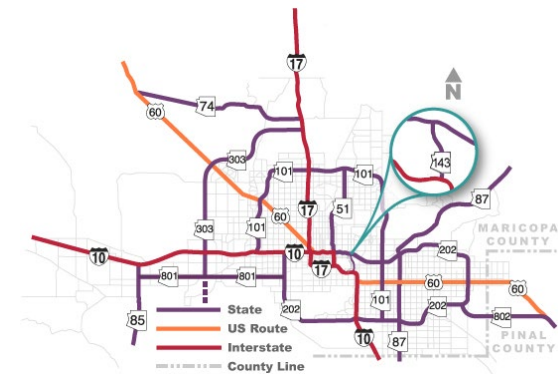


# UTILITY AND RAILROAD ENGINEERING (URR)

**Mohamed Ali Noun, PE**  
Statewide Utility Engineer  
[MNoun@azdot.gov](mailto:MNoun@azdot.gov)  
602 712-8689



# URR Mission

URR is responsible for:

- clearing the right-of-way of utility conflicts in advance of highway construction projects; in a safe, efficient, and cost-effective manner.
- Also, improving safety of public railroad crossings in Arizona.

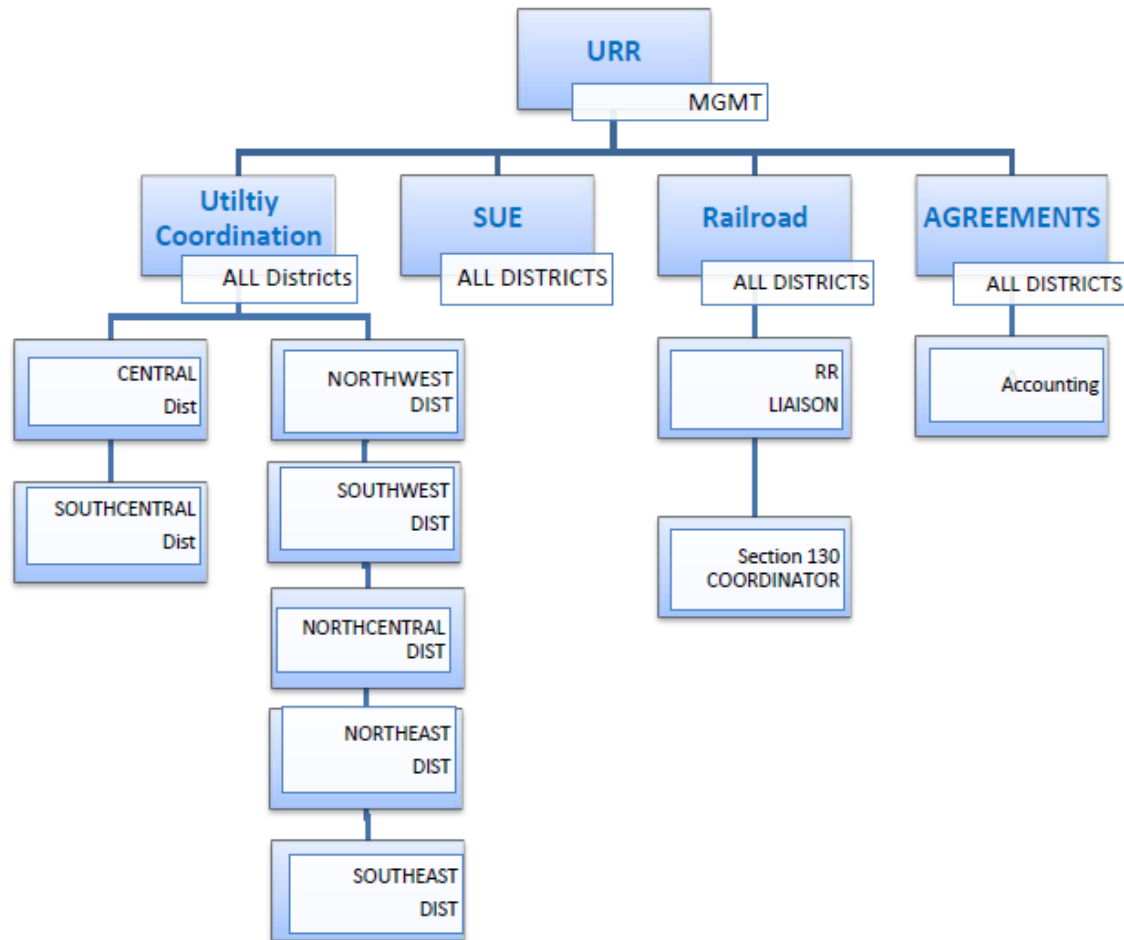


# URR KEY OBJECTIVES

- **Public Safety:** Minimize / Eliminate liability on Hwy CONST projects & Improve safety at public railroad/highway crossings in Arizona
- **Project Schedule:** Support ADOT's Construction Schedule & Service Delivery
- **Project Budget:** Ensure Cost Effective Operations & avoid unnecessary costs



# URR STRUCTURE





# PRIMARY ROLE

URR Role is integral and critical  
to  
ADOT IDO Project Development & Construction


