

August 16, 2011

Kale Horton  
Regulatory Branch  
U.S. Army Corps of Engineers – KC District  
Federal Building – 4<sup>th</sup> Floor  
601 E. 12<sup>th</sup> St.  
Kansas City, MO 64106



**Re: #2010-1168 – Section 404 Permit Application – Lee’s Summit Road Improvements**

Dear Mr. Horton:

The County of Jackson, in Missouri, in cooperation with the City of Kansas City, is proposing improvements to Lee’s Summit Road, between Highway 40 on the north, and the vicinity of Anderson Road on the south, within the city limits of Kansas City, Missouri. The existing roadway is currently a two-lane road (one lane in each direction), and the project includes widening the existing roadway to add a middle turn lane in order to provide improved traffic flow in the area.

Field investigations were performed in mid April of 2010 in order to assess Waters of the U.S. located in and adjacent to the project area. A *Preliminary Jurisdictional Waters Summary Report* was prepared and submitted to your office. After review, your agency provided an approved Jurisdictional Determination for the water resources in the project site.

The project is now in the final design phase and I am submitting a Section 404 Permit Application Form ENG 4345, as well as a vicinity map, plan view exhibits, cross-sections, Block Attachments, and Stream Mitigation Forms to provide required details regarding the project and its impact on jurisdictional waters. The Stream Mitigation Forms indicate that 7,036 credits are required for stream mitigation. The project will also impact 1.24 acres of emergent wetlands. Jackson County is proposing to compensate for stream and wetland impacts through payment to the Sni-A-Bar Creek Stream & Wetland Mitigation Bank. Coordination with this bank is currently taking place to reserve those credits.

I am acting as the County’s agent, and if you have any questions please call me at 816-527-2415 or send an email to [tflagler@hntb.com](mailto:tflagler@hntb.com).

Sincerely,

A handwritten signature in blue ink that reads "Tim Flagler". The signature is fluid and cursive, with the first name "Tim" and last name "Flagler" clearly legible.

Tim Flagler, RLA, ASLA  
HNTB Corporation

enclosure

cc: John McClernon, P.E., Jackson County Public Works  
Scott Heavin - HNTB



18. Nature of Activity (Description of project, include all features)

See Block 18 attachment.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

1. To improve traffic flow by expanding the two-lane roadway to a three lane roadway (center left-turn lane). 2. To improve both geometric as well as roadside safety (the existing road is narrow, lacking adequate clear zone or shoulders, no pedestrian facilities), 3. To replace the deteriorating bridge over the Little Blue River, and 4. To provide facilities for additional modes of transportation including pedestrians, bicyclists and buses. Construction of the project is anticipated to begin in October 2012 and end in fall/winter of 2014.

**USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED**

20. Reason(s) for Discharge

Earthen fill material will be discharged into the existing stream channels and wetlands in order to construct embankment for the widened roadway. Culverts will be utilized in order to convey storm water under the roadway. Outflow areas of culverts will include rock rip rap for erosion control.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
Earthen Fill = 2522 cu.yd.	Rock = 3.3 cu.yd.	See Block 21 attachment for discharge details

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres Wetlands = 1.24 Acres; Streams = 0.103 Acre; (See Block 22 attachment for impact details)  
Or  
Liner Feet Streams = 2145 L.F.

23. Description of Avoidance, Minimization, and Compensation (see instructions)

See Block 23 attachment

24. Is Any Portion of the Work Already Complete? Yes  No  IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

Address - See Block 25 attachment

City - State - Zip -

26. List of Other Certifications or Approvals/Denials Received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
Dept. of Nat. Resources	Land Disturbance Permit		Will be applied for		
Dept. of Nat. Resources	NPDES Permit		Will be applied for		
SEMA / County / City	Floodplain Permit		Will be applied for		

\* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT

DATE



SIGNATURE OF AGENT

8-16-2011  
DATE

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

## BLOCK 18 – Nature of Activity

The existing Lee's Summit Road is currently a two-lane paved road (one lane in each direction) with no shoulders and unsafe horizontal curves. The proposed project includes expanding the existing roadway to three lanes (adding a middle left-turn lane) as well as curb and gutter. Additional improvements will include an 8-foot bike-pedestrian path on the east side of the road, a 5-foot sidewalk on the west side, and 5-foot on-street bike lanes. At the crossing of the Little Blue River, a new bridge will be constructed also including the above mentioned features. The new bridge will be located just east of the existing bridge. Geometry enhancements/safety improvements will include a reduction in horizontal curves north and south of the river. Additionally, intersection sight distance will be improved at side street locations to meet 45 mph design speed.

To accommodate the widening and realignment of the roadway, earthen fill material will be placed in jurisdictional waters to construct roadway embankment, and existing culverts will be replaced. Table 1 below indicates the type of impact that will occur at each stream resource including the size of proposed culvert structures. Some streams paralleling the roadway also functioned as ditches. Although, they will require filling, new open ditches will be constructed along the roadway to convey slope runoff. Work will be performed with equipment such as cranes, bulldozers, earthmovers, scrapers, and sheepsfoot rollers. Dump trucks will be used to haul materials.

**Table 1: Impact Type and Culvert Structures**

Stream #	Stream Name (if any)	Culvert No.	Culvert Type*	Impact Type	Diameter / Size (in. or ft.)	Length (feet)
NRPW-1	Unnamed trib. of Little Blue River	C-153	RCP	Fill / Culvert	60"	108
NRPW-2	Unnamed trib.	C146A C-146B	RCP RCP	Fill / Culvert	48" 48"	104 104
RPW-1	Unnamed trib. of Little Blue River			Fill		
NRPW-3	Unnamed trib.			Fill		
RPW-2	Remnant of Little Blue River	C-134	RCB	Fill / Culvert	8' x 4'	143
RPW-3	Little Blue River			None / Bridge		
RPW-4	Unnamed trib. of Little Blue River			Fill		
RPW-5	Unnamed trib.	C-108A C-108B	RCP RCP	Fill / Culvert	24" 24"	89 89
<b>TOTALS</b>						

\* RCP = Reinforced Concrete Pipe; RCB = Reinforced Concrete Box

## BLOCK 21 – Types and Amount of Material Being Discharged

The types and amounts of material being discharged below the Ordinary High Water Mark into jurisdictional waters include 2522 cubic yards of earthen fill material and 3.3 cubic yards of rock. Tables 2 through 4 below show the types and amounts of discharge material at each water resource.

**Table 2 – Wetland Impacts**

Wetland #	NWI	Adjacent/ Abutting/ Isolated	Adjacent Waterway	Wetland Impacts (by Type)			Depth at OHWM (ft.)	Volume Impact (cu.yds) Earthen Fill
				Emergent (ac.)	Scrub-Shrub (ac.)	Forested (ac.)		
Wetland 1	None	Abutting	RPW-1	0.06			0.50	48.40
Wetland 2	None	Abutting	RPW-1	No impact			0.50	0
Wetland 3	None	Abutting	NRPW-3	0.04			0.25	16.13
Wetland 4	None / PFO1A	Abutting	RPW-2	0.23			0.5	185.53
Wetland 4A (oxbow open water-2)	PUBF	Adjacent	RPW-2	0.90			1.5	2178.0
Wetland 5	PFO1A	Abutting	RPW-4			No impact	0.25	0
Wetland 6	None	Adjacent	RPW-4	0.01			0.25	4.03
<b>TOTAL - Wetland Impacts</b>				<b>1.24</b>	<b>0</b>	<b>0</b>		<b>2432.10</b>

**Table 3 – Stream Impacts**

Stream #	Stream Name (if any)	Stream Type	Discharge Material Type	OHWM Width (ft)	OHWM Depth (ft)	Stream Segment Length (l.f.)	Surface Area Impact (ac.)	Volume Impact (cu.yds)
NRPW-1	Unnamed trib. of Little Blue River	Ephemeral	Earthen Fill	2.0	0.50	694	0.032	25.7
NRPW-2	Unnamed trib.	Ephemeral	Earthen Fill	3.0	0.50	63	0.004	3.5
RPW-1	Unnamed trib. of Little Blue River	Intermittent	Earthen Fill	1.0	0.50	480	0.011	8.9
NRPW-3	Unnamed trib.	Ephemeral	Earthen Fill	3.0	0.50	347	0.024	19.3
RPW-2	Remnant of Little Blue River	Intermittent	Earthen Fill	2.5	1.00	94	0.005	8.7
			Rock Riprap	2.5	1.00	36	0.002	3.3
RPW-3	Little Blue River	Perennial	None / Bridge	20.0	4.00	0	0.000	0.0
RPW-4	Unnamed trib. of Little Blue River	Intermittent	Earthen Fill	2.0	0.50	394	0.018	14.6
RPW-5	Unnamed trib.	Intermittent	Earthen Fill	7.0	1.00	37	0.006	9.6
<b>TOTALS</b>						<b>2145</b>	<b>0.103</b>	<b>93.6</b>

**Table 4 – Pond Impacts (Open Water)**

Open Water Pond #	NWI	Pond Type	Adjacent Waterway (surface connection)	Depth at OHWM (ft.)	Pond Impact (ac.)	Volume Impact (cu.yds) Earthen Fill
Open Water-1	PUBGh	Diked	NRPW-1	4.0	No impact	0
<b>TOTALS</b>					<b>0</b>	<b>0</b>

## BLOCK 22 – Surface Areas of Wetlands and Other Waters Filled

The proposed roadway widening would impact (fill below the Ordinary High Water Mark) approximately 1.24 acres of emergent wetlands, 0.103 acre of jurisdictional streams (2,145 linear feet), but no impacts to open water ponds. The discharge of fill material will be done with bulldozers and backhoes. Tables 2 through 4 above show the surface area impacts at each water resource.

## BLOCK 23 – Avoidance, Minimization, and Compensation

Impacts to the Little Blue River will be avoided by crossing the river with a new bridge. The bridge piers will be above the Ordinary High Water Mark (OHWM) and no fill material will be discharged into the river. An emergent wetland on the east side of the roadway (Wetland 2), and the one forested wetland on the west side of the roadway (Wetland 5), just south of the Little Blue River will also be avoided.

Since the majority of the other existing streams and wetlands run parallel to the roadway and in some areas function as roadside ditches, the widening of the road will result in unavoidable impacts to these water resources. Jackson County is proposing to compensate for unavoidable stream impacts through mitigation banking. The Missouri Stream Mitigation Method forms have been filled out (see attachments) indicating that there will be 7,036 stream mitigation credits required. Stream mitigation is proposed to be in the form of payment to a mitigation bank. Impacts to 1.24 acres of wetlands will also be mitigated through a mitigation bank.

Stream Segment	Linear Feet of Impact	Stream Mitigation Credits Required
NRPW-1	694	2285
NRPW-2	63	57
RPW-1	480	1680
NRPW-3	347	1110
RPW-2	130	410
RPW-3 (Little Blue River)	0	(avoided) 0
RPW-4	394	1379
RPW-5	37	115
<b>TOTAL</b>	<b>2145</b>	<b>7036</b>

Wetland	Wetland Type	Acreage to Mitigate
Wetland W-1	Emergent	0.06
Wetland W-2	Emergent	(avoided) 0
Wetland W-3	Emergent	0.04
Wetland W-4	Emergent	0.23
Wetland W-4A (oxbow open water-2)	Emergent	0.90
Wetland W-5	Forested	(avoided) 0
Wetland W-6	Emergent	0.01
<b>TOTAL</b>		<b>1.24</b>

