

2022 D-9/ ASHE WORKSHOP

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Assistant District Executive – Construction**

April 18, 2022

JOINT MGMT/ IIC COUNCIL QUALITY EFFORT

Goal:

To identify focus areas where the potential for quality improvements may exist that would provide mutual benefit to both Design and Construction

JOINT MGMT/ IIC COUNCIL QUALITY EFFORT

INITIAL CONCLUSIONS

1. While Construction AARs and Design Quality Surveys are completed on every project and Design Errors and Omissions are communicated prior with Design Project Managers, we have generally been unable to productively inventory high priority issues and provide the Design Unit with over-arching areas where greater focus may result in a high cost/benefit ratio.
2. At times, feedback from Construction to Design is broadly generalized and fails to provide designers with quality improvement items which are clear in detail (i.e. ~ include examples) and potentially 'actionable'.
3. Focusing on 'outlier issues' can be counterproductive. Too often, across all Department areas, we have over-reaction to relatively minor issues that may have occurred on one project and, as a result, policy changes are made that then impact and burden staff with additional steps and paperwork on every future project. When this occurs, it only serves to sacrifice overall quality by wasting time on these outliers at the expense of the big picture.

JOINT MGMT/ IIC COUNCIL QUALITY EFFORT

- Purpose:** To identify focus areas where the potential for quality improvements may exist that would provide mutual benefit to both Design and Construction
- Criteria:** Omissions, quantity shortfalls, missing items, inconsistencies, etc. that have been encountered on a repetitive basis during construction
OR
Major errors or omissions which have occurred which have had major cost and/or time implications
- Deliverable:** Prioritized list of focus areas for potential quality improvements which are both clear in detail (i.e. ~ including examples) and potentially actionable
- Status:** Focus areas completed and transmitted to Design on 2/11/22
Joint meeting held with Construction & Design on 4/7/22
- Next Step:** Implementation of potential improvement measures

JOINT MGMT/ IIC COUNCIL QUALITY EFFORT

QUALITY PRIORITY RANK	FOCUS AREA	DESCRIPTION
1	Existing Drainage Verification	Existing drainage conditions vary from those depicted on the plans
2	Utility Verification	Field conditions vary from those depicted on the plans
3	Quantity Omissions - Inaccuracies	Quantities required but either not included or significantly under/over estimated
3A	<i>Tree Removals/ Trimming</i>	<i>Impacts to trees not adequately assessed</i>
3B	<i>Shoulder Back-Up</i>	<i>Shoulder back-up quantities significantly underestimated</i>
4	Penelec Outages	Reliance on scheduled power outages to facilitate work operations and lack of Penelec reliability to provide as scheduled (and lack of adequate advanced notice)
5	Not to Scale Drawings	Not to scale drawings result in layout issues in the field or missed conflicts/ issues

PRIORITY #1

DRAINAGE VERIFICATION

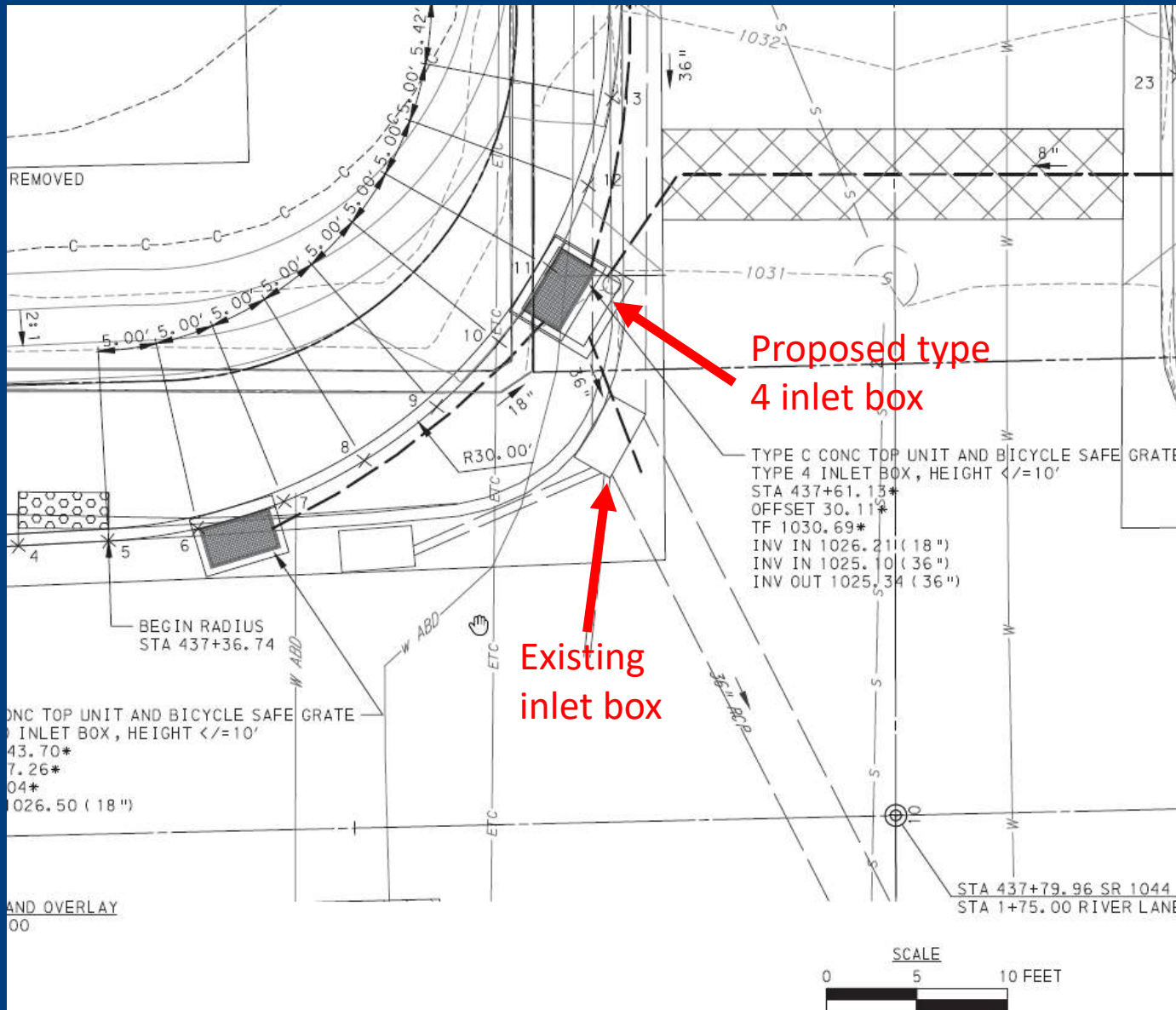
DRAINAGE VERIFICATION

Issues: Existing conditions vary from those depicted on the plans

Impacts: Additional costs along with delay of associated work

- Exposure to costs associated with contractor demob/ remob costs and/or equipment standby costs
- If contractor needs to shutdown and wait for redesign, negative public perception of 'no work going on' for extended period
- Particularly problematic when a project has a compressed schedule/ public commitments for completion (school, environmental, EMS, special events, etc.) ~ may require payment of acceleration costs
- Wages of the IIC, ACE/ACM, ADE, County Maintenance Manager and Work Order Specialist for the creation and review of additional Work Orders and Cost Funding Changes.

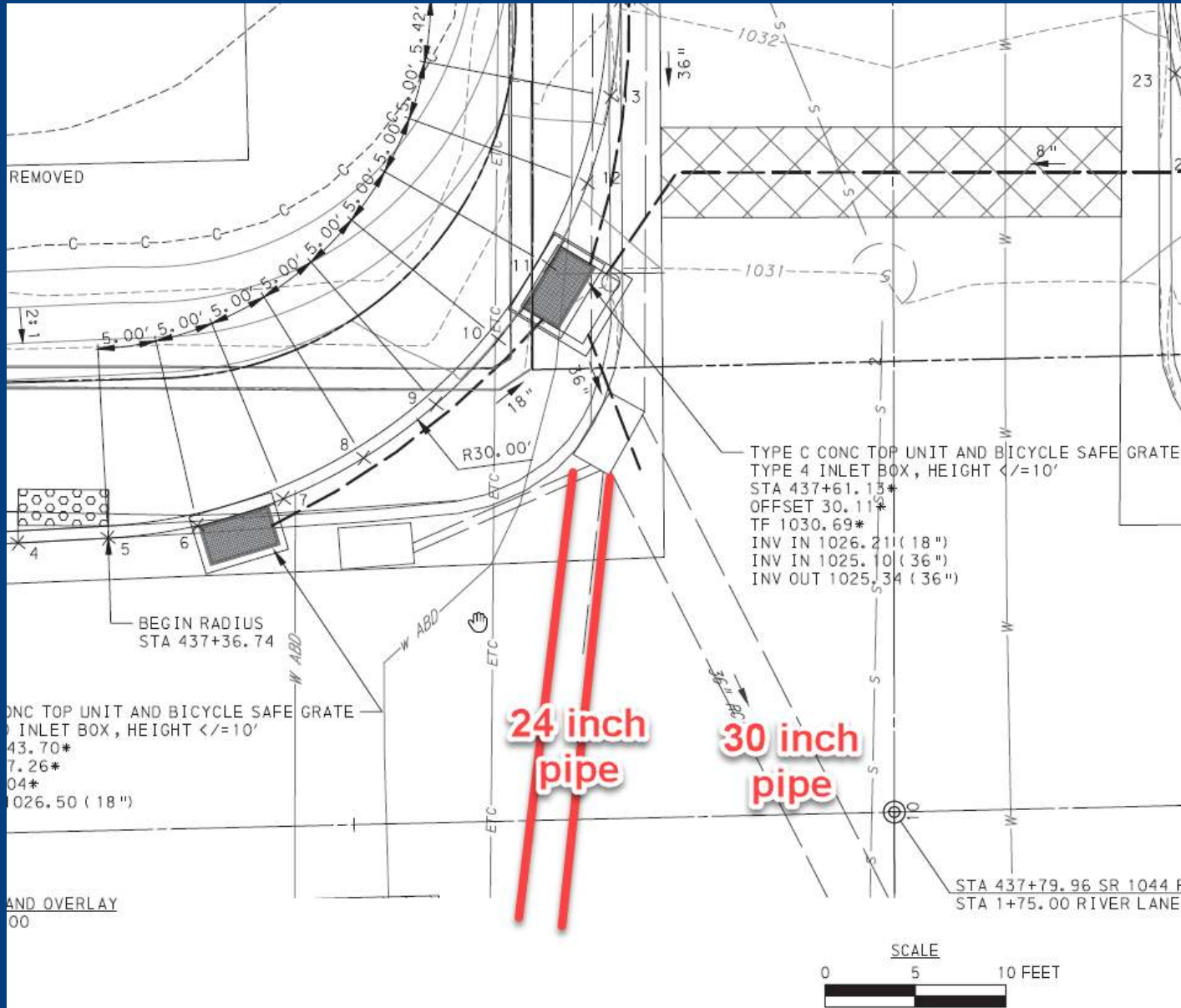
DRAINAGE VERIFICATION



EXAMPLE #1

- Plan shows existing 36-inch pipe and 18-inch pipe coming into existing inlet box, with one 36-inch pipe going out
- New inlet box called out as Type 4, but with 36-inch pipe on such a skew needed a larger box
- Ordered larger box for 36-inch pipe on sharp skew instead of Type 4

DRAINAGE VERIFICATION



EXAMPLE #1 (cont.)

- When excavating at existing inlet box, found the actual condition to be different than shown
- Instead of one 36-inch pipe outlet, there were two pipes: one 24-inch and one 30-inch

DRAINAGE VERIFICATION



EXAMPLE #1 (cont.)

- Actual condition at existing inlet box
- Left outlet pipe 30-inch concrete (not 36")
- Right outlet pipe 24-inch concrete
- Both were needed and functional
- This changed the entire approach
- Field staff scrambling to make decisions on what to do with traffic control

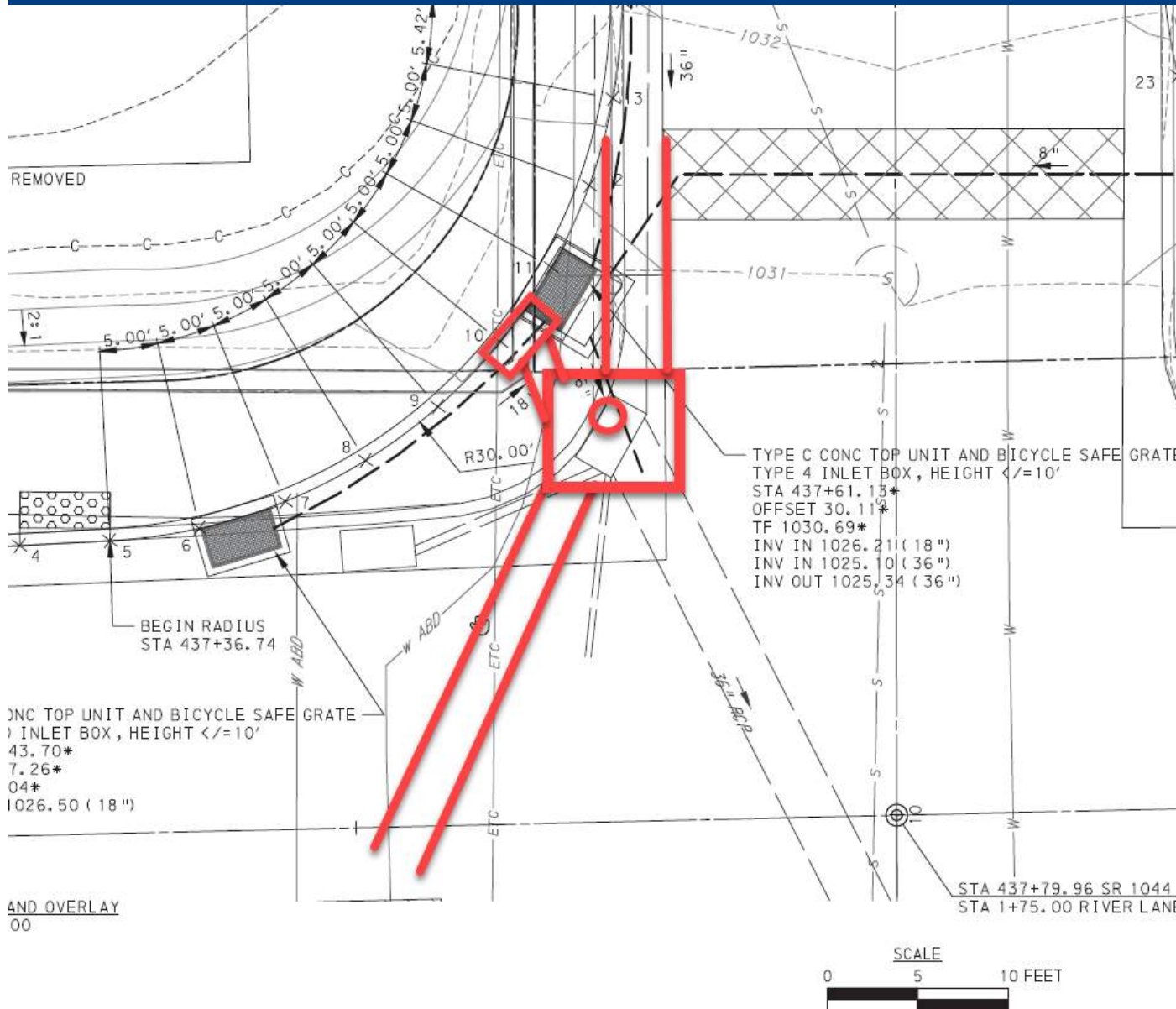
DRAINAGE VERIFICATION



EXAMPLE #1 (cont.)

- Because both pipes needed to remain, a new large inlet box was cast in place at the junction of these two pipes
- Due to the time needed for cast-in-place box, temporary traffic control issues were encountered
- The larger precast box that had been previously ordered due to the 36-inch pipe on a skew was no longer needed

DRAINAGE VERIFICATION



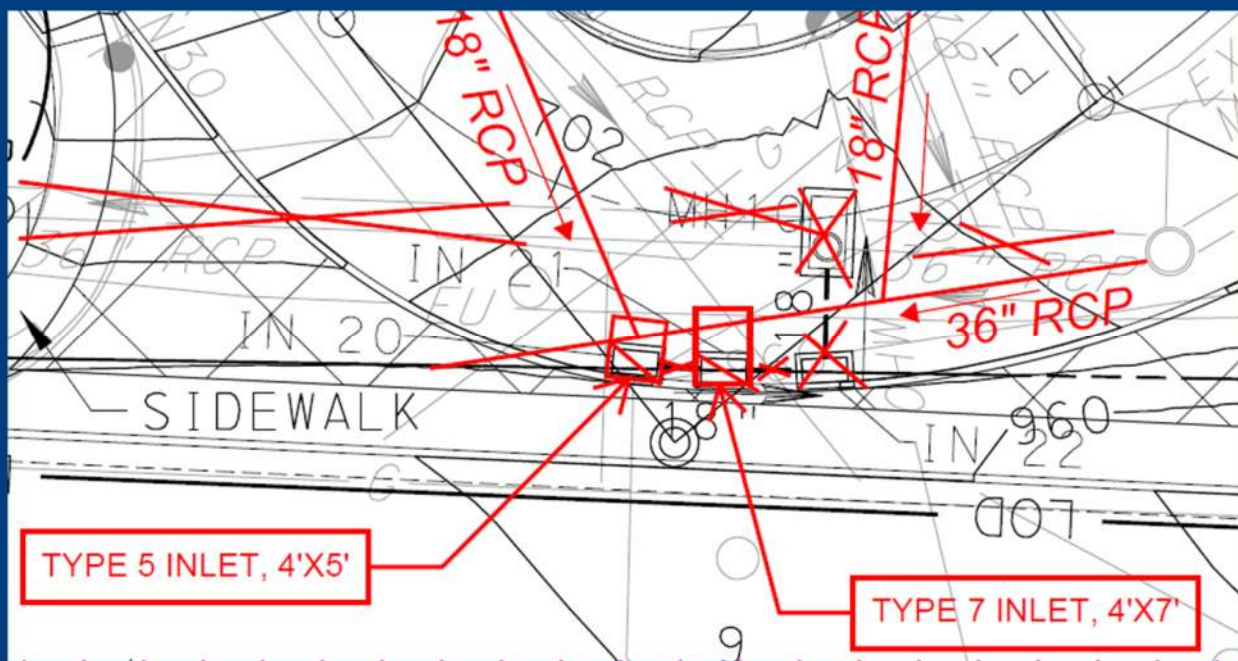
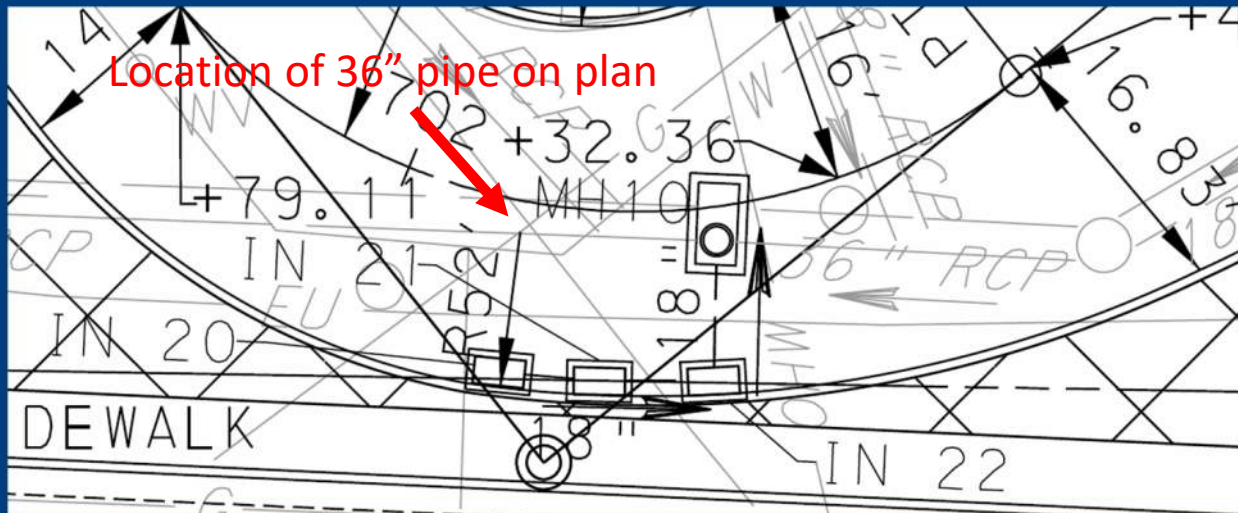
EXAMPLE #1 (cont.)

- Approximate as-built box location with manhole
- Time impact – approximately 7 days to cast in place new box and top w/ manhole
- Project impact - substandard traffic control during this time
- Cost impact - \$21,375 total

EXAMPLE #1 (CONT.) FINISHED INTERSECTION



DRAINAGE VERIFICATION

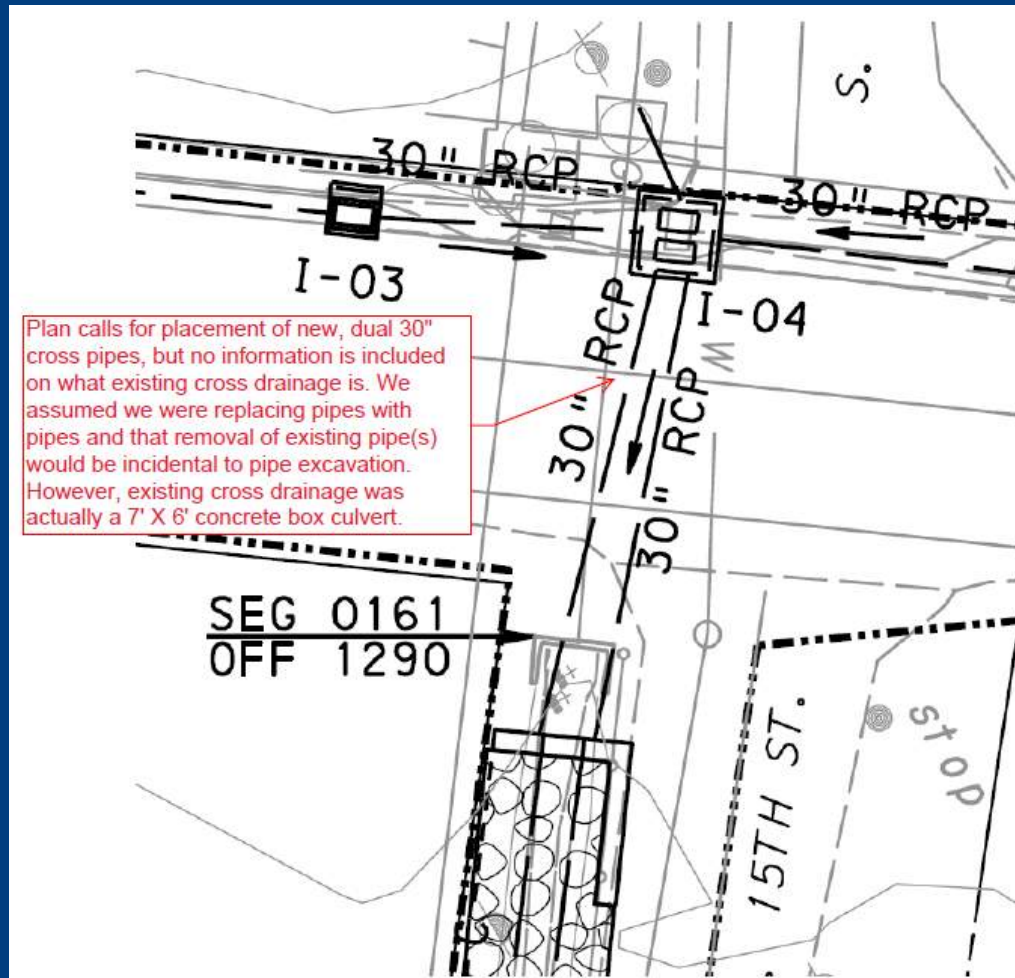


EXAMPLE #2

- New drainage was designed to be outlet to an existing 36" pipe
- Actual location of 36" pipe was in conflict with three new inlets that were to be installed
- Drainage was redesigned
- Redesign added cost and delay to project since the inlets were larger and now had to be cast in place
- Original inlets were precast and on site ~ these had to be purchased and given to maintenance

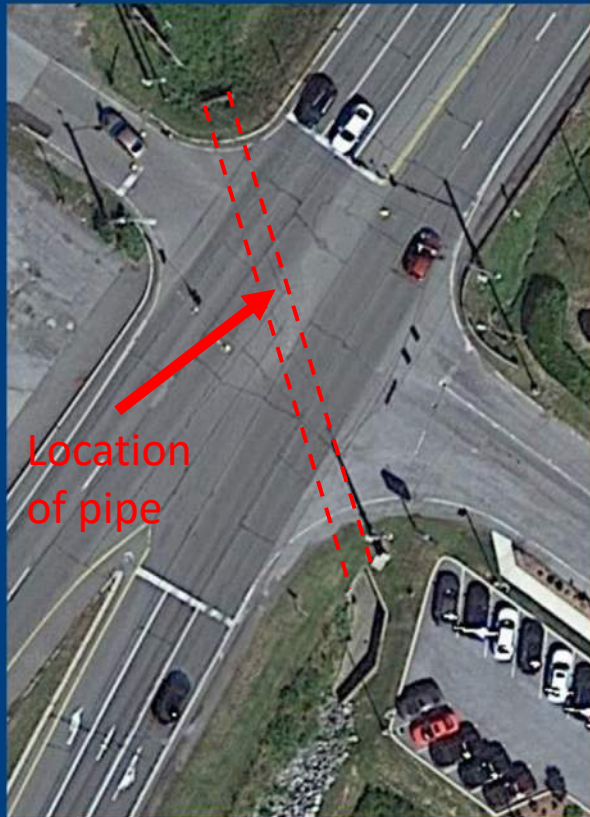
DRAINAGE VERIFICATION

EXAMPLE #3



- Plans called to replace the existing cross drainage with two 30" pipes, but no call out indicating what existing cross drainage consisted of
- Existing cross drainage was found to be a 7' X 6' concrete box culvert
- Although removal of small existing pipes would be incidental to pipe excavation, structure demolition (i.e. ~ box demolition) is not incidental
- There was no item for structure demolition to remove the box
- Department had to add a demolition item with long-term traffic control to enable the work to be completed in a safe manner (Cost ~ \$27K , Delay ~ two weeks)

DRAINAGE VERIFICATION



EXAMPLE #4

- During construction, the IIC was reviewing pipe cleaning locations and found a failing 46"x70" elliptical metal pipe
- This was a mill and overlay project and the paving was already complete, so replacement was not a desirable option
- The designer proposed to use a Geospray Pipe Liner to rehabilitate the pipe
- Cost to project: \$189,000

DRAINAGE VERIFICATION

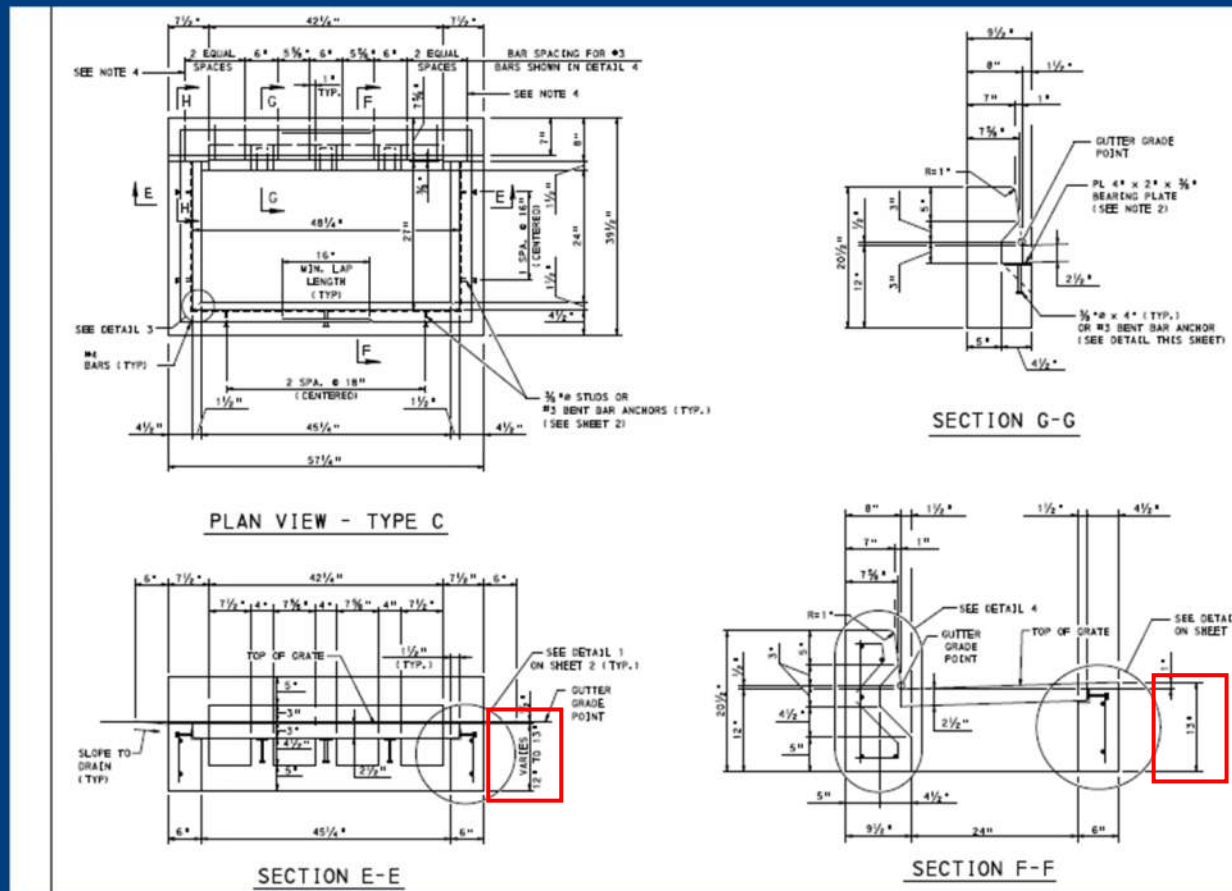
20	0605	TYPE C CONCRETE TOP UNIT USING EXISTING GRATE
	2713	
	SET	

EXAMPLE #5

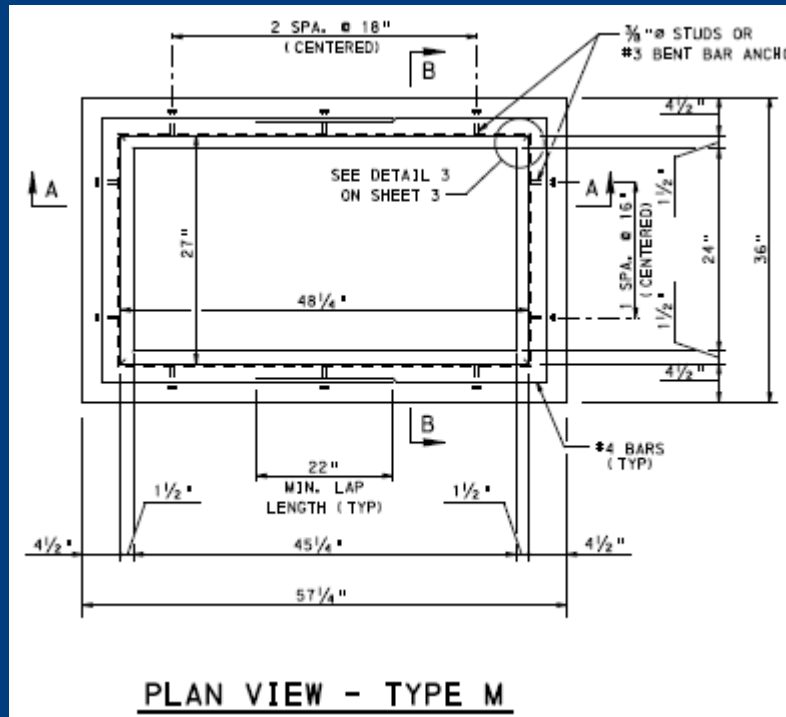
- New Type C Inlet Tops utilizing existing grates were planned. Old tops were 8" depth. Current RC-45M Type C inlet tops are 13" in depth.

- Special provision/ details required to provide alternate inlet tops or provide a grade adjustment of existing inlets item

- In this case, work order was processed for adjusting inlet grades to accept standard top at a cost of \$800 per inlet (luckily, contractor accepted Allied Contract pricing in lieu of force account)

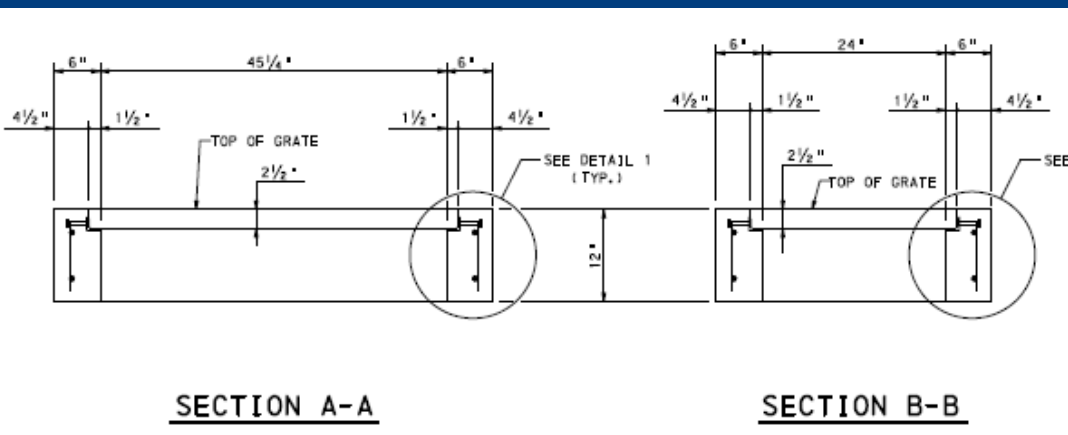


DRAINAGE VERIFICATION



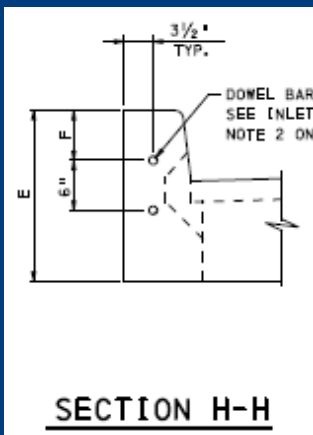
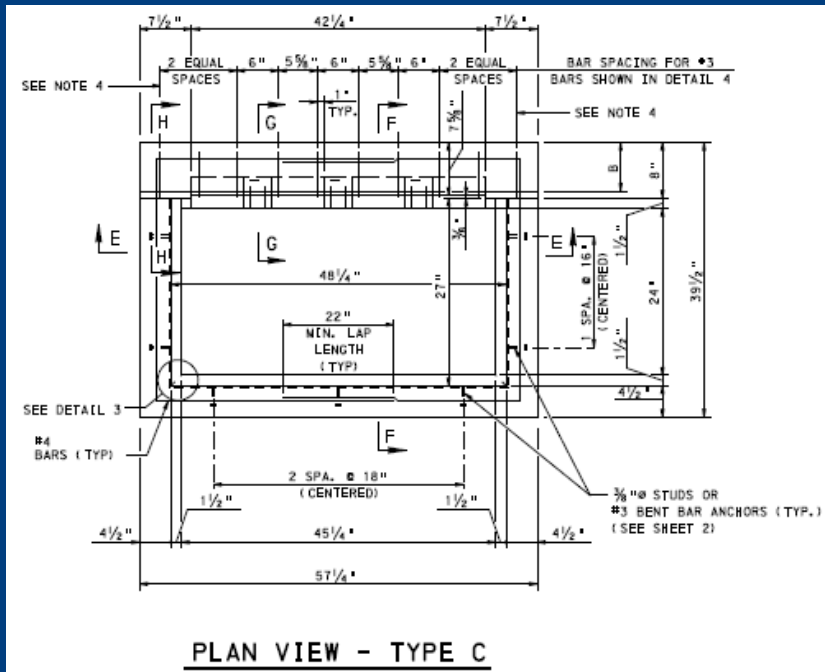
EXAMPLE #6

- Corridor improvements project calls for installation of precast Type M Inlet Tops on existing inlets in curbed section
- Due to 4" width of concrete around the perimeter prior to the inlet grate, water will bypass inlet between curb and grate



DRAINAGE VERIFICATION

EXAMPLE #6 (cont.) ~ Desirable condition is Type C Top & Frame



DRAINAGE VERIFICATION

MISCELLANEOUS ISSUES

- Specifying standard inlet tops on non-standard inlets
 - Many inlets on rehab projects are dimensionally non-standard or custom built
 - The existing inlet will need replaced or rebuilt to receive a standard top
- Specifying replacement of inlet tops on highly deteriorated existing inlets
 - Will the old inlet need replaced or repaired to receive a new 12" or 13" top?
- When calling for pipe cleaning on projects, the parallel pipe systems likely need cleaned also
 - Sometimes there is only quantity provided to clean cross pipes
- When there is drainage work on a project, even if no new inlets are anticipated, consider calling for an as directed quantity of standard inlets ~ more expensive to negotiate costs for these after the fact

PRIORITY #2

UTILITY VERIFICATION

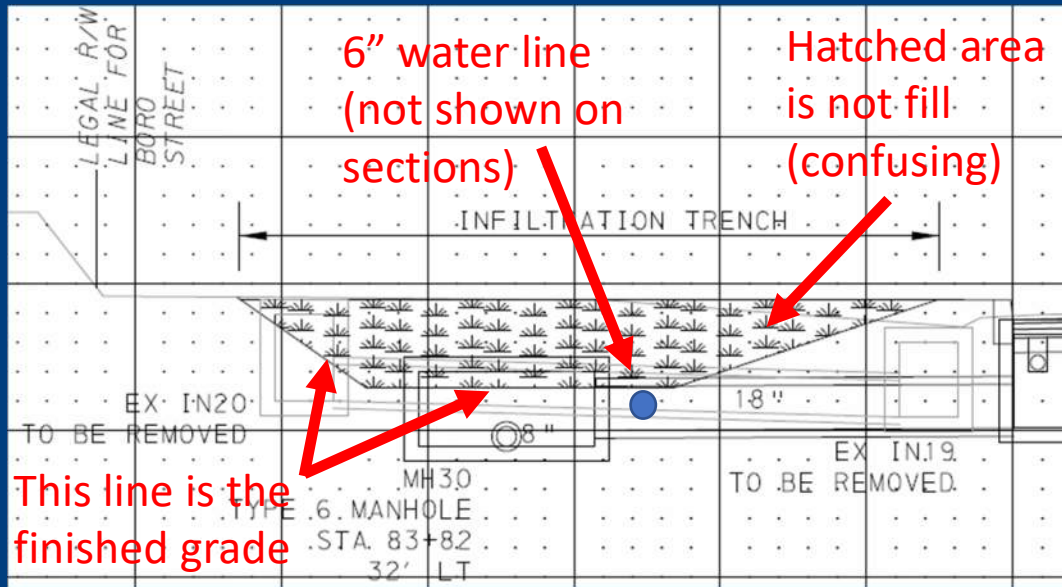
UTILITY VERIFICATION

Issues: Field conditions vary from those depicted on the plans. Although it does not occur often, failure to show utility lines on cross sections becomes a major time and cost impact when it results in missed conflicts.

Impacts: Additional costs along with delay of associated work

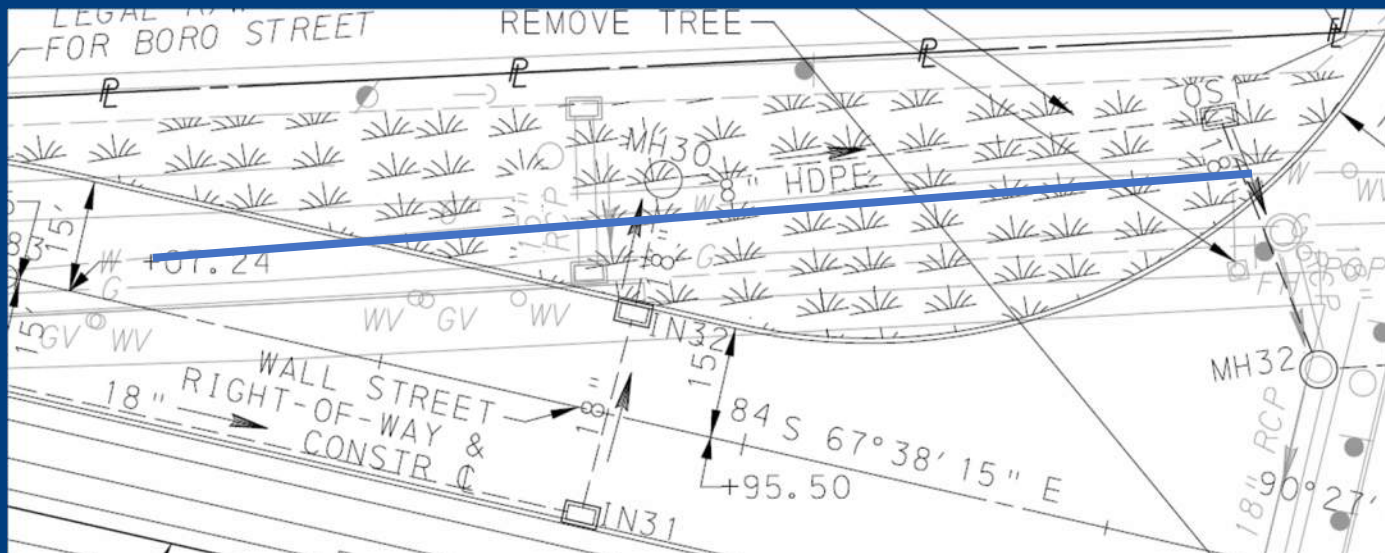
- End up relying on utilities to help resolve conflicts which is seldom their top priority
- Exposure to costs associated with contractor demob/ remob costs and/or equipment standby costs
- If contractor needs to shutdown and wait for outage, negative public perception of 'no work going on' for extended period
- Particularly problematic when a project has a compressed schedule/ public commitments for completion (school, environmental, EMS, special events, etc.) ~ may require payment of acceleration costs

UTILITY VERIFICATION



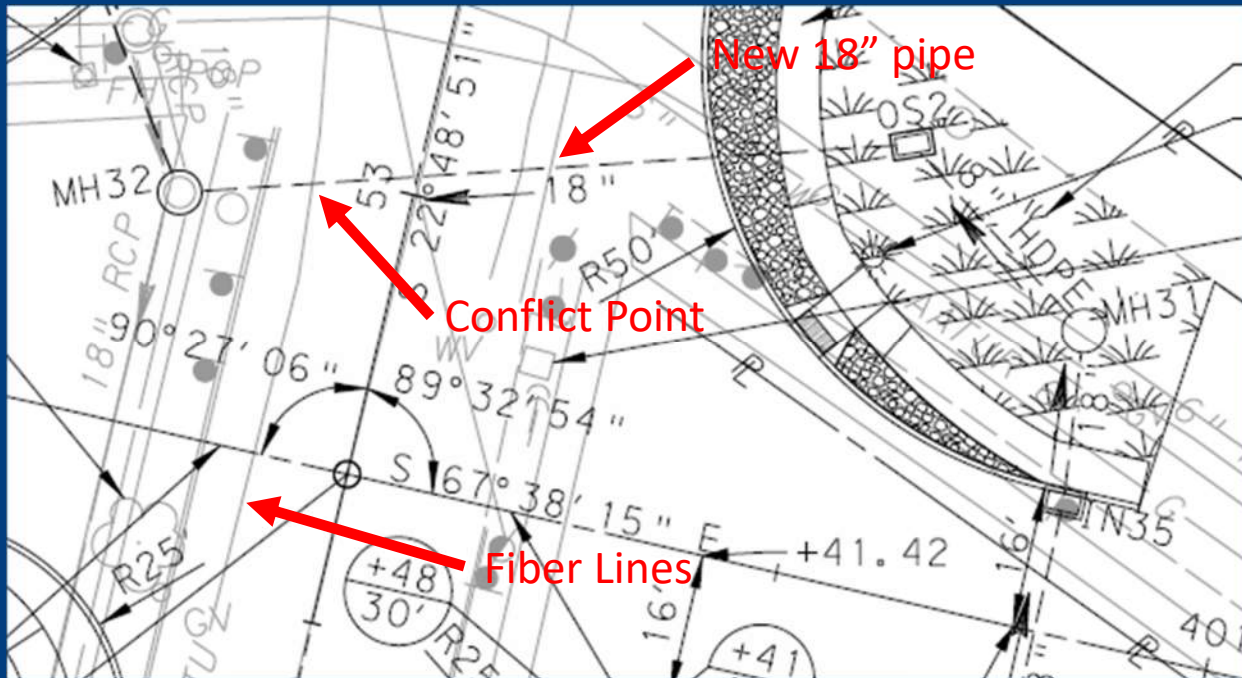
EXAMPLE #1

- An existing 6" waterline is shown on the plan view, but not shown on the cross sections
- This waterline ended up being near the bottom of a new infiltration trench whereby the active waterline would be exposed/undermined during trench construction
- The waterline was also in conflict with an 18" pipe to be installed



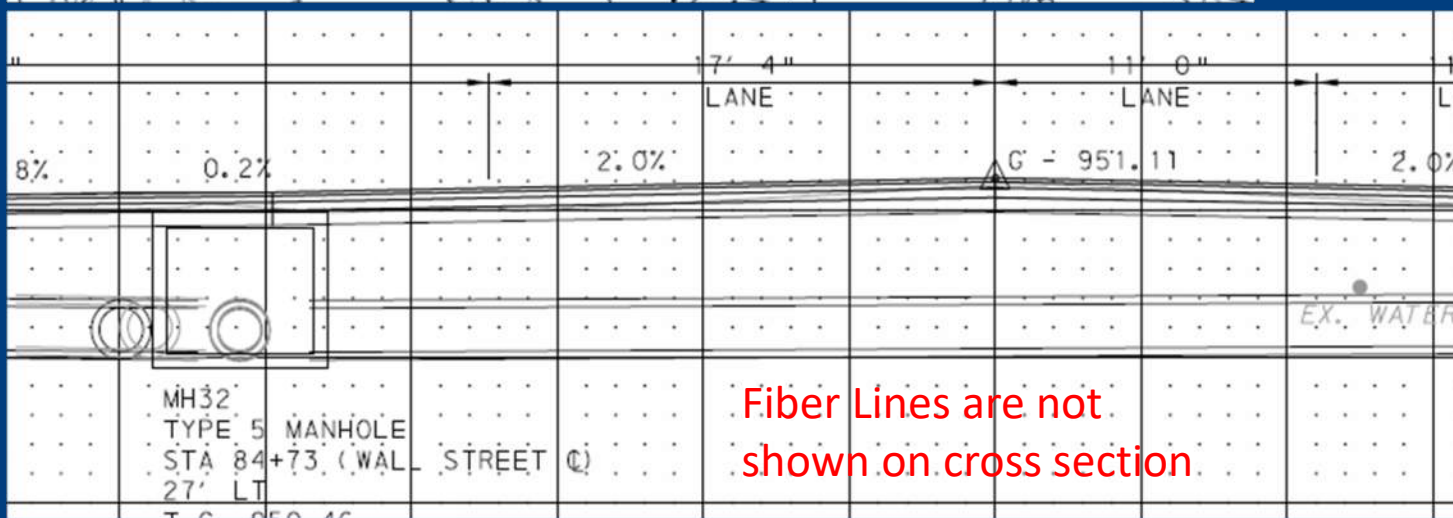
- END RESULT: Waterline was relocated adding delay and cost to the project

UTILITY VERIFICATION

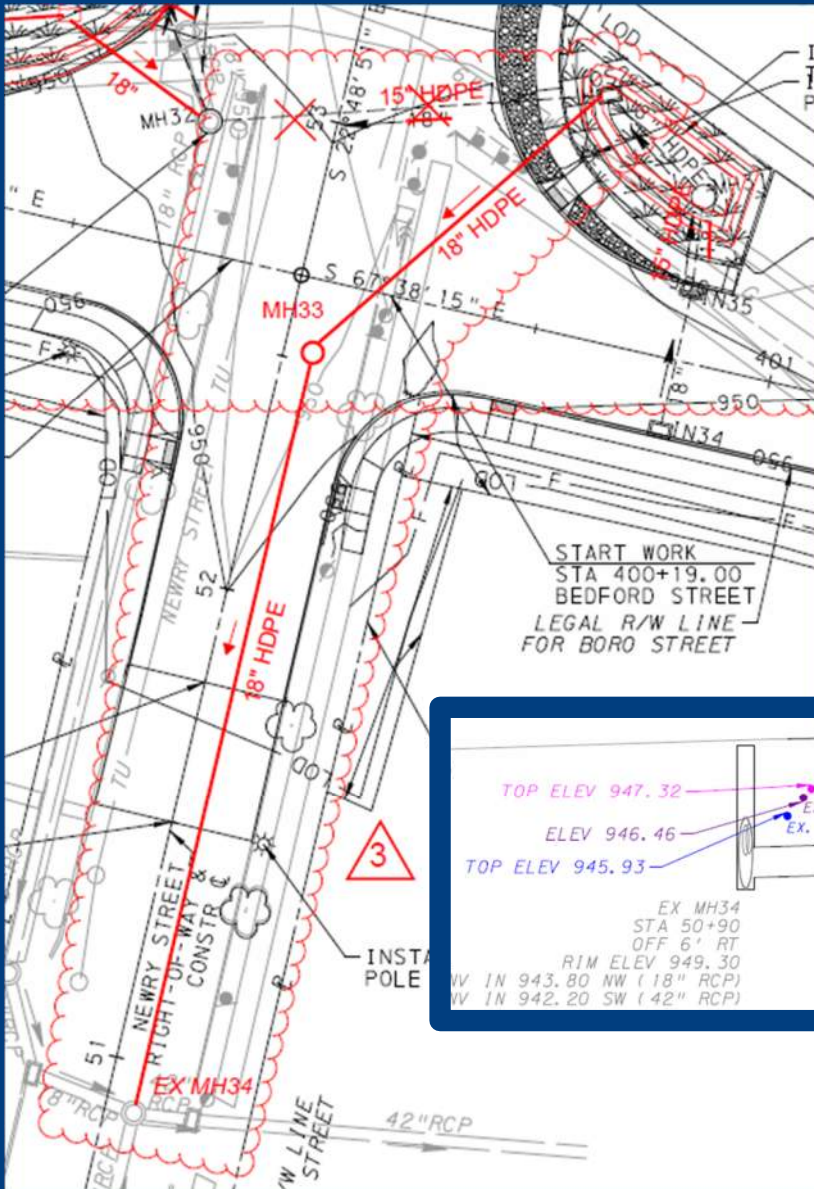


EXAMPLE #2

- Existing fiber optic lines are shown on the plan view, but not shown on the cross sections
- An as designed drainage pipe was to connect to existing drainage
- While excavating, it was found that existing fiber optic lines were in conflict with the pipe

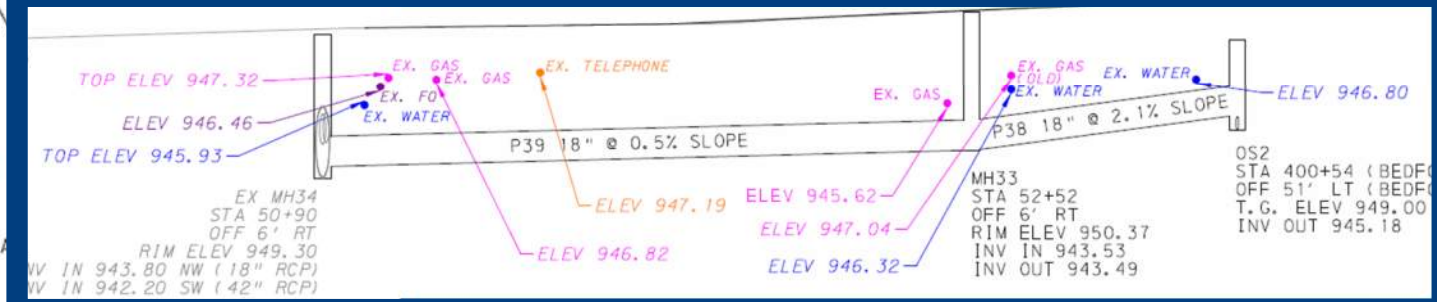


UTILITY VERIFICATION

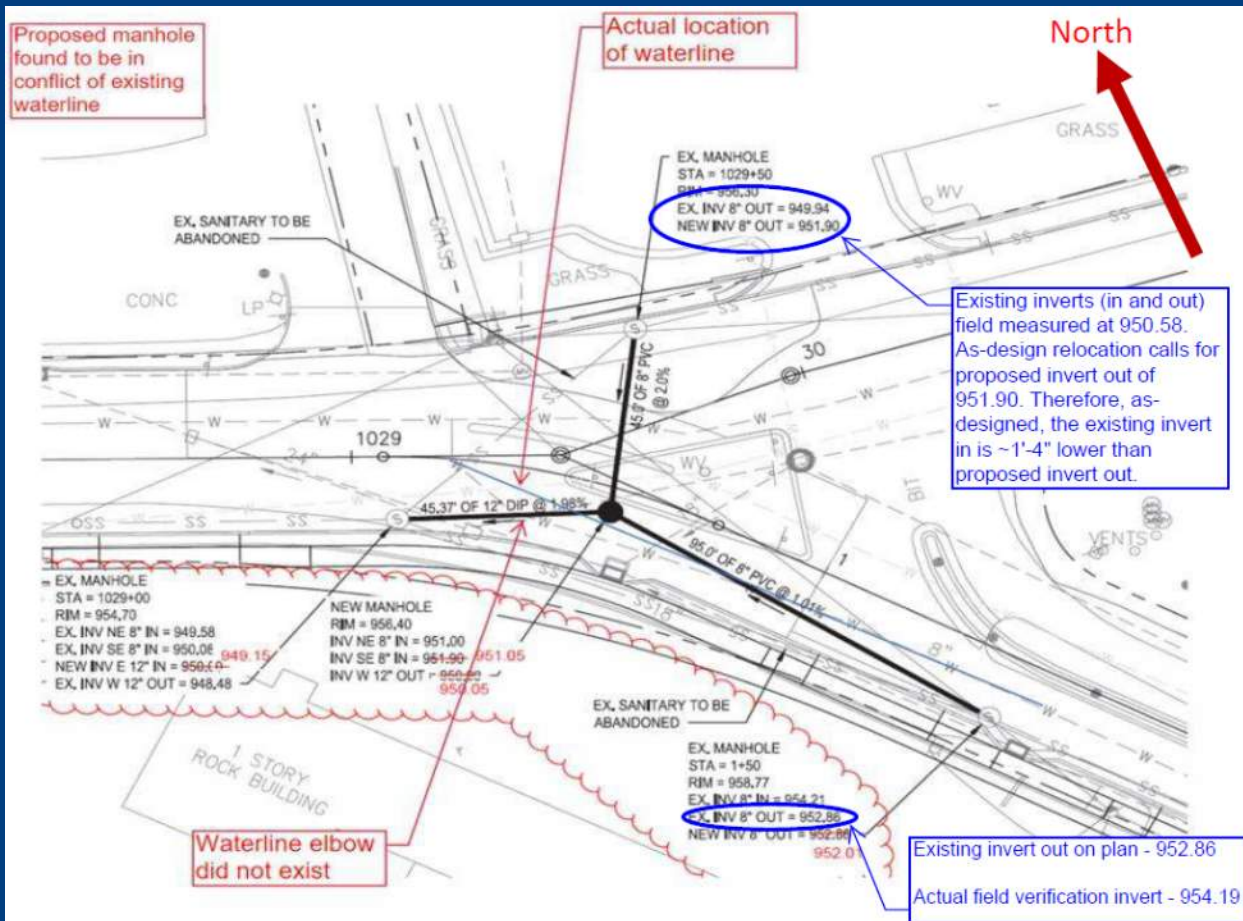


EXAMPLE #2 (cont.)

- END RESULT: Resolution involved outletting to an entirely different location resulting in almost 200' of additional pipe
- Test holes were performed to verify potential impacts with the new alignment (below right)
- Design change impacts were additional costs and time delay waiting for pipe delivery



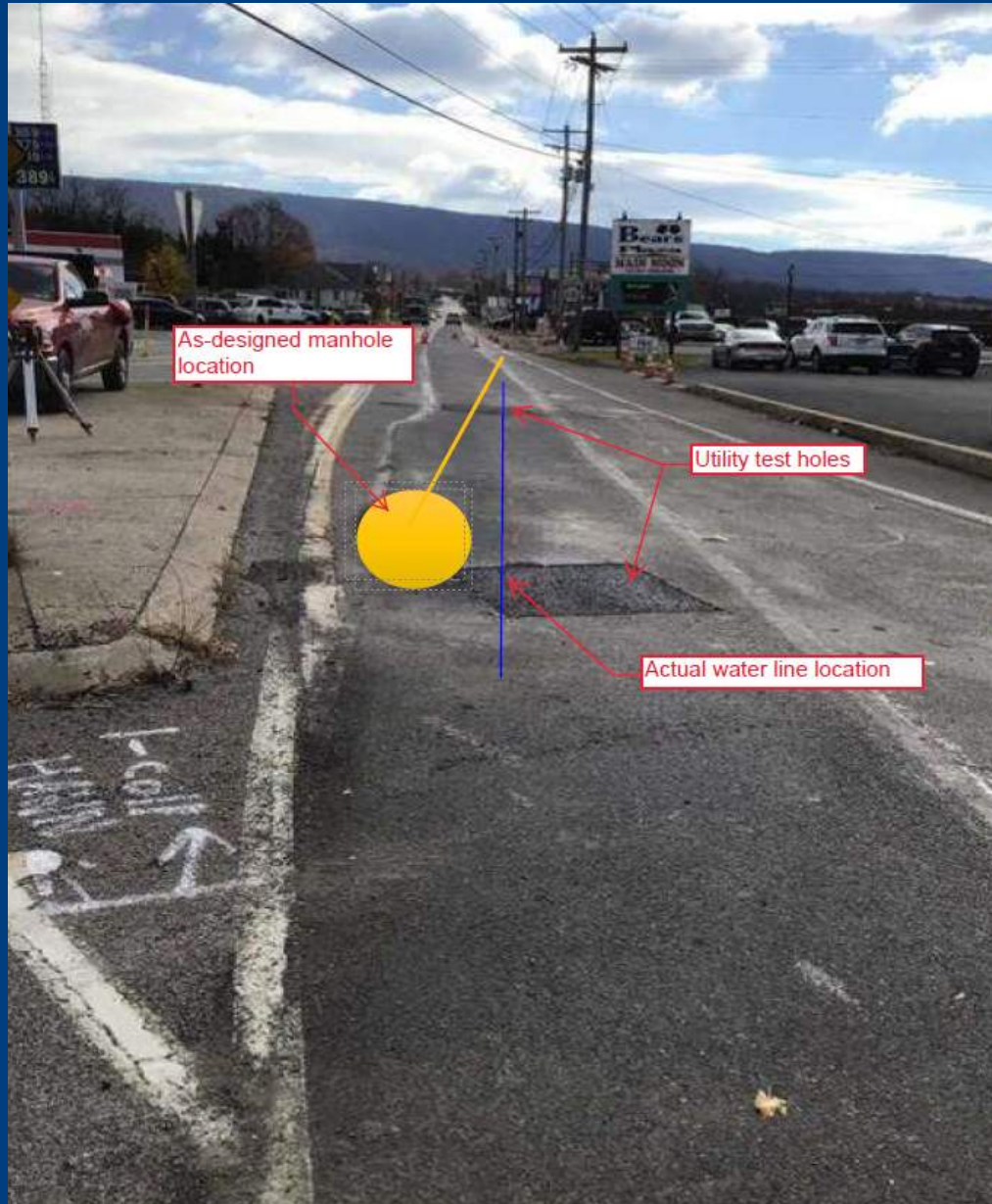
UTILITY VERIFICATION



EXAMPLE #3

- \$4.2M safety improvement project includes incorporated sewer line relocation work
- Contractor plans to start sewer relocation shortly after NTP on 11/21/21 (before local bituminous plant closes for season) to be set to go with intersection work in the spring
- Ten days before NTP issued, utility meeting held with sewer and water authorities
- As part of meeting and to confirm aspects of the work, manhole covers were opened and it immediately became apparent several existing inverts as shown on the plans were off significantly (see in blue)

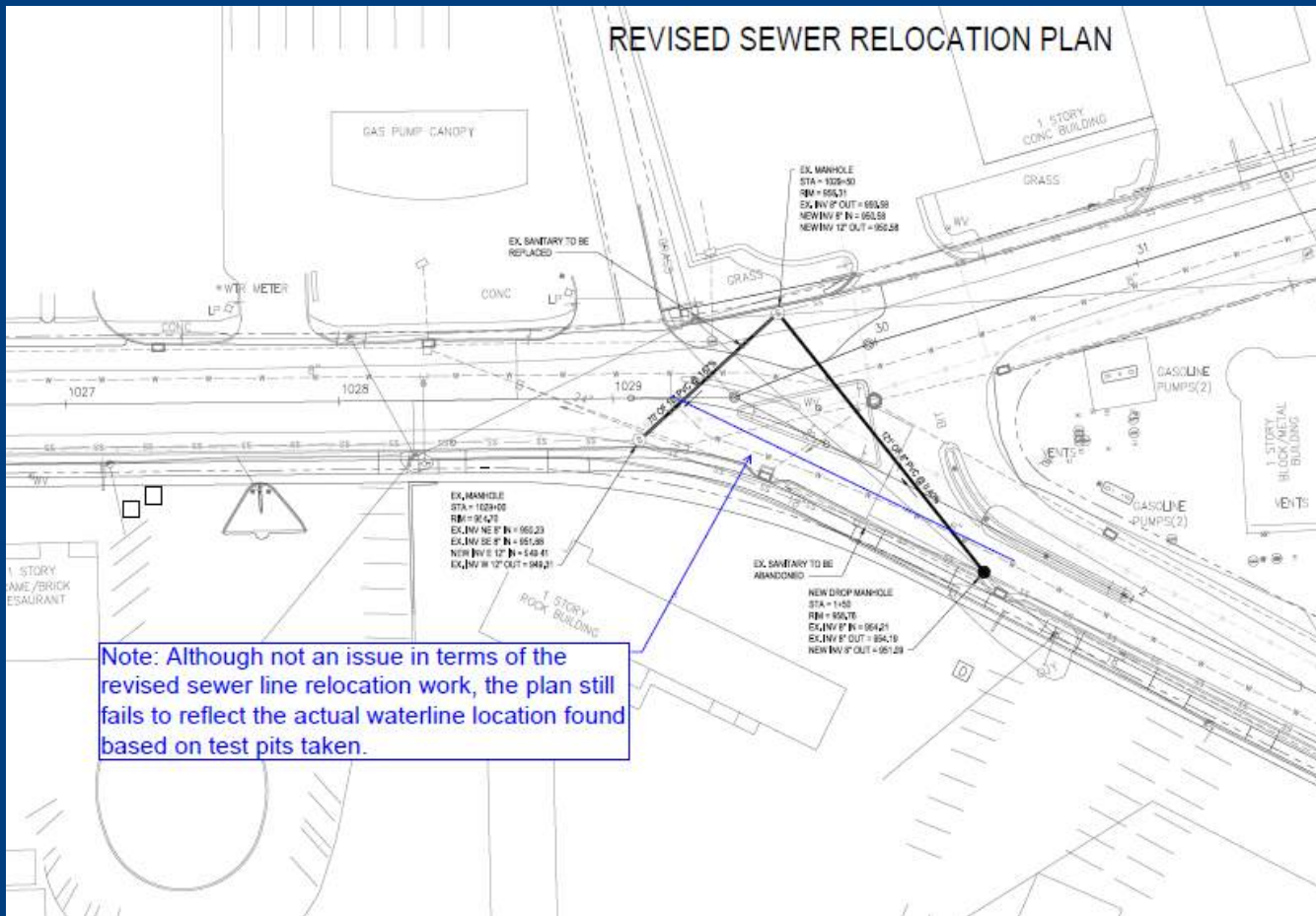
UTILITY VERIFICATION



EXAMPLE #3 (cont.)

- In addition, municipality noted that the location of the existing water line as shown may not be correct due to relocation work completed the prior season
- Test holes were taken and verified the water line was incorrectly shown and, as a result, would be in conflict with the new proposed sewer manhole
- Complete re-design of sewer relocation would be required

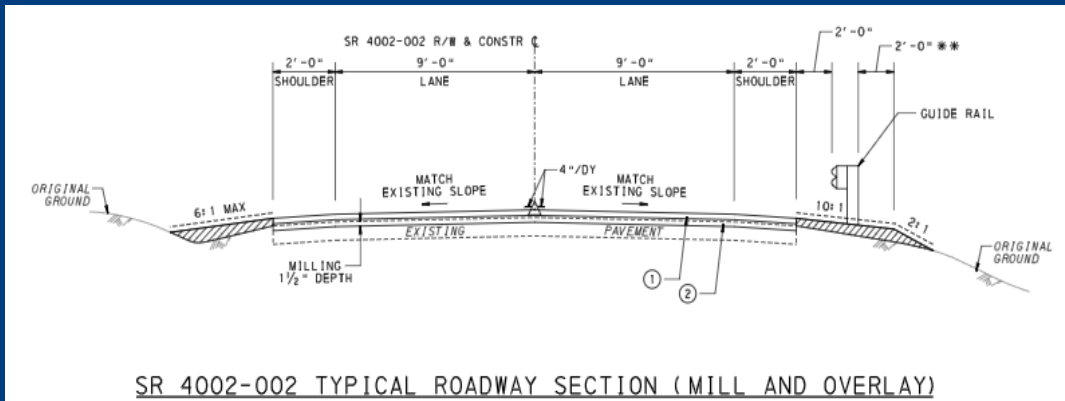
UTILITY VERIFICATION



EXAMPLE #3 (cont.)

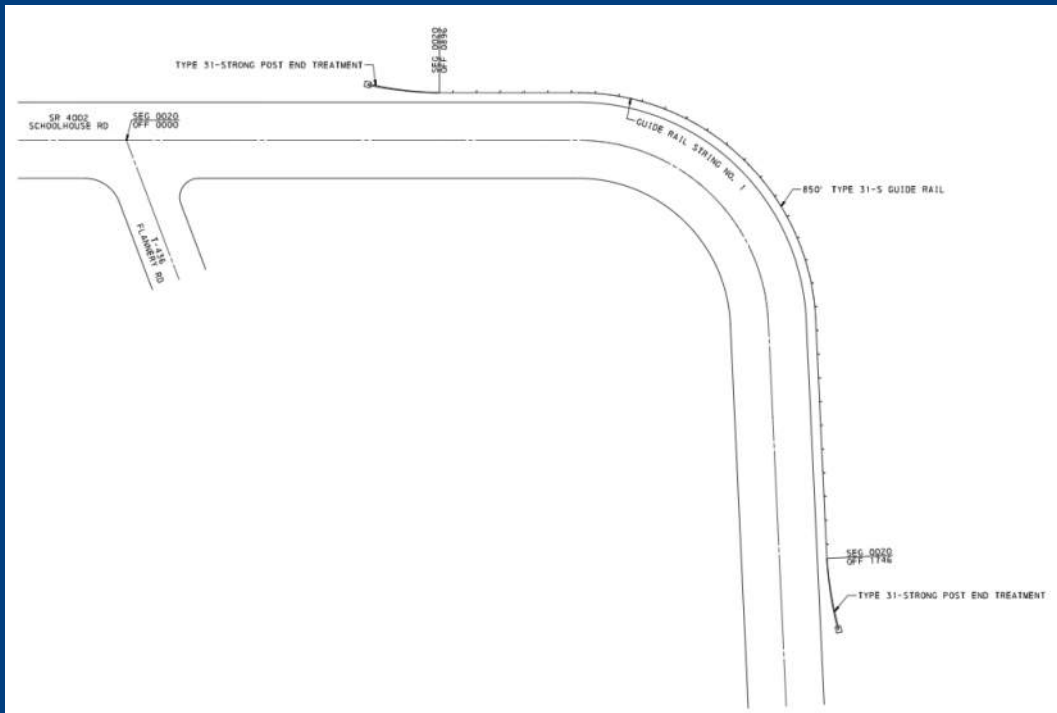
- Sewer relocation redesign took two months
- Contractor has placed Department on written notice of utility delay status, as they will now be unable to start work until the spring
- Overall additional costs are not yet determined, but may include additional costs of relocation work, acceleration to meet original completion milestones, standby/material storage costs, etc.

UTILITY VERIFICATION



EXAMPLE #4

- New Type 31-S guiderail depicted around curve
- No utilities depicted on plan
- In reality, several overhead utility poles were located along the run
- Along with requiring string realignment (to <2' from shoulder edge in some areas), added Type 31-SC and 31-SCC for proper deflection

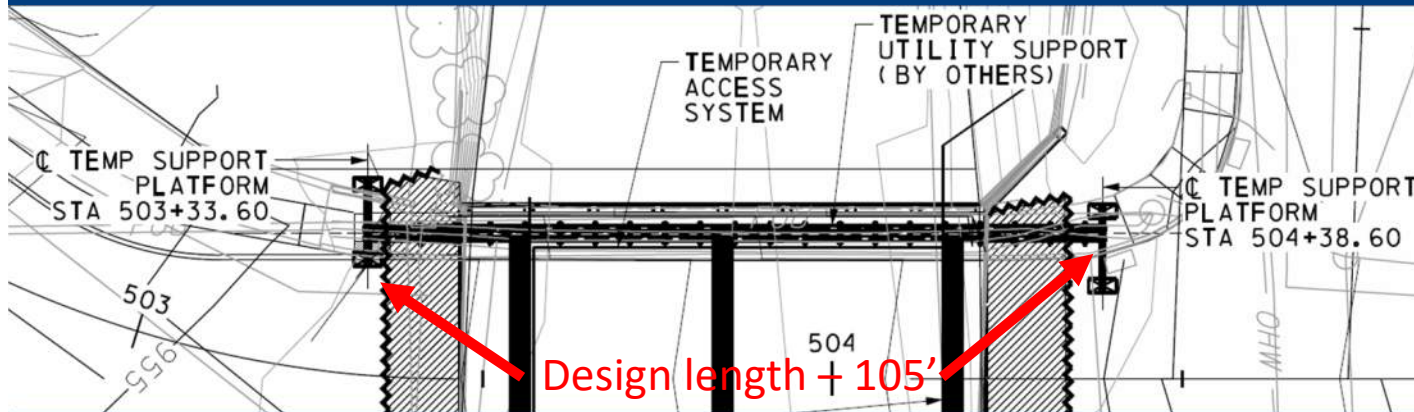


UTILITY VERIFICATION

EXAMPLE #4 (cont.)

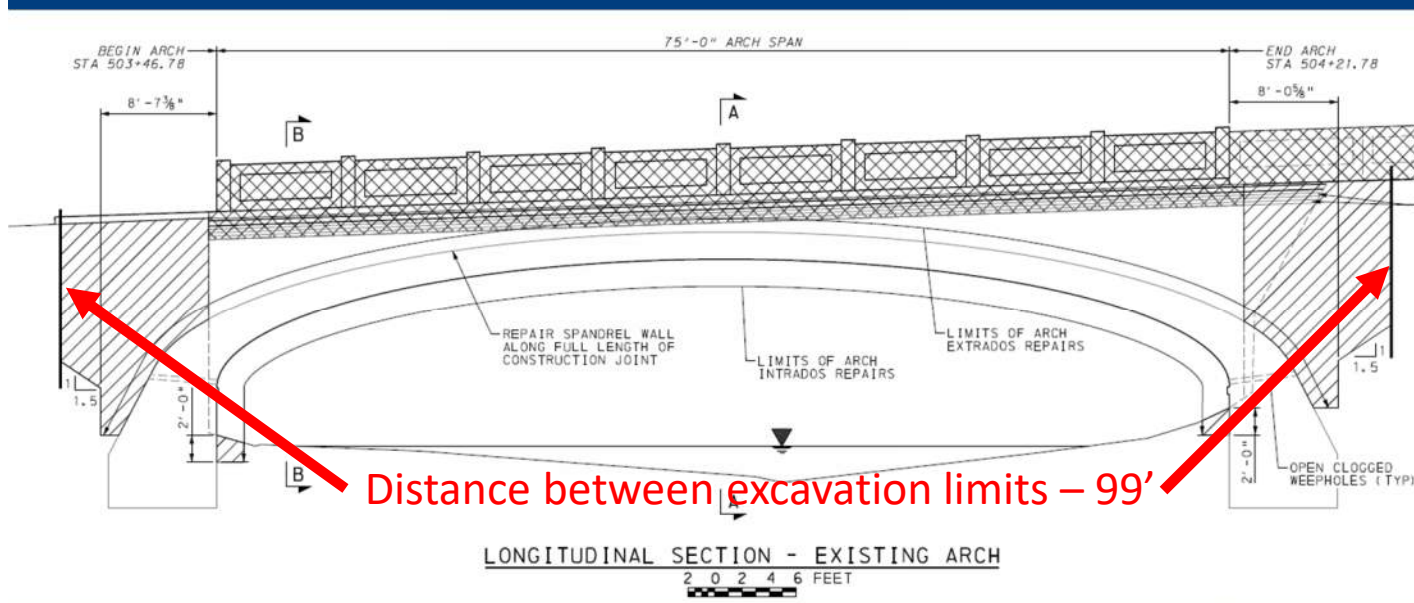


UTILITY VERIFICATION



EXAMPLE #5

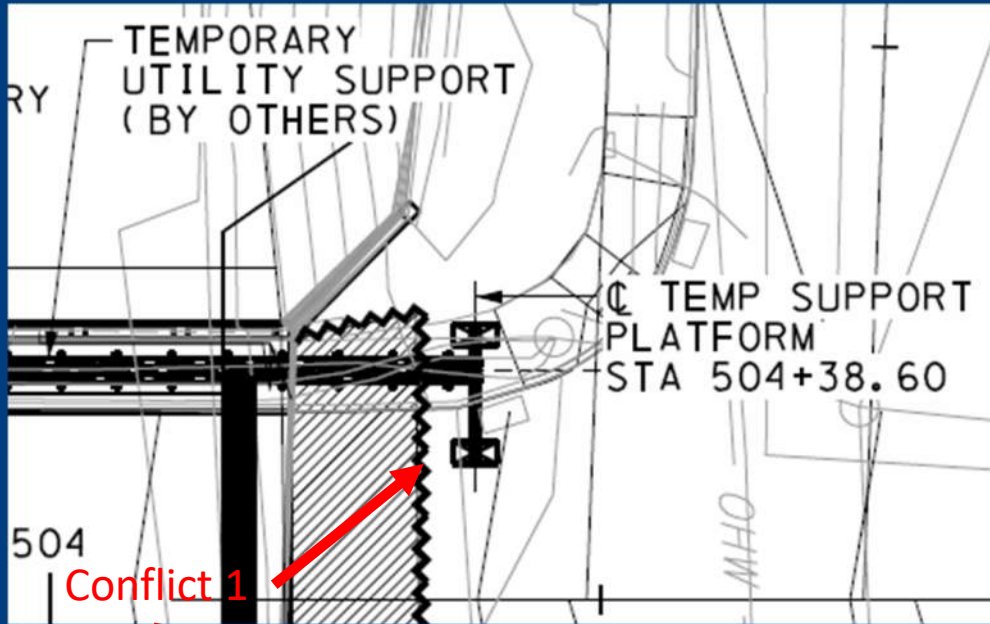
- Temporary support beam for Verizon line was designed at 105'
- Distance between excavation limits was 99'
- Taking the width of the shoring and holes into consideration, leaves 1.5' of space behind the shoring to set the footing for the support platform



UTILITY VERIFICATION

EXAMPLE #5 (cont.)

- Footing support platforms were 4' long
- Conflict 1: The footing support platform would be on top of the shoring
- Conflict 2: The footing support platform would be in the same location as the access point for the Verizon Conduit
- END RESULT: Verizon needed to order a longer beam. That combined with constructability complications and the temporary support operation added a month delay to the project.



PRIORITY #3
QUANTITY OMISSIONS -
INACCURACIES

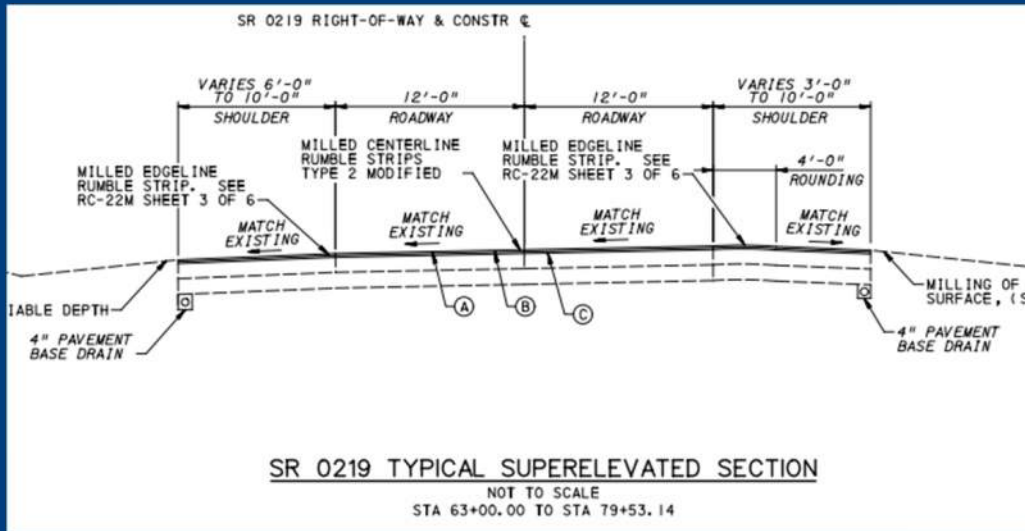
QUANTITY OMISSIONS - INACCURACIES

Issues: Quantities required but either not included or significantly under/over estimated

Impacts: Additional costs along with potential delay of associated work

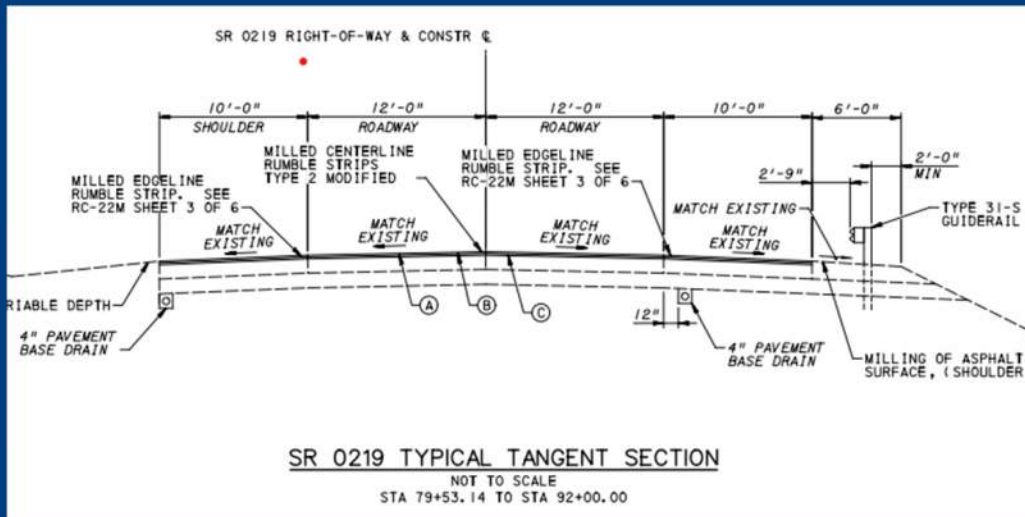
- When items needed are completely omitted, items become far more expensive than if originally bid
- When increasing/ decreasing quantities by more than 25% of plan value, contractor's right to renegotiate can result in unit prices above bid unit prices
- Exposure to costs associated with contractor demob/ remob

PAVED SHOULDER QUANTITIES



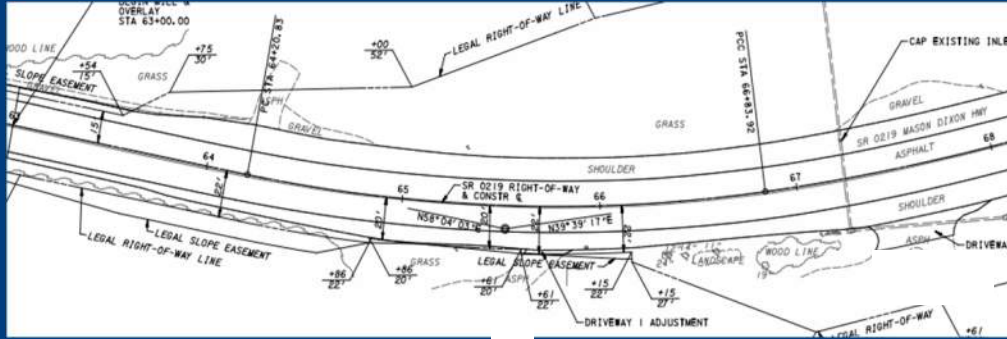
EXAMPLE #1

- Typical Cross Section shows shoulder widths vary 3' to 10' from Sta 63+00 to 79+53.14



- Typical Cross Section shows shoulder widths are 10' from Sta. 79+53.14 to 92+00

PAVED SHOULDER QUANTITIES (CONT.)



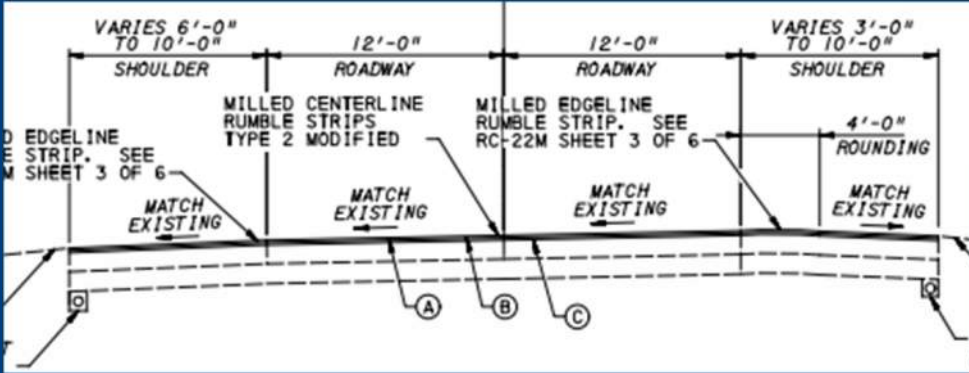
EXAMPLE #1 (cont.)

- Plan Sheets Show 10' (scaled) shoulders starting about Sta 64+00 Left and 67+25 Right
- Design calculations assumed two 5' shoulders from Sta 63+00 to 92+00 causing significant quantity overruns
- Actual Wearing Course, Leveling Course, Tack, and Milling quantities were roughly double the plan quantities

ITEM 0491-0014 MILLING, 0413-2089 SUPERPAVE ASPHALT WEARING COURSE (LEVELING), 0413-0298 SUPERPAVE ASPHALT WEARING COURSE 1 1/2" DEPTH, 0460-0003 BITUMINOUS TACK COAT

Route	Sta Begin	Sta End	Side	Length	Area (SY)	Volume (CY)	Remarks
SR-0219	63+00.00	92+00.00	LT/RT	2900	7,733.33	214.81	Assume 2 - 12' lanes
SR-0219	63+00.00	92+00.00	LT/RT	2900	3,222.22	89.51	Assume 2 - 5' shoulders
SR-0219	65+62.00	65+86.00	RT		4.86		Driveway 1
SR-0219	67+34.00	67+95.00	RT		61.61		Driveway 2/3
SR-0219	63+00.00	92+00.00	LT	2900	644.44		Shoulder Backup
SR-0219	63+00.00	92+00.00	RT	2900	644.44		Shoulder Backup
Stru	tal Length)			0.00			
Total					11,022.03	304.32	

MILLING QUANTITIES



PAVEMENT DESIGN:	
A	MILLING OF BITUMINOUS PAVEMENT SURFACE, 2 1/2" DEPTH
B	SUPERPAVE ASPHALT MIXTURE DESIGN, WMA WEARING COURSE, PG 645-22, 3 TO < 10 MILLION ESALS, 9.5 MM MIX, 1 1/2" DEPTH, SRL-H
C	SUPERPAVE ASPHALT MIXTURE DESIGN, WEARING COURSE (LEVELING), PG 645-22, 3 TO < 10 MILLION ESALS, 9.5 MM MIX, SRL-L, (120 LBS/SY MIN)

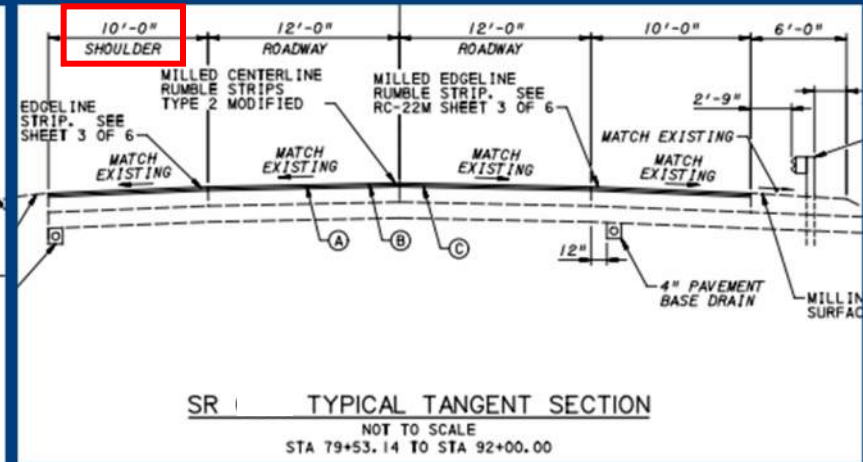
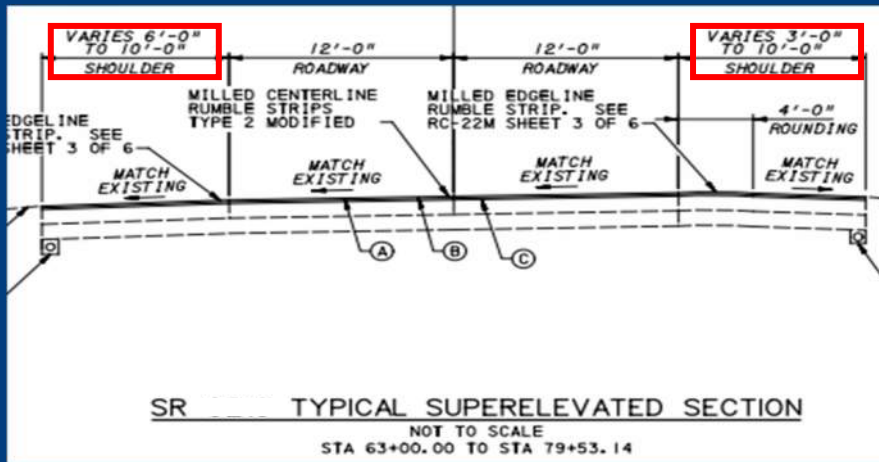
EXAMPLE #2

- Milling called out as 2 1/2" depth on Cross Section but tabbed as 1 1/2" depth

ASPHALT PRIME COAT			REMARKS	SIDE	STATIONS
Q461 0001 SY	Q491 0512 SY	Q491 0034 SY			
	MILLING OF ASPHALT PAVEMENT SURFACE, 1 1/2" DEPTH, MILLED MATERIAL RETAINED BY CONTRACTOR	MILLING OF ASPHALT PAVEMENT SURFACE, 2 1/2" DEPTH, MILLED MATERIAL RETAINED BY DEPARTMENT (DELIVERED TO STOCKPILE)			
		MILLING OF BITUMINOUS PAVEMENT SURFACE, (SHOULDER BACKUP) VARIABLE DEPTH			
	PAVEMENT RELIEF JOINT				
	SAWING AND SEALING OF ASPHALT OVERLAYS				
	CONCRETE PAVEMENT PATCHING, PERPENDICULAR JOINTS, TYPE A, 10" DEPTH				
	CONCRETE PAVEMENT PATCHING, PERPENDICULAR JOINTS, TYPE B, 10" DEPTH				
	CONCRETE PAVEMENT PATCHING, PERPENDICULAR JOINTS, TYPE C, 10" DEPTH				
	ACCELERATED CONCRETE PAVEMENT PATCHING, PERPENDICULAR JOINTS, TYPE A, 10" DEPTH				
	PATCHING JOINT				
	ITEM NUMBER				
	UNIT				
			SR 0219		
			ENTIRE PROJECT		92+00.00 to 292+67.42
2900	6767	1289	2-12' LANES	LT / RT	63+00.00 to 92+00.00
			2-6' SHOULDERS	LT / RT	63+00.00 to 92+00.00
			DRIVEWAY 1	RT	65+62.00 to 65+86.00



MILLING QUANTITIES



ITEM 0491-0014 MILLING, 0413-2089 SUPERPAVE ASPHALT WEARING COURSE (LEVELING), 0413-0298 SUPERPAVE ASPHALT WEARING COURSE 1 1/2" DEPTH, 0460-0003 BITUMINOUS TACK COAT

Route	Sta Begin	Sta End	Side	Length	Area (SY)	Volume (CY)	Remarks
	63+00.00	92+00.00	LT/RT	2900	7,733.33	214.81	Assume 2 - 12' lanes
	63+00.00	92+00.00	LT/RT	2900	3,222.22	89.51	Assume 2 - 5' shoulders
	65+62.00	65+86.00	RT		4.86		Driveway 1
	67+34.00	67+95.00	RT		61.61		Driveway 2/3
	63+00.00	92+00.00	LT	2900	644.44		Shoulder Backup
	63+00.00	92+00.00	RT	2900	644.44		Shoulder Backup
Structures (Total Length)				0.00	-		
				Total	11,022.03	304.32	

EXAMPLE #2 (cont.)

- Designers assumed 5' average shoulder widths, but Cross Sections show shoulder widths as 10' or varying from 3' to 10'

MILLING QUANTITIES

ITEM 0491-0014 MILLING, 0413-2089 SUPERPAVE ASPHALT WEARING COURSE (LEVELING), 0413-0298 SUPERPAVE ASPALT WEARING COURSE 1 1/2" DEPTH, 0460-0003 BITUMINOUS TACK COAT

Route	Sta Begin	Sta End	Side	Length	Area (SY)	Volume (CY)	Remarks
SR-0219	63+00.00	92+00.00	LT/RT	2900	7,733.33	214.81	Assume 2 - 12' lanes
SR-0219	63+00.00	92+00.00	LT/RT	2900	3,222.22	89.51	Assume 2 - 5' shoulders
SR-0219	65+62.00	65+86.00	RT		4.00		Driveway 1
SR-0219	67+34.00	67+95.00	RT		61.61		Driveway 2/3
SR-0219	63+00.00	92+00.00	LT	2900	644.44		Shoulder Backup
SR-0219	63+00.00	92+00.00	RT	2900	644.44		Shoulder Backup
Structures (Total Length)				0.00	-		
				Total	11,022.03	304.32	

EXAMPLE #2 (cont.)

- Tabulation quantities don't match Designer calculated quantities
- 2900 is the length of the milled area (NOT SY)
- \$10,000 Work Order Required

TABULATION OF QUANTITIES ROADWAY

REVISION NO.	REVISIONS	DATE	BY	DISTRICT	COUNTY	ROUTE	SECTION	SHEET
				09				20 OF 78

ITEM NUMBER	UNIT	REMARKS	SIDE
0190	SY	SUBBASE 4" DEPTH (NO. 2A)	
0191	SY	SUBBASE 6" DEPTH (NO. 2A)	
0402	SY	SUPERPAVE ASPHALT MIXTURE DESIGN, THIN ASPHALT OVERLAY WEARING COURSE, PG 64E-22, 6.3MM MIX, 1" DEPTH, SRL-H	
0412	SY	SUPERPAVE ASPHALT MIXTURE DESIGN, THIN ASPHALT OVERLAY WEARING COURSE, PG 64E-22, 6.3MM MIX, 1" DEPTH, SRL-G	
0413	SY	SUPERPAVE ASPHALT MIXTURE DESIGN, WEARING COURSE (LEVELING), PG 64E-22, 3 TO < 10 MILLION ESALS, 1.5 MM MIX, 1 1/2" DEPTH, SRL-G	
0414	SY	SUPERPAVE ASPHALT MIXTURE DESIGN, WEARING COURSE (LEVELING), PG 64E-22, 3 TO < 10 MILLION ESALS, 1.5 MM MIX, 1 1/2" DEPTH, SRL-H	
0415	SY	SUPERPAVE ASPHALT MIXTURE DESIGN, WEARING COURSE (LEVELING), PG 64E-22, 3 TO < 10 MILLION ESALS, 1.5 MM MIX, SRL-L	
0480	TON	ASPHALT TACK COAT (INTICENT)	
0491	SY	MILLING OF ASPHALT PAVEMENT SURFACE, 1 1/2" DEPTH, MILLED MATERIAL RETAINED BY CONTRACTOR	
0491	SY	MILLING OF ASPHALT PAVEMENT SURFACE, 2 1/2" DEPTH, MILLED MATERIAL RETAINED BY DEPARTMENT (DELIVERED TO ST/CONTRACTOR)	
4481	SY	MILLING OF BITUMINOUS PAVEMENT SURFACE, (SHOULDER BACKUP) VARIABLE DEPTH	
0404	SY	PAVEMENT RELIEF JOINT	
0515	LF	SAWING AND SEALING OF ASPHALT OVERLAYS	
0516	LF	CONCRETE PAVEMENT PATCHING, PERPENDICULAR JOINTS, TYPE A, 1" DEPTH	
0516	SY	CONCRETE PAVEMENT PATCHING, PERPENDICULAR JOINTS, TYPE B, 1" DEPTH	
0516	SY	CONCRETE PAVEMENT PATCHING, PERPENDICULAR JOINTS, TYPE C, 1" DEPTH	
0516	SY	ASSEMBLED CONCRETE PAVEMENT PATCHING, PERPENDICULAR JOINTS, TYPE A, 1" DEPTH	
0516	SY	PATCHING JOINT	
SR 0219			
		ENTIRE PROJECT	92+00.00 to 292+67.42
		2-12' LANES	LT / RT 63+00.00 to 92+00.00
		2-5' SHOULDERS	LT / RT 63+00.00 to 92+00.00

PAVEMENT MARKINGS

- EXAMPLE #3
- Pavement marking quantities provided in tabulation form/comps with no notes attached
- No calculations provided for plan Items 0962-1001, 0962-1002, 0962-1006, 0964-0022, and 0965-0230

Designer Calculations

ITEM NUMBER	DESCRIPTION	UNIT	PHASE 1	PHASE 1A	PHASE 2	PHASE 3	MAX REQUIRED
0901-0240	ADDITIONAL TRAFFIC CONTROL SIGNS	SF					250
0901-0102	SHADOW VEHICLE	EACH	6	2	6		6
0627-3020	TEMPORARY BARRIER, TEST LEVEL 3, BARRIER DEFLECTION DISTANCE </=2'	LF	2095				2095
0628-3020	RESET TEMPORARY BARRIER, TEST LEVEL 3, BARRIER DEFLECTION DISTANCE </=2'	LF			2095		2095
0696-0610	TEMPORARY IMPACT ATTENUATING DEVICE, TYPE V (STANDARD), TEST LEVEL 3	EACH	2		2		2
0697-0610	RESET TEMPORARY IMPACT ATTENUATING DEVICE, TYPE V (STANDARD), TEST LEVEL 3	EACH			2		2
9000-0096	REPAIR TEMPORARY IMPACT ATTENUATING DEVICE, TYPE V (STANDARD), TEST LEVEL 3	DOLLA					
4901-0450	3-LINE CHANGEABLE MESSAGE SIGN WITH TELECOMMUNICATIONS, PAID PER DAY	DAY	180	0	120	24	324
0962-1000	4" WHITE WATERBORNE PAVEMENT MARKINGS	LF	20100	9700	6850		36650
0962-1005	4" YELLOW WATERBORNE PAVEMENT MARKINGS	LF	6850	700	20100		27650
0962-1004	24" WHITE WATERBORNE PAVEMENT MARKINGS	LF	24	24	24		72
0963-0001	PAVEMENT MARKING REMOVAL	SF	20124	10400	30824		20124

Plan Tabulation Sheet

83664	0962 1000	4" WHITE WATERBORNE PAVEMENT MARKINGS
	LF	
87250	0962 1001	6" WHITE WATERBORNE PAVEMENT MARKINGS
	LF	
11800	0962 1002	8" WHITE WATERBORNE PAVEMENT MARKINGS
	LF	
164	0962 1004	24" WHITE WATERBORNE PAVEMENT MARKINGS
	LF	
76680	0962 1005	4" YELLOW WATERBORNE PAVEMENT MARKINGS
	LF	
84240	0962 1006	6" YELLOW WATERBORNE PAVEMENT MARKINGS
	LF	
130344	0963 0001	PAVEMENT MARKING REMOVAL
	SF	
600	0964 0022	24" YELLOW EPOXY PAVEMENT MARKINGS
	LF	
4	0965 0230	WHITE PREFORMED THERMOPLASTIC LEGEND, "WRONG WAY ARROW", 23' - 0"
	EACH	

PAVEMENT MARKINGS

EXAMPLE #3 (cont.)

- Calculated quantities do not match either Signage and Pavement Marking or Traffic Control Plan tabulated quantities

Designer Calculations

ITEM NUMBER	DESCRIPTION	UNIT	PHASE 1	PHASE 1A	PHASE 2	PHASE 3	MAX REQUIRED
0901-0240	ADDITIONAL TRAFFIC CONTROL SIGNS	SF					250
0901-0102	SHADOW VEHICLE	EACH	6	2	6		6
0627-3020	TEMPORARY BARRIER, TEST LEVEL 3, BARRIER DEFLECTION DISTANCE </=2'	LF	2095				2095
0628-3020	RESET TEMPORARY BARRIER, TEST LEVEL 3, BARRIER DEFLECTION DISTANCE </=2'	LF			2095		2095
0696-0610	TEMPORARY IMPACT ATTENUATING DEVICE, TYPE V (STANDARD), TEST LEVEL 3	EACH	2		2		2
0697-0610	RESET TEMPORARY IMPACT ATTENUATING DEVICE, TYPE V (STANDARD), TEST LEVEL 3	EACH			2		2
9000-0096	REPAIR TEMPORARY IMPACT ATTENUATING DEVICE, TYPE V (STANDARD), TEST LEVEL 3	DOLLA					
4901-0450	3-LINE CHANGEABLE MESSAGE SIGN WITH TELECOMMUNICATIONS, PAID PER DAY	DAY	180	0	120	24	324
0962-1000	4" WHITE WATERBORNE PAVEMENT MARKINGS	LF	20100	9700	6850		36650
0962-1005	4" YELLOW WATERBORNE PAVEMENT MARKINGS	LF	6850	700	20100		27650
0962-1004	24" WHITE WATERBORNE PAVEMENT MARKINGS	LF	24	24	24		72
0963-0001	PAVEMENT MARKING REMOVAL	SF	20124	10400	30824		20124

S & PMP

4" WHITE WATERBORNE PAVEMENT MARKINGS	4" YELLOW WATERBORNE PAVEMENT MARKINGS	6" WHITE WATERBORNE PAVEMENT MARKINGS	6" RECESSED WHITE REFLECTIVE PAVEMENT MARKING TAPE	8" WHITE WATERBORNE PAVEMENT MARKINGS	24" WHITE WATERBORNE PAVEMENT MARKINGS	6" YELLOW WATERBORNE PAVEMENT MARKINGS	24" YELLOW EPOXY PAVEMENT MARKINGS	WHITE PREFORMED THERMOPLASTIC LEGEND, "WRONG WAY ARROW", 23'-0"
0962 1000 LF	0962 1005 LF	0962 1001 LF	9000 0004 LF	0962 1002 LF	0962 1004 LF	0962 1006 LF	0964 0022 LF	0965 0230 EACH
13600	16400	87250	8760	11800	92	84240	600	4

TCP

0962-1000	4" WHITE WATERBORNE PAVEMENT MARKINGS	LF	50456	9955	9653		70064
0962-1004	24" WHITE WATERBORNE PAVEMENT MARKINGS	LF	24	24	24		72
0962-1005	4" YELLOW WATERBORNE PAVEMENT MARKINGS	LF	7780	0	52500		60280
0963-0001	PAVEMENT MARKING REMOVAL	SF	9955	58236	62153		130344

PAVEMENT MARKINGS

EXAMPLE #3 (cont.)

- Calculated Pavement Marking Removal quantities don't match Traffic Control Plan tabulated quantities
- Pavement Marking Removal quantities grossly overestimated (Plan: 130,344 SF , Used: 10,352 SF)
- Pavement Marking Removal quantities (SF) closely match Line Painting LF quantities
- Required Renegotiated Unit Price due to using only 8% of plan quantity

Designer Calculations

ITEM NUMBER	DESCRIPTION	UNIT	PHASE 1	PHASE 1A	PHASE 2	PHASE 3	MAX REQUIRED
0901-0240	ADDITIONAL TRAFFIC CONTROL SIGNS	SF					250
0901-0102	SHADOW VEHICLE	EACH	6	2	6		6
0627-3020	TEMPORARY BARRIER, TEST LEVEL 3, BARRIER DEFLECTION DISTANCE $\leq 2'$	LF	2095				2095
0628-3020	RESET TEMPORARY BARRIER, TEST LEVEL 3, BARRIER DEFLECTION DISTANCE $\leq 2'$	LF			2095		2095
0696-0610	TEMPORARY IMPACT ATTENUATING DEVICE, TYPE V (STANDARD), TEST LEVEL 3	EACH	2		2		2
0697-0610	RESET TEMPORARY IMPACT ATTENUATING DEVICE, TYPE V (STANDARD), TEST LEVEL 3	EACH			2		2
9000-0096	REPAIR TEMPORARY IMPACT ATTENUATING DEVICE, TYPE V (STANDARD), TEST LEVEL 3	DOLLA					
4901-0450	3-LINE CHANGEABLE MESSAGE SIGN WITH TELECOMMUNICATIONS, PAID PER DAY	DAY	180	0	120	24	324
0962-1000	4" WHITE WATERBORNE PAVEMENT MARKINGS	LF	20100	9700	6850		36650
0962-1005	4" YELLOW WATERBORNE PAVEMENT MARKINGS	LF	6850	700	20100		27650
0962-1004	24" WHITE WATERBORNE PAVEMENT MARKINGS	LF	24	24	24		72
0963-0001	PAVEMENT MARKING REMOVAL	SF	20124	10400	30824		20124

TCP

0962-1000	4" WHITE WATERBORNE PAVEMENT MARKINGS	LF	50456	9955	9653		70064
0962-1004	24" WHITE WATERBORNE PAVEMENT MARKINGS	LF	24	24	24		72
0962-1005	4" YELLOW WATERBORNE PAVEMENT MARKINGS	LF	7780	0	52500		60280
0963-0001	PAVEMENT MARKING REMOVAL	SF	9955	58236	62153		130344

PAVEMENT MARKINGS

EXAMPLE #3 (cont.)

ITEM NUMBER	DESCRIPTION	UNIT	PHASE 1	PHASE 1A	PHASE 2	PHASE 3	MAX REQUIRED
0901-0240	ADDITIONAL TRAFFIC CONTROL SIGNS	SF					250
0901-0102	SHADOW VEHICLE	EACH	6	2	6		6
0627-3020	TEMPORARY BARRIER, TEST LEVEL 3, BARRIER DEFLECTION DISTANCE </>=2'	LF	2095				2095
0628-3020	RESET TEMPORARY BARRIER, TEST LEVEL 3, BARRIER DEFLECTION DISTANCE </>=2'	LF			2095		2095
0696-0610	TEMPORARY IMPACT ATTENUATING DEVICE, TYPE V (STANDARD), TEST LEVEL 3	EACH	2		2		2
0697-0610	RESET TEMPORARY IMPACT ATTENUATING DEVICE, TYPE V (STANDARD), TEST LEVEL 3	EACH			2		2
9000-0096	REPAIR TEMPORARY IMPACT ATTENUATING DEVICE, TYPE V (STANDARD), TEST LEVEL 3	DOLLA					
4901-0450	3-LINE CHANGEABLE MESSAGE SIGN WITH TELECOMMUNICATIONS, PAID PER DAY	DAY	180	0	120	24	324
0962-1000	4" WHITE WATERBORNE PAVEMENT MARKINGS	LF	20100	9700	6850		36650
0962-1005	4" YELLOW WATERBORNE PAVEMENT MARKINGS	LF	6850	700	20100		27650
0962-1004	24" WHITE WATERBORNE PAVEMENT MARKINGS	LF	24	24	24		72
0963-0001	PAVEMENT MARKING REMOVAL	SF	20124	10400	30824		20124

- No 24" Yellow Pavement Marking quantity calculations provided
- Field quantity was half of plan quantity (requiring unit price renegotiation)
- Did Designer possibly tab SF instead of LF???

4" WHITE WATERBORNE PAVEMENT MARKINGS	4" YELLOW WATERBORNE PAVEMENT MARKINGS	6" WHITE WATERBORNE PAVEMENT MARKINGS	6" RECESSED WHITE REFLECTIVE PAVEMENT MARKING TAPE	8" WHITE WATERBORNE PAVEMENT MARKINGS	24" WHITE WATERBORNE PAVEMENT MARKINGS	6" YELLOW WATERBORNE PAVEMENT MARKINGS	24" YELLOW EPOXY PAVEMENT MARKINGS	WHITE PREFORMED THERMOPLASTIC LEGEND, "WRONG WAY ARROW", 23' - 0"	REMARKS	SIDE	STATIONS
0962 1000 LF	0962 1005 LF	0962 1001 LF	9000 0004 LF	0962 1002 LF	0962 1004 LF	0962 1006 LF	0964 0022 LF	0965 0230 EACH			
13600	16400	87250	8760	11800	92	84240	600	4			
TOTALS											

SEEDING AND SOIL

EXAMPLE #4

- When specifying formula B seeding on a project, topsoil is almost always required
- This project called for 570 LB of B seed, but there was no topsoil item
- Many of the areas that required seeding were adjacent to curb replacement, inlet top replacement, driveway adjustments and signal pole foundations
- These areas were all lawn areas and required topsoil for proper growth
- Cost to add: \$69,000
- Also verify quantity of seed needed. Out of the 570 LB of B seed, less than 100 was needed.
- Overestimating quantity can lead to contractor renegotiation of prices, costing the project just as much money for less



SEEDING AND SOIL SUPPLEMENTS - FORMULA B,
INCLUDING MULCH

0804
0001
LB

27

13

133

145

11

120

121

MISC QUANTITY OMISSIONS

OTHER COMMON QUANTITY OMISSIONS/ SHORTFALLS

- RPM Removal Without Replacement, examples including:
 - ECMS #88524, Work Order #7
 - ECMS #96597, Work Order #9
 - ECMS #110219, Work Order #9
 - ECMS #109816, Work Order #12 (reference Authorization #13)
 - ECMS #91606, Work Order #5
 - ECMS #105116, no RPM specific WO as we paid for manual patching to fix holes
 - ECMS #110499, future work order
 - ❖ Note that RPM removals are to be incidental to new RPM item per Section 966 if replacements are called for within the same limits as the existing RPMs, but RPM Removal Without Replacement item is needed if replacement RPMs are not included (or not included in that specific area where removals are needed)
- Line Eradication for symbols (arrows, stop bars, advisories, etc.), examples including:
 - ECMS #105116, Existing arrow removal (paid under 6" Removal item)
 - ECMS #88524, Preformed pavement markings (Left Arrow) called for without prior removal of existing arrows (Sta. 1541+60 to Sta. 1573+80, sheet 6 of 16)