\*\*\*\*\*

## URR UTILITY CLEARANCE CERTIFICATION

is required PRIOR to

PROJECT ADVERTISEMENT

Utility & Railroad Engineering

Arizona Department of Transportation ADOT UTILITY & RAILROAD ENGINEERING SECTION 205 S. 17th AVE., Phoenix, AZ 85007	
MEMORANDUM	
To: Barry Crockett, PE Engineer - Manager Contracts and Specifications (217)	Date: September 3, 2008
From: Mohamed Ali Hour, PE SAG Inventory Coordinator Utility and Railroad Engineering Section SAG UTILITIES M&E BR	Subject: Utility Clearance Letter TRACS HO-100 MA 120 H211 81C PROJECT HO-100 SECTION: Phoenix - Phoenix Hwy 0-10 LOCATION: 1-10 VERMADO TO SARVAL
<small>The enclosed letter from "URS" certifies utility clearance for the subject project. In addition to your stated specifications under section 107.15, please include the attached information in the Project Special Provisions. With respect to utility adjustments, this project may be released for bids.</small>	
 Mohamed Ali Hour, PE	
<small>Enclosure: Letter.</small>	
<small>cc: Stephanie Huang, ADOT VPM Ali Schmeier, URS Rob Karpov, ADOT Phoenix Construction D.E. Mike Sarnow, ADOT PM, M&amp;E BR Stephanie Sarnow, URS Re: TRACS H211</small>	

# Utility Clearance

- All Utility-related concerns have been addressed in the Utility Clearance Letter.
- The project Plans, Specifications, & Estimates (PS&E) contain all the information needed by State and contractor forces to prevent unforeseen problems involving utility facilities.

# FEDERAL & STATE LAWS

- FHWA 23 CFR
  - Utility Relocations, Adjustments & Reimbursement
  - Accommodation of Utilities
  - Railway/Hwy Crossings (Sec 130)
  
- Arizona Revised Statutes (ARS):
  - ARS 28-7092: Land acquisition for utility relocation
  - ARS 28-7156: Utility Relocation & Reimbursement

# Stakeholders

## External

- Utility companies, Counties, Cities and Towns
- On-Call Consultants
- Design Consultants
- Railroad Companies
- AZ Corporation Commission
- AZ Attorney General
- FHWA

## Internal

- Executive Mgmt
- PMG
- Contracts & Specifications
- Design & Construction Staff
- Environmental Group
- Right of Way Group
- Financial Services
- Audit & Analysis Office

# Projects Handled by URR

## ■ PROJECTS:

- All Highway Projects Currently processed through IDO
- About 200 Projects Cleared in a Fiscal Year

# What are Utilities?

**Utilities are the Veins and Arteries of our Cities and Roads...**



## Utilities:

- Electric Power
- Gas - Oil - Product Lines
- Telecom./Cable TV
- Water
- Sanitary Sewer
- Reclaimed Water
- RR (treated as a Utility)



# Utilities

Existing utilities  
abound!

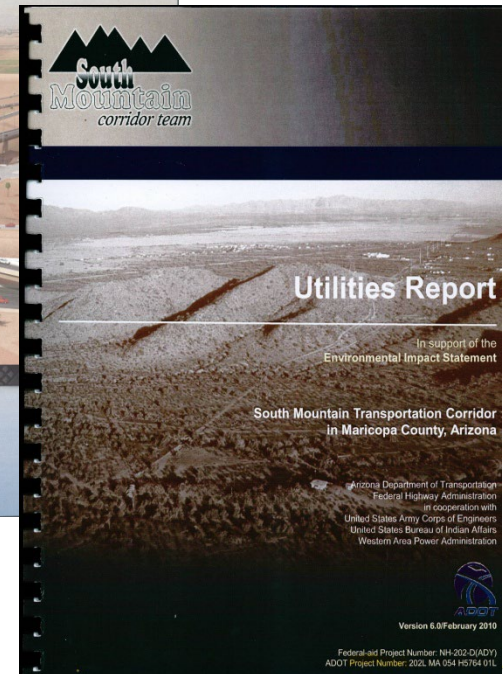
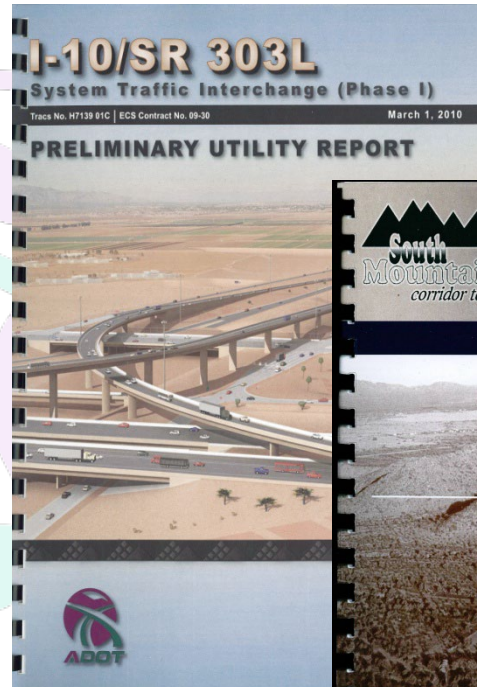
*...and...*

How do you  
ever identify  
and avoid these  
facilities!!!



# ADOT Utility & Railroad Engineering

## Utility Coordination Process



# Utility Coordination

***Art  
vs.  
Engineering***



# Art vs. Engineering

Art...

*Not this Art...*

**A position with URR  
if you know who this is!**



# Art vs. Engineering

## *This kind of Art:*

- Knowledge of the Utility Coordination Process
- Knowledge of State Statutes (ARS) and FHWA regulations (CFR)
- Effective Verbal & Written Communication Skills
- Negotiation & Organizational Skills
- Productive Relationships with Utility Owners
- Also, a personality helps!



# Art vs. Engineering

## Engineering:

- Plan Reading
- Field Reviews
- Utility Conflict Analysis
- General Utility Design Concepts & Alternatives
- Utility Construction and Inspection
- Principles and Practices of Civil Engineering
- ADOT Standards and Procedures





# Why we need Utility Coordination!

## Design in Progress

- Multiple Existing underground facilities.



**Traffic Signal foundation is  
designed right here!**

# Why we need Utility Coordination!

Construction  
in  
Progress!



**Lack of Communication!**

# Why we need Utility Coordination!

**Safety ... Safety ... Safety!!!**





# Why we need Utility Coordination!

- 36" gas line explosion



# Why we need Utility Coordination!

## Construction Completed!



Not what we  
expected!!!

