

PROJECT NO. SZ041 01C
FLO-0(201)T
SR 287 & SR 79B Intersection

EARTHWORK SUMMARY

April 22, 2022

FINAL

Prepared For:

ADOT

Prepared By:

Kimley»»Horn



ARIZONA DEPARTMENT OF TRANSPORTATION
PROJECT MANAGEMENT GROUP
205 S. 17th Ave.
Phoenix, Arizona 85007-3217

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EARTHWORK COMPUTATIONS - Factors**Kimley»»Horn**

Project Name: **SR 287 & SR 79B Intersection**
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Date: 04/22/22
 Prepared by: TNS
 Checked by: ARH

EARTHWORK FACTORS

EARTHWORK FACTORS					
Location	Maximum Anticipated Cut Depth	Max. Cut Slopes (h:v)	Shrink (-)	Swell (+)	Ground Compaction (ft)
SR 287, SR 79B, Sideroads, and Driveways	20'	3:1	-10% *	0%	0.10' *

* Value per Materials Design Report.

EARTHWORK COMPUTATIONS - Plans Summary**Kimley»Horn**

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PLANS TABLE

EARTHWORK QUANTITIES		
<i>Roadway Excavation</i>	11,714	CY
<i>Shrink/Swell</i>	-1,218	CY
<i>Pipe Excavation</i>	430	CY
<i>Shrink/Swell</i>	-43	CY
TOTAL EXCAVATION	10,883	
<i>Roadway Embankment (Including Ground Comp)*</i>	10,883	CY
<i>Pipe & Trench Backfill</i>	132	CY
TOTAL EMBANKMENT	11,015	CY
Borrow	132	CY

*Non-Pay Item

EARTHWORK COMPUTATIONS - Embankment Summary**Kimley»Horn**

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EMBANKMENT**ROADWAY EMBANKMENT**

SR 287, SR 79B, Florence Heights Drive	5,419.0	cu yd	<i>See pages 9 to 10</i>
Roundabouts (Northern and Southern)	4,940.0	cu yd	<i>See page 11</i>
Minor Sideroads and Driveways	175.9	cu yd	<i>See page 11</i>
Misc. Adj - Drainage Basins *	(367.4)	cu yd	<i>See page 12</i>
Total Roadway Embankment	10,167.5	cu yd	

GROUND COMPACTION

SR 287, SR 79B, Florence Heights Drive	435.0	cu yd	<i>See page 15</i>
Roundabouts (Northern and Southern)	245.0	cu yd	<i>See page 15</i>
Minor Sideroads and Driveways	36.0	cu yd	<i>See page 15</i>
Total Ground Compaction	716.0	cu yd	

PIPE & TRENCH BACKFILL

Pipe & Trench Backfill	132.0	cu yd	<i>See pipe summary</i>
Total Pipe & Trench Backfill	132.0	cu yd	

EMBANKMENT SUMMARY

Total Embankment	11,015.5	cu yd	
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* Reduction from SR 287 and SR 79B cross sections.

EARTHWORK COMPUTATIONS - Excavation Summary**Kimley»Horn**

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EXCAVATION

Type	Excavation	Shr/Swl	Unit	
ROADWAY EXCAVATION				
SR 287, SR 79B, Florence Heights Drive	7,513.0	(650.0)	cu yd	<i>See pages 9 to 10</i>
Roundabouts (Northern and Southern)	142.5	(548.9)	cu yd	<i>See page 11</i>
Minor Sideroads and Driveways	1,843.7	(19.5)	cu yd	<i>See page 11</i>
Misc. Adj - Drainage Basins	2,215.4	0	cu yd	<i>See page 13</i>
Total Roadway Excavation	11,714.5	(1,218.4)	cu yd	
PIPE EXCAVATION				
Pipe Excavation	430.0	(43.0)	cu yd	<i>See pipe summary</i>
Total Pipe Excavation	430.0	(43.0)	cu yd	
EXCAVATION SUMMARY				
Total Excavation	12,144.5	(1,261.4)	cu yd	

EARTHWORK COMPUTATIONS



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Exhibit A - Roadway Excavation and Embankment

