

# Southern Company

## Modular Standards and Substation Model Structure

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# Class summary

This session will be an overview of Standards at The Southern Company as well as a introduction to our modular concept, development of substation models and our take on high levels of customer service.

# Key learning objectives

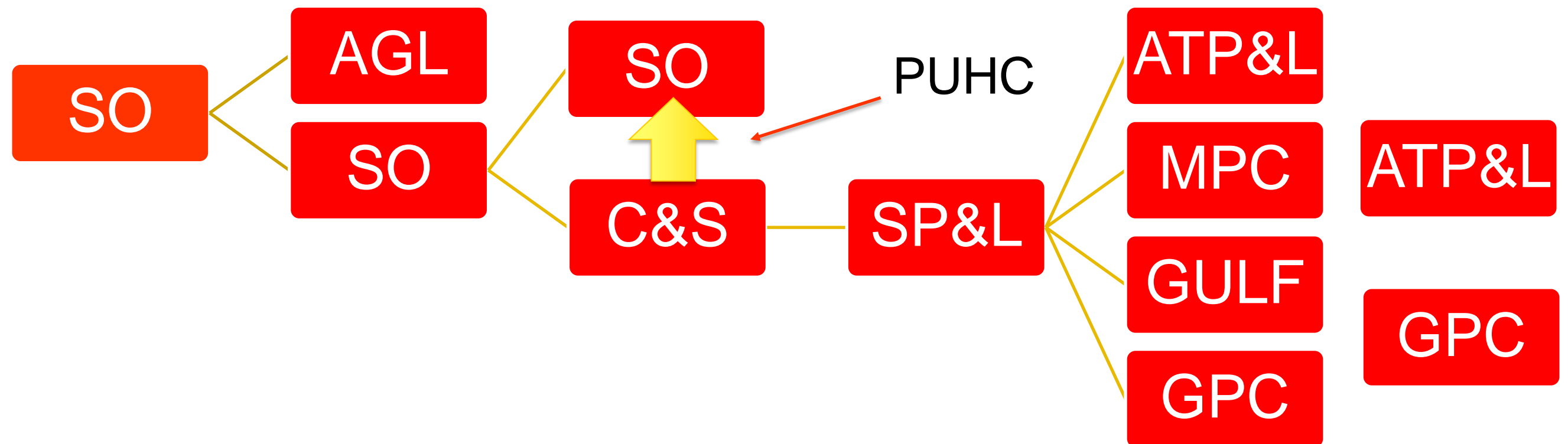
At the end of this class, you should have an understanding of:

- History of Southern Company
- Standards development at Southern Company
- Modular Standards
- Insight into the structure of models
- Recognizing importance of customer needs.

# History of Southern Company



# History of Southern Company



PRESENT-----2016-----1945-----1930-----1924-26-----1902-06

# SoToday

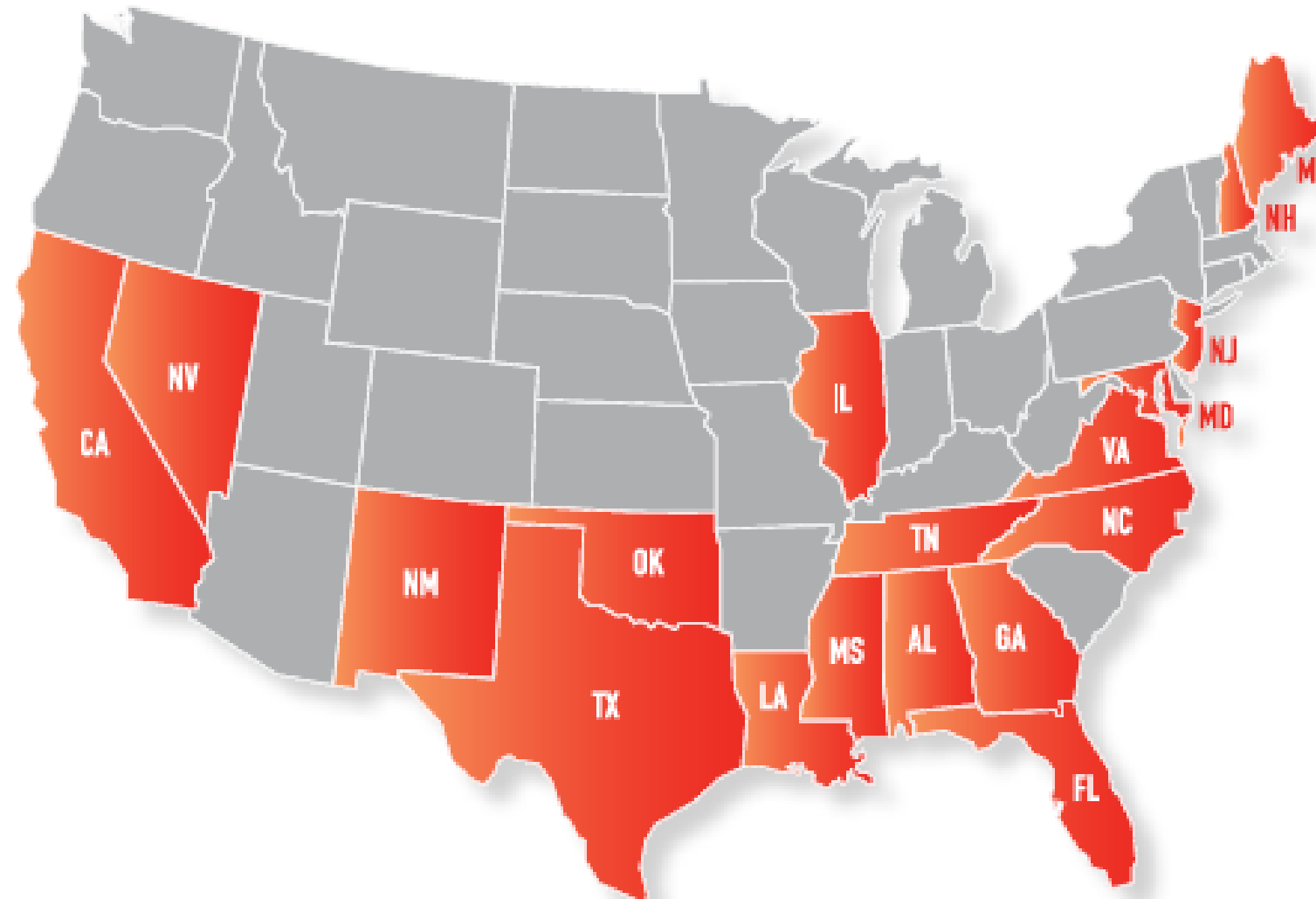
## Over 3200 Transmission and Distribution Substations