# Why we need Utility Coordination!

## That's Why:

- Public Safety
- Project Schedule
- Project Budget



\*\*\*No unexpected delays/expenses occur during construction as a result of conflicts with utility or railroad facilities.



# Utility Coordination



## The Process in Project Development

# Project Develop. Phases

- Scoping Phase: SL / PA / L-DCR
- Design Phase:
  - Stage II: 30%
  - Stage III: 60%
  - Stage IV: 95%
  - Stage V: 100% ( PS&E)
- Construction Phase

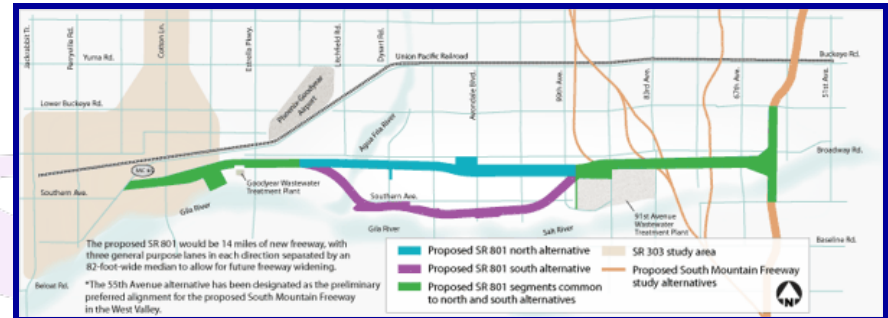


# Scoping Phase (SL / PA / L-DCR)

## Early Coordination:

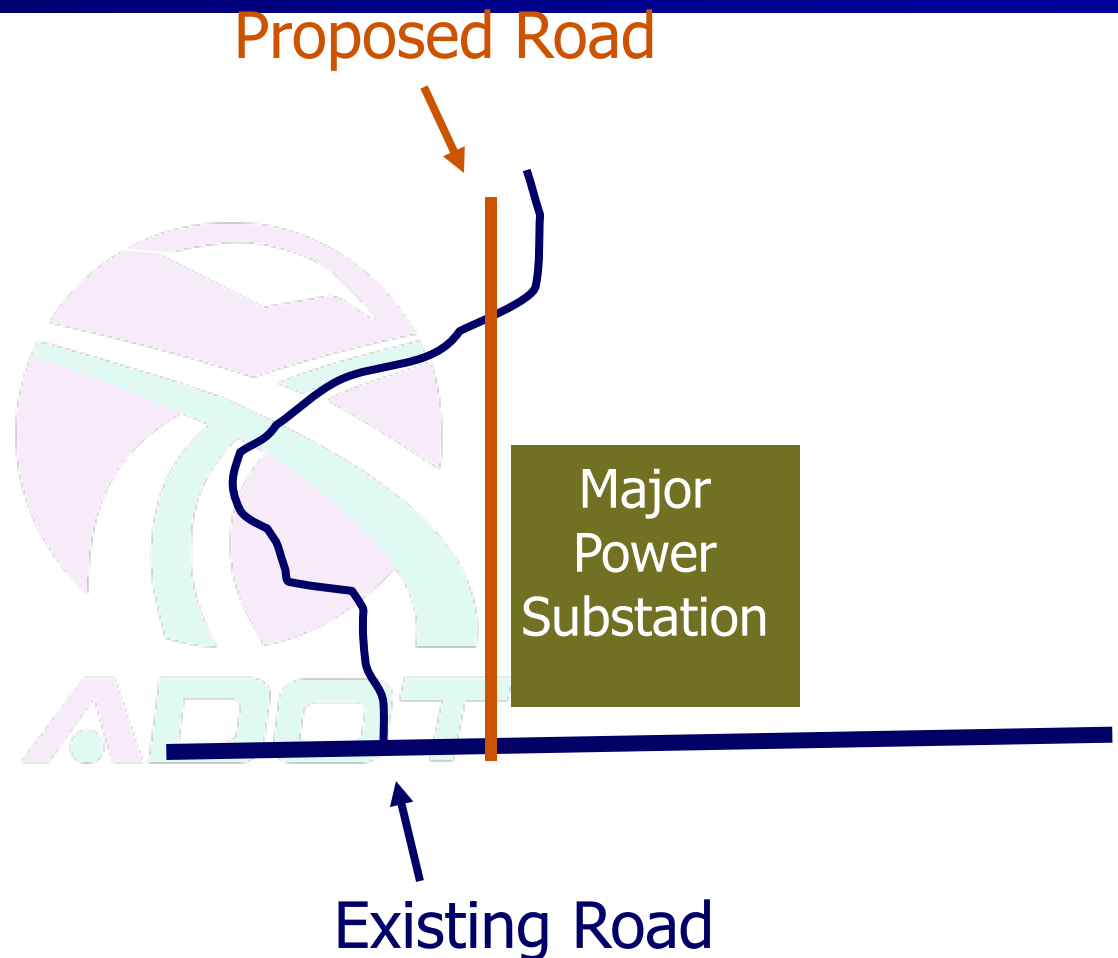
- Alignment Selection impacts on utilities
- Utility Relocation impacts on:
  - Environment
  - Right-of-way

