

Trials & Tribulations

How to be an effective Expert Witness

presentation created by

Fredric L. Plotnick, Ph.D., Esq., P.E.

ENPROMAC, Jenkintown, PA

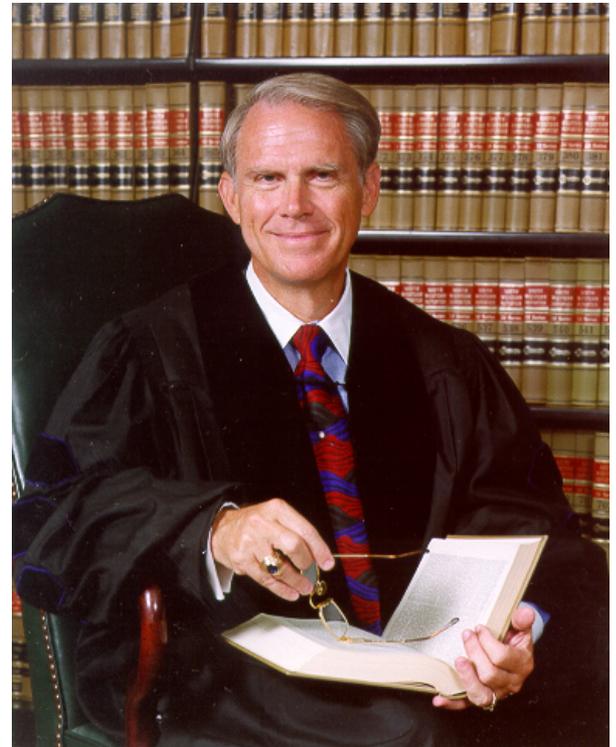
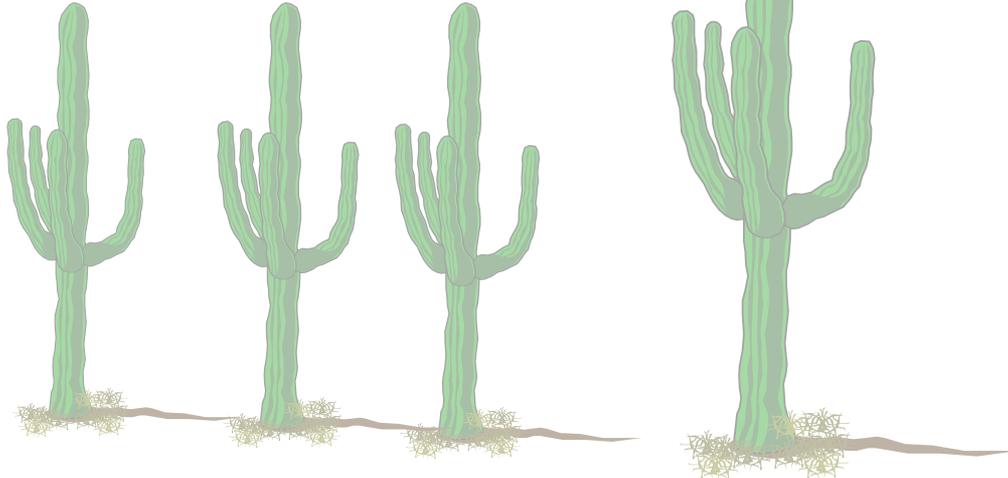
for

Construction CPM Conference 2015

Hon. John M. Marshall

Presiding

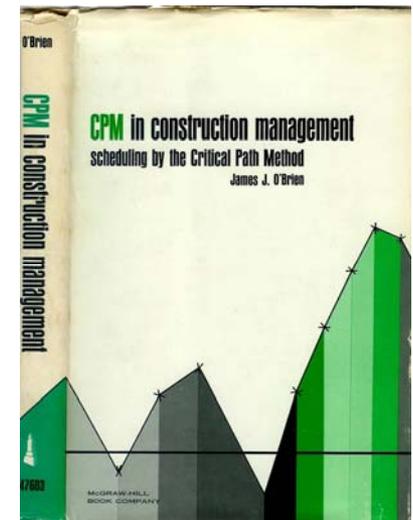
- Senior Judge of the 14th Judicial District Court, Dallas County, TX
- **MC²**, PLLC - *real trials, real judges, real appeal.*
3418 Daniel Avenue, University Park, TX 75205
214-361-1107 Mc2judge@aol.com
- Honorary Professor of the University, UMCS, Lublin, Poland
- Co-author, West's Texas Rules of Civil Procedure Annotated
- Alumnus of SMU Law School



James J. O'Brien., P.E.

Expert for the Court

- Founder O'Brien-Kreitzberg Associates
- Currently “trying to retire” – private practice
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856-829-9480 jimobriendd527@aol.com
- Scheduler -- CPM since 1962 -- 43 years
- Construction Engineering since 1955 -- 50 years
- Professional Engineer -- 6 states
- Author: *CPM in Construction Management*
--and 12 other books
- PMI, CMAA, AACEi, SAVE and ASCE



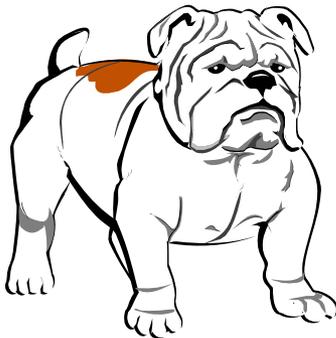


Daniel D. McMillan, Esq.

Attorney for the Contractor Change Order Charley



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- Co-chair, Domestic and International Construction Law Practice
- Author, “Federal And State False Claims Acts And Public Construction Projects”
- Author, “An Owner’s Guide to Avoiding the Pitfalls of Disputes Review Boards”



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Attorney for the Owner Redtape County



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- Member of Jones Day's Domestic and International Construction Law Practice
- Has represented Owners in major construction cases including:
 - Orange County Transportation Authority • County of Los Angeles
 - Los Angeles County Metropolitan Transportation Authority
 - County of San Bernardino • San Bernardino County Flood Control District



Gray Childs

Project Manager for Contractor “Change Order Charley”



- Gray Childs has spent the last 20 years believing and proving that the way to control and predict the future of projects is through scheduling by leveraging technology.
- Starting as a PM/Scheduler, Gray has traveled the globe “Paying Forward” the lessons learned from an exceptional field superintendent.
- Gray’s field construction experience, combined with extensive technology experience working for software companies like ConstructWare/Autodesk and Primavera/Oracle and has developed a broad and deep technical skill set specific to the industry.
- Gray now works for LoadSpring Solutions, the industry leading Project Management/Controls Cloud Services company, evangelizing and implementing the technology, processes and people that began with the lessons learned 20 years ago now delivered in the modern world of projects and technology

Timothy T. Calvey, PE

Resident Engineer of the Owner



Timothy T. Calvey has thirty years of experience managing and studying construction projects and providing construction consulting services on numerous projects ranging from the Cleveland Browns Stadium to highway expansions to residential housing. In addition to providing CPM schedule analysis, cost impact analysis and construction defect analysis, he has assisted in negotiating settlements on numerous construction disputes and is an experienced expert witness at trials, arbitrations and mediations.

Mr. Calvey is a registered Professional Engineer (PE) with the State of Ohio, a Certified Planning & Scheduling Professional (PSP) with AACE International and a Certified Professional Estimator (CPE) with the American Society of Professional Estimators. He received his BS in Engineering and MBA from Case Western Reserve University. He is past-president of the Cleveland Chapter of the American Society of Professional Estimators and a member of the Association for the Advancement of Cost Engineering Planning and Scheduling Committee. He is also a subcommittee member of the Project Management Institute – College of Scheduling and a construction arbitrator with the American Arbitration Association.

Prior to co-founding Calvey Consulting, LLC, Mr. Calvey was the Senior Vice President for R. V. Buric Construction Management Consultants, was Manager of Construction Services for Middough & Associates, Inc., was Project Director/Senior Consultant for Hill International, and started his career with Davy McKee Corporation where his last position was Project Cost and Schedule Manager.



Calvey Consulting, LLC

8473 Settlers Passage

Cleveland, OH 44141

Phone: 440-740-1132

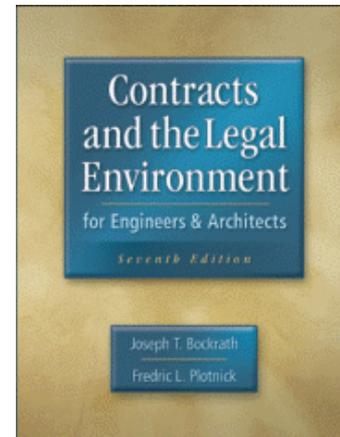
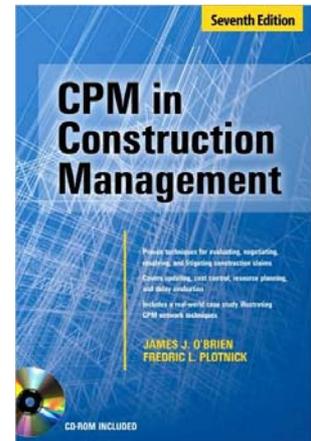
Fax: 440-740-1134

Tcalvey@calveyconsulting.com

Fredric L. Plotnick, Ph.D., Esq., P.E.

Moderator & Expert for Contractor

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215-885-3733 fplotnick@fplotnick.com
- **CPM Scheduling since 1975**
- **Professional Engineer and Attorney -- PA, NJ, FL**
- **Professor of Engineering -- Drexel U. -- Philadelphia, PA**
- **Co-Author: CPM in Construction Management**
- **Founder and Host: Construction CPM Conference**
- **ENR.com Blog The Next Generation**
- **Past President NSPE/PSPE-Philadelphia Chapter**
- **Member ASCE, AACE, PMI, ABA Forum on Construction**



A NEW ACTIVITY CODE FOR SCHEDULERS: **PARTICIPATION AT MEDIATION AND TESTIFYING IN** **LITIGATION AS AN EXPERT WITNESS**

- You just got the phone call you have been dreading. The Project Manager needs you to testify in support of the contractor's claim on a tunneling project where delays in readying the tunnel boring machine have caused a lengthy delay in the start of tunneling and an even lengthier delay in project completion. The competing claims of the contractor and owner put the scheduler right in the middle.
- This is a panel presentation demonstrating how to be an effective scheduling expert in different litigation settings including mediation, arbitration and trial. Being comfortable in litigation situations is increasingly important whether serving as a project scheduler or a retained outside consultant. A wide range of skills is needed for different litigation roles, which can range from being the focal point in a presentation, to being the only person who can explain how scheduling software works. In this presentation, **Fredric L. Plotnick** is the scheduling expert, Hon. **John M. Marshall** is the presiding official, and **Daniel D. McMillan** and **Jeff Kirzner**, partners at Jones Day, are the lawyers, and we have two surprise fact witnesses.

The Problem

- **Change Order Charlie (“COC”) is building a subway tunnel for owner Redtape Metro System (“Redtape”). Shortly after winning the job, COC submitted the proposed design of its tunnel digging machines or tunnel boring machines (“TBMs”) to Redtape for approval. The worrywarts at Redtape were nervous about the proposed TBM design and rejected several of COC's submissions while making numerous suggestions for improvements.**
- **What should have been a three week submittal process took three months before approval was given. COC put its TBM manufacturer on an accelerated schedule to try to make up the lost time. However, accelerating the work caused manufacturing problems and mistakes in the as-built tolerances of the TBMs.**
- **Although COC managed to get the TBMs delivered to the project close to the scheduled time, the on-site assembly took months more than expected because of fit-up problems and manufacturing defects.**
- **Tunneling started three months late and the overall project completion was six months late.**

The Problem

- **The Approved Baseline Schedule ("ABS") did not identify TBM submittal or approval as a scheduled activity. The contract specifications required COC to put all critical path activities on its ABS. Nonetheless, there is no dispute that the TBM approval took months longer than COC anticipated.**
- **COC also submitted monthly schedule updates during the project, as was required by the contract. None of these updates identified the problems with the TBM approval or TBM manufacturing as causing a critical path delay.**
- **The contract specifications required that COC's monthly updates to describe the cause and amount of any critical path delay. COC was optimistic that its acceleration of TBM manufacturing would make up for lost time and did not want to alarm Redtape by forecasting a project delay.**

The Problem

- **While the TBM on-site assembly took longer than scheduled, COC explains that the assembly was not a critical path delay because Redtape was chemically grouting the tunnel start up area and that the grouting was not completed until a few days before tunneling started. A “chicken or the egg” debate has ensued. COC says it could have completed its TBM assembly to be prepared for the originally scheduled mining date but had no need to because Redtape was dragging its feet on the grouting. Redtape contends, however, that it was COC's TBM assembly that delayed the work and chemical grouting would not have been directed absent the pre-existing delay caused by COC.**

