Appendix B

Standard Cost Category Worksheet

Build Alternative

DRAFT

MAIN WORKSHEET-BUILD ALTERNATIVE

(Rev.14, August 5, 2011)

METRO

Phoenix West LRT Extension

Today's Date	5/11/12
Yr of Base Year $	2012
Yr of Revenue Ops	2023

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**11.14**	107,412	21,482	**128,894**	**$11,570**	**26%**	**13%**	**166,760**
10.01 Guideway: At-grade exclusive right-of-way	7.27	14,600	2,920	17,520	$2,410			22,667
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	2.58	3,448	690	4,138	$1,604			5,353
10.03 Guideway: At-grade in mixed traffic			0	0				0
10.04 Guideway: Aerial structure	0.04	17,300	3,460	20,760	$519,000			26,859
10.05 Guideway: Built-up fill			0	0				0
10.06 Guideway: Underground cut & cover			0	0				0
10.07 Guideway: Underground tunnel			0	0				0
10.08 Guideway: Retained cut or fill	1.25	25,960	5,192	31,152	$24,922			40,303
10.09 Track: Direct fixation		1,700	340	2,040				2,639
10.10 Track: Embedded		13,084	2,617	15,701				20,313
10.11 Track: Ballasted		23,700	4,740	28,440				36,795
10.12 Track: Special (switches, turnouts)		7,620	1,524	9,144				11,830
10.13 Track: Vibration and noise dampening			0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**10**	46,100	11,525	**57,625**	**$5,763**	**11%**	**6%**	**74,553**
20.01 At-grade station, stop, shelter, mall, terminal, platform	9	40,100	10,025	50,125	$5,569			64,850
20.02 Aerial station, stop, shelter, mall, terminal, platform	1	6,000	1,500	7,500	$7,500			9,703
20.03 Underground station, stop, shelter, mall, terminal, platform			0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.			0	0				0
20.05 Joint development			0	0				0
20.06 Automobile parking multi-story structure			0	0				0
20.07 Elevators, escalators			0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	11.14	16,132	4,840	**20,972**	**$1,883**	**4%**	**2%**	**27,133**
30.01 Administration Building: Office, sales, storage, revenue counting		16,132	4,840	20,972				27,133
30.02 Light Maintenance Facility			0	0				0
30.03 Heavy Maintenance Facility			0	0				0
30.04 Storage or Maintenance of Way Building			0	0				0
30.05 Yard and Yard Track			0	0				0
40 SITEWORK & SPECIAL CONDITIONS	11.14	160,180	48,054	**208,233**	**$18,692**	**41%**	**21%**	**253,841**
40.01 Demolition, Clearing, Earthwork		3,165	949	4,114				5,015
40.02 Site Utilities, Utility Relocation		86,530	25,959	112,489				137,127
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments			0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks			0	0				0
40.05 Site structures including retaining walls, sound walls		4,500	1,350	5,850				7,131
40.06 Pedestrian / bike access and accommodation, landscaping		5,480	1,644	7,124				8,684
40.07 Automobile, bus, van accessways including roads, parking lots		20,505	6,152	26,657				32,495
40.08 Temporary Facilities and other indirect costs during construction		40,000	12,000	52,000				63,389
50 SYSTEMS	11.14	74,440	14,888	**89,328**	**$8,019**	**18%**	**9%**	**115,570**
50.01 Train control and signals		17,000	3,400	20,400				26,393
50.02 Traffic signals and crossing protection		6,300	1,260	7,560				9,781
50.03 Traction power supply: substations		22,000	4,400	26,400				34,156
50.04 Traction power distribution: catenary and third rail		17,000	3,400	20,400				26,393
50.05 Communications		7,700	1,540	9,240				11,954
50.06 Fare collection system and equipment		2,340	468	2,808				3,633
50.07 Central Control		2,100	420	2,520				3,260
Construction Subtotal (10 - 50)	11.14	404,264	100,789	**505,053**	**$45,337**	**100%**	**50%**	**637,857**
60 ROW, LAND, EXISTING IMPROVEMENTS	11.14	46,300	13,890	**60,190**	**$5,403**		**6%**	**73,373**
60.01 Purchase or lease of real estate		46,300	13,890	60,190				73,373
60.02 Relocation of existing households and businesses			0	0				0
70 VEHICLES (number)	**82**	159,019	23,853	**182,872**	**$2,230**		**18%**	**236,594**
70.01 Light Rail	27	115,290	17,294	132,584	$4,911			171,532
70.02 Heavy Rail			0	0				0
70.03 Commuter Rail			0	0				0
70.04 Bus	55	32,200	4,830	37,030	$673			47,908
70.05 Other			0	0				0
70.06 Non-revenue vehicles			0	0				0
70.07 Spare parts		11,529	1,729	13,258				17,153
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	11.14	140,000	0	**140,000**	**$12,567**	**28%**	**14%**	**160,461**
80.01 Preliminary Engineering		30,000		30,000				34,385
80.02 Final Design		30,000		30,000				34,385
80.03 Project Management for Design and Construction		32,000		32,000				36,677
80.04 Construction Administration & Management		32,000		32,000				36,677
80.05 Professional Liability and other Non-Construction Insurance		4,000		4,000				4,585
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		12,000		12,000				13,754
80.07 Surveys, Testing, Investigation, Inspection		0		0				0
80.08 Start up		0		0				0
Subtotal (10 - 80)	11.14	749,583	138,532	**888,115**	**$79,723**		**89%**	**1,108,285**
90 UNALLOCATED CONTINGENCY				**112,000**			**11%**	**139,330**
Subtotal (10 - 90)	11.14			**1,000,115**	**$89,777**		**100%**	**1,247,615**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	11.14			**1,000,115**	**$89,777**		**100%**	**1,247,615**