\*\*\*Corridor Studies



# Initial Proposed Alignment

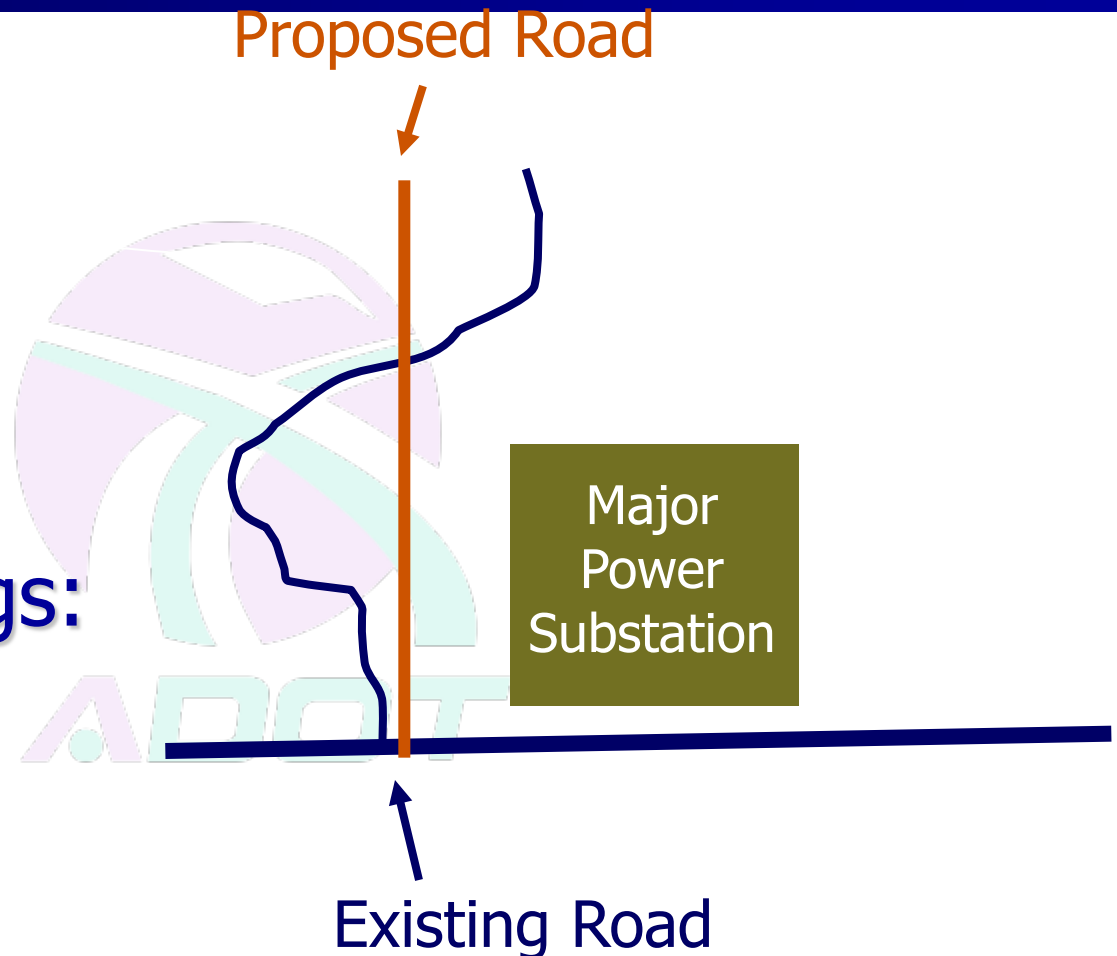
- Consider impact to utilities



# Final Alignment

- Utility has Prior Rights (ADOT pays)

- ADOT Savings:
  - Time
  - Money



# Avoid...Avoid...Avoid Utility Conflicts

## ■ Suggest Alternatives:

- Move alignment
- Change grade
- Widen only one side of highway
- Move ramps
- Other design modifications

\*\*\*Team will re-align Freeway/ modify design to avoid & minimize impact to Utilities



# Design Phase

## URR Milestones:

1. Identify utilities within project limits
2. Subsurface Utility Engineering (SUE Phase I)
3. Utility Conflicts Analysis
4. Subsurface Utility Engineering (SUE Phase II)
5. Resolve utility conflicts
6. Agreements (Land Rights, Cost, Plans & Sch.)
7. Issue the Utility Clearance Letter



# 1. Identify Utilities (Data Collection)

- Contact AZ blue stake center
- Utility owners listing & Field Review
- Obtain As-Builts / Facility maps from Ut.
- Research ADOT Permit Log  
(Existing & proposed Ut.)
- Review Existing R/W plans



## 2. SUE Phase I (Designate utilities)

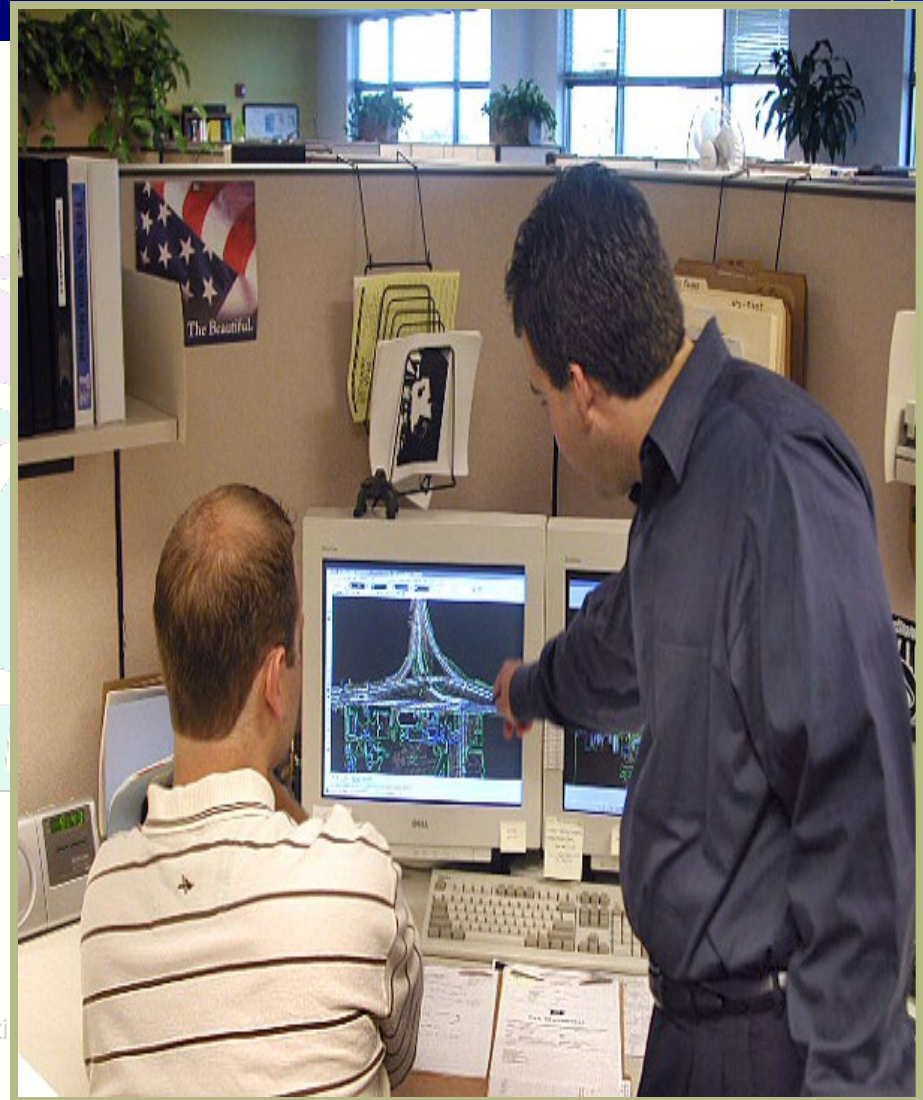
### Surveying/Mapping:

