

STATE OF FLORIDA  
DEPARTMENT OF TRANSPORTATION

CONTRACT PLANS

FINANCIAL PROJECT ID 430185-3-56-01

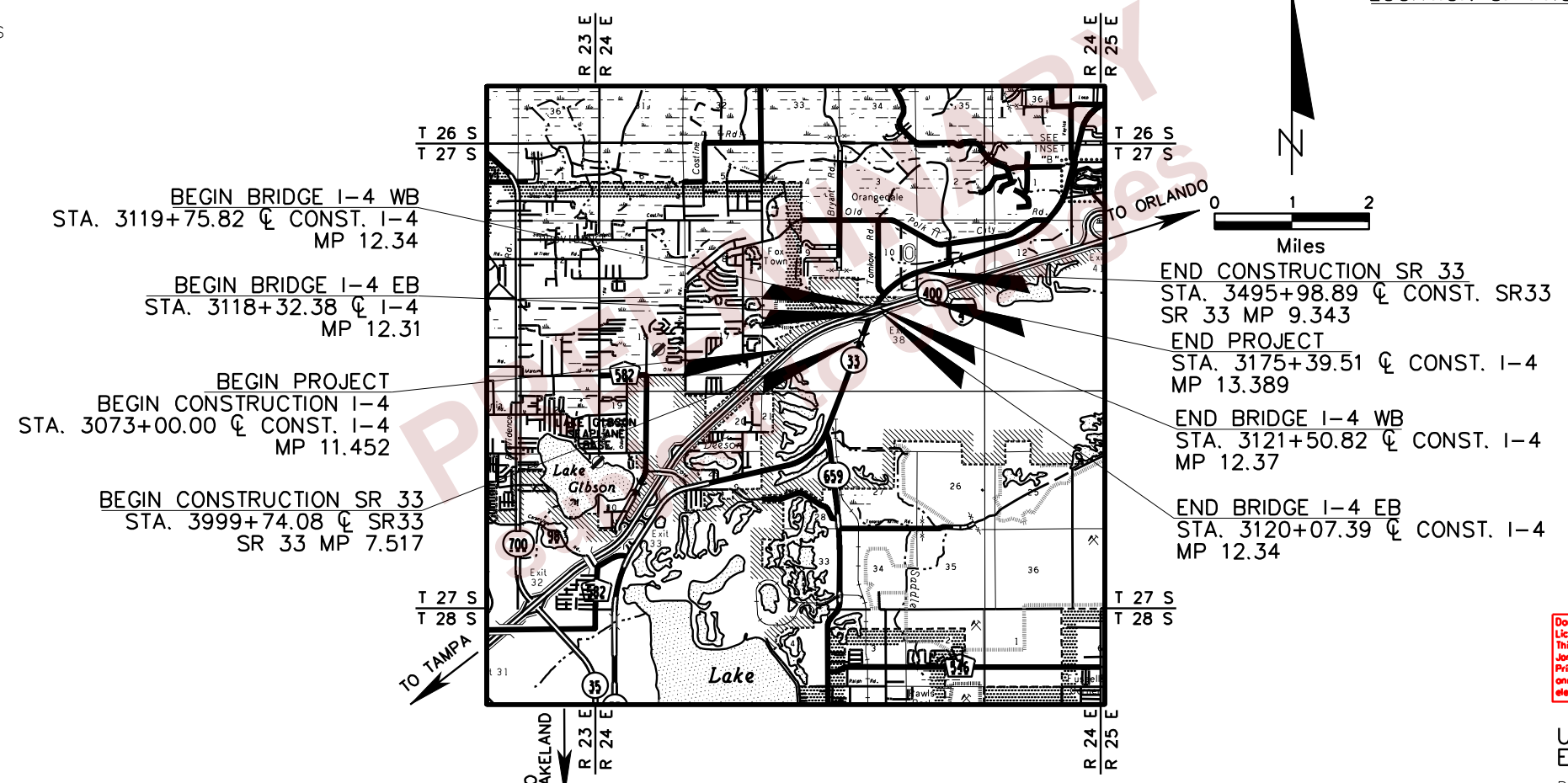
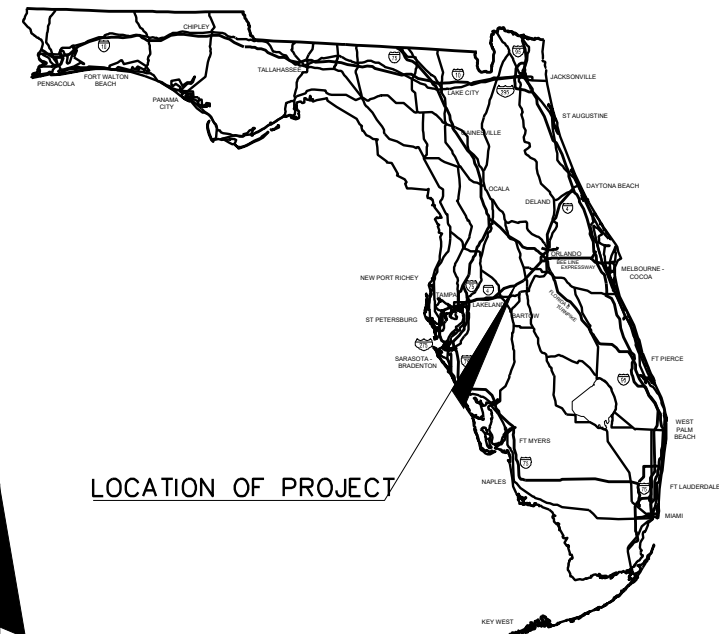
POLK COUNTY (16070)

STATE ROAD NO. 400  
I-4 AT SR 33 INTERCHANGE MODIFICATION

THIS PROJECT TO BE LET TO CONTRACT WITH FINANCIAL PROJECT ID(S):  
430185-3-52-01, 430185-4-52-01, 430185-7-52-01, 201214-8-52-01

INDEX OF UTILITY PLANS

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BEGIN BRIDGE I-4 WB  
STA. 3119+75.82  $\bar{C}$  CONST. I-4  
MP 12.34

BEGIN BRIDGE I-4 EB  
STA. 3118+32.38  $\bar{C}$  I-4  
MP 12.31

BEGIN PROJECT  
BEGIN CONSTRUCTION I-4  
STA. 3073+00.00  $\bar{C}$  CONST. I-4  
MP 11.452

BEGIN CONSTRUCTION SR 33  
STA. 3999+74.08  $\bar{C}$  SR33  
SR 33 MP 7.517

END CONSTRUCTION SR 33  
STA. 3495+98.89  $\bar{C}$  CONST. SR33  
SR 33 MP 9.343

END PROJECT  
STA. 3175+39.51  $\bar{C}$  CONST. I-4  
MP 13.389

END BRIDGE I-4 WB  
STA. 3121+50.82  $\bar{C}$  CONST. I-4  
MP 12.37

END BRIDGE I-4 EB  
STA. 3120+07.39  $\bar{C}$  CONST. I-4  
MP 12.34

Douglas E. Jones State of Florida, Professional Engineer,  
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March 1, 2024  
**UTILITY PLANS  
ENGINEER OF RECORD:**  
DOUGLAS E. JONES, P.E. NO.: 58077  
CHASTAIN SKILLMAN, INC.  
205 EAST ORANGE ST, SUITE 110  
LAKELAND, FLORIDA 33801  
(863) 646-1402  
FBPR CERTIFICATE OF AUTHORIZATION NO. 262  
CONSULTANT CONTRACT NO. : 9922.25 & 9922.26

**GOVERNING STANDARD PLANS:**  
Florida Department of Transportation, FY 2023-24 Standard Plans for Road and Bridge Construction and applicable Interim Revisions (IRs).

Standard Plans for Road Construction and Associated IRs are available at the following website: <http://www.fdot.gov/design/standardplans>

**GOVERNING STANDARD SPECIFICATIONS:**  
Florida Department of Transportation, FY 2023-24 Standard Specifications for Road and Bridge Construction at the following website: <http://www.fdot.gov/programmangement/Implemented/SpecBooks>

REVISIONS:

CONSTRUCTION CONTRACT NO.	FISCAL YEAR	SHEET NO.
T0000	24	U-01

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\$USERS\$ \$DATES\$ \$TIMES\$ \$FILES\$

TABULATION OF QUANTITIES

Pay Item No.	Description	Unit																				TOTAL
			U-11	U-12	U-13	U-14	U-15	U-16	U-17	U-18	U-19	U-20	U-21	U-22	U-23	U-24	U-25	U-26	U-27	U-28	U-29	
1050-16-003	Utility Pipe, Remove and Dispose, 5"-7.9"	LF												112	933	560	560	566	560	560	79	3930
1050-16-004	Utility Pipe, Remove and Dispose, 8"-19.9"	LF	522	560	560	597	605	600	460	535	460	460	560	580	1491	560	612	206				9368
1050-16-005	Utility Pipe, Remove and Dispose, 20"-49.9	LF						132	259													391
1050-31-206	Utility Pipe, F&I, PVC Water/Sewer, 6"	LF													185							185
1050-31-208	Utility Pipe, F&I, PVC Water/Sewer, 8"	LF															50					50
1050-31-218	Utility Pipe, F&I, PVC Water/Sewer, 12"	LF													455							455
1050-31-218	Utility Pipe, F&I, PVC Water/Sewer, 18"	LF							81	478	460	617	560	306								2502
1050-31-224	Utility Pipe, F&I, PVC Water/Sewer, 24"	LF	522	560	560	560	566	560	460	363												4151
1050-51-236	Utility Pipe, Ductile Iron, F&I, Water/Sewer, 36"	LF						134	259													393
1050-51-212	Utility Pipe, Ductile Iron, F&I, Water/Sewer, 12"	LF												81	107							188
1050-51-216	Utility Pipe, Ductile Iron, F&I, Water/Sewer, 16"	LF													551	567	560	214				1892
1055-31-108	Utility Fittings for PVC Pipe, F&I, 8" Elbow (45 Deg.)	EA															4					4
1055-31-112	Utility Fittings for PVC Pipe, F&I, 12" Elbow (45 Deg.)	EA												4	10							14
1055-31-112	Utility Fittings for PVC Pipe, F&I, 12" Elbow (90 Deg.)	EA													1							1
1055-31-118	Utility Fittings for PVC Pipe, F&I, 18" Elbow (11.25 Deg.)	EA							1	1		1										3
1055-31-118	Utility Fittings for PVC Pipe, F&I, 18" Elbow (22.5 Deg.)	EA								1		1										2
1055-31-118	Utility Fittings for PVC Pipe, F&I, 18" Elbow (45 Deg.)	EA								12		4	8									24
1055-31-124	Utility Fittings for PVC Pipe, F&I, 24" Elbow (90 Deg.)	EA							2													2
1055-31-124	Utility Fittings for PVC Pipe, F&I, 24" Elbow (11.25 Deg.)	EA		2																		2
1055-31-212	Utility Fittings for PVC Pipe, F&I, 12" Tee	EA													1							1
1055-31-218	Utility Fittings for PVC Pipe, F&I, 18" Tee	EA													2							2
1005-31-224	Utility Fittings for PVC Pipe, F&I, 24" Tee	EA				1	1			1												3
1055-51-116	Utility Fittings, F&I, DI/CI, Elbow, 16" (45 Deg.)	EA												1	1		4					6
1055-51-116	Utility Fittings, F&I, DI/CI, Elbow, 16" (90 Deg.)	EA												2								2
1055-51-216	Utility Fittings, F&I, DI/CI, Tee, 16"	EA													1	2						3
1055-51-312	Utility Fittings, F&I, DI/CI, Reducer, 12"	EA													1							1
1055-51-318	Utility Fittings, F&I, DI/CI, Reducer, 18"	EA													2							2
1055-51-408	Utility Fittings, F&I, DI/CI, Union, 8"	EA														1						1
1055-51-424	Utility Fittings, F&I, DI/CI, Union, 24"	EA	1																			1
1055-51-436	Utility Fittings, F&I, DI/CI, Union, 36"	EA							1													1
1080-21-400	Utility Fixture, Valve/Meterbox, Relocate	EA			1		1		1													3
1080-21-500	Utility Fixture, Valve/Meterbox, Adjust	EA																	2			2
1080-27-106	Utility Fixture, Line Stop Assembly, F&I, 6"	EA					2						1	2								5
1080-27-112	Utility Fixture, Line Stop Assembly, F&I, 12"	EA				2								6								8
1080-27-116	Utility Fixture, Line Stop Assembly, F&I, 16"	EA												2				2				4
1080-29-106	Utility Fixture, Mechanical Joint Restraint, 6"	EA																				0
1080-29-108	Utility Fixture, Mechanical Joint Restraint, 8"	EA													5	1	7					13
1080-29-112	Utility Fixture, Mechanical Joint Restraint, 12"	EA												5	8							13
1080-29-116	Utility Fixture, Mechanical Joint Restraint, 16"	EA													6			5				11
1080-29-118	Utility Fixture, Mechanical Joint Restraint, 18"	EA							6	13		12	13	8								52
1080-29-124	Utility Fixture, Mechanical Joint Restraint, 24"	EA		3					3													6
1080-32-112	Utility Fixture, Sample Point, 12"	EA											1	1								2
1080-32-116	Utility Fixture, Sample Point, 16"	EA												1		1	1					3
1080-33-106	Utility Fixture, Plug Valve, F&I, 6"	EA												1								1
1080-33-108	Utility Fixture, Plug Valve, F&I, 8"	EA												1								1
1080-33-112	Utility Fixture, Plug Valve, F&I, 12"	EA				1								2								3
1080-33-118	Utility Fixture, Plug Valve, F&I, 18"	EA							1					1								2
1080-33-124	Utility Fixture, Plug Valve, F&I, 24"	EA							1													1
1644-800	Fire Hydrant, Relocate	EA			1					1												2

PRELIMINARY  
Subject to changes

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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CHASTAIN-SKILLMAN  
205 EAST ORANGE STREET  
SUITE #110  
LAKELAND, FL 33801-4611  
(863) 646-1402

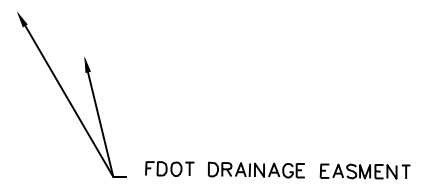
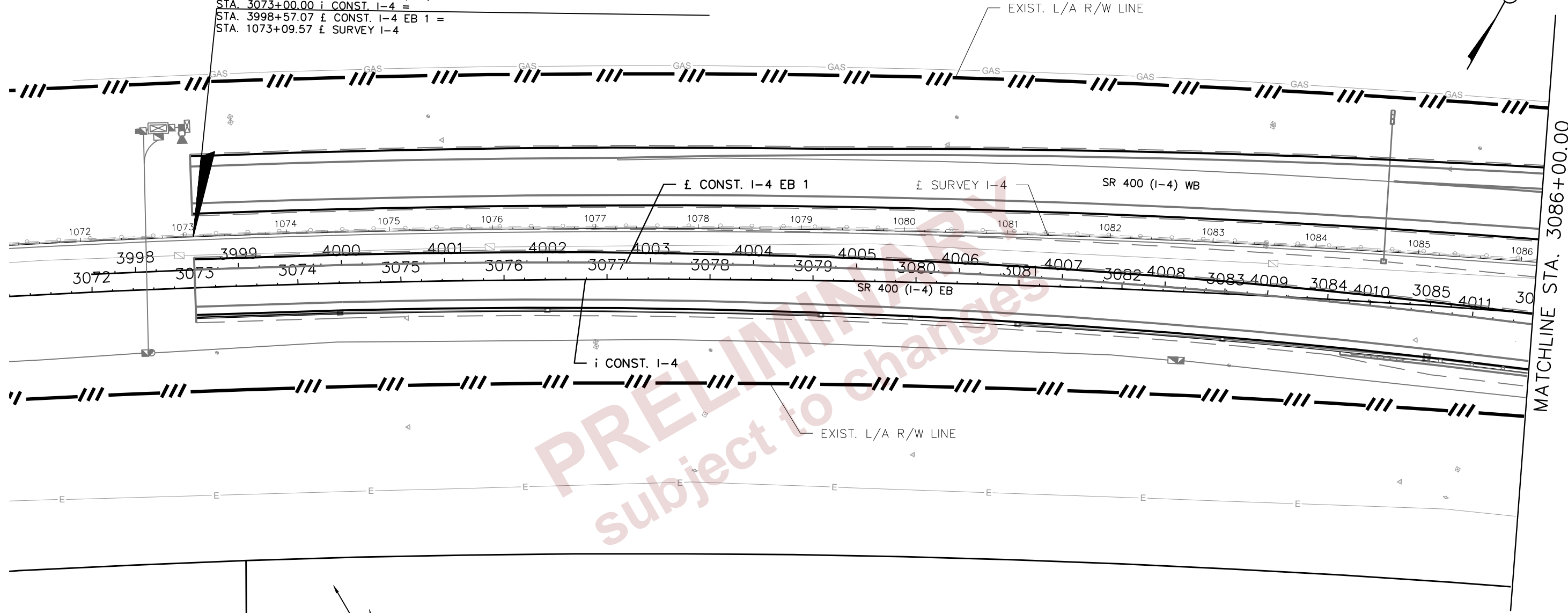
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

TABULATION OF QUANTITIES
U-02

SHEET NO.  
U-02



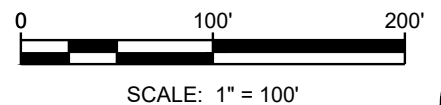
BEGIN PROJECT  
 BEGIN MILLING, RESURFACING AND WIDENING SR 400 (I-4) WB  
 BEGIN RECONSTRUCTION SR 400 (I-4) EB  
 STA. 3073+00.00 i CONST. I-4 =  
 STA. 3998+57.07 f CONST. I-4 EB 1 =  
 STA. 1073+09.57 f SURVEY I-4



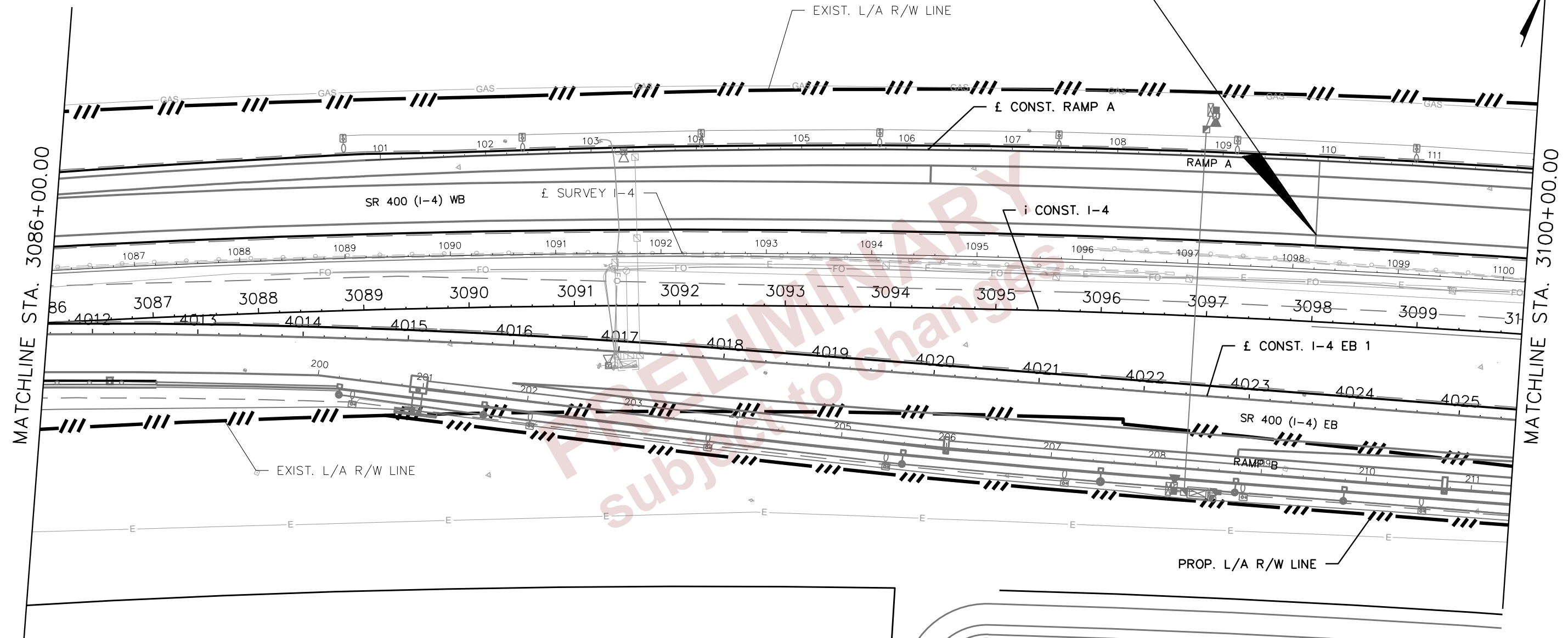
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DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		U-03
				DOUGLAS E. JONES, P.E. CHASTAIN-SKILLMAN 205 EAST ORANGE STREET SUITE #110 LAKELAND, FL 33801-4611 (863) 646-1402	SR 400	POLK	430185-3-56-01		

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END MILLING, RESURFACING AND WIDENING SR 400 (I-4) WB  
 BEGIN RECONSTRUCTION SR 400 (I-4) WB  
 STA. 3098+00.00 i CONST. I-4 =  
 STA. 1098+20.43 £ SURVEY I-4



MATCHLINE STA. 3086+00.00

MATCHLINE STA. 3100+00.00

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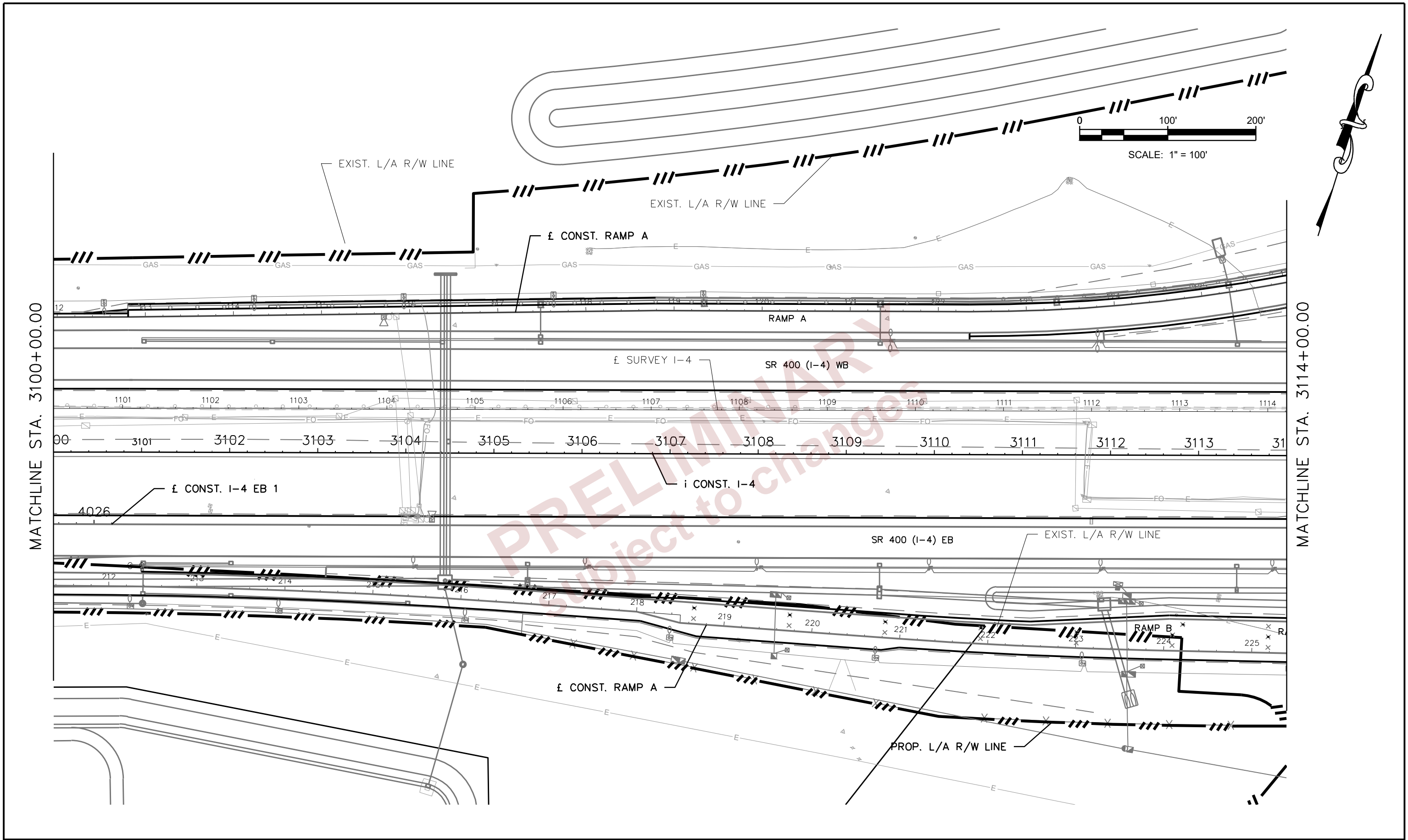
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 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
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 (863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY ADJUSTMENTS	
U-04	

SHEET NO.
U-04

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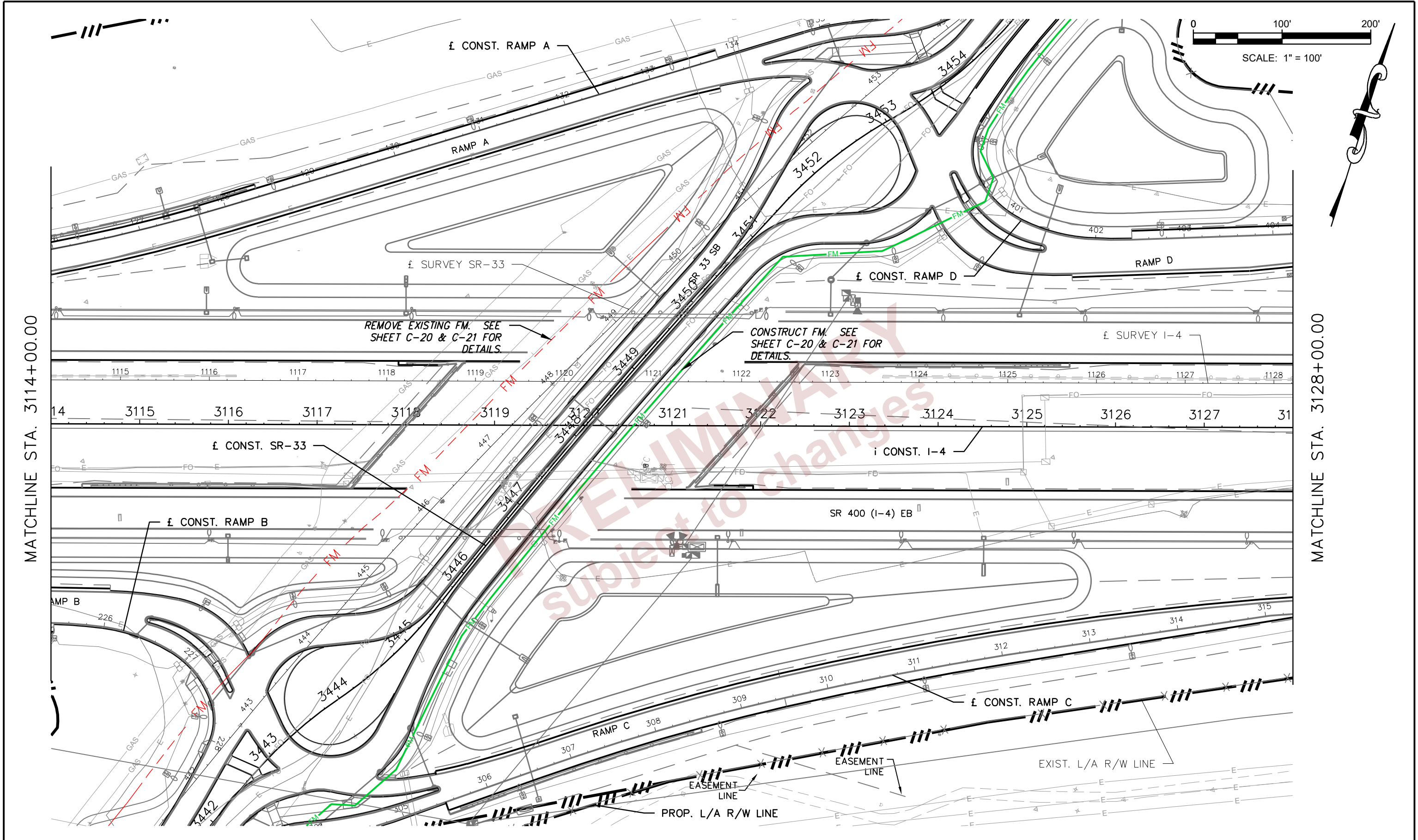


MATCHLINE STA. 3100+00.00

MATCHLINE STA. 3114+00.00

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DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
				<small>DOUGLAS E. JONES, P.E.            CHASTAIN-SKILLMAN            205 EAST ORANGE STREET            SUITE #110            LAKELAND, FL 33801-4611            (863) 646-1402</small>	SR 400	POLK	430185-3-56-01		

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MATCHLINE STA. 3114+00.00

MATCHLINE STA. 3128+00.00

REVISIONS	
DATE	DESCRIPTION

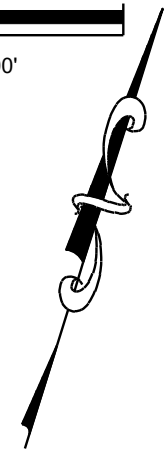
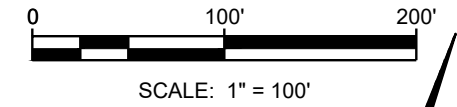
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

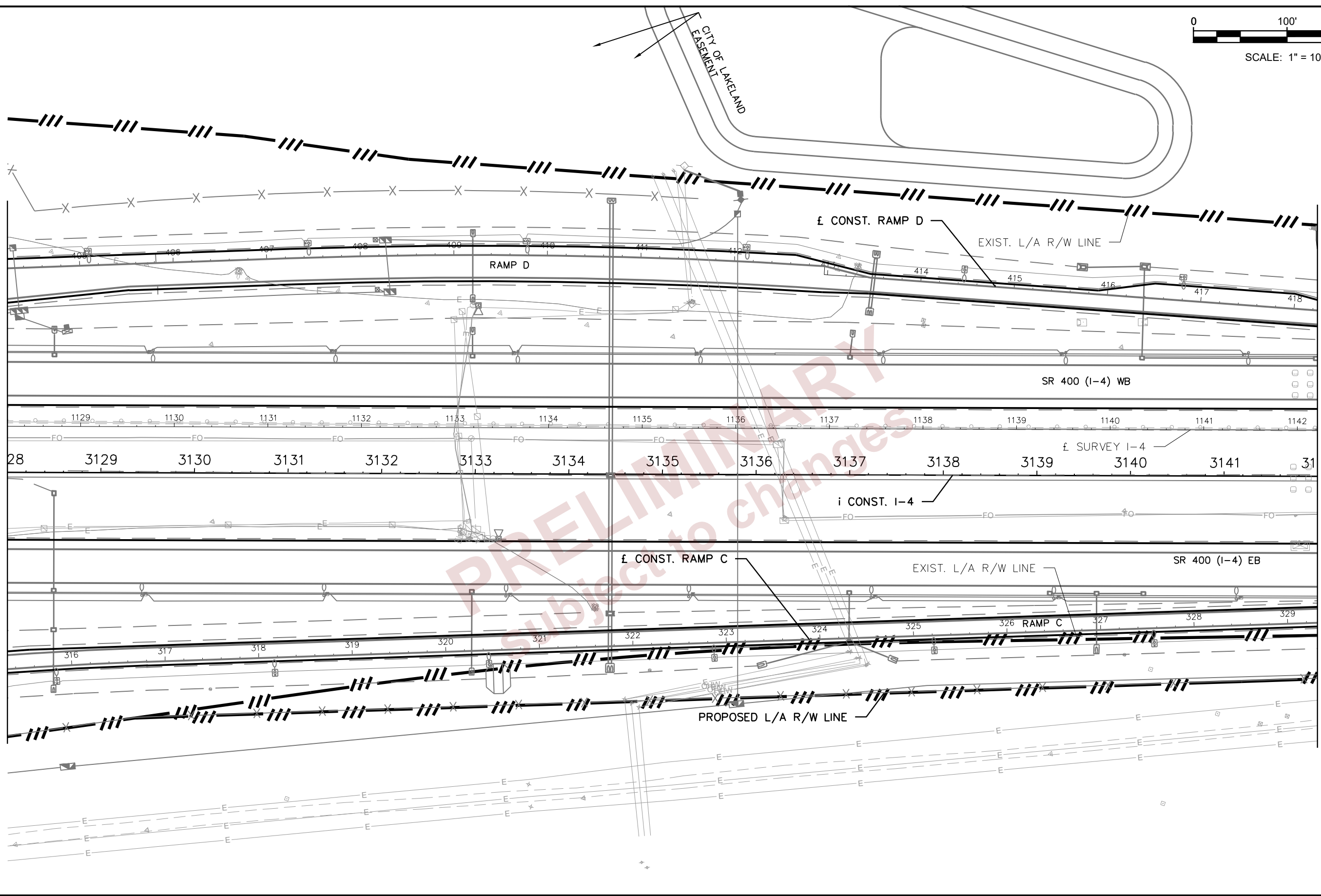
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MATCHLINE STA. 3128+00.00

MATCHLINE STA. 3142+00.00



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REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			UTILITY ADJUSTMENTS	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		U-07
				SR 400	POLK	430185-3-56-01		

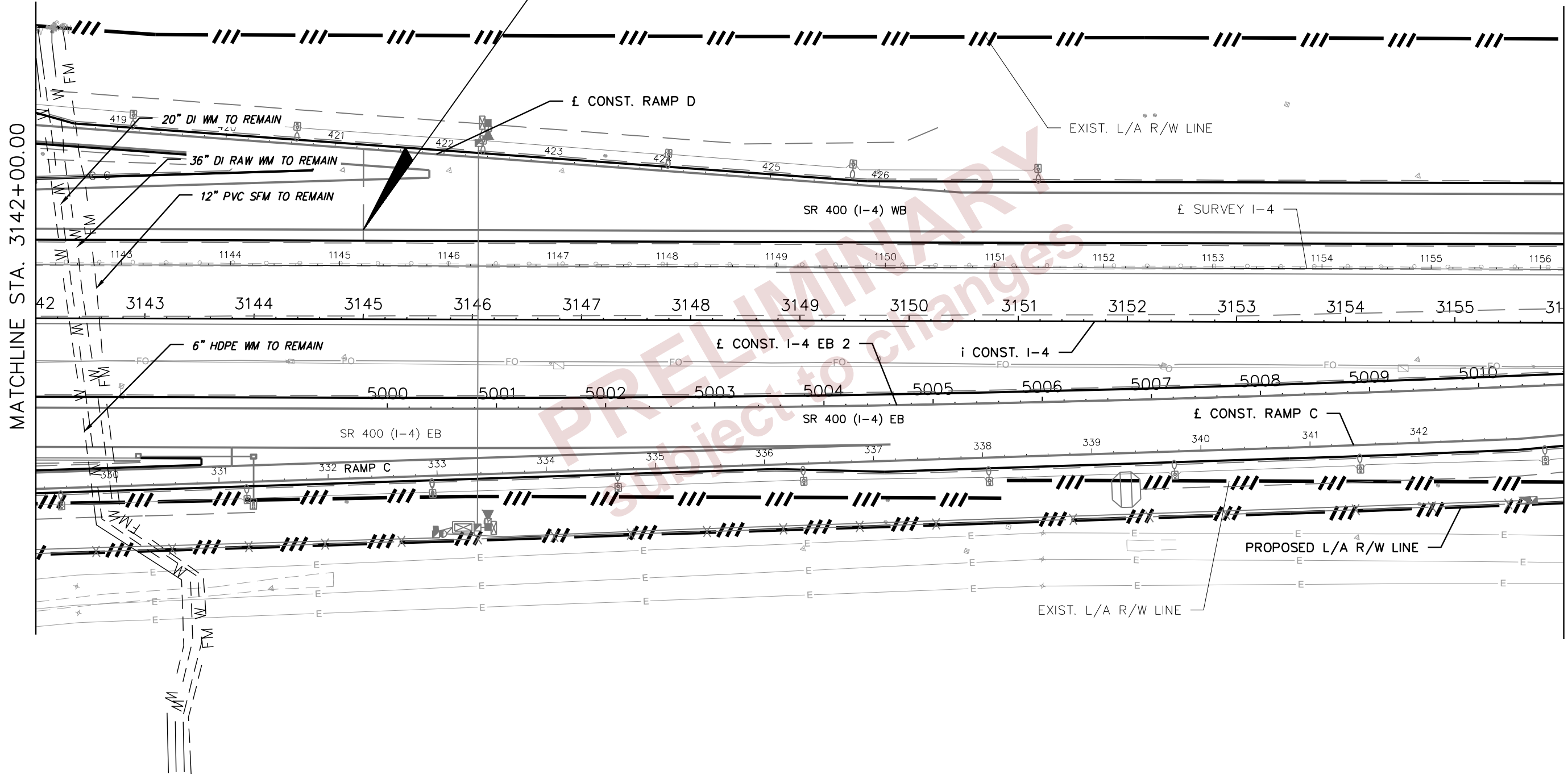
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205 EAST ORANGE STREET  
SUITE #110  
LAKE LAND, FL 33801-4611  
(863) 646-1402

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END RECONSTRUCTION SR 400 (I-4) WB  
 BEGIN MILLING, RESURFACING AND WIDENING SR 400 (I-4) WB =  
 STA. 3145+00.00 i CONST. I-4 =  
 STA. 1145+21.66 £ SURVEY I-4



MATCHLINE STA. 3142+00.00

MATCHLINE STA. 3156+00.00

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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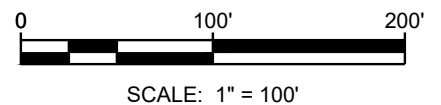
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY ADJUSTMENTS

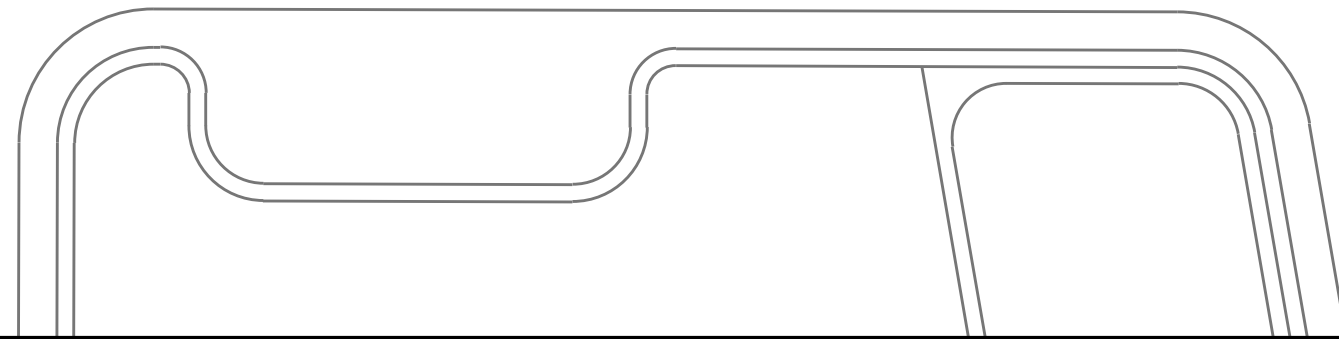
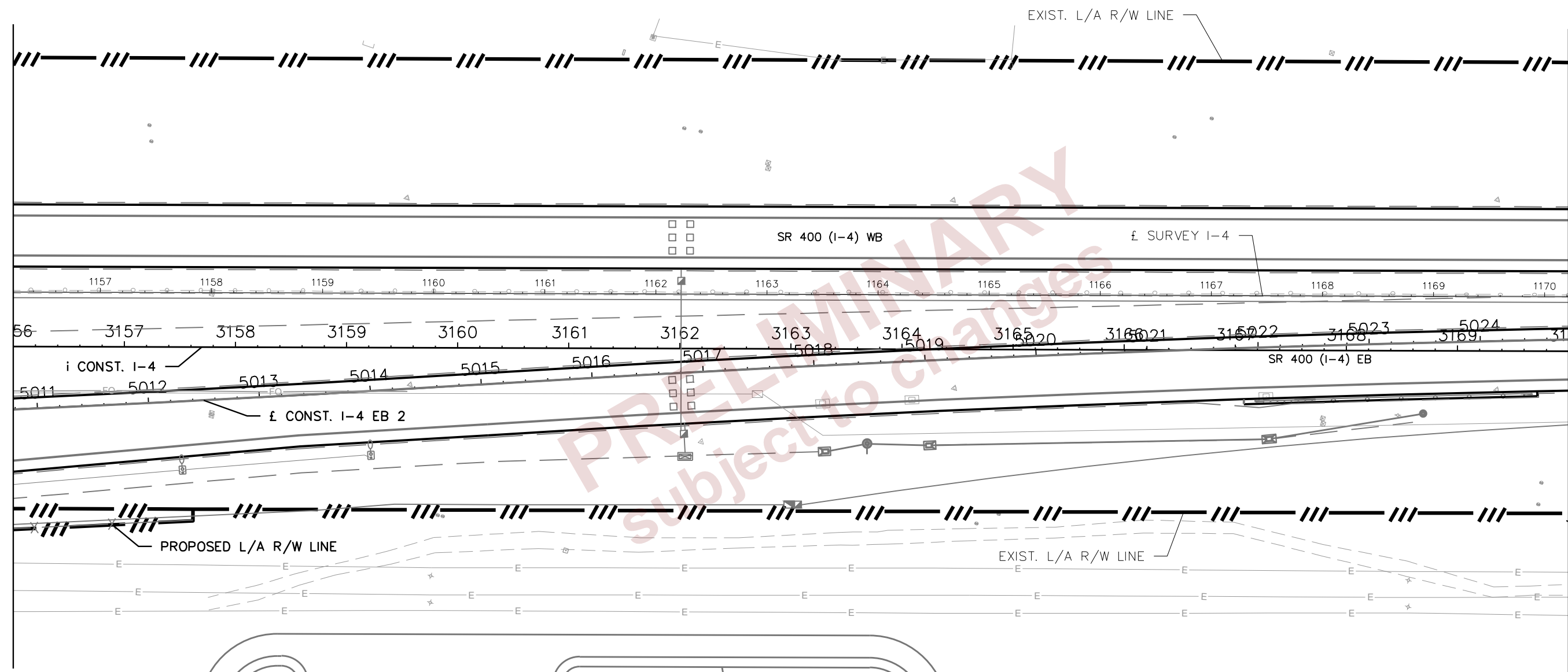
SHEET NO.  
**U-08**





MATCHLINE STA. 1156+00.00

MATCHLINE STA. 3170+00.00



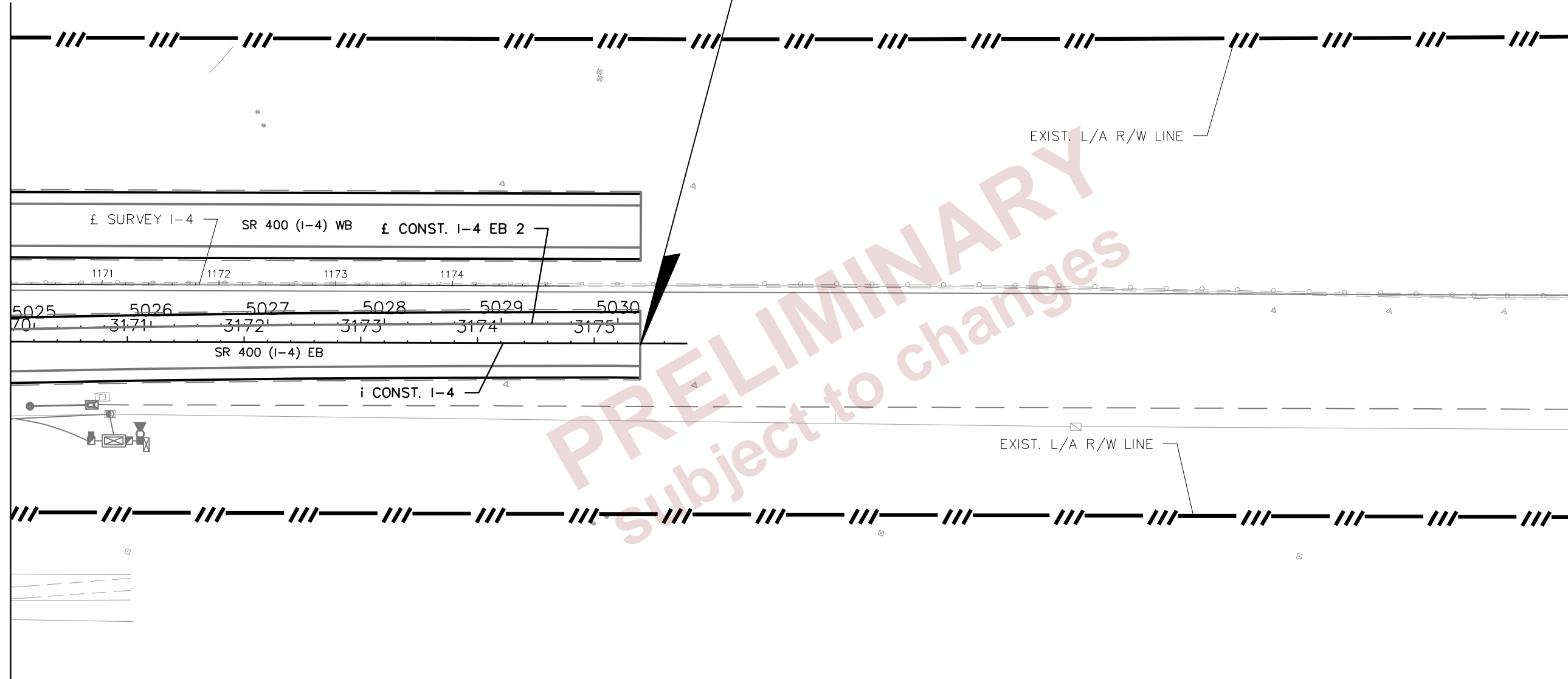
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DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		U-09
				DOUGLAS E. JONES, P.E. CHASTAIN-SKILLMAN 205 EAST ORANGE STREET SUITE #110 LAKELAND, FL 33801-4611 (863) 646-1402	SR 400	POLK	430185-3-56-01		

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END PROJECT  
 END MILLING, RESURFACING AND WIDENING SR 400 (I-4) WB  
 END RECONSTRUCTION SR 400 (I-4) EB  
 MATCH EXISTING  
 STA. 3175+39.51 i CONST. I-4

MATCHLINE STA. 3170+00.00



PRELIMINARY  
Subject to changes

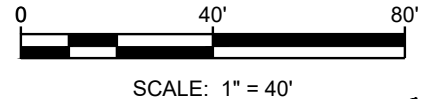
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 LAKELAND, FL 33801-4611  
 (863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY ADJUSTMENTS
SHEET NO. <b>U-10</b>



BEGIN PROJECT  
 BEGIN MILLING, RESURFACING AND WIDENING SR 33 SB  
 BEGIN RECONSTRUCTION SR 33 NB  
 STA. 399+46.72 £ SURVERY SR 33 =  
 STA. 2398+78.14 £ CONST. SR 33 NB =  
 STA. 1398+76.06 £ CONST. SR 33 SB

#1-CONNECT PROPOSED 24" PVC  
 FORCEMAIN TO PROPOSED 24" FORCEMAIN  
 REFERENCED IN PROJECT FPID  
 430185-4-56-01.

6" HDPE WM / TO REMAIN  
 CITY OF LAKELAND

36" DI WM / TO REMAIN  
 CITY OF LAKELAND

30" DI WM / TO REMAIN  
 CITY OF LAKELAND

CONSTRUCT 24" C905  
 PVC FORCEMAIN

REMOVE EXIST. 12" FORCEMAIN

EXIST. R/W LINE

POLE FROM 430185-4-56-01  
 399

SR 33 SB

3399

SR 33 NB

POLE FROM 430185-4-56-01

£ SURVEY SR-33

£ CONST. SR-33

EXIST. R/W LINE

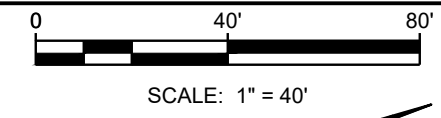
MATCHLINE STA. 3404+00.00

PROPOSED FITTINGS TABLE			
ITEM NUMBER	DESCRIPTION	LOCATION STATION	OFFSET
1	24" M.J. UNION	3399+74.1	109.8' L

\* SIZES UP TO 7.9" INCLUDES THE COST OF FITTINGS

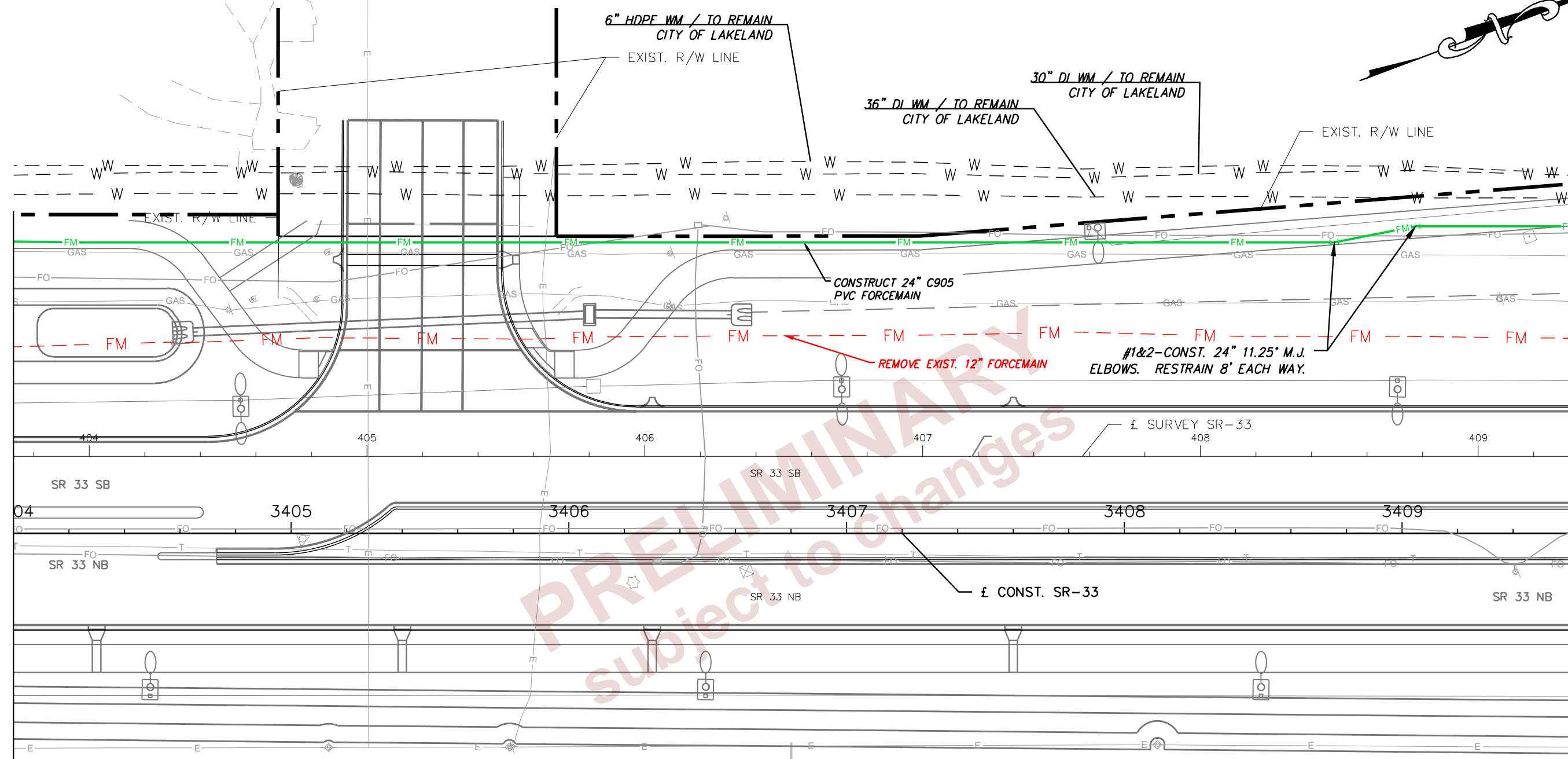
REVISIONS				DOUGLAS E. JONES, P.E. CHASTAIN-SKILLMAN 205 EAST ORANGE STREET SUITE #110 LAKELAND, FL 33801-4611 (863) 646-1402	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			UTILITY ADJUSTMENTS	SHEET NO.  U-11
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
				Douglas E. Jones State of Florida, Professional Engineer, License No. 58077 This item has been digitally signed and sealed by Douglas E. Jones on the date indicated here. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.	SR 400	POLK	430185-3-56-01		

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MATCHLINE STA. 3404+00.00

MATCHLINE STA. 3409+60.00



PROPOSED FITTINGS TABLE			
ITEM NUMBER	DESCRIPTION	LOCATION STATION	OFFSET
1	24" 11.25' M.J. ELBOW	3408+75.5	104.8' L
2	24" 11.25' M.J. ELBOW	3409+04.9	110.6' L

\* SIZES UP TO 7.9" INCLUDES THE COST OF FITTINGS

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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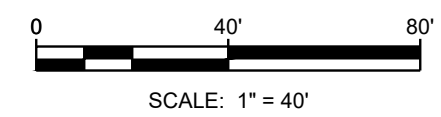
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 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY ADJUSTMENTS

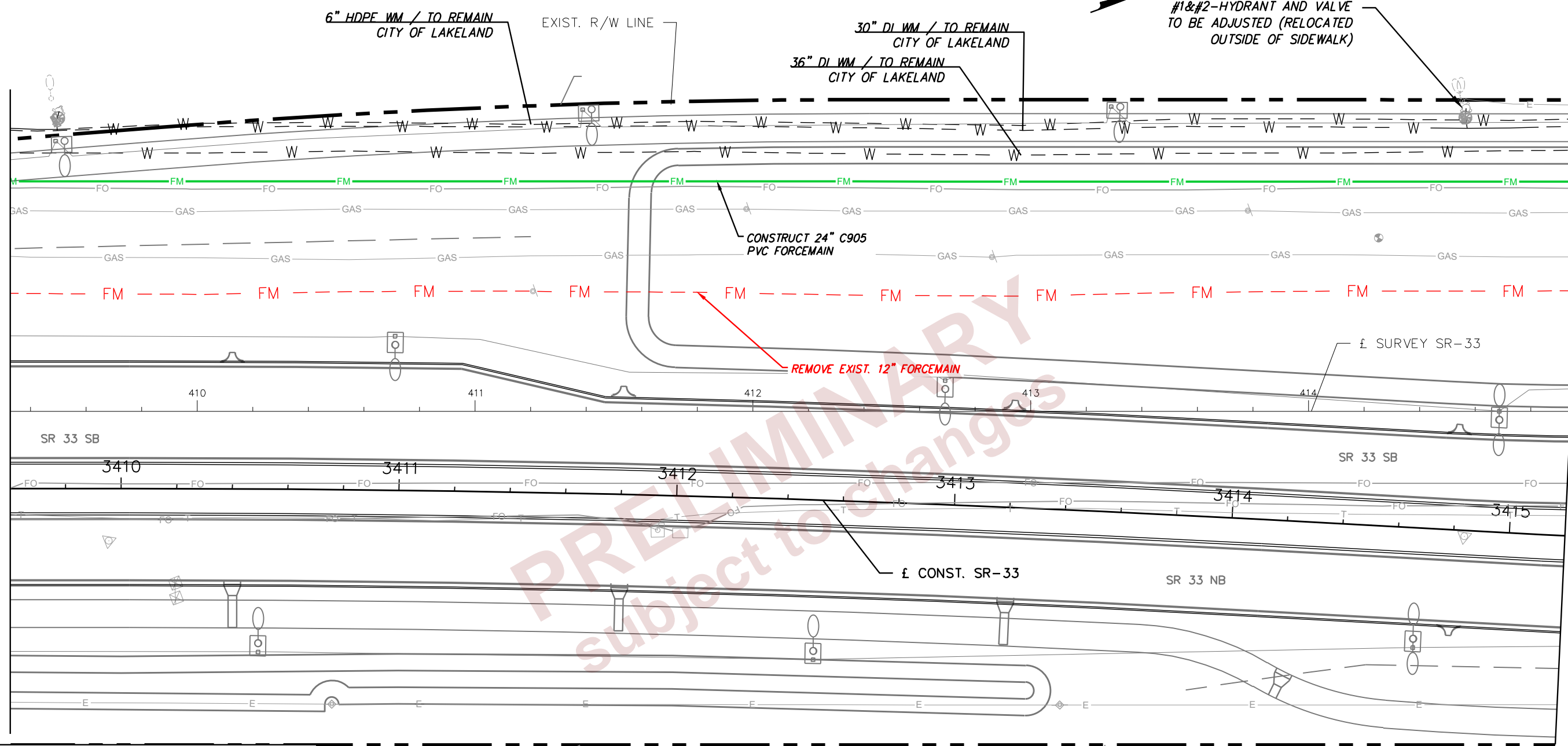
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**U-12**

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MATCHLINE STA. 3409+60.00

MATCHLINE STA. 3415+20.00



PROPOSED FITTINGS TABLE

ITEM NUMBER	DESCRIPTION	LOCATION STATION	OFFSET
1	ADJUST EXISTING HYDRANT	3414+74.6	152.0' L
2	RELOCATE EXISTING VALVE	3414+74.6	152.0' L

\* SIZES UP TO 7.9" INCLUDES THE COST OF FITTINGS

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

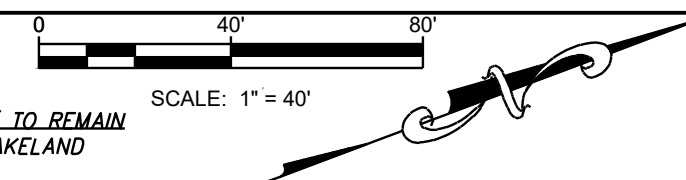
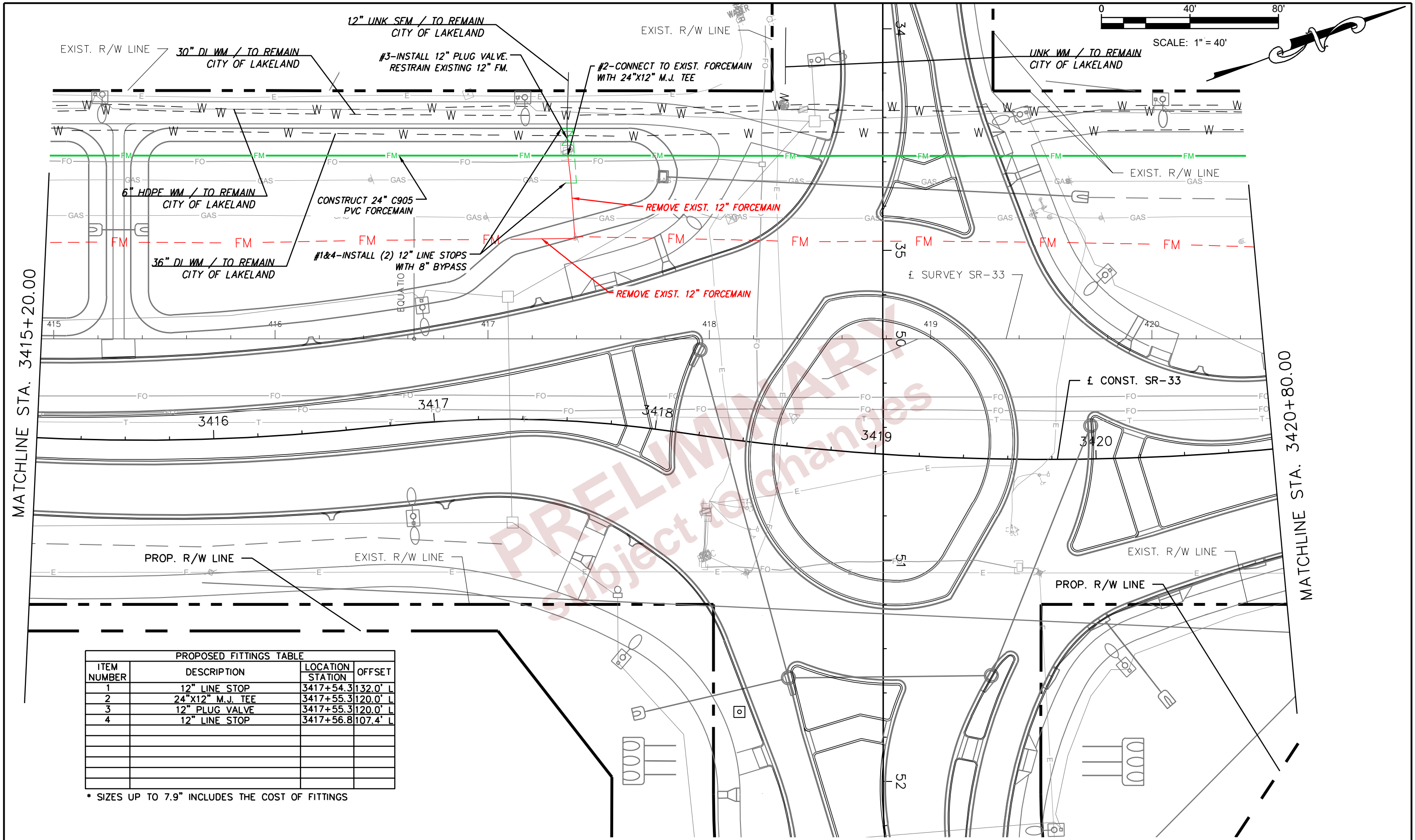
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY ADJUSTMENTS

SHEET NO.  
**U-13**



MATCHLINE STA. 3415+20.00

MATCHLINE STA. 3420+80.00

PROPOSED FITTINGS TABLE			
ITEM NUMBER	DESCRIPTION	LOCATION STATION	OFFSET
1	12" LINE STOP	3417+54.3	132.0' L
2	24"x12" M.J. TEE	3417+55.3	120.0' L
3	12" PLUG VALVE	3417+55.3	120.0' L
4	12" LINE STOP	3417+56.8	107.4' L

