Wire Installation Safety & Productivity

Southwire
Wire Installation Foundation

The core principles

Safety + Productivity = Profitability!
System Approach to Safety & Productivity

Tie it all together to create a safer way to install wire and cable
Plan the Work

• Instruct workers to notify their supervisor if they feel a task is beyond their capability or if they feel pain while performing a task

• Have workers start with stretching, gently moving through a range of motions

• Do a job hazard analysis to identify hazardous tasks
Importance of Planning

• Are there heavy materials that will be handled on site?
• Do workers lift more than 50 pounds without help?
• Are there handles to help carry materials?
• Are there carts or dollies available?
• Do any of the job tasks require lifting overhead or working on items above shoulder height? Where will the materials be staged?
• Which tasks use the same motion over and over for more than 1 hour?
• Which jobs require workers to stay in one position for a long time?
• Which jobs require a lot of bending and twisting?
<table>
<thead>
<tr>
<th>Task</th>
<th>Hazard</th>
<th>Protection/Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiving and staging Wire Reels</td>
<td>Back strain, Knees &amp; Hands, crushing injuries, repetitive tasks, crouching/kneeling. Flipping reels upright</td>
<td>Have wire delivered on paralleled, stacked reels. Provide mechanical lifting devices for reels. Eliminate jack stands</td>
</tr>
<tr>
<td>Serving up the pulling head</td>
<td>Hand/wrist sprains &amp; cuts</td>
<td>Provide factory installed pulling heads</td>
</tr>
<tr>
<td>Pulling the wire</td>
<td>Back strain, cuts, high pulling tension recoil, carrying wire on shoulders,</td>
<td>Provide no-lube low friction wire. Use low friction, lighter ropes. Provide easy setup pullers &amp; payoff devices. Provide colored conductors. Get the wire closer to the pull point</td>
</tr>
<tr>
<td>Planning and preparation</td>
<td>Lack of planning creates multiple hazards. Unknown pulling tensions</td>
<td>Use pulling tension and reel size/configuration calculators</td>
</tr>
</tbody>
</table>
SIMpull® Solutions Timeline

Relentless pursuit to make our customer’s jobs safer and more productive through innovation.
Wire Installation System Components

Reduce the number of steps required to install wire & cable

• **Wire Selection**
  – Colored conductors
  – Low Friction Insulation

• **Reel Management**
  – Receiving
  – Handling
  – Setup

• **Pulling ropes**
  – Selecting the right rope
  – Installing & Handling Ropes
  – Low Friction
Wire Installation System Components

Reduce the number of steps required to install wire & cable

• Serving up the Head
  – Taking the knife out of your hands
  – No failed heads

• Making the Pull
  – Safer Wire Pullers
  – Safely controlling the Puller

• Preconstruction Planning
  – Pulling Calculations
  – Planning for Risk Avoidance

• Branch Circuit Innovations
Receiving Reels & Setting Up
6-Men working to set up reels, axles, and jack stands
Setting Up Large Reels

Do you ever have this much room? Do you carry wire on your shoulders?
Time to Serve Up the Head

All hands on deck – Where are the gloves??
Prepping Wire for Making Up the Head

Ouch!! Another injury
Mechanical Pulling Grips

Parts missing, wrong size, not on the jobsite, still using a knife!!
Cross Phased Conductors

Which one is B-Phase?
Wire Selection

• Colored Conductors
• No-Lube Low Friction insulation
• Reduced Pulling Tension & Sidewall Pressures
• Eliminate Cross Phasing
• MV Low Friction Cabling
• Safer Efficient Packing

Do Not LUBE?
Safer Methods to Handle Reels

No more reels on their sides
No More Heavy Lifting
Reels Delivered on Payoff Frames

No setup, no lifting, no reels to dispose of
Get the Reels Closer to the Pull Location

Reels made to fit through a 36” doorway

Reel Size & Weight Planning. Order wire on reels that fit the space
Pre-Installed Pulling Heads

Take the knife out of your hands. Reduced variability
Pre-Installed MV Pulling Heads
Factory installed watertight heads. No moisture in the cable
Paralleled Multi-Circuit Reels – No Setup!

Why Stack It Up?

- Fewer Reels to Dispose
  12 Reels vs. 1

- Improved Productivity
  Less installers standing around guiding cables, keep working to keep job moving forward.

- Improved Safety
  Reduced risk to installers when moving huge reels and heavy cables.

- Reduces Cable Damage
  Compact single reel can be set up right at pull location.

