Hydrolake Inc.

- Member of: Utility Supply and Construction Company’s family of businesses along with:
  - Reed City Powerline Supply Co.
  - Crossroads Mobile Maintenance
  - Hydaker-Wheatlake Powerline Construction Co.
- Corporate office in Reed city, MI
- Pole peeler and concentration yard in Grayling, MI
- Wood preservation plant in McBain, MI
Utility Supply and Construction Employs:

- Approximately 600 people in Michigan, Ohio, Indiana, Iowa, Pennsylvania, and Kentucky.

Hydrolake Inc.

- Grayling – Pole Peeler and Wood Yard – 3 employees
- McBain – Treating Plant, Forestry Office, Finished Pole Yard and Logistics – 18 employees
Utility Pole Markets

Hydrolake’s CCA treated red pine utility poles are sold to major electric companies, rural electric associations, and municipal electric companies throughout Michigan.

Some customers you may recognize include:

- Detroit Edison
- Great Lakes Energy
- Cloverland Electric Co.
- Newberry Water and Light
- Presque Isle Electric Co.
- Tri-County Electric Co.
- Marquette Board of Water and Light
- Alpena Power Co.
- City of Holland
- Sebawing Light and Power
- City of Grand Rapids
- City of Bay City
- City of Saginaw
- Lansing Board of Water and Light
Wooden Pole Markets

• Markets for wooden poles remain strong due to:
  • Relative low cost of wood poles compared to concrete, steel and fiberglass alternatives.
  • Ease of overhead installation compared to underground digging and trenching.
  • Multiple services can be strung from one utility pole; such as electricity, cable TV, and telephone lines.
  • Wooden poles can also be used for light poles, pilings for house and marina construction and sign posts.
  • Untreated wooden poles are also used in log home and post and beam construction.
  • Wooden poles are easily climbable with climbing spikes and belt, where concrete, steel and fiberglass poles are not.
  • Wooden poles are a renewable resource where concrete, steel and fiberglass poles are not.
Wood Procurement

• Red pine pole timber is purchased throughout Michigan’s Upper and Lower Peninsulas.
• Pole stock comes off of:
  • MI State Forest and Game Area lands
  • Industrial forest lands
  • Non-Industrial private forest lands
  • Township and school forest lands
  • Ottawa, Hiawatha, and Huron/Manistee National Forests
Procurement Process

