
	72" Long 2-Lamp		1.15	1.44	1.80		E
	72" Long 3-Lamp		1.20	1.50	1.88		E
	72" Long 4-Lamp		1.25	1.56	1.95		E
	96" Long 1-Lamp		1.20	1.50	1.88		E
	96" Long 2-Lamp		1.25	1.56	1.95		E
	96" Long 3-Lamp		1.30	1.63	2.03		E
	96" Long 4-Lamp		1.35	1.69	2.11		E
	12" Long - LED	X	0.60	0.75	0.94		E
	24" Long - LED	X	0.80	1.00	1.25		E
	36" Long - LED	X	0.90	1.13	1.41		E
	48" Long - LED	X	1.00	1.25	1.56		E
	60" Long - LED	X	1.10	1.38	1.72		E
	LED Remote Driver	X	0.50	0.63	0.78		E
	*** Note for Recessed Cove Lighting add 20% for Labor	X					

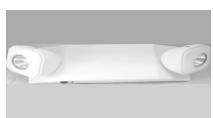
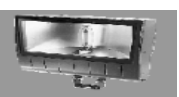
Section 5 - Lighting Fixtures, Poles and Parking Lot Lighting

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Surface Mount Strip						
	18" Long 1-Lamp		0.50	0.63	0.78		E
	18" Long 2-Lamp		0.55	0.69	0.86		E
	24" Long 1-Lamp		0.55	0.69	0.86		E
	24" Long 2-Lamp		0.60	0.75	0.94		E
	36" Long 1-Lamp		0.60	0.75	0.94		E
	36" Long 2-Lamp		0.65	0.81	1.02		E
	48" Long 1-Lamp		0.70	0.88	1.09		E
	48" Long 2-Lamp		0.75	0.94	1.17		E
	48" Long 3-Lamp		0.80	1.00	1.25		E
	48" Long 4-Lamp		0.85	1.06	1.33		E
	72" Long 1-Lamp		0.85	1.06	1.33		E
	72" Long 2-Lamp		0.90	1.13	1.41		E
	72" Long 3-Lamp		0.95	1.19	1.48		E
	72" Long 4-Lamp		1.00	1.25	1.56		E
	96" Long 1-Lamp		1.10	1.38	1.72		E
	96" Long 2-Lamp		1.15	1.44	1.80		E
	96" Long 3-Lamp		1.20	1.50	1.88		E
	96" Long 4-Lamp		1.25	1.56	1.95		E
	24" Long - LED	X	0.60	0.75	0.94		E
	48" Long - LED	X	0.75	0.94	1.17		E
	98" Long - LED	X	1.15	1.44	1.80		E
	18" Wire Guard		0.10	0.13	0.16		E
	24" Wire Guard		0.10	0.13	0.16		E
	36" Wire Guard		0.10	0.13	0.16		E
	48" Wire Guard		0.20	0.25	0.31		E
	72" Wire Guard		0.20	0.25	0.31		E
	96" Wire Guard		0.20	0.25	0.31		E
	Weatherproof Fluorescent Fixture - Outdoor						
	48" Long 1-Lamp		1.50	1.88	2.34		E
	48" Long 2-Lamp		1.55	1.94	2.42		E
	72" Long 1-Lamp		1.75	2.19	2.73		E
	72" Long 2-Lamp		1.80	2.25	2.81		E
	96" Long 1-Lamp		2.00	2.50	3.13		E
	Fixture Mounting Accessories						
	Quake Clips		0.15	0.19	0.23		E
	Fixture Chain Set - 4 Foot	X	0.30	0.31	0.39		E
	Aircraft Cable with Quick Grip Tensioner	X	0.25	0.31	0.39		E
	Fixture Seismic Wire		0.25	0.31	0.39		E
	Tek Screw to T-Bar		0.10	0.13	0.16		E
	Lighting Flex Whips - Pre-assembled						
	6' 3-Wire Flex Whip		0.25	0.31	0.39		E
	6' 4-Wire Flex Whip		0.35	0.44	0.55		E
	6' 5-Wire Flex Whip		0.35	0.44	0.55		E
	Modular Wiring System (MWS) Components - Pre-manufactured						
	Circuit Distributor Box		0.30	0.40	0.50		E
	Cable Extender to 15'L		0.35	0.45	0.60		E
	Cable Extender from 20'L to 35'L		0.45	0.55	0.70		E
	Circuit Selector Unit		0.30	0.40	0.50		E
	Switch or Receptacle Drop Cable		0.35	0.45	0.60		E
	Power or Switching Tee		0.35	0.45	0.60		E
	Splitter Splice		0.20	0.30	0.40		E
	Standard Selector Cable		0.40	0.45	0.50		E
	Fluorescent Ballast Disconnect		0.15	0.20	0.23		E
	Commercial Indoor Fixtures - Wall Mounted - Up To 150 Watt						
	1-Lamp		0.75	0.94	1.17		E
	2-Lamp		1.00	1.25	1.56		E
	LED	X	1.00	1.25	1.56		E
	Surface Mount - Up to 300 Watt Ceiling Mounted						
	150 Watt		1.00	1.25	1.56		E
	200 Watt		1.50	1.88	2.34		E
	300 Watt		2.00	2.50	3.13		E
	LED	X	1.50	1.88	2.34		E
	Pendant Mount - Up to 150 Watt						
	1-Lamp		1.25	1.56	1.95		E
	2-Lamp		1.50	1.88	2.34		E
	Pendant Mount - Up to 300 Watt						
	1-Lamp		1.50	1.88	2.34		E
	2-Lamp		1.75	2.19	2.73		E

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Section 5 - Lighting Fixtures, Poles and Parking Lot Lighting

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Ceiling Fans						
	up to 36" Diameter Ceiling Fan	X	1.50	1.88	2.34		E
	37"-48" Diameter Ceiling Fan	X	2.50	3.13	3.91		E
	49"-55" Diameter Ceiling Fan	X	3.50	4.38	5.47		E
	60" Diameter Ceiling Fan	X	4.50	5.63	7.03		E
	72" Diameter Ceiling Fan	X	5.00	6.25	7.81		E
	80" Diameter Ceiling Fan	X	6.00	7.50	9.38		E
	Ceiling Fans - Low Velocity						
	Low Velocity Ceiling Fan - Up to 12' Diameter	X	7.00	8.75	10.94		E
	Low Velocity Ceiling Fan - 14-16' Diameter	X	9.00	11.25	14.06		E
	Low Velocity Ceiling Fan - 18-20' Diameter	X	12.00	15.00	18.75		E
	Low Velocity Ceiling Fan - 24' Diameter	X	16.00	20.00	25.00		E
	Low Velocity Ceiling Fan - Remote Speed Controller	X	1.50	1.88	2.34		E
							
	High Bay Fixture Ultra- Efficient 2x4						
	T5 HO 6 Lamps	X	1.75	2.19	2.71		E
	T8 HO 6 Lamps	X	1.85	2.31	2.89		E
	LED	X	1.75	2.19	2.73		E
	Exit Fixtures						
	Surface Mount - Standard or LED		1.00	1.25	1.56		E
	Pendant Mount - Standard or LED		1.50	1.88	2.34		E
	Recessed Mount - Standard or LED		1.25	1.56	1.95		E
							
	Exit Fixtures - Edge Lit						
	Surface Mount - Standard or LED		1.50	1.88	2.34		E
	Pendant Mount - Standard or LED		2.00	2.50	3.13		E
	Recessed Mount - Standard or LED		1.75	2.19	2.73		E
	Exit Sign - Self Powered		0.70	0.88	1.09		E
	Egress / Emergency Fixtures						
	Self Contained Dual Head		1.20	1.50	1.88		E
	Remote Single Head		0.60	0.75	0.94		E
	Remote Double Head		0.70	0.88	1.09		E
	Recessed Emergency Fixtures		1.50	1.88	2.34		E
	Emergency Ballasts - Field Installed		0.75	0.94	1.17		E
							
	Emergency Lighting Inverter Panels - up to 5000W						
	Small Emergency Lighting Inverter Panel - Surface Mtd		2.00	2.50	3.12		E
	Small Emergency Lighting Inverter Panel - Recessed Mtd		2.50	3.13	3.91		E
	Small Emergency Lighting Inverter Panel - Ceiling Mtd		3.00	3.75	4.69		E
	Power Pack w/ Dual Heads						
	36 Watt		1.10	1.38	1.72		E
	54 Watt		1.30	1.63	2.03		E
	80 Watt		1.40	1.75	2.19		E
	110 Watt		1.50	1.88	2.34		E
	160 Watt		1.70	2.13	2.66		E
	200 Watt		1.90	2.38	2.97		E
	Mounting Shelf		1.00	1.25	1.56		E
							
	Wall Packs - Wall Mounted						
	35 Watt H.I.D.		1.25	1.56	1.95		E
	50 Watt H.I.D.		1.25	1.56	1.95		E
	70 Watt H.I.D.		1.25	1.56	1.95		E
	100 Watt H.I.D.		1.25	1.56	1.95		E
	150 Watt H.I.D.		1.75	2.19	2.73		E
	250 Watt H.I.D.		2.00	2.50	3.13		E
	400 Watt H.I.D.		3.00	3.75	4.69		E
	LED		1.25	1.56	1.95		E
							
	Bracket Mount - Wall Mounted						
	250 Watt H.I.D.		3.50	4.38	5.47		E
	400 Watt H.I.D.		4.25	5.31	6.64		E
	1000 Watt H.I.D.		5.00	6.25	7.81		E
	1500 Watt H.I.D.		6.00	7.50	9.38		E
	LED		3.50	4.38	5.47		E
	Build Fixture Backing		1.50	1.88	2.34		E
	Surface Ceiling Mounted						
	70 Watt H.I.D.		1.50	1.88	2.34		E
	100 Watt H.I.D.		1.50	1.88	2.34		E
	150 Watt H.I.D.		2.00	2.50	3.13		E
	250 Watt H.I.D.		2.50	3.13	3.91		E
	400 Watt H.I.D.		3.50	4.38	5.47		E
	1500 Watt H.I.D.		6.00	7.50	9.38		E

Section 5 - Lighting Fixtures, Poles and Parking Lot Lighting

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Recessed H.I.D.						
	50 Watt H.I.D.		1.75	2.19	2.73		E
	70 Watt H.I.D.		1.75	2.19	2.73		E
	100 Watt H.I.D.		2.00	2.50	3.13		E
	150 Watt H.I.D.		2.25	2.81	3.52		E
	250 Watt H.I.D.		2.75	3.44	4.30		E
	400 Watt H.I.D.		3.75	4.69	5.86		E
	Fluorescent High Bay Fixture Ultra- Efficient 6 Lamp HO						
	T5 HO Lamps		1.75	2.19	2.71		E
	T8 HO Lamps		1.85	2.31	2.89		E
	High Bay Fixtures - Multi Vapor H.I.D. Fixtures - 250 Watt - Without Lens						
	18" Reflector (25 Lb)		1.75	2.19	2.73		E
	20" Reflector (35 Lb)		2.00	2.50	3.13		E
	24" Reflector (45 Lb)		2.25	2.81	3.52		E
	30" Reflector (55 Lb)		2.50	3.13	3.91		E
	High Bay Fixtures - Multi Vapor H.I.D. Fixtures - 400 Watt - Without Lens						
	20" Reflector (40 Lb)		2.25	2.81	3.52		E
	24" Reflector (50 Lb)		2.50	3.13	3.91		E
	30" Reflector (60 Lb)		2.75	3.44	4.30		E
	High Bay Fixtures - Multi Vapor H.I.D. Fixtures - 250 Watt - With Lens						
	18" Reflector (30 Lb)		2.00	2.50	3.13		E
	20" Reflector (40 Lb)		2.25	2.81	3.52		E
	24" Reflector (50 Lb)		2.50	3.13	3.91		E
	High Bay Fixtures - Multi Vapor H.I.D. Fixtures - 400 Watt - With Lens						
	18" Reflector (35 Lb)		2.25	2.81	3.52		E
	20" Reflector (45 Lb)		2.50	3.13	3.91		E
	24" Reflector (55 Lb)		2.75	3.44	4.30		E
	30" Reflector (65 Lb)		3.00	3.75	4.69		E
	High Bay Fixtures - Multi Vapor H.I.D. Fixtures - 1000 Watt - With Lens						
	20" Reflector (50 Lb)		2.75	3.44	4.30		E
	24" Reflector (60 Lb)		3.00	3.75	4.69		E
	30" Reflector (70 Lb)		3.50	4.38	5.47		E
	Multi Vapor H.I.D. Fixtures - Twin Mounted						
	400 Watt Twin Fixture w/o Lens		4.00	5.00	6.25		E
	400 Watt Twin Fixture with Lens		4.50	5.63	7.03		E
	Low Bay - Multi Vapor H.I.D. Fixtures - 250 Watt With Lens						
	18" Reflector (30 Lb)		1.85	2.31	2.89		E
	20" Reflector (40 Lb)		2.00	2.50	3.13		E
	24" Reflector (50 Lb)		2.25	2.81	3.52		E
	30" Reflector (55 Lb)		2.50	3.13	3.91		E
	Low Bay - Multi Vapor H.I.D. Fixtures - 400 Watt With Lens						
	18" Reflector (35 Lb)		1.95	2.44	3.05		E
	20" Reflector (45 Lb)		2.15	2.69	3.36		E
	24" Reflector (55 Lb)		2.40	3.00	3.75		E
	30" Reflector (65 Lb)		2.60	3.25	4.06		E
	Porcelain Enamel Reflector With Lens - Pendant Mounted						
	150 Watt		1.00	1.25	1.56		E
	300 Watt		1.15	1.44	1.78		E
	500 Watt		1.25	1.56	1.94		E
	750 Watt		1.35	1.69	2.16		E
	1000 Watt		1.50	1.88	2.38		E

Section 5 - Lighting Fixtures, Poles and Parking Lot Lighting

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Porcelain Enamel Reflector - Vaportite - Surface Mounted						
	150 Watt		1.10	1.38	1.72		E
	300 Watt		1.25	1.56	1.95		E
	500 Watt		1.35	1.69	2.11		E
	750 Watt		1.50	1.88	2.34		E
	1000 Watt		1.75	2.19	2.73		E
	Porcelain Enamel Reflector - Vaportite - Pendant Mounted						
	150 Watt		1.25	1.56	1.95		E
	300 Watt		1.35	1.69	2.11		E
	500 Watt		1.50	1.88	2.34		E
	750 Watt		1.75	2.19	2.73		E
	1000 Watt		2.00	2.50	3.13		E
	High Bay with Prismatic Lens - Pendant Mounted						
	200 Watt		1.25	1.56	1.95		E
	300 Watt		1.25	1.56	1.95		E
	500 Watt		1.50	1.88	2.34		E
	750 Watt		1.50	1.88	2.34		E
	1000 Watt		1.75	2.19	2.73		E
	1500 Watt		1.75	2.19	2.73		E
	Pendant High Bay - Safety Cable or Chain Assembly		0.15	0.25	0.33		E
	Outdoor Ground Mtd Fixture W/ Spikes						
	2' 1-Lamp - Fluorescent		0.75	0.94	1.17		E
	3' 1-Lamp - Fluorescent		0.95	1.19	1.48		E
	4' 1-Lamp - Fluorescent		1.20	1.50	1.88		E
	LED - 14"		0.75	0.94	1.17		E
	LED - 23"		0.75	0.94	1.17		E
	Swimming Pool & Fountain Lighting - Wet Niche Fixtures						
	100 Watt		2.00	2.50	3.13		E
	300 Watt		2.25	2.81	3.52		E
	500 Watt		2.50	3.13	3.91		E
	750 Watt		2.75	3.44	4.30		E
	LED	X	2.25	2.81	3.52		E
	Swimming Pool & Fountain Lighting - Dry Niche Fixtures						
	100 Watt		3.00	3.75	4.69		E
	300 Watt		3.25	4.06	5.08		E
	500 Watt		3.50	4.38	5.47		E
	750 Watt		4.00	5.00	6.25		E
	LED	X	3.25	4.06	5.08		E
	Recessed Fountain Fixtures						
	100 Watt		3.00	3.75	4.69		E
	300 Watt		3.25	4.06	5.08		E
	750 Watt		3.75	4.69	5.86		E
	Submerged Fountain Fixtures						
	1-Lamp 100 Watt		1.00	1.25	1.56		E
	1-Lamp 300 Watt		1.10	1.38	1.72		E
	2-Lamp 100 Watt		1.20	1.50	1.88		E
	2-Lamp 300 Watt		1.50	1.88	2.34		E
	3-Lamp 100 Watt		1.60	2.00	2.50		E
	3-Lamp 300 Watt		2.00	2.50	3.13		E
	4-Lamp 100 Watt		2.25	2.81	3.52		E
	4-Lamp 300 Watt		2.50	3.13	3.91		E
	5-Lamp 100 Watt		2.75	3.44	4.30		E
	5-Lamp 300 Watt		3.00	3.75	4.69		E
	6-Lamp 100 Watt		3.50	4.38	5.47		E
	6-Lamp 300 Watt		4.00	5.00	6.25		E
	LED - 1 Head	X	1.00	1.25	1.56		E
	LED - 2 Head	X	1.20	1.50	1.88		E
	LED - 3 Head	X	1.60	2.00	2.50		E
	LED - 4 Head	X	2.25	2.81	3.52		E
	LED - 5 Head	X	2.75	3.44	4.30		E
	LED - 6 Head	X	3.50	4.38	5.47		E

Section 5 - Lighting Fixtures, Poles and Parking Lot Lighting

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Post Top Mounted						
	100 Watt	X	2.00	2.50	3.13		E
	200 Watt	X	2.50	5.00	6.25		E
	250 Watt		3.00	3.75	4.69		E
	400 Watt		4.00	5.00	6.25		E
	1000 Watt		6.00	7.50	9.38		E
	1500 Watt		8.00	10.00	12.50		E
	LED		4.00	5.00	6.25		E
	Fixture Aiming	X	1.50	1.88	2.34		E
	Showroom Stage & Auditorium Fixtures - Recessed Fixtures Hi-Ceiling						
	300 Watt		5.00	6.25	7.81		E
	500 Watt		5.00	6.25	7.81		E
	1000 Watt		7.00	8.75	10.94		E
	1500 Watt		8.00	10.00	12.50		E
	Showroom Stage & Auditorium Fixtures - Surface Mounted Spot or Flood						
	300 Watt		2.00	2.50	3.13		E
	500 Watt		2.50	3.13	3.91		E
	1000 Watt		3.50	4.38	5.47		E
	1500 Watt		4.00	5.00	6.25		E
	Safety Cable		0.50	0.63	0.78		E
	Fixture Aiming	X	1.50	1.88	2.34		E
	Showroom Stage & Auditorium Fixtures - Stage Footlight Troughs - 3 Color						
	6 Ft Long		6.00	7.50	9.38		E
	8 Ft Long		7.00	8.75	10.94		E
	10 Ft Long		8.00	10.00	12.50		E
	12 Ft Long		10.00	12.50	15.63		E
	16 Ft Long		12.00	15.00	18.75		E
	20 Ft Long		14.00	17.50	21.88		E
	Showroom Stage & Auditorium Fixtures - Stage Hanging Borderlights - 3 Color						
	6 Ft Long		8.00	10.00	12.50		E
	8 Ft Long		9.00	11.25	14.06		E
	10 Ft Long		10.00	12.50	15.63		E
	12 Ft Long		12.00	15.00	18.75		E
	16 Ft Long		14.00	17.50	21.88		E
	20 Ft Long		16.00	20.00	25.00		E
	Colored Lamps In Stage Troughs or Stage Borderlights						
	Up to 300 Watt		0.20	0.25	0.31		E
	Showroom Stage & Auditorium Fixtures - Hardware						
	10 Ft. Connector Strip Gutter		4.00	5.00	6.25		E
	End Cap		0.50	0.63	0.78		E
	Light Outlet		0.40	0.50	0.63		E
	Power Feed Per Ckt.		0.50	0.63	0.78		E
	Coupling		0.50	0.63	0.78		E
	2" Pipe Batten		0.10	0.13	0.16		LF
	Fixed Pendant Support		3.00	3.75	4.69		E
	Chandelier - Incandescent or Similar						
	8 Lamp or 25 Lb		16.00	20.00	25.00		E
	12 Lamp or 50 Lb		20.00	25.00	31.25		E
	16 Lamp or 75 Lb		24.00	30.00	37.50		E
	20 Lamp or 100 Lb		30.00	37.50	46.88		E
	24 Lamp or 150 Lb		36.00	45.00	56.25		E
	30 Lamp or 200 Lb		48.00	60.00	75.00		E
	36 Lamp or 300 Lb		60.00	75.00	93.75		E
	Decorative Outdoor Fixture - Wall Mounted						
	20 Lb		3.00	3.75	4.69		E
	30 Lb		3.50	4.38	5.47		E
	40 Lb		4.00	5.00	6.25		E
	50 Lb		4.50	5.63	7.03		E
	60 Lb		5.00	6.25	7.81		E
	70 Lb		5.50	6.88	8.59		E
	80 Lb		6.00	7.50	9.38		E
	90 Lb		6.50	8.13	10.16		E
	100 Lb		8.00	10.00	12.50		E

Section 5 - Lighting Fixtures, Poles and Parking Lot Lighting

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Decorative Outdoor Fixtures - Pendant or Chain Supported						
	20 Lb		4.00	5.00	6.25		E
	30 Lb		4.50	5.63	7.03		E
	40 Lb		5.00	6.25	7.81		E
	50 Lb		5.50	6.88	8.59		E
	60 Lb		6.00	7.50	9.38		E
	70 Lb		6.50	8.13	10.16		E
	80 Lb		7.00	8.75	10.94		E
	90 Lb		8.00	10.00	12.50		E
	100 Lb		9.00	11.25	14.06		E
	Wall Mounted Incandescent						
	1-Lamp 200 Watt		1.00	1.25	1.56		E
	1-Lamp 300 Watt		1.25	1.56	1.95		E
	1-Lamp 500 Watt		1.50	1.88	2.34		E
	2-Lamp 200 Watt/Lamp		1.25	1.56	1.95		E
	2-Lamp 300 Watt/Lamp		1.50	1.88	2.34		E
	2-Lamp 500 Watt/Lamp		1.75	2.19	2.73		E
	Pendant Mounted Incandescent						
	200 Watt		1.50	1.88	2.34		E
	300 Watt		2.00	2.50	3.13		E
	500 Watt		2.50	3.13	3.91		E
	Bollard Lights 36 Inch High (Round or Square)						
	Incandescent up to 150 Watt		1.40	1.75	2.19		E
	H.I.D. 35 - 50 Watt		2.10	2.63	3.28		E
	H.I.D. 70 - 100 Watt		2.25	2.81	3.52		E
	H.I.D. 150 Watt		2.35	2.94	3.67		E
	Fluorescent 1-PL26		1.20	1.50	1.88		E
	Fluorescent 2-PL26		1.30	1.63	2.03		E
	Bollard Lights 42 Inch High (Round or Square)						
	Incandescent up to 150 Watt		1.45	1.81	2.27		E
	H.I.D. 35 - 50 Watt		2.10	2.63	3.28		E
	H.I.D. 70 - 100 Watt		2.30	2.88	3.59		E
	H.I.D. 150 Watt		2.45	3.06	3.83		E
	Fluorescent 1-PL26		1.65	2.06	2.58		E
	Fluorescent 2-PL26		1.75	2.19	2.73		E
	LED	X	2.00	2.50	3.13		E
	Concrete Bases for Bollards:						
	12"X12"X12"		2.20	2.75	3.44		E
	18"X18"X18"		2.90	3.63	4.53		E
	Landscape Lighting - DC & AC Voltages						
	Recessed in Earth	X	1.75	2.09	2.61		E
	Spike Mounted		0.40	0.50	0.63		E
	J-Box Mounted		1.00	1.25	1.56		E
	50 watt Fiberglass or Aluminum WP Transformer		1.00	1.25	1.56		E
	Parking Lot Lighting - Pre-Cast Concrete Bases w/ Hole and Gravel Fill						
	18" X 36" Base		4.00	5.00	6.25		E
	18" X 48" Base		4.50	5.63	7.03		E
	18" X 60" Base		5.00	6.25	7.81		E
	24" X 48" Base		5.00	6.25	7.81		E
	24" X 60" Base		6.00	7.50	9.38		E
	24" X 72" Base		7.00	8.75	10.94		E
	24" X 84" Base		8.00	10.00	12.50		E
	Ground Rod Installed In or Exterior to Concrete Base		1.00	1.25	1.56		E
	Parking Lot Lighting - Cast-In-Place Base						
	24" X 48" Base		12.00	15.00	18.75		E
	24" X 60" Base		13.00	16.25	20.31		E
	24" X 72" Base		15.00	18.75	23.44		E
	24" X 84" Base		16.00	20.00	25.00		E
	Walkway Lighting - Steel and Aluminum Poles						
	8 Ft.		3.00	3.75	4.69		E
	10 Ft.		3.25	4.06	5.08		E
	12 Ft.		3.50	4.38	5.47		E
	14 Ft.		4.00	5.00	6.25		E
	15 Ft.		4.50	5.63	7.03		E

Section 5 - Lighting Fixtures, Poles and Parking Lot Lighting

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Parking Lot Lighting - Steel and Aluminum Poles						
	5" X 16 Ft.		5.00	6.25	7.81		E
	5" X 20 Ft.		6.00	7.50	9.38		E
	5" X 24 Ft.		8.00	10.00	12.50		E
	5" X 28 Ft.		8.50	10.63	13.28		E
	5" X 32 Ft.		9.00	11.25	14.06		E
	5" X 36 Ft.		9.50	11.88	14.84		E
	6" X 40 Ft.		10.00	12.50	15.63		E
	6" X 44 Ft.		13.00	16.25	20.31		E
	8" X 48 Ft.		15.00	18.75	23.44		E
	8" X 52 Ft.		17.00	21.25	26.56		E
	8" X 60 Ft.		20.00	25.00	31.25		E
	Parking Lot Lighting - Shoe Box						
	150 Watt		2.00	2.50	3.13		E
	250 Watt		3.00	3.75	4.69		E
	400 Watt		4.00	5.00	6.25		E
	1000 Watt		6.00	7.50	9.38		E
	LED		3.00	3.75	4.69		E
	Parking Lot Lighting - Post Top						
	250 Watt		4.00	5.00	6.25		E
	400 Watt		5.00	6.25	7.81		E
	1000 Watt		8.00	10.00	12.50		E
	LED		4.00	5.00	6.25		E
	Parking Lot Lighting Accessories						
	Pre-Wired Photo Cell		0.50	0.63	0.78		E
	120V Receptacle		1.00	1.25	1.56		E
	Walk Way Lighting - Post Mounted H.I.D. Fixture						
	100 Watt		2.00	2.50	3.13		E
	150 Watt		2.50	3.13	3.91		E
	250 Watt		3.00	3.75	4.69		E
	Walk Way Lighting - Hollow Wood Posts - Direct Bury						
	10'		4.00	5.00	6.25		E
	15'		4.50	5.63	7.03		E
	18'		6.00	7.50	9.38		E
	Walk Way Lighting - Concrete Posts - Direct Bury						
	10'		6.00	7.50	9.38		E
	15'		8.00	10.00	12.50		E
	20'		10.00	12.50	15.63		E
	Walk Way Lighting						
	Fixture Aiming		1.50	1.88	2.34		E
	Explosion Proof Fixtures: Fluorescent						
	36" 1-Lamp		2.40	3.00	3.75		E
	36" 2-Lamp		2.85	3.56	4.45		E
	36" 3-Lamp		3.35	4.19	5.23		E
	36" 4-Lamp		3.80	4.75	5.94		E
	48" 1-Lamp		2.85	3.56	4.45		E
	48" 2-Lamp		3.35	4.19	5.23		E
	48" 3-Lamp		3.80	4.75	5.94		E
	48" 4-Lamp		4.30	5.38	6.72		E
	72" 1-Lamp		3.80	4.75	5.94		E
	72" 2-Lamp		4.25	5.31	6.64		E
	72" 3-Lamp		4.75	5.94	7.42		E
	72" 4-Lamp		5.20	6.50	8.13		E
	Surface Exit		1.50	1.88	2.34		E
	Explosion Proof Fixtures: Incandescent						
	100 Watt Wall Mount		1.35	1.69	2.11		E
	300 Watt Wall Mount		1.55	1.94	2.42		E
	500 Watt Wall Mount		1.75	2.19	2.73		E
	100 Watt Ceiling Mount		1.45	1.81	2.27		E
	300 Watt Ceiling Mount		1.65	2.06	2.58		E
	500 Watt Ceiling Mount		1.85	2.31	2.89		E
	100 Watt Pendant Mount		1.65	2.06	2.58		E
	300 Watt Pendant Mount		1.85	2.31	2.89		E
	500 Watt Pendant Mount		2.05	2.56	3.20		E

Section 5 - Lighting Fixtures, Poles and Parking Lot Lighting

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Explosion Proof Fixtures: H.I.D.						
	250 Watt Wall Mount		2.50	3.13	3.91		E
	400 Watt Wall Mount		2.90	3.63	4.53		E
	1000 Watt Wall Mount		3.60	4.50	5.63		E
	250 Watt Ceiling Mount		3.00	3.75	4.69		E
	400 Watt Ceiling Mount		3.40	4.25	5.31		E
	1000 Watt Ceiling Mount		4.00	5.00	6.25		E
	100 Watt Reflectors		1.75	2.19	2.73		E
	250 Watt Reflectors		1.90	2.38	2.97		E
	400 Watt Reflectors		2.10	2.63	3.28		E
	1000 Watt Reflectors		2.50	3.13	3.91		E
	Explosion Proof Fixtures: Guards						
	100 - 250 Watt		0.20	0.23	0.26		E
	400 - 1000 Watt		0.25	0.28	0.30		E
	Industrial Vaportite Surface Mounted Lampholders						
	150 Watt W/O Metal Cover		0.68	0.85	1.06		E
	300 Watt W/O Metal Cover		0.68	0.85	1.06		E
	500 Watt W/O Metal Cover		0.78	0.98	1.22		E
	150 Watt W/ Metal Cover		0.69	0.86	1.08		E
	300 Watt W/ Metal Cover		0.78	0.98	1.22		E
	Industrial Vaportite Pendant Mounted Lampholders						
	150 Watt W/O Metal Cover		0.77	0.96	1.20		E
	300 Watt W/O Metal Cover		0.87	1.09	1.36		E
	500 Watt W/O Metal Cover		0.96	1.20	1.50		E
	150 Watt W/ Metal Cover		0.88	1.10	1.38		E
	300 Watt W/ Metal Cover		0.97	1.21	1.52		E
	Lamps						
	Incandescent up to 75w	X	0.08	0.10	0.13		E
	Incandescent up to 100 to 300W	X	0.15	0.19	0.23		E
	Fluorescent Tube - up to 36"	X	0.08	0.10	0.13		E
	Fluorescent Tube - 48"	X	0.10	0.13	0.16		E
	Fluorescent Tube - 72"-96"	X	0.14	0.18	0.22		E
	Compact Fluorescent (Twin or Quad Tube)	X	0.05	0.06	0.08		E
	Mercury Vapor / Metal Halide - up to 175W	X	0.14	0.18	0.22		E
	Mercury Vapor / Metal Halide - 250 to 1000W	X	0.25	0.31	0.39		E
	High Pressure Sodium - up to 100W	X	0.10	0.13	0.16		E
	High Pressure Sodium - 150 to 250W	X	0.20	0.25	0.31		E
	High Pressure Sodium - 400 to 1000W	X	0.30	0.38	0.47		E
	Fluorescent Ballast						
	2' Lamp	X	0.35	0.50	0.60		E
	4' Lamp	X	0.50	0.50	0.60		E
	8' Lamp	X	0.75	0.60	0.75		E
	Dimming - 2' Lamp	X	0.45	0.56	0.70		E
	Dimming - 4' Lamp	X	0.60	0.75	0.94		E
	Dimming - 8' Lamp	X	0.90	1.13	1.41		E
	Fluorescent Ballast Disconnect		0.15	0.20	0.23		E
	RFI Filters						
	Small		0.75	1.00	1.25		E
	Large		1.25	1.65	2.10		E
	Remote Ballast						
	Fluorescent 4'		1.00	1.20	1.50		E
	Fluorescent 8'		1.40	1.70	2.10		E
							
	Remote Ballast						
	HID Up to 150 Watt		1.25	1.50	1.90		E
	HID Up to 400 Watt		1.75	2.10	2.60		E
	HID Up to 1000 Watt		2.25	2.70	3.35		E
	Retro-Fit						
	4' Lamps		0.65	0.90	1.25		E
	8' Lamps		0.70	1.00	1.20		E
	Retro-Fit						
	4' Ballast		0.45	0.65	0.85		E
	8' Ballast		0.45	0.65	0.85		E

Section 5 - Lighting Fixtures, Poles and Parking Lot Lighting

Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Remove and Package for Disposal						
4' Tube		0.15	0.18	0.22		E
8' Tube		0.20	0.24	0.30		E
Remove and Package for Disposal						
4' Ballast		0.40	0.50	0.60		E
8' Ballast		0.45	0.55	0.70		E
Socket Replacement						
2-PIN Fluorescent		0.25	0.30	0.40		E
Slimline or H.O.		0.30	0.36	0.45		E
Incandescent		0.35	0.42	0.50		E
HID		1.00	1.50	2.00		E
Quartz		1.00	1.50	2.00		E
Lens Replacement						
Flat Acrylic 1x4 Lens Replacement		0.15	0.20	0.25		E
Flat Acrylic 2x2 Lens Replacement		0.20	0.25	0.35		E
Flat Acrylic 2x 4 Lens Replacement		0.25	0.30	0.40		E
Flat Acrylic 4x 4 Lens Replacement		0.40	0.50	0.60		E
Paracube 1x4 Lens Replacement	X	0.25	0.40	0.50		E
Paracube 2x2 Lens Replacement	X	0.30	0.50	0.70		E
Paracube 2x4 Lens Replacement		0.40	0.60	0.90		E
Paracube 4x4 Lens Replacement		0.70	1.00	1.50		E
Parabolic 1x4 Lens Replacement		0.30	0.40	0.50		E
Parabolic 2x2 Lens Replacement		0.35	0.55	0.80		E
Parabolic 2x4 Lens Replacement		0.50	0.70	1.20		E
Parabolic 4x4 Lens Replacement		0.80	1.20	1.50		E
Remove and Package for Disposal						
4' Tube		0.15	0.18	0.22		E
8' Tube		0.20	0.24	0.30		E
4' Ballast		0.40	0.50	0.60		E
8' Ballast		0.45	0.55	0.70		E
Fixture Cleaning						
2x2		0.25	0.30	0.40		E
2x4		0.35	0.40	0.50		E
4x4		0.50	0.60	0.75		E
1x4 Strip		0.20	0.30	0.40		E
1x8 Strip		0.35	0.50	0.60		E
Lens Cleaning						
2x2		0.15	0.25	0.35		E
2x4		0.15	0.25	0.35		E
4x4		0.25	0.30	4.00		E

SECTION 6

WIRING DEVICES

General Information

The labor units in this section include the installation of the wiring device in a box already in place and the termination of copper conductors on the wiring device. The labor units for wiring devices which are factory mounted in enclosures include the installation of the enclosure and the termination of copper conductors. When aluminum conductors are terminated on wiring devices the labor units in this section must be increased.

Scope of These Labor Units

The Introduction section includes details on the scope of labor units across the manual. Some items included are:

- Drawing and specification study
- Layout, measuring and marking installation location
- Material unloading, storage and delivery to the installation area
- Tool acquisition and return to storage
- Device installation in appropriate boxes already in place
- Clean-up of electrical contractor furnished excess material and cardboard containers
- Normal non-productive labor

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Work Operations Not Included In These Labor Units

- Field supervision
- Wire or cable installation
- Clean-out boxes containing water, dirt, plaster, concrete, etc.
- Replacing devices damaged by other crafts
- Removing and reinstalling devices or covers due to painting or plastering
- Painting device boxes, enclosures, or covers
- Measurement and alignment more precise than normal industry standards

Labor Adjustments for Non-Typical Conditions

See the Introduction section for details.

Application Instructions

- The labor units in this section are based on the following 600-volt rated copper single conductor building wire types THHN, THWN, or RHW
 - #14 AWG for 15 Amp rated circuits and wiring devices
 - #12 AWG for 20 Amp rated circuits and wiring devices
 - #10 AWG for 30 Amp rated circuits and wiring devices
 - # 8 AWG for 50 Amp rated circuits and wiring devices
 - # 6 AWG for 60 Amp rated circuits and wiring devices
- The labor tables in this section do not identify the mechanical operation of the wiring device. For example, the labor units for general use snap switches are applicable for toggle, mercury, silent, pressure, lighted handle, key operated and other types when a large quantity is required. When only a few of these special types of switches are required, a minimum of one hour is usually required to install each special switch.
- The labor units in this section are based on the installation of specification grade wiring devices. When “competitive” grade wiring devices are used the labor units may need to be adjusted.
- The labor units for wall mounted items in this manual are based on wood screws being used to fasten the items to a wood surface installed by others. If a plywood surface is installed by the electrical contractor, a separate labor allowance must be added for the plywood installation. If other than wood screws are required to mount any item in this manual, a separate material cost and labor allowance must be added.