- Request utility designation (horizontal QL-B)
- Map designated utilities in CADD within Project limits



# 3. Utility Conflict Analysis

- Lay out horiz. Designated utilities on the design plans (Stage II)
- Determine potential utility conflicts:
  - Review plans
  - Engineering analysis

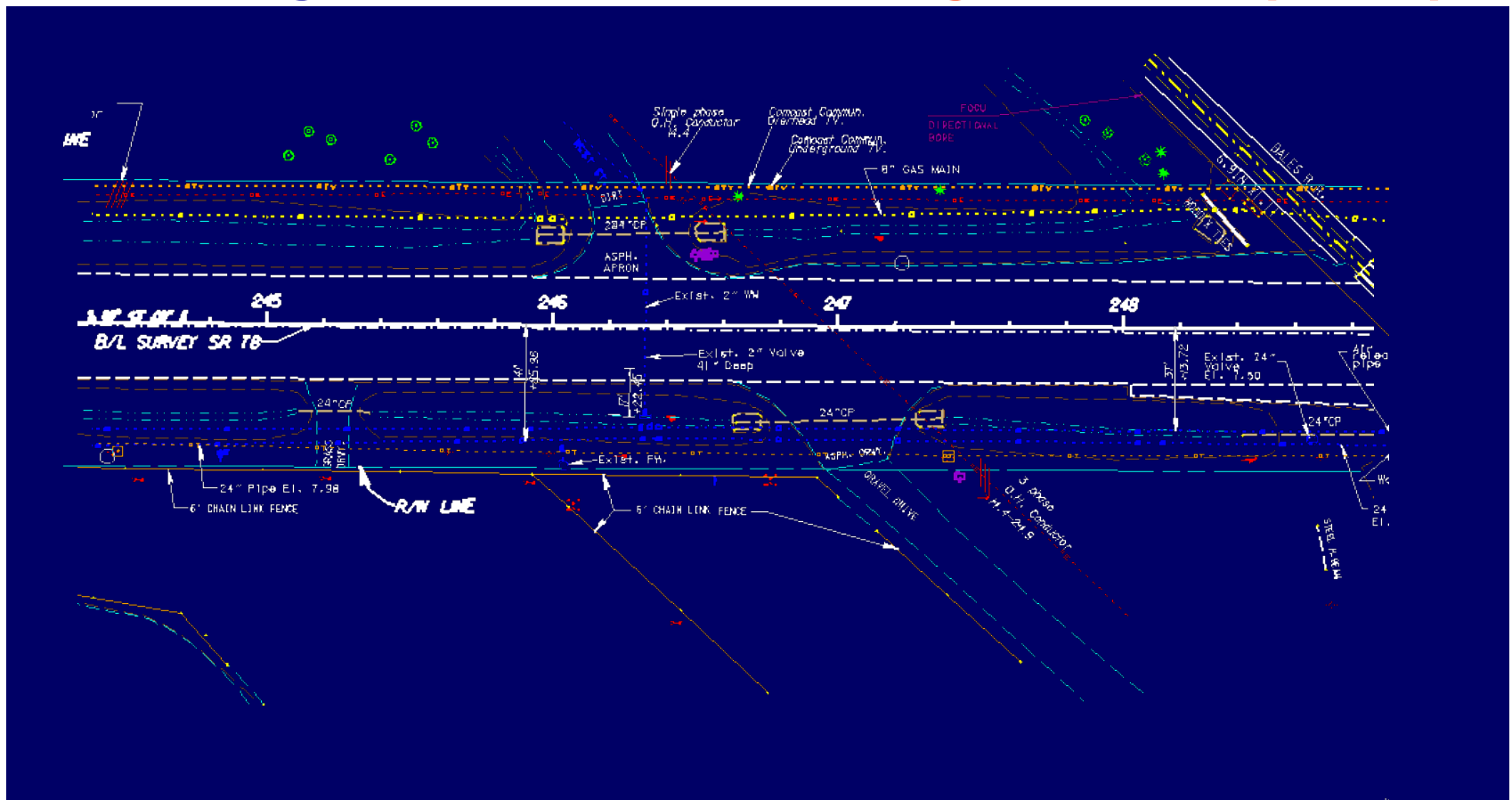




# Start With the Topography

Add Existing R/W

Add Existing Utilities (QL-B)