Roadway Excavation Summary
SR 287, SR 79B, and Florence Heights Drive
Roundabouts, Minor Sideroads, and Driveways

EARTHWORK COMPUTATIONS - Excavation Summary



Project Name: SR 287 & SR 79B Intersection
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Roadway Excavation Summary

No.	Roadway	Station		Station	Cut Volume (cu yd)	Fill Volume (cu yd)	Shr (-%) /Swell (%)	Fill Quantity 1 (cu yd)	Ground Compaction	From	Shr (-%) /Swell (%)	Shr/Swell (cu yd)	Fill Quantity 2 (cu yd)	From	Shr (-%) /Swell (%)	Shr/Swell (cu yd)	Total Shr/Swell (cu yd)	
1	SR 287 (West of North RAB)	8+50.00	to	13+22.00	468	1,908	-10%	468	135	1	-10%	(67.0)	1,440	5	-10%	(160.0)	(227.0)	See page 9
2	SR 79B (South of South RAB)	542+22.00	to	544+80.00	360	1,156	-10%	360	69	2	-10%	(47.7)	796	5	-10%	(88.0)	(135.7)	See page 9
3	SR 79B (Between RABs)	546+50.00	to	549+70.00	593	782	-10%	593	88	3	-10%	(75.7)	189	5	-10%	(21.0)	(96.7)	See page 9
4	SR 79B (North of North RAB)	A 550+50.00	to	A 555+36.00	1,140	945	-10%	945	91	4	-10%	(115.1)	0	-	-	0	(115.1)	See page 10
5	Florence Heights Drive	20+85.00	to	27+86.44	4,952	628	-10%	628	52	5	-10%	(75.6)	0	-	-	0	(75.6)	See page 10
Total					7,513.0	5,419.0						(381.0)				(269.0)	(650.0)	To Pages 5 & 6

EARTHWORK COMPUTATION - Florence Roundabouts



Project Name: **SR 287 & SR 79B Intersection**
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STATION NUMBER	CUT				FILL				OVEREXCAVATION CUT VOLUME			OVEREXCAVATION FILL VOLUME			MASS ORDINATE (cu yd)
	AREA	VOLUME	ADJ		AREA	VOLUME	ADJ		AREA	ADJ		AREA	ADJ		
	FACT (sq ft)	(cy yd)	(cu yd)		FACT (sq ft)	(cu yd)	(cu yd)		FACT (sq ft)	(cu yd)		FACT (sq ft)	(cu yd)		

SR 287 (West of North RAB) 8+50.00 to 13+22.00

8+50.00	1.00	0.00	0.00	0.00	1.00	276.25	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00
9+00.00	1.00	0.00	0.00	0.00	1.00	343.60	573.94	573.94	1.00	0.00	0.00	1.00	0.00	0.00	-573.94
9+50.00	1.00	0.00	0.00	0.00	1.00	264.03	562.62	562.62	1.00	0.00	0.00	1.00	0.00	0.00	-1136.56
10+00.00	1.00	0.00	0.00	0.00	1.00	155.88	388.81	388.81	1.00	0.00	0.00	1.00	0.00	0.00	-1525.36
10+50.00	1.00	18.01	16.68	16.68	1.00	49.01	189.71	189.71	1.00	0.00	0.00	1.00	0.00	0.00	-1698.40
10+70.00	1.00	29.48	17.59	17.59	1.00	41.61	33.56	33.56	1.00	0.00	0.00	1.00	0.00	0.00	-1714.37
11+00.00	1.00	30.91	33.55	33.55	1.00	0.01	23.12	23.12	1.00	0.00	0.00	1.00	0.00	0.00	-1703.94
11+30.00	1.00	36.42	37.41	37.41	1.00	9.76	5.43	5.43	1.00	0.00	0.00	1.00	0.00	0.00	-1671.97
11+50.00	1.00	39.05	27.95	27.95	1.00	29.74	14.63	14.63	1.00	0.00	0.00	1.00	0.00	0.00	-1658.64
12+00.00	1.00	47.99	80.59	80.59	1.00	19.15	45.27	45.27	1.00	0.00	0.00	1.00	0.00	0.00	-1623.32
12+50.00	1.00	54.53	94.93	94.93	1.00	16.52	33.03	33.03	1.00	0.00	0.00	1.00	0.00	0.00	-1561.42
13+00.00	1.00	63.40	109.19	109.19	1.00	15.91	30.03	30.03	1.00	0.00	0.00	1.00	0.00	0.00	-1482.26
13+22.00	1.00	58.75	49.76	49.76	1.00	4.22	8.20	8.20	1.00	0.00	0.00	1.00	0.00	0.00	-1440.69

Section 1 Totals:	468	1,908	-	-
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SR 79B (South of South RAB) 542+22.00 to 544+80.00

542+22.00	1.00	37.30	0.00	0.00	1.00	0.40	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00
542+50.00	1.00	42.42	41.34	41.34	1.00	23.63	12.46	12.46	1.00	0.00	0.00	1.00	0.00	0.00	28.88
543+00.00	1.00	40.20	76.50	76.50	1.00	66.90	83.83	83.83	1.00	0.00	0.00	1.00	0.00	0.00	21.55
543+50.00	1.00	32.87	67.66	67.66	1.00	137.95	189.68	189.68	1.00	0.00	0.00	1.00	0.00	0.00	-100.47
544+00.00	1.00	34.63	62.50	62.50	1.00	174.27	289.09	289.09	1.00	0.00	0.00	1.00	0.00	0.00	-327.07
544+50.00	1.00	45.59	74.28	74.28	1.00	230.13	374.44	374.44	1.00	0.00	0.00	1.00	0.00	0.00	-627.24
544+80.00	1.00	22.73	37.96	37.96	1.00	142.13	206.81	206.81	1.00	0.00	0.00	1.00	0.00	0.00	-796.09

Section 2 Totals:	360	1,156	-	-
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SR 79B (Between RABs) 546+50.00 to 549+70.00

546+50.00	1.00	30.20	0.00	0.00	1.00	46.44	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00
547+00.00	1.00	70.46	93.20	93.20	1.00	12.87	54.92	54.92	1.00	0.00	0.00	1.00	0.00	0.00	38.29
547+50.00	1.00	50.36	111.87	111.87	1.00	45.59	54.13	54.13	1.00	0.00	0.00	1.00	0.00	0.00	96.03
548+00.45	1.00	47.01	90.97	90.97	1.00	20.13	61.40	61.40	1.00	0.00	0.00	1.00	0.00	0.00	125.60
548+50.00	1.00	33.37	73.76	73.76	1.00	70.49	83.15	83.15	1.00	0.00	0.00	1.00	0.00	0.00	116.20
549+00.00	1.00	51.10	78.21	78.21	1.00	114.86	171.62	171.62	1.00	0.00	0.00	1.00	0.00	0.00	22.79
549+50.00	1.00	71.26	113.30	113.30	1.00	155.94	250.74	250.74	1.00	0.00	0.00	1.00	0.00	0.00	-114.65
549+70.00	1.00	13.04	31.22	31.22	1.00	130.98	106.27	106.27	1.00	0.00	0.00	1.00	0.00	0.00	-189.70

Section 3 Totals:	593	782	-	-
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STATION NUMBER	CUT			FILL			OVEREXCAVATION CUT VOLUME			OVEREXCAVATION FILL VOLUME			MASS ORDINATE (cu yd)
	AREA	VOLUME	ADJ	AREA	VOLUME	ADJ	AREA	ADJ	AREA	ADJ	AREA	ADJ	
	FACT (sq ft)	(cy yd)	(cu yd)	FACT (sq ft)	(cu yd)	(cu yd)	FACT (sq ft)	(cu yd)	FACT (sq ft)	(cu yd)	FACT (sq ft)	(cu yd)	

SR 79B (North of North RAB) A 550+50.00 to A 555+36.00

A 550+50.00	1.00	12.87	0.00	0.00	1.00	196.98	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00
A 551+00.00	1.00	16.59	27.28	27.28	1.00	152.89	323.95	323.95	1.00	0.00	0.00	1.00	0.00	0.00	-296.68
A 551+40.00	1.00	17.84	25.50	25.50	1.00	90.34	180.17	180.17	1.00	0.00	0.00	1.00	0.00	0.00	-451.34
A 551+80.00	1.00	60.10	57.73	57.73	1.00	61.26	112.30	112.30	1.00	0.00	0.00	1.00	0.00	0.00	-505.91
A 552+00.00	1.00	96.75	58.09	58.09	1.00	58.80	44.47	44.47	1.00	0.00	0.00	1.00	0.00	0.00	-492.28
A 552+50.00	1.00	92.72	175.44	175.44	1.00	58.91	108.99	108.99	1.00	0.00	0.00	1.00	0.00	0.00	-425.84
A 553+00.00	1.00	75.57	155.82	155.82	1.00	36.17	88.04	88.04	1.00	0.00	0.00	1.00	0.00	0.00	-358.05
A 553+50.00	1.00	74.53	138.98	138.98	1.00	16.88	49.12	49.12	1.00	0.00	0.00	1.00	0.00	0.00	-268.19
A 554+00.00	1.00	74.20	137.71	137.71	1.00	6.92	22.04	22.04	1.00	0.00	0.00	1.00	0.00	0.00	-152.51
A 554+50.00	1.00	75.14	138.28	138.28	1.00	1.82	8.09	8.09	1.00	0.00	0.00	1.00	0.00	0.00	-22.33
A 555+00.00	1.00	70.75	135.08	135.08	1.00	2.64	4.13	4.13	1.00	0.00	0.00	1.00	0.00	0.00	108.63
A 555+36.00	1.00	64.50	90.17	90.17	1.00	2.47	3.41	3.41	1.00	0.00	0.00	1.00	0.00	0.00	195.39

Section 4 Totals:	1,140	945	-	-
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Florence Heights Drive 20+85.00 to 27+86.44

20+85.00	1.00	0.00	0.00	0.00	1.00	235.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00
21+00.00	1.00	0.00	0.00	0.00	1.00	260.62	137.67	137.67	1.00	0.00	0.00	1.00	0.00	0.00	-137.67
21+50.00	1.00	0.00	0.00	0.00	1.00	90.31	324.94	324.94	1.00	0.00	0.00	1.00	0.00	0.00	-462.61
22+00.00	1.00	13.84	12.81	12.81	1.00	21.98	103.97	103.97	1.00	0.00	0.00	1.00	0.00	0.00	-553.76
22+50.00	1.00	80.82	87.65	87.65	1.00	0.00	20.35	20.35	1.00	0.00	0.00	1.00	0.00	0.00	-486.47
23+00.00	1.00	240.93	297.92	297.92	1.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	-188.55
23+50.00	1.00	324.36	523.42	523.42	1.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	334.86
24+00.00	1.00	377.33	649.71	649.71	1.00	11.87	10.99	10.99	1.00	0.00	0.00	1.00	0.00	0.00	973.59
24+50.00	1.00	385.93	706.72	706.72	1.00	0.32	11.29	11.29	1.00	0.00	0.00	1.00	0.00	0.00	1669.02
25+00.00	1.00	357.78	688.62	688.62	1.00	0.34	0.61	0.61	1.00	0.00	0.00	1.00	0.00	0.00	2357.03
25+50.00	1.00	76.82	402.41	402.41	1.00	0.00	0.31	0.31	1.00	0.00	0.00	1.00	0.00	0.00	2759.12
26+00.00	1.00	57.55	124.42	124.42	1.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	2883.54
26+50.00	1.00	317.08	346.88	346.88	1.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	3230.42
27+00.00	1.00	225.67	502.55	502.55	1.00	0.88	0.81	0.81	1.00	0.00	0.00	1.00	0.00	0.00	3732.15
27+50.00	1.00	169.02	365.45	365.45	1.00	0.44	1.22	1.22	1.00	0.00	0.00	1.00	0.00	0.00	4096.38
27+86.44	1.00	192.28	243.81	243.81	1.00	23.60	16.22	16.22	1.00	0.00	0.00	1.00	0.00	0.00	4323.97

Section 5 Totals:	4,952	628	-	-
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EARTHWORK COMPUTATION - Roundabouts, Minor Sideroads, and Driveways