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Section 6 - Wiring Devices

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Switch and Receptacle Combination - 20 Amp						
	Single Pole		25.00	31.25	37.50		C
	Double Pole		35.00	43.75	52.50		C
	Three-Way		40.00	50.00	60.00		C
	Four-Way		45.00	56.25	67.50		C
	Push Button Station NEMA-1 Non Assembled (Button, Sel. Sw., Pilot Lt., Contact Block & Legend Plate)						
	1-Button		1.00	1.25	1.50		E
	2-Button		1.30	1.63	1.95		E
	3-Button		1.60	2.00	2.40		E
	4-Button		2.00	2.50	3.00		E
	5-Button		2.50	3.13	3.75		E
	6-Button		3.00	3.75	4.50		E
	Push Button Station NEMA-4 Non Assembled (Button, Sel. Sw., Pilot Lt., Contact Block & Legend Plate)						
	1-Button		1.30	1.63	1.95		E
	2-Button		1.60	2.00	2.40		E
	3-Button		2.00	2.50	3.00		E
	4-Button		2.50	3.13	3.75		E
	5-Button		3.00	3.75	4.50		E
	6-Button		3.50	4.38	5.25		E
	Double Throw Switches Maintained Contact 2 Circuit 3 Position						
	1-Pole 10 Amp		0.35	0.44	0.53		E
	1-Pole 15 Amp		0.35	0.44	0.53		E
	1-Pole 20 Amp		0.35	0.44	0.53		E
	2-Pole 10 Amp		0.50	0.63	0.75		E
	2-Pole 15 Amp		0.50	0.63	0.75		E
	2-Pole 20 Amp		0.50	0.63	0.75		E
	Manual Motor Starter 120/230 Volt AC Box Mounted Toggle Switch W/O Enclosure						
	1-Pole 1/4HP		0.30	0.38	0.45		E
	1-Pole 1/2HP		0.35	0.44	0.53		E
	1-Pole 1HP		0.40	0.50	0.60		E
	2-Pole 1/4HP		0.35	0.44	0.53		E
	2-Pole 1/2HP		0.40	0.50	0.60		E
	2-Pole 1HP		0.45	0.56	0.68		E
	3-Pole 1/2HP		0.40	0.50	0.60		E
	3-Pole 1HP		0.45	0.56	0.68		E
	3-Pole 2HP		0.50	0.63	0.75		E
	Manual Motor Starter W/ Enclosure						
	1-Pole 1/4 HP		0.55	0.69	0.83		E
	1-Pole 1/2 HP		0.60	0.75	0.90		E
	1-Pole 1 HP		0.65	0.81	0.98		E
	2-Pole 1/4 HP		0.60	0.75	0.90		E
	2-Pole 1/2 HP		0.65	0.81	0.98		E
	2-Pole 1 HP		0.70	0.88	1.05		E
	3-Pole 1/4 HP		0.65	0.81	0.98		E
	3-Pole 1/2 HP		0.70	0.88	1.05		E
	3-Pole 1 HP		0.75	0.94	1.13		E
	Dimmer Switch						
	1-Pole 600 Watt		0.40	0.50	0.60		E
	1-Pole 1000 Watt		0.50	0.63	0.75		E
	1 Pole - 1500 Watt		0.55	0.69	0.83		E
	1 Pole - 2000 Watt		0.60	0.75	0.90		E
	3-Way 600 Watt		0.70	0.88	1.05		E
	3-Way 1000 Watt		0.85	1.06	1.28		E
	3 Way - 1500 Watt		0.85	1.06	1.28		E
	3 Way - 2000 Watt		0.90	1.13	1.35		E
	Wiring Device Cover Plates						
	1-Gang		10.00	12.50	15.00		C
	2-Gang		12.00	15.00	18.00		C
	3-Gang		14.00	17.50	21.00		C
	4-Gang		17.00	21.25	25.50		C
	5-Gang		20.00	25.00	30.00		C
	6-Gang		24.00	30.00	36.00		C
	Wiring Device Cover Plates - Decorative & Engraved						
	1-Gang		20.00	25.00	30.00		C
	2-Gang		25.00	31.25	37.50		C
	3-Gang		30.00	37.50	45.00		C
	4-Gang		35.00	43.75	52.50		C
	50 & 60 Amp Single Receptacle Cover Plates		25.00	31.25	37.50		C
	Telephone TV & Blank Cover Plates		12.00	15.00	18.00		C

The image displays four orthographic views of a mechanical component. The top view shows a square flange with a central circular hole and four mounting holes. The bottom view shows a square flange with a central circular hole and four mounting holes. The front view shows a rectangular frame with a central circular hole and four mounting holes. The back view shows a rectangular frame with a central circular hole and four mounting holes.



SECTION 7

HAZARDOUS SYSTEMS

General Information

The labor units in this section are applicable for hazardous location electrical systems more commonly referred to as explosion proof equipment. See Section 2 of this manual for metal conduit and fastener labor units.

Scope of These Labor Units

The Introduction section includes details on the scope of labor units across the manual. Some items included are:

- Material unloading, jobsite storage and delivery to the installation area
- Drawing and specification study
- Layout, measuring and marking the installation location
- Tool acquisition and return to storage
- Material assembly and installation
- Clean-up of electrical contractor furnished excess material
- Circuit testing for continuity
- Normal non-productive labor

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Work Operations Not Included In These Labor Units

- Field supervision
- Hanger or fastener installation
- Welding or painting
- Measurement and alignment more precise than normal industry standards
- Conductor installation (wire pulling)
- Testing other than circuit continuity testing

Labor Adjustments for Non-Typical Conditions

See the Introduction section for details.

Application Instructions

- Labor units under the “Normal” column are for heights up to eight feet above a smooth, hard floor. Labor units under the “Difficult” column are for heights up to 12 feet. Labor units under the “Very Difficult” column are for heights up to 16 feet.
- Labor units for conduit, pull boxes, receptacles, switches, circuit breakers and panel boards in this section exclude supports, straps, hangers, anchors and fasteners other than wood screws.
- Labor unit tables do not include every type and size of explosion proof items available. When labor units are required for items not listed, an approximate labor unit may be obtained from the tables for a similar item of about the same weight, dimensions and conductor terminations.
- All the labor units in this section are based on using the most efficient tools and equipment available. When the anticipated jobsite conditions will prevent the optimum use of tools and equipment, an appropriate additional labor allowance in proportion to the anticipated difficulties is necessary.
- Labor units in this manual are for new work only and for a complete electrical installation. For remodeling or change order situations these labor units need to be substantially increased.

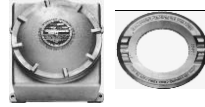
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	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Sealing Hub Listed by Female Hub Size						
	1/2"		0.55	0.68	0.80		E
	3/4"		0.60	0.75	0.90		E
	1"		0.70	0.87	1.05		E
	1 1/4"		0.80	1.00	1.20		E
	1 1/2"		0.90	1.12	1.35		E
	2"		1.00	1.25	1.50		E
	2 1/2"		1.20	1.50	1.80		E
	3"		1.40	1.75	2.10		E
	3 1/2"		1.70	2.10	2.55		E
4"		2.00	2.50	3.00		E	
	Conduit Seal Fittings with or without Drain Fittings						
	1/2"		0.55	0.68	0.80		E
	3/4"		0.60	0.75	0.90		E
	1"		0.70	0.87	1.05		E
	1 1/4"		0.80	1.00	1.20		E
	1 1/2"		0.90	1.12	1.35		E
	2"		1.00	1.25	1.50		E
	2 1/2"		1.20	1.50	1.80		E
	3"		1.40	1.75	2.10		E
	3 1/2"		1.70	2.10	2.55		E
4"		2.00	2.50	3.00		E	
	Sealing Compound						
	1/2" Fittings		0.18	0.25	0.30		E
	3/4" Fittings		0.22	0.28	0.33		E
	1" Fittings		0.28	0.35	0.42		E
	1 1/4" Fittings		0.32	0.40	0.48		E
	1 1/2" Fittings		0.35	0.44	0.53		E
	2" Fittings		0.40	0.50	0.60		E
	2 1/2" Fittings		0.43	0.54	0.65		E
	3" Fittings		0.45	0.56	0.68		E
	3 1/2" Fittings		0.47	0.59	0.71		E
4" Fittings		0.50	0.63	0.75		E	
	Steel Conduit Unions						
	1/2"		0.45	0.56	0.67		E
	3/4"		0.50	0.62	0.75		E
	1"		0.60	0.75	0.90		E
	1 1/4"		0.70	0.87	1.05		E
	1 1/2"		0.80	1.00	1.20		E
	2"		1.00	1.25	1.50		E
	2 1/2"		1.20	1.50	1.80		E
	3"		1.40	1.75	2.10		E
	3 1/2"		1.70	2.10	2.55		E
4"		2.00	2.50	3.00		E	
	Flexible Steel Couplings						
	1/2"		0.45	0.56	0.67		E
	3/4"		0.50	0.62	0.75		E
	1"		0.60	0.75	0.90		E
	1 1/4"		0.70	0.87	1.05		E
	1 1/2"		0.80	1.00	1.20		E
	2"		0.90	1.12	1.35		E
	2 1/2"		1.00	1.25	1.50		E
	3"		1.20	1.50	1.80		E
	3 1/2"		1.50	1.85	2.25		E
4"		1.80	2.25	2.70		E	
	Breather/Drain Fittings						
	1/2"		0.35	0.43	0.52		E
	Explosion Proof Conduit Bodies 2-Hub						
	1/2"		0.60	0.75	0.90		E
	3/4"		0.70	0.87	1.05		E
	1"		0.90	1.12	1.35		E
	1 1/4"		1.10	1.35	1.65		E
	1 1/2"		1.40	1.75	2.10		E
	2"		1.80	2.25	2.70		E
	Explosion Proof Conduit Bodies 3-Hub						
	1/2"		0.70	0.87	1.05		E
	3/4"		0.80	1.00	1.20		E
	1"		1.00	1.25	1.50		E
	1 1/4"		1.30	1.60	1.90		E
	1 1/2"		1.60	2.00	2		

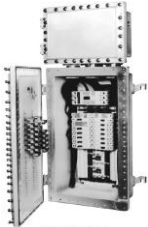
Section 7 - Hazardous Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	2-Hub Round Junction Boxes						
	1/2"		0.60	0.75	0.90		E
	3/4"		0.70	0.87	1.05		E
	1"		0.90	1.12	1.35		E
	1 1/4"		1.10	1.35	1.65		E
	1 1/2"		1.40	1.75	2.10		E
	2"		1.80	2.25	2.70		E
	3-Hub Round Junction Boxes						
	1/2"		0.70	0.87	1.05		E
	3/4"		0.80	1.00	1.20		E
	1"		1.00	1.25	1.50		E
	1 1/4"		1.30	1.60	1.90		E
	1 1/2"		1.60	2.00	2.40		E
	2"		2.00	2.50	3.00		E
	Explosion Proof Junction Boxes with Hubs Up to 5" x 5"						
	1/2"		1.75	2.15	2.60		E
	3/4"		2.00	2.50	3.00		E
	1"		2.25	2.80	3.40		E
	1 1/4"		2.60	3.25	3.90		E
	1 1/2"		3.00	3.75	4.50		E
	2"		3.50	4.35	5.25		E
	Explosion Proof Junction Boxes with Hubs Up to 10 x 10"						
	1/2"		2.50	3.10	3.75		E
	3/4"		2.75	3.40	4.10		E
	1"		3.00	3.75	4.50		E
	1 1/4"		3.30	4.10	5.00		E
	1 1/2"		3.60	4.50	5.50		E
	2"		4.00	5.00	6.00		E
	Explosion Proof Junction Boxes with Hubs up to 12 x 12"						
	3/4"		3.30	4.10	5.00		E
	1"		3.60	4.50	5.50		E
	1 1/4"		4.00	5.00	6.00		E
	1 1/2"		4.50	5.60	6.75		E
	2"		5.00	6.25	7.50		E
	Drill and Tap for Hubs						
	1/2"		0.90	1.13	1.35		E
	3/4"		0.95	1.19	1.43		E
	1"		1.15	1.44	1.73		E
	1 1/4"		1.20	1.50	1.80		E
	1 1/2"		1.25	1.56	1.88		E
	2"		1.75	2.19	2.63		E
	Control & Instrument Enclosures 2-Hubs						
	5" x 5"		2.00	2.50	3.00		E
	6 1/2" x 7"		2.50	3.10	3.75		E
	8" x 10"		2.75	3.40	4.10		E
	12" x 12"		3.25	4.00	4.80		E
	17" x 17"		4.00	5.00	6.00		E
	Control & Instrument Enclosures 3-Hub						
	5" x 5"		2.25	2.80	3.40		E
	6 1/2" x 7"		2.60	3.25	3.90		E
	8" x 10"		3.00	3.75	4.50		E
	12" x 12"		3.50	4.35	5.25		E
	17" x 17"		4.25	5.30	6.35		E
	Explosion Proof Large Junction Boxes						
	Up to 10 x 10"		3.00	3.75	4.50		E
	Up to 15 x 15"		3.75	4.50	5.50		E
	Up to 20 x 20"		4.50	5.50	6.50		E
	Up to 24 x 24"		6.5	7.5	8.5		E
	Explosion Proof Single Receptacles						
	20 Amp 2 Wire		0.80	1.00	1.20		E
	20 Amp 3 Wire		0.85	1.05	1.27		E
	20 Amp 4 Wire		0.90	1.10	1.35		E
	30 Amp 2 Wire		0.85	1.05	1.27		E
	30 Amp 3 Wire		0.90	1.10	1.35		E
	30 Amp 4Wire		1.00	1.25	1.50		E
	50 Amp 3 Wire		1.10	1.35	1.65		E
	50 Amp 4 Wire		1.20	1.50	1.80		E
	60 Amp 3 Wire		1.40	1.75	2.10		E
	60 Amp 4 Wire		1.50	1.90	2.25		E

Section 7 - Hazardous Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Explosion Proof Single Receptacles with Factory Seal						
	20 Amp 2 Wire		0.75	0.94	1.13		E
	20 Amp 3 Wire		0.80	1.00	1.20		E
	20 Amp 4 Wire		0.85	1.05	1.27		E
	30 Amp 2 Wire		0.90	1.10	1.35		E
	30 Amp 3 Wire		0.85	1.05	1.27		E
	30 Amp 4Wire		0.90	1.10	1.35		E
	50 Amp 3 Wire		1.00	1.25	1.50		E
	50 Amp 4 Wire		1.10	1.35	1.65		E
	60 Amp 3 Wire		1.20	1.50	1.80		E
	60 Amp 4 Wire		1.40	1.75	2.10		E
	Explosion Proof Polarized Pin Receptacles						
	20 Amp 2 Wire		0.90	1.10	1.35		E
	20 Amp 3 Wire		1.00	1.25	1.50		E
	20 Amp 4 Wire		1.10	1.35	1.65		E
	20 Amp 5 Wire		1.20	1.50	1.80		E
	30 Amp 2 Wire		1.00	1.25	1.50		E
	30 Amp 3 Wire		1.10	1.35	1.65		E
	30 Amp 4Wire		1.20	1.50	1.80		E
	30 Amp 5 Wire		1.30	1.60	1.95		E
	60 Amp 3 Wire		1.40	1.75	2.10		E
	60 Amp 4 Wire		1.50	1.90	2.25		E
	Explosion Proof Receptacle Male Attachment Cap						
	20 Amp 2 Wire		0.25	0.31	0.39		E
	20 Amp 3 Wire		0.30	0.38	0.47		E
	20 Amp 4 Wire		0.33	0.41	0.52		E
	20 Amp 5 Wire		0.40	0.50	0.63		E
	30 Amp 3 Wire		0.25	0.31	0.39		E
	30 Amp 4 Wire		0.30	0.38	0.47		E
	30 Amp 5 Wire		0.33	0.41	0.52		E
	60 Amp 3 Wire		0.50	0.63	0.78		E
	60 Amp 4 Wire		0.60	0.75	0.94		E
	Explosion Proof Snap Switches						
	1-Pole 15 Amp		0.80	1.00	1.20		E
	1-Pole 20 Amp		0.85	1.05	1.27		E
	1-Pole 30 Amp		0.90	1.10	1.35		E
	2-Pole 15 Amp		1.00	1.25	1.50		E
	2-Pole 20 Amp		1.05	1.30	1.55		E
	2-Pole 30 Amp		1.10	1.35	1.60		E
	3-Way 15 Amp		1.15	1.40	1.70		E
	3-Way 20 Amp		1.20	1.50	1.80		E
	3-Way 30 Amp		1.25	1.55	1.90		E
	4-Way 15 Amp		1.30	1.65	2.00		E
	4-Way 20 Amp		1.35	1.70	2.10		E
	4-Way 30 Amp		1.40	1.80	2.20		E
	Explosion Proof Snap Switches with Factory Seal						
	1-Pole 15 Amp		0.75	0.94	1.13		E
	1-Pole 20 Amp		0.80	1.00	1.20		E
	1-Pole 30 Amp		0.85	1.05	1.27		E
	2-Pole 15 Amp		0.90	1.10	1.35		E
	2-Pole 20 Amp		1.00	1.25	1.50		E
	2-Pole 30 Amp		1.05	1.30	1.55		E
	3-Way 15 Amp		1.10	1.35	1.60		E
	3-Way 20 Amp		1.15	1.40	1.70		E
	3-Way 30 Amp		1.20	1.50	1.80		E
	4-Way 15 Amp		1.25	1.55	1.90		E
	4-Way 20 Amp		1.30	1.65	2.00		E
	4-Way 30 Amp		1.35	1.70	2.10		E
	Explosion Proof Receptacles with Interlocked Switches						
	20-Amp 2-Wire		2.00	2.50	3.00		E
	20-Amp 3-Wire		2.30	2.90	3.50		E
	20-Amp 4-Wire		2.60	3.30	4.00		E
	30-Amp 2-Wire		2.30	2.90	3.50		E
	30-Amp 3-Wire		2.60	3.30	4.00		E
	30-Amp 4-Wire		3.00	3.75	4.50		E
	Push Button Station - Wall Mounted - 120 Volt - Explosion Proof Enclosure						
	1-Button or Pilot Light		1.50	1.88	2.25		E
	2-Button or Pilot Light		1.80	2.25	2.70		E
	3-Button or Pilot Light		2.10	2.63	3.15		E
	4-Button or Pilot Light		2.50	3.13	3.75		E
	Explosion Proof 2-Wire Safety Switches						
	30 Amp		3.00	3.75	4.50		E
	60 Amp		3.50	4.35	5.25		E
	100 Amp		4.50	5.60	6.75		E
	150 Amp		5.50	6.85	8.25		E
	200 Amp		6.50	8.10	9.75		E

Section 7 - Hazardous Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Explosion Proof 3-Wire Safety Switches						
	30 Amp		3.50	4.35	5.25		E
	60 Amp		4.00	5.00	6.00		E
	100 Amp		5.00	6.25	7.50		E
	150 Amp		6.00	7.50	9.00		E
	200 Amp		7.00	8.75	10.00		E
	Explosion Proof 4-Wire Safety Switches						
	30 Amp		4.00	5.00	6.00		E
	60 Amp		4.50	5.60	6.75		E
	100 Amp		5.50	6.85	8.25		E
	150 Amp		6.50	7.10	9.75		E
	200 Amp		7.50	9.35	11.25		E
	1-Pole Circuit Breakers with Spin Top Covers						
	20 Amp		2.00	2.50	3.00		E
	30 Amp		2.25	2.80	3.35		E
	40 Amp		2.50	3.10	3.75		E
	50 Amp		2.70	3.35	4.00		E
	70 Amp		3.25	4.05	4.85		E
	90 Amp		3.75	4.65	5.60		E
	100 Amp		4.00	5.00	6.00		E
	2-Pole Circuit Breakers with Spin Top Covers						
	30 Amp		2.50	3.10	3.75		E
	40 Amp		2.75	3.40	4.10		E
	50 Amp		3.00	3.75	4.50		E
	70 Amp		3.50	4.35	5.25		E
	90 Amp		4.00	5.00	6.00		E
	100 Amp		4.50	5.60	6.75		E
	125 Amp		5.00	6.25	7.50		E
	150 Amp		5.50	6.85	8.25		E
	175 Amp		6.00	7.50	9.00		E
	200 Amp		7.00	8.75	10.50		E
	225 Amp		8.00	10.00	12.00		E
	250 Amp		9.00	11.25	13.50		E
	300 Amp		10.00	12.50	15.00		E
	400 Amp		12.00	15.00	18.00		E
	3-Pole Circuit Breakers with Spin Top Covers						
	30 Amp		2.75	3.44	4.13		E
	40 Amp		3.00	3.75	4.50		E
	50 Amp		3.50	4.38	5.25		E
	70 Amp		4.00	5.00	6.00		E
	90 Amp		4.50	5.63	6.75		E
	100 Amp		5.00	6.25	7.50		E
	125 Amp		5.50	6.88	8.25		E
	150 Amp		6.00	7.50	9.00		E
	175 Amp		7.00	8.75	10.50		E
	200 Amp		8.00	10.00	12.00		E
	225 Amp		9.00	11.25	13.50		E
	250 Amp		10.00	12.50	15.00		E
	300 Amp		12.00	15.00	18.00		E
	400 Amp		14.00	17.50	21.00		E
	Panelboard Class 1 Div 2 up to 30 Circuit Breakers Style D2L						
	6 Single Pole Spaces		10.00	12.50	15.00		E
	12 Single Pole Spaces		10.50	13.13	15.75		E
	18 Single Pole Spaces		11.00	13.75	16.50		E
	24 Single Pole Spaces		11.50	14.38	17.25		E
	30 Single Pole Spaces		12.00	15.00	18.00		E
	Panelboard Class 1 Div 1 up to 30 Circuits Style LP-1						
	6 Single Pole Spaces		11.00	13.75	16.50		E
	12 Single Pole Spaces		11.50	14.38	17.25		E
	18 Single Pole Spaces		12.00	15.00	18.00		E
	24 Single Pole Spaces		12.50	15.63	18.75		E
	30 Single Pole Spaces		13.00	16.25	19.50		E
	One Speed Non-Reversing Combination Motor Starters - 2-Pole						
	NEMA 0		3.50	4.30	5.20		E
	NEMA 1		4.00	5.00	6.00		E
	NEMA 2		5.00	6.20	7.50		E

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SECTION 8

GROUNDING AND LIGHTNING PROTECTION SYSTEMS

General Information

The labor units in this section are applicable for the installation of exposed indoor grounding systems and outdoor buried grounding systems. These labor units do not include the excavation or backfilling for outdoor grounding systems.

Scope of These Labor Units

The Introduction section includes details on the scope of labor units across the manual. Some items included are:

- Material unloading, jobsite storage and delivery to the installation area
- Drawing and specification study
- Layout, measuring and marking the installation location
- Tool acquisition and return to storage
- Grounding materials installation
- Grounding conductor terminations on grounding bushings and clamps
- Clean-up of electrical contractor furnished excess material
- Normal non-productive labor

Work Operations Not Included In These Labor Units

- Field supervision
- Conduit or physical protection for grounding conductors
- Lug installation for conductor terminations
- Testing of any type
- Electrical equipment enclosure grounding conductor terminations
- Excavation or backfilling for indoor or outdoor grounding systems

Labor Adjustments for Non-Typical Conditions

See the Introduction section for details.

Application Instructions

- Labor units under the “Normal” column are for locations with good access, no obstructions and large quantities of grounding conductors. Labor units under the “Difficult” column are for locations with less than good access, a few minor obstructions and large quantities of grounding conductors. Labor units under the “Very Difficult” column are for locations with poor access or require the use of a ladder, numerous obstructions, limited space, or small quantities of grounding materials.
- Labor units for driving grounding rods are for locations with loam, hard clay, or loose shale the full depth of the rods. For other locations the labor units must be increased in proportion to the density of the soil encountered.
- All the labor units in this section are based on using the most efficient tools and equipment available. When the anticipated jobsite conditions will prevent the optimum use of tools and equipment, an appropriate additional labor allowance in proportion to the anticipated difficulties is necessary.
- Labor units in this manual are for new work only and for a complete electrical installation. For remodeling or change order situations these labor units need to be substantially increased.

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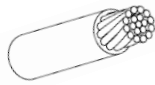
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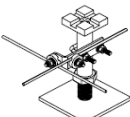
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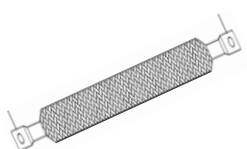
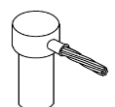
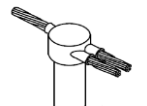
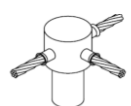
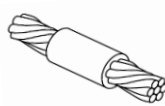
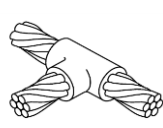
	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Bare Copper Grounding Conductors -						
	Buried - Outdoors - Does not include Excavation						
	#12, #10		8.00	10.00	12.00		M
	#8, #6		12.00	15.00	18.00		M
	#4, #3		16.00	20.00	24.00		M
	#2, #1		20.00	25.00	30.00		M
	1/0		26.00	32.50	39.00		M
	2/0		29.00	36.20	43.00		M
	3/0		32.00	40.00	48.00		M
	4/0		35.00	43.00	52.00		M
	250 kcmil		38.00	47.00	57.00		M
	300 kcmil		41.00	51.00	61.00		M
	350 kcmil		44.00	55.00	66.00		M
	400 kcmil		48.00	60.00	72.00		M
	500 kcmil		52.00	65.00	78.00		M
	600 kcmil		56.00	70.00	84.00		M
	750 kcmil		62.00	77.00	93.00		M
	1000 kcmil		70.00	85.00	100.00		M
	Bare and Insulated Copper Grounding Conductors -						
	Indoors - Exposed or In Cable Trays						
	#12, #10		8.00	10.00	12.00		M
	#8, #6		12.00	15.00	18.00		M
	#4, #3		16.00	20.00	24.00		M
	#2, #1		20.00	25.00	30.00		M
	1/0		35.00	43.00	52.00		M
	2/0		40.00	50.00	60.00		M
	3/0		45.00	56.00	67.00		M
	4/0		50.00	62.00	75.00		M
	250 kcmil		55.00	68.00	82.00		M
	300 kcmil		60.00	75.00	90.00		M
	350 kcmil		65.00	81.00	95.00		M
	400 kcmil		70.00	85.00	100.00		M
	500 kcmil		75.00	93.00	110.00		M
	600 kcmil		80.00	100.00	120.00		M
	750 kcmil		88.00	110.00	135.00		M
	1000 kcmil		100.00	125.00	150.00		M
	<i>Note: Modify rates based on cable tray types (ie: ladder, centerhung)</i>						
	<i>Modify rates for stacked cable tray runs</i>						
	Conduit Grounding Wedges						
	3/4"		0.16	0.20	0.25		E
	1"		0.18	0.23	0.28		E
	1 1/4"		0.22	0.28	0.34		E
	1 1/2"		0.23	0.29	0.36		E
	2"		0.24	0.30	0.38		E
	2 1/2"		0.26	0.33	0.41		E
	3"		0.29	0.36	0.45		E
	3 1/2"		0.32	0.40	0.50		E
	4"		0.36	0.45	0.56		E
	Conduit Grounding Bushings or Locknuts						
	3/4"		0.20	0.25	0.30		E
	1"		0.22	0.27	0.33		E
	1 1/4"		0.24	0.29	0.36		E
	1 1/2"		0.26	0.32	0.39		E
	2"		0.28	0.35	0.42		E
	2 1/2"		0.30	0.37	0.45		E
	3"		0.33	0.41	0.50		E
	3 1/2"		0.36	0.45	0.55		E
	4"		0.40	0.50	0.60		E
	5"		0.70	0.88	1.09		E
	6"		0.77	0.96	1.20		E
	<i>Note: Cutting and threading conduit is not included</i>						
	Conductor Grounding Clamps						
	3/4"		0.40	0.50	0.60		E
	1"		0.44	0.55	0.66		E
	1 1/4"		0.48	0.60	0.72		E
	1 1/2"		0.52	0.65	0.78		E
	2"		0.56	0.70	0.84		E
	2 1/2"		0.60	0.75	0.90		E
	3"		0.64	0.80	0.96		E
	3 1/2"		0.68	0.85	1.02		E
	4"		0.72	0.90	1.08		E
	5"		0.76	0.95	1.14		E
	6"		0.80	1.00	1.20		E

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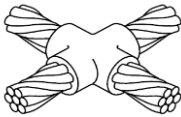
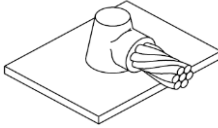
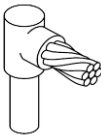
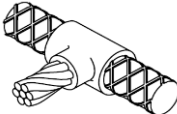
	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Conduit Grounding Clamps						
	3/4"		0.60	0.75	0.90		E
	1"		0.64	0.80	0.96		E
	1 1/4"		0.72	0.85	1.02		E
	1 1/2"		0.80	0.90	1.08		E
	2"		0.88	0.95	1.14		E
	2 1/2"-4" (universal size)		1.10	1.35	1.60		E
	5"		1.25	1.55	1.85		E
	6"		1.40	1.75	2.10		E
	Pedestal Grounding Clamp-Raised Floor						
	Round up to 3/4" - #8 to #2		0.25	0.35	0.45		E
	Round up to 1" - #8 to #2		0.30	0.40	0.50		E
	Square up to 5/8" - #8 to #2		0.25	0.35	0.45		E
	Square up to 7/8" - #8 to #2		0.30	0.40	0.50		E
	Grounding Rods						
	Grounding Rod with Clamp		1.60	2.00	2.50		E
	<i>Note: Verify Soil Conditions</i>						
	Sectional Ground Rods						
	First Rod		1.60	2.00	2.50		E
	Second Rod		2.10	2.63	3.28		E
	Third Rod		2.60	3.25	4.06		E
	Drive Stud		0.10	0.13	0.16		E
	Rod Coupling		0.10	0.13	0.16		E
	<i>(Based on total length of 30')</i>						
	<i>Note: Verify Soil Conditions</i>						
	<i>Labor units based on the use of air or electrical hammer</i>						
	<i>Use Drive Stud to prevent damaging threads</i>						
	Flexible Braid Grounding Strap						
	100 Amp		1.00	1.25	1.50		E
	200 Amp		1.10	1.37	1.65		E
	300 Amp		1.20	1.50	1.80		E
	500 Amp		1.35	1.65	2.00		E
	800 Amp		1.50	1.85	2.25		E
	1000 Amp		1.70	2.10	2.55		E
	1600 Amp		2.00	2.50	3.00		E
	AL Flexible Braid Conductor						
	AL Flexible Braid Conductor #2		0.75	0.90	1.10		E
	CU Flexible Braid Conductor						
	CU Flexible Braid Conductor #6		0.55	0.75	0.85		E
	CU Flexible Braid Conductor #4		0.70	0.90	1.15		E
	CU Flexible Braid Conductor #2		0.85	1.05	1.35		E
	CU Flexible Braid Conductor #1/0		1.10	1.35	1.70		E
	AL Rod Conductor						
	AL Rod Conductor 3/8" Dia.		1.25	1.50	1.75		E
	AL Rod Conductor 1/2" Dia.		1.75	2.00	2.25		E
	CU Rod Conductor						
	CU Rod Conductor 3/8" Dia.		1.50	2.00	2.50		E
	CU Rod Conductor 1/2" Dia.		2.00	2.50	3.00		E
	AL Flexible Braid Conductor						
	AL Flexible Braid Cond. #2		0.75	0.90	1.10		E

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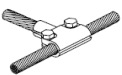
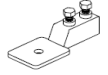
	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Braided Copper Bonding Jumpers						
	3/4" Conduit		0.80	1.00	1.20		E
	1" Conduit		0.85	1.05	1.25		E
	1 1/4" Conduit		0.90	1.12	1.35		E
	1 1/2" Conduit		1.00	1.25	1.50		E
	2" Conduit		1.10	1.37	1.65		E
	2 1/2" Conduit		1.20	1.50	1.80		E
	3" Conduit		1.30	1.62	1.95		E
	3 1/2" Conduit		1.40	1.75	2.10		E
	4" Conduit		1.60	2.00	2.40		E
	5" Conduit		1.80	2.25	2.70		E
	6" Conduit		2.00	2.50	3.00		E
	Ground Clips for Boxes						
	Ground clip		0.06	0.08	0.10		E
	Ground Pigtail for Boxes						
	Ground pigtail		0.06	0.08	0.10		E
	Grounding Wire Connectors						
	Accepts 2 - #14 TO 5 - #12'S						
	Grounding wire connector		0.08	0.10	0.12		E
	One-shot Conductor to Ground Rod-Cadweld						
	Single Conductor to Ground Rod						
	#8 - #4 to 5/8" or 3/4" ground rod		0.37	0.46	0.58		E
	#1 - #3 to 5/8" or 3/4" ground rod		0.42	0.53	0.66		E
	#1/0 - #4/0 to 5/8" or 3/4" ground rod		0.47	0.59	0.73		E
	Tri-line Conductor to Ground Rod						
	#8 - #4 to 5/8" or 3/4" ground rod		0.47	0.59	0.73		E
	#1 - #3 to 5/8" or 3/4" ground rod		0.52	0.65	0.81		E
	#1/0 - #4/0 to 5/8" or 3/4" ground rod		0.57	0.71	0.89		E
	Tee Conductor to Ground Rod						
	#8 - #4 to 5/8" or 3/4" ground rod		0.57	0.71	0.89		E
	#1 - #3 to 5/8" or 3/4" ground rod		0.62	0.78	0.97		E
	#1/0 - #4/0 to 5/8" or 3/4" ground rod		0.67	0.84	1.05		E
	In-Line Splices-Cadweld Splices						
	Up to #6		1.00	1.25	1.50		E
	#4		1.05	1.30	1.55		E
	#3		1.10	1.35	1.60		E
	#2		1.15	1.40	1.70		E
	#1		1.20	1.50	1.80		E
	1/0		1.25	1.60	1.90		E
	2/0		1.30	1.70	2.00		E
	3/0		1.40	1.80	2.10		E
	4/0		1.50	1.90	2.25		E
	250 kcmil		1.60	2.00	2.40		E
	300-350 kcmil		1.70	2.10	2.55		E
	400-500 kcmil		1.80	2.20	2.70		E
	600-750 kcmil		1.90	2.35	2.85		E
	1000 kcmil		2.00	2.50	3.00		E
	Tee or Wye Cadwelds						
	Up to #6		1.10	1.35	1.60		E
	#4		1.15	1.40	1.70		E
	#3		1.20	1.50	1.80		E
	#2		1.25	1.60	1.80		E
	#1		1.30	1.70	2.00		E
	1/0		1.40	1.80	2.10		E
	2/0		1.50	1.90	2.25		E
	3/0		1.60	2.00	2.40		E
	4/0		1.70	2.10	2.55		E
	250-300 kcmil		1.80	2.20	2.70		E
	350-400 kcmil		1.90	2.35	2.85		E
	500-600 kcmil		2.00	2.50	3.00		E
	750 kcmil		2.10	2.65	3.15		E
	1000 kcmil		2.25	2.80	3.35		E

Section 8 - Grounding & Lightning Protection Systems

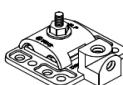
	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Cross (4 Way) Cadwelds						
	Up to #6		1.20	1.50	1.80		E
	#4		1.25	1.60	1.90		E
	#3		1.30	1.70	2.00		E
	#2		1.40	1.80	2.10		E
	#1		1.50	1.90	2.25		E
	1/0		1.60	2.00	2.40		E
	2/0		1.70	2.10	2.55		E
	3/0		1.80	2.20	2.70		E
	4/0		1.90	2.35	2.85		E
	250-300 kcmil		2.00	2.50	3.00		E
	350-400 kcmil		2.10	2.65	3.15		E
	500-600 kcmil		2.20	2.80	3.30		E
	750 kcmil		2.35	2.95	3.50		E
	1000 kcmil		2.50	3.10	3.75		E
	Conductor to Steel - Cadweld						
	Up to #6		1.00	1.25	1.50		E
	#4		1.05	1.30	1.55		E
	#3		1.10	1.35	1.60		E
	#2		1.15	1.40	1.70		E
	#1		1.20	1.50	1.80		E
	1/0		1.25	1.60	1.90		E
	2/0		1.30	1.70	2.00		E
	3/0		1.40	1.80	2.10		E
	4/0		1.50	1.90	2.25		E
	250 - 300 kcmil		1.60	2.00	2.40		E
	350 -400 kcmil		1.70	2.10	2.55		E
	500 - 600 kcmil		1.80	2.20	2.70		E
	750 kcmil		1.90	2.35	2.85		E
	1000 kcmil		2.00	2.50	3.00		E
	<i>Note: Add 15% for Cadweld round surface</i>						
	Cadweld To Ground Rod						
	#6		1.00	1.25	1.50		E
	#4		1.05	1.31	1.57		E
	#2		1.15	1.43	1.72		E
	#1/0		1.25	1.56	1.87		E
	#2/0		1.30	1.62	1.95		E
	#3/0		1.35	1.68	2.00		E
	#4/0		1.40	1.75	2.10		E
	#250 kcmil		1.45	1.81	2.17		E
	<i>Note: See Section 11 for hand holes for test wells</i>						
	Cadweld Bare Copper Wire To Rebar						
	#6		1.10	1.37	1.65		E
	#4		1.15	1.43	1.72		E
	#2		1.25	1.56	1.87		E
	#1/0		1.35	1.68	2.00		E
	#2/0		1.40	1.75	2.19		E
	#3/0		1.45	1.81	2.27		E
	Irreversible Compression Ground System						
	Ground Grid Cross Connector						
	#6 - #2 conductor to #6 - #2 conductor		0.45	0.56	0.70		E
	#1 - #250 conductor to #6 - #2 conductor		0.75	0.94	1.17		E
	#2 - #250 conductor to #6 - #2 conductor		0.97	1.21	1.52		E
	#250 - #500 conductor to #6 - #2 conductor		1.03	1.29	1.61		E
	#250 - #500 conductor to #2 - #250 conductor		1.18	1.48	1.84		E
	#250 - #500 conductor to #250 - #500 conductor		1.28	1.60	2.00		E
	1/2" - 5/8" rod to #6 - #2 conductor		0.65	0.81	1.02		E
	1/2" - 5/8" rod to #2 - #250 conductor		0.85	1.06	1.33		E
	5/8" - 3/4" rod to #6 - #2 conductor		0.75	0.94	1.17		E
	5/8" - 3/4" rod to #2 - #250 conductor		0.95	1.19	1.48		E
	5/8" - 3/4" rod to #200 - #500 conductor		1.15	1.44	1.80		E
	Compression Ground Rod with 1ea Tap Connectors						
	1/2" - 5/8" rod to #2-2/0 tap		0.60	0.75	0.94		E
	1/2" - 5/8" rod to #4/0-250 tap		0.75	0.94	1.17		E
	5/8" rod to #300-#500 tap		0.95	1.19	1.48		E
	3/4" - 1" rod to #2-2/0 tap		0.70	0.88	1.09		E
	3/4" - 1" rod to #4/0-250 tap		0.85	1.06	1.33		E
	3/4" - 1" rod to #300-#500 tap		1.05	1.31	1.64		E
	Compression Ground Rod with 2ea Tap Connectors						
	1/2" - 5/8" rod to 2ea		0.85	1.06	1.33		E
	Compression Ground Rod with 3ea Tap Connectors						
	5/8" rod to 3ea #2 tap		1.00	1.25	1.56		E