8. 80

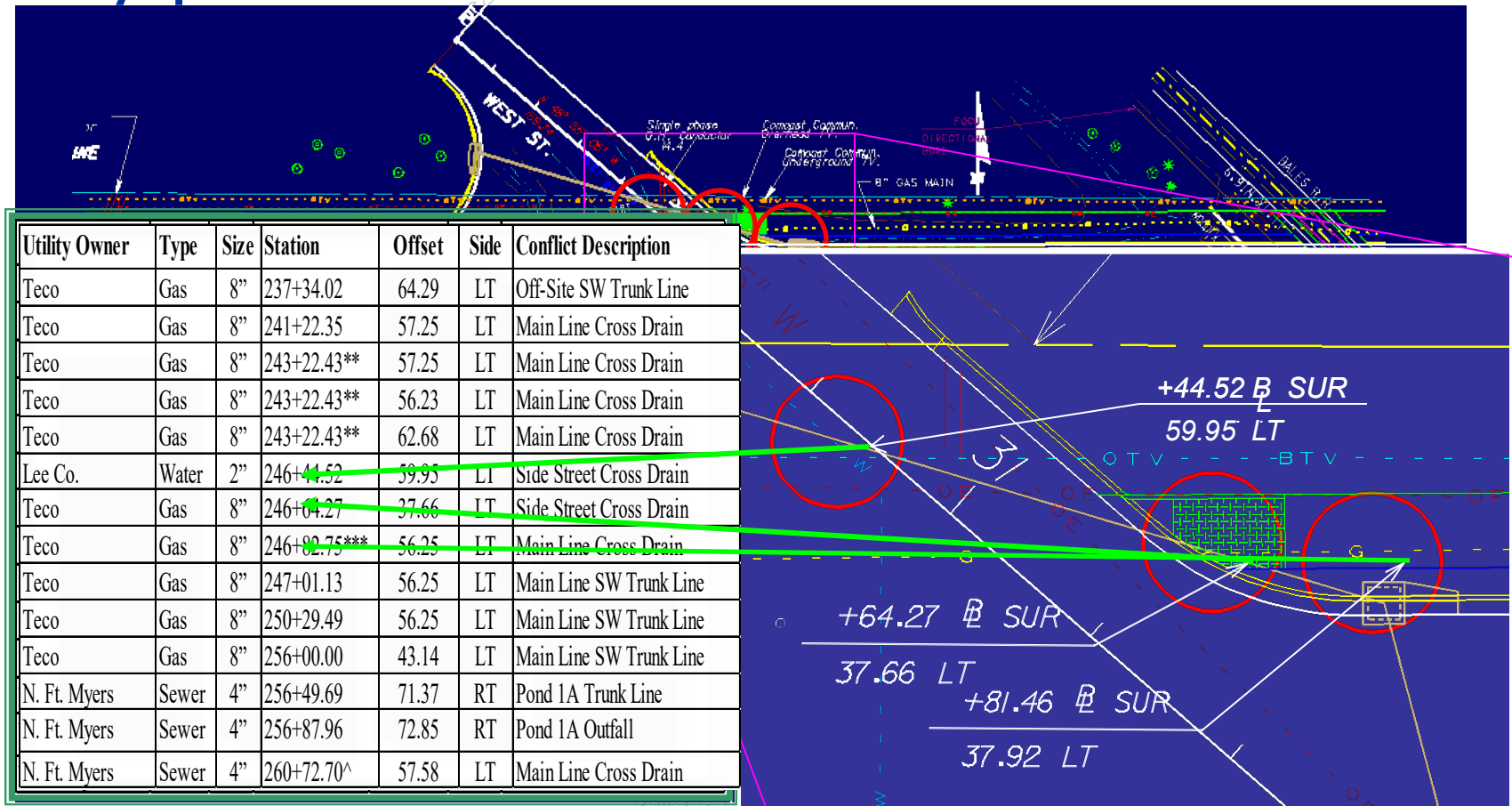


James E. Remond Engineering



# Analyze Conflicts

# Identify potential Conflicts      Build Conflict Matrix



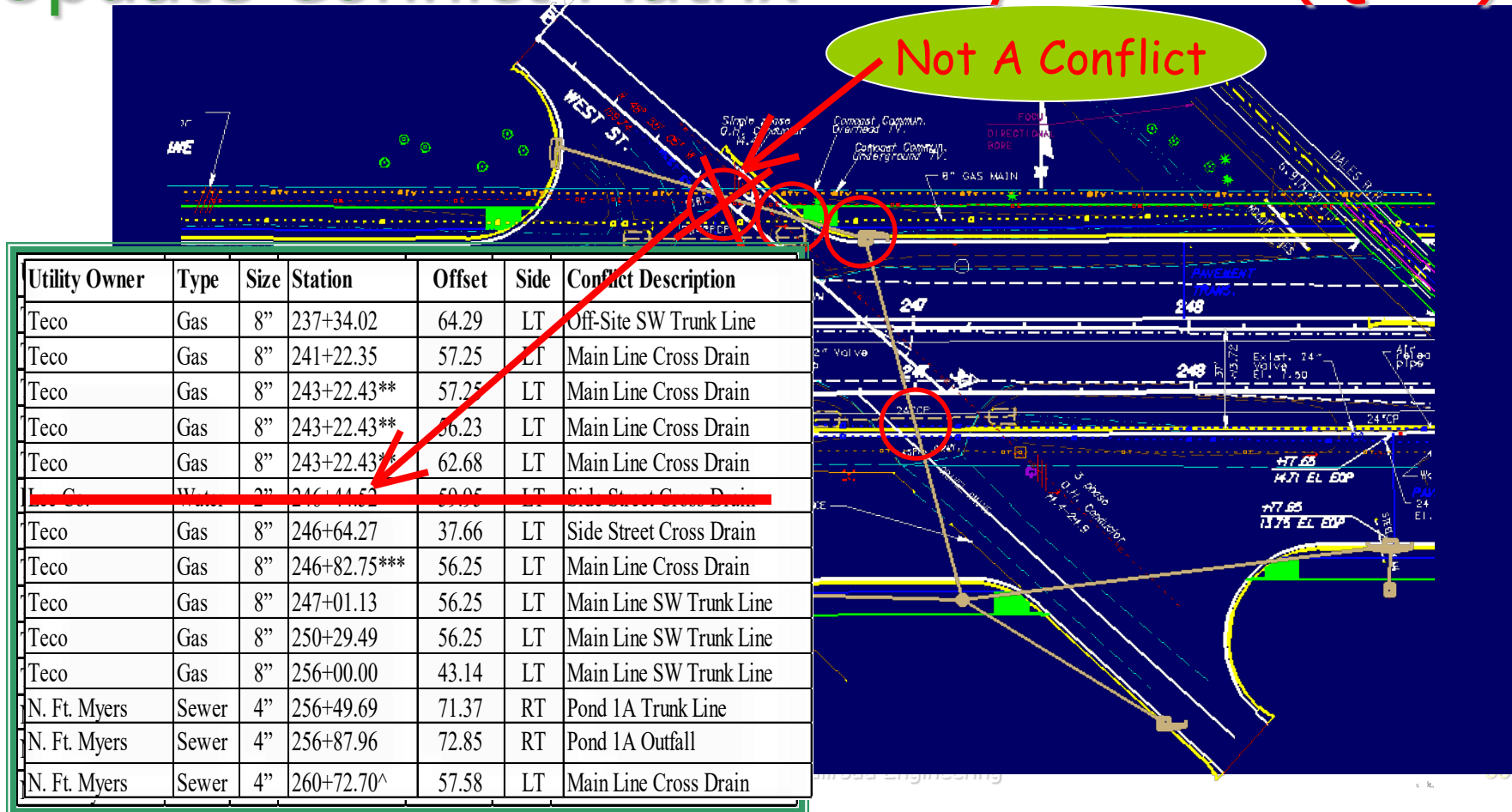
## 4. SUE Phase II (Locate Utilities)

- Request utility vertical locating services (Potholing QL-A) to confirm/rule out potential conflicts.



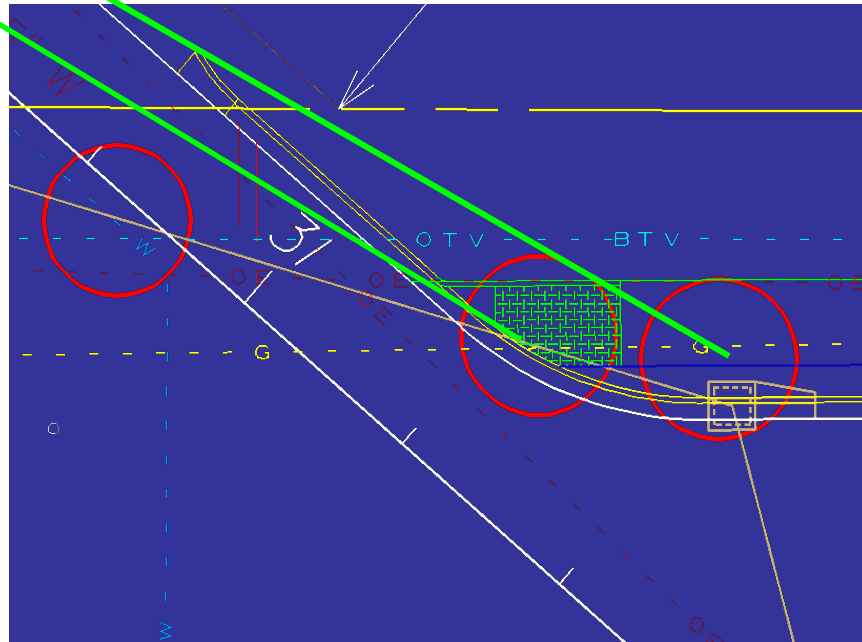
# Identify Actual Conflicts

Update Conflict Matrix Analyze Data (QL-A)



# Actual Conflict Matrix

Station & Offset	Utility	Comments	Action Required