\* SIZES UP TO 7.9" INCLUDES THE COST OF FITTINGS

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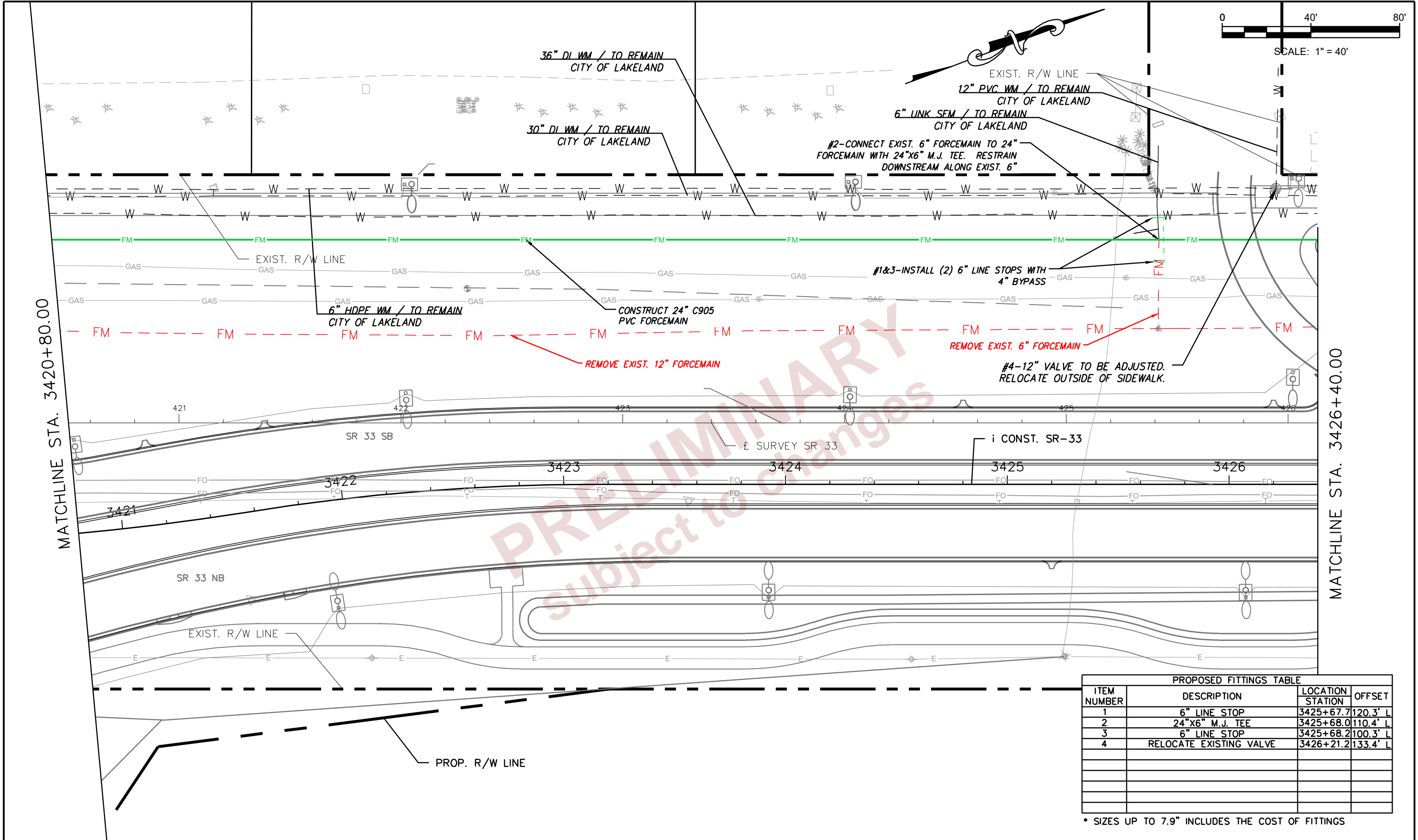
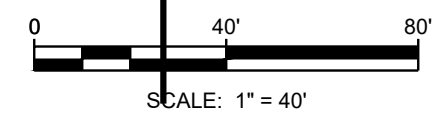
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY ADJUSTMENTS

SHEET NO.  
**U-14**

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MATCHLINE STA. 3420+80.00

MATCHLINE STA. 3426+40.00

PROPOSED FITTINGS TABLE			
ITEM NUMBER	DESCRIPTION	LOCATION STATION	OFFSET
1	6" LINE STOP	3425+67.7	120.3' L
2	24"x6" M.J. TEE	3425+68.0	110.4' L
3	6" LINE STOP	3425+68.2	100.3' L
4	RELOCATE EXISTING VALVE	3426+21.2	133.4' L

\* SIZES UP TO 7.9" INCLUDES THE COST OF FITTINGS

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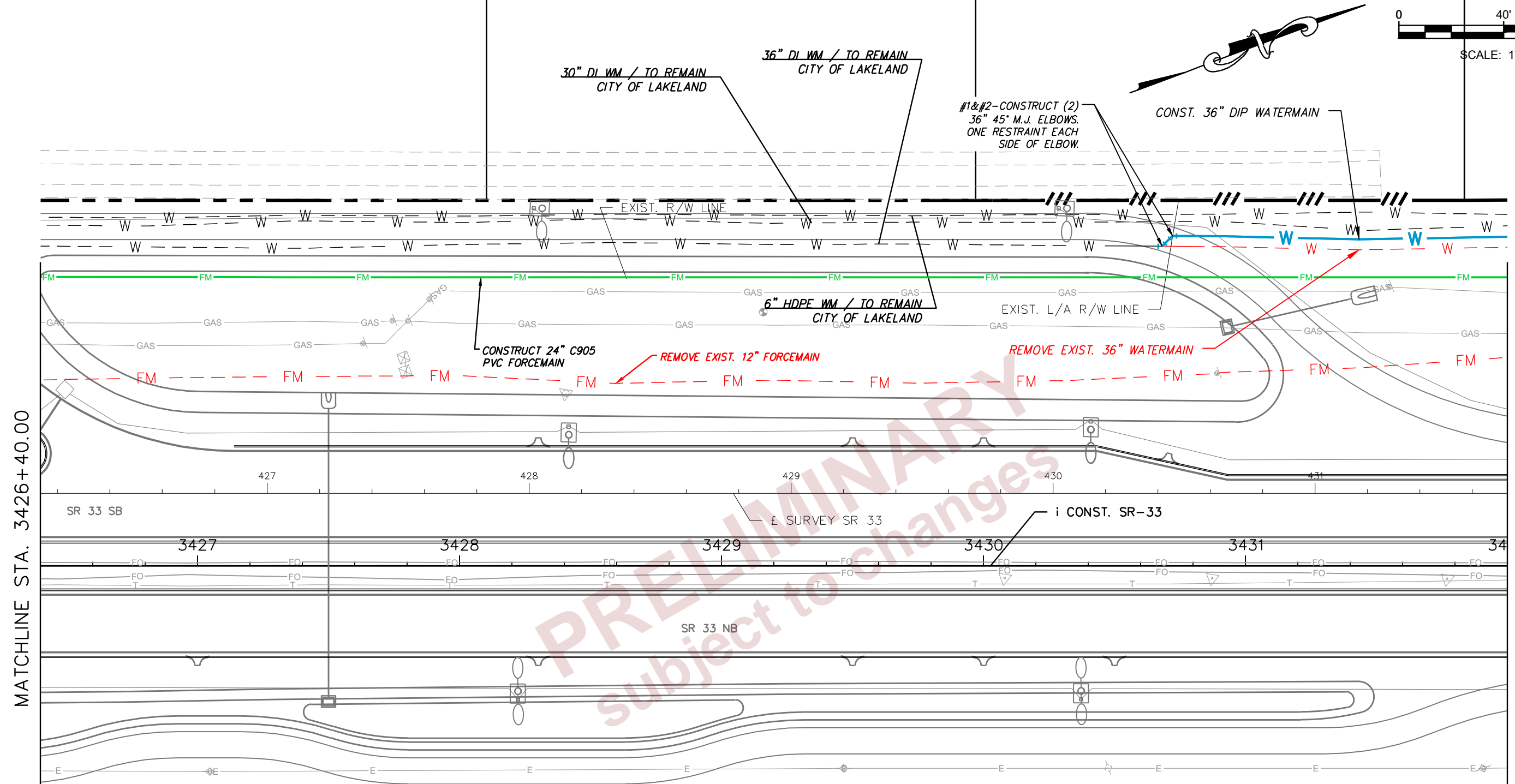
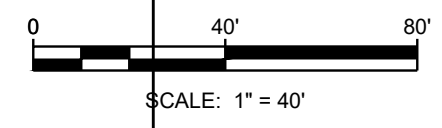
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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UTILITY ADJUSTMENTS

SHEET NO.  
**U-15**

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MATCHLINE STA. 3426+40.00

MATCHLINE STA. 3432+00.00

PROPOSED FITTINGS TABLE			
ITEM NUMBER	DESCRIPTION	LOCATION STATION	OFFSET
1	36" 45° M.J. ELBOW	3430+68.2	122.1' L
2	36" 45° M.J. ELBOW	3430+72.2	126.1' L

\* SIZES UP TO 7.9" INCLUDES THE COST OF FITTINGS

EXIST. R/W LINE

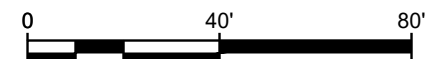
PROP. L/A R/W LINE

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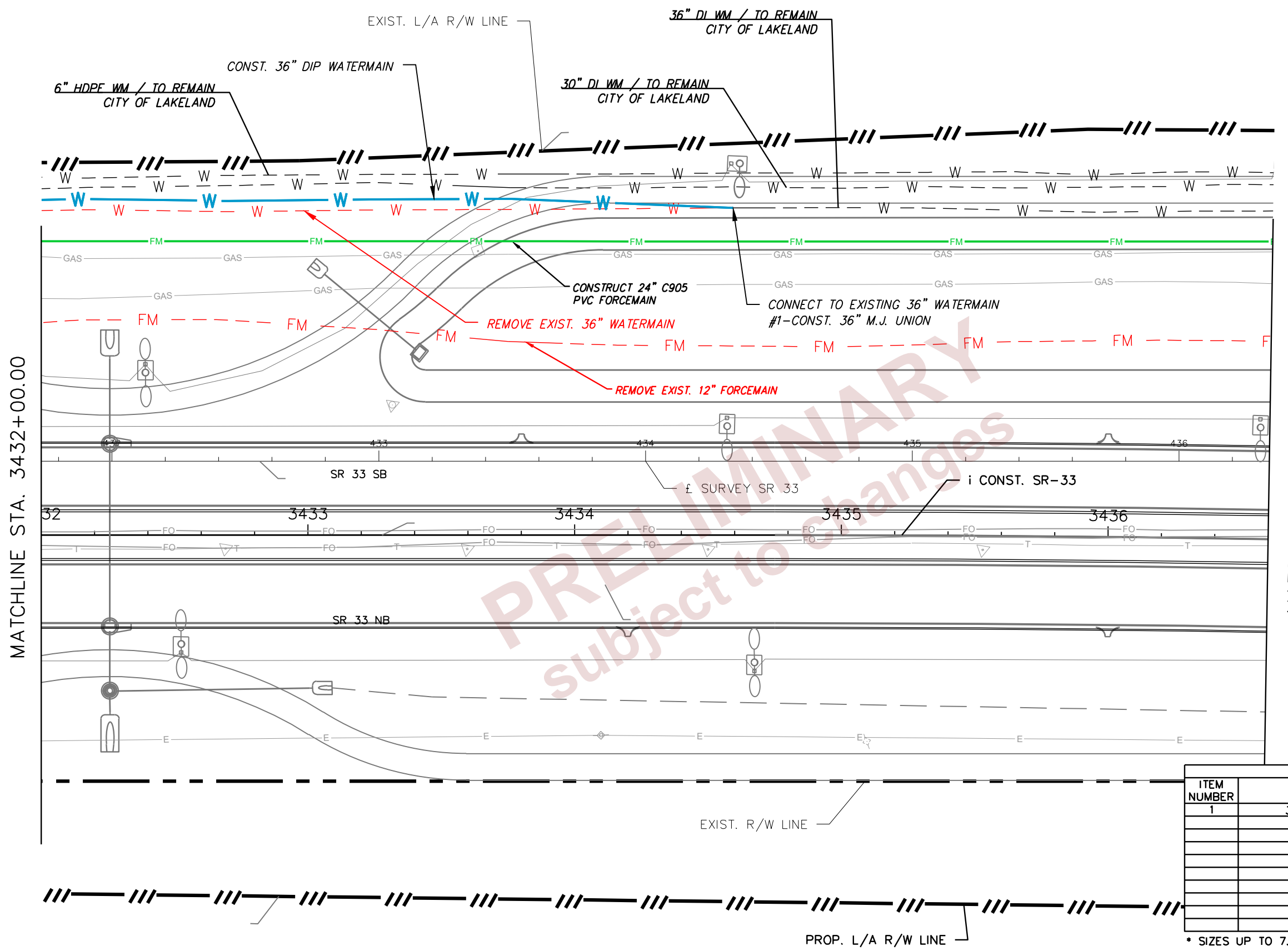
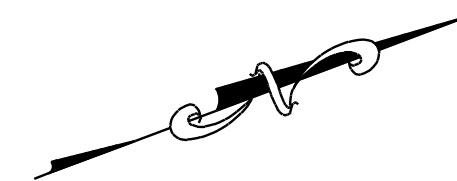
REVISIONS				<small>Douglas E. Jones State of Florida, Professional Engineer, License No. 58077 This form has been digitally signed and sealed by Douglas E. Jones on the date indicated here. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.</small>	<small>DOUGLAS E. JONES, P.E. CHASTAIN-SKILLMAN 205 EAST ORANGE STREET SUITE #110 LAKELAND, FL 33801-4611 (863) 646-1402</small>	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			UTILITY ADJUSTMENTS	SHEET NO.  U-16
DATE	DESCRIPTION	DATE	DESCRIPTION			ROAD NO.	COUNTY	FINANCIAL PROJECT ID		

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SCALE: 1" = 40'



MATCHLINE STA. 3432+00.00

MATCHLINE STA. 3436+60.00

PROPOSED FITTINGS TABLE			
ITEM NUMBER	DESCRIPTION	LOCATION STATION	OFFSET
1	36" 45' M.J. UNION	3434+59.5	122.8' L

\* SIZES UP TO 7.9" INCLUDES THE COST OF FITTINGS

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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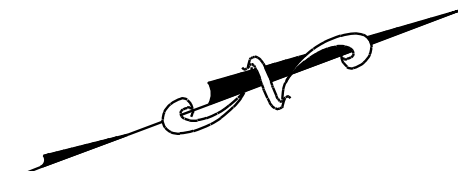
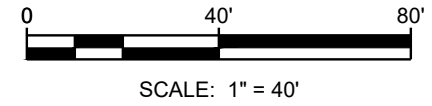
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY ADJUSTMENTS

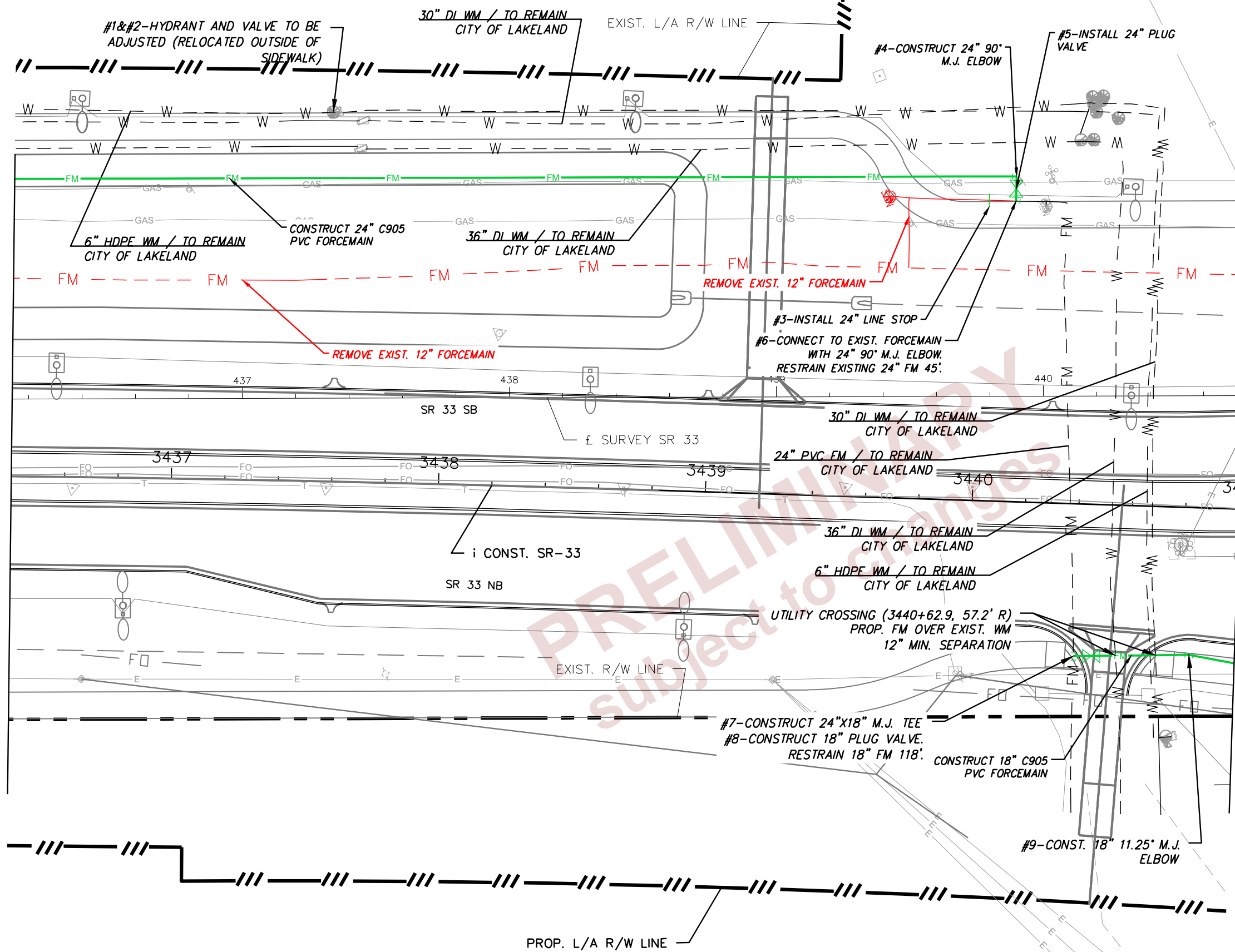
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**U-17**

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MATCHLINE STA. 3436+60.00

MATCHLINE STA. 3441+20.00



PROPOSED FITTINGS TABLE			
ITEM NUMBER	DESCRIPTION	LOCATION STATION	OFFSET
1	ADJUST EXISTING HYDRANT	3437+57.8	138.4' L
2	RELOCATE EXISTING VALVE	3437+57.8	138.4' L
3	24" LINE STOP	3440+02.8	112.6' L
4	24" 90° M.J. ELBOW	3440+12.7	121.8' L
5	24" PLUG VALVE	3440+12.7	116.3' L
6	24" 90° M.J. ELBOW	3440+12.7	112.6' L
7	24"x18" M.J. TEE	3440+39.7	57.1 R
8	18" PLUG VALVE	3440+39.7	57.1 R
9	18" 11.25° M.J. ELBOW	3440+89.3	55.2' R

\* SIZES UP TO 7.9" INCLUDES THE COST OF FITTINGS

REVISIONS			
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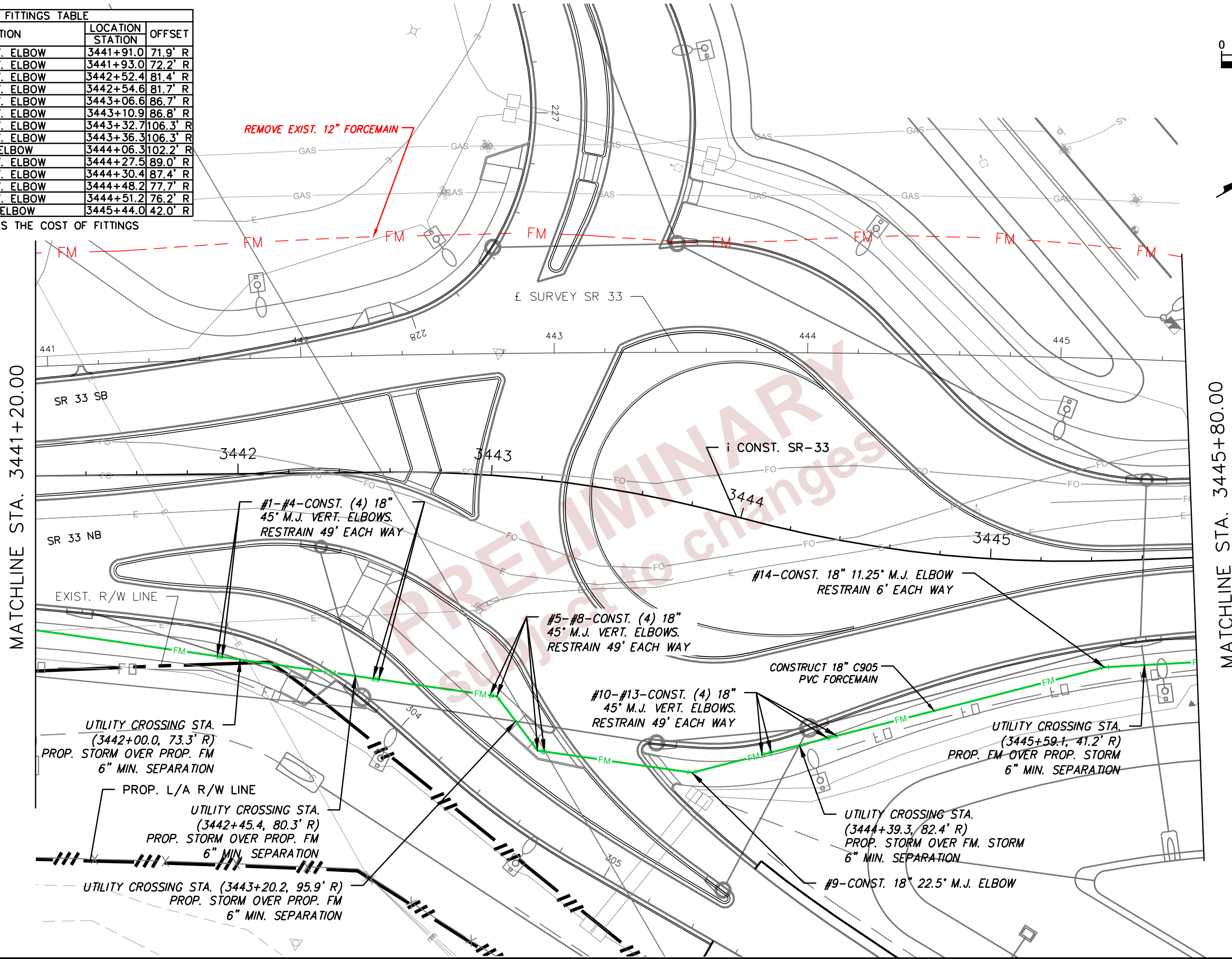
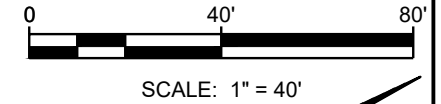
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY ADJUSTMENTS

SHEET NO.  
**U-18**

PROPOSED FITTINGS TABLE			
ITEM NUMBER	DESCRIPTION	LOCATION STATION	OFFSET
1	18" 45° VERT. ELBOW	3441+91.0	71.9' R
2	18" 45° VERT. ELBOW	3441+93.0	72.2' R
3	18" 45° VERT. ELBOW	3442+52.4	81.4' R
4	18" 45° VERT. ELBOW	3442+54.6	81.7' R
5	18" 45° VERT. ELBOW	3443+06.6	86.7' R
6	18" 45° VERT. ELBOW	3443+10.9	86.8' R
7	18" 45° VERT. ELBOW	3443+32.7	106.3' R
8	18" 45° VERT. ELBOW	3443+36.3	106.3' R
9	18" 22.5° ELBOW	3444+06.3	102.2' R
10	18" 45° VERT. ELBOW	3444+27.5	89.0' R
11	18" 45° VERT. ELBOW	3444+30.4	87.4' R
12	18" 45° VERT. ELBOW	3444+48.2	77.7' R
13	18" 45° VERT. ELBOW	3444+51.2	76.2' R
14	18" 11.25° ELBOW	3445+44.0	42.0' R

\* SIZES UP TO 7.9" INCLUDES THE COST OF FITTINGS



REVISIONS			
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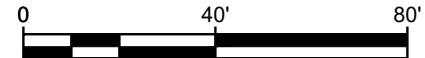
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

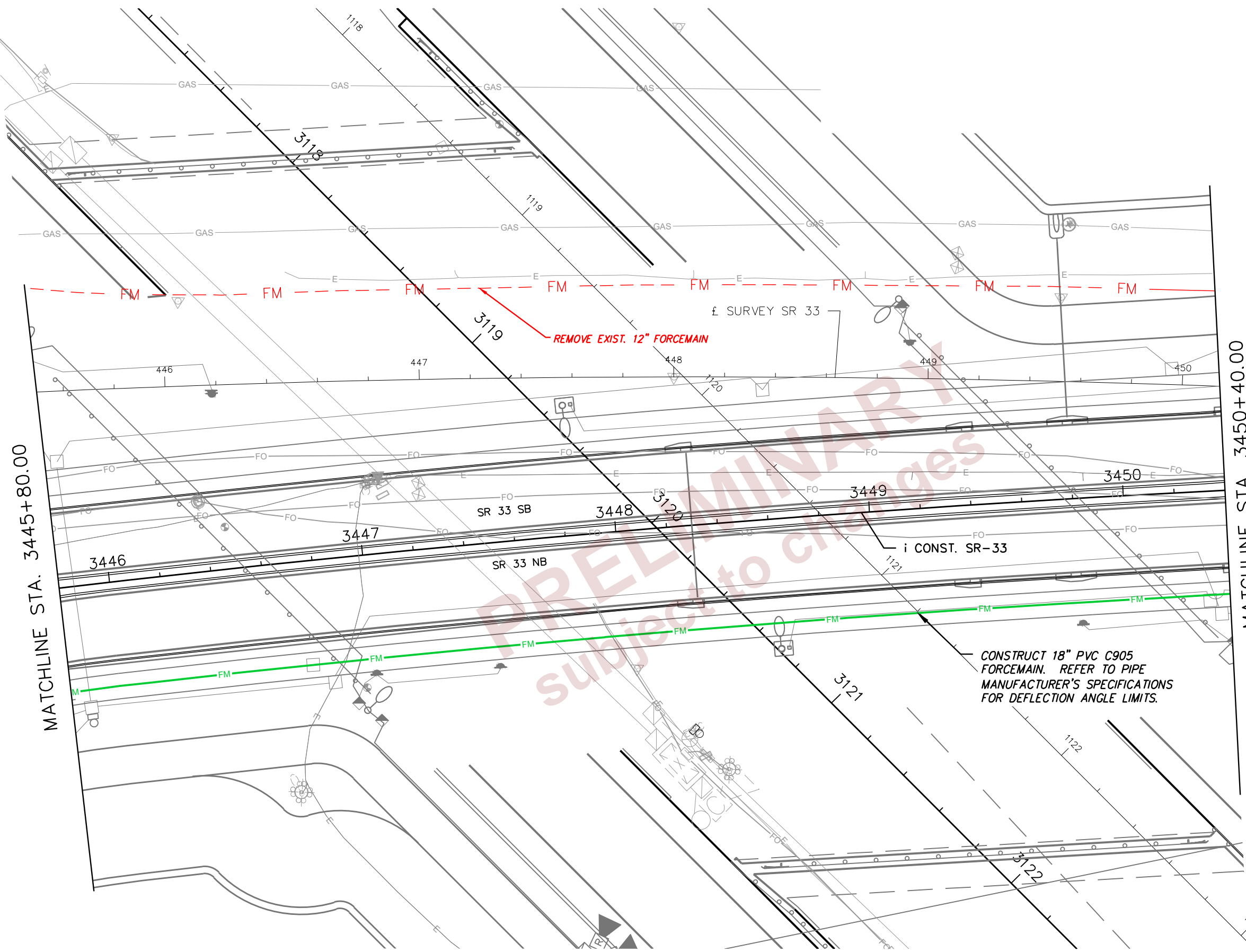
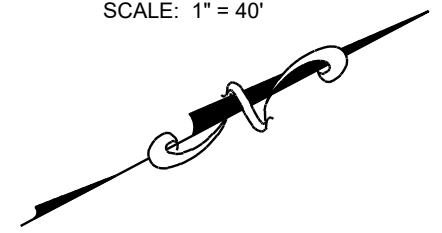
UTILITY ADJUSTMENTS

SHEET NO.
U-19

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SCALE: 1" = 40'



MATCHLINE STA. 3445+80.00

MATCHLINE STA. 3450+40.00

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subject to changes

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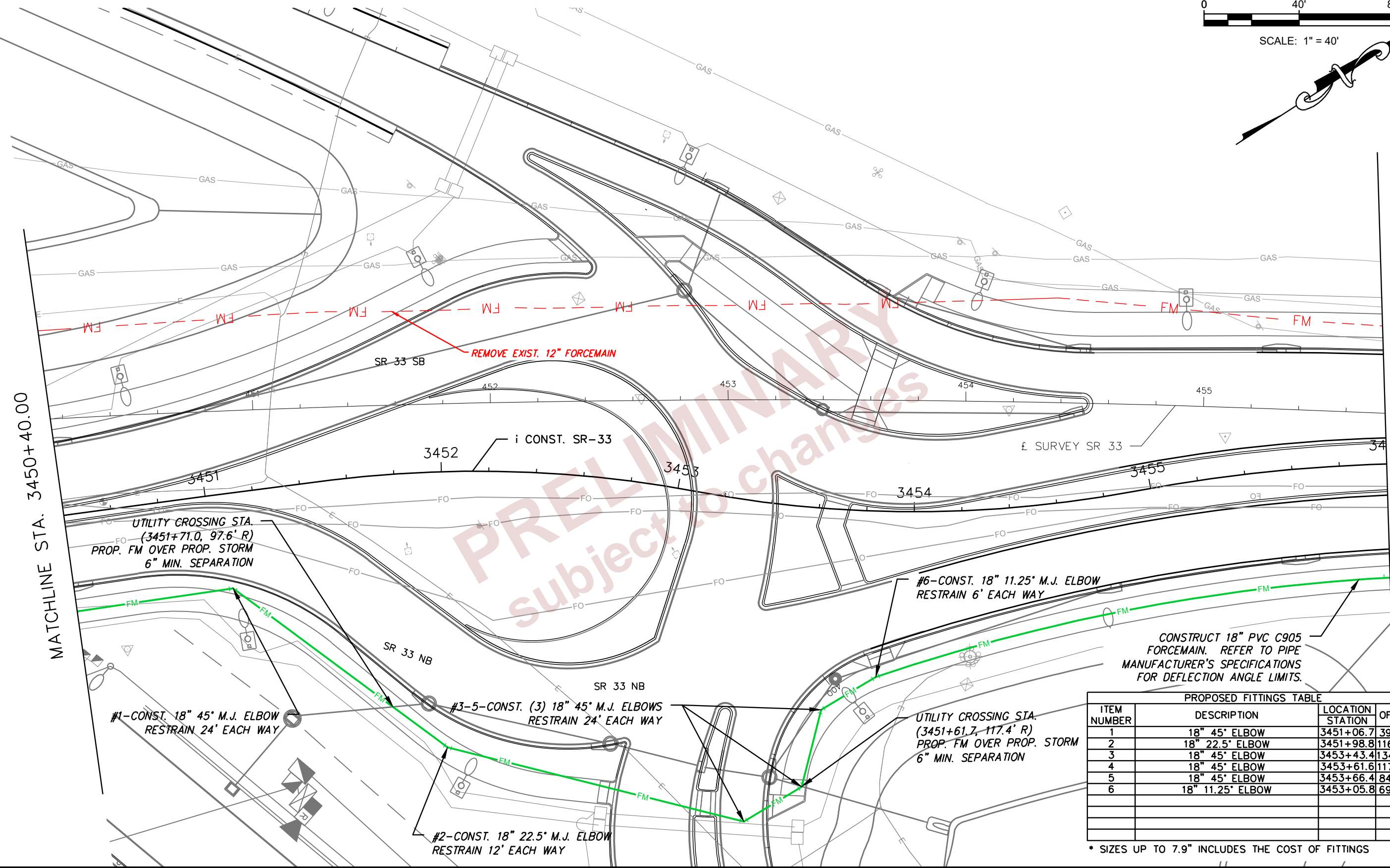
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY ADJUSTMENTS

SHEET NO.  
**U-20**

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PROPOSED FITTINGS TABLE			
ITEM NUMBER	DESCRIPTION	LOCATION STATION	OFFSET
1	18" 45° ELBOW	3451+06.7	39.9' R
2	18" 22.5° ELBOW	3451+98.8	116.0' R
3	18" 45° ELBOW	3453+43.4	134.4' R
4	18" 45° ELBOW	3453+61.6	117.6' R
5	18" 45° ELBOW	3453+66.4	84.7' R
6	18" 11.25° ELBOW	3453+05.8	69.8' R

\* SIZES UP TO 7.9" INCLUDES THE COST OF FITTINGS

REVISIONS			
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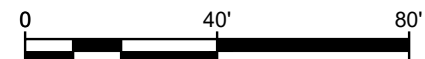
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

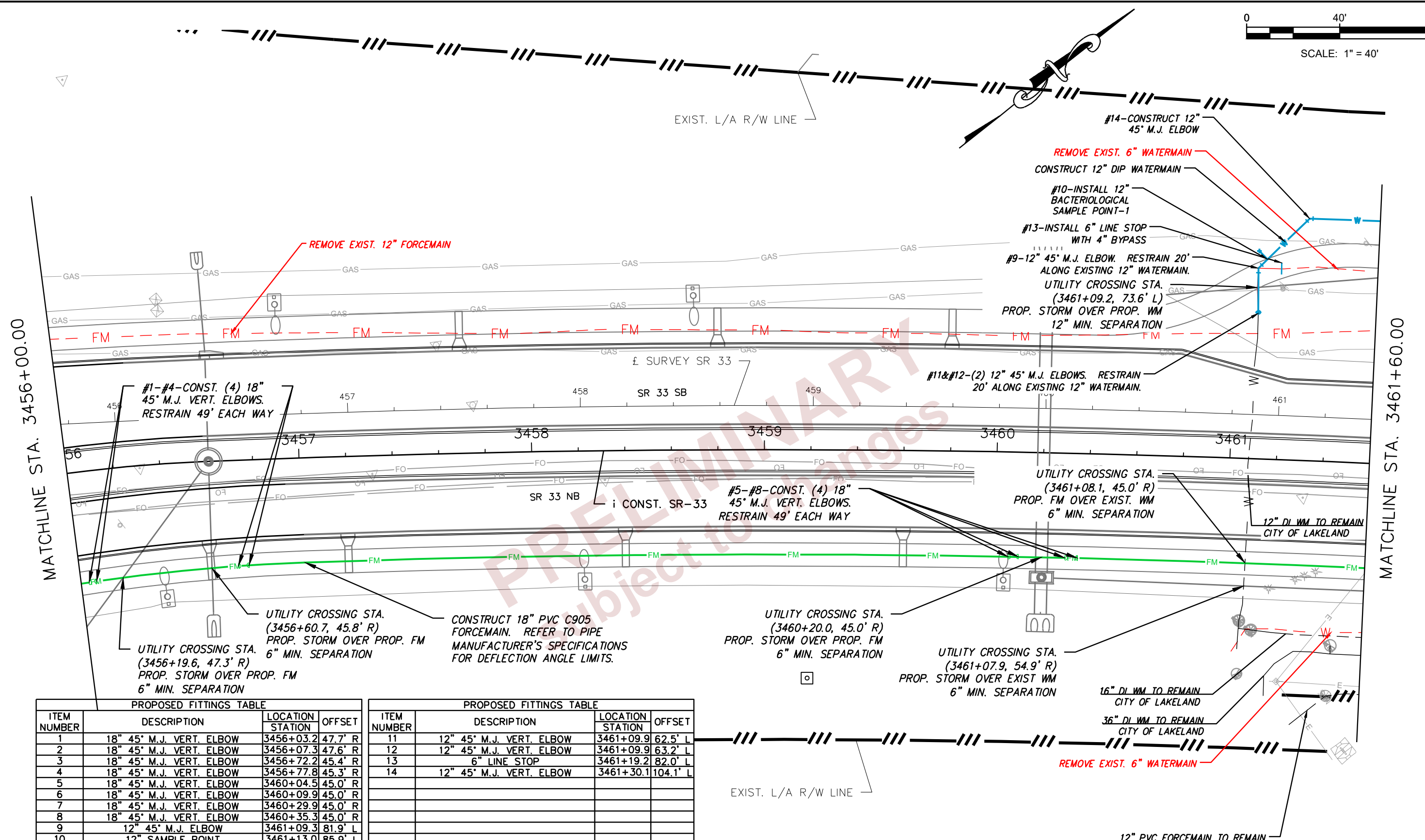
UTILITY ADJUSTMENTS

SHEET NO.  
U-21

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SCALE: 1" = 40'



PROPOSED FITTINGS TABLE

ITEM NUMBER	DESCRIPTION	LOCATION STATION	OFFSET
1	18" 45° M.J. VERT. ELBOW	3456+03.2	47.7' R
2	18" 45° M.J. VERT. ELBOW	3456+07.3	47.6' R
3	18" 45° M.J. VERT. ELBOW	3456+72.2	45.4' R
4	18" 45° M.J. VERT. ELBOW	3456+77.8	45.3' R
5	18" 45° M.J. VERT. ELBOW	3460+04.5	45.0' R
6	18" 45° M.J. VERT. ELBOW	3460+09.9	45.0' R
7	18" 45° M.J. VERT. ELBOW	3460+29.9	45.0' R
8	18" 45° M.J. VERT. ELBOW	3460+35.3	45.0' R
9	12" 45° M.J. ELBOW	3461+09.3	81.9' L
10	12" SAMPLE POINT	3461+13.0	85.9' L

PROPOSED FITTINGS TABLE

ITEM NUMBER	DESCRIPTION	LOCATION STATION	OFFSET
11	12" 45° M.J. VERT. ELBOW	3461+09.9	62.5' L
12	12" 45° M.J. VERT. ELBOW	3461+09.9	63.2' L
13	6" LINE STOP	3461+19.2	82.0' L
14	12" 45° M.J. VERT. ELBOW	3461+30.1	104.1' L

\* SIZES UP TO 7.9" INCLUDES THE COST OF FITTINGS

REVISIONS

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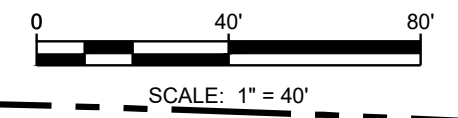
STATE OF FLORIDA  
 DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY ADJUSTMENTS

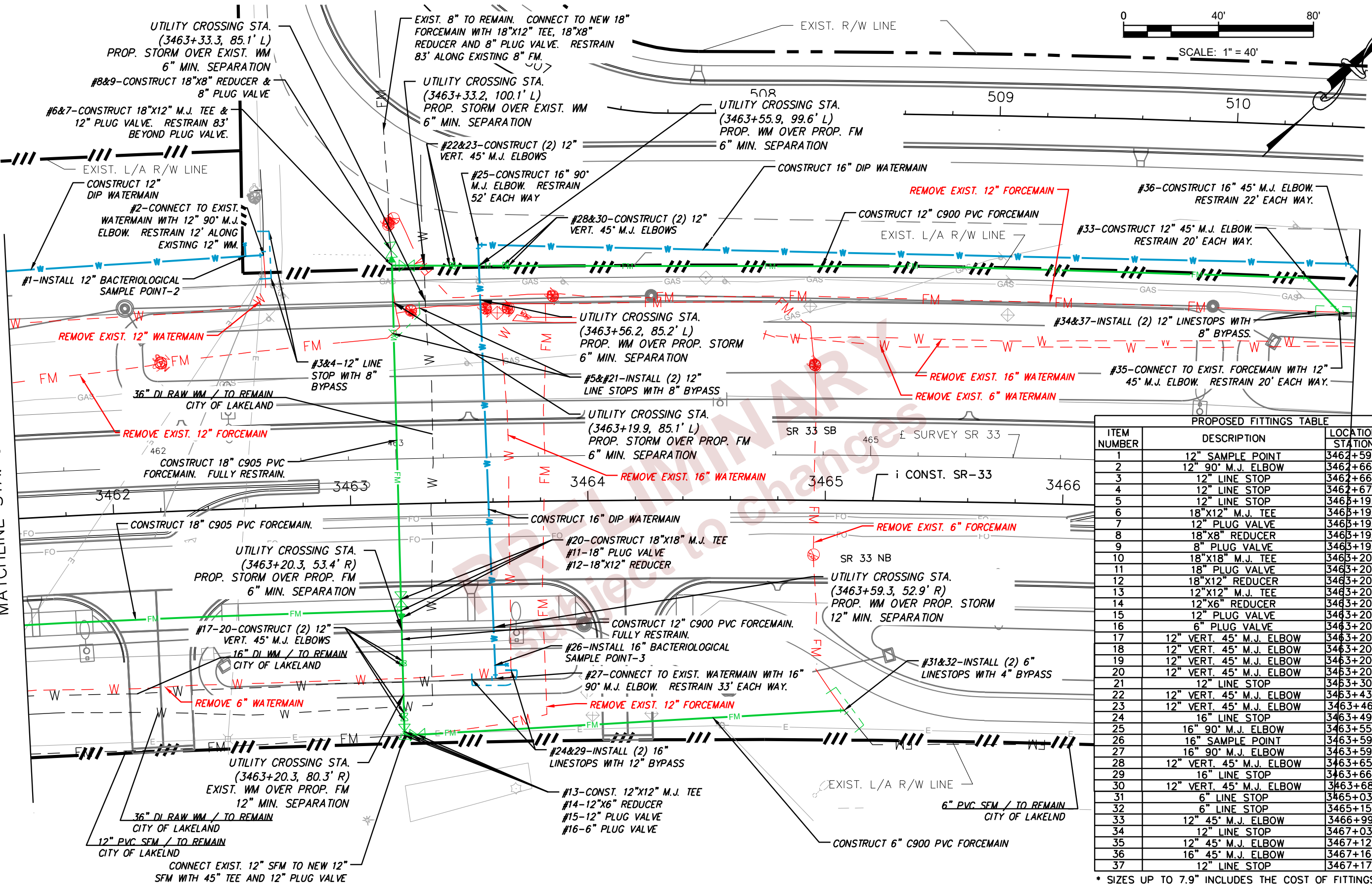
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 U-22

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MATCHLINE STA. 3461+60.00

MATCHLINE STA. 3467+20.00



PROPOSED FITTINGS TABLE			
ITEM NUMBER	DESCRIPTION	LOCATION STATION	OFFSET
1	12" SAMPLE POINT	3462+59.4	106.2' L
2	12" 90° M.J. ELBOW	3462+66.9	106.4' L
3	12" LINE STOP	3462+66.9	116.4' L
4	12" LINE STOP	3462+67.3	96.5' L
5	12" LINE STOP	3463+19.5	71.9' L
6	18"x12" M.J. TEE	3463+19.9	100.4' L
7	12" PLUG VALVE	3463+19.9	100.4' L
8	18"x8" REDUCER	3463+19.9	100.4' L
9	8" PLUG VALVE	3463+19.9	100.4' L
10	18"x18" M.J. TEE	3463+20.3	45.0' R
11	18" PLUG VALVE	3463+20.3	45.0' R
12	18"x12" REDUCER	3463+20.3	45.0' R
13	12"x12" M.J. TEE	3463+20.3	97.6' R
14	12"x6" REDUCER	3463+20.3	97.6' R
15	12" PLUG VALVE	3463+20.3	97.6' R
16	6" PLUG VALVE	3463+20.3	97.6' R
17	12" VERT. 45° M.J. ELBOW	3463+20.3	66.2' R
18	12" VERT. 45° M.J. ELBOW	3463+20.4	68.3' R
19	12" VERT. 45° M.J. ELBOW	3463+20.4	88.3' R
20	12" VERT. 45° M.J. ELBOW	3463+20.5	91.5' R
21	12" LINE STOP	3463+30.8	82.3' L
22	12" VERT. 45° M.J. ELBOW	3463+43.7	99.9' L
23	12" VERT. 45° M.J. ELBOW	3463+46.1	99.8' L
24	16" LINE STOP	3463+49.6	74.6' R
25	16" 90° M.J. ELBOW	3463+55.8	108.4' L
26	16" SAMPLE POINT	3463+59.6	68.8' R
27	16" 90° M.J. ELBOW	3463+59.7	74.4' R
28	12" VERT. 45° M.J. ELBOW	3463+65.7	99.4' L
29	16" LINE STOP	3463+66.4	71.0' R
30	12" VERT. 45° M.J. ELBOW	3463+68.1	99.4' L
31	6" LINE STOP	3465+03.0	80.2' R
32	6" LINE STOP	3465+15.2	96.2' R
33	12" 45° M.J. ELBOW	3466+99.1	98.7' L
34	12" LINE STOP	3467+03.0	84.7' L
35	12" 45° M.J. ELBOW	3467+12.8	84.7' L
36	16" 45° M.J. ELBOW	3467+16.2	105.3' L
37	12" LINE STOP	3467+17.9	84.8' L

\* SIZES UP TO 7.9" INCLUDES THE COST OF FITTINGS

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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DOUGLAS E. JONES, P.E.  
CHASTAIN-SKILLMAN  
205 EAST ORANGE STREET  
SUITE #110  
LAKELAND, FL 33801-4611  
(863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

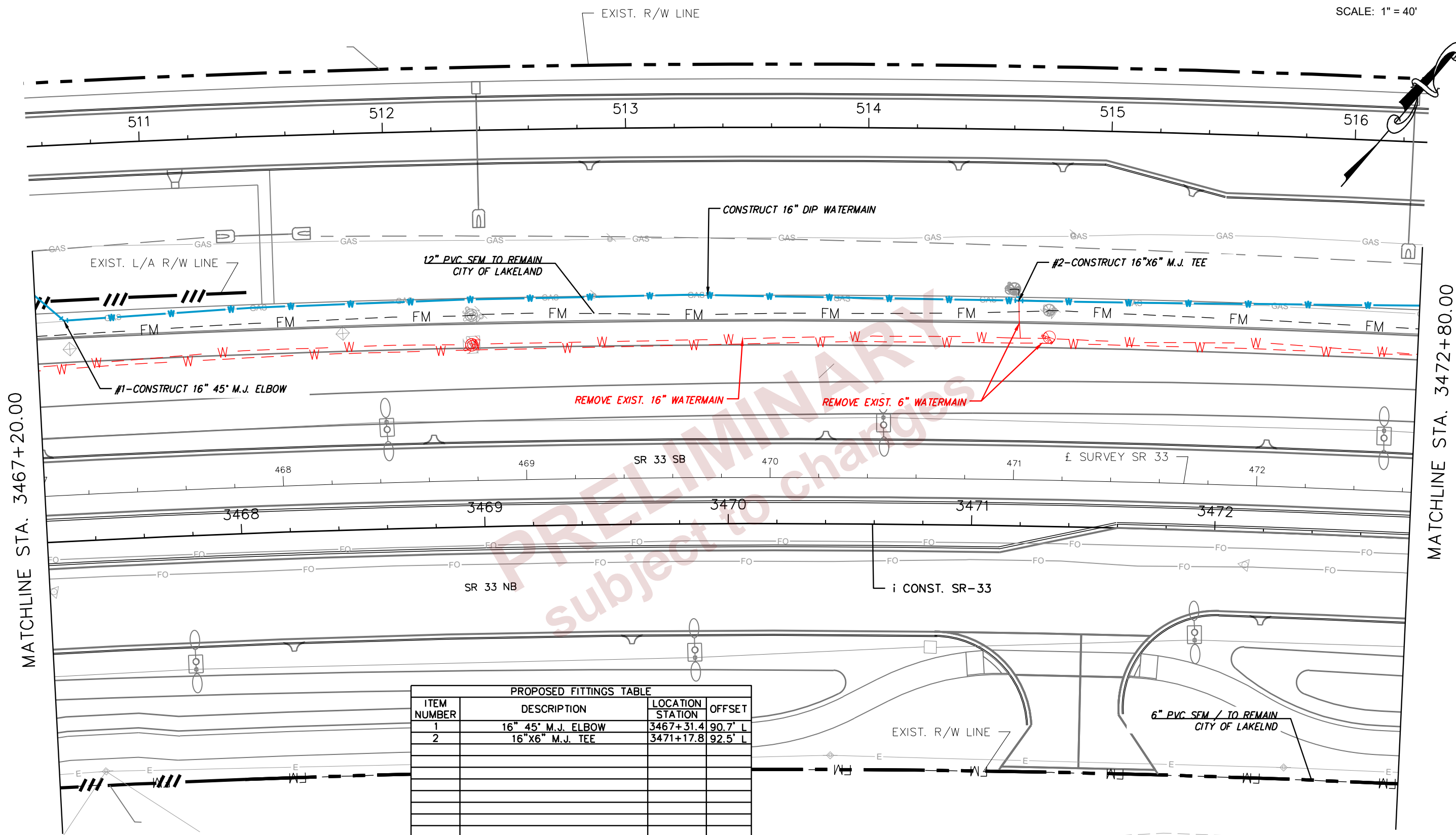
UTILITY ADJUSTMENTS

SHEET NO.
U-23

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SCALE: 1" = 40'



MATCHLINE STA. 3467+20.00

MATCHLINE STA. 3472+80.00

PROPOSED FITTINGS TABLE			
ITEM NUMBER	DESCRIPTION	LOCATION STATION	OFFSET
1	16" 45° M.J. ELBOW	3467+31.4	90.7' L
2	16"X6" M.J. TEE	3471+17.8	92.5' L

\* SIZES UP TO 7.9" INCLUDES THE COST OF FITTINGS

REVISIONS			
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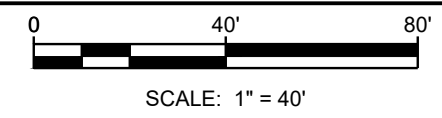
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY ADJUSTMENTS

SHEET NO.  
**U-24**

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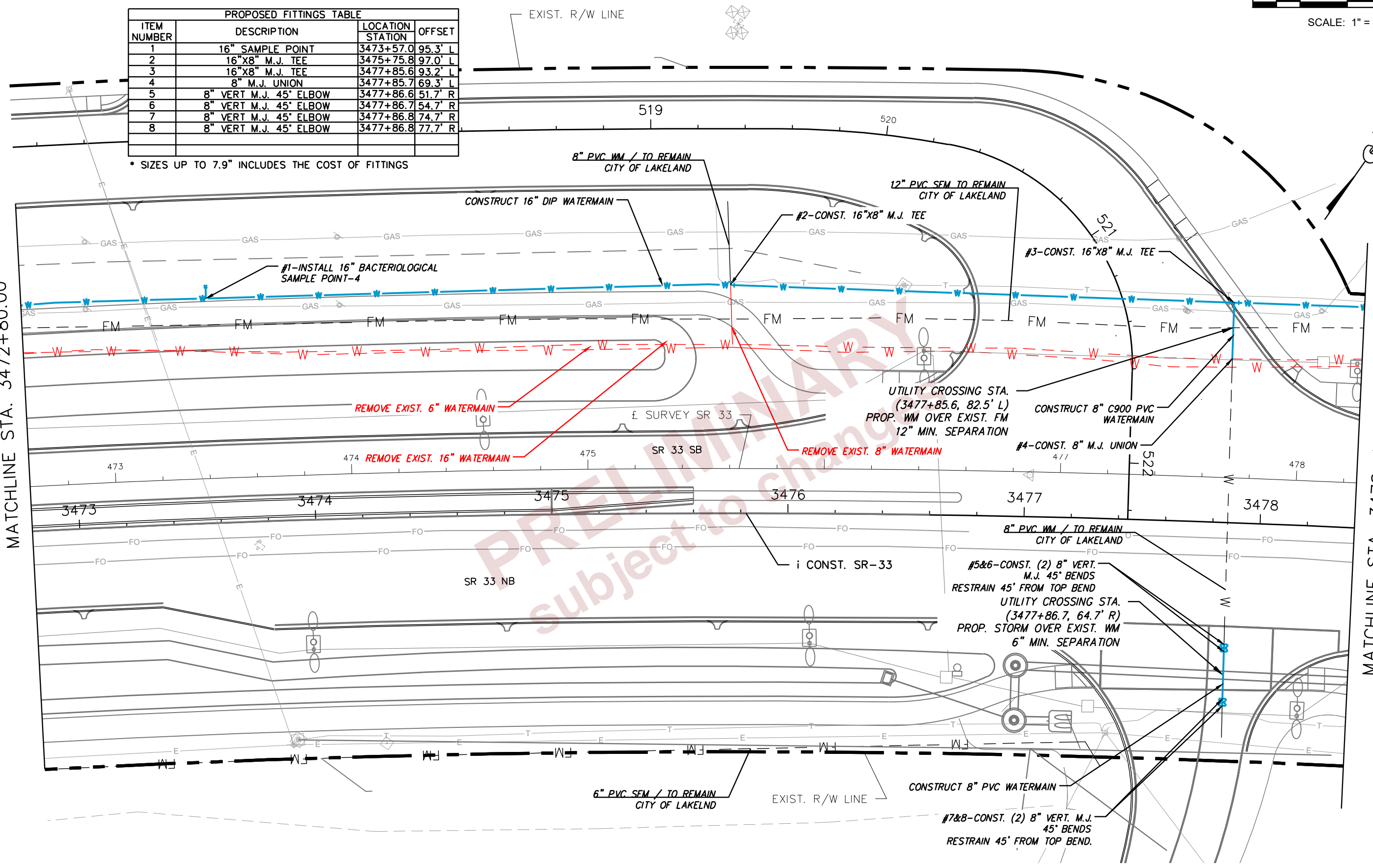


PROPOSED FITTINGS TABLE			
ITEM NUMBER	DESCRIPTION	LOCATION STATION	OFFSET
1	16" SAMPLE POINT	3473+57.0	95.3' L
2	16"x8" M.J. TEE	3475+75.8	97.0' L
3	16"x8" M.J. TEE	3477+85.6	93.2' L
4	8" M.J. UNION	3477+85.7	69.3' L
5	8" VERT M.J. 45° ELBOW	3477+86.6	51.7' R
6	8" VERT M.J. 45° ELBOW	3477+86.7	54.7' R
7	8" VERT M.J. 45° ELBOW	3477+86.8	74.7' R
8	8" VERT M.J. 45° ELBOW	3477+86.8	77.7' R

\* SIZES UP TO 7.9" INCLUDES THE COST OF FITTINGS

MATCHLINE STA. 3472+80.00

MATCHLINE STA. 3478+40.00



REVISIONS			
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
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SR 400	POLK	430185-3-56-01

UTILITY ADJUSTMENTS	
SHEET NO. U-25	

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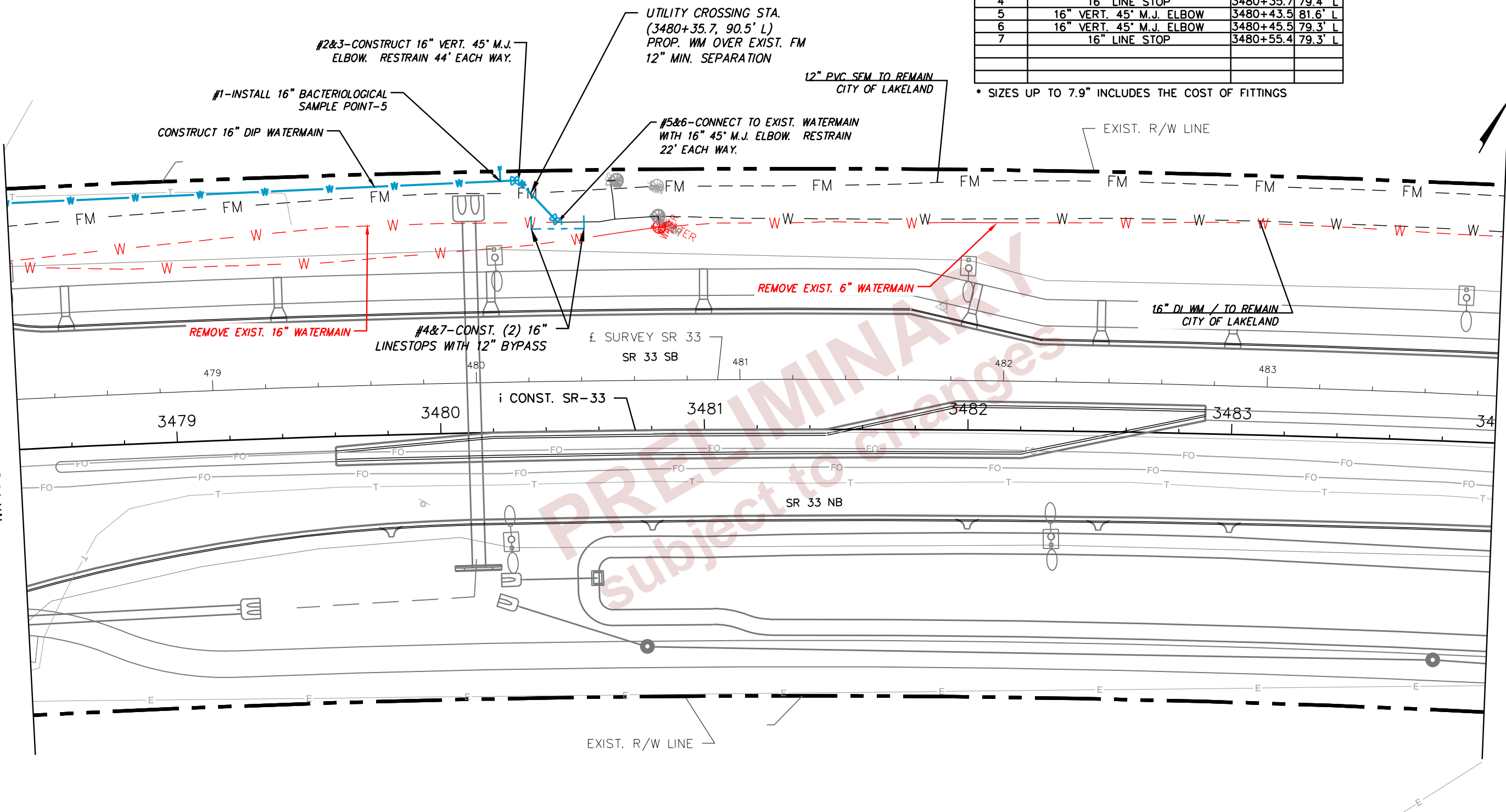
SCALE: 1" = 40'

PROPOSED FITTINGS TABLE			
ITEM NUMBER	DESCRIPTION	LOCATION STATION	OFFSET
1	16" SAMPLE POINT	3480+24.4	95.2' L
2	16" VERT. 45° M.J. ELBOW	3480+28.3	95.3' L
3	16" VERT. 45° M.J. ELBOW	3480+31.2	95.4' L
4	16" LINE STOP	3480+35.7	79.4' L
5	16" VERT. 45° M.J. ELBOW	3480+43.5	81.6' L
6	16" VERT. 45° M.J. ELBOW	3480+45.5	79.3' L
7	16" LINE STOP	3480+55.4	79.3' L

\* SIZES UP TO 7.9" INCLUDES THE COST OF FITTINGS

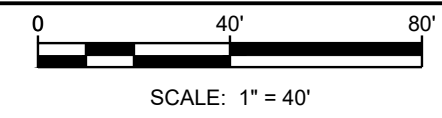
MATCHLINE STA. 3478+40.00

MATCHLINE STA. 3484+00.00



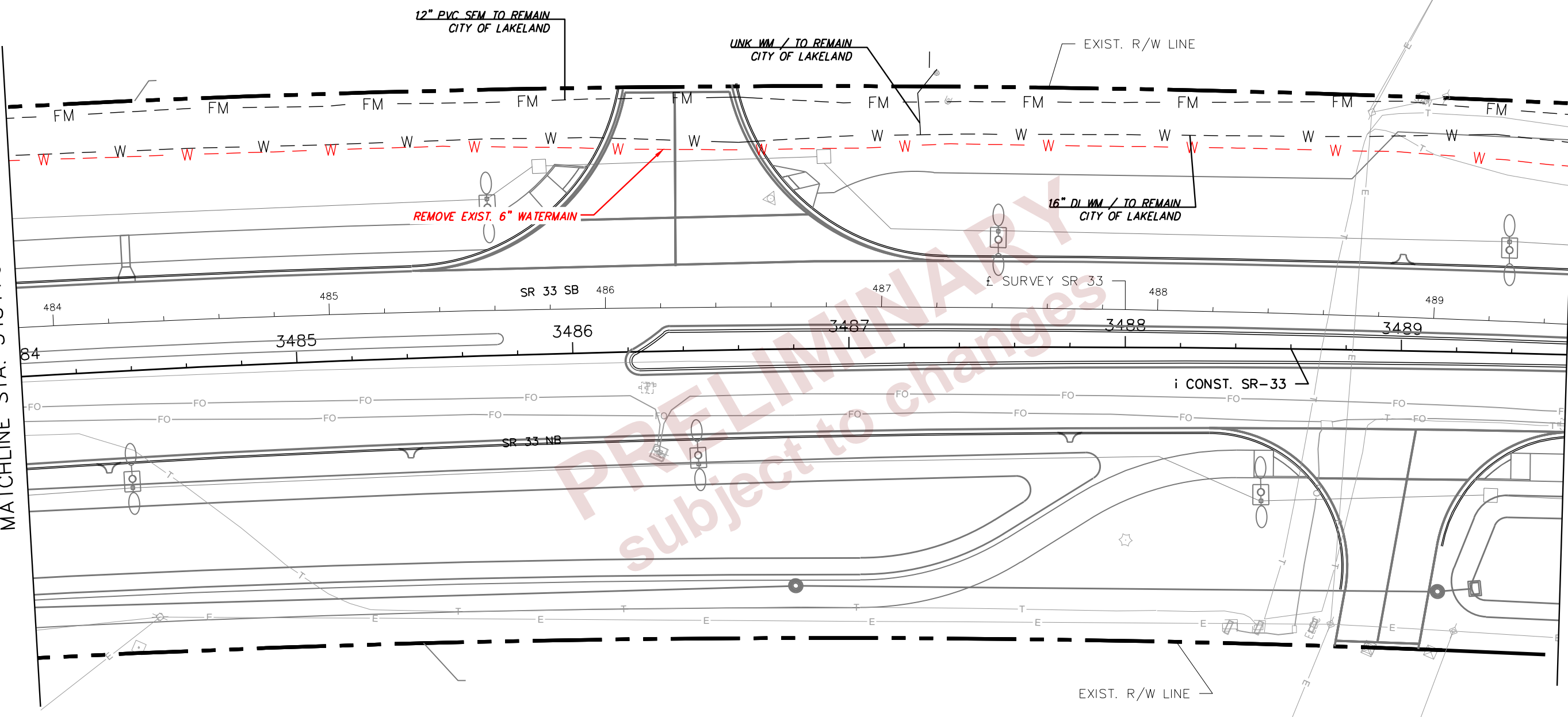
REVISIONS				<small>Douglas E. Jones State of Florida, Professional Engineer,          License No. 58077          This form has been digitally signed and sealed by Douglas E. Jones on the date indicated here.          Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.</small>	<small>DOUGLAS E. JONES, P.E.          CHASTAIN-SKILLMAN          205 EAST ORANGE STREET          SUITE #110          LAKELAND, FL 33801-4611          (863) 646-1402</small>	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			UTILITY ADJUSTMENTS	SHEET NO.  U-26
DATE	DESCRIPTION	DATE	DESCRIPTION			ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
						SR 400	POLK	430185-3-56-01		

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MATCHLINE STA. 3484+00.00

MATCHLINE STA. 3489+60.00



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 subject to changes

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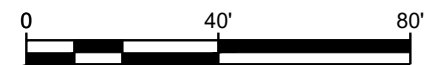
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

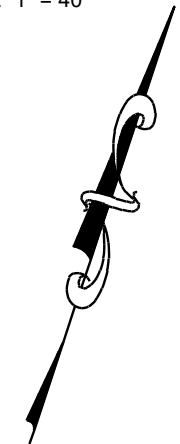
UTILITY ADJUSTMENTS
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SHEET NO.
U-27

