

Case Study: Public Art Projects at Substations

Substations

An electrical substation is a subsidiary station of an electricity generation, transmission, and distribution system where voltage is transformed from high to low or the reverse using transformers. A transformer is a device that transfers electrical energy from one circuit to another through conductors. Substations may be on the surface in fenced enclosures, underground, or located in special-purpose buildings. Substations do not usually have generators, although a power plant may have a substation nearby. High-rise buildings may have indoor substations. Indoor substations are usually found in urban areas to reduce the noise from the transformers, for reasons of appearance, or to protect switchgear from extreme climate or pollution conditions.

Distribution substations transfer power from the transmission system to the distribution system of an area. It is uneconomical to directly connect electricity consumers to the high-voltage main transmission network, unless they use large amounts of energy; so the distribution station reduces voltage to a value suitable for local distribution. The electricity outputs are feeders (power lines) which run overhead or underground (in cities) to power the distribution transformers nearby the customers.



View substation along
14th Avenue South

Nashville Electric Service (NES) Substations

The NES operates 238 distribution substations in Davidson County. This case study is focused on substations in downtown Nashville and in areas with heavy pedestrian traffic. There are important safety guidelines outlined in the National Electric Safety Code (NESC) and the IEEE Guide for Fence Safety Clearances. Below are the basic guidelines:

- o Electric supply conductors or equipment must be enclosed by fences, screens, partitions, or walls with a height no less than 2.13 meters (7 feet)
- o Entrances not under observation should be locked at all times signs must be displayed at each entrance and/or side of fence

Downtown Nashville Vicinity



Substation at Demonbreun and 6th Avenue, Nashville



Substation at Broadway and 10th Avenue, Nashville

Watkins Park Neighborhood



Substation located on Jo Johnston Avenue and Dr DB Todd Jr. Boulevard



View of substation from Jo Johnston Avenue



View of substation from school parking lot on Dr. DB Todd Jr. Boulevard

What is Public Art?

The term public art refers to any art or design that has been created specifically to be sited in the public domain. All forms of public art attract attention and heighten our awareness of and encourage our interaction with public space. Public art has a very positive impact on a community and it helps to define and reveal the unique character of a specific neighborhood.

Metro Nashville Arts Commission

“The purpose of the public art program is to strengthen the positive reputation of the community, enhance the civic environment, and enrich the lives of citizens and visitors through the involvement of professional artists to integrate public artwork throughout Metropolitan Nashville and Davidson County.”

Benefits of Public Art for Community

- Creates new understanding and function of substations
- Enhance visual presence of substation within community
- Engage community members in the process and character of the art
- Strengthens sense of connectivity and neighborhood ownership within the community
- Potential decrease in crime in the area surrounding the substation

Benefits for Nashville Electric Service

- Involvement in downtown redevelopment
- Collaboration with art and culture organizations, local artists, and community members
- Possibility of receiving funding for the public art project
- Enhance connection with communities
- Opportunity to inform and education citizens about substations and the role of NES in communities
- Contribute to and support Nashville’s cultural tourism

Examples of Public Art in Nashville



Community mural in East Nashville



Mural behind Downtown Presbyterian Church (5th Ave and Commerce Street)



Community mural along Rosa Parks Boulevard

Examples of Public Art and Alternative Designs at Substations

Georgia Tech Power Wrap—Decatur, GA

- Designed by Amy Landesberg Architects, LLC, in collaboration with Georgia Tech University engineering faculty and students
- Positioned along I-75 in front of a substation near Georgia Tech University.
- Project Size: 480-foot-long linear enclosure; 20 feet to 24 feet high; 1.5 acres
- Materials: “Louver wrap” (mild steel bars mostly powder coated with a thermo-elastic coating); programmable LED lighting
- There are four full height hydraulically operated gates camouflaged by the fluctuating steel pattern. There is no opening greater than 3” opening.
- Approximate cost: \$1,000,000
- Funded by Georgia Technical University
- Recipient of 2007 AIA Merit Award



Color lights enhance visual affects at night



Detail of slotted, steel wall

Roosevelt Park Substation—Anaheim, CA

- Designed an underground electric substation using Gas Insulated Switchgear (GIS) with a 2-acre park on top that serves the community
- Collaboration of three companies: Siemens, a worldwide supplier of GIS equipment; Turner Construction, a general contracting firm; and BETA Engineering, a highly experienced specialty electrical engineering firm
- Approximate cost: \$19.5 million
- Funded by the city of Anaheim



Construction of substation enclosure



Roosevelt Park conceals substation enclosure

1982 Knoxville World's Fair Substation

During the 1982 World's Fair in Knoxville, the KUB Substation—positioned next to the theme center—was decorated and incorporated into the Fair's theme about energy. In 2000 the substation was removed and replaced by a new convention center.