APPROXIMATELY  
**44,000 MW**  
OF GENERATING  
CAPACITY

NEARLY  
**200,000**  
MILES OF  
POWER LINES

MORE THAN  
**80,000**  
MILES OF NATURAL  
GAS PIPELINES

**190 Bcf**  
OF NATURAL GAS  
STORAGE CAPACITY



OPERATIONS IN  
**18 STATES**

**11**  
ELECTRIC & NATURAL  
GAS UTILITIES

**32,500**  
TOTAL EMPLOYEES

**9 MILLION**  
UTILITY CUSTOMERS

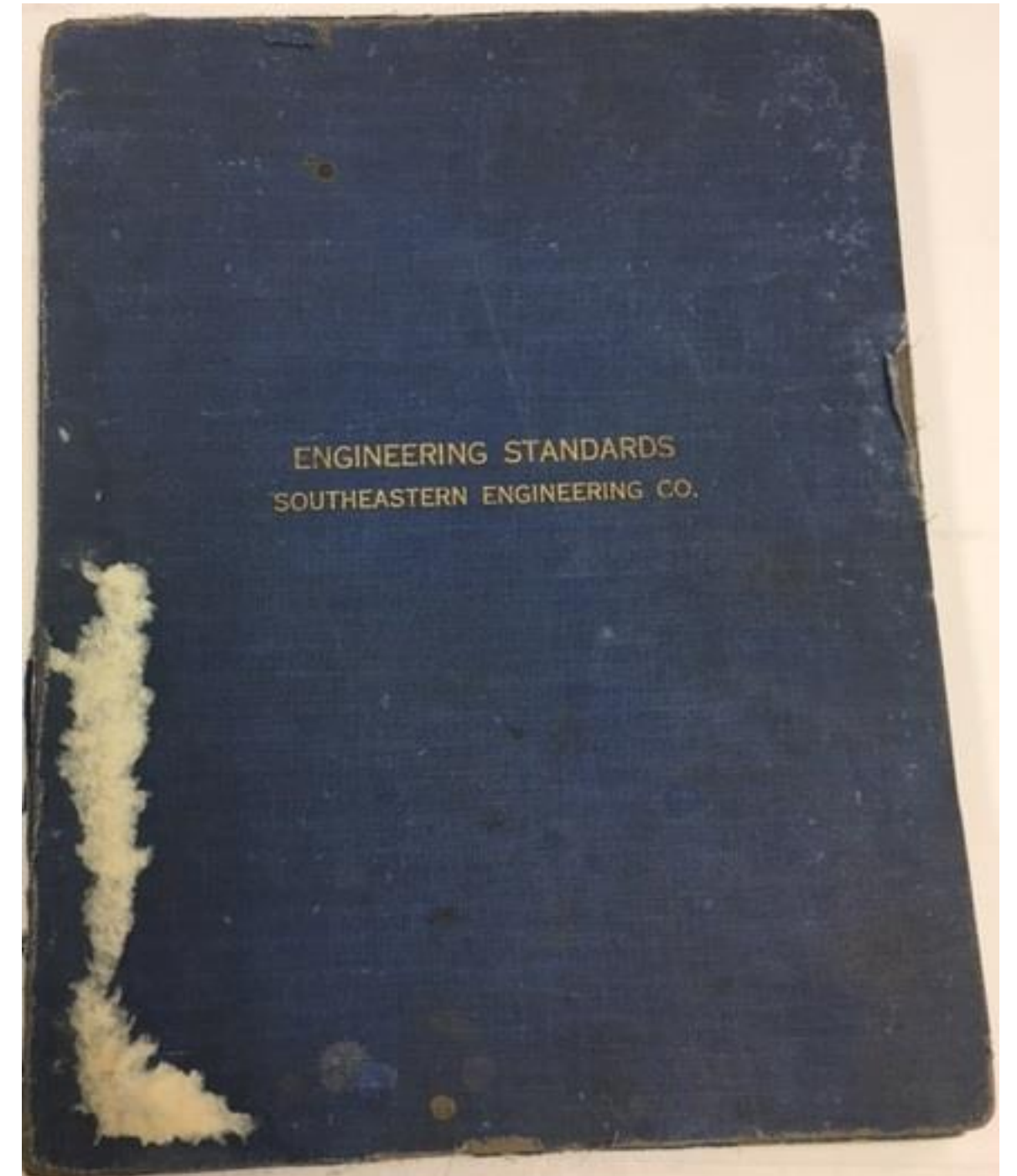
MORE THAN  
**1 MILLION**  
RETAIL CUSTOMERS

# History of Standards Southern Company



# History of Standards at Soco

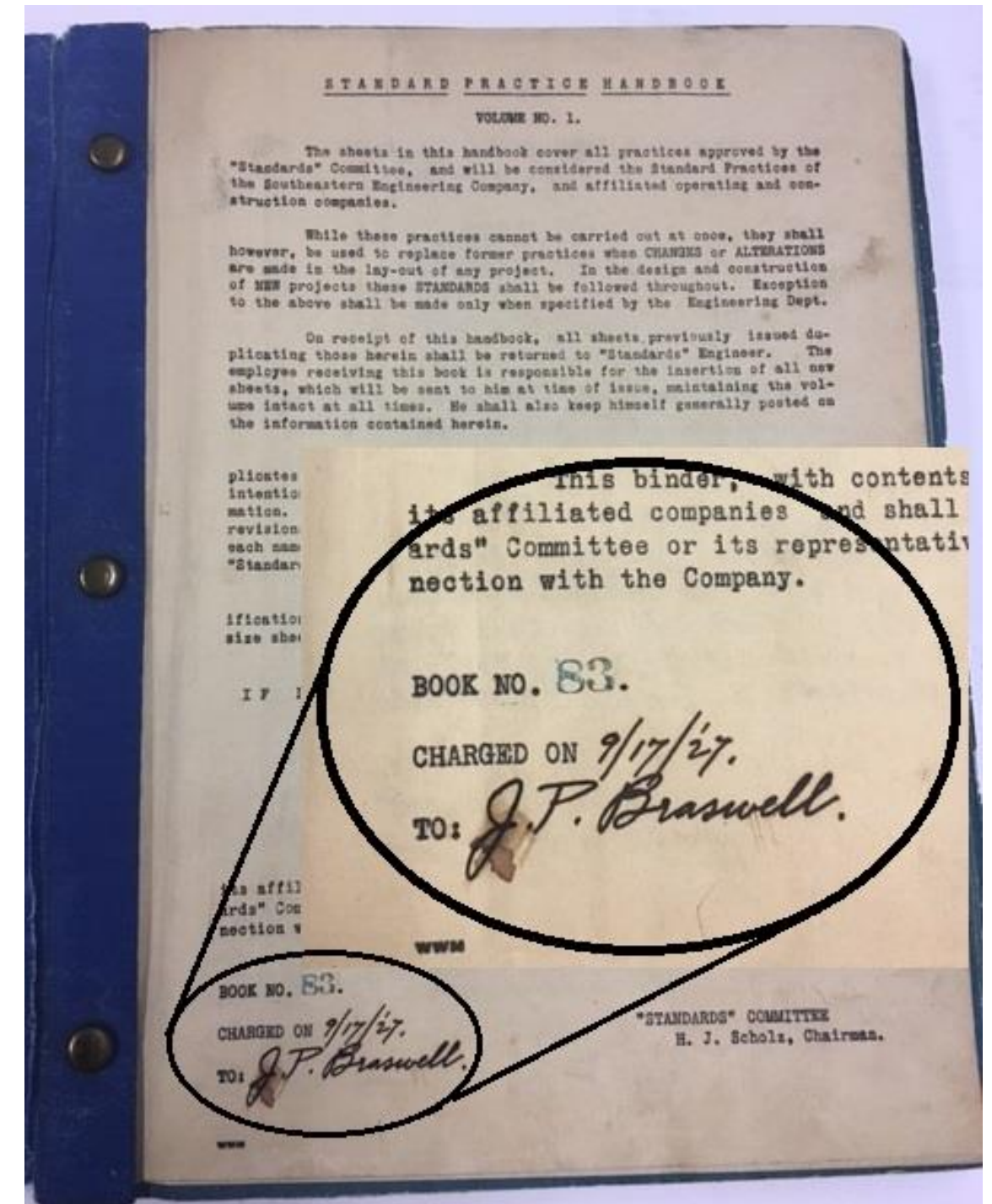
- **Southern Company back in 1924 was known as Southeastern Power and Light. A long history of supported standards.**
- **Engineering Standards book issued in 1927**





