

UTILITY AND RAILROAD ENGINEERING (URR)

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UTILITY COORDINATION

PROCESS OVERVIEW

What are Utilities What is Utility Coordination What it takes to be a coordinator Why we need to do utility coordination The Process in PDP Project Development & Construction

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



Key Objectives

- Public Safety: Minimize / Eliminate liability on roadway CNST projects
- Project Schedule: Support project Construction Schedule & Service Delivery
- Project Budget: Ensure Cost Effective Operations & avoid unnecessary costs



Utility Coordination

PROCESS:

clearing the right-of-way of utility conflicts in advance of highway construction projects; in a safe, efficient, and costeffective manner.

RESULT: UTILITY CLEARANCE PRIOR to PROJECT ADVERTISEMENT



Utility Clearance

- All Utility-related concerns have been addressed in the <u>Utility Clearance Letter</u>.
 - The project Plans, Specifications, & Estimates (<u>PS&E</u>) contain all the information needed by the Engineer & Contractor to prevent unforeseen problems involving utility facilities.

Stakeholders

<u>External</u>

<u>Internal</u>

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

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

FEDERAL & STATE LAWS

FHWA 23 CFR

- Utility Relocations, Adjustments & Reimbursement
- Accommodation of Utilities
- Arizona Revised Statutes (ARS):
 - ARS 28-7092: Land acquisition for utility relocation
 - ARS 28-7156: Utility Relocation & Reimbursement

What does it take to do Utility Coordination







Art vs. Engineering

<u>Art...</u>

Not this Art....

A position with ADOT if you know who this is!



Utility & Railroad Eng

Art vs. Engineering

This kind of Art:

Knowledge of the Utility Coordination Process
Knowledge of Standards and Procedures
Knowledge of State Statutes (ARS)
Knowledge of FHWA regulations (CFR)

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

Design in Progress

 Multiple Existing underground facilities.



Traffic Signal foundation is designed right here!



Lack of Communication!

Safety ... Safety ... Safety!!!







36" gas line explosion





Construction Completed!





Not what we expected!!!

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 I: 15% (F-DCR)
 - 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



Avoid...Avoid...Avoid Utility Conflicts

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

***Project may re-align roadway/ modify design to avoid & minimize impact to Utilities

Design Phase

Process 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 Permit Database (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 GIS/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)



Add Preliminary Roadway Design



Add Preliminary Drainage Design



Analyze Conflicts

Identify potential Conflicts Build Conflict Matrix

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Utility Owner	Туре	Size	Station	Offset	Side	Conflict Description
Гесо	Gas	8"	237+34.02	64.29	LT	Off-Site SW Trunk Line
Teco	Gas	8"	241+22.35	57.25	LT	Main Line Cross Drain
Teco	Gas	8"	243+22.43**	57.25	LT	Main Line Cross Drain
Teco	Gas	8"	243+22.43**	56.23	LT	Main Line Cross Drain
Teco	Gas	8"	243+22.43**	62.68	LT	Main Line Cross Drain
Lee Co.	Water	12"	246+44.52	59.95	LI	Side Street Cross Drain
Teco	Gas	8"	246+64.27	37.00	LT	Side Street Cross Drain
Teco	Gas	8"	246+82.75***	56.25	LT	Main Line Cross Drain
Teco	Gas	8"	247+01.13	56.25	LT	Main Line SW Trunk Line
Teco	Gas	8"	250+29.49	56.25	LT	Main Line SW Trunk Line
Teco	Gas	8"	256+00.00	43.14	LT	Main Line SW Trunk Line
N. Ft. Myers	Sewer	4"	256+49.69	71.37	RT	Pond 1A Trunk Line
N. Ft. Myers	Sewer	4"	256+87.96	72.85	RT	Pond 1A Outfall
N. Ft. Myers	Sewer	4"	260+72.70^	57.58	LT	Main Line Cross Drain

4. SUE Phase II (Locate Utilities)

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





Utility & Railroad Engineering

Identify Actual Conflicts

Update Conflict Matrix Analyze Data (QL-A)

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Actual Conflict Matrix

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



5. Resolve Utility Conflicts

Provide technical guidance to the 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

A & CONTINUET NO. 101-2010-00. ARIZONA DEPARTMENT OF TRANSPORTATION UTILITY AND RALFROAD ENGINEERING SECTION UTILITY AGREEMENT Between	2142
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UTILITY AGREEMENT Between	
Deveoli	
THE STATE OF ARIZONA	
and	
AT&T CORP.	
Agreement No. 3130-08-ATT TRACS No. 300 MA 104 H7139 01U PROJECT NO. 300-A0050 HIGHNYL: Estrella Freevay LOCATION: SR-330L and H0(PAPAGO)	
THIS AGREEMENT is made between the STATE OF ARIZONA, acting throug DEPARTMENT OF TRANSPORTATION, and AT&T CORP. All lettered exhibits	phits are
incorporated and made a part of this agreement by reference and attachment regardle	ss of

*** 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 applicable standards, policies and regulations



PROJECT NO/ 6661372 SPECIFICATION NG 96591 CABLE CLLI- PHNXAZU8517		GOODYEAR
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V	MAY, 2010	22311 BROOKHRST ST., STE. 203 HUNTINGTON BEACH, CALIFORNIA \$2945 PHONE: (714) 963-6793

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; including schedule & permit # for relocations.
- Issue the utility clearance letter authorizing project construction



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

Questions? Thank you!



UTILITY AND RAILROAD ENGINEERING