246+64.27, 37.66 LT (x&y)	Teco	Proposed main line drain in close proximity to 8" gas line	Confirmed 8" gas line at z= 2.67 ft. CONFLICT
246+82.75; 56.25 Lt (x&y)	Teco	Proposed Side street Cross drain on top of 8" gas line	Confirmed 8' gas line at z= 2.65 ft. CONFLICT





# 5. Resolve Utility Conflicts

Provide technical guidance to the utility relocation design team:

- Safe option
- Cost effective
- R/W
- Environmental
- Permit
- Multiple Utility Relocations Schedule

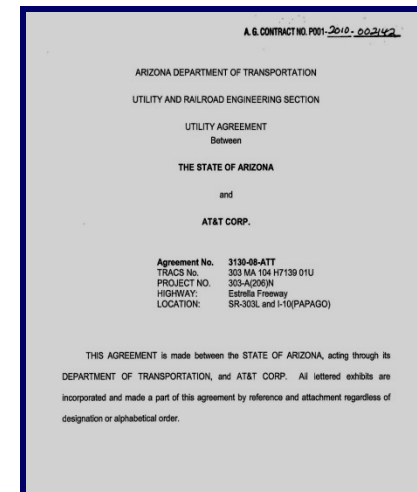




# 6. Utility Agreements

Prepare, review and process legal Utility Agreement Contracts:

