

## **Session 56**

### **Ken Weldon**

FL. Dept. of Transportation RDO

### ***FDOT Policy & Processes to Avoid Utility Conflicts***

#### **Topic Description**

This is the first part of a two part presentation. It will be interactive between the speaker and audience.

Designers will learn about the impact that One Call Legislation (SS 556) has upon their design and RFP functions and in particular utility locate requirements.

#### **Speaker Biography**

Kenneth Weldon is a Registered Professional Engineer with over 35 years experience in public works. He served as a consultant and has been employed by city, county and state government. Responsibilities included major residential, commercial site, and transportation corridor design, including utilities, roadways, right of way, rail, traffic operations, signalization, bridge opening, scour, revetment, and drainage. Other duties performed have included land surveys, construction inspection, and serving as a Hillsborough County Engineer. He currently serves in the capacity of the Florida Department of Transportation State Utilities Engineer and has since 1996.

**Welcome to!**

**Utility Conflict Avoidance  
For  
Designers & Project Managers**

Last Updated 07/06/06



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# Objective?

## Explore Examples & Reasons For Overlooked Utility Conflicts

- Physical
- Time

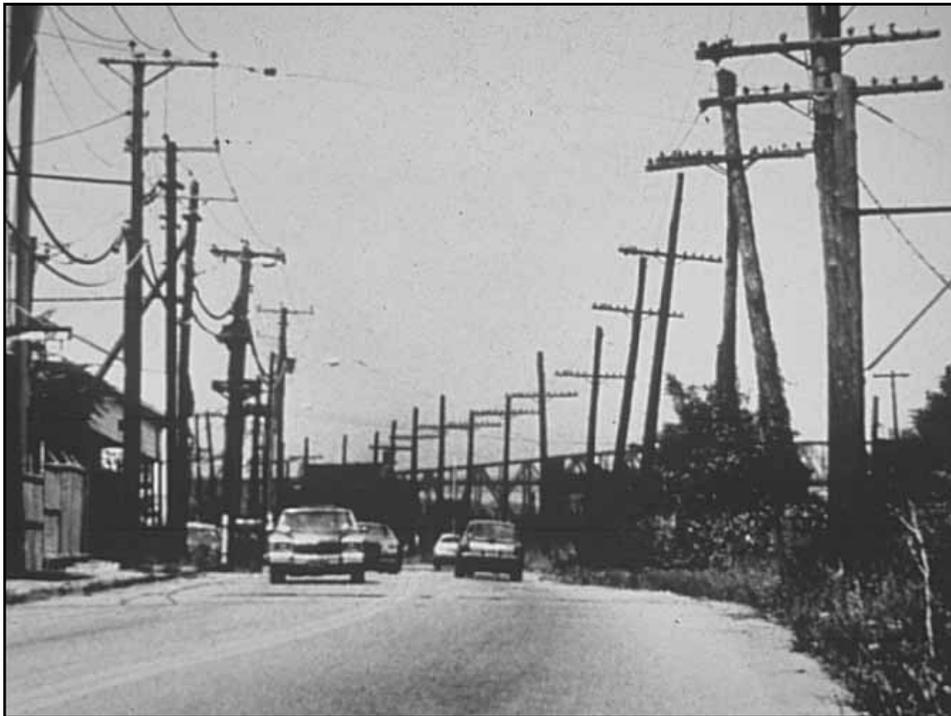
**Both Types Of Conflicts Impact Letting & Construction Schedules!**

Sometimes the project is more consuming than you thought!



# Content

1. Utility Planning, Design, & Coordination
2. R/W Issues
3. Gas Transmission Issues
4. Pole Design / Location / Agreements
5. Construction Issues
6. Aerial To Underground Conversion
7. MSE Walls & Utility Placement Concerns



There are harder things to deal with  
than Utilities on the job!



## Utility Planning, Design, & Coordination Issues

**Be Realistic And Determine The Time  
Requirements And Number Of Other Or  
Regulatory Agencies That Are Involved**

- Highway
- Other Utilities
- R.O.W.
- Environmental
- Local Agency

**Meeting schedules may be quarterly!**

## **Types of Authorizations Utilities May Need To Acquire Or Revise**

- **Permits** - Usually to accommodate utility activities other than during a highway improvement project.
- **Agreements** - Usually covers utility relocations that occur during a highway construction project.
- **Franchises** - An agreement which grants access to the R/W; however, it does not typically allow unrestricted use. A franchise agreement usually requires a fee.
- **Tariffs** - PSC requirements that fix or limit what a Utility may do because it could affect their approved operational rate structure.

## **State & Local Planning Activities That Utilities Must Consider / Do**

### **Corridor Plans**

- ✓ *R/W Issues*    ✓ *Joint Use*    ✓ *Environmental*
- ✓ *Feasibility Studies*    ✓ *Public Hearings*

### **Project Plans**

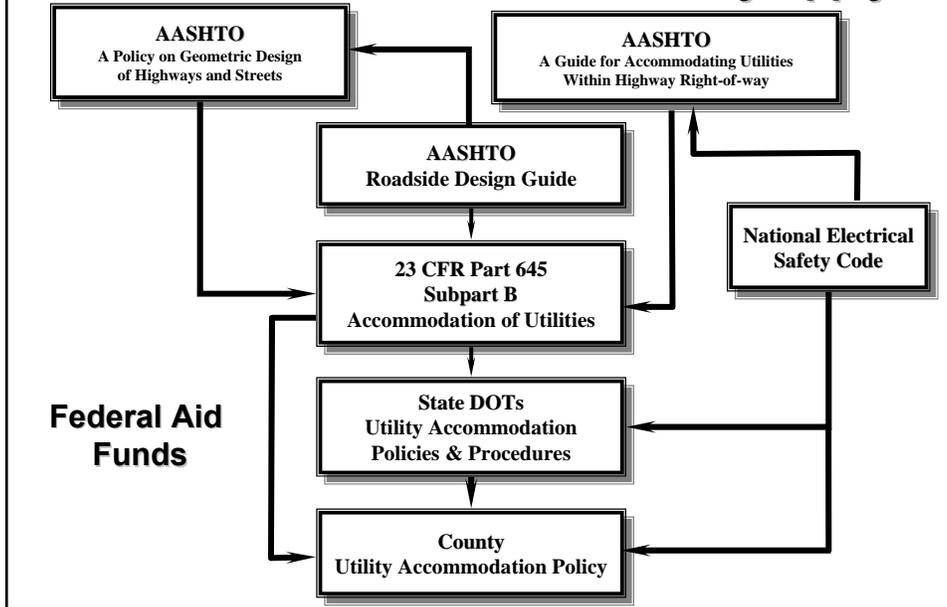
- ✓ *Utility Conflicts*
- ✓ *Upgrade / Taken out Of Service*

### **Preliminary Construction Plan**

- ✓ *Construction Phasing*    ✓ *TCP Issues*
- ✓ *Maintaining Service*

### **Final Construction Plan**

## Example National & State Utility Accommodation Criteria That May Apply



## Which Are You ?



## Internal Utility Planning / Design

### Estimates Of Present & Future Utility Demands

- Are there future plans for upgrading?

### Operating Characteristics Of The System

- Is the system outdated ..... meet future criteria?
- Can the system be operated in the same manner after relocation or will it require changes?

### Availability Of R/W

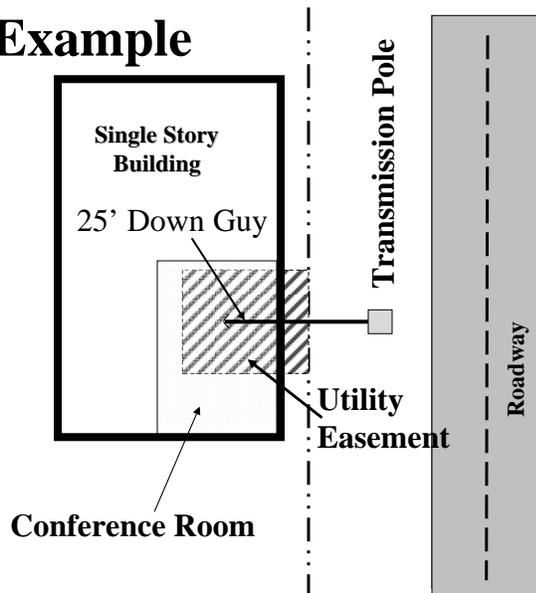
- To install the new facilities without creating servicing problems or conflicts (I. E. ADA, Utilities)

### Safety & Physical Barriers

- NESC Clearances & Setback criteria, for trees, buildings, overhead signs, sound walls.