Allocated Contingency as % of Base Yr Dollars w/o Contingency	18.48%
Unallocated Contingency as % of Base Yr Dollars w/o Contingency	14.94%
Total Contingency as % of Base Yr Dollars w/o Contingency	33.42%
Unallocated Contingency as % of Subtotal (10 - 80)	12.61%
YOE Construction Cost per Mile (X000)	$57,258
YOE Total Project Cost per Mile Not Including Vehicles (X000)	$90,756
YOE Total Project Cost per Mile (X000)	$111,994

MAIN WORKSHEET-BUILD ALTERNATIVE

(Rev.14, August 5, 2011)

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10.01 Guideway: At-grade exclusive right-of-way	7.27	14,600	2,920	17,520	$2,410			22,667
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	2.58	3,448	690	4,138	$1,604			5,353
10.03 Guideway: At-grade in mixed traffic			0	0				0
10.04 Guideway: Aerial structure	0.04	17,300	3,460	20,760	$519,000			26,859
10.05 Guideway: Built-up fill			0	0				0
10.06 Guideway: Underground cut & cover			0	0				0
10.07 Guideway: Underground tunnel			0	0				0
10.08 Guideway: Retained cut or fill	1.25	25,960	5,192	31,152	$24,922			40,303
10.09 Track: Direct fixation		1,700	340	2,040				2,639
10.10 Track: Embedded		13,084	2,617	15,701				20,313
10.11 Track: Ballasted		23,700	4,740	28,440				36,795
10.12 Track: Special (switches, turnouts)		7,620	1,524	9,144				11,830
10.13 Track: Vibration and noise dampening			0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**10**	46,100	11,525	**57,625**	**$5,763**	**11%**	**6%**	**74,553**
20.01 At-grade station, stop, shelter, mall, terminal, platform	9	40,100	10,025	50,125	$5,569			64,850
20.02 Aerial station, stop, shelter, mall, terminal, platform	1	6,000	1,500	7,500	$7,500			9,703
20.03 Underground station, stop, shelter, mall, terminal, platform			0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.			0	0				0
20.05 Joint development			0	0				0
20.06 Automobile parking multi-story structure			0	0				0
20.07 Elevators, escalators			0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	11.14	16,132	4,840	**20,972**	**$1,883**	**4%**	**2%**	**27,133**
30.01 Administration Building: Office, sales, storage, revenue counting		16,132	4,840	20,972				27,133
30.02 Light Maintenance Facility			0	0				0
30.03 Heavy Maintenance Facility			0	0				0
30.04 Storage or Maintenance of Way Building			0	0				0
30.05 Yard and Yard Track			0	0				0
40 SITEWORK & SPECIAL CONDITIONS	11.14	160,180	48,054	**208,233**	**$18,692**	**41%**	**21%**	**253,841**
40.01 Demolition, Clearing, Earthwork		3,165	949	4,114				5,015
40.02 Site Utilities, Utility Relocation		86,530	25,959	112,489				137,127
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments			0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks			0	0				0
40.05 Site structures including retaining walls, sound walls		4,500	1,350	5,850				7,131
40.06 Pedestrian / bike access and accommodation, landscaping		5,480	1,644	7,124				8,684