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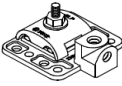
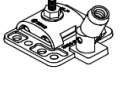
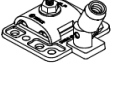
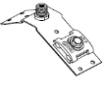
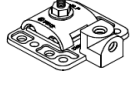
Section 8 - Grounding & Lightning Protection Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Lightning Protection						
	AL Flat Conductor						
	AL Flat Conductor 14GA x 5/8"W		8.00	10.00	12.00		C
	AL Flat Conductor 12GA x 1"W		9.00	11.30	13.50		C
	AL Flat Conductor 12GA x 1 1/4"W		10.00	12.50	15.00		C
	CU Flat Conductor						
	CU Flat Conductor 16GA x 1/2"W		8.00	10.00	12.00		C
	CU Flat Conductor 14GA x 1"W		10.00	12.50	15.00		C
	CU Flat Conductor 14GA x 1 1/4"W		12.00	15.00	18.00		C
	CU Flat Conductor 0.129" x 3/4"W		14.00	17.50	21.00		C
	Bonding Plates						
	Bonding Plates AL #2 - 1/0		0.50	0.75	0.80		E
	Bonding Plates AL 2/0 - 1/0		0.65	0.80	1.00		E
	Bonding Plates CU #6 - #2		0.50	0.65	0.85		E
	Bonding Plates CU #1 - 4/0		0.80	0.95	1.15		E
	Adhesive Cable Holder						
	Adhesive Cable Holder AL #2 - 1/0		0.30	0.40	0.55		E
	Adhesive Cable Holder AL #2/0 - 4/0		0.50	0.60	0.75		E
	Adhesive Cable Holder CU #6 - #2		0.35	0.45	0.60		E
	Adhesive Cable Holder CU #1 - 4/0		0.60	0.70	0.85		E
	Cable Fastener (Masonry)						
	Cable Fastener (Masonry) AL #2 - 1/0		0.18	0.23	0.30		E
	Cable Fastener (Masonry) AL 2/0 - 4/0		0.23	0.28	0.35		E
	Cable Fastener (Masonry) CU #6 - #2		0.20	0.25	0.33		E
	Cable Fastener (Masonry) CU #1 - 4/0		0.25	0.30	0.38		E
	Cable Fasteners						
	Cable Fasteners AL #2 - 1/0		0.12	0.14	0.20		E
	Cable Fasteners AL 2/0 - 4/0		0.15	0.20	0.25		E
	Cable Fasteners CU #6 - #2		0.13	0.17	0.23		E
	Cable Fasteners CU #1 - 4/0		0.18	0.22	0.28		E
	Cable Splicers						
	Cable Splicers AL #2 - 1/0		0.28	0.34	0.43		E
	Cable Splicers AL 2/0 - 4/0		0.40	0.48	0.60		E
	Cable Splicers CU #6 - #2		0.30	0.37	0.45		E
	Cable Splicers CU #1 - 4/0		0.43	0.51	0.63		E
	Tee Cable Splicers						
	Tee Cable Splicers AL #2 - 1/0		0.55	0.68	0.83		E
	Tee Cable Splicers AL 2/0 - 4/0		0.80	0.95	1.15		E
	Tee Cable Splicers CU #6 - #2		0.60	0.73	0.90		E
	Tee Cable Splicers CU #1 - 4/0		0.90	1.08	1.30		E
							
	Three Way Splicer						
	Three Way Splicer AL #2 - 1/0		0.75	0.90	1.10		E
	Three Way Splicer AL 2/0 - 4/0		1.15	1.35	1.65		E
	Three Way Splicer CU #6 - #2		0.90	1.08	1.30		E
	Three Way Splicer CU #1 - 4/0		1.30	1.53	1.85		E
	Cross Run Splicer						
	Cross Run Splicer AL #2 - 1/0		0.80	0.95	1.20		E
	Cross Run Splicer AL 2/0 - 4/0		1.20	1.45	1.80		E
	Cross Run Splicer CU #6 - #2		1.00	1.20	1.50		E
	Cross Run Splicer CU #1 - 4/0		1.50	1.80	2.25		E
	Straight Splicer						
	Straight Splicer AL #2 - 1/0		0.60	0.72	0.90		E
	Straight Splicer AL 2/0 - 4/0		0.90	1.10	1.35		E
	Straight Splicer CU #6 - #2		0.65	0.80	1.00		E
	Straight Splicer CU #1 - 4/0		0.95	1.15	1.45		E
							
	Bonding Lug						
	Bonding Lug AL #2 - 1/0		0.30	0.40	0.53		E
	Bonding Lug AL 2/0 - 4/0		0.53	0.65	0.80		E
	Bonding Lug CU #6 - #2		0.35	0.45	0.58		E
	Bonding Lug CU #1 - 4/0		0.55	0.68	0.85		E

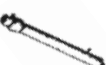
Section 8 - Grounding & Lightning Protection Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Thru Roof Point Adapt						
	Thru Roof Point Adapt AL 3/8"		0.83	0.95	1.15		E
	Thru Roof Point Adapt AL 1/2"		1.08	1.28	1.53		E
	Thru Roof Point Adapt AL 5/8"		1.32	1.58	1.90		E
	Thru Roof Point Adapt CU 3/8"		0.75	0.90	1.10		E
	Thru Roof Point Adapt CU 1/2"		1.13	1.33	1.60		E
	Thru Roof Point Adapt CU 5/8"		1.38	1.63	2.05		E
	Thru Wall or Roof Cable Connector						
	Thru Wall or Roof Cable Connector AL 3/8"		0.70	0.85	1.03		E
	Thru Wall or Roof Cable Connector AL 1/2"		1.08	1.28	1.53		E
	Thru Wall or Roof Cable Connector 5/8"		1.33	1.58	1.90		E
	Thru Wall or Roof Cable Connector CU 3/8"		0.75	0.90	1.10		E
	Thru Wall or Roof Cable Conn CU 1/2"		1.13	1.32	1.60		E
	Thru Wall or Roof Cable Connector CU 5/8"		1.38	1.63	2.05		E
	Swivel Adapt AL						
	Swivel Adapt AL 1/2"F to 1/2"F		0.45	0.50	0.60		E
	Swivel Adapt AL 1/2"F to 1/2"M		0.50	0.60	0.70		E
	Swivel Adapt AL 1/2"F to 5/8"F		0.50	0.60	0.70		E
	Swivel Adapt AL 1/2"M to 5/8"F		0.60	0.70	0.85		E
	Swivel Adapt CU						
	Swivel Adapt CU 1/2"F to 3/8"F		0.45	0.55	0.75		E
	Swivel Adapt CU 1/2"F to 3/8"M		0.55	0.70	0.90		E
	Swivel Adapt CU 1/2"F to 1/2"F		0.50	0.60	0.75		E
	Swivel Adapt CU 1/2"M to 1/2"F		0.60	0.70	0.80		E
	Swivel Adapt CU 1/2"F to 5/8"F		0.65	0.75	0.95		E
	Swivel Adapt CU 1/2"M to 5/8"F		0.75	0.85	1.00		E
	AL Points						
	AL Points 1/2" Dia. x 10"L thru 30"		0.40	0.48	0.60		E
	AL Points 1/2" Dia. x 36"L thru 60"		0.50	0.60	0.75		E
	AL Points 5/8" Dia. x 10"L thru 36"		0.40	0.48	0.60		E
	AL Points 5/8" Dia. x 48"L		0.50	0.60	0.75		E
	AL Points 5/8" Dia. x 60"L		0.60	0.72	0.90		E
	CU Points						
	CU Points 3/8" Dia x 10"L thru 30"		0.40	0.48	0.60		E
	CU Points 3/8" Dia x 36"L thru 60"		0.50	0.60	0.75		E
	CU Points 1/2" Dia.x 10"L thru 30"		0.40	0.48	0.60		E
	CU Points 1/2" Dia.x 36"L thru 48"		0.50	0.60	0.75		E
	CU Points 1/2" Dia.x 60"L		0.60	0.72	0.90		E
	CU Points 5/8" Dia.x 10"L thru 36"		0.50	0.60	0.75		E
	CU Points 5/8" Dia.x 48"L		0.60	0.72	0.90		E
	CU Points 5/8" Dia.x 60"L		0.70	0.80	1.00		E
	Ridge or Flat Point Base						
	Ridge or Flat Point Base AL 3/8"		1.00	1.20	1.45		E
	Ridge or Flat Point Base AL 1/2"		1.00	1.20	1.45		E
	Ridge or Flat Point Base AL 5/8"		1.00	1.20	1.45		E
	Ridge or Flat Point Base CU 3/8"		1.00	1.20	1.45		E
	Ridge or Flat Point Base CU 1/2"		1.00	1.20	1.45		E
	Ridge or Flat Point Base CU 5/8"		1.00	1.20	1.45		E
	Side Ridge Point Base						
	Side Ridge Point Base AL 3/8"		1.00	1.20	1.45		E
	Side Ridge Point Base AL 1/2"		1.00	1.20	1.45		E
	Side Ridge Point Base AL 5/8"		1.00	1.20	1.45		E
	Side Ridge Point Base CU 3/8"		1.00	1.20	1.45		E
	Side Ridge Point Base CU 1/2"		1.00	1.20	1.45		E
	Side Ridge Point Base CU 5/8"		1.00	1.20	1.45		E
	Flue Liner Point Base						
	Flue Liner Point Base AL 3/8"		1.00	1.20	1.45		E
	Flue Liner Point Base AL 1/2"		1.00	1.20	1.45		E
	Flue Liner Point Base AL 5/8"		1.00	1.20	1.45		E
	Flue Liner Point Base CU 3/8"		1.00	1.20	1.45		E
	Flue Liner Point Base CU 1/2"		1.00	1.20	1.45		E
	Flue Liner Point Base CU 5/8 "		1.00	1.20	1.45		E
	Tee Point Base						
	Tee Point Base AL 3/8"		0.48	0.60	0.75		E
	Tee Point Base AL 1/2"		0.60	0.75	0.93		E
	Tee Point Base AL 5/8"		0.73	0.90	1.10		E
	Tee Point Base CU 3/8"		0.52	0.65	0.82		E
	Tee Point Base CU 1/2"		0.65	0.80	1.00		E
	Tee Point Base CU 5/8"		0.78	0.95	1.18		E

Section 8 - Grounding & Lightning Protection Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Straight Point Base						
	Straight Point Base AL 3/8"		0.60	0.72	0.90		E
	Straight Point Base AL 1/2"		0.80	0.95	1.20		E
	Straight Point Base AL 5/8"		1.00	1.20	1.50		E
	Straight Point Base CU 3/8"		0.70	0.85	1.05		E
	Straight Point Base CU 1/2"		0.90	1.10	1.35		E
	Straight Point Base CU 5/8"		1.10	1.35	1.65		E
	Comb. Point Base						
	Comb. Point Base AL 3/8"		0.90	1.10	1.35		E
	Comb. Point Base AL 1/2"		1.10	1.35	1.65		E
	Comb. Point Base AL 5/8"		1.30	1.55	1.95		E
	Comb. Point Base CU 3/8"		1.00	1.20	1.50		E
	Comb. Point Base CU 1/2"		1.20	1.45	1.80		E
	Comb. Point Base CU 5/8"		1.40	1.70	2.10		E
	Adhesive Point Base						
	Adhesive Point Base AL 3/8"		0.60	0.75	0.93		E
	Adhesive Point Base AL 1/2"		0.75	0.93	1.13		E
	Adhesive Point Base AL 5/8"		0.90	1.08	1.33		E
	Adhesive Point Base CU 3/8"		0.65	0.80	1.00		E
	Adhesive Point Base CU 1/2"		0.80	0.98	1.20		E
	Adhesive Point Base CU 5/8"		0.95	1.15	1.40		E
	Offset Wall Point Base						
	Offset Wall Point Base AL 3/8"		0.80	0.98	1.18		E
	Offset Wall Point Base AL 1/2"		1.00	1.13	1.38		E
	Offset Wall Point Base AL 5/8"		1.10	1.30	1.58		E
	Offset Wall Point Base CU 3/8"		0.85	1.03	1.25		E
	Offset Wall Point Base CU 1/2"		1.00	1.20	1.45		E
	Offset Wall Point Base CU 5/8"		1.15	1.38	1.65		E
	Metal Mount Point Base						
	Metal Mount Point Base AL 3/8"		0.70	0.85	1.03		E
	Metal Mount Point Base AL 1/2"		0.90	1.03	1.23		E
	Metal Mount Point Base AL 5/8"		1.00	1.18	1.43		E
	Metal Mount Point Base CU 3/8"		0.75	0.90	1.10		E
	Metal Mount Point Base CU 1/2"		0.90	1.08	1.30		E
	Metal Mount Point Base CU 5/8"		1.05	1.25	1.50		E
	Reglet Mount Point Base						
	Reglet Mount Point Base AL 3/8"		0.70	0.85	1.05		E
	Reglet Mount Point Base AL 1/2"		0.85	1.03	1.25		E
	Reglet Mount Point Base AL 5/8"		1.00	1.20	1.45		E
	Reglet Mount Point Base CU 3/8"		0.75	0.93	1.13		E
	Reglet Mount Point Base CU 1/2"		0.90	1.08	1.33		E
	Reglet Mount Point Base CU 5/8"		1.05	1.25	1.53		E
	Flat Surface Point Base						
	Flat Surface Point Base AL 3/8"		0.80	0.95	1.15		E
	Flat Surface Point Base AL 1/2"		0.95	1.13	1.35		E
	Flat Surface Point Base AL 5/8"		1.10	1.30	1.55		E
	Flat Surface Point Base CU 3/8"		0.85	1.03	1.23		E
	Flat Surface Point Base CU 1/2"		1.00	1.18	1.43		E
	Flat Surface Point Base CU 5/8"		1.15	1.35	1.63		E
	Cone Vent Point Base						
	Cone Vent Point Base AL 3/8"		0.65	0.80	0.98		E
	Cone Vent Point Base AL 1/2"		0.80	0.98	1.18		E
	Cone Vent Point Base AL 5/8"		0.95	1.13	1.38		E
	Cone Vent Point Base CU 3/8"		0.70	0.85	1.05		E
	Cone Vent Point Base CU 1/2"		0.85	1.03	1.25		E
	Cone Vent Point Base CU 5/8"		1.00	1.20	1.45		E
	Coupling and Adapters for Point AL						
	1/2"F to 1/2"F		0.12	0.15	0.20		E
	5/8"F to 5/8"F		0.18	0.21	0.30		E
	1/2"F to 5/8"F		0.18	0.21	0.30		E
	1/2"F to 1/2"M	X	0.12	0.15	0.20		E
	5/8"F to 5/8"M		0.18	0.21	0.30		E
	1/2"F to 5/8"M		0.18	0.21	0.30		E
	5/8"F to 1/2"M		0.18	0.21	0.30		E
	1/2"M to 1/2"M		0.12	0.15	0.20		E
	5/8"M to 5/8"M		0.18	0.21	0.30		E
	1/2"M to 5/8"M		0.18	0.21	0.30		E

Section 8 - Grounding & Lightning Protection Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Coupling and Adapters for Point CU						
	3/8"F to 3/8"F		0.10	0.12	0.15		E
	1/2"F to 1/2"F		0.15	0.18	0.25		E
	1/2"F to 3/8"F		0.15	0.18	0.25		E
	5/8"F to 5/8"F		0.20	0.25	0.30		E
	1/2"F to 5/8"F		0.20	0.25	0.30		E
	3/8"F to 3/8"M		0.10	0.12	0.15		E
	1/2"F to 1/2"M		0.15	0.18	0.25		E
	1/2"F to 3/8"M		0.15	0.18	0.25		E
	3/8"F to 1/2"M		0.15	0.18	0.25		E
	5/8"F to 5/8"M		0.20	0.25	0.30		E
	1/2"F to 5/8"M		0.20	0.25	0.30		E
	5/8"F to 1/2"M		0.20	0.25	0.30		E
	3/8"M to 3/8"M		0.10	0.12	0.15		E
	1/2"M to 1/2"M		0.15	0.18	0.25		E
	1/2"M to 3/8"M		0.15	0.18	0.25		E
	5/8"M to 5/8"M		0.20	0.25	0.30		E
	1/2"M to 5/8"M		0.20	0.25	0.30		E
	Ground Rod for Down Spout						
	Ground Rod 1/2" Dia. X 8'		1.00	1.20	1.50		E
	Ground Rod 1/2" Dia. X 10'		1.25	1.50	1.90		E
	Ground Rod 5/8" Dia. X 6'		1.10	1.35	1.65		E
	Ground Rod 5/8" Dia. X 8'		1.35	1.60	2.00		E
	Ground Rod 5/8" Dia. X 10'		1.75	2.10	2.60		E
	Ground Rod 3/4" Dia. X 6'		1.25	1.50	1.90		E
	Ground Rod 3/4" Dia. X 8'		1.50	1.80	2.25		E
	Ground Rod 3/4" Dia. X 10'		2.00	2.40	3.00		E
	Ground Rod 1" Dia. X 10'		2.50	3.00	3.75		E
	Cable Protectors CU						
	Cable Protectors CU Pipe 5/8" Dia. X 7"L		0.75	0.90	1.15		E
	Cable Protectors CU Pipe 3/4" Dia. X 7"L		0.95	1.15	1.30		E
	Cable Protectors CU Pipe 7/8" Dia. X 7"L		1.25	1.50	1.90		E
	Cable Protectors PVC Pipe						
	Cable Protectors PVC Pipe 1/2" IPS x 10'L		0.50	0.60	0.75		E
	Cable Protectors PVC Pipe 3/4" IPS x 10'L		0.75	0.90	1.15		E
	Cable Protectors Galv Steel						
	Cable Protectors Galv Steel 3/4" Dia. x 8'L		1.50	1.80	2.25		E
	Cable Protectors Wood						
	Cable Protectors Wood 3/4" Dia. X 8'L		0.80	0.95	1.20		E
	Cable Protectors Strap Pipe						
	Cable Protectors Strap Pipe 5/8"		0.20	0.25	0.30		E
	Cable Protectors Strap Pipe 3/4"		0.25	0.30	0.40		E
	Cable Protectors Strap Pipe 1"		0.25	0.30	0.40		E
	Electronically Activated Streamer Emission Air Terminal.						
	Most streamer emission systems cannot offer an UL Master label, check with manufacturer for details.						
	Roof repair and sealing is not included.						
	It is recommended to test this system once a year, check with manufacturer for details.						
	Check FAA requirements for obstruction warning lights.						
	Stainless steel bolts, washers and nuts are recommended.						
	Install down lead per manufacturer's instructions.						
	Streamer emission air terminal		4.00	5.00	6.25		E
	Mast-8' tall, 3" top dia, 4" butt dia		2.00	2.50	3.13		E
	Mast-10' tall, 3" top dia, 4" butt dia		2.25	2.81	3.52		E
	Mast-12' tall, 3" top dia, 4" butt dia		2.50	3.13	3.91		E
	Mast-14' tall, 3" top dia, 4" butt dia		2.75	3.44	4.30		E
	Mast-16' tall, 3" top dia, 4" butt dia		3.00	3.75	4.69		E
	Mast-18' tall, 3" top dia, 4" butt dia		3.25	4.06	5.08		E
	Mast-20' tall, 3" top dia, 4" butt dia		3.50	4.38	5.47		E
	18" welding adapter plate		2.00	2.50	3.13		E
	12'X12' pre-cast/concrete adapter plate		2.00	2.50	3.13		E

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SECTION 9

HEATING EQUIPMENT CONNECTIONS

General Information

The labor units in this section are applicable for the installation of electrical heating equipment and their controls. A separate labor unit table is included for the power conductor termination labor on other heating, ventilating, air conditioning and related items not listed in this manual. For electric motor conductor termination labor units, see Section 12.

Scope of These Labor Units

The Introduction section includes details on the scope of labor units across the manual. Some items included are:

- Material unloading at jobsite
- Moving material to the point of installation
- Plan study, layout and marking of installation location
- Actual material installation time
- Appropriate fastening to existing supports
- Power and grounding conductor connections
- Clean-up of electrical contractor furnished excess material
- Normal non-productive labor

Work Operations Not Included In These Labor Units

- Field supervision
- Raceway terminations
- Welding or painting
- Testing of any type
- Installation of branch circuits, including such items as pull boxes, flexible conduit, wire, etc.
- Control wiring
- Mounting of motors when shipped separately with equipment
- Sheet metal ducting
- Design of electric heating systems
- Fabrication or installation of supports
- Adjustment of air flow, equipment calibration and similar environmental system testing

Labor Adjustments for Non-Typical Conditions

See the Introduction section for details.

Application Instructions

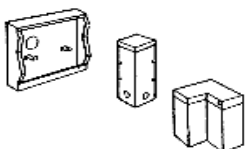
- Labor units under the “Normal” column are for heights up to eight feet above a smooth, hard floor. Labor units under the “Difficult” column are for heights up to 12 feet. Labor units under the “Very Difficult” column are for heights up to 16 feet.
- Labor unit tables do not include every type and size of items available. When labor units are required for items not listed, an approximate labor unit may be obtained from the tables for a similar item of about the same weight, dimensions and conductor terminations.
- All the labor units in this section are based on using the most efficient tools and equipment available. When the anticipated jobsite conditions will prevent the optimum use of tools and equipment, an appropriate additional labor allowance in proportion to the anticipated difficulties is necessary.
- Labor units in this manual are for new work only and for a complete electrical installation. For remodeling or change order situations these labor units need to be substantially increased.

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Section 9 - Heating Equipment Connections

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Baseboard Heaters						
	24"		0.75	0.94	1.13		E
	36"		0.80	1.00	1.20		E
	48"		0.90	1.13	1.35		E
	60"		1.00	1.25	1.50		E
	72"		1.10	1.38	1.65		E
	96"		1.25	1.56	1.88		E
	120"		1.40	1.75	2.10		E
	Blank Baseboard Section						
	18"		0.30	0.38	0.45		E
	24"		0.35	0.44	0.53		E
	30"		0.40	0.50	0.60		E
	36"		0.45	0.56	0.68		E
	Splice Plate		0.12	0.13	0.15		E
	End Section Cap		0.10	0.15	0.18		E
	Baseboard Section - Electrical Accys						
	20 Amp 120 Volt Receptacle Section		0.60	0.75	0.90		E
	240 Volt Air Conditioning Section		0.80	1.00	1.20		E
	Thermostat Baseboard Section		0.60	0.75	0.90		E
	Radiant Heat Panels						
	2' x 2'		0.50	0.63	0.75		E
	2' x 4'		0.75	0.94	1.13		E
	2' x 8'		1.10	1.38	1.65		E
	4' x 8'		1.60	2.00	2.40		E
	Radiant Heat Panel Frames						
	2' x 2'		0.40	0.50	0.60		E
	2' x 4'		0.50	0.63	0.75		E
	2' x 8'		0.70	0.88	1.05		E
	4' x 8'		1.20	1.50	1.80		E
	Electric 120 Volt Wall Heaters						
	400 Watt		1.00	1.13	1.35		E
	600 Watt		1.10	1.25	1.50		E
	800 Watt		1.20	1.38	1.65		E
	1000 Watt		1.30	1.50	1.80		E
	1200 Watt		1.40	1.63	1.95		E
	1400 Watt		1.50	1.75	2.10		E
	1600 Watt		1.75	1.88	2.25		E
	1800 Watt		1.85	2.06	2.48		E
	2000 Watt		2.00	2.25	2.70		E
	Electric 240 Volt Wall Heaters						
	2500 Watt		2.00	2.25	2.70		E
	3000 Watt		2.20	2.50	3.00		E
	3500 Watt		2.30	2.75	3.30		E
	4000 Watt		2.75	3.13	3.75		E
	5000 Watt		3.25	3.75	4.50		E
	One Conductor 600 Volt Heating Cable						
	2 Watt/Ft Plastic Jacket		2.00	2.50	3.00		C
	5 Watt/Ft Plastic Jacket		2.20	2.75	3.30		C
	7 Watt/Ft Plastic Jacket		2.40	3.00	3.60		C
	7 Watt/Ft Lead Jacket		2.60	3.25	3.90		C
	10 Watt/Ft Plastic Jacket		2.60	3.25	3.90		C
	15 Watt/Ft Plastic Jacket		2.80	3.50	4.20		C
	20 Watt/FT Plastic Jacket		3.00	3.75	4.50		C
	Radiant Heat Ceiling Panel Installation Only 12" to 24"		2.00	2.50	3.00		E
	Heat Tape and Accessories						
	Self Regulating Heat Tape		2.50	4.00	6.00		C
	Power Connection Kit w/o J Box		0.50	0.75	1.00		E
	Power Connection Kit with J Box		0.75	1.00	1.25		E
	Splice Kit		0.50	0.75	1.00		E
	Tee Kit		0.75	1.50	2.00		E
	End Seal Kit		0.50	0.75	1.00		E
	Ordinary Area Thermostats		1.00	1.50	2.00		E



Section 9 - Heating Equipment Connections

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Step Controllers-20 Amp per Step						
	4 Steps		4.00	5.00	6.00		E
	6 Steps		5.00	6.25	7.50		E
	8 Steps		6.00	7.50	9.00		E
	10 Steps		7.00	8.75	10.50		E
	12 Steps		8.00	10.00	12.00		E
	Power Connections to Equipment Installed by Others - Copper 600 Volt Cond.						
	20 Amp Circuits #12 & #10		0.25	0.30	0.36		E
	50 Amp Circuits #8		0.30	0.37	0.45		E
	60 Amp Circuits #6		0.33	0.42	0.50		E
	80 Amp Circuits #4		0.36	0.45	0.54		E
	90 Amp Circuits #3		0.45	0.51	0.64		E
	100 Amp Circuits #2		0.45	0.57	0.68		E
	125 Amp Circuits #1		0.50	0.62	0.75		E
	150 Amp Circuits 1/0		0.54	0.68	0.81		E
	175 Amp Circuits 2/0		0.60	0.75	0.90		E
	200 Amp Circuits 3/0		0.68	0.84	1.02		E
	225 Amp Circuits 4/0		0.75	0.95	1.13		E
	250 Amp Circuits 250 kcmil		0.83	1.04	1.25		E
	300 Amp Circuits 350 kcmil		0.90	1.13	1.35		E
	350 Amp Circuits 500 kcmil		1.05	1.32	1.58		E
	400 Amp Circuits 600 kcmil		1.20	1.50	1.80		E
	450 Amp Circuits 750 kcmil		1.35	1.70	2.03		E
	500 Amp Circuits 1000 kcmil		1.50	1.88	2.25		E
	600 Amp Circuits 2/350		1.95	2.45	2.93		E
	700 Amp Circuits 2/500		2.40	3.00	3.60		E
	800 Amp Circuits 2/750	X	3.00	3.25	3.50		E
	Power Connections to Equipment Installed by Others - Aluminum 600 Volt Cond.						
	20 Amp Circuits #10		0.40	0.50	0.90		
	30 Amp Circuits #8		0.33	0.42	0.50		E
	50 Amp Circuits #6		0.36	0.45	0.54		E
	60 Amp Circuits #4		0.41	0.51	0.62		E
	80 Amp Circuits #2		0.45	0.57	0.68		E
	90 Amp Circuits #1		0.50	0.62	0.75		E
	100 Amp Circuits 1/0		0.54	0.68	0.81		E
	125 Amp Circuits 2/0		0.60	0.75	0.90		E
	150 Amp Circuits 3/0		0.68	0.84	1.02		E
	175 Amp Circuits 4/0		0.75	0.95	1.13		E
	200 Amp Circuits 250 kcmil		0.83	1.04	1.25		E
	225 Amp Circuits 300 kcmil		0.90	1.13	1.35		E
	250 Amp Circuits 350 kcmil		1.05	1.32	1.58		E
	300 Amp Circuits 500 kcmil		1.20	2.00	1.90		E
	350 Amp Circuits 750 kcmil		1.35	1.70	2.03		E
	400 Amp Circuits 1000 kcmil		2.00	1.88	2.25		E
	450 Amp Circuits 2/300		2.30	2.25	2.70		E
	500 Amp Circuits 2/350		2.10	2.63	3.15		E
	600 Amp Circuits 2/500		2.55	3.20	3.83		E
	700 Amp Circuits 2/750		3.00	3.75	4.50		E
	800 Amp Circuits 2/1000		3.60	4.50	5.40		E
	Reference Installation and Connections Section 12						

SECTION 10

TEMPORARY POWER AND LIGHTING

General Information

The labor units in this section are applicable for the installation of temporary 600-volt power services and temporary lighting. For electric motor conductor termination labor units see Section 12 in this manual. The labor units for temporary portable electrical equipment in this section do not include the labor to fabricate or assemble the portable equipment. The labor units for temporary lighting, temporary receptacle outlets and temporary extension cords do not include labor to service, inspect, or maintain these items.

Scope of These Labor Units

The Introduction section includes details on the scope of labor units across the manual. Some items included are:

- Material unloading at the jobsite
- Coordinating the location where each item is to be installed
- Moving material to the point of installation or usage
- Power and grounding conductor terminations
- Disconnecting conductor terminations for the removal of the item
- Material loading for removal from the jobsite
- Normal non-productive labor

Work Operations Not Included In These Labor Units

- Field supervision
- Maintenance of any temporary equipment while at the jobsite
- Conduit or cable installation unless specifically noted otherwise
- Relocating temporary equipment after the initial installation
- Design or engineering of any temporary system
- Reconditioning used equipment
- Temporary barricades or fences
- Removal of temporary equipment

Labor Adjustments for Non-Typical Conditions

See the Introduction section for details.

Application Instructions

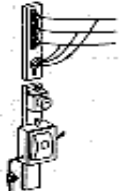
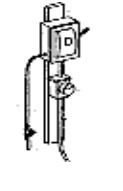
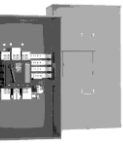
- Labor units under the “Normal” column are for locations with good access, no obstructions and a complete temporary system. Labor units under the “Difficult” column are for locations with less than good access, a few minor obstructions and a complete temporary system. Labor units under the “Very Difficult” column are for locations with poor access, limited space, work performed in bad weather or small quantities of materials.
- Labor units for driving temporary grounding rods and service pole installation are for locations with loam, hard clay or loose shale the full depth of the rods. For other locations the labor units must be increased in proportion to the density of the soil encountered.
- The labor units in Section 12 may be used for terminating temporary conductors on permanent power equipment.
- For temporary cable installation labor units, use the labor units in Section 3, plus an appropriate labor allowance for the cable removal.

Section 10 - Temporary Power & Lighting

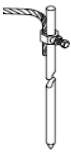
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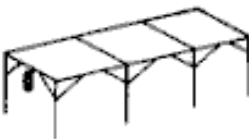
Section 10 - Temporary Power & Lighting

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Temp Svc-16 to 20 Ft Dim Lumber Pole						
	By Elec Cont. - OH Lines B Pwr Co.						
	Single Phase 100 Amp		8.00	10.00	12.50		E
	Single Phase 150 Amp		12.00	15.00	18.75		E
	Single Phase 200 Amp		12.00	15.00	18.75		E
	C/T Can Required for 400 AMPS and above						
	Single Phase 400 Amp		30.00	37.50	46.88		E
	Single Phase 600 Amp		47.00	58.75	73.44		E
	Single Phase 800 Amp		64.00	80.00	100.00		E
	Three Phase 200 Amp		14.00	17.50	21.88		E
	Three Phase 400 Amp		34.00	42.50	53.13		E
	Three Phase 600 Amp		55.00	68.75	85.94		E
	Three Phase 800 Amp		69.00	86.25	107.81		E
	Three Phase 1000 Amp		80.00	100.00	125.00		E
	Temp Svc - 20 to 30 ft Std Pole & Arms By Elec Cont. OH & Trans by Utl. Co.						
	Single Phase 200 Amp		14.00	17.50	21.88		E
	Single Phase 400 Amp		34.00	42.50	53.13		E
	Single Phase 600 Amp		51.00	63.75	79.69		E
	Single Phase 800 Amp		68.00	85.00	106.25		E
	Single Phase 1000 Amp		85.00	106.25	132.81		E
	Three Phase 200 Amp		20.00	25.00	31.25		E
	Three Phase 400 Amp		40.00	50.00	62.50		E
	Three Phase 600 Amp		61.00	76.25	95.31		E
	Three Phase 800 Amp		75.00	93.75	117.19		E
	Three Phase 1000 Amp		86.00	107.50	134.38		E
	Three Phase 1200 Amp		97.00	121.25	151.56		E
	Temp Svc-Undergnd Feed 12-16Ft Pole						
	by Elec. Cont. UndGnd Cable by Utl. Co.						
	Single Phase 200 Amp						
	Single Phase 200 Amp		11.00	13.75	17.19		E
	Single Phase 400 Amp		28.00	35.00	43.75		E
	Single Phase 600 Amp		45.00	56.25	70.31		E
	Single Phase 800 Amp		62.00	77.50	96.88		E
	Single Phase 1000 Amp		83.00	103.75	129.69		E
	Three Phase 200 Amp		12.00	15.00	18.75		E
	Three Phase 400 Amp		32.00	40.00	50.00		E
	Three Phase 600 Amp		53.00	66.25	82.81		E
	Three Phase 800 Amp		67.00	83.75	104.69		E
	Three Phase 1000 Amp		78.00	97.50	121.88		E
	Fittings						
	3 Spool Secondary Racks		1.00	1.25	1.56		E
	4 Spool Secondary Racks		1.10	1.38	1.72		E
	Screw Type Pin Insulator		0.25	0.31	0.39		E
	Pin Type Pin Insulator		0.50	0.63	0.78		E
	Screw Type Insulator		0.25	0.31	0.39		E
	Pin Type Wire holder		0.25	0.31	0.39		E
	Service Entrance Cap-Up to 2"		0.80	1.00	1.25		E
	Service Entrance Cap-Up to 3"		1.50	1.88	2.34		E
	Service Entrance Cap-Up to 4"		2.50	3.13	3.91		E
	Wall Mounted Watthour Sockets & Meters						
	100 Amp Single Phase		2.00	2.50	3.13		E
	100 Amp Three Phase		2.50	3.13	3.91		E
	200 Amp Single Phase		3.00	3.75	4.69		E
	200 Amp Three Phase		3.50	4.38	5.47		E
	Wall Mounted Watthour Meter & Main Breaker						
	100 Amp Breaker; Single Phase		2.25	2.81	3.52		E
	150 Amp Breaker; Single Phase		2.50	3.13	3.91		E
	200 Amp Breaker; Single Phase		3.00	3.75	4.69		E
	100 Amp Breaker; Three Phase		2.50	3.13	3.91		E
	150 Amp Breaker; Three Phase		3.00	3.75	4.69		E
	200 Amp Breaker; Three Phase		3.50	4.38	5.47		E
	Wall Mounted Watthour Meter with 20 Amp Branch Circuit Breakers						
	100 Amp Meter 4 Circuit Breakers		3.45	4.31	5.39		E
	100 Amp Meter 6 Circuit Breakers		4.05	5.06	6.33		E
	100 Amp Meter 8 Circuit Breakers		4.65	5.81	7.27		E
	100 Amp Meter 10 Circuit Breakers		5.25	6.56	8.20		E
	100 Amp Meter 12 Circuit Breakers		5.85	7.31	9.14		E
	150 Amp Meter 4 Circuit Breakers		3.70	4.63	5.78		E
	150 Amp Meter 6 Circuit Breakers		4.30	5.38	6.72		E
	150 Amp Meter 8 Circuit Breakers		4.90	6.13	7.66		E
	150 Amp Meter 10 Circuit Breakers		5.50	6.88	8.59		E
	150 Amp Meter 12 Circuit Breakers		6.10	7.63	9.53		E
	200 Amp Meter 4 Circuit Breakers		4.20	5.25	6.56		E
	200 Amp Meter 6 Circuit Breakers		4.80	6.00	7.50		E
	200 Amp Meter 8 Circuit Breakers		5.40	6.75	8.44		E
	200 Amp Meter 10 Circuit Breakers		6.00	7.50	9.38		E
	200 Amp Meter 12 Circuit Breakers		6.60	8.25	10.31		E