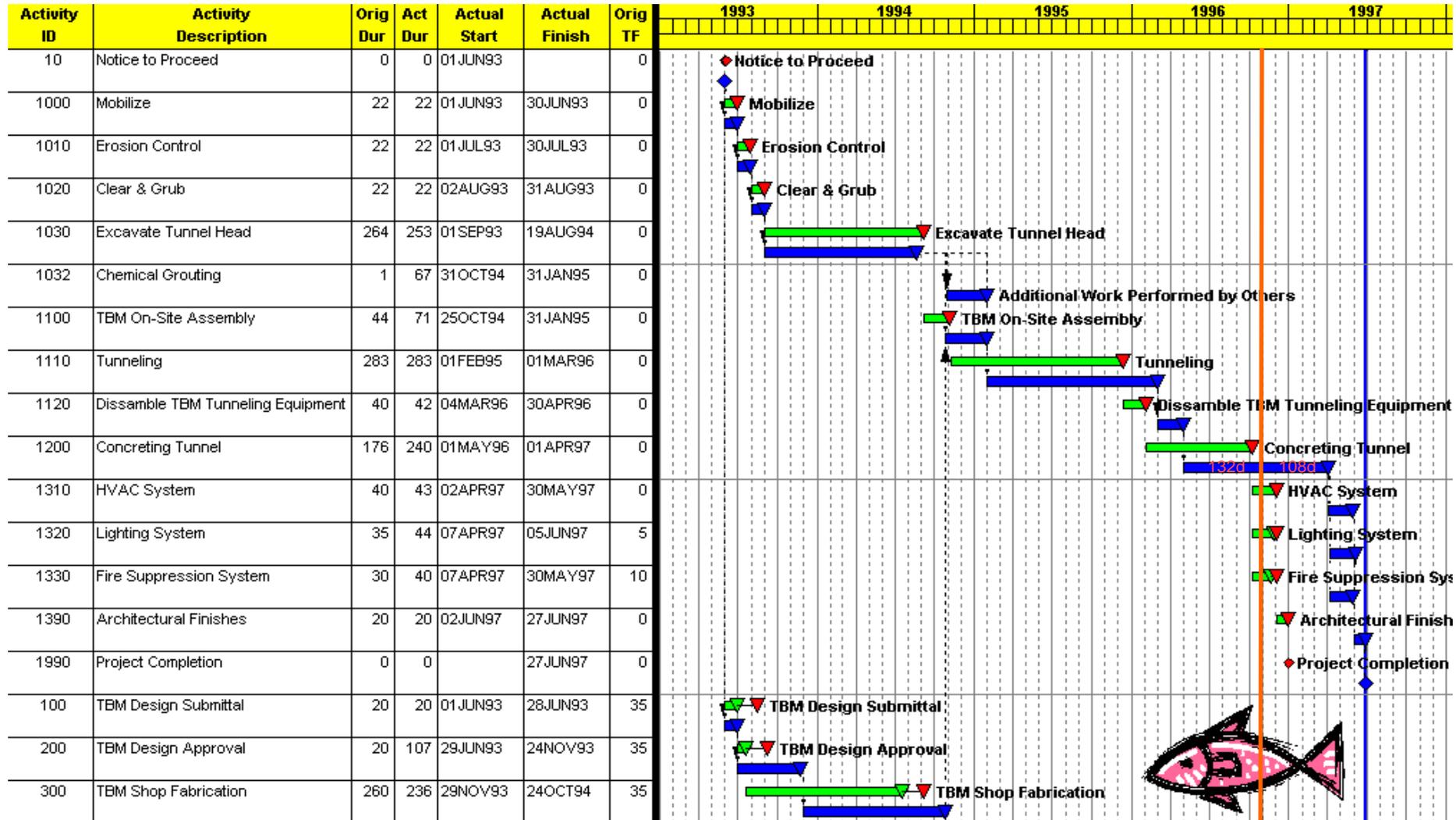
The contractor also claims that the three month tunneling delay multiplied into a six month project completion delay because the contractor had to work with reduced shaft and staging area access in the last few months of the final tunnel concrete work.

The scheduling expert is asked for his opinion on the scheduling issues.

The Problem

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- **The contractor also claims that the three month tunneling delay multiplied into a six month project completion delay because the contractor had to work with reduced shaft and staging area access in the last few months of the final tunnel concrete work.**
- **The scheduling expert is asked for his opinion on the scheduling issues.**

The Problem

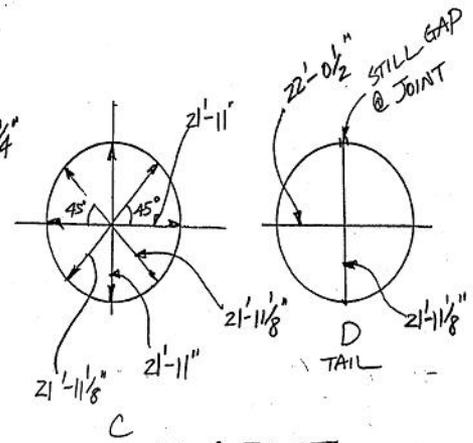
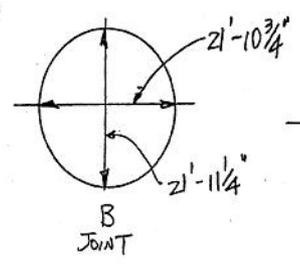
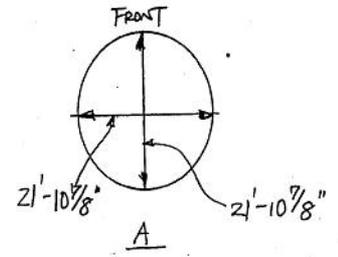
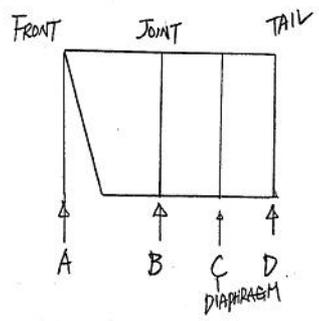


1132
 Date 10/13/94

FROM:
 NAME _____

Total Pages (incl. This Page) 1

SUBJECT SHIELD DIMENSION



WIDTH OF TAIL (D) CAN BE ADJUSTED @ JOB SITE
 SHIPPING WILL BE MIDDLE OF NEXT WEEK FOR REAR.
 AND END OF NEXT WEEK OR EARLY FOLLOWING WEEK FOR FRONT.

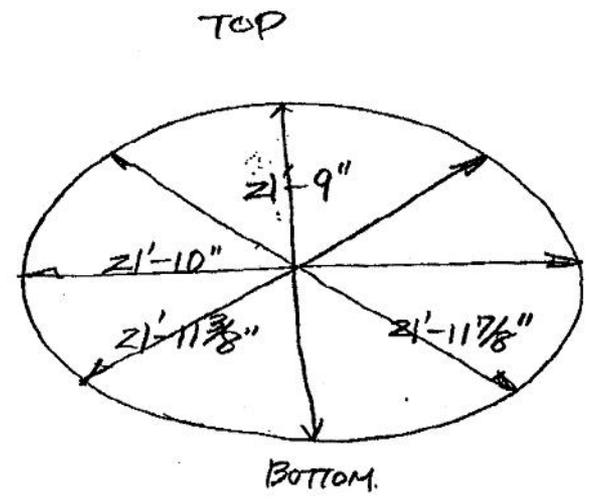
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TAIL END DIMENSION



CIRCUMFERENCE LENGTH
 68'-10 3/8"

10/25/94

REAR SHIELD ARRIVED AT THE JOBSITE

11/1/94

FRONT BOTTOM SHIELD ARRIVED

11/2/94

FRONT TOP SHIELD ARRIVED.
SET TOP HALF ON BOTTOM SHIELD.
FIT REAR RIGHT HALF

11/3/94

FIT REAR LEFT HALF TO RIGHT REAR AND FRONT
TOO TALL ON FRONT SHIELD.
REMOVED FRONT TOP SHIELD.
REMOVED JOINT SHIM AT FRONT SHIELD.

11/4/94

- SET FRONT TOP SHIELD BACK ON TO BOTTOM SHIELD.
- TOOK MEASUREMENT. STILL TOO TALL ON
FRONT SHIELD 22'-0 1/2"
- REMOVED FRONT TOP SHIELD
- REMOVED JOINT SHIM AT FRONT SHIELD

11/5/94

- CONTINUED TO WORK ON REMOVING JOINT SHIM.
- SET FRONT TOP SHIELD BACK.
- TOOK MEASUREMENT 21'-10 5/16"

11/7/94

- MAKING NEW SHIM TO FILL IN GAP AT
FRONT HORIZONTAL JOINT.

EXHIBIT

2989

11/7/94

- REMOVE TOP HALF OFF.
- WELDED SHIM.
- SET TOP HALF BACK ON.
- TOOK MEASUREMENT 21'-11 3/32"

11/8/94

- REMOVED TOP HALF OFF
- TRIMMED HIGH SPONT AT THE JOINT
- SET TOP HALF BACK ON
- TOOK MEASUREMENT - 21'-10 3/4"
- SECURED FRONT TOP AND BOTTOM.

11/9/94

- REMOVED REAR LEFT HALF
- CUT TOP BRUSSET AND TRIMMED SKIN BY 3/4"
- FIT REAR RIGHT HALF TO FRONT
- SET REAR LEFT HALF BACK.

11/10/94 RAIN OUT

11/11/94

11/14/94

- WELDING FRONT SHIELD JOINT
- WORKING ON FITTING UP REAR

11/15/94

- WELDING FRONT & REAR SHIELD JOINT.

11/16/94

- SPLIT FRONT AND REAR SHIELD -
- ROTATED REAR
- WELDED REAR SHIELD JOINT

1

2

11/17/94

- WELDING SHIELD JOINT
- INSTALLING SHIELD TAIL

11/18/94

- INSTALLED SHIELD TAIL
- INSTALLING OPERATOR DECK

11/19/94

- WORKING ON INSTALLATION OF OPERATOR DECK

11/21/94

- INSTALLING ERECTOR

11/22/94

- INSTALLED ERECTOR

11/23/94

- WORKING ON TAIL SHIELD
- JACK OUT AND HEATED FOR REQUIRED DIMENSION

11/28/94

- WORKING ON TAIL SHIELD.

11/29/94

- WORKING ON TAIL

11/30/94

- WORKING ON TAIL
- REMOVED ERECTOR TO CUT TAIL SHIELD
- CUT 5' OFF FROM TAIL

3

12/1/94 ~ 12/4/94

- WAITING FOR TAIL
- MAKING SET UP FOR TAIL SHIELD.

12/5/94

- TAIL SHIELD ARRIVED
- SET UP FOR ROUNDNESS

12/6/94

- WELDING ON TAIL SHIELD

12/7/94

- WELDING ON TAIL SHIELD

12/8/94

- WELDING ON TAIL SHIELD
- PAINTING TAIL SHIELD

4

Schedule/Cost Narrative
December 1994 Progress Update
Data date: 12/30/94

1. GENERAL/WORK PROGRESS:

The AR shield machine assembly and the installation of the mucking system are ongoing at the cross over area. Grouting for the tunnel breakout is being performed as a change order. At the mid-vent area, utility support was completed and the contractor is excavating, lagging and bracing at the main structure. Excavation at the small structures was completed. The contractor is proceeding with pouring the tunnel concrete segments and with installing instrumentation systems.

The progress payment estimate calculated in this update is \$ 1,132,663.98.

Activities Completed: See attachment 1.

Activities in progress: See attachment 2.

Upcoming Work: See attachment 3.

2. RAIN DAYS

As of the date of this report, this month saw an actual total of 1 rain days versus the expected number of 3 rain days.

3. CRITICAL PATH

The schedule was updated as of December 30, 1994. The critical path has a float of -46 days and it starts from activities pertaining to shield machine assembly and then goes through tunnel excavation. The contractor believes that the schedule delay will be eliminated once the pending time extensions are processed.

4. SCHEDULE CHANGES:

The following changes were discussed and agreed to on 12/29/94:

CALENDAR:

- Changed calendar ID of all milestones to ID # 4 (calendar days).
- Defined rain days for the months of January and February 1997.

FINANCIAL

- Allocated \$ 1,000,000 for each tunnel machine mobilization (per CN # 26).

5. SCHEDULE DELAYS:

As requested by the Authority, the following is a list of factors that contributed to the project delay:

<u>Delay</u>	<u>Allocation (WD)</u>
- Earthquake	2
- 3" DWP line	3
- X-over traffic control	8
- Seismic wall	21
- Survey points	28
- Traffic control @ mid-vent	TBD
- CN 7.01	12
- Mid vent redesign	TBD
- Shutdown @ mid-vent on 9/21/94	1
- October 1994 rain	2

total = 78 + TBD
Current delay = -46

Total acceleration by contractor = 32 WD + TBD

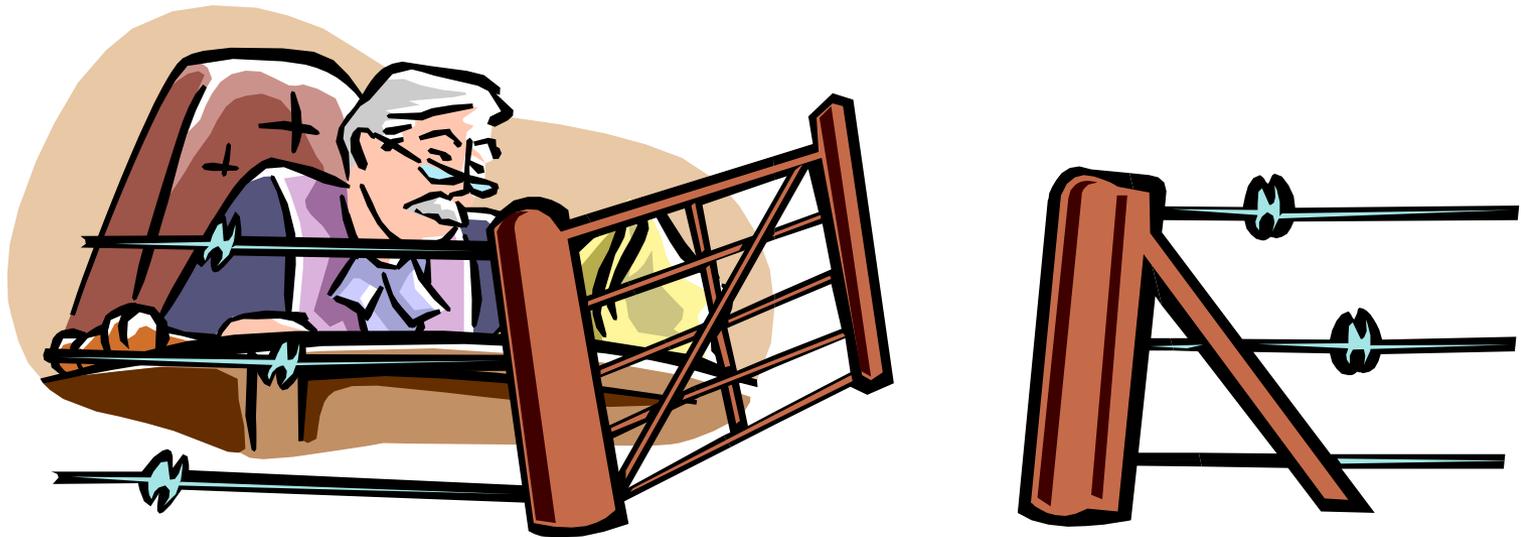
6. MITIGATION PLAN:

The contractor plans to increase production during tunnel excavation. The contractor is considering achieving a production rate of 600-650 LF/week. Also, the contractor plans to increase excavation production at the midvent area. The contractor believes that the delay is entirely due to Authority's action, and therefore, providing a mitigation plan, should by no means indicate that the contractor is taking any responsibility for the delay. This mitigation plan was requested by the authority in order not to reject the schedule.



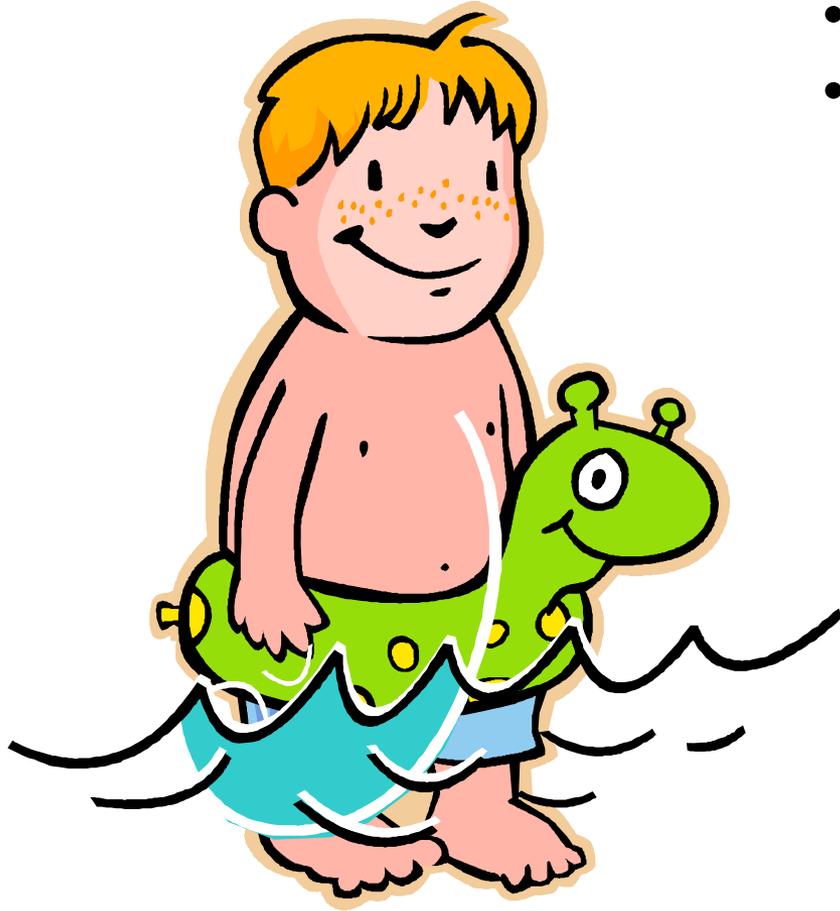
Voir Dire

Is the “Expert” competent to testify?





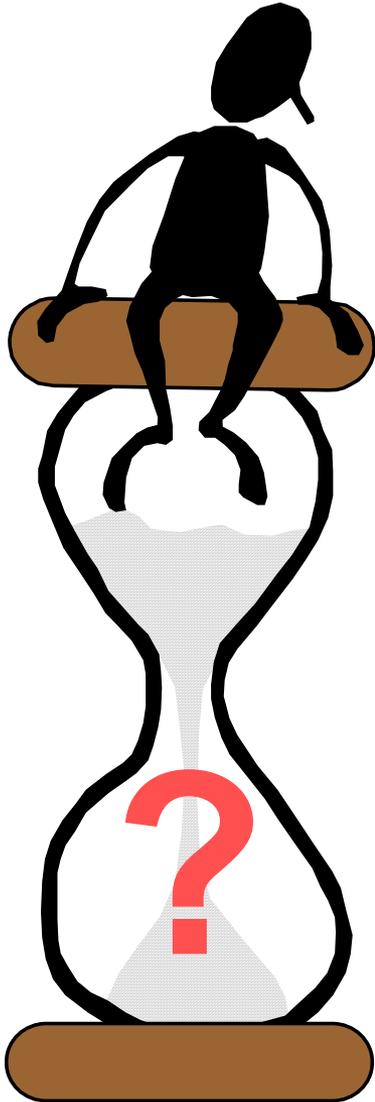
Speak to the Judge and Jury



- “Explain what is a ‘CPM’ analysis?”
- “What to you mean by ‘Float?’”



Explain in 'every day' terms



Decision Time





Direct Examination

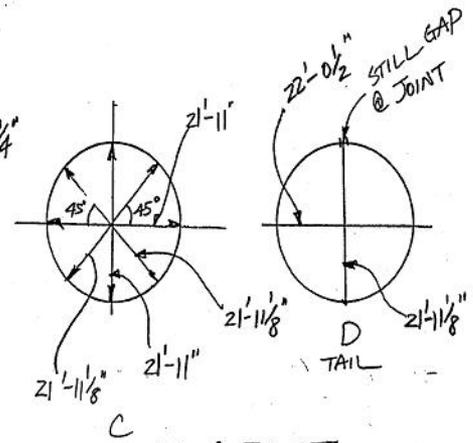
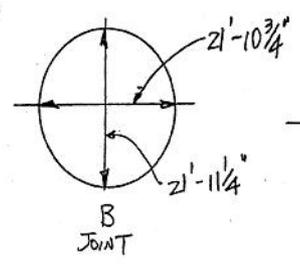
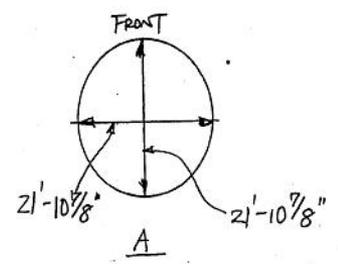
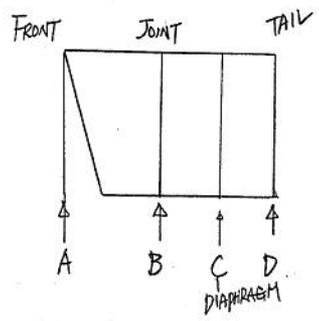


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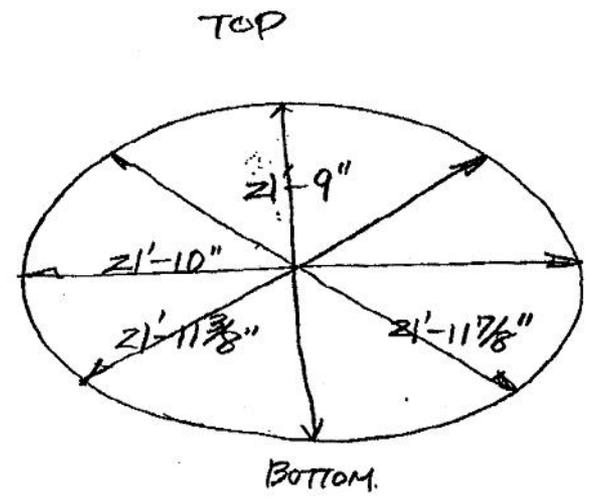
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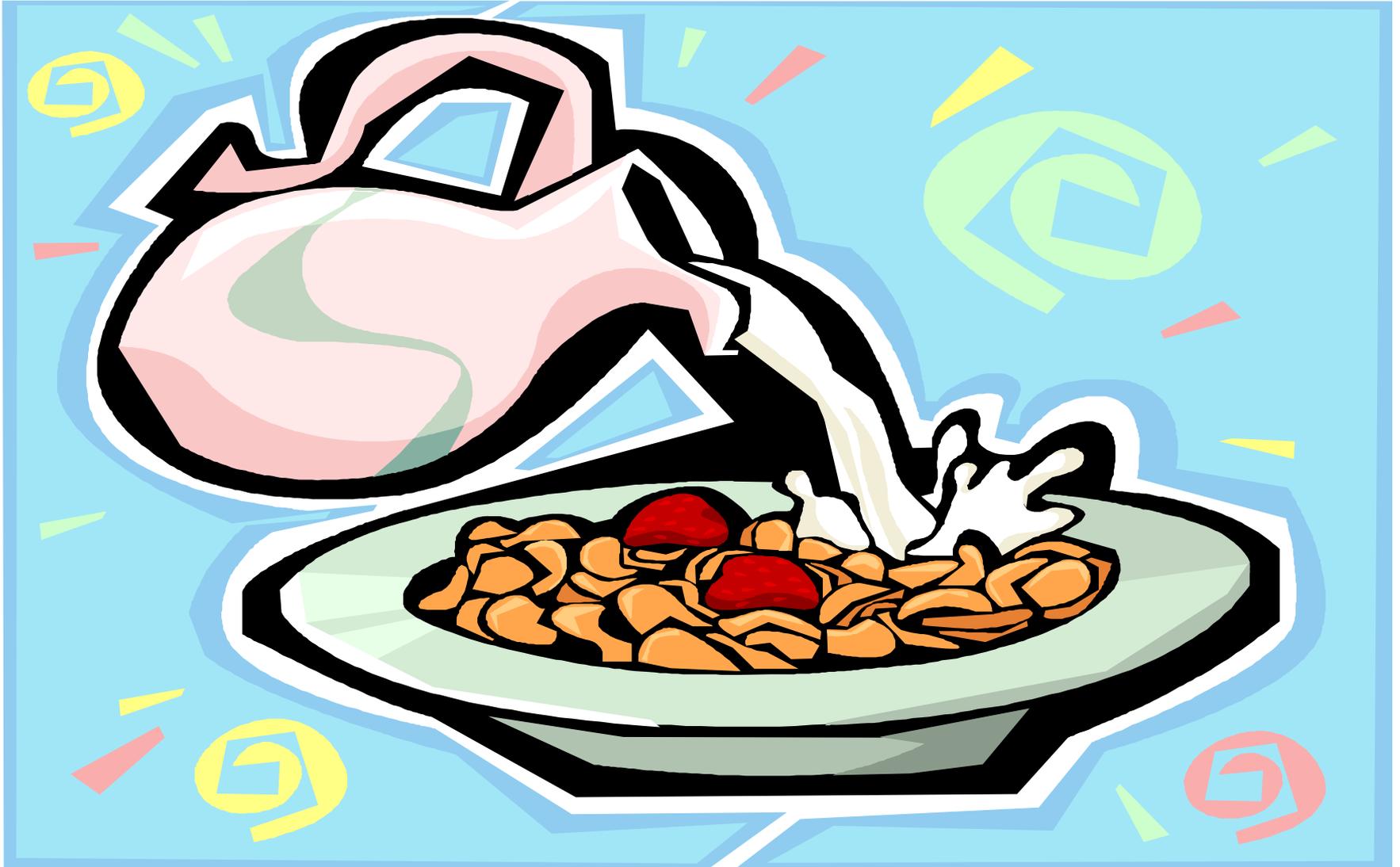
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Cereal Delay