PRIORITY #3A

TREE REMOVALS/ TRIMMING

TREE REMOVALS

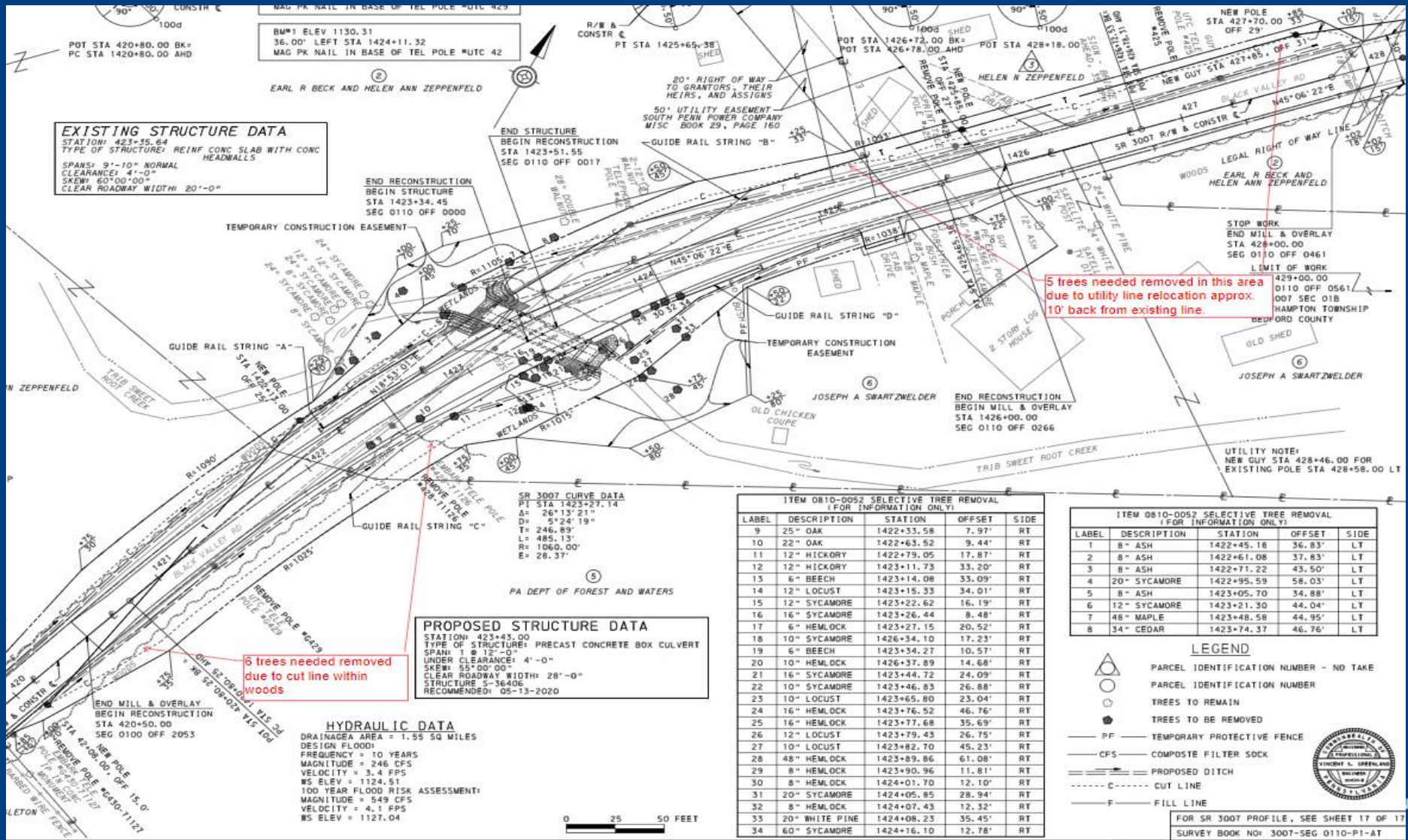
Issue: Impacts to trees not adequately assessed for required utility relocations, cuts, access, etc. or neglected due to being off right-of-way

Impacts: Additional costs (anywhere from \$750 to \$2,000 per tree depending on size) along with potential delays to associated work

- If contract already has a unit price for Select Tree Removal, we have been generally unsuccessful in trying to negotiate a unit price reduction for additional tree removal
- If contract has no Select Tree Removal item, we feel we end up paying 30% or more premium on removals than if they were originally bid
- If additional trees in conflict with work are discovered during construction season (April-October), bat cutting restrictions may apply leading to the need for environmental evaluation (bat surveys) and, therefore, project delays
- Are trees which conflict work within right-of-way or easement?
- Design assessment should include assessment of both items for tree removals and selective tree trimming

TREE REMOVALS

EXAMPLE #1



TREE REMOVALS

EXAMPLE #1 (cont.)



TREE REMOVALS

EXAMPLE #1 (cont.)



TREE REMOVALS

EXAMPLE #1 (cont.)



TREE REMOVALS

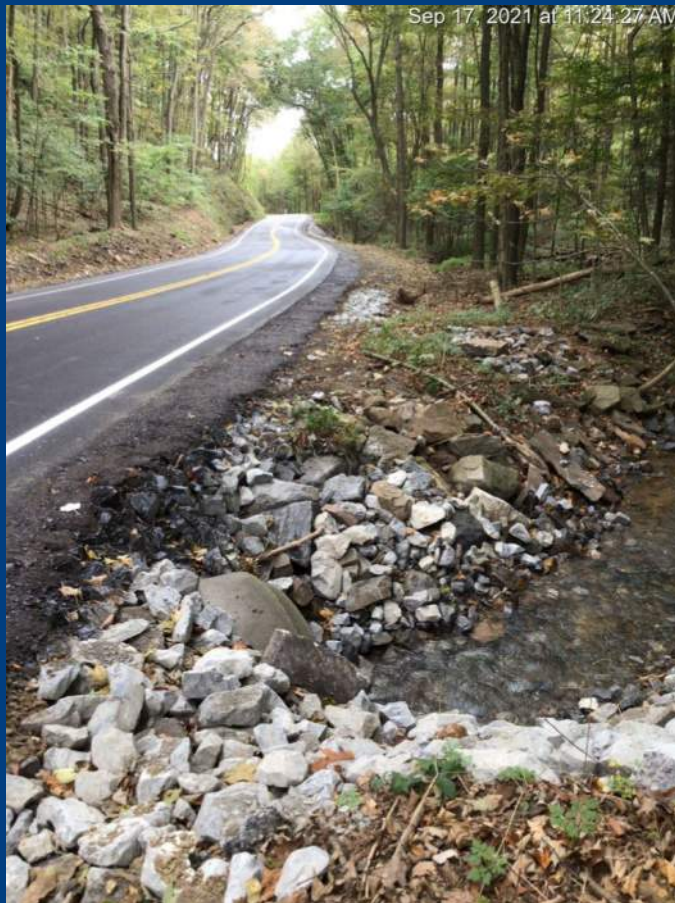
EXAMPLE #1 (cont.)



TREE REMOVALS

EXAMPLE #2

- In these areas, item called for tree trimming of unlimited height to the existing right-of-way line
- Doing so would have left numerous trees as just ~20' high stumps off the right of way
- Decision made instead to cut up to 20' in height and blend cuts to avoid killing trees



TREE REMOVALS

EXAMPLE #3



- 3.6 mile long safety improvement project with resurfacing, guiderail, drainage, signing, signal, and bridge rehabs
- Contract includes item for tree trimming, but no tree removal
- Throughout corridor, there are numerous dead or dying trees leaning towards the roadway (majority within existing ROW)
- After NTP, coordinated with Maintenance and Environmental Units and identified 81 trees for removal due to safety concerns as well as an additional 1075 LF of tree trimming
- Work will need to be performed via force account, with a preliminary estimate of roughly \$100K

TREE REMOVALS

EXAMPLE #3 (cont.)



TREE REMOVALS



EXAMPLE #4

- Dead tree just off right-of-way
- Throughout corridor, there were about 15 trees of similar condition and location
- Due to maintenance funding concerns, decision was made to leave as is
- In some cases, may be advisable to account for these costs and either take ROW or include as knock-out block to see if right-of-entry can be obtained

PRIORITY #3B

SHOULDER BACK-UP

SHOULDER BACK-UP

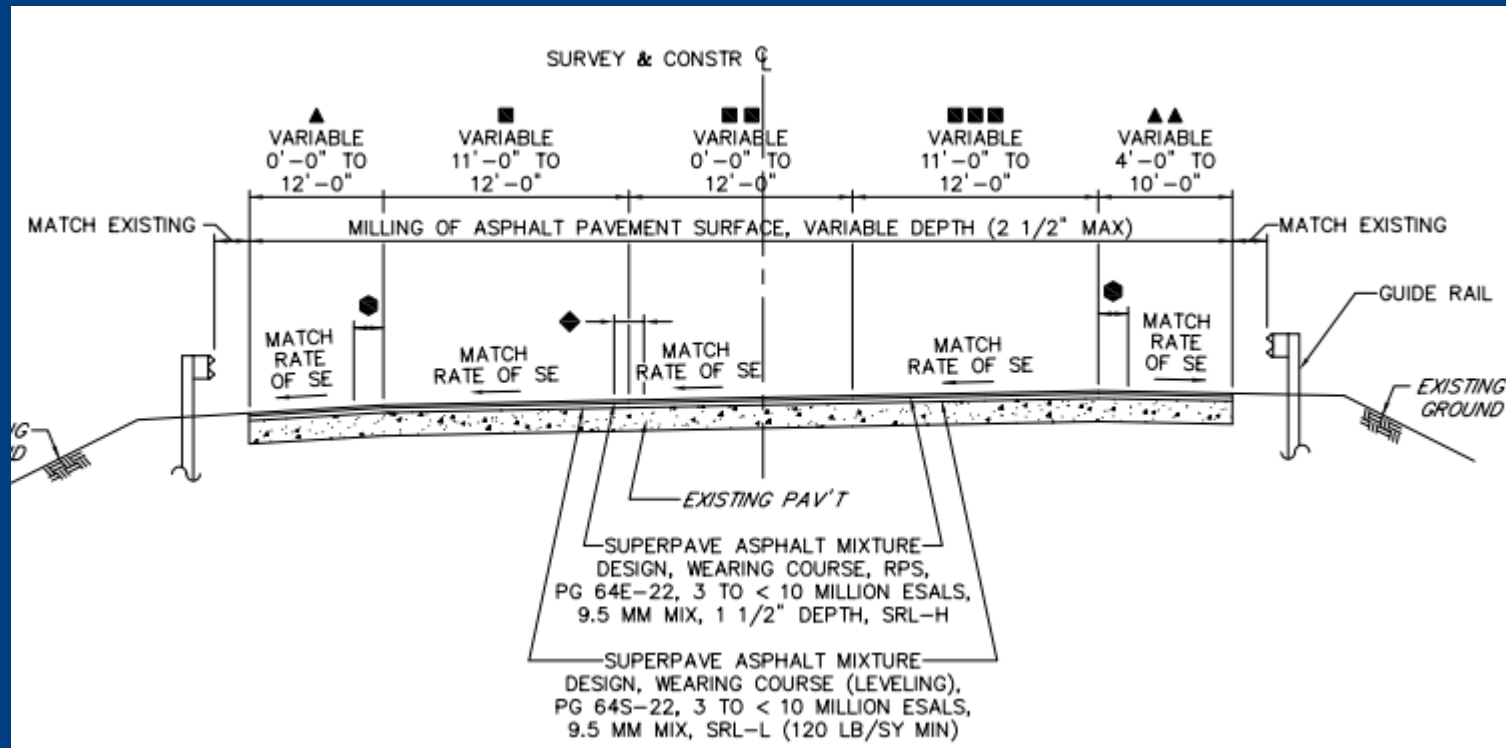
Issue: Items for shoulder back-up either missed or significantly underestimated

Impacts: Additional time and costs

SHOULDER BACK-UP

EXAMPLE #1

- Project scope was for milling and resurfacing to match existing elevations and cross slopes
- Based on mill and fill scope, no items for shoulder back-up were provided in the contract
- In reality, shoulder drop-offs were present throughout much of project corridor
- Item added via work order at a cost of \$26K



SHOULDER BACK-UP

EXAMPLE #1 (cont.)

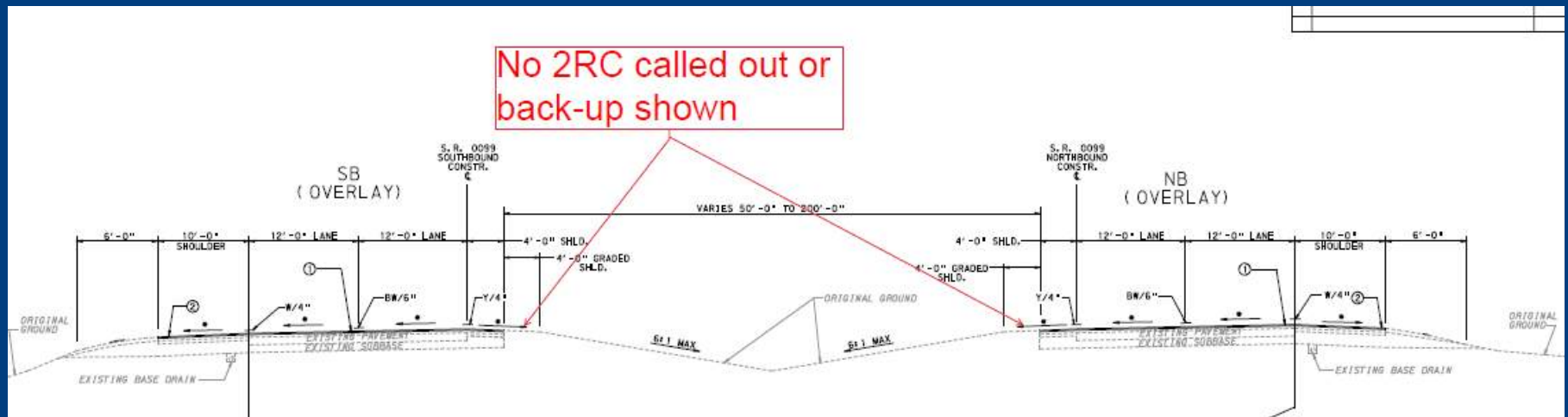
- Photo below represents some of the actual field conditions encountered
- When computing shoulder back-up, whether mill/fill or overlay, there are rarely cases where the existing road does not already have shoulder drop-offs that need accounted for



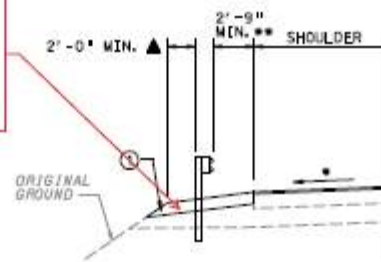
SHOULDER BACK-UP

EXAMPLE #2

- Project scope was for 1" thin lift overlay of four-lane
- No shoulder back-up was shown in median areas or included in back-up quantity computations
- Additional quantity of 2RC back-up added via work order at a cost of \$131K



Only location
2RC was called
out or tabbed
(guiderail areas)



TYPICAL ROADWAY GUIDERAIL SECTION

NOT TO SCALE

SHOULDER BACK-UP

EXAMPLE #2 (cont.)

- Photo below represents final edge drop off in median before back-up placed
- Note that drop off is $>1''$ thin lift depth due to drop-off condition being pre-existing ($\sim 1.5''$)



SHOULDER BACK-UP

EXAMPLE #3

Computed by: [REDACTED] Date: 7/1/2020
Checked by: [REDACTED] Date: 2/24/2020

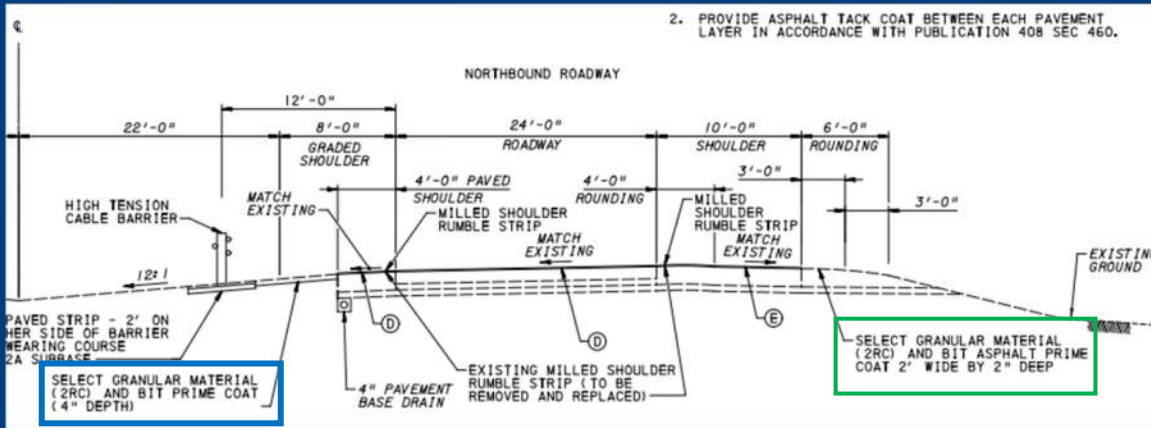
- The designers' methodology (refer to green areas) state 2RC areas were calculated at 2' width and 6" depth. However, cross sections show areas are typically 2' wide and 2" depth except at the HTCB (4' width and 4" depth)
- Plan 2RC quantity is 1331 tons while the designer calculations are for 1100 tons (missing designer calculations for 231 tons ~ was this an arbitrary % increase?)
- No 2RC, Class 1 Excavation, or Prime Coat quantities were provided for areas between the paved shoulder and HTCB (refer to blue box)
- Calculations have a 'Computed By' date of 7/1/20, and a 'Checked By' date of 2/24/20
- \$276K in work orders required for areas missed and incorrect calculation assumptions (including 2RC, Prime Coat, and Class 1)

ITEM 0206-0010 SELECT GRANULAR MATERIAL (2RC)

Route	Sta Begin	Sta End	Side	Area (SY)	Volume (CY)	TONS	Remarks	
SR-0219	92+00.00	134+64.00	NB/SB	1895	54	105	Area = (Take the length multiply by 2' and divide by 9 for SY)*2 (both sides) to get the SY for the geotextile class 4, type A	
RAMP L	10+00.00	31+75.60	LT/RT	1934	27	54		
RAMP K	10+21.77	32+94.85	LT/RT	2021	29	56	Volume = (Take the length multiply by 2' width and 0.5' depth and divide by 27 for CY)*2 (both sides) to get the CY for the class 1 excavation	
SR-0219	135+92.00	155+28.53	NB	1721	24	48		
SR-0219	135+45.22	154+95.89	SB	1734	25	48	Tons = (Take the length multiply by 2' (width) multiply by 6" (depth)) to get CF take CF multiply by 145 lbs and divide 2000 lbs to get Tons for 2RC)*2 (both sides)	
RAMP I	10+21.53	28+82.65	LT/RT	1654	23	46		
RAMP J	15+58.78	37+09.31	LT/RT	1912	27	53		
SR-0219	161+99.35	230+30.47	NB	6072	86	168		
SR-0219	160+98.46	231+10.63	SB	6233	88	173		
SR-0219	235+75.31	259+41.65	NB	2103	30	58		
SR-0219	236+23.03	259+40.41	SB	2060	29	57		
SR-0219	263+88.23	292+18.02	NB	2515	36	70		
SR-0219	263+52.20	292+28.82	SB	2557	36	71		
Structures (Total Length)								

Total 1,100

Assumptions 2' wide by 6" deep



PRIORITY #4

PENELEC OUTAGES

PENELEC OUTAGES

Issue: Reliance on scheduled power outages to facilitate work operations and lack of Penelec reliability to provide as scheduled (and lack of adequate advanced notice)

Impacts: Additional costs along with delay of associated work

- General lack of advanced notice prior to cancellations ~ crew and equipment already mobilized and on-site
- Lack of leverage (or hesitancy to exercise such leverage) when scheduled outage is cancelled. Ultimately, Department ends up paying contractor delays costs (including high cost demob and remob).
- If contractor needs to shutdown and wait for outage, negative public perception of 'no work going on' for extended period
- Particularly problematic when a project has a compressed schedule/ public commitments for completion (school, environmental, EMS, special events, etc.) ~ may require payment of acceleration costs

PENELEC OUTAGES

Example #1: Clay Avenue Bridge

Utility: First Energy/ Penelec

Purpose of Outage: Setting of downstream box culvert sections

Original Details/Schedule of Planned Outage:

- Per utility specification, Penelec was to de-energize, back feed circuit, and remove lines for a total of two days
- Outage was coordinated and scheduled to begin July 6th
- Overall project had a restriction to open the bridge by the end of August due to location adjacent to Tyrone High School

Circumstances of Cancellation:

- On July 6th, the crane was beginning to set up and Penelec was on site. When they contacted their Dispatch to cut the power, Dispatch would not allow the outage. Penelec left and said they would try again the next day. The crane set-up under a revised position since the power was still in place.
- On the morning of July 7th, the box sections began to arrive. Penelec was once again on site to cut power and was denied by Dispatch. The crane was able to remain on site for the next two days and again, Penelec denied the outage.
- On July 9th, the crane had to demobilize for other commitments

When was outage rescheduled: The next available day was July 27, 2021

Impacts: Project delayed 20 calendar days, Utility delay costs of \$36,661, negative public feedback due to three week complete project shutdown while under detour

PENELEC OUTAGES

Example #2: Hill Valley Creek Bridge

Utility: First Energy/ Penelec

Purpose of Outage: Shoring Installation

Original Details/Schedule of Planned Outage:

- Outage planned in design, but funds not captured for outage (required construction to pay for via work order as per discussion with Utilities Unit)
- February 3rd correspondence from First Energy asking for an address to bill for the outage following utility NTP
- June 21st outage (contractor requested on 6/3/21, Penelec confirmed on 6/8/21)
- Contractor paid Penelec \$2,903 for de-energizing in advance

Circumstances of Cancellation: No power outage occurs, no advanced notice that it will not occur. Contractor followed-up, with Penelec stating that Mondays aren't good and personnel in this area are limited. Contractor would need to work around Penelec's schedule and resources. If they have time and people they will provide an outage at another time.

When was outage rescheduled: Not rescheduled, contractor instead found a way to work around the lines and performed the shoring operation in less than ideal conditions

Impacts: Had a work around not been found there would have been both time and cost impacts. Contractor ultimately recouped funds paid and no project work order was required.