## Lack Of Coordination

### Example



### Building Construction

1. Built building without contacting power company.
2. Left a hole in exterior wall for the existing down guy
3. Poured the floor
4. Built the interior walls
5. Installed the carpet
6. Installed the furniture

### Then

*Asked when they were going to remove the down guy.*

### Results

*Building did not get its CO for 3 years.*

*Transmission line had to be redesigned to eliminate the down guy.*

## Moral of Story

- Don't assume that everybody is informed
- Make contact early in the process
- Ensure that all parties know what they have to do and document it.
- Develop a critical path to avoid conflicts at the end of the project.
- Lack of coordination will destroy a project.

## R/W Issues

- Law
- FDOT Policy
- Acquisition

Early coordination and communication with the affected Utilities is critical to success.

## Utilities Are R/W Owners !

- Article X, Sec. 6A, Fla. Constitution

No property shall be taken except for a public purpose and with full compensation therefore paid to each owner.

What percent of the time do Utilities have property rights:

1. Within FDOT R/W?
2. Off the project but affecting a project?

### POLICY

Effective: September 15, 2005  
Office: Right of Way  
Topic No.: 000-575-002-b

#### UTILITY ACCOMMODATION WHEN UTILITIES OCCUPY THEIR OWN EASEMENTS OR PROPERTY

Coordination with utilities should begin as early as possible in the initial phase of the project. At this stage, the Florida Department of Transportation (Department) should do an assessment of the utility options available and the estimated cost impact of each alternative option. Utilities are entitled to be made whole for the loss of their existing property rights. The Department will attempt to provide the utilities the same, but not greater, property rights than those which they originally possessed.

If the utility is occupying its own easement or fee property, the Department's options include:

- designing the project to avoid the utility property;
- replacing the original utility property to be taken with comparable property and paying for relocation of the utility to that property; or
- providing an easement to the utility over Department right of way with equal rights to those lost by the utility on their original property, including exclusive use and reasonable access for maintenance; or
- providing an easement to the utility over Department right of way allowing property rights to the greatest extent possible, including exclusive use and maintenance responsibility, plus monetary compensation for those rights which are lost and cannot be replaced; or
- providing any other arrangements agreeable to both the utility and the Department through permits and subordination.

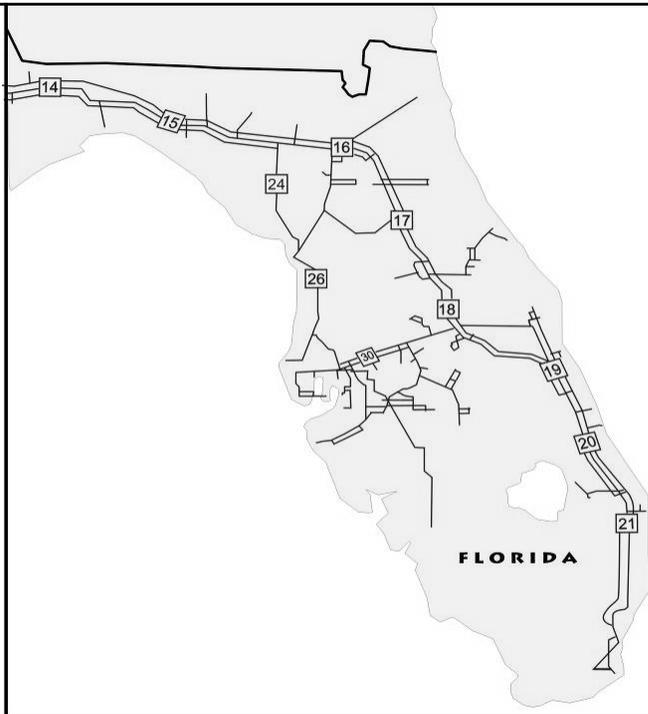
To the extent possible, resolution of these issues should be resolved through engineering accommodations. Litigation should be the last resort.

  
Denver J. Studds, Jr., P.E.  
Secretary

**Private property acquisition must consider Utility involvement!**



**MAJOR  
GAS  
LINE  
ISSUES**



## Gas Regulatory Jurisdiction

- Federal Energy Regulatory Commission
- U.S. Department of Transportation – Office of Pipeline Safety
- Florida Public Service Commission
- Applicable State and Local Regulatory Agencies

## FERC – Federal Energy Regulatory Commission

- Provides Regulatory Oversight and Approvals for Routing and Construction of New Pipelines and/or Relocations of Existing Pipelines under:
  - Blanket Certificate
    - Automatic Authorization
    - Prior Notice Filing (45 days)
  - 7(c) Filing

## Blanket Certificate Automatic Authorization

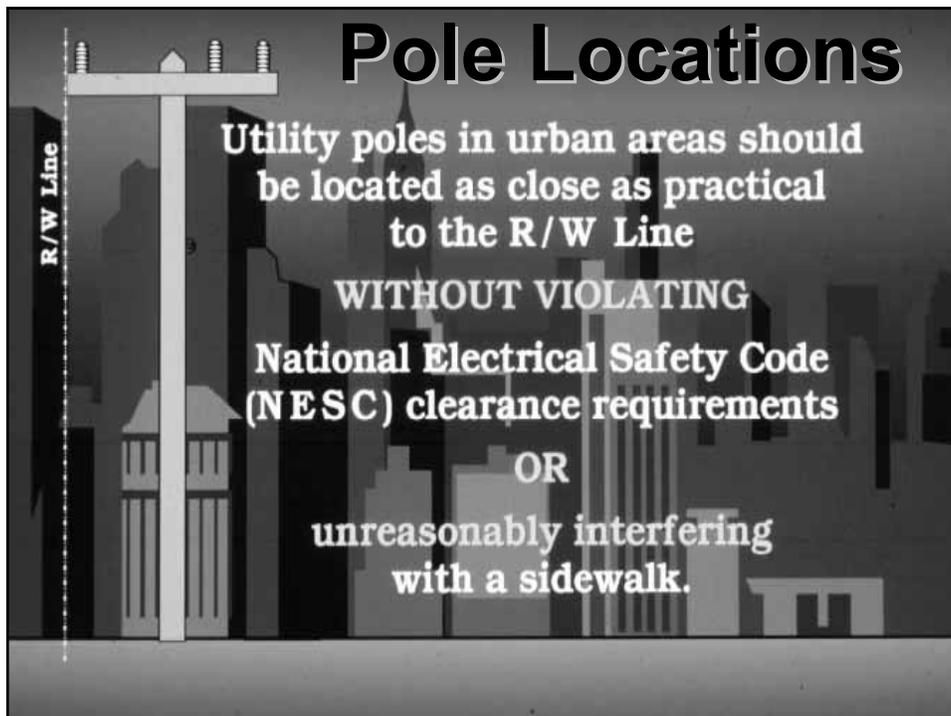
- Can be used for relocation projects with estimated costs less than \$7.8 million
- All State/Local regulatory agency permits required
- Right of way acquisition, engineering, design, permitting and construction minimum 9-12 month process

## Blanket Certificate 45 Day Prior Notice Filing

- Requires filing with FERC
- Required for projects with estimated costs over \$7.8 million and less than \$21.6 million
- Permitting requirements same as with Automatic Authorization
- Minimum 12-15 month process from Prior Notice filing to construction completion
- If protests to filing cannot be resolved within 45 day notice period, then application becomes subject to 7(c) filing requirements

## 7(c) Filing

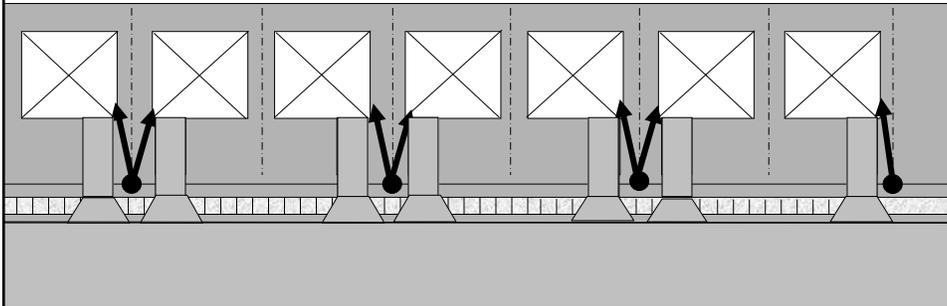
- Required for new mainline construction and other construction/relocations of existing facilities with estimated costs over \$21.6 million
- Public notifications/meetings and comprehensive environmental impact statement or environmental assessment required for filing
- FERC Certificate required prior to Construction
- Minimum 24-36 month approval/Construction process.