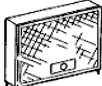
Section 10 - Temporary Power & Lighting

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Grounding Rods						
	Ground Rod With Clamp		1.13	1.41	1.77		E
	Bare Copper Grounding up to Wire-6 Ft Long						
	#10		0.42	0.53	0.66		E
	#8		0.46	0.58	0.72		E
	#6		0.50	0.63	0.78		E
	#4		0.53	0.66	0.83		E
	#2		0.56	0.70	0.88		E
	#1		0.60	0.75	0.94		E
	1/0		0.70	0.88	1.09		E
	2/0		0.80	1.00	1.25		E
	Portable Post Mounted 3-Wire Safety Switches						
	30 Amp		2.75	3.44	4.30		E
	60 Amp		3.25	4.06	5.08		E
	100 Amp		5.00	6.25	7.81		E
	150 Amp		7.50	9.38	11.72		E
	200 Amp		7.50	9.38	11.72		E
	400 Amp		9.50	11.88	14.84		E
	Portable Lighting Panelboards with 20 Amp 1 Pole S/N Branch Circuit Breakers						
	100 Amp 4 CBs		4.50	5.63	7.03		E
	100 Amp 6 CBs		4.70	5.88	7.34		E
	100 Amp 8 CBs		5.00	6.25	7.81		E
	150 Amp 4 CBs		6.00	7.50	9.38		E
	150 Amp 6 CBs		6.20	7.75	9.69		E
	150 Amp 8 CBs		6.50	8.13	10.16		E
	200 Amp 6 CBs		7.00	8.75	10.94		E
	200 Amp 8 CBs		7.20	9.00	11.25		E
	200 Amp 10 CBs		7.50	9.38	11.72		E
	Portable Lighting Panelboards With Up to 30 Amp 2-Pole S/N Branch CB's						
	100 Amp 4 cbs		4.40	5.50	6.88		E
	100 Amp 6 CBs		4.70	5.88	7.34		E
	100 Amp 8 CBs		5.00	6.25	7.81		E
	150 Amp 4 CBs		5.90	7.38	9.22		E
	150 Amp 6 Cbs		6.20	7.75	9.69		E
	150 Amp 8 CBs		6.50	8.13	10.16		E
	200 Amp 6 CBs		6.90	8.63	10.78		E
	200 Amp 8 CBs		7.20	9.00	11.25		E
	200 Amp 10 CBs		7.50	9.38	11.72		E
	Portable Lighting Panelboards with up to 60 Amp 2-Pole S/N Branch CB's						E
	150 Amp 4 CBs		7.10	8.88	11.09		E
	150 Amp 6 CBs		7.50	9.38	11.72		E
	150 Amp 8 CBs		7.90	9.88	12.34		E
	200 Amp 6 Cbs		7.10	8.88	11.09		E
	200 Amp 8 Cbs		7.50	9.38	11.72		E
	200 Amp 10 CBs		7.90	9.88	12.34		E
	225 Amp 6 CBs		7.60	9.50	11.88		E
	225 Amp 8 CBs		8.00	10.00	12.50		E
	225 Amp 10 CBs		8.40	10.50	13.13		E
	100 Ft Extension Cord						
	3/C 20 Amp		0.25	0.31	0.39		E
	3/C 30 Amp		0.35	0.44	0.55		E
	3/C 50 Amp		0.60	0.75	0.94		E
	4/C 20 Amp		0.35	0.44	0.55		E
	4/C 30 Amp		0.45	0.56	0.70		E
	4/C 50 Amp		0.70	0.88	1.09		E
	4/C 60 Amp		0.80	1.00	1.25		E
	Prefabbed Light Strings With Bulbs						
	50 Ft Prefab light Strings Bulbs & Guards		1.50	1.88	2.34		E
	100 Ft Prefab Light Strings Bulbs & Grds		2.00	2.50	3.13		E
	Relamping		0.05	0.06	0.08		E

Section 10 - Temporary Power & Lighting

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Free Standing Temporary Light Standard (27"±36" Tall)						
	27" 150W Fluorescent-Coverage 10'		0.50	0.63	0.78		E
	27" 425W Fluorescent-Coverage 20'		0.60	0.75	0.94		E
	27" 850W Metal Halide-Coverage 30'		0.60	0.75	0.94		E
	36" 500W Halogen-Coverage 16'-24'		0.60	0.75	0.94		E
	36" 120W Fluorescent-Coverage 20'-28'		0.65	0.81	1.02		E
	36" 175W Metal Halide-Coverage 30'-42'		0.65	0.81	1.02		E
	36" 250W Metal Halide-Coverage 40'-56'		0.70	0.88	1.09		E
	36" 400W Metal Halide-Coverage 78'-110'		0.75	0.94	1.17		E
	Notes 120v-fed from 3/C extension cord to power inlet Power outlet for tools or connecting additional light standards On/Off switch Repositions to original position when knocked down Polycarbonate dome protects lamp						
	HID Temporary Light Fixtures Scaffold not included Mount height = 20' Installation includes anchor and eyebolt Fixtures equipped with locking hook Fixtures equipped with 3' cord Power cable (20 amp) suspended with receptacle mounted by each fixture						
	400W HID Temporary Fixture		2.75	3.44	4.30		E
	250W HID Temporary Fixture		2.50	3.13	3.91		E
	150W HID Temporary Fixture		2.25	2.81	3.52		E
	100W HID Temporary Fixture		2.00	2.50	3.13		E
	50' Suspended cable with receptacle		3.50	4.38	5.47		E
	100' Suspended cable with receptacle		6.30	7.88	9.84		E
	HID Temporary Light Fixture Same as above except fixture is equipped with modular cable system adapter Modular cable system suspended from ceiling						
	400W HID Temporary Fixture		2.75	3.44	4.30		E
	250W HID Temporary Fixture		2.50	3.13	3.91		E
	150W HID Temporary Fixture		2.25	2.81	3.52		E
	100W HID Temporary Fixture		2.00	2.50	3.13		E
	50' Suspended modular cable		2.50	3.13	3.91		E
	100' Suspended modular cable		5.00	6.25	7.81		E
	Box Connected Pigtail, Lamp & Guard Box Connected Pigtail, Lamp & Guard		0.40	0.50	0.63		E
	Portable Post Mounted Lighting Fixtures Outdoors						
	200 watt 1-Lamp		2.00	2.50	3.13		E
	200 Watt 2-Lamp		2.20	2.75	3.44		E
	200 Watt 4-Lamp		3.00	3.75	4.69		E
	500 Watt 1-Lamp		2.50	3.13	3.91		E
	500 Watt 2-Lamp		2.70	3.38	4.22		E
	500 Watt 4-lamp		3.50	4.38	5.47		E
	1000 Watt 1-Lamp		3.00	3.75	4.69		E
	1000 Watt 2-lamp		3.30	4.13	5.16		E
	1000 Watt 4-lamp		4.00	5.00	6.25		E
	Portable Post Mounted Lighting Fixtures Indoor Grade						
	1-Single Fixture		1.50	1.88	2.34		E
	2-Single Fixture		1.50	1.88	2.34		E
	4-Single Fixture		2.00	2.50	3.13		E
	1-Twin Fixtures		2.00	2.50	3.13		E
	2-Twin Fixtures		2.00	2.50	3.13		E
	4-Twin Fixtures		3.00	3.75	4.69		E
	Sidewalk Cover Lighting						
	10 Feet of 1/2" EMT #12 Wire & KO boxes		4.00	5.00	6.25		E
	10 Feet of 3/4" EMT #12 Wire & KO Boxes		4.40	5.50	6.88		E
	10' of 1/2" rigid conduit #12 Wire & WP Boxes		5.00	6.25	7.81		E
	10' of 3/4" rigid Conduit #12 Wire & WP Boxes		6.00	7.50	9.38		E
	200 Watt Porcelain Enamel Reflectors		0.80	1.00	1.25		E
	200 Watt Box Mounted Vaportite Lampholders		1.00	1.25	1.56		E

Section 10 - Temporary Power & Lighting

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	48" Vaportite Fluorescent Fixtures						
	1-Tube		1.00	1.25	1.56		E
	2-Tube		1.10	1.38	1.72		E
	4-Tube		1.30	1.63	2.03		E
	48" Weatherproof Fluorescent Fixtures						
	1-Tube		1.10	1.38	1.72		E
	2-Tube		1.20	1.50	1.88		E
	4-Tube		1.50	1.88	2.34		
	Wall Mounted WP Box & 20 Amp Snap Switch						
	Wall Mounted WP Box & 20 Amp Snap Switch		1.90	2.38	2.97		E
	240 Volt Portable Electric Heaters						
	1 KW		2.00	2.50	3.13		E
	3 KW		2.50	3.13	3.91		E
	5 KW		3.00	3.75	4.69		E
	10 KW		4.00	5.00	6.25		E
	15 KW		6.00	7.50	9.38		E
	20 KW		8.00	10.00	12.50		E
	Portable Electric Generators						
	5 KW		2.00	2.50	3.13		E
	10 KW		2.50	3.13	3.91		E
	15 KW		3.00	3.75	4.69		E
	20 KW		4.00	5.00	6.25		E
	50 KW		6.00	7.50	9.38		E
	Portable Power Distribution Center						
	480V units consist of 480V panel, transformer, 120/208V panel mounted on portable steel frame. Center is equipped with 50/2 receptacle to feed 120/208/240 power center. 120/208/240 unit consists of panel mounted on portable steel frame						
	Units equipped with GFI receptacle						
	Spider units rated 50/2 125v/250v						
	100/3 480v PDC with 75 KVA transformer and 200/3 120/208 panel		4.00	5.00	6.25		E
	50/3 277/480 PDC with 45 KVA transformer and 100/3 120/208 panel		3.00	3.75	4.69		E
	50/3 120/208 PDC		1.00	1.25	1.56		E
	50/2 120/208 PDC		1.00	1.25	1.56		E
	50/2 125/250 Spider		1.00	1.25	1.56		E
	100' - 100/3 Power cable with terminations (Ceiling Suspended)		16.00	20.00	25.00		E
	100' - 50/3 Power cable with terminations (Ceiling Suspended)		12.00	15.00	18.75		E
	100' - 5C 50 amp Power cord (Ceiling Suspended)		10.00	12.50	15.63		E
	100' - 4C 50 amp Power cord (Ceiling Suspended)		9.00	11.25	14.06		E
							

SECTION 11

OUTDOOR OVERHEAD AND UNDERGROUND SYSTEMS

General Information

The labor units within Section 11 are intended for inside electrical contractors installing overhead and underground electrical systems permitted by their craft jurisdiction. The labor units within Section 11 (A) are applicable for electrical inside and line contractors installing up to and including 35 KV overhead or underground electrical power systems, if trained and certified with these medium voltage systems.

Scope of These Labor Units

The Introduction section includes details on the scope of labor units across the manual. Some items included are:

- Labor units are for new construction, de-energized in compliance with NFPA 70E
- Safety measures indicated in NFPA 70E will need to be factored by contractor's resources
- Material unloading at the job site
- Moving material to the point of installation
- Plan study, layout and marking of installation location
- Actual material and installation time
- Normal clean-up of electrical contractor furnished excess material compliance with OSHA
- Normal non-productive labor

Work Operations Not Included In These Labor Units

- Field supervision
- Drilling and blasting rock or boulders
- Heavy equipment operators' time
- Design of electric systems
- Grade and elevation stakes
- Seeding, sodding or protection against soil erosion
- Dewatering of open trench
- Measurement and alignment more precise than normal industry standards
- Rerouting due to structural or mechanical obstacles
- Coordination studies including fuse and circuit breaker sizing and settings, arc hazard analysis and fault current analysis
- Testing or Commissioning of any type
- High Altitude Electromagnetic Pulse (HEMP) or Electro Magnetic Pulse (EMP) Shielding

Labor Adjustments for Non-Typical Conditions

See the Introduction section for details.

Application Instructions

- Labor units under the "Normal" column could apply to installations during the spring and fall months, substantial quantities of materials and typical jobsite conditions. Labor units under the "Difficult" column could apply to installations during the summer months, substantial quantities of materials and slightly poorer than typical jobsite conditions. Labor units under the "Very Difficult" column could apply to installations during the winter months or rainy weather, small quantities of materials or abnormally difficult jobsite conditions.
- The labor units in this section do not include an allowance for situations that require dewatering of trenches or other excavations.
- When the installation specifications require the buried conduit or excavations to have a uniform slope, the labor units in this section must be increased in proportion to the tolerance of the slope requirements.

- The labor units in this section for work items that may be performed by crafts, such as laborers or carpenters, are included as a guide for estimating purposes only.
- The labor units for installing electrical cable in this section include a prorated amount of the normal equipment set-up labor. For abnormal situations, such as excessive changes in direction or physical obstacles, these labor units must be increased or a separate labor allowance must be added to allow for the non-typical conditions.

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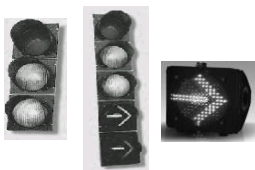
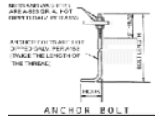
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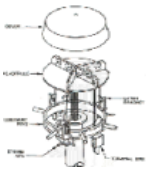
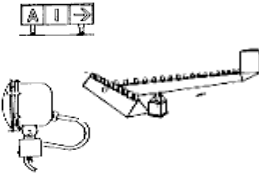
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	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Traffic Signal Lights						
	Signal Head 1 Section		3.00	3.60	4.32		E
	Signal Head 2 Section		3.00	3.60	4.32		E
	Signal Head 3 Section		4.00	4.80	5.76		E
	Signal Head 4 Section		5.00	6.00	7.20		E
	Signal Head 5 Section		6.00	7.20	8.64		E
	Optically Programmed 3 Sec		8.00	9.60	11.52		E
	Pedestrian Signal Lights						
	Signal Head 1 Section		6.00	7.20	8.64		E
	Signal Head 2 Section		8.00	9.60	11.52		E
	Back Plate		1.00	1.20	1.44		E
	Pedestrian Signal Head		3.00	3.60	4.32		E
	Regulatory Sign - non-illuminated		3.00	3.60	4.32		E
	Regulatory Sign - illuminated		8.00	9.60	11.52		E
	Ped. Push Button - Includes Sign		2.50	3.00	3.60		E
	Signal Hangers						
	Astro Bracket		1.50	1.80	2.16		E
	Span Wire Hangers with Tether Clamps		1.50	1.80	2.16		E
	Span Wire		0.08	0.10	0.12		LF
	Tether		0.04	0.05	0.06		LF
	Concrete Sawing For Loop Detector Wire						
	1/2 X 2" Deep		0.17	0.20	0.24		LF
	1/2 X 3" Deep		0.20	0.24	0.29		LF
	1/2 X 4" Deep		0.24	0.29	0.35		LF
	5/8 X 2" Deep		0.20	0.24	0.29		LF
	5/8 X 3" Deep		0.25	0.30	0.36		LF
	5/8 X 4" Deep		0.30	0.36	0.43		LF
	Epoxy Backfill for Loop Detector Trench		0.05	0.06	0.07		LF
	600 Volt Loop Detector Wire		0.02	0.02	0.03		LF
	Loop Detector Wire		2.00	2.50	3.00		C
	Loop Detector Termination WP Box		2.00	2.40	2.88		E
	Traffic Signal With Cabinet & Controller		16.00	19.20	23.04		E
	Computerized Traffic Controller						
	Modules Wiring Harness Interconnected						
	Controller Modules		4.00	4.80	5.76		E
	Loop Detector Amplifier		0.50	0.60	0.72		E
	Vehicle Detection						
	Magnetic Detectors		6.00	7.20	8.64		E
	Microwave Detectors		2.50	3.00	3.60		E
	Image Sensor Camera ***		24.00	28.80	34.56		E
	*** The first camera includes hardware, terminations and testing - add for additional cameras		12.00	14.40	17.28		E
	Emergency Preemption						
	Emergency Detector		3.00	3.60	4.32		E
	Confirmation Light		2.00	2.40	2.88		E
	Amplifier		3.00	3.60	4.32		E
	Preemption Cable per foot		10.00	12.50	15.00		M
	Anchor Bolts (Set of 4) With Template						
	3/4" to 24 "		1.50	1.80	2.16		E
	1" to 48 "		2.00	2.40	2.88		E
	1 1/4" to 54 "		2.50	3.00	3.60		E
	1 1/2" to 60 "		4.00	4.60	5.32		E
	2 " to 72 "		6.00	7.20	8.64		E
	2 1/4 " to 72 "		8.00	10.20	12.64		E
	Excavation per Vert. Ft. - Units are designed for stable soil, no rock and do not include casings or dewatering						
	Up to 30 " diameter		1.00	1.20	1.44		LF
	Up to 36 " diameter		1.50	1.80	2.16		LF
	Up to 42 " diameter		2.50	3.00	3.60		LF
	Up to 48 " diameter		3.00	3.60	4.32		LF
	High Mast Fixtures Less Poles - H.I.D Fixtures (each Fixture)	X					
	1000 Watt	X	4.00	5.00	6.25		E
	1500 Watt	X	5.00	6.25	7.81		E
	2000 Watt	X	6.00	7.50	9.38		E
	**** Note Add Additional Labor for Lowering Device Assembly	X					

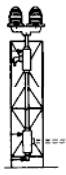
Section 11 - Outdoor Overhead and Underground Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Stadium Light Fixtures Less Poles/Brackets - H.I.D. (each Fixture)	X					
	1000 Watt	X	4.00	5.00	6.25		E
	1500 Watt	X	5.00	6.25	7.81		E
	2000 Watt	X	6.00	7.50	9.38		E
	**** Note Add Additional Labor for Lowering Device Assembly	X					
	**** Note Add Additional Labor for Remote Ballast Installation	X					
	**** Note Add Additional Labor for Special Support Brackets	X					
	**** Note Add Additional Labor for Spotting and Aiming	X					
	Steel Poles with Factory Assembled Arms or Brackets	X					
	40 Ft.	X	10.00	12.50	15.63		E
	50 Ft.	X	16.00	20.00	25.00		E
	60 Ft.	X	20.00	25.00	31.25		E
	70 Ft.	X	30.00	37.50	46.88		E
	80 Ft.	X	40.00	50.00	62.50		E
	90 Ft.	X	50.00	62.50	78.13		E
	100 Ft.	X	75.00	93.75	117.19		E
	120 Ft.	X	75.00	93.75	117.19		E
	150 Ft.	X	100.00	125.00	156.25		E
	Steel Pole Fixture Mounting Support Arms - Field Installed	X					
	40 Lb	X	6.00	7.50	9.38		E
	60 Lb	X	7.00	8.75	10.94		E
	80 Lb	X	8.00	10.00	12.50		E
	100 Lb	X	9.00	11.25	14.06		E
	125 Lb	X	10.00	12.50	15.63		E
	150 Lb	X	12.00	15.00	18.75		E
	Street Lighting Steel or Aluminum Poles						
	20'		4.00	4.80	5.76		E
	25'		4.50	5.40	6.48		E
	30'		5.00	6.00	7.20		E
	35'		5.50	6.60	7.92		E
	40'		6.00	7.20	8.64		E
	50'		8.00	9.60	11.52		E
	60'		12.00	14.40	17.28		E
	Street Lighting Concrete Poles						
	20'		6.00	7.20	8.64		E
	25'		8.00	9.60	11.52		E
	30'		10.00	12.00	14.40		E
	35'		12.00	14.40	17.28		E
	40'		14.00	16.80	20.16		E
	Street Lighting Class 3 Wood Pole						
	20'		3.60	4.32	5.18		E
	25'		4.00	4.80	5.76		E
	30'		4.50	5.40	6.48		E
	35'		5.00	6.00	7.20		E
	40'		5.50	6.60	7.92		E
	50'		7.00	8.40	10.08		E
	60'		10.00	12.00	14.40		E
	Street Light Poles - Mast Arm						
	8'		1.50	1.80	2.16		E
	10'		2.00	2.40	2.88		E
	12'		2.50	3.00	3.60		E
	15'		3.00	3.60	4.32		E
	20'		5.00	6.00	7.20		E
	25'		6.00	7.20	8.64		E
	30'		8.00	9.60	11.52		E
	Street Light Fixtures - Cobra Head						
	Up to 1000 Watt		2.50	3.00	3.60		E
	Steel or Aluminum Traffic Poles Foundations and Anchor Bolts Not Included						
	10'		4.00	4.80	5.76		E
	15'		5.00	6.00	7.20		E
	20'		6.00	7.20	8.64		E
	25'		8.00	9.60	11.52		E
	30'		10.00	12.00	14.40		E
	35'		12.00	14.40	17.28		E

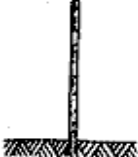
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	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Steel or Aluminum Mast Arms						
	20'		6.00	7.20	8.64		E
	25'		7.00	8.40	10.08		E
	30'		8.00	9.60	11.52		E
	35'		9.00	10.80	12.96		E
	40'		12.00	14.40	17.28		E
	45'		13.00	15.60	18.72		E
	50'		14.00	16.80	20.16		E
	60'		16.00	19.20	23.04		E
	65'		18.00	21.60	25.92		E
	70'		20.00	24.00	28.80		E
	Pole Pedestals						
	Breakaway Steel or Aluminum		4.00	4.80	5.76		E
	High Mast Lighting - Per Head						
	Up to 1000 Watt		3.00	3.60	4.32		E
	Up to 2000 Watt		4.00	4.80	5.76		E
	High Mast Steel Poles With Fixture Raising & Lowering Device (Does not include lighting control)						
	40'		10.00	12.00	14.40		E
	60'		24.00	28.80	34.56		E
	80'		48.00	57.60	69.12		E
	120'		72.00	86.40	103.68		E
	150'		80.00	96.00	115.20		E
	Miscellaneous						
	Time Switches for Street Lighting		4.00	4.80	5.76		E
	Photo Cell		1.00	1.20	1.44		E
	Airport Runway Lighting-200 Watt HID						
	with Transformer in Base Housing		1.97	2.46	2.96		E
	200 Watt Recessed Fixture		2.96	3.64	4.43		E
	45 Watt Taxi Fixture Mounted on 1" Pipe		1.97	2.46	2.96		E
	Base Housing with Cover Only		1.50	1.87	2.25		E
	Aircraft Lighted Guide Signs						
	1-Section		3.94	4.93	5.91		E
	2-Section		4.93	6.11	7.39		E
	3-Section		5.91	7.39	8.87		E
	4-Section		6.90	8.37	9.85		E
	10" Dia 300 Watt Approach Light 2C/#12		2.96	3.64	4.43		E
	500 Watt Threshold Light-#8/5KW Conductor		3.94	4.93	5.91		E
	Lighted Wind Tee-Free Floating		5.91	7.39	8.87		E
	Lighted Wind Tee-Remote Controlled		7.88	9.85	11.82		E
	Obstruction Lights						
	116 Watt 120 Volt Obstruction Light		1.97	2.46	2.96		E
	700 Watt 120 Volt Obstruction Light		2.36	3.64	4.43		E
	116 Watt 120 Volt Twin Obstruction Light		2.36	2.96	3.55		E
	Rotating Beacons-120 Volts						
	500 Watt 24" Dia 400 Lb		31.52	39.52	47.28		E
	1000 Watt 30" Dia 670 Lb		35.46	44.33	53.19		E
	1500 Watt 36" 800 Lb		39.40	49.25	59.10		E
	Obstruction Twin Light & Tower - Factory Assembled						
	10' high		3.94	4.93	5.91		E
	15' high		4.93	6.11	7.39		E
	20' high		5.91	7.39	8.87		E
	25' high		6.90	8.37	10.34		E
	30' high		7.88	9.85	11.82		E
	35' high		8.87	11.03	13.30		E
	40' high		9.85	12.31	14.78		E
	45' high		10.84	13.49	16.25		E
	50' high		11.82	14.78	17.73		E

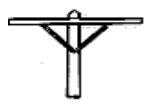
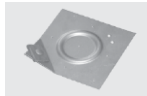
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	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Obstruction Twin Light & Tower - Field Assembled						
	10' high		7.88	9.85	11.82		E
	15' high		9.85	12.31	14.78		E
	20' high		11.82	14.78	17.73		E
	25' high		13.79	17.24	20.69		E
	30' high		15.76	19.70	23.64		E
	35' high		17.73	22.16	26.60		E
	40' high		19.70	24.63	29.55		E
	50' high		23.64	29.55	35.46		E
	Trimmed-Out Pole in Place with 1-Cross Arm, 3-Pin Insulators, Hdwe & Pwr Augered Hole						
	20'		8.00	10.00	12.00		E
	25'		8.20	10.20	12.30		E
	30'		8.40	10.50	12.60		E
	35'		8.70	10.80	13.00		E
	40'		9.00	11.20	13.50		E
	45'		9.50	11.80	14.20		E
	50'		10.00	12.50	15.00		E
	55'		11.00	13.70	16.50		E
	60'		12.00	15.00	18.00		E
	65'		13.00	16.20	19.50		E
	70'		14.00	17.50	21.00		E
	75'		15.00	18.70	22.50		E
	80'		16.00	20.00	24.00		E
	90'		18.00	22.50	27.00		E
	100'		20.00	25.00	30.00		E
	Trimmed Out Pole with 2 Cross Arms, 3-HV, Ins., Hdwe, & Power Augered Hole						
	20'		10.00	12.50	15.00		E
	25'		10.50	13.10	15.70		E
	30'		11.00	13.70	16.50		E
	35'		11.50	14.30	17.20		E
	40'		12.00	15.00	18.00		E
	45'		12.50	15.60	18.70		E
	50'		13.00	16.20	19.50		E
	55'		14.00	17.50	21.00		E
	60'		15.00	18.70	22.50		E
	65'		16.00	20.00	24.00		E
	70'		17.00	21.20	25.50		E
	75'		18.00	22.50	27.00		E
	80'		19.00	23.70	28.50		E
	90'		21.00	26.50	32.00		E
	100'		24.00	30.00	36.00		E
	Hand Dug Post Holes						
	Sandy Soil 3'		3.00	3.70	4.50		E
	4'		4.00	5.00	6.00		E
	5'		5.00	6.20	7.50		E
	6'		6.50	8.10	9.70		E
	7'		8.00	10.00	12.00		E
	8'		10.00	12.50	15.00		E
	Soft Clay 3'		4.00	5.00	6.00		E
	4'		5.00	6.20	7.50		E
	5'		6.00	7.50	9.00		E
	6'		7.50	9.30	11.20		E
	7'		9.00	11.20	13.50		E
	8'		11.00	13.70	16.50		E
	Hard Clay 3'		5.00	6.20	7.50		E
	4'		6.00	7.50	9.00		E
	5'		7.00	8.70	10.50		E
	6'		8.50	10.60	12.70		E
	7'		10.00	12.50	15.00		E
	8'		12.00	15.00	18.00		E
	Shale 3'		6.00	7.50	9.00		E
	4'		7.00	8.70	10.50		E
	5'		8.00	10.00	12.00		E
	6'		10.00	12.50	15.00		E
	7'		12.00	15.00	18.00		E
	8'		14.00	17.50	21.00		E

Section 11 - Outdoor Overhead and Underground Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Post Hole Excavation With Truck Auger						
	Sandy Soil 3'		0.70	0.85	1.00		E
	4'		0.80	1.00	1.20		E
	5'		0.90	1.12	1.35		E
	6'		1.00	1.25	1.50		E
	7'		1.20	1.50	1.80		E
	8'		1.50	1.85	2.25		E
	10'		2.10	2.60	3.15		E
	Soft Clay 3'		0.80	1.00	1.20		E
	4'		0.90	1.12	1.35		E
	5'		1.00	1.25	1.50		E
	6'		1.10	1.37	1.65		E
	7'		1.30	1.65	2.00		E
	8'		1.60	2.00	2.40		E
	10'		2.20	2.75	3.30		E
	Hard Clay 3'		0.90	1.12	1.35		E
	4'		1.00	1.25	1.50		E
	5'		1.15	1.43	1.75		E
	6'		1.30	1.65	2.00		E
	7'		1.60	2.00	2.40		E
	8'		2.00	2.50	3.00		E
	10'		2.50	3.15	3.75		E
	Shale 3'		1.00	1.25	1.50		E
	4'		1.10	1.36	1.65		E
	5'		1.25	1.55	1.85		E
	6'		1.40	1.75	2.10		E
	7'		1.75	2.15	2.60		E
	8'		2.25	2.80	3.35		E
	10'		3.00	3.75	4.50		E
	Wood Pole Installation						
	25'		4.00	5.00	6.00		E
	30'		4.50	5.60	6.70		E
	35'		5.00	6.20	7.50		E
	40'		5.50	6.80	8.20		E
	45'		6.00	7.50	9.00		E
	50'		7.00	8.70	10.50		E
	55'		8.00	10.00	12.00		E
	60'		10.00	12.50	15.00		E
	65'		12.00	15.00	18.00		E
	70'		14.00	17.50	21.00		E
	75'		17.00	21.20	25.50		E
	80'		20.00	25.00	30.00		E
	90'		28.00	35.00	42.00		E
	100'		38.00	48.00	58.00		E
	Steel or Aluminum Pole Installation						
	25'		4.50	5.60	6.70		E
	30'		5.00	6.20	7.50		E
	35'		5.50	6.80	8.20		E
	40'		6.00	7.50	9.00		E
	45'		7.00	8.70	10.50		E
	50'		8.00	10.00	12.00		E
	55'		10.00	12.50	15.00		E
	60'		12.00	15.00	18.00		E
	65'		14.00	17.50	21.00		E
	70'		16.00	20.00	24.00		E
	75'		19.00	23.00	28.00		E
	80'		22.00	27.00	33.00		E
	90'		30.00	37.00	45.00		E
	100'		40.00	50.00	60.00		E
	<i>Note: Excludes Template and Anchor Bolt Setting</i>						
	Concrete Pole Installation						
	25'		5.00	6.20	7.50		E
	30'		5.50	6.80	8.20		E
	35'		6.00	7.50	9.00		E
	40'		6.50	8.20	10.00		E
	45'		7.20	9.00	11.00		E
	50'		8.00	10.00	12.00		E
	55'		9.00	11.20	13.50		E
	60'		10.00	12.50	15.00		E
	65'		11.00	13.70	16.50		E
	70'		12.00	15.00	18.00		E
	75'		14.00	17.50	21.00		E
	80'		16.00	20.00	24.00		E
	Single Wooden Cross Arms						
	3'		1.00	1.20	1.50		E
	4'		1.10	1.30	1.60		E
	5'		1.20	1.40	1.70		E
	6'		1.30	1.50	1.90		E
	7'		1.40	1.70	2.10		E
	8'		1.50	1.90	2.30		E
	10'		1.70	2.10	2.60		E

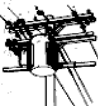
Section 11 - Outdoor Overhead and Underground Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Double Wooden Cross Arms						
	3'		2.00	2.50	3.00		E
	4'		2.20	2.70	3.30		E
	5'		2.40	2.90	3.60		E
	6'		2.60	3.20	3.90		E
	7'		2.80	3.50	4.20		E
	8'		3.00	3.80	4.50		E
	10'		3.40	4.20	5.10		E
	Single Steel Cross Arms						
	3'		1.30	1.50	1.90		E
	4'		1.40	1.60	2.00		E
	5'		1.50	1.80	2.20		E
	6'		1.60	2.00	2.40		E
	7'		1.70	2.20	2.60		E
	8'		1.80	2.40	2.80		E
	10'		2.00	2.60	3.00		E
	Cross Arm Pins						
	Shank Type		0.25	0.31	0.37		E
	Saddle Type		0.30	0.37	0.45		E
	Pole Top Type		0.40	0.50	0.60		E
	Porcelain Spool Insulators						
	2" Dia		0.10	0.12	0.15		E
	3" Dia		0.12	0.15	0.18		E
	4" Dia		0.15	0.18	0.22		E
	Porcelain LV Pin Insulators						
	4" Dia		0.15	0.18	0.22		E
	5" Dia		0.20	0.25	0.30		E
	7" Dia		0.30	0.37	0.45		E
	Porcelain Screw Type Wireholders						
	1 1/2" Dia		0.20	0.25	0.30		E
	2" Dia		0.22	0.27	0.33		E
	2 1/2" Dia		0.25	0.31	0.37		E
	Wood Pole Butt Plates						
	Wood Pole Butt Plates		0.40	0.50	0.60		E
	Grounding Rods						
	8 Ft Grounding Rod with Clamp		1.00	1.25	1.50		E
	Bare Copper Grounding Conductors						
	25'		0.50	0.60	0.70		E
	30'		0.60	0.70	0.80		E
	35'		0.70	0.80	0.90		E
	40'		0.80	0.90	1.10		E
	45'		0.90	1.00	1.30		E
	50'		1.00	1.20	1.50		E
	60'		1.20	1.40	1.80		E
	70'		1.40	1.70	2.10		E
	80'		1.60	2.00	2.40		E
	90'		1.80	2.20	2.70		E
	100'		2.00	2.50	3.00		E
	Wood or Plastic Molding Over Grounding Conductors						
	10 Ft or Shorter Sections		0.50	0.60	0.70		E
	Secondary Racks						
	2 Spools		0.80	1.00	1.20		E
	3 Spools		0.90	1.10	1.35		E
	4 Spools		1.00	1.25	1.50		E
	Plate or Bladed Anchors (Excavation Add'l)						
	Plate or Bladed Anchors (Excavation Add'l)		1.00	1.25	1.50		E

Section 11 - Outdoor Overhead and Underground Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Screw Type Anchors-Power Driven						
	Screw Type Anchors-Power Driven		2.00	2.50	3.00		E
	Threaded Anchor Rods						
	5'		0.20	0.25	0.30		E
	6'		0.22	0.27	0.35		E
	7'		0.25	0.31	0.40		E
	8'		0.30	0.37	0.45		E
	Threaded Eye Bolts						
	8"		0.20	0.25	0.30		E
	10"		0.22	0.27	0.33		E
	12"		0.24	0.29	0.36		E
	14"		0.26	0.31	0.39		E
	16"		0.28	0.34	0.42		E
	18"		0.30	0.37	0.45		E
	20"		0.32	0.40	0.48		E
	Cross Arm Braces 26" to 32" Long						
	Cross Arm Braces 26" to 32" Long		0.30	0.37	0.45		E
	Alley Braces 5' to 7' Long						
	Alley Braces 5' to 7' Long		0.40	0.50	0.60		E
	Steel Anchoring Cable with One Insulator						
	20'		2.00	2.50	3.00		E
	25'		2.50	3.10	3.70		E
	30'		3.00	3.80	4.50		E
	40'		4.00	5.00	6.00		E
	50'		5.00	6.20	7.50		E
	60'		6.00	7.50	9.00		E
	70'		7.00	8.70	10.50		E
	80'		8.00	10.00	12.00		E
	1/C ACSR Cable on Outdoor Poles						
	#6		12.00	15.00	18.00		M
	#4		13.00	16.20	19.50		M
	#2		14.00	17.50	21.00		M
	#1		15.00	18.70	22.50		M
	1/0		16.00	20.00	24.00		M
	2/0		18.00	22.50	27.00		M
	3/0		20.00	25.00	30.00		M
	4/0		22.00	27.50	33.00		M
	1/C 600 Volt Copper Polyethylene Cable on Pole						
	#6		14.00	17.50	21.00		M
	#4		16.00	20.00	24.00		M
	#2		18.00	22.50	27.00		M
	#1		20.00	25.00	30.00		M
	1/0		24.00	30.00	36.00		M
	2/0		28.00	35.00	42.00		M
	3/0		32.00	40.00	48.00		M
	4/0		36.00	45.00	54.00		M
	1/C 600 Volt Alum Polyethylene Cable on Poles						
	#6		12.00	15.00	18.00		M
	#4		14.00	17.50	21.00		M
	#2		16.00	20.00	24.00		M
	#1		18.00	22.50	27.00		M
	1/0		20.00	25.00	30.00		M
	2/0		22.00	27.50	33.00		M
	3/0		24.00	30.00	36.00		M
	4/0		26.00	32.50	39.00		M
	1/C Bare Copper Cable On Outdoor Poles						
	#6		14.00	17.50	21.00		M
	#4		16.00	20.00	24.00		M
	#2		18.00	22.50	27.00		M
	#1		20.00	25.00	30.00		M
	1/0		24.00	30.00	36.00		M
	2/0		28.00	35.00	42.00		M
	3/0		32.00	40.00	48.00		M
	4/0		36.00	45.00	54.00		M

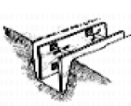
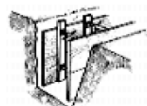
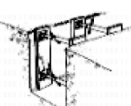
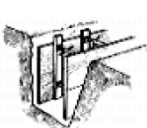
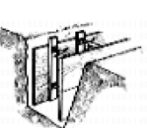
Section 11 - Outdoor Overhead and Underground Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	3/C 600 Volt Copper Primary Cable with Messenger Wire Support						
	#6		28.00	35.00	42.00		M
	#4		32.00	40.00	48.00		M
	#2		36.00	45.00	54.00		M
	#1		40.00	50.00	60.00		M
	1/0		48.00	60.00	72.00		M
	2/0		56.00	70.00	84.00		M
	3/0		64.00	80.00	96.00		M
	4/0		72.00	90.00	108.00		M
	3/C 600 Volt Alum Primary Cable with Messenger Wire Support						
	#6		24.00	30.00	36.00		M
	#4		28.00	35.00	42.00		M
	#2		32.00	40.00	48.00		M
	#1		36.00	45.00	5.00		M
	1/0		40.00	50.00	60.00		M
	2/0		44.00	55.00	66.00		M
	3/0		48.00	60.00	72.00		M
	4/0		52.00	65.00	78.00		M
	Pole Mounted Single Phase Transformers						
	5 KVA		6.00	7.50	9.00		E
	10 KVA		7.00	8.50	10.00		E
	15 KVA		8.00	10.00	12.00		E
	25 KVA		10.00	12.50	15.00		E
	37 1/2 KVA		12.00	15.00	18.00		E
	50 KVA		15.00	17.50	22.50		E
	75 KVA		18.00	22.50	27.00		E
	100 KVA		22.00	27.50	33.00		E
	167 KVA		26.00	33.00	40.00		E
	Pole Mounted Three Phase Transformers						
	30 KVA		30.00	37.50	45.00		E
	45 KVA		34.00	42.00	51.00		E
	75 KVA		38.00	47.00	57.00		E
	112 1/2 KVA		43.00	54.00	64.00		E
	150 KVA		48.00	60.00	72.00		E
	225 KVA		54.00	67.00	80.00		E
	300 KVA		60.00	75.00	90.00		E
	500 KVA		72.00	90.00	110.00		E
	Pole Mounted Capacitors						
	25 KVAR		8.00	10.00	14.00		E
	50 KVAR		10.00	12.00	16.00		E
	100 KVAR		16.00	18.00	20.00		E
	Pole Mounted Air Break Switches						
	5KV Pole Mounted Air Break Switches		36.00	45.00	54.00		E
	15KV Pole Mounted Air Break Switches		40.00	50.00	60.00		E
	5-15KV Single Phase Pole Mounted Oil Switches						
	1-Switch Remote Operated		10.00	12.50	15.00		E
	1-Switch Manual Operated		20.00	25.00	30.00		E
	2-Switch Manual Operated		30.00	37.50	45.00		E
	3-Switch Manual Operated		40.00	50.00	60.00		E
	5-15KV Three Phase Pole Mounted Oil Switches						
	3-Switch Remote Operated		40.00	50.00	60.00		E
	3-Switch Manual Operated		60.00	75.00	90.00		E
	Pole Mounted Lightning Arrestors						
	20 KV		5.00	6.20	7.50		E
	35 KV		6.00	7.50	9.00		E
	50 KV		7.00	8.70	10.50		E
	70 KV		8.00	10.00	12.00		E
	100 KV		9.00	11.20	13.50		E
	120 KV		10.00	12.50	15.00		E
	160 KV		12.00	15.00	18.00		E
	200 KV		14.00	17.50	21.00		E
	Circuit Reclosures						
	Single Phase Circuit Reclosure		12.00	15.00	18.00		E
	Three Phase Circuit Reclosures		24.00	30.00	36.00		E