PENELEC OUTAGES

Example #3: SR 271 over Hinckston Run Bridge

Utility: First Energy/ Penelec

Purpose of Outage: Setting of downstream box culvert sections

Original Details/Schedule of Planned Outage:

- Per utility specification, Penelec was to de-energize and back feed circuit for a total of 4 hours
- Outage was coordinated and scheduled to occur on August 16th
- The project had a 105 calendar day duration once the initial lane closure was implemented

Circumstances of Cancellation:

- Crane was mobilized to site on August 13th for box setting on August 16th
- Box sections were loaded on delivery trucks August 13th
- On August 13th, the contractor was notified by Penelec that the outage would not take place as scheduled due to their crews being needed to repair storm damage at one of their facilities
- Crane was demobilized August 13th

When was outage rescheduled: August 26th

Impacts: Project delayed 10 calendar days; negative public feedback due to project setting idle for nearly 2 weeks under one lane signal-controlled traffic. Contractor was charged additional crane freight totaling \$3,000

PENELEC OUTAGES

Example #4: SR 3008 Hostetler Road

Utility: First Energy/ Penelec

Purpose of Outage: Outage was required for Penelec to relocate their facilities to allow roadway widening and slope lay back to occur

Original Details/Schedule of Planned Outage:

- A schedule for the outage and the relocation was never provided by Penelec
- The prime contractor did their part by trimming trees shortly after their NTP (7/6/2021)
- Outage and relocation was completed on 10/20/21
- Although Penelec was complete, two other utilities had to relocate for the area to be clear for construction

Impacts: Contractor could not work in the areas affected by the relocation. Presently there are no delay costs as, due to other contributing factors on the project, the contract has been extended until 2022.

PRIORITY #5
NOT TO SCALE DRAWINGS

NOT TO SCALE DRAWINGS

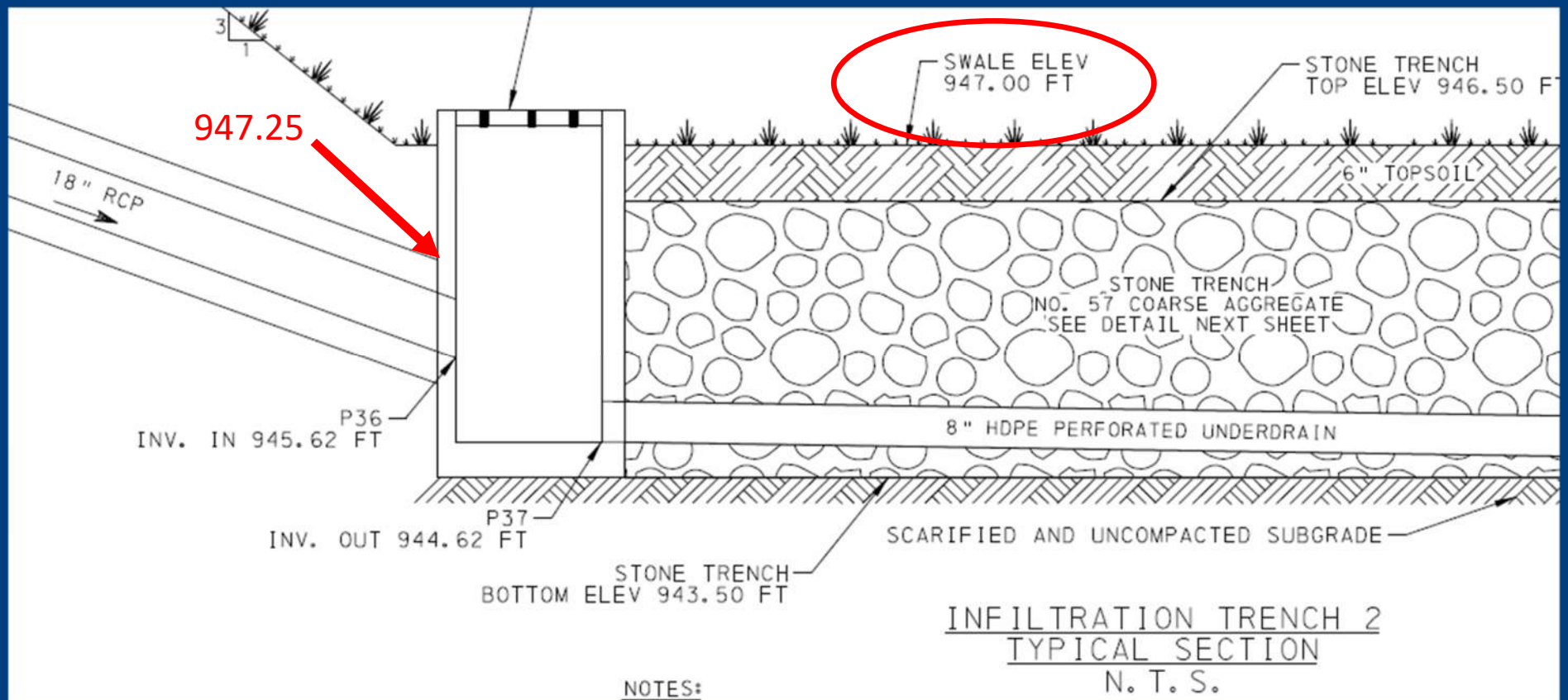
Issue: Not to scale drawings result in layout issues in the field or missed conflicts/ issues

Impacts: Additional time and costs

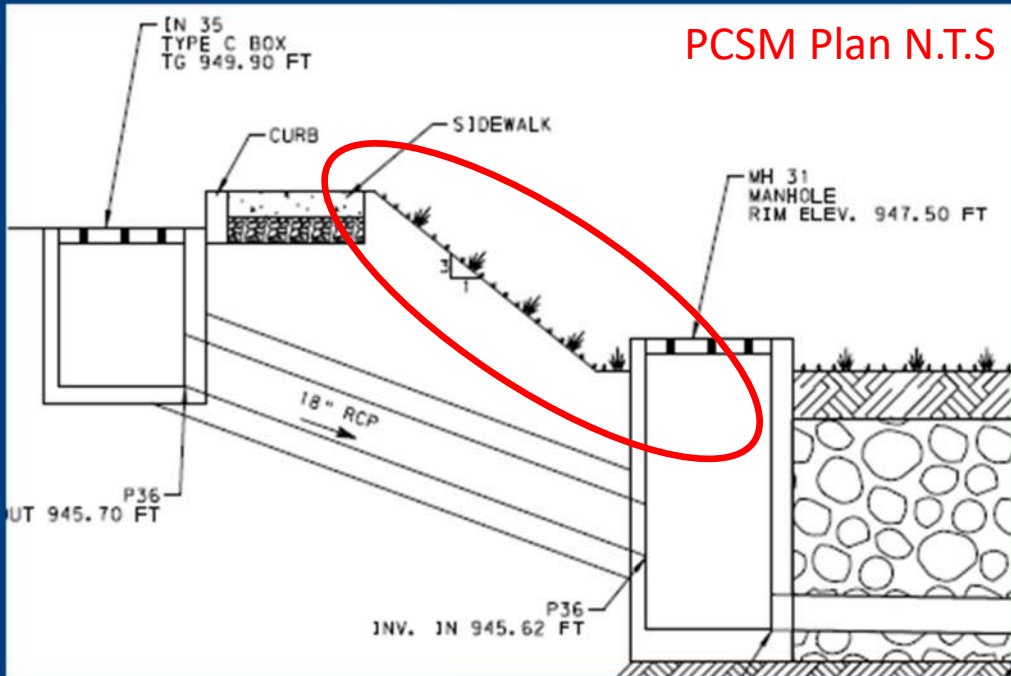
NOT TO SCALE DRAWINGS

EXAMPLE #1

- The top of this 18" pipe entering the manhole is 947.25 as designed (based on invert)
- The top of swale elevation is 947.00 as designed
- Therefore, top of pipe would be 3" above finished grade if constructed as designed
- This one issue affected multiple drainage locations and required drainage to be redesigned
- If the detail was drawn to scale, this issue would have been realized during drafting

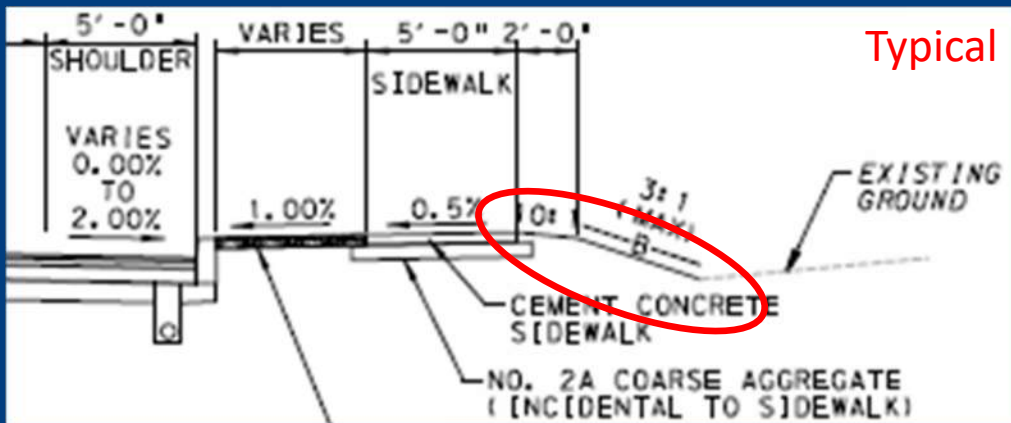


NOT TO SCALE DRAWINGS



EXAMPLE #2

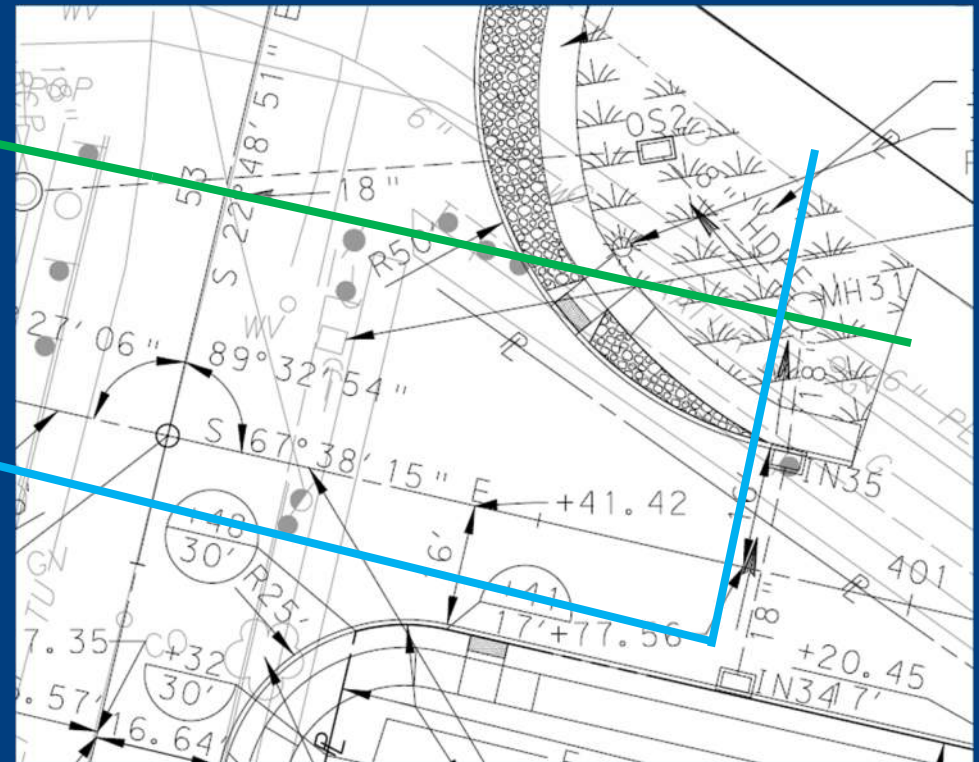
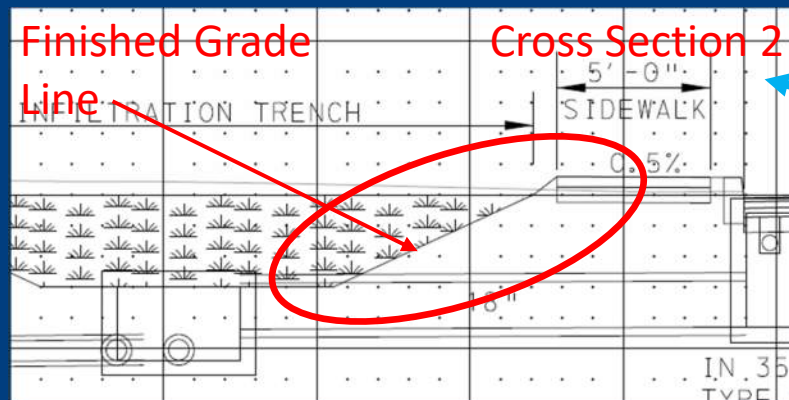
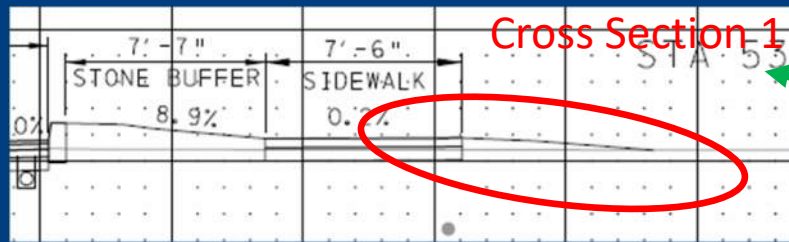
- This same area is depicted on three different plans and none are matching
- The PCSM Plan is not to scale, but does not appear to show a 2 foot flat area beyond the sidewalk
- The Typical shows the 2 foot flat area but does not show the pond



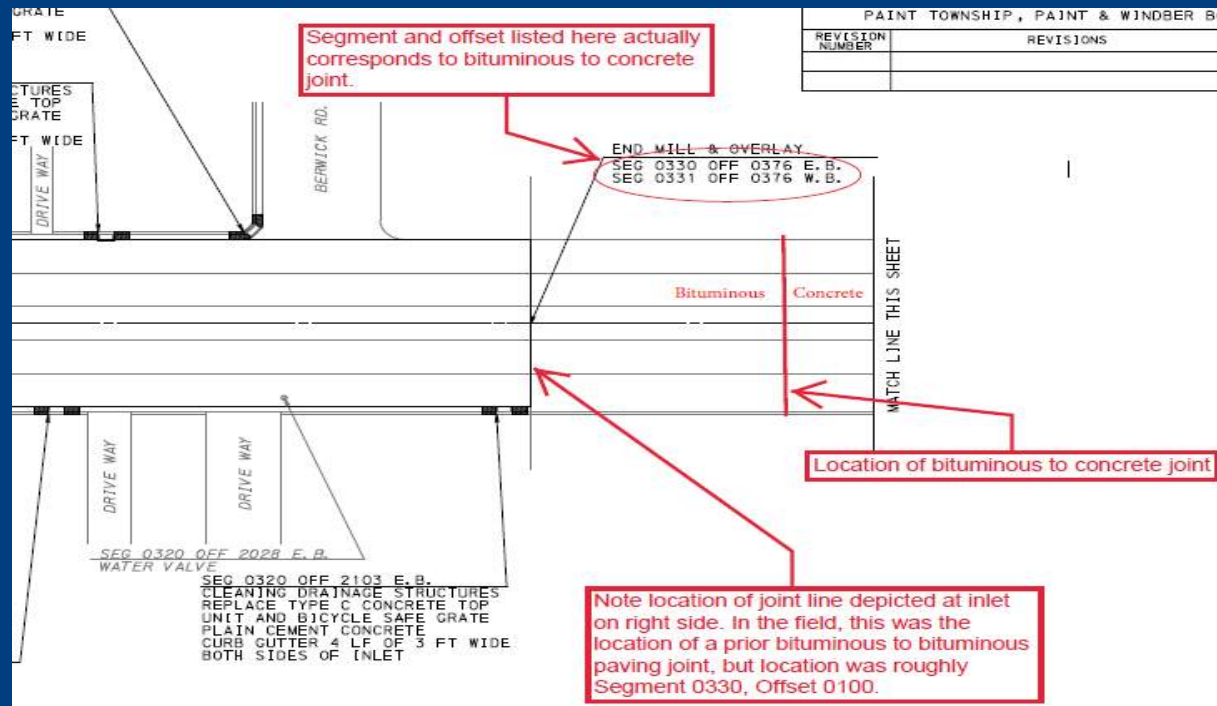
NOT TO SCALE DRAWINGS

EXAMPLE #2 (cont.)

- This area is near two intersecting roads, so the area is covered on multiple cross sections
- The cross sections are what is used to build the project and do not show the 2 foot flat area. One shows a flatter downslope and does not show the pond.
- Ultimately, a majority of the sidewalk was shifted away from the pond in order to be able to maintain a 2 foot flat area. Without the flat area, it would be a direct slope from the edge of the sidewalk into the pond.



NOT TO SCALE DRAWINGS

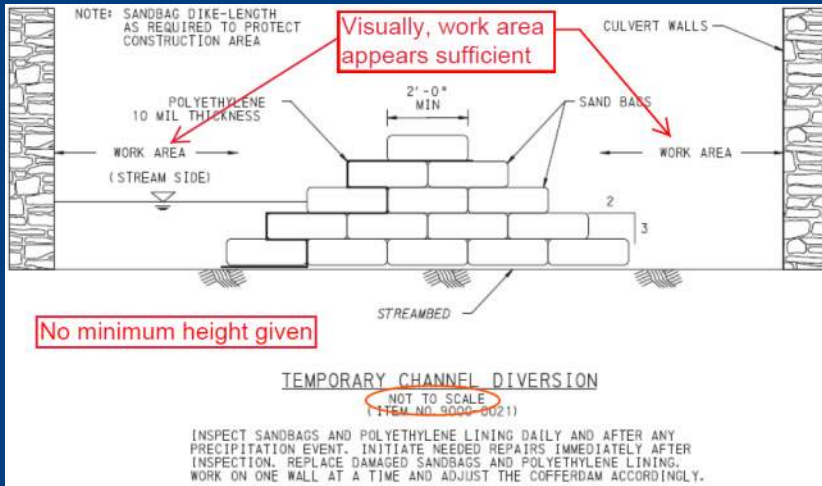


EXAMPLE #3

- Not to scale plan view appears to show end of mill and overlay corresponding to prior bituminous paving joint
- Intent, however, was to pave to concrete joint
- Contractor laid out to bituminous joint and left roughly 276' of old bituminous
- Not discovered until final inspection
- Although segment and offset were correct, contractor argued the plan was misleading due to location of joint at inlet and presence of prior bituminous joint
- Based on potential exposure for claim, required work order to pave remaining 276' costing \$59K (including remob)

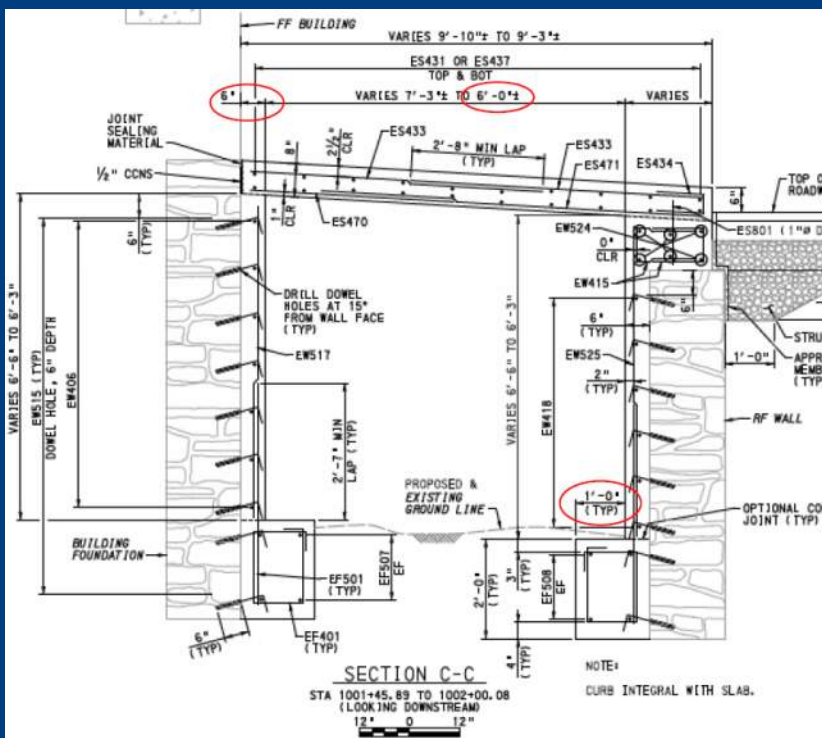


NOT TO SCALE DRAWINGS

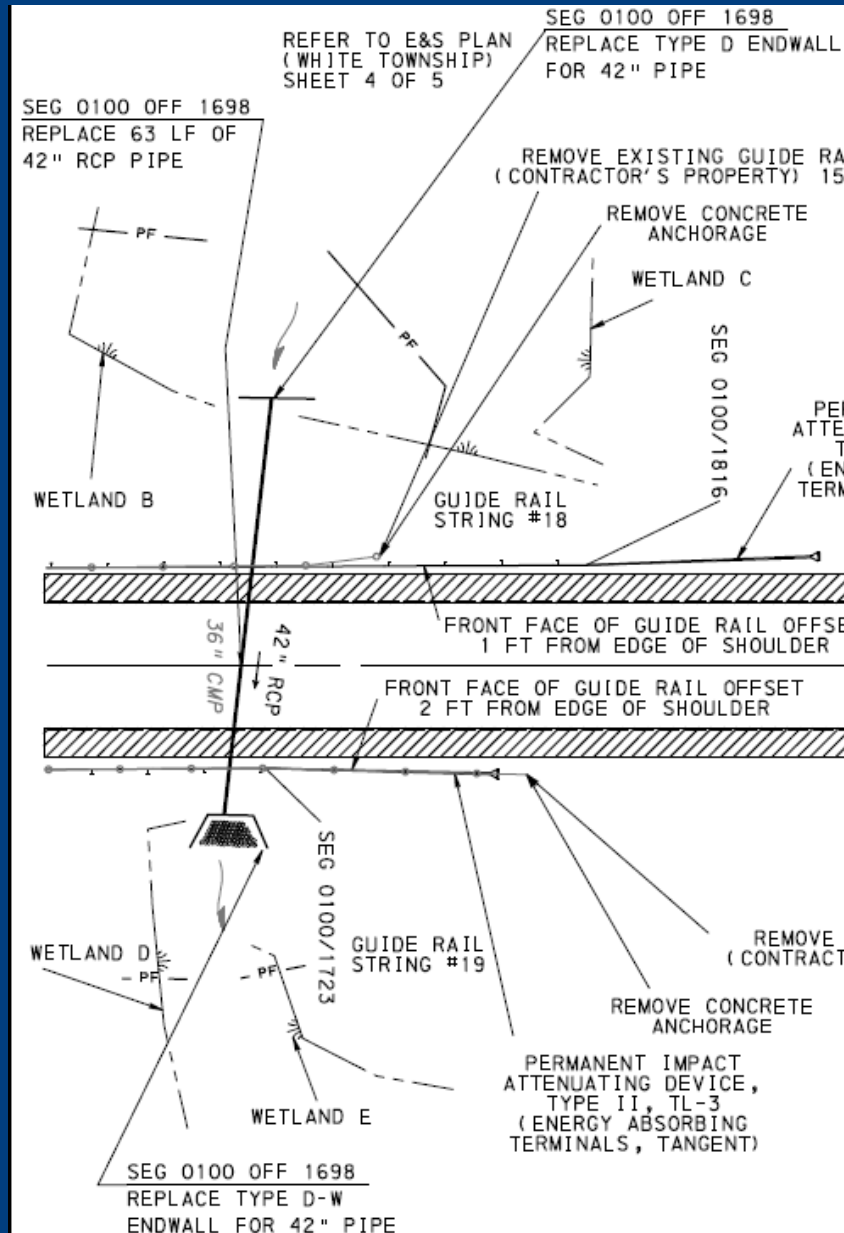


EXAMPLE #4

- Temporary Channel Diversion detail on E&S Plan appears to show adequate work area, showing a minimum diversion width of 2' (but no minimum height)
- 6'-0" minimum clearance after encasements shown on Section C-C of the structure plan
- Sandbags are shown set once down the middle of the stream and just switching the bags at upstream and downstream ends between each phase/ side of work
- Underpinning 1'-6" (1' beyond 6" encasement) on each side, so clearance between underpinning is 4' minimum
- Bags would need stacked vertically in order for contractor to have 1' work area on each side of diversion ($4' - 2' / 2 = 1'$)