## Typical Pole Line Arrangement

### Urban Areas

Poles are located at every other property line.



#### Rationale:

1. Provide service to the customer.
2. Reduce conflicts with driveways.

## Pole Relocation Requires A Knowledge Of The Following:

**Attachment Method VS Offset**

**Guying Requirements**

**Alignment Requirements**

**NESC**

**Clearance (Horizontal and Clear Zone)**

**Tree & Sign Clearances**

**ADA**

**Relocation Sequence**

**Control Zones**

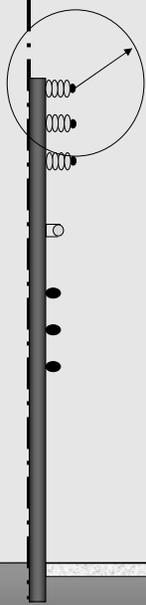
## Crossarm Construction

1. All facilities must be inside the R/W.
2. Pole cannot be placed closer than half the distance of the crossarm.
3. Crossarm vary in length from 6'-9'.

## Triangular Construction

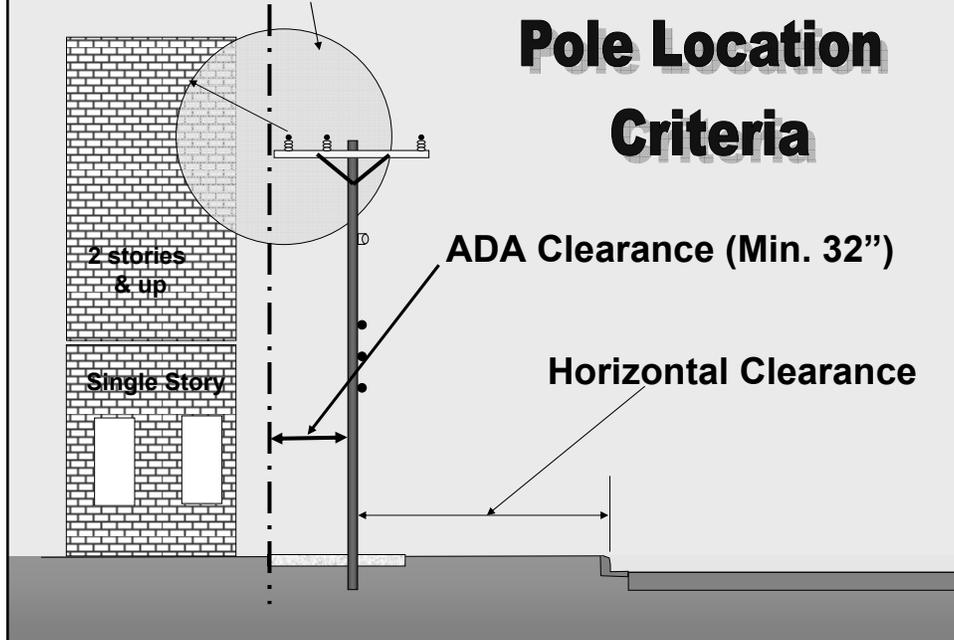
1. All facilities must be inside the R/W.
2. Pole cannot be placed closer than the length of insulator.

## Vertical Construction



1. All facilities must be inside the R/W.
2. Pole can be placed at R/W Line as long as there is no NESC Clearance problems.

## NESC Clearance

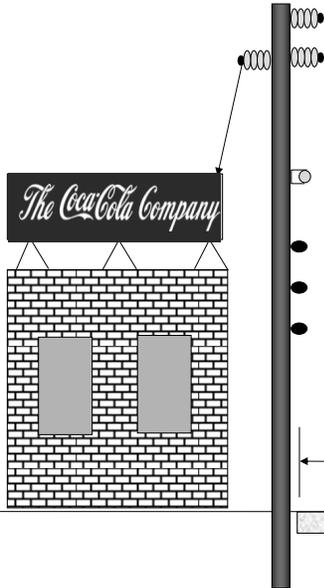


## Pole Location Criteria

ADA Clearance (Min. 32'')

Horizontal Clearance

# NESC Setback



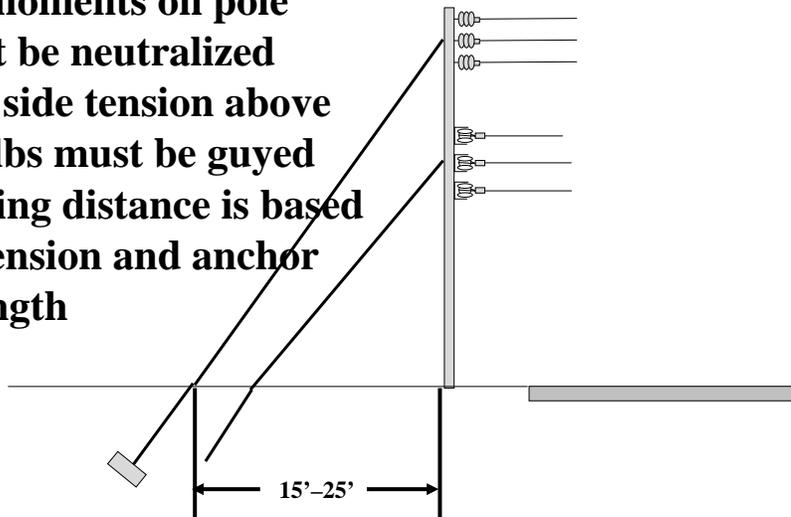
1. Poles should not be installed next to building
2. Clearances are in all directions not just horizontal