# History of Standards at Soco Off and On again

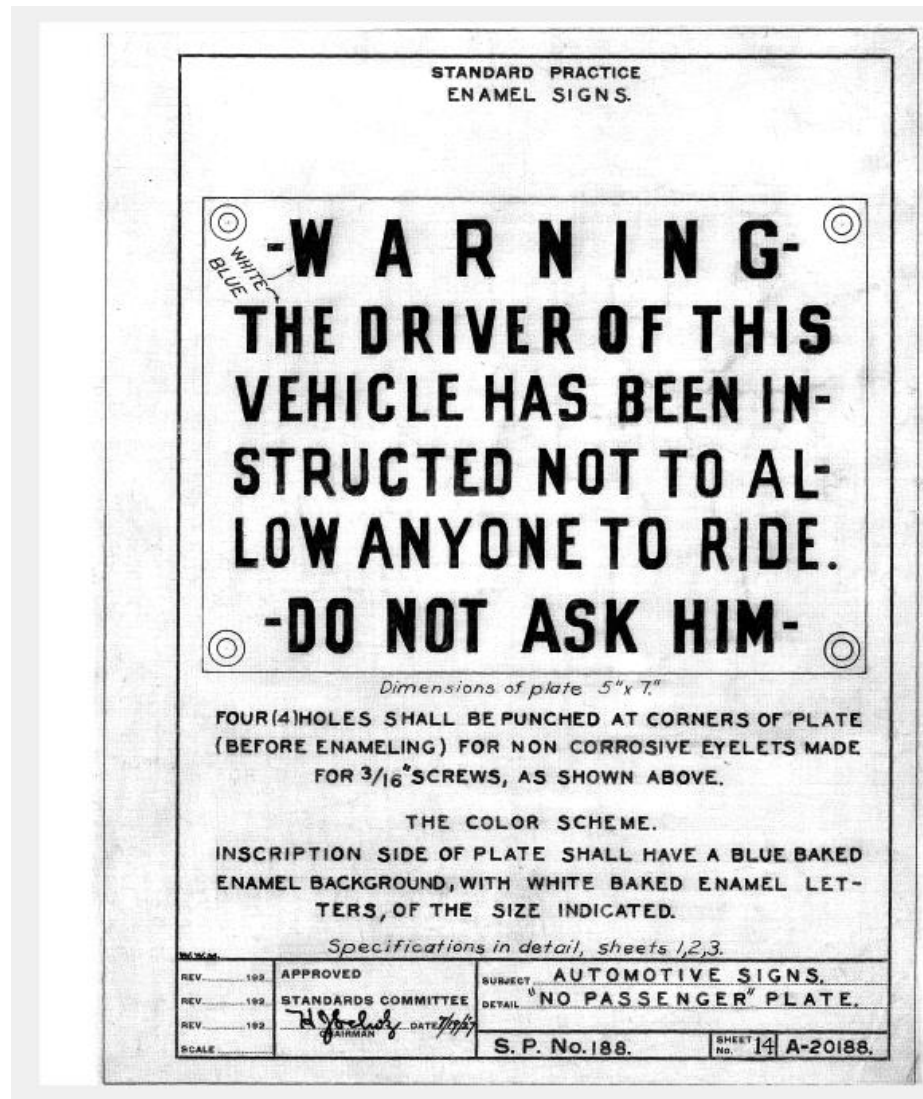
- Standards still around today
- The current modular style Southern Company Standards were developed in the early 1990's. and are still in use today.
- In 2007 the need for improved Standards was again recognized.
  - Multiple initiatives still ongoing
  - Common Materials System
  - Unified set of standards
  - Time consuming and difficult changes



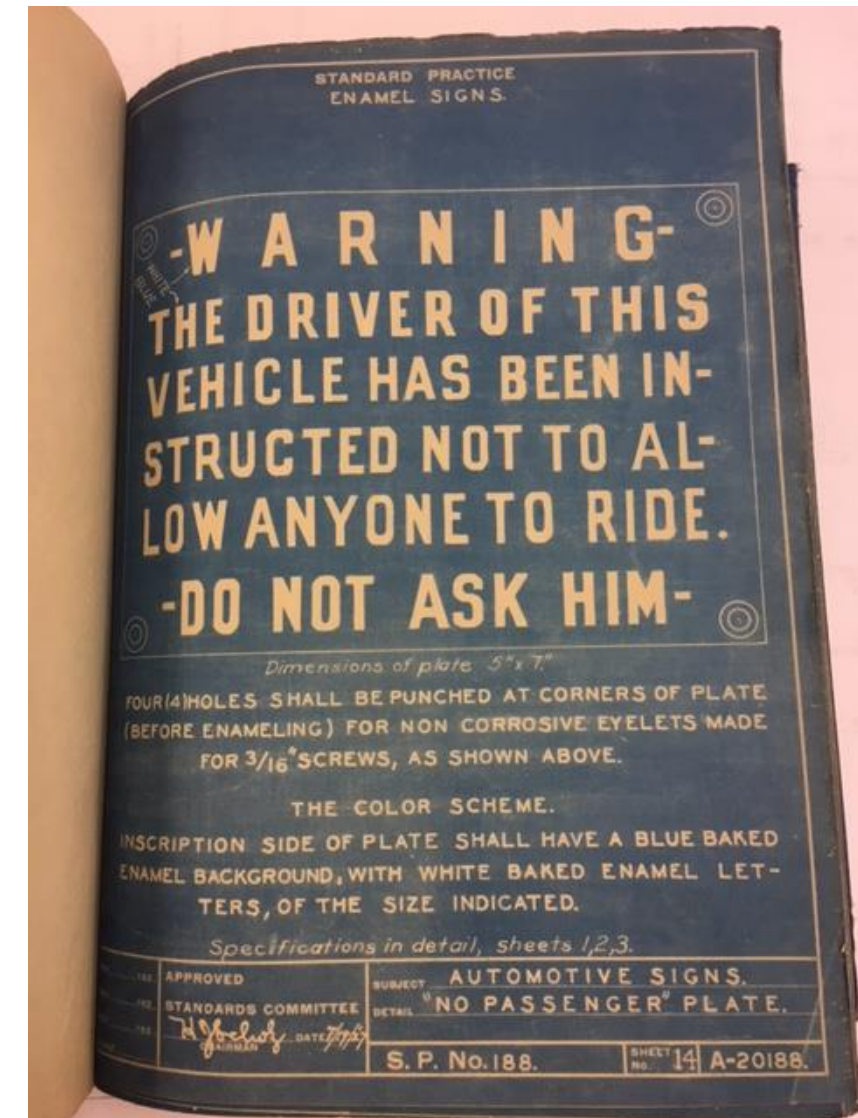
Book #83 Issued in Sept 1927

# History of Standards at Soco

- Standards last
- Change is difficult!
- Not impossible.



2016



1927

# SoToday - Standards

- Our **Core Decision Beliefs** provide the framework by which all Standards decisions are made. These beliefs formulate the process for making the best overall value decision.



# SoToday - Standards

- **Core Decision Beliefs**
  1. Safety
  2. Reliability
  3. Sound Engineering Principles
  4. Construction Considerations
  5. Maintenance Considerations
  6. Cost Considerations

# Modular Standards

# Modular Standards

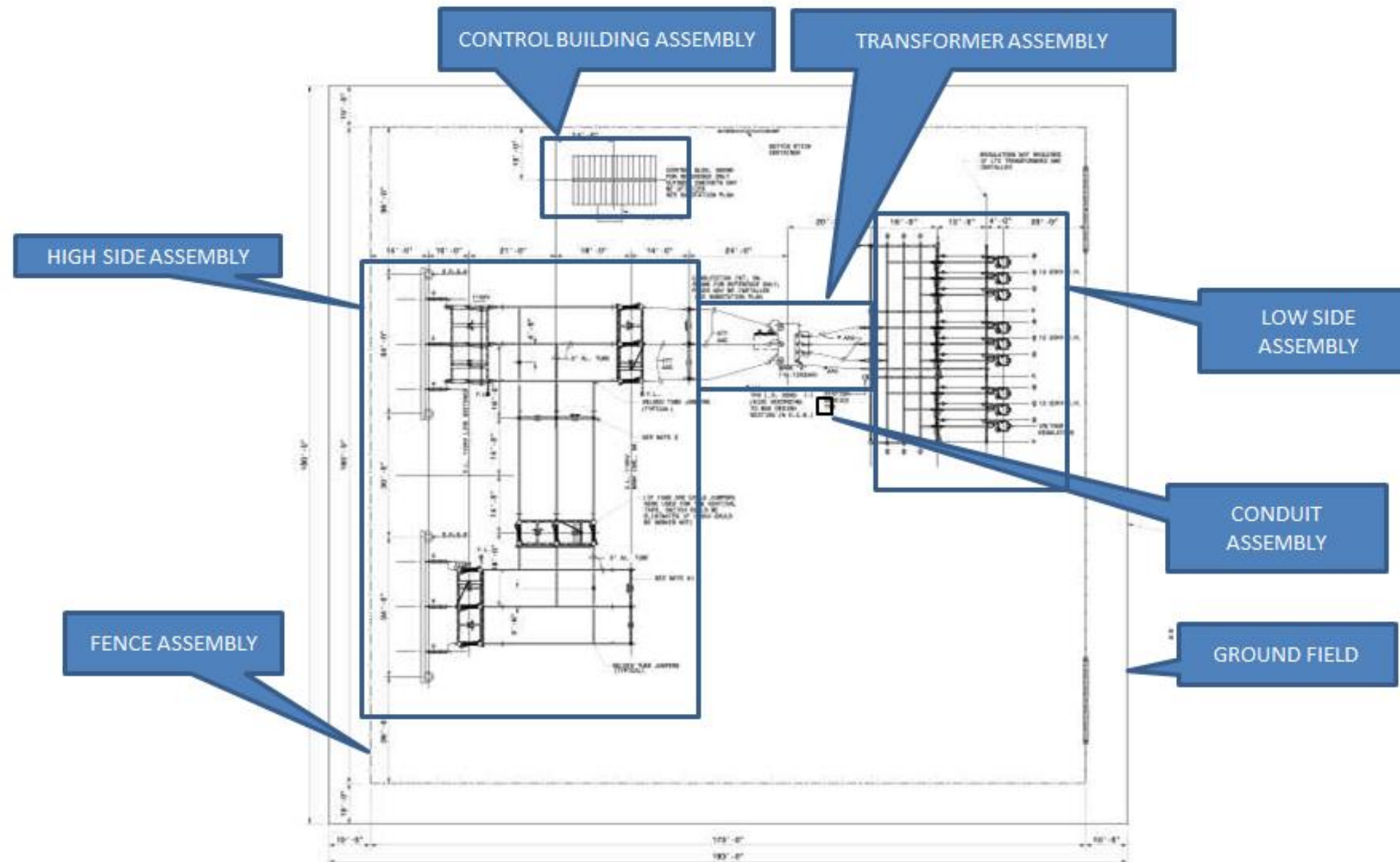
- **Standards are categorized then divided by Kv:**
  - General Applications
  - Foundations General thru 500kv
  - Structures General thru 500kv
  - Grounding
  - Conduit
  - Yard Improvements
  - Switches 15kv thru 500kv
  - Modules 15kv thru 500kv
  - Super Assemblies 15kv thru 500kv
  - Station Models 15kv thru 500kv

