US Army Corps of Engineers®

Piat Place & Harding Ditch

Flood Hazard Analysis

(Floodplain Management Services - FPMS)

Appendix D -

Cost

1.0 Construction Cost Development

Study construction costs were developed based on quantities provided by civil engineering. This is a very preliminary design and as such, the construction cost estimates would be considered a rough order of magnitude (ROM) or Class 5 estimate. The costs reflect current labor and equipment rates and assume all material will need to be hauled and disposed of offsite in a landfill. A 35% contingency was used based off of previous similar projects. Engineering and design costs are assumed to be 18% of the construction costs, and construction management costs are assumed to be 10% of the construction costs. The study did not include development of real estate or environmental mitigation costs, so these are not included in the alternatives costs here in the cost appendix or in the main report.

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Alt 1 - Summit A - Limited 9/6/2024

**Excludes Real Estate & Mitigation Costs

ITEM	ESTIMATED AMOUNT	
Mobilization and Demobilization	$92,000	
Earthwork		
Embankment	$12,960	
Roadwork		
Subbase	$13,915	
Asphalt Paving	$434,920	
SUBTOTAL:	$554,000	
Contingency:	$194,000	35%
Construction Subtotal:	$748,000	
E & D :	$130,000	18%
CM :	$70,000	10%
TOTAL COST:	**$948,000**	

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Alt 2 - Summit B - Max

**Excludes Real Estate & Mitigation Costs

ITEM	ESTIMATED AMOUNT	
Mobilization and Demobilization	$534,000	
Earthwork		
Ditch Excavation	$103,950	
Soil Disposal Costs	$11,880	
Establishment of Turf	$6,380	
Pump Station (30 CFS)	$3,620,000	
Trenching		
Saw Cutting	$10,000	
Asphalt Demo	$55,660	
Excavation	$38,400	
Bedding Material	$175,500	
Circular RCP		
12" Diameter	$19,600	
24" Diameter	$37,620	
36" Diameter	$333,720	
72" Diameