

**ARIZONA DEPARTMENT OF TRANSPORTATION
PROJECT DELIVERY AND OPERATIONS DIVISION
ROADWAY ENGINEERING GROUP
ROADWAY DESIGN**

**SAN PEDRO RIVER BRIDGE NO. 0403
PROJECT NO. 082 CH 061 F0522 01C
FEDERAL AID NO. FA 082-A(210)T**

EARTHWORK REPORT



Prepared By: ARIZONA DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN SECTION

June 29, 2026

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**EARTHWORK
 CALCULATION TABLE**

SUMMARY OF (Unadjusted) EARTHWORK			
Earthwork Section	Cut (Exc)	Fill (Emb)	Remarks
Roadway	2800	111	See Earthwork Calcs Tab
Pipe Excavation/Backfill	121	93	
Berms			
Riprap Excavation			
Structural Excavation/Backfill	368	98	See Basin Calcs Tabs
Drainage Excavation	191	0	
Ground Compaction		51	

Adjustment Notes:

EARTHWORK CALCULATION TABLE			
PRIMARY CALCULATIONS			
Shrink Not Applied	Exc(+)		Emb(-)
Roadway Excavation	2800	CY	
Swell	9	CY	
Pipe Excavation	121	CY	
Swell	0	CY	
Structural Excavation	368	CY	
Swell	0	CY	
Drainage Excavation	191	CY	
Swell	0	CY	
Riprap Excavation		CY	
Swell	0	CY	
Borrow (In-Place)			
Embankment (Inc GC)			162 CY
Pipe Backfill			93 CY
Structural Backfill			98
Berms			CY
Waste			3327 CY
	3489	CY	-3489 CY
			3489 CY
Check Balance	=		0 CY

Calculated By: Preston Meek
Checked By: Ivan Bystrov

EARTHWORK FACTORS

5% Swell

QC EARTHWORK CHECK

Sum of Total Emb, Bf, & Berm
162 CY

Sum of Total Swell
9 CY

Sum of Total Exc+Borrow
3480 CY

Required Dirt to Balance Earthwork
-3327 CY

Positive is borrow, negative is waste

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Earthwork Calculation

Start of Project to Start of Bridge									
STATION	Excavation			Embankment			Mass Ordinate	Ground Compaction	
	Factor	Area	Raw Volume	Factor	Area	Raw Volume		GROUND COMP Width	GROUND COMP VOLUME
		(SF)	(CY)		(SF)	(CY)		Gnd Comp=	0.10
2311+86	1	137.021	0.00	1	0	0	0	2	0
2312+00	1	162.311	76.99	1	0	0.00	76.99	2	0
2312+25	1	222.828	178.31	1	0	0.00	255.30	4	0
2312+50	1	280.579	233.06	1	0	0.00	488.36	7	0
2312+75	1	340.275	287.43	1	0	0.00	775.79	8	1
2313+00	1	328.473	309.61	1	0	0.00	1085.40	9	1
2313+25	1	288.191	285.49	1	0	0.00	1370.89	13	1
2313+50	1	252.69	409.67	1	0	0.00	1780.56	16	1
2313+75	1	186.373	203.27	1	0	0.00	1983.83	16	1
2313+86	1	152.411	69.70	1	0	0.00	2053.53	16	1
Grand Total:			2053.53			0.00			7

NOTE: Gap of 40.9 feet used between station 2313+25 and 2313+50. This because of the station equation change between these two cross sections which is 15.9 feet plus the original length of 25 feet

End of Bridge to End of Project									
STATION	Excavation			Embankment			Mass Ordinate	Ground Compaction	
	Factor	Area	Raw Volume	Factor	Area	Raw Volume		GROUND COMP Width	GROUND COMP VOLUME
		(SF)	(CY)		(SF)	(CY)		Gnd Comp=	0.10
2317+54	1	0	0.00	1	197.273	0.00	0	16	0
2317+75	1	15.34	5.98	1	14.275	82.50	-76.52	16	1
2318+00	1	24.314	18.36	1	4.379	8.64	-66.80	16	1
2318+25	1	28.079	24.26	1	2.372	3.13	-45.67	14	1
2318+50	1	30.556	27.15	1	0.248	1.21	-19.74	12	1
2318+75	1	33.9	29.84	1	0	0.11	9.99	11	1
2319+00	1	26.628	28.02	1	0.158	0.07	37.94	10	1
2319+25	1	26.134	24.43	1	0.225	0.18	62.19	10	1
2319+50	1	30.82	26.37	1	0	0.10	88.45	10	1
2319+75	1	34.147	30.08	1	0	0.00	118.53	10	1
2320+00	1	32.063	30.65	1	0	0.00	149.18	9	1
2320+25	1	29.266	28.39	1	0	0.00	177.58	9	1
2320+50	1	37.359	30.84	1	0	0.00	208.42	9	1
2320+75	1	55.12	42.81	1	0	0.00	251.23	8	1
2321+00	1	36.955	42.63	1	0	0.00	293.86	8	1