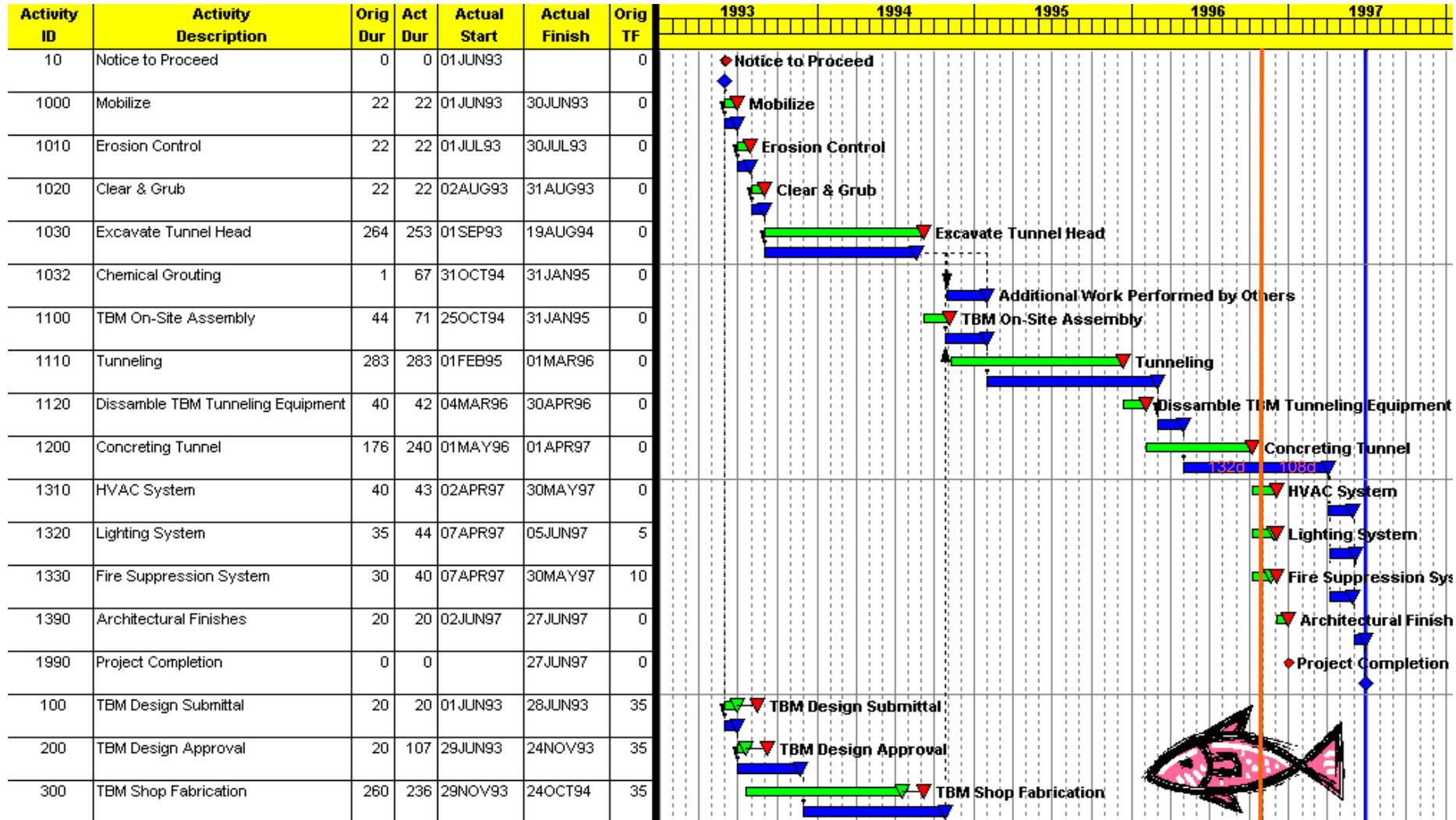




Serial Delay



The Problem

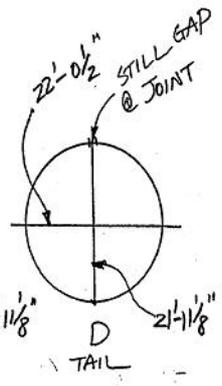
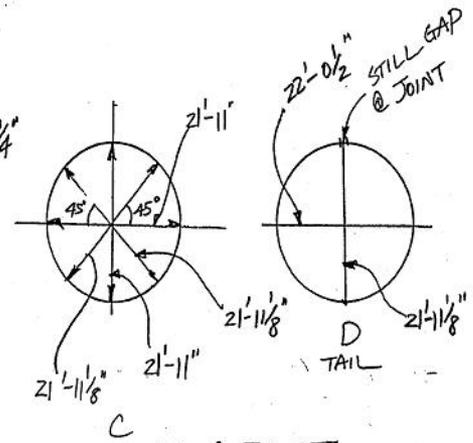
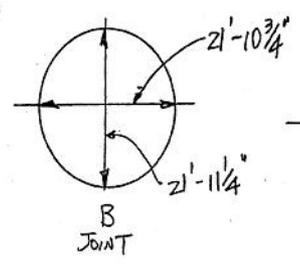
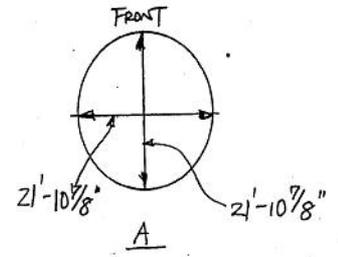
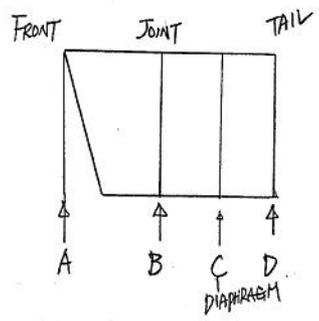


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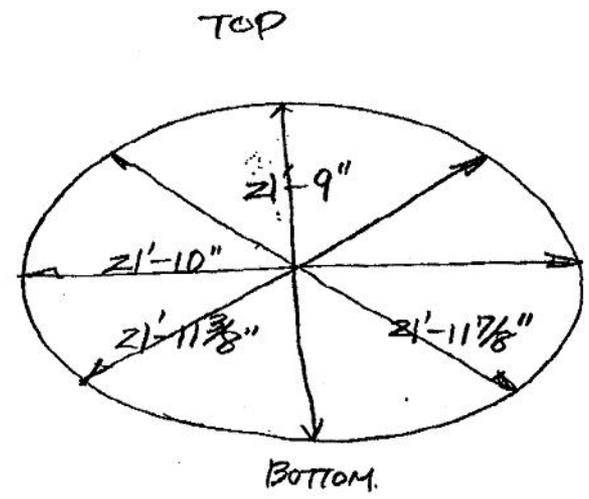
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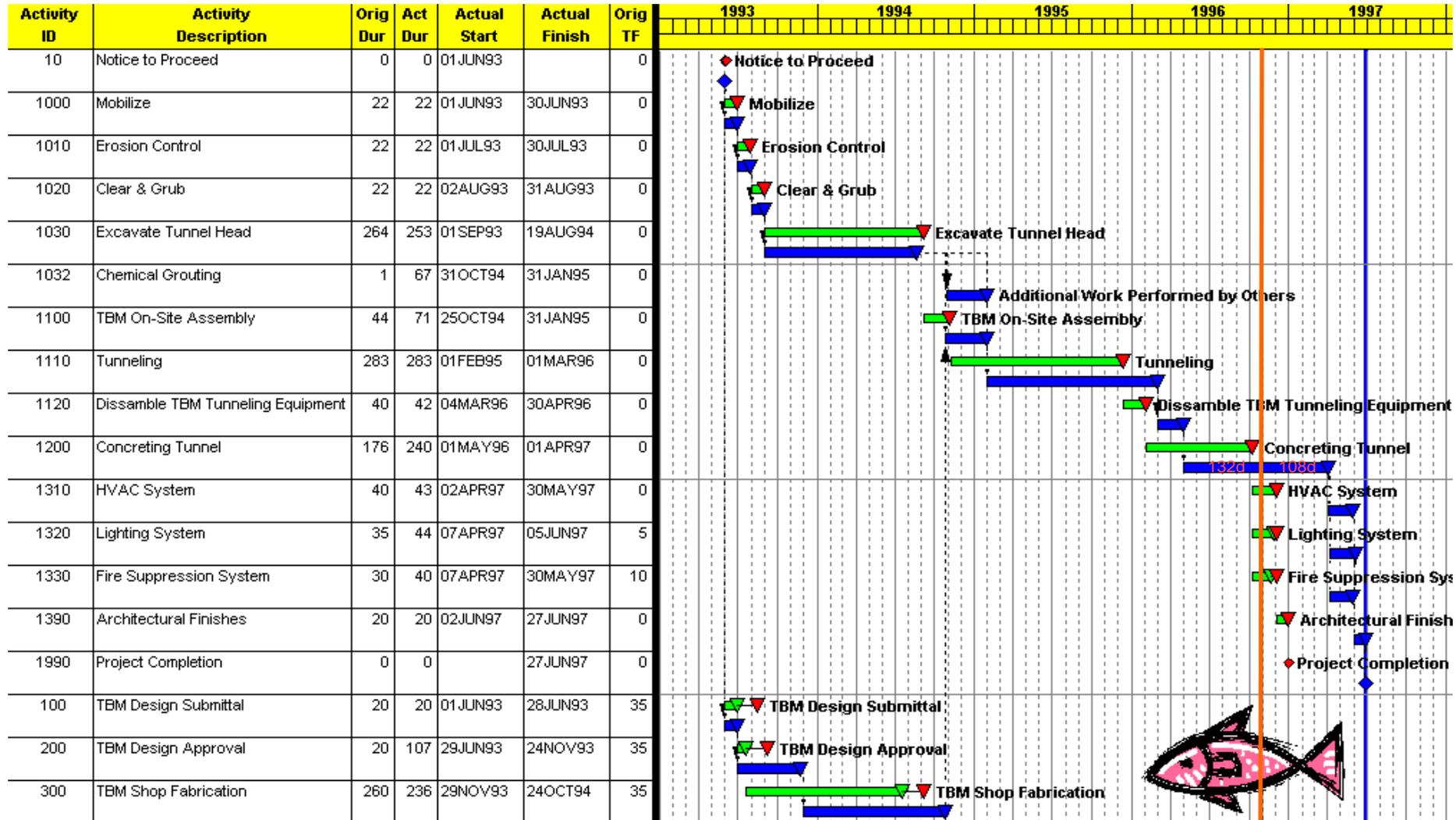
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The Problem





Delay Analysis



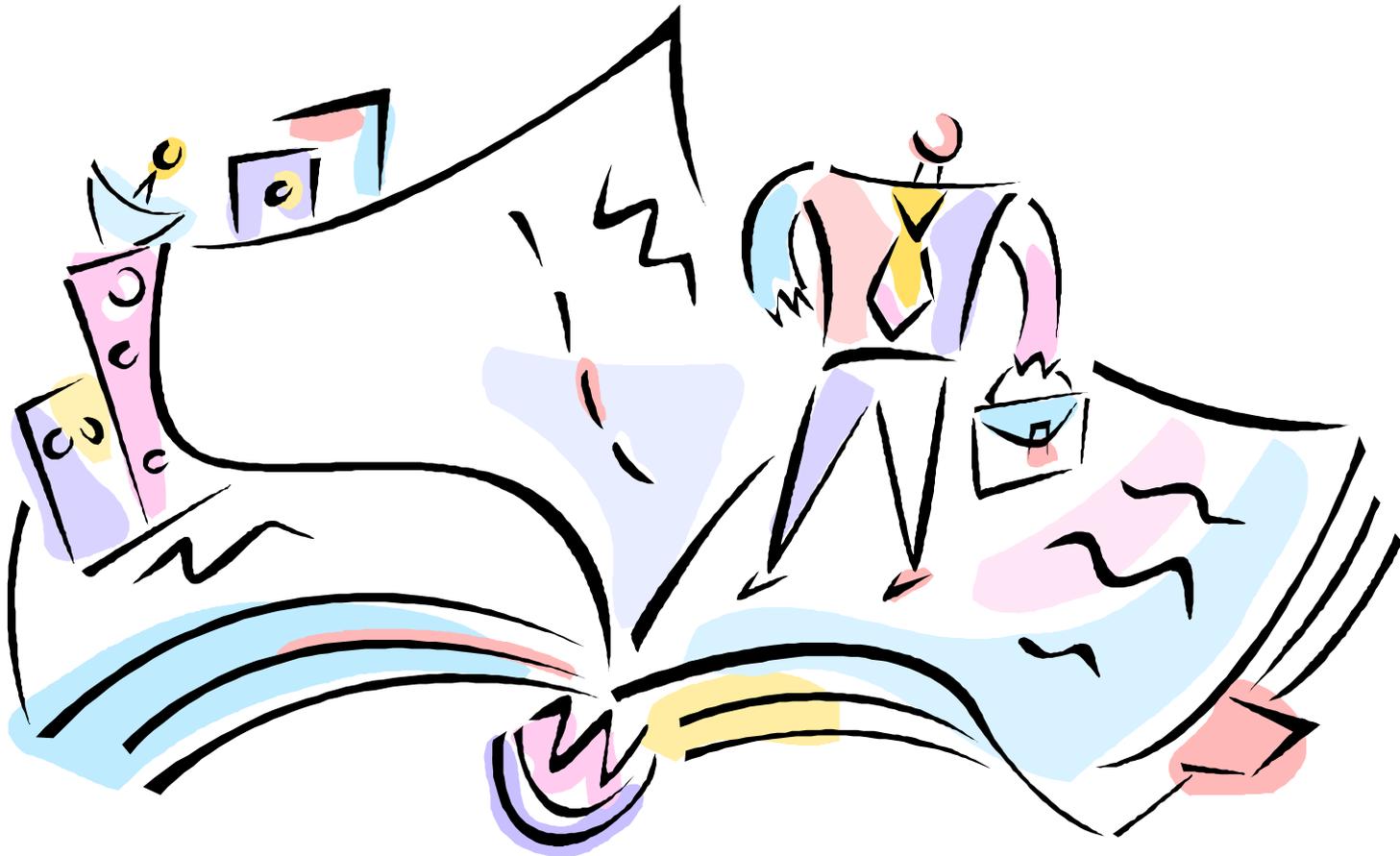


Cross-Examination



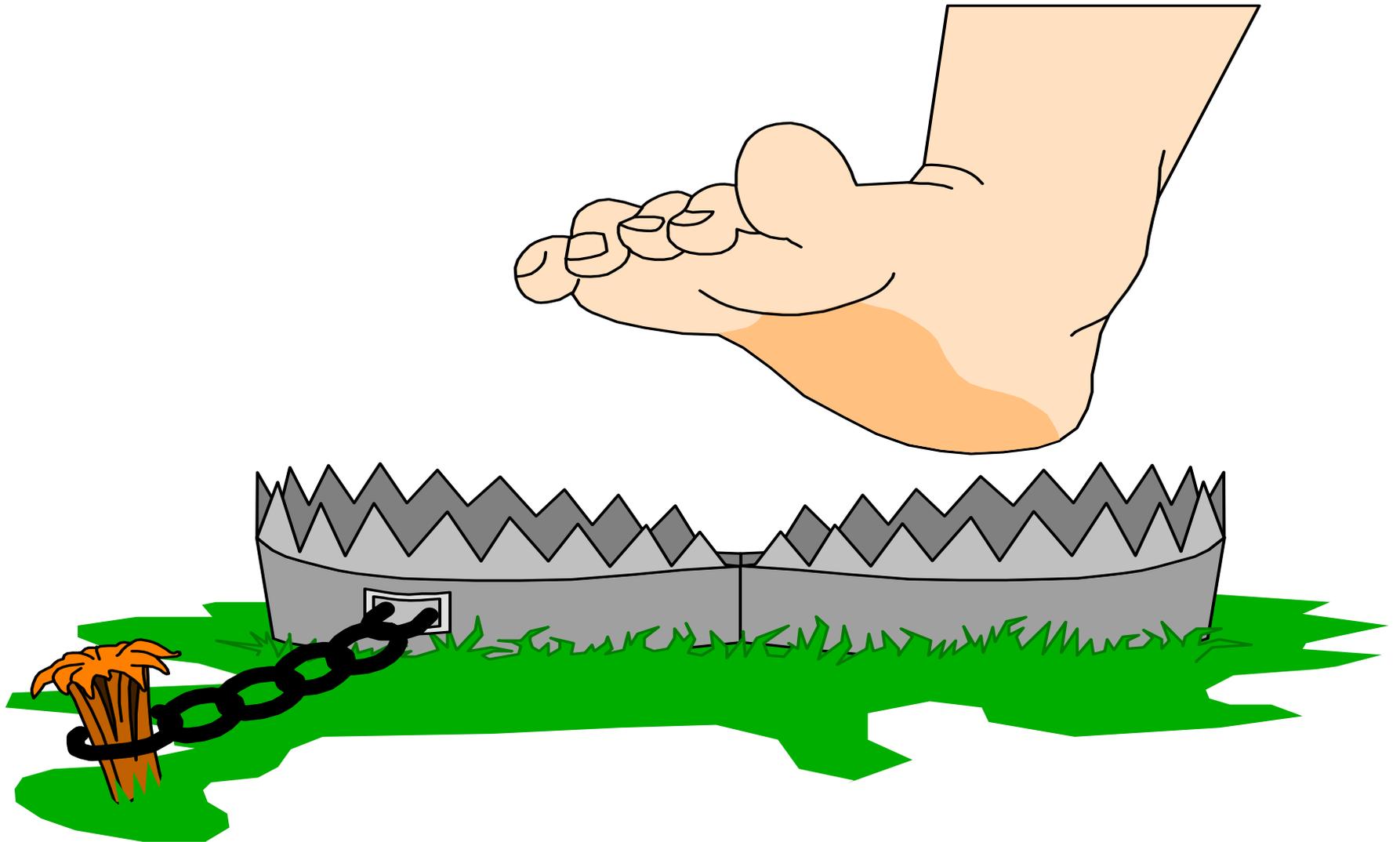


Setup #1





Setup #2





Hammer #1

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total = 78 + TBD
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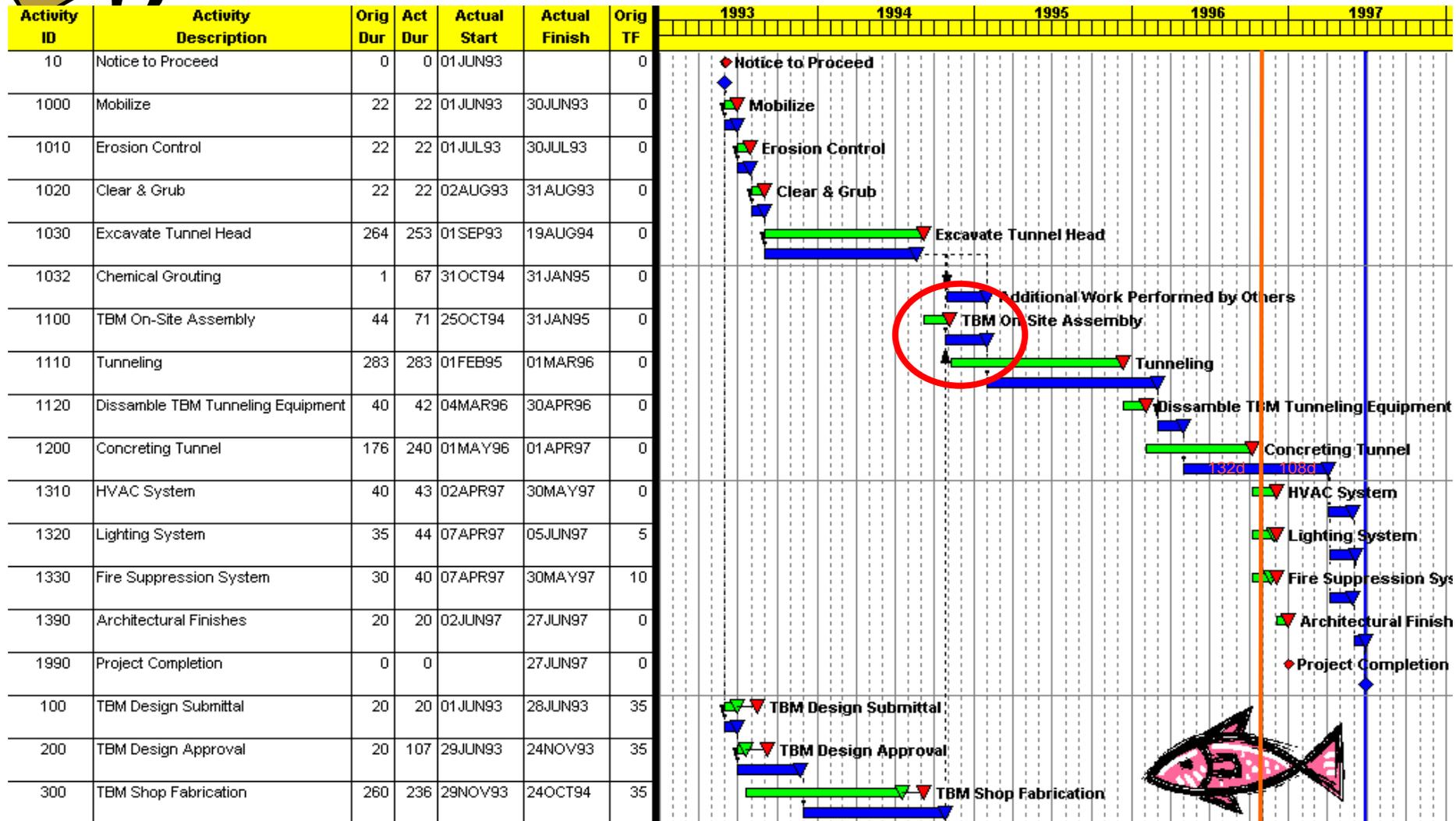
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Hammer #2