1. Stumpage is purchased through MDNR, Forest Service or private timber bids which contain utility pole stock.
2. Stumpage is purchased from private landowners through our private landowner forestry assistance program.
3. Pole stock is purchased on the roadside from independent logging contractors or forestry companies.
4. Prior to harvest, utility pole trees which meet the specifications set forth by the American National Standards Institute are identified and marked for harvest by Hydrolake’s forestry staff.
5. Independent logging contractors and wood haulers are hired to harvest and deliver the poles to our wood yard in Grayling, MI.
<table>
<thead>
<tr>
<th>Class</th>
<th>Minimum circumference at top in</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum circumference at 6 ft from butt in</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of pole ft</td>
<td>Groundline 1) distance from butt ft</td>
<td>22</td>
<td>21</td>
<td>20</td>
<td>19</td>
<td>18</td>
<td>17</td>
<td>16</td>
<td>15</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>20</td>
<td>4</td>
<td>27.5</td>
<td>30.5</td>
<td>28.5</td>
<td>26.5</td>
<td>24.5</td>
<td>22.5</td>
<td>21.0</td>
<td>18.0</td>
<td>14.5</td>
<td>13.0</td>
</tr>
<tr>
<td>25</td>
<td>5</td>
<td>36.0</td>
<td>33.5</td>
<td>31.0</td>
<td>29.0</td>
<td>27.0</td>
<td>25.0</td>
<td>23.0</td>
<td>20.0</td>
<td>15.5</td>
<td>13.5</td>
</tr>
<tr>
<td>30</td>
<td>5.5</td>
<td>39.0</td>
<td>36.5</td>
<td>34.0</td>
<td>31.5</td>
<td>29.0</td>
<td>27.0</td>
<td>25.0</td>
<td>21.0</td>
<td>16.5</td>
<td>14.5</td>
</tr>
<tr>
<td>35</td>
<td>6</td>
<td>41.0</td>
<td>38.5</td>
<td>36.0</td>
<td>33.5</td>
<td>31.0</td>
<td>28.0</td>
<td>26.0</td>
<td>22.0</td>
<td>17.5</td>
<td>15.5</td>
</tr>
<tr>
<td>40</td>
<td>6.5</td>
<td>44.0</td>
<td>41.0</td>
<td>38.5</td>
<td>36.0</td>
<td>33.5</td>
<td>31.0</td>
<td>28.0</td>
<td>25.0</td>
<td>20.0</td>
<td>16.5</td>
</tr>
<tr>
<td>45</td>
<td>7</td>
<td>46.0</td>
<td>43.0</td>
<td>40.0</td>
<td>37.0</td>
<td>34.5</td>
<td>32.0</td>
<td>29.0</td>
<td>26.0</td>
<td>21.0</td>
<td>17.5</td>
</tr>
<tr>
<td>50</td>
<td>7.5</td>
<td>48.0</td>
<td>45.0</td>
<td>42.0</td>
<td>39.0</td>
<td>36.0</td>
<td>33.0</td>
<td>30.0</td>
<td>27.0</td>
<td>23.0</td>
<td>18.5</td>
</tr>
<tr>
<td>55</td>
<td>8</td>
<td>49.0</td>
<td>46.5</td>
<td>43.5</td>
<td>40.0</td>
<td>37.0</td>
<td>34.0</td>
<td>31.0</td>
<td>28.0</td>
<td>24.0</td>
<td>19.5</td>
</tr>
<tr>
<td>60</td>
<td>8.5</td>
<td>51.0</td>
<td>48.0</td>
<td>45.0</td>
<td>42.0</td>
<td>39.0</td>
<td>36.0</td>
<td>33.0</td>
<td>30.0</td>
<td>26.0</td>
<td>21.5</td>
</tr>
<tr>
<td>65</td>
<td>9</td>
<td>53.0</td>
<td>49.5</td>
<td>46.0</td>
<td>43.0</td>
<td>40.0</td>
<td>37.0</td>
<td>34.0</td>
<td>31.0</td>
<td>27.0</td>
<td>22.5</td>
</tr>
<tr>
<td>70</td>
<td>9.5</td>
<td>55.0</td>
<td>51.0</td>
<td>47.5</td>
<td>44.5</td>
<td>41.5</td>
<td>38.0</td>
<td>35.0</td>
<td>32.0</td>
<td>28.0</td>
<td>23.5</td>
</tr>
<tr>
<td>75</td>
<td>10</td>
<td>56.0</td>
<td>52.5</td>
<td>49.0</td>
<td>46.0</td>
<td>42.0</td>
<td>39.0</td>
<td>36.0</td>
<td>33.0</td>
<td>29.0</td>
<td>24.5</td>
</tr>
<tr>
<td>80</td>
<td>10.5</td>
<td>57.5</td>
<td>54.0</td>
<td>50.5</td>
<td>47.0</td>
<td>44.0</td>
<td>41.0</td>
<td>38.0</td>
<td>35.0</td>
<td>31.0</td>
<td>27.5</td>
</tr>
<tr>
<td>85</td>
<td>11</td>
<td>58.0</td>
<td>55.0</td>
<td>51.5</td>
<td>48.0</td>
<td>44.0</td>
<td>41.0</td>
<td>38.0</td>
<td>35.0</td>
<td>31.0</td>
<td>27.5</td>
</tr>
<tr>
<td>90</td>
<td>11.5</td>
<td>60.0</td>
<td>56.5</td>
<td>52.5</td>
<td>48.0</td>
<td>44.0</td>
<td>40.0</td>
<td>37.0</td>
<td>34.0</td>
<td>30.0</td>
<td>26.0</td>
</tr>
<tr>
<td>95</td>
<td>12</td>
<td>61.5</td>
<td>58.0</td>
<td>54.0</td>
<td>50.0</td>
<td>44.0</td>
<td>41.0</td>
<td>38.0</td>
<td>35.0</td>
<td>31.0</td>
<td>27.5</td>
</tr>
<tr>
<td>100</td>
<td>12.5</td>
<td>63.0</td>
<td>59.5</td>
<td>55.0</td>
<td>51.0</td>
<td>45.0</td>
<td>42.0</td>
<td>39.0</td>
<td>36.0</td>
<td>32.0</td>
<td>28.0</td>
</tr>
<tr>
<td>105</td>
<td>13</td>
<td>64.0</td>
<td>60.0</td>
<td>56.0</td>
<td>52.0</td>
<td>46.0</td>
<td>43.0</td>
<td>40.0</td>
<td>37.0</td>
<td>33.0</td>
<td>29.0</td>
</tr>
<tr>
<td>110</td>
<td>13.5</td>
<td>66.0</td>
<td>61.0</td>
<td>57.0</td>
<td>53.0</td>
<td>47.0</td>
<td>44.0</td>
<td>41.0</td>
<td>38.0</td>
<td>34.0</td>
<td>30.0</td>
</tr>
<tr>
<td>115</td>
<td>14</td>
<td>66.0</td>
<td>62.0</td>
<td>58.0</td>
<td>54.0</td>
<td>48.0</td>
<td>45.0</td>
<td>42.0</td>
<td>39.0</td>
<td>35.0</td>
<td>31.0</td>
</tr>
<tr>
<td>120</td>
<td>14.5</td>
<td>67.0</td>
<td>63.0</td>
<td>59.0</td>
<td>55.0</td>
<td>49.0</td>
<td>46.0</td>
<td>43.0</td>
<td>40.0</td>
<td>36.0</td>
<td>32.0</td>
</tr>
<tr>
<td>125</td>
<td>15</td>
<td>68.0</td>
<td>64.0</td>
<td>60.0</td>
<td>56.0</td>
<td>50.0</td>
<td>47.0</td>
<td>44.0</td>
<td>41.0</td>
<td>37.0</td>
<td>33.0</td>
</tr>
</tbody>
</table>

