

APPENDIX E

Transportation Calculations

Transportation Calculations - Flood Barrier

Material and Roadway	Unit	Estimated Quantity	Number of trips required for transport	Roundtrip distance of transport (miles)	Source	Duration - days	Duration - hours	Notes	Vehicle Miles Traveled	Worker Vehicle Trips (Roundtrip)
Concrete for Stop Log Structures										
CR99	CY	79	11	7	Woodland	1	8	Assuming 5 trucks carrying	140	7
Frontage Rd (Dubach)	CY	72	10	8		1	8	7.5 CY/truck making 4 trips/day	160	7
CR101	CY	50	7	13		1	8	Also required - pump	260	7
CR102	CY	74	10	15		1	8		300	7
SH113	CY	124	17	15		1	8		300	7
RR (I-5)	CY	94	13	16		1	8		320	7
AB Class II										
HWY 16	tons	3132	216	8	Woodland	3	24	Assuming 20 trucks carrying	1728	68
97A	tons	1666	115	6		2	16	14.5 tons/truck making 4 trips/day	960	50
CR99	tons	7165	494	10		7	56	Also required - 2 dozers, 2 graders	5600	175
Frontage Rd (Dubach)	tons	6356	438	12		6	48		5760	150
Churchhill Downs	tons	1450	100	14		2	16		2240	50
CR101	tons	3132	216	16		3	24		3840	75
CR102	tons	8280	571	20		8	64		12800	200
Aggregate Subbase										
19B	tons	42	3	6	Woodland	1	8	Assuming 20 trucks carrying	480	25
97A	tons	704	49	6		1	8	14.5 tons/truck making 4 trips/day	480	25
CR99	tons	7165	494	10		6	48	Also required - 2 dozers, 2 graders	4800	150
Frontage Rd (Dubach)	tons	6356	438	12		6	48		5760	150
Churchhill Downs	tons	1363	94	14		2	16		2240	50
CR101	tons	17896	1234	16		16	128		20480	400
CR102	tons	36164	2494	20		32	256		51200	800
HWY 16	tons	2420	167	8		3	24		1920	75
AC										
19B	tons	218	11	6	Woodland	1	8	Assuming 5 trucks carrying	120	10
97A	tons	389	19	6		2	16	20 tons/truck making 4 trips/day	240	20
CR99	tons	667	33	10		2	16	Also required 1 asphalt paver, 3 rollers	400	20
Frontage Rd (Dubach)	tons	131	7	12		1	8		240	10
Churchhill Downs	tons	387	19	14		1	8		280	10
CR101	tons	1044	52	16		3	24		960	30
CR102	tons	2480	124	20		7	56		2800	70
HWY 16	tons	836	42	8		3	24		480	30
Levee Construction										
Sections 1,2,3		from drainage channel excv.								
Levee Construction										
Section 4	CY	34069	2350	7		15	120	Assuming 20 dump trucks carrying	12600	450
Section 5	CY	40102	2766	4		18	144	14.5 CY/truck making 8 trips/day	8640	540
Section 6	CY	136234	9395	2		59	472	Also required - 3 backhoes, 4 water	14160	1770
Section 7	CY	175805	12124	1		76	608	trucks, 2 compactors, 1 grader, 2 dozers	9120	2280
Drainage Channel Excv.										
Section 1	CY	2000				1	8	Assuming 2 backhoes, 1 grader		8
Section 2	CY	20000				8	64	2 dozers, 2 compactors		64
Section 3	CY	30000				12	96	1 water truck		96

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Material and Roadway	Unit	Estimated Quantity	Number of trips required for transport	Roundtrip distance of transport (miles)	Source	Duration - days	Duration - hours	Notes	Vehicle Miles Traveled	Worker Vehicle Trips (Roundtrip)
Section 4	CY	20000				8	64			64
Section 5	CY	25000				10	80			80
Section 6	CY	25000				10	80			80
Section 7	CY	16000				7	56			56
Rip Rap					Yuba City					
Flood Barrier	tons	44396	2220	90		45	360	Assuming 25 trucks carrying	202500	1575
West Levee	tons	50010	2501	90		50	400	20 tons/truck making 2 trips/day	225000	1750
I-5	tons	6160	308	90		7	56	Also required - 4 cranes and 4 dozers	31500	245
Bedding					Woodland					
Flood Barrier	tons	15135	757	20		20	160	Assuming 10 trucks carrying	16000	300
West Levee	tons	16968	848	20		25	200	20tons/truck making 4 trips/day	20000	375
I-5	tons	2122	106	14		3	24	Also required - 4 dozers	1680	45
Patrol Road AB Class II					Woodland					
East of I-5	CY	4480	309	16		16	128	Assuming 5 trucks carrying	5120	160
West of I-5	CY	4816	332	5		17	136	14.5 tons/truck making 4 trips/day Also required 2 dozers and 2 graders	1700	170
Slurry Wall	CY	4,089	545	75		20	160	Assuming 10 trucks carrying 7.5CY/truck making 3 trips/day Also required - 2 dozers, 2 frontend loaders, 2 cranes/drill rigs	45000	320
Inlet Weir					Woodland					
RC Concrete	CY	10296	858	20		16	128	Assuming 9 trucks carrying 12 CY/truck making 6 trips/day Also required 2 dozers, excavator, grader, compactor	17280	240
Concrete	CY	2223	296	20		8	64	Assuming 10 trucks @ 7.5 CY/truck making 4 trips/day Also required - pump	6400	96
Slope Protection	tons	7425	371	90		8	64	Assuming 25 trucks carrying 20 tons/truck making 2 trips/day Also required 1 crane and 1 dozer	36000	240