## **BLOCK 25 – Adjoining Property Owners**

Space Center Kansas City, Inc.  
6211 Lee's Summit Road  
Kansas City, MO 64064

Harold Mitts & James Lee  
5600 Lee's Summit Road  
Kansas City, MO 64136

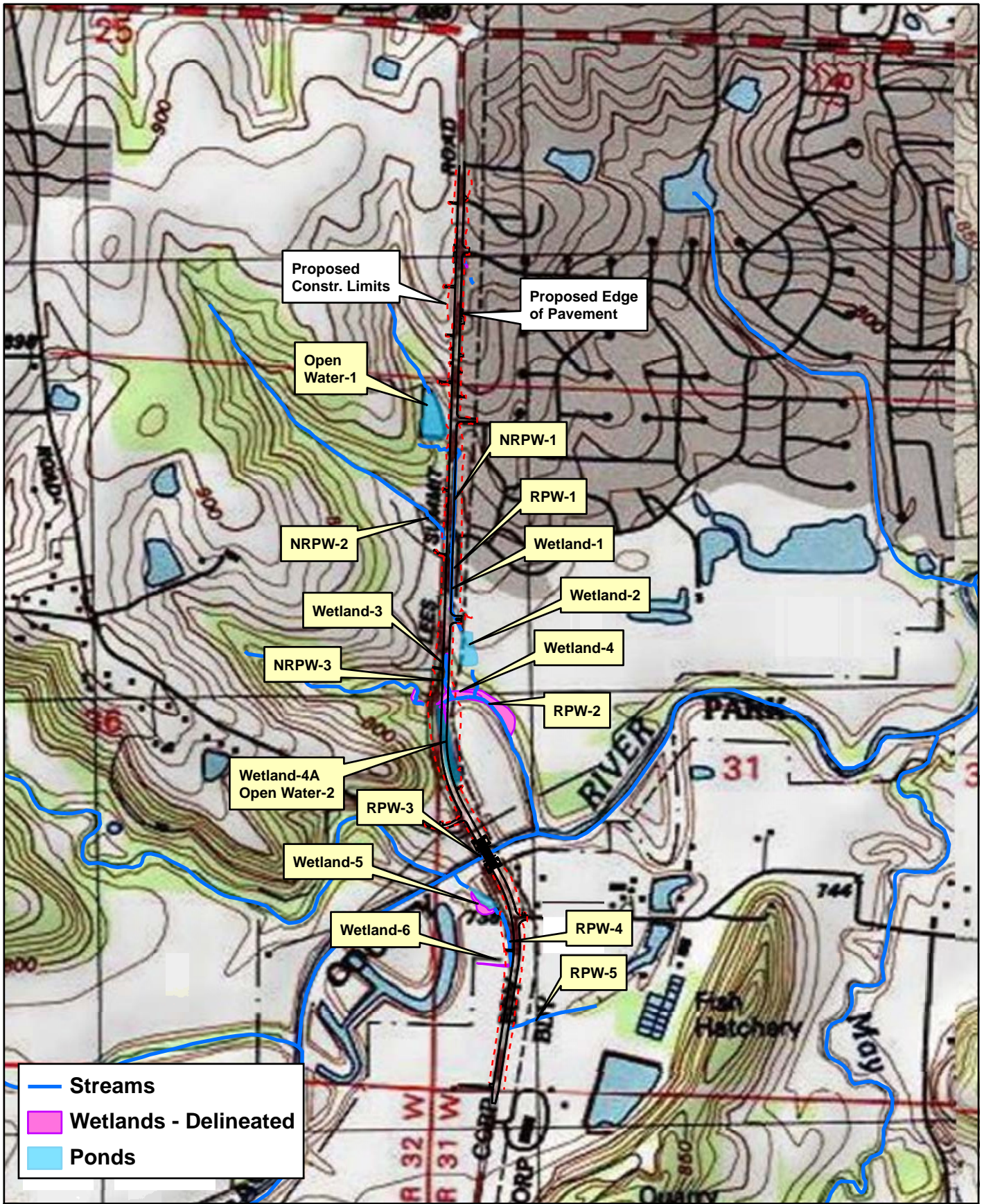
Daryl & Tammy Evans  
5555 Lee's Summit Road  
Kansas City, MO 64064

Vito J. Labruzzo Family Trust  
5300 Lee's Summit Road  
Kansas City, MO 64136

L.C. Lester Construction, Inc.  
5212 Lee's Summit Road  
Kansas City, MO 64055

John & Kathleen Killip  
5100 Lee's Summit Road  
Kansas City, MO 64136

Jackson County Missouri  
c/o Mike Sanders  
County Executive  
Jackson County Courthouse  
415 E. 12th Street  
Kansas City, MO 64106