**NOTE** - Classes and lengths for which circumferences at 6 feet from the butt are listed in boldface type are the preferred standard sizes. Those shown in light type are included for engineering purposes only.

1) The figures in this column are intended for use only when a definition of groundline is necessary in order to apply requirements relating to sound, straightness, etc.
# RED PINE POLE SPECIFICATIONS

<table>
<thead>
<tr>
<th>POLE SIZE</th>
<th>TRIM</th>
<th>TOTAL LENGTH</th>
<th>CIRCUM. RANGE @ 6'</th>
<th>TOP DIAM RANGE</th>
<th>ALLOWABLE SWEET 6&quot; TO TOP</th>
<th>SUM OF KNOTS OVER 5&quot; IN ANY 1&quot; SECTION</th>
<th>MAX. SINGLE KNOT IN POLE LENGTH</th>
<th>TOP 1/2</th>
<th>BOTTOM 1/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>25'</td>
<td>24&quot;</td>
<td>37'</td>
<td>38.0&quot; - 41.5&quot;</td>
<td>6&quot; - 8&quot;</td>
<td>2.9&quot;</td>
<td>8&quot;</td>
<td>4&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
</tr>
<tr>
<td>40'</td>
<td>24&quot;</td>
<td>42'</td>
<td>38.0&quot; - 44.9&quot;</td>
<td>6&quot; - 8&quot;</td>
<td>3.4&quot;</td>
<td>8&quot;</td>
<td>4&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
</tr>
<tr>
<td>45'</td>
<td>24&quot;</td>
<td>47'</td>
<td>43.0&quot; - 46.9&quot;</td>
<td>7&quot; - 8&quot;</td>
<td>3.9&quot;</td>
<td>8&quot;</td>
<td>4&quot;</td>
<td>2&quot;</td>
<td>2&quot;</td>
</tr>
<tr>
<td>50'</td>
<td>24&quot;</td>
<td>52'</td>
<td>47.0&quot; - 54.0&quot;</td>
<td>8&quot; - 9&quot;</td>
<td>4.4&quot;</td>
<td>10&quot;</td>
<td>6&quot;</td>
<td>4&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>55'</td>
<td>24&quot;</td>
<td>57'</td>
<td>50.0&quot; - 57.0&quot;</td>
<td>8&quot; - 9&quot;</td>
<td>4.9&quot;</td>
<td>10&quot;</td>
<td>6&quot;</td>
<td>4&quot;</td>
<td>4&quot;</td>
</tr>
</tbody>
</table>

Poles must be free of: crooks, rot, insect damage, fire damage, lighting damage, and previous logging damage.