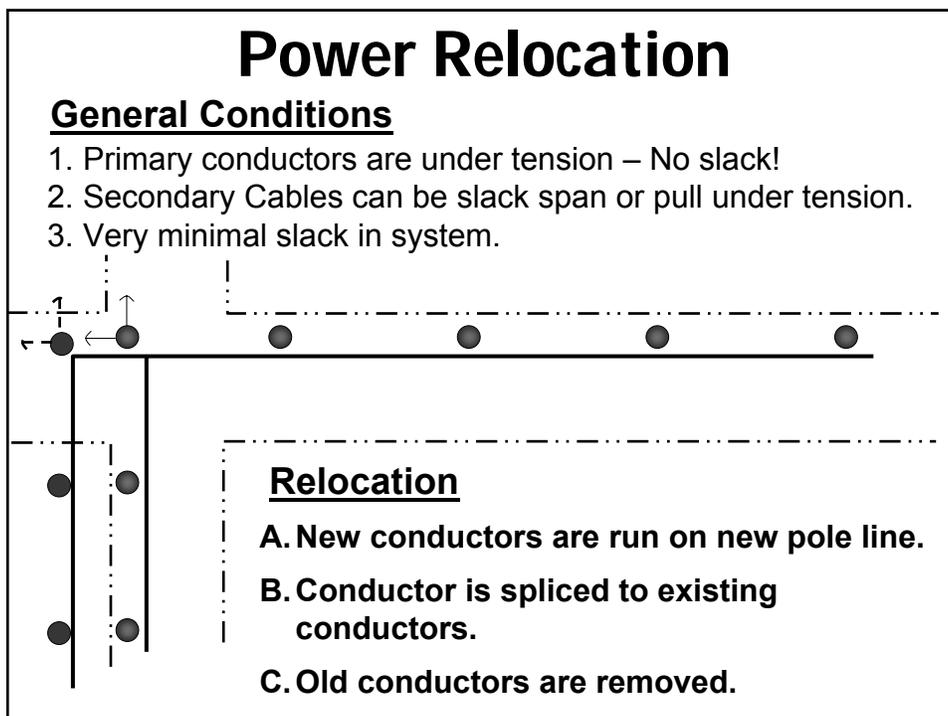
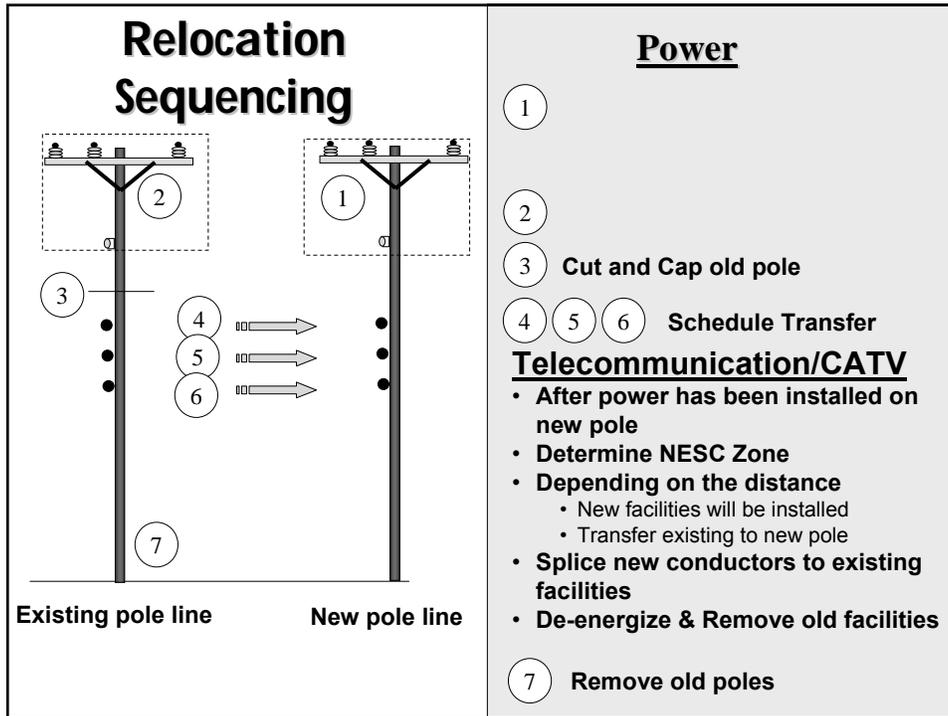
**ADA Min. Requirements don't include curb width!**

**38" Min.**

# Anchoring Requirements

1. All moments on pole must be neutralized
2. Any side tension above 600 lbs must be guyed
3. Guying distance is based on tension and anchor strength

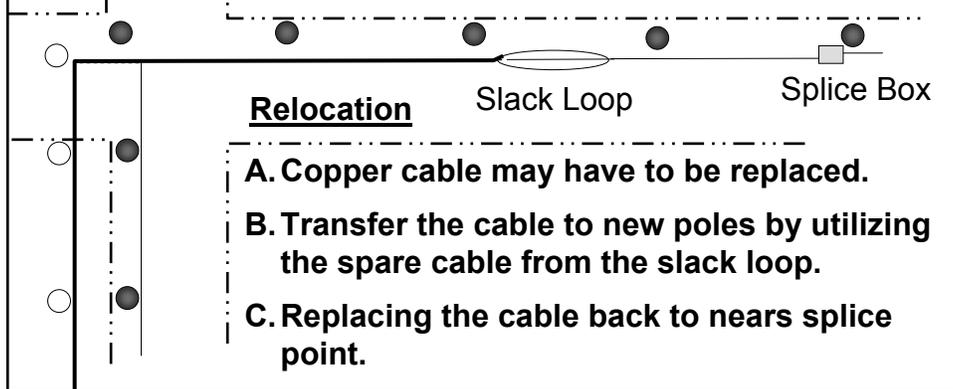




## Telephone / Fiber Cable Relocation

### General Conditions

1. Copper or fiber cable is used for trunk line and can be spliced
2. Slack is built into the fiber cable runs – Snow Shoes
3. Fiber cable splices must be kept to a minimum
4. Copper cable can withstand more splices
5. Fiber relocation is the same as Fiber cable replacement.

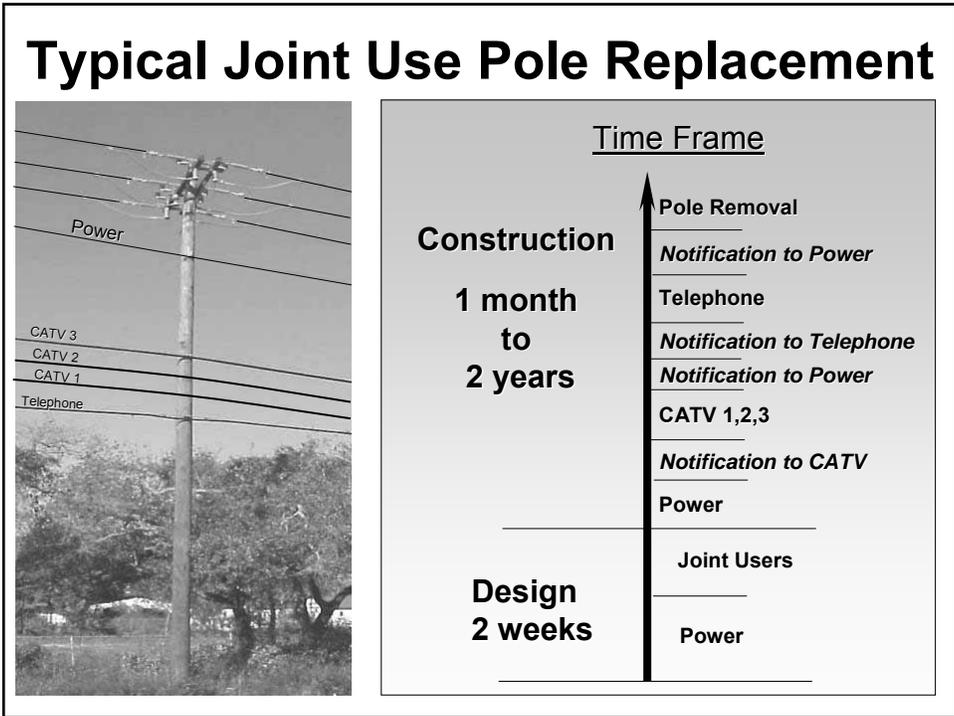
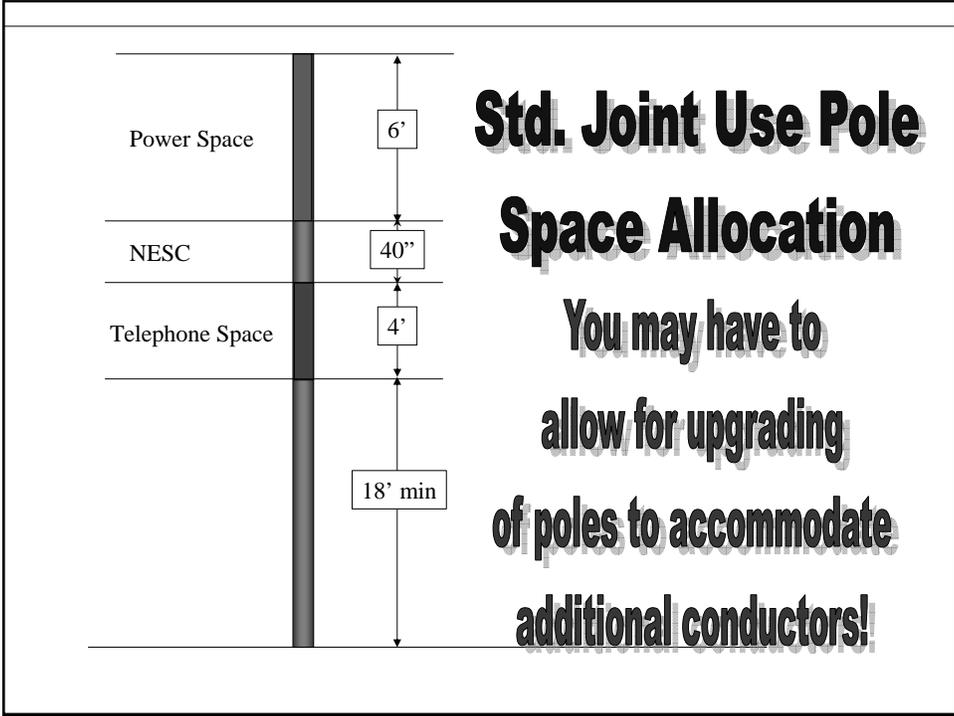