- Streams
- Wetlands - Delineated
- Ponds



0 500 1,000 Feet

**LEE'S SUMMIT ROAD IMPROVEMENTS**  
**40 Highway to Anderson Road**  
**Jackson County, Missouri**

**Exhibit A**  
**Vicinity Map**  
**& Jurisdictional Waters**



LEE'S SUMMIT RD

℄ PHELPS RD

Wetland-4

Wetland-3

NRPW-2

Open Water-1

5

4

3

2

1

Wetland-5

130+00

135+00

140+00

145+00

150+00

155+00

Wetland-6

RPW-4

6

RPW-2

Wetland-2

RPW-1

℄ E 52ND ST

NRPW-1

110+00

115+00

120+00

RPW-3

Wetland-4A  
Open Water-2

NRPW-3

Wetland-1

℄ E 54TH ST

RPW-5

8

℄ ANDERSON DR

7

SHEET 9

SHEET 8

SHEET 7

SHEET 6

SHEET 5

SHEET 4

SHEET 3

SHEET 2

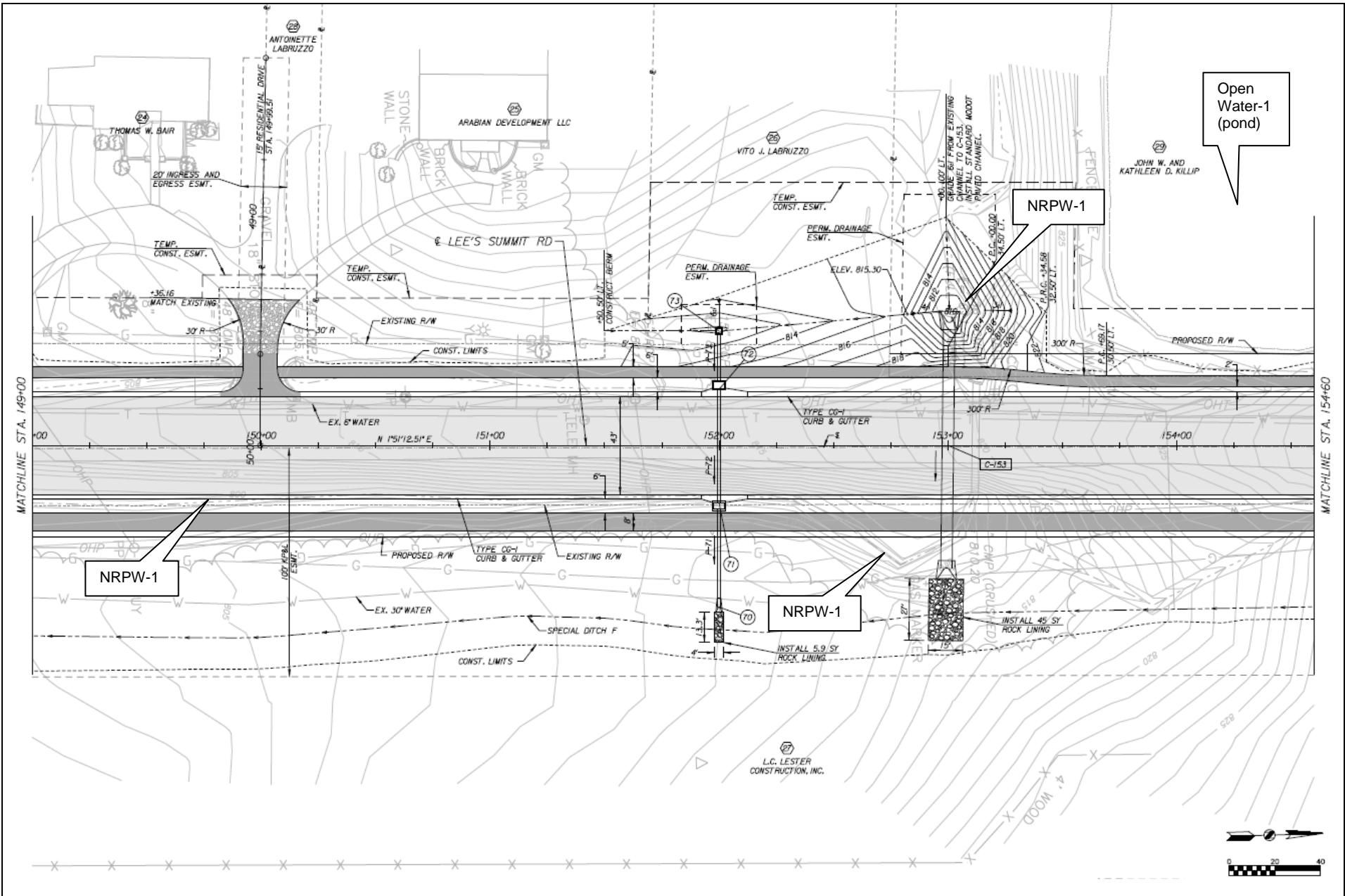
SHEET 1



LEE'S SUMMIT ROAD IMPROVEMENTS  
40 Highway to Anderson Road

Jackson County, Missouri

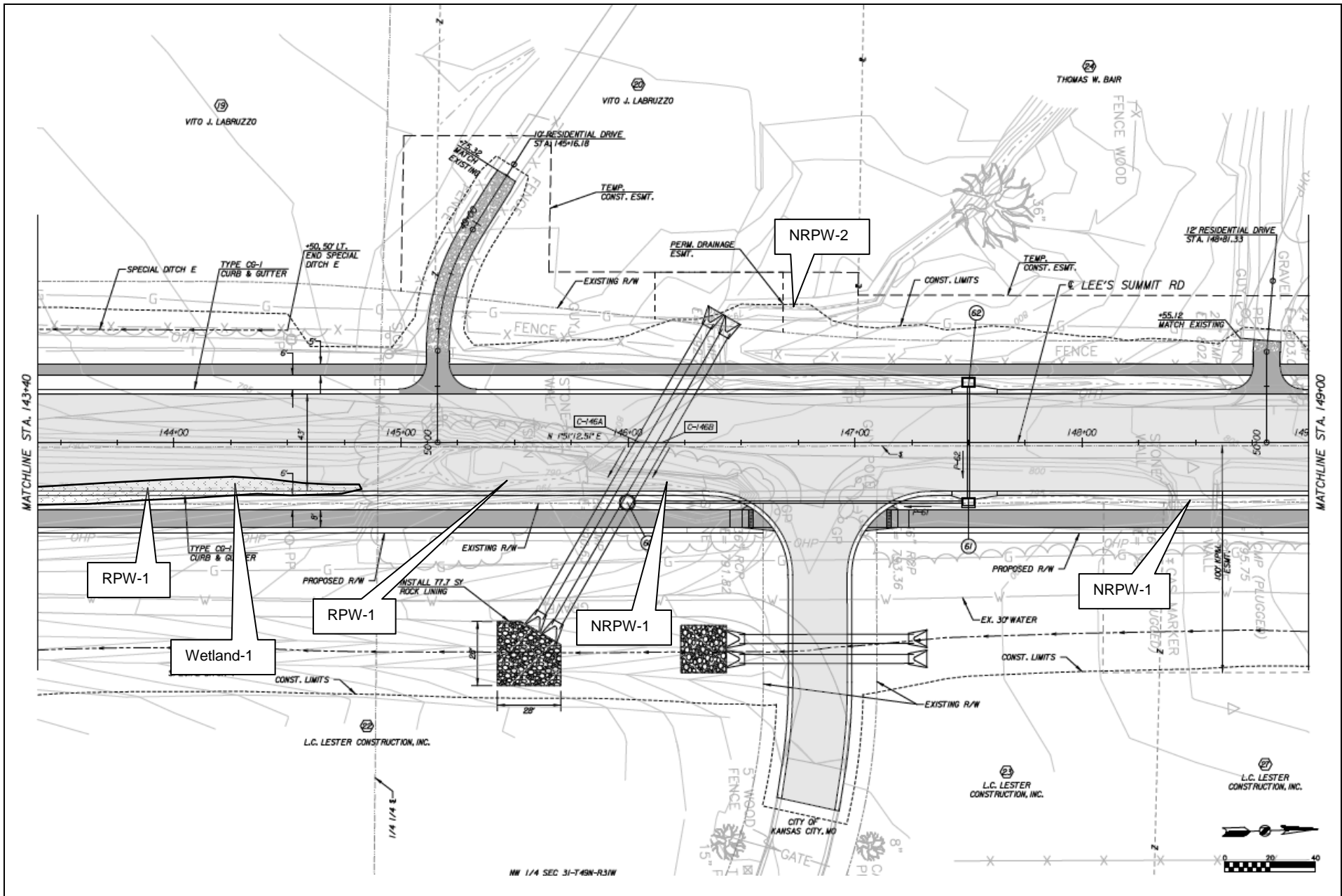
Exhibit B  
Plan Key Sheet



**LEE'S SUMMIT ROAD IMPROVEMENTS  
40 Highway to Anderson Road**

**Jackson County, Missouri**

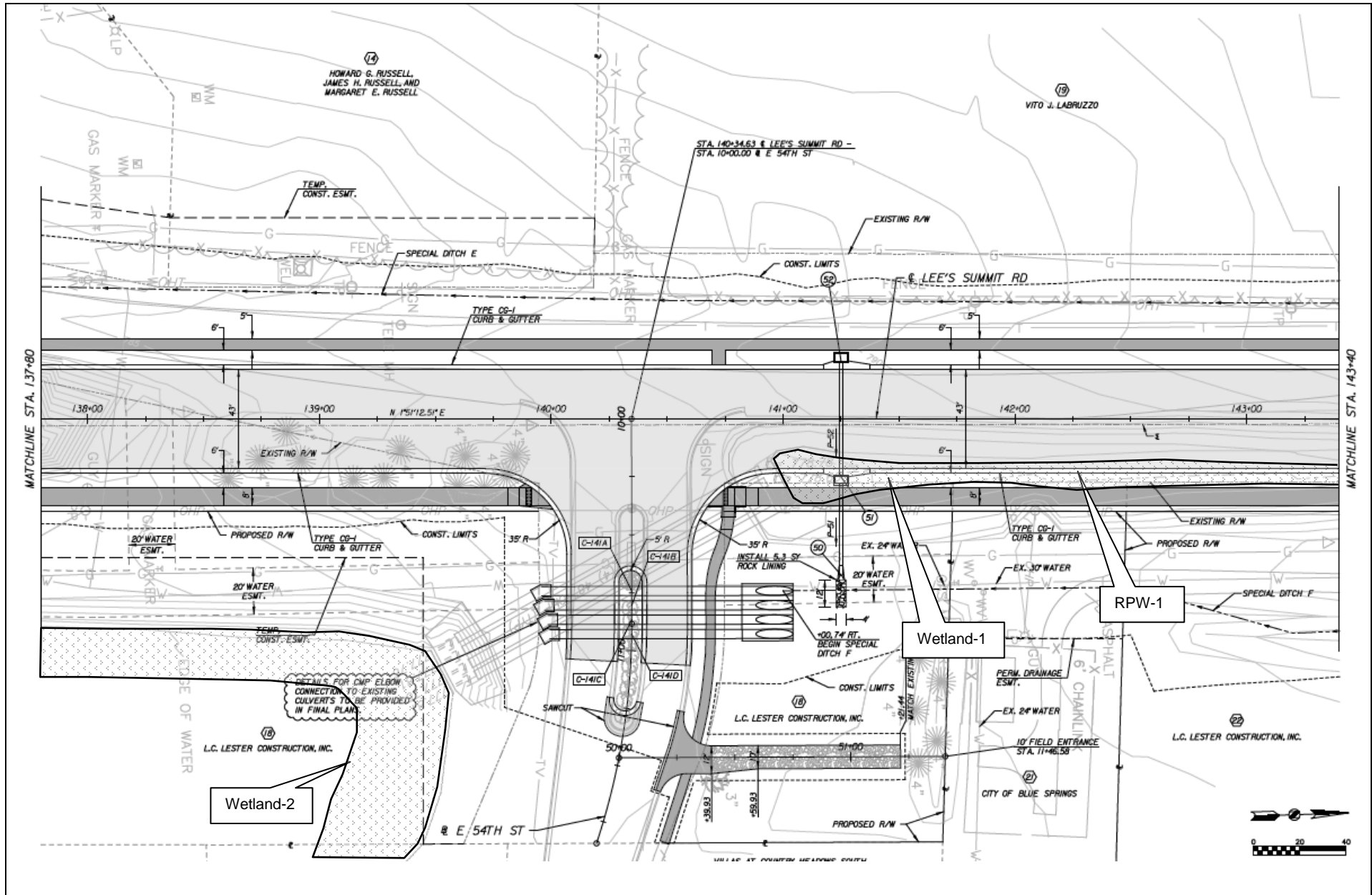
**Stream - NRPW-1, Open Water-1  
Plan View  
Sheet 1 of 8**



**LEE'S SUMMIT ROAD IMPROVEMENTS**  
40 Highway to Anderson Road

Jackson County, Missouri

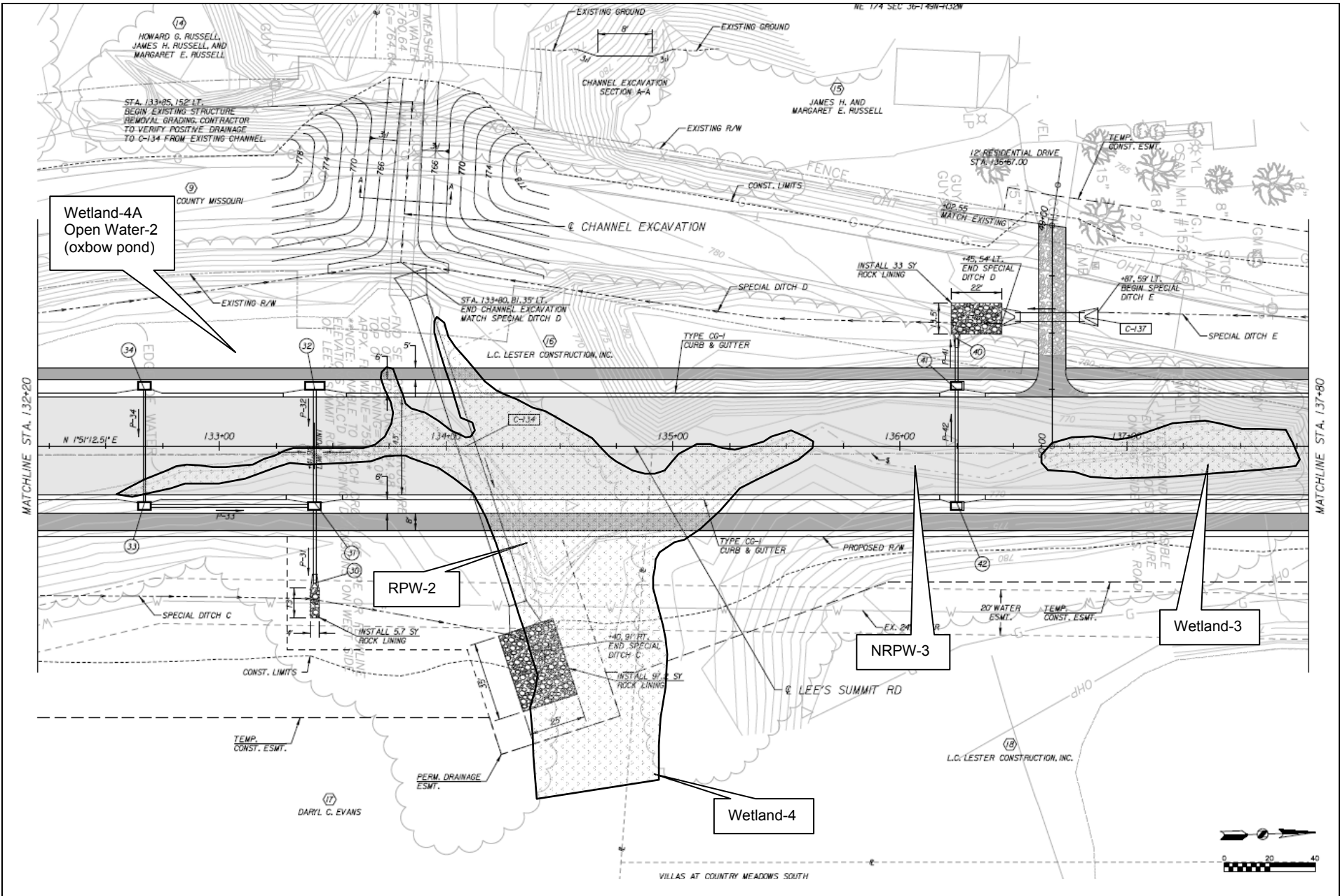
**Streams - NRPW-1 & 2, RPW-1, Wetland-1**  
Plan View  
Sheet 2 of 9



**LEE'S SUMMIT ROAD IMPROVEMENTS**  
 40 Highway to Anderson Road

**Jackson County, Missouri**

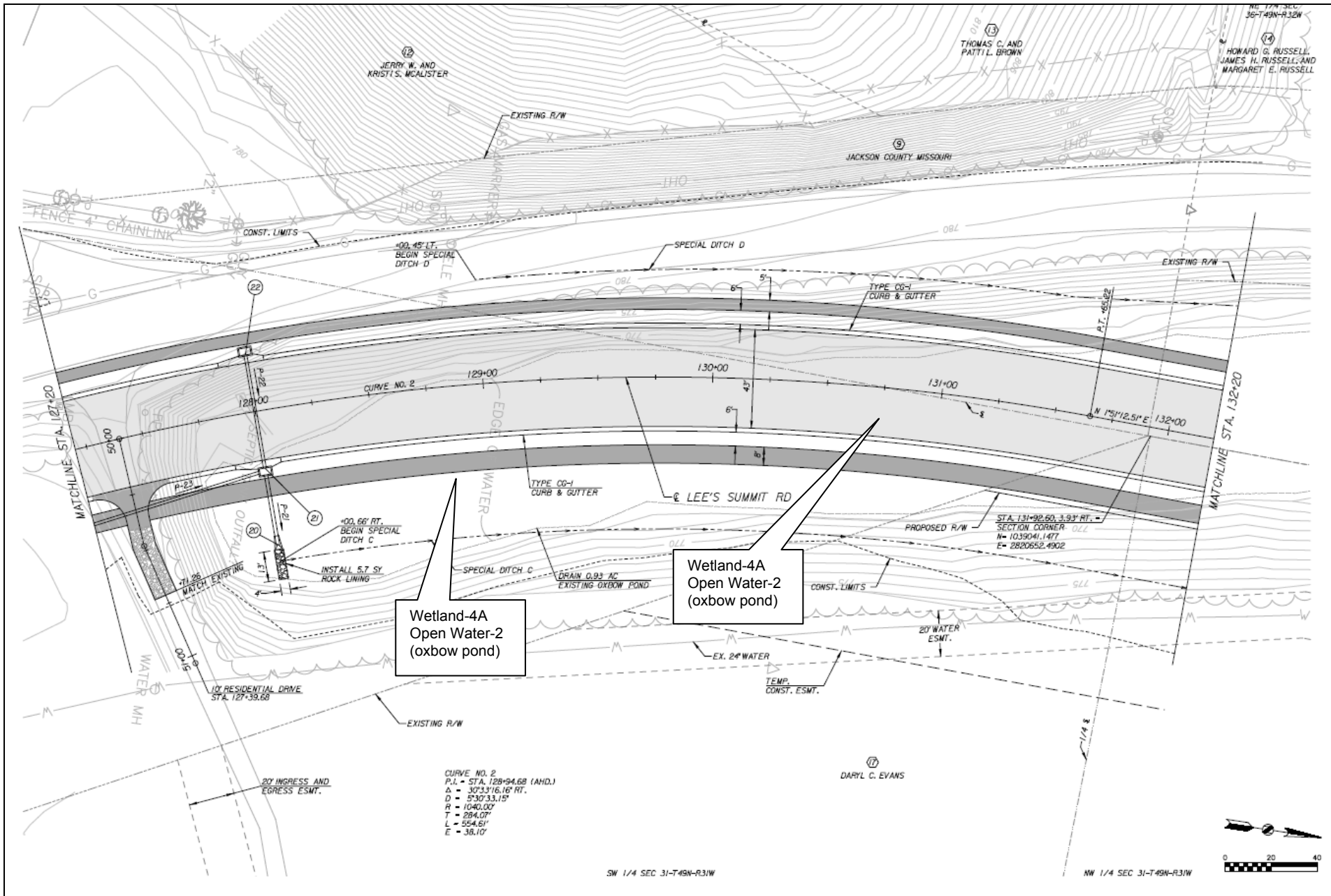
**Streams - RPW-1, Wetlands-1 & 2**  
**Plan View**  
**Sheet 3 of 9**