40.07 Automobile, bus, van accessways including roads, parking lots		20,505	6,152	26,657				32,495
40.08 Temporary Facilities and other indirect costs during construction		40,000	12,000	52,000				63,389
50 SYSTEMS	11.14	74,440	14,888	**89,328**	**$8,019**	**18%**	**9%**	**115,570**
50.01 Train control and signals		17,000	3,400	20,400				26,393
50.02 Traffic signals and crossing protection		6,300	1,260	7,560				9,781
50.03 Traction power supply: substations		22,000	4,400	26,400				34,156
50.04 Traction power distribution: catenary and third rail		17,000	3,400	20,400				26,393
50.05 Communications		7,700	1,540	9,240				11,954
50.06 Fare collection system and equipment		2,340	468	2,808				3,633
50.07 Central Control		2,100	420	2,520				3,260
Construction Subtotal (10 - 50)	11.14	404,264	100,789	**505,053**	**$45,337**	**100%**	**51%**	**637,857**
60 ROW, LAND, EXISTING IMPROVEMENTS	11.14	33,200	9,960	**43,160**	**$3,874**		**4%**	**52,613**
60.01 Purchase or lease of real estate		33,200	9,960	43,160				52,613
60.02 Relocation of existing households and businesses			0	0				0
70 VEHICLES (number)	**82**	159,019	23,853	**182,872**	**$2,230**		**19%**	**236,594**
70.01 Light Rail	27	115,290	17,294	132,584	$4,911			171,532
70.02 Heavy Rail			0	0				0
70.03 Commuter Rail			0	0				0
70.04 Bus	55	32,200	4,830	37,030	$673			47,908
70.05 Other			0	0				0
70.06 Non-revenue vehicles			0	0				0
70.07 Spare parts		11,529	1,729	13,258				17,153
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	11.14	140,000	0	**140,000**	**$12,567**	**28%**	**14%**	**160,461**
80.01 Preliminary Engineering		30,000		30,000				34,385
80.02 Final Design		30,000		30,000				34,385
80.03 Project Management for Design and Construction		32,000		32,000				36,677
80.04 Construction Administration & Management		32,000		32,000				36,677
80.05 Professional Liability and other Non-Construction Insurance		4,000		4,000				4,585
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		12,000		12,000				13,754
80.07 Surveys, Testing, Investigation, Inspection		0		0				0
80.08 Start up		0		0				0
Subtotal (10 - 80)	11.14	736,483	134,602	**871,085**	**$78,194**		**89%**	**1,087,525**
90 UNALLOCATED CONTINGENCY				**110,000**			**11%**	**136,842**
Subtotal (10 - 90)	11.14			**981,085**	**$88,069**		**100%**	**1,224,367**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	11.14			**981,085**	**$88,069**		**100%**	**1,224,367**

Allocated Contingency as % of Base Yr Dollars w/o Contingency	18.28%
Unallocated Contingency as % of Base Yr Dollars w/o Contingency	14.94%
Total Contingency as % of Base Yr Dollars w/o Contingency	33.21%
Unallocated Contingency as % of Subtotal (10 - 80)	12.63%
YOE Construction Cost per Mile (X000)	$57,258
YOE Total Project Cost per Mile Not Including Vehicles (X000)	$88,669
YOE Total Project Cost per Mile (X000)	$109,907