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Location	CUT	FILL	ADD (cu yd)	TOTAL	VOLUME
	VOLUME (cu yd)	VOLUME (cu yd)		SHRINK (cu yd)	NET (cu yd)

Roundabouts

Southern Roundabout	44.2	1510.5		(167.8)	(1,634.1)
Northern Roundabout	98.3	3429.5		(381.1)	(3,712.3)
TOTAL	142.5	4,940.0	-	(548.9)	(5,346.4)

Minor Sideroads and Driveways

Campbell Avenue	10.8	15.4		(1.7)	(6.3)
Keating Street	65.6	22.6		(2.5)	40.5
Elizabeth Street	566.4	39.5		(4.4)	522.5
Orlando Street	53.6	2.8		(0.3)	50.5
Canal Road	11.5	21.3		(2.4)	(12.1)
Driveway No 1	34.8	24.6		(2.7)	7.5
Driveway No 2	22.7	31.3		(3.5)	(12.1)
Driveway No 3	115.8	14.4		(1.6)	99.8
Driveway No 4	3.1	0.4		(0.0)	2.6
Driveway No 5	58.1	2.8		(0.3)	55.0
Driveway No 6	886.5	0		0	886.5
Driveway No 7	14.8	0.9		(0.1)	13.9
TOTAL	1,843.7	175.9	-	(19.5)	1,648.2

EARTHWORK COMPUTATIONS



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Exhibit B - Miscellaneous Adjustments

Miscellaneous Adjustments Calculations

EARTHWORK COMPUTATION - Miscellaneous Adjustments

Kimley»Horn

Project Name: **SR 287 & SR 79B Intersection**
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4/22/2022
TNS
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Drainage Basins

Location	Excavation Cut (CY)	Fill Adjustment Cut (CY) *
SR 287 Basin (Sta 8+45, 65' Rt)	0	(28.06)
SR 79B Basin (Sta A550+28, 100' Rt)	216.95	(64.61)
SR 79B Basin (Sta A550+45, 100' Lt)	67.40	(49.52)
SR 79B Basin (Sta A551+60, 55' Lt)	211.93	(225.21)
Florence Heights Drive Basin (Sta 21+60, 100' Lt)	1280.48	0
Florence Heights Drive Basin (Sta 23+10, 70' Lt)	222.65	0
Florence Heights Drive Basin (Sta 24+40, 50' Lt)	65.52	0
Florence Heights Drive Basin (Sta 24+90, 45' Rt)	150.43	0
TOTAL	2,215.4	(367.4)

* Roadway cross section embankment value is tabulated from proposed finished grade to existing ground and does not account for basin volume located above existing ground.

Values shown shall be removed from roadway cross section embankment.

EARTHWORK COMPUTATIONS



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Exhibit C - Ground Compaction

EARTHWORK COMPUTATIONS - Ground Compaction Summary**Kimley»Horn**

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Ground Compaction Calculation Table

STATION to STATION	Fill Area (sq ft)	Ground Compaction	
		Factor (ft)	Volume (cu yd)

Mainline, Roundabouts, Sideroads, and Driveways Ground Compaction

SR 287 (West of North RAB)	36,453.5	0.1	135
SR 79B (South of South RAB)	18,633.45	0.1	69
SR 79B (Between RABs)	23,805.99	0.1	88
SR 79B (North of North RAB)	24,649.84	0.1	91
Florence Heights Drive	14,174.51	0.1	52
Southern Roundabout	24,010.99	0.1	89
Northern Roundabout	42,225.06	0.1	156
Campbell Avenue	578.42	0.1	2
Keating Street	1,435.29	0.1	5
Elizabeth Street	2,391.95	0.1	9
Orlando Street	256.29	0.1	1
Canal Road	1,083.83	0.1	4
Driveway No 1	1,239.81	0.1	5
Driveway No 2	905.18	0.1	3
Driveway No 3	1,104.14	0.1	4
Driveway No 4	70.43	0.1	1
Driveway No 5	147.13	0.1	1
Driveway No 6	0	0.1	0
Driveway No 7	176.41	0.1	1
TOTAL GROUND COMPACTION			716