**LEE'S SUMMIT ROAD IMPROVEMENTS**  
**40 Highway to Anderson Road**

**Jackson County, Missouri**

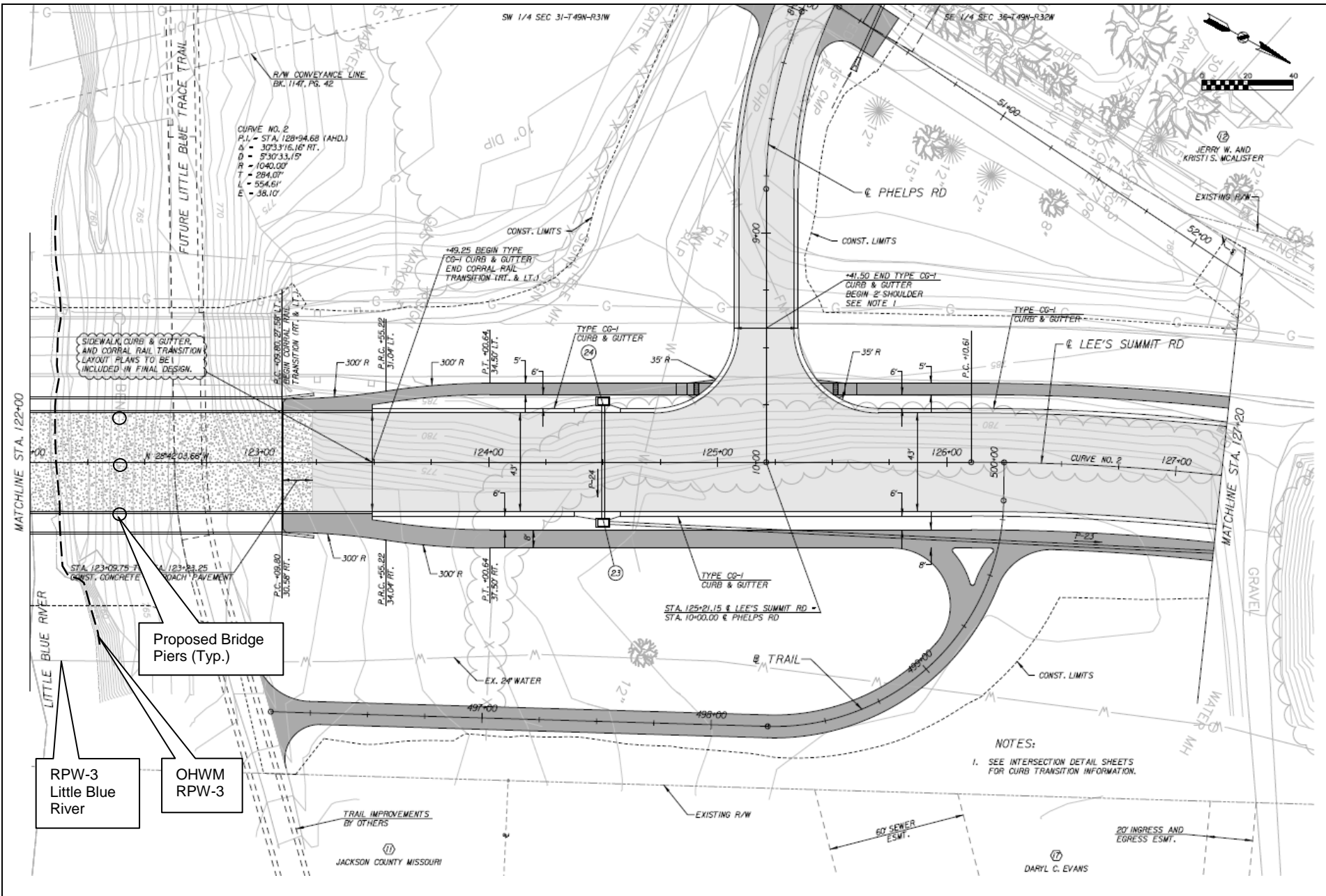
**Streams - NRPW-3, RPW-2, Wetlands-3, 4 & 4A, Open Water-2**  
**Plan View**  
**Sheet 4 of 9**



**LEE'S SUMMIT ROAD IMPROVEMENTS  
 40 Highway to Anderson Road**

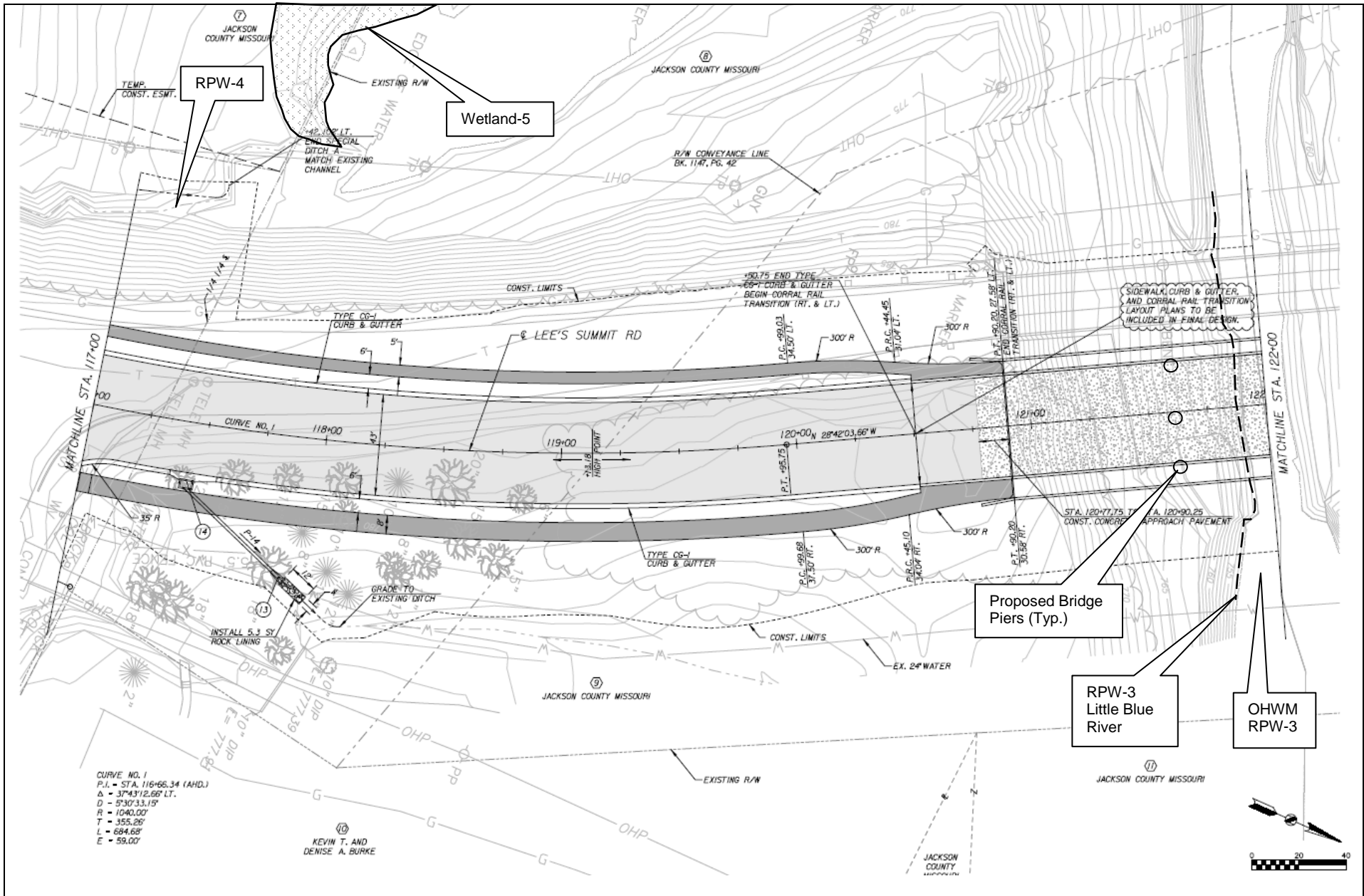
**Jackson County, Missouri**

**Wetland-4A, Open Water-2  
 Plan View  
 Sheet 5 of 9**



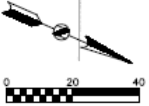
**LEE'S SUMMIT ROAD IMPROVEMENTS**  
40 Highway to Anderson Road

Jackson County, Missouri



CURVE NO. 1  
 P.I. - STA. 116+66.34 (AHD.)  
 $\Delta = 37^{\circ}43'12.66''$  LT.  
 $D = 530'33.15''$   
 $R = 1040.00'$   
 $T = 355.29'$   
 $L = 684.68'$   
 $E = 59.00'$