# Modular Standards

- **Parts**
  - General Applications
  - Foundations General thru 500kv
  - Structures General thru 500kv
  - Switches 15kv thru 500kv
  - Yard Improvements
- **Assemblies**
  - Grounding
  - Conduit
  - Foundations
  - Modules 15kv thru 500kv
  - Super Assemblies
  - Station Models

# Modular Standards

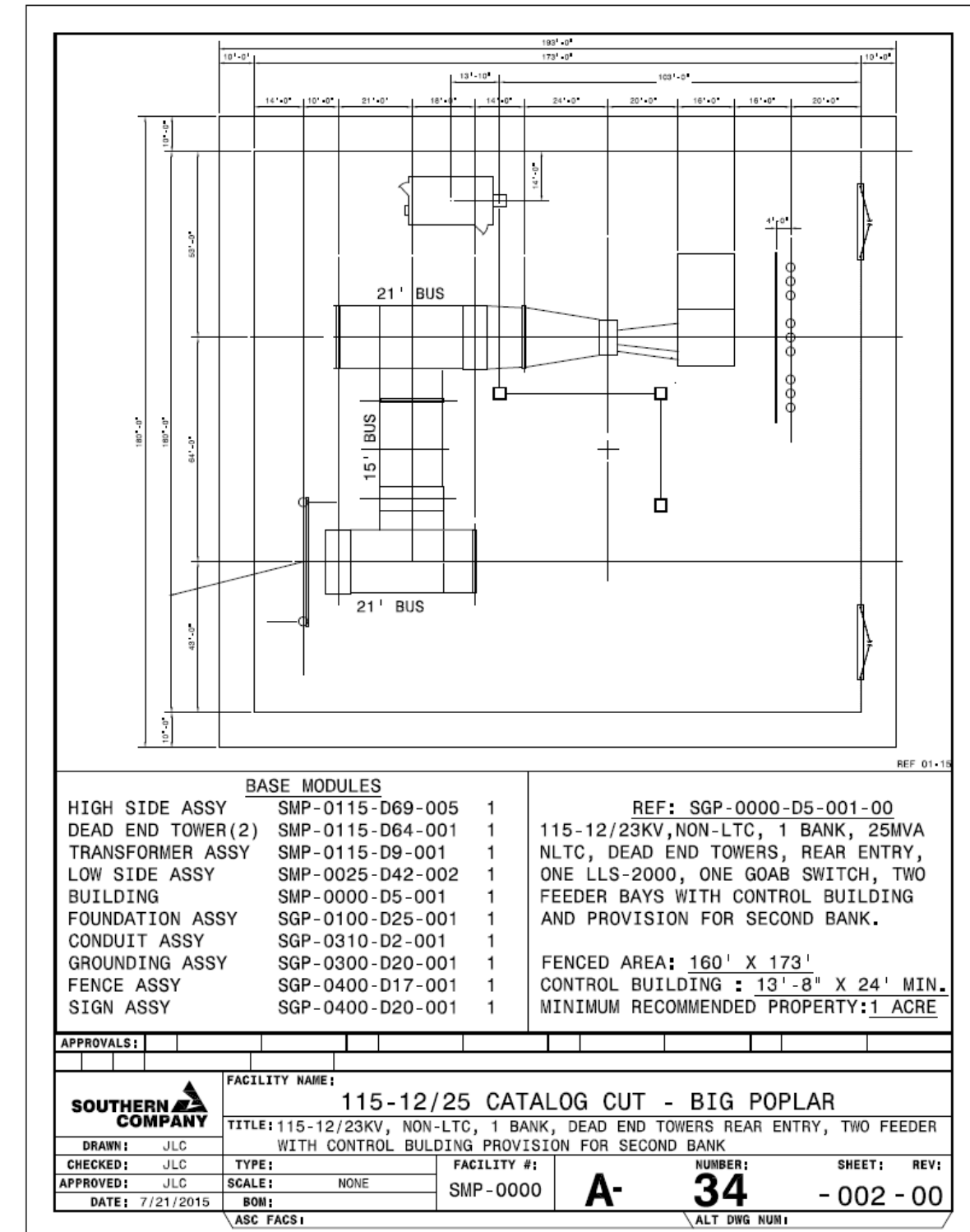
- Substations are modular





# Modular Standards

- Catalog Sheets based on popular Substation Models
- Utilize Modular Concept
- Options to Accommodate Various Needs



# Structure of Models



# Structure of Models

Southern Company Models Consist of:

## **Parts**

- Purchased Items
- Foundations
- Structures
- Brackets etc.

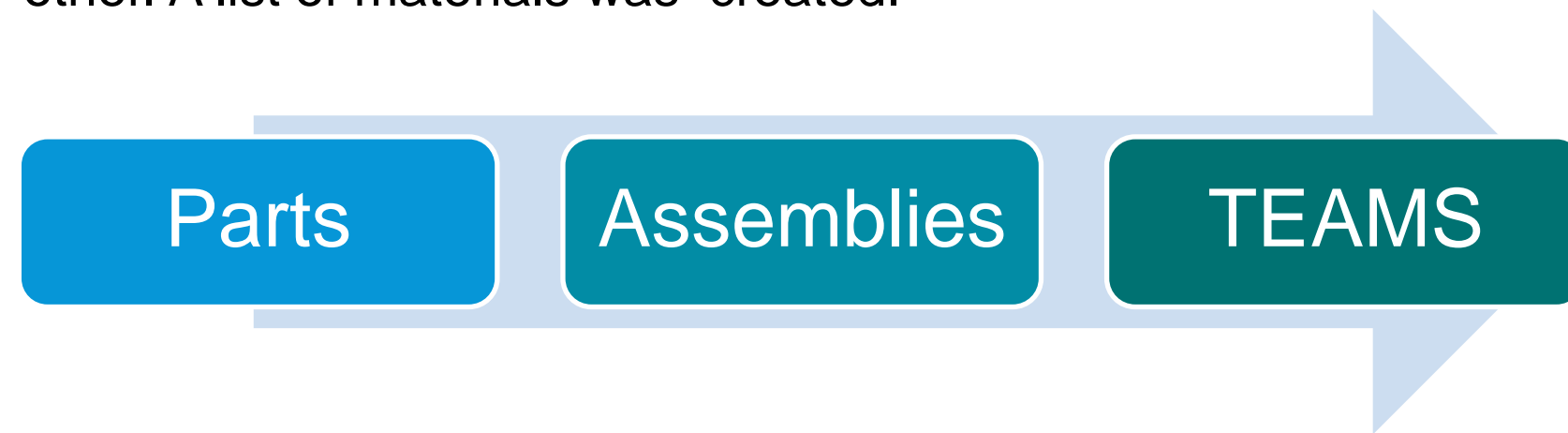
## **Assemblies**

- Assemblies
- Super Assemblies
- Station Models

# Structure of Models

- **1990 standards...**

Stations are constructed in our estimating system by adding assemblies to each other. A list of materials was created.