Transportation Calculations - Flood Barrier

Material and Roadway	Unit	Estimated Quantity	Number of trips required for transport	Roundtrip distance of transport (miles)	Source	Duration - days	Duration - hours	Notes	Vehicle Miles Traveled	Worker Vehicle Trips (Roundtrip)
Gravel Backup	tons	4367	218	20		6	48	Assuming 10 trucks carrying 20 tons/truck making 4 trips/day Also required - 2 dozers	4800	72

Transportation Calculations - 20-foot wide levee crown

Although several supply quantities are increased to construct the 20-foot levee crown instead of the 12-foot levee crown, the following quantities are the only two that have noteworthy increases.

Levee Construction

Additional 42,290 CY of soil = 2915 trucks traveling on construction easements.
Also required: backhoes, compactors, grader, and dozers.

Patrol Road

Additional 6198 CY of AB Class II = 430 trucks trips
Also required: dozers and graders.

Transportation Calculations - Modified Wide Setback Levee

Material and Location	Unit	Estimated Quantity	Number of trucks required for transport	Roundtrip distance of transport (miles)	Source of Material	Duration (days)	Duration (hours)	Notes	Vehicle Miles Traveled	Worker Vehicle Trips (roundtrip)
Rip Rap B left	tons	26067	1303	90	Yuba City	26	208	Assuming 25 trucks carrying 20 tons/truck making 2 trips/day Also required - 4 cranes and 4 dozers	117000	910
Rip Rap Bedding B left	tons	7043	352	10	Woodland	10	80	Assuming 10 trucks carrying 20tons/truck making 4 trips/day Also required - 4 dozers	4000	150
Stone - hardpoints B left	tons	31700	1585	90	Yuba City	32	256	Assuming 25 trucks carrying 20 tons/truck making 2 trips/day Also required - 4 cranes and 4 dozers	144000	1120
Levee Const. A left	CY	97212				14	111	Assuming 10 scrapers at 700 CY/day/scrapper		278
B left	CY	257623				37	294	Also required -		736
C left	CY	167100				24	191	2 water trucks, 1 grader,		477
D left	CY	90146				13	103	1 excavator, 2 compactors		258
A right	CY	156363				22	179			447
B right	CY	248126				35	284			709
C right	CY	82590				12	94			236
D right	CY	112195				16	128			321
Toe Drain Excv. A left	CY	37067				15	120	Assuming 2 backhoes, 1 grader		150
B left	CY	33600				15	120	2 dozers, 2 compactors		150
C left	CY	22400				10	80	1 water truck		100
D left	CY	8533				5	40			50
A right	CY	35733				15	120			150
B right	CY	28267				10	80			100
C right	CY	12533				5	40			50
D right	CY	6400				3	24			30

Transportation Calculations - Modified Wide Setback Levee

Material and Location	Unit	Estimated Quantity	Number of trucks required for transport	Roundtrip distance of transport (miles)	Source of Material	Duration (days)	Duration (hours)	Notes	Vehicle Miles Traveled	Worker Vehicle Trips (roundtrip)
Hardpoint Excv.										
B left	CY	40000				16	128	Assuming 2 backhoes, 1 grader 2 dozers, 2 compactors 1 water truck		160
B right	CY	41667				17	136			170
Patrol Road AB ¹										
					Woodland					
A left	tons	5098	352	8		10	80	Assuming 10 trucks carrying	3200	150
B left	tons	5090	351	10		10	80	14.5 tons/truck making 4 trips/day	4000	150
C left	tons	3245	224	12		6	48	Also required - 3 dozers	2880	90
D left	tons	1662	115	16		3	24	and 2 graders	1920	45
A right	tons	4974	343	8		9	72		2880	135
B right	tons	4080	281	10		7	56		2800	105
C right	tons	3448	238	12		6	48		2880	90
D right	tons	1185	82	16		3	24		1920	45
Toe Drain Outlets - Concrete Transitions										
					Woodland					
A left	CY	51	7	8		1	8	Assuming 3 trucks carrying	72	5
B left	CY	59	8	10		1	8	7.5CY/day making 3 trips/day	90	5
C left	CY	59	8	12		1	8		108	5
D left	CY	17	2	16		1	8		144	5
A right	CY	51	7	8		1	8		72	5
B right	CY	59	8	10		1	8		90	5
C right	CY	25	3	12		1	8		108	5
D right	CY	17	2	16		1	8		144	5
Toe Drain Outlets - Total Length of RCP²										
A left	FT	600	5	30		1	8	Assuming 3 trucks carrying	270	5
B left	FT	700	6	30		1	8	(16) 8ft pieces/truck	270	5
C left	FT	700	6	30		1	8	making 3 trip/day	270	5
D left	FT	200	2	30		1	8	Also required - crane	270	5
A right	FT	600	5	30		1	8		270	5
B right	FT	700	6	30		1	8		270	5
C right	FT	300	3	30		1	8		270	5
D right	FT	200	2	30		1	8		270	5
Slurry Wall ³										
A left	CY	7813	1042	75		35	280	Assuming 10 trucks carrying	78750	700
B left	CY	7800	1040	75		35	280	7.5CY/truck making 3 trips/day	78750	700
C left	CY	4973	663	75		20	160	Also required - 2 dozers	45000	400
D left	CY	2547	340	75		10	80	2 frontend loaders	22500	200
A right	CY	7622	1016	75		35	280	2 cranes/drill rigs	78750	700
B right	CY	6253	834	75		30	240		67500	600
C right	CY	5284	705	75		25	200		56250	500
D right	CY	1816	242	75		10	80		22500	200