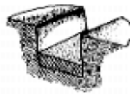
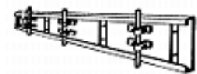
Section 11 - Outdoor Overhead and Underground Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
  Three Phase Single Phase	Transformers Outdoor Type Up to 15 KV Primary, Unload, Inspect and Handling Labor Only	X					
	25 KVA	X	6.00	7.50	9.00		E
	50 KVA	X	7.00	8.75	10.50		E
	75 KVA	X	8.00	10.00	12.00		E
	100 KVA	X	9.00	11.25	13.50		E
	150 KVA	X	10.00	12.50	15.00		E
	200 KVA	X	11.00	13.75	16.50		E
	225 KVA	X	12.00	15.00	18.00		E
	250 KVA	X	13.00	16.25	19.50		E
	300 KVA	X	14.00	17.50	21.00		E
	400 KVA	X	15.00	18.75	22.50		E
	500 KVA	X	16.00	20.00	24.00		E
	600 KVA	X	18.00	22.50	27.00		E
	750 KVA	X	20.00	25.00	30.00		E
	1000 KVA	X	22.00	27.50	33.00		E
	1500 KVA	X	24.00	30.00	36.00		E
	2000 KVA	X	26.00	32.50	39.00		E
	2500 KVA	X	29.00	36.25	43.50		E
	3000 KVA	X	32.00	40.00	48.00		E
	<i>Note: Labor Units Do Not Include</i>	X					
	1) Housekeeping Pad	X					
	2) Vibration Isolator	X					
	3) Seismic Supports	X					
	4) Larger Sized Equipment Will Require Special Handling And/Or Rigging						
	600 Amp Sectional Switches, Pad Mounted, Outdoor Type Up to 15 KV Primary, Unload, Inspect and Handling Labor Only	X					
	2 Section	X	21.00	27.00	32.00		E
	4 Section	X	40.00	48.00	56.00		E
	<i>Note: Labor Units do not Include</i>	X					
	1) Housekeeping Pad	X					
	2) Remote Supervisory	X					
	3) Remote Source Transfer	X					
	4) Fuses or Fusing	X					
	600-1200 Amp Pad Mounted Switchgear, Outdoor Type Up to 15 KV Primary, Unload, Inspect and Handling Labor Only	X					
	Radial System:	X					
	3 Section	X	64.00	81.00	97.00		E
	4 Section	X	79.00	99.00	118.00		E
	5 Section	X	99.00	124.00	148.00		E
	6 Section	X	140.00	175.00	210.00		E
	Common Bus, Primary-Selective	X					
	6 Section	X	140.00	175.00	210.00		E
	7 Section	X	189.00	236.00	284.00		E
	8 Section	X	216.00	270.00	324.00		E
	9 Section	X	236.00	285.00	335.00		E
	Split-Bus, Primary-Selective	X					
	6 Section	X	140.00	175.00	210.00		E
	7 Section	X	189.00	236.00	284.00		E
	8 Section	X	216.00	270.00	324.00		E
	9 Section	X	236.00	285.00	335.00		E
	<i>Note: Labor Units do not Include</i>	X					
	1) Housekeeping Pad	X					
	2) Remote Supervisory	X					
	3) Remote Source Transfer	X					
	4) Fuses or Fusing	X					
	Hand Excavation of Small Trenches						
	Sandy Soil - 6" x 18" Deep		4.00	5.00	6.00		C
	9" x 18" Deep		5.00	6.20	7.50		C
	12" x 18" Deep		6.00	7.50	9.00		C
	12" x 24" Deep		9.00	11.20	13.50		C
	12" x 30" Deep		12.00	15.00	18.00		C
	18" x 36" Deep		20.00	25.00	30.00		C
	Clay Soil - 6" x 18" Deep		6.00	7.50	9.00		C
	9" x 18" Deep		8.00	10.00	12.00		C
	12"x 18" Deep		10.00	12.50	15.00		C
	12"x 24" Deep		15.00	18.70	22.50		C
	12"x 30" Deep		20.00	25.00	30.00		C
	18" x 36" Deep		34.00	42.00	50.00		C
	Loose Shale 6" x 18" Deep		8.00	10.00	12.00		C
	9" x 18" Deep		10.00	12.50	15.00		C
	12"x 18" Deep		13.00	16.00	19.00		C
	12"x 24" Deep		18.00	22.00	27.00		C
	12"x 30" Deep		24.00	30.00	36.00		C
	18" x 36" Deep		40.00	50.00	60.00		C
	Rocky Soil 6" x 18" Deep		10.00	12.50	15.00		C
	9" x 18" Deep		14.00	17.50	21.00		C
	12"x 18" Deep		18.00	22.00	27.00		C
	12"x 24" Deep		24.00	30.00	36.00		C
	12"x 30" Deep		32.00	40.00	48.00		C
	18" x 36" Deep		56.00	70.00	84.00		C

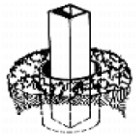
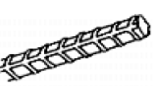
Section 11 - Outdoor Overhead and Underground Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Hand Trim Bottom of Machine Excavated Trenches						
	12" Wide - Sandy Soil		2.00	2.50	3.00		C
	18" Wide - Sandy Soil		3.00	3.70	4.50		C
	24" Wide - Sandy Soil		4.00	5.00	6.00		C
	36" Wide - Sandy Soil		6.00	7.50	9.00		C
	48" Wide - Sandy Soil		8.00	10.00	12.00		C
	60" Wide - Sandy Soil		10.00	12.50	15.00		C
	12" Wide - Soft Clay		3.00	3.70	4.50		C
	18" Wide - Soft Clay		4.00	5.00	6.00		C
	24" Wide - Soft Clay		5.00	6.20	7.50		C
	36" Wide - Soft Clay		8.00	10.00	12.00		C
	48" Wide - Soft Clay		10.00	12.50	15.00		C
	60" Wide - Soft Clay		13.00	16.00	19.00		C
	12" Wide - Hard Clay		4.00	5.00	6.00		C
	18" Wide - Hard Clay		5.00	6.20	7.50		C
	24" Wide - Hard Clay		6.00	7.50	9.00		C
	36" Wide - Hard Clay		9.00	11.20	13.50		C
	48" Wide - Hard Clay		12.00	15.00	18.00		C
	60" Wide - Hard Clay		15.00	18.70	22.50		C
	12" Wide - Shale		5.00	6.20	7.50		C
	18" Wide - Shale		6.00	7.50	9.00		C
	24" Wide - Shale		8.00	10.00	12.00		C
	36" Wide - Shale		10.00	12.50	15.00		C
	48" Wide - Shale		14.00	17.50	21.00		C
	60" Wide - Shale		18.00	22.00	27.00		C
	12" Wide - Rocky Soil		6.00	7.50	9.00		C
	18" Wide - Rocky Soil		7.00	8.70	10.50		C
	24" Wide - Rocky Soil		9.00	11.20	13.50		C
	36" Wide - Rocky Soil		12.00	15.00	18.00		C
	48" Wide - Rocky Soil		16.00	20.00	24.00		C
	60" Wide - Rocky Soil		20.00	25.00	30.00		C
	Inst. & Removal of Trench Shoring - 3/4" Plywood Shoring Both Sides & Steel Trench Jacks Bracing						
	4' Deep		0.40	0.50	0.60		LF
	6' Deep		0.45	0.56	0.67		LF
	8' Deep		0.50	0.62	0.75		LF
	10' Deep		0.55	0.68	0.82		LF
	Inst. & Removal of Trench Shoring - 3/4" Plywood Both Sides - 2x8 Vert Planks & Steel Trench Jacks						
	4' Deep		0.50	0.62	0.75		LF
	6' Deep		0.55	0.68	0.82		LF
	8' Deep		0.60	0.75	0.90		LF
	10' Deep		0.65	0.81	0.97		LF
	Inst. & Removal of Trench Shoring - 2x12's Laid Horiz. Both Sides 2x8 Vert Planks & Steel Trench Jacks						
	4' Deep		0.50	0.62	0.75		LF
	6' Deep		0.60	0.75	0.90		LF
	8' Deep		0.70	0.87	1.05		LF
	10' Deep		0.80	1.00	1.20		LF
	Inst. & Removal of Trench Shoring - Vert 2x12's Both Sides - 2x8 Horiz Headers & Steel Trench Jacks						
	4' Deep		0.80	1.00	1.20		LF
	6' Deep		0.85	1.06	1.27		LF
	8' Deep		0.90	1.12	1.35		LF
	10' Deep		1.00	1.25	1.50		LF
	Inst. & Removal of Trench Shoring - Steel Shoring Both Sides w/ Either Steel Trench Jacks or 4x4 Horiz. Wood Bracing						
	4' Deep		0.30	0.37	0.45		LF
	6' Deep		0.35	0.43	0.52		LF
	8' Deep		0.40	0.50	0.60		LF
	10' Deep		0.50	0.62	0.75		LF
	Inst. & Removal of Trench Shoring - 2x12 Vert Planks Both Sides & Two Steel Trench Jacks or Two 4 x 4 Wood Braces						
	4' Deep		0.25	0.31	0.34		E
	6' Deep		0.30	0.37	0.45		E
	8' Deep		0.35	0.43	0.52		E
	10' Deep		0.40	0.50	0.60		E

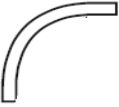
Section 11 - Outdoor Overhead and Underground Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	3" Deep Sand Bedding in Trenches						
	12" Wide		8.00	10.00	12.00		C
	18" Wide		10.00	12.50	15.00		C
	24" Wide		12.00	15.00	18.00		C
	36" Wide		15.00	18.70	22.00		C
	48" Wide		18.00	22.00	27.00		C
	60" Wide		22.00	27.00	33.00		C
	3" Deep Concrete Bedding in Trenches						
	12" Wide		6.00	8.00	10.00		C
	18" Wide		7.00	9.00	11.00		C
	24" Wide		8.00	10.00	12.00		C
	36" Wide		9.00	11.00	13.00		C
	48" Wide		10.00	12.00	14.00		C
	60" Wide		12.00	14.00	16.00		C
	Backfill & Compaction of Trenches						
	6" x 18" Deep		4.00	5.00	6.00		C
	6" x 24" Deep		5.00	6.20	7.50		C
	6" x 30" Deep		6.00	7.50	9.00		C
	12" x 24" Deep		8.00	10.00	12.00		C
	12" x 30" Deep		10.00	12.50	15.00		C
	12" x 36" Deep		12.00	15.00	18.00		C
	18" x 24" Deep		10.00	12.50	15.00		C
	18" x 30" Deep		12.00	15.00	18.00		C
	18" x 36" Deep		14.00	17.50	21.00		C
	24" x 24" Deep		16.00	20.00	24.00		C
	24" x 30" Deep		18.00	22.50	27.00		C
	24" x 36" Deep		20.00	25.00	30.00		C
	30" x 30" Deep		24.00	30.00	36.00		C
	30" x 36" Deep		28.00	35.00	42.00		C
	30" x 48" Deep		36.00	45.00	54.00		C
	36" x 36" Deep		32.00	40.00	48.00		C
	36" x 48" Deep		40.00	50.00	60.00		C
	36" x 60" Deep		48.00	60.00	72.00		C
	48" x 48" Deep		50.00	62.00	75.00		C
	48" x 60" Deep		60.00	75.00	90.00		C
	48" x 72" Deep		70.00	85.00	100.00		C
	3/4" Plywood Forms for Duct Bank Concrete Encasement - One Side Only						
	12" Deep		10.00	12.50	15.00		C
	18" Deep		12.00	15.00	18.00		C
	24" Deep		14.00	17.50	21.00		C
	30" Deep		16.00	20.00	24.00		C
	36" Deep		18.00	22.50	27.00		C
	48" Deep		20.00	25.00	30.00		C
	60" Deep		24.00	30.00	36.00		C
	3/4" Plywood Forms for Duct Bank Concrete Encasement - Forms on Both Sides						
	12" Deep		20.00	25.00	30.00		C
	18" Deep		24.00	30.00	36.00		C
	24" Deep		28.00	35.00	42.00		C
	30" Deep		32.00	40.00	48.00		C
	36" Deep		36.00	45.00	54.00		C
	48" Deep		40.00	50.00	60.00		C
	60" Deep		48.00	60.00	72.00		C
	Plastic Spacers in Duct Bank for Conduit						
	2" - 6" Wide		12.00	14.00	16.00		C
	<i>Note: Add for tie-wire</i>						
	Pouring Concrete Directly From Ready Mix Trucks Into Duct Banks - Per Cubic Yard (CY)						
	Pouring Concrete Directly From Ready Mix Trucks Into Duct Banks		0.50	0.75	1.00		CY
	<i>Note: Excludes Rebar</i>						
	Wood Forms For Concrete Slabs						
	6" High		0.60	0.75	0.90		LF
	8" High		0.65	0.80	0.95		LF
	10" High		0.70	0.85	1.00		LF
	12" High		0.80	1.00	1.20		LF
	18" High		1.00	1.25	1.50		LF
	24" High		1.20	1.50	1.80		LF
	Rented Steel Forms For Concrete Slabs						
	6" High		0.50	0.62	0.75		LF
	8" High		0.55	0.68	0.82		LF
	10" High		0.60	0.75	0.90		LF
	12" High		0.70	0.85	1.00		LF
	18" High		0.85	1.05	1.25		LF
	24" High		1.00	1.25	1.50		LF

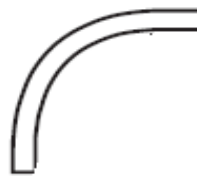
Section 11 - Outdoor Overhead and Underground Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Sonotube Pole Foundation Forms - 48" High						
	8" Dia		0.60	0.75	0.90		E
	12" Dia		0.65	0.80	0.95		E
	16" Dia		0.70	0.85	1.00		E
	20" Dia		0.80	1.00	1.20		E
	24" Dia		0.90	1.12	1.35		E
	30" Dia		1.00	1.25	1.50		E
	Plywood Pole Foundation Forms - 48" High						
	8" x 8"		3.00	3.75	4.50		E
	12" x 12"		3.50	4.35	5.25		E
	16" x 16"		4.00	5.00	6.00		E
	20" x 20"		5.00	6.25	7.50		E
	24" x 24"		6.00	7.50	9.00		E
	Wire Reinforcing Mesh In Concrete Slabs						
	Wire Reinforcing Mesh In Concrete Slabs		0.40	0.50	0.60		SF
	Steel Reinforcing Bars In Concrete Slabs						
	2 to 5 #/SF		0.40	0.50	0.60		SF
	6 to 10 #/SF		0.50	0.62	0.75		SF
	11 to 15 #/SF		0.60	0.75	0.90		SF
	16 to 20 #/SF		0.70	0.85	1.00		SF
	Steel Reinforcing Bars in Pole Foundations						
	2 to 5 #/CY		1.00	1.25	1.50		CY
	6 to 10 #/CY		1.50	1.85	2.25		CY
	11 to 15 #/CY		2.25	2.80	3.35		CY
	16 to 20 #/CY		3.00	3.75	4.50		CY
	Pour Concrete Slabs At Grade Elevation						
	Directly From Ready Mix Trucks						
	6" Thick		0.10	0.12	0.15		SF
	8" Thick		0.12	0.15	0.18		SF
	10" Thick		0.14	0.17	0.21		SF
	12" Thick		0.16	0.20	0.24		SF
	18" Thick		0.18	0.22	0.27		SF
	24" Thick		0.20	0.25	0.30		SF
	Pouring Concrete In 48" High Pole Foundations	X					
	8" Dia	X	0.50	0.62	0.75		E
	12" Dia	X	0.55	0.68	0.82		E
	16" Dia	X	0.60	0.75	0.90		E
	20" Dia	X	0.70	0.85	1.00		E
	24" Dia	X	0.85	1.05	1.25		E
	30" Dia	X	1.00	1.25	1.50		E
	Hand Finish Concrete Slabs At Grade						
	Hand Finish Concrete Slabs At Grade		0.10	0.12	0.15		SF
	Hand Finish Pole Foundations Above Grade						
	Hand Finish Pole Foundations Above Grade		0.20	0.25	0.30		SF
	HDPE Polyethylene Plastic Laid In Trenches -						
	Per LF With O-Rings						
	1"		4.00	5.00	6.00		C
	1 1/2"		4.25	5.30	6.35		C
	2"		4.50	5.60	6.75		C
	3"		4.75	5.90	7.10		C
	4"		5.00	6.25	7.50		C
	5"		5.25	6.50	7.75		C
	HDPE Coupling O-Ring Type						
	1"		10.00	12.50	15.00		C
	1 1/2"		12.00	15.00	18.00		C
	2"		14.00	17.50	21.00		C
	3"		17.00	21.00	25.00		C
	4"		20.00	25.00	30.00		C
	5"		23.00	27.00	32.00		C
	6"		25.00	30.00	35.00		C
	HDPE Conduit Adapter						
	1"		15.00	18.70	22.50		C
	1 1/2"		20.00	25.00	30.00		C
	2"		25.00	31.00	37.00		C
	3"		30.00	37.00	45.00		C
	4"		35.00	43.00	52.00		C
	5"		40.00	49.00	59.00		C
	6"		45.00	55.00	65.00		C

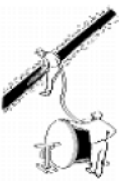
Section 11 - Outdoor Overhead and Underground Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	PVC EB/DB Plastic Conduit Laid In Trenches - 10Ft & 20Ft Lengths With Glued Couplings						
	2"		4.00	5.00	6.00		C
	3"		4.25	5.30	6.35		C
	3 1/2"		4.50	5.60	6.75		C
	4"		4.75	5.90	7.10		C
	5"		5.00	6.25	7.50		C
	6"		5.40	6.75	8.00		C
	<i>Note: Reduce Labor Units for 20Ft Lengths by 10%</i>						
	PVC EB/DB Plastic Conduit Laid In Trenches - Couplings - Glued Type						
	2"		15.00	18.70	22.50		C
	3"		20.00	25.00	30.00		C
	3 1/2"		25.00	31.00	37.00		C
	4"		30.00	37.00	45.00		C
	5"		35.00	43.00	52.00		C
	6"		40.00	50.00	60.00		C
	PVC EB/DB Plastic Conduit Laid In Trenches - 90 Degree Elbows						
	2"		30.00	37.00	45.00		C
	3"		35.00	43.00	52.00		C
	3 1/2"		40.00	50.00	60.00		C
	4"		45.00	56.00	67.00		C
	5"		50.00	62.00	75.00		C
	6"		58.00	73.00	87.00		C
	PVC EB/DB Plastic Conduit Laid In Trenches - Threaded End Conduit Adapters						
	2"		20.00	25.00	30.00		C
	3"		25.00	31.00	37.00		C
	3 1/2"		30.00	37.00	45.00		C
	4"		35.00	43.00	52.00		C
	5"		40.00	50.00	60.00		C
	6"		46.00	58.00	70.00		C
	PVC Duct Bank Conduit Spacers						
	1/2" - 2"		12.00	14.00	16.00		C
	2 1/2" - 6"		20.00	25.00	30.00		C
	Sch 40 PVC Conduit Laid In Trenches - 10Ft & 20Ft Len. w/ Glued Couplings						
	3/4"		3.50	4.50	5.50		C
	1"		3.75	4.75	5.75		C
	1 1/4"		4.00	5.00	6.00		C
	1 1/2"		4.25	5.30	6.35		C
	2"		4.50	5.60	6.75		C
	2 1/2"		4.75	5.90	7.10		C
	3"		5.00	6.25	7.50		C
	3 1/2"		5.25	6.55	7.85		C
	4"		5.50	6.85	8.25		C
	5"		5.75	7.15	8.60		C
	6"		6.00	7.50	9.00		C
	<i>Note: Reduce Labor Units for 20Ft Lengths by 10%</i>						
	Sch 40 PVC Conduit Laid In Trenches - 90 Degree Elbows Add 20% for Wide Sweep Elbows						
	1/2"		0.20	0.25	0.30		E
	3/4"		0.22	0.28	0.33		E
	1"		0.25	0.31	0.38		E
	1 1/4"		0.32	0.40	0.48		E
	1 1/2"		0.40	0.48	0.60		E
	2"		0.50	0.63	0.75		E
	2 1/2"		0.60	0.75	0.90		E
	3"		0.70	0.84	1.05		E
	3 1/2"		0.85	1.06	1.28		E
	4"		1.00	1.25	1.50		E
	5"		1.25	1.56	1.88		E
	6"		1.50	1.88	2.25		E
	Sch 40 PVC Conduit Laid In Trenches - Threaded Adapters						
	1/2"		0.14	0.17	0.21		E
	3/4"		0.16	0.20	0.24		E
	1"		0.18	0.22	0.27		E
	1 1/4"		0.20	0.25	0.30		E
	1 1/2"		0.25	0.31	0.37		E
	2"		0.30	0.37	0.45		E
	2 1/2"		0.40	0.50	0.60		E
	3"		0.50	0.62	0.75		E
	3 1/2"		0.65	0.81	0.97		E
	4"		0.80	1.00	1.20		E
	5"		1.00	1.25	1.50		E
	6"		1.25	1.55	1.85		E

Section 11 - Outdoor Overhead and Underground Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Sch 40 PVC Conduit Laid In Trenches - Expansion Couplings						
	1/2"		0.50	0.62	0.75		E
	3/4"		0.60	0.75	0.90		E
	1"		0.70	0.87	1.05		E
	1 1/4"		0.80	1.00	1.20		E
	1 1/2"		0.90	1.12	1.35		E
	2"		1.00	1.25	1.50		E
	2 1/2"		1.15	1.43	1.72		E
	3"		1.30	1.62	1.95		E
	3 1/2"		1.50	1.85	2.25		E
	4"		1.75	2.15	2.60		E
	5"		2.00	2.50	3.00		E
	6"		2.25	2.75	3.25		E
	Field Bend Sch 40 PVC Conduit & Installation						
	Add 10% for each field cut & ream						
	1/2"		0.40	0.50	0.60		E
	3/4"		0.50	0.60	0.75		E
	1"		0.60	0.75	0.90		E
	1 1/4"		0.65	0.81	0.98		E
	1 1/2"		0.80	1.00	1.20		E
	2"		1.00	1.25	1.50		E
	2 1/2"		1.20	1.50	1.80		E
	3"		1.40	1.75	2.10		E
	3 1/2"		1.70	2.13	2.55		E
	4"		2.00	2.50	3.00		E
	5"		3.15	3.94	4.73		E
	6"		4.20	5.25	6.30		E
	Sch 80 PVC Conduit Laid In Trenches - 10Ft & 20Ft Lengths w/ Glued Couplings						
	1/2"		4.00	5.00	6.00		C
	3/4"		4.20	5.20	6.20		C
	1"		4.50	5.50	6.50		C
	1 1/4"		4.80	5.80	6.80		C
	1 1/2"		5.10	6.10	7.10		C
	2"		5.40	6.40	7.40		C
	2 1/2"		5.70	6.70	7.70		C
	3"		6.00	7.00	8.00		C
	4"		6.60	7.60	8.60		C
	5"		6.90	7.90	8.90		C
	6"		7.20	8.20	9.20		C
	Sch 80 PVC Conduit Laid In Trenches - 90 Degree Elbows						
	Add 20% for Wide Sweep Elbows						
	1/2"		0.22	0.27	0.32		E
	3/4"		0.24	0.29	0.34		E
	1"		0.28	0.33	0.38		E
	1 1/4"		0.35	0.40	0.45		E
	1 1/2"		0.46	0.56	0.66		E
	2"		0.58	0.73	0.88		E
	2 1/2"		0.69	0.89	1.09		E
	3"		0.84	1.09	1.34		E
	4"		1.20	1.70	2.20		E
	5"		1.50	2.00	2.50		E
	6"		1.80	2.30	2.80		E
	Sch 80 PVC Conduit Laid In Trenches - Threaded Adapters						
	1/2"		0.16	0.19	0.23		E
	3/4"		0.18	0.22	0.26		E
	1"		0.20	0.24	0.28		E
	1 1/4"		0.22	0.27	0.32		E
	1 1/2"		0.30	0.35	0.40		E
	2"		0.35	0.42	0.47		E
	2 1/2"		0.45	0.55	0.65		E
	3"		0.60	0.70	0.80		E
	4"		0.70	0.85	1.00		E
	5"		0.85	1.15	1.35		E
	6"		1.20	1.40	1.70		E
	Sch 80 PVC Conduit Laid In Trenches - Expansion Couplings						
	1/2"		0.25	0.30	0.35		E
	3/4"		0.30	0.36	0.41		E
	1"		0.40	0.48	0.55		E
	1 1/4"		0.50	0.60	0.70		E
	1 1/2"		0.65	0.78	0.90		E
	2"		0.75	0.90	1.05		E
	2 1/2"		0.85	1.02	1.17		E
	3"		1.05	1.26	1.45		E
	4"		1.40	1.68	1.93		E
	5"		1.65	1.98	2.28		E
	6"		1.90	2.28	2.62		E

Section 11 - Outdoor Overhead and Underground Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	5 KV Direct Burial Aluminum Cable						
	1/C #12 TO #8		18.00	22.00	27.00		M
	1/C #6 to #3		20.00	25.00	30.00		M
	1/C #2 to 2/0		22.00	27.00	33.00		M
	1/C 3/0 to 250		24.00	30.00	36.00		M
	1/C 300 to 500		26.00	32.00	39.00		M
	1/C 600 to 750		30.00	37.00	45.00		M
	2/C #12 to #8		23.00	28.00	34.00		M
	2/C #6 to #3		25.00	31.00	37.00		M
	2/C #2 to 2/0		27.00	33.00	40.00		M
	2/C 3/0 to 250		30.00	37.00	45.00		M
	2/C 300 to 500		34.00	42.00	51.00		M
	2/C 600 to 750		38.00	47.00	57.00		M
	3/C #12 to #8		25.00	31.00	37.00		M
	3/C #6 to #3		27.00	33.00	40.00		M
	3/C #2 to 2/0		30.00	37.00	45.00		M
	3/C 3/0 to 250		33.00	41.00	49.00		M
	3/C 300 to 500		37.00	46.00	55.00		M
	3/C 600 to 750		42.00	52.00	63.00		M
	15 KV Direct Burial Copper Cable						
	1/C #12 TO #8		24.00	30.00	36.00		M
	1/C #6 to #3		26.00	32.00	39.00		M
	1/C #2 to 2/0		28.00	35.00	42.00		M
	1/C 3/0 to 250		30.00	37.00	45.00		M
	1/C 300 to 500		33.00	41.00	49.00		M
	1/C 600 to 750		36.00	45.00	54.00		M
	2/C #12 to #8		30.00	37.00	45.00		M
	2/C #6 to #3		32.00	40.00	48.00		M
	2/C #2 to 2/0		34.00	42.00	51.00		M
	2/C 3/0 to 250		36.00	45.00	54.00		M
	2/C 300 to 500		39.00	48.00	58.00		M
	2/C 600 to 750		43.00	53.00	64.00		M
	3/C #12 to #8		32.00	40.00	48.00		M
	3/C #6 to #3		35.00	43.00	52.00		M
	3/C #2 to 2/0		38.00	47.00	57.00		M
	3/C 3/0 to 250		41.00	51.00	61.00		M
	3/C 300 to 500		45.00	56.00	67.00		M
	3/C 600 to 750		50.00	62.00	75.00		M
	15 KV Direct Burial Aluminum Cable						
	1/C #12 TO #8		20.00	25.00	30.00		M
	1/C #6 to #3		22.00	27.00	33.00		M
	1/C #2 to 2/0		24.00	30.00	36.00		M
	1/C 3/0 to 250		26.00	32.00	39.00		M
	1/C 300 to 500		28.00	35.00	42.00		M
	1/C 600 to 750		30.00	37.00	45.00		M
	2/C #12 to #8		25.00	31.00	37.00		M
	2/C #6 to #3		27.00	33.00	40.00		M
	2/C #2 to 2/0		30.00	37.00	45.00		M
	2/C 3/0 to 250		33.00	41.00	49.00		M
	2/C 300 to 500		36.00	45.00	54.00		M
	2/C 600 to 750		40.00	50.00	60.00		M
	3/C #12 to #8		30.00	37.00	45.00		M
	3/C #6 to #3		32.00	40.00	48.00		M
	3/C #2 to 2/0		34.00	42.00	51.00		M
	3/C 3/0 to 250		36.00	45.00	54.00		M
	3/C 300 to 500		40.00	50.00	60.00		M
	3/C 600 to 750		44.00	55.00	66.00		M
	25 KV 1/C Direct Burial Copper Cable w/ Concentric Wire Neutral						
	#4		27.00	33.00	40.00		M
	#2		28.00	35.00	42.00		M
	#1		29.00	36.00	43.00		M
	1/0		30.00	37.00	45.00		M
	2/0		31.00	38.00	46.00		M
	3/0		32.00	40.00	48.00		M
	4/0		34.00	42.00	51.00		M
	250 kcmil		36.00	45.00	54.00		M
	350 kcmil		38.00	47.00	57.00		M
	500 kcmil		40.00	50.00	60.00		M
	750 kcmil		42.00	52.00	63.00		M
	25 KV 1/C Direct Burial Aluminum Cable w/ Concentric Wire Neutral						
	#4		25.00	31.00	37.00		M
	#2		26.00	32.00	38.00		M
	#1		27.00	33.00	40.00		M
	1/0		28.00	35.00	42.00		M
	2/0		29.00	36.00	43.00		M
	3/0		30.00	37.00	45.00		M
	4/0		32.00	40.00	48.00		M
	250 kcmil		34.00	42.00	51.00		M
	350 kcmil		36.00	45.00	54.00		M
	500 kcmil		38.00	47.00	57.00		M
	750 kcmil		40.00	50.00	60.00		M

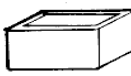
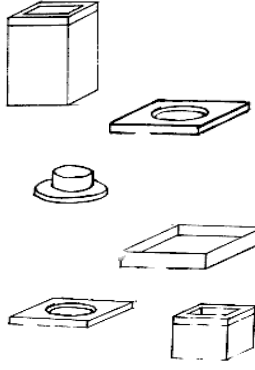
Section 11 - Outdoor Overhead and Underground Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	35 KV 1/C Direct Burial Copper Cable w/ Concentric Wire Neutral						
	#1		30.00	37.00	45.00		M
	1/0		31.00	38.00	46.00		M
	2/0		32.00	40.00	48.00		M
	3/0		33.00	41.00	49.00		M
	4/0		35.00	43.00	52.00		M
	250 kcmil		37.00	46.00	55.00		M
	350 kcmil		39.00	48.00	58.00		M
	500 kcmil		41.00	51.00	61.00		M
	750 kcmil		44.00	55.00	66.00		M
	1000 kcmil		48.00	60.00	72.00		M
	35 KV 1/C Direct Burial Aluminum Cable w/ Concentric Wire Neutral						
	#1		27.00	33.00	40.00		M
	1/0		28.00	34.00	41.00		M
	2/0		29.00	35.00	43.00		M
	3/0		30.00	37.00	45.00		M
	4/0		31.00	38.00	46.00		M
	250 kcmil		32.00	40.00	48.00		M
	350 kcmil		34.00	42.00	51.00		M
	500 kcmil		36.00	45.00	54.00		M
	750 kcmil		39.00	48.00	58.00		M
	1000 kcmil		42.00	52.00	63.00		M
	600 Volt Copper Cable Pulled Into Buried Conduit						
	1/C #12 TO #8		40.00	50.00	60.00		M
	1/C #6 to #3		42.00	52.00	63.00		M
	1/C #2 to 2/0		44.00	55.00	66.00		M
	1/C 3/0 to 250		46.00	57.00	69.00		M
	1/C 300 to 500		48.00	60.00	72.00		M
	1/C 600 to 750		50.00	62.00	75.00		M
	2/C #12 to #8		44.00	55.00	66.00		M
	2/C #6 to #3		46.00	57.00	69.00		M
	2/C #2 to 2/0		48.00	60.00	72.00		M
	2/C 3/0 to 250		50.00	62.00	75.00		M
	2/C 300 to 500		53.00	66.00	79.00		M
	2/C 600 to 750		56.00	70.00	84.00		M
	3/C #12 to #8		48.00	60.00	72.00		M
	3/C #6 to #3		50.00	62.00	75.00		M
	3/C #2 to 2/0		52.00	65.00	78.00		M
	3/C 3/0 to 250		54.00	67.00	81.00		M
	3/C 300 to 500		57.00	71.00	85.00		M
	3/C 600 to 750		60.00	75.00	90.00		M
	600 Volt Aluminum Cable Pulled Into Buried Conduit						
	1/C #12 TO #8		36.00	45.00	54.00		M
	1/C #6 to #3		38.00	47.00	57.00		M
	1/C #2 to 2/0		40.00	50.00	60.00		M
	1/C 3/0 to 250		42.00	52.00	63.00		M
	1/C 300 to 500		44.00	55.00	66.00		M
	1/C 600 to 750		46.00	57.00	69.00		M
	2/C #12 to #8		40.00	50.00	60.00		M
	2/C #6 to #3		42.00	52.00	63.00		M
	2/C #2 to 2/0		44.00	55.00	66.00		M
	2/C 3/0 to 250		46.00	57.00	69.00		M
	2/C 300 to 500		49.00	61.00	73.00		M
	2/C 600 to 750		52.00	65.00	78.00		M
	3/C #12 to #8		44.00	55.00	66.00		M
	3/C #6 to #3		46.00	57.00	69.00		M
	3/C #2 to 2/0		48.00	60.00	72.00		M
	3/C 3/0 to 250		50.00	62.00	75.00		M
	3/C 300 to 500		53.00	66.00	79.00		M
	3/C 600 to 750		56.00	70.00	84.00		M
	5KV Copper Cable Pulled Into Buried Conduit						
	1/C #12 TO #8		42.00	52.00	63.00		M
	1/C #6 to #3		44.00	55.00	66.00		M
	1/C #2 to 2/0		46.00	57.00	69.00		M
	1/C 3/0 to 250		48.00	60.00	72.00		M
	1/C 300 to 500		50.00	62.00	75.00		M
	1/C 600 to 750		53.00	66.00	79.00		M
	2/C #12 to #8		46.00	57.00	69.00		M
	2/C #6 to #3		48.00	60.00	72.00		M
	2/C #2 to 2/0		50.00	62.00	75.00		M
	2/C 3/0 to 250		52.00	65.00	78.00		M
	2/C 300 to 500		54.00	67.00	81.00		M
	2/C 600 to 750		57.00	71.00	85.00		M
	3/C #12 to #8		50.00	62.00	75.00		M
	3/C #6 to #3		52.00	65.00	78.00		M
	3/C #2 to 2/0		54.00	67.00	81.00		M
	3/C 3/0 to 250		56.00	70.00	84.00		M
	3/C 300 to 500		59.00	73.00	88.00		M
	3/C 600 to 750		62.00	77.00	93.00		M

Section 11 - Outdoor Overhead and Underground Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	5KV Aluminum Cable Pulled Into Buried Conduit						
	1/C #12 TO #8		39.00	48.00	58.00		M
	1/C #6 to #3		41.00	51.00	61.00		M
	1/C #2 to 2/0		43.00	53.00	64.00		M
	1/C 3/0 to 250		45.00	56.00	67.00		M
	1/C 300 to 500		47.00	58.00	70.00		M
	1/C 600 to 750		50.00	62.00	75.00		M
	2/C #12 to #8		44.00	55.00	66.00		M
	2/C #6 to #3		46.00	57.00	69.00		M
	2/C #2 to 2/0		48.00	60.00	72.00		M
	2/C 3/0 to 250		50.00	62.00	75.00		M
	2/C 300 to 500		52.00	65.00	78.00		M
	2/C 600 to 750		55.00	68.00	82.00		M
	3/C #12 to #8		46.00	57.00	69.00		M
	3/C #6 to #3		48.00	60.00	72.00		M
	3/C #2 to 2/0		50.00	62.00	75.00		M
	3/C 3/0 to 250		52.00	65.00	78.00		M
	3/C 300 to 500		54.00	68.00	81.00		M
	3/C 600 to 750		57.00	71.00	85.00		M
	15KV Copper Cable Pulled Into Buried Conduit						
	1/C #12 TO #8		44.00	55.00	66.00		M
	1/C #6 to #3		46.00	57.00	69.00		M
	1/C #2 to 2/0		48.00	60.00	72.00		M
	1/C 3/0 to 250		50.00	62.00	75.00		M
	1/C 300 to 500		52.00	65.00	78.00		M
	1/C 600 to 750		54.00	68.00	81.00		M
	2/C #12 to #8		48.00	60.00	72.00		M
	2/C #6 to #3		50.00	62.00	75.00		M
	2/C #2 to 2/0		52.00	65.00	78.00		M
	2/C 3/0 to 250		54.00	68.00	81.00		M
	2/C 300 to 500		56.00	70.00	84.00		M
	2/C 600 to 750		58.00	72.00	87.00		M
	3/C #12 to #8		51.00	63.00	76.00		M
	3/C #6 to #3		53.00	66.00	79.00		M
	3/C #2 to 2/0		55.00	69.00	82.00		M
	3/C 3/0 to 250		57.00	71.00	85.00		M
	3/C 300 to 500		59.00	74.00	88.00		M
	3/C 600 to 750		62.00	78.00	93.00		M
	15KV Aluminum Cable Pulled Into Buried Conduit						
	1/C #12 TO #8		40.00	50.00	60.00		M
	1/C #6 to #3		42.00	52.00	63.00		M
	1/C #2 to 2/0		44.00	55.00	66.00		M
	1/C 3/0 to 250		46.00	57.00	69.00		M
	1/C 300 to 500		48.00	60.00	72.00		M
	1/C 600 to 750		50.00	62.00	75.00		M
	2/C #12 to #8		46.00	57.00	69.00		M
	2/C #6 to #3		48.00	60.00	72.00		M
	2/C #2 to 2/0		50.00	62.00	75.00		M
	2/C 3/0 to 250		52.00	65.00	78.00		M
	2/C 300 to 500		54.00	68.00	81.00		M
	2/C 600 to 750		56.00	70.00	84.00		M
	3/C #12 to #8		48.00	60.00	72.00		M
	3/C #6 to #3		50.00	62.00	75.00		M
	3/C #2 to 2/0		52.00	65.00	78.00		M
	3/C 3/0 to 250		54.00	68.00	81.00		M
	3/C 300 to 500		56.00	70.00	84.00		M
	3/C 600 to 750		58.00	72.00	87.00		M
	25 KV 1/C Direct Burial Copper Cable w/ Concentric Neutral Pulled Into Buried Conduit						
	#4		47.00	59.00	70.00		M
	#2		48.00	60.00	71.00		M
	#1		49.00	61.00	72.00		M
	1/0		50.00	62.00	73.00		M
	2/0		51.00	63.00	74.00		M
	3/0		52.00	64.00	76.00		M
	4/0		53.00	65.00	78.00		M
	250 kcmil		54.00	66.00	80.00		M
	350 kcmil		55.00	68.00	82.00		M
	500 kcmil		56.00	70.00	84.00		M
	750 kcmil		58.00	72.00	88.00		M
	25 KV 1/C Direct Burial Aluminum Cable w/ Concentric Neutral Pulled Into Buried Conduit						
	#4		44.00	56.00	67.00		M
	#2		45.00	57.00	68.00		M
	#1		46.00	58.00	69.00		M
	1/0		47.00	59.00	70.00		M
	2/0		48.00	60.00	71.00		M
	3/0		49.00	61.00	72.00		M
	4/0		50.00	62.00	73.00		M
	250 kcmil		51.00	63.00	74.00		M
	350 kcmil		52.00	64.00	76.00		M
	500 kcmil		53.00	65.00	78.00		M
	750 kcmil		54.00	66.00	80.00		M