CIRCUIT 1

CIRCUIT 2

CIRCUIT 3

SIMpull HEAD® PULLING GRIPS

PLASTIC WRAP TO PROTECT & SEPARATE LAYERS

SIMpull HEAD® PULLING GRIPS ON ALL CIRCUITS. PULLING GRIPS COVERED WITH A PROTECTIVE OUTER SLEEVE

AVAILABLE ON A-FRAME & MAXISJAX™
Outdoor Payoff Directly From a Truck
New Technology Pulling Ropes
No Stretch, lighter, slicker, faster – Far less pulling tension

170lb Cotton Rope
-or-
50lb Slick Synthetic Rope
Cotton Rope vs Synthetic Rope

Pulling through 12 - 90°’s

Skip a step – No Poly-Rope Needed
Safer Mechanical Pullers and Controllers

• Reduces the strain that would occur from pulling wire manually
• Pull controlled with foot at both ends
Old Way vs New Way
Which would YOU choose!!

6 – Men Required
3 – Men Required
Without Early Advanced Planning

Who measured the door!!! Who planned these pulls???
Put the Reel Close to the Pull Point

Don’t carry wire on your back
Put it Together as a System
180ft, 10-Sets of 4- #600MCM CU in 10-Way Duct Bank

<table>
<thead>
<tr>
<th>Quant</th>
<th>Wire</th>
<th>Labor Unit</th>
<th>Labor Per</th>
<th>Labor Extension</th>
<th>Loaded Rate</th>
<th>Estimated Labor Cost</th>
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</thead>
<tbody>
<tr>
<td>7,200</td>
<td>600mcm CU</td>
<td>38.00 M</td>
<td>273.60</td>
<td>$ 35.00</td>
<td></td>
<td>$ 9,576.00</td>
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</table>

<table>
<thead>
<tr>
<th>Quant</th>
<th>Wire</th>
<th>Labor Unit</th>
<th>Labor Per</th>
<th>Labor Extension</th>
<th>Loaded Rate</th>
<th>Actual Labor Cost</th>
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<tr>
<td>7,200</td>
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<td>18.00</td>
<td>$ 35.00</td>
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<td>$ 630.00</td>
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Labor Savings $ 8,946.00

- Pre-Installed Pulling Heads $ 1,000.00
- Distributor Cut Charges $ 1,000.00
- Reel Frames Cost $ 150.00

Total Additional Cost $ 2,150.00

Net Savings $ 6,796.00
Making a Pull Without Back feeding
Safer and faster

275' of 3-#500 THHN CU & 1-#3 Gnd
3” EMT Conduit with 7 bends!!
### Pull Calculation

Yes – I can make this pull without back feeding

<table>
<thead>
<tr>
<th></th>
<th>Recommended</th>
<th>Not Recommended</th>
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</thead>
<tbody>
<tr>
<td><strong>CU THHN</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>No Lube Required</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colored Wires</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Black with phase tape</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>tension (lbs.)</th>
<th>sidewall pres. (lbs.)</th>
<th>tension (lbs.)</th>
<th>sidewall pres. (lbs.)</th>
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<tbody>
<tr>
<td>139</td>
<td>90</td>
<td>221</td>
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<tr>
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<td><strong>904</strong></td>
<td><strong>20,078</strong></td>
<td><strong>13,014</strong></td>
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<tr>
<td><strong>1,317</strong></td>
<td><strong>904</strong></td>
<td><strong>20001</strong></td>
<td><strong>13,014</strong></td>
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Branch Circuit Management

Why do we care about branch circuits

Feeder Management

70% of Material ($)
30% of Labor ($)

Circuit Management

30% of Material ($)
70% of Labor ($)
Alternatives to Wire Spools

New packaging makes it safer to carry and set up pulls
Branch Circuit Home Run Parallels

Multiple circuits in an easy payoff package – Low friction no-lube wire

- Easy transport and setup
- Less fatigue and back strain
- Fewer men required to pull
- No lube required
- Reduced material handling
- Less waste
- Large quantities in barrels
- Home run circuits
Advance Planning, Proper Tools & Equipment, Best Practices

Keys to a safe and productive job site

Innovative products

Tools

Material handling

Planning applications

Cable Pulling
Contractor Adoption Challenge
If it is so great...why is everyone not doing it this way??

• Resistance to change - old habits
• The comfort zone
• Total Installed cost vs lowest material price
• Lack of planning
• Reallocation of manpower
• Ownership must drive change
Questions & Comments

Southwire