KEVIN T. AND  
 DENISE A. BURKE

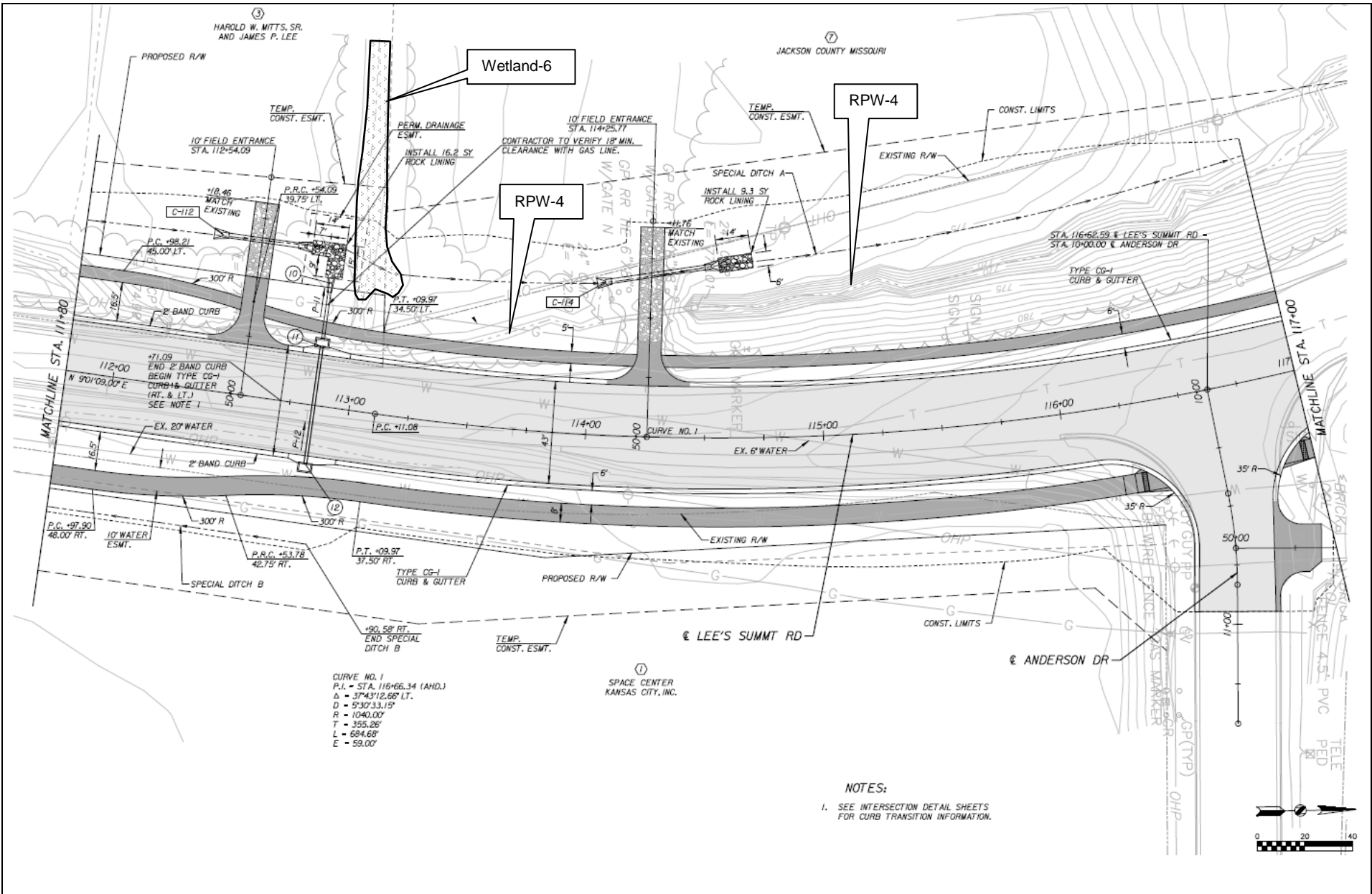


**LEE'S SUMMIT ROAD IMPROVEMENTS  
 40 Highway to Anderson Road**

**Jackson County, Missouri**

**Streams - RPW-3 & 4, Wetland-5  
 Plan View  
 Sheet 7 of 9**

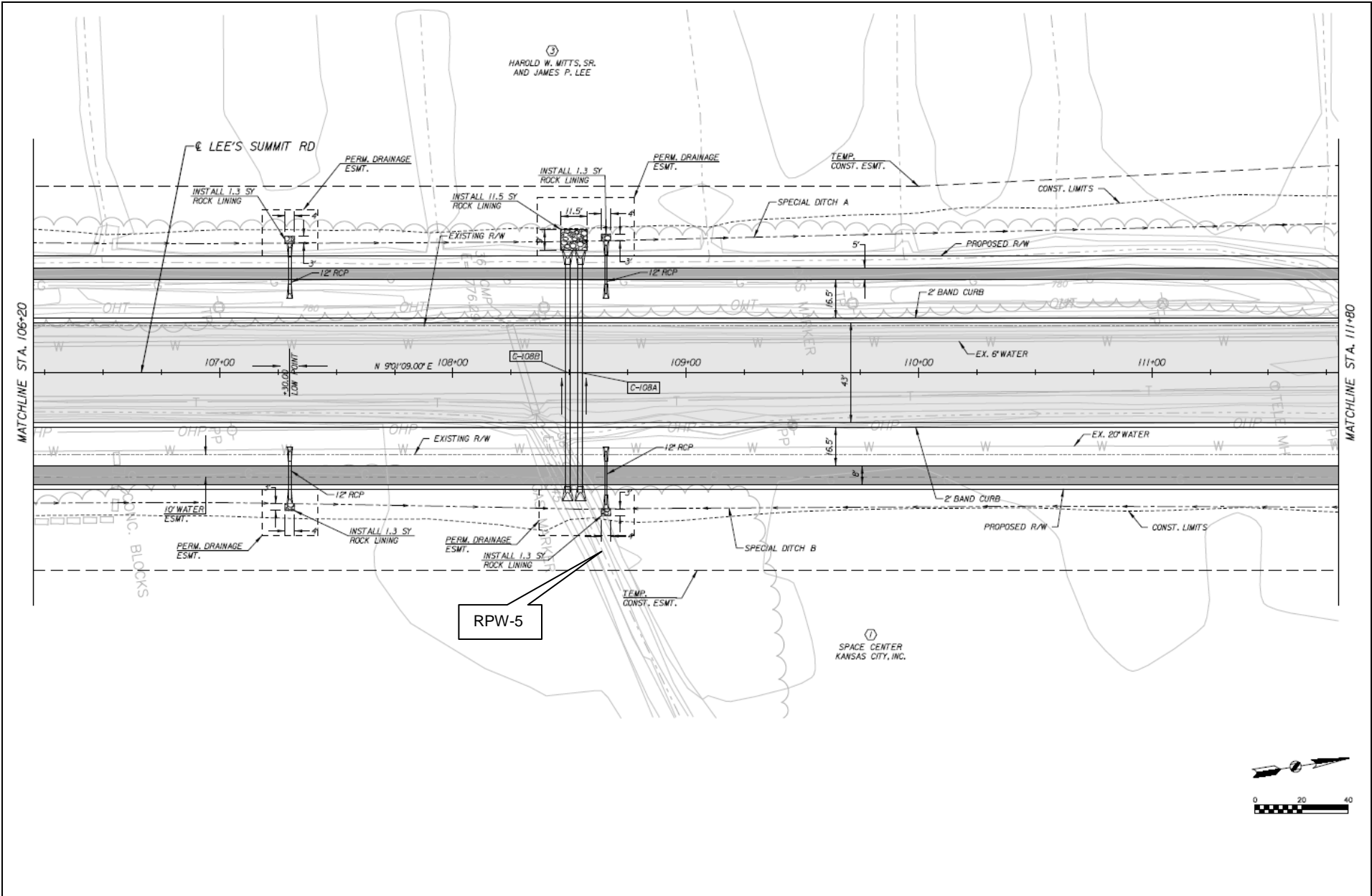




**LEE'S SUMMIT ROAD IMPROVEMENTS  
40 Highway to Anderson Road**

**Jackson County, Missouri**

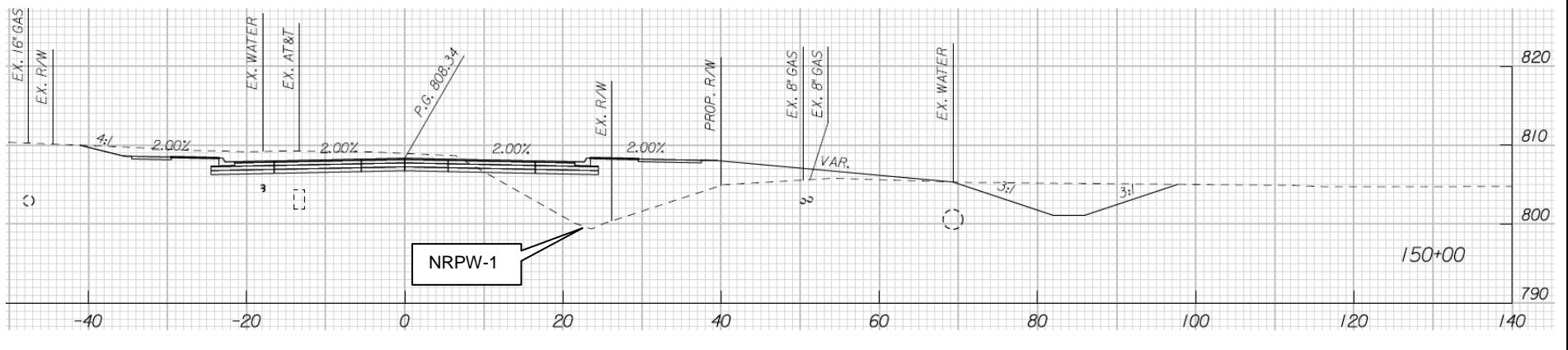
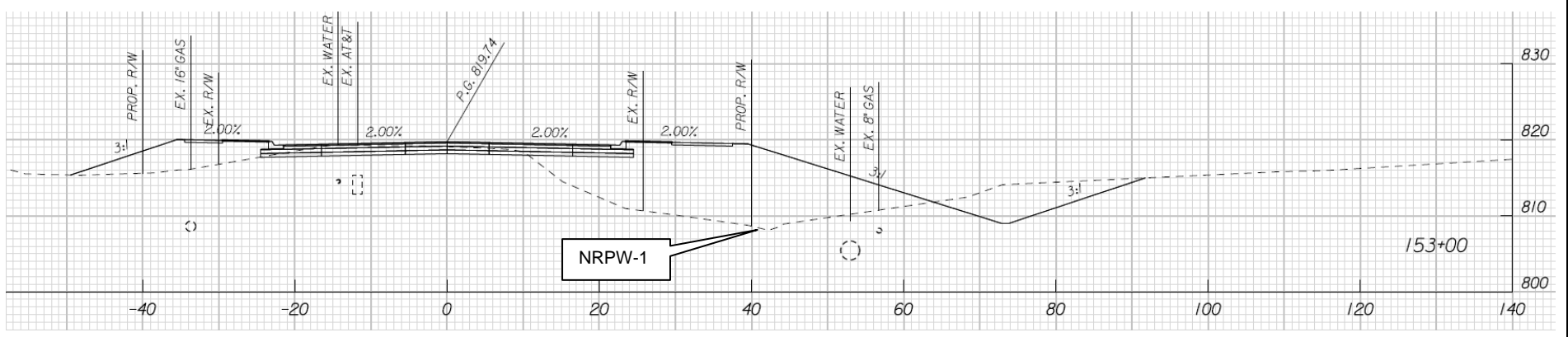
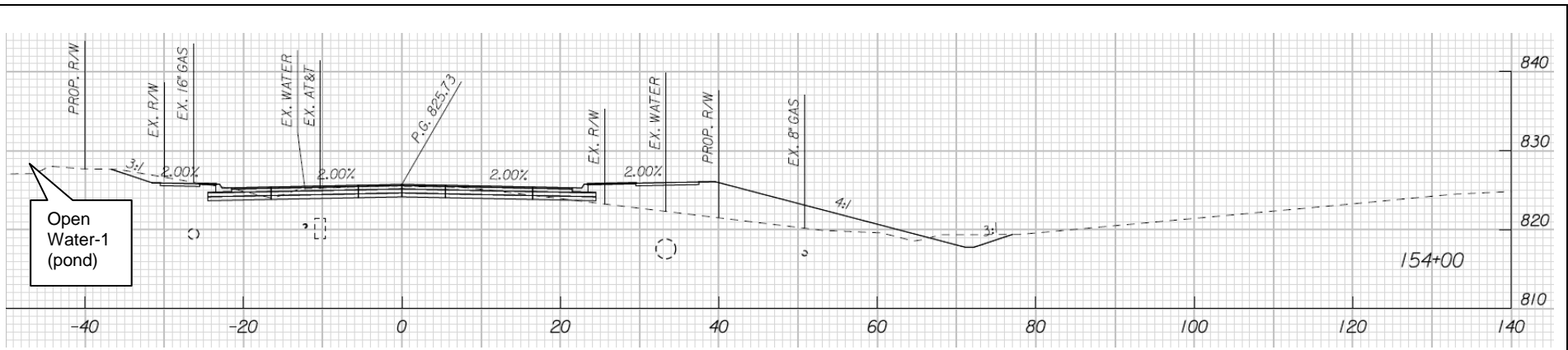
**Stream - RPW-4, Wetland-6  
Plan View  
Sheet 8 of 9**



**LEE'S SUMMIT ROAD IMPROVEMENTS**  
**40 Highway to Anderson Road**

**Jackson County, Missouri**

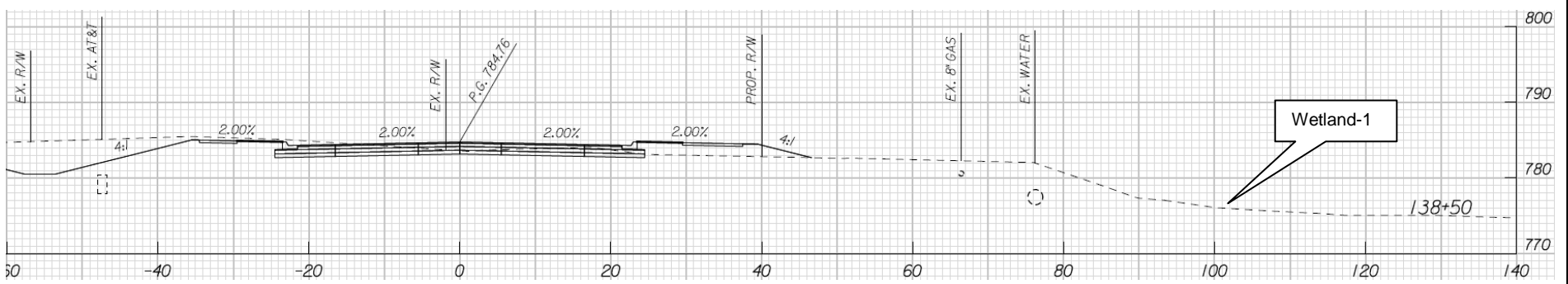
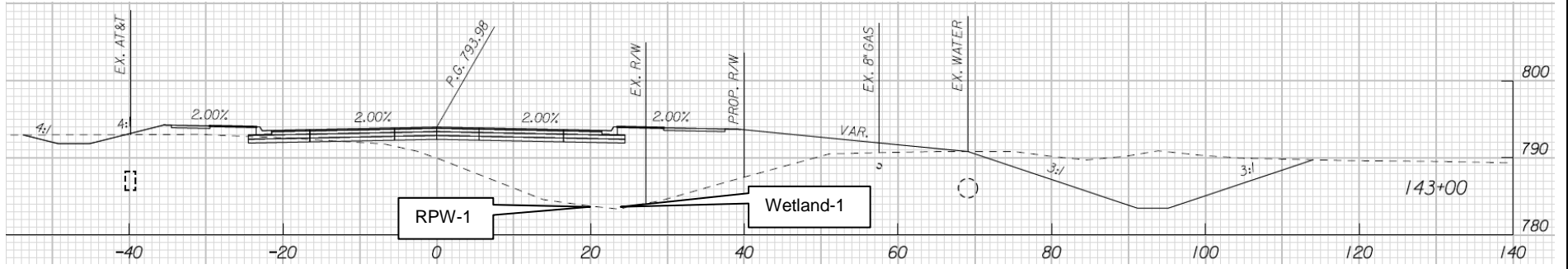
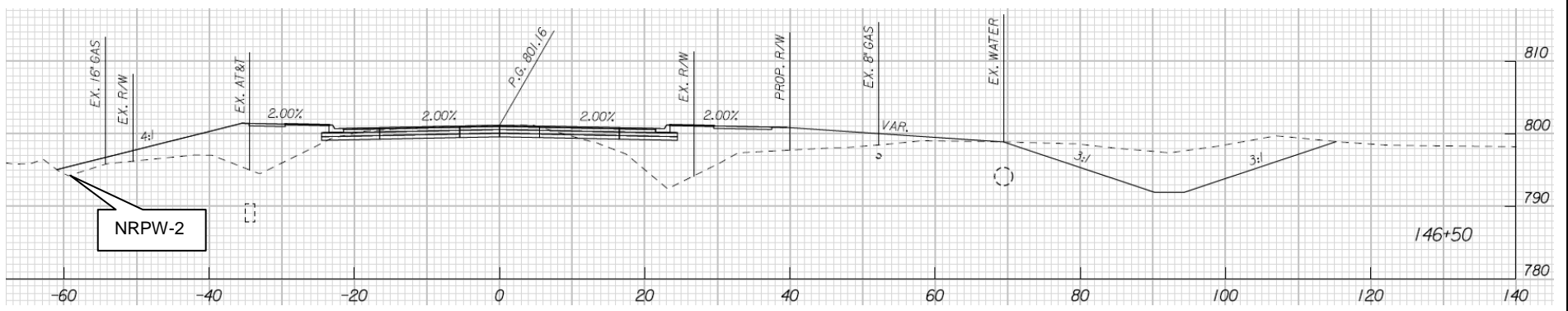
**Stream - RPW-5**  
**Plan View**  
**Sheet 9 of 9**



