

## SAME STRENGTH AND LOWER COST

In today's environment, utilities continue to be confronted with budget constraints, limited resources and strict environmental criteria. While structural shapes have a history of strength and can have their place in low-profile or low-voltage situations, their complexity and bulk can become unwieldy. However, tubular structures provide the same strength with significantly less weight, fewer bolts and lower cost.

Affording flexibility and providing strength in engineered substation structures is the cornerstone at Valmont<sup>®</sup> Utility. Our designers and engineers have determined that tubular structures are especially beneficial for dead ends, those final structures that hold the largest loads. Installers have found that, because our designs use fewer bolts, assembly is efficient, with less room for error onsite.



### Substance Comes Standard

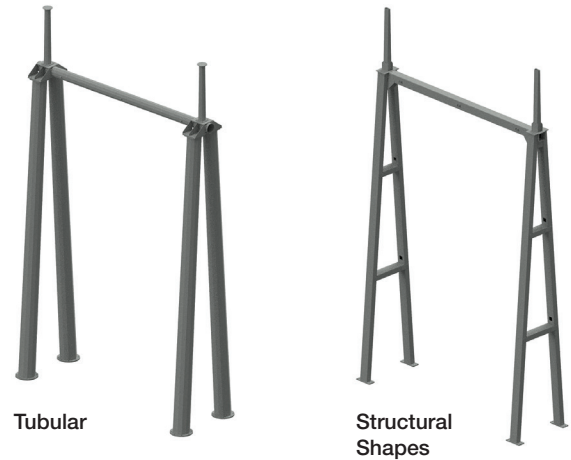
Larger kV structural shapes are typically special order, adding additional time and increasing cost per pound. Valmont Utility gives substance to each structure through consistency in design, flexibility in connection and provides tubular builds with higher kV ratings (230kV – 765kV) setting the industry standard.

### TUBULAR STRUCTURES VS. STRUCTURAL SHAPES FOR SUBSTATION TERMINATIONS & DEAD ENDS

- Up to 50% lighter
- Generally simpler connections for fewer joints
- Higher stiffness per pound
- High torsional rigidity
- No weak axis bracing
- Fewer foundations and reduced number of members
- Faster erection and assembly
- Easier access
- Reduces forces from wind
- More flexibility in design

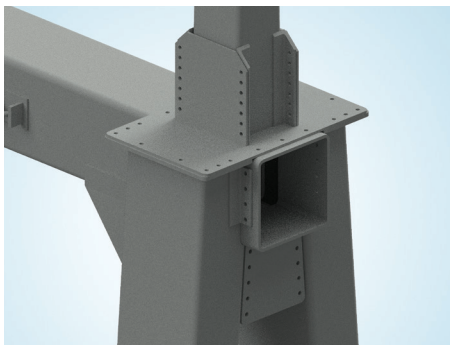
# FLEXIBILITY: LESS WEIGHT. LOWER COSTS.

Because tubular structures provide a large strength-to-weight ratio, less material is used to get a light, strong structure. Closed sections of tubular structures provide excellent torsional and translational stiffness, which allows utilities greater design and layout flexibility, with larger dead end take-off angles and higher tensions.

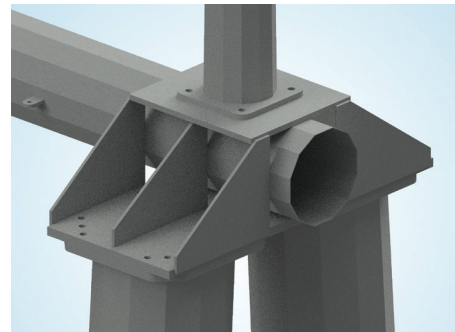


# COST CONTAINMENT IS NOT A DEAD END

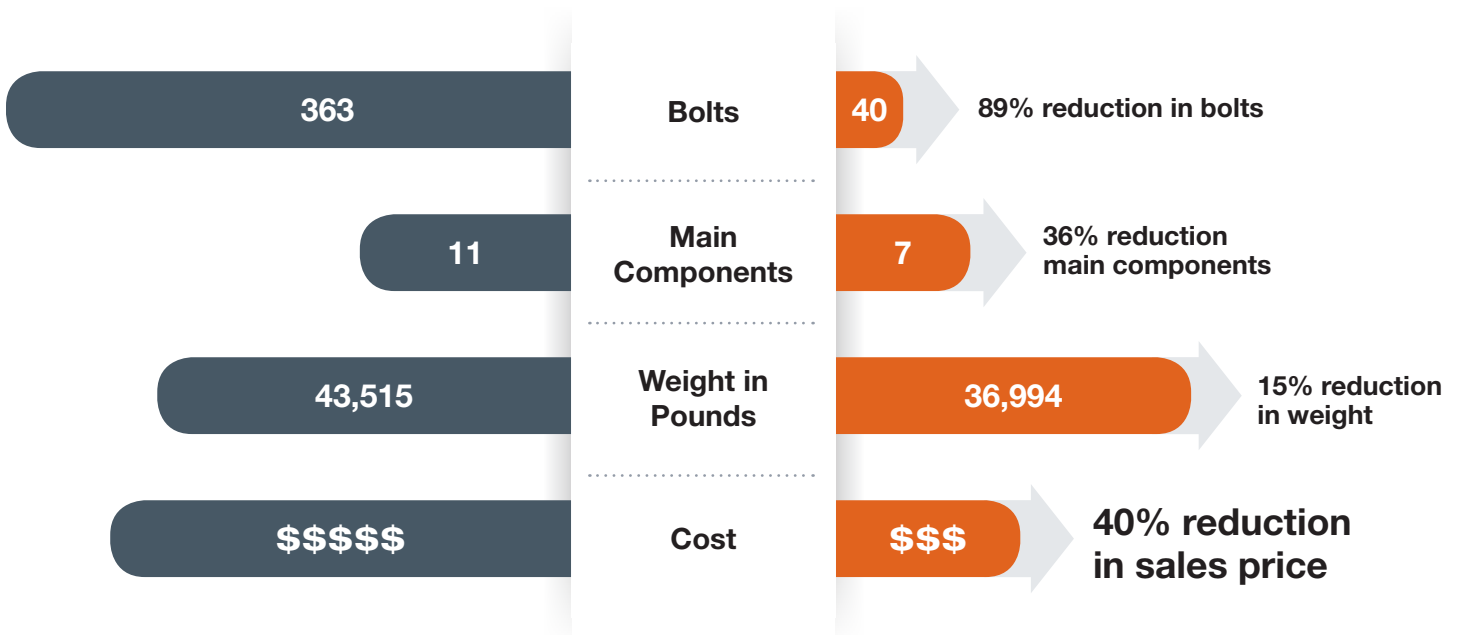
## 1-Bay A-Frame Design Comparison



**STRUCTURAL SHAPE DESIGN**



**TUBULAR FLANGE DESIGN**



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