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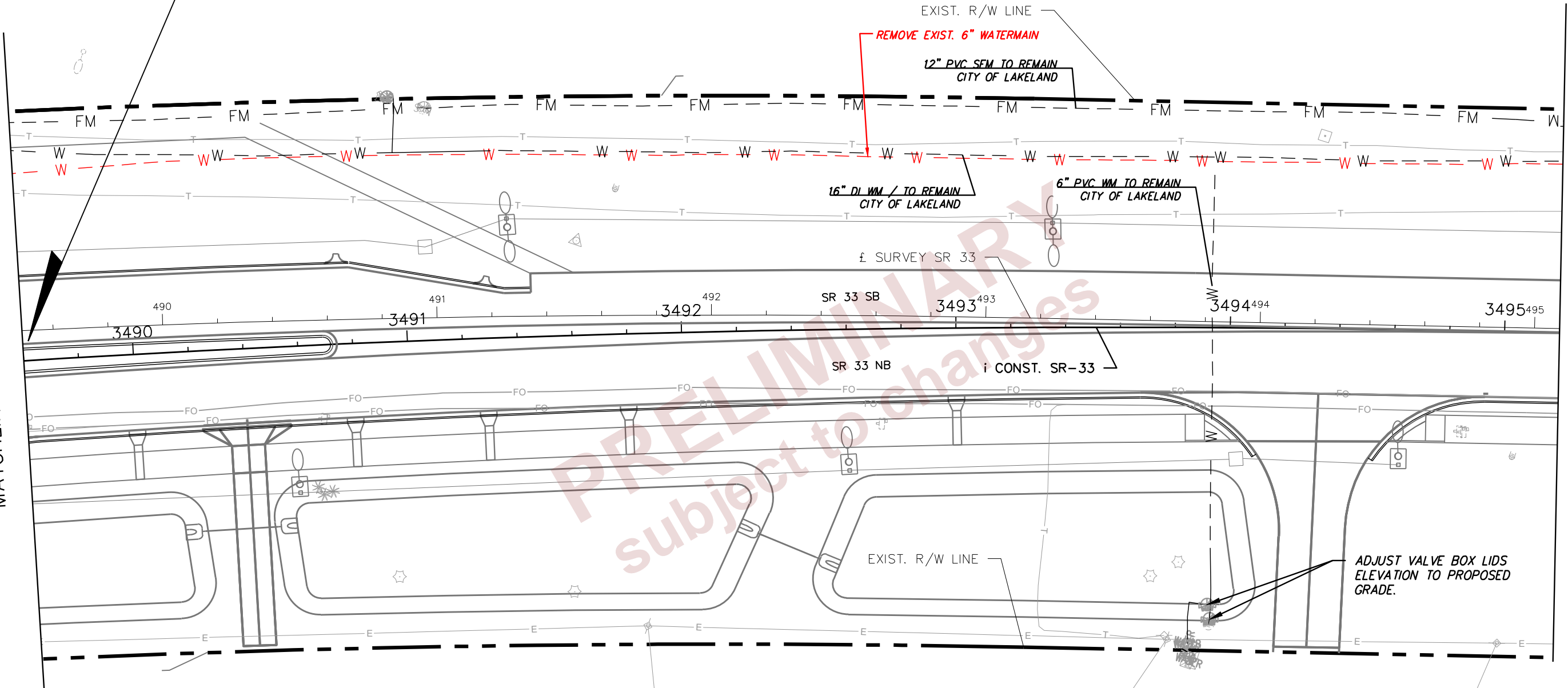
SCALE: 1" = 40'



END of CONST. SR 33 NB  
 STA. 2489+32.25 of CONST. SR 33 NB =  
 STA. 1489+49.14 of CONST. SR 33 SB =  
 STA. 489+50.73 (4.00' RT.) of SURVEY SR 33

MATCHLINE STA. 3489+60.00

MATCHLINE STA. 3495+20.00



PRELIMINARY  
 subject to changes

REVISIONS			
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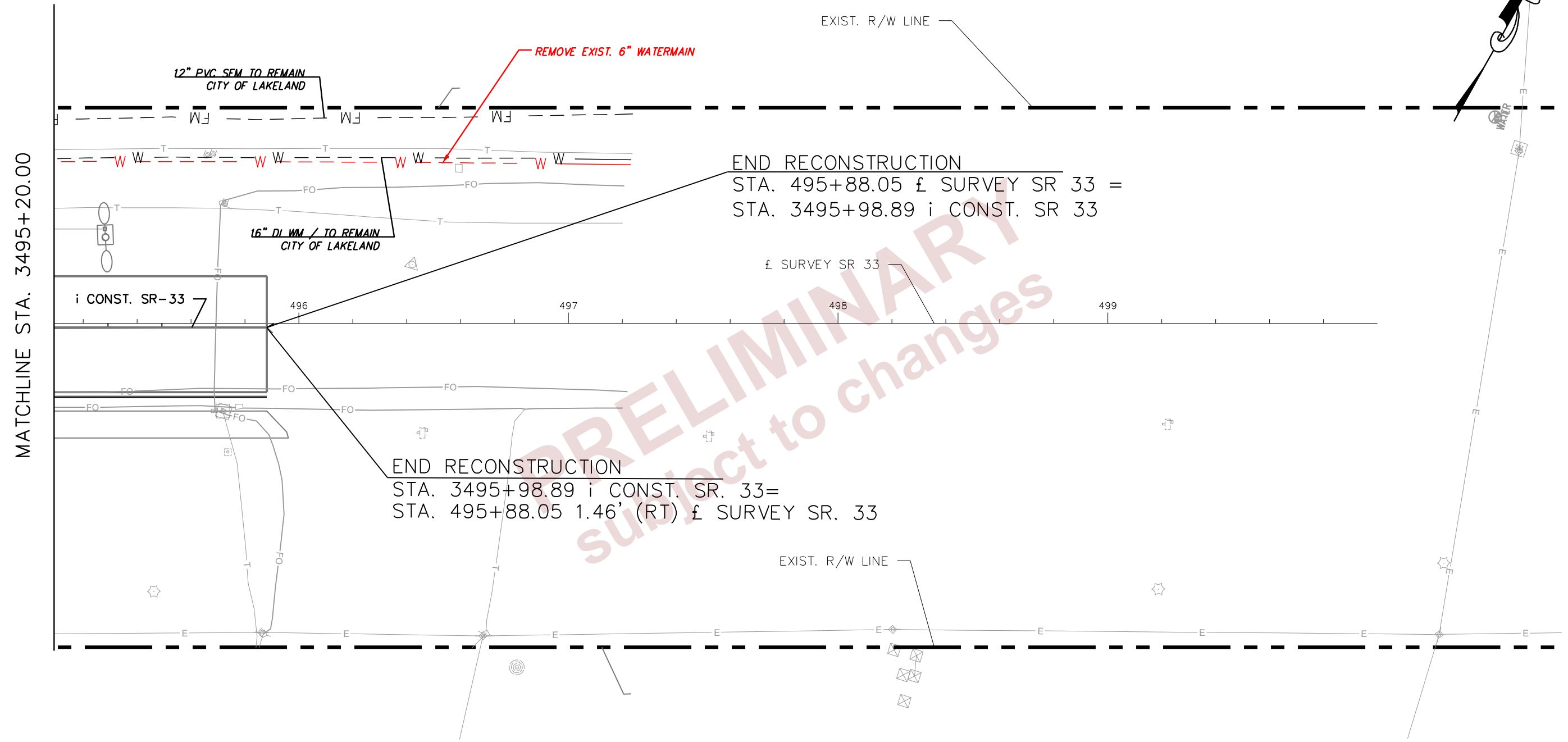
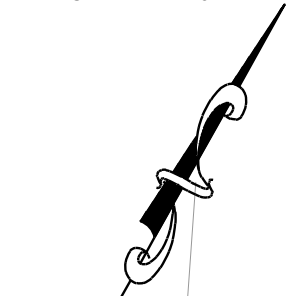
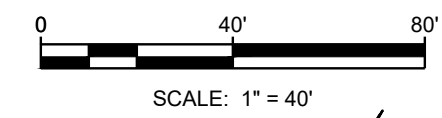
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UTILITY ADJUSTMENTS

SHEET NO.  
**U-28**

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MATCHLINE STA. 3495+20.00

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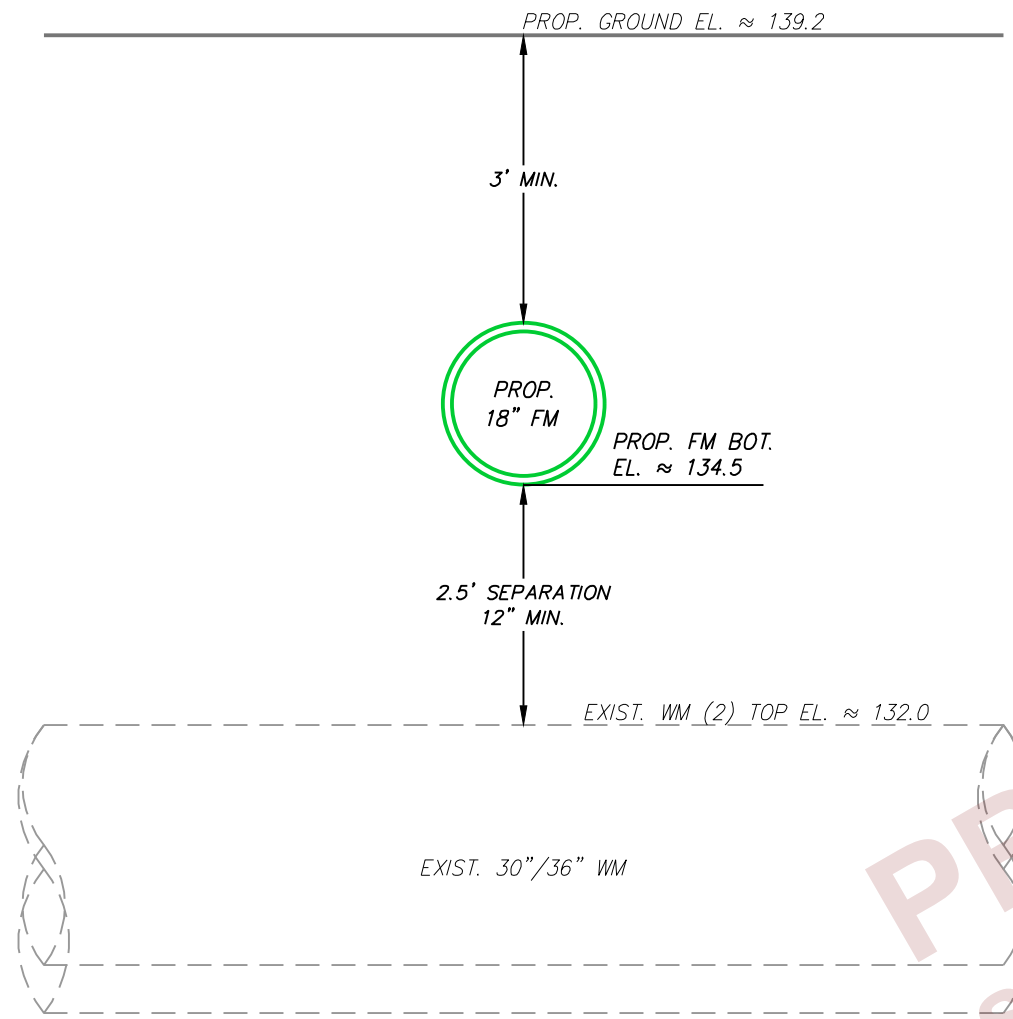
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

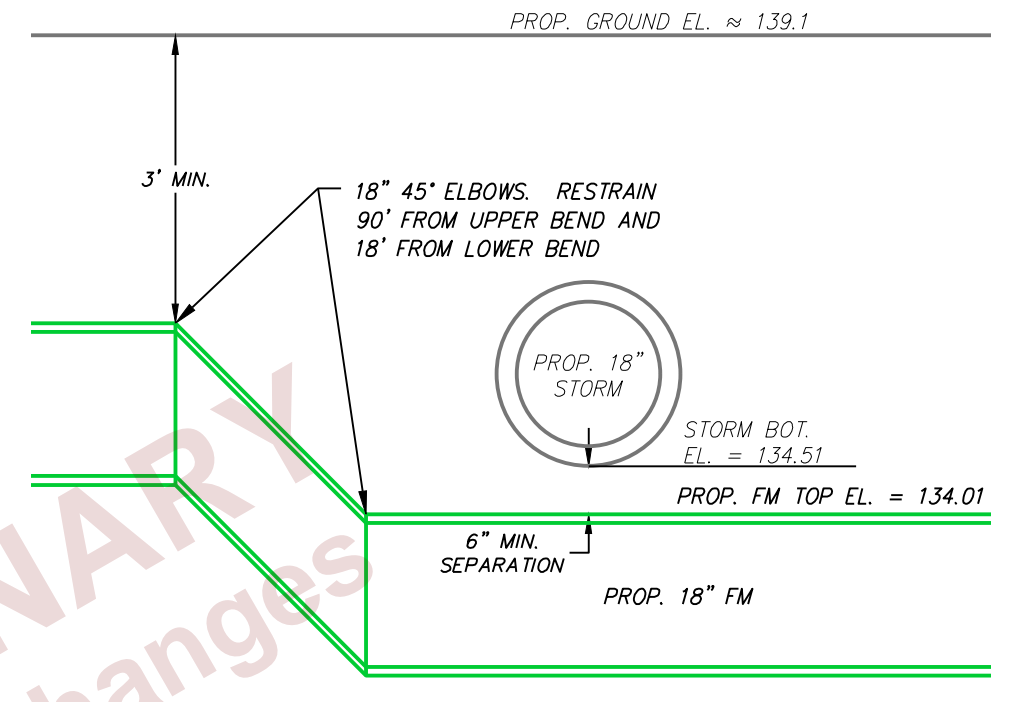
UTILITY ADJUSTMENTS
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SHEET NO.
U-29

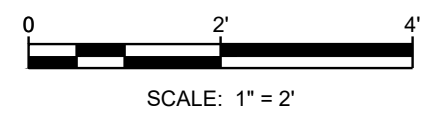
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UTILITY CROSSING DETAIL: STA. 3440+62.9, 57.2' R



UTILITY CROSSING DETAIL: STA. 3442+00.0, 73.3' R



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

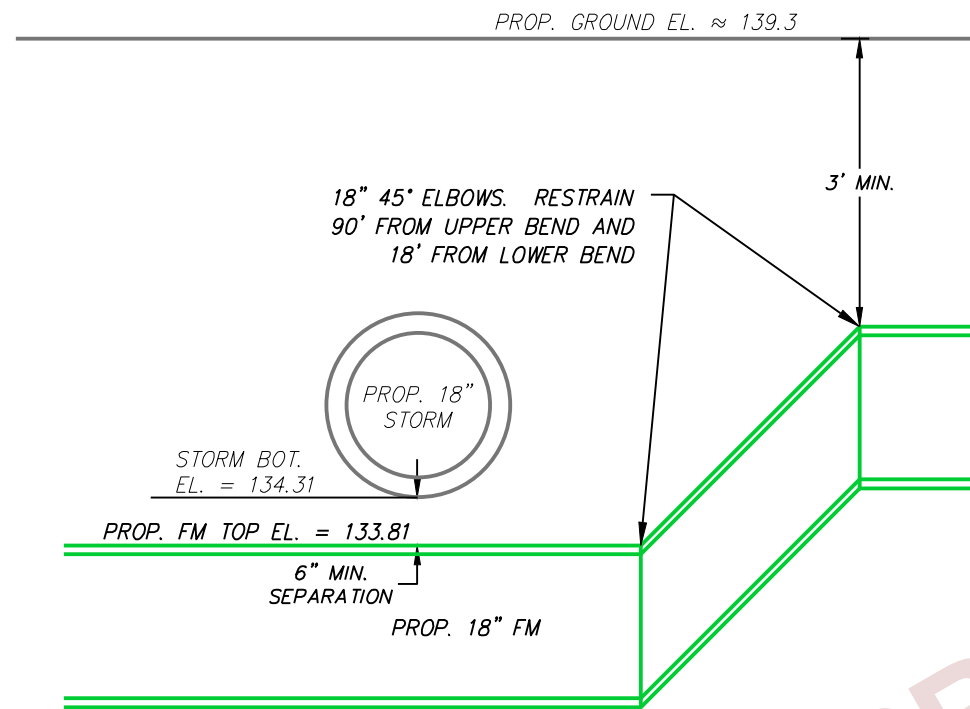
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

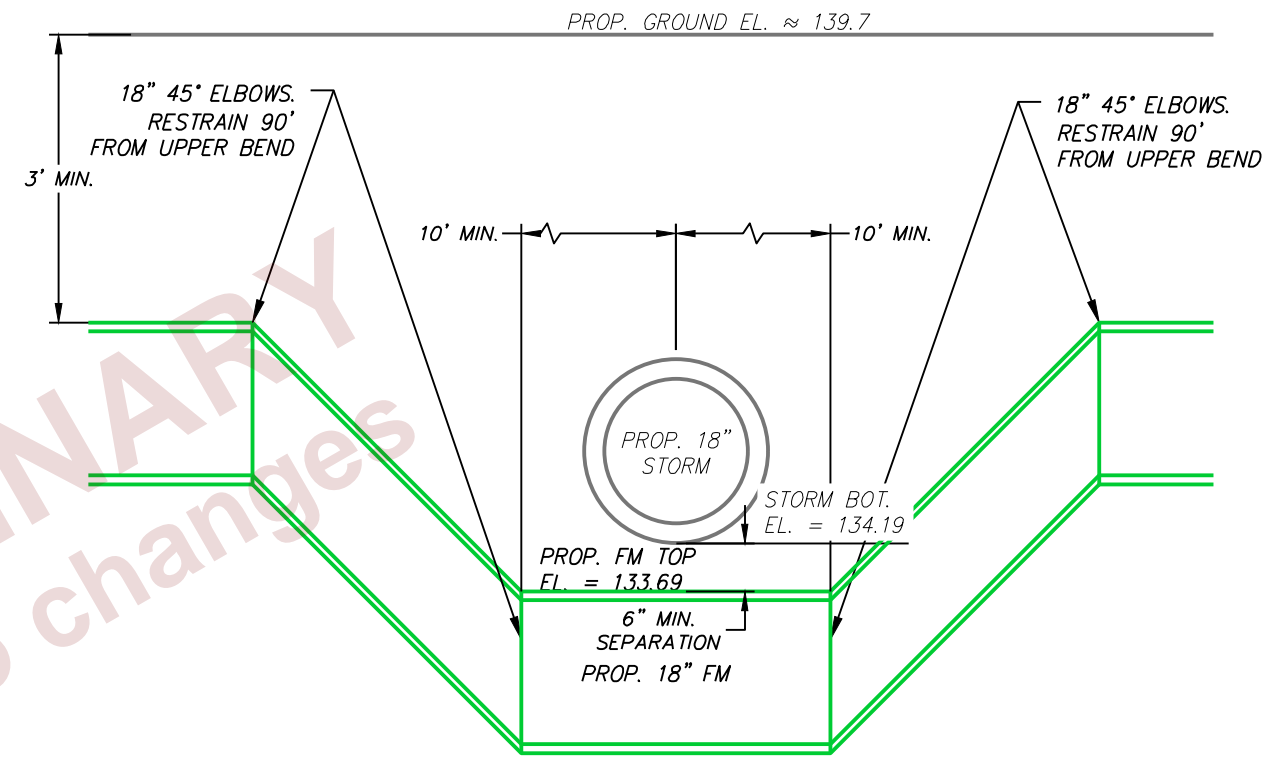
UTILITY CROSSING DETAILS

SHEET NO.  
**U-30**

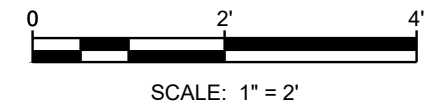
THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



UTILITY CROSSING DETAIL: STA. 3442+45.4, 80.3' R



UTILITY CROSSING DETAIL: STA. 3443+20.2, 95.9' R



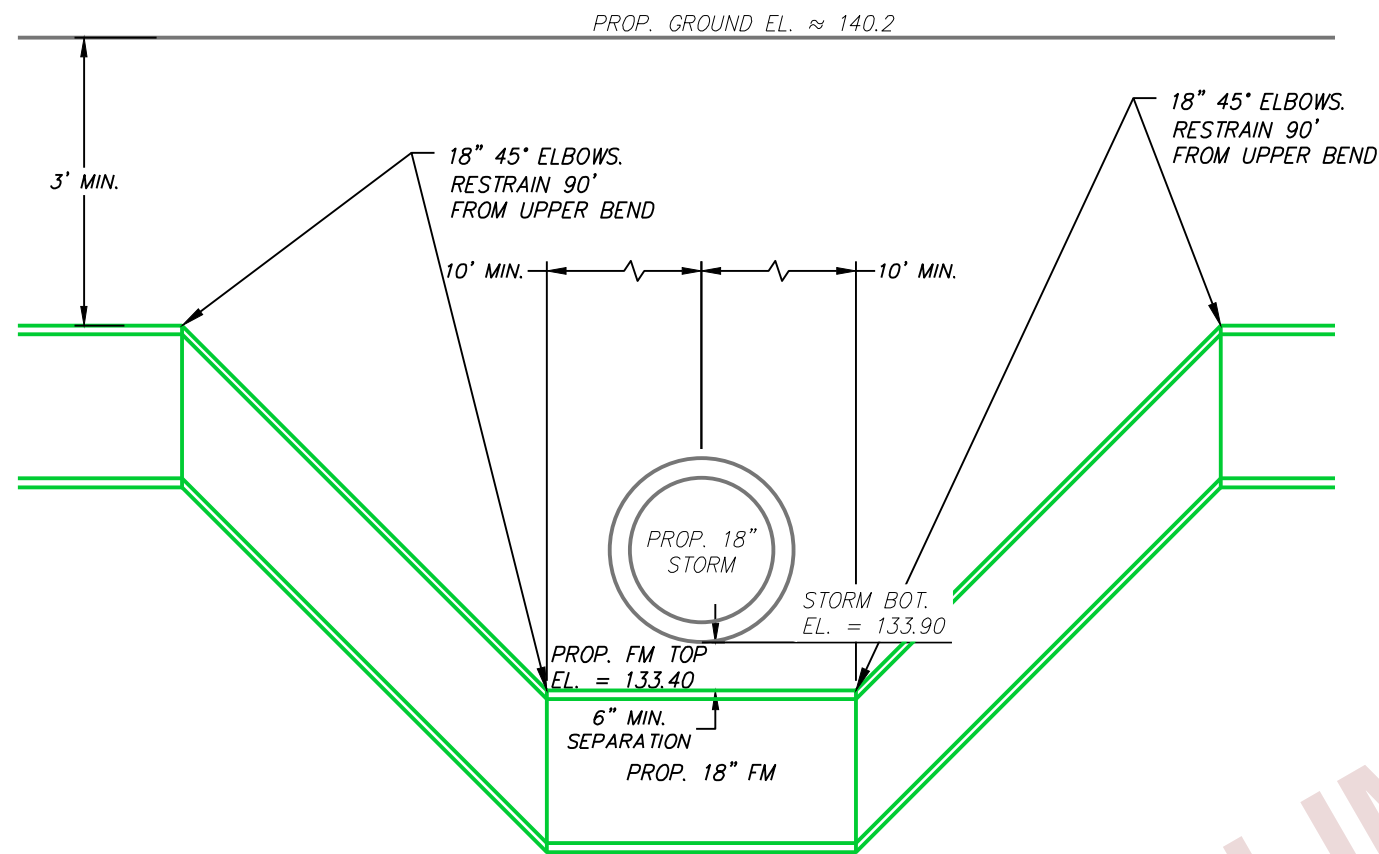
PRELIMINARY  
 subject to changes

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

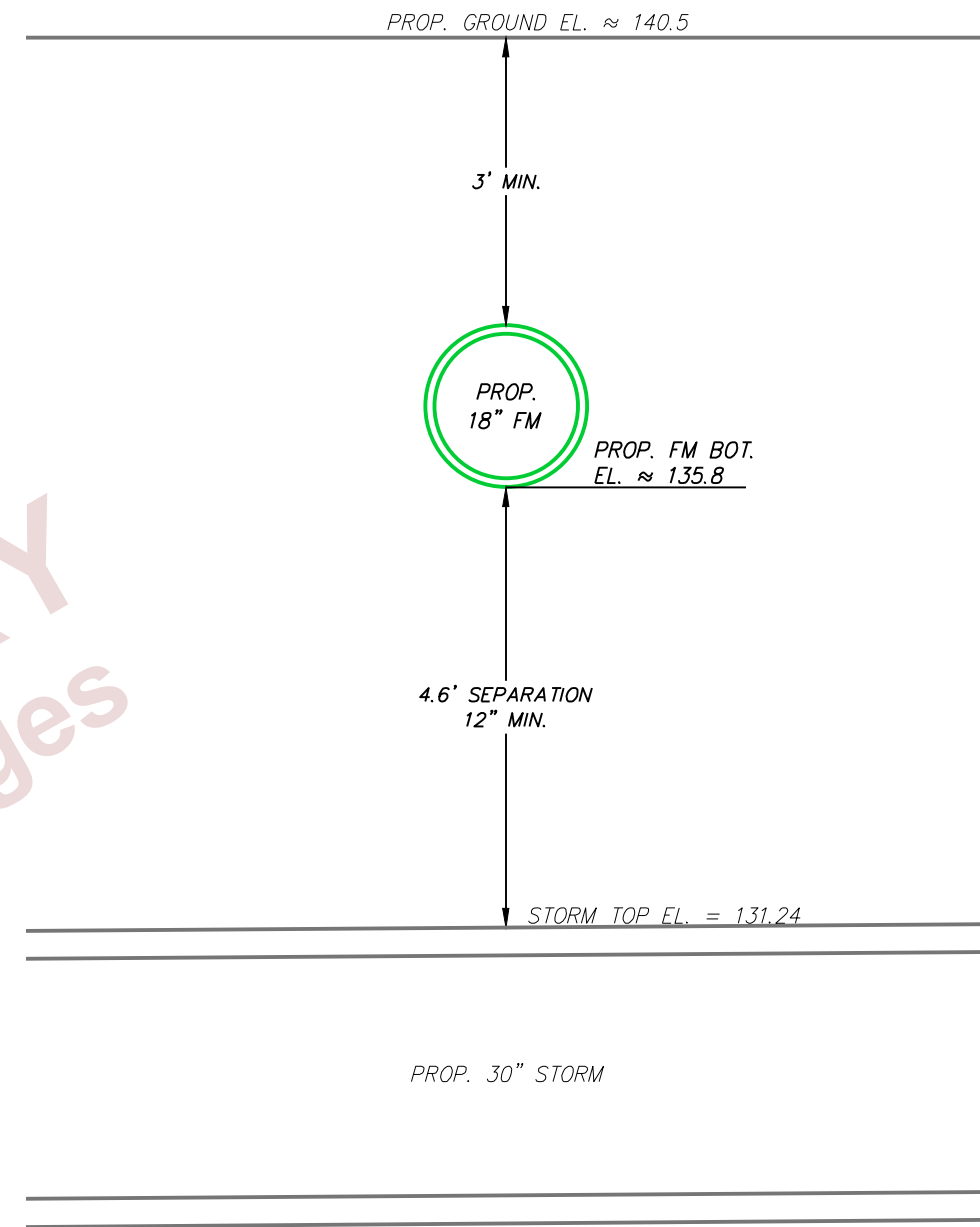
DOUGLAS E. JONES, P.E. CHASTAIN-SKILLMAN 205 EAST ORANGE STREET SUITE #110 LAKELAND, FL 33801-4611 (863) 646-1402			STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID	UTILITY CROSSING DETAILS		
SR 400	POLK	430185-3-56-01			

SHEET NO. <b>U-31</b>
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UTILITY CROSSING DETAIL: STA. 3444+39.3, 82.4' R



UTILITY CROSSING DETAIL: STA. 3445+59.1, 41.2' R



SCALE: 1" = 2'

PRELIMINARY  
subject to changes

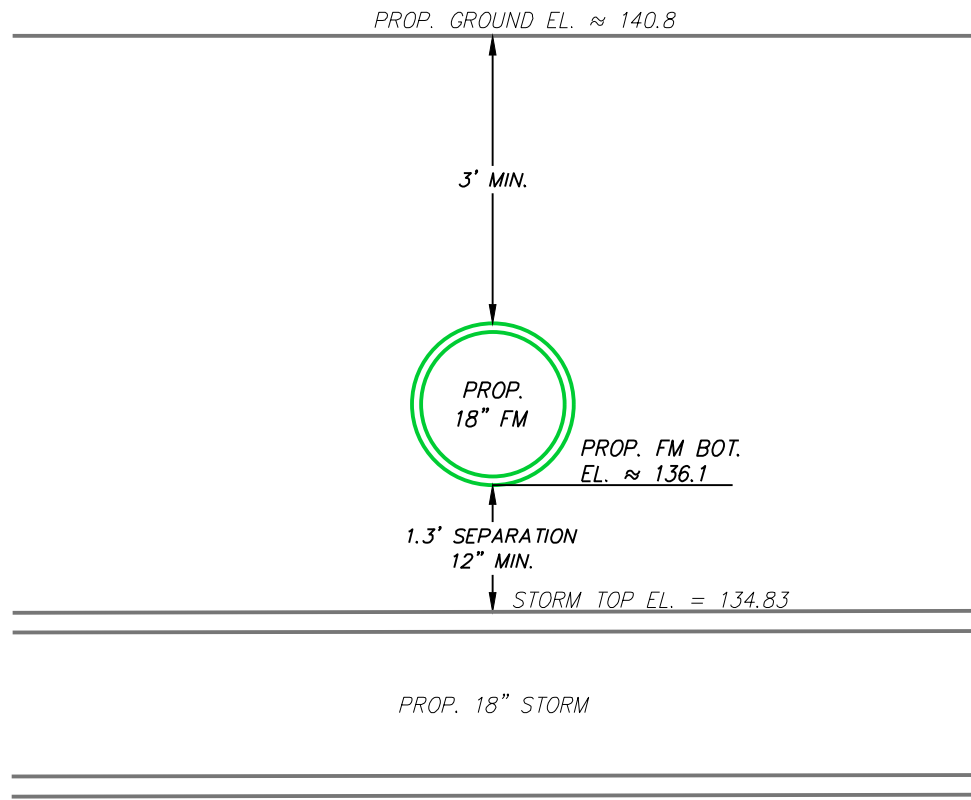
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

DOUGLAS E. JONES, P.E. CHASTAIN-SKILLMAN 205 EAST ORANGE STREET SUITE #110 LAKELAND, FL 33801-4611 (863) 646-1402			STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID	UTILITY CROSSING DETAILS		
SR 400	POLK	430185-3-56-01			

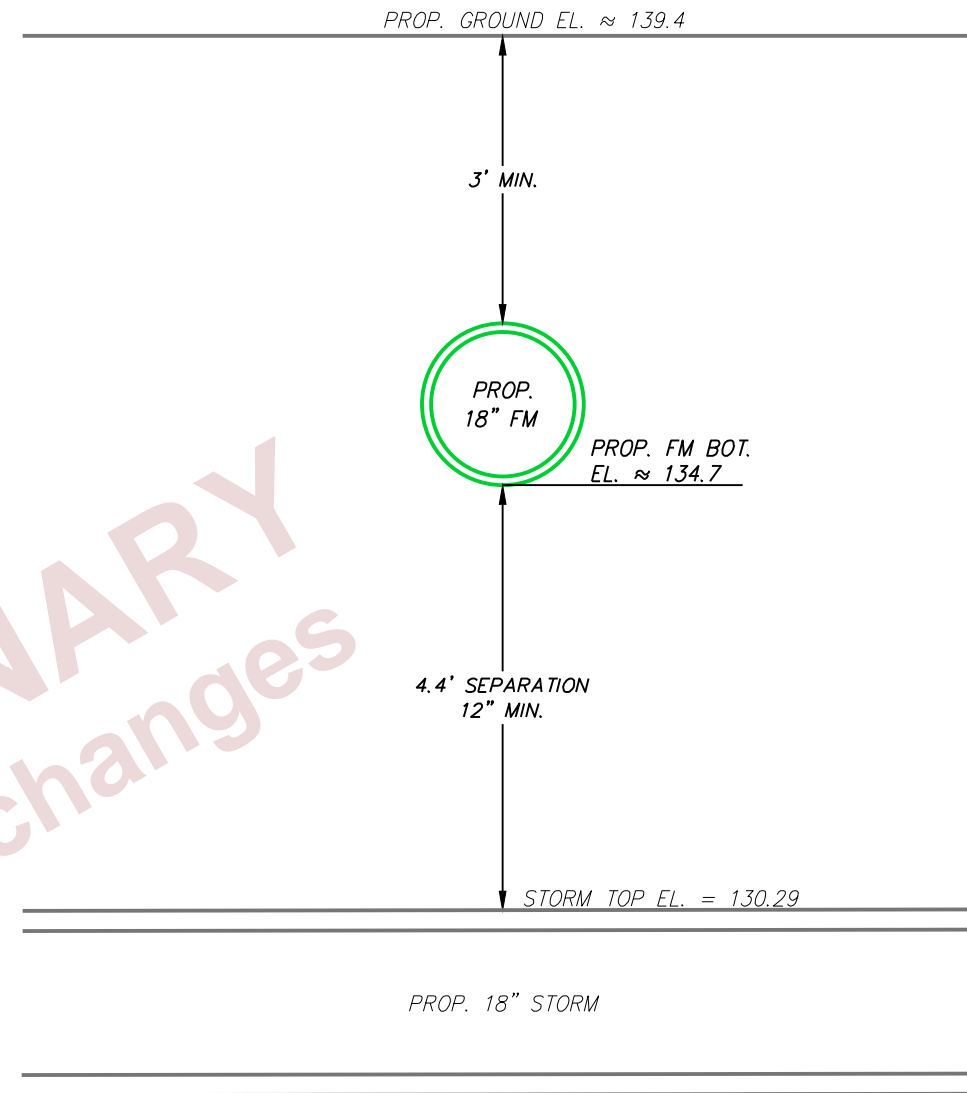
SHEET NO.
U-32

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UTILITY CROSSING DETAIL: STA. 3451+71.0, 97.6' R



UTILITY CROSSING DETAIL: STA. 3451+61.7, 117.4' R

PRELIMINARY  
subject to changes



SCALE: 1" = 2'

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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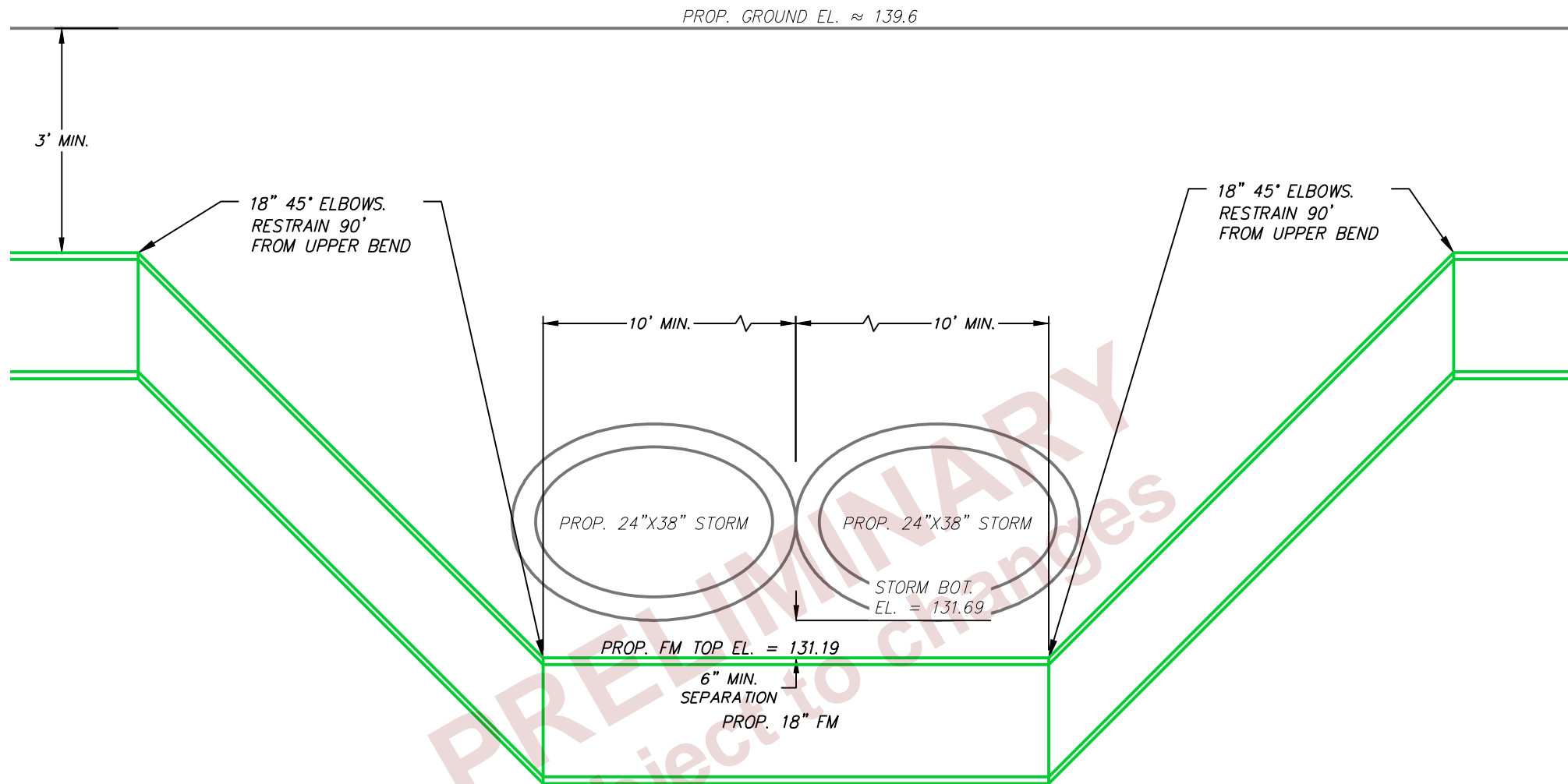
STATE OF FLORIDA  
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSSING DETAILS

SHEET NO.

U-33



UTILITY CROSSING DETAIL: STA. 3460+20.0, 45.0' R



SCALE: 1" = 2'

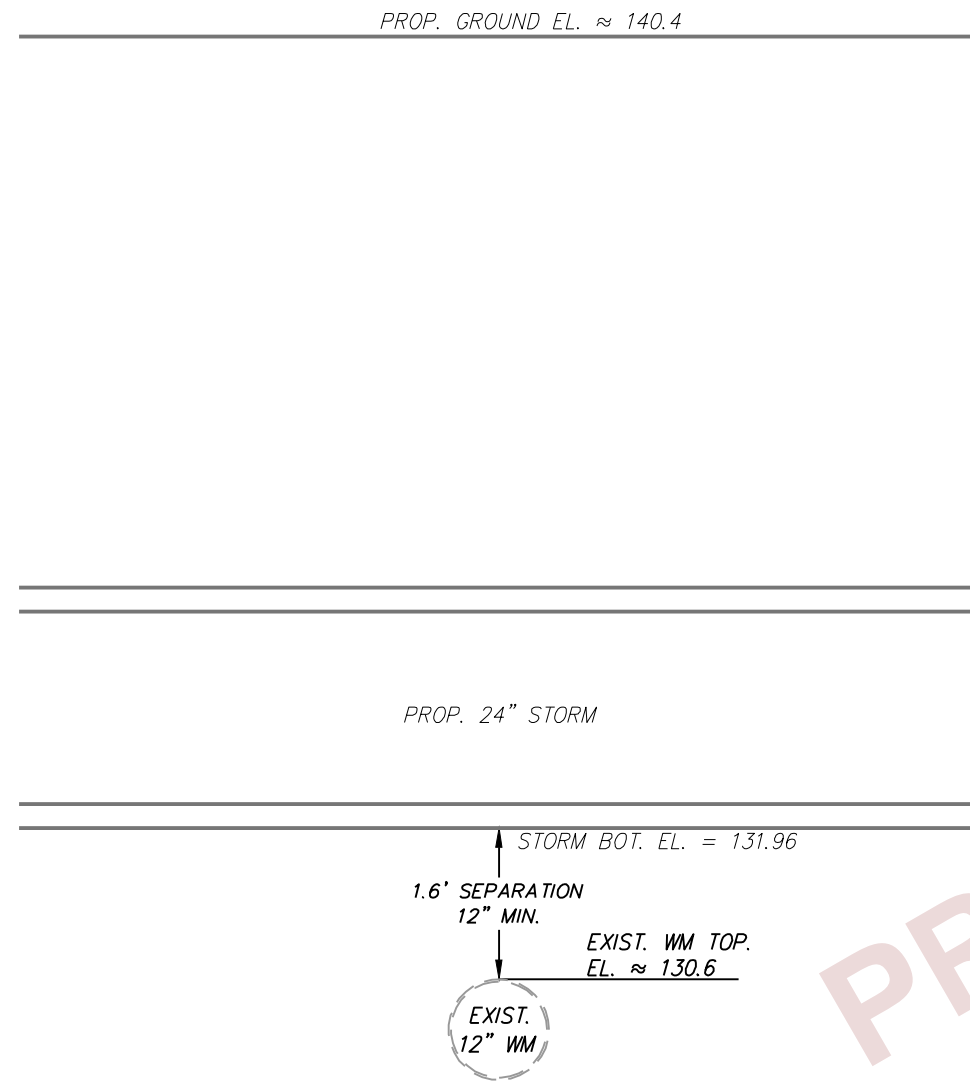
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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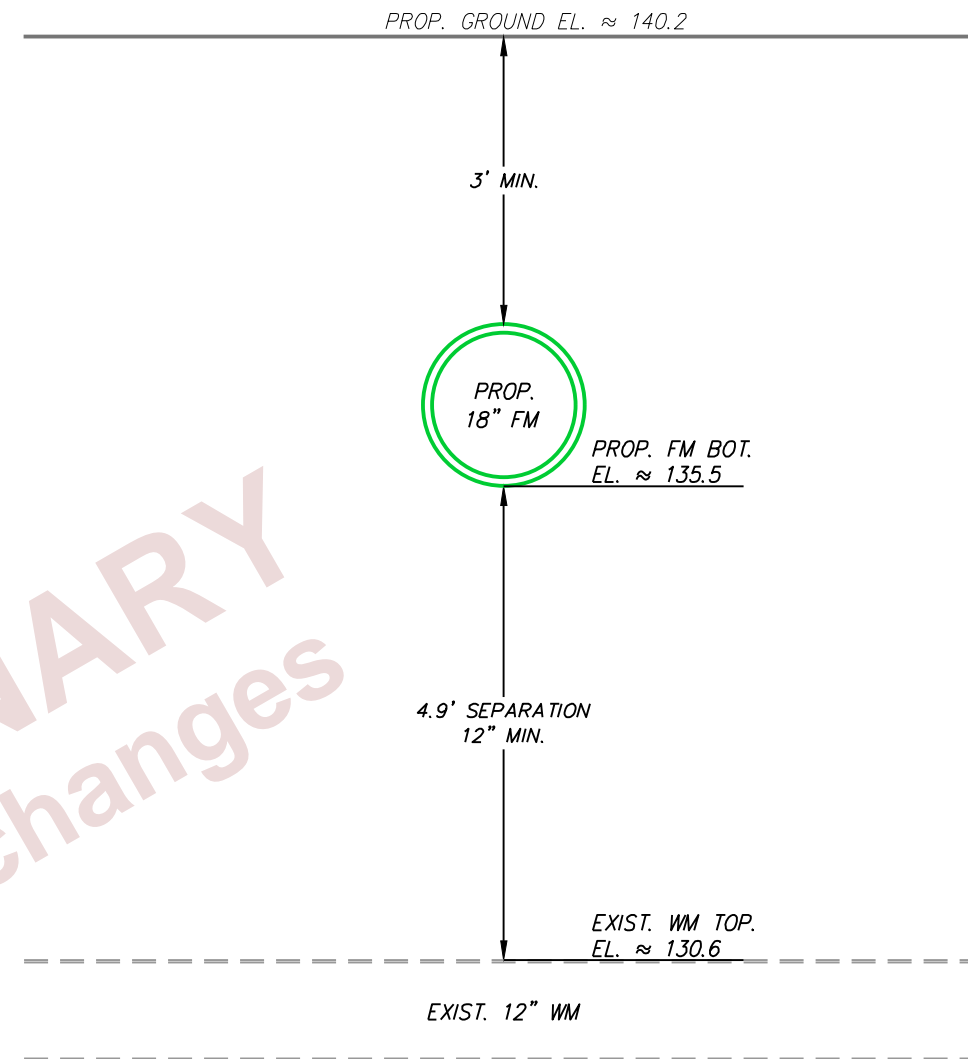
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSSING DETAILS

SHEET NO.  
U-34



UTILITY CROSSING DETAIL: STA. 3461+07.9, 54.9' R



UTILITY CROSSING DETAIL: STA. 3461+08.1, 45.0' R

PRELIMINARY  
subject to changes



SCALE: 1" = 2'

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

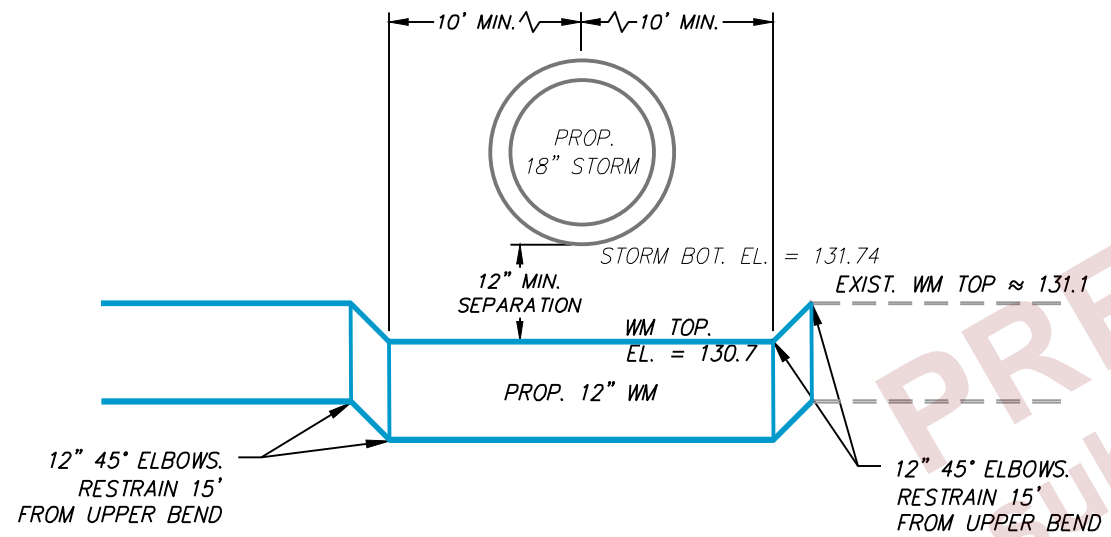
UTILITY CROSSING DETAILS

SHEET NO.  
**U-35**

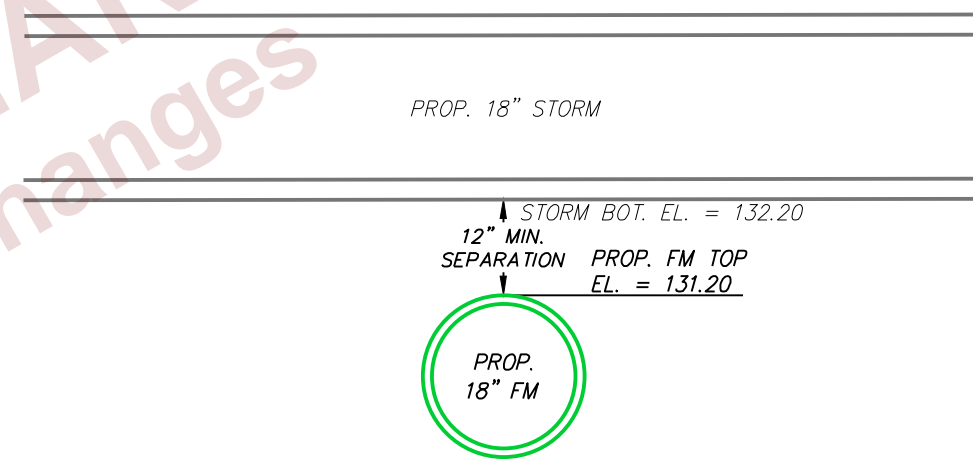
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PROP. GROUND EL.  $\approx$  139.3

PROP. GROUND EL.  $\approx$  139.3



UTILITY CROSSING DETAIL: STA. 3461+09.2, 73.6' L



UTILITY CROSSING DETAIL: STA. 3463+19.9, 85.1' L



SCALE: 1" = 2'

PRELIMINARY  
 Subject to changes

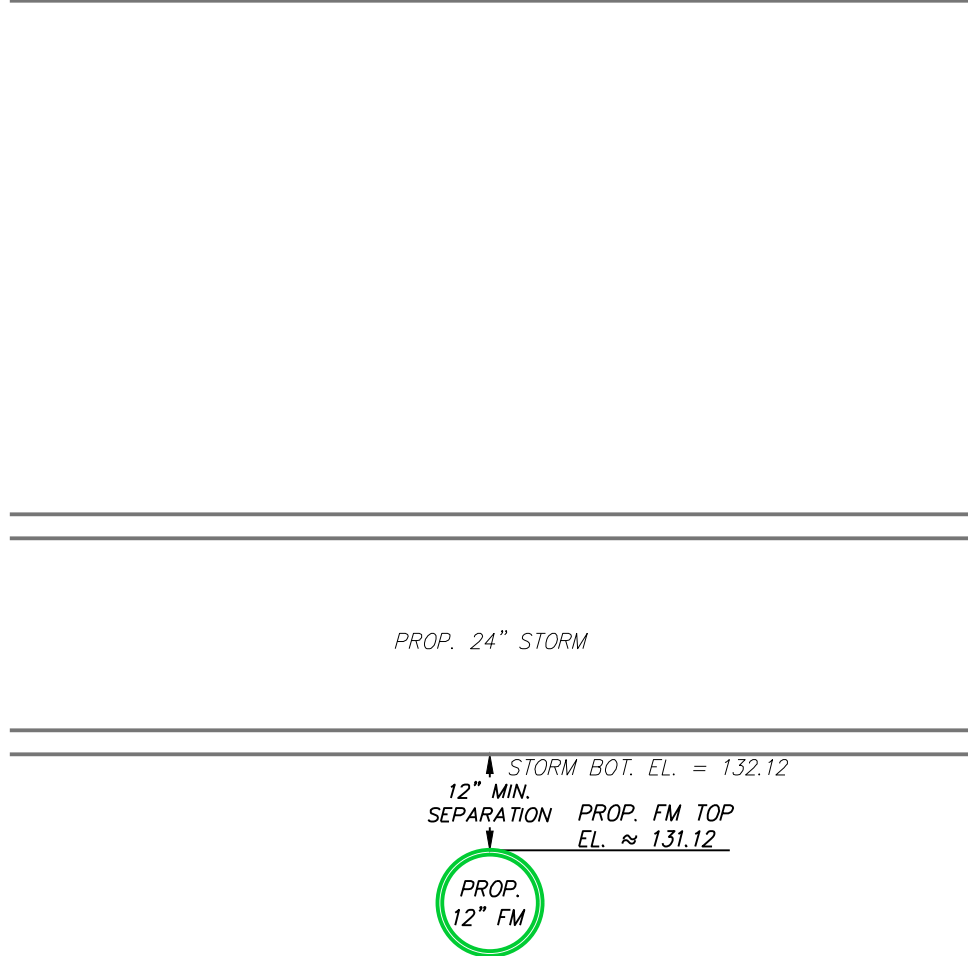
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID	UTILITY CROSSING DETAILS		
SR 400	POLK	430185-3-56-01			

SHEET NO. <b>U-36</b>
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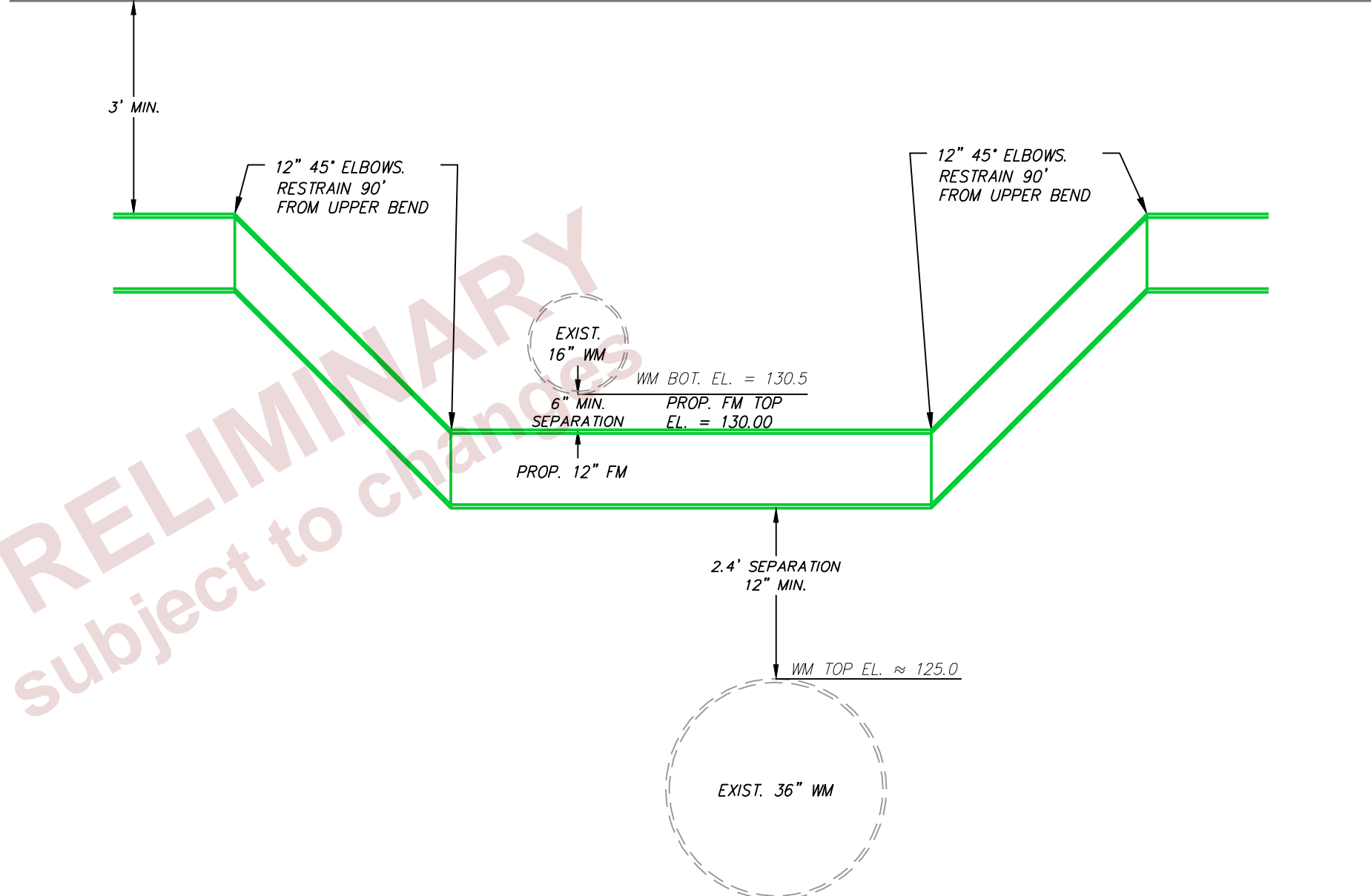
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PROP. GROUND EL. ≈ 139.9



UTILITY CROSSING DETAIL: STA. 3463+20.3, 53.4' R

PROP. GROUND EL. ≈ 136.0



UTILITY CROSSING DETAIL: STA. 3463+20.3, 80.3' R

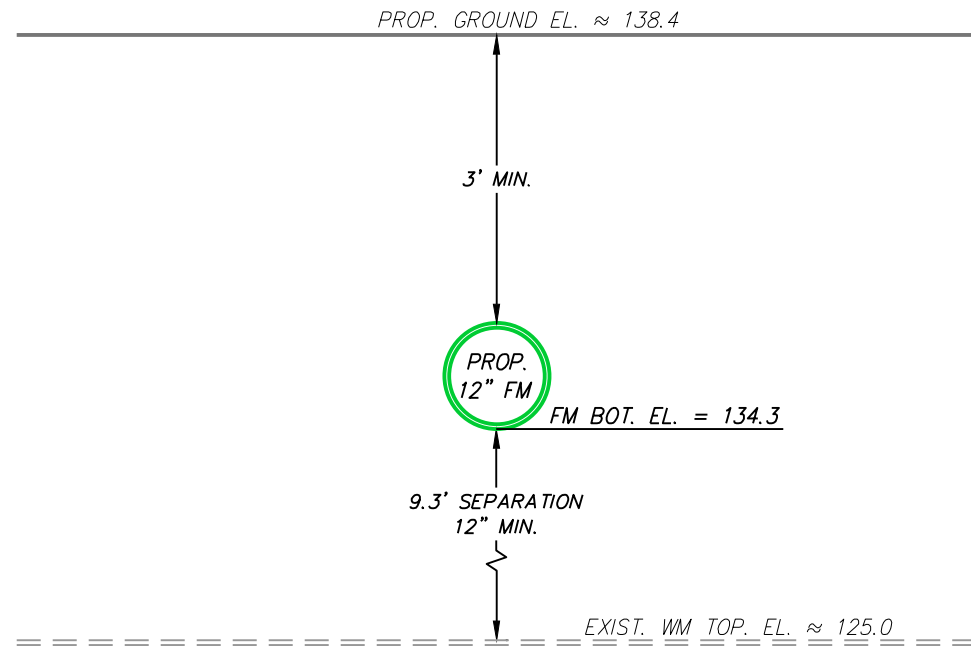


PRELIMINARY  
 subject to change

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

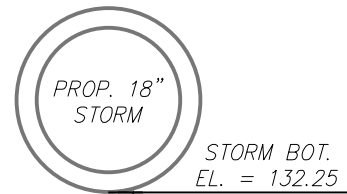
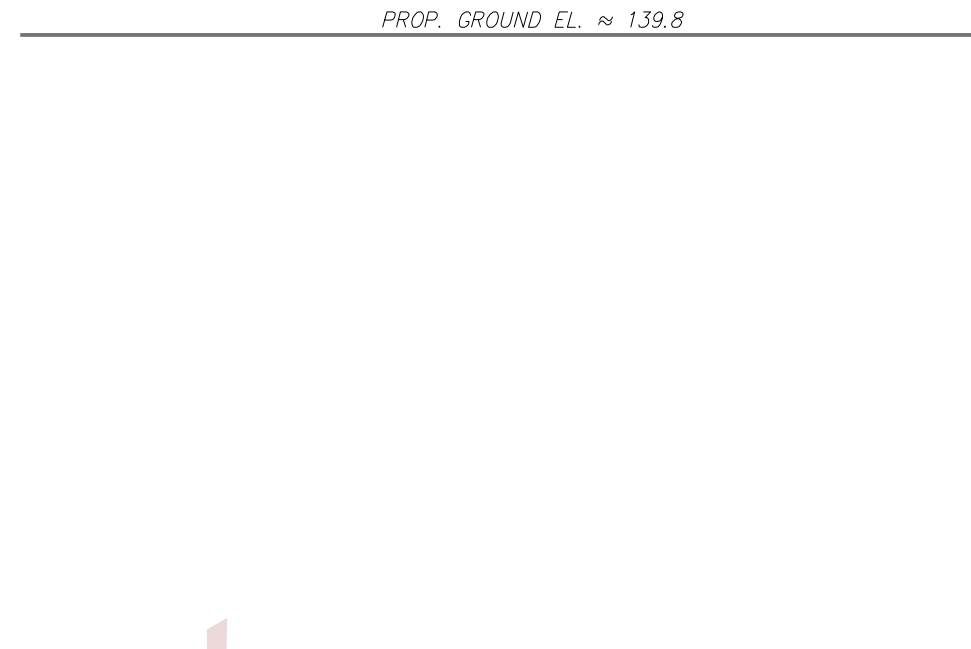
DOUGLAS E. JONES, P.E. CHASTAIN-SKILLMAN 205 EAST ORANGE STREET SUITE #110 LAKELAND, FL 33801-4611 (863) 646-1402			STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID	UTILITY CROSSING DETAILS		
SR 400	POLK	430185-3-56-01			

SHEET NO. <b>U-37</b>
--------------------------



EXIST. 36" WM

UTILITY CROSSING DETAIL: STA. 3463+33.2, 100.1' L



STORM BOT. EL. = 132.25

7.3' SEPARATION  
12" MIN.

EXIST. WM TOP. EL. ≈ 125.0

EXIST. 36" WM

UTILITY CROSSING DETAIL: STA. 3463+33.3, 85.1' L

PRELIMINARY  
subject to changes



SCALE: 1" = 2'

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

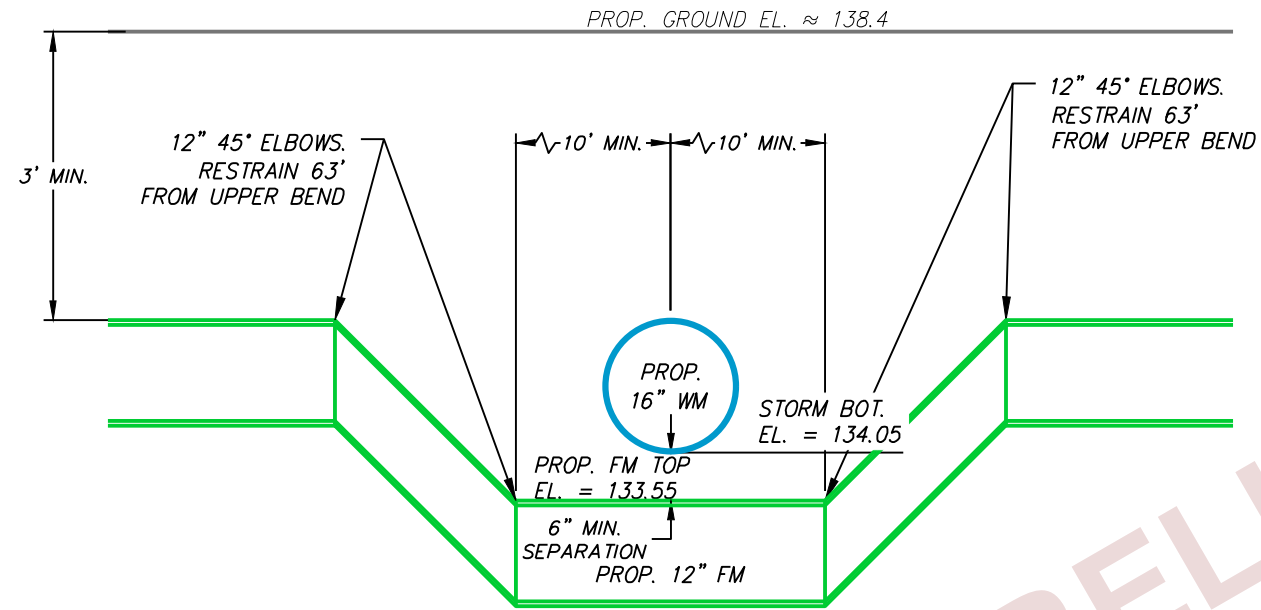
DOUGLAS E. JONES, P.E.  
CHASTAIN-SKILLMAN  
205 EAST ORANGE STREET  
SUITE #110  
LAKELAND, FL 33801-4611  
(863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

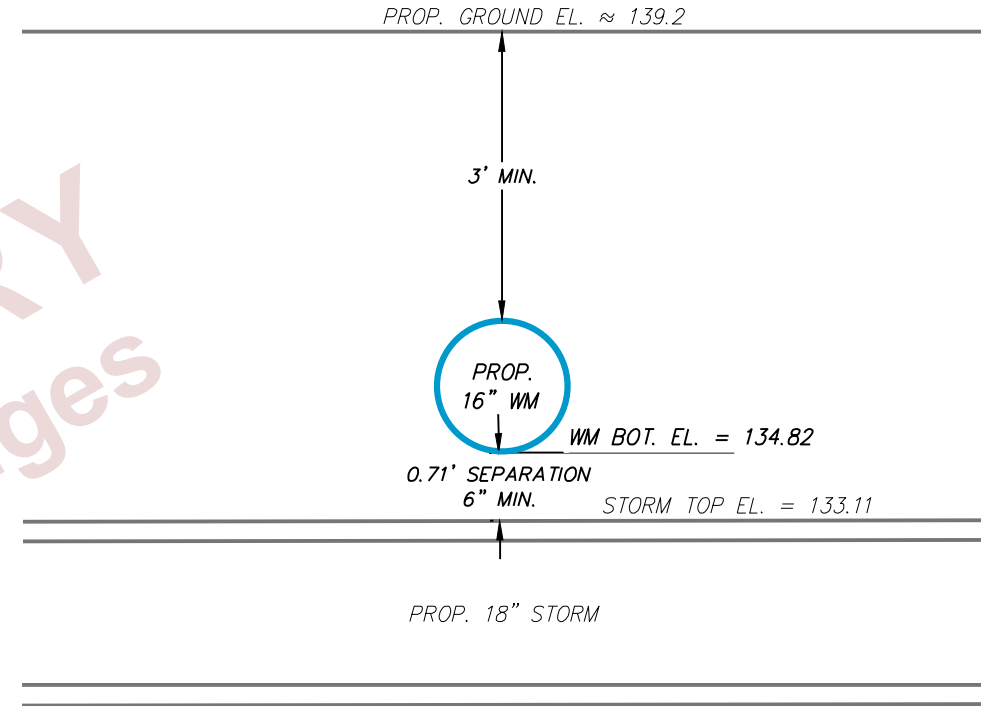
UTILITY CROSSING DETAILS

SHEET NO.  
**U-38**

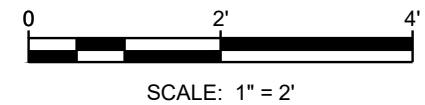
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UTILITY CROSSING DETAIL: STA. 3463+55.9, 99.6' L



UTILITY CROSSING DETAIL: STA. 3463+56.2, 85.2' L



PRELIMINARY  
Subject to changes

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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CHASTAIN-SKILLMAN  
205 EAST ORANGE STREET  
SUITE #110  
LAKELAND, FL 33801-4611  
(863) 646-1402

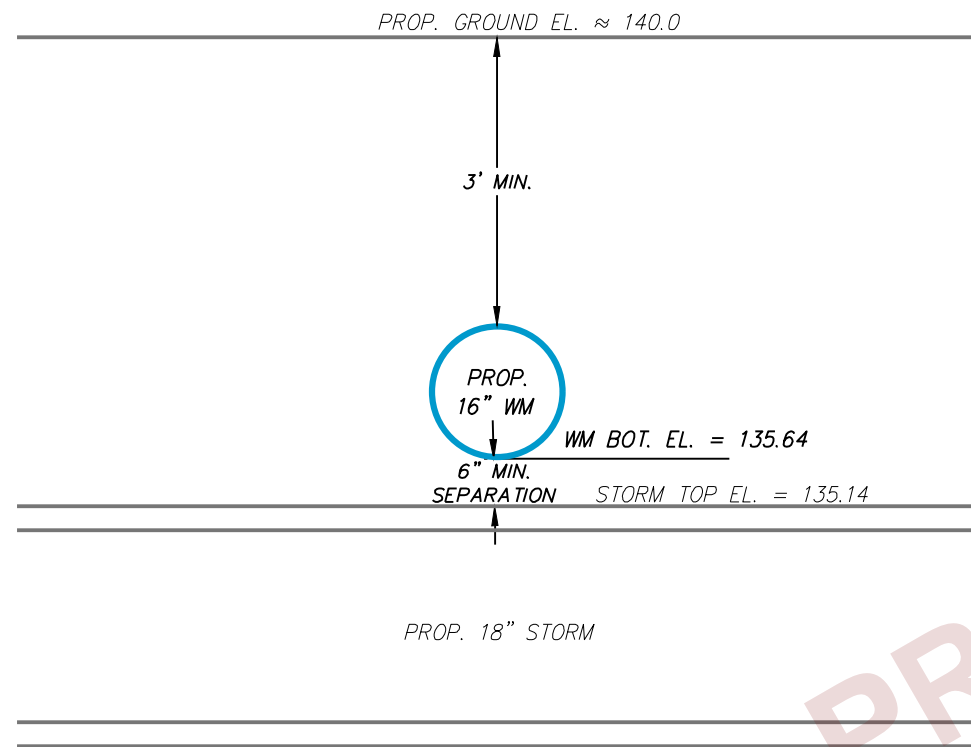
STATE OF FLORIDA  
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

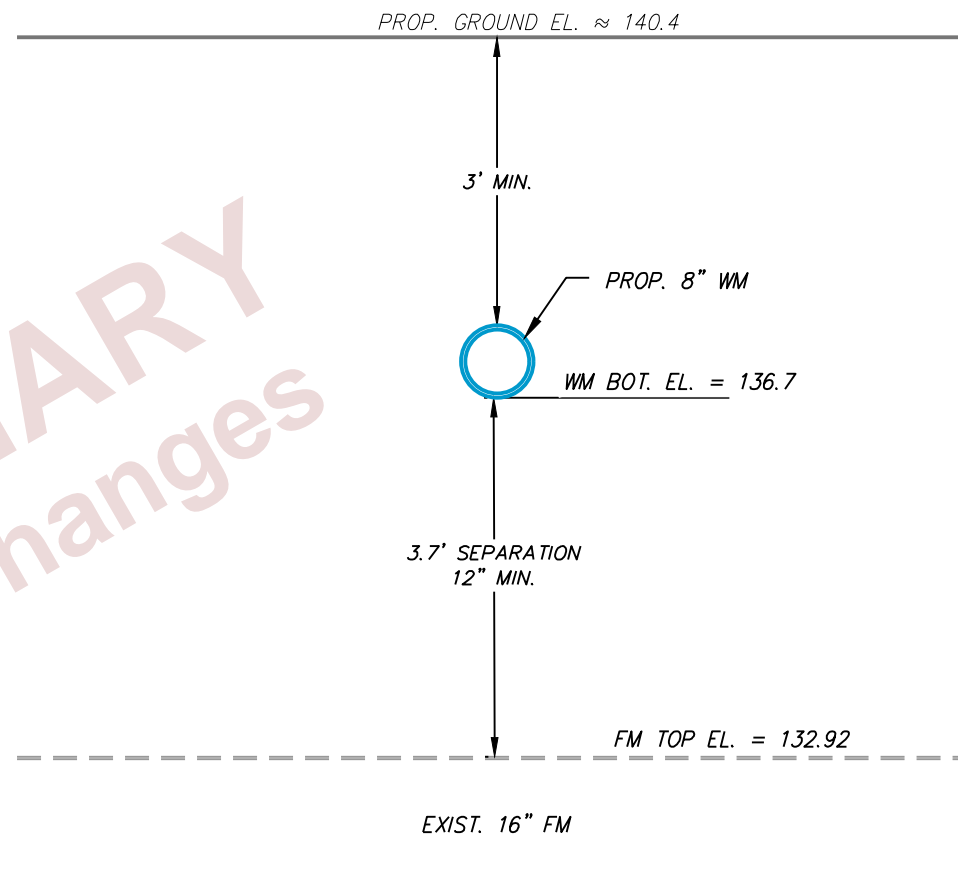
UTILITY CROSSING DETAILS

SHEET NO.

U-39



UTILITY CROSSING DETAIL: STA. 3463+59.3, 52.9' R



UTILITY CROSSING DETAIL: STA. 3477+85.6, 82.5' L



SCALE: 1" = 2'

PRELIMINARY  
subject to changes

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

DOUGLAS E. JONES, P.E.  
CHASTAIN-SKILLMAN  
205 EAST ORANGE STREET  
SUITE #110  
LAKELAND, FL 33801-4611  
(863) 646-1402

STATE OF FLORIDA  
DEPARTMENT OF TRANSPORTATION

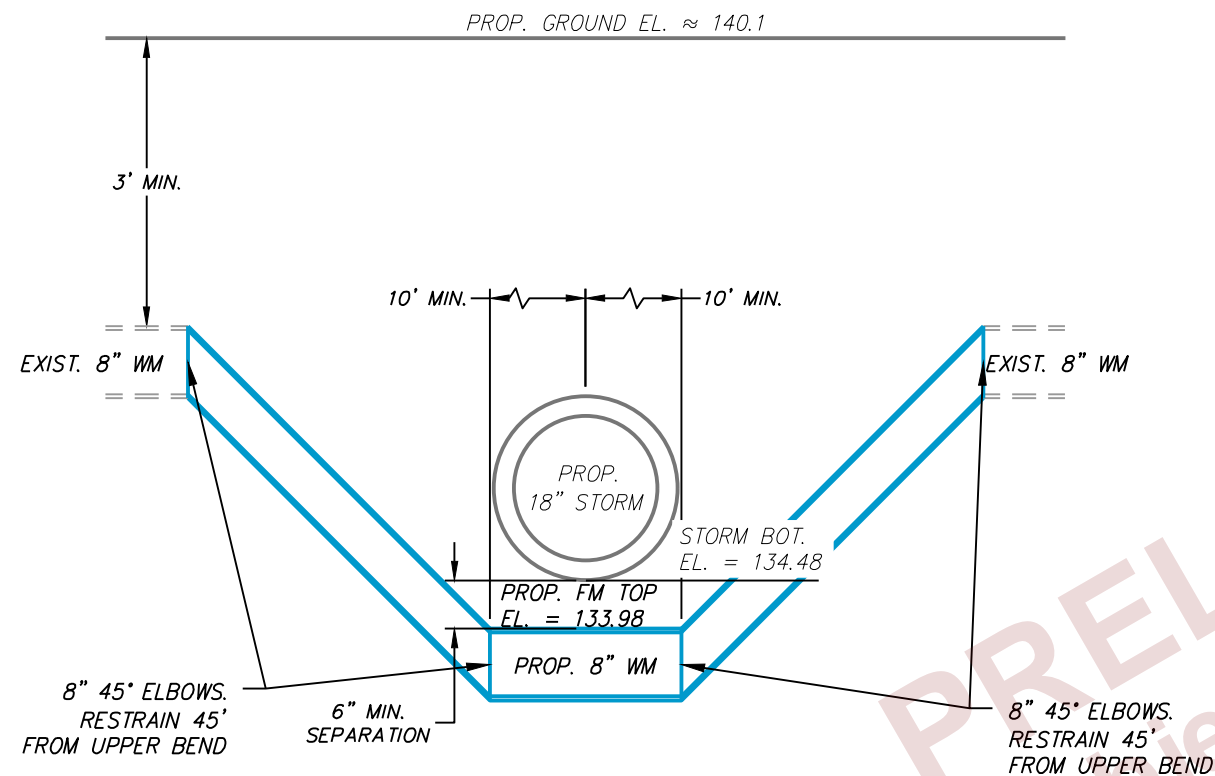
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSSING DETAILS

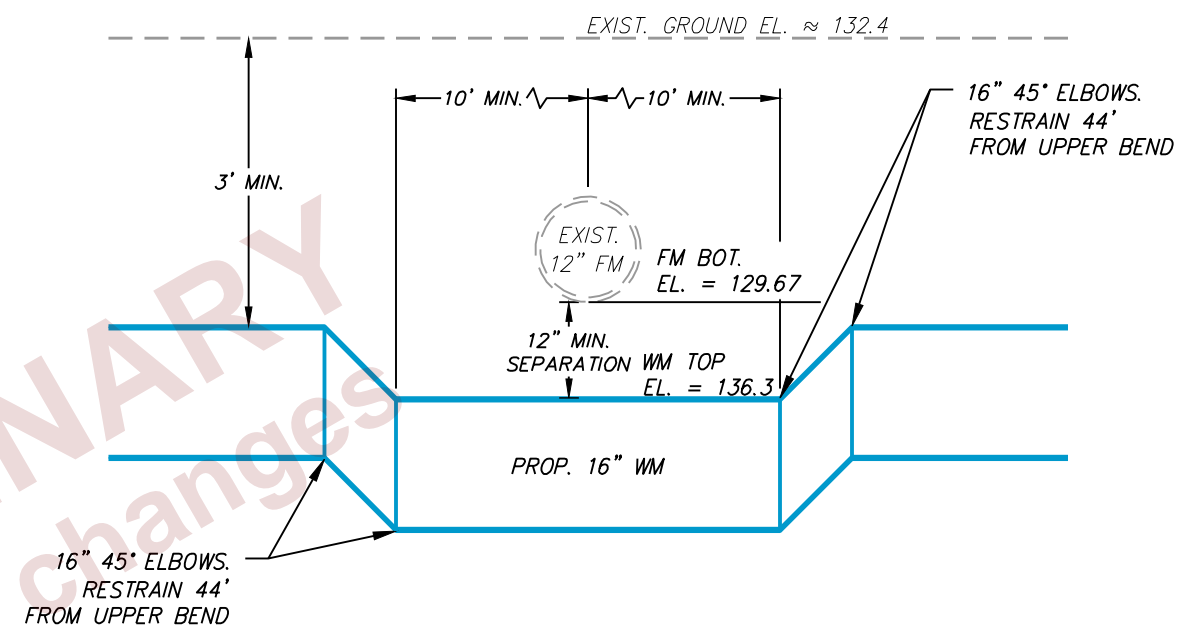
SHEET NO.

U-40





UTILITY CROSSING DETAIL: STA. 3477+86.7, 64.7' R



UTILITY CROSSING DETAIL: STA. 3480+35.7, 90.5' L



SCALE: 1" = 2'

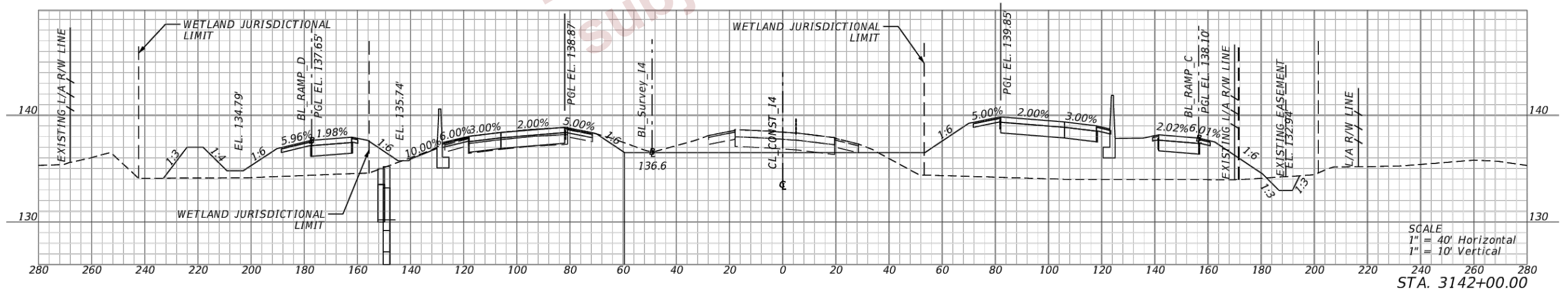
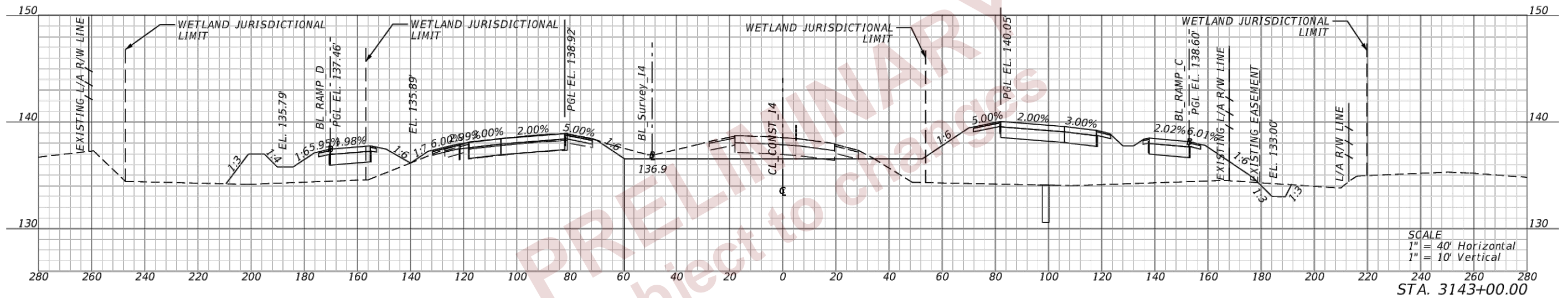
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

DOUGLAS E. JONES, P.E. CHASTAIN-SKILLMAN 205 EAST ORANGE STREET SUITE #110 LAKELAND, FL 33801-4611 (863) 646-1402	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	
	ROAD NO.	COUNTY
	SR 400	POLK
FINANCIAL PROJECT ID		430185-3-56-01

UTILITY CROSSING DETAILS
U-41

SHEET NO.
U-41

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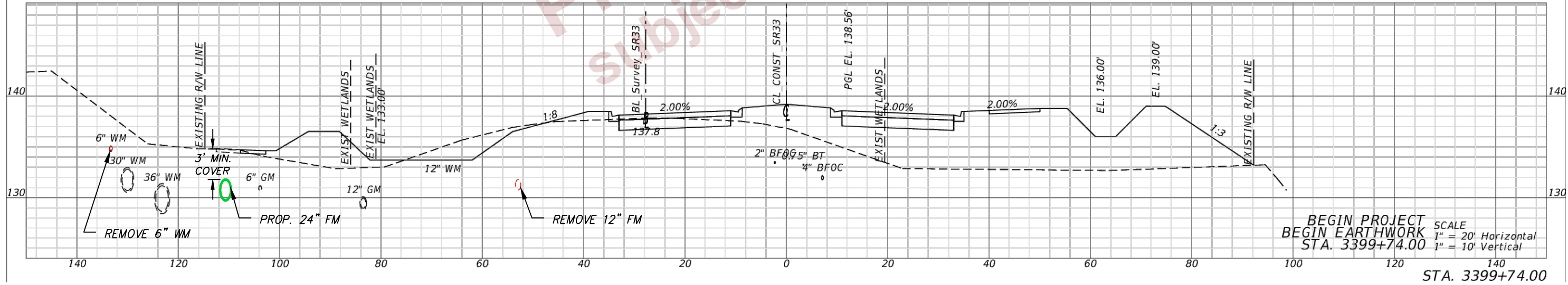
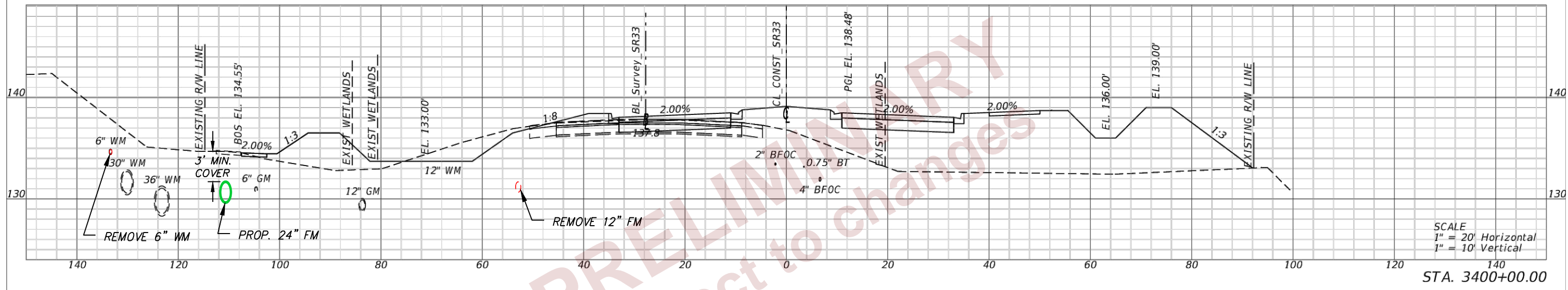
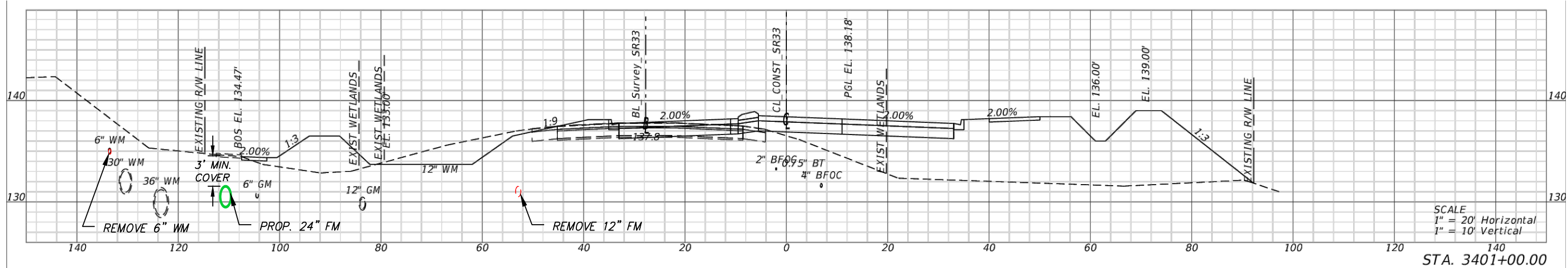
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
U-42

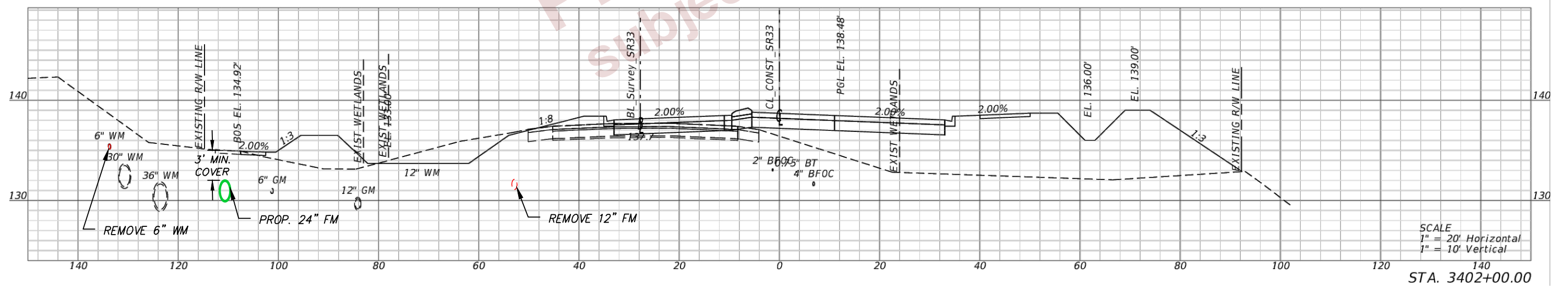
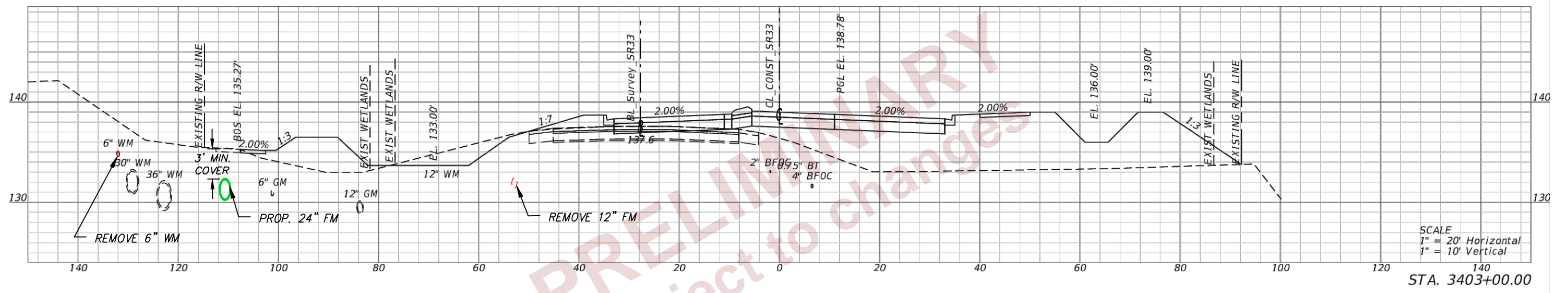
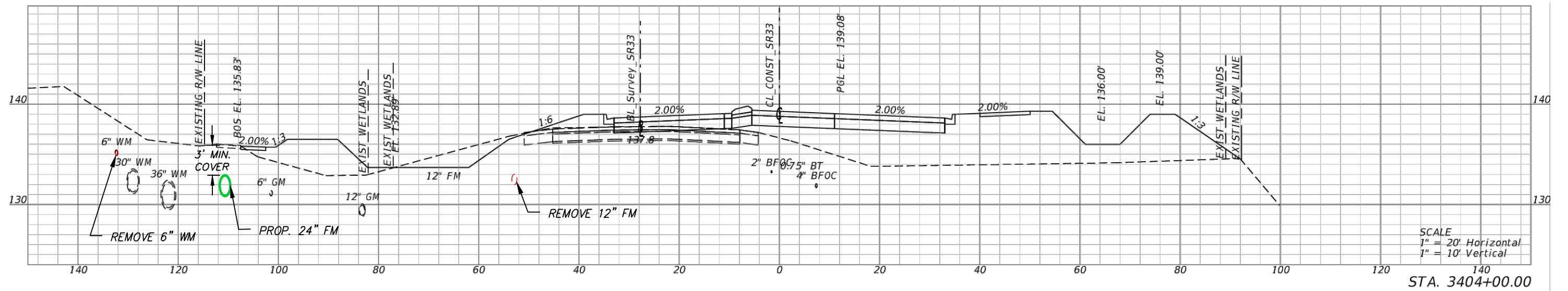


REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS  <b>U-43</b>	SHEET NO.  <b>U-43</b>
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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

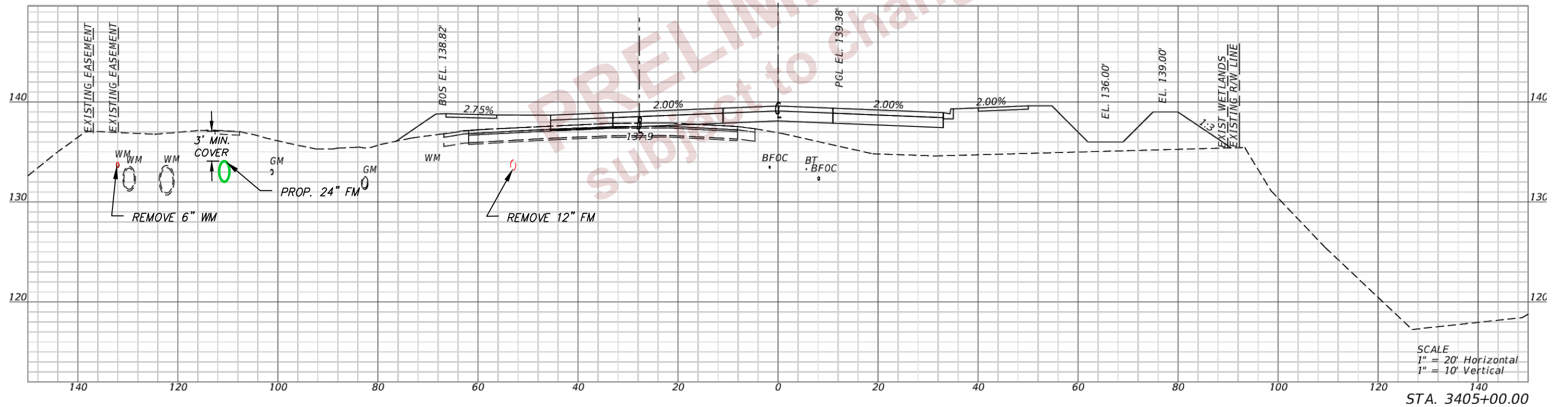
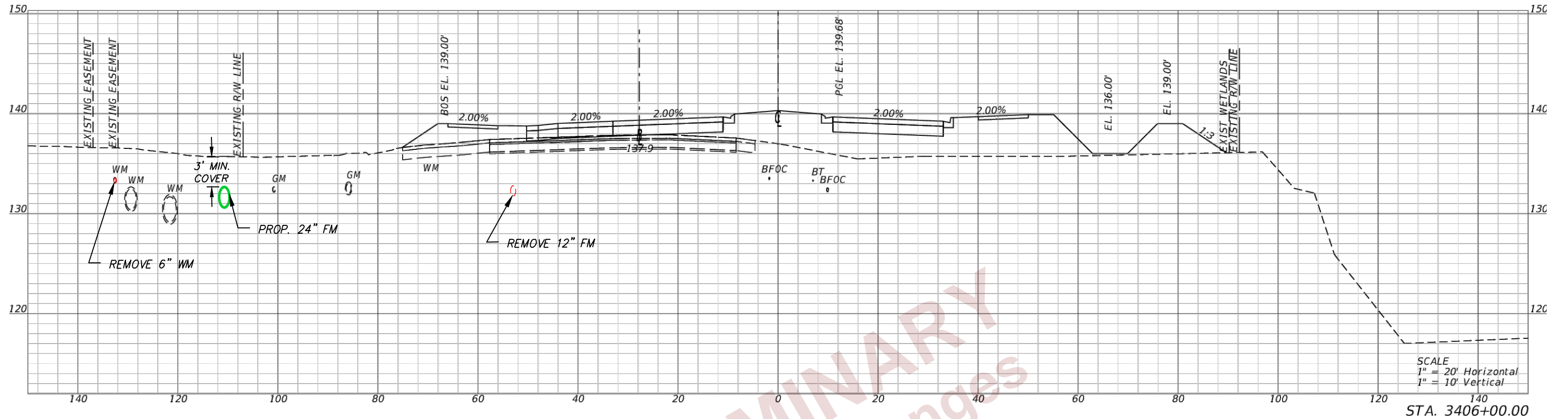
DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
**U-44**

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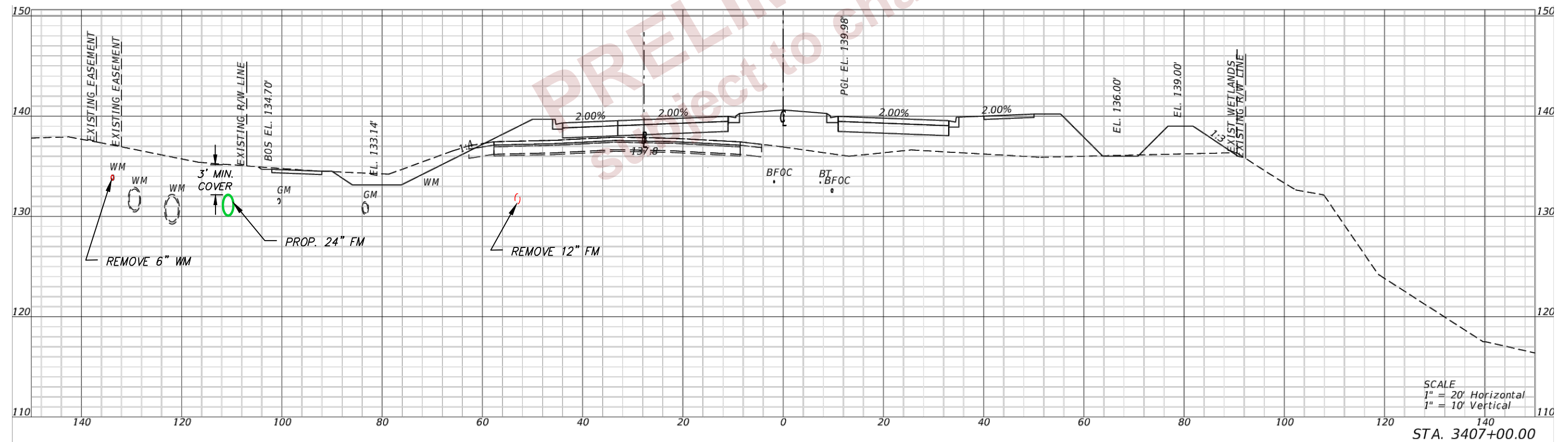
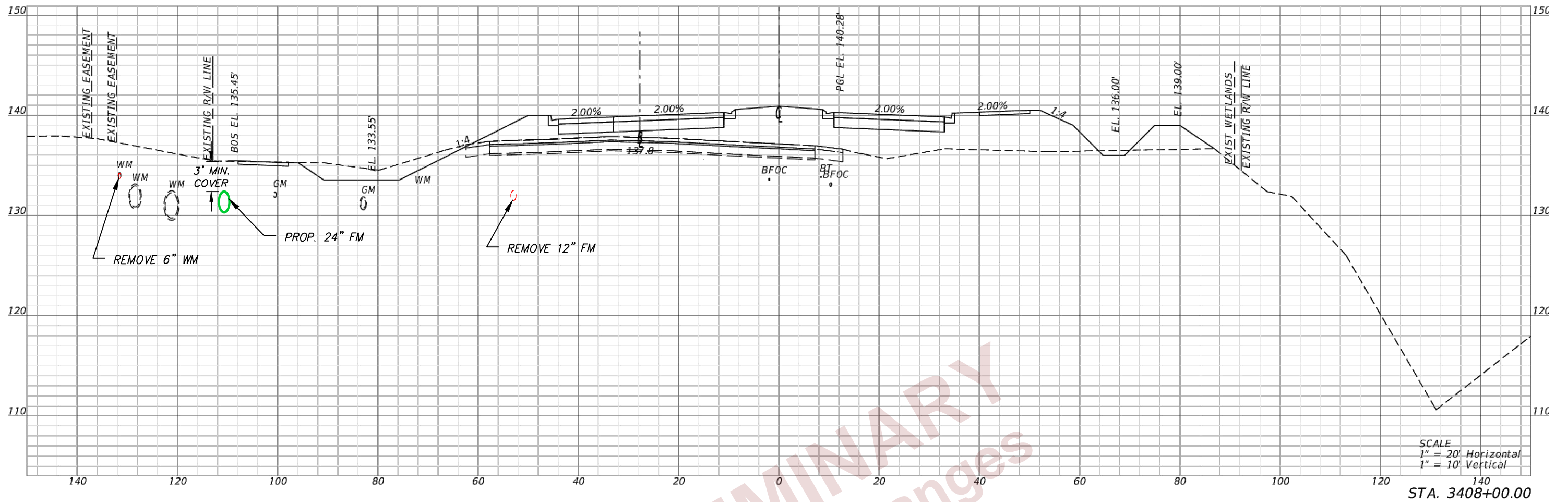
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
U-45



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

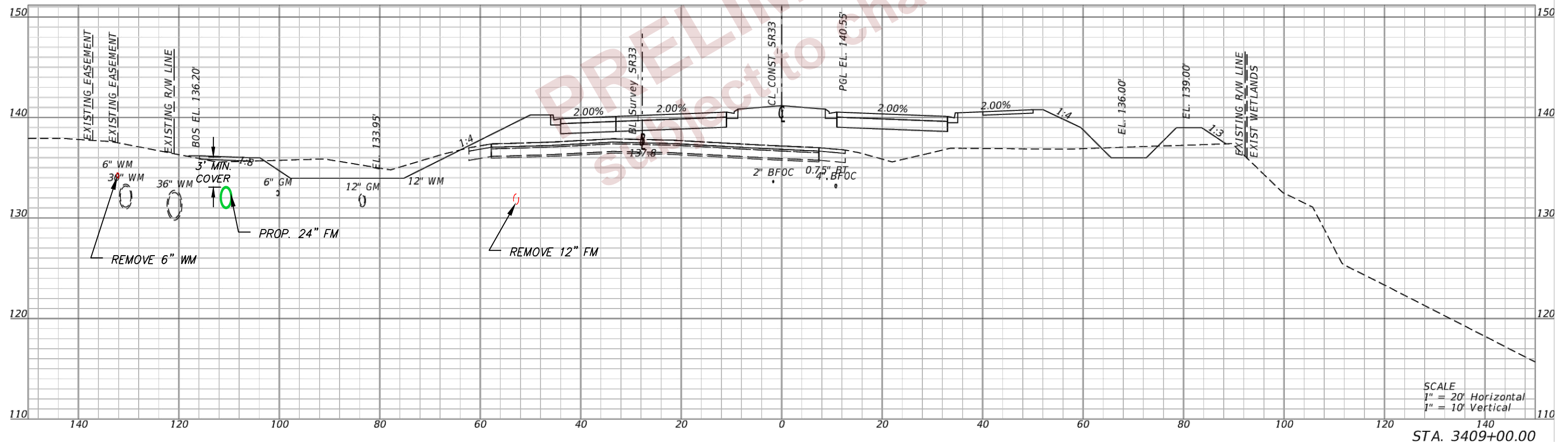
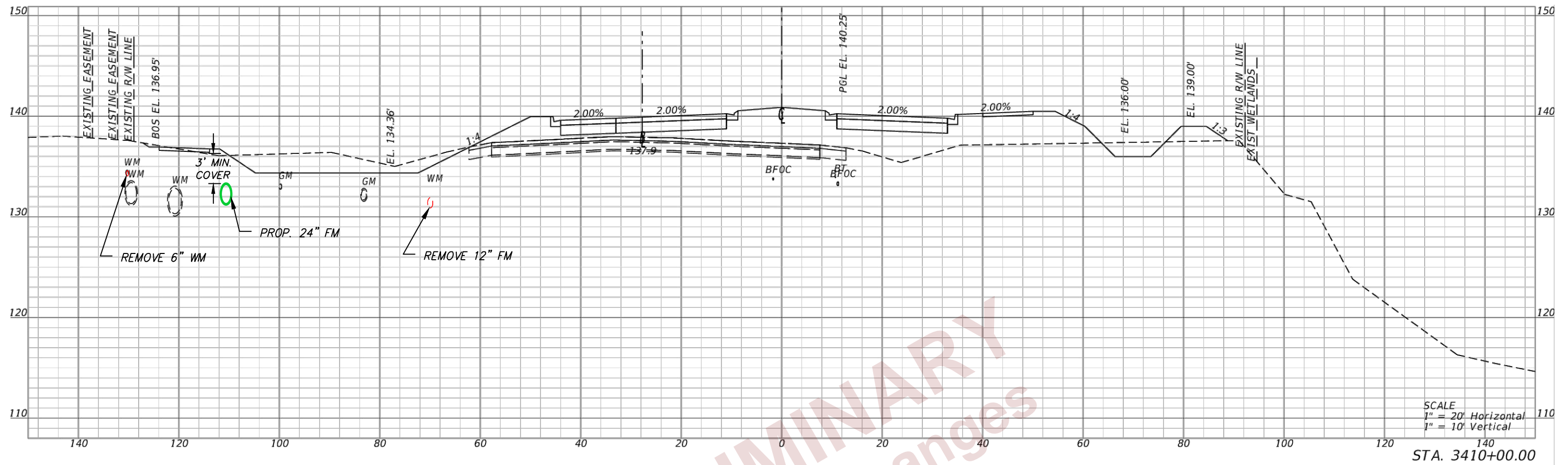
DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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UTILITY CROSS SECTIONS

SHEET NO.  
U-46

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

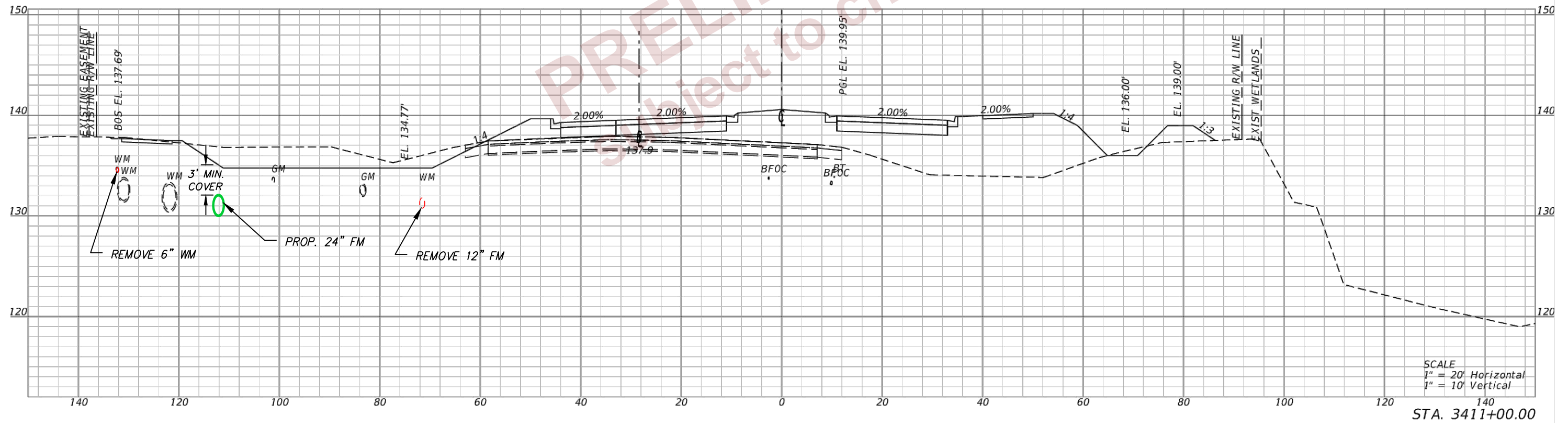
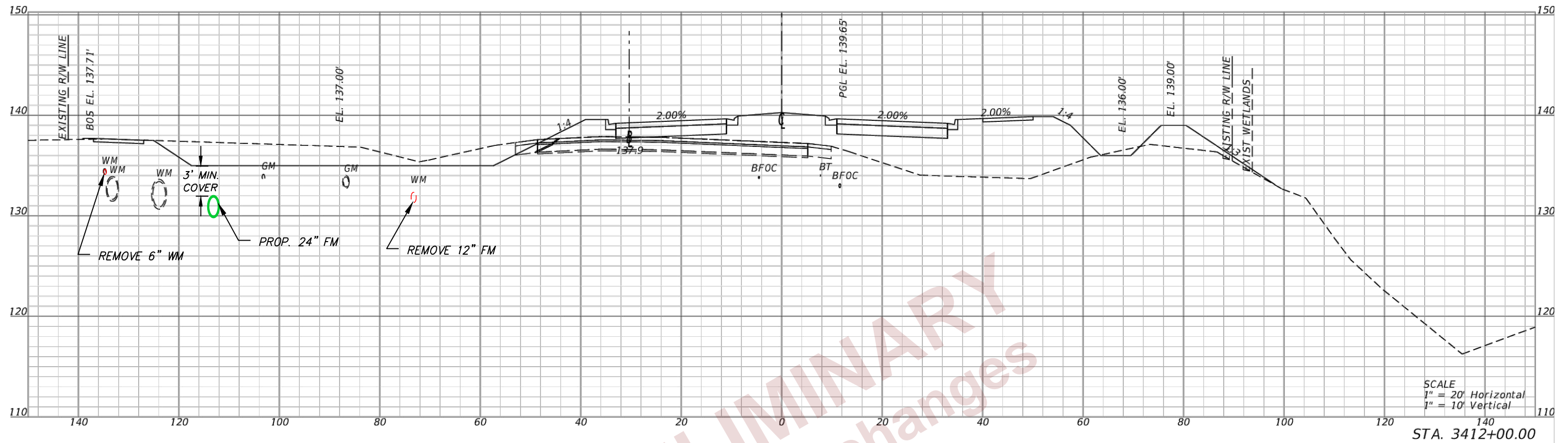
DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
U-47

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DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

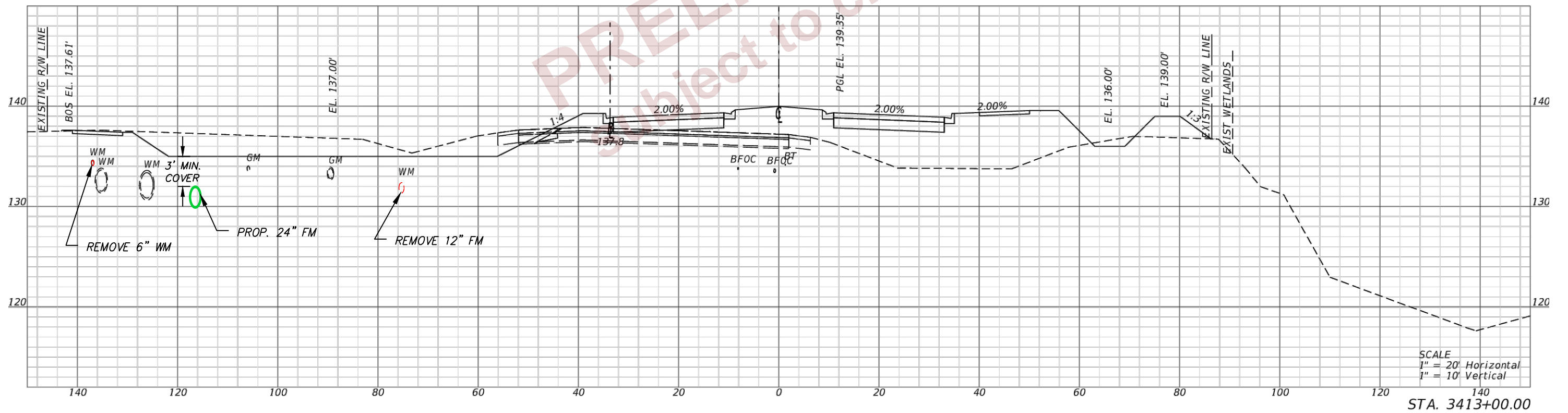
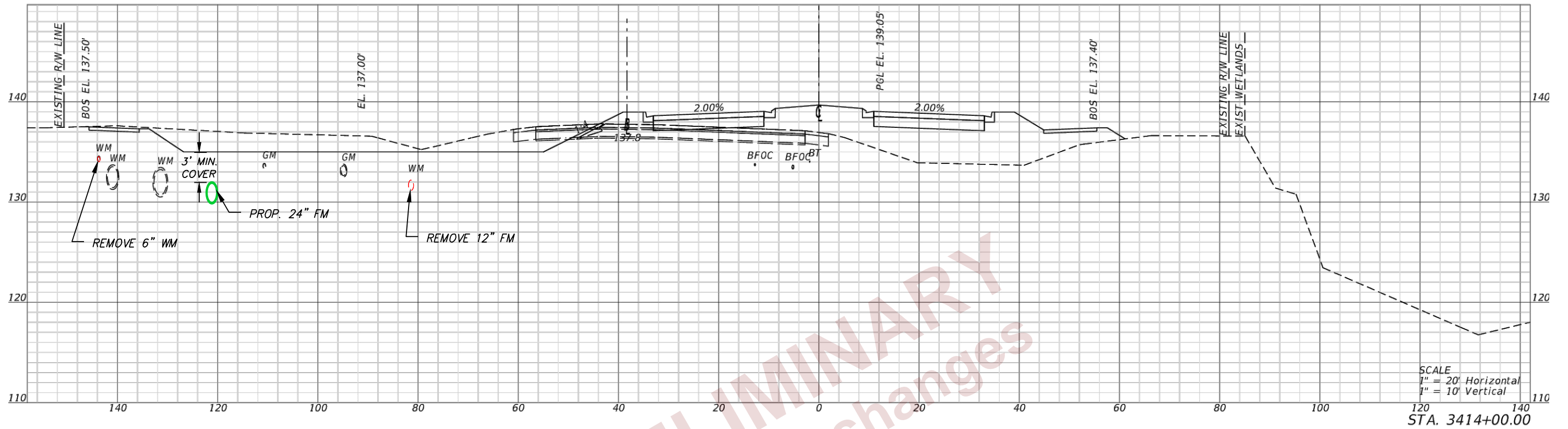
UTILITY CROSS SECTIONS

SHEET NO.  
**U-48**

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 205 EAST ORANGE STREET  
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 LAKELAND, FL 33801-4611  
 (863) 646-1402

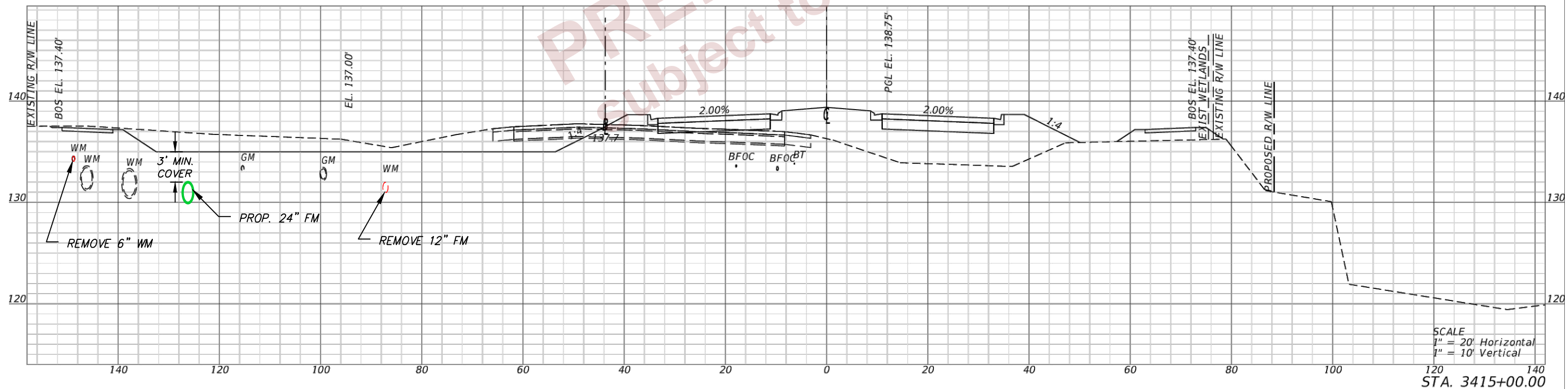
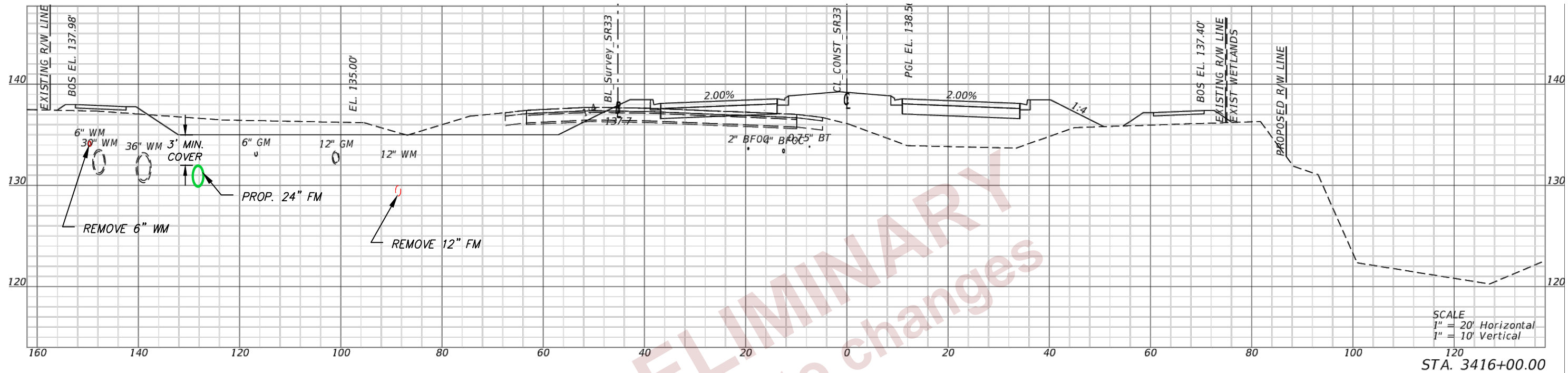
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
 U-49

PRELIMINARY  
 Subject to changes

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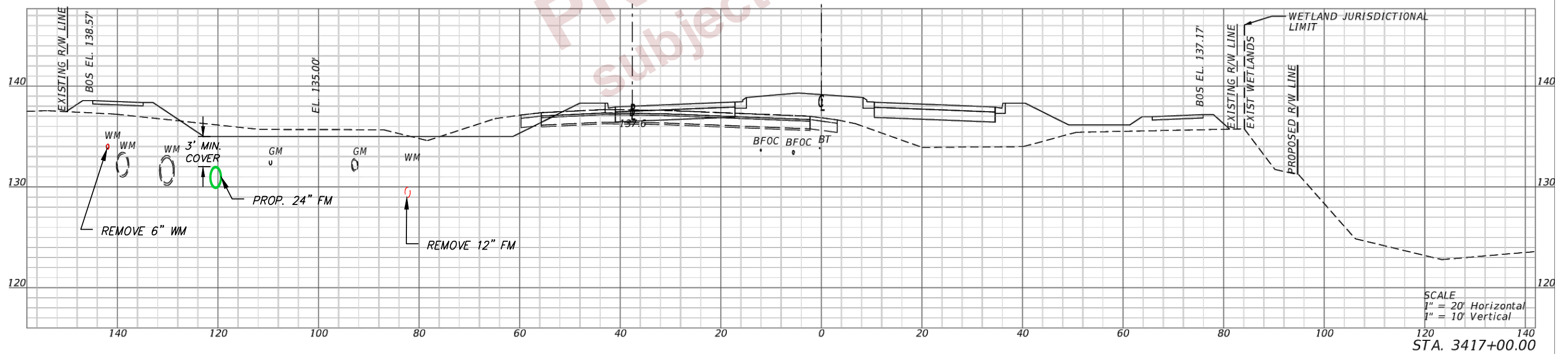
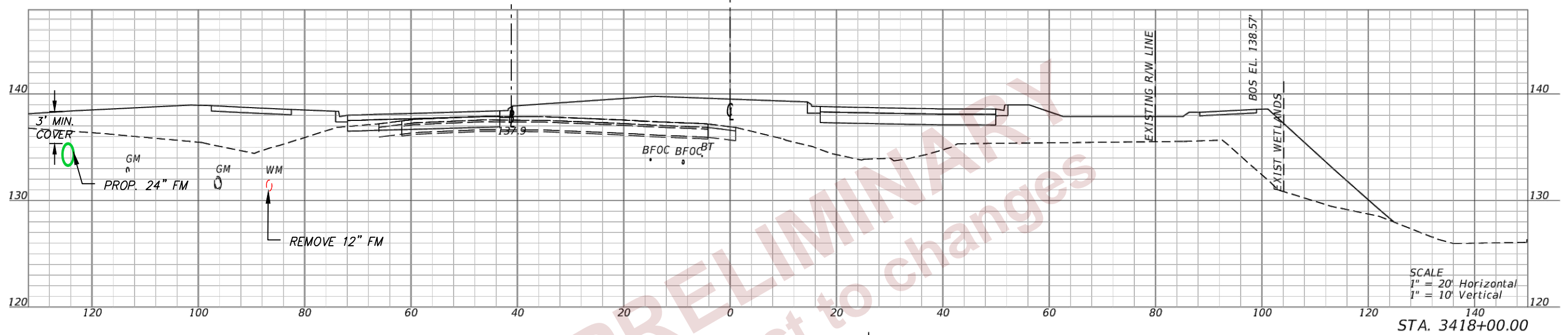
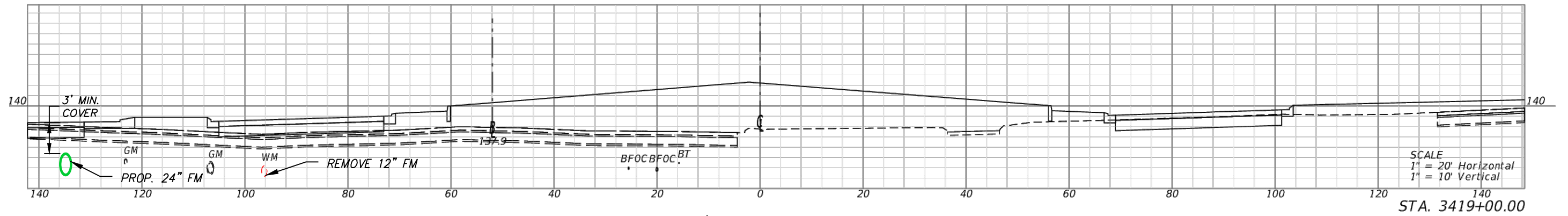
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

DOUGLAS E. JONES, P.E.  
CHASTAIN-SKILLMAN  
205 EAST ORANGE STREET  
SUITE #110  
LAKELAND, FL 33801-4611  
(863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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UTILITY CROSS SECTIONS

SHEET NO.  
U-50



PRELIMINARY  
 Subject to changes

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

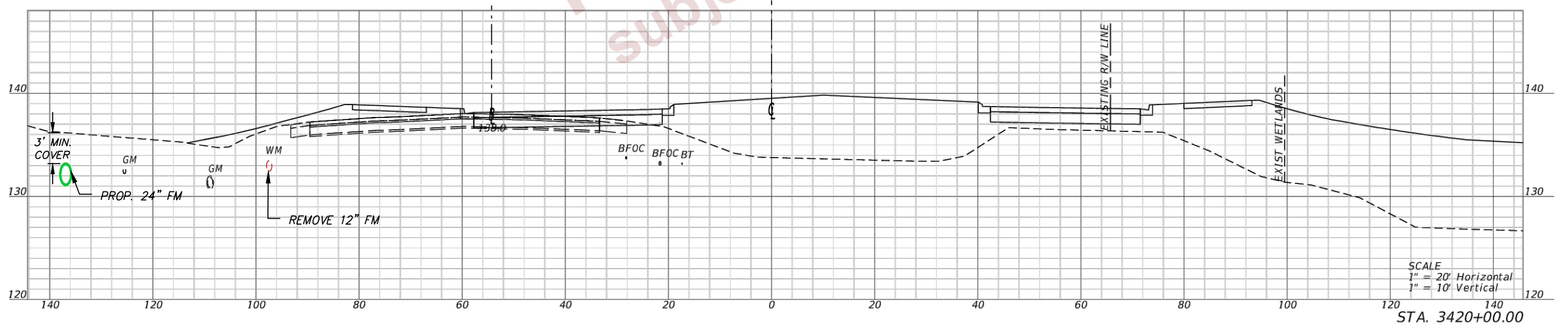
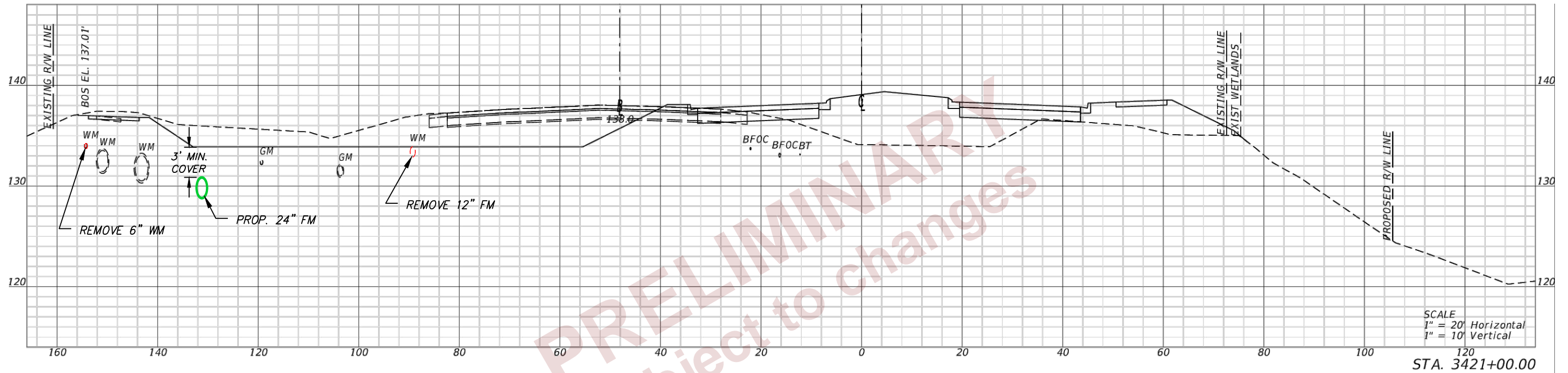
DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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UTILITY CROSS SECTIONS

SHEET NO.  
 U-51

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DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

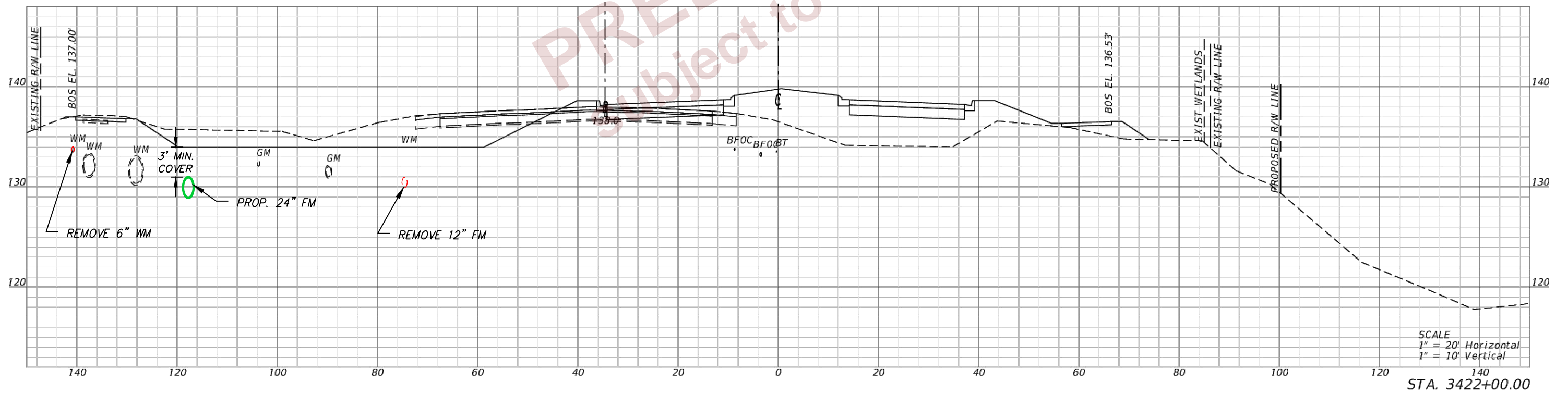
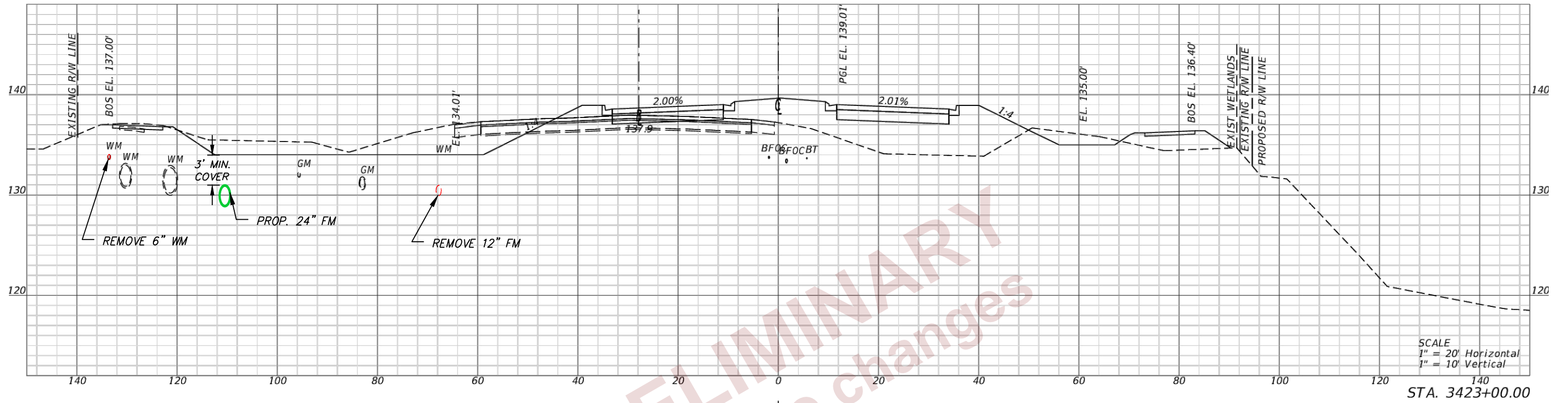
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
 U-52

PRELIMINARY  
 subject to changes

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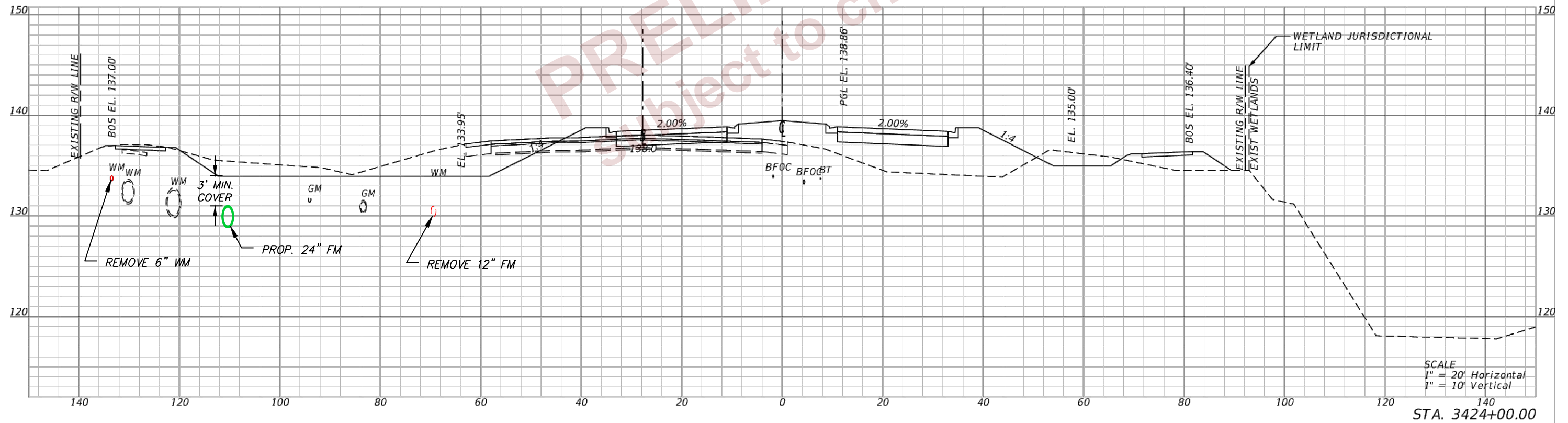
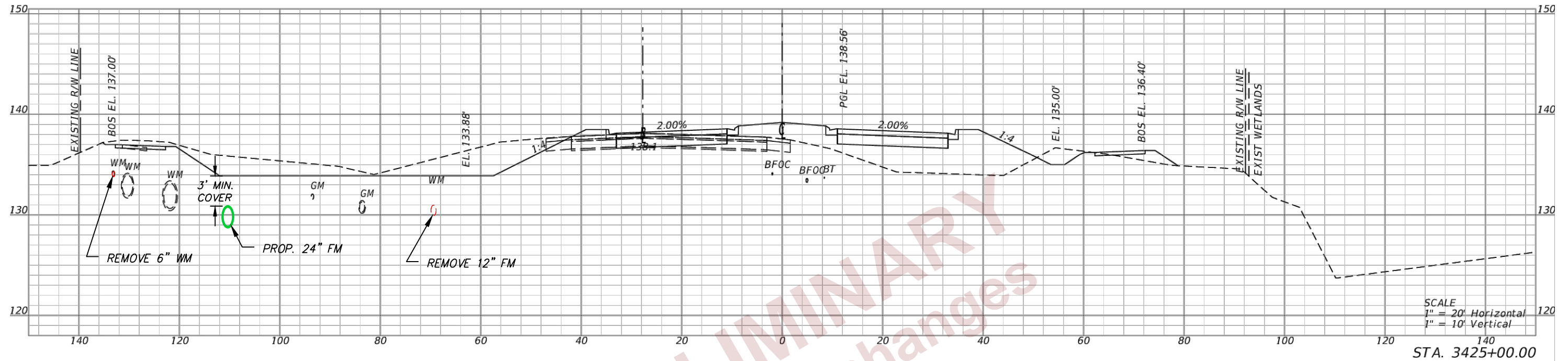
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

DOUGLAS E. JONES, P.E.  
CHASTAIN-SKILLMAN  
205 EAST ORANGE STREET  
SUITE #110  
LAKELAND, FL 33801-4611  
(863) 646-1402

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
**U-53**



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

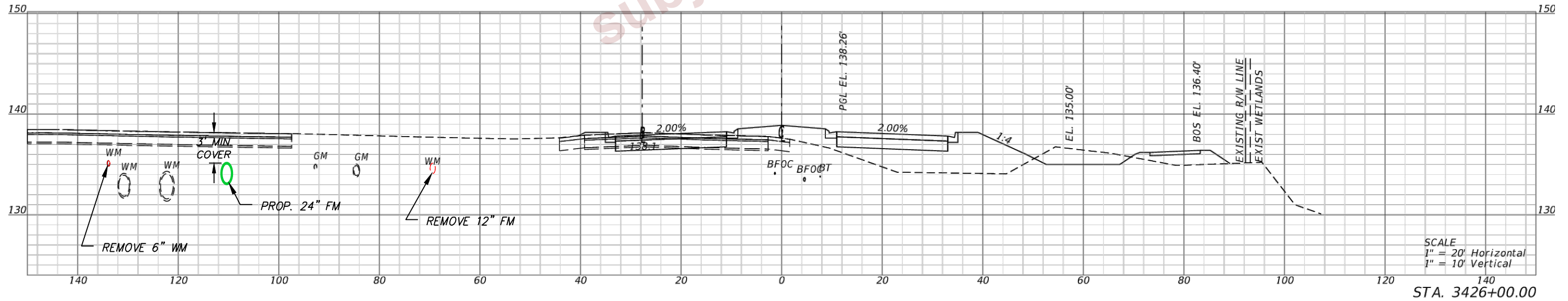
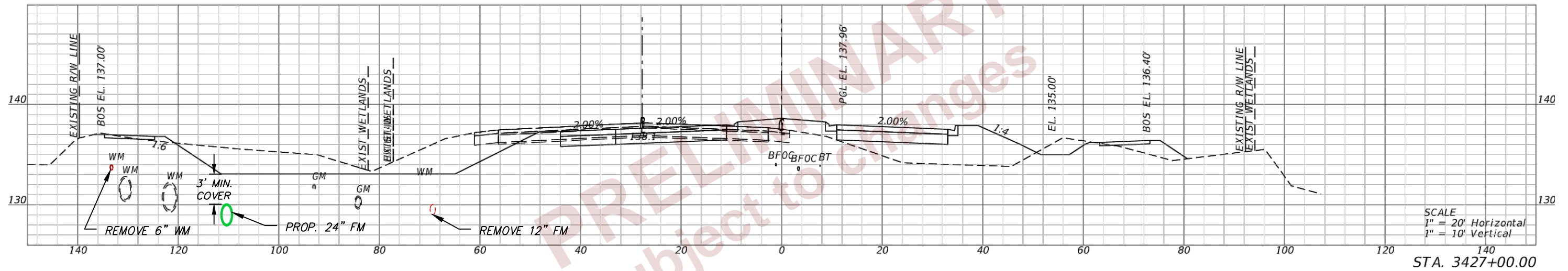
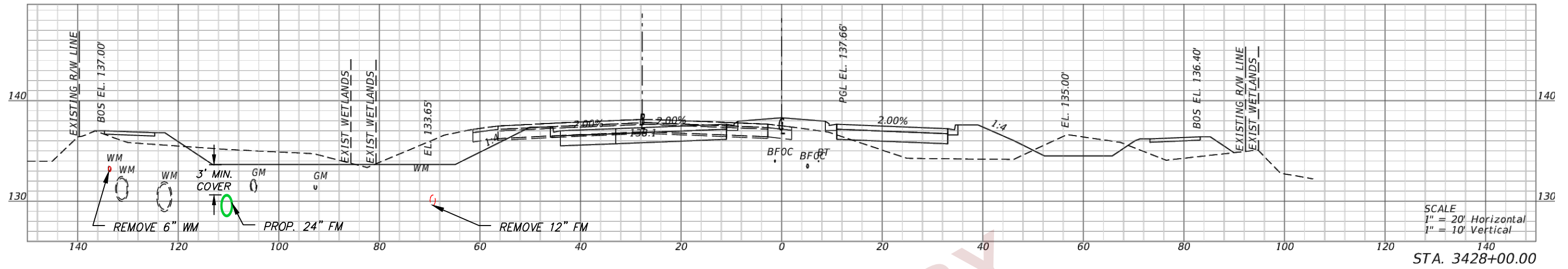
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
U-54

PRELIMINARY  
 Subject to changes

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

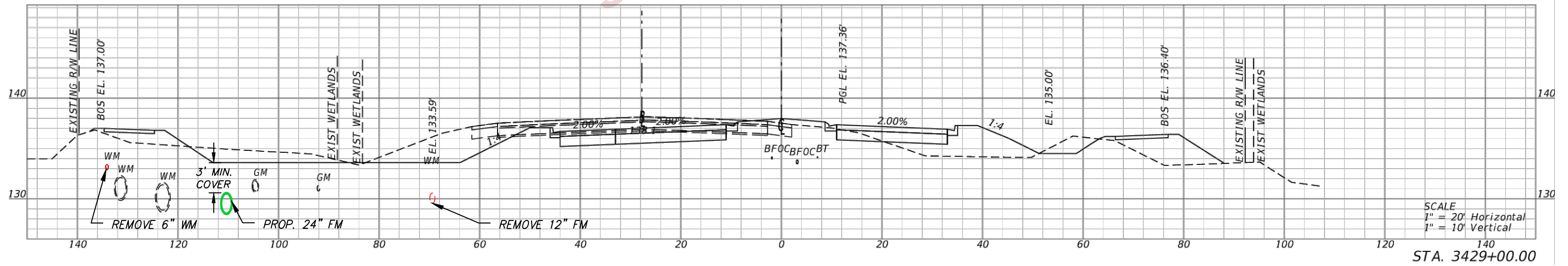
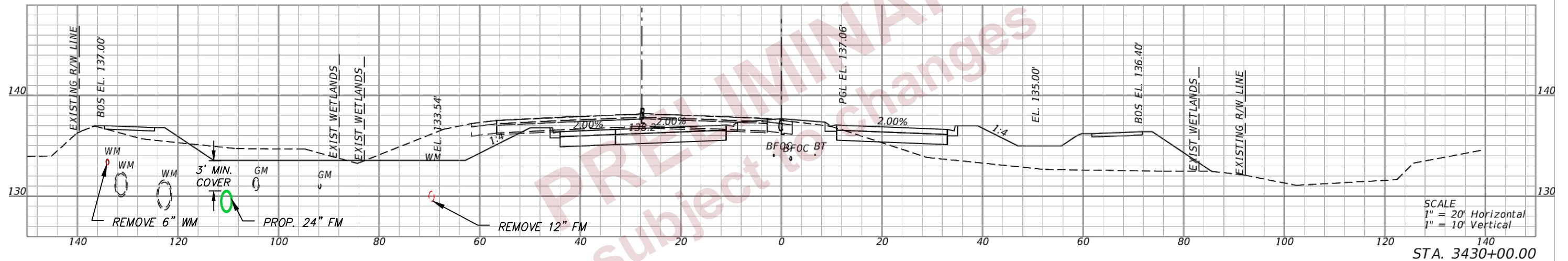
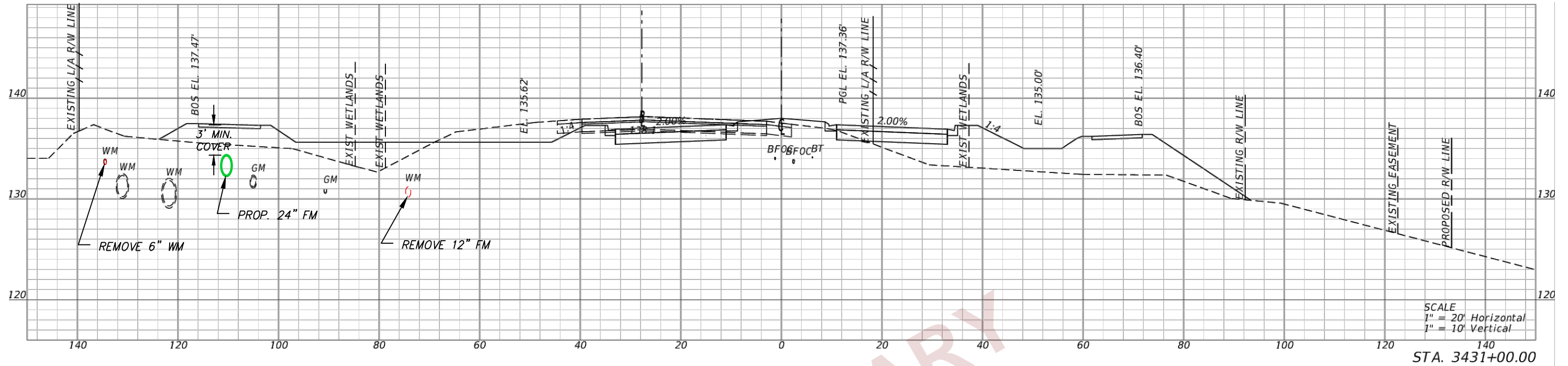
DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
 U-55

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

DOUGLAS E. JONES, P.E.  
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 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

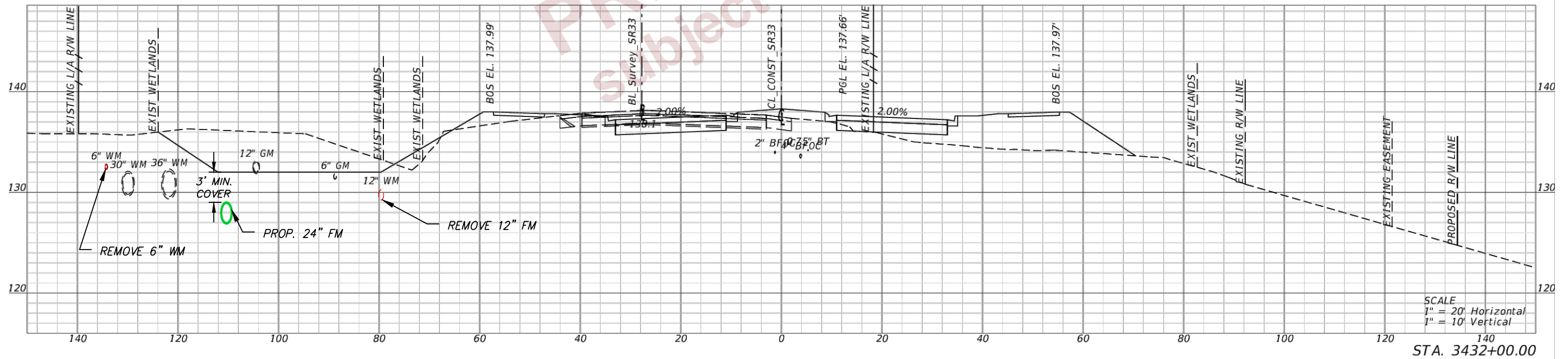
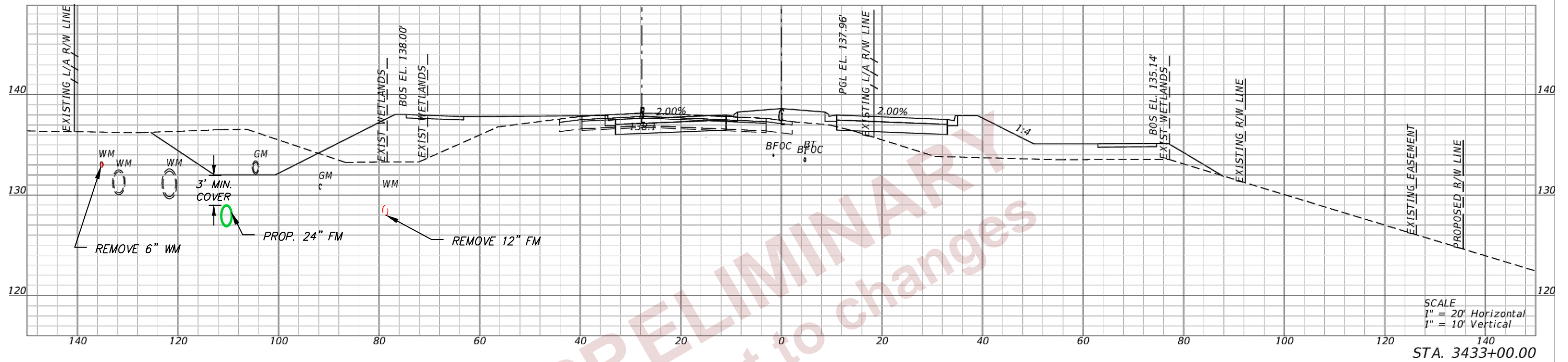
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
 U-56

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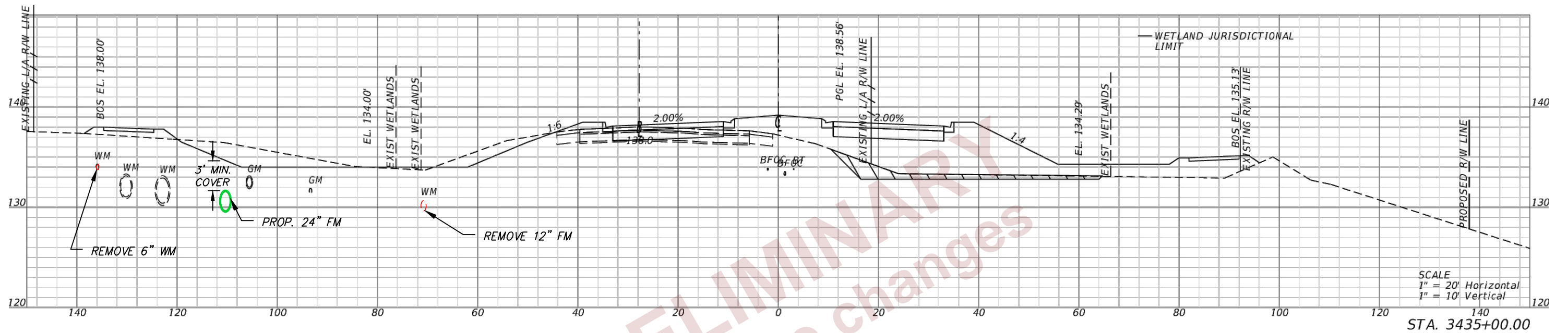
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

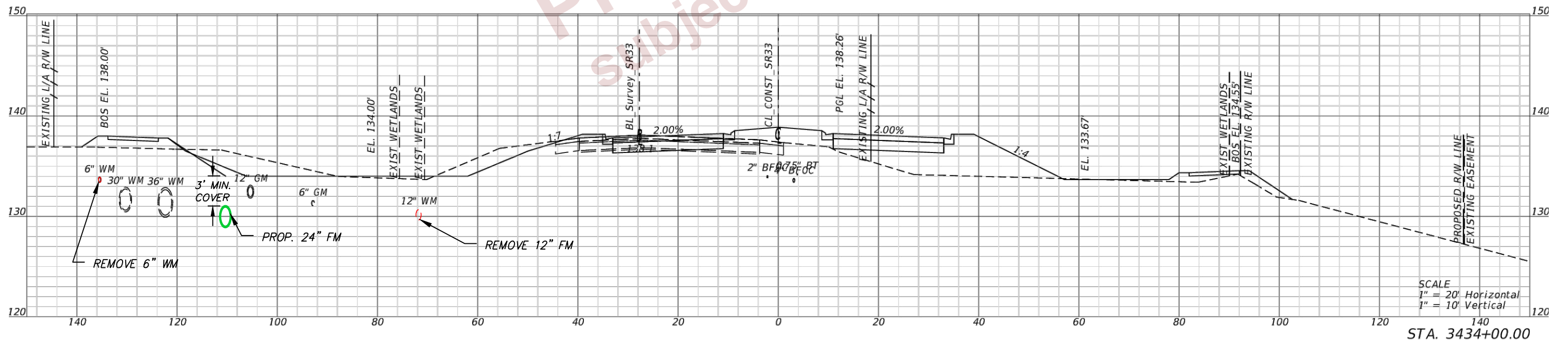
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
U-57



BEGIN SUBSOIL EXCAVATION  
STA. 3435+00.00



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

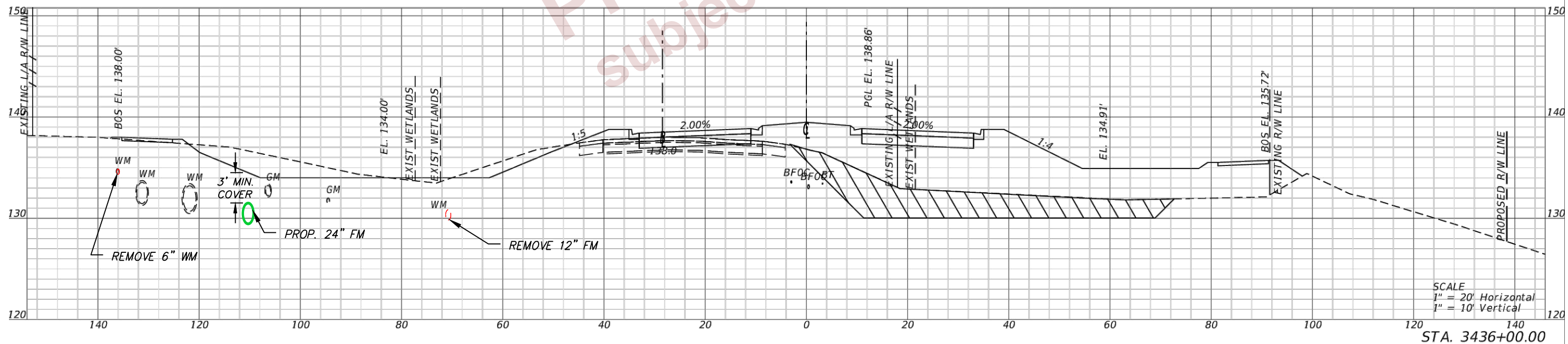
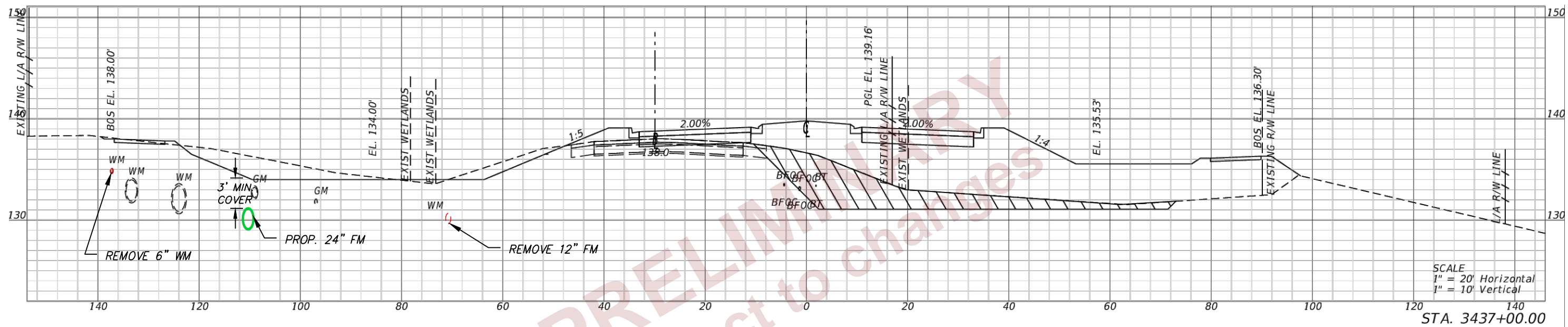
DOUGLAS E. JONES, P.E.  
CHASTAIN-SKILLMAN  
205 EAST ORANGE STREET  
SUITE #110  
LAKELAND, FL 33801-4611  
(863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
U-58

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REVISIONS			
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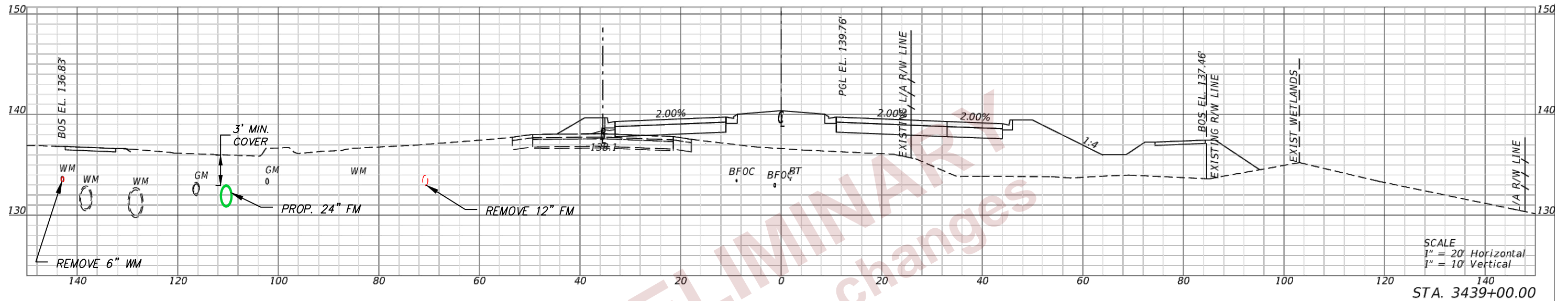
DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

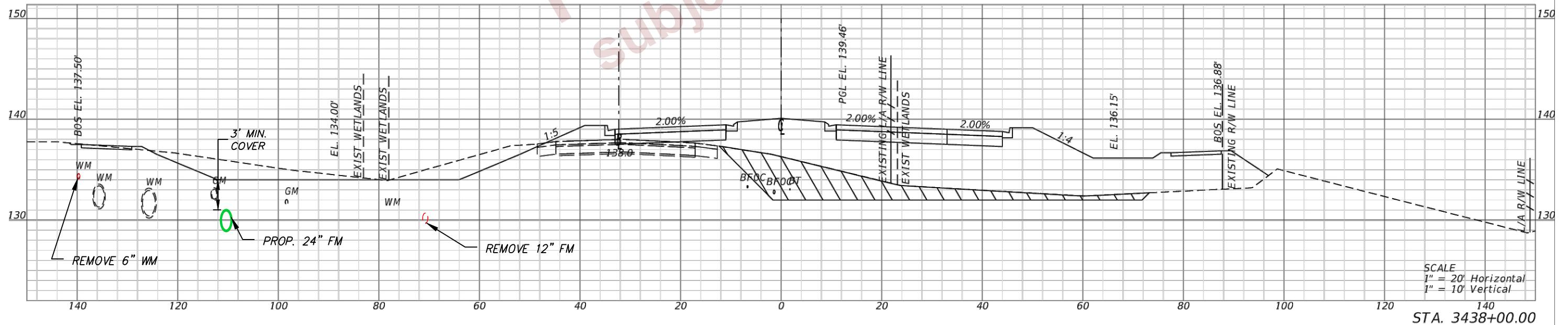
UTILITY CROSS SECTIONS

SHEET NO.  
 U-59

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END SUBSOIL EXCAVATION  
STA. 3438+80.00



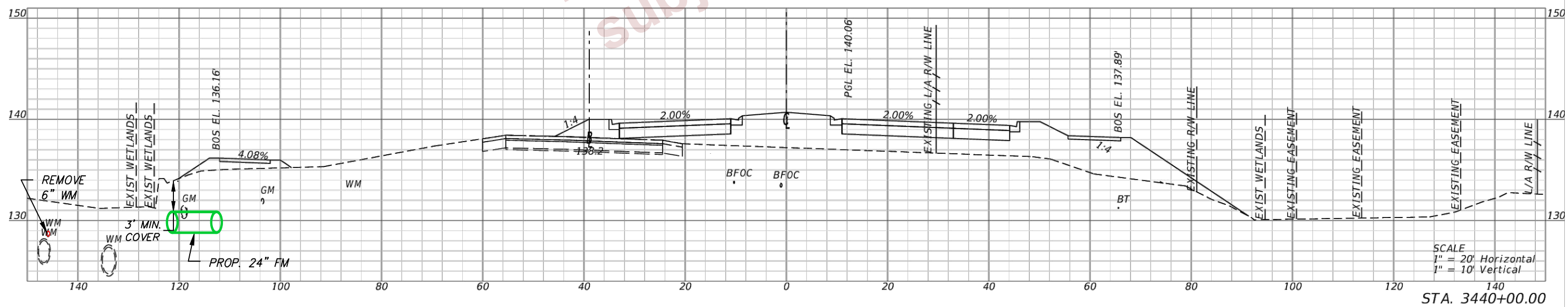
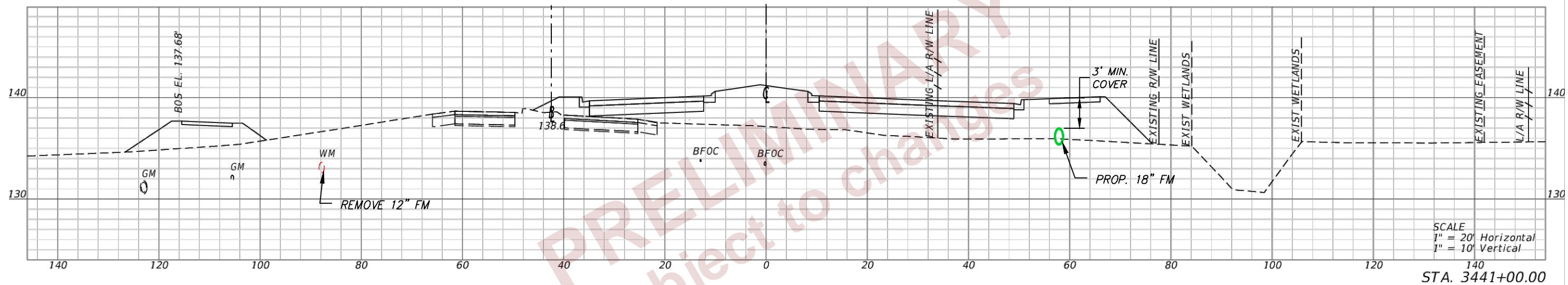
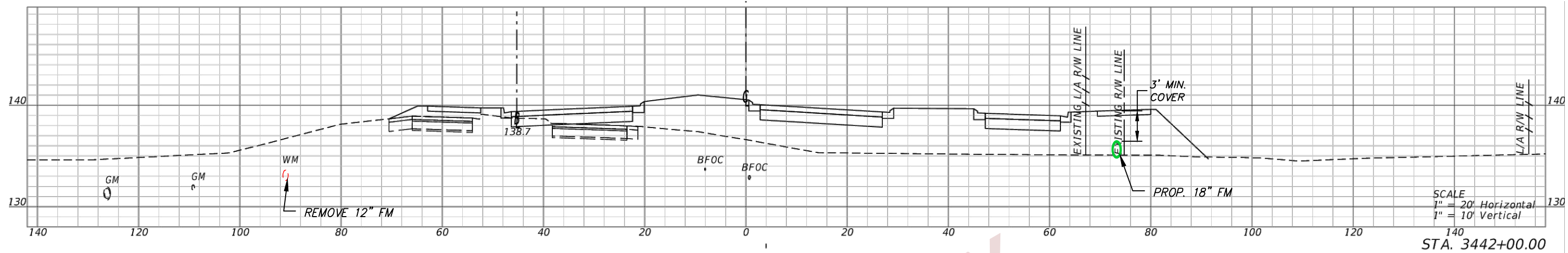
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

DOUGLAS E. JONES, P.E.  
CHASTAIN-SKILLMAN  
205 EAST ORANGE STREET  
SUITE #110  
LAKELAND, FL 33801-4611  
(863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
U-60



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

DOUGLAS E. JONES, P.E.  
CHASTAIN-SKILLMAN  
205 EAST ORANGE STREET  
SUITE #110  
LAKELAND, FL 33801-4611  
(863) 646-1402

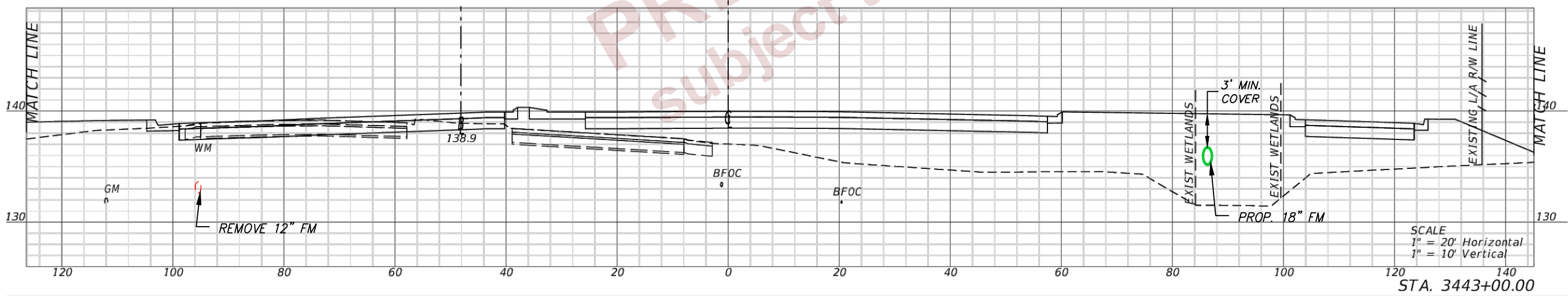
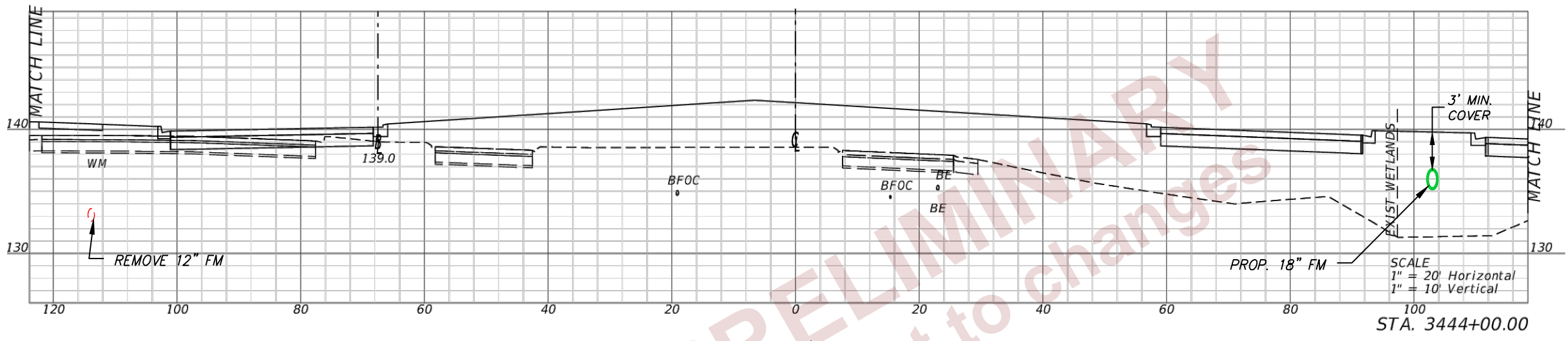
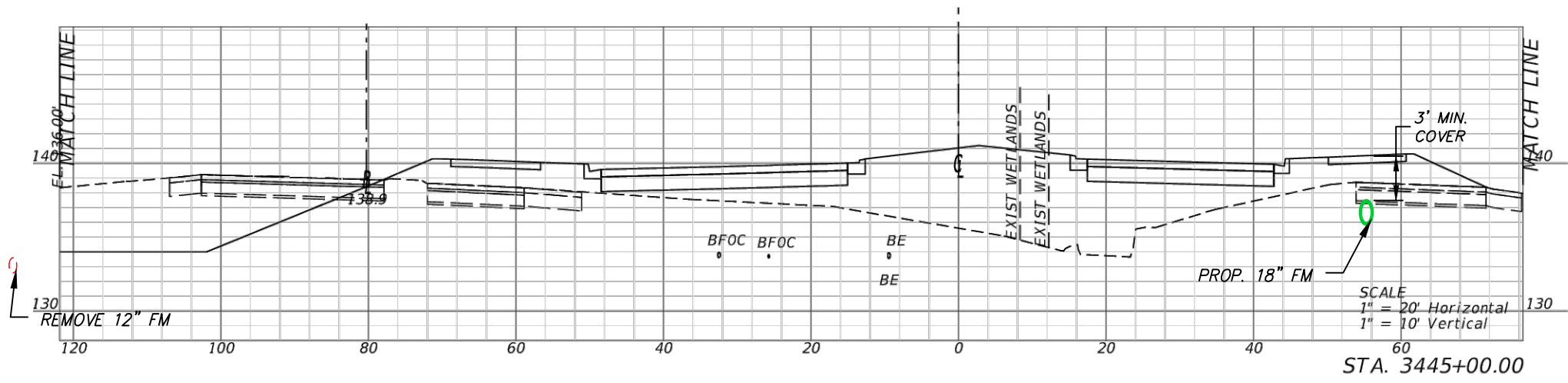
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

U-61

SHEET NO.  
U-61

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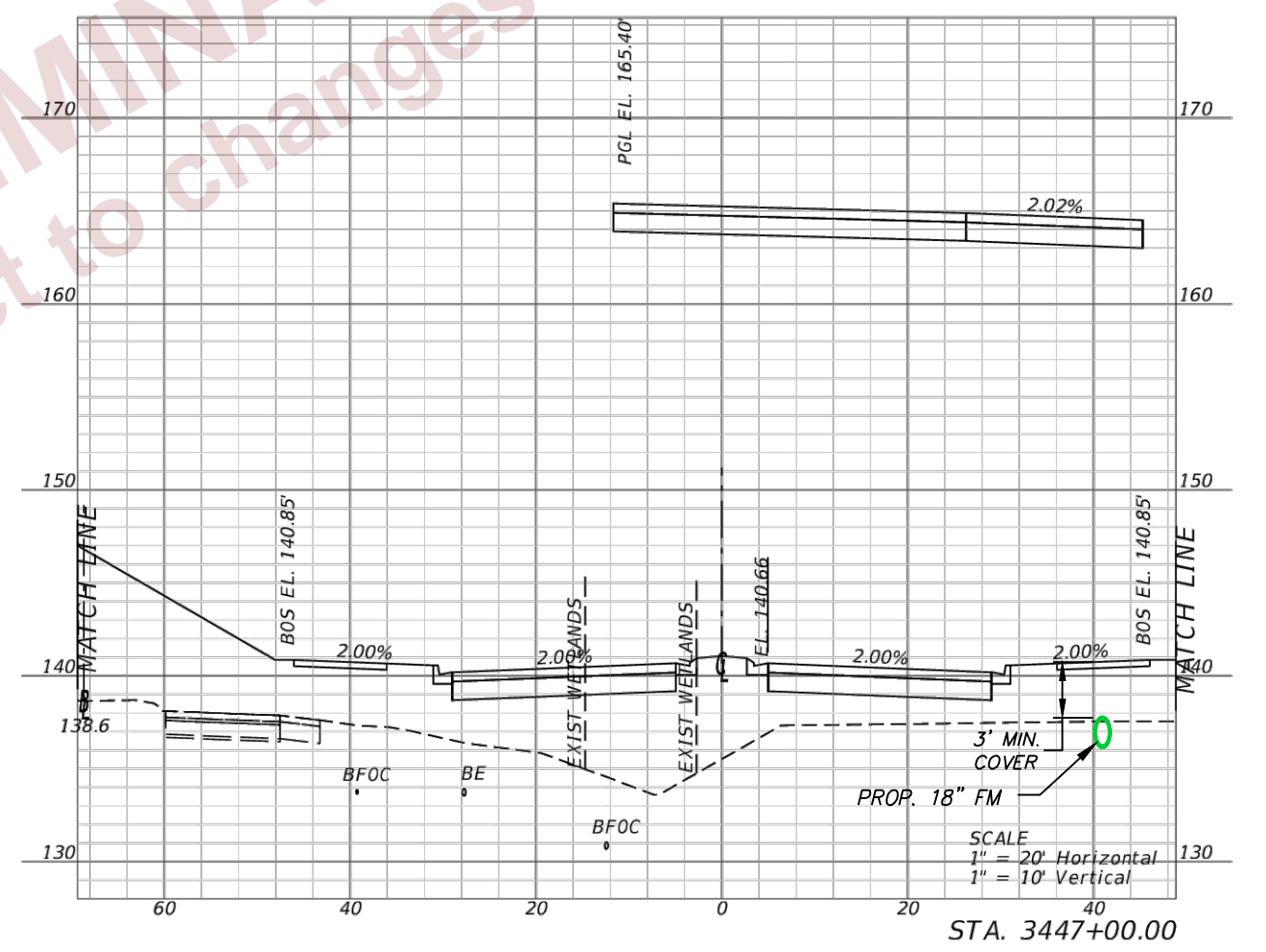
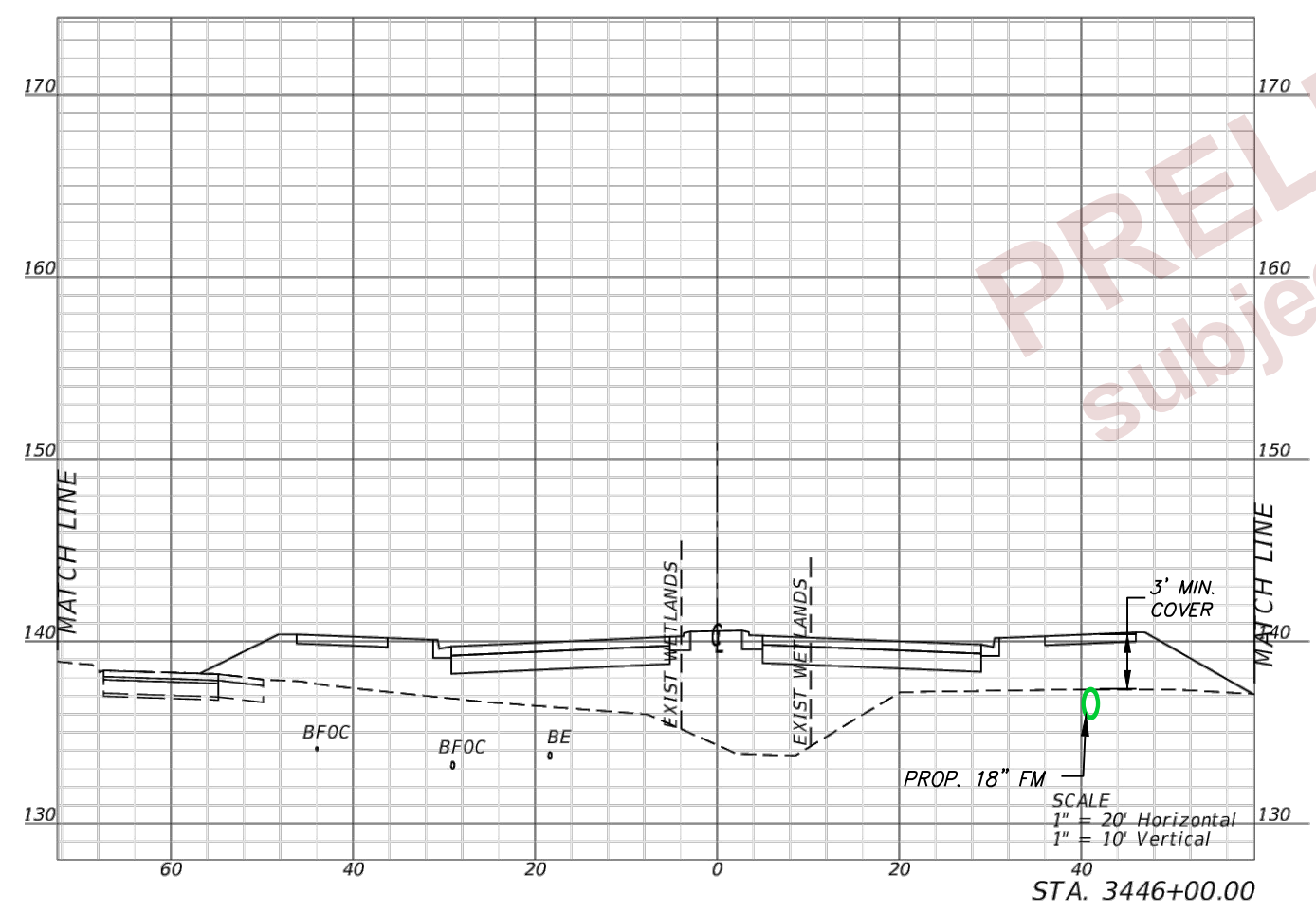
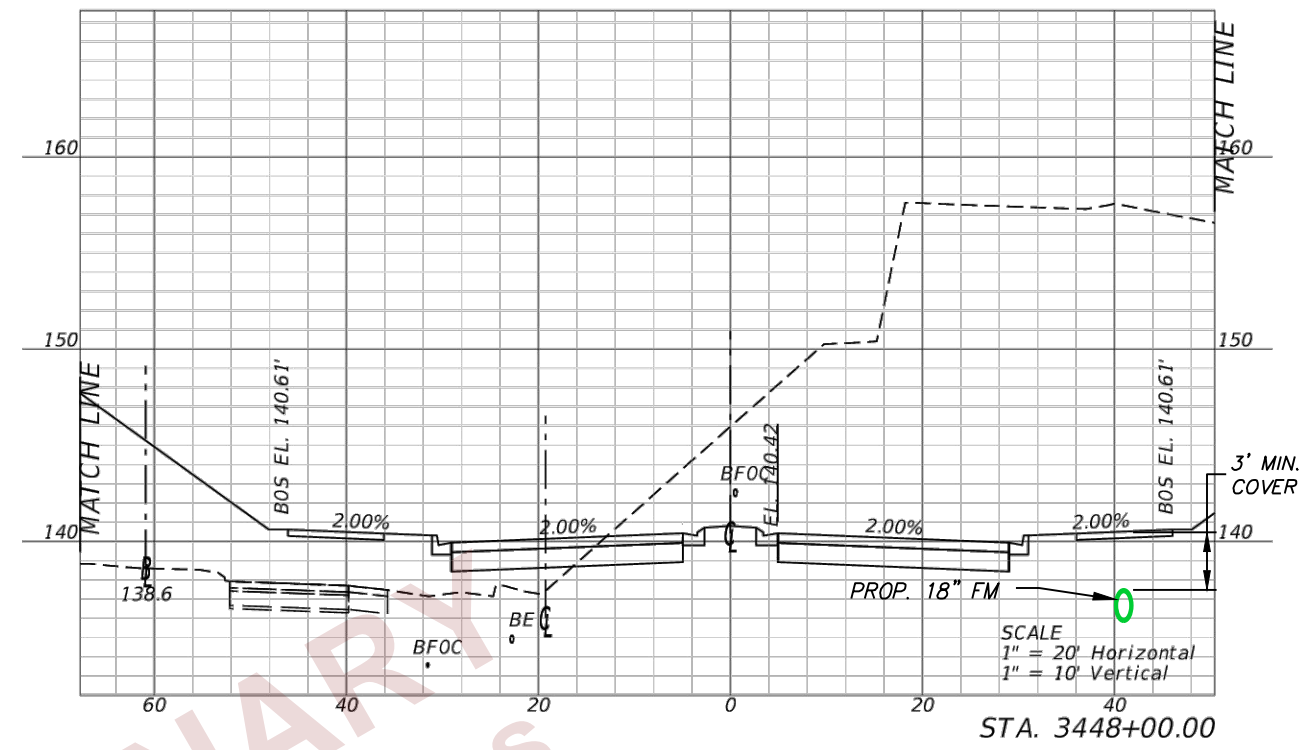
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DATE	DESCRIPTION	DATE	DESCRIPTION

DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
**U-62**



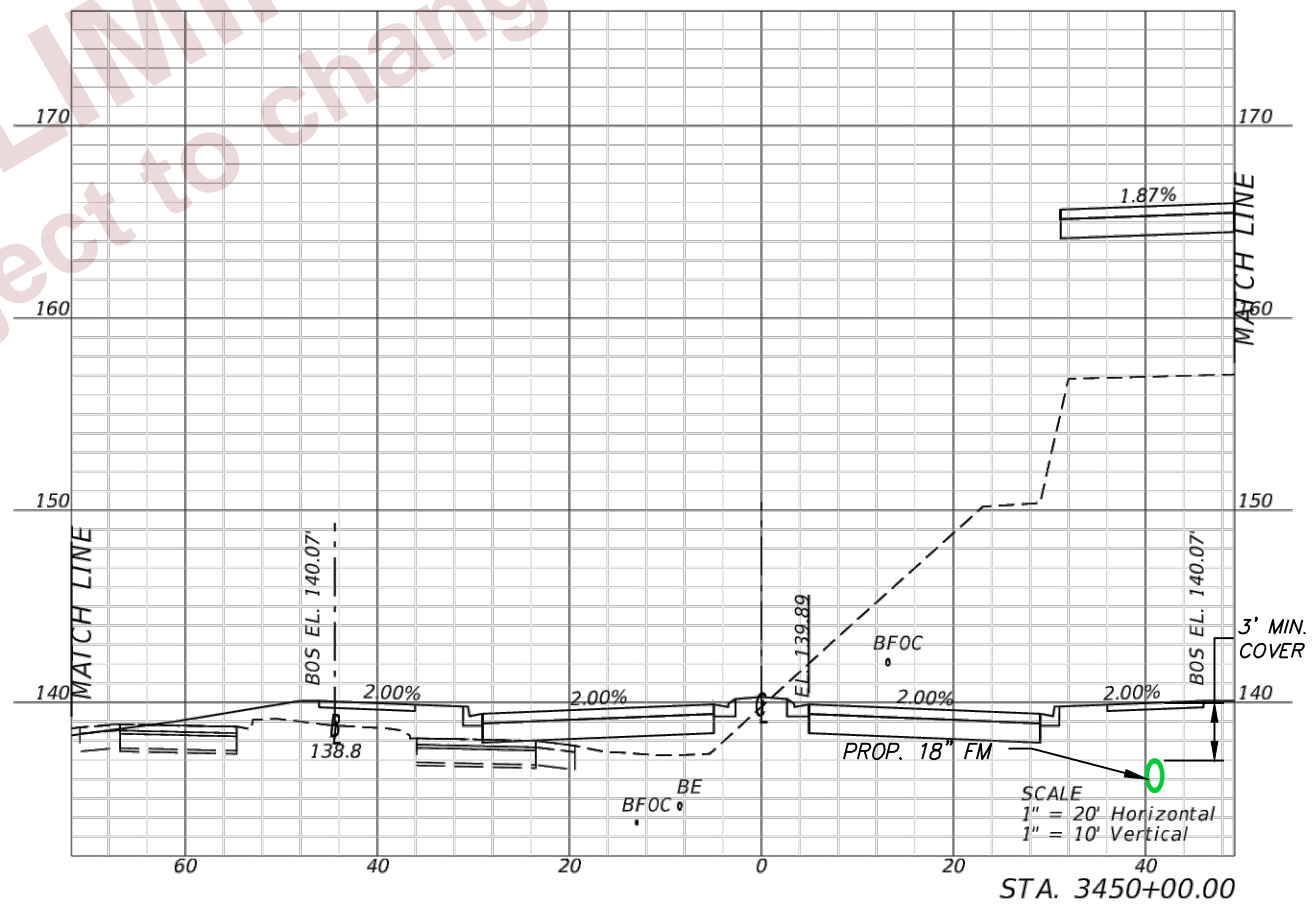
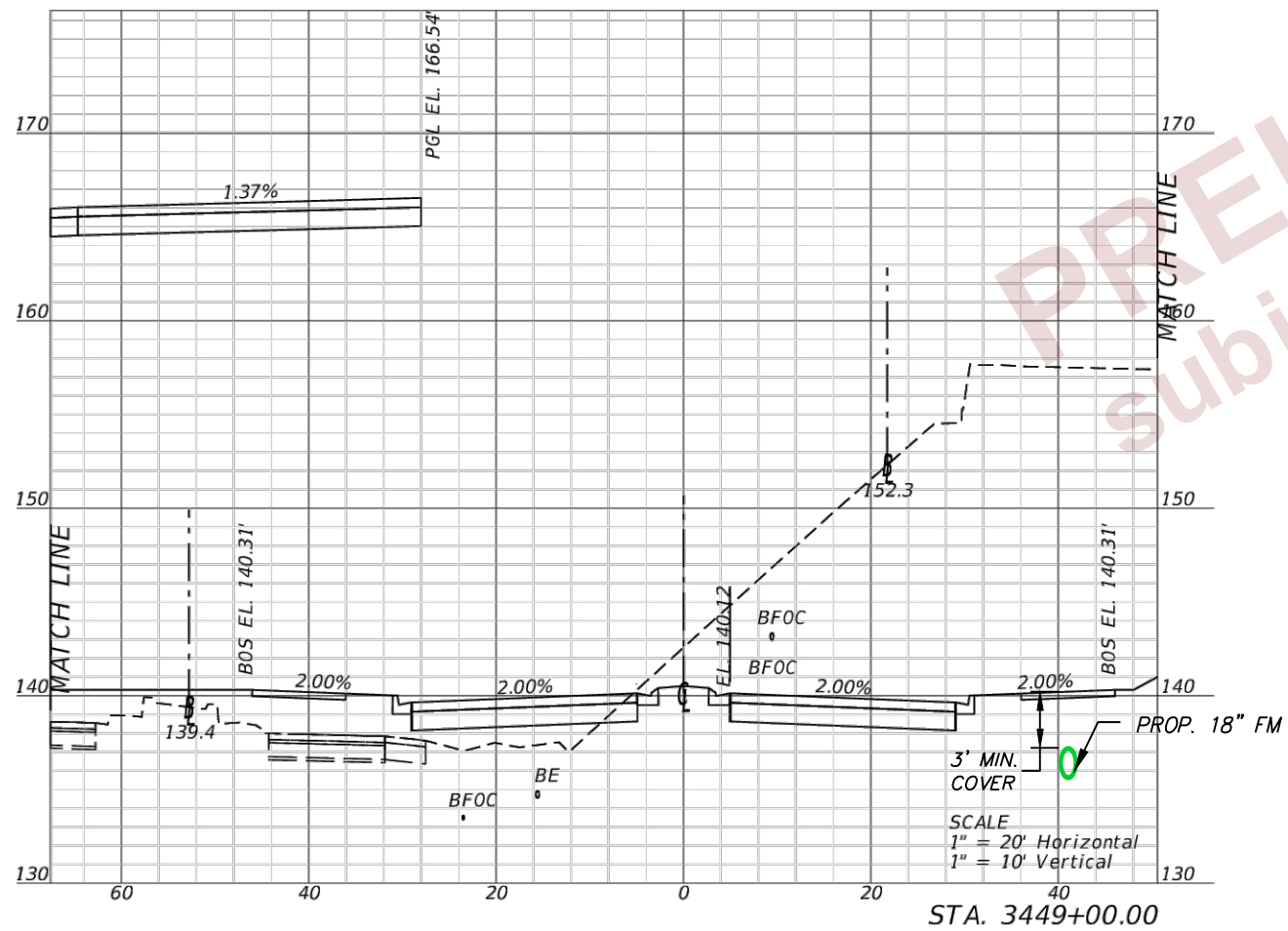
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DATE	DESCRIPTION	DATE	DESCRIPTION

DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
 U-63



PRELIMINARY  
 Subject to changes

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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 SUITE #110  
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 DEPARTMENT OF TRANSPORTATION

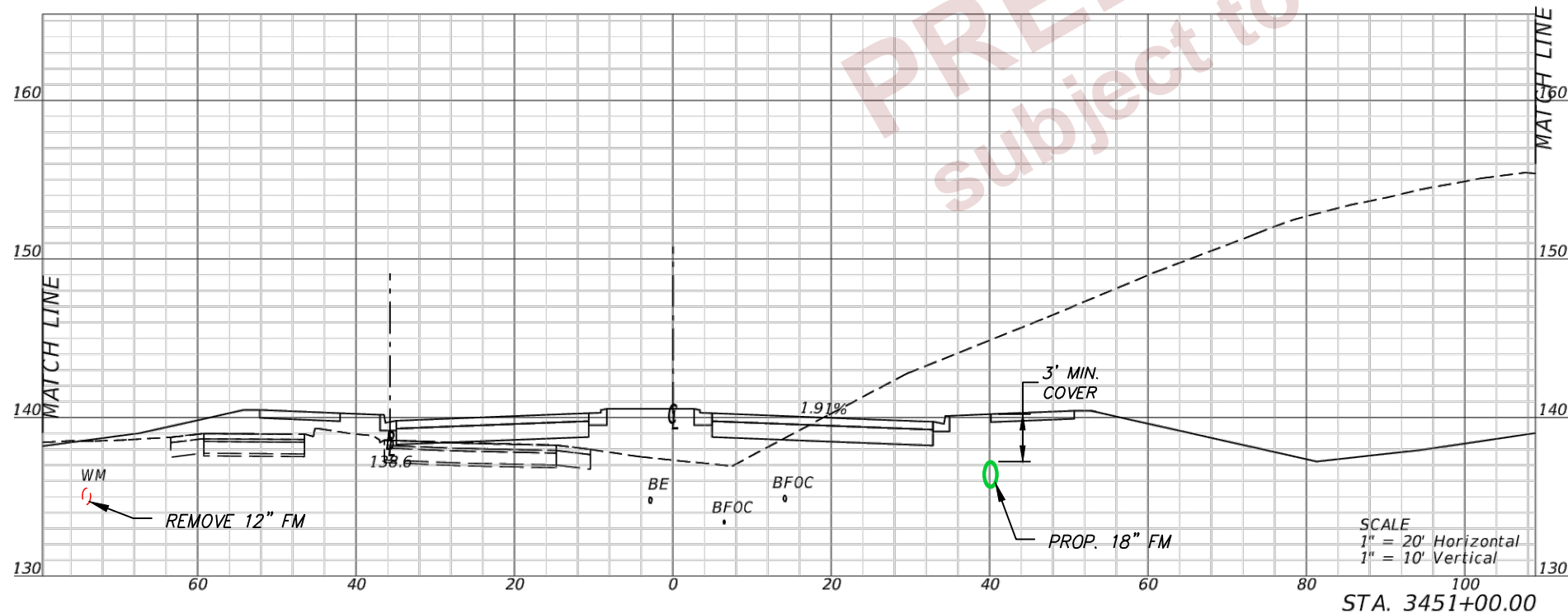
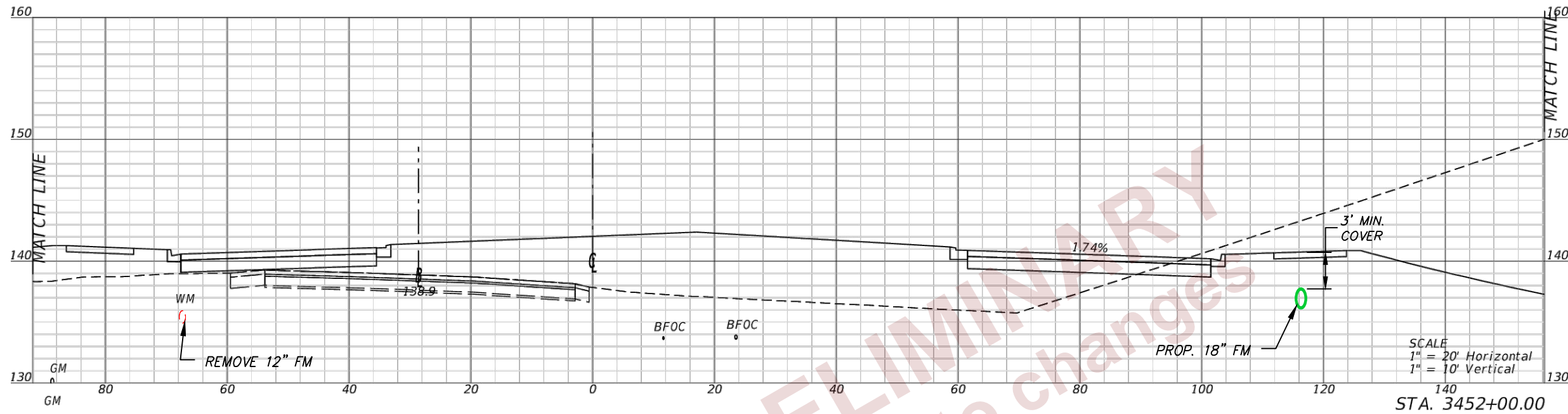
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

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SHEET NO.