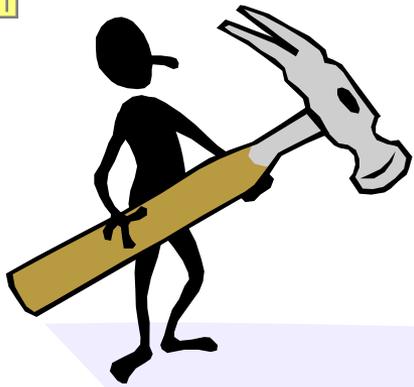


Response

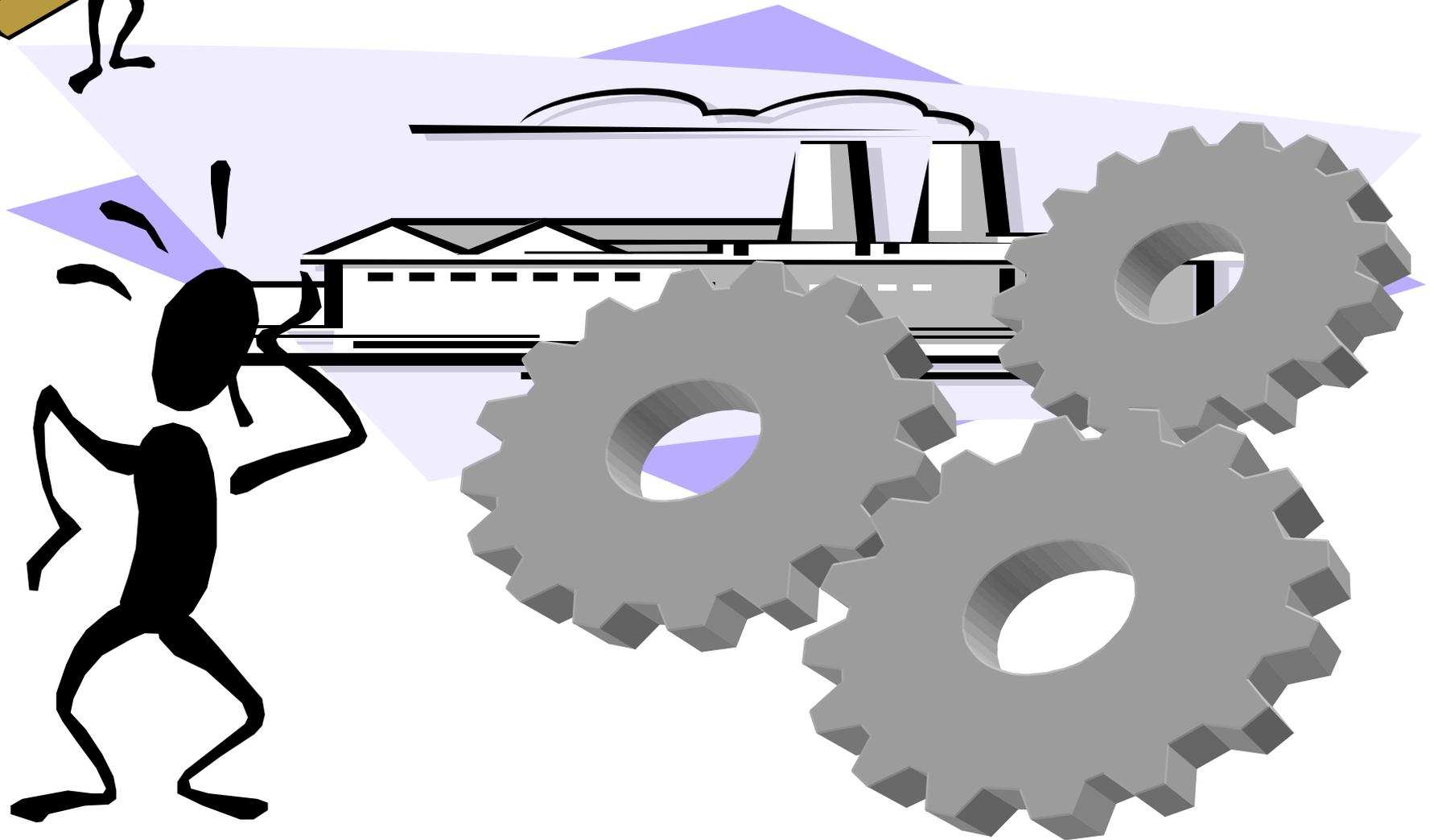


3. CRITICAL PATH

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Setup & Hammer



10/25/94

REAR SHIELD ARRIVED AT THE JOBSITE

11/1/94

FRONT BOTTOM SHIELD ARRIVED

11/2/94

FRONT TOP SHIELD ARRIVED.
SET TOP HALF ON BOTTOM SHIELD.
FIT REAR RIGHT HALF

11/3/94

FIT REAR LEFT HALF TO RIGHT REAR AND FRONT
TOO TALL ON FRONT SHIELD.
REMOVED FRONT TOP SHIELD.
REMOVED JOINT SHIM AT FRONT SHIELD.

11/4/94

- SET FRONT TOP SHIELD BACK ON TO BOTTOM SHIELD.
- TOOK MEASUREMENT. STILL TOO TALL ON
FRONT SHIELD 22'-0 1/2"
- REMOVED FRONT TOP SHIELD
- REMOVED JOINT SHIM AT FRONT SHIELD

11/5/94

- CONTINUED TO WORK ON REMOVING JOINT SHIM.
- SET FRONT TOP SHIELD BACK.
- TOOK MEASUREMENT 21'-10 5/16"

11/7/94

- MAKING NEW SHIM TO FILL IN GAP AT
FRONT HORIZONTAL JOINT.

EXHIBIT
2989

11/7/94

- REMOVE TOP HALF OFF.
- WELDED SHIM.
- SET TOP HALF BACK ON.
- TOOK MEASUREMENT 21'-11 3/32"

11/8/94

- REMOVED TOP HALF OFF
- TRIMMED HIGH SPONT AT THE JOINT
- SET TOP HALF BACK ON
- TOOK MEASUREMENT - 21'-10 3/4"
- SECURED FRONT TOP AND BOTTOM.

11/9/94

- REMOVED REAR LEFT HALF
- CUT TOP BRUSSET AND TRIMMED SKIN BY 3/4"
- FIT REAR RIGHT HALF TO FRONT
- SET REAR LEFT HALF BACK.

11/10/94 RAIN OUT

11/11/94

11/14/94

- WELDING FRONT SHIELD JOINT
- WORKING ON FITTING UP REAR

11/15/94

- WELDING FRONT & REAR SHIELD JOINT.

11/16/94

- SPLIT FRONT AND REAR SHIELD -
- ROTATED REAR
- WELDED REAR SHIELD JOINT

1

2

11/17/94

- WELDING SHIELD JOINT
- INSTALLING SHIELD TAIL

11/18/94

- INSTALLED SHIELD TAIL
- INSTALLING OPERATOR DECK

11/19/94

- WORKING ON INSTALLATION OF OPERATOR DECK

11/21/94

- INSTALLING ERECTOR

11/22/94

- INSTALLED ERECTOR

11/23/94

- WORKING ON TAIL SHIELD
- JACK OUT AND HEATED FOR REQUIRED DIMENSION

11/28/94

- WORKING ON TAIL SHIELD.

11/29/94

- WORKING ON TAIL

11/30/94

- WORKING ON TAIL
- REMOVED ERECTOR TO CUT TAIL SHIELD
- CUT 5' OFF FROM TAIL

3

12/1/94 ~ 12/4/94

- WAITING FOR TAIL
- MAKING SET UP FOR TAIL SHIELD.