## **What's Missing?**

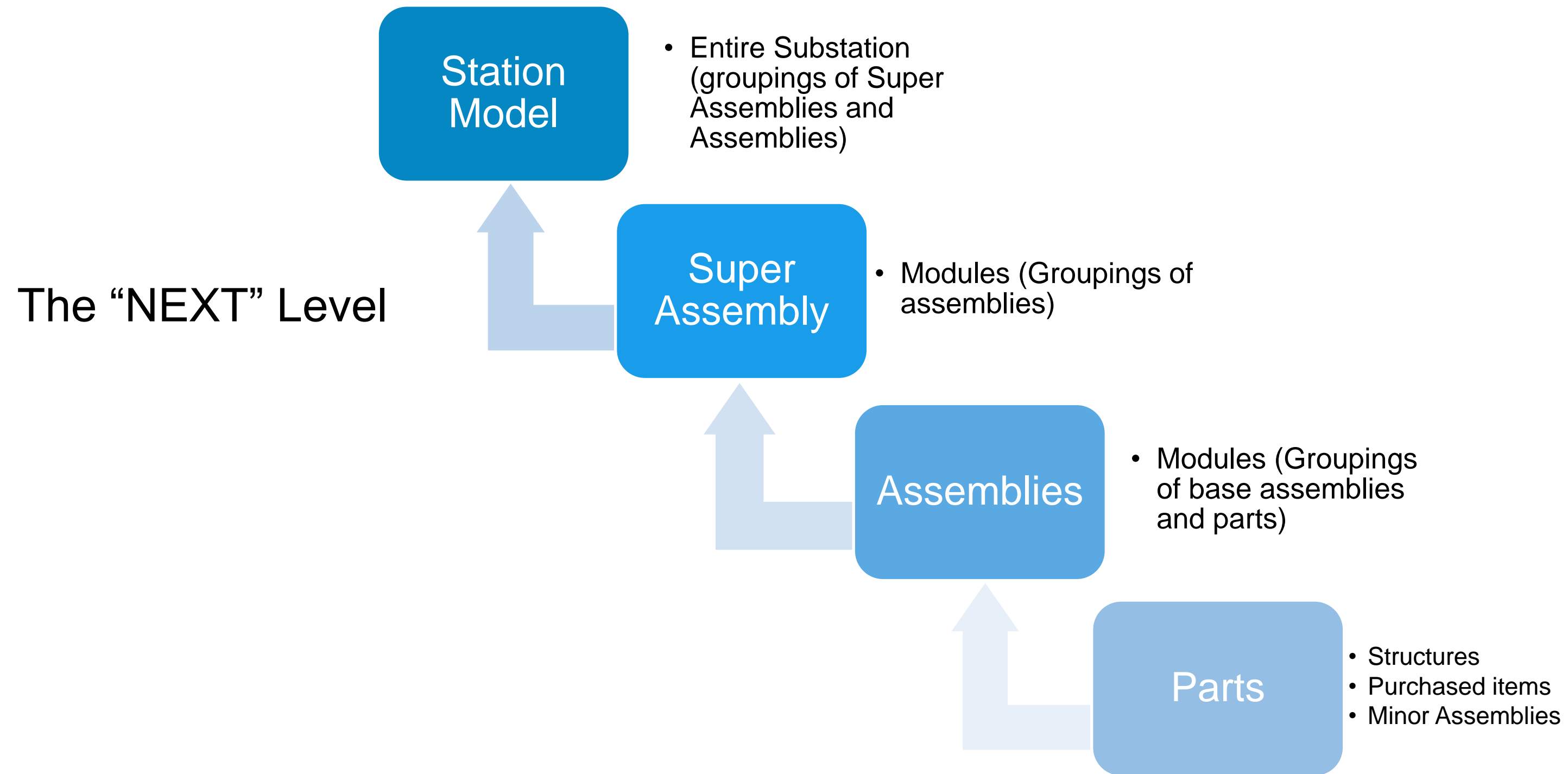
**Previous Standards were never carried to the “ Next” level.**

- **The Next Level**

Super Assemblies – No Parts, Assemblies Only

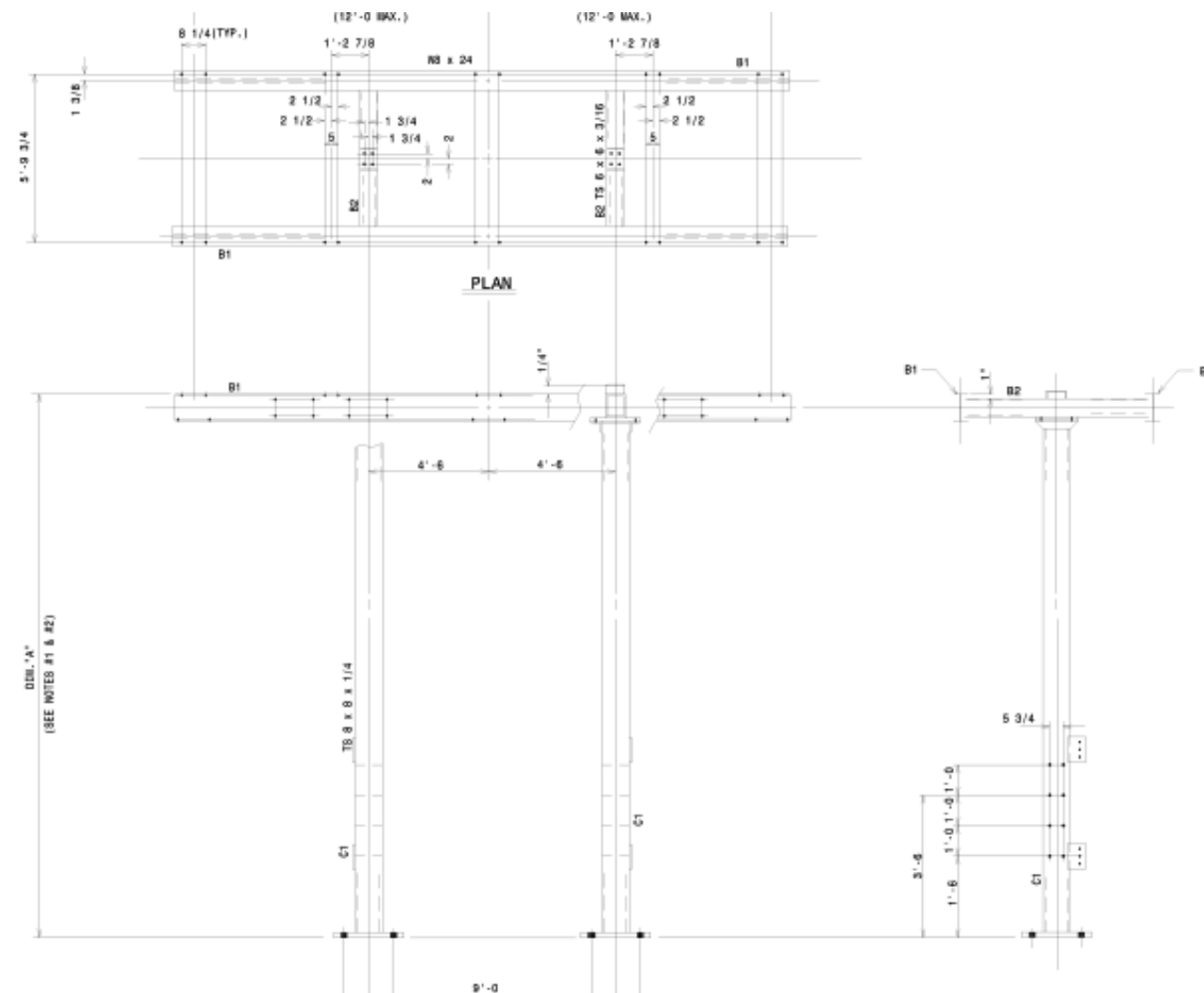
Station Models – No Parts, Assemblies and Super Assemblies Only