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

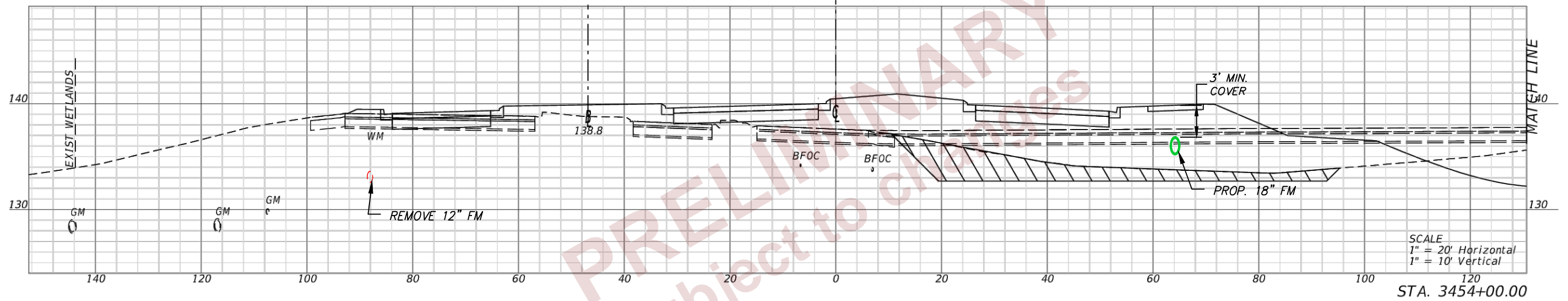
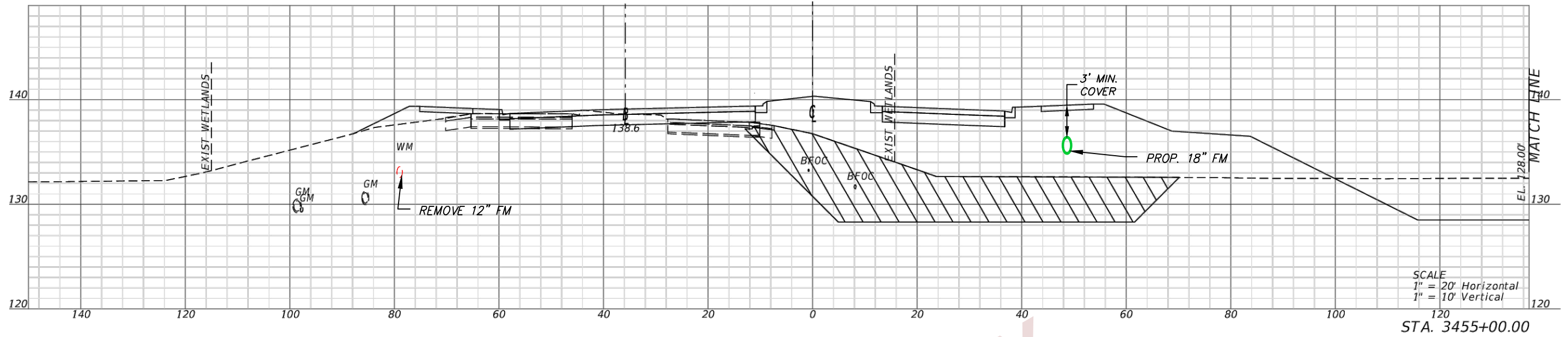
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

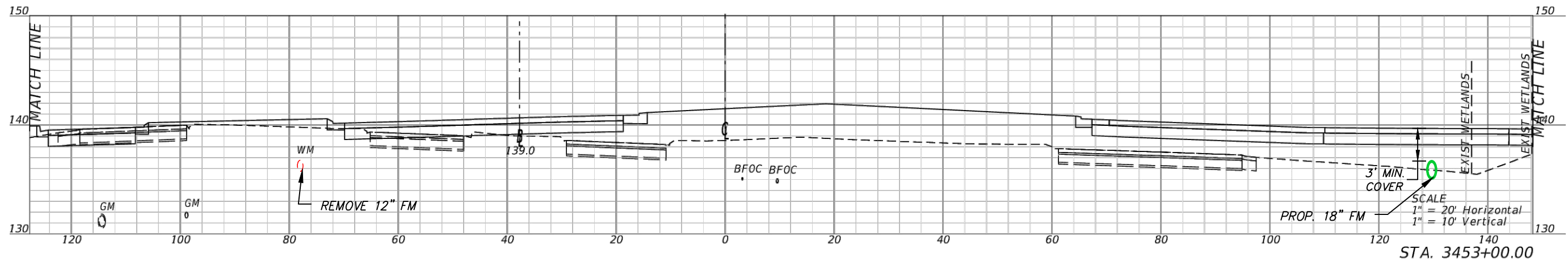
SHEET NO.  
U-65

PRELIMINARY  
 subject to changes

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STA. 3453+73.00



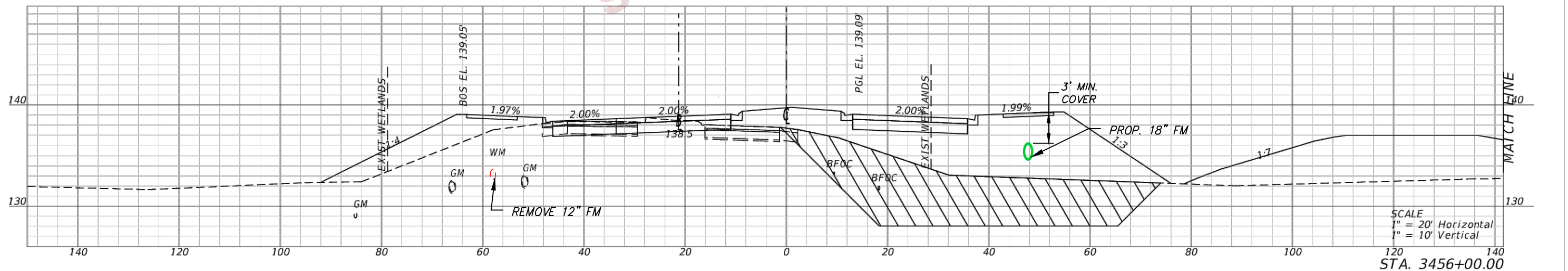
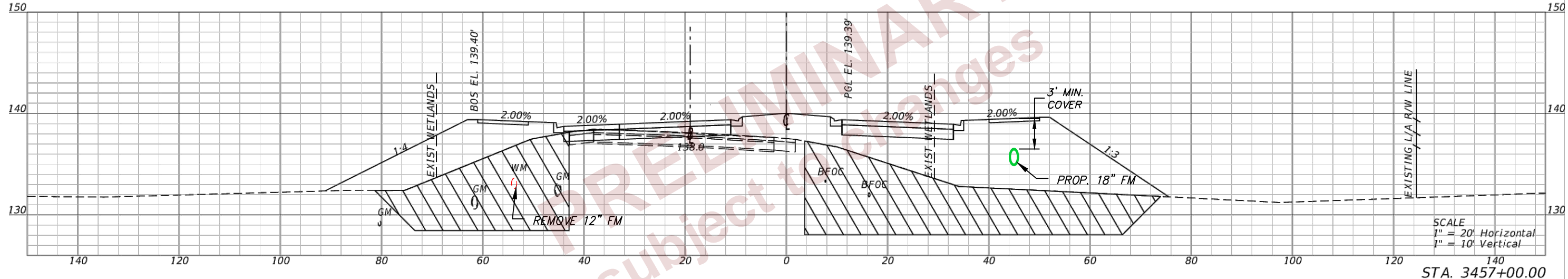
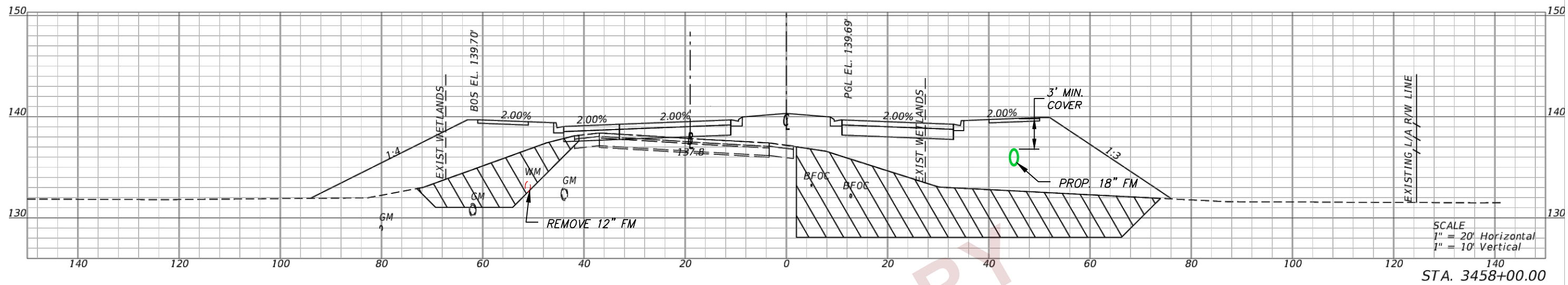
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

DOUGLAS E. JONES, P.E.  
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205 EAST ORANGE STREET  
SUITE #110  
LAKELAND, FL 33801-4611  
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
U-66



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

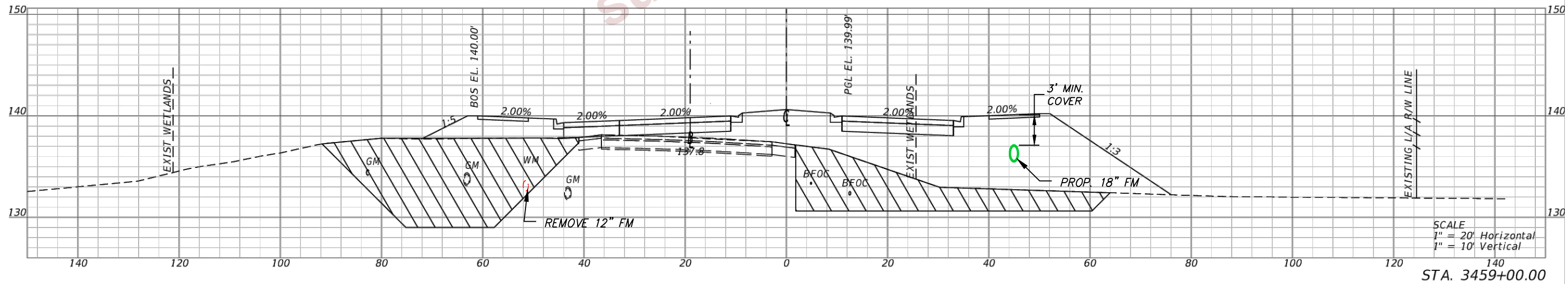
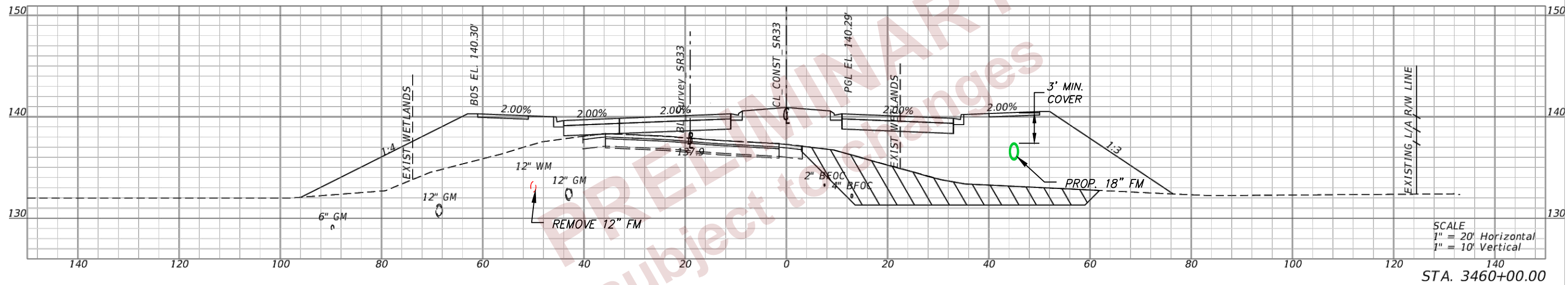
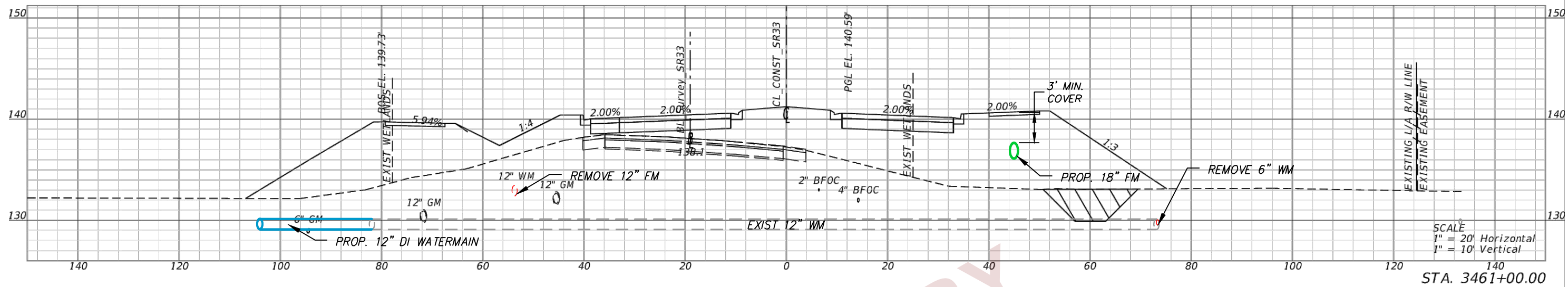
DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

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UTILITY CROSS SECTIONS

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U-67

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DATE	DESCRIPTION	DATE	DESCRIPTION

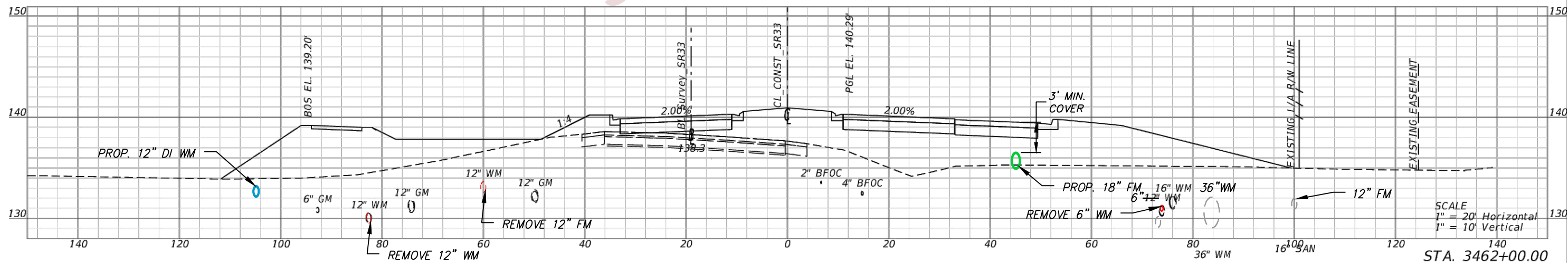
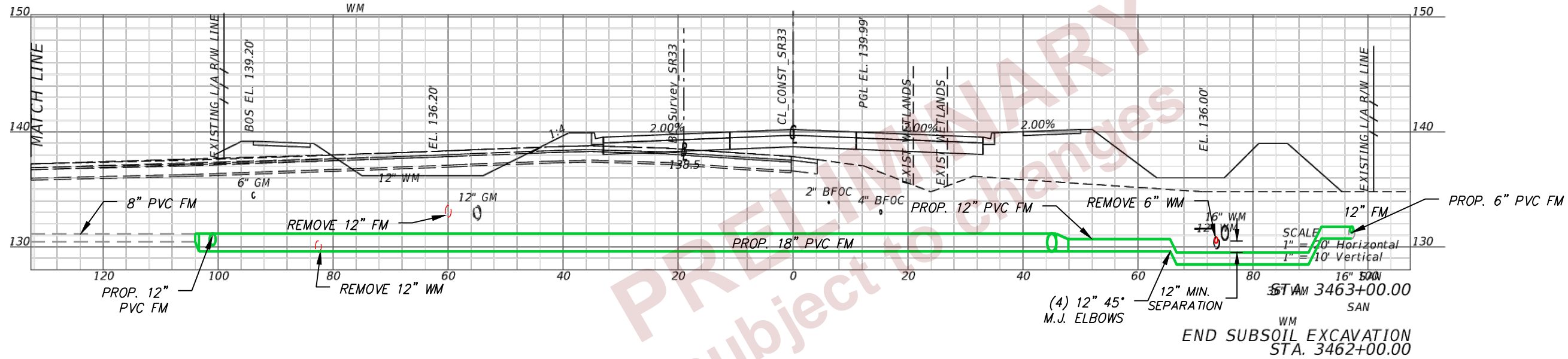
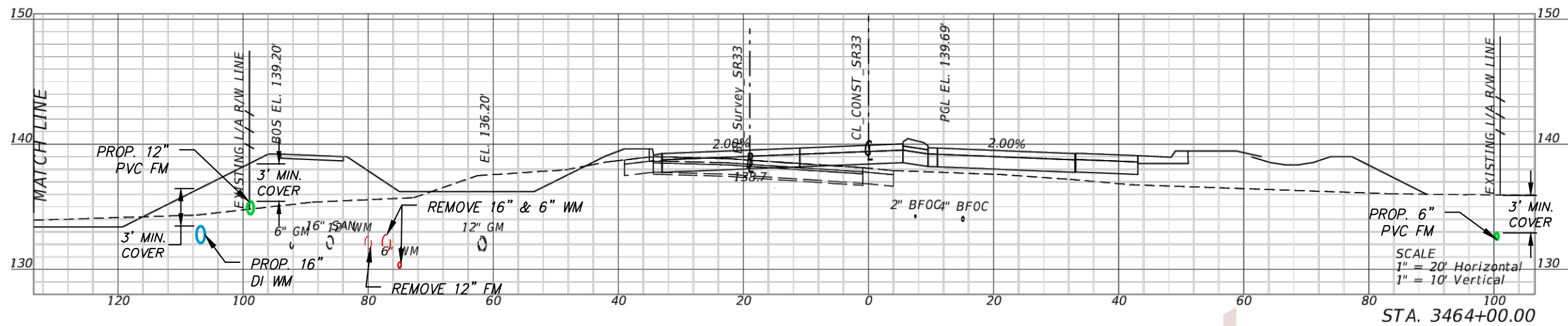
DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

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UTILITY CROSS SECTIONS

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**U-68**

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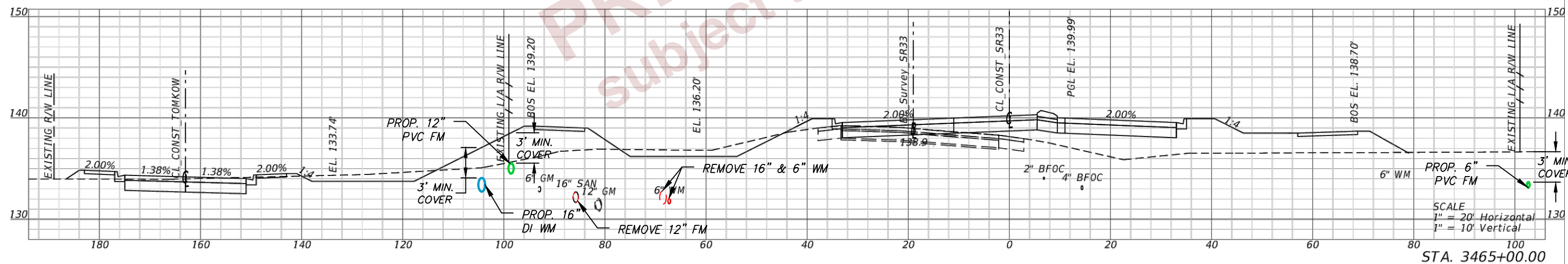
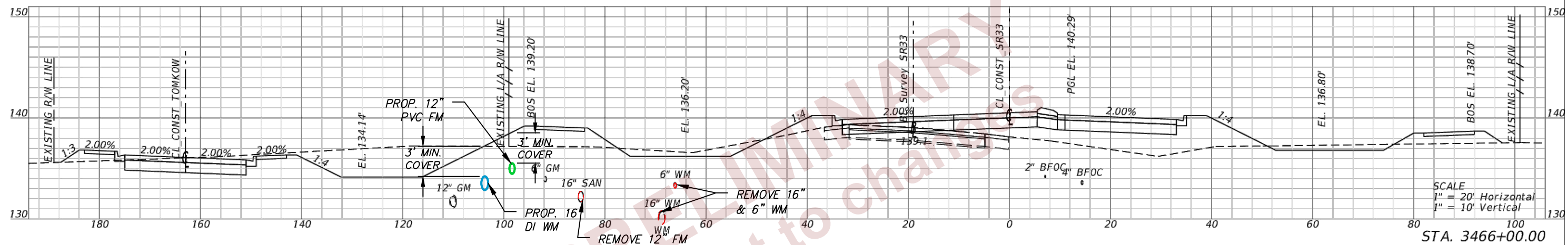
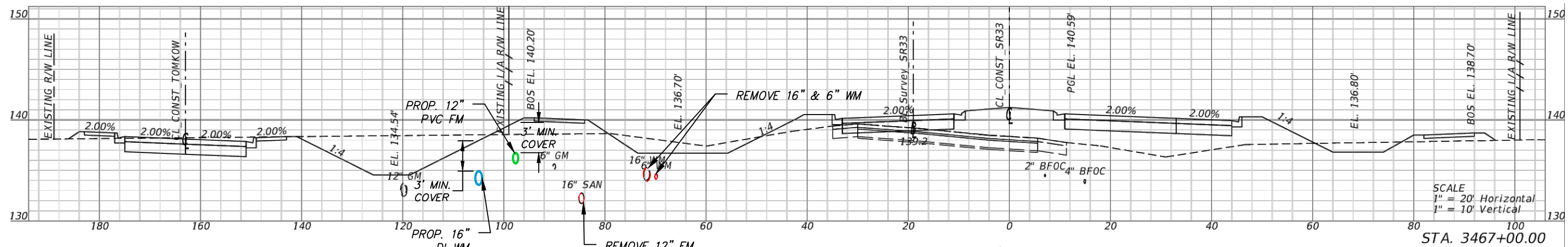
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
U-69



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

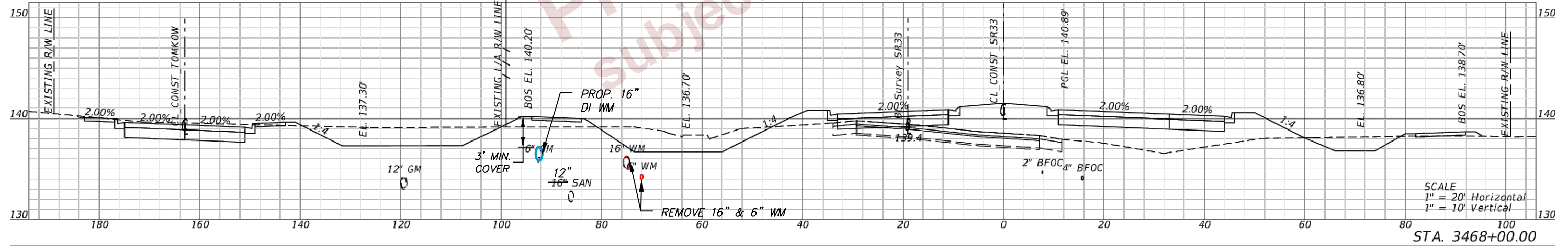
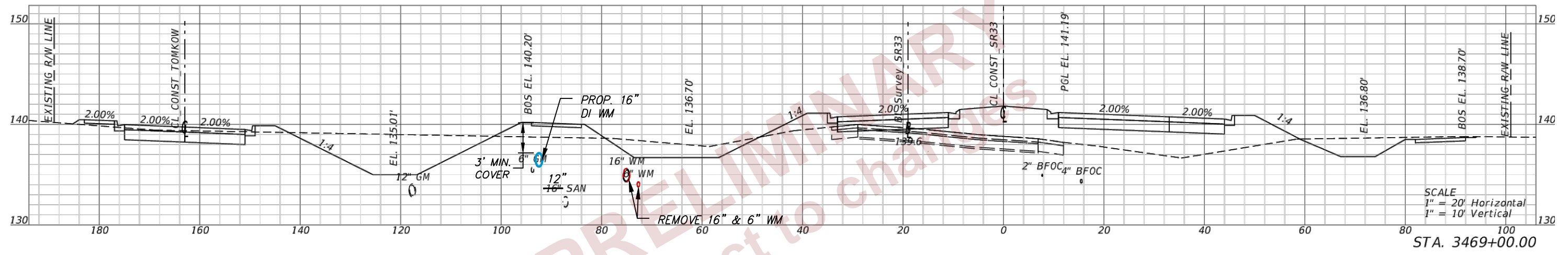
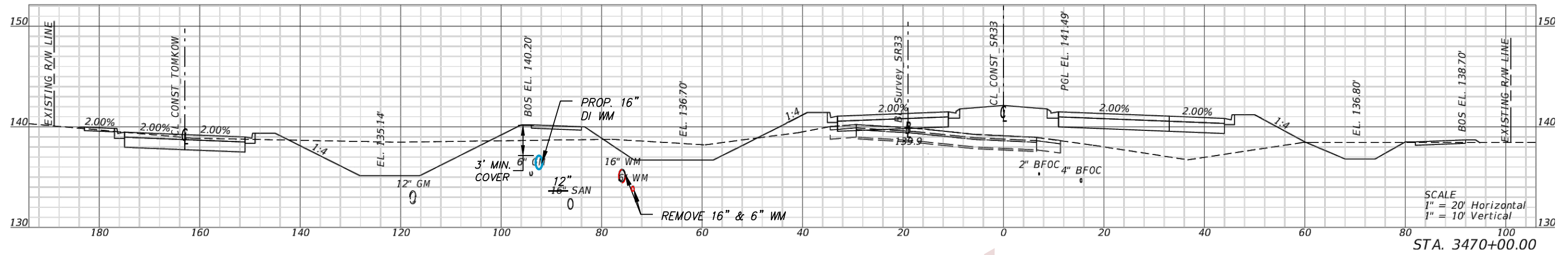
DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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UTILITY CROSS SECTIONS

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 U-70

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

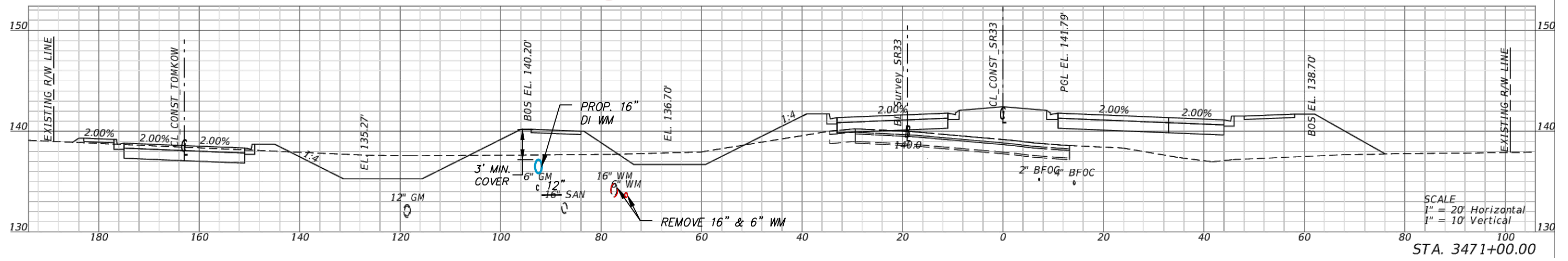
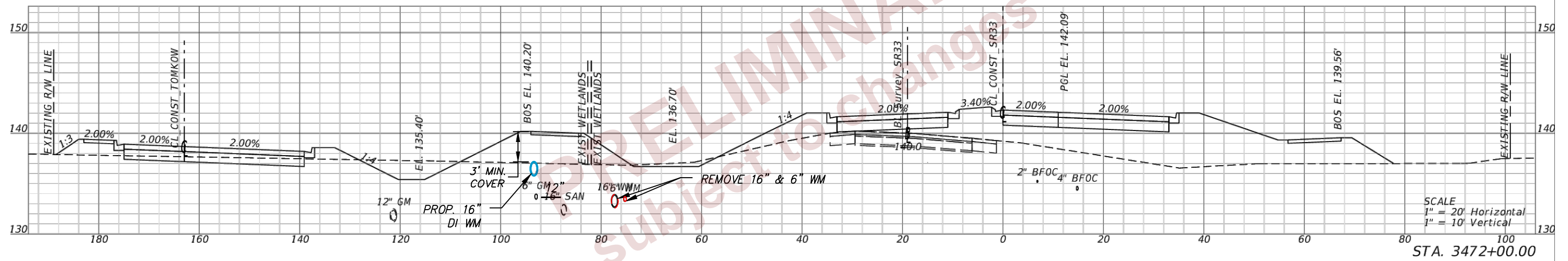
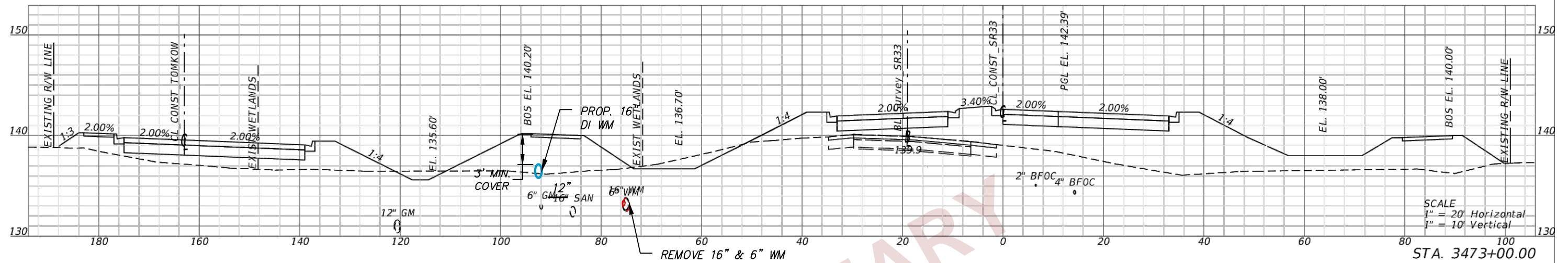
DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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UTILITY CROSS SECTIONS

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U-71

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 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

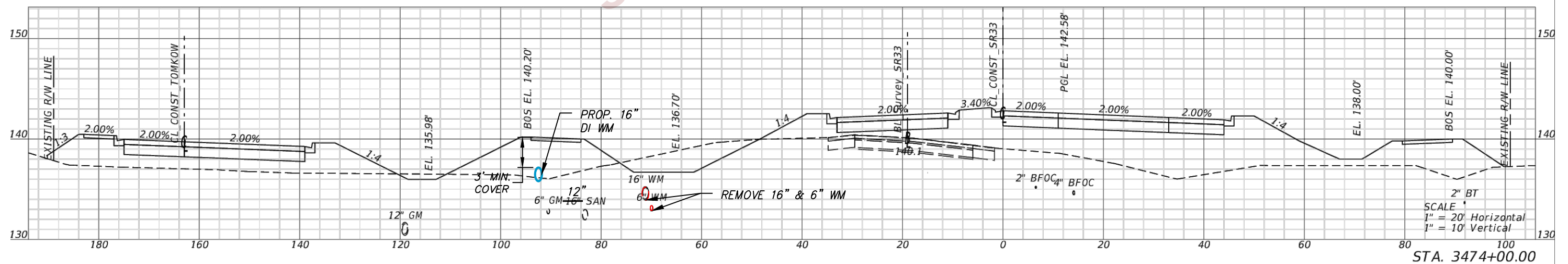
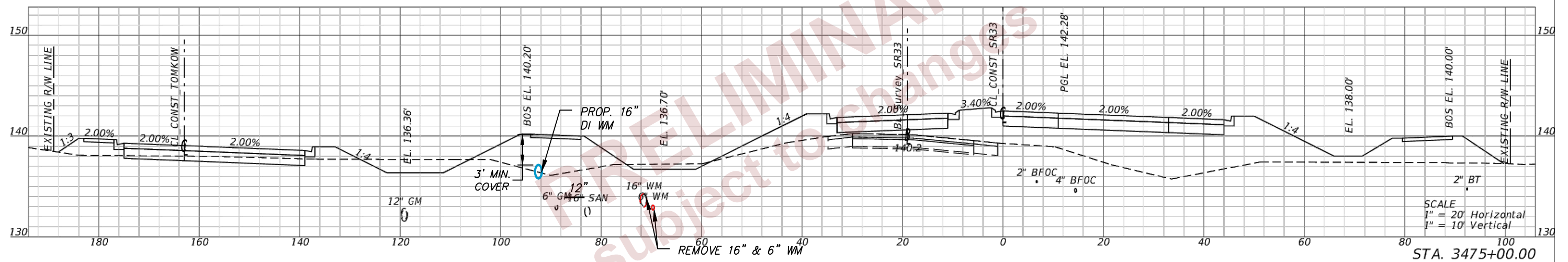
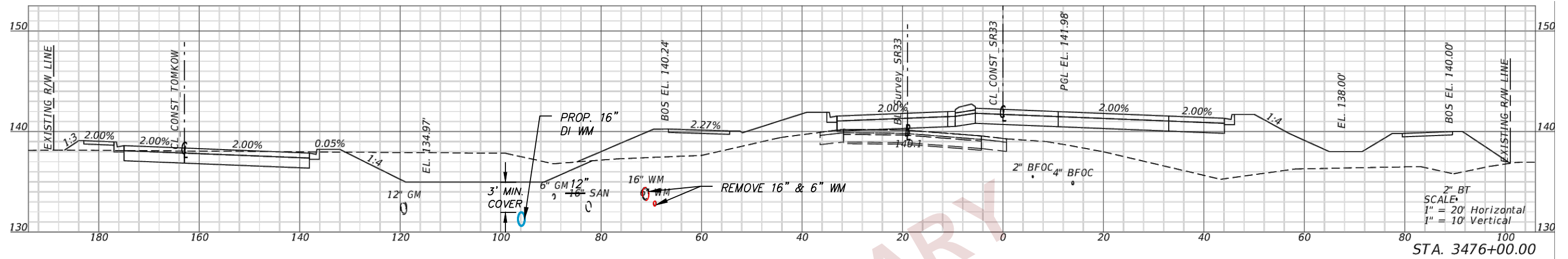
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

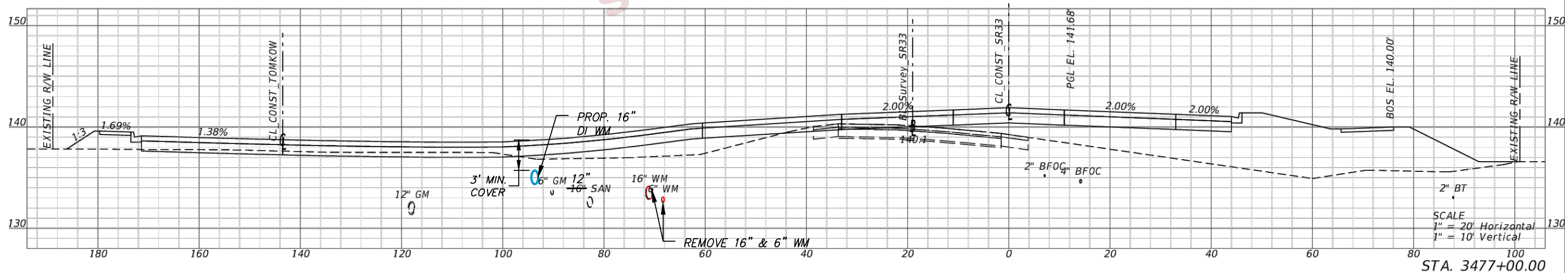
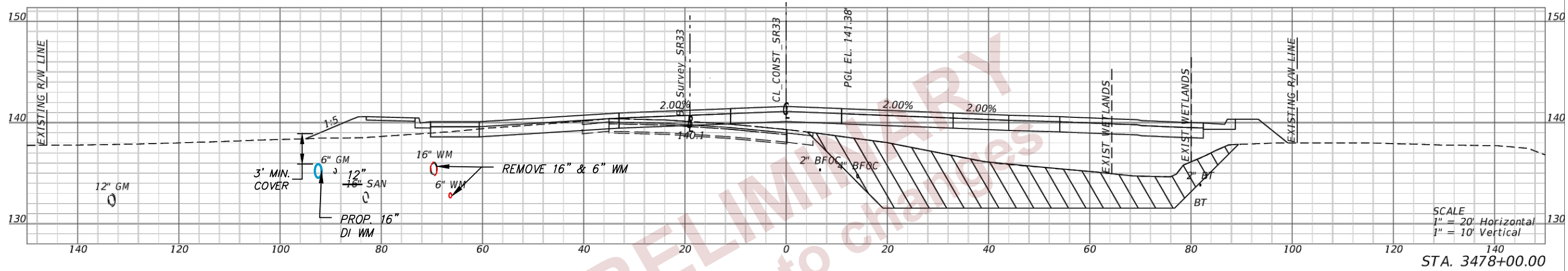
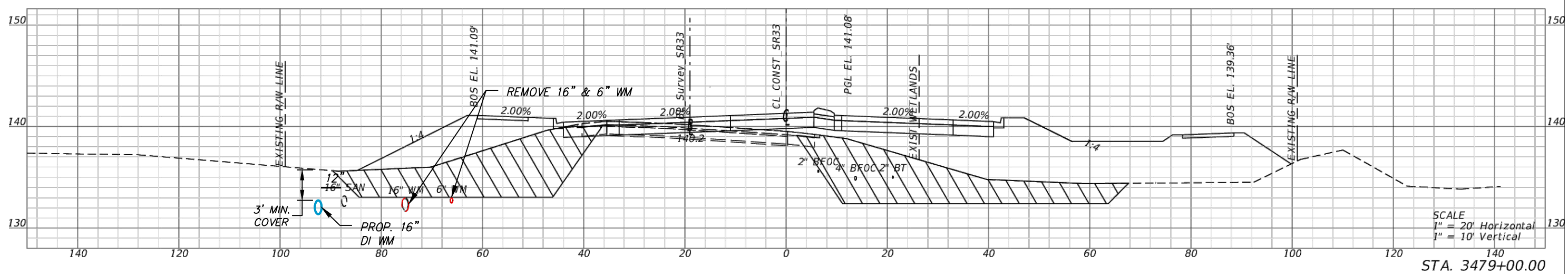
DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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UTILITY CROSS SECTIONS

SHEET NO.  
**U-73**

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BEGIN SUBSOIL EXCAVATION  
STA. 3477+86.00

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

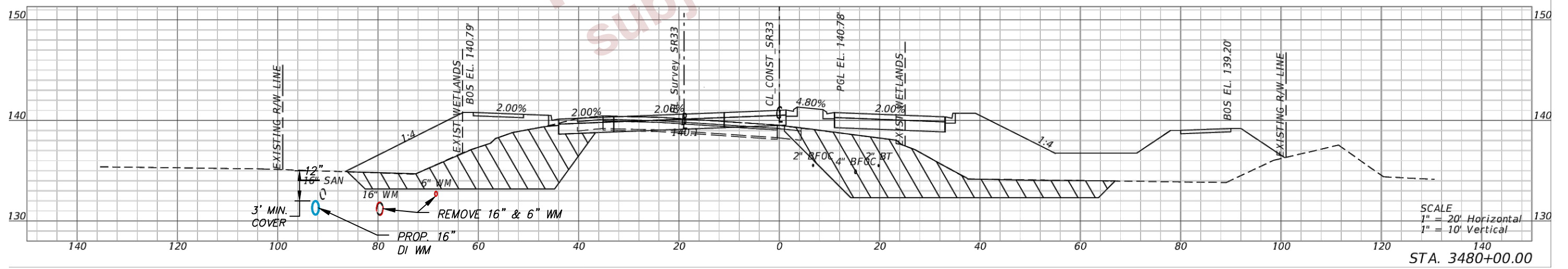
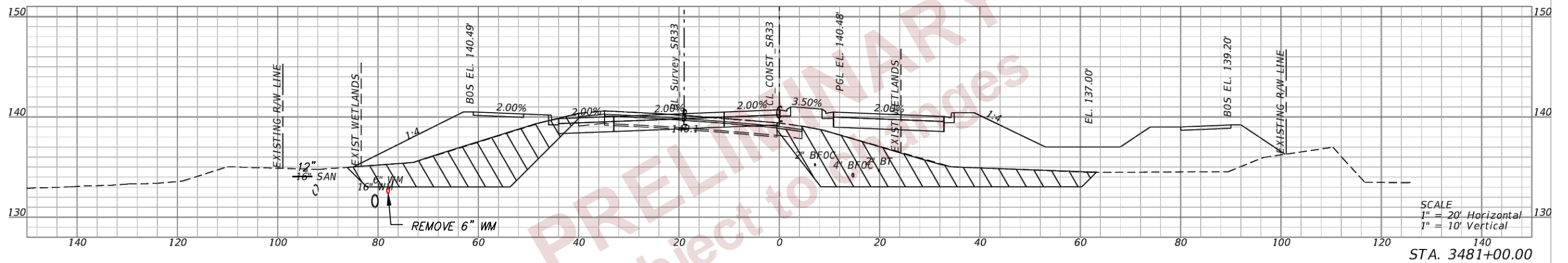
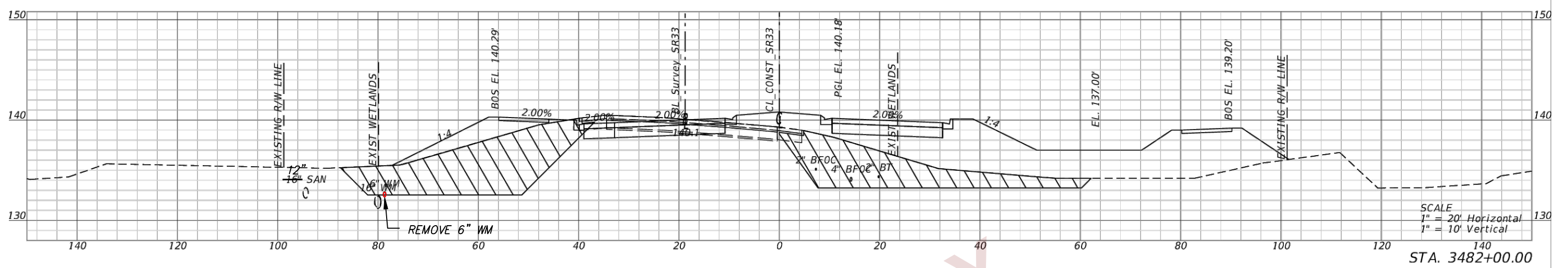
DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
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 LAKELAND, FL 33801-4611  
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UTILITY CROSS SECTIONS

SHEET NO.  
U-74

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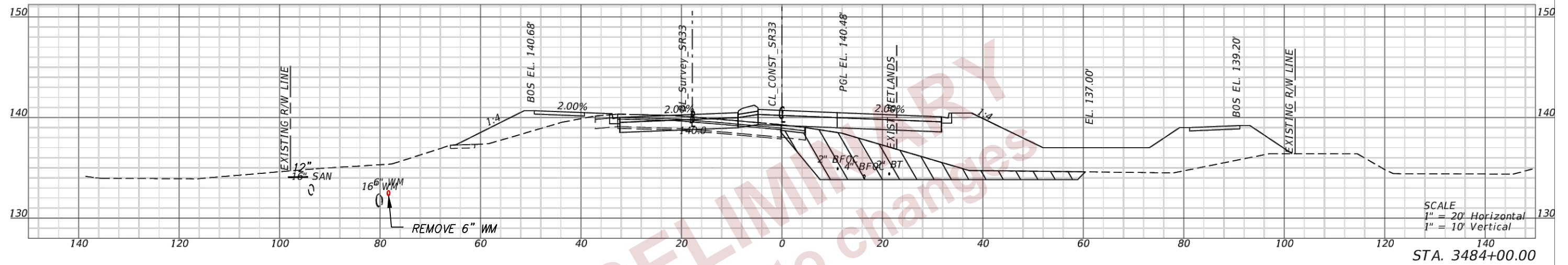
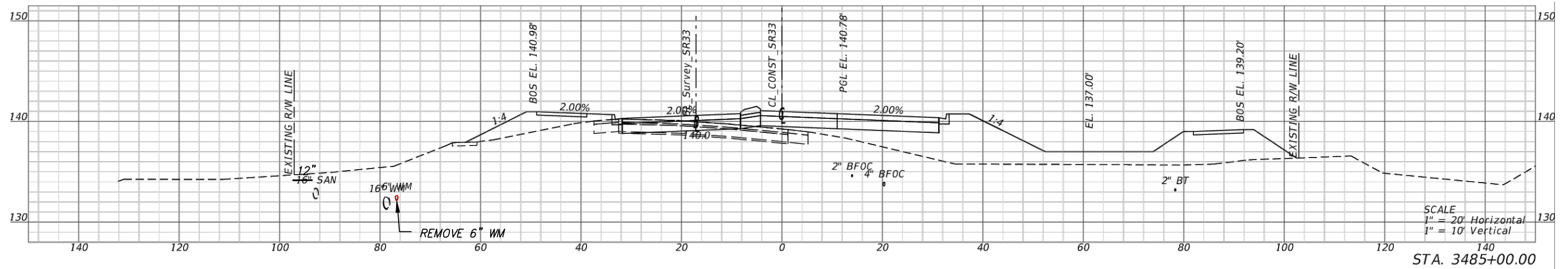
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
 205 EAST ORANGE STREET  
 SUITE #110  
 LAKELAND, FL 33801-4611  
 (863) 646-1402

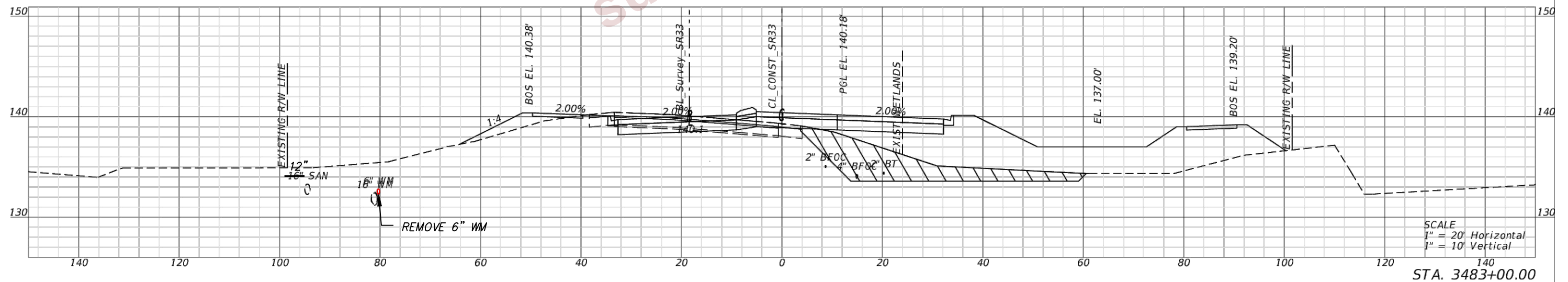
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
U-75



END SUBSOIL EXCAVATION  
STA. 3483+10.00



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

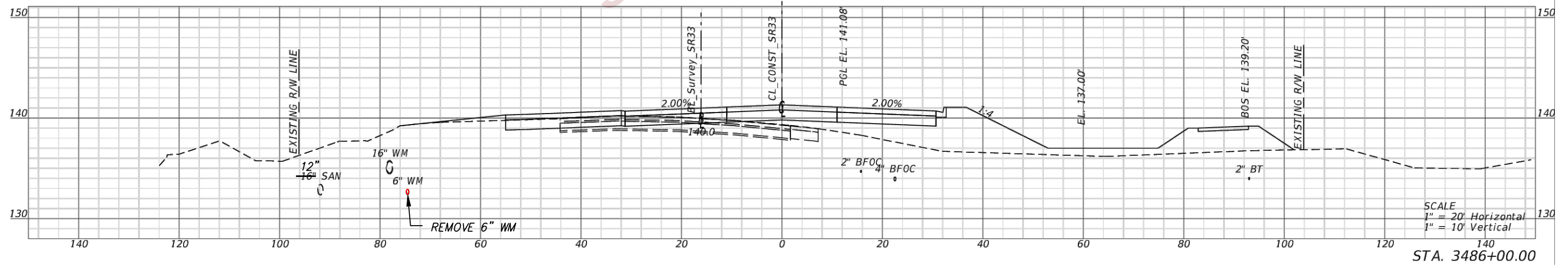
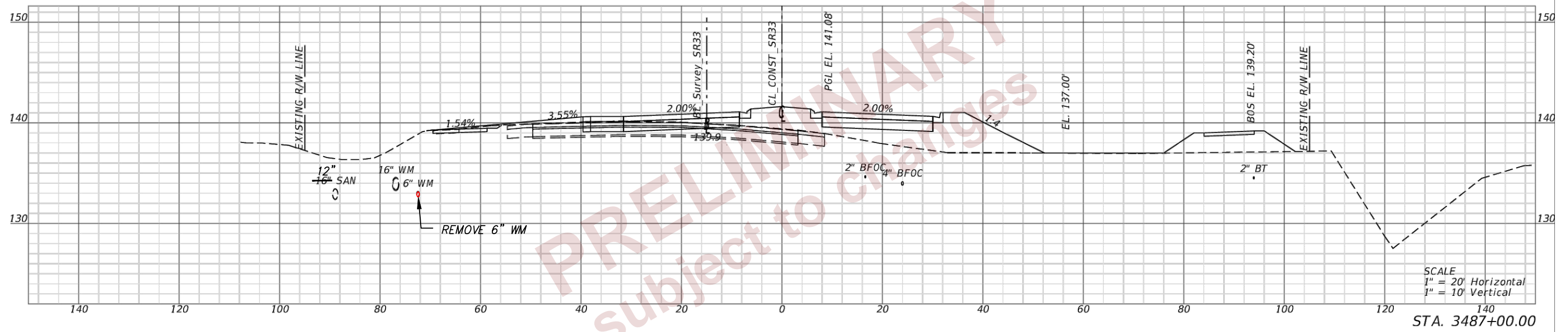
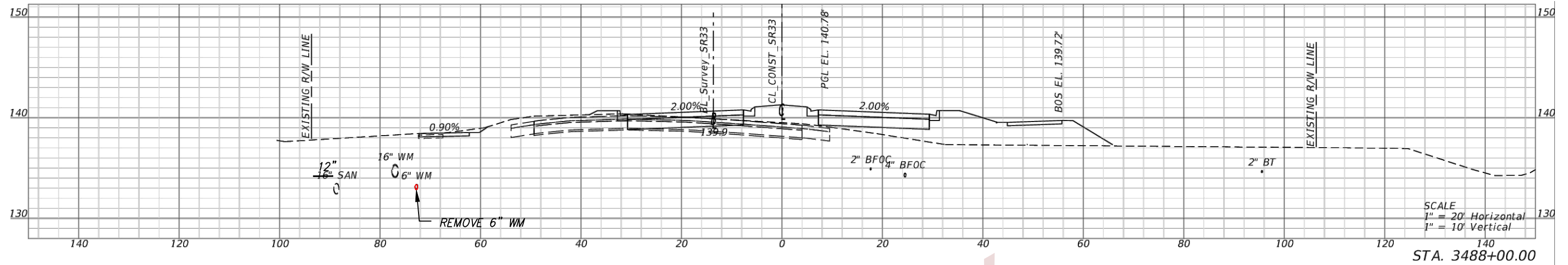
DOUGLAS E. JONES, P.E.  
CHASTAIN-SKILLMAN  
205 EAST ORANGE STREET  
SUITE #110  
LAKELAND, FL 33801-4611  
(863) 646-1402

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
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UTILITY CROSS SECTIONS

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U-76

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REVISIONS			
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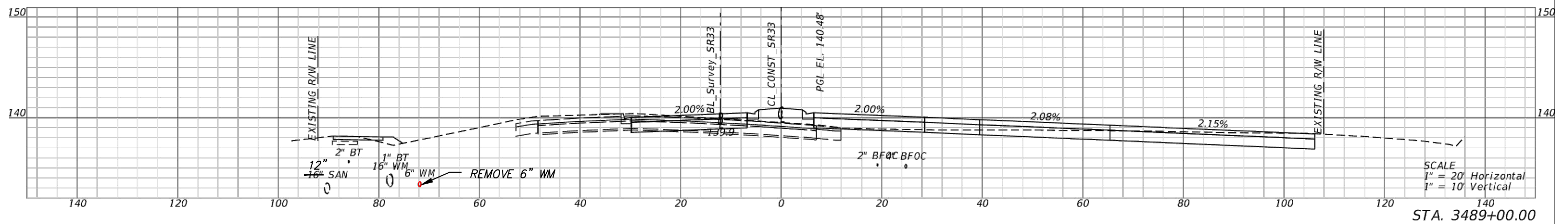
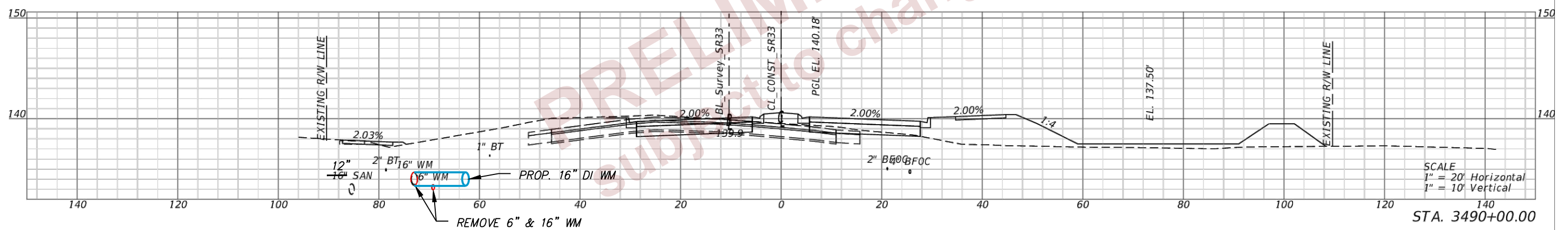
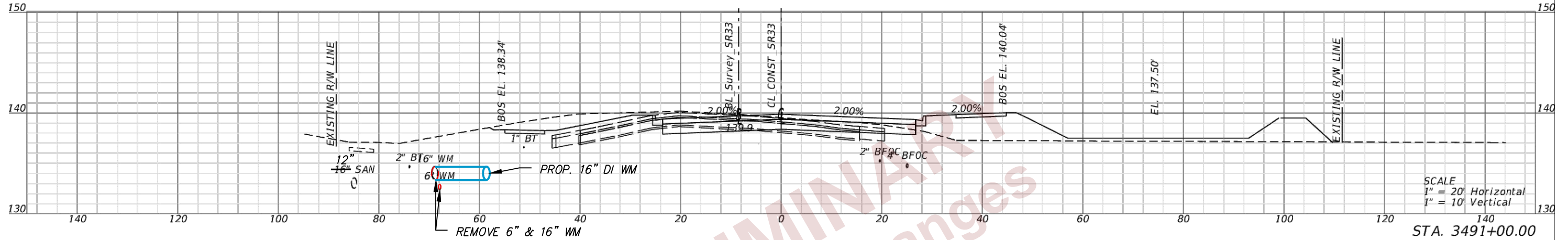
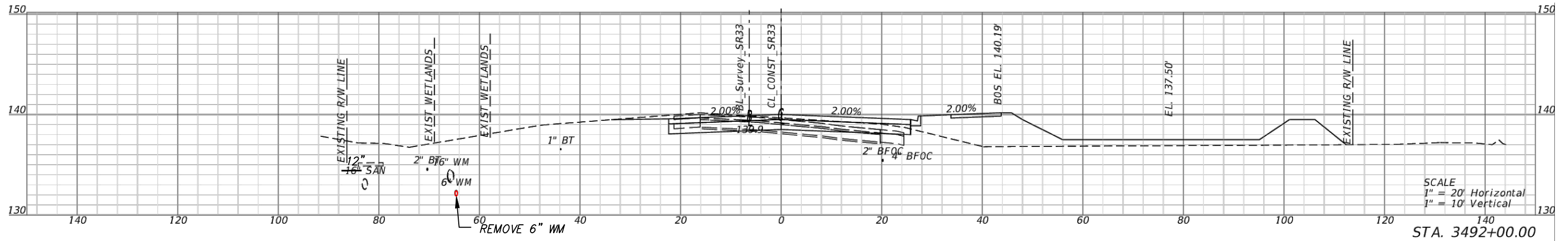
DOUGLAS E. JONES, P.E.  
 CHASTAIN-SKILLMAN  
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UTILITY CROSS SECTIONS

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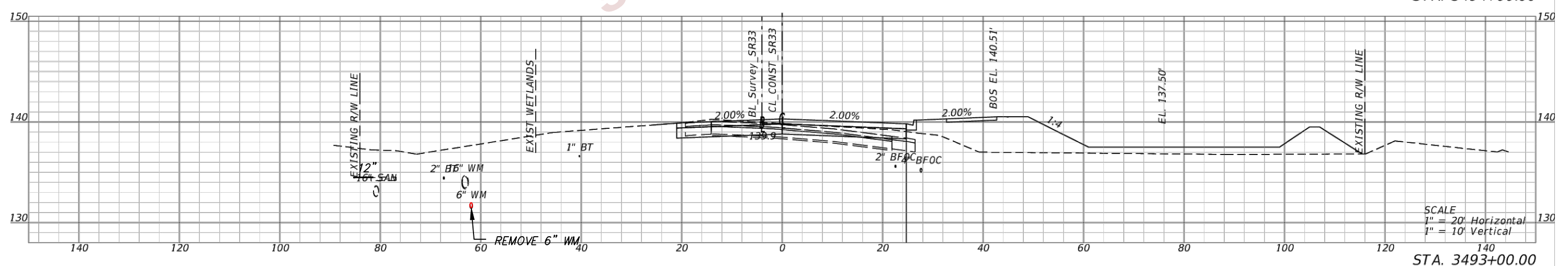
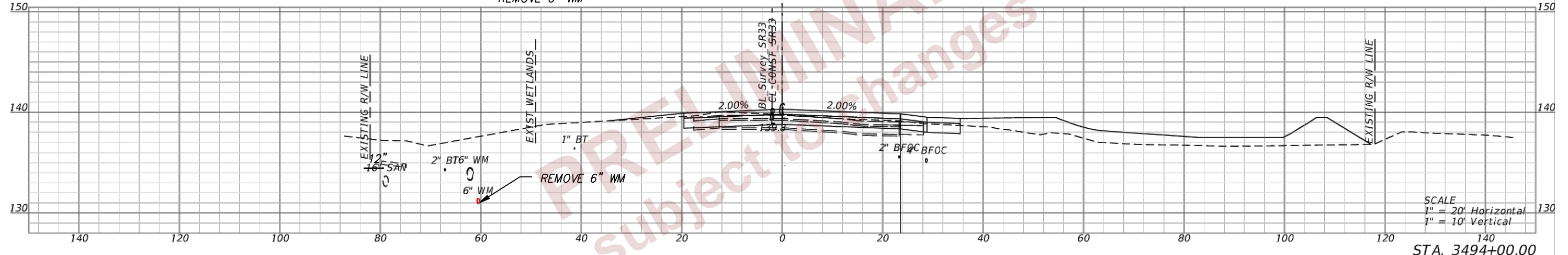
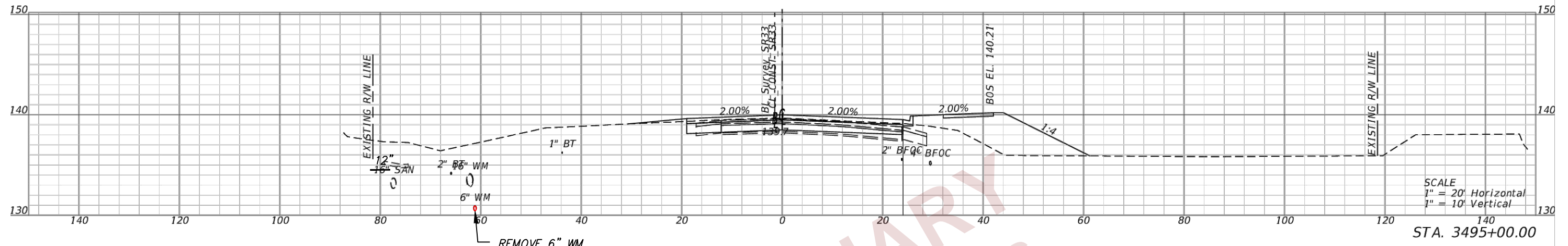
DOUGLAS E. JONES, P.E.  
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY CROSS SECTIONS

SHEET NO.  
 U-78

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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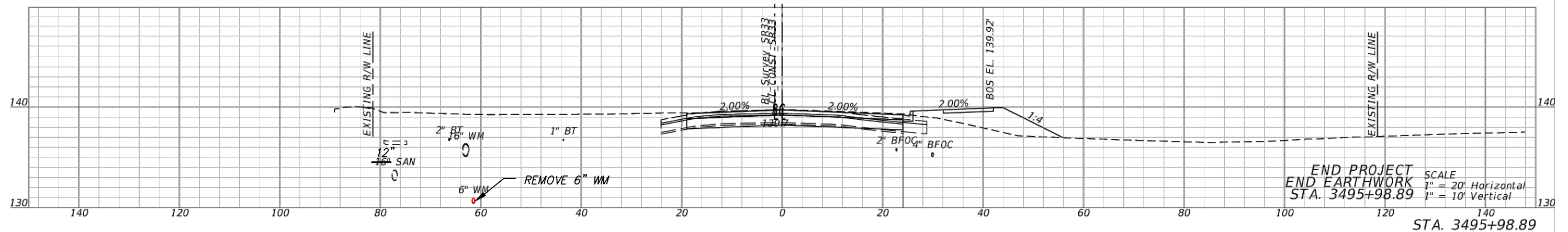
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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UTILITY CROSS SECTIONS

SHEET NO.  
U-79

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PRELIMINARY  
 subject to changes



END PROJECT  
 END EARTHWORK  
 STA. 3495+98.89

SCALE  
 1" = 20' Horizontal  
 1" = 10' Vertical

STA. 3495+98.89

REVISIONS			
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UTILITY CROSS SECTIONS

SHEET NO.  
**U-80**



**WATER & SEWER SPECIFICATIONS  
FOR CITY OF LAKELAND UTILITY CONSTRUCTION**

THESE SPECIFICATIONS SHALL APPLY WHERE WATER IS PROVIDED BY THE CITY OF LAKELAND OR WHERE THE PROJECT SEWER IS CONNECTED TO THE CITY OF LAKELAND COLLECTION SYSTEM.

THE CONTRACTOR SHALL CONSIDER DURING BIDDING AND HAVE AVAILABLE ON SITE A COPY OF THE LATEST "LAKELAND WATER OPERATIONS POLICIES, STANDARDS, AND SPECIFICATIONS FOR SUBDIVISIONS AND COMMERCIAL DEVELOPMENTS", INCLUDING APPROPRIATE CROSS CONNECTION CONTROL REQUIREMENTS AS COVERED BY C.O.L. ORDINANCE #3175. NON-COMPLIANCE WILL RESULT IN THE WITHHOLDING OF WATER SERVICE AND/OR CERTIFICATE OF OCCUPANCY. CONTACT WATER UTILITIES ENGINEERING AT 863-834-8316 FOR ADDITIONAL INFORMATION. THE DOCUMENTS CAN BE DOWNLOADED FROM THE FOLLOWING WORLD WIDE WEB LOCATION:

HTTPS://WWW.LAKELANDGOV.NET/DEPARTMENTS/PUBLIC-WORKS/ENGINEERING/ENGINEERING-STANDARDS/

SIGNIFICANT EXCERPTS OF THOSE OCTOBER 15, 2007 SPECIFICATIONS ARE SHOWN HEREIN FOR BIDDING. HOWEVER, THE CITY STANDARDS SHALL APPLY TO THEIR FULLEST EXTENT FOR CONSTRUCTION. CHANGE ORDER JUSTIFICATION DUE TO SUCH DIFFERENCES, IF ANY, SHALL BE RECOMMENDED BY THE CONTRACTOR AND DETERMINED BY THE ENGINEER.

ALL INSPECTIONS REQUIRE A 48-HOUR NOTICE. CALL THE NUMBER ABOVE TO SCHEDULE ALL INSPECTIONS AND TESTS.

**CONNECTIONS TO EXISTING SYSTEMS**

ALL CONNECTIONS TO AN EXISTING CITY WATER MAIN SHALL BE PERFORMED BY THE CITY AT THE DEVELOPER'S EXPENSE. IN THE EVENT THERE IS AN EXISTING STUB FROM PREVIOUS CONSTRUCTION, THE CONNECTION MAY BE MADE BY THE CONTRACTOR, UNDER THE CITY'S SUPERVISION. HOWEVER, THE CONNECTION CAN NOT BE MADE UNTIL THE CITY GRANTS APPROVAL. ALL CONNECTIONS SHALL BE MADE IN A THOROUGH MANNER USING PROPER MATERIALS, FITTINGS, AND LABOR PRACTICES TO SUIT THE ACTUAL CONDITIONS.

**WATER SYSTEM GENERAL NOTES**

- A. IF THERE ARE ANY NEW OR RELOCATED WATER MAINS THAT CROSS ANY SANITARY SEWERS, STORM SEWERS, FORCEMAINS, OR RECLAIMED WATER MAINS, A MINIMUM OF 18 INCHES CLEAR BETWEEN PIPES IS REQUIRED WITH THE JOINTS SPACED EQUIDISTANT FROM THE CROSSING (MINIMUM OF 10 FEET BETWEEN JOINTS).
- B. STONES FOUND IN TRENCHES FOR THE NEW AND RELOCATED WATER MAIN PIPE BE REMOVED TO A DEPTH OF AT LEAST SIX INCHES BELOW THE BOTTOM OF THE PIPE, THAT CONTINUOUS AND UNIFORM BEDDING BE PROVIDED IN TRENCHES FOR NEW AND RELOCATED WATER MAIN PIPE, AND TO A SUFFICIENT HEIGHT ABOVE TO ADEQUATELY SUPPORT AND PROTECT THE WATER PIPE.
- C. NEW AND RELOCATED WATER SERVICES AND PLUMBING MUST BE IN CONFORMANCE WITH THE STATE OF FLORIDA PLUMBING CODE.
- D. DISINFECTION SAMPLE POINTS VARY WITH RELEASE SEQUENCE AND THEREFORE SHALL BE PROVIDED BY THE CHASTAIN-SKILLMAN CONSTRUCTION REPRESENTATIVE.
- E. PIPE AND FITTINGS FOR THE WATER MAIN SHALL BE STRUNG OUT ALONG THE ROUTE OF CONSTRUCTION WITH THE BELL JOINTS POINTING IN THE DIRECTION OF CONSTRUCTION. PIPE SHALL BE PLACED WHERE IT WILL CAUSE THE LEAST INTERFERENCE WITH TRAFFIC. PIPE SHALL BE HANDLED IN A METHOD AS RECOMMENDED BY THE MANUFACTURER.
- F. BEFORE PIPE IS LOWERED INTO THE TRENCH IT SHALL BE SWABBED OR BRUSHED OUT TO ENSURE THAT NO DIRT OR FOREIGN MATERIAL ENTERS THE FINISHED LINE. TRENCH WATER SHALL BE KEPT OUT OF THE PIPE AND THE PIPE KEPT CLOSED BY MEANS OF A TEST PLUG WHENEVER WORK IS NOT IN PROGRESS.
- G. DEWATERING MAY BE REQUIRED IF IN THE OPINION OF THE CITY'S INSPECTOR THE TRENCH CONTAINS EXCESSIVE WATER. THE CONTRACTOR SHALL PROVIDE THE MEANS FOR DEWATERING THE TRENCH AND THE COST THEREOF SHALL BE INCLUDED IN THE PRICE OF INSTALLING THE PIPE.
- H. DEFLECTIONS FROM A STRAIGHT LINE OR GRADE MADE NECESSARY BY VERTICAL CURVES OR HORIZONTAL CURVES OR OFFSETS SHALL NOT EXCEED THE MANUFACTURER'S RECOMMENDATIONS. IF THE SPECIFIED OR REQUIRED ALIGNMENT REQUIRES DEFLECTIONS IN EXCESS OF THOSE RECOMMENDED, THE CONTRACTOR SHALL EITHER PROVIDE SPECIAL BENDS AS APPROVED BY THE CITY OR A SUFFICIENT NUMBER OF SHORTER LENGTHS OF PIPE TO PROVIDE ANGULAR DEFLECTIONS WITHIN THE REQUIRED LIMIT.
- I. PIPE SHALL BE LAID IN A LEVEL TRENCH. IRREGULARITIES SHALL BE SMOOTHED OUT OR FILLED IN WITH SAND AND TAMPED PRIOR TO PIPE LAYING. A HOLE SHALL BE SCOOPED OUT WHERE THE JOINTS OCCUR LEAVING THE ENTIRE BARREL OF THE PIPE BEARING ON SOLID GROUND. BACKFILLING AND EARTH COVER SHALL CONFORM TO STANDARDS.
- J. LAYING OF THE PIPE SHALL COMMENCE IMMEDIATELY AFTER THE EXCAVATION HAS STOPPED AND EVERY MEANS SHALL BE USED TO KEEP PIPE LAYING CLOSELY BEHIND THE TRENCHING. THE CITY MAY START THE TRENCHING WHEN, IN ITS OPINION; THE TRENCH IS OPEN TOO FAR IN ADVANCE OF THE PIPE LAYING OPERATIONS. THE PIPE LAYING METHOD SHALL, HOWEVER, BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
- K. DAMAGED OR UNSOUND PIPE OR FITTINGS SHALL BE REJECTED. BEFORE JOINING THE PIPE, ALL LUMPS, BLISTERS, EXCESS COATING MATERIAL, OR OIL SHALL BE REMOVED FROM THE ENDS OF PIPE. BLEACHED PIPE, OR PIPE DAMAGED OR WEATHERED IN ANY OTHER WAY WHICH RENDERS ILLEGIBLE THE SPECIFICATIONS ON THE PIPE SHALL BE REJECTED.
- L. UNSUITABLE OR UNSTABLE SUBGRADE MATERIALS SHALL BE REPLACED WITH MATERIALS SUITABLE FOR PREPARING STABILIZED BEDDING FOR THE PIPE.
- M. THE CONTRACTOR SHALL OBTAIN A WELL-COMPACTED BED AND SHALL CAREFULLY FILL AND COMPACT ALONG THE SIDES OF THE PIPE IN SIX-INCH LAYERS TO A POINT AT LEAST ONE-FOOT ABOVE THE TOP OF THE PIPE. WHERE NO PAVEMENT IS TO BE CONSTRUCTED OR VEHICULAR TRAFFIC IS TO PASS OVER THE PIPE, SUCH AS ROAD SHOULDER AND GRASS MEDIUM STRIP AREAS, BACKFILL MATERIAL ABOVE ONE FOOT OVER THE TOP OF THE PIPE SHALL BE COMPACTED TO A FIRMNESS APPROXIMATELY EQUAL TO THAT OF THE SOIL ADJACENT TO THE PIPE TRENCH EXCAVATION. WHEN PAVEMENT IS TO BE CONSTRUCTED OVER THE PIPE, BACKFILL MATERIAL ABOVE ONE FOOT OVER THE TOP OF THE PIPE SHALL BE PLACED IN A MANNER AND COMPACTED TO A DEGREE REQUIRED TO MEET THE MINIMUM REQUIREMENTS FOR COMPACTION.

**WATER SYSTEM PIPING**

- A. POLYVINYL CHLORIDE (PVC)
  - 1. PVC WATER DISTRIBUTION PIPE SIZE 4" THROUGH 12" SHALL MEET THE REQUIREMENTS OF AWWA C-900. PIPE SHALL MATCH CAST IRON OUTSIDE DIAMETERS AND SHALL BE CLASS 150 OR GREATER, AND MEET OR EXCEED THE REQUIREMENTS OF DR 18 FOR SIZES 4" THROUGH 12". ALL FITTINGS 4" AND LARGER SHALL BE MADE OF CAST IRON OR DUCTILE IRON, MECHANICAL JOINT AND SHALL CONFORM TO AWWA C-110 OR AWWA C-153.
  - 2. WATER DISTRIBUTION PIPE SIZES 16" AND 18" SHALL MEET THE REQUIREMENTS OF AWWA C-905. ALL FITTINGS SHALL BE MADE OF CAST IRON OR DUCTILE IRON, MECHANICAL JOINT AND SHALL CONFORM TO AWWA C-110 OR AWWA C-153.
  - 3. MAXIMUM LAYING LENGTH FOR ALL PVC WATER PIPE SHALL BE 20 FEET. PIPE SIZE 2" AND BELOW SHALL CONFORM TO ASTM D-2241 FOR STANDARD DIMENSION RATIO FOR SDR 21 AND CLASS 200. SCHEDULE 40 WITH GLUED JOINTS IS ACCEPTABLE UNDER 2" SIZE.
  - 4. PIPE SHALL BE MANUFACTURED FROM CLEAN, VIRGIN, UNPLASTICIZED POLYVINYL RESIN, CELL CLASSIFICATION 12454-A OR 12454-B AS DEFINED AS ASTM D-1784. ALL PIPES SHALL BEAR THE NATIONAL SANITATION FOUNDATION SEAL FOR POTABLE WATER PIPE.
  - 5. ALL PVC WATER PIPE SHALL BE BLUE IN COLOR OR BEAR AN ACCEPTABLE INDELIBLE BLUE MARKING IN THREE LOCATIONS FOR THE CONTINUOUS LENGTH OF EACH PIPE JOINT. THE REQUIRED SPACING FOR THESE MARKINGS IS TO BE 120 DEGREES APART.
  - 6. ALL PIPE SHALL BEAR THE TRADE NAME, PIPE MANUFACTURER'S NAME, AND AWWA STANDARD NUMBER.
  - 7. APPROVED MANUFACTURERS:
    - A. JM PIPE C-900/C-905 (USA)
    - B. NATIONAL PIPE C-900/C905 (USA)
    - C. DIAMOND PLASTICS C-900/C905 (USA)
    - D. DOMESTIC MFR. ONLY (SCHEDULE 40)

**B. DUCTILE IRON PIPE (DIP).**

- 1. ALL PIPE WITH AN INSIDE DIAMETER GREATER THAN OR EQUAL TO 20-IN. SHALL BE MADE OF DUCTILE IRON.
- 2. DUCTILE IRON PIPE FOR UNDERGROUND WATER MAINS SHALL BE MANUFACTURED IN ACCORDANCE WITH AWWA C-151. PIPE SHALL BE DESIGNED FOR THICKNESS IN ACCORDANCE WITH AWWA C-150.
- 3. DUCTILE IRON PIPE SHALL COMPLY TO ANSI STANDARD A21.10, WITH A 150 PSI MINIMUM PRESSURE RATING.
- 4. DUCTILE IRON PIPE INSTALLATION SHALL CONFORM TO LAYING CONDITION TYPE 2 (B) WITH A FLAT BOTTOM TRENCH AND BACKFILL LIGHTLY COMPACTED TO THE CENTERLINE OF THE PIPE. MINIMUM TRENCH WIDTH SHALL BE THE DIAMETER OF THE PIPE PLUS 2 FT. FOR ALL PIPE SIZES 4-INCH AND LARGER.
- 5. LAYING LENGTHS FOR DUCTILE IRON PIPE SHALL BE 18 FT. - 20 FT., AND SHALL CONFORM TO ALL APPLICABLE AWWA AND ANSI SPECIFICATIONS.
- 6. PRESSURE CLASS SHALL BE CLASS 350 FOR PIPE SIZES 4 THROUGH 20-INCH AND CLASS 250 FOR PIPE SIZES 24 THROUGH 36-INCHES. THE PIPE MANUFACTURER SHALL DETERMINE ADDITIONAL WALL THICKNESS REQUIRED WHERE DEPTH OF COVER EXCEEDS THE MINIMUM REQUIREMENTS.
- 7. WHERE DUCTILE IRON IS THREADED FOR A FLANGE, THE THICKNESS SHALL BE INCREASED ACCORDINGLY. IN ALL CASES THE FLANGED PIPE THICKNESS SHALL NOT BE LESS THAN THICKNESS CLASS 53 DUCTILE IRON PIPE AND FITTINGS SHALL RECEIVE AN EXTERIOR BITUMINOUS COATING AS SPECIFIED IN ANSI SPECIFICATIONS A21.4, A21.50, OR A21.51 AND SHALL BE CEMENT MORTAR LINED AND BITUMINOUS SEALED IN ACCORDANCE WITH ANSI STANDARD A21.4.
- 8. JOINTS FOR DUCTILE IRON SHALL BE MECHANICAL OR PUSH-ON TYPE DESIGNED IN ACCORDANCE WITH AWWA C-111. GASKET LUBRICANT FOR PUSH-ON JOINTS SHALL BE LABELED WITH TRADE NAME AND THE PIPE MANUFACTURER'S NAME. USE OF ADAPTABLE FLANGES MAY BE USED SUBJECT TO APPROVAL BY WATER UTILITIES ENGINEERING.
- 9. PER F.A.C. 62-555, ALL DUCTILE IRON PIPE SHALL HAVE A BLUE STRIPE APPLIED BY THE MANUFACTURER, OR THE CONTRACTOR SHALL SPRAY PAINT A BLUE STRIP ON ALL JOINTS OF PIPE.
- 10. APPROVED MANUFACTURERS:

- A. AMERICAN CAST IRON PIPE CO. (USA)
- B. GRIFFIN PIPE (USA)
- C. U.S. PIPE (USA)
- D. MCWANE PIPE (USA)
- E. CLOW PIPE (USA)

**C. POLYETHYLENE (PE) POLY TUBING**

- 1. HARTER PLASTICS
- 2. ENDOT
- 3. DRISCOPE
- 4. VANGUARD PROGUARD

**D. HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS (DIRECTIONAL BORE)**

- 1. HDPE PIPE SHALL ONLY BE USED FOR DIRECTIONAL BORES.
- 2. WATER DISTRIBUTION PIPE AND FITTINGS SIZES 4 INCHES THROUGH 16 INCHES SHALL MEET THE REQUIREMENTS OF AWWA C906. PIPE SHALL BE MADE FROM MATERIALS CONFORMING TO POLYETHYLENE CODE DESIGNATION PE 3408. ALL PIPE SHALL BE DUCTILE IRON PIPE SIZE.
- 3. STANDARD DIMENSION RATIO SHALL BE 11 AND DIP OUTSIDE DIAMETER. THERE SHALL BE NO MORE THAN A 3% DIFFERENCE IN THE PIPE DIAMETER WHEN MEASURED AT TWO PLACES 90° OF EACH OTHER.
- 4. PRESSURE CLASS SHALL BE 160 PSI.
- 5. ALL MARKINGS SHALL BE BLUE IN COLOR AND CO-EXTRUDED.
- 6. MARKINGS ON THE PIPE SHALL INCLUDE THE FOLLOWING:

- A. NOMINAL SIZE AND OD BASE.
- B. STANDARD MATERIAL CODE DESIGNATION.
- C. DIMENSIONAL RATIO.
- D. PRESSURE CLASS.
- E. AWWA DESIGNATION (AWWA C906).
- F. MATERIAL TEST CATEGORY OF PIPE.
- G. CONTINUOUS BLUE STRIPS 120 DEGREES APART, OR BLUE EXTRUDED.
- H. APPROVED MANUFACTURERS:
  - A. RINKER POLYPIPE (USA)
  - B. JM PIPE (USA)
  - C. CHARTER PLASTICS (USA)
  - D. CP CHEM PERFORMANCE PIPE (USA)

**E. GALVANIZED PIPE AND FITTINGS**

- 1. GALVANIZED PIPE AND FITTINGS SHALL CONFORM TO THE APPLICABLE PROVISION OF FEDERAL SPECIFICATION WW-P-521D TYPE 2 AND MAY ONLY BE USED IN SIZE 2" AND UNDER.
- 2. APPROVED MANUFACTURERS: DOMESTIC MFR. ONLY (USA)

- A. TRACER WIRE: A BLUE COATED NUMBER (#) 12 GAUGE UF (UNDERGROUND FEEDER PER NATIONAL ELECTRIC CODE ARTICLE 339) SOLID STRAND TRACER WIRE AND JOINT SEAL (KEARNEY AQUASEAL, BISHOP OR APPROVED EQUAL) SHALL BE INSTALLED ALONG ALL PIPE AND SERVICES AND MUST BE TAPED BELOW THE SPRING LINE OF THE PIPE AND STUBBED UP AT HYDRANTS AND VALVES. AT EACH VALVE, THE WIRE SHALL BE INSTALLED ALONG THE OUTSIDE OF THE VALVE BOX TO THE ADJUSTABLE TOP PIECE (SEE W.S. 501). SECTIONS OF WIRE SHALL BE SPLICED TOGETHER USING BUCHANON CONNECTORS. TWISTING THE WIRE TOGETHER IS NOT ACCEPTABLE. FOR DIRECTIONAL BORES, TWO NUMBER (#)4 GAUGE UF TRACER WIRES SHALL BE USED. THE TRACER WIRE MUST PROVIDE FULL SIGNAL CONDUCTIVITY (INCLUDING SPLICES), FOR LINE LOCATING EQUIPMENT. DETECTION TAPE PROVIDED FOR EARLY WARNING OF BURIED PIPE SHALL BE PLASTIC AND FOIL LAMINATE, 3 INCHES WIDE, BLUE IN COLOR, WITH LETTERED MESSAGE "CAUTION, BURIED WATER MAIN" REPEATING EVERY 20-36 INCHES AND BURIED 2- FEET ABOVE PIPE.

**WATER SYSTEM FITTINGS**

- A. ALL FITTINGS SHALL BE RATED FOR NOT LESS THAN 150 PSI WORKING PRESSURE.
- B. GRADE FOR DUCTILE IRON PIPE FITTINGS SHALL BE ANSI/AWWA STANDARD C110-93 OR ANSI/AWWA C-111/A21.11-90, AND SHALL BE CEMENT LINED INSIDE AND BITUMINOUS COATED OUTSIDE. MECHANICAL JOINT DUCTILE IRON FITTINGS COMPLYING WITH AWWA C153 ARE ACCEPTABLE.
- C. MALLEABLE IRON FITTINGS SHALL BE GALVANIZED CONFORMING TO THE APPLICABLE PROVISION OF FEDERAL SPECIFICATION WW-P-521D TYPE II, AND MAY BE USED IN SIZES TWO (2) INCHES AND UNDER ONLY.
- D. POLYVINYL CHLORIDE (PVC) FITTINGS SHALL BE MINIMUM SCHEDULE 40 AND MAY BE USED IN SIZES TWO (2) INCHES AND UNDER ONLY.
- E. GATE VALVES 4" AND OVER SHALL BE OF THE RESILIENT WEDGE TYPE AND SHALL BE IN ACCORDANCE WITH ANSI/AWWA C509-94 WITH "O" TYPE STEM SEAL AND 2" SQUARE OPERATING NUT FOR BURIED SERVICES. WATER VALVES SHALL BE MECHANICAL JOINT AND OPEN LEFT.
- F. VALVE BOX EXTENSIONS SHALL BE APPROVED BY WATER UTILITIES ENGINEERING AND INSTALLED ON ANY VALVE DEEPER THAN FIVE (5) FEET BELOW FINISHED GRADE.

- G. HYDRANTS SHALL BE CONNECTED TO THE MAINS WITH DUCTILE IRON OR C900 PVC AND A 6-INCH GATE VALVE. HYDRANTS SHALL BE SET AT THE BURY LINE WITH A MINIMUM OF 18" CLEARANCE FROM HOSE CONNECTION TO THE FINISHED GRADE. HYDRANT VALVES SHALL BE ATTACHED DIRECTLY TO THE WATER MAIN BY A GLAND, SWIVEL TEE OR A TAPPING SADDLE AS APPROVED BY THE CITY. RESTRAINING RODS SHALL BE AT LEAST 3/4" STOCK AND SHALL BE THOROUGHLY PROTECTED BY PAINTING WITH ACID RESISTANT PAINT OR MAY BE GALVANIZED. ALL BACKFILL AROUND HYDRANTS SHALL BE THOROUGHLY COMPACTED TO THE SURFACE OF THE GROUND, NO. 57 ROCK SHALL BE PLACED AROUND THE HYDRANT BARREL AS SHOWN ON WS-401. BEFORE INSTALLING ANY HYDRANT OR VALVE, CARE SHALL BE TAKEN TO SEE THAT ALL FOREIGN MATERIAL IS REMOVED FROM THE INTERIOR OF THE BARREL. ALL NOZZLES SHALL BE TIGHTENED AND THE HYDRANTS OR VALVES OPENED AND CLOSED TO SEE THAT ALL PARTS ARE IN PROPER WORKING CONDITION.
- H. FITTINGS FOR DUCTILE IRON PIPE SHALL BE MANUFACTURED OF DUCTILE IRON OR GRAY CAST IRON, AND SHALL CONFORM TO THE STANDARDS OF AWWA C-110 OR AWWA C-153 (COMPACT FITTINGS). FITTINGS SHALL BE DESIGNED SO AS TO BE COMPATIBLE WITH THE PIPE AND SO AS TO PROVIDE AT LEAST EQUAL RESISTANCE TO INTERNAL AND EXTERNAL LOAD ON THE PIPE. FITTING JOINTS SHALL BE MECHANICAL TYPE FOR UNDERGROUND SERVICE. THE JOINTS, BOLTS, AND NUTS SHALL CONFORM TO AWWA C-111. ALL FITTINGS SHALL BE RATED FOR NOT LESS THAN 150 PSI WORKING PRESSURE (CROSSES ARE NOT TO BE USED).

- A. APPROVED MANUFACTURERS:
  - I. UNION/TYLER CLASS 153 COMPACT FITTING (USA & CHINA)
  - II. EBAA MEGA-LUG SERIES 1100 (USA)

**I. GATE VALVES**

- A. GATE VALVES 4" AND LARGER SHALL BE IN ACCORDANCE WITH AWWA C-509 WITH (O TYPE STEM SEAL AND 2" SQUARE-OPERATING NUT FOR BURYING SERVICE). VALVES SHALL BE MECHANICAL JOINT AND OPEN LEFT (COUNTER CLOCKWISE). THE OPERATING NUT SHALL HAVE AN ARROW CAST IN THE NUT INDICATING DIRECTION OF OPENING.
- B. GATE VALVES SHALL BE OF RESILIENT SEAT WEDGE AND WHEN FULLY OPEN SHALL HAVE A CLEAN WATERWAY EQUAL TO THE NORMAL DIAMETER OF THE PIPE. EACH VALVE SHALL HAVE THE MANUFACTURER'S DISTINCTIVE MARKING, PRESSURE RATING, AND YEAR OF MANUFACTURE CAST ON THE BODY. PRIOR TO SHIPMENT FROM THE FACTORY, EACH VALVE SHALL BE TESTED BY APPLYING IT TO HYDRAULIC PRESSURE EQUAL TO TWICE THE SPECIFIED WORKING PRESSURE.
- C. GATE VALVES 2" AND UNDER SHALL CONFORM WITH FEDERAL SPECIFICATION WW-V-54 TYPE 2 SOLID WEDGE DISC, RISING STEM, SECURE JOINTS, AND OF BRONZE CONSTRUCTION. VALVES SHALL HAVE A MALLEABLE IRON HAND WHEEL AND THE MANUFACTURER APPROVED BY THE CITY.
- D. SUGGESTED MANUFACTURERS ARE: STOCKHAM B100, STOCKHAM B105, AND HAMMOND IB 640.
- E. ALL GATE VALVES SHALL OPEN LEFT.
- F. UNLESS RECEIVING PRIOR APPROVAL, VALVES SHALL BE FROM AN AMERICAN MANUFACTURER.
- G. APPROVED MANUFACTURERS:
  - I. MJ - RESILIENT WEDGE - 4" TO 12"
    - 1. MUELLER (A-2360) (USA)
    - 2. AMERICAN FLOW CONTROL (SERIES 2500) (USA)
    - 3. US PIPE/METROSEAL (250) (USA)
    - 4. CLOW (F-6100) (USA)
  - II. BRONZE RISING STEM - 1/2" TO 2"
    - 1. HAMMOND (IB640) (USA)
    - 2. NIBCO (T-111) (USA)
    - 3. STOCKHAM (B-100) (USA)

**J. RESTRAINTS**

- A. THE FOLLOWING RESTRAINTS ARE ACCEPTABLE FOR RESTRAINING DUCTILE IRON AND PVC PIPE TO MECHANICAL JOINT VALVES AND FITTINGS PROVIDED FOR UNDERGROUND SERVICE:
  - I. DUCTILE IRON PIPE, SIZES 4 INCHES THROUGH 12 INCHES - EBAA IRON SERIES 1200 MECHANICAL JOINT RETAINER GLAND. (USA)
  - II. DUCTILE IRON PIPE SIZES LARGER THAN 12 INCHES - EBAA IRON SERIES 100 MECHANICAL JOINT RETAINER GLAND. (USA)
  - III. PVC PIPE SIZES 4 INCHES THROUGH 12 INCHES - EBAA IRON MEGALUG SERIES 2000PV MECHANICAL JOINT RETAINER GLAND. (USA)
  - IV. PVC PIPE SIZES LARGER THAN 12 INCHES - EBAA IRON MEGALUG SERIES 1100PV MECHANICAL JOINT RETAINER GLAND. (USA)
  - V. UNI-FLANGE (SERIES 1300) (USA & CHINA)
- B. THE FOLLOWING ADAPTERS ARE ACCEPTABLE FOR MATING DUCTILE IRON AND PVC PIPE TO FLANGED VALVES AND FITTINGS PROVIDED FOR ABOVEGROUND SERVICE AND/OR IN WELLS AND VALVE VAULTS:
  - I. DUCTILE IRON PIPE, SIZES 4 INCHES THROUGH 12 INCHES - EBAA IRON MEGAFLANGE FLANGE ADAPTER SERIES 2100, OR UNI-FLANGE SERIES 200 FLANGE ADAPTER. (USA)
  - II. DUCTILE IRON PIPE, SIZES LARGER THAN 12 INCHES - UNI-FLANGE SERIES 400 FLANGE ADAPTER. (USA)
  - III. PVC PIPE, SIZES 4 INCHES THROUGH 12 INCHES - EBAA IRON SERIES 3500 FLANGE ADAPTER, OR UNI-FLANGE SERIES 900-C FLANGE ADAPTER. (USA)
- C. THE FOLLOWING RESTRAINTS ARE ACCEPTABLE FOR RESTRAINING DUCTILE IRON AND PVC PIPE BELLS AS INDICATED ON THE DESIGN DRAWINGS:
  - I. DUCTILE IRON PIPE, MECHANICAL JOINT, SIZES 4 INCHES THROUGH 12 INCHES - EBAA IRON SERIES 1200 MECHANICAL JOINT RETAINER GLAND. (USA)
  - II. DUCTILE IRON PIPE, MECHANICAL JOINT, SIZES LARGER THAN 12 INCHES - EBAA IRON SERIES 100 MECHANICAL JOINT RETAINER GLAND. (USA)
  - III. DUCTILE IRON PIPE, PUSH-ON, SIZES 4 INCHES AND LARGER - EBAA IRON SERIES 800 BELL RETAINER. (USA)
  - IV. PVC PIPE BELLS, SIZES 4 INCHES AND LARGER - UNI- FLANGE SERIES 1350-C BELL RETAINER. (USA/CHINA)

**K. MISCELLANEOUS ITEMS**

- A. CORPORATION STOPS
  - I. FORD F-500
  - II. MUELLER H10013
  - III. JONES J41
- B. SERVICE SADDLES
  - I. FORD F202
  - II. POWERSEAL 3413
  - III. JCM 402
  - IV. SMITH BLAIR 313
- C. STAINLESS STEEL POLY TUBING INSERTS
  - I. FORD

**REVISIONS**

DATE	DESCRIPTION	DATE	DESCRIPTION

**Douglas E. Jones** State of Florida, Professional Engineer, License No. 56077  
This item has been digitally signed and sealed by Douglas E. Jones on the date indicated here.  
Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

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STATE OF FLORIDA  
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY NOTES

SHEET NO.

U-81

**D. CASING SPACERS**

- I. CASCADE

**E. BRASS BALL VALVES & ADAPTERS**

- I. FORD
- II. MUELLER
- III. JONES

**WATER SERVICE LINES**

- A. WATER SERVICE SHALL EXTEND PAST THE SWALE EDGE OF DRAINAGE DITCHES.
- B. WATER SERVICE LINES SHOULD NOT BE LOCATED UNDER PROPOSED DRIVEWAYS. THE LOCATION OF SERVICE STUBS SHALL BE NOTED ON AS-BUILT DRAWINGS WITH DISTANCES FROM EDGE OF PAVEMENT, LOT LINES, ETC.
- C. IN CASES WHERE CONFLICTS IN SEPARATION OCCUR BETWEEN BURIED ELECTRIC LINES, TRANSFORMER PADS, AND WATER SERVICE LINES, THE ALTERNATE SERVICE DETAIL (W.S. 101 SH 2) SHALL BE USED. IN CASES WHERE CONFLICTS OCCUR BETWEEN SANITARY SEWER OR STORM DRAINS, PROPER CLEARANCES MUST BE MAINTAINED. IF CLEARANCES CAN NOT BE MAINTAINED, WATER SERVICE LINES MUST BE INSTALLED USING GALVANIZED PIPE.
- D. IN ALL CASES, A GATE VALVE SHALL IMMEDIATELY JOIN THE MAIN CONNECTION AND A SECOND GATE VALVE EQUIVALENT IN SIZE TO THE SERVICE SHALL BE PROVIDED AT LINE TERMINATION ADJACENT TO THE PROPERTY LINE OR OTHER SPECIFIED POINT. THIS VALVE SHALL BE 12" DEEP TO THE TOP OF THE VALVE.
- E. THE UTILITY WILL NOT ACCEPT 3-INCH PIPE (ANY MATERIAL) AS A SERVICE LINE TO A METER.

**WATER MAIN PIGGING PRIOR TO SERVICE**

- A. WATER MAINS EQUAL TO OR GREATER THAN SIX (6) INCHES IN DIAMETER SHALL REQUIRE FLUSHING USING POLY PIGS.
- B. SHORT PIPE LENGTHS (I.E. STUBS) MAY BE FLUSHED WITHOUT POLY PIGS WITH PRIOR APPROVAL BY WATER UTILITIES ENGINEERING.
- C. THE PIGGING SHALL BE PERFORMED WITH SWAB TYPE B1 WITH A MINIMUM OF TWO SWABS TO BE USED FOR EACH SECTION / RUN OF PIPE. THE TWO SWABS SHALL NOT BE INSERTED AT THE SAME TIME UNLESS THERE IS SUFFICIENT DISTANCE BETWEEN THEM TO INHIBIT CONTACT.
- D. THE NEXT SIZE SWAB LARGER THAN THE PIPE SIZE SHALL BE USED (I.E., AN 8-INCH SWAB ON A 6-INCH DIAMETER PIPE).
- E. INSERTION OR REMOVAL FITTINGS THAT WILL REMAIN IN THE WATER SYSTEM SHALL BE NOTED ON THE RECORD DRAWINGS.
- F. WATER UTILITIES ENGINEERING SHALL BE NOTIFIED 48 HOURS IN ADVANCE OF ANY PIGGING/FLUSHING (863-834-8316). A CITY REPRESENTATIVE SHALL BE ON-SITE DURING THE PIGGING PROCEDURE.

**WATER SYSTEM TESTING**

- A. A 48-HOUR NOTICE MUST BE PROVIDED TO THE WATER UTILITIES DEPARTMENT PRIOR TO TESTING.
- B. THE SYSTEM SHALL BE FILLED WITH WATER AND FLUSHED AT THE HIGHEST OBTAINABLE VELOCITY AND AT THE FARTHEST POINTS. ALL AIR MUST BE EXPELLED.
- C. A PRE-TEST USING PRESSURE AT LEAST EQUAL TO THE EXISTING SYSTEM SHALL BE PERFORMED. SHOULD THE SYSTEM APPEAR TIGHT, THEN THE LEAKAGE TEST MAY BEGIN.
- D. THE CONTRACTOR SHALL PUMP THE LINES TO A PRESSURE EQUAL TO OR GREATER THAN 150 PSI. SHOULD PRESSURE FALL BELOW 150 PSI DURING THE 2-HOUR TEST PERIOD, THEN ADDITIONAL WATER SHALL BE ADDED TO MAINTAIN AT LEAST 145 PSI. THE TEST IS ACCEPTABLE IF THE AMOUNT OF WATER ADDED IS LESS THAN ALLOWED BY HEALTH DEPARTMENT FORM CALCULATIONS.

**BACKFLOW PREVENTERS**

THE TABLE BELOW SHOWS BACKFLOW PREVENTERS APPROVED FOR USE. NO SUBSTITUTIONS ARE ALLOWED.

Application/Type Required	Manufacturer	Size	Model
Domestic, Commercial, & Irrigation / Reduced Pressure Zone Backflow Assemblies (RPZ)	Ames	¾" - 1", 1-1/2" - 2"	400B
	Febco	¾" - 2"	825Y, 825YA, 825YR
		3" - 10"	880, 880V, 860
	Watts	¾" - 2", 3" - 10"	909.00
		¾" - 1", 1-1/2" - 2"	919.00
	Wilkins	¾" - 2"	975XL
Fire Protection / Double Detector Check Assemblies (DDC)	Febco (Detector Side)	3" - 10"	806DDC, 876
		3" - 8"	856.00
	Wilkins (Detector Side)	¾"	805Y
		3" - 10"	950DA/350DA
	Febco	¾"	950XL
		3" - 10"	826YD
Fire Protection / Reduced Pressure Zone Detector Check (RPZDC)	Wilkins	3" - 10"	975DA/375DA
	Watts	3" - 10"	909RPDA

BACKFLOW PREVENTER INSTALLATIONS SHALL REQUIRE A CONCRETE PAD AND MAY REQUIRE POSTS FOLLOWING THE GUIDELINES OUTLINED BELOW:

- 1. CONCRETE PADS MUST BE POURED UNDER THE UNIT AND MUST EXTEND 1 FOOT AROUND THE PERIMETER OF THE DEVICE.
- 2. IF BACKFLOW PREVENTER IS ADJACENT TO TRAFFIC FLOW, POSTS ARE REQUIRED. POSTS SHALL BE SCHEDULE 40, GALVANIZED STEEL AND CAPPED WITH CONCRETE. THE TOP OF THE POSTS ARE TO BE A MAXIMUM OF 3-INCHES ABOVE THE 90 DEGREE ELBOWS OF THE BACKFLOW PREVENTION DEVICE. ADJACENT SHALL MEAN THE DEVICE IS NOT SEPARATED FROM THE NORMAL TRAFFIC FLOW BY A SIDEWALK, CURB, DITCH, STRUCTURE, OR BY LESS THAN TWO CAR LENGTHS.
- 3. BACKFLOW PREVENTERS 2" IN SIZE AND SMALLER, REQUIRE 2" POSTS.
- 4. BACKFLOW PREVENTERS LARGER THAN 2" IN SIZE REQUIRE 4" POSTS.

FREEZE PROTECTION DEVICES ARE REQUIRED ON ALL NEW BACKFLOW PREVENTER INSTALLATIONS. THE FREEZE PROTECTION VALVES ARE TO BE INSTALLED DOWNSTREAM OF THE BACKFLOW PREVENTER. FREEZE PROTECTION DEVICES SHALL BE DOLE MODEL FP-45, MANUFACTURED BY EATON CONTROLS DIVISION, (CAROL STREAM, ILLINOIS.)

**WATER SYSTEM DISINFECTION**

- A. AFTER THE WATER SYSTEM OR ANY UNIT OR PORTIONS OF THE PROJECT HAVE BEEN DISINFECTED AND THOROUGHLY FLUSHED, SAMPLES OF WATER SHALL BE TAKEN FROM SEVERAL POINTS AS DIRECTED BY THE POLK COUNTY HEALTH DEPARTMENT. IF REPEATED TESTS OF SUCH SAMPLES SHOW THE PRESENCE OF COLIFORM ORGANISMS, THE DISINFECTION PROCEDURE SHALL BE REPEATED AND CONTINUED UNTIL TESTS INDICATE ABSENCE OF POLLUTION.
- B. PER THE HEALTH DEPARTMENT, BACTERIOLOGICAL SAMPLES ON TWO CONSECUTIVE DAYS SHALL BE SATISFACTORILY COMPLETED AND WRITTEN NOTICE GIVEN TO THE POLK COUNTY HEALTH DEPARTMENT. BACTERIOLOGICAL SAMPLE(S) ARE ONLY VALID FOR SIXTY (60) DAYS.

- C. AT NO POINT IS WATER TO BE USED FROM THE SYSTEM (EXCEPT FOR FLUSHING AND CHLORINATION OF THE SYSTEM BEING TESTED) PRIOR TO SATISFACTORY BACTERIOLOGICAL RESULTS AND "APPROVAL FOR PUBLIC USE" NOTIFICATION ISSUED FROM THE POLK COUNTY HEALTH DEPARTMENT.
- D. THE CITY WILL TAKE CHECK SAMPLES AT THE SAME LOCATIONS AS REQUIRED BY THE POLK COUNTY HEALTH DEPARTMENT AND IDENTIFIED BY THE CHASTAIN-SKILLMAN REPRESENTATIVE. THE CHECK SAMPLES SHALL BE ANALYZED AT THE CITY'S STATE CERTIFIED LABORATORY. IF A CHECK SAMPLE DOES NOT MEET APPLICABLE HEALTH CRITERIA, SECOND DAY, ADDITIONAL SAMPLES MAY BE REQUIRED AT THE AFFECTED LOCATIONS.
- E. SAMPLES AT EACH LOCATION FROM TWO CONSECUTIVE DAYS ARE REQUIRED TO SHOW ACCEPTABILITY.

**FIRE HYDRANTS**

- HYDRANTS SHALL BE IN ACCORDANCE WITH AWWA STANDARD C-502-85 AND THE FOLLOWING REQUIREMENTS:
- A. ALL HYDRANT LEADS SHALL BE VALVED AND THE HYDRANT INSTALLED WITH A MINIMUM OF 18" HOSE NOZZLE TO GROUND CLEARANCE
- B. ALL HYDRANTS SHALL BE INSTALLED PLUMB AND IN TRUE ALIGNMENT WITH THE CONNECTION PIPE TO THE WATER MAIN
- C. GRAVEL OR CRUSHED STONE SHALL BE USED FOR THE DRAIN SUMP AND SHALL BE CAREFULLY PLACED AND COMPACTED
- D. HYDRANTS SHALL BE INSTALLED WITH SIX (6) INCH LEAD VALVES USING MECHANICAL RESTRAINTS.
- E. UNTIL AUTHORIZED BY THE CITY, NEW HYDRANTS MUST REMAIN OUT OF SERVICE AND THIS SHALL BE INDICATED BY A PLASTIC "OUT OF SERVICE" RING PLACED ON THE PUMPER CONNECTION.
- F. APPROVED MANUFACTURERS:
  - 1. MUELLER SUPER CENTURION 200 OR 250 (USA)
  - 2. KENNEDY MODEL K-81D (USA)
  - 3. WATEROUS PACER WB-67 (USA)

**FIRE MAINS**

- A. FIRE MAINS ARE TO BE FULLY RESTRAINED.
- B. WATER MAIN PIPE WITH A PRESSURE RATING OF 200 PSI SHALL BE USED (PVC SDR 14).
- C. PRESSURE TESTING IS ADMINISTERED BY THE FIRE MARSHALL AT 200 PSI.
- D. THE CONTRACTOR MUST BE SPECIFICALLY LICENSED TO INSTALL FIRE MAIN.

**WATER AND WASTEWATER CLEARANCES FOR USE OF FACILITIES**

NO WATER/WASTEWATER USE/DISCHARGE SHALL BE ALLOWED FOR OTHER THAN FOR TESTING PURPOSES PRIOR TO THE CITY RECEIVING WRITTEN CLEARANCE FROM FDEP. PRIOR TO THE FDEP CLEARANCE FOR THE WASTEWATER SYSTEM, NO PERMANENT WATER SERVICE SHALL BE PROVIDED. DISCHARGE OF A NON-PERMITTED NON-METERED WATER/WASTEWATER INTO THE SYSTEM UNDER ANY OTHER CIRCUMSTANCES IS AN UNAUTHORIZED DISCHARGE AND SHALL PLACE THE VIOLATOR OR THE DEVELOPER SUBJECT TO FINES AND PENALTIES ACCORDING TO APPLICABLE FLORIDA STATUTES, CHAPTER 62-604 F.A.C., AND CITY ORDINANCE.

**WATER AND SEWER GENERAL NOTES**

- A. THE CONTRACTOR SHALL VERIFY THE LOCATIONS, ELEVATIONS, AND DIMENSIONS OF ALL EXISTING UTILITIES AFFECTING THIS WORK PRIOR TO CONSTRUCTION.
- B. THE CONTRACTOR SHALL USE EXTREME CAUTION IN AREAS OF BURIED UTILITIES AND SHALL PROVIDE AT LEAST 48 HOURS NOTICE TO UTILITY COMPANIES PRIOR TO CONSTRUCTION TO OBTAIN FIELD LOCATIONS OF EXISTING UNDERGROUND UTILITIES (SUNSHINE NOTIFICATION). THE CONTRACTOR SHALL PROTECT AND MAINTAIN OPERATION OF EXISTING UTILITY SERVICES DURING CONSTRUCTION.
- C. THE ENGINEER (CHASTAIN-SKILLMAN, INC.) SHALL BE NOTIFIED AS TO WHERE EXISTING UTILITY SERVICES INTERFERE WITH THE PROPOSED CONSTRUCTION OR IF THE EXISTING UTILITIES ARE NOT AS SHOWN ON THE PLANS.
- D. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO EXISTING FACILITIES, ABOVE OR BELOW GROUND, THAT MAY OCCUR AS A RESULT OF THE WORK PERFORMED BY THE CONTRACTOR. ANY DAMAGES MUST BE REPORTED. THE ENGINEER WILL DECIDE IF REPAIR CAN BE DONE BY THE CONTRACTOR. IF THE CITY MAKES THE REPAIRS, THE CONTRACTOR WILL PAY ALL EXPENSES.
- E. VERTICAL/HORIZONTAL CLEARANCE REQUIREMENTS
  - 1. GRAVITY SEWERS OR FORCEMAINS CROSSING OVER OR UNDER WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL SEPARATION OF EIGHTEEN (18) INCHES OF CLEARANCE. THE CROSSING SHALL BE ARRANGED SO THAT THE SEWER JOINTS AND THE WATER JOINTS WILL BE EQUIDISTANT FROM THE POINT OF CROSSING WITH NO LESS THAN TEN (10) FEET BETWEEN ANY TWO JOINTS. DEVIATIONS REQUIRE PRIOR APPROVAL.
  - 2. GRAVITY SEWER, FORCEMAINS, OR STORM SEWER SHALL BE INSTALLED AT LEAST TEN (10) FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED WATER MAIN. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE.
- F. THE CONTRACTOR SHALL COORDINATE WITH THE CITY OF LAKELAND FOR WET TAPS AND METER INSTALLATIONS. THE INSTALLATIONS SHALL CONFORM TO THE REQUIREMENTS OF THE CITY.
- G. ALL BACKFILL SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH FDOT SPECIFICATIONS.

**UTILITY SEPARATIONS**

THE WATER UTILITY MUST MAINTAIN AND ACCESS ITS FACILITIES. FLORIDA STATUTE 62-555 ALLOWS THE UTILITY TO DETERMINE SEPARATION DISTANCES. BASED UPON 62-555 AND THE NEED TO PROTECT AND MAINTAIN ITS FACILITIES, THE WATER UTILITY SHALL REQUIRE 10 FEET HORIZONTAL AND 18 INCH VERTICAL SEPARATION FROM ITS FACILITIES TO ALL STORM SEWERS. THIS SEPARATION SHALL ALSO BE MAINTAINED BETWEEN WATER UTILITY FACILITIES, (WATER TO SANITARY SEWER, (FORCE MAINS OR GRAVITY). THE WATER UTILITY MAY REDUCE SEPARATION REQUIREMENTS BASED UPON A SPECIFIC CONFLICT AT A SPECIFIC LOCATION. HOWEVER, THE SEPARATION SHALL NOT BE REDUCED LESS THAN THE 6 FEET REFERENCED IN 62-555. WATER UTILITY ENGINEERING SHALL REVIEW AND APPROVE ALL REQUESTS FOR REDUCED SEPARATION.

IN ORDER TO PROTECT THE WATER SUPPLY FACILITIES, THE LOCATIONS OF UTILITIES MUST BE FIELD VERIFIED BY THE DEVELOPER/ENGINEER DURING DESIGN AND/OR BEFORE CONSTRUCTION. THE FOLLOWING MINIMUM SEPARATIONS MUST BE MAINTAINED FROM ALL WATER MAINS.

Utility	Horizontal	Vertical
Gas	5 ft.	12 in.
Telephone	2 ft.	12 in.
Cable TV	2 ft.	12 in.
Fiber Optics	2 ft.	12 in.
Reclaim Water	6ft.	18 in.
Wastewater/Storm Main, if Water above	10 ft.	18 in.
Wastewater/Storm Main, if Water below	10 ft.	18 in.
Sewer Lateral	10 ft.	12 in.
Electric Underground	5 ft.	12 in.
Electric Utility Poles	2 ft.	N/A
Storm Water Structures	ø 8 in. See Detail WS-403 sheet 2 of 2	18 in.
Sanitary Manholes		18 in.

WHEN THE MINIMUM SEPARATION REQUIREMENTS FOR THE CITY, THE POLK COUNTY HEALTH DEPARTMENT, OR OTHER AGENCIES DIFFER, THE MORE STRINGENT REQUIREMENT MUST BE MET.

ANY VARIANCES TO THE DISTANCES SHOWN IN TABLE 2.1 MUST BE SUBMITTED BY THE ENGINEER AND APPROVED BY WATER ENGINEERING AND THE POLK COUNTY HEALTH DEPARTMENT PRIOR TO CONSTRUCTION.

TREES ARE NOT TO BE PLACED OVER WATER LINES AND THERE MUST BE A 5-FT HORIZONTAL SEPARATION BETWEEN SMALL TREES AND WATER LINES, AND 8-FT BETWEEN LARGE TREES AND WATER LINES. THE CITY RESERVES THE RIGHT, WHEN NECESSARY, TO REQUIRE ADDITIONAL SEPARATION DEPENDING ON THE CIRCUMSTANCES.

NOTE: PER ARTICLE 33, LANDSCAPING REQUIREMENTS, AND THIS SECTION, SMALL TREES ARE DESIGNATED AS A OR B AND LARGE TREES HAVE A C DESIGNATION.

**GRAVITY SANITARY SEWERS**

- A. POLYVINYL CHLORIDE (PVC) GRAVITY PIPE/FITTINGS
  - 1. PVC GRAVITY PIPE AND FITTINGS, SIZES 4 INCHES THROUGH 15 INCHES, FOR SANITARY SEWER GRAVITY MAINS SHALL MEET THE REQUIREMENTS OF ASTM D3034. PVC GRAVITY PIPE AND FITTINGS, SIZES LARGER THAN 15 INCHES, SHALL MEET THE REQUIREMENTS OF ASTM F679 T-1. PVC GRAVITY PIPE AND FITTINGS SHALL MEET OR EXCEED THE REQUIREMENTS OF SDR35. PVC GRAVITY PIPE INTENDED FOR DEPTH OF BURIAL HAVING 10 FEET OR MORE OF COVER SHALL MEET THE ASTM D3034 SPECIFICATIONS INCLUSIVE OF HAVING THE OUTSIDE DIAMETER OF STANDARD SDR35 PIPE, BUT SHALL HAVE THE WALL THICKNESS RATING OF SDR26.
  - 2. MAXIMUM LAYING LENGTHS FOR ALL PVC GRAVITY PIPE SIZES SHALL BE AS FOLLOWS:
    - i) 4 INCHES THROUGH 15 INCHES -- 13 FEET.
    - ii) 18 INCHES - 12.5 FEET
    - iii) LARGER THAN 18 INCHES - 12 FEET
  - 3. PVC GRAVITY PIPE SHALL BE GREEN IN COLOR
  - 4. JOINTS FOR PVC GRAVITY PIPE 4 INCHES AND LARGER IN DIAMETER SHALL BE INTEGRAL BELL AND SPIGOT, WITH A SINGLE RUBBER GASKET. THE BELL SHALL CONSIST OF AN INTEGRAL WALL SECTION WITH A SOLID CROSS SECTION ELASTOMERIC RING, FACTORY INSTALLED, AND SHALL CONFORM TO ASTM F477 AND MEET THE REQUIREMENTS OF ASTM D3212.
  - 5. PVC FITTINGS SHALL BE MADE OF PVC PLASTIC HAVING A CELL CLASSIFICATION OF 12454-B, OR 12454-C, OR 13343-C AS DEFINED IN ASTM D1784, JOINED WITH A RUBBER GASKET JOINT.

**FORCEMAIN PIPING**

- A. POLYVINYL CHLORIDE (PVC) PRESSURE PIPE (GREEN)
  - 1. PVC PRESSURE PIPE SHALL BE MANUFACTURED FROM CLEAN, VIRGIN, UNPLASTICIZED POLYVINYL RESIN. CELL CLASSIFICATION 12454-A OR 12454-B AS DEFINED IN ASTM D1784. PVC GRAVITY SEWER PIPE SHALL BE MANUFACTURED FROM PVC PLASTIC HAVING A CELL CLASSIFICATION 12364-B AS DEFINED IN ASTM 1784. ALL PIPE SHALL BEAR THE NATIONAL SANITATION FOUNDATION SEAL FOR POTABLE WATER PIPE, TRADE NAME, PIPE MANUFACTURER'S NAME, AND AWWA STANDARD NUMBER.
  - 2. PVC PIPE SHALL BE FURNISHED WITH FACTORY LUBRICANT, IN SUFFICIENT QUANTITIES FOR THE LENGTHS OF PIPE PROVIDED, AND UTILIZED EXCLUSIVELY IN THE INSTALLATION OF THE PIPE.
  - 3. PVC PRESSURE PIPE SIZES 4 INCHES THROUGH 12 INCHES FOR SANITARY SEWER FORCEMAINS INSTALLED UNDERGROUND SHALL MEET THE REQUIREMENTS OF AWWA C900, AND SHALL BE CLASS 100 OR GREATER AND MEET OR EXCEED THE REQUIREMENTS OF DR25. PVC PRESSURE PIPE SIZES LARGER THAN 12 INCHES SHALL MEET THE REQUIREMENTS OF AWWA C905, AND SHALL BE CLASS 150 OR GREATER AND MEET OR EXCEED THE REQUIREMENTS OF DR18. PVC PRESSURE PIPE C900 AND C905 SHALL BE OF DUCTILE IRON OD.
  - 4. PVC PRESSURE PIPE SIZES 4 AND 6 INCHES FOR SANITARY SEWER FORCEMAINS INSTALLED UNDERGROUND MAY, UPON CITY AUTHORIZATION, MEET THE REQUIREMENTS OF ASTM D2241, AND MEET OR EXCEED THE REQUIREMENTS OF SDR21.
  - 5. MAXIMUM LAYING LENGTH FOR ALL PVC PRESSURE PIPE SHALL BE 20 FEET.
- B. DUCTILE IRON PIPE
  - 1. DUCTILE IRON PIPE AND FITTINGS SHALL RECEIVE AN EXTERIOR BITUMINOUS COATING AS SPECIFIED IN AWWA C104, C150, OR C151 AND SHALL BE EPOXY LINED WITH A CHEMICALLY CURED, TWO COMPONENT EPOXY MATERIAL, HAVING A MINIMUM 24 MILS DRY THICKNESS AS SPECIFIED IN AWWA C550 AND/OR AWWA C210. PERMEABILITY SHALL BE IN ACCORDANCE WITH ASTM D1653. ALTERNATELY, DUCTILE IRON PIPE AND FITTING LINER MAY BE OF FUSION-BONDED POLYETHYLENE, HAVING A NOMINAL THICKNESS OF 40 MILS, AND A MINIMUM THICKNESS OF 35 MILS.
  - 2. THE POLYETHYLENE LINING SHALL MEET THE REQUIREMENTS OF ASTM D1238. CEMENT LINED AND COAL TAR EPOXY LINED DUCTILE IRON PIPE AND FITTINGS ARE NOT ACCEPTABLE FOR WASTEWATER APPLICATIONS.
  - 3. DUCTILE IRON PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH AWWA C151 AND AWWA C111. PIPE SHALL BE DESIGNED FOR THICKNESS IN ACCORDANCE WITH AWWA C150 WITH A 150 PSI MINIMUM PRESSURE RATING.
  - 4. THICKNESS CLASS FOR DUCTILE IRON PIPE FOR UNDERGROUND SERVICE SHALL BE MINIMUM CLASS 50. LAYING LENGTHS FOR MECHANICAL JOINT OR PUSH JOINT DUCTILE IRON PIPE SHALL BE 18 OR 20 FEET, AS SPECIFIED, AND SHALL CONFORM TO ALL APPLICABLE ANSI/AWWA SPECIFICATIONS.
  - 5. JOINTS FOR DUCTILE IRON PIPE USED FOR UNDERGROUND SERVICE SHALL BE MECHANICAL OR PUSH-ON TYPE DESIGN IN ACCORDANCE WITH AWWA C111. MECHANICAL OR PUSH JOINT PIPE SHALL BE LABELED WITH TRADE NAME AND THE PIPE MANUFACTURER'S NAME.
- C. HIGH DENSITY POLYETHYLENE (HDPE) PIPE
  - 1. PIPE SHALL BE HIGH DENSITY POLYETHYLENE (HDPE) AS PER AWWA C906, SDR11, WITH A WORKING PRESSURE RATING OF 160 PSI, 4 TO 24 INCHES.
  - 2. HDPE PIPE SHALL BE PERMANENTLY COLOR CODED WITH STRIPES ALONG THE ENTIRE LENGTH OF THE PIPE, 120 DEGREES APART. FULLY COLORED PIPE CO-EXTRUDED FROM PERMANENTLY PIGMENTED HDPE IS ACCEPTABLE. COLOR CODING FOR SANITARY SEWER FORCEMAIN SERVICE SHALL BE GREEN STRIPES OR SOLID GREEN PIPE.
- D. FORCE MAIN IDENTIFICATION, AND TRACER WIRE
  - 1. A GREEN COATED NUMBER (#) 12 GAUGE UF (UNDERGROUND FEEDER PER NATIONAL ELECTRIC CODE ARTICLE 339) SOLID TRACER WIRE AND JOINT SEAL (KEARNEY AQUASEAL, BISHOP OR APPROVED EQUAL) SHALL BE INSTALLED ALONG ALL PUBLIC AND PRIVATE FORCE MAINS AND MUST BE TAPED BELOW THE SPRING LINE OF THE PIPE. AT EACH VALVE, THE WIRE SHALL BE INSTALLED ALONG THE OUTSIDE OF THE VALVE BOX TO THE ADJUSTABLE TOP PIECE. SECTIONS OF WIRE SHALL BE SPLICED TOGETHER USING BUCHANON CONNECTORS. TWISTING THE WIRE TOGETHER IS NOT ACCEPTABLE.
  - 2. FOR DIRECTIONAL BORES, A MINIMUM OF TWO (2) (#) 4 GAUGE UF SOLID TRACER WIRES SHALL BE USED.
  - 3. FOIL DETECTION TAPE BURIED 12-INCHES ABOVE THE PIPE SHALL BE PLACED ABOVE PIPE TO PROVIDE EARLY WARNING OF FORCE MAIN.

**REVISIONS**

DATE	DESCRIPTION	DATE	DESCRIPTION

Douglas E. Jones State of Florida, Professional Engineer, License No. 56077. This item has been digitally signed and sealed by Douglas E. Jones on the date indicated here. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

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STATE OF FLORIDA  
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

**UTILITY NOTES**

SHEET NO.

U-82

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

E. CURVATURE

F. FORCE MAIN ALIGNMENTS MAY CONTAIN CURVATURE IN PLACE OF BEND FITTINGS. DUCTILE IRON MAINS MAY CONTAIN JOINT DEFLECTIONS LIMITED TO 2 DEGREES PER JOINT. PVC MAINS MAY BE CURVED SUCH THAT A TRUE ARC IS FORMED UNIFORMLY THROUGHOUT THE PIPE SEGMENTS. PVC PIPE CURVATURE SHALL BE LIMITED IN ACCORDANCE WITH THE FOLLOWING TABLE:

DIAMETER (INCHES)	MINIMUM RADIUS (FEET)
4	120
6	180
8	240
10	280
12	350

**FORCEMAIN FITTINGS**

FITTINGS FOR DUCTILE IRON AND PVC PRESSURE PIPE SHALL BE MANUFACTURED OF DUCTILE IRON, AND SHALL CONFORM TO AWWA C153. FITTINGS SHALL BE DESIGNED SO AS TO BE COMPATIBLE WITH THE PIPE AND TO PROVIDE AT LEAST EQUAL RESISTANCE TO INTERNAL AND EXTERNAL LOADS ON THE PIPE. THE JOINTS, BOLTS, AND NUTS SHALL CONFORM TO AWWA C111 (MECHANICAL/PUSH JOINT) AND AWWA C115 (FLANGED JOINT). ALL FITTINGS SHALL BE RATED FOR NOT LESS THAN 150 PSI WORKING PRESSURE.

**PIPE FITTINGS/BELLS - RESTRAINTS**

A. THE FOLLOWING RESTRAINTS ARE ACCEPTABLE FOR RESTRAINING DUCTILE IRON AND PVC PIPE TO MECHANICAL JOINT VALVES AND FITTINGS PROVIDED FOR UNDERGROUND SERVICE:

- APPROVED SUPPLIER -- EBAA (USA)
- DUCTILE IRON PIPE, SIZES 4 INCHES THROUGH 12 INCHES - EBAA IRON SERIES 1200 MECHANICAL JOINT RETAINER GLAND.
- DUCTILE IRON PIPE SIZES LARGER THAN 12 INCHES - EBAA IRON SERIES 100 MECHANICAL JOINT RETAINER GLAND.
- PVC PIPE SIZES 4 INCHES THROUGH 12 INCHES - EBAA IRON MEGALUG SERIES 2000PV MECHANICAL JOINT RETAINER GLAND.
- PVC PIPE SIZES LARGER THAN 12 INCHES - EBAA IRON MEGALUG SERIES 1100PV MECHANICAL JOINT RETAINER GLAND.

B. THE FOLLOWING RESTRAINTS ARE ACCEPTABLE FOR RESTRAINING DUCTILE IRON AND PVC PIPE BELLS AS INDICATED ON THE DESIGN DRAWINGS:

- APPROVED SUPPLIER EBAA (USA)
- DUCTILE IRON PIPE, MECHANICAL JOINT, SIZES 4 INCHES THROUGH 12 INCHES - EBAA IRON SERIES 1200 MECHANICAL JOINT RETAINER GLAND.
- DUCTILE IRON PIPE, MECHANICAL JOINT, SIZES LARGER THAN 12 INCHES - EBAA IRON SERIES 100 MECHANICAL JOINT RETAINER GLAND.
- DUCTILE IRON PIPE, PUSH-ON, SIZES 4 INCHES AND LARGER - EBAA IRON SERIES 800 BELL RETAINER
- PVC PIPE BELLS, SIZES 4 INCHES AND LARGER - UNI-FLANGE SERIES 1350-C BELL RETAINER. (APPROVED SUPPLIER UNI-FLANGE (USA))

**VALVES FOR FORCEMAINS**

A. PLUG VALVES - FORCEMAINS (UNDERGROUND SERVICE)

- PLUG VALVES SHALL BE OF ROUND PORT DESIGN, APPLICABLE TO BURIED FORCEMAINS AND FORCEMAIN MANIFOLD VAULTS, TO BETTER ENABLE EFFICIENT PIGGING OF THE FORCEMAIN.
- ALL PLUG VALVES SHALL BE FROM THE SAME MANUFACTURER. PLUG VALVES SHALL BE AS MANUFACTURED BY HENRY PRATT COMPANY, 401 SOUTH HIGHLAND AV., AURORA, ILLINOIS 60506-5563, FIGURE 550 OR FIGURE 551 AS SPECIFIED OR APPROVED EQUAL.

B. GATE VALVES

- ALL GATE VALVES SHALL BE FROM THE SAME USA MANUFACTURER. GATE VALVES SHALL BE AS MANUFACTURED BY MUELLER, KENNEDY, OR APPROVED EQUAL.
- GATE VALVES 2 INCHES AND SMALLER SHALL CONFORM TO FEDERAL SPECIFICATIONS WW-V-54, TYPE II, SOLID WEDGE DISC, RISING STEM, SECURED JOINTS AND OF BRONZE CONSTRUCTION. VALVES SHALL HAVE MALLEABLE IRON HANDWHEELS.
- VALVE SIZES 4 INCHES THROUGH 12 INCHES SHALL BE MUELLER CATALOG NUMBER A-2370-6 OR KENNEDY FIGURE 561X, OR APPROVED EQUAL, OF THE RESILIENT WEDGE TYPE WITH IRON BODY, BRONZE MOUNTED, NON-RISING STEM WITH OPERATING WHEEL OR 2 INCH AWWA NUT, IN ACCORDANCE WITH AWWA C509 REQUIREMENTS. THE OPERATING WHEEL OR NUT SHALL HAVE AN ARROW CAST THEREON INDICATING THE DIRECTION OF OPENING. VALVES SHALL HAVE A CLEAR WATERWAY OPENING OF FULL NOMINAL DIAMETER OF THE VALVE.
- VALVE SIZES LARGER THAN 12 INCHES SHALL BE MUELLER CATALOG NUMBER A-2380-23 OR KENNEDY FIGURE 561X, OR APPROVED EQUAL, OF THE DOUBLE-DISC TYPE HAVING AN IRON BODY, BRONZE MOUNTED, WITH PARALLEL SEATS AND O. S. & Y. OR NON-RISING STEM AS SPECIFIED, WITH OPERATING WHEEL OR 2 INCH AWWA NUT, IN ACCORDANCE WITH AWWA C500 REQUIREMENTS. THE OPERATING WHEEL OR NUT SHALL HAVE AN ARROW CAST THEREON INDICATING THE DIRECTION OF OPENING.
- VALVES SHALL BE PROVIDED WITH BYPASS VALVES. VALVES SHALL HAVE A CLEAR WATERWAY OPENING OF FULL NOMINAL DIAMETER OF THE VALVE.
- GATE VALVES 4 INCHES AND LARGER SHALL HAVE FLANGED JOINTS AS SPECIFIED, AND UTILIZED EXCLUSIVELY IN PIGGING PORTS, WET TAPS AND EMERGENCY PUMP-OUT BY-PASS APPLICATIONS.

**SWING CHECK VALVES - LEVER AND WEIGHT**

ALL SWING CHECK VALVES SHALL BE FROM THE SAME MANUFACTURER. SWING CHECK VALVES WITH LEVER AND WEIGHT AS MANUFACTURED BY MUELLER SHALL BE CATALOG NUMBER A-2600-6-01. SWING CHECK VALVES AS MANUFACTURED BY KENNEDY SHALL BE FIGURE 106LW.

**BALL CHECK VALVES**

ALL BALL CHECK VALVES SHALL BE FROM THE SAME MANUFACTURER. BALL CHECK VALVES SHALL BE AS MANUFACTURED BY THE ITT FLYGT CORPORATION. FOR VALVE SIZES 4 INCHES THROUGH 14 INCHES, TYPE 5087 BALL CHECK VALVE SHALL BE PROVIDED. FOR VALVE SIZES 16 INCHES THROUGH 20 INCHES, TYPE 2016 SHALL BE PROVIDED.

**TELEVISIONING GRAVITY SEWER**

- THE WATER UTILITIES ENGINEERING DIVISION INSPECTION SECTION SHALL BE GIVEN TWO (2) WORKING DAYS NOTICE PRIOR TO PLANNED TV INSPECTION.
- THE CONTRACTOR AND THE INSPECTOR WILL AGREE UPON A DEFINITE TIME AND DATE AT THAT TIME. NO T.V. INSPECTION SHALL COMMENCE WITHOUT THE PRESENCE OF THE INSPECTOR.
- TV INSPECTIONS SHALL COMMENCE IN THE UP STREAM MOST SEGMENT OF THE SYSTEM; WORKING DOWN STREAM, TO PREVENT FOREIGN SUBSTANCES FROM ENTERING A SECTION PREVIOUSLY TELEVIEWED. WITHIN EACH SEGMENT, THE CAMERA SHALL TRAVEL IN A DIRECTION WHICH ALLOWS VIEWING OF SERVICE LATERALS CONNECTED TO THE FIRST PIPE JOINT AND BEYOND.