Substation decorated with paint

In 2000, the 69-kV substation was removed for construction of a high profile convention center on that site. A new indoor gas-insulated substation, set 20-feet below grade, was positioned near to the convention center. An attractive 10 to 12-foot retaining wall encloses the entire facility. The wall is made from Tennessee marble and brick interspersed with iron and the surrounding landscape consists of dogwood, magnolia, and oak trees and flower beds, a decision made with input from the local community.



Dagenham Substation—Dagenham, England

- Designed by Jason Burges Studio, London, England
- Project features digital light installations, artistic fencing, and buffer zone
- Approximate cost: N/A
- Commissioned by London Development Agency and Scottish and Southern Electricity



Viewland/Hoffman Substation—Seattle, WA

- Designed and constructed Andrew Keating, Sherry Markovitz, and Lewis Simpson, in collaboration with ARC Architects
- Artists Emil and Veva Gehrke designed art in the whirligig garden
- Project included mural on the interior wall, color-coded electrical equipment, and an artwork key to describe the function of each part
- Materials included painted steel, aluminum, and found objects (hubcaps, hard hats, dust pans, and washing-machine parts)
- Approximate cost: N/A



View of substation fence with art installation



Protected walkway allows visitors to walk through the substation



A background mural and painted components energize the substation

Broad Street Substation—Seattle, WA

- Artist Carolyn Law was part of a team that designed the annex facility and made changes to existing yard to unite the two facilities
- Project includes two 12'H x 75'W sections of fencing; one section was for car commuters and the other for pedestrians
- Approximate cost: \$100,000
- Funded by the Seattle Arts Commission and City Light



Examples of other Public Art Projects

Valley Traverse Overpass—Kent, OR

- Artist Carolyn Law redesigned the existing overpass barrier fencing to related to the natural landscape
- Fencing is 120'W x 12'H x 40'D
- Materials include steel, custom colored cyclone fencing, concrete stain
- Approximate cost: \$100,000 to \$150,000
- Funded by the Kent Public Art Program



Holly Street Power Plant—Austin, TX

- Local artist created overall plan for mural and community members helped paint
- Mural was painted on perimeter wall
- Commissioned by Austin's Art in Public Places (AAIP)



Utility Box Project—Los Angeles, CA

- Joshua Callaghan covered nine utility boxes in Culver City with photos of the space prior to the existence of the boxes
- Approximate cost: \$10,000 for nine boxes
- Commissioned by Los Angeles Art Department of Public Art and Historic Preservation
- 2004



Opportunities for Public Art Projects at Nashville Substations

Edgehill Neighborhood

The Edgehill substation, located on 14th Avenue South and Horton Street, is a good example of an opportunity for a community public art project. Instead of placing red brick on the cement wall or leaving the concrete wall as is, community members and artist(s) could design and paint a mural reflecting the values and characteristic of the neighborhood. The NES could engage the Nashville Civic Design Center and the Metro Nashville Arts Commission (MNAC) to help facilitate the project and reach out to Edgehill community leaders.



East Nashville Neighborhood

The substation behind East Nashville High School has a strong visual presence in the surrounding community. Each side of the substation fronts a school, residential community, or recreational space. This would be a prime opportunity to engage the community, especially the schools, to participate in a public art project to enhance the visual appearance of the substation. In addition, the project could involve an educational component to inform the students as to why the substation is located in the neighborhood and what it provides to the community.



Substation located on Finn Street, behind East Nashville High School



North side of the substation faces the high school track

Nashville Civic Design Center—Mission Statement

Founded in 2000, the Nashville Civic Design Center is a nonprofit organization whose mission is to elevate the quality of Nashville's built environment and to promote public participation in the creation of a more beautiful and functional city for all.