Section 11 - Outdoor Overhead and Underground Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	35 KV 1/C Direct Burial Copper Cable w/ Concentric Neutral Pulled Into Buried Conduit						
	#1		50.00	62.00	73.00		M
	1/0		51.00	63.00	74.00		M
	2/0		52.00	64.00	76.00		M
	3/0		53.00	65.00	78.00		M
	4/0		54.00	66.00	80.00		M
	250 kcmil		55.00	68.00	82.00		M
	350 kcmil		56.00	70.00	84.00		M
	500 kcmil		57.00	72.00	86.00		M
	750 kcmil		58.00	74.00	88.00		M
	1000 kcmil		60.00	76.00	90.00		M
	35 KV 1/C Direct Burial Aluminum Cable w/ Concentric Neutral Pulled Into Buried Conduit						
	#1		47.00	59.00	70.00		M
	1/0		48.00	60.00	71.00		M
	2/0		49.00	61.00	72.00		M
	3/0		50.00	62.00	73.00		M
	4/0		51.00	63.00	74.00		M
	250 kcmil		52.00	64.00	76.00		M
	350 kcmil		53.00	65.00	78.00		M
	500 kcmil		54.00	66.00	80.00		M
	750 kcmil		55.00	68.00	82.00		M
	1000 kcmil		56.00	70.00	84.00		M
	Excavation, Backfilling, & Soil Compaction For Manholes						
	6' X 6' X 6' Deep - Sandy Soil		8.00	10.00	12.00		E
	6' X 6' X 8' Deep - Sandy Soil		9.00	11.00	13.00		E
	6' X 6' X 10' Deep - Sandy Soil		10.00	12.00	14.00		E
	6' X 6' X 6' Deep - Clay Soil		9.00	11.00	13.00		E
	6' X 6' X 8' Deep - Clay Soil		10.00	12.00	14.00		E
	6' X 6' X 10' Deep - Clay Soil		11.00	13.00	15.00		E
	6' X 6' X 6' Deep - Loose Shale		10.00	14.00	16.00		E
	6' X 6' X 8' Deep - Loose Shale		11.00	15.00	17.00		E
	6' X 6' X 10' Deep - Loose Shale		12.00	16.00	18.00		E
	8" Thick Concrete Foundation For Manholes						
	5' x 5'		5.00	7.00	9.00		E
	6' x 6'		6.00	8.00	10.00		E
	7' x 7'		7.00	9.00	11.00		E
	8' x 8'		8.00	10.00	12.00		E
	Hand Holes-Open Bottom						
	Pre-Cast Concrete 11" x 16"		2.00	2.50	3.00		E
	Pre-Cast Concrete 18" x 24"		3.00	3.50	3.90		E
	Composite 11" x 16"		1.50	1.75	2.00		E
	Composite 18" x 24"		2.00	2.30	2.60		E
	Concrete Man Holes Base, Cover and Riser - Excludes Excavation and Gravel Base						
	36" x 36" x 36" Base		3.00	4.00	5.00		E
	48" x 48" x 48" Base		5.00	6.00	7.00		E
	48" x 60" x 48" Base		6.00	7.00	8.00		E
	36" x 36" LID		1.25	1.75	1.25		E
	48" x 48" LID		2.00	2.50	3.00		E
	48" x 60" LID		3.50	3.00	3.50		E
	24" Covers		1.00	1.25	1.50		E
	36" Covers		1.00	1.25	1.50		E
	4' x 6' Base		6.00	8.00	10.00		E
	6' x 8' Base		8.00	10.00	12.00		E
	8' x 10' Base		10.00	12.00	14.00		E
	4' x 4' x 6' Riser		4.00	6.00	8.00		E
	6' x 6' x 8' Riser		5.00	7.00	8.00		E
	6' x 8' x 10' Riser		6.00	8.00	9.00		E
	4' x 6' LID		2.00	3.00	4.00		E
	6' x 8' LID		3.00	4.00	5.00		E
	8' x 10' LID		4.00	6.00	8.00		E
	Manhole Racks Install in Manholes						
	4'L with Saddle and Arms		2.00	2.50	3.00		E
	6'L with Saddle and Arms		3.00	3.75	4.50		E
	8'L with Saddle and Arms		4.00	5.00	6.00		E

Section 11 - Outdoor Overhead and Underground Systems

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Section 11 (A) - Outdoor Overhead and Underground Systems

Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Installation of Items						
Wood Poles - Cedar or Pine						
25'		4.00	5.00	6.25		E
30'		4.50	5.63	7.03		E
35'		5.00	6.25	7.81		E
40'		5.50	6.88	8.59		E
45'		6.00	7.50	9.38		E
50'		7.00	8.75	10.94		E
55'		8.00	10.00	12.50		E
60'		10.00	12.50	15.63		E
65'		12.00	15.00	18.75		E
70'		14.00	17.50	21.88		E
75'		17.00	21.25	26.56		E
80'		20.00	25.00	31.25		E
85'		24.00	30.00	37.50		E
90'		28.00	35.00	43.75		E
95'		33.00	41.25	51.56		E
100'		38.00	47.50	59.38		E
Wood Poles - Adder for Setting In Rock						
25'		1.30	1.63	2.03		E
30'		1.40	1.75	2.19		E
35'		1.50	1.88	2.34		E
40'		1.60	2.00	2.50		E
45'		1.70	2.13	2.66		E
50'		1.80	2.25	2.81		E
55'		1.90	2.38	2.97		E
60'		2.00	2.50	3.13		E
65'		2.10	2.63	3.28		E
70'		2.20	2.75	3.44		E
75'		2.40	3.00	3.75		E
80'		2.60	3.25	4.06		E
85'		2.80	3.50	4.38		E
90'		3.00	3.75	4.69		E
95'		3.20	4.00	5.00		E
100'		3.40	4.25	5.31		E
Straighten Existing Poles						
Up To 40 Ft		1.25	1.56	1.95		E
45 To 55 Ft		1.50	1.88	2.34		E
60 To 75 Ft		2.25	2.81	3.52		E
80 To 100 Ft		3.00	3.75	4.69		E
Add For Pole Set In Sidewalk or Pavement						
Add For Pole Set In Sidewalk or Pavement		1.50	1.88	2.34		E
Key Pole - Lof or Plank Key						
New Pole		0.65	0.81	1.02		E
Existing Pole		1.20	1.50	1.88		E
Key Pole - Bottom Of Hole						
Key Pole - Bottom Of Hole		0.40	0.50	0.63		E
Re-Roof Pole						
Re-Roof Pole		1.60	2.00	2.50		E
Dig Poles Holes & Not Used						
Dig Poles Holes & Not Used		1.40	1.75	2.19		E
Haul Poles or Pick Up & Return To Storage						
25 To 35 Ft		2.00	2.50	3.13		E
40 To 55 Ft		3.00	3.75	4.69		E
60 To 75 Ft		4.00	5.00	6.25		E
80 To 100 Ft		5.00	6.25	7.81		E
Barrel Holes - Per Pole						
25 To 35 Ft		4.00	5.00	6.25		E
40 To 55 Ft		5.00	6.25	7.81		E
60 To 75 Ft		7.00	8.75	10.94		E
80 To 100 Ft		9.00	11.25	14.06		E



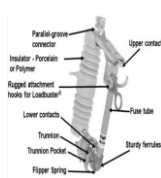
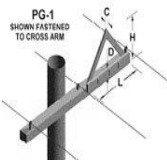
Section 11 (A) - Outdoor Overhead and Underground Systems

Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Cross Arms With Braces & Pins						
2 To 6 Ft		1.00	1.25	1.56		E
7 To 8 Ft		1.50	1.88	2.34		E
9 To 11 Ft		2.00	2.50	3.13		E
12 To 16 Ft		3.00	3.75	4.69		E
17 To 24 Ft		4.00	5.00	6.25		E
Replace Steel Braces With Wood Braces						
Replace Steel Braces With Wood Braces		0.60	0.75	0.94		E
Conductor Attachments						
Shank Pins		0.10	0.13	0.16		E
Pole Top Pins		0.40	0.50	0.63		E
Stud Bolts, Clevis, or Side Pins		0.40	0.50	0.63		E
20 KV Insulator		0.10	0.13	0.16		E
25 KV Post Insulator		0.40	0.50	0.63		E
3-Wire Section Rack		0.60	0.75	0.94		E
Riser Brackets		0.40	0.50	0.63		E
Down Guys						
Dig Anchor Holes		1.50	1.88	2.34		E
10 Ft Swamp Anchor		7.00	8.75	10.94		E
20 Ft Swamp Anchor		7.40	9.25	11.56		E
2 Ft Anchor In Rock		3.00	3.75	4.69		E
3 Ft Anchor In Rock		3.50	4.38	5.47		E
4 Ft Anchor In Rock		4.00	5.00	6.25		E
Replace Guy Wire		2.75	3.44	4.30		E
Transfer Guy Wire End		2.00	2.50	3.13		E
Add Guy Wire		2.40	3.00	3.75		E
Add Guy Wire Guard		2.75	3.44	4.30		E
Bond Existing Guy Wire		0.60	0.75	0.94		E
Complete Guy With Anchor, Rod, Wire & Guard						
Complete Guy With Anchor, Rod, Wire & Guard		5.00	6.25	7.81		E
Complete Overhead Guy						
Complete Overhead Guy		3.00	3.75	4.69		E
Bond Existing Overhead Guy						
Bond Existing Overhead Guy		0.60	0.75	0.94		E
Transformer Platform						
One Pole		5.60	7.00	8.75		E
Two Pole		10.00	12.50	15.63		E
Three Pole		18.00	22.50	28.13		E
Two Pole With Stub Pole		16.00	20.00	25.00		E
Railing On One Side		2.30	2.88	3.59		E
Primary Attachment						
Primary Clevis		0.50	0.63	0.78		E
Bells & D/E Clamp		0.75	0.94	1.17		E
Neural Suspension or D/E Clamp		0.40	0.50	0.63		E
1/C Copper or Aluminum Cable - Bare or Insulated (Labor units are per span)						
#4 to #1		1.50	1.88	2.34		E
1/0 To 2/0		2.00	2.50	3.13		E
3/0 To 4/0		2.50	3.13	3.91		E
250 To 400		3.00	3.75	4.69		E
500 To 750		4.00	5.00	6.25		E
800 To 1000		5.50	6.88	8.59		E
Re-sag 1/C Copper or Aluminum Cable						
#4 to #1		0.50	0.63	0.78		E
1/0 To 2/0		0.70	0.88	1.09		E
3/0 To 4/0		1.00	1.25	1.56		E
250 To 400		1.50	1.88	2.34		E
500 To 750		2.00	2.50	3.13		E
800 To 1000		2.50	3.13	3.91		E
3/C Triplex Secondary Cable						
#1 and Smaller		2.30	2.88	3.59		E
1/0 To 2/0		3.00	3.75	4.69		E
3/0 To 4/0		4.00	5.00	6.25		E
250 To 350		5.00	6.25	7.81		E

Section 11 (A) - Outdoor Overhead and Underground Systems

Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Re-sag 3/C Triplex Secondary Cable						
#1 and Smaller		0.90	1.13	1.41		E
1/0 To 2/0		1.30	1.63	2.03		E
3/0 To 4/0		1.80	2.25	2.81		E
250 To 350		2.20	2.75	3.44		E
Copperweld Conductors						
#8A To #6A		1.70	2.13	2.66		E
#4A To #2A		1.90	2.38	2.97		E
Larger Than #2A		2.20	2.75	3.44		E
Re-sag Copperweld Conductors						
#8A To #6A		0.90	1.13	1.41		E
#4A To #2A		1.00	1.25	1.56		E
Larger Than #2A		1.10	1.38	1.72		E
2/C Duplex Secondary Cable						
Up To #1		1.50	1.88	2.34		E
1/0 To 2/0		1.60	2.00	2.50		E
Re-sag 2/C Duplex Secondary Cable						
Up To #1		0.60	0.75	0.94		E
1/0 To 2/0		0.70	0.88	1.09		E
Aluminum Conductor Armor Rods						
Aluminum Conductor Armor Rods		0.40	0.50	0.63		E
1/C ACSR Cable - Bare or Insulated (Labor units are per span)						
#1 and Smaller		2.40	3.00	3.75		E
1/0		2.80	3.50	4.38		E
2/0		3.20	4.00	5.00		E
3/0		3.60	4.50	5.63		E
4/0		4.10	5.13	6.41		E
336 kcmil		4.60	5.75	7.19		E
477 kcmil		5.10	6.38	7.97		E
556 kcmil		5.60	7.00	8.75		E
Re-sag 1/C ACSR Cable						
#1 and Smaller		1.10	1.38	1.72		E
1/0		1.30	1.63	2.03		E
2/0		1.50	1.88	2.34		E
3/0		1.70	2.13	2.66		E
4/0		1.90	2.38	2.97		E
336 kcmil		2.10	2.63	3.28		E
477 kcmil		2.40	3.00	3.75		E
556 kcmil		2.70	3.38	4.22		E
Replace Sleeves In Existing Primary Cable						
Up To #1 Copper		2.40	3.00	3.75		E
1/0 To 2/0 Copper		2.80	3.50	4.38		E
3/0 To 4/0 Copper		3.20	4.00	5.00		E
Copperweld						
Up To #6A Copperweld		2.40	3.00	3.75		E
#4A to 2A Copperweld		2.80	3.50	4.38		E
Up To #1 ACSR		3.80	4.75	5.94		E
1/0 To 2/0 ACSR		4.40	5.50	6.88		E
3/0 To 4/0 ACSR		5.20	6.50	8.13		E
336 ACSR		6.00	7.50	9.38		E
477 ACSR		7.00	8.75	10.94		E
556 ACSR		8.00	10.00	12.50		E
Temporary Installations & Cable Transfers						
Up To #1		1.10	1.38	1.72		E
1/0		1.30	1.63	2.03		E
2/0		1.50	1.88	2.34		E
3/0		1.70	2.13	2.66		E
4/0		1.90	2.38	2.97		E
336 kcmil		2.10	2.63	3.28		E
477 kcmil		2.40	3.00	3.75		E
556 kcmil		2.70	3.38	4.22		E

Section 11 (A) - Outdoor Overhead and Underground Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Cross Arms & Pins						
	Cross Arms & Pins		1.00	1.25	1.56		E
	Cutouts						
	Cutouts		0.80	1.00	1.25		E
	Arresters						
	Arresters		0.70	0.88	1.09		E
	Perch Guard						
	Perch Guard	X	0.25	0.30	0.40		E
	Primary Jumpers						
Primary Jumpers		0.50	0.63	0.78		E	
	Primary Dead Ends						
Primary Dead Ends		0.60	0.75	0.94		E	
	Neutral Dead Ends						
Neutral Dead Ends		0.60	0.75	0.94		E	
	Lightning Arrestors						
Lightning Arrestors		0.70	0.88	1.09		E	
	Complete Pole Grounding Systems						
Complete Pole Grounding Systems		1.10	1.38	1.72		E	
	Pole Grounding System Components						
Each Additional Grounding Rod		0.60	0.75	0.94		E	
Butt Wrapped Ground		0.80	1.00	1.25		E	
Replace Grounding Wire		1.00	1.25	1.56		E	
Extend Neutral To Primary Arm		0.50	0.63	0.78		E	
	Disconnect Switches						
Solid Blade or Bypass		1.60	2.00	2.50		E	
3 Shot Enclosure		1.60	2.00	2.50		E	
1 Phase Oil Circuit Enclosure		2.50	3.13	3.91		E	
3 Phase Oil Circuit Enclosure		3.00	3.75	4.69		E	
3 Phase GOAB Switch-Pole Top Mtd.		18.00	22.50	28.13		E	
	Single Pole Mounted Transformers						
10 KVA and Smaller		3.20	4.00	5.00		E	
15 To 25 KVA		5.20	6.50	8.13		E	
37 1/2 To 50 KVA		10.00	12.50	15.63		E	
75 To 100 KVA		17.00	21.25	26.56		E	
150 To 167 KVA		25.00	31.25	39.06		E	
	Two Or More Pole Mounted Transformers						
10 KVA and Smaller		2.20	2.75	3.44		E	
15 To 25 KVA		3.60	4.50	5.63		E	
37 1/2 To 50 KVA		7.00	8.75	10.94		E	
75 To 100 KVA		12.00	15.00	18.75		E	
150 To 167 KVA		18.00	22.50	28.13		E	
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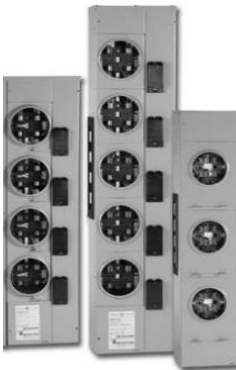
Section 11 (A) - Outdoor Overhead and Underground Systems



Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Single Pad Mounted Transformers - Pole Type Transformers						
75 To 100 KVA		15.00	18.75	23.44		E
150 To 167 KVA		22.00	27.50	34.38		E
200 To 250 KVA		27.00	33.75	42.19		E
333 To 500 KVA		43.00	53.75	67.19		E
Two Or More Pad Mounted Transformers - Pole Type Transformers						
75 To 100 KVA		13.00	16.25	20.31		E
150 To 167 KVA		16.00	20.00	25.00		E
200 To 250 KVA		19.00	23.75	29.69		E
333 To 500 KVA		40.00	50.00	62.50		E
Brackets For Cluster Mounted Transformers						
Brackets For Cluster Mounted Transformers		1.80	2.25	2.81		E
Change Ratios on Dual Voltage Transformers						
Before Mounting On Pole		2.00	2.50	3.13		E
After Mounting On Pole		4.00	5.00	6.25		E
1/C Power Terminations on Transformers						
600 Volt Copper Cable						
#4 To #1		0.25	0.31	0.39		E
1/0 To 2/0		0.30	0.38	0.47		E
3/0 To 4/0		0.40	0.50	0.63		E
250 kcmil		0.50	0.63	0.78		E
350 kcmil		0.60	0.75	0.94		E
500 kcmil		0.70	0.88	1.09		E
Secondary Service - Two Copper Conductors						
(Reduce 10% for Aluminum)						
#8		1.50	1.88	2.34		E
#6		1.70	2.13	2.66		E
#4		2.00	2.50	3.13		E
#2		2.30	2.88	3.59		E
#1		2.50	3.13	3.91		E
1/0		2.75	3.44	4.30		E
2/0		3.00	3.75	4.69		E
3/0		3.30	4.13	5.16		E
4/0		3.60	4.50	5.63		E
250		3.90	4.88	6.09		E
350		4.30	5.38	6.72		E
500		4.90	6.13	7.66		E
Secondary Service - Three Copper Conductors						
(Reduce 10% for Aluminum)						
#8		1.70	2.13	2.66		E
#6		2.00	2.50	3.13		E
#4		2.30	2.88	3.59		E
#2		2.60	3.25	4.06		E
#1		3.00	3.75	4.69		E
1/0		3.30	4.13	5.16		E
2/0		3.60	4.50	5.63		E
3/0		3.90	4.88	6.09		E
4/0		4.20	5.25	6.56		E
250		4.50	5.63	7.03		E
350		5.15	6.44	8.05		E
500		5.80	7.25	9.06		E
Secondary Service - Four Copper Conductors						
(Reduce 10% for Aluminum)						
#8		2.10	2.63	3.28		E
#6		2.50	3.13	3.91		E
#4		3.00	3.75	4.69		E
#2		3.50	4.38	5.47		E
#1		3.80	4.75	5.94		E
1/0		4.10	5.13	6.41		E
2/0		4.50	5.63	7.03		E
3/0		4.90	6.13	7.66		E
4/0		5.30	6.63	8.28		E
250		5.80	7.25	9.06		E
350		6.50	8.13	10.16		E
500		7.40	9.25	11.56		E

Section 11 (A) - Outdoor Overhead and Underground Systems

Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Secondary Service - Five Copper Conductors (Reduce 10% for Aluminum)						
#8		3.00	3.75	4.69		E
#6		3.50	4.38	5.47		E
#4		4.00	5.00	6.25		E
#2		4.80	6.00	7.50		E
#1		5.20	6.50	8.13		E
1/0		5.70	7.13	8.91		E
2/0		6.20	7.75	9.69		E
3/0		6.70	8.38	10.47		E
4/0		7.20	9.00	11.25		E
250		7.80	9.75	12.19		E
350		8.90	11.13	13.91		E
500		10.00	12.50	15.63		E
Secondary Copper Triplex Cable (Reduce 10% for Aluminum)						
#4		1.50	1.88	2.34		E
#2		1.75	2.19	2.73		E
#1		2.00	2.50	3.13		E
1/0		3.00	3.75	4.69		E
4/0		4.00	5.00	6.25		E
House Service Residential Meter Socket Base		0.60	0.75	0.94		E
House Service - 2/C Service Entrance Cable - 30FT Length						
#8 To #4		1.30	1.63	2.03		E
#3 To #1		1.50	1.88	2.34		E
House Service - 3/C Service Entrance Cable - 30FT Length						
#8 To #4		1.50	1.88	2.34		E
#3 To #1		1.70	2.13	2.66		E
1/0 To 2/0		2.00	2.50	3.13		E
3/0 To 4/0		2.40	3.00	3.75		E
House Service - 4/C Service Entrance Cable - 30FT Length						
#8 To #4		1.70	2.13	2.66		E
#3 To #1		1.90	2.38	2.97		E
1/0 To 2/0		2.20	2.75	3.44		E
3/0 To 4/0		2.60	3.25	4.06		E
House Service - Service Entrance Conduit Cap						
3/4" To 1"		0.35	0.44	0.55		E
1 1/4" To 2"		0.40	0.50	0.63		E
House Service - Threaded Steel Conduit & Fasteners - 30Ft Length						
3/4" & 1"		5.00	6.25	7.81		E
1 1/4" & 1 1/2"		5.50	6.88	8.59		E
2" & 2 1/2"		6.00	7.50	9.38		E
House Service - EMT With Fasteners & WP Couplings Up to 30 Ft Length						
3/4" To 1"		4.50	5.63	7.03		E
1 1/4" To 1 1/2"		5.00	6.25	7.81		E
2" To 2 1/2"		5.50	6.88	8.59		E
House Service - Three Single Conductors Pulled Into Conduit - Up To 30 Ft Length						
#8 To #4		0.50	0.63	0.78		E
#3 To #1		0.60	0.75	0.94		E
1/0 To 2/0		0.70	0.88	1.09		E
3/0 To 4/0		1.00	1.25	1.56		E
Apt & Comm WP Svc - 3-Wire Solid Neutral Meter Center Modules w/ Main CB or Main Disc. Switch						
400 Amp		20.00	25.00	31.25		E
600 Amp		22.00	27.50	34.38		E
800 Amp		25.00	31.25	39.06		E
1000 Amp		28.00	35.00	43.75		E
1200 Amp		32.00	40.00	50.00		E
1600 Amp		36.00	45.00	56.25		E
2000 Amp		40.00	50.00	62.50		E



Section 11 (A) - Outdoor Overhead and Underground Systems

Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Apt & Comm WP Svc -						
Single Phase 125 Amp Meter Socket Modules						
2 Meters		4.00	5.00	6.25		E
3 Meters		4.60	5.75	7.19		E
4 Meters		5.20	6.50	8.13		E
5 Meters		6.00	7.50	9.38		E
Apt & Comm WP Svc -						
Three Phase 125 Amp Meter Socket Modules						
2 Meters		4.80	6.00	7.50		E
3 Meters		5.20	6.50	8.13		E
4 Meters		5.80	7.25	9.06		E
5 Meters		6.60	8.25	10.31		E
Street Lighting Systems -						
Metal Poles With Internal Wiring - (Bolted metal bases with foundations & anchor bolts by others)						
20'		4.00	5.00	6.25		E
25'		4.50	5.63	7.03		E
30'		5.00	6.25	7.81		E
35'		5.50	6.88	8.59		E
40'		6.00	7.50	9.38		E
45'		7.00	8.75	10.94		E
50'		8.00	10.00	12.50		E
55'		10.00	12.50	15.63		E
60'		12.00	15.00	18.75		E
Street Lighting Systems -						
Mast Arms Attached Before Pole Erection						
8'		3.00	3.75	4.69		E
10'		3.50	4.38	5.47		E
12'		4.00	5.00	6.25		E
15'		5.00	6.25	7.81		E
20'		6.00	7.50	9.38		E
25'		7.00	8.75	10.94		E
30'		8.00	10.00	12.50		E
Street Lighting Systems -						
Light Fixtures Attached Before Pole Erection						
250 Watt		2.00	2.50	3.13		E
400 Watt		2.40	3.00	3.75		E
700 Watt		2.80	3.50	4.38		E
1000 Watt		3.20	4.00	5.00		E
Street Lighting Systems - Upsweep Bracket On Pole						
Upsweep Bracket On Pole		2.40	3.00	3.75		E
Street Lighting Systems -						
Pull Cable In Pole & Arm-Series Circuit						
Pull Cable In Pole & Arm-Series Circuit		2.50	3.13	3.91		E
Street Lighting Systems -						
Pole Mounted Photo Switch With Relay						
Pole Mounted Photo Switch With Relay		1.20	1.50	1.88		E
Street Lighting Systems -						
Metal Pole Transformer Base Housing						
Metal Pole Transformer Base Housing		4.00	5.00	6.25		E
Street Lighting Systems - Constant Current Transformers						
5 KW		4.00	5.00	6.25		E
10 KW		5.00	6.25	7.81		E
15 KW		6.00	7.50	9.38		E
20 KW		7.50	9.38	11.72		E
25 KW		9.00	11.25	14.06		E
30 KW		11.00	13.75	17.19		E
Street Lighting Systems - Street Lighting Transformers						
Street Lighting Transformers		1.10	1.38	1.72		E
Street Lighting Systems - Series Street Lighting Protectors						
Series Street Lighting Protectors		1.50	1.88	2.34		E



Section 11 (A) - Outdoor Overhead and Underground Systems

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Section 11 (A) - Outdoor Overhead and Underground Systems

Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Removal of Items						
Wood Poles - Cedar or Pine						
25'		2.00	2.50	3.13		E
30'		2.20	2.75	3.44		E
35'		2.40	3.00	3.75		E
40'		2.70	3.38	4.22		E
45'		3.00	3.75	4.69		E
50'		3.50	4.38	5.47		E
55'		4.00	5.00	6.25		E
60'		5.00	6.25	7.81		E
65'		6.00	7.50	9.38		E
70'		7.00	8.75	10.94		E
75'		8.50	10.63	13.28		E
80'		10.00	12.50	15.63		E
85'		12.00	15.00	18.75		E
90'		14.00	17.50	21.88		E
95'		16.50	20.63	25.78		E
100'		19.00	23.75	29.69		E
Cross Arms With Braces & Pins						
2 To 6 Ft		0.50	0.63	0.78		E
7 To 8 Ft		0.75	0.94	1.17		E
9 To 11 Ft		1.00	1.25	1.56		E
12 To 16 Ft		1.50	1.88	2.34		E
17 To 24 Ft		2.00	2.50	3.13		E
Replace Steel Braces With Wood Braces						
Replace Steel Braces With Wood Braces		0.80	1.00	1.25		E
Conductor Attachments						
Shank Pins		0.10	0.13	0.16		E
Pole Top Pins		0.20	0.25	0.31		E
Stud Bolts, Clevis, or Side Pins		0.20	0.25	0.31		E
20 KV Insulator		0.10	0.13	0.16		E
25 KV Post Insulator		0.20	0.25	0.31		E
3-Wire Section Rack		0.30	0.38	0.47		E
Riser Brackets		0.20	0.25	0.31		E
Complete Guy With Anchor, Rod, Wire & Guard						
Complete Guy With Anchor, Rod, Wire & Guard		1.00	1.25	1.56		E
Complete Overhead Guy						
Complete Overhead Guy		1.00	1.25	1.56		E
Transformer Platform						
One Pole		1.70	2.13	2.66		E
Two Pole		3.80	4.75	5.94		E
Three Pole		6.70	8.38	10.47		E
Two Pole With Stub Pole		5.00	6.25	7.81		E
Railing On One Side		1.20	1.50	1.88		E
Primary Attachment						
Primary Clevis		0.25	0.31	0.39		E
Bells & D/E Clamp		0.30	0.38	0.47		E
Neural Suspension or D/E Clamp		0.20	0.25	0.31		E
1/C Copper or Aluminum Cable - Bare or Insulated (Labor units are per span)						
#4 to #1		0.50	0.63	0.78		E
1/0 To 2/0		0.70	0.88	1.09		E
3/0 To 4/0		0.90	1.13	1.41		E
250 To 400		1.20	1.50	1.88		E
500 To 750		1.50	1.88	2.34		E
800 To 1000		2.00	2.50	3.13		E
3/C Triplex Secondary Cable						
#1 and Smaller		0.80	1.00	1.25		E
1/0 To 2/0		1.20	1.50	1.88		E
3/0 To 4/0		1.50	1.88	2.34		E
250 To 350		2.00	2.50	3.13		E
Copperweld Conductors						
#8A To #6A		0.40	0.50	0.63		E
#4A To #2A		0.50	0.63	0.78		E
Larger Than #2A		0.60	0.75	0.94		E
Re-sag Copperweld Conductors						
#8A To #6A		0.70	0.88	1.09		E
#4A To #2A		0.80	1.00	1.25		E

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Section 11 (A) - Outdoor Overhead and Underground Systems

Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Secondary Service - Three Copper Conductors (Reduce 10% for Aluminum)						
#8		1.00	1.25	1.56		E
#6		1.10	1.38	1.72		E
#4		1.30	1.63	2.03		E
#2		1.50	1.88	2.34		E
#1		1.80	2.25	2.81		E
1/0		2.00	2.50	3.13		E
2/0		2.20	2.75	3.44		E
3/0		2.40	3.00	3.75		E
4/0		2.55	3.19	3.98		E
250		2.70	3.38	4.22		E
350		3.10	3.88	4.84		E
500		3.50	4.38	5.47		E
Secondary Service - Four Copper Conductors (Reduce 10% for Aluminum)						
#8		1.30	1.63	2.03		E
#6		1.50	1.88	2.34		E
#4		1.80	2.25	2.81		E
#2		2.10	2.63	3.28		E
#1		2.30	2.88	3.59		E
1/0		2.50	3.13	3.91		E
2/0		2.70	3.38	4.22		E
3/0		2.90	3.63	4.53		E
4/0		3.20	4.00	5.00		E
250		3.50	4.38	5.47		E
350		4.00	5.00	6.25		E
500		4.50	5.63	7.03		E
Secondary Service - Five Copper Conductors (Reduce 10% for Aluminum)						
#8		1.80	2.25	2.81		E
#6		2.10	2.63	3.28		E
#4		2.40	3.00	3.75		E
#2		2.80	3.50	4.38		E
#1		3.10	3.88	4.84		E
1/0		3.40	4.25	5.31		E
2/0		3.70	4.63	5.78		E
3/0		4.00	5.00	6.25		E
4/0		4.35	5.44	6.80		E
250		4.70	5.88	7.34		E
350		5.35	6.69	8.36		E
500		6.00	7.50	9.38		E
Secondary Copper Triplex Cable (Reduce 10% for Aluminum)						
#4		0.90	1.13	1.41		E
#2		1.00	1.25	1.56		E
#1		1.20	1.50	1.88		E
1/0		1.40	1.75	2.19		E
4/0		1.60	2.00	2.50		E
Street Lighting Systems - Metal Poles With Internal Wiring - (Bolted metal bases with foundations & anchor bolts by others)						
20'		2.00	2.50	3.13		E
25'		2.25	2.81	3.52		E
30'		2.50	3.13	3.91		E
35'		2.75	3.44	4.30		E
40'		3.00	3.75	4.69		E
45'		3.50	4.38	5.47		E
50'		4.00	5.00	6.25		E
55'		5.00	6.25	7.81		E
60'		6.00	7.50	9.38		E
Street Lighting Systems - Mast Arms Attached Before Pole Erection						
8'		1.50	1.88	2.34		E
10'		1.70	2.13	2.66		E
12'		2.00	2.50	3.13		E
15'		2.50	3.13	3.91		E
20'		3.00	3.75	4.69		E
25'		3.50	4.38	5.47		E
30'		4.00	5.00	6.25		E

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Section 11 (A) - Outdoor Overhead and Underground Systems

Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Transfer of Items						
Wood Poles - Cedar or Pine						
25'		5.00	6.25	7.81		E
30'		5.60	7.00	8.75		E
35'		6.20	7.75	9.69		E
40'		6.80	8.50	10.63		E
45'		7.60	9.50	11.88		E
50'		8.70	10.88	13.59		E
55'		10.00	12.50	15.63		E
60'		12.50	15.63	19.53		E
65'		15.00	18.75	23.44		E
70'		17.50	21.88	27.34		E
75'		21.20	26.50	33.13		E
80'		25.00	31.25	39.06		E
85'		30.00	37.50	46.88		E
90'		35.00	43.75	54.69		E
95'		41.00	51.25	64.06		E
100'		48.00	60.00	75.00		E
Cross Arms With Braces & Pins						
2 To 6 Ft		1.50	1.88	2.34		E
7 To 8 Ft		2.25	2.81	3.52		E
9 To 11 Ft		3.00	3.75	4.69		E
12 To 16 Ft		4.50	5.63	7.03		E
17 To 24 Ft		6.00	7.50	9.38		E
Conductor Attachments						
Shank Pins		0.20	0.25	0.31		E
Pole Top Pins		0.60	0.75	0.94		E
Stud Bolts, Clevis, or Side Pins		0.60	0.75	0.94		E
20 KV Insulator		0.20	0.25	0.31		E
25 KV Post Insulator		0.60	0.75	0.94		E
3-Wire Section Rack		0.90	1.13	1.41		E
Riser Brackets		0.60	0.75	0.94		E
Transfer One End Of Overhead Guy						
Transfer One End Of Overhead Guy		2.20	2.75	3.44		E
Transformer Platform						
One Pole		7.30	9.13	11.41		E
Two Pole		13.80	17.25	21.56		E
Three Pole		24.70	30.88	38.59		E
Two Pole With Stub Pole		21.00	26.25	32.81		E
Railing On One Side		3.40	4.25	5.31		E
Primary Attachment						
Primary Clevis		0.75	0.94	1.17		E
Bells & D/E Clamp		1.00	1.25	1.56		E
Neural Suspension or D/E Clamp		0.60	0.75	0.94		E
1/C Copper or Aluminum Cable - Bare or Insulated (Labor units are per span)						
#4 to #1		1.00	1.25	1.56		E
1/0 To 2/0		1.40	1.75	2.19		E
3/0 To 4/0		1.80	2.25	2.81		E
250 To 400		2.20	2.75	3.44		E
500 To 750		3.70	4.63	5.78		E
800 To 1000		5.00	6.25	7.81		E
3/C Triplex Secondary Cable						
#1 and Smaller		1.70	2.13	2.66		E
1/0 To 2/0		2.20	2.75	3.44		E
3/0 To 4/0		3.70	4.63	5.78		E
250 To 350		5.00	6.25	7.81		E
Copperweld Conductors						
#8A To #6A		0.75	0.94	1.17		E
#4A To #2A		1.00	1.25	1.56		E
Larger Than #2A		1.20	1.50	1.88		E
Re-sag Copperweld Conductors						
#8A To #6A		1.40	1.75	2.19		E
#4A To #2A		1.70	2.13	2.66		E
2/C Duplex Secondary Cable						
Up To #1		1.10	1.38	1.72		E
1/0 To 2/0		1.20	1.50	1.88		E