**LEE'S SUMMIT ROAD IMPROVEMENTS**  
**40 Highway to Anderson Road**

**Jackson County, Missouri**

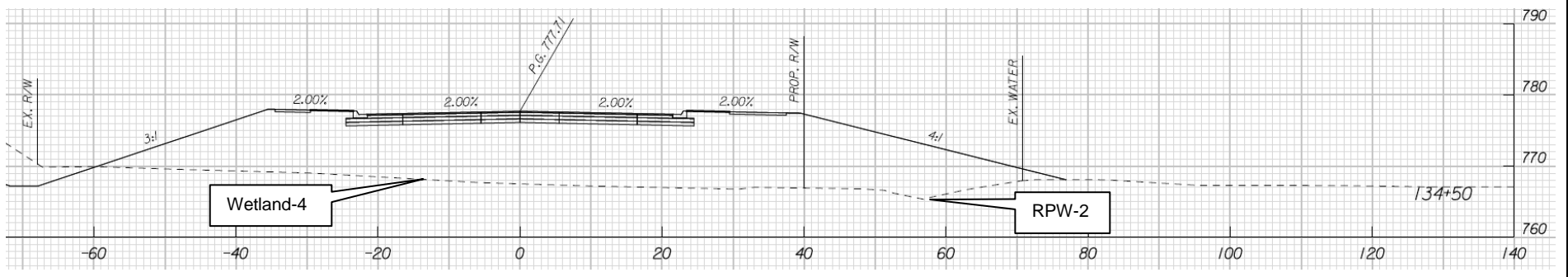
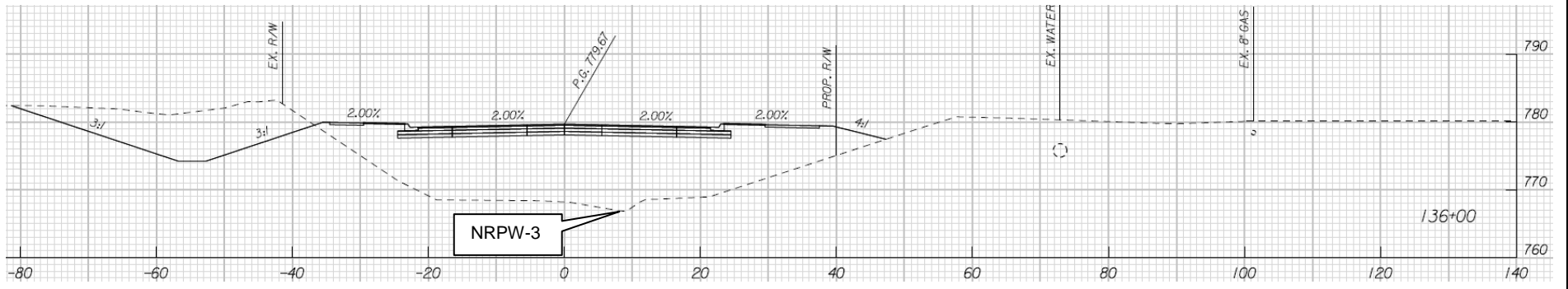
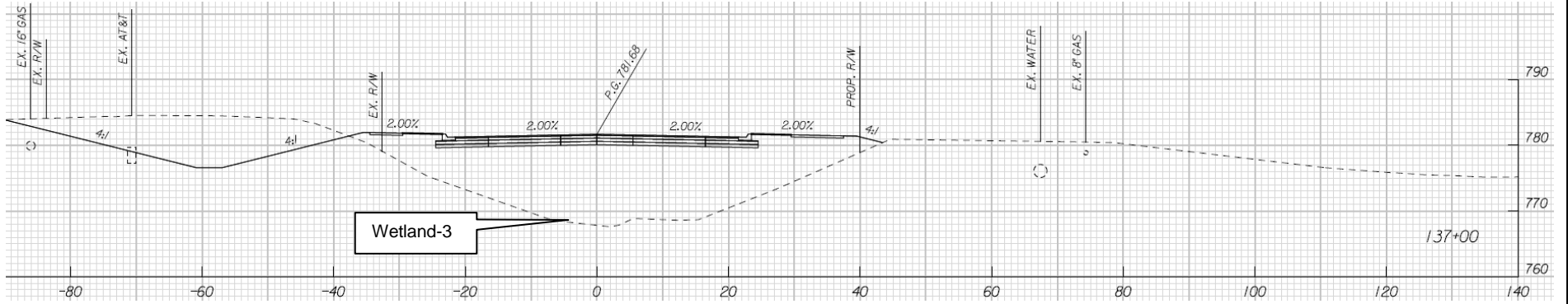
**Stream - NRPW-1, Open Water-1**  
**Cross-Sections (looking north)**  
**Sheet 1 of 5**



**LEE'S SUMMIT ROAD IMPROVEMENTS**  
**40 Highway to Anderson Road**

**Jackson County, Missouri**

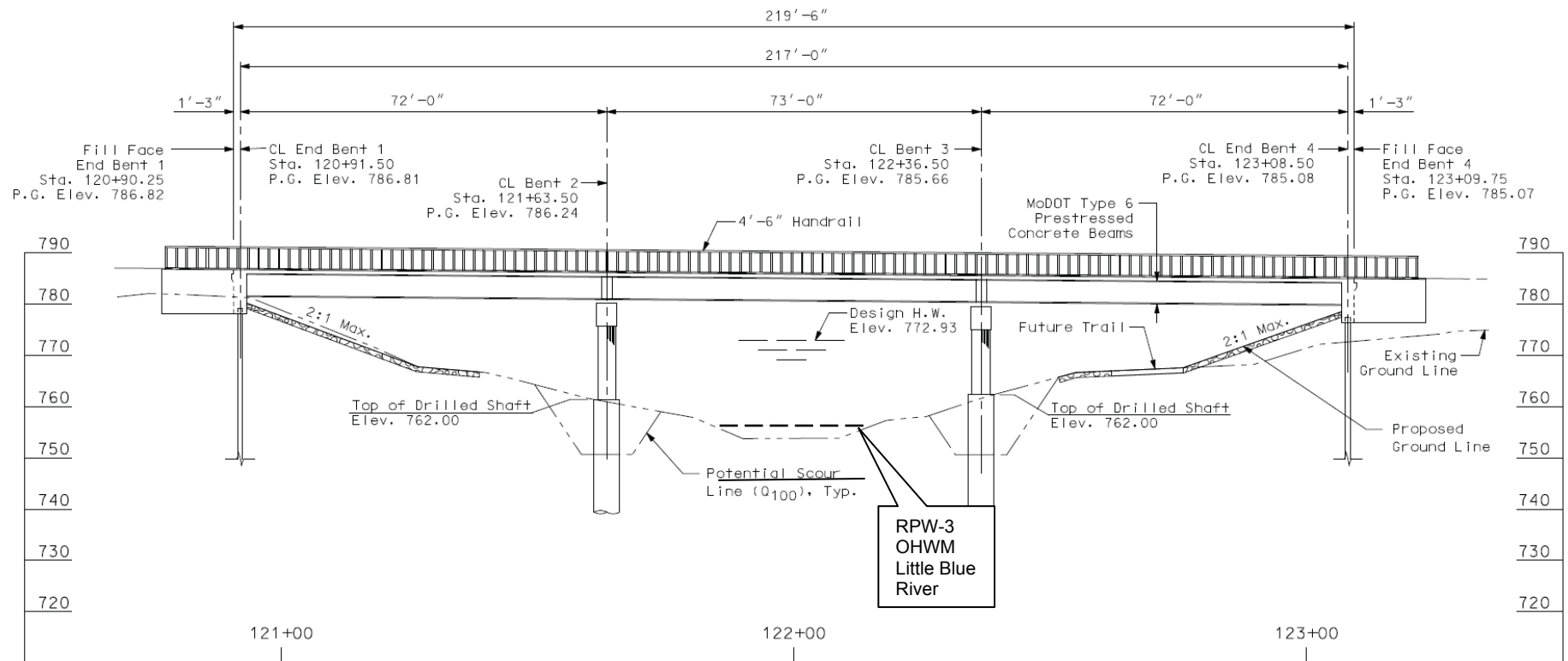
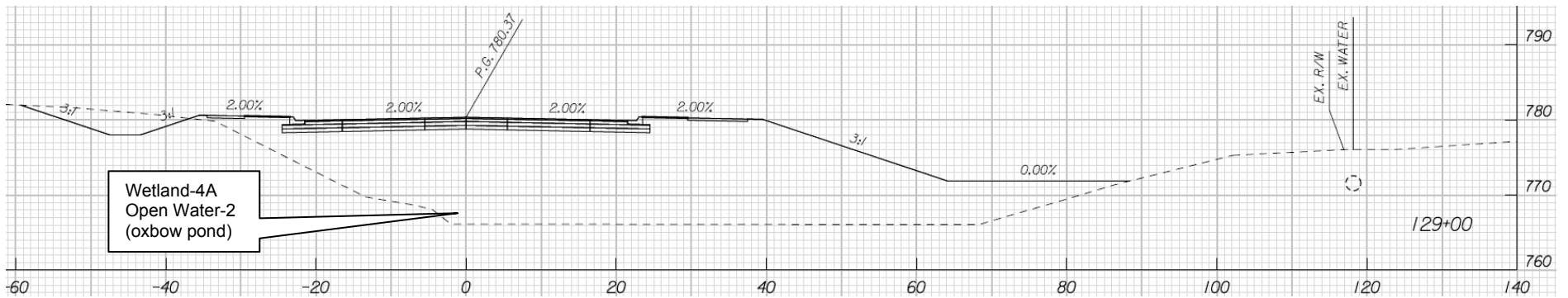
**Streams - NRPW-2, RPW-1, Wetland-1**  
**Cross-Sections (looking north)**  
**Sheet 2 of 5**