NOT TO SCALE DRAWINGS



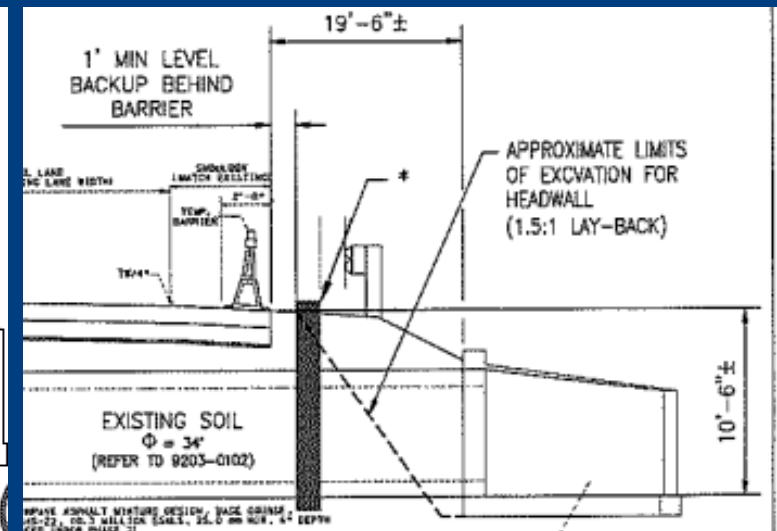
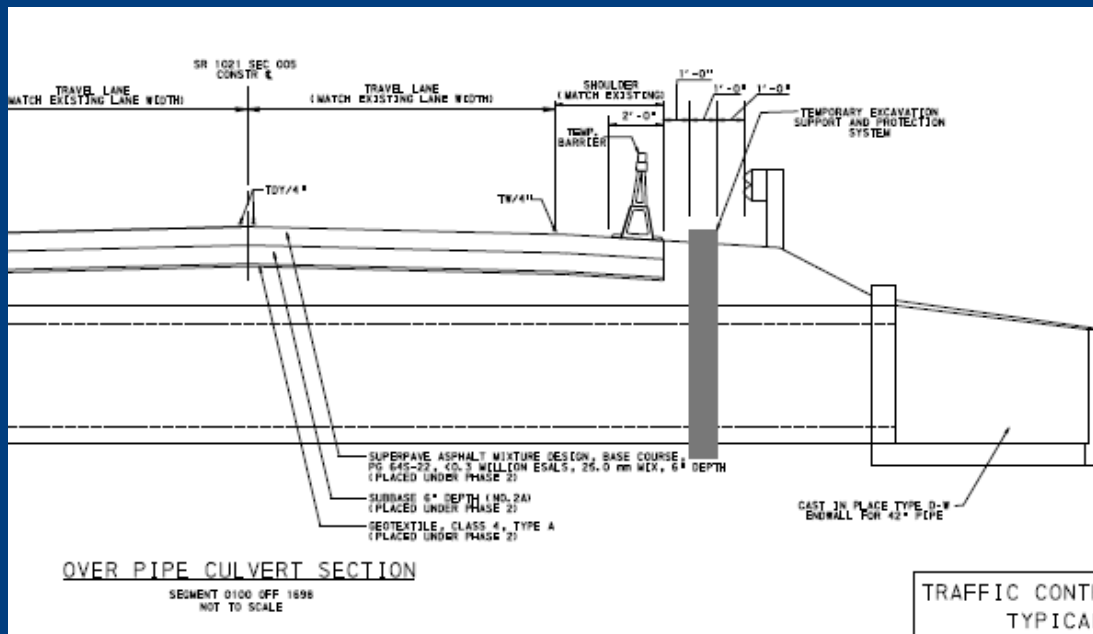
EXAMPLE #5

- Replacing existing 36" cross pipe with a new 63' long, 42" cross pipe
- Notice the distance from the guiderail to the ends of pipe on this drawing (which is to scale)

NOT TO SCALE DRAWINGS

EXAMPLE #5 (cont.)

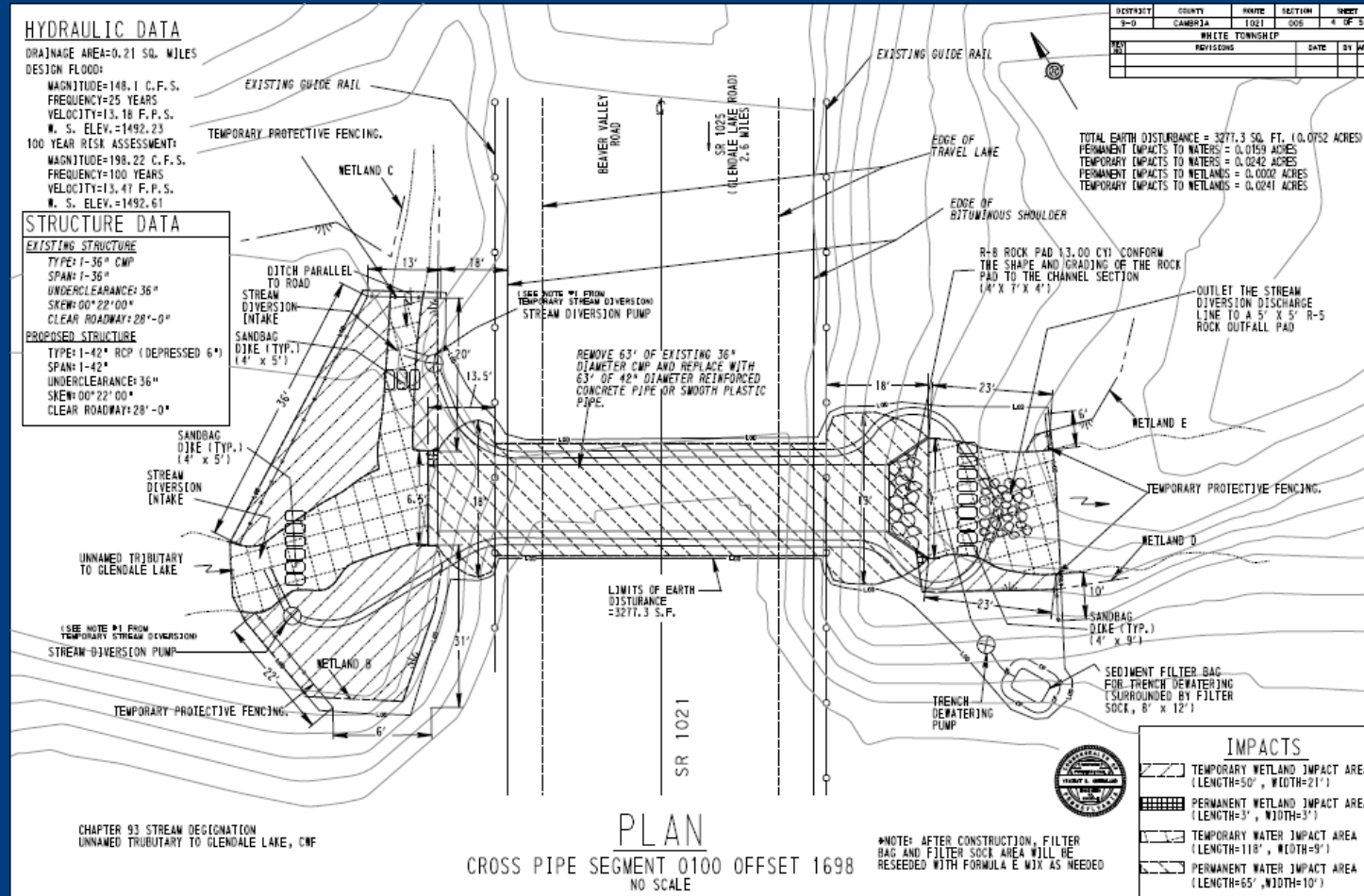
- Detail shown on TCP, NTS detail calls for shoring on downstream end of pipe
- Contractor field measures over 19'-6" from back of proposed temporary barrier to back side of headwall and cut depth of roughly 10'-6"
- Therefore, slope can be laid back at 1.5 to 1 and no shoring is required
- Item Description - "This work is the design and construction of a temporary excavation support and protection system or appropriately designed open cut excavation" (so we pay full price on item anyway)



NOT TO SCALE DRAWINGS

EXAMPLE #5 (cont.)

- Detail shown on E&S Plan ~ understand NTS, but looks completely different than 'to scale' plan



ADDITIONAL REMINDERS

E&S PLAN PHASING

ENVIRONMENTAL MITIGATION COMMITMENTS

E&S PLAN INCONSISTENCIES

Issues: Notes and details in conflict on approved E&S Plans

Impacts: Additional costs along with delay of associated work

- Exposure to costs associated with E&S contractor demob/ remob costs and/or equipment standby costs if BMPs conflict with work

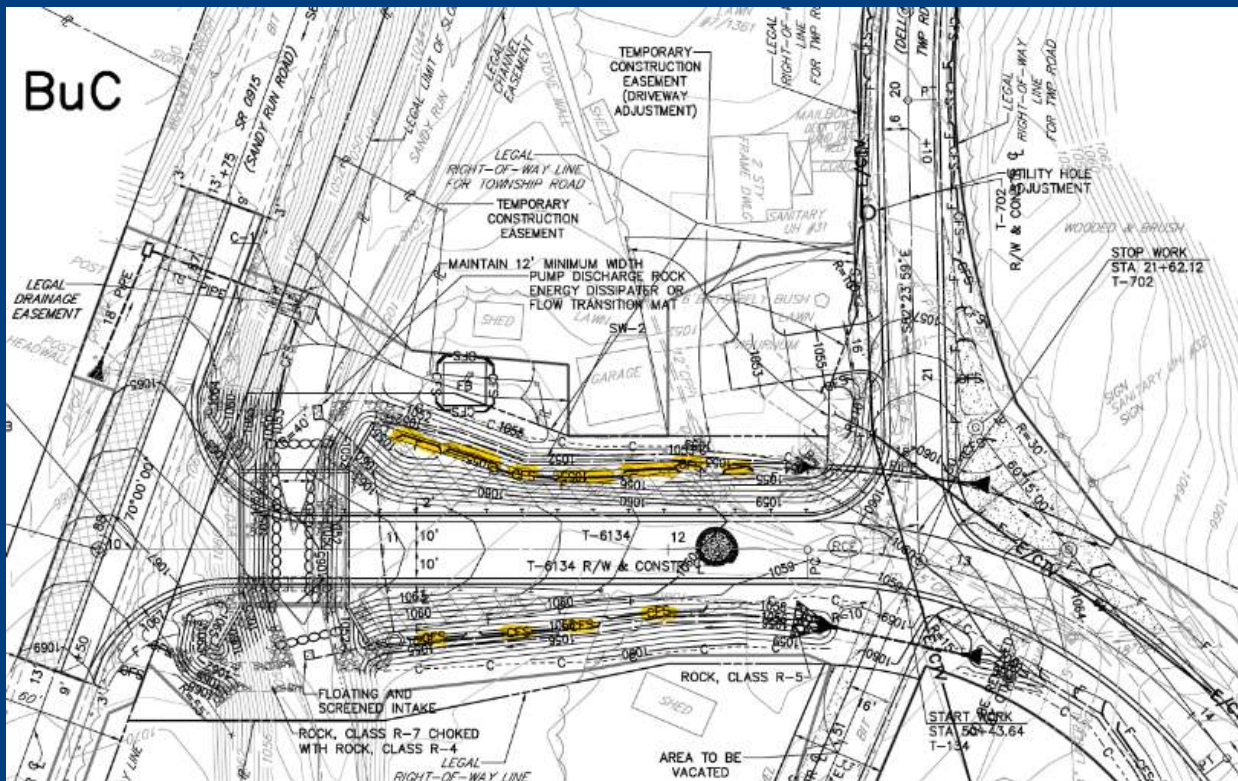
E&S PLAN INCONSISTENCIES

EROSION AND SEDIMENT POLLUTION CONTROL SEQUENCE NOTES

1. WHEN PERFORMING THIS WORK, COMPLY WITH THE TRAFFIC CONTROL PLAN, MAINTAIN TRAFFIC VIA APPROVED DETOUR AND PHASING.
2. BEFORE EARTH MOVING ACTIVITIES BEGIN, CLEARLY MARK THE LIMIT OF DISTURBANCE.
3. ALL EROSION CONTROL BMPs ARE TO BE INSTALLED PRIOR TO THE START OF EARTH DISTURBANCE ACTIVITIES, INCLUDING CLEARING AND GRUBBING.

EXAMPLE #1

- Note on E&S Plan requires all BMPs shown on plan to be in place prior to start of earth disturbance
- Plan shows compost filter sock to be installed in ditches cut into existing ground at the base of fills
- Contractor brings E&S sub to site to place all BMPs first thing to comply with Note 3 and avoid additional mobilizations
- How is work on the cuts and fills to be done if filter sock is placed in the way?
- Designers need to consider phased E&S Plans in such cases



ENVIRONMENTAL COMMITMENTS

Issues: Commitments contained on ECMTS form but not included in plans & specifications

Impacts:

- Potential for commitment to be violated
- Adding associated items/ work or time after the bid can become very costly in comparison to if originally bid

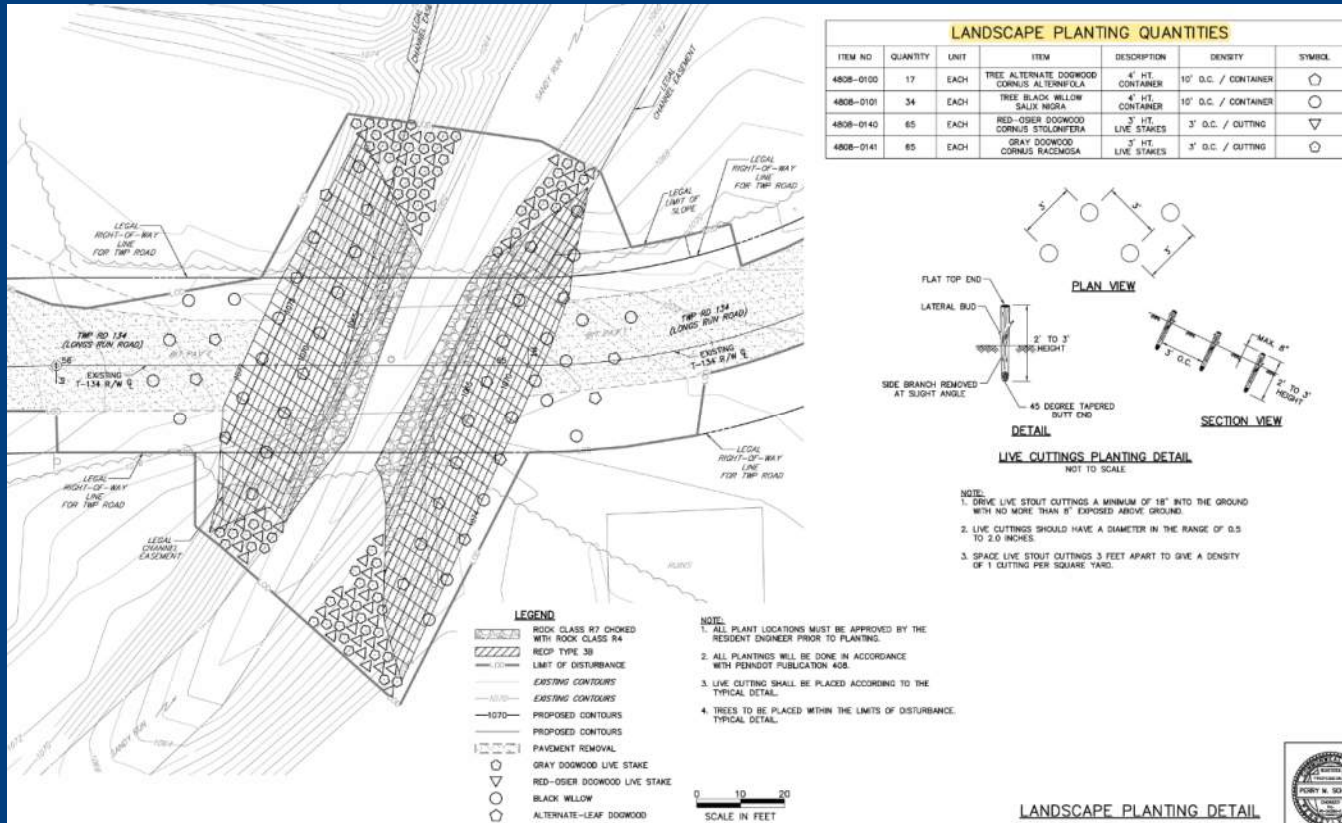
ENVIRONMENTAL COMMITMENTS

Mitigation or Commitment Activity	Source Document	Resource Impacted	Impact	Location	
				Begin Station	End Station
<p>3. Special provisions will need to be added to the contract to address, environmental monitoring during construction and sampling and disposal of suspected contaminated media, if encountered (Potential Locations: One former gas station is located on the corner of 15th street and Pleasant Valley BLVD in an area of new drainage excavation along the project corridor.</p> <p>In addition 8 intersections are getting traffic upgrades that may need special provisions (Pleasant Valley and Altoona Alliance Church exit, Pleasant Valley ent/exit Carol Cable, Pleasant Valley and Cayuga Avenue, Pleasant Valley and Valley View Blvd and 22nd street, Pleasant Valley and Jaggard Street, Valley View Blvd and 7th street, Pleasant Valley and 7th Street, Pleasant Valley and Kettle Street).</p>	BRPA	Hazardous Waste	None Anticipated	0080/0100	0210/2850

EXAMPLE #1

- ECMTS defines environmental commitment for environmental monitoring and sampling and disposal of contaminated media
- There were no bid items included in the contract for this work
- These items become very costly when added after the project is bid

ENVIRONMENTAL COMMITMENTS



EXAMPLE #2

- Plantings to be done during the last phase of the project (when traffic is on new alignment and old bridge is demolished)
- Contract Completion Date: September 9th
- By specification, planting window is between October 15th and November 30th
- Either need to plant out of season or issue time extension

JOINT MGMT/ IIC COUNCIL QUALITY EFFORT

QUALITY PRIORITY RANK	FOCUS AREA	DESCRIPTION	POTENTIAL RESOLUTION IDEAS
1	Existing Drainage Verification	Existing drainage conditions vary from those depicted on the plans	<p>Communicate Expectations to Staff:</p> <ul style="list-style-type: none"> - If we are tapping into existing drainage facilities, test holes need to be performed after preliminary drainage is designed - Design Team to pop inlet grates and manhole lids to get/verify inverts and directions of the pipe - Need to update the ECMS Department Details to include for consultant projects - also include for the consultant to go through the PM to coordinate with Maintenance for assistance as needed - Remind staff to think about the size of the pipes vs the inlet boxes to be aware if they can be attached, especially when on a skew - Do not show pipes on a radius - show in straight lines - Staff should contact Maintenance any time Traffic Control is needed to safely field view projects - Staff should contact Maintenance any time they need assistance opening grates and/or cleaning inlets to get existing drainage - Need to Field Verify drainage features - can't not rely solely on STAMPP and/or Maintenance coordination - Need to evaluate the need for pipe cleaning on the parallel system, not just cross pipes - Try to minimize the inlet adjustments - Staff to verify the size/shape of the existing inlet if it is remain and include an item (Qty of 2 "as directed") for adjustment if needed - Add item/qty for inlet tops - PM can coordinate with Construction ACE to determine the condition of the inlets - Ex. 6 - M vs C Inlets: Make QA/QC plan reviewer aware to look for these conditions

QUESTIONS?