In a double sweep, thebole of the pole must stay within a straight line drawn from the midpoint at ground line (6" from the butt) to the midpoint at the top allows 1" each side for bark and peeling loss.

Revised: 2-9-09
Unacceptable Defects in Red Pine Utility Poles

- Crooks
- Sweeps
- Rot
- Insect Damage
- Fire Damage
- Lightning Damage
- Previous Logging Damage
- Excessive Limb Diameters
Red Pine Pole Management/Marking Guidelines

- **First Thinning**
  - Should take place at approximately 30-35 years of age when basal area reaches 180-200 sq ft.
  - Natural self pruning/die-off of tree limbs at least 30 ft above ground is desirable. If natural pruning isn’t up to 30 ft at age 30, it is preferred to let the stand grow another 5 years.
  - Remove every fourth row to provide skidding access, and selectively mark grossly defective trees for removal.
  - If there is less than 6’ of space between rows, it will be necessary to cut two rows for skidding access.
  - Goal is to reduce basal area to 120-140 sq ft.
  - If plantation has 80% + of potential produce poles, removing every third row may be considered.
  - Natural red pine stands should be selectively logged due to uneven tree spacing.
  - Large size utility poles (40, 45, 50) should be harvested along with all over-mature suppressed and defective trees.
  - No more than 40% of pre harvest basal area should be removed.
Red Pine Pole Management/Marking Guidelines

• Second Thinning
  • Should take place 7-10 years after the first when basal area has returned to 180-200 sq ft.
  • This will only be a selectively marked thinning.
  • Focus on marking damaged, defective, and suppressed trees and any 40 ft + poles.
  • Goal is to remove 30+/–5% of basal area. Leaving 120-140 sq ft.
  • If natural stand is premature (14” or less average diameter) only remove 40% of basal area.
  • If stand regenerates naturally and/or there are many large poles, may thin heavier.
Red Pine Pole Management/Marking Guidelines

- Third Thinning
  - Should be mainly selection of larger class size utility poles (40, 45, 50).
  - The amount of basal area removed is dependent on number of mature poles.
  - Do not want to remove good quality future poles to reach set basal area production, and do not want to limit to 30+/-5% basal area reduction if more poles exist for harvest.
  - Not necessary to carry a high residual basal area as 140 sq ft as pole height potential and wind firmness should already be established.
Red Pine Pole Management/Marking Guidelines

• Fourth Thinning
  • Should essentially be removal of utility poles.
  • Young hardwood and natural red pine regeneration should start to become established by this thinning.
  • Thought should be given towards regeneration of the site at this time.
  • Heavy thinning to promote growth of the understory might be beneficial.
Red Pine Pole Management/Marking Guidelines

- Regeneration
- Consists of removal of all trees in the overstory to release natural regeneration or prepare for re-planting.
- Necessary to mechanically prepare site and spray herbicide if replanting red pine.
- Planting at 6’x8’ or 7’x7’ is most ideal for establishing red pine poles.
Pole Treating Process

• Poles are peeled and dried to 15% to 25% moisture content, removing all the free water from the wood cells, but leaving the bound water in the cell walls so that the pore openings remain flexible.
• Poles are framed and branded according to customer specifications.
• 60% chromated copper arsenate concentrate is mixed with water to make a 2% treating solution.
• Poles are loaded onto the tram and pushed into the pressure treating vessel.
Pole Treating Process

- Once sealed in the treating vessel, a vacuum of 24 inches of mercury is run to evacuate all of the air from the wood cells making room for treating solution (15 mins).

- Treating vessel is filled with 2% solution while still under vacuum.

- After vessel fills with solution, it is pressurized to 190 PSI for 45 minutes to 1 hour in order to impregnate all of the cells in the sap wood with treating solution.

- After the pressure is released, all of the extra solution is recovered into the work tank.
Wood Treating Process

• After the cylinder is drained and pressure equalized, another vacuum of 26 inches of mercury is run to remove excess treating solution from the wood cells (30 mins to 1 hr).

• After the poles are removed from the vessel, they are bored to check for adequate chemical penetration and retention of 0.6 lbs/cu. ft.

• The poles are then placed in a fixation chamber for at least 8 hours to fix the CCA to the wood cells making it 99.9% leach resistant.