Designing Underground for Large Subdivisions

**JUNE 16–18 • TEC GEORGETOWN TRAINING FACILITY**
Register by May 15

Tuesday–Thursday: 9 a.m.–4 p.m.

This course covers underground line design and subdivision layout; construction contracts; sizing transformers and conductors; and basic sectionalizing and line equipment.

Class limited to 20 attendees.

To register online, go to texas-ec.org.
DESIGNING UNDERGROUND FOR LARGE SUBDIVISIONS
June 16–18 • TEC Georgetown Training Facility, 100 Cooperative Way, Georgetown

COURSE INFORMATION

Course Description
This three-day program is designed to educate experienced engineers, staking technicians and line foreman with the techniques needed to design underground distribution service to small and large subdivisions. The course is divided into 5 sections: How and where to underground, designing low voltage systems, laying out primary cable, using junction cabinets/sectionalizing cabinets, and designing in large subdivisions.

Prequisites
Attendees should be familiar with underground components, elbows and terminators, and the installation techniques. Some knowledge of overcurrent protection theory is necessary when designing the placement and use of switchgear.

Participants will learn to:
• Design secondary systems within the voltage drop limit between the transformer and the meter.
• Design secondary systems within the voltage flicker limit between the transformer and the meter.
• Correctly size transformers to serve prospective residential dwellings within a subdivision.
• Loop transformers within a subdivision to meet reliability goals, provide adequate load balance, and meet the limitations of the installation method used.
• Perform load calculations in amps and kW for the load within the subdivision for sizing cables and switchgear for normal operation and back feed scenarios.
• Identify the types and uses of switchgear and sectionalizing cabinets.
• Utilize various techniques in selecting routes for the main line cables to meet reliability goals.
• Utilize techniques for selecting locations for switchgear and sectionalizing cabinets.

Continuing Education Units and Continuing Professional Education Hours
This course may be eligible for CEUs or CPEs, depending on the governing body. Upon request and completion of the entire course, TEC will provide a certificate of completion to participants that may be used to apply for CEUs/CPEs.
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COURSE OUTLINE

Part 1: How and Where to Underground
A. Desire to underground
B. Underground system limitations
C. Services
   1. Typical conductor size
   2. Locating the meter
   3. Installation options
D. Secondary layout options
   1. Transformer to pedestals
   2. Transformer to pedestals across the street
   3. Transformer directly to 4-6 services
   4. Sizing secondary conductor
E. Locating equipment
F. Locating cables
G. Other conflicting structures

Part 2: Designing Low Voltage Systems
A. Overview of design guide
B. Transformer sizing
C. Voltage flicker
D. Voltage drop
   1. ANSI C84 requirements
   2. Design guide form

Part 3: Laying Out Primary Cable
A. When to loop
B. Determining load on loop or number of transformers
C. Balancing the load on the phases
D. Best practices in cable layout
E. Two example subdivisions
F. How cable installation affects design
   1. Direct buried design or CIC design
   2. Cable to be installed in conduit

Part 4: Using Junction and Sectionalizing Cabinets
A. Defining the cabinets
B. Primary junction
C. Suitable locations
D. Use to serve lift stations
E. Locate in back of development

Part 5: Designing in Large Subdivisions
A. Prospective load calculations
B. Selection of main feeder
   1. Concept of single contingency
   2. 200 amp versus 600 amp feeders
   3. Converting prospective load to load current
   4. Looping the main feeder
C. 600 amp/200 amp switchgear
   1. Defining the cabinets
   2. Types available
   3. Suitable locations
   4. Using switchgear back-to-back
   5. Double lugging on tap points
D. Class problems

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### Registration Form

Register by May 15. Click here to register online.

Please print clearly. One registration form per attendee. Duplicate as necessary.

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### Registration Fees (all include lunch)

- **Member Registration**: $1,095 per person
- **Group Rate for 4 or More Employees**: $995 per person
- **Nonmember Registration**: $1,195 per person

**Note**: Cancellations received two weeks prior to the start of the workshop are fully refundable. Any cancellations received after this date will be issued a refund minus $175 cancellation fee. Substitutions are accepted. No shows and registrants failing to cancel prior to the first day of the workshop are responsible for paying the full registration fee.

Signature

Register online or email completed form to brobertson@texas-ec.org.

Questions: Brooke Robertson, (512) 486-6212 or brobertson@texas-ec.org

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**Training Location**: TEC Georgetown Training Facility
100 Cooperative Way, Georgetown 78626, (512) 868-8610 or 1-877-868-8610

**Suggested Places To Stay**: Attendees are responsible for making their own hotel room reservations.

- **Holiday Inn**
  - 2370 Chisholm Trail
  - Round Rock 78681
  - (512) 246-7000
  - $89, includes hot breakfast

- **Hilton Garden Inn Round Rock**
  - 2310 North Interstate Hwy 35
  - Round Rock 78681
  - (512) 341-8200
  - $121, includes hot breakfast

- **Courtyard Austin Round Rock**
  - 2700 Hoppe Trail
  - Round Rock 78681
  - (512) 244-1457
  - $103; Use code X58

- **Hampton Inn & Suites Georgetown**
  - 160 River Oaks Cove
  - Georgetown 78628
  - (512) 688-5300
  - $119, includes hot breakfast