## Pole Attachment Agreements

There are 2 types of agreements associated with Joint Use Pole attachments.

**Joint Use Agreement**  
**Attachment Agreement**

**Knowing what exists can affect reimbursement & schedule!**



# Construction Issues

**Often Overlooked  
Opportunities For Design To  
Eliminate Utility Conflicts  
that may not be realized  
except in Construction**

Things that have provided benefits  
to the Utility & the FDOT

- **Share information with Utilities**

- Environmental
- Archaeological
- Paleontological
- Soils & Hydrologic

It helps avoid future design and construction delays!

## Things that have provided benefits to the Utility & the FDOT

- Require a contractor to use low profile drilling rigs to prevent unnecessary Utility relocation, cutting service, & less MOT required.

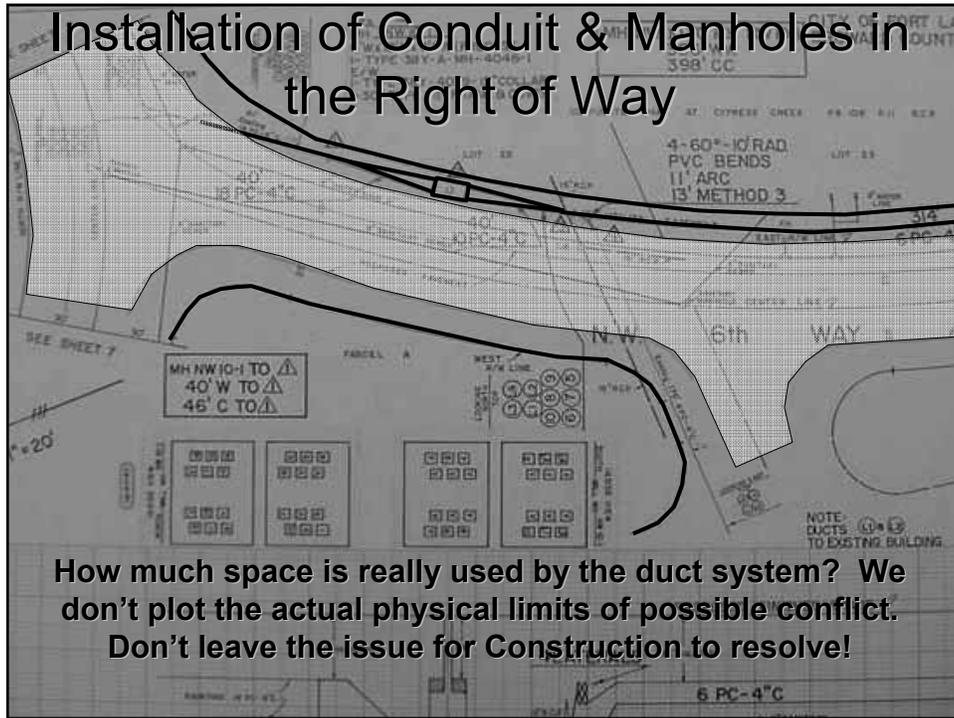


It helps avoid future design and construction delays!

## Mast Arm Installation VS SUE

- Mast arm installation and utility conflict have become synonymous. Oft times, expensive and lengthy utility relocation efforts must be undertaken to resolve these issues. This can result in delays to the Contractor's work schedule and ultimately claims for lost productivity. SUE is critical at intersections.

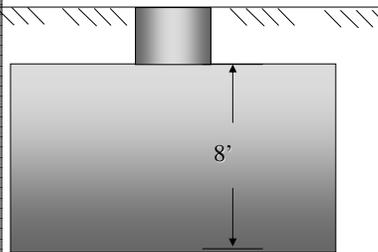
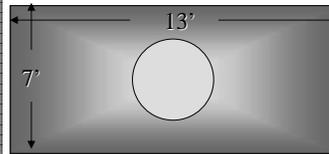
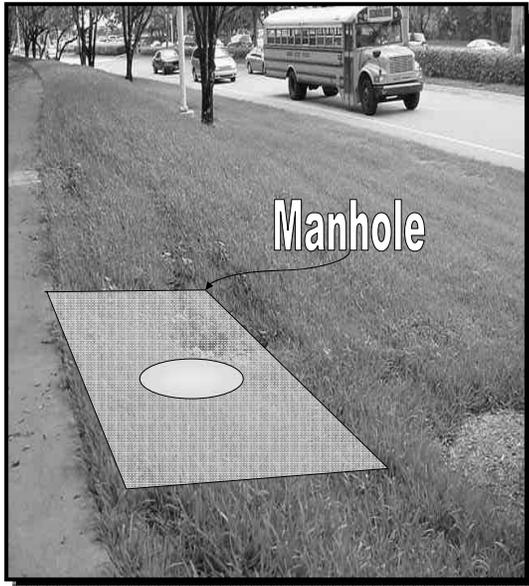
*Sometimes situations are so complex or expensive that signalization improvements may have to be removed from the contract.*



## **Engineers Must!**

- 1. Familiarize Themselves With  
Utility Facility Dimensions & Cost.**
  
- 2. Learn To See Beyond The  
Plans Symbols To Visualize The  
Real Dimensions Of Structures!**

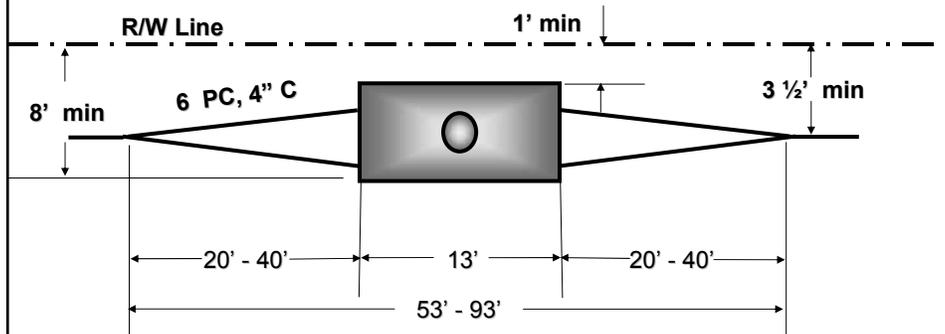
## BellSouth Manhole Location



## Traditional Duct System Manhole

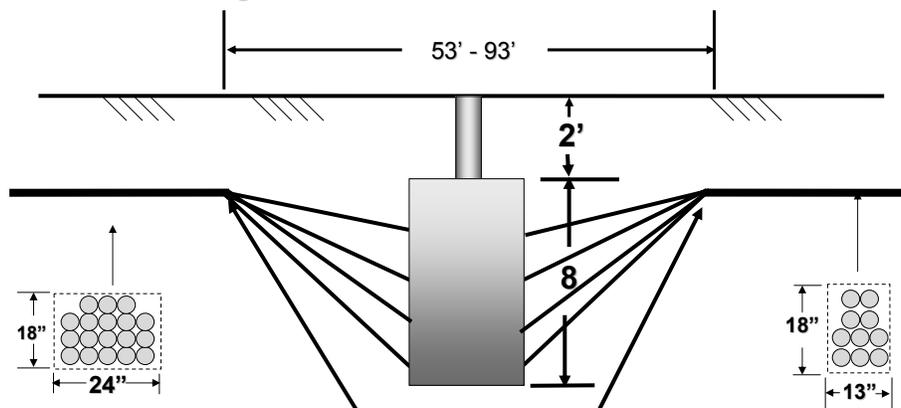


## Utility Manhole Plan View



- Conduits must be flared to outer edge of manhole
- Is there 8' of roadside area to install the manhole?
- Will it impact any existing UG facilities?