Transportation Calculations - Modified Wide Setback Levee

Material and Location	Unit	Estimated Quantity	Number of trucks required for transport	Roundtrip distance of transport (miles)	Source of Material	Duration (days)	Duration (hours)	Notes	Vehicle Miles Traveled	Worker Vehicle Trips (roundtrip)
Roadway Realignment - AB					Woodland					
Rd 18	tons	1305	90	10		3	24	Assuming 10 trucks carrying	1200	45
97A	tons	5485	378	5		10	80	14.5 tons/truck making 4 trips/day	2000	150
Rd 17	tons	1830	126	10		3	24	Also required - 2 dozers	1200	45
Rd 18A	tons	2350	162	10		4	32	2 graders	1600	60
Roadway Realignment - AC					Woodland					
Rd 18	tons	435	22	10		2	16	Assuming 5 trucks carrying	400	20
97A	tons	1830	92	5		5	40	20 tons/truck making 4 trips/day	500	50
Rd 17	tons	610	31	10		2	16	Also required 1 asphalt paver,	400	20
Rd 18A	tons	785	39	10		2	16	3 rollers	400	20
Bridge Work - Concrete Lining Under Bridges ⁴					Woodland					
RD 102	CY	744	99	16		5	40	Assuming 5 trucks carrying	1600	25
HWY 113	CY	571	76	12		4	32	7.5 CY/truck making 4 trips/day	960	20
4 I-5 Bridges	CY	2828	377	10		20	160		4000	100
Bridge Ramp Raises - AC ⁵					Woodland					
Rd 102	tons	3654	183	16		10	80	Assuming 5 trucks carrying	3200	100
HWY 113	tons	2045	102	12		6	48	20 tons/truck making 4 trips/day	1440	60
4 I-5 Bridges	tons	2132	107	10		6	48	Also required 1 asphalt paver, 3 rollers	1200	60
Bridge Ramp Raises - AB ⁵					Woodland					
Rd 102	tons	12200	841	16		20	160	Assuming 10 trucks carrying	12800	300
HWY 113	tons	7667	529	12		15	120	14.5 tons/truck making 4 trips/day	7200	225
4 I-5 Bridges	tons	4568	315	10		8	64	Also required - 2 dozers 2 graders	3200	120
Bridge Ramp Raises - Concrete					Woodland					
4 I-5 Bridges	CY	2544	339	16		17	136	Assuming 5 trucks carrying 7.5 CY/truck making 4 trips/day	5440	340
Road Realignment					Woodland					
Rd 18	CY	1422	98	5		3	24	Assuming 10 trucks carrying		48
Rd 97A	CY	5975	412	5		12	96	14.5 CY/truck making 4 trips/day		192
Rd 17	CY	1994	138	5		4	32	Also required - 2 dozers, 1 grader		64
Rd 18A	CY	2562	177	5		5	40	2 backhoes, 1 compactor		80

Transportation Calculations - Modified Wide Setback Levee

Material and Location	Unit	Estimated Quantity	Number of trucks required for transport	Roundtrip distance of transport (miles)	Source of Material	Duration (days)	Duration (hours)	Notes	Vehicle Miles Traveled	Worker Vehicle Trips (roundtrip)
Fill - Bridge Ramps					Woodland			Assuming 10 scrapers		
4 I-5 bridges	CY	16178				4	32	at 700 CY/day/scrapper		64
Rd 102	CY	26216				6	48	Also required -		96
HWY 113	CY	21445				5	40	2 water trucks, 1 grader, 1 excavator, 2 compactors		80

Transportation Calculations - 20-foot wide levee crown

Although several supply quantities are increased to construct the 20-foot levee crown instead of the 12-foot levee crown, the following quantities are the only two that have noteworthy increases.

Levee Construction

Additional 312,340 CY of soil = 10 scrapers @ 700CY/day/scrapper = 45 days
 Also required: graders, excavators, and compactors.

Patrol Road

Additional 19,190 tons of aggregate base = 1325 trucks.
 Also required: dozers and graders.