- Scope of work
- Utility Design Authorization
- Cost Estimates
- Utility Relocation plans
- Land Rights documents
- Schedule of work
- Utility Construction Authorization
- Payments Approval



**\*\*\* All components in compliance with ADOT Standards & Policies; and with Federal Requirements.**

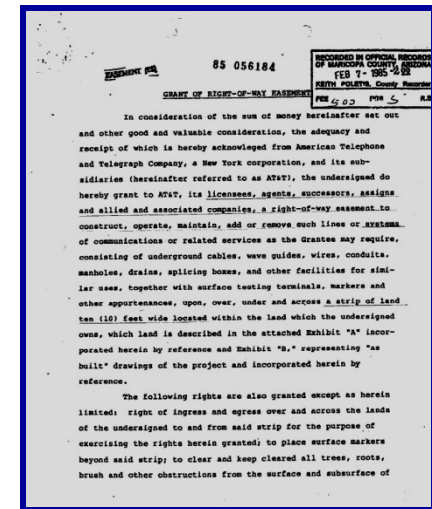
# Land Rights

## ■ Evaluate land rights documentation

- County maps, title reports, Easements, R/W plans, ADOT permit log and other property plans and legal descriptions

## ■ Determine prior rights status

## ■ Validate financial responsibilities for relocations as appropriate.



# Approve Relocation Plans

- Utility relocation plans and specifications are in compliance with ADOT applicable standards, policies and regulations



PROJECT NO. 6661372  
SPECIFICATION NG 96591  
CABLE CLL- PHXKZUB517

WESTERN REGION  
MAINTENANCE PROJECTS

PHOENIX POP  
TO  
BUCKEYE OA

REROUTE FTA CABLE INTO NEXGEN  
LINK 13 CONDUIT ALONG THE ROOSEVELT  
CANAL FROM Mc DOWELL ROAD TO  
WEST OF COTTON LANE  
IN GOODYEAR, AZ

GOODYEAR  
Mc DOWELL RD  
ROOSEVELT BRANCH  
ROOSEVELT CANAL  
COTTON LANE  
NEXGEN LINK 13

ROOSEVELT IRRIGATION DISTRICT APPROVAL  
THE DISTRICT APPROVES THESE PLANS FOR CONCEPT ONLY AND  
ACCEPTS NO LIABILITY FOR ERRORS OR OMISSIONS.

13 June 2010  
13 June 2010

at&t

CONSTRUCTION ISSUE  
MAY, 2010

FORREST ENGINEERING &  
SURVEYING, INC.  
2201 BROOKDALE ST., STE. 203  
HUNTINGTON BEACH, CALIFORNIA 92648  
PHONE (714) 865-9700  
MAY, 2010 JN 6661372

# 7. Utility Clearance

- Write the Utility Clearance Letter with Special Provisions language to include in the Project Specifications
- State clearly the status of each utility facilities within the project limits.
- Issue the utility clearance letter authorizing project construction

The image shows a sample of a Utility Clearance Letter from the Arizona Department of Transportation (ADOT) Utility & Railroad Engineering Section. The document is a memorandum dated September 3, 2008, addressed to Barry Crockett, PE, Engineer - Manager, Contract and Specifications (217). The subject is a Utility Clearance letter for TRACS HO-010 MA 120 H211 01C PROJECT HO, located at SECTION Haverburg - Phoenix Hwy 0-10 PHOENIX. The location is specified as I-10 VERBANO TO SARVAL. The letter is from Mohamed Ali Hour, PE, MAG Reentry Coordinator, Utility and Railroad Engineering Section, MAG UTILITIES, and MAG 43RE. The letter certifies utility clearance for the subject project. It also includes a list of contacts: Stephanie Huang, ADOT URM; Ari Schmeier, UES; Bob Sarrou, ADOT Phoenix Construction D.E.; Tom Sarrou, ADOT PHOENIX, MAG 43RE; and Bob Sarrou, URM, MAG 43RE (TRACS H211).

Arizona Department of Transportation UTILITY & RAILROAD ENGINEERING SECTION 205 S. 17th AVE., Phoenix, AZ 85007	
MEMORANDUM	
To: Barry Crockett, PE Engineer - Manager Contract and Specifications (217)	Date: September 3, 2008
From: Mohamed Ali Hour, PE MAG Reentry Coordinator Utility and Railroad Engineering Section MAG UTILITIES MAG 43RE	Subject: Utility Clearance letter TRACS HO-010 MA 120 H211 01C PROJECT HO, SECTION Haverburg - Phoenix Hwy 0-10 PHOENIX LOCATION: I-10 VERBANO TO SARVAL
<p>The enclosed letter from "URS" certifies utility clearance for the subject project.</p> <p>In addition to your stated specifications under section 107.1.5, please include the attached information in the Project Special Provisions.</p> <p>With respect to utility adjustments, this project may be released for bids.</p> <p><i>Mohamed Ali Hour</i> Mohamed Ali Hour, PE</p> <p>Enc: Clearance Letter Stephanie Huang, ADOT URM Ari Schmeier, UES Bob Sarrou, ADOT Phoenix Construction D.E. Tom Sarrou, ADOT PHOENIX, MAG 43RE Bob Sarrou, URM, MAG 43RE Re (TRACS H211)</p>	

# Construction Phase

- Attend Partnering/Pre-construction Meetings
- Alert Utilities & Contractor to comply with project CNST schedule
- Ensure minimal interruptions to Utility Services during construction
- Resolve any arising utility issues during project construction





# ADOT Utility and Railroad Engineering

*Thank you!*

**Questions?**

ADOT



ARIZONA DEPARTMENT OF TRANSPORTATION

For more info:

**ADOT**  
**UTILITY AND RAILROAD ENGINEERING**

205 S 17<sup>TH</sup> AVE, RM 357  
PHOENIX, AZ 85007

[www.azdot.gov](http://www.azdot.gov)

602 712-7541