**LEE'S SUMMIT ROAD IMPROVEMENTS  
40 Highway to Anderson Road**

**Jackson County, Missouri**

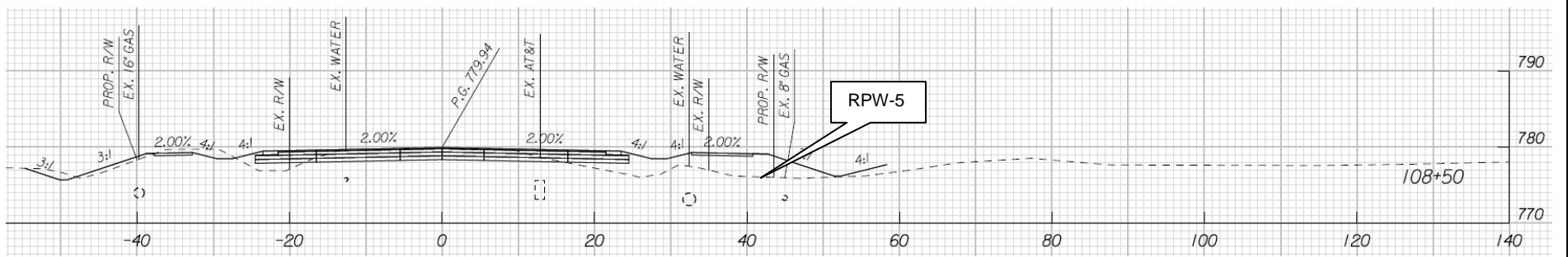
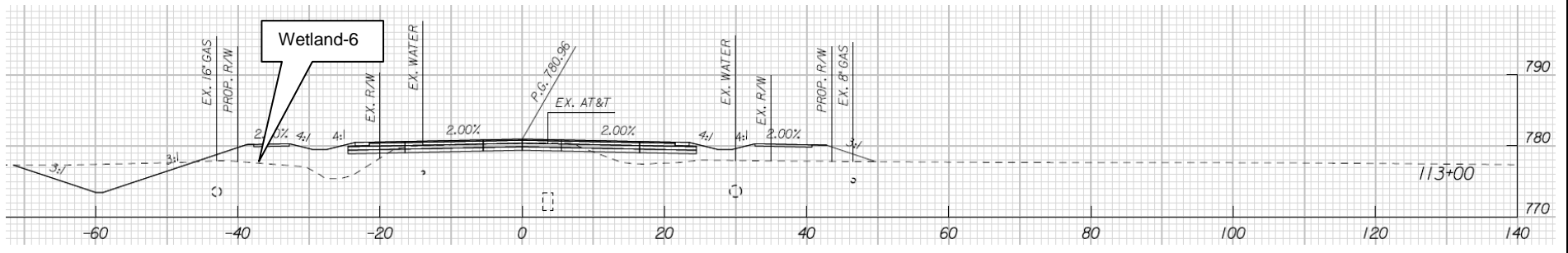
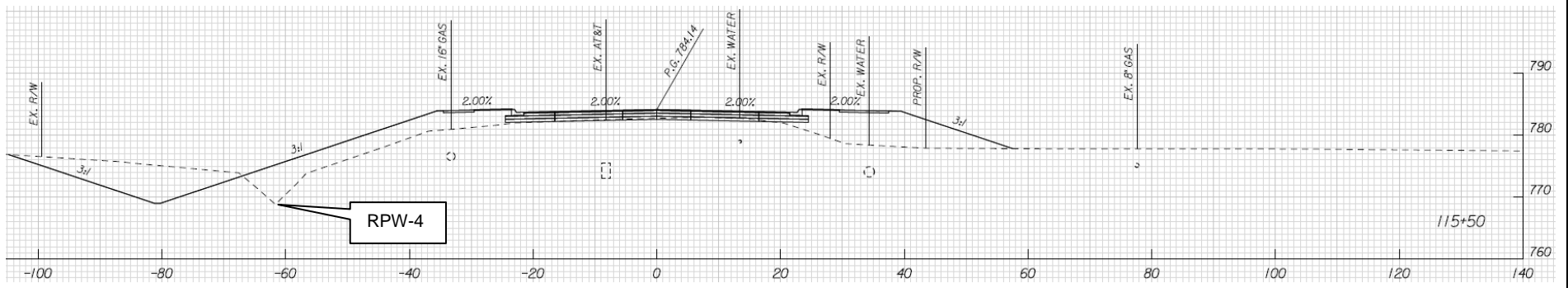
**Streams - NRPW-3, RPW-2, Wetlands-3 & 4  
Cross-Sections (looking north)  
Sheet 3 of 5**



**LEE'S SUMMIT ROAD IMPROVEMENTS**  
40 Highway to Anderson Road

**Jackson County, Missouri**

**Stream - RPW-3, Wetland-4A, Open Water-2**  
**Cross-Sections (looking north)**  
**Sheet 4 of 5**



**LEE'S SUMMIT ROAD IMPROVEMENTS**  
**40 Highway to Anderson Road**

**Jackson County, Missouri**

**Streams - RPW-4 & 5, Wetland-6**  
**Cross-Sections (looking north)**  
**Sheet 5 of 5**

## Adverse Impact Factors for Riverine Systems Worksheet

<b>MITIGATION SITE NAME:</b>	Lee's Summit Road Stream NRPW-1	<b>ORM #:</b>		<b>DATE:</b>		<b>STATE, COUNTY:</b>	MO Jackson	<b>SECTION-TOWNSHIP-RANGE:</b>	
<b>Stream Type</b>	Ephemeral 0.1	Intermittent 0.4	Perennial 0.8						
<b>Priority Area</b>	Tertiary 0.1	Secondary 0.4	Primary 0.8						
<b>Existing Condition</b>	Functionally Impaired 0.1	Moderately Functional 0.8	Fully Functional 1.6						
<b>Duration</b>	Temporary 0.05	Recurrent 0.1	Permanent 0.3						
<b>Activity</b>	Clearing 0.05	Utility Crossing or Bridge Footing 0.15	Below Grade Culvert 0.30	Armor 0.50	Detention 0.75	Morphologic Change 1.50	Impoundment (Dam) 2.00	Pipe 2.20	Fill 2.50
<b>Linear Impact</b>	?	<100' 0	100'-200' 0.05	201-500' 0.1	501-1000' 0.2	>1000'	0.1 per 500 LF of impact (example: scaling factor for 5,280 LF of impacts = 1.1)		

For each Category select a Criteria from the drop down list for each tan box for a Dominant Impact Type. A red box indicates that no selection has been made.

	Dominant Impact Type 1		Dominant Impact Type 2		Dominant Impact Type 3		Dominant Impact Type 4		Dominant Impact Type 5		Dominant Imp
<b>Site Name</b>	<b>Non-RPW-1</b>										
	<b>Criteria</b>	<b>Factor</b>	<b>Criteria</b>	<b>Factor</b>	<b>Criteria</b>	<b>Factor</b>	<b>Criteria</b>	<b>Factor</b>	<b>Criteria</b>	<b>Factor</b>	<b>Criteria</b>
<b>Stream Type</b>	Ephemeral	0.10	Ephemeral	0.10		?		?		?	
<b>Priority Area</b>	Tertiary	0.10	Tertiary	0.10		?		?		?	
<b>Existing Condition</b>	Functionally Impaired	0.10	Functionally Impaired	0.10		?		?		?	
<b>Duration</b>	Permanent	0.30	Permanent	0.30		?		?		?	
<b>Activity</b>	Fill	2.50	Fill	2.50		?		?		?	
<b>Linear feet of Stream Impacted in the Reach (LF) =</b>	670	0.20	24	0.00		?		?		?	
<b>Sum of Factors (M) =</b>		3.30		3.10		?		?		?	
<b>Mitigation Credits Required (M x LF x MF) =</b>		2,211		74		?		?		?	

**Total Mitigation Credits Required\* = Sum of All Mitigation Credits Required for All Dominant Impact Types = 2,285**

\* This value may be applied to mitigation at an approved mitigation bank at a 1:1 ratio, when the impact area is within the service area of that mitigation bank. The mitigation requirement may be multiplied by 2 at the Corps discretion when mitigation is proposed in an approved mitigation bank but the impact occurs outside of the service area of that mitigation bank, or when mitigation is proposed through an approved in-lieu-fee program.

**Explanatory Notes:**

670 L.F. on east side of road, 24 L.F. on west side of road.



## Adverse Impact Factors for Riverine Systems Worksheet

<b>MITIGATION SITE NAME:</b>	Lee's Summit Road Stream NRPW-2	<b>ORM #:</b>		<b>DATE:</b>		<b>STATE, COUNTY:</b>	MO Jackson	<b>SECTION-TOWNSHIP-RANGE:</b>	
<b>Stream Type</b>	Ephemeral 0.1	Intermittent 0.4	Perennial 0.8						
<b>Priority Area</b>	Tertiary 0.1	Secondary 0.4	Primary 0.8						
<b>Existing Condition</b>	Functionally Impaired 0.1	Moderately Functional 0.8	Fully Functional 1.6						
<b>Duration</b>	Temporary 0.05	Recurrent 0.1	Permanent 0.3						
<b>Activity</b>	Clearing 0.05	Utility Crossing or Bridge Footing 0.15	Below Grade Culvert 0.30	Armor 0.50	Detention 0.75	Morphologic Change 1.50	Impoundment (Dam) 2.00	Pipe 2.20	Fill 2.50
<b>Linear Impact</b>	?	<100' 0	100'-200' 0.05	201-500' 0.1	501-1000' 0.2	>1000'	0.1 per 500 LF of impact (example: scaling factor for 5,280 LF of impacts = 1.1)		

For each Category select a Criteria from the drop down list for each tan box for a Dominant Impact Type. A red box indicates that no selection has been made.

	Dominant Impact Type 1		Dominant Impact Type 2		Dominant Impact Type 3		Dominant Impact Type 4		Dominant Impact Type 5		Dominant Imp
Site Name	NRPW-2										
	Criteria	Factor	Criteria	Factor	Criteria	Factor	Criteria	Factor	Criteria	Factor	Criteria
<b>Stream Type</b>	Ephemeral	0.10		?		?		?		?	
<b>Priority Area</b>	Tertiary	0.10		?		?		?		?	
<b>Existing Condition</b>	Functionally Impaired	0.10		?		?		?		?	
<b>Duration</b>	Permanent	0.30		?		?		?		?	
<b>Activity</b>	Below Grade Culvert	0.30		?		?		?		?	
<b>Linear feet of Stream Impacted in the Reach (LF) =</b>	63	0.00		?		?		?		?	
<b>Sum of Factors (M) =</b>		0.90		?		?		?		?	
<b>Mitigation Credits Required (M x LF x MF) =</b>		57		?		?		?		?	

**Total Mitigation Credits Required\* = Sum of All Mitigation Credits Required for All Dominant Impact Types = 57**

\* This value may be applied to mitigation at an approved mitigation bank at a 1:1 ratio, when the impact area is within the service area of that mitigation bank. The mitigation requirement may be multiplied by 2 at the Corps discretion when mitigation is proposed in an approved mitigation bank but the impact occurs outside of the service area of that mitigation bank, or when mitigation is proposed through an approved in-lieu-fee program.

**Explanatory Notes:**

This crossing impacts less than 1/10th acre below the OHWM of Stream NRPW-2

## Adverse Impact Factors for Riverine Systems Worksheet

<b>MITIGATION SITE NAME:</b> Lee's Summit Road Stream RPW-1	<b>ORM #:</b>	<b>DATE:</b>	<b>STATE, COUNTY:</b> MO Jackson	<b>SECTION-TOWNSHIP-RANGE:</b>
<b>Stream Type</b>	Ephemeral 0.1	Intermittent 0.4	Perennial 0.8	
<b>Priority Area</b>	Tertiary 0.1	Secondary 0.4	Primary 0.8	
<b>Existing Condition</b>	Functionally Impaired 0.1	Moderately Functional 0.8	Fully Functional 1.6	
<b>Duration</b>	Temporary 0.05	Recurrent 0.1	Permanent 0.3	
<b>Activity</b>	Clearing 0.05	Utility Crossing or Bridge Footing 0.15	Below Grade Culvert 0.30	Armor 0.50
			Detention 0.75	Morphologic Change 1.50
				Impoundment (Dam) 2.00
				Pipe 2.20
				Fill 2.50
<b>Linear Impact</b>	? <100' 0	100'-200' 0.05	201-500' 0.1	501-1000' 0.2
			>1000'	0.1 per 500 LF of impact (example: scaling factor for 5,280 LF of impacts = 1.1)

For each Category select a Criteria from the drop down list for each tan box for a Dominant Impact Type. A red box indicates that no selection has been made.

	Dominant Impact Type 1		Dominant Impact Type 2		Dominant Impact Type 3		Dominant Impact Type 4		Dominant Impact Type 5		Dominant Imp
Site Name	RPW-1										
	Criteria	Factor	Criteria	Factor	Criteria	Factor	Criteria	Factor	Criteria	Factor	Criteria
<b>Stream Type</b>	Intermittent	0.40		?		?		?		?	
<b>Priority Area</b>	Tertiary	0.10		?		?		?		?	
<b>Existing Condition</b>	Functionally Impaired	0.10		?		?		?		?	
<b>Duration</b>	Permanent	0.30		?		?		?		?	
<b>Activity</b>	Fill	2.50		?		?		?		?	
<b>Linear feet of Stream Impacted in the Reach (LF) =</b>	480	0.10		?		?		?		?	
<b>Sum of Factors (M) =</b>		3.50		?		?		?		?	
<b>Mitigation Credits Required (M x LF x MF) =</b>		1,680		?		?		?		?	