Section 11 (A) - Outdoor Overhead and Underground Systems

Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Aluminum Conductor Armor Rods						
Aluminum Conductor Armor Rods		0.60	0.75	0.94		E
1/C ACSR Cable - Bare or Insulated (Labor units are per span)						
#1 and Smaller		1.70	2.13	2.66		E
1/0		1.90	2.38	2.97		E
2/0		2.10	2.63	3.28		E
3/0		2.40	3.00	3.75		E
4/0		2.70	3.38	4.22		E
336 kcmil		3.00	3.75	4.69		E
477 kcmil		3.30	4.13	5.16		E
556 kcmil		3.60	4.50	5.63		E
Disconnect Switches						
Solid Blade or Bypass		1.80	2.25	2.81		E
3 Shot Enclosure		1.80	2.25	2.81		E
1 Phase Oil Circuit Enclosure		3.20	4.00	5.00		E
3 Phase Oil Circuit Enclosure		4.10	5.13	6.41		E
3 Phase GOAB Switch-Pole Top Mtd.		22.00	27.50	34.38		E
Single Pole Mounted Transformers						
10 KVA and Smaller		4.40	5.50	6.88		E
15 To 25 KVA		7.20	9.00	11.25		E
37 1/2 To 50 KVA		12.40	15.50	19.38		E
75 To 100 KVA		21.00	26.25	32.81		E
150 To 167 KVA		29.00	36.25	45.31		E
Two Or More Pole Mounted Transformers						
10 KVA and Smaller		3.10	3.88	4.84		E
15 To 25 KVA		5.00	6.25	7.81		E
37 1/2 To 50 KVA		8.50	10.63	13.28		E
75 To 100 KVA		14.00	17.50	21.88		E
150 To 167 KVA		22.00	27.50	34.38		E
Single Pad Mounted Transformers - Pole Type Transformers						
75 To 100 KVA		18.00	22.50	28.13		E
150 To 167 KVA		25.00	31.25	39.06		E
200 To 250 KVA		32.00	40.00	50.00		E
333 To 500 KVA		40.00	50.00	62.50		E
Two Or More Pad Mounted Transformers - Pole Type Transformers						
75 To 100 KVA		16.00	20.00	25.00		E
150 To 167 KVA		28.00	35.00	43.75		E
200 To 250 KVA		31.00	38.75	48.44		E
333 To 500 KVA		35.00	43.75	54.69		E
Brackets For Cluster Mounted Transformers						
Brackets For Cluster Mounted Transformers		2.50	3.13	3.91		E
Secondary Service - Two Copper Conductors (Reduce 10% for Aluminum)						
#8		1.40	1.75	2.19		E
#6		1.60	2.00	2.50		E
#4		1.90	2.38	2.97		E
#2		2.20	2.75	3.44		E
#1		2.40	3.00	3.75		E
1/0		2.60	3.25	4.06		E
2/0		2.85	3.56	4.45		E
3/0		3.10	3.88	4.84		E
4/0		3.40	4.25	5.31		E
250		3.70	4.63	5.78		E
350		4.10	5.13	6.41		E
500		4.60	5.75	7.19		E
Secondary Service - Three Copper Conductors (Reduce 10% for Aluminum)						
#8		1.60	2.00	2.50		E
#6		1.90	2.38	2.97		E
#4		2.20	2.75	3.44		E
#2		2.50	3.13	3.91		E
#1		2.85	3.56	4.45		E
1/0		3.10	3.88	4.84		E
2/0		3.40	4.25	5.31		E
3/0		3.70	4.63	5.78		E
4/0		4.00	5.00	6.25		E
250		4.30	5.38	6.72		E
350		4.90	6.13	7.66		E
500		5.50	6.88	8.59		E

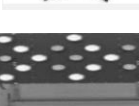
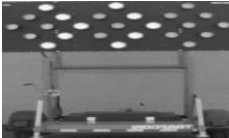
Section 11 (A) - Outdoor Overhead and Underground Systems

Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
Secondary Service - Four Copper Conductors (Reduce 10% for Aluminum)						
#8		2.00	2.50	3.13		E
#6		2.40	3.00	3.75		E
#4		2.85	3.56	4.45		E
#2		3.30	4.13	5.16		E
#1		3.60	4.50	5.63		E
1/0		3.90	4.88	6.09		E
2/0		4.30	5.38	6.72		E
3/0		4.60	5.75	7.19		E
4/0		5.00	6.25	7.81		E
250		5.50	6.88	8.59		E
350		6.20	7.75	9.69		E
500		7.00	8.75	10.94		E
Secondary Service - Five Copper Conductors (Reduce 10% for Aluminum)						
#8		2.85	3.56	4.45		E
#6		3.30	4.13	5.16		E
#4		3.80	4.75	5.94		E
#2		4.50	5.63	7.03		E
#1		4.90	6.13	7.66		E
1/0		5.40	6.75	8.44		E
2/0		5.90	7.38	9.22		E
3/0		6.40	8.00	10.00		E
4/0		6.90	8.63	10.78		E
250		7.50	9.38	11.72		E
350		8.50	10.63	13.28		E
500		9.50	11.88	14.84		E
Secondary Copper Triplex Cable (Reduce 10% for Aluminum)						
#4		1.40	1.75	2.19		E
#2		1.65	2.06	2.58		E
#1		1.90	2.38	2.97		E
1/0		2.00	2.50	3.13		E
4/0		2.20	2.75	3.44		E
Street Lighting Systems - Metal Poles With Internal Wiring - (Bolted metal bases with foundations & anchor bolts by others)						
20'		5.00	6.25	7.81		E
25'		5.60	7.00	8.75		E
30'		6.25	7.81	9.77		E
35'		6.80	8.50	10.63		E
40'		7.50	9.38	11.72		E
45'		8.75	10.94	13.67		E
50'		10.00	12.50	15.63		E
55'		12.50	15.63	19.53		E
60'		15.00	18.75	23.44		E
Street Lighting Systems - Mast Arms Attached Before Pole Erection						
8'		3.75	4.69	5.86		E
10'		4.35	5.44	6.80		E
12'		5.00	6.25	7.81		E
15'		6.25	7.81	9.77		E
20'		7.50	9.38	11.72		E
25'		8.75	10.94	13.67		E
30'		10.00	12.50	15.63		E
Street Lighting Systems - Light Fixtures Attached Before Pole Erection						
250 Watt		2.50	3.13	3.91		E
400 Watt		3.00	3.75	4.69		E
700 Watt		3.50	4.38	5.47		E
1000 Watt		4.00	5.00	6.25		E
Street Lighting Systems - Upsweep Bracket On Pole Upsweep Bracket On Pole		3.00	3.75	4.69		E
Street Lighting Systems - Pull Cable In Pole & Arm-Series Circuit Pull Cable In Pole & Arm-Series Circuit		3.10	3.88	4.84		E
Street Lighting Systems - Pole Mounted Photo Switch With Relay Pole Mounted Photo Switch With Relay		1.50	1.88	2.34		E
Street Lighting Systems - Metal Pole Transformer Base Housing Metal Pole Transformer Base Housing		5.00	6.25	7.81		E

Section 11 (A) - Outdoor Overhead and Underground Systems

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Section 11 (A) - Outdoor Overhead and Underground Systems

Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
						
Maintenance and Protection of Traffic						
Labor is for set up and breakdown -						
Labor for flagmen has to be addressed as actual time						
Illuminated Arrow Sign	X	3.00	3.75	4.05		E
						
Attenuator Barrels	X	2.00	2.50	2.70		E
						
Attenuator Truck		See section on utility trucks				
						
Barricade Lights	X	1.00	1.25	1.35		E
						
Barricade Horse	X	1.00	1.25	1.35		E
						
Roll up work in progress alert signs - Road closed, detour, lane closed, shoulder closed, workmen ahead	X	2.00	2.50	2.70		E
						
Flag Man Flag		Use labor hours planned				
						
Flag Man Traffic Paddle		Use labor hours planned				
						
Light Towers	X	4.00	5.00	5.40		E
						
Portable Traffic Light	X	4.00	5.00	5.40		E
						
Electric Message Boards	X	4.00	5.00	5.40		E
						
Sign Stands	X	3.00	3.75	4.05		E
						
Folding Sign Stands						

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SECTION 12

EQUIPMENT INSTALLATION AND CONNECTIONS

General Information

The labor units in this section include installing and terminating power equipment, variable frequency drives, DC drives, motors, fixed and adjustable motor bases and similar equipment.

Scope of These Labor Units

The Introduction section includes details on the scope of labor units across the manual. Some items included are:

- Material unloading, jobsite storage and delivery to the installation area
- Drawing and specification study
- Layout, measuring and marking the installation location
- Tool acquisition and return to storage
- Material assembly and installation
- Pulling cable
- Clean-up of electrical contractor furnished excess material
- Normal non-productive labor

Work Operations Not Included In These Labor Units

- Field supervision
- Hoisting above three floors
- Grounding, bonding, welding or painting
- Testing of any type
- Grouting or anchoring
- Cutting holes or openings in walls, floors, cabinets, or panels
- Heavy equipment (crane) operator's time

Labor Adjustments for Non-Typical Conditions

See the Introduction section for details.

Application Instructions

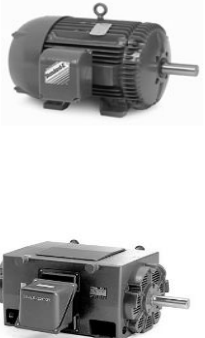
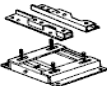
- Labor units under the "Normal" column are for locations with good access, no obstructions and large quantities of equipment. Labor units under the "Difficult" column are for locations with less than good access, a few minor obstructions and large quantities of equipment. Labor units under the "Very Difficult" column are for locations with poor access or require the use of a ladder, numerous obstructions, limited space or small quantities of equipment.
- All the labor units in this section are based on using the most efficient tools and equipment available. When the anticipated jobsite conditions will prevent the optimum use of tools and equipment, an appropriate additional labor allowance in proportion to the anticipated difficulties is necessary.
- Labor units in this manual are for new work only and for a complete electrical installation. For remodeling or change order situations these labor units need to be substantially increased.

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Section 12 - Equipment Installation and Connections

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Motor Handling - 280 - 550 Volt D.C.						
	(Unload, Inspect, Install - Labor Only)						
	Up to 5 H.P.		7.00	9.00	10.00		E
	7 1/2 H.P.		7.50	9.50	10.50		E
	10 H.P.		8.00	10.00	11.00		E
	15 H.P.		10.00	12.00	13.50		E
	20 H.P.		10.50	12.50	14.00		E
	25 H.P.		11.00	12.50	14.50		E
	30 H.P.		12.00	13.00	14.50		E
	40 H.P.		13.00	15.50	18.50		E
	50 H.P.		13.50	16.00	19.00		E
	60 H.P.		16.00	19.00	22.50		E
	75 H.P.		19.00	23.00	27.50		E
	100 H.P.		23.00	29.00	35.00		E
	125 H.P.		27.50	34.00	41.00		E
	150 H.P.		30.00	37.00	44.00		E
	200 H.P.		34.00	41.50	49.00		E
	250 - 400 H.P.		38.00	47.00	56.00		E
	500 - 600 H.P.		45.00	55.00	65.00		E
	Motor Handling - 0 - 600 Volt A.C.						
	(Unload, Inspect, Install - Labor Only)						
	Up to 5 H.P.		5.00	6.00	7.00		E
	7 1/2 H.P.		5.50	6.50	7.50		E
	10 H.P.		6.00	7.00	8.00		E
	15 H.P.		6.50	8.00	9.00		E
	20 H.P.		7.00	8.50	9.50		E
	25 H.P.		8.00	9.50	11.00		E
	30 H.P.		8.50	10.00	12.50		E
	40 H.P.		10.00	12.00	14.00		E
	50 H.P.		10.50	12.50	14.50		E
	60 H.P.		13.00	15.50	18.00		E
	75 H.P.		14.00	17.00	20.00		E
	100 H.P.		18.00	22.50	27.00		E
	125 H.P.		21.00	26.00	31.00		E
	150 H.P.		24.00	30.00	35.00		E
	200 H.P.		27.00	33.00	39.00		E
	250 to 400 H.P.		36.00	45.00	54.00		E
	500 to 750 H.P.		40.00	50.00	60.00		E
	800 to 1000 H.P.		44.00	55.00	66.00		E
	1200 to 1500 H.P.		48.00	60.00	72.00		E
	1800 RPM Motor Mounting						
	Up to 1/2 H.P.		2.00	2.50	3.13		E
	3/4 H.P.		2.00	2.50	3.13		E
	1 H.P.		2.00	2.50	3.13		E
	1 1/2 H.P.		2.00	2.50	3.13		E
	2 H.P.		2.00	2.50	3.13		E
	3 H.P.		3.50	4.38	5.47		E
	5 H.P.		3.50	4.38	5.47		E
	7 1/2 H.P.		3.50	4.38	5.47		E
	10 H.P.		5.00	6.25	7.81		E
	15 H.P.		5.00	6.25	7.81		E
	20 H.P.		5.00	6.25	7.81		E
	25 H.P.		8.00	10.00	12.50		E
	30 H.P.		10.00	12.50	15.63		E
	40 H.P.		12.00	15.00	18.75		E
	50 H.P.		14.00	17.50	21.88		E
	75 H.P.		16.00	20.00	25.00		E
	100 H.P.		18.00	22.50	28.13		E
	125 H.P.		20.00	25.00	31.25		E
	150 H.P.		24.00	30.00	37.50		E
	200 H.P.		34.00	42.50	53.13		E
	Adjustable Base Plates for Motor Mounting						
	8" x 10" 5 lbs		2.00	2.50	3.00		E
	10" x 12" 10 lbs		2.25	2.80	3.35		E
	12" x 15" 15 lbs		2.50	3.10	3.75		E
	16" x 20" 20 lbs		2.75	3.40	4.10		E
	18" x 22" 30 lbs		3.00	3.75	4.50		E
	20" x 25" 45 lbs		3.50	4.35	5.25		E
	22" x 28" 60 lbs		4.00	5.00	6.00		E
	24" x 30" 75 lbs		4.50	5.60	6.75		E
	30" x 32" 90 lbs		5.00	6.25	7.50		E
	32" x 34" 110 lbs		5.50	6.85	8.25		E
	34" x 36" 130 lbs		6.00	7.50	9.00		E
	Motor Mounting Base Conversion Brackets						
	8" long 4 lb per pair		1.00	1.25	1.50		E
	10" Long 6 lb per pair		1.10	1.35	1.65		E
	12" Long 10 lb per pair		1.20	1.50	1.80		E
	14" Long 15 lb per pair		1.35	1.65	2.00		E
	16" Long 20 lb per pair		1.50	1.85	2.25		E
	18" Long 26 lb per pair		1.75	2.15	2.60		E
	20" Long 40 lb per pair		2.00	2.50	3.00		E
	22" long 44 lbs per pair		2.25	2.80	3.35		E
	24" Long 50 lb per pair		2.50	3.10	3.75		E

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Section 12 - Equipment Installation and Connections

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	3 Conductor + Ground - 600V						
	Phase Wire Size						
	#14		1.41	1.76	2.11		E
	#12		1.51	1.89	2.27		E
	#10		1.61	2.01	2.42		E
	#8		1.90	2.37	2.85		E
	#6		2.00	2.50	3.00		E
	#4		2.57	3.21	3.85		E
	#3		3.01	3.77	4.52		E
	#2		2.85	3.57	4.28		E
	#1		3.14	3.92	4.71		E
	1/0		3.58	4.47	5.37		E
	2/0		4.16	5.20	6.24		E
	3/0		4.44	5.55	6.66		E
	4/0		4.87	6.08	7.30		E
	250		5.52	6.90	8.28		E
	300		5.66	7.07	8.49		E
	350		5.94	7.43	8.91		E
	400		6.45	8.06	9.68		E
	500		6.59	8.24	9.89		E
	600		7.47	9.34	11.21		E
	750		7.50	9.38	11.26		E
	3 conductor + Ground - 5KV						
	Phase Wire Size						
	#14		1.88	2.35	2.81		E
	#12		2.01	2.52	3.02		E
	#10		2.16	2.70	3.24		E
	#8		2.54	3.17	3.81		E
	#6		2.70	3.37	4.04		E
	#4		3.43	4.28	5.14		E
	#3		3.98	4.97	5.97		E
	#2		3.77	4.72	5.66		E
	#1		4.20	5.25	6.30		E
	1/0		4.71	5.89	7.06		E
	2/0		5.43	6.79	8.15		E
	3/0		5.86	7.32	8.78		E
	4/0		6.49	8.11	9.74		E
	250		7.32	9.15	10.98		E
	300		7.53	9.42	11.30		E
	350		7.96	9.95	11.93		E
	400		8.50	10.63	12.75		E
	500		8.71	10.89	13.07		E
	Standard Wire Conductor Terminations						
	#12		0.15	0.19	0.23		E
	#10		0.16	0.20	0.24		E
	#8		0.18	0.23	0.27		E
	#6		0.20	0.25	0.30		E
	#4		0.22	0.27	0.33		E
	#3		0.24	0.30	0.36		E
	#2		0.27	0.33	0.40		E
	#1		0.30	0.37	0.45		E
	1/0		0.33	0.41	0.50		E
	2/0		0.36	0.45	0.55		E
	3/0		0.40	0.50	0.60		E
	4/0		0.45	0.56	0.67		E
	250 kcmil		0.50	0.62	0.75		E
	300 kcmil		0.55	0.68	0.82		E
	350 kcmil		0.60	0.75	0.90		E
	400 kcmil		0.65	0.81	0.97		E
	500 kcmil		0.70	0.87	1.05		E
	600 kcmil		0.80	1.00	1.20		E
	750 kcmil		0.90	1.12	1.35		E
	1000 kcmil		1.00	1.25	1.50		E
	Motor Stub Splice Insulators						
	#14 - #10 Motor Splice Insulator		0.15	0.20	0.25		E
	#12 - #3 Motor Splice Insulator		0.18	0.23	0.28		E
	#2 - #2/0 Motor Splice Insulator		0.22	0.27	0.32		E
	#3/0 - #300 Motor Splice Insulator		0.25	0.30	0.32		E
	#350 - #500 Motor Splice Insulator		0.30	0.35	0.40		E

SECTION 13

INDUSTRIAL CONTROL AND INSTRUMENTATION

General Information

The labor units in this section include installing and terminating control and instrumentation equipment including temperature control cabinets and devices.

Scope of These Labor Units

The Introduction section includes details on the scope of labor units across the manual. Some items included are:

- Material unloading, jobsite storage and delivery to the installation area
- Drawing and specification study
- Layout, measuring and marking the installation location
- Terminating conductors
- Tool acquisition and return to storage Material assembly and installation
- Clean-up of electrical contractor furnished excess material
- Normal non-productive labor

Work Operations Not Included In These Labor Units

- Field supervision
- Hoisting above three floors
- Grounding, bonding, welding or painting
- Testing of any type
- Commissioning equipment
- Grouting or anchoring
- Cutting holes or openings in walls, floors, cabinets or panels
- Heavy equipment (crane) operator's time

Labor Adjustments for Non-Typical Conditions

See the Introduction section for details.

Application Instructions

- Labor units under the "Normal" column are for locations with good access, no obstructions and large quantities of equipment. Labor units under the "Difficult" column are for locations with less than good access, a few minor obstructions and large quantities of equipment. Labor units under the "Very Difficult" column are for locations with poor access or require the use of a ladder, numerous obstructions, limited space or small quantities of equipment.
- All the labor units in this section are based on using the most efficient tools and equipment available. When the anticipated jobsite conditions will prevent the optimum use of tools and equipment, an appropriate additional labor allowance in proportion to the anticipated difficulties is necessary.
- Labor units in this manual are for new work only and for a complete electrical installation. For remodeling or change order situations these labor units need to be substantially increased.

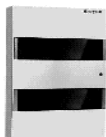
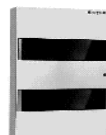
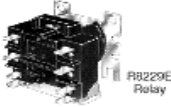
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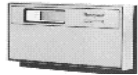
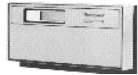
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(Updated)

Section 13 - Industrial Control and Instrumentation

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Temperature Controls - Panel Enclosures - 19"H X 24" W Panel						
	Rough-in Enclosure		1.00	1.50	2.00		E
	Install Interior		0.50	0.75	1.00		E
	Terminate Conductors		0.04	0.05	0.06		E
	Test & Start-up Per Termination Point		0.05	0.06	0.08		E
	Temperature Controls - Panel Enclosures - 23"H X 24" W Panel						
	Rough-in Enclosure		1.00	1.50	2.00		E
	Install Interior		0.50	0.75	1.00		E
	Terminate Conductors		0.04	0.05	0.06		E
	Test & Start-up Per Termination Point		0.05	0.06	0.08		E
	Temperature Controls - Panel Enclosures - 38"H X 24" W Panel						
	Rough-in Enclosure		1.50	2.00	2.50		E
	Install Interior		0.75	1.00	1.25		E
	Terminate Conductors		0.04	0.05	0.06		E
	Test & Start-up Per Termination Point		0.05	0.06	0.08		E
	Temperature Controls - Thermostatic Control Valves - Water, Straight Through: Installation Only in Existing Fitting						
	1/2"		1.50	2.00	2.50		E
	3/4"		1.50	2.00	2.50		E
	1"		1.50	2.00	2.50		E
	1 1/4"		2.00	2.50	3.00		E
	1 1/2"		2.00	2.50	3.00		E
	2"		2.00	2.50	3.00		E
	2 1/2"		2.50	3.00	3.50		E
	3"		2.50	3.00	3.50		E
	Terminate Conductors		0.50	0.75	1.00		E
	Note: Conduit, Conductors, Box Installation not included						
	Temperature Controls - Thermostatic Control Valves - Water, 3 Way Installation Only in Existing Fitting						
	1/2"		1.50	2.00	2.50		E
	3/4"		1.50	2.00	2.50		E
	1"		1.50	2.00	2.50		E
	1 1/4"		2.00	2.50	3.00		E
	1 1/2"		2.00	2.50	3.00		E
	2"		2.00	2.50	3.00		E
	2 1/2"		2.50	3.00	3.50		E
	3"		2.50	3.00	3.50		E
	Terminate Conductors		0.50	0.75	1.00		E
	Note: Conduit, Conductors, Box Installation not included						
	Install Temperature Controls - Electrical Relays - 4 SPDT Outputs						
	Floating Control		1.50	2.00	2.50		E
	2 SPDT, 1 SPST		1.50	2.00	2.50		E
	DPDT 24VAC, General Pur		1.50	2.00	2.50		E
	DPDT 24VAC, Pilot Duty		1.50	2.00	2.50		E
	1-SPDT 12A, 1 SPDT pilot		1.50	2.00	2.50		E
	DPDT 12A, 120Vac, Gen		1.50	2.00	2.50		E
	DPDT pilot duty 120 Vac		1.50	2.00	2.50		E
	SPDT for XL 100/80		1.50	2.00	2.50		E
	Relay Base, HOA		0.50	0.75	1.00		E
	Relay Base		0.50	0.75	1.00		E
	Terminate Conductors		0.04	0.05	0.06		E
	Install Temperature Controls - Electrical Relays - E/P Relays						
	2W Pneu. Xducer		1.00	1.50	2.00		E
	3W Pneu. Xducer		1.00	1.50	2.00		E
	120V/60HZ, Field Mounted		1.00	1.50	2.00		E
	120V/60HZ, Panel Mounted		1.00	1.50	2.00		E
	24V/60HZ, Field Mounted		1.00	1.50	2.00		E
	24V/60HZ, Panel Mounted		1.00	1.50	2.00		E
	Terminate Conductors		0.50	0.75	1.00		E
	Temperature Controls - Electrical Relays - Water Flow Switch Installation Only						
	PENN NEMA-1 1" NPT		1.50	2.00	2.50		E
	PENN NEMA-4 1" NPT		1.50	2.00	2.50		E
	Terminate Conductors		0.50	0.75	1.00		E
	Timers						
	Install and connect:						
	Timer: Wall Mounted		1.00	1.50	2.00		E
	Timer: Panel Mounted		1.00	1.50	2.00		E

Section 13 - Industrial Control and Instrumentation

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Temperature Controls - Electrical Relays - Miscellaneous						
	Installation Only in Existing Fitting						
	Air Flow DP Switch .05-12"		1.00	1.50	2.00		E
	Air Quality Sensor -		1.00	1.50	2.00		E
	Kele Wall Mount CO2		0.75	1.25	1.75		E
	Kele Duct Mount CO2		1.50	2.00	2.50		E
	Freeze Stat		1.00	1.50	2.00		E
	Terminate Conductors		0.75	1.00	1.50		E
	Temperature Controls - Central Equipment						
	Controller		1.00	1.20	1.50		E
	Panel Mounting Kit		0.50	0.60	0.75		E
	Terminate Conductors		0.04	0.05	0.06		E
	Temperature Controls - Central Equipment - Power Supply						
	Std. + 24 Vac		2.50	3.00	3.75		E
	Std. + 24 Vac & 24 Vdc		2.50	3.00	3.75		E
	120/24 VAC Transformer		2.50	3.00	3.75		E
	Uninterrupted Power Sup.		3.50	4.00	5.00		E
	Miscellaneous Controls						
	Connect Controls at Furnace		0.75	1.25	1.50		E
	Connect Controls at Condensor		1.00	1.50	2.00		E
	Connect Controls at Roof Top HVAC		1.00	1.50	2.00		E
	Connect Thermostat		0.75	1.25	1.50		E
	Interlock to Fan		0.75	1.25	1.50		E
	Interlock to Damper		0.75	1.25	1.50		E
	Connect VAV Unit		1.00	1.50	2.00		E
	Connect Fan/Coil Unit		1.00	1.50	2.00		E
	Temperature Controls - Central Equipment - Computer Systems						
	Personal Computer System w/Programming Pre-Installed		4.00	5.00	7.00		E
	Modem		2.00	2.50	3.00		E
	Modem Comm. Module						
	Area Control Module		3.00	3.50	4.00		E
	Main Control Module		3.00	3.50	4.00		E
	Terminate to Computer		3.00	3.50	4.00		E
	Test / Start-up		0.50	0.75	1.00		E
	<i>You Must Include All Components: Stats, Sensors, Dampers, Equip., Etc.</i>						
	Temperature Controls -						
	Temperature Sensors - Wall Mount Standard						
	Install and Connect		1.50	2.00	2.50		E
	Temperature Controls - Temperature Sensors - Space						
	Wall Mount Install and Connect		1.00	1.50	2.00		E
	Temperature Controls - Temperature Sensors - Duct						
	Installation Only in Existing Fitting						
	Install Duct Sensor		2.00	3.00	4.00		E
	Terminate Conductor		1.00	1.30	1.50		E
	Temperature Controls - Temperature Sensors - Pipe						
	Installation Only in Existing Fitting						
	20K NTC, Nipple-in		1.50	2.00	2.50		E
	20K NTC, Strap-on		1.00	1.50	2.00		E
	Terminate Conductors		0.75	1.00	1.25		E
	Temperature Controls - Temperature Sensors - Miscellaneous						
	Installation Only in Existing Fitting						
	PT 3000, Bulb, 24" leads		1.50	2.00	2.50		E
	PT 3000, Bulb, 180" leads		1.75	2.25	2.75		E
	C7 170 Duct Bulb Holder	X	0.50	0.75	1.00		E
	Terminate Conductors		0.75	1.00	1.25		E
	Temperature Controls - Humidity Sensors - Wall Mount						
	Typical, Install and Connect		1.00	1.50	2.00		E
	Temperature Controls - Humidity Sensors - Duct						
	Installation Only in Existing Fitting						
	Typical, Install		2.00	3.00	4.00		E
	Terminate Conductors		0.75	1.00	1.25		E

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SECTION 14

ALTERNATIVE ENERGY SYSTEMS

General Information

This section includes labor units for installing and terminating generating equipment and the related controls and instrumentation, including photovoltaic modules, wind turbines, gas fired cogeneration and fuel cell technologies.

Scope of These Labor Units

The Introduction section includes details on the scope of labor units across the manual. Some items included are:

- Material unloading, jobsite storage and delivery to the installation area
- Drawing and specification study
- Layout, measuring and marking the installation location
- Terminating and quick connect splices of conductors
- Tool acquisition and return to storage Material assembly and installation
- Clean-up of electrical contractor furnished excess material
- Normal non-productive labor

Work Operations Not Included In These Labor Units

- Field supervision
- Hoisting above two floors
- Grounding, bonding, welding or painting
- Testing of any type unless specifically listed
- Grouting or anchoring
- Cutting holes or openings in walls, floors, cabinets, or panels
- Heavy equipment (crane) operator's time
- Roof sealing or roofing sub-contracts as may be needed
- Pre-engineering or design
- Slabs or foundations for gear, inverters, power generating equipment
- Any and all engineering, electrical, mechanical, or structural

Labor Adjustments for Non-Typical Conditions

See the Introduction section for details.

Application Instructions

- Labor units for roof mounted photovoltaic solar arrays are based on a single story structure with less than a 15 degree slope to the roof line and use of a stationary extension ladder up to a single story structure. If roof slope is more than 15 degrees these labor units need to be substantially increased.
- Labor units under the "Normal" column are for locations with good access, no obstructions and large quantities of equipment. Labor units under the "Difficult" column are for locations with less than good access, a few minor obstructions, two story structure and large quantities of equipment. Labor units under the "Very Difficult" column are for locations with poor access or require the use of a scaffold or scissor-lift, etc., numerous obstructions, limited space or small quantities of equipment, above a two story structure and may require the use of cranes etc.
- All the labor units in this section are based on using the most efficient tools and equipment available. When the anticipated jobsite conditions will prevent the optimum use of tools and equipment, an appropriate additional labor allowance in proportion to the anticipated difficulties is necessary.
- Labor units in this manual are for new work only and for a complete electrical installation. For remodeling or change order situations these labor units need to be substantially increased.

Section 14 - Alternate Energy Systems

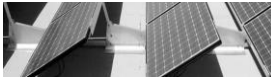
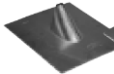
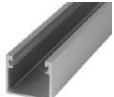
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Section 14 - Alternate Energy Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Photovoltaic Solar Modules						
	Standard Frame, Front Hardware Mounted						
	Factory Installed Whip w/ MC Quick Connector						
	Up to 50 Watt		0.30	0.38	0.45		E
	51 to 100 Watt		0.40	0.50	0.60		E
	101 to 240 Watt		0.50	0.63	0.75		E
	241 to 380 Watt		0.60	0.75	0.90		E
	Photovoltaic Solar Modules						
	Standard Frame, Rear Hardware Mounted						
	Factory Installed Whips w/ MC Quick Connector						
	Up to 50 Watt		0.35	0.44	0.53		E
	51 to 100 Watt		0.45	0.56	0.68		E
	101 to 240 Watt		0.65	0.81	0.98		E
	241 to 380 Watt		0.85	1.06	1.28		E
	Photovoltaic Solar						
	Solar Roofing Shingles						
	up to 20 Watts		0.90	1.22	1.44		E
	<i>**Note: roofing underlayment not included</i>						
	Photovoltaic Solar						
	Solar Laminate						
	up to 150 Watts		0.15	0.20	0.24		LF
	<i>**Note: roofing underlayment not included</i>						
	Multi-Contact Quick Connector						
	MC-3 Connectors		0.40	0.50	0.60		E
	MC-4 Connectors		0.44	0.55	0.66		E
	<i>**Note: Includes time for crimping</i>						
	MC-3 Parallel Connector		0.20	0.25	0.30		E
	Sunlight Resistant Wire/Cable, Type USE-2						
	#12 Copper Conductor, Type USE-2		4.80	6.00	7.20		M
	#10 Copper Conductor, Type USE-2		7.00	8.75	10.50		M
	#8 Copper Conductor, Type USE-2		9.00	11.25	13.50		M
	#12 Aluminum Conductor, Type USE-2		3.85	4.80	5.78		M
	#10 Aluminum Conductor, Type USE-2		5.60	7.00	8.40		M
	#8 Aluminum Conductor, Type USE-2		7.20	9.00	10.80		M
	Photovoltaic Solar Inverters						
	Grid-Tied Rated, 208-240VAC, Single Phase						
	Up to 600VDC						
	Up to 3000 Watts		2.60	3.25	3.90		E
	3001 to 7000 Watts		3.70	4.63	5.55		E
	Photovoltaic Solar Micro Inverters						
	Grid-Tied Rated, 120-240VAC, Single Phase and Three Phase						
	M190 Watt Inverter		0.25	0.31	0.38		E
	M210 Watt Inverter		0.25	0.31	0.38		E
	D380 Watt Inverter (Twin Pack)		0.30	0.38	0.45		E
	Micro Inverters Accessories						
	6 foot cable extension		0.25	0.31	0.38		E
	20 foot cable extension		0.31	0.39	0.47		E
	12 foot extension cable for D380 only		0.29	0.36	0.43		E
	6 foot AC interconnect cable		0.25	0.31	0.38		E
	12 foot AC Interconnect cable		0.29	0.36	0.43		E
	20 foot AC Interconnect cable		0.31	0.39	0.47		E
	Mounting bracket		0.20	0.25	0.30		E
	Sealing end caps		0.15	0.19	0.23		E
	240 VAC AC branch circuit Installation Kit		0.25	0.31	0.38		E
	Alternative Energy, Data Acquisition Systems (DAS)						
	Enlighten						
	Energy Management Unit, with indoor enclosure		1.50	1.88	2.25		E
	Line Communication Filter		0.50	0.63	0.75		E

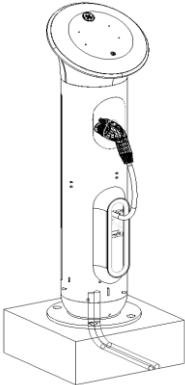
Section 14 - Alternate Energy Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Photovoltaic Solar Inverters						
	Grid-Tied Rated, 208-480vAC, Three Phase						
	Up to 600vDC						
	30 kW		8.00	10.00	12.00		E
	45 kW		10.00	12.50	15.00		E
	50 kW		11.00	13.75	16.50		E
	75 kW		13.00	16.25	19.50		E
	100 kW		11.00	13.75	16.50		E
	150 kW		14.00	17.50	21.00		E
	225 kW		21.00	26.25	31.50		E
	250 kW		23.00	28.75	34.50		E
	375 kW		28.00	35.00	42.00		E
	500 kW		34.00	42.50	51.00		E
	1 mW		50.00	62.50	75.00		E
	Photovoltaic Solar Roof Mounting Systems						
	* Note: for racking and mounting hardware, go to the following websites for additional information						
	1) www.prosolar.com (primarily for residential)						
	2) www.unirac.com						
	3) www.sunlink.com						
	Sunlink Racking						
	Non-Penetrating and Minimal Penetrations for Seismic		0.25	0.31	0.38		E
	* Note: Labor is based per PV module						
	* Note: Labor for ballasting is not included						
	Unirack Mono-Pole						
	Mono-Pole install only (does not include caisson)		5.00	6.25	7.50		E
	Tile Trac						
	Composite Shingled Roof Hardware Assembly		0.15	0.19	0.23		E
	Concrete Tile Roof Hardware Assembly		0.31	0.39	0.47		E
	*Note: If installing on clay tile roof, suggest removing the tiles in the array area and applying a torch down or 3-tab shingle roofing material, under the array						
	Photovoltaic Solar Roof Mounting Systems						
	Commercial & Residential Stations						
	Mounting base, Station & Hardware Assembly		0.20	0.25	0.30		E
	Roof Flashings						
	Up to 1"		0.20	0.25	0.30		E
	1-1/4" up to 2"		0.25	0.31	0.38		E
	Solar Railing						
	Residential Rated		6.00	7.50	9.00		C
	Commercial Rated		7.20	9.00	10.80		C
	Solar Module Clamping Assemblies						
	Intermediate or End Clamping Assemblies		0.15	0.19	0.23		E

Section 14 - Alternate Energy Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Wind Generation						
	1.5MW, 2.5MW, 3.6MW Size						
	Foundations						
	Grounding						
	reference Section 8 - Grounding & Lightning Protection of the MLU						
	U.G. Conduit						
	reference Section 11 - Outdoor Overhead & Underground Systems						
	** Does not include civil / concrete work						
	Erection						
	** Does not include setting of pole or tower on base						
	** Does not include erection of pole or tower sections						
	** Does not include setting of generator on pole or tower						
	Pole / Tower Interior						
	Tower Climbing - Unproductive Labor (/tower)		15.00	18.75	22.50		E
	average 13.25 feet per minute						
	Control Cable - Uncoil & Lower Cable (/foot)		8.00	10.00	12.00		M
	Control Cable - Lacing (Ty-Raps every 3')(/cable)		7.50	9.38	11.25		C
	Power Cable Splice - Compression Type (up to 500 kcmil)		0.75	0.94	1.13		E
	Power Cable Splice - Compression Type (500 kcmil and larger)		1.00	1.25	1.50		E
	Power Cable Splice - Heat Shrink (/Cable)		0.75	0.94	1.13		E
	Compression Tool Test & Log (Daily per Tool)		1.50	1.88	2.25		E
	Power Busduct - Flexible Splice		4.00	5.00	6.00		E
	Power Busduct - Torque Flexible Splice		3.00	3.75	4.50		E
	Power Busduct - Heat Shrink (/splice)		1.00	1.25	1.50		E
	Cable Tray Splice at Tower Section (/pair)		1.50	1.88	2.25		E
	Cable Tray Grounding - Ground Jumper		0.75	0.94	1.13		E
	Ladder - Ground Jumper		0.75	0.94	1.13		E
	FAA Obstruction Light (on top of generator)		2.00	2.50	3.00		E
	Anemometer		2.00	2.50	3.00		E
	Overtwist Limit Switch		2.00	2.50	3.00		E
	Pole Interior Safety Lighting Connection (/section)		1.00	1.25	1.50		E
	Equipment						
	Down Terminal Assembly (DTA)(Switchgear Package)		24.00	30.00	36.00		E
	Pad Mount Transformer - See Section 4						
	Prepackaged Fuel Cell Generator						
	The work outlined below is to accommodate offloading, setting and mounting to existing pad or foundation. (Directly from truck to pad)						
	** Does not include civil / concrete work						
	** Does not include mechanical process piping						
	300KW Fuel Cell CHP Generator						
	Fuel Cell Module		6.00	7.50	9.00		E
	Mechanical Balance of Plant		6.00	7.50	9.00		E
	Electrical Balance of Plant		6.00	7.50	9.00		E
	1.5MW Fuel Cell CHP Generator						
	Fuel Cell Module		12.00	15.00	18.00		E
	Mechanical Balance of Plant		12.00	15.00	18.00		E
	Electrical Balance of Plant		12.00	15.00	18.00		E
	3.0MW Fuel Cell CHP Generator						
	Fuel Cell Module		24.00	30.00	36.00		E
	Mechanical Balance of Plant		24.00	30.00	36.00		E
	Electrical Balance of Plant		24.00	30.00	36.00		E
	** For all other work associated with the installation please refer to the respective section of the MLU						
	Bloom Energy Fuel Cell						
	100KW Fuel Cell Generator						
	Fuel Cell Module		10.00	12.50	15.00		E
	** For all other work associated with the installation please refer to the respective section of the MLU						

Section 14 - Alternate Energy Systems

	Description	Rev	Normal	Difficult	Very Difficult	Company Experience	Unit
	Electric Vehicle Charging Stations						
	Wall Mount Electric Vehicle Supply Equipment (EVSE)						
	<i>Factory Warranty Requires Certified Installers</i>						
	<i>Verify Installation Instructions</i>						
	<i>Verify Manufacture Recommendations</i>						
	<i>Branch Wiring Not Included</i>						
	<i>Layout Not Included</i>						
	30 AMP 2 Pole Unit		1.50	1.90	2.40		E
	40/2 AMP 2 Pole Unit		2.00	2.50	3.10		E
	Ceiling Mount Electric Vehicle Supply Equipment (EVSE)						
	<i>Factory Warranty Requires Certified Installers</i>						
	<i>Verify Installation Instructions</i>						
	<i>Verify Manufacture Recommendations</i>						
	<i>Branch Wiring Not Included</i>						
	<i>Backing and Layout not Included</i>						
	30 AMP 2 Pole Unit		2.50	3.00	4.00		E
	40/2 AMP 2 Pole Unit		3.00	3.80	4.70		E
	Pedestal Mount Electric Vehicle Supply Equipment (EVSE)						
	<i>Factory Warranty Requires Certified Installers</i>						
	<i>Verify Installation Instructions</i>						
	<i>Verify Manufacture Recommendations</i>						
	<i>Branch Wiring Not Included</i>						
	<i>Base and Layout not Included</i>						
	30 AMP 2 Pole Unit		3.00	3.80	4.70		E
	70/2 AMP 2 Pole Unit		4.00	5.00	6.25		E

ELECTRICAL CONSTRUCTION ABBREVIATIONS

3W	3-Way	Occ.	Occupancy (As in occupancy sensor)
4s	4-Square (As in 4" square box)	O&M	Operations and Maintenance
4W	4-Way	PIV	Post Indicating Valve
A	Amps	PNL	Panel or Panel Board
AFF	Above Finished Floor	PVC	Plastic conduit (Also known as polyvinyl chloride)
AHU	Air Handling Unit	Recp.	Receptacle
AIA	The American Institute of Architects	RFI	Request for Information
AL	Aluminum	RMC	Rigid Metallic Conduit
Alt	Alternate	R/R	Remove and Relocate
AWG	American Wire Gauge	RTU	Roof Top Unit
BCW	Branch Circuit Wiring	SD	Smoke Detector
Conc.	Concrete	SP	Single Pole
CU	Copper	STE	Switch with Thermal Element
CUH	Cabinet Unit Heater	Stl.	Steel
CWP	Chilled Water Pump	SW	Switch
DEMO	Demolition	SWBD	Switch Board
DJE	Direct Job Expenses	TAB	Terminal Air Blender (Electric or pneumatic device to regulate air temperature cooling or heating)
EF	Exhaust Fan	T&BF	Trench and backfill (Or T&B)
EMT	Electrical Metallic Tubing	TBB	Telephone Back Board
Equip.	Equipment	TC	Time Clock
EWC	Electric Water Cooler (Drinking fountain)	T/D	Telephone/Data
Exc.	Excavation	Tele	Telephone
FA	Fire Alarm	U.G.	Under Ground
FACP	Fire Alarm Control Panel	V	Volts
FCU	Fan Coil Unit	VAV	Variable Air Volume (Electric or pneumatic device to regulate air temperature cooling or heating)
GFI	Ground Fault Interrupter	VDV	Voice/Data/Video
GFCI	Ground Fault Circuit Interrupter	W	Watts
GRC	Galvanized Rigid Conduit	WP	Weatherproof
GRS	Galvanized Rigid Steel	XFMR	Transformer
HD	Heat Detector		
Hdwr.	Hardware		
HP	Horse Power		
HWP	Hot Water Pump		
kW	Kilowatt		
LF	Lineal Foot		
Ltg.	Lighting		
MAU	Make Up Air Unit		
MBCW	Motor Branch Circuit Wiring		
Misc.	Miscellaneous		
MSB	Main Switchboard/Main Service Board		
Mtg.	Mounting		
NEC	National Electric Code		
NECA	National Electrical Contractors Association		
NF	Non-Fused		
NFPA	National Fire Protection Agency		

Manufacturer Abbreviations

C-H	Cutler Hammer
GE	General Electric
Sie	Siemens
SQ D	Square D

ELECTRICAL CONSTRUCTION DEFINITIONS

Addendum – A written change or clarification issued, typically by the architect or general contractor, prior to bid, which becomes part of the contract documents.