# Structure of Models

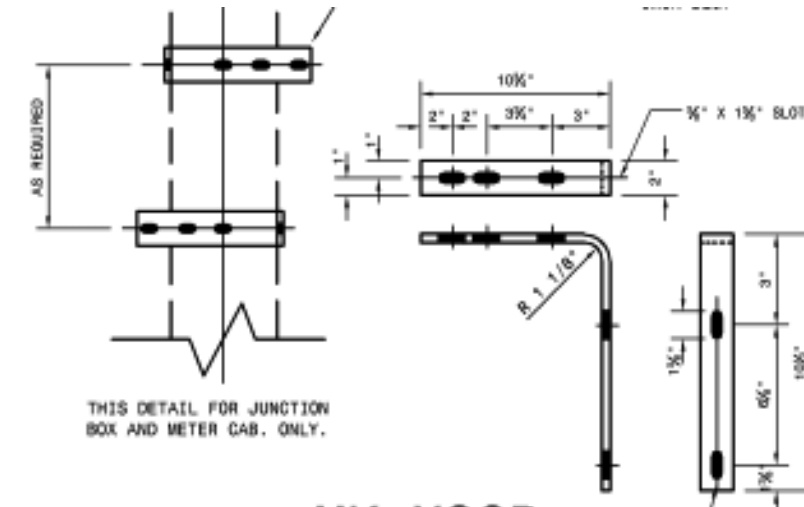


# Structure of Models

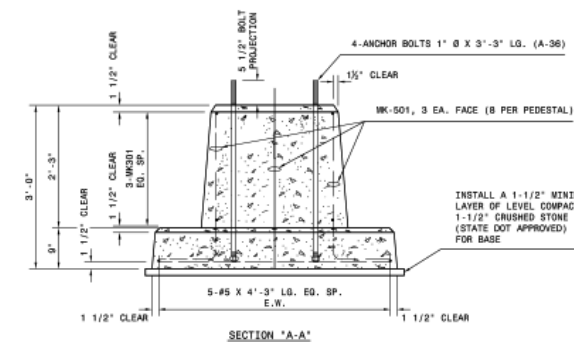
- **Parts** – Breakers, Structures, Insulators, Purchased parts, Hardware, Switches, Bolts, Nuts, Brackets, Foundations, etc.



# Structure



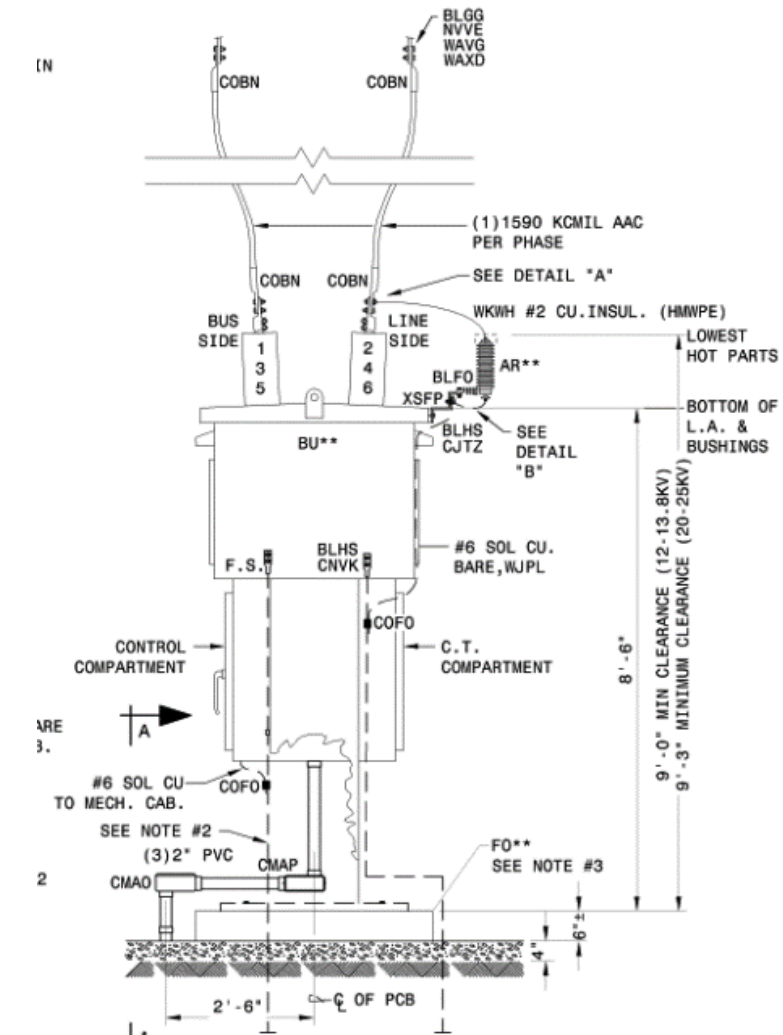
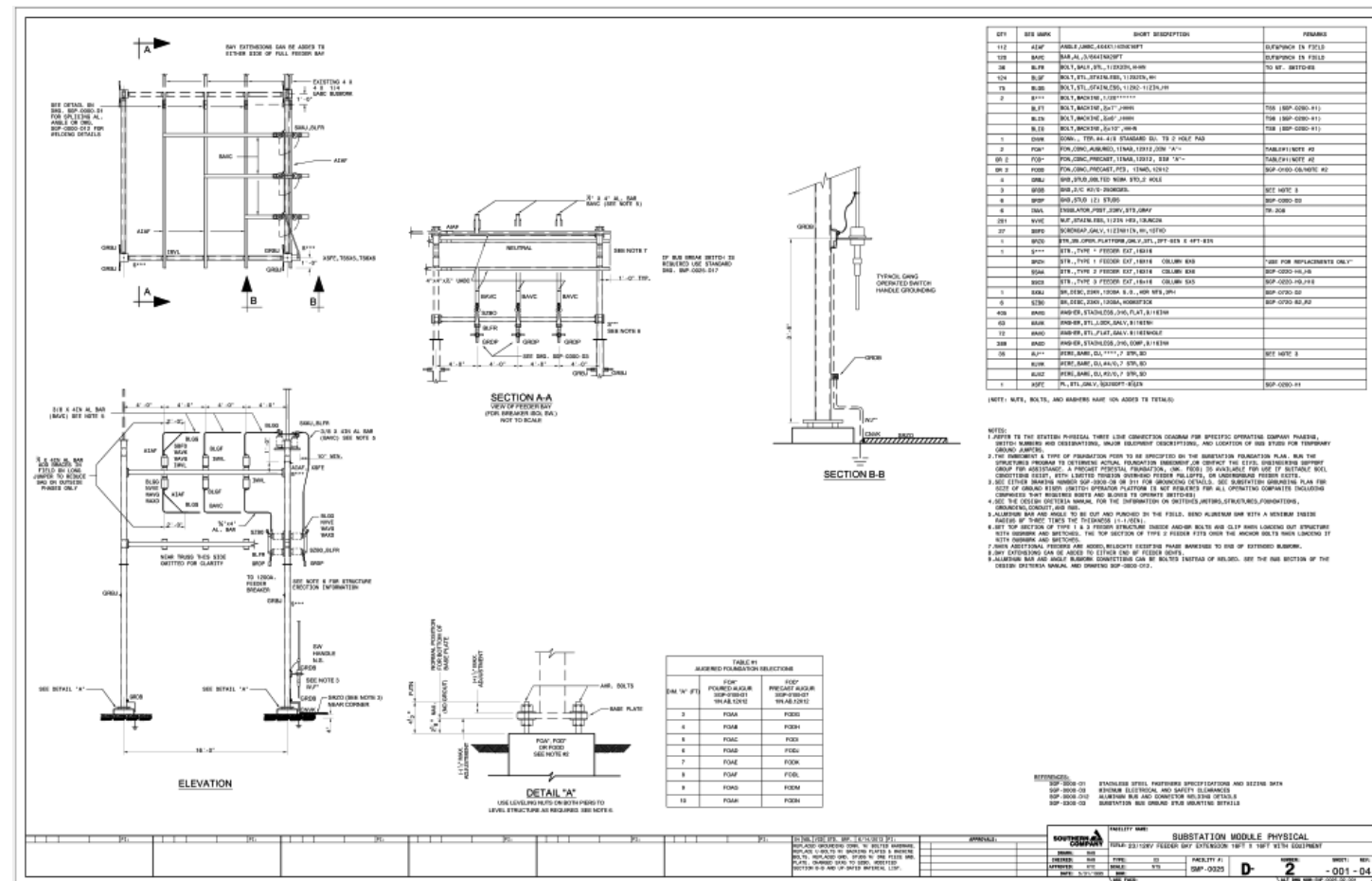
# Fabricated Steel



# Foundations

# Structure of Models

- **Assembly:** Feeder Bay Assembly, Regulator Bay Assembly, Line Terminal Assembly, Other Modules, Foundation Assembly, Conduit Assembly, Grounding Assembly, Sign Assembly and other smaller assemblies.