12/5/94

- TAIL SHIELD ARRIVED
- SET UP FOR ROUNDNESS

12/6/94

- WELDING ON TAIL SHIELD

12/7/94

- WELDING ON TAIL SHIELD

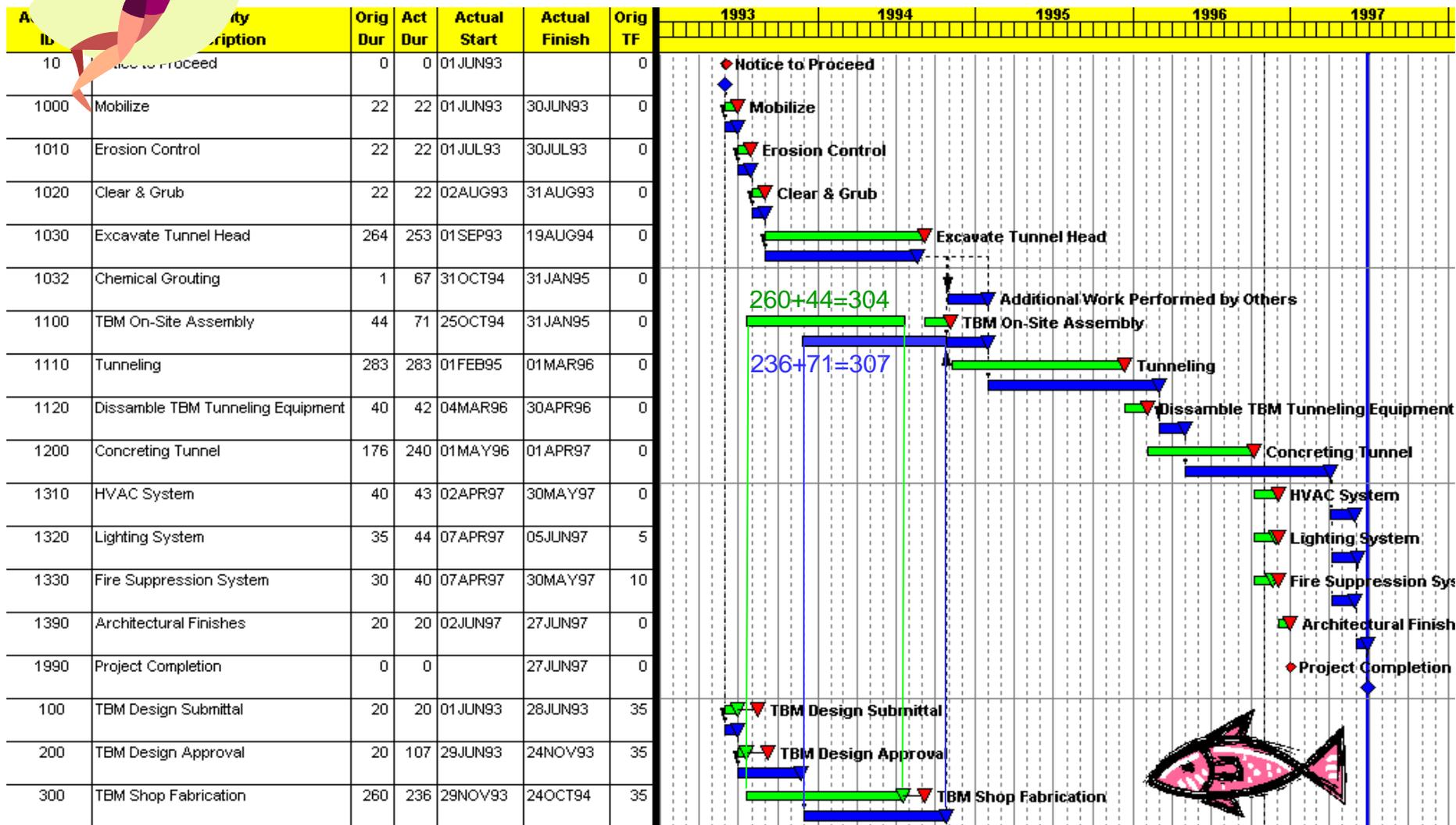
12/8/94

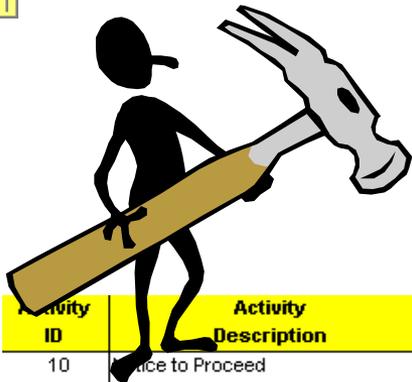
- WELDING ON TAIL SHIELD
- PAINTING TAIL SHIELD

4

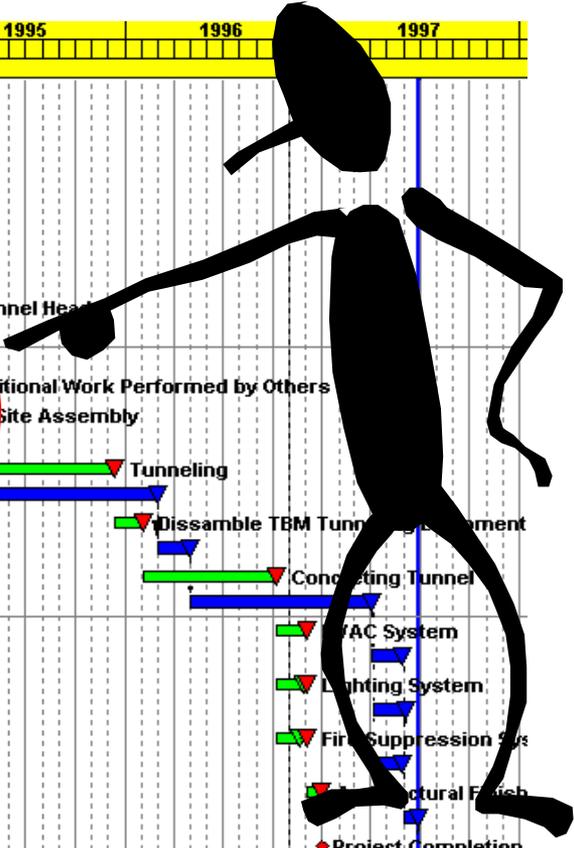
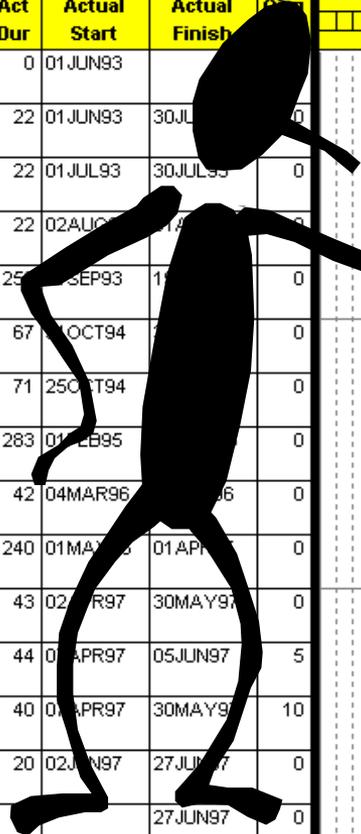
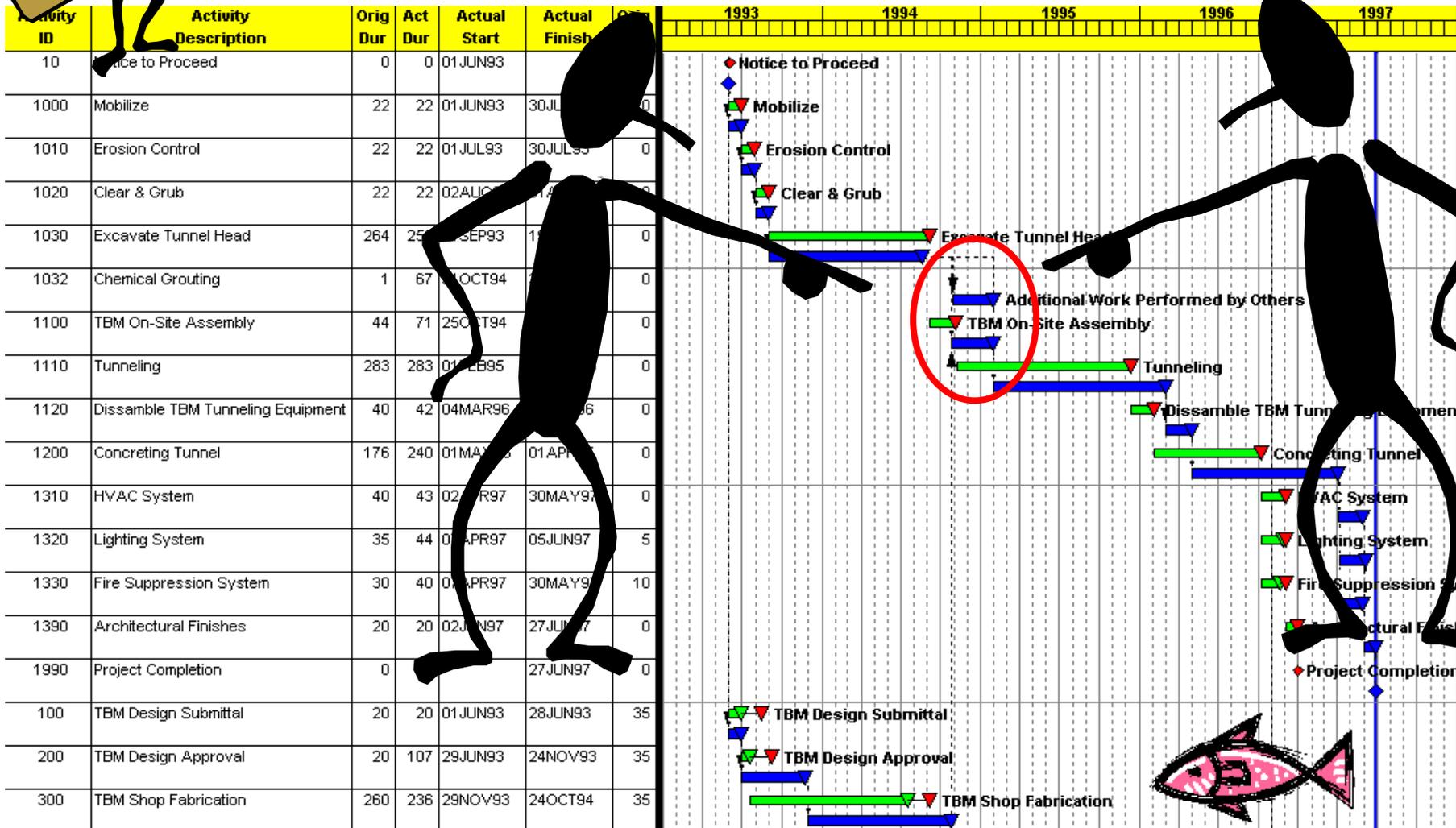


Response

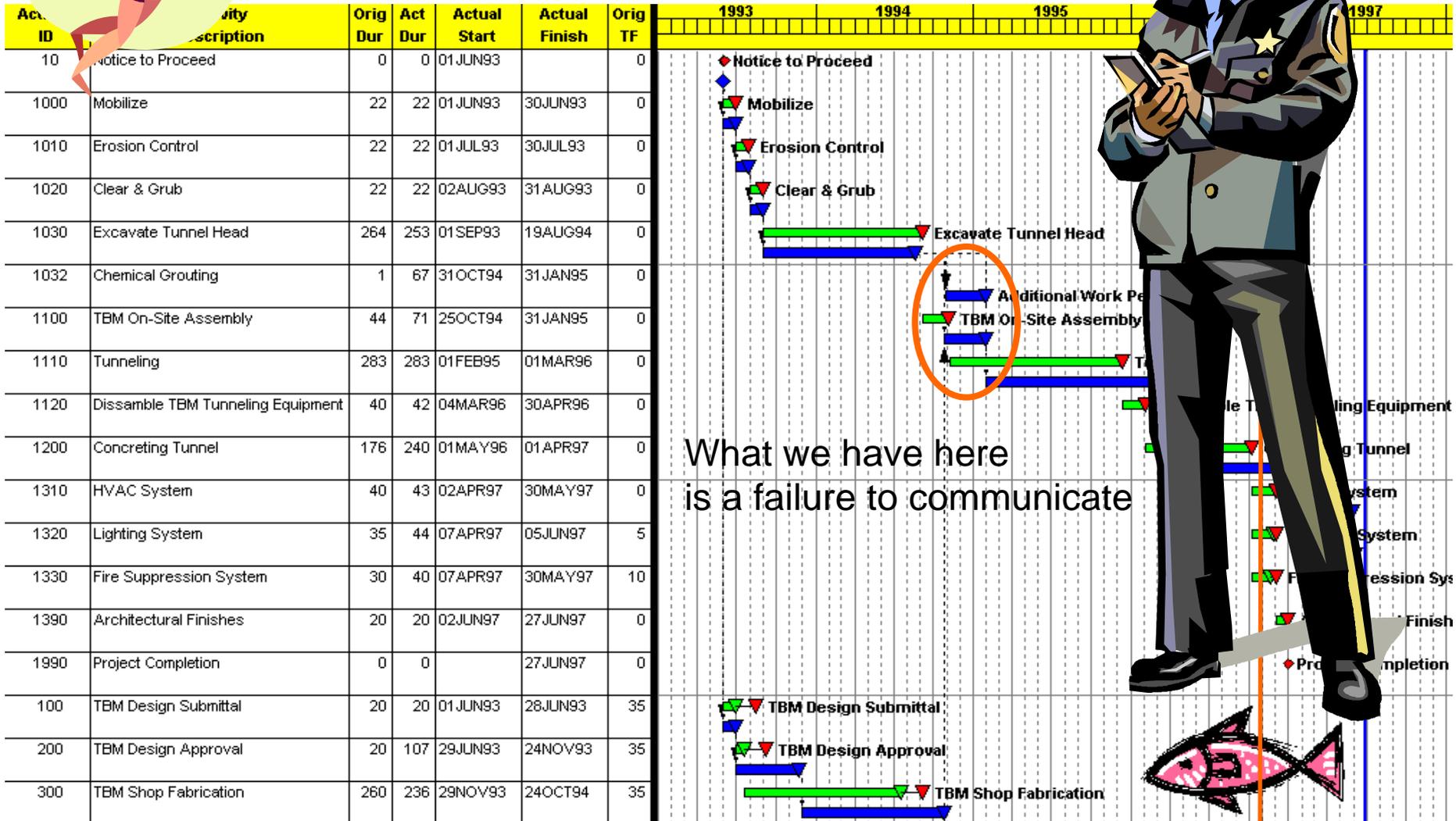
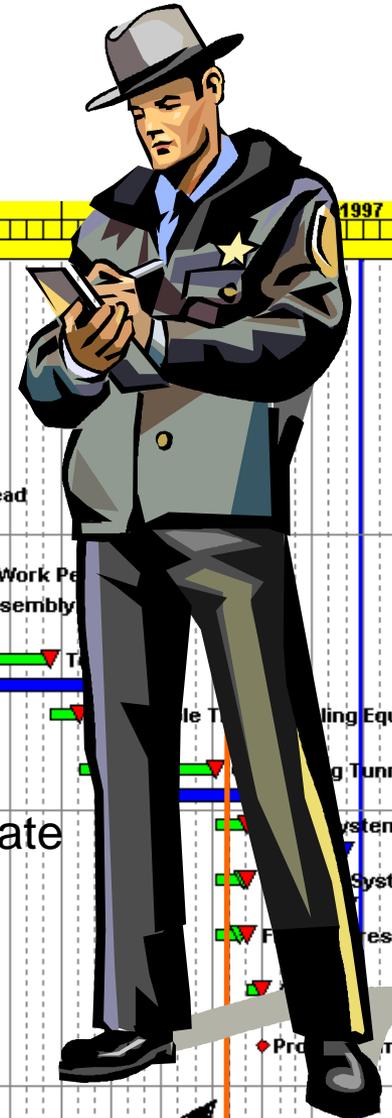
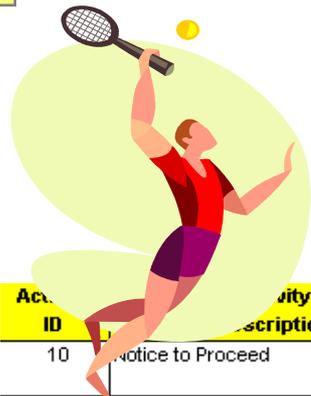




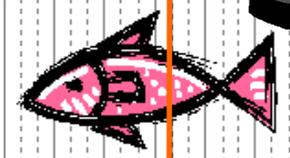
Setup & Hammer



Response



What we have here is a failure to communicate





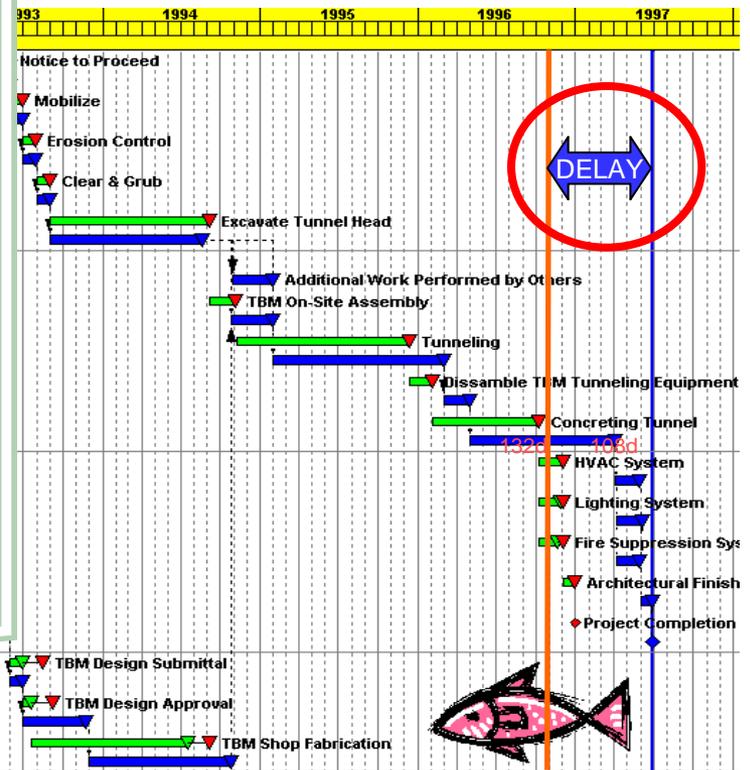
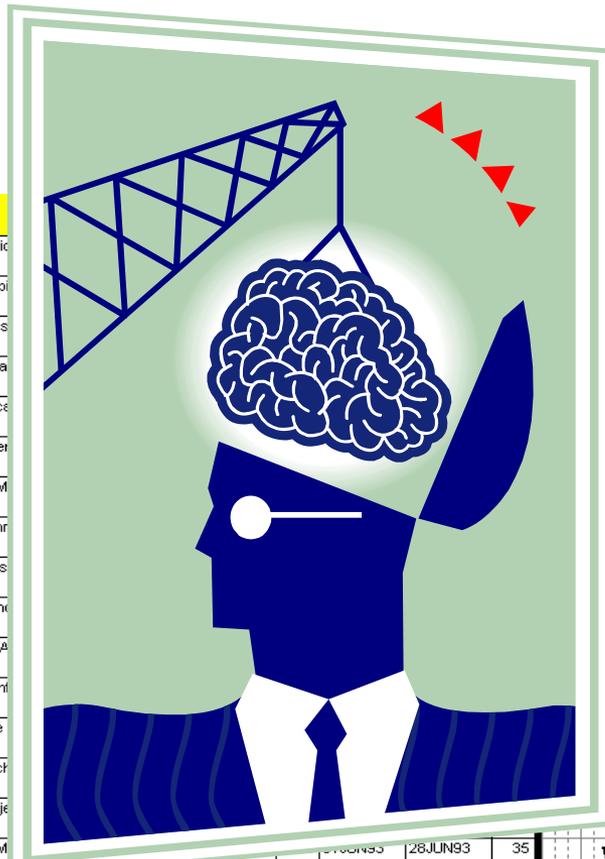
Re-Direct Examination



Response



Activity ID	Activity Name	Start	End	Duration
10	Notice to Proceed			
1000	Mobilize			
1010	Erosion Control			
1020	Clear & Grub			
1030	Excavate Tunnel Head			
1032	Cher			
1100	TBM Design Submittal			
1110	TBM Design Approval			
1120	TBM Shop Fabrication			
1200	Disassemble TBM Tunneling Equipment			
1310	Concreting Tunnel			
1320	HVAC System			
1330	Lighting System			
1390	Fire Suppression System			
1990	Architectural Finish			
1990	Project Completion			
100	TBM Design Submittal	28JUN93	28JUN93	35
200	TBM Design Approval	29JUN93	24NOV93	35
300	TBM Shop Fabrication	29NOV93	24OCT94	35



Response



Schedule/Cost Narrative
December 1994 Progress Update
Data date: 12/30/94

1. GENERAL/WORK PROGRESS:

The AR shield machine assembly and the installation of the mucking system are ongoing at the cross over area. Grouting for the tunnel breakout is being performed as a change order. At the mid-vent area, utility support was completed and the contractor is excavating, lagging and bracing at the main structure. Excavation at the small structures was completed. The contractor is proceeding with pouring the tunnel concrete segments and with installing instrumentation systems.