2321+25	1	30.073	31.03	1	0.204	0.09	324.80	7	1
2321+50	1	19.67	23.03	1	0.582	0.36	347.46	7	1
2321+75	1	19.628	18.19	1	6.977	3.50	362.16	7	1
2322+00	1	10.276	13.84	1	0.856	3.63	372.38	6	1
2322+25	1	16.336	12.32	1	0.857	0.79	383.90	5	1
2322+50	1	19.821	16.74	1	0.904	0.82	399.83	5	0
2322+75	1	15.954	16.56	1	0.677	0.73	415.66	5	0
2323+00	1	23.354	18.20	1	0.668	0.62	433.23	5	0
2323+25	1	23.372	21.63	1	2.141	1.30	453.57	4	0
2323+50	1	23.592	21.74	1	0.944	1.43	473.88	4	0
2323+75	1	19.777	20.08	1	0.276	0.56	493.39	3	0
2324+00	1	18.669	17.80	1	0.678	0.44	510.75	3	0
2324+25	1	22.546	19.08	1	0.072	0.35	529.48	2	0
2324+50	1	29.974	24.31	1	0.001	0.03	553.77	1	0
2324+75	1	37.593	31.28	1	0.012	0.01	585.04	1	0
2325+00	1	34.311	33.29	1	0.297	0.14	618.19	1	0
2325+16	1	26.574	17.58	1	0.782	0.31	635.45	1	0
Grand Total:		746.52		111.07				34	

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Earthwork Calculation

STATION	Excavation			Embankment			Mass Ordinate	Ground Compaction	
	Factor	Area	Raw Volume	Factor	Area	Raw Volume		GROUND COMP Width	GROUND COMP VOLUME
		(SF)	(CY)		(SF)	(CY)		Gnd Comp=	0.15
+00	1	42.735	0.00	1	3.023	0	0		0
+05	1	48.969	8.49	1	0	0.28	8.21		0
+10	1	56.43	9.76	1	0	0.00	17.97		0
+15	1	63.891	11.44	1	0	0.00	29.41		0
+20	1	66.713	11.77	1	0	0.00	41.18		0
Grand Total:			48.83			0.28			0

NOTE: Side slopes are accounted for in final raw volume for excavation (1 on each side of basin).
 These values were found in ORD using the area tool and multiplying by 8 feet for the basin width

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STATION	Excavation			Embankment			Mass Ordinate	Ground Compaction	
	Factor	Area	Raw Volume	Factor	Area	Raw Volume		GROUND COMP Width	GROUND COMP VOLUME
		(SF)	(CY)		(SF)	(CY)		Gnd Comp=	0.15
+00	1	53.216	0.00	1	0	0	0		0
+05	1	55.732	10.09	1	0	0.00	10.09		0
+10	1	55.804	10.33	1	0	0.00	20.42		0
+15	1	51.784	9.96	1	0.011	0.00	30.38		0
+20	1	49.466	9.38	1	0	0.00	39.75		0
Grand Total:			50.28				0.00	0	

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	Factor	Area	Raw Volume	Factor	Area	Raw Volume		GROUND COMP Width	GROUND COMP VOLUME
		(SF)	(CY)		(SF)	(CY)		Gnd Comp=	0.15
+00	1	49.55	0.00	1	0	0	0		0
+05	1	48.698	9.10	1	0	0.00	9.10		0
+10	1	48.011	8.95	1	0	0.00	18.05		0
+15	1	46.794	8.78	1	0.074	0.01	26.82		0
+20	1	54.78	9.41	1	0	0.01	36.22		0
+25	1	57.172	10.37	1	0	0.00	46.59		0
+30	1	59.184	10.77	1	0	0.00	57.36		0
+35	1	61.136	11.14	1	0	0.00	68.50		0
+40	1	61.584	11.36	1	0	0.00	79.86		0
Grand Total:			92.14			0.01			0

NOTE: Side slopes are accounted for in final raw volume for excavation (1 on each side of basin).
 These values were found in ORD using the area tool and multiplying by 8 feet for the basin width