**Total Mitigation Credits Required\* = Sum of All Mitigation Credits Required for All Dominant Impact Types = 1,680**

\* This value may be applied to mitigation at an approved mitigation bank at a 1:1 ratio, when the impact area is within the service area of that mitigation bank. The mitigation requirement may be multiplied by 2 at the Corps discretion when mitigation is proposed in an approved mitigation bank but the impact occurs outside of the service area of that mitigation bank, or when mitigation is proposed through an approved in-lieu-fee program.

**Explanatory**

98 L.F. is from culvert outflow opening of Stream NRPW-2 to beginning of Wetland 1.

**Notes:**

382 L.F. of one-foot wide channel is within Wetland 1, to quad box culvert inflow opening at north side of E. 54th St. S.

## Adverse Impact Factors for Riverine Systems Worksheet

<b>MITIGATION SITE NAME:</b>	Lee's Summit Road Stream NRPW-3	<b>ORM #:</b>		<b>DATE:</b>		<b>STATE, COUNTY:</b>	MO Jackson	<b>SECTION-TOWNSHIP-RANGE:</b>	
<b>Stream Type</b>	Ephemeral 0.1	Intermittent 0.4		Perennial 0.8					
<b>Priority Area</b>	Tertiary 0.1	Secondary 0.4		Primary 0.8					
<b>Existing Condition</b>	Functionally Impaired 0.1	Moderately Functional 0.8		Fully Functional 1.6					
<b>Duration</b>	Temporary 0.05	Recurrent 0.1		Permanent 0.3					
<b>Activity</b>	Clearing 0.05	Utility Crossing or Bridge Footing 0.15	Below Grade Culvert 0.30	Armor 0.50	Detention 0.75	Morphologic Change 1.50	Impoundment (Dam) 2.00	Pipe 2.20	Fill 2.50
<b>Linear Impact</b>	?	<100' 0	100'-200' 0.05	201-500' 0.1	501-1000' 0.2	>1000' 0.1 per 500 LF of impact (example: scaling factor for 5,280 LF of impacts = 1.1)			

For each Category select a Criteria from the drop down list for each tan box for a Dominant Impact Type. A red box indicates that no selection has been made.

	Dominant Impact Type 1		Dominant Impact Type 2		Dominant Impact Type 3		Dominant Impact Type 4		Dominant Impact Type 5		Dominant Imp
Site Name	NRPW-3										
	Criteria	Factor	Criteria	Factor	Criteria	Factor	Criteria	Factor	Criteria	Factor	Criteria
<b>Stream Type</b>	Ephemeral	0.10		?		?		?		?	
<b>Priority Area</b>	Tertiary	0.10		?		?		?		?	
<b>Existing Condition</b>	Functionally Impaired	0.10		?		?		?		?	
<b>Duration</b>	Permanent	0.30		?		?		?		?	
<b>Activity</b>	Fill	2.50		?		?		?		?	
<b>Linear feet of Stream Impacted in the Reach (LF) =</b>	347	0.10		?		?		?		?	
<b>Sum of Factors (M) =</b>		3.20		?		?		?		?	
<b>Mitigation Credits Required (M x LF x MF) =</b>		1,110		?		?		?		?	

**Total Mitigation Credits Required\* = Sum of All Mitigation Credits Required for All Dominant Impact Types = 1,110**

\* This value may be applied to mitigation at an approved mitigation bank at a 1:1 ratio, when the impact area is within the service area of that mitigation bank. The mitigation requirement may be multiplied by 2 at the Corps discretion when mitigation is proposed in an approved mitigation bank but the impact occurs outside of the service area of that mitigation bank, or when mitigation is proposed through an approved in-lieu-fee program.

**Explanatory Notes:**

Functionally impaired - 5 or more pipes/culverts/man-made modifications within 1/2 mile upstream.  
114 L.F. within Wetland 3.  
132 L.F. within Wetland 4.  
101 L.F. open channel between W-3 and W-4.

## Adverse Impact Factors for Riverine Systems Worksheet

<b>MITIGATION SITE NAME:</b> Lee's Summit Road Stream RPW-2	<b>ORM #:</b>	<b>DATE:</b>	<b>STATE, COUNTY:</b> MO Jackson	<b>SECTION-TOWNSHIP-RANGE:</b>					
<b>Stream Type</b>	Ephemeral 0.1	Intermittent 0.4	Perennial 0.8						
<b>Priority Area</b>	Tertiary 0.1	Secondary 0.4	Primary 0.8						
<b>Existing Condition</b>	Functionally Impaired 0.1	Moderately Functional 0.8	Fully Functional 1.6						
<b>Duration</b>	Temporary 0.05	Recurrent 0.1	Permanent 0.3						
<b>Activity</b>	Clearing 0.05	Utility Crossing or Bridge Footing 0.15	Below Grade Culvert 0.30	Armor 0.50	Detention 0.75	Morphologic Change 1.50	Impoundment (Dam) 2.00	Pipe 2.20	Fill 2.50
<b>Linear Impact</b>	?	<100' 0	100'-200' 0.05	201-500' 0.1	501-1000' 0.2	>1000'	0.1 per 500 LF of impact (example: scaling factor for 5,280 LF of impacts = 1.1)		

For each Category select a Criteria from the drop down list for each tan box for a Dominant Impact Type. A red box indicates that no selection has been made.

	Dominant Impact Type 1		Dominant Impact Type 2		Dominant Impact Type 3		Dominant Impact Type 4		Dominant Impact Type 5		Dominant Imp
Site Name	RPW-2										
	Criteria	Factor	Criteria	Factor	Criteria	Factor	Criteria	Factor	Criteria	Factor	Criteria
<b>Stream Type</b>	Intermittent	0.40		?		?		?		?	
<b>Priority Area</b>	Tertiary	0.10		?		?		?		?	
<b>Existing Condition</b>	Functionally Impaired	0.10		?		?		?		?	
<b>Duration</b>	Permanent	0.30		?		?		?		?	
<b>Activity</b>	Pipe	2.20		?		?		?		?	
<b>Linear feet of Stream Impacted in the Reach (LF) =</b>	130	0.05		?		?		?		?	
<b>Sum of Factors (M) =</b>		3.15		?		?		?		?	
<b>Mitigation Credits Required (M x LF x MF) =</b>		410		?		?		?		?	

**Total Mitigation Credits Required\* = Sum of All Mitigation Credits Required for All Dominant Impact Types = 410**

\* This value may be applied to mitigation at an approved mitigation bank at a 1:1 ratio, when the impact area is within the service area of that mitigation bank. The mitigation requirement may be multiplied by 2 at the Corps discretion when mitigation is proposed in an approved mitigation bank but the impact occurs outside of the service area of that mitigation bank, or when mitigation is proposed through an approved in-lieu-fee program.

**Explanatory Notes:**

Functionally impaired - 5 or more pipes/culverts/man-made modifications within 1/2 mile upstream.  
All 130 L.F. of this stream channel is within Wetland 4.

## Adverse Impact Factors for Riverine Systems Worksheet

<b>MITIGATION SITE NAME:</b>	Lee's Summit Road Stream RPW-4	<b>ORM #:</b>		<b>DATE:</b>		<b>STATE, COUNTY:</b>	MO Jackson	<b>SECTION-TOWNSHIP-RANGE:</b>	
<b>Stream Type</b>	Ephemeral 0.1	Intermittent 0.4	Perennial 0.8						
<b>Priority Area</b>	Tertiary 0.1	Secondary 0.4	Primary 0.8						
<b>Existing Condition</b>	Functionally Impaired 0.1	Moderately Functional 0.8	Fully Functional 1.6						
<b>Duration</b>	Temporary 0.05	Recurrent 0.1	Permanent 0.3						
<b>Activity</b>	Clearing 0.05	Utility Crossing or Bridge Footing 0.15	Below Grade Culvert 0.30	Armor 0.50	Detention 0.75	Morphologic Change 1.50	Impoundment (Dam) 2.00	Pipe 2.20	Fill 2.50
<b>Linear Impact</b>	?	<100' 0	100'-200' 0.05	201-500' 0.1	501-1000' 0.2	>1000'	0.1 per 500 LF of impact (example: scaling factor for 5,280 LF of impacts = 1.1)		

For each Category select a Criteria from the drop down list for each tan box for a Dominant Impact Type. A red box indicates that no selection has been made.

	Dominant Impact Type 1		Dominant Impact Type 2		Dominant Impact Type 3		Dominant Impact Type 4		Dominant Impact Type 5		Dominant Imp
Site Name	RPW-4										
	Criteria	Factor	Criteria	Factor	Criteria	Factor	Criteria	Factor	Criteria	Factor	Criteria
<b>Stream Type</b>	Intermittent	0.40		?		?		?		?	
<b>Priority Area</b>	Tertiary	0.10		?		?		?		?	
<b>Existing Condition</b>	Functionally Impaired	0.10		?		?		?		?	
<b>Duration</b>	Permanent	0.30		?		?		?		?	
<b>Activity</b>	Fill	2.50		?		?		?		?	
<b>Linear feet of Stream Impacted in the Reach (LF) =</b>	394	0.10		?		?		?		?	
<b>Sum of Factors (M) =</b>		3.50		?		?		?		?	
<b>Mitigation Credits Required (M x LF x MF) =</b>		1,379		?		?		?		?	

**Total Mitigation Credits Required\* = Sum of All Mitigation Credits Required for All Dominant Impact Types = 1,379**

\* This value may be applied to mitigation at an approved mitigation bank at a 1:1 ratio, when the impact area is within the service area of that mitigation bank. The mitigation requirement may be multiplied by 2 at the Corps discretion when mitigation is proposed in an approved mitigation bank but the impact occurs outside of the service area of that mitigation bank, or when mitigation is proposed through an approved in-lieu-fee program.

**Explanatory Notes:**

290 L.F. to culvert at north side of driveway.  
104 L.F. from culvert opening on south side of drive to beginning of roadside ditch.

## Adverse Impact Factors for Riverine Systems Worksheet

<b>MITIGATION SITE NAME:</b> Lee's Summit Road Stream RPW-5	<b>ORM #:</b>	<b>DATE:</b>	<b>STATE, COUNTY:</b> MO Jackson	<b>SECTION-TOWNSHIP-RANGE:</b>
<b>Stream Type</b>	Ephemeral 0.1	Intermittent 0.4	Perennial 0.8	
<b>Priority Area</b>	Tertiary 0.1	Secondary 0.4	Primary 0.8	
<b>Existing Condition</b>	Functionally Impaired 0.1	Moderately Functional 0.8	Fully Functional 1.6	
<b>Duration</b>	Temporary 0.05	Recurrent 0.1	Permanent 0.3	
<b>Activity</b>	Clearing 0.05	Utility Crossing or Bridge Footing 0.15	Below Grade Culvert 0.30	Armor 0.50
			Detention 0.75	Morphologic Change 1.50
				Impoundment (Dam) 2.00
				Pipe 2.20
				Fill 2.50
<b>Linear Impact</b>	? <100' 0	100'-200' 0.05	201-500' 0.1	501-1000' 0.2
			>1000'	0.1 per 500 LF of impact (example: scaling factor for 5,280 LF of impacts = 1.1)

For each Category select a Criteria from the drop down list for each tan box for a Dominant Impact Type. A red box indicates that no selection has been made.

	Dominant Impact Type 1		Dominant Impact Type 2		Dominant Impact Type 3		Dominant Impact Type 4		Dominant Impact Type 5		Dominant Imp
Site Name	RPW-5										
	Criteria	Factor	Criteria	Factor	Criteria	Factor	Criteria	Factor	Criteria	Factor	Criteria
<b>Stream Type</b>	Intermittent	0.40		?		?		?		?	
<b>Priority Area</b>	Tertiary	0.10		?		?		?		?	
<b>Existing Condition</b>	Functionally Impaired	0.10		?		?		?		?	
<b>Duration</b>	Permanent	0.30		?		?		?		?	
<b>Activity</b>	Pipe	2.20		?		?		?		?	
<b>Linear feet of Stream Impacted in the Reach (LF) =</b>	37	0.00		?		?		?		?	
<b>Sum of Factors (M) =</b>		3.10		?		?		?		?	
<b>Mitigation Credits Required (M x LF x MF) =</b>		115		?		?		?		?	

**Total Mitigation Credits Required\* = Sum of All Mitigation Credits Required for All Dominant Impact Types = 115**

\* This value may be applied to mitigation at an approved mitigation bank at a 1:1 ratio, when the impact area is within the service area of that mitigation bank. The mitigation requirement may be multiplied by 2 at the Corps discretion when mitigation is proposed in an approved mitigation bank but the impact occurs outside of the service area of that mitigation bank, or when mitigation is proposed through an approved in-lieu-fee program.

**Explanatory Notes:**