The progress payment estimate calculated in this update is \$ 1,132,663.98.

Activities Completed: See attachment 1.

Activities in progress: See attachment 2.

Upcoming Work: See attachment 3.

2. RAIN DAYS

As of the date of this report, this month saw an actual total of 1 rain days versus the expected number of 3 rain days.

3. CRITICAL PATH

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4. SCHEDULE CHANGES:

The following changes were discussed and agreed to on 12/29/94:

CALENDAR:

- Changed calendar ID of all milestones to ID # 4 (calendar days).
- Defined rain days for the months of January and February 1997.

FINANCIAL

- Allocated \$ 1,000,000 for each tunnel machine mobilization (per CN # 26).

5. SCHEDULE DELAYS:

As requested by the Authority, the following is a list of factors that contributed to the project delay:

<u>Delay</u>	<u>Allocation (WD)</u>
- Earthquake	2
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Response to ABS Inadequacy Question



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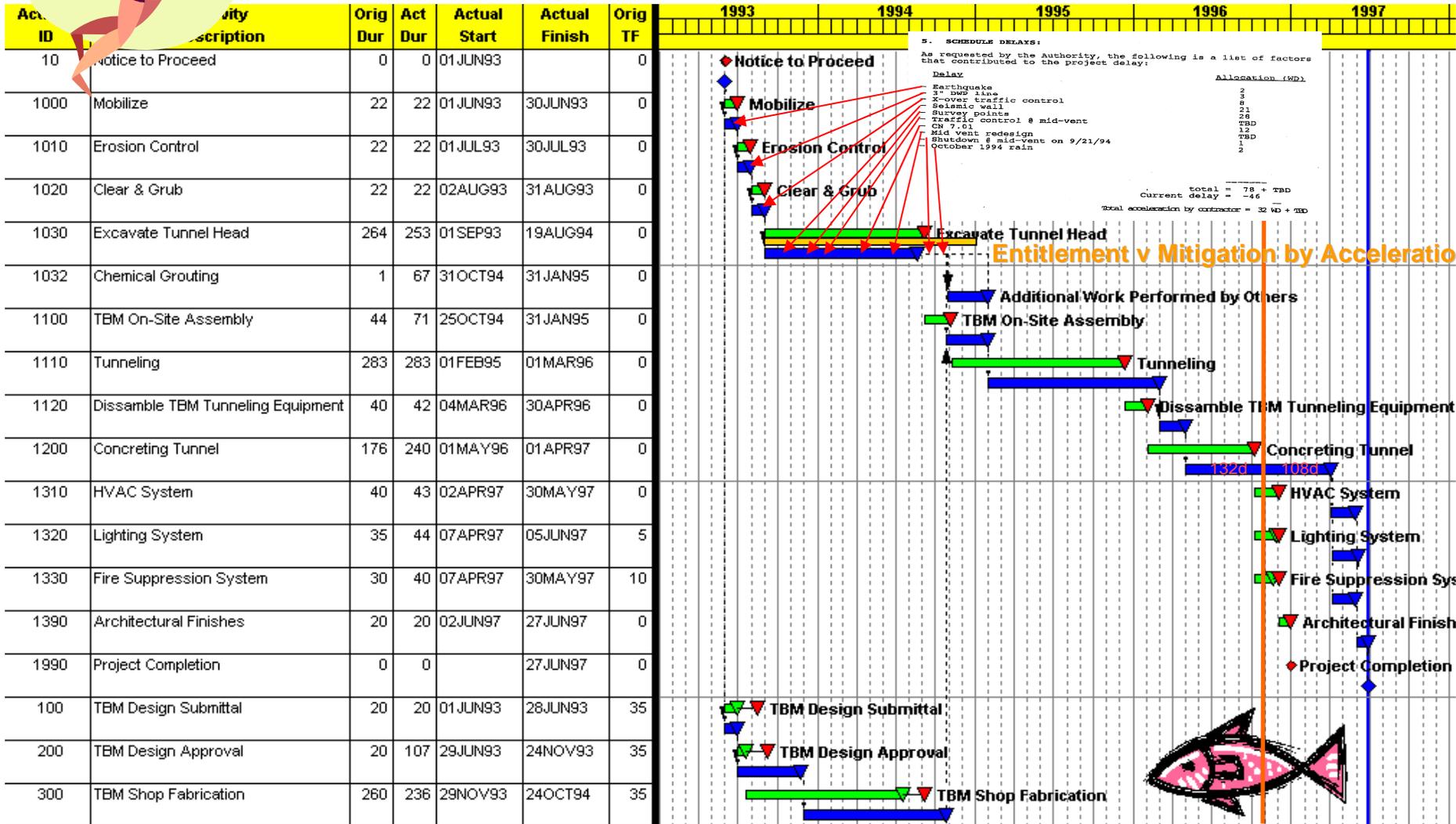
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Fact Witness for the Contractor Project Manager / Superintendent



“These tunnels will play a vital role in strengthening the regional transit capabilities,” Gray said late Tuesday. “We are proud to continue our strong working relationship with Redtape Metro on the Shaky Ground Transit Tunnel Connector Project..”

- **P.M. will politely tell the Court how Redtape “assisted” the design**
- **Cross examining attorney will attempt to have P.M. lose his cool**
- **P.M. will politely tell the Court how Redtape delayed his progress.**
- **P.M. will complain he could see no reason for the chemical grouting**
- **P.M. will explain he could gauge Redtape progress**



Fact Witness for the Owner The Resident Engineer



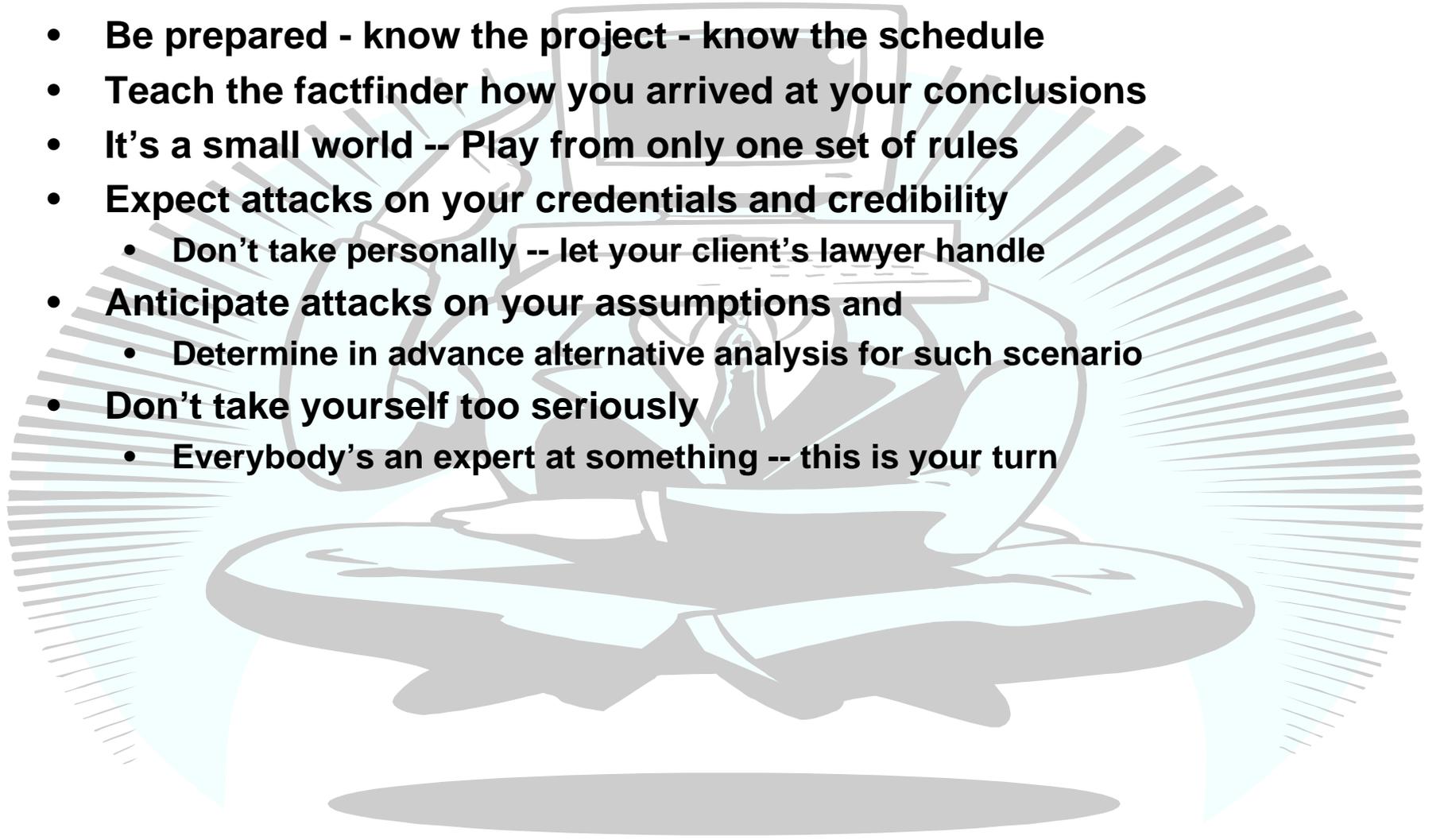
- **R.E. will politely tell the Court how and why Charlie risked catastrophe**
- **R.E. will explain why the need for chemical grouting**
- **R.E. will explain he could gauge Charlie's progress and saw no reason to suspend grouting while TCM continued to be fiddled with**
- **Cross examining attorney will have R.E. discuss his extensive education and experience in earthquake engineering, tunnel boring machines and chemical grouting, and perhaps his daughter's homework assignments**

Decision Time

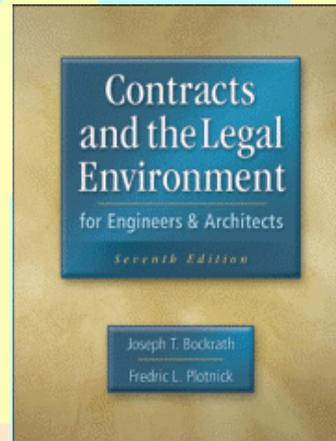
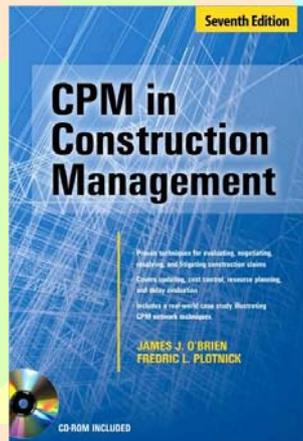




Summary of Expert Appearance

- **Be prepared - know the project - know the schedule**
 - **Teach the factfinder how you arrived at your conclusions**
 - **It's a small world -- Play from only one set of rules**
 - **Expect attacks on your credentials and credibility**
 - **Don't take personally -- let your client's lawyer handle**
 - **Anticipate attacks on your assumptions and**
 - **Determine in advance alternative analysis for such scenario**
 - **Don't take yourself too seriously**
 - **Everybody's an expert at something -- this is your turn**
- 

Questions?



- Fredric L. Plotnick, Ph.D., P.E., Esq.
 - fplotnick@fplotnick.com
 - 215-885-3733