Alternate – An additive or deductive price option to the base bid price submitted. Usually pertains to an alternate manufacturer of materials or additional or reduction in project scope.

Approved Equal – Equipment, material or means of construction approved by the architect or engineer as being of equal attributes to those described in the contract documents.

Arbitration Clause – A provision that may be included in certain construction, insurance, labor or sale contracts, requiring settlement of disputes through arbitration instead of litigation, and often providing the procedure to be followed.

As-Built Drawings – As specified drawings of installations, including circuit numbers and conduit routing, either submitted as hand-drawn, generated, marked-up red-line drawings or as CAD/BIM generated drawings in specified format.

Beneficial Occupancy – The stage of construction of a building or facility, before final completion, at which its owner can occupy it for the purpose it was constructed.

Bid – 1) An offer or proposal of a price. 2) The amount offered or proposed. 3) To tender a price for work.

Bid Bond – A written form of security executed by the bidder as principal and by a surety for the purpose of guaranteeing that the bidder will sign the contract, if awarded the contract, for the stated bid amount.

Bid Documents – The drawings and specifications and addendums for a project that are provided to potential bidders.

Bid Rigging – A form of price fixing and market allocation collusion, in which an agreement is illegally made among two or more bidders to allow one party to win the bid.

Bid Shopping – A practice in which a contractor uses the lowest subcontract bid as a tool in negotiating lower bids from other subcontractors prior to award of the contract.

Building Information Modeling (BIM) – A process involving the generation and management of digital representations of physical and functional characteristics of a structure. The resulting building information models become shared resources that can support decision-making about a facility from earliest conceptual stages to eventual demolition.

Cash Allowance – A dollar amount described in the contract documents to be included in the bid to cover the cost for a scope of work not specified in detail.

Change Order – A written order, agreed upon by the owner, contractor and designer, authorizing changes to the scope of work, the contract sum, and/or the contract time.

Closeout Documents – Material cut sheets of equipment used, warranties and as-built drawings that are required for final payment.

Contract Documents – The legally binding, written agreement to perform work. May include drawings, specifications and addendums for a project. A construction project may have many levels of contract documents.

Cost Breakdown – A statement furnished by the contractor to the architect or engineer reflecting the portions of the contract sum allotted for the various parts of the work that is used as the basis for reviewing the contractor's applications for progress payments. Also known as a Schedule of Values.

Cost Codes – A numbering system given to specific kinds of work for the purpose of organizing the cost control process of a specific project.

Design/Bid/Build – A project delivery method in which design and construction are separate contracts. The contract for construction is awarded based on bids provided in response to the design.

Design/Build – A project delivery method in which design and construction contracts are combined.

Direct Job Expenses (DJE) – Expenses attributed to a specific project that end once the project ends. Some examples are field supervision, engineering, equipment rental, insurance, permits and travel. Sometimes confused with general overhead. (See also Overhead)

Estimating – Determining the accurate cost of proposed work through reviewing and analyzing construction documents, economic conditions, the physical location of the work, and the parties involved.

Field authorization – Order to perform a change issued by the owner's representative in the field, made directly to the contractor's field personnel. This process requires significant extra transfers of information from the field to management.

General Conditions – Contract conditions, usually included in the book of specifications (or in the accompanying architectural drawings) of a contract, which set the minimum performance requirements for the contractor. These conditions also include the rights and responsibilities of the parties involved.

Greenfield – Flexible metal conduit, steel or aluminum.

Guaranteed Maximum Price (GMP) – A type of project contract where the contractor is compensated for actual costs incurred, plus a fixed fee, to a ceiling price. The contractor is responsible for cost over runs, unless the GMP has been increased due to a change order. Savings resulting from cost under runs are returned to the owner. This is also known as Not-to-Exceed Price.

Integrated Project Delivery (IPD) – A project delivery approach that emphasizes increased stakeholder involvement from the beginning of the project to increase project efficiency, increase value to the owner, reduce waste and improve design quality. IPD projects typically have characteristics such as multi-party contractual agreements, shared risk/reward incentives, and buyout processes.

Letter of Intent – An agreement between two or more parties prior to an agreement on the final contract.

Liens – A charge upon real or personal property for the satisfaction of some debt or duty ordinarily arising by operation of law.

Liquidated Damages – Damages that can be collected by the injured party as compensation in the event of a specific breach. The amount may be specified in the contract or to agreed to or determined by a court of tribunal in the event of a breach. Also known as liquidated and ascertained damages.

Notice To Proceed (NTP) – Letter from a principal to a contractor stating the date the contractor can begin work subject to the conditions of the contract. The performance time of the contract starts from the NTP date.

Order to Proceed – A directive from the customer (or customer's representative) to perform a specific task or tasks. Not necessarily an approval of a change order.

Overhead – Items or expenses that cannot be attributed to one specific project. Overhead is the cost

of running your company, such as building lease, utility bills, office salaries, warehouse, legal and accounting fees, etc. Sometimes confused with direct job expenses. (See also Direct Job Expenses)

Performance Bond – A written form of security from a surety (bonding) company to the owner, on behalf of an acceptable prime contractor or subcontractor, guaranteeing payment to the owner in the event the contractor fails to perform all labor, materials, equipment, or services in accordance with the contract.

Prefabrication – The process by which components are assembled or prepared, in whole or in part, before reaching their final location.

Prime Contractor – Contractor who has a contract with the owner of a project and has the full responsibility for its completion. A prime contractor undertakes to perform a complete contract, and may employ, and manage, one or more subcontractors to carry out specific parts of the contract. Also called main or general contractor.

Profit – The excess revenue after all expenditures including direct job cost and overhead are considered.

Raceway – Generic term describing material used to contain electrical wiring. This could include conduit, cable tray, wire way, etc.

Request for Information (RFI) – A written request to the owner, architect or engineer for guidance on a job condition prior to bidding or during the project. A good tool to let others make a decision without taking the responsibility.

Retainage – A portion of a contractor's payment that is withheld until the contract is satisfactorily completed.

Rough Order of Magnitude (ROM) – An estimate of costs and time provided in the early stages of a project when its scope and requirements has not been fully defined. An ROM is used to reduce the uncertainty of cost outcomes for both parties when project details have yet to be identified.

Schedule of Values – A statement furnished by the contractor to the architect or engineer reflecting the portions of the contract sum allotted for the various parts of the work and used as the basis for reviewing the contractor's applications for progress payments.

Scope Letter – A letter or statement submitted with a contractors bid listing inclusions and exclusions they make to their bid.

Special Conditions – Provisions of a contract that are peculiar to the project under consideration and do not fall under the general conditions or supplementary conditions.

Subcontractor – A contractor who has a contractual relationship to perform work with an entity other than the owner of a project, typically a general or prime contractor, although there can be multiple tiers of subcontractors. The lower-tier subcontractor completes a portion of the higher-tier contractor's work.

Submittal – Documents of equipment or procedures needing approval prior to implementation.

Substantial Completion – Stage in the progress of the work when the work is sufficiently complete in accordance with a contract so the owner can occupy or utilize the work for its intended use.

Supplemental Conditions – Special provisions in a contract that modify or qualify its general provisions. Also called supplementary conditions.

Time and Material (T&M) – Contracted construction work paid-for on the basis of time taken and material consumed. Also known as force account.

Unit Price – A predetermined price for a measurement or quantity of work to be performed within a

specific contract. The designated unit price would include all labor materials, equipment or services associated with the measurement or quantity established.

Work directive – Generally an authorization to perform a specific task or tasks, with the payment to be negotiated at a later date.

APPENDIX A: TECHNICAL DATA TABLES

Table 1: Conversion Of Minutes To Decimal Hours

Minutes	Hours	Minutes	Hours	Minutes	Hours	Minutes	Hours
1	0.017	16	0.267	31	0.517	46	0.767
2	0.033	17	0.283	32	0.533	47	0.783
3	0.050	18	0.300	33	0.550	48	0.800
4	0.067	19	0.317	34	0.567	49	0.817
5	0.083	20	0.333	35	0.583	50	0.833
6	0.100	21	0.350	36	0.600	51	0.850
7	0.117	22	0.367	37	0.617	52	0.867
8	0.133	23	0.383	38	0.633	53	0.883
9	0.150	24	0.400	39	0.650	54	0.900
10	0.167	25	0.417	40	0.667	55	0.917
11	0.183	26	0.433	41	0.683	56	0.933
12	0.200	27	0.450	42	0.700	57	0.950
13	0.217	28	0.467	43	0.717	58	0.967
14	0.233	29	0.483	44	0.733	59	0.983
15	0.250	30	0.500	45	0.750	60	1.000

Table 2: Metric Conversions

1 meter = 39.37 inches
1 centimeter = 0.39 inch
1 millimeter = 0.04 inch
1 inch = 0.025 meter
1 inch = 2.564 centimeters
1 inch = 25.641 millimeters

Table 3: Rigid Metal Conduit Inside Diameters

Trade Size	Inches	Millimeters	Trade Size	Inches	Millimeters
½	0.632	16.1	2 ½	2.489	63.2
¾	0.836	21.2	3	3.090	78.5
1	1.063	27.0	3 ½	3.570	90.7
1 ¼	1.394	35.4	4	4.050	102.9
1 ½	1.624	41.2	5	5.073	128.9
2	2.083	52.9	6	6.093	154.8

Table 4: Electrical Conductor Areas

United States			Closest European Sizes	
	Area		Size	Area
Size (AWG)	Circular Mils	Square Millimeter	Square Millimeter	Circular Mils
18	1,620	0.82	0.75	1,480
16	2,580	1.30	1.00	1,974
14	4,110	2.08	1.50	2,961
12	6,530	3.30	2.50	4,935
10	10,380	5.25	4.00	7,896
8	16,510	8.36	6.00	11,844
6	26,240	13.29	10.00	19,740
4	41,740	21.14	16.00	31,584
3	52,620	26.65	25.00	49,350
2	66,360	33.61	—	—
1	83,690	42.39	35.00	69,090
1/0	105,600	53.49	50.00	98,700
2/0	133,100	67.42	—	—
3/0	167,800	85.00	70.00	138,180
4/0	211,600	107.19	95.00	187,530
250	250,000	126.64	120.00	236,880
300	300,000	151.97	150.00	296,100
350	350,000	177.30	—	—
400	400,000	202.63	185.00	365,190
500	500,000	253.29	240.00	473,760

Table 5: Conduit Weight Comparisons (All Weights Are Per 100 Feet Of Conduit)**

Size	Rigid Steel	IMC	Rigid Aluminum	EMT	PVC Sch 40	PVC Sch 80	PVC Coated* Rigid Steel
½"	80	60	28	29	16	21	87
¾"	108	82	37	45	22	29	115
1"	160	116	55	65	33	42	166
1 ¼"	208	150	72	96	46	61	217
1 ½"	254	182	89	111	56	71	262
2"	344	242	119	141	74	98	267
2 ½"	550	401	188	215	117	149	557
3"	710	493	246	260	153	200	724
3 ½"	855	571	296	365	185	246	917
4"	1000	638	350	390	219	292	1056
5"	1335	—	479	—	298	400	1535
6"	1845	—	630	—	385	510	2025

*20 mil thickness

**The above weights were taken from several manufacturers' catalogues, include the threaded coupling when applicable, and have been rounded off to the closest whole number.

Table 6: Estimating the Effects of Extended Duration Beyond a Normal Job Period

Extra Labor Hours Consumed						
Base Estimated Electrical Contract Time		Optimum Average Crew	Crew Weeks **	Normal Related Construction Project Duration	Effect of Extended Duration Increase of Base Estimated Labor Per Month of Extended Duration	
Labor-Hours	Labor-Days*	Workers		Months	%	Labor-Hours
500	62	2	6	2	8.00	40
1,000	125	3	8	3	6.50	65
1,250	156	4	8	3	6.50	81
2,500	313	5	10	4	5.00	125
5,000	625	8	16	5	4.00	200
10,000	1,250	11	23	7	3.50	350
15,000	1,875	14	27	8	2.75	415
20,000	2,500	15	34	10	2.25	450
30,000	3,750	17	44	12	1.75	525
45,000	5,625	25	45	12	1.75	785
60,000	7,500	30	50	14	1.45	870
75,000	9,400	35	54	15	1.35	1,010
100,000	12,500	38	65	18	1.25	1,250
125,000	15,650	40	78	21	1.15	1,445
150,000	18,750	45	83	22	1.00	1,500
200,000	25,000	58	86	23	.95	1,900
250,000	33,000	70	90	24	.85	2,120
300,000	37,500	80	94	26	.84	2,520

*Based on 8 Hour Day

**Based on 40 Hour Week

Example:

A labor estimate based on normal project duration (7 months) = 10,000 hours

Project extension past normal duration = 2.5 months

$10,000 \times 3.50\% \times 2.5 = 875$ hours additional time

Therefore: A typical 10,000 hour project that extends to 9.5 months for completion would require a total of 10,875 hours due to the abnormal project duration time.

APPENDIX B: ELECTRICAL FORMULAS

To Find:	Single Phase	Three Phase	Direct Current
Ampere when KVA is known	$\frac{KVA \times 1000}{E}$	$\frac{KVA \times 1000}{E \times 1.73}$	Not Applicable
Amperes when Horsepower is known	$\frac{HP \times 1000}{E \times \%Eff. \times PF}$	$\frac{HP \times 746}{E \times 1.73 \times \%Eff. \times PF}$	$\frac{HP \times 746}{E \times \%Eff.}$
Amperes when Kilowatts are known	$\frac{kW \times 1000}{E \times PF}$	$\frac{kW \times 1000}{E \times 1.73 \times PF}$	$\frac{kW \times 1000}{E}$
Kilowatts	$\frac{I \times E \times PF}{1000}$	$\frac{1 \times E \times 1.73 \times PF}{1000}$	$\frac{I \times E}{1000}$
Kilovolt/Amperes	$\frac{I \times E}{1000}$	$\frac{I \times E \times 1.73}{1000}$	Not Applicable
Horsepower	$\frac{I \times E \times \%Eff. \times PF}{746}$	$\frac{I \times E \times 1.73 \times \%Eff. \times PF}{746}$	$\frac{I \times E \times \%Eff.}{746}$
Watts	$E \times I \times PF$	$E \times I \times 1.73 \times PF$	$E \times I$

Key

I = Amperes
 E = Volts
 kW = Kilowatts
 KVA = Kilovolt/Amperes
 HP = Horsepower
 %Eff. = Percent Efficiency
 PF = Power Factor

Voltage Drop

Single Phase $VD = \frac{2K \times L \times I}{D}$

Three Phase $VD = \frac{2K \times L \times I}{D} (0.8666)$

Key

VD = Voltage Drop
 L = Length of Circuit
 I = Current
 D = Circular Mills of Conductor
 K = Resistivity of Conductor (Copper = 12, Aluminum = 18)

APPENDIX C: ADDITIONAL COSTS OF CHANGE ORDERS

Change Orders Cost More

One should not be deceived by the illusion that all change orders make money. The majority of change orders have adverse impacts to the base contract, and in the long run cause the contractor to experience detrimental conditions and increased costs. There are many reasons for this adversity, some of them are:

- **Additional management time.** When critical project information must be transferred from one person to another, a substantial amount of time is required, usually this time is the company's most expensive time—that of top managers, supervisors, and executives. The information handoffs are numerous with the request for changes being transferred from the superintendent to the estimator; the estimator discussing the change with the project manager and/or owner; the estimator explaining the accepted project to the project manager (this information transfer must be slow and careful, so that nothing is lost); the project manager discussing changes with the foreman; supervision of additional or extended contracts; and more complex job accounting information going both ways. In addition to this, there may be additional discussions with the owner or owner's representative while the changes are being considered. All of this adds hours of extra work by management personnel, even for a fairly modest change order. The contractor must either recover these costs from the change order, or absorb the cost in the project.
- **Redirecting the workforce.** Any change order is disruptive to the flow of work at the jobsite. The obvious costs are the extra hours needed for the foreman and lead installers to read the new plans, interpret them, and pass the information along to the field workers. In addition to this, there are other, less obvious, costs:
 - Material quantities must be verified and more materials ordered, received and stored if necessary.
 - New or increased numbers of tools may be necessary and will have to be procured and distributed.
 - Sections of the workforce may be reassigned. This is an expensive process, as each worker must stop what he or she is doing, move their tools and/or equipment and familiarize themselves with new tasks and a new work area before they begin any actual installation.
 - When it is known that changes may be coming in one portion of the project, workers tend to “work around” that area, rather than installing equipment that they will have to remove later. This inhibits the streamlining of the workflow and reduces efficiency, sometimes substantially.

All of these things are in addition to the “put down what you’re doing and do something else” losses that the contractor will incur because of a change in the work.

- **Incorrect installation based on untimely information.** In almost every case there is an “approval gap” in the change order process—the time between when the change is requested and when it is finally approved. During this gap, it is quite likely that a good deal of the electrical system will be incorrectly routed. The routing will be correct according to the original plans, but incorrect according to the change. This requires the field workers to reroute, and sometimes deconstruct their previous work. Not only does this take extra time, but also it is demoralizing to many workers, thus harming long-term productivity. The longer the “approval gap” is, the more likely it is that the contractor will encounter excessive losses.
- **Finance costs on extra cash flow.** The financing of large change orders is a serious matter to the electrical contractor. On average, an electrical contractor is required to finance about one third of the projects they perform. Thus a change order that increases a contract amount by

20% will require the contractor to finance an extra 7% of the contract amount. Not only is this an extra expense by itself, but it may also require the contractor to spend time negotiating (or renegotiating) a loan. If the contractor takes on a large change, and associated financing, there is also the possibility that the firm may not be able to obtain that extra financing, at least not without great difficulty.

- **Compressed job schedule.** Because of project delays, and due to the fact that change orders are often approved at the last minute, a high concentration of workers in the changed areas is usually necessary. This obviously reduces the electrical contractor's efficiency, since his workers are putting down one set of tasks and picking up others; but it also causes losses from too many workers in too small an area. Additionally, there are usually several other trades involved with change and each of them will also be putting a large number of workers into the area. This causes problems, not only of too many electricians running pipe past each other, but too many different trades working on top of each other. Disputes easily break out, and morale almost always suffers. If no contract time is made for a large change, the contractor is likely to see significant losses. For this reason, it is prudent for the electrical contractor to include a clause in a change proposal that reads something like:

A time extension of _____ days will be necessary for the satisfactory completion of these changes. Furthermore, this price is subject to change if not accepted within _____ days.

- **Extended overhead costs.** The longer and more complex a project is, the greater the contractor's overhead expenses will be. The time of overhead employees is required for the oversight of tools, storage trailers, support facilities, telephone and electrical service, electronic and computer equipment and jobsite offices. All support personnel such as CAD/BIM operators, office help and the like are direct overhead expenses.
- **Additional estimating costs.** Estimating expenses for change orders are very high, for several reasons. First of all, the change order is a new project, and must be estimated from scratch. The estimator will likely have to call a variety of suppliers for accurate quotes on material costs and will have to spend time factoring the labor for the expected conditions.

The estimator will have to account for not only material and labor expenses, but must also account for job costs and for the full impact that the change will make on the existing portion of the project. This process takes quite a bit of thought and project review. For an estimator to spend several hours on a \$1,000.00 change order may not be out of line.

A second reason for high estimating costs to the contractor on changes is that not all change estimates are accepted. The estimator may price two, three, or more proposed changes before one is accepted. One way or another, the contractor must find a way of recovering these estimating costs.

- **Updating as-built drawings.** This requires not only the time of draftspersons and/or CAD/BIM operators, but also a great deal of information transfer between the jobsite and the office. Information transfer monopolizes the time of at least two highly paid persons, and is far more costly than is commonly supposed.
- **Updating operations and maintenance manuals.** The use of new types of materials under a change requires the contractor to modify the operations and maintenance manuals that are required under the base contract. This requires not only replication expenses of reworking the books, but also a potentially significant amount of time securing the necessary new information and graphic representations.
- **Revised and/or additional testing.** New items required by the change may have different testing requirements, and may also affect other items, requiring them to be tested differently or repetitively. A particular hazard is the coordination of over-current interrupting capacities.

- **Revising and/or updating project schedules.** For both contractual and project management reasons, schedules must be revised for significant changes. Even if time delays are not given, the work must flow and must be reconfigured. Someone on the contractor's payroll will be required to perform this coordination and rescheduling. On a complex project, this task may require multiple conversations with field personnel, transferring information back and forth, which is very expensive.
- **Processing revised shop drawings.** If there are changes in specified materials, submittals and shop drawings required under the base contract may have to be modified and expanded.
- **Additional rental expenses for tools.** For example, a second conduit bender may be required to do both the change and the base contract work concurrently. Extra lifts may be required, etc.
- **Additional rental expenses for equipment.** Cranes, lifts and similar items may have to be left on the site longer than originally planned, or will have to be returned to the site. This may result in not only time charges, but in mobilization costs as well.
- **Additional safety costs.** Not only are safety equipment costs significant, but safety training may be necessary as well. These expenses are related to the extra workers who are required for the most change orders, as most changes are performed concurrent with the base contract, not consecutive to it.
- **Freight charges on rushed material orders.** "Hurry-up" items necessary for changes may not meet freight minimums, may not be available in time, or may require the contractor to send a man and a truck to pick it up. All of these situations result in extra costs.
- **Restocking and return freight charges for credited items.** Changes in the work may render some materials ordered under the base contract unnecessary. In these cases, the materials may be returned to the supplier for only partial credit due to restocking and/or freight charges.
- **Extended warrantee exposure.** Changes often involve equipment that has been placed in service prior to the beginning of the contractor's warrantee period. Unless the manufacturer's warrantee is longer than the contractor's warrantee, the contractor has a liability exposure for this warrantee period. For example, a switchgear manufacturer will typically guarantee equipment one year from date of energizing. The contractor's warrantee, however, is one year from date of acceptance, which may be months after the initial energizing. If the equipment fails during this gap, the contractor will have to replace the equipment at his or her own expense. Change orders can greatly increase the contractor's exposure to these risks.
- **Additional financing on extended retainage.** If a project, the closeout of a project, or the final payment on a project is delayed due to changes, the contractor will have to wait for the final retainage payment. Thus the contractor is forced to finance this dollar amount for an extended period of time. The cost of money is significant, whether borrowed from one's self or from others. Depending on the contract terms, a change order that increases the total amount of a contract may also be subject to retainage, therefore, the amount of total retainage on the project is increased.
- **Extra bond, permit, tax, and insurance costs.** On a bonded project, a fee must be paid to increase the amount of coverage due to the increased contract amount.
- **Additional non-working foremen.** If a change increases the necessary workforce beyond a certain limit, additional non-working personnel may be required.
- **Reductions in the quality of the workforce.** New electricians hired to rush the work are almost never up to the efficiency of the contractor's continuing workforce. This not only reduces the productivity immediately, but due to decreased morale reduces long-term productivity.

It is important to note that all of these items are prime costs to the electrical contractor. None of these items are covered in the contractor's standard overhead percentages. These are purely job-related impacts.

It is strongly recommended that you use a copy of the following **Change Order Costs Form** for each change order you estimate. If you hope to recover these very significant costs, you will most certainly have to document them.

Change Orders Supplemental Material

Questions regarding change orders are some of the more complex issues that electrical contractors face. When bidding a project, the contractor should check the contract documents to see what requirements are given regarding the change orders. Usually, these requirements will be very detailed.

One of the first things that will usually be specified is the percentages of mark-up that will be allowed on changes. In most contracts these percentages are very low and the contractor will lose money doing change orders this way.

Another primary question is this: What is an extra? As you will often find, you may be required to move several lights, outlets, etc., without ever being able to charge for this work. Carefully research these details, and also the time requirements for them. Contract documents should never require moving items after they have been roughed-in.

A very critical matter regarding changes is contract time extension. *The contractor should be allowed time extensions for substantial or numerous change orders.* If there is no time extension allowed for extra work, the contractor will be in serious danger of paying liquidated damages. It is the owner's prerogative to request extra work, but it is not the contractor's responsibility to do the additional work without the allowance of additional time. A contract is for a certain amount of work (that which is shown in the contract documents) to be performed in a certain amount of time and it is the contractor's responsibility to meet these conditions. If, however, more work is added to the original contract, the contractor should be entitled to more time to perform that work. The contractor must make sure that time extensions are a part of significant extras; to fail to do so is to court disaster.

Change Order Requirements

The requirements covering change orders are of extreme importance, especially if the project looks like it will have numerous changes. (The contractor can usually count on numerous changes if there are incomplete plans, large numbers of addenda, parts of the job that aren't clearly defined, or if there are other gaps in the design.) The following questions need to be answered:

- Who has the authority to issue change orders?
- Do change orders need to be put in writing?
- How will payment for change orders be handled?
- Who approves payment?
- How do you verify extensions of time for changes?
- What percentages of overhead and profit can you charge?
- Do you need signed work tickets to verify the labor hours?
- Will you have to submit copies of invoices to verify your material costs?

Make sure all of these questions are answered; every one of them is very important to the profitability of the project. There can be a great deal of money contained in change orders; and probably more money is lost by contractors in disallowed change orders than by any other means. Protect profits by making sure all of these questions are clearly answered. To do otherwise can be disastrous. Be very cautious about change order requirements. Clarity in this part of your contract is can pay dividends in the overall performance of the project.

Change Order Costs Form

Cost*	Amount	Notes
Additional management time		
Redirecting the workforce		
Incorrect installation based on untimely information		
Finance costs on extra cash flow		
Compressed job schedule		
Extended overhead costs		
Additional estimating costs		
Updating as-built drawings		
Updating operating and maintenance manuals		
Revised or additional testing		
Revising and/or updating CPM and other schedules		
Processing revised shop drawings		
Additional rental expenses for tools		
Additional rental expenses for equipment		
Additional safety costs		
Freight charges on rushed material orders		
Restocking and return freight charges for credited items		
Extended warrantee exposure		
Additional financing on extended retainage		
Extra bond, permit, tax, and insurance costs		
Additional non-working foreman		
Reductions in the quality of the workforce		
TOTAL		

*This list is not to be construed as complete and should be modified as needed per project.

The best way to argue these pitfalls is to prepare an accurate change order estimate with the real costs itemized in detail and accompanying documentation outlining these costs. Through the use of the charts and information in this manual you can strengthen your negotiating position and a pre-construction change order meeting should help you recover these hidden costs associated with change orders.

Several publications are available to provide additional information on change orders and are included Appendix G.

APPENDIX D: ESTIMATING THE COST OF SUPERVISION

The labor units in this manual **do not** include any labor for supervision of any type. All electrical construction requires more than one level of supervision, and the magnitude of supervision depends on the complexity, type, and size of each project. In addition, many labor agreements include special requirements related to supervision. Because each project is unique, it is the opinion of most electrical contractors that the labor for supervision is best estimated as a separate cost item and that no part of the supervision labor be included in the material installation labor units.

For estimating, accounting and cost control purposes, the direct and indirect costs of supervision are usually separated into home office supervision costs and field supervision costs.

- **Home Office Supervision Costs** – These direct (payroll) costs and indirect (fringe benefits, insurance, taxes, etc.) costs are usually included in the cost category of home office overhead. The owner's salary is usually not included in the home office supervision category, but other salaried employees such as project managers are included when they supervise more than one project simultaneously. When an electrical contractor's project manager supervises only one project, these direct and indirect supervision costs are more appropriately included in the field supervision cost category.
- **Field Supervision Costs** – These direct and indirect costs are usually separated into two separate categories for ease of calculations:
 - **Salaried Supervision Costs.** These direct and indirect costs include all supervisory personnel assigned full time to a single project whose pay is based on an annual salary.
 - **Non-Salaried Supervision Costs.** These direct and indirect costs include all supervisory personnel assigned full time to a single project whose pay is based on an hourly wage rate.

The calculation of supervisory costs is usually accomplished by the multiplication of each supervisor's cost per hour, day, week or month and the quantity of the time required.

The most frequent area of dispute is in change order cost negotiations. Owners are often reluctant to allow supervisory costs in the estimating of change order costs. The owner's reluctance is usually based on the incorrect assumption that the electrical contractor's supervisory personnel are already on the construction site and that their costs were already included in the original contract price. This is an incorrect assumption because each change, whether an add-on change order or a deduct change order, will require additional supervisory labor to examine, estimate the cost or credit, administrate, document, complete the change (if approved), and other requirements of the supervisor's time as a direct result of any change order. The supervisor's labor spent on change orders is not included in the scope of work defined in the bid contract documents, and therefore the electrical contractor is clearly entitled to additional reimbursement for the supervisory labor regardless of the change order being approved or rejected.

In the interest of expediency and fair play, many electrical contractors negotiate fixed rates for supervision, overhead and profit for all change orders shortly after each construction contract is awarded or at the time that the first change order is presented. One of the many advantages of this early settlement of future change order cost calculations is that they are resolved before an uncooperative or antagonistic relationship can develop.

APPENDIX E: SUGGESTED LABOR FACTOR PERCENTAGE TO USE WITH MULTIPLE RUNS

Labor Factor Description	Raceway	Support Channel and Fittings	Pull Boxes	Wire
Parallel 2 Runs @ 10'	90	90	100	90
Parallel 4 Runs @ 10'	80	80	100	85
Parallel 6 Runs @ 10'	78	78	100	80
Parallel 8 Runs @ 10'	76	76	100	75
Parallel 10 Runs @ 10'	75	75	100	70
Parallel 2 Runs @ 15'	96	96	110	90
Parallel 4 Runs @ 15'	90	90	110	85
Parallel 6 Runs @ 15'	86	86	110	80
Parallel 8 Runs @ 15'	84	84	110	75
Parallel 10 Runs @ 15'	82	82	110	70
Parallel 2 Runs @ 20'	113	113	125	90
Parallel 4 Runs @ 20'	100	100	125	85
Parallel 6 Runs @ 20'	98	98	125	80
Parallel 8 Runs @ 20'	95	95	125	75
Parallel 10 Runs @ 20'	94	94	125	70
Parallel 2 Runs @ 25'	117	117	130	90
Parallel 4 Runs @ 25'	104	104	130	85
Parallel 6 Runs @ 25'	101	101	130	80
Parallel 8 Runs @ 25'	98	98	130	75
Parallel 10 Runs @ 25'	96	96	130	70
Parallel 2 Runs @ 30'	126	126	140	90
Parallel 4 Runs @ 30'	112	112	140	85
Parallel 6 Runs @ 30'	109	109	140	80
Parallel 8 Runs @ 30'	106	106	140	75
Parallel 10 Runs @ 30'	104	104	140	70
Parallel 2 Runs @ 40'	135	135	150	90
Parallel 4 Runs @ 40'	120	120	150	85
Parallel 6 Runs @ 40'	117	117	150	80
Parallel 8 Runs @ 40'	114	114	150	75
Parallel 10 Runs @ 40'	111	111	150	70

Note: The above table does not take into account specific jobsite conditions, ease of access to installation location, hanging or strapping material, congestion of work area, conflict with other trades, and other items that may impact overall crew productivity. The table also assumes the parallel runs are like type and size of material.

Table courtesy of AccuBid

APPENDIX F: EQUIPMENT STARTUP CHECKLIST RESOURCES

The *National Electrical Installation Standards (NEIS)* are the first and only quality and performance standards for electrical construction. Developed by NECA, in partnership with several industry organizations, these standards clearly define the actions needed to perform an installation in a “neat and workmanlike manner,” as often referenced in the National Electrical Code (NEC).

The following publications represent a sample of the *NEIS* available and all can be viewed at www.neca-neis.org or purchased through the NECA Store at www.necanet.org/store or by emailing orderdesk@necanet.org or calling (301) 215-4504.

Title	NECA Index Number
Recommended Practice for Commissioning Building Electrical Systems	NECA90-09
Standard for Installing and Maintaining Switchboards	NECA400-07
Standard for Installing and Maintaining Motor Control Centers	NECA402-14

APPENDIX G: ADDITIONAL NECA RESOURCES

The following publications, referenced throughout the *Manual of Labor Units*, are available through the NECA Store at www.necanet.org/store or by emailing orderdesk@necanet.org or calling (301) 215-4504.

Title	NECA Index Number
Change Order Guidelines for Electrical and Low Voltage Contractors	F3405a
The Effect of Multi-Story Buildings on Productivity	5071-04
The Effect of Temperature on Productivity	5072-04
Factors Affecting Labor Productivity for Electrical Contractors	F3000(R-07)
Impact of Change Orders on Labor Efficiency for Electrical Construction	F9901
Impact of Overtime on Electrical Labor Productivity: A Measured Mile Approach	F3101
Rate of Manpower Consumption	5075-04
Normal Project Duration	5076-04
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Quantifying the Cumulative Impact of Change Orders for Electrical Contractors	F2004

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