- NO MORE THAN 24 HOURS PRIOR TO PLACEMENT OF CAMERA INTO SEWER, WATER SHALL BE PLACED IN THE UPSTREAM MANHOLE OF THE SECTION TO BE TELEVIEWED TO ENABLE DETECTION OF CHANGES IN GRADE THAT MAY BE PRESENT.
- THE TV CAMERA AND VIDEOTAPE SHALL BE TURNED ON BEFORE THE CAMERA IS PLACED IN THE MANHOLE FOR INSPECTION AND SHALL NOT BE TURNED OFF UNTIL THE CAMERA IS REMOVED FROM THE MANHOLE. THE CAMERA SHALL BE MOVED THROUGH THE LINE UNDER THE CONTROL OF THE TV CAMERA OPERATOR.
- THE CAMERA SHALL BE DRAWN THROUGH THE LINE AT A RATE NOT TO EXCEED THIRTY (30) FEET PER MINUTE AND SHALL STOP AT ALL SERVICE CONNECTIONS IN THE LINE, OR AT LOCATIONS OF CONCERN AS IDENTIFIED BY THE INSPECTOR.
- VHS VIDEOTAPE AND WRITTEN LOG SHALL BE MADE OF THE ENTIRE SYSTEM BEING TELEVIEWED. THIS TAPE SHALL BECOME THE PROPERTY OF THE CITY UPON COMPLETION OF THE TV INSPECTION (NOT A COPY). THE TAPE(S) SHALL BE LABELED IN SUCH A MANNER THAT STATES THE PROJECT NAME, DATE OF INSPECTION LINE, SECTIONS, CITY MANHOLE NUMBERS CONTAINED ON EACH TAPE.
- TO VERIFY THE ACCURACY OF PIPE GRADE, A GAUGE SHALL BE VISIBLE IN FRONT OF THE CAMERA LENS WHILE THE CAMERA IS PROPELLED THROUGH THE SEWER LINE. IF THE CAMERA IS PULLED THROUGH THE LINE THE CITY HAS A GRADE GAUGE THAT CAN BE UTILIZED BY THE CONTRACTOR. IF A SELF-PROPELLED CAMERA IS USED FOR THE INSPECTION IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE A MEANS OF INDICATING, AT A MINIMUM, 1/4 INCH AND 1 INCH DEVIATIONS IN PIPE GRADE. THE APPARATUS SHALL NOT IMPAIR THE CAMERA'S NORMAL OPERATION. ALL CONTRACTOR SUPPLIED DEVICES MUST BE PRE-APPROVED BY THE CITY'S WATER UTILITIES INSPECTOR PRIOR TO BEGINNING INSPECTION OF THE SEWER LINES.
- SEWER SYSTEMS SHALL BE CONSTRUCTED AS DESIGNED, ONLINE AND ONGRADE. HOWEVER, WHILE SEWER CONSTRUCTION ONLINE AND TO GRADE IS REQUIRED, CIRCUMSTANCES SOMETIMES OCCUR RESULTING IN LOW AREAS OR DIPS IN GRAVITY SEWER LINES. SINCE RELATIVE PIPE DEPTH AVAILABLE TO FLOW RELATES TO RELATIVE PIPE CAPACITY, THE CRITERIA FOR PERMITTED PIPE DIP HEREIN ARE BASED UPON THE PIPE DIAMETER. BASED UPON THE CONDITIONS OR CIRCUMSTANCES WHICH CREATED THIS DEVIATION, THE CITY MAY AT ITS SOLE DISCRETION PERMIT ON A CASE-BY-CASE BASIS DEVIATIONS AS LONG AS THE FOLLOWING CRITERIA ARE NOT EXCEEDED:

**MAIN DIAMETER      MAX. DEPTH OF DEVIATION SIZE**

8"	0.5"
10"	0.5"
12"	0.75"
15"	1.0"
18"	1.0"
21"	1.5"
24"	1.5"
27"	1.5"

- THE MAXIMUM NEGATIVE DEVIATION FROM MINIMUM STANDARD GRADE IN ANY SEWER INTENDED FOR PUBLIC OPERATION AND MAINTENANCE IS 10%.
- ANY SECTIONS REQUIRING REPAIRS DUE TO PIPE FRACTURES, POOR GRADE OR DIPS MUST BE RETELEVIEWED WITHIN THE SAME GUIDELINES AFTER REPAIR WORK IS COMPLETED.
- ANY SECTION FOUND TO BE UNCLEAN OR ANY CLOGGED CLEAN-OUTS SHALL ALSO REQUIRE RETELEVIEWING WHEN CLEANING OF SAID LINE IS COMPLETED.
- ANY SECTIONS OF PIPE WITH MORE THAN 5% DEFLECTION (REDUCTION IN VERTICAL INSIDE DIAMETER) SHALL NOT BE ACCEPTED. MANDREL PROOFING WILL BE REQUIRED WHEN TV INSPECTION INDICATES DEFLECTION.

PRELIMINARY  
subject to changes

**REVISIONS**

DATE	DESCRIPTION	DATE	DESCRIPTION

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STATE OF FLORIDA  
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY NOTES

SHEET NO.

U-83

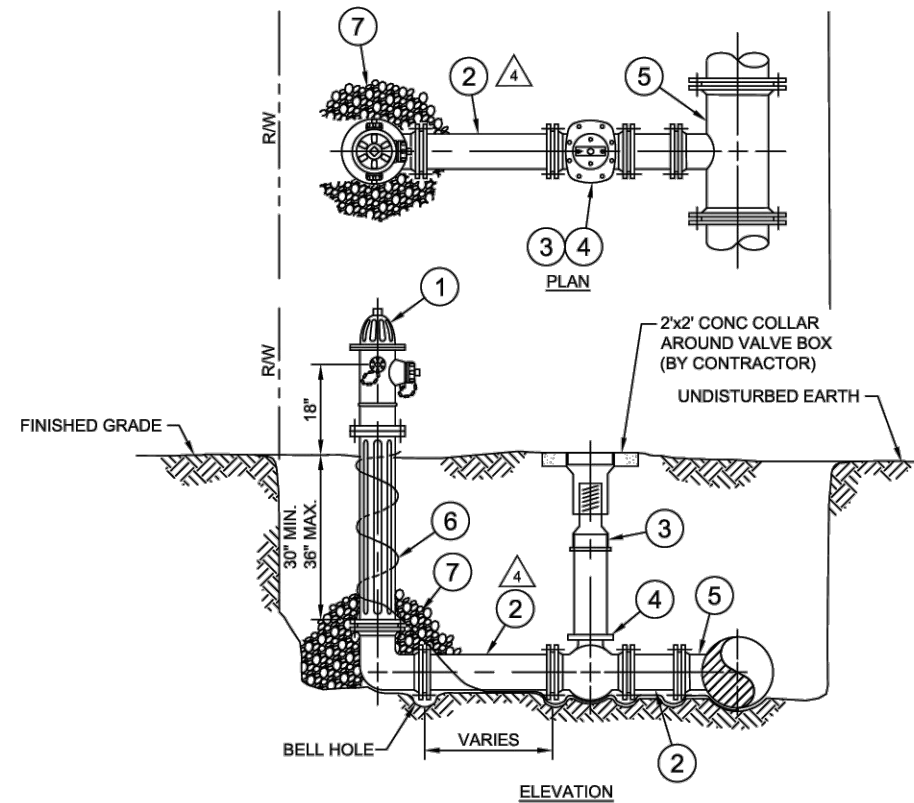


WATER STANDARDS  
WATER ENGINEERING DIVISION

STD. NO. WS-401

FIRE HYDRANT INSTALLATION  
PLAN AND ELEVATION

SHT. 1 OF 1



BILL OF MATERIALS		
ITEM	QUAN.	DESCRIPTION
1	1	HYDRANT, FIRE
2	-	6" PIPE, DIP
3	1	BOX, VALVE, W/ 2x2' CONCRETE COLLAR AS REQ'D
4	1	6" VALVE, GATE, MJ
5	1	TEE, ANCHORING, MJ
6	-	SOLID CORE INSULATED COPPER TRACER WIRE. REF. WS-601
7	-	DRAINAGED BED, 57 OR LARGER STONE, COMPACTED. 30"x30"x12" DEEP

GENERAL NOTES:

- SEE 'FIRE HYDRANT ASSEMBLIES' FOR FURTHER INFORMATION.
- ALL FITTINGS TO BE RESTRAINED.
- TRACER WIRE TO BE BROUGHT UP TO GRADE. REFERENCE STANDARD DETAIL WS-501.

APPROVED	DATE	PREPARED BY	DATE	REVISION
		GEG	11/14/01	5
APPROVED	DATE	CHECKED BY	ISSUE DATE:	REVISION DATE:
			08/16/16	07/21/16

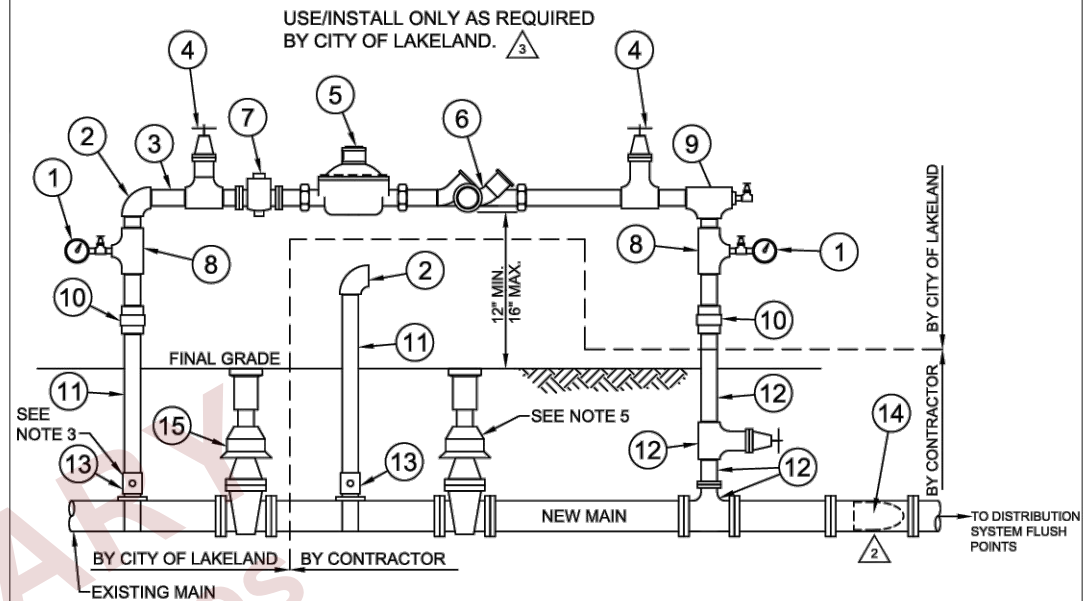


WATER STANDARDS  
WATER ENGINEERING DIVISION

STD. NO. WS-402

TEMPORARY JUMPER DETAIL

SHT. 1 OF 1



BILL OF MATERIALS		
ITEM	QUAN.	DESCRIPTION
1	2	PRESSURE GAUGE W/ 1/2" BALL VALVE
2	2	2" 90 DEG ELBOW, GALVANIZED SCH 40
3	-	2" THREADED NIPPLE, GALVANIZED SCH 40
4	2	2" GATE VALVE, THREADED x FLANGED
5	1	2" METER, FLANGED
6	1	2" RPZ BACKFLOW PREVENTER, FLANGED
7	1	STRAINER, FLANGED
8	2	2"x1" RED. TEE, GALVANIZED SCH 40
9	1	2" TEE, GALVANIZED SCH 40
10	2	2" UNION, GALVANIZED SCH 40
11	CUT TO FIT	2" PIPE, GALVANIZED SCH 40
12	1 ASSY.	2" TEE, NIPPLES, AND GATE VALVE BY OTHERS (SEE NOTE 4)
13	1	TAPPING SLEEVE AND VALVE
14	-	INSERT PIG(S) DURING ASSEMBLY
15	1	TIE-IN VALVE - SIZE AND TYPE - LATER

GENERAL NOTES:

- ALL PIPES AND FITTINGS 2 INCHES AND SMALLER SHALL BE THREADED SCH 40 GALVANIZED STEEL.
- PROVIDE PIPE SUPPORTS AS REQUIRED.
- TAP ON CITY MAIN BY CITY OF LAKELAND PERSONNEL, AT DEVELOPER'S EXPENSE.
- CONTRACTOR TO EXTEND NIPPLE TO 12 INCHES ABOVE GRADE.
- AFTER INITIAL FLUSHING, TIE-IN VALVE SHALL BE LOCKED IN THE CLOSED POSITION AND OPERATED BY CITY OF LAKELAND PERSONNEL ONLY (TYPICAL FOR BOTH VALVES).
- PIGGING PLAN TO BE PROVIDED BY CONTRACTOR.

APPROVED	DATE	PREPARED BY	DATE	REVISION
		GEG	11/14/01	3
APPROVED	DATE	CHECKED BY	ISSUE DATE:	REVISION DATE:
			08/16/16	07/21/16

REVISIONS

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STATE OF FLORIDA  
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY DETAILS

SHEET NO.

U-84

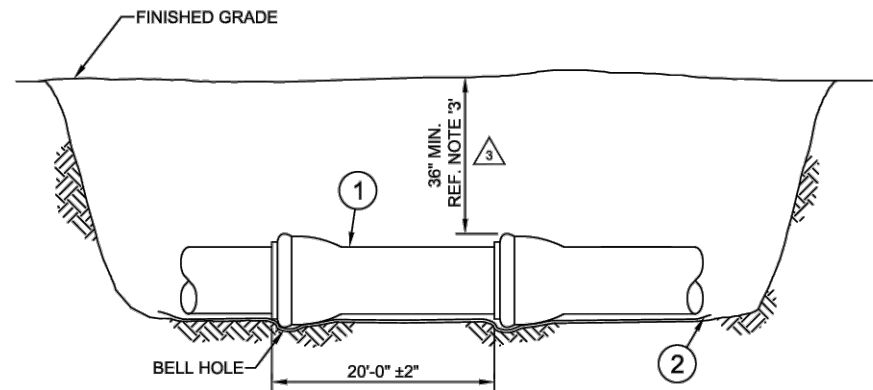


WATER STANDARDS  
WATER ENGINEERING DIVISION

STD. NO. WS-403

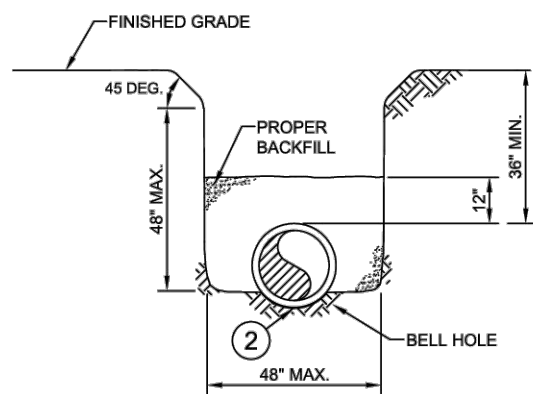
WATER MAIN INSTALLATION  
ELEVATION AND SECTION

SHT. 1 OF 2



ELEVATION

SPECIAL NOTE  
TRACER WIRE SHOULD BE INSTALLED  
UNDERNEATH WATER LINE



SECTION

BILL OF MATERIALS		
ITEM	QUAN.	DESCRIPTION
1	CUT TO FIT	PIPE, D.I. (CLASS 30) OR PVC (C900 DR-18)
2	CUT TO FIT	SOLID CORE INSULATED COPPER TRACER WIRE. REF. WS-501

GENERAL NOTES:

- ALL PIPE SHALL BE INSTALLED WITH A CONTINUOUS BLUE COATED SOLID TRACER WIRE TAPED EVERY TEN FEET TO THE SIDE OF THE PIPE AND WRAPPED AROUND EACH FIRE HYDRANT AT FINAL GRADE.
- TRACER WIRE TO BE BROUGHT UP TO GRADE AT EVERY IN-LINE VALVE AND SERVICE VALVE.
- DEPTH OF PIPE MAY BE FIELD ADJUSTED TO MEET SPECIAL CONDITIONS AS DETERMINED BY ENGINEER OR INSPECTOR, INCLUDING, BUT NOT LIMITED TO, ARV INSTALLATIONS. DEPTH OF PIPE SHOULD REMAIN CONSTANT WHEN APPROACHING AND DEPARTING AN ARV LOCATION.

APPROVED	DATE	PREPARED BY DW	DATE 02/04/99	REVISION	4
APPROVED	DATE	CHECKED BY	ISSUE DATE: 08/16/16	REVISION DATE: 07/21/16	NO. 4

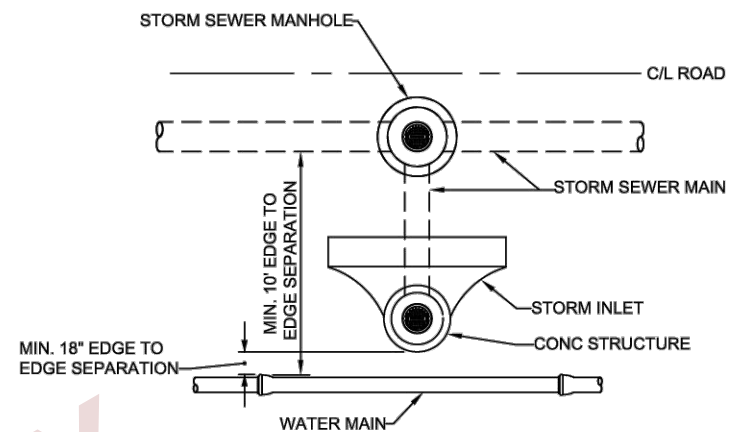


WATER STANDARDS  
WATER ENGINEERING DIVISION

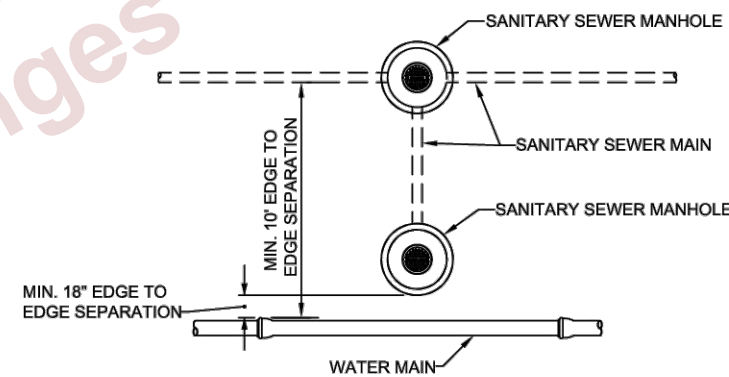
STD. NO. WS-403

WATER MAIN INSTALLATION  
HORIZONTAL CLEARANCES

SHT. 2 OF 2



WATER MAIN / STORM SEWER STRUCTURE CLEARANCE



WATER MAIN / SANITARY SEWER STRUCTURE CLEARANCE

APPROVED	DATE	PREPARED BY GEG	DATE 04/22/05	REVISION	1
APPROVED	DATE	CHECKED BY	ISSUE DATE: 08/16/16	REVISION DATE: 07/21/16	NO. 4

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY DETAILS

SHEET NO.

U-85

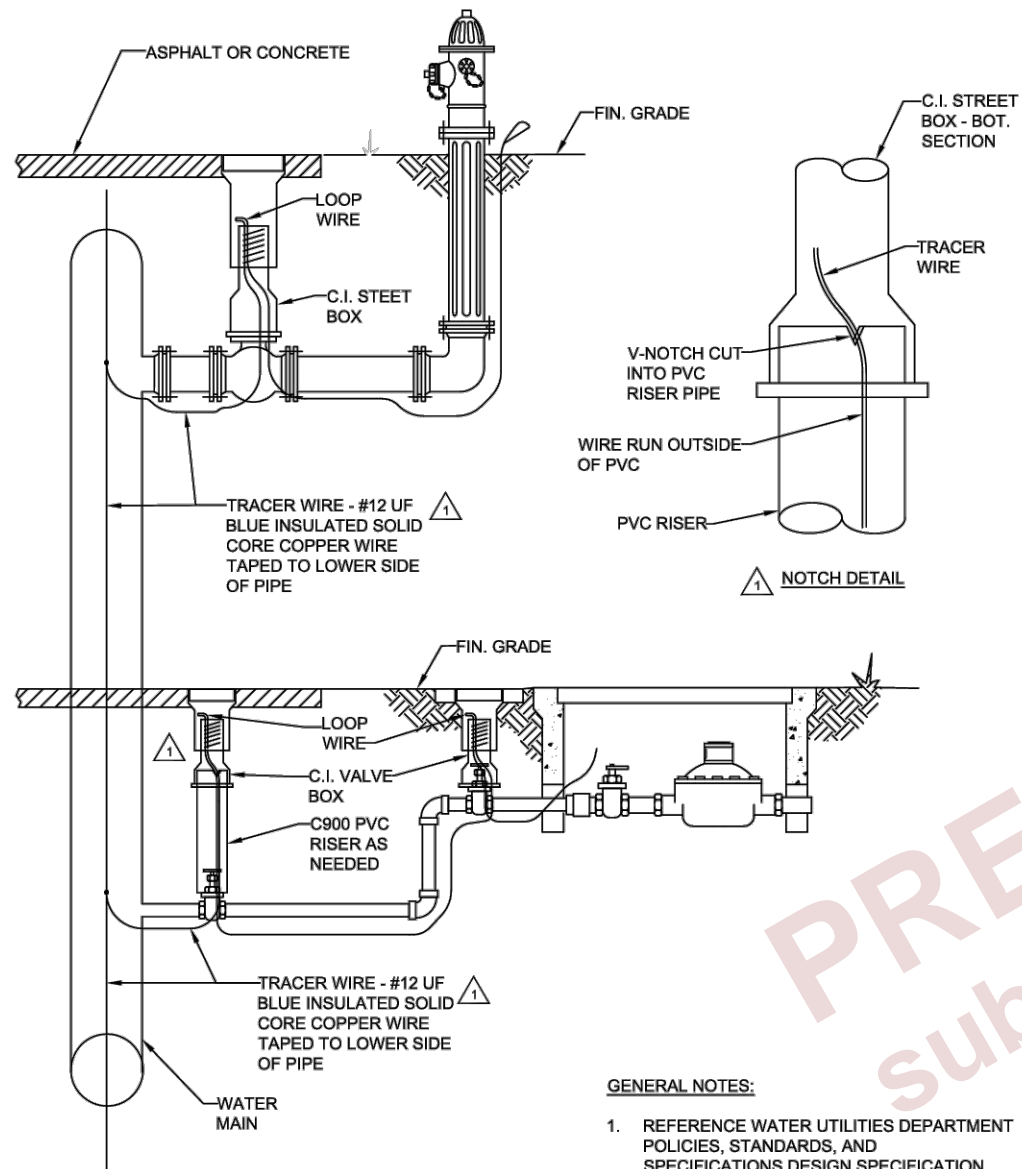


WATER STANDARDS  
WATER ENGINEERING DIVISION

STD. NO. WS-501

TRACER WIRE  
INSTALLATION

SHT. 1 OF 2



**GENERAL NOTES:**

1. REFERENCE WATER UTILITIES DEPARTMENT POLICIES, STANDARDS, AND SPECIFICATIONS DESIGN SPECIFICATION 2.7.17 AND 4.1.5.
2. REFERENCE DETAIL 501-2.

APPROVED	DATE	PREPARED BY	DATE	REVISION	NO. <b>2</b>
		GEG	10/11/00		
APPROVED	DATE	CHECKED BY	ISSUE DATE:	REVISION DATE:	
			08/16/16	07/21/16	

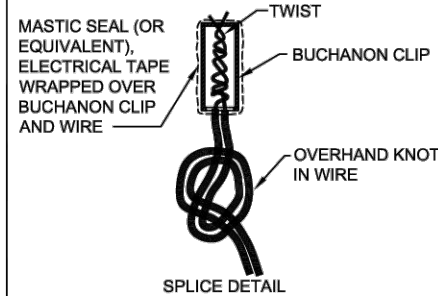
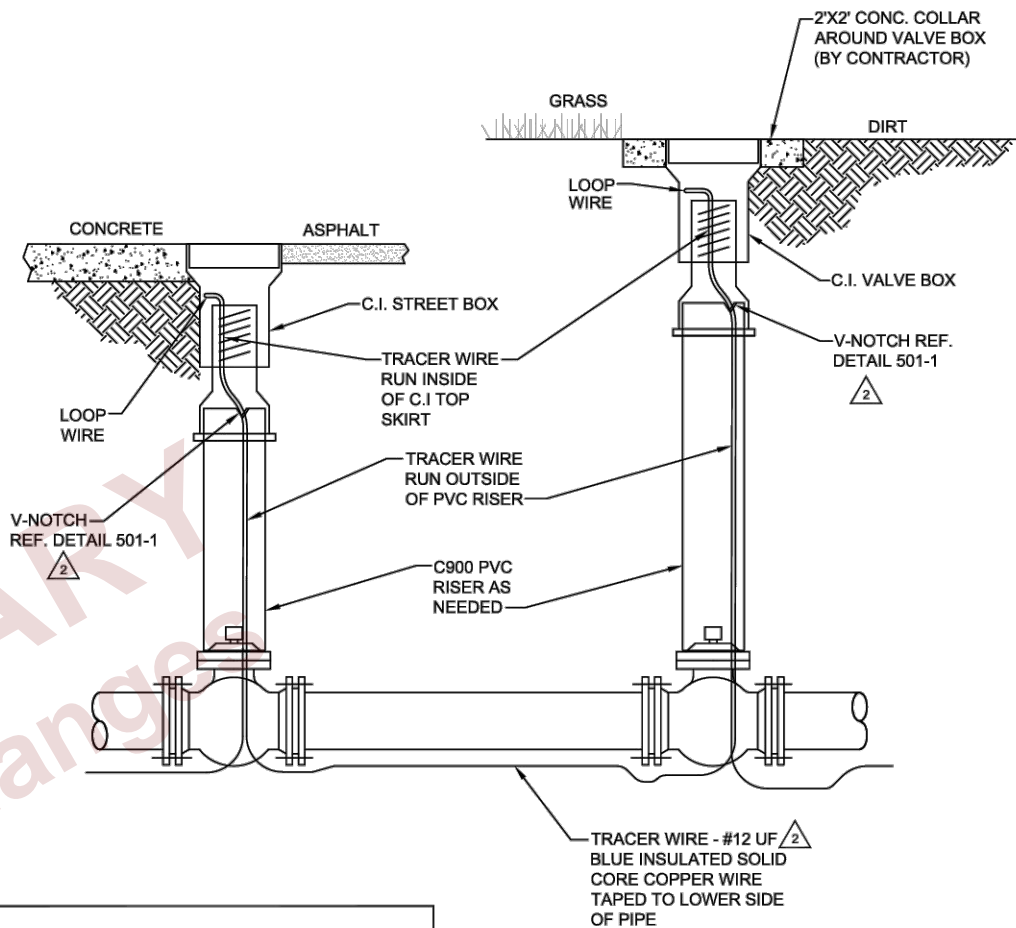


STANDARDS  
WATER ENGINEERING DIVISION

STD. NO. WS-501

TRACER WIRE  
INSTALLATION

SHT. 2 OF 2



**GENERAL NOTES:**

1. REFERENCE WATER UTILITIES DEPARTMENT POLICIES, STANDARDS, AND SPECIFICATIONS DESIGN SPECIFICATION 2.7.17 AND 4.1.5

APPROVED	DATE	PREPARED BY	DATE	REVISION	NO. <b>3</b>
		GEG	11/14/01		
APPROVED	DATE	CHECKED BY	ISSUE DATE:	REVISION DATE:	
			08/16/16	07/21/16	

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

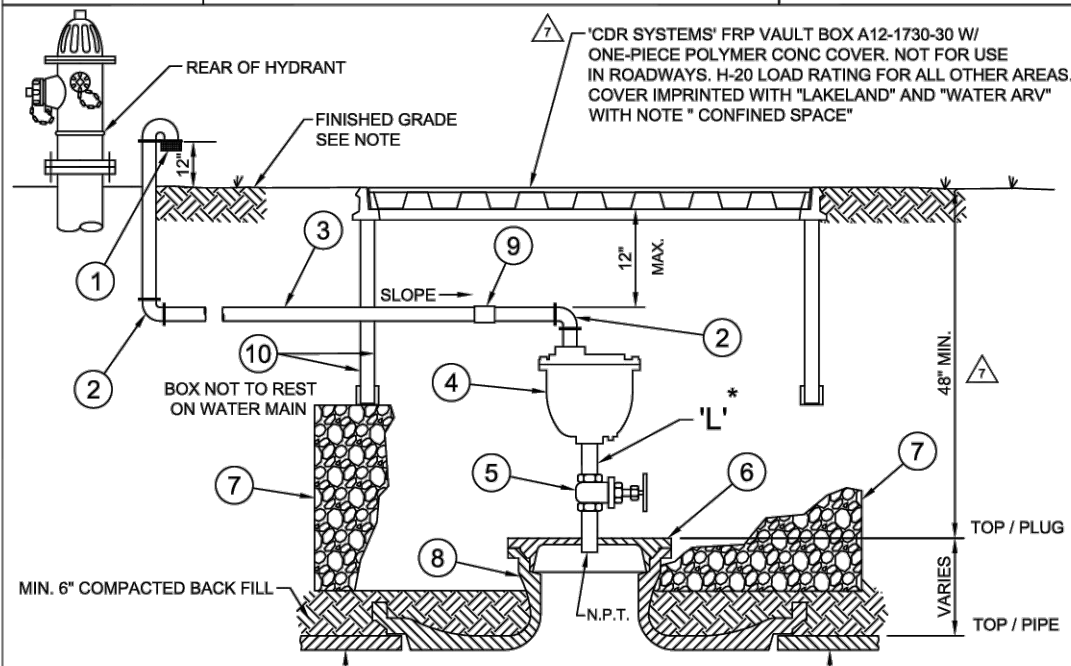
UTILITY DETAILS

SHEET NO.

U-86



WATER STANDARDS WATER ENGINEERING DIVISION		STD. NO. WS-404
VALVE VAULT FOR AIR RELEASE VALVE		SHT. 1 OF 1



\* 'L' DENOTES DISTANCE BETWEEN BOTTOM OF AIR RELEASE VALVE & GATE VALVE. A 2ND VALVE IS REQUIRED IF 'L' IS >3 FT.

BILL OF MATERIALS		
ITEM	QUAN	DESCRIPTION
1	1	BUG SCREEN - STAINLESS STEEL
2	2	2" 90 DEG ELBOW, GALVANIZED SCH 40
3	1	2" PIPE, GALVANIZED SCH 40
4	1	2" AIR & VAC RELEASE VALVE APCO MOD 145C
5	1	GATE VALVE *
6	1	MJ PLUG W / 2" TAP
7	-	DRAINAGE BED, #57 STONE
8	1	TEE, REDUCING, DIP, MJ, RESTRAINED
9	1	GALVANIZED UNION
10	1	'CDR SYSTEMS' FRP VAULT BOX W / POLYMER CONCRETE ONE-PIECE COVER

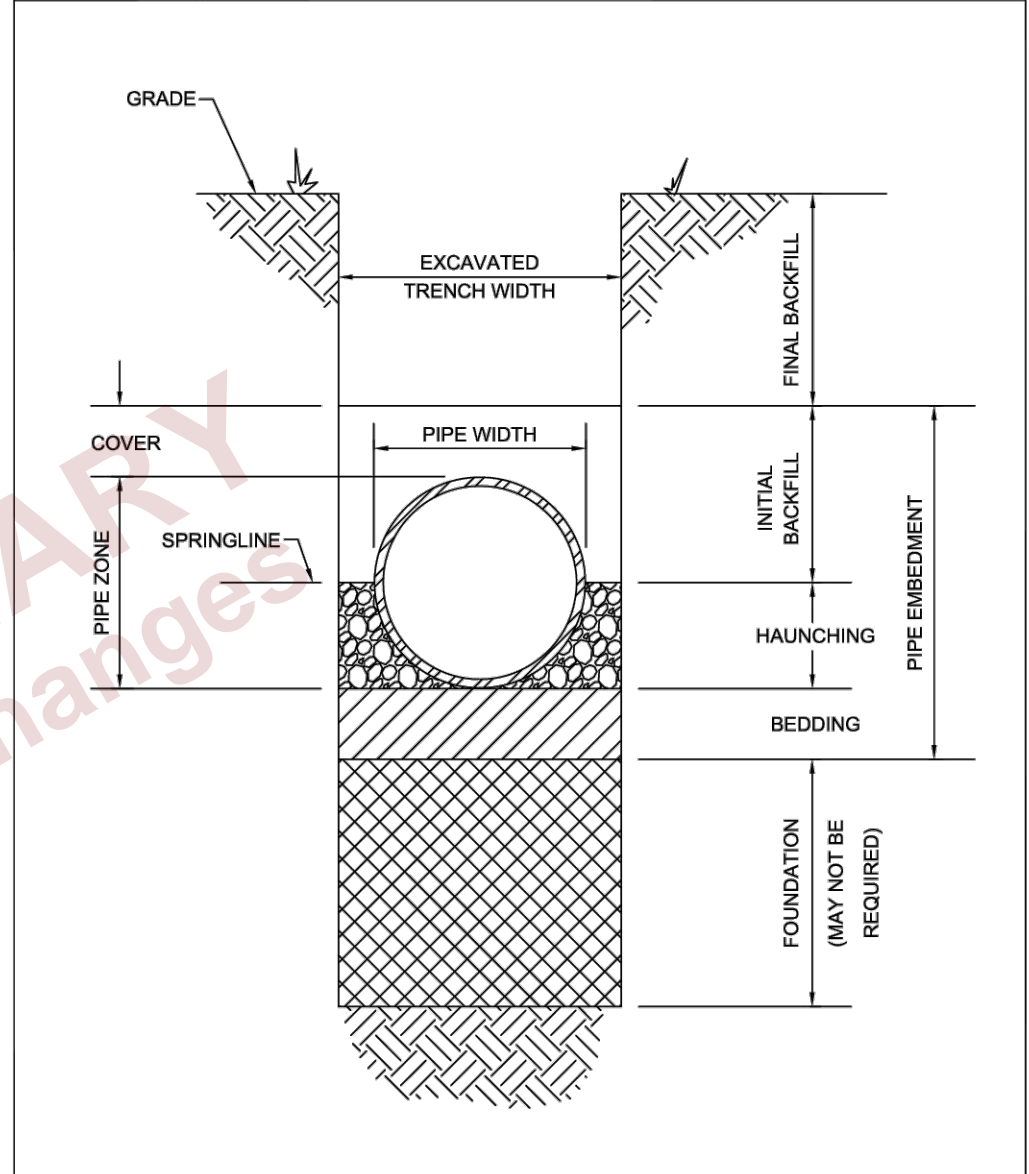
DIA. OF WATER MAIN (IN.)	MJ TEE, BRANCH DIA. (IN.)
48	16
42	16
36	12
30	10
24	10
20	8
16	8
12	8
10	6
8	6
6	6

- GENERAL NOTES:**
- WHEN AIR RELEASE VALVE VAULT IS IN CONFLICT WITH STABILIZED ROAD OR EXISTING PAVEMENT TOP OF POLYMER CONCRETE VAULT COVER WILL BE AT THE SAME ELEVATION.
  - INSTALL COMBINATION AIR / VACUUM VALVE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
  - DRAINAGE BED IS REQUIRED REGARDLESS OF SOIL TYPE.
  - ADJUST DEPTH OF WATERMAIN VIA SMOOTH TRANSITION TO ACCOMMODATE REQUIRED DEPTH OF MJ PLUG IN ARV VAULT.

APPROVED	DATE	PREPARED BY	GEG	DATE	10/11/06	REVISION	8
APPROVED	DATE	CHECKED BY		ISSUE DATE:	08/16/16	REVISION DATE:	07/21/16



WASTEWATER STANDARDS WATER ENGINEERING DIVISION		DETAIL NO.: WWS-001
TRENCH CROSS-SECTION TERMINOLOGY		SHT. 1 OF 1



01\_TRNSEC.DWG

APPROVED	DATE	PREPARED BY	GEG	DATE	11/21/00	REVISION
APPROVED	DATE	CHECKED BY		ISSUE DATE	10/15/07	REVISION DATE
						NO. 0

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY DETAILS	
SHEET NO.	U-87

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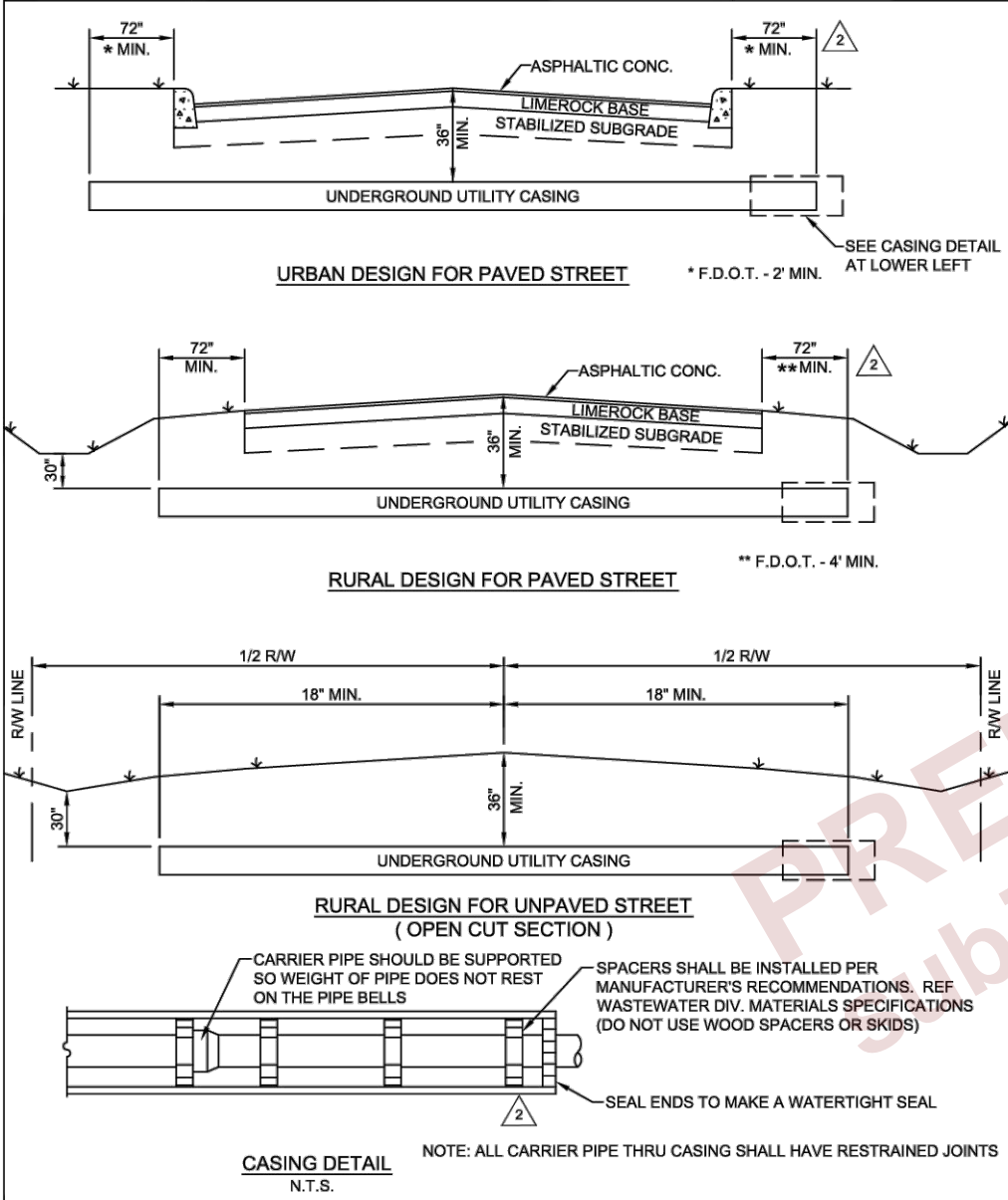


WASTEWATER STANDARDS  
WATER ENGINEERING DIVISION

DETAIL NO.: WWS-003

UNDERGROUND UTILITY  
CROSSING OF STREETS

SHT. 1 OF 3



APPROVED	DATE	PREPARED BY	DATE	REVISION	2
		GEG	09/29/03		
APPROVED	DATE	CHECKED BY	ISSUE DATE	REVISION DATE	NO.
			10/15/07	09/29/03	2



WASTEWATER STANDARDS  
WATER ENGINEERING DIVISION

DETAIL NO.: WWS-003

UNDERGROUND UTILITY  
CROSSING OF STREETS

SHT. 2 OF 3

**PAVED STREET INSTALLATION**

- The following methods shall be the only approved methods of installing a gravity main or a forcemain under an existing paved street:  
Gravity Main - Jack and Bore (Push) method  
Forcemain - Jack and Bore or Directional Bore method  
Neither "Air Jetting" nor "Water Jetting" methods will be allowed. Where extraordinary circumstances preclude the aforementioned methods of crossing, the Director of Public Works may authorize an "open-cut" trench across the paved street. The Contractor shall then be required to backfill the trench and patch the pavement as indicated on City of Lakeland Index No. 205 A. In certain instances a "feathering-in" of the asphalt patch, overlay, or milling & resurfacing may be required, as deemed appropriate by the Director of Public Works.
- The casing of the underground utility crossing shall maintain a minimum of thirty six (36) inches of cover from the crown of the roadway pavement to the outside diameter of the casing.
- The casing shall extend a minimum of six (6) feet from the back of curb on both sides of the road on an urban design section and a minimum of six (6) feet from the outside edge of pavement of both sides of the road on a rural design section.
- Where the actual location of a potential conflict may exist between the proposed casing and an existing utility, a "window" in the asphalt pavement may be authorized by the City in order to verify the exact depth and location of the utility. This window must be patched as soon as it has served its purpose and shall not remain unpatched overnight under any circumstance. The window shall not exceed an area of one (1) square foot.
- All methods of installation are subject to the review, approval, and inspection by the City of Lakeland. Such installations will require the issuance of a City of Lakeland Utility Permit. Operations deemed as potentially damaging or unsafe will not be permitted. Road crossings shall be completed on the same day whenever possible.
- Traffic control at the project site shall conform to FDOT Standards. Traffic control, as approved by the City of Lakeland, shall be maintained during all stages of the underground utility installation.

**UNPAVED STREET INSTALLATION**

The crossing of an unpaved street may be accomplished by open-cutting of the street. The depth of cover of the underground installation shall be a minimum of thirty six (36) inches. The material removed is to be replaced in layers and compacted. The last six (6) inches of backfill material will be replaced with limerock or shell material (as deemed appropriate) and compacted. This will serve to provide a traffic bearing material and as an indication that there is a utility crossing at the location. A City of Lakeland or Polk County Utility Permit shall be required and adequate traffic control shall be maintained at all stages of the operation.

APPROVED	DATE	PREPARED BY	DATE	REVISION	1
		GEG	09/29/03		
APPROVED	DATE	CHECKED BY	ISSUE DATE	REVISION DATE	NO.
			10/15/07	09/29/03	1

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY DETAILS

SHEET NO.  
**U-88**

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WASTEWATER STANDARDS  
WATER ENGINEERING DIVISION

DETAIL NO.: WWS-003

UNDERGROUND UTILITY  
CROSSING OF STREETS

SHT. 3 OF 3

MINIMUM CASING PIPE SIZE

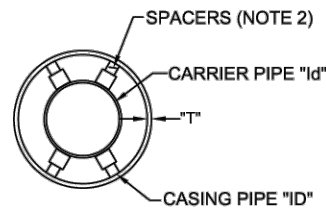
CARRIER PIPE	INSIDE DIAMETER 'ID'												
	DIP MECHANICAL JOINT	--	--	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
DIP PUSH-ON JOINT	--	--	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"
PVC	--	4"	6"	8"	--	10"	12"	14"	16"	18"	20"	24"	--
CONCRETE	--	--	--	--	--	--	--	--	--	--	15"	18"	24"

CARRIER PIPE	INSIDE DIAMETER 'ID'														
	STEEL CASING PIPE SIZE	8"	10"	12"	16"	16"	18"	20"	24"	30"	30"	30"	36"	42"	48"

AGENCIES	MINIMUM WALL THICKNESS 'T'														
	C.O.L.	.188"	.188"	.250"	.281"	.281"	.312"	.344"	.375"	.469"	.469"	.469"	.532"	.625"	.688"
F.D.O.T.															
RAILROAD															



- 3** NOTES:
1. MINIMUM STEEL CASING PIPE SIZES ARE BASED ON USING "UNI-FLANGE" SERIES 1390-C BELL-JOINT RESTRAINERS FOR 4" THRU 24" C-900/905 PVC PIPE. BELL-JOINT RESTRAINERS BY OTHER MANUFACTURERS WILL REQUIRE LARGER CASING PIPE SIZES.
  2. REFERENCE WASTEWATER DIVISION MATERIAL SPECIFICATIONS. USE OF WOOD SKIDS ARE NOT PERMITTED.

APPROVED	DATE	PREPARED BY	GEG	DATE	REVISION	<b>3</b>
				09/29/03		
APPROVED	DATE	CHECKED BY		ISSUE DATE	REVISION DATE	NO.
				10/15/07	10/20/04	3

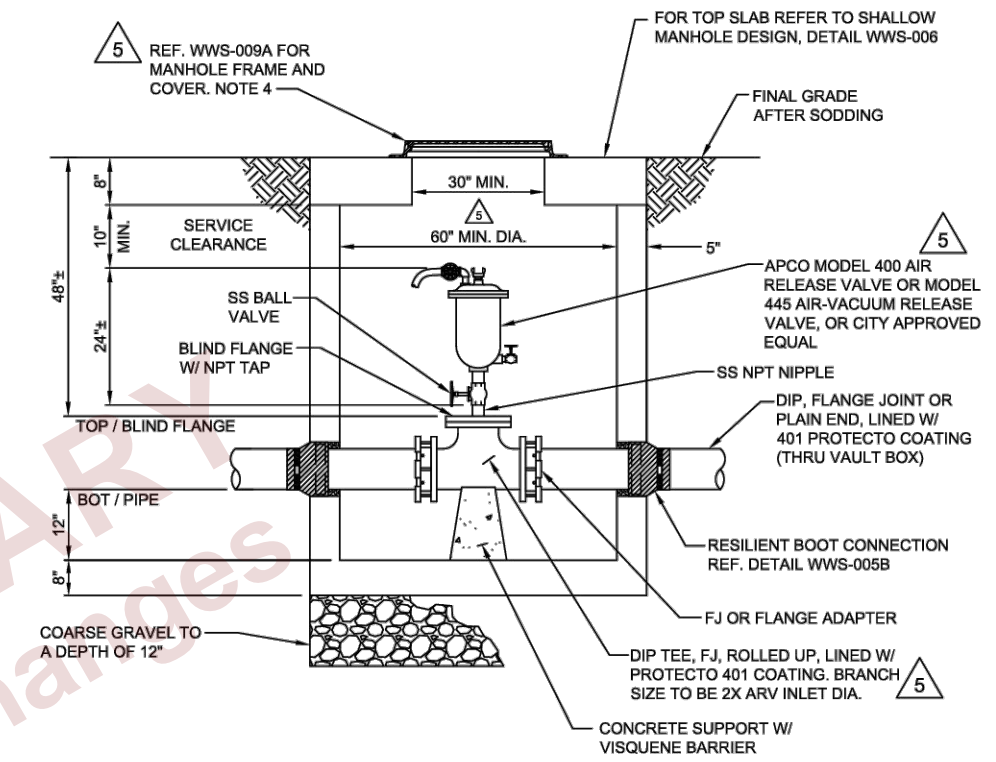


WASTEWATER STANDARDS  
WATER ENGINEERING DIVISION

DETAIL NO.: WWS-008

SANITARY SEWER FORCEMAIN  
AIR RELEASE VALVE ON NEW FORCEMAINS

SHT. 1 OF 1



- 5** NOTES:
1. STANDARD MANHOLE SPECIFICATIONS APPLY EXCEPT WHERE OTHERWISE NOTED.
  2. INSTALL AIR RELEASE VALVE TO MANUFACTURER'S SPECIFICATIONS.
  3. COARSE GRAVEL BEDDING REQUIRED REGARDLESS OF SOIL TYPE.
  4. NOT INTENDED FOR USE IN ROADWAYS. BRICK OR PRECAST SPACER RING IS REQUIRED IF STRUCTURE IS LOCATED UNDER PAVEMENT. REFERENCE DETAIL WWS-009A.
  5. ADJUST DEPTH OF FORCEMAIN VIA SMOOTH TRANSITION TO ACCOMMODATE DEPTH TO TOP OF BLIND FLANGE LOCATED IN ARV VAULT.
  6. ALL NUTS AND BOLTS TO BE STAINLESS STEEL. DO NOT PAINT.
  7. DO NOT PAINT STAINLESS STEEL NIPPLES OR STAINLESS ISOLATION VALVE.
  8. PAINT THE FOLLOWING EXTERNAL SURFACES WITH PROTECTO 401: DUCTILE IRON PIPE, DUCTILE IRON FITTINGS, DUCTILE IRON BLIND FLANGE, AND ARV BODY.

APPROVED	DATE	PREPARED BY	GEG	DATE	REVISION	<b>5</b>
				09/29/03		
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				10/15/07	02/10/15	

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY DETAILS

SHEET NO.  
U-89

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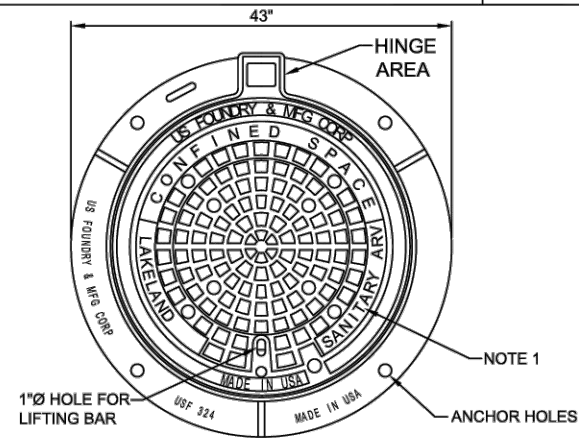


WASTEWATER STANDARDS  
WATER ENGINEERING DIVISION

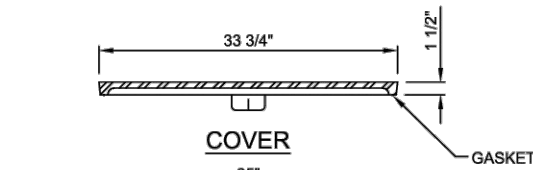
DETAIL NO.: WWS-009A

SANITARY SEWER MANHOLE - ARV &  
SHALLOW MANHOLE FRAME AND COVER

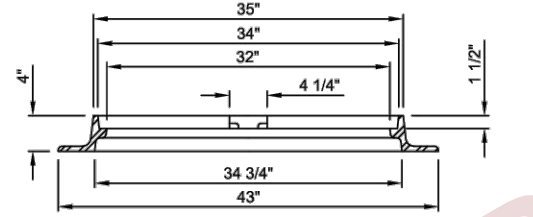
SHT. 1 OF 1



FRAME & COVER - PLAN



COVER



FRAME

U.S. FOUNDRY & MFG. CORP.  
REF. CAT. NO. 324  
FRAME WT. 165 LBS. ±  
COVER WT. 180 LBS. ±  
MAT'L - CAST IRON, ONE COAT OF  
ASPHALTIC PAINT  
(OR CITY APPROVED EQUAL)

NOTE:

- MANHOLE COVER SHALL BE IMPRINTED WITH "LAKELAND" AND "SANITARY SEWER" OR "SANITARY ARV", AND WITH NOTE "CONFINED SPACE"

APPROVED	DATE	PREPARED BY	DATE	REVISION	4
		GEG	09/29/03		
APPROVED	DATE	CHECKED BY	ISSUE DATE	REVISION DATE	NO.
			10/15/07	02/10/15	

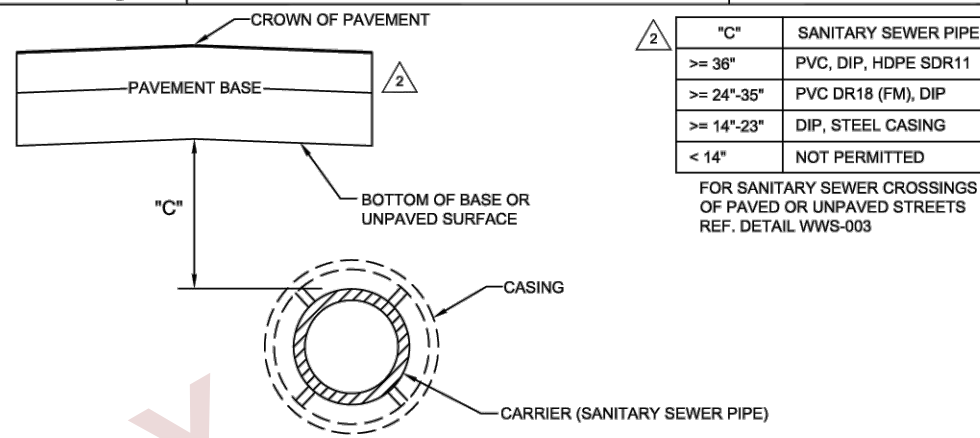


WASTEWATER STANDARDS  
WATER ENGINEERING DIVISION

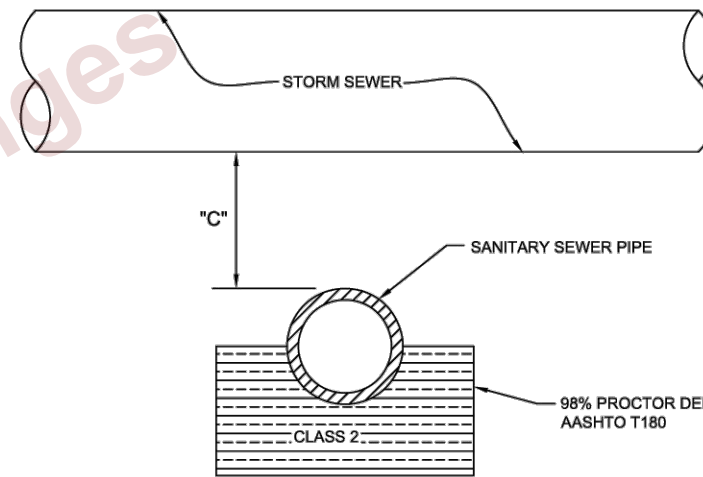
DETAIL NO.: WWS-011

SANITARY SEWER  
CLEARANCES

SHT. 1 OF 1



CLEARANCES-STRUCTURAL REQUIREMENTS



CLEARANCES-VERTICAL SEPARATION

APPROVED	DATE	PREPARED BY	DATE	REVISION	2
		GEG	09/29/03		
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			10/15/07	04/05/04	2

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STATE OF FLORIDA  
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	POLK	430185-3-56-01

UTILITY DETAILS

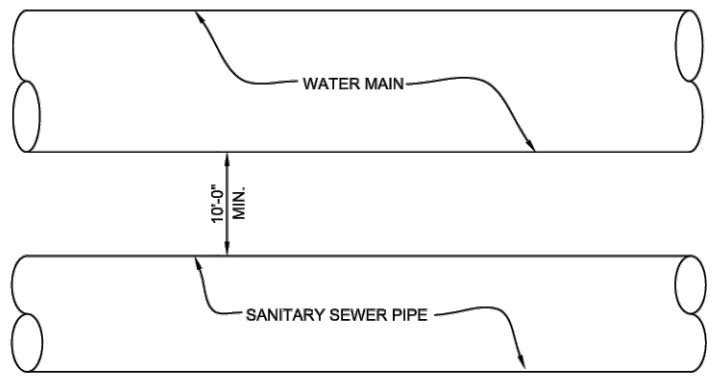
SHEET NO.

U-90

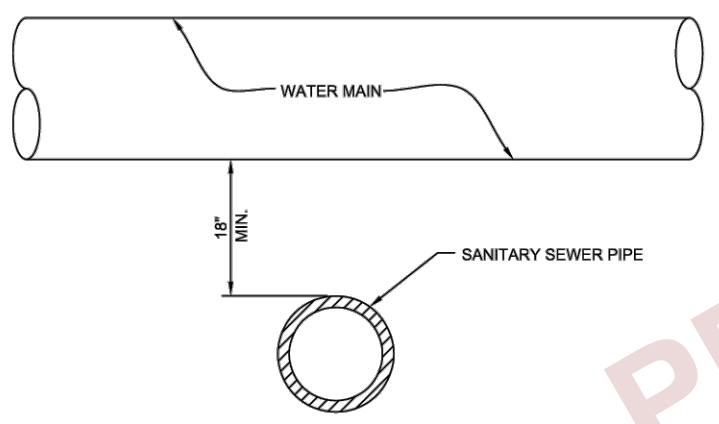


WASTEWATER STANDARDS  
WATER ENGINEERING DIVISION  
SANITARY SEWER  
CLEARANCES FOR WATER MAINS

DETAIL NO.: WWS-011A  
SHT. 1 OF 1



CLEARANCES-HORIZONTAL SEPARATION



CLEARANCES-VERTICAL SEPARATION

GENERAL NOTES:

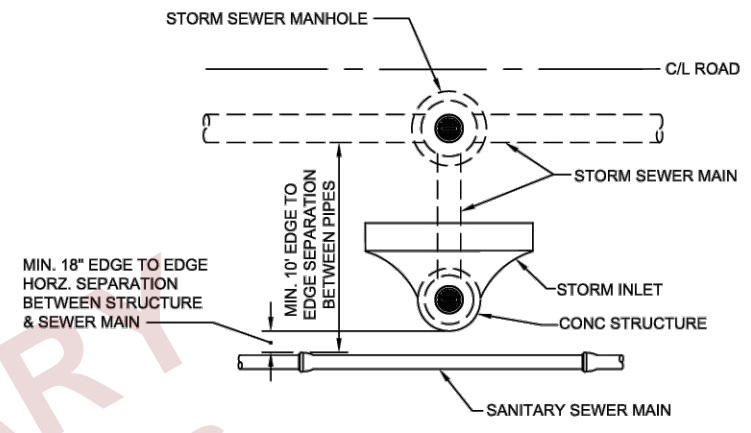
- WHERE ENCROACHMENT UPON THE MINIMUM 10 FOOT HORIZONTAL SEPARATION IS PERMITTED BY THE WATER UTILITY, C900 OR DUCTILE IRON PIPE SHALL BE USED.
- WHERE ENCROACHMENT UPON THE MINIMUM 18" VERTICAL SEPARATION IS PERMITTED BY THE WATER UTILITY, THE SEWER PIPE SHALL EITHER BE PLACED IN A STEEL SLEEVE OR ARRANGED SO SEWER PIPE AND WATER PIPE JOINTS ARE SEPARATED BY A MINIMUM OF 10 FEET. REFERENCE LAKELAND WATER UTILITIES WASTEWATER OPERATIONS POLICIES, STANDARDS, AND SPECIFICATIONS FOR SUBDIVISIONS AND COMMERCIAL DEVELOPMENTS, SECTION 8.4 "PROTECTION OF WATER SUPPLY".

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			10/15/07		



WASTEWATER STANDARDS  
WATER ENGINEERING DIVISION  
SANITARY SEWER INSTALLATION  
HORIZONTAL CLEARANCES

DETAIL NO.: WWS-011B  
SHT. 1 OF 1



CLEARANCES-HORIZONTAL SEPARATION

GENERAL NOTES:

- SANITARY SEWER MAINS SHALL BE DESIGNED WITH MINIMUM 18" EDGE TO EDGE HORIZONTAL SEPARATION FROM STORM STRUCTURES.
- INCREASE HORIZONTAL SEPARATION AS DEPTH OF COVER INCREASES OVER SANITARY SEWER MAINS DESIGNED ADJACENT TO STORM STRUCTURES. FOR EXCAVATION BELOW THE BASE OF THE STRUCTURE, SOIL CLASSIFICATION AND STABILITY OF THE STRUCTURE DURING EXCAVATION IS TO BE CONSIDERED.

APPROVED	DATE	PREPARED BY	DATE	REVISION	
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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UTILITY DETAILS

SHEET NO.  
U-91

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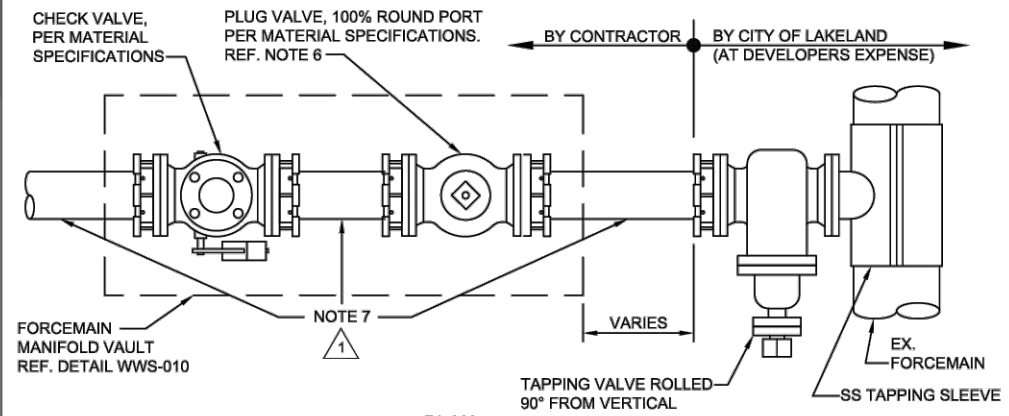


WASTEWATER STANDARDS  
WATER ENGINEERING DIVISION

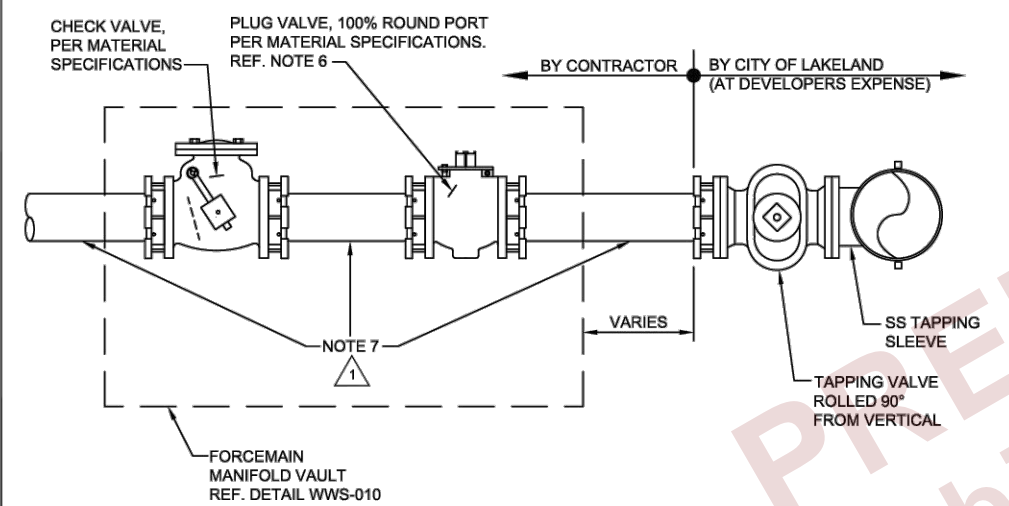
SANITARY SEWER FORCEMAIN  
WET TAP - PLAN AND ELEVATION

DETAIL NO.: WWS-020

SHT. 1 OF 1



PLAN



ELEVATION

- GENERAL NOTES:**
1. WET TAPS ON WASTEWATER FORCEMAINS ARE TO BE PERFORMED BY CITY OF LAKELAND AT THE EXPENSE OF THE DEVELOPER.
  2. TAPPING VALVE TO BE ROLLED 90° FROM VERTICAL.
  3. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING A MANIFOLD VAULT WITH A ROUND PORT PLUG VALVE AND A CHECK VALVE. REFERENCE DETAIL WWS-010 FOR MANIFOLD VAULT SPECIFICATIONS.
  4. MINIMUM DISTANCE FOR EXCAVATION OF TAPPING PIT SHALL BE SIX FEET FROM EXISTING FORCEMAIN TO BACK OF PIT.
  5. TAPPING SLEEVES SHALL NOT BE INSTALLED WITHIN TWO FEET OF ANY PIPE JOINT.
  6. PLUG VALVES SIX INCHES IN SIZE AND GREATER SHALL BE EQUIPPED WITH A GEAR OPERATOR.
  7. DUCTILE IRON PIPE, FLANGED JOINT OR PLAIN END, LINED W/ 401 PROTECTO COATING (THRU VAULT BOX).

APPROVED	DATE	PREPARED BY	DATE	REVISION	1
		RP/GEG	06/15/07		
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