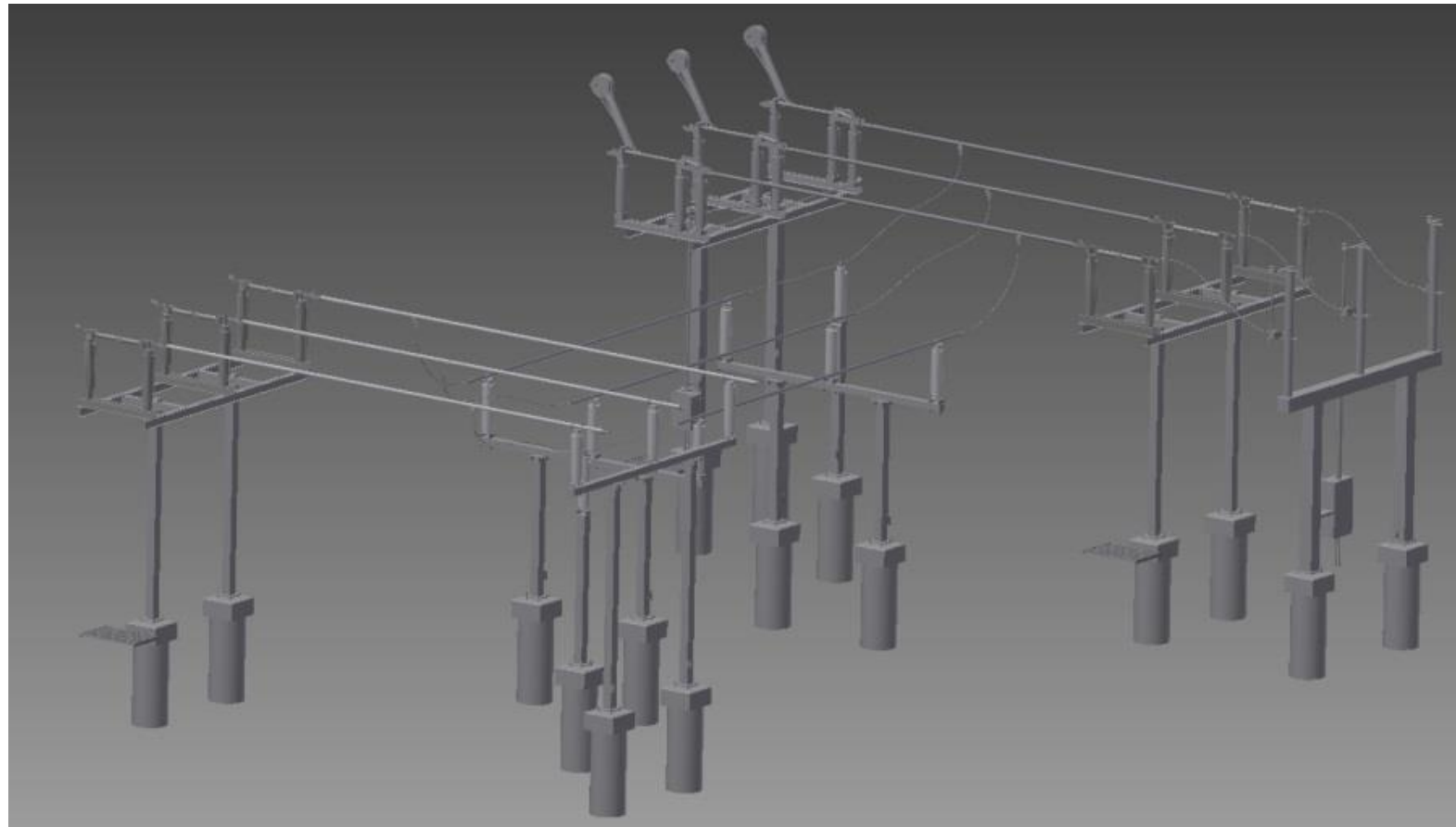


# Formal Module Drawing

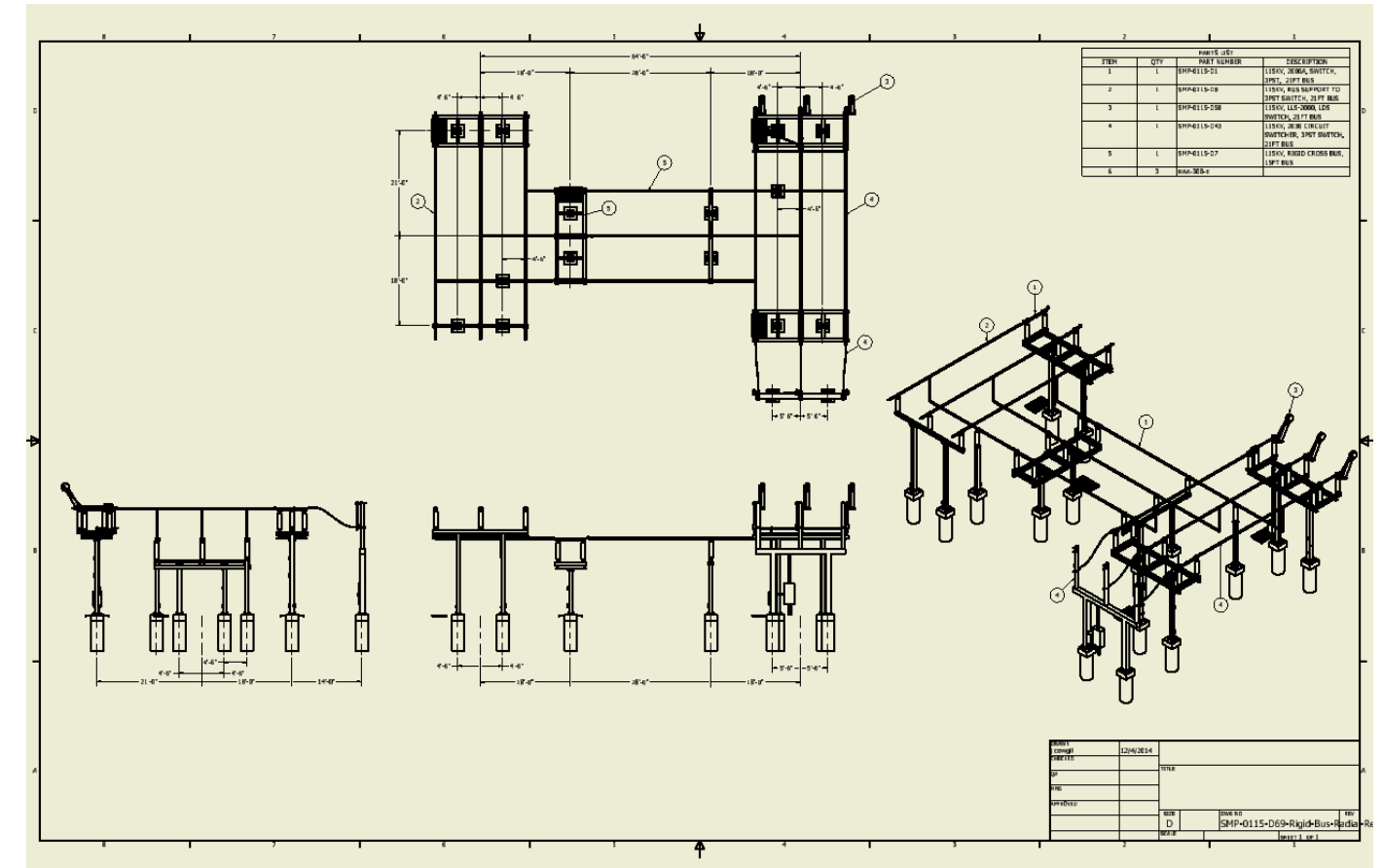
# Breaker Assy

# Structure of Models

- **Super Assembly:** Low side assemblies, High side assemblies.
  - Groupings of large substation assemblies.
  - Consists of typically no more than 10-15 assemblies.
  - No Individual Parts