## Utility Manhole Profile View

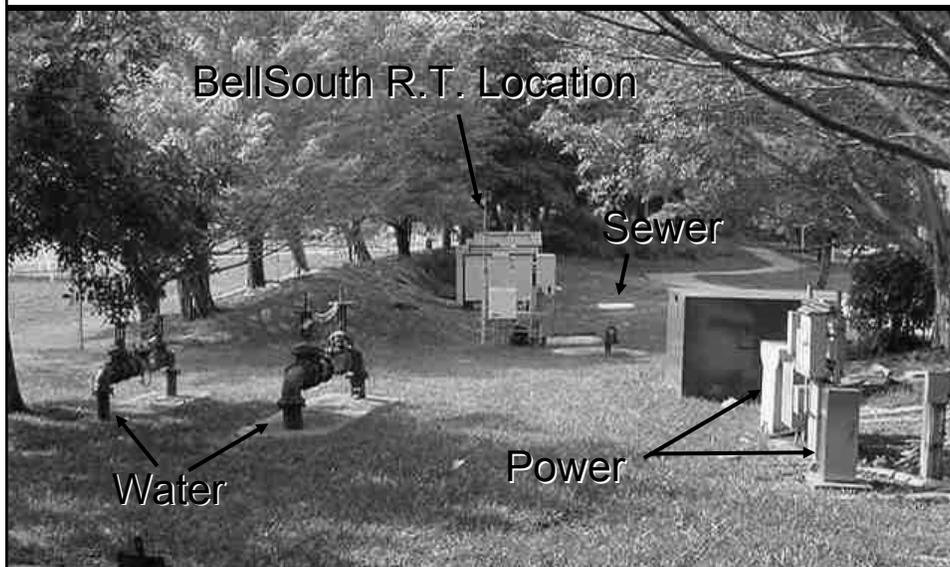


This total area must be free of any service laterals and roadway drainage. Note the change in duct configuration!

It said Telephone Duct Bank !  
Not Cable!

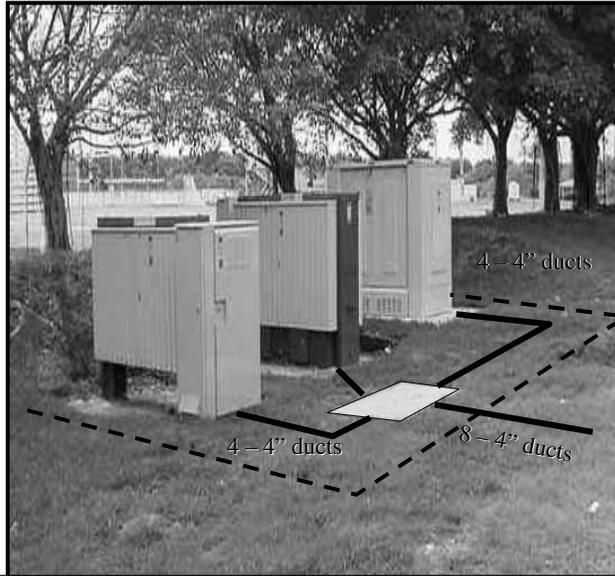


What do those small symbols really  
look like and how big are they?

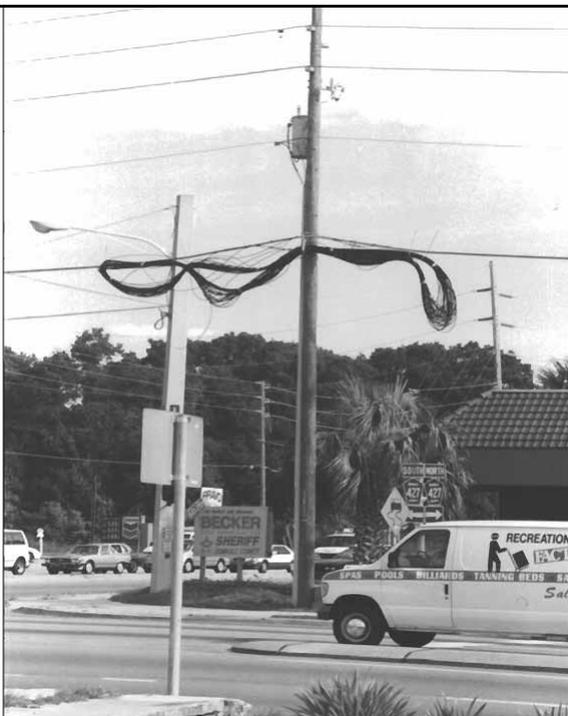


## Lets Relocate A Fiber Served Remote Terminal Multiplexer

- This equipment is used to convert lightwave to electrical signal.
- Requires a 40' x 20' Utility Easement
- Serves approx. 3500-4000 lines.
- Relocate cost - approx. \$250,000-\$300,000
- The Relocation time frame is greater than 180 days.
- Easement acquisition add approx. 90 days to the process.



Does this Utility have insight or what? It must be a DOT job!



Did you consider this drag as a conflict in your conflict matrix or in the placement of structures?



Did you consider the dewatering risers in the placement of that cable or pipe?



# Aerial To Underground Conversion

Most Everything You  
Wanted To No & More!

Is it.....  
**Feasible?**  
**Cost effective?**

## Is Undergrounding Feasible?

**Technology exists to convert any utility facility to an underground facility. What factors should be considered?**

- **Is there ample space to install the new UG facilities?**
- **Is it cost prohibitive?**
- **Will the undergrounding resolve the problems or create new problems?**
- **Are easements available?**
- **Can the customers be serviced from the new UG facilities?**
- **What changes must be made at the private services to accommodate UG VS Aerial?**

## **Is Undergrounding Feasible?**

What can, reasonably, be converted to underground?

- Power conductors
- Telecommunication cables
- Fiber optic cables
- CATV cables
- Some types of taps
- Services
- Splices, etc.

## **Is Undergrounding Feasible?**

What facilities are impractical to be installed underground?

- Power Transformers
- Power Sectionalizing Switches
- Street lights
- Fiber Optic Splices
- CATV Service Terminals
- Telephone Service Terminals

## Can these facilities be put underground?



## Is there adequate space?

## Where do you install the UG Facilities? Under the sidewalk?



- How would you provide service to the customers behind the wall?
- Where would you place the above ground appurtenances?
  - Transformers
  - Switch gear
  - Terminals, etc.

### **Can it be installed behind the wall?**

- Yes, but it would require private easements.

## Can these facilities be converted to underground?



- 1. How many different attachees?**
  - Power, telephone, CATV, Telecom
  - 3' – 6' space requirements to install underground.
- 2. What is currently underground between the curb and the R/W line?**
  - Gas main and service laterals
  - Water main
  - FDOT street light cable
  - Traffic control cable
  - FDOT Drainage
- 3. Is there ample space to install the UG facilities?**
  - ✓ Gas is at R/W line
  - ✓ The roadside area = 6'
  - ✓ Water is 2' into R/W
  - ✓ SL/TC cables are 1' behind curb
- 4. How will the existing commercial customers be serviced?**
  - 1 phase and 3 phase customers
  - Conversion of customer services
  - Some buildings have zero setbacks.

