

# Hard Bid | Fixed Priced Expansion of Facilities & Infrastructure



**National Renewable Energy Lab:  
NWTC Site Improvements/Substation**

18200 CO-128  
Boulder, CO 80303

**Construction:**

Start: January 2017  
Completed: April 2020

**Contract Price:**

Initial: \$3,153,925  
Change Orders: \$3,605,163\*  
Final: \$6,759,088  
\*Owner Requested Additive Scope & Phases

**Delivery Method:**

Hard Bid | Fixed Price

**Objective:**

Offer the expanded facilities and infrastructure needed by researchers to validate multiple technologies at scale (10-20 MW) and achieve an integrated energy system to meet the complex energy challenges of the future through construction of a 115 kilovolt transmission line between a new Flatirons Campus substation and an Xcel energy switch yard. NREL also set plans in motion for a new 19.9-megawatt-capacity Controllable Grind Interface (CGI). These upgrades will enable the energy systems of the future.

**References:**

Kiley Taylor  
NREL  
303.275.4631

Brian Cox, Project Leader  
NREL  
303.384.7375

**Design Team:**

Martin/Martin  
Atwell  
NREL Site Operations

**Key Staff:**

Scott Solem, VP of Operations & Project Executive  
Dave Armstrong, Project Manager  
Brad Myers, Superintendent

## Project Description

This was a multifaceted, multi-phased project that included civil improvements such as site drainage and paving, a new salt storage pad, demolition and replacement of a 24" thick concrete slab at the 5 MW Dyno Building, extended sewer, gas, fire water lines and hydrants, and asphalt paving. In addition, there were three phases of new electrical service work including the Phase 1 Substation and Power Transformer T1 115kV with 1.5 miles of new underground feeder lines to feed electrical service for the entire 325 acre campus. Phase 2 doubled the substation size adding another T2 115kv Transformer and associated bus. Phase 3 was over 1.5 miles of 115kV Transmission lines.

## Project Challenges

The campus does not have water sources other than what is brought in by NREL for its use. All contractors imported water for construction use for the duration of the project. The ground in this area is extremely rocky, making it challenging to drill concrete piers.

## Project Accomplishments

Sun successfully executed the lift of a 120,000 lb switch gear building and installed over 40 concrete piers up to 8' in diameter and 22' deep.