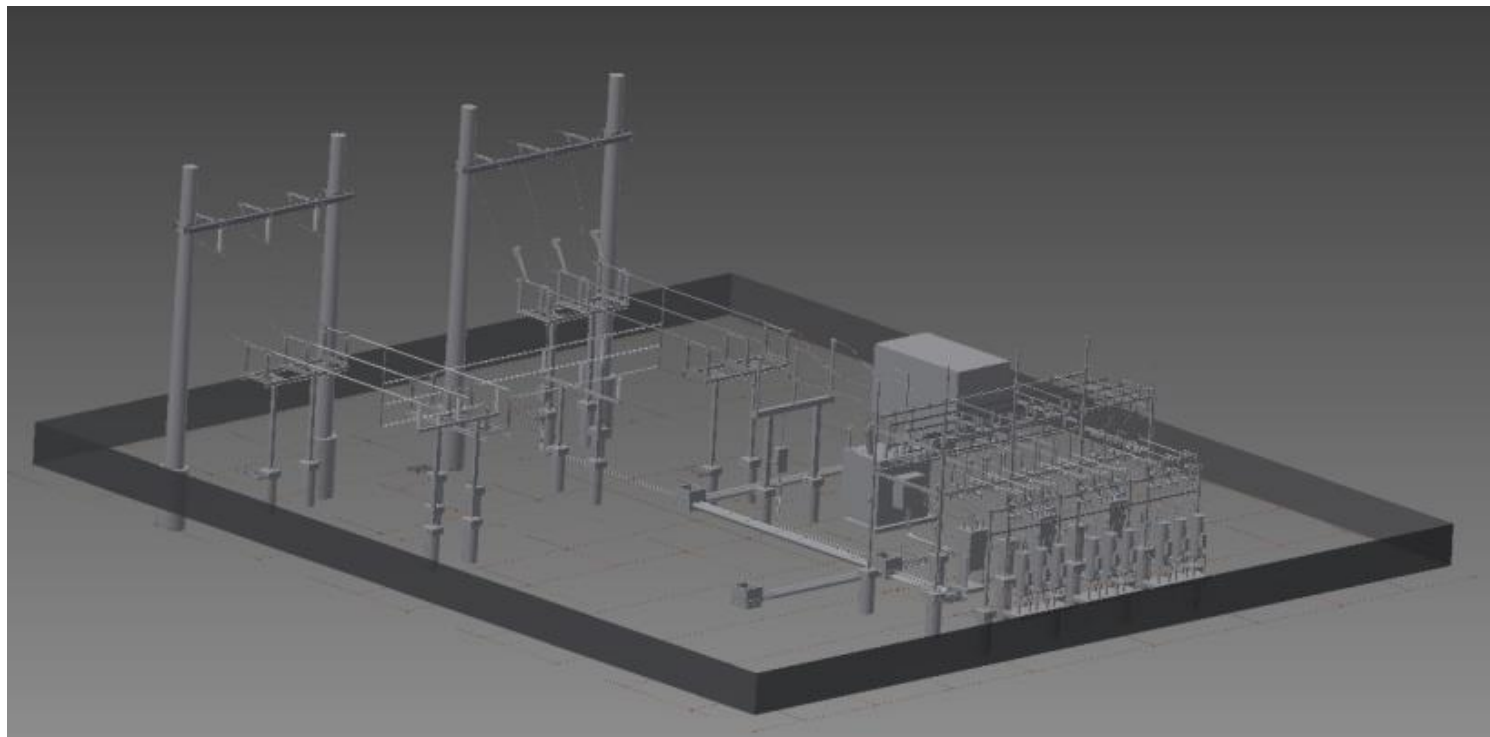
Model



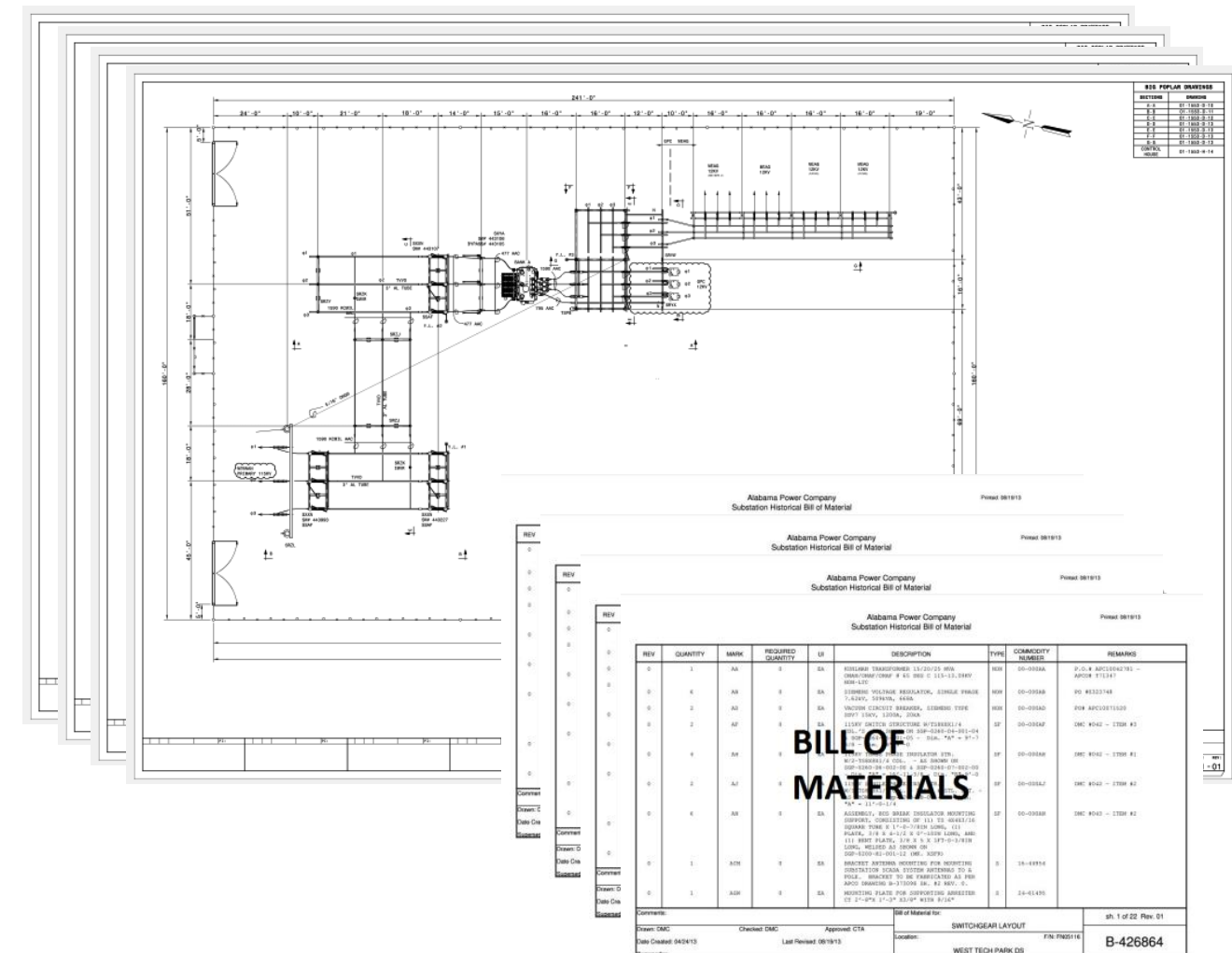


# Structure of Models

- **Station Model :** Entire substation model, consisting of all required models and formal drawings.
  - Groupings of super assemblies and assemblies.
  - Consists of typically no more than 10-15 super assemblies and assemblies.
  - No Individual Parts
  - Complete with all formal drawings and a Bill of Materials.



# Station Model



# Formal Drawings

# Structure of Models

**Substation Options can vary by region as well as being driven by site and project specific requirements.**

- Structure Size – Larger tube, based on weather zone, loading and fault current.
- Structure Type – Direct Embedded pole, tubular steel, other. Based on soil and site specific needs.
- Ground Field Size –Typically 2/0 or 4/0 – Based on fault current and preferences.
- Foundation type – Precast, poured in place or modification. Based on wind zone, soil conditions, structural loading and construction preferences.
- Fencing – Typically chain link, but we also have decorative, non-conductive, or high security options based on site requirements.
- **Some options handled as a separate assembly**
- **Others will use levels of detail**

# Customer Needs

# Customer Needs

## Who Are Your Customers?

- Get to know your customers.
  - Why do they need you?
  - What do you know about them?
- Listen to your customers.
  - What do they expect?
  - Solicit Feedback
  - Involve them in the solution
- Know and anticipate their needs.
  - What do they need?
  - When do they need it?
  - Overachieve



# Customer Needs

## Considerations for SDS Team

- Integrate SDS into existing design process.
- Meet the needs of production and also quickly develop SDS.
- Find synergy between production design and standards to produce the best results.

# Customer Needs

## Excellent Customer Service

- “Well done is better than well said.”  
Benjamin Franklin
- “Ask your customers to be a part of the solution and don’t view them as a part of the problem.”  
Alan Weiss (author Million Dollar Consulting)
- “I like to listen. I have learned a great deal from listening carefully. Most people never listen.”  
Earnest Hemingway
- “Always do more than is required of you.”  
George Patton

# Questions?