## Is conversion Feasible ?



1. What type of facilities are involved?

- Transmission Lines
- Power Distribution Lines
- Telephone lines
- Power Risers
- Service laterals

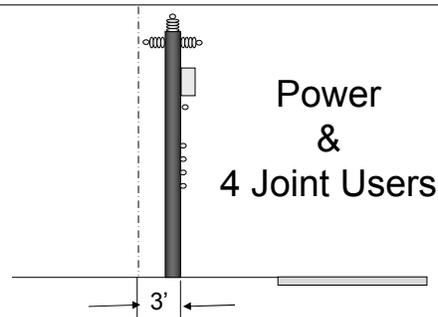
2. Is there adequate space to put the facilities underground?

3. Will there be any residual above ground appurtenances?

- Mini Transmission Substations
- Power Switch Cabinets
- Pad mounted Transformers
- Telephone Terminals

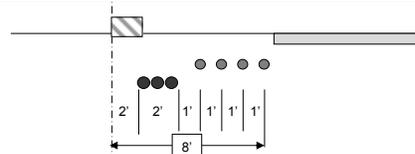


## Space Allocation



**Overhead Construction**

## Underground Comparison

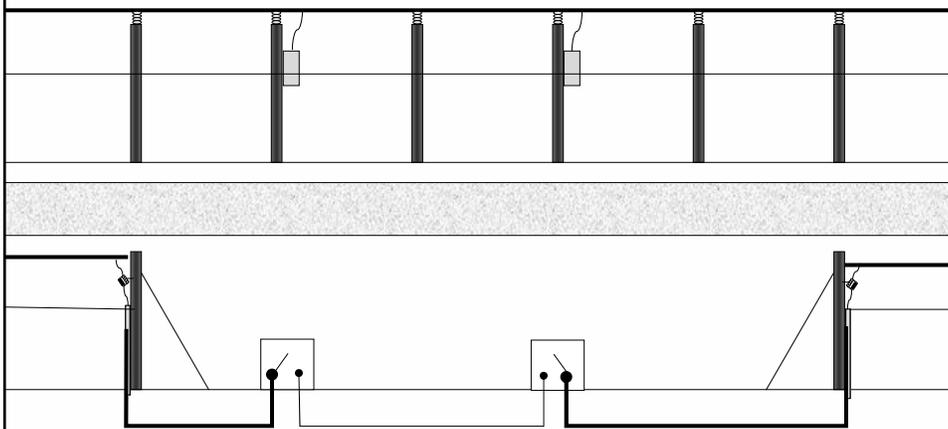




## Roadside Allocation

1. The space allocation for utilities will change from:
  - a. OH = 3'
  - b. UG = 8'
2. No underground facilities can be located at R/W line because of existing OH facilities.
3. If water & sewer lines are located in roadside area, *then new facilities may need to be located under pavement.*
4. Joint trenching will reduce the amount of UG space requirements.

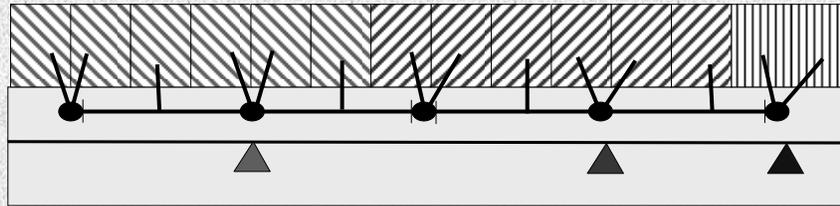
## Overhead vs. Underground Operations



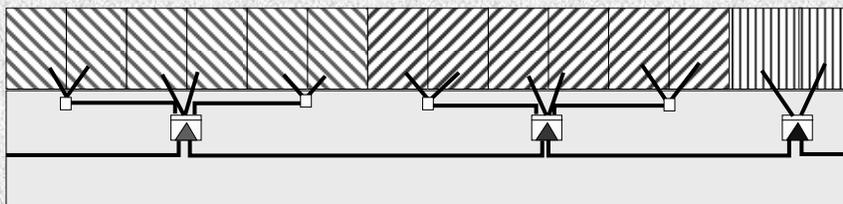
- Switching devices are used to aid in service reliability
- Additional down guying is required
- Damaged cable repair must be isolated
- Repair time is longer and more costly

## Direct Replacement of Pole Line

Overhead System



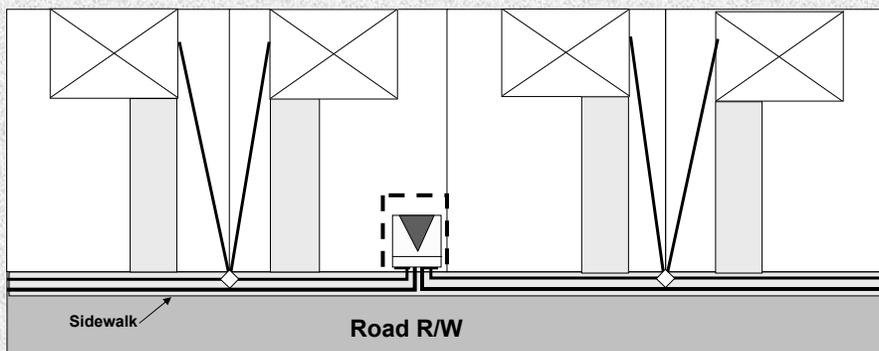
Underground Replacement



Poles are replaced with transformers, pedestals and handholes  
Where will the UG facilities be placed ? In R/W or Private Easement

## Direct Replacement of Pole Line

Underground Replacement in public R/W.

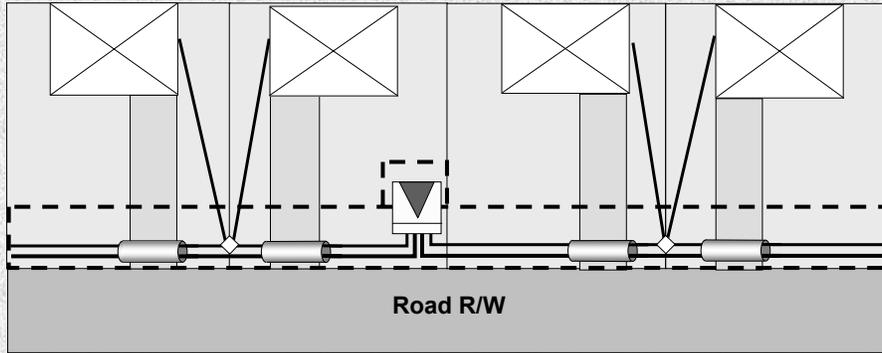


- Easements for transformers
- Handholes in sidewalk
- Cable under sidewalk

- Do you replace the sidewalk or bore under?
- Will there be conflicts with existing UG utilities?

