

Installation Analysis of Line Voltage vs Low Voltage LED Lighting



METHODOLOGY

An independent study by Inglett & Stubbs, a premier electrical contractor experienced in digital infrastructure, examined the speed and cost impact of installing low voltage vs. line voltage lighting in a 40,000 SF hyperscaler data hall.

LOW VOLTAGE PARAMETERS

- Scope
 - 40,000 sf
 - 272, 4' & 8' LANTANA LED Edge remote fixtures
 - 14 pre-configured remote driver units (RDU)
 - Low voltage
- Materials
 - #18/5 & #18/2 low voltage wire
 - RDU mounting & in-wall cable runs to j-hook
 - J-hooks
 - Onboard sensors for some fixtures
- Costs
 - Materials & Package = \$244,687
 - Direct Labor = \$218,745

LINE VOLTAGE PARAMETERS

- Scope
 - 40,000 sf
 - 272, 4' & 8' LED LANTANA LED Edge integral fixtures
 - Onboard drivers (included in fixture)
 - Line voltage
- Materials
 - #10 wire, daisy-chained
 - Conduit
 - Onboard sensors for some fixtures
- Costs
 - Materials & Package = \$226,588
 - Direct Labor = \$238,102

FINDINGS

The study discovered a slight overall cost saving. However, the most significant finding is the opportunity for faster project completion or smaller crew sizes using low voltage. Leveraging prefabrication, pre-zoning, and pre-wiring, the contractor predicted a time savings of 1.38 hours per fixture.

Material & Package Cost Differential	\$18,099
Direct Labor Cost Differential	(\$19,357)
Total Costs Savings with Low Voltage	\$1,285
Total Labor Time Savings with Low Voltage	375 hours
Total Time Savings per Fixture	1.38 hours

CONCLUSION

As the labor market continues to constrict for data center construction, low-voltage lighting provides overall cost and labor savings. Electrical contractors can install faster, leveraging the prefabrication benefits of low voltage, by turning over key components faster or delivering the same excellence with smaller crew sizes. For less cost and a faster turnover, owners are able to capitalize on the intrinsic benefits of low-voltage lighting:

- Risk Management: Maintenance and operations use a centralized, wall-mounted AC-to-DC conversion location for improved safety for employees and equipment.
- Flexibility: Low-voltage lights can be easily moved or reinstalled for future-proofing.
- Faster and Safer Response: Lock-out/tag-out procedures are not required for low voltage as it is less than 50VDC.
- Thermal Management: Low-voltage lighting generates less heat with drivers relocated away from hot aisles.
- Increase Capacity: Reduced kW on lighting and cooling, gives capacity back to the owner.
- Efficiency/Sustainability: Low-voltage lighting offers minimal power consumption and long lifespan, significantly reducing energy usage.

The study is based on direct labor and materials only using current market rates, subject to change, and should not be considered as pricing for future projects. Low voltage uses structured cable and J-hooks in lieu of power strut.