## Direct Replacement of Pole Line

### Underground Replacement in Easement

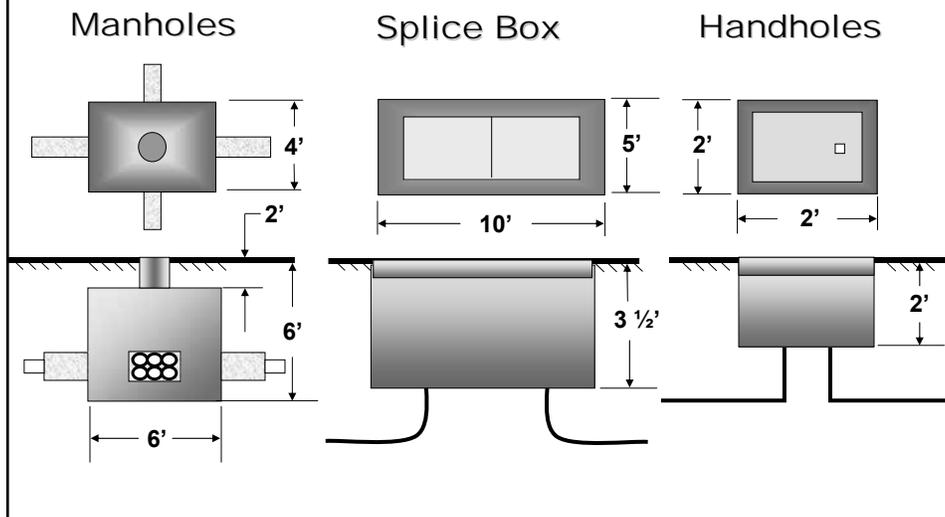


- Requires a 2' lateral easement
- Easement for transformers
- Bore under driveways
- Landscape restoration

**Will the land owners grant the easements?**

## Power System Design Philosophy

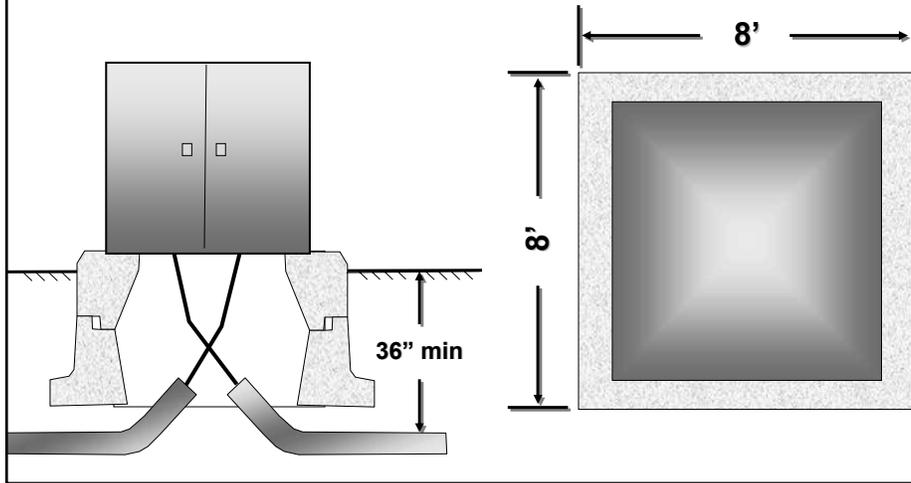
### UG System Components



## Power System Design Philosophy

### Above Ground Components

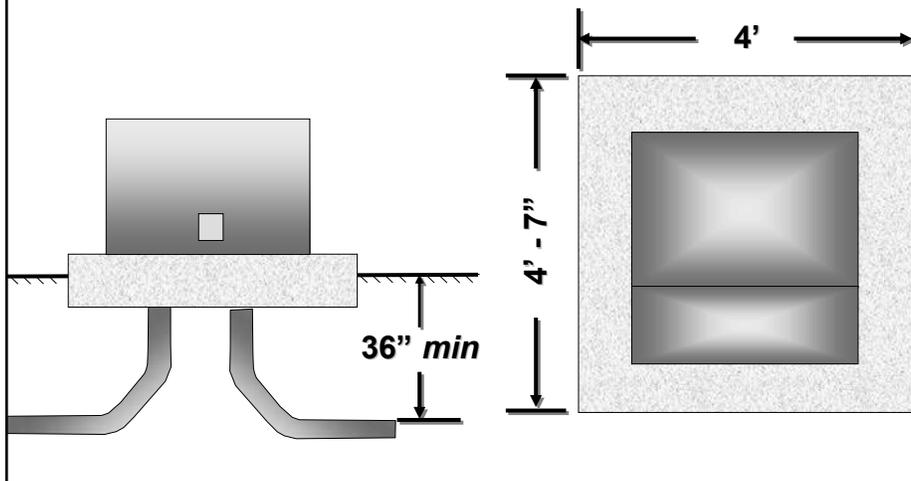
Pad Mounted Switch Cabinet



## Power System Design Philosophy

### Above Ground Components

Pad Mounted Transformer



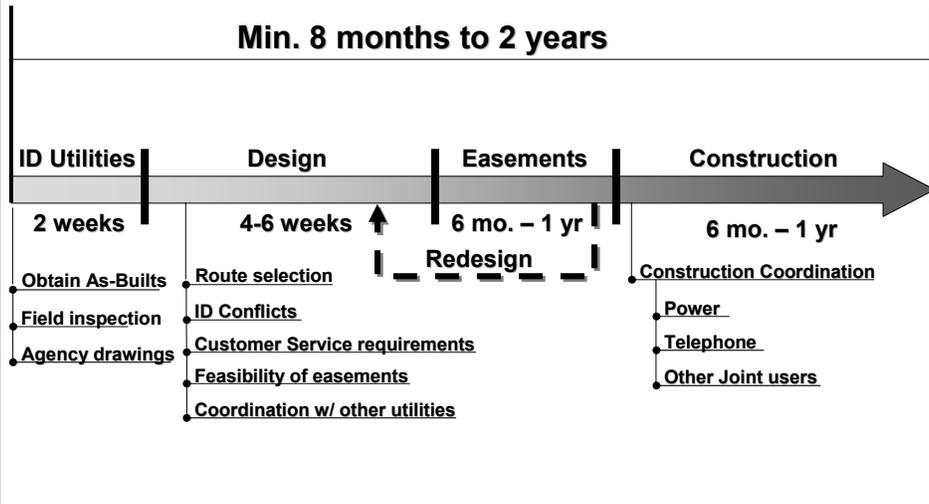
Conversions

## Sequencing of Events

- ✓ Identify & obtain “As-Builts” of all existing UG facilities.
- ✓ Determine UG route & the locations of above ground facilities.
- ✓ Acquire all easements & permits
- ✓ Install new UG system
- ✓ Energize UG System
- ✓ Convert all services
- ✓ De-energize OH system
- ✓ Remove OH System
- ✓ Remove existing poles \*\*

**\*\*After all attachees have relocated!**

## Estimated Utility Pole To UG Relocation Time Frame



# **MSE – Mechanically Stabilized Earthwalls and Utility Placement**

## **LONG TERM SETTLEMENT!**



## HOW BAD IS IT REALLY?



## THE ROOT OF THE PROBLEM!



## THE FIX IS A PROBLEM?



**WHAT IF  
YOU WERE  
DEALING  
WITH THIS  
KIND OF  
WATER  
PRESSURE?**

© 2001, The Washington Post. Photo by James A. Parcell. Reprinted with permission  
WASHINGTON DC—A break in a 48-inch water main sent water spewing 150 feet  
into the air. Several hundred houses experience low water pressure and traffic was  
affected for several hours during the evening rush. Flying chunks of asphalt heavily  
damaged at least one car, but no one was seriously hurt. Firefighters were summoned  
by people reporting a huge cloud of "smoke" and an "explosion" that scattered  
debris over a large area. Water department officials were conducting an investigation  
into the cause of the rupture. 11/6/01

Underground Focus

19

## WHAT IS THE UTILITY CHALLENGE ?



NO PILE SUPPORTS!

## SAND FLOWS LIKE WATER ?



Easily eroded material make these installations more critical.

**IMPROPER UTILITY  
PLACEMENT WITH FAILURE  
CAN RESULT IN:**

- Wall collapse
- Fatalities
- Collateral damage to adjacent facilities
- MOT (Loss of use to public)
- Cost of repair
- Supplemental Agreements

**DESIGN ISSUES ?**

- Physical conflicts with structural elements
- Compaction
- Shear and settlement (joints)
- Safety redundancy (encasement)
- Specs
- Where should the Utility go?

## **COORDINATION & APPROVAL**

- Advance requirements (Bridge work usually precedes roadway work)
- Special utility items (purchase and funding)
- Identifying special wall constraints, making Utilities aware and programming
- Subordination
- State Structures Engineer or Designee Must Approve Utility Locations – UAM Section 5.7

## **IN SUMMARY - The two keys to a successful project are:**

- 1. Understanding project requirements,**
- 2. A commitment to reasonable schedules and results!**

The solution to your problems may be closer than you realize!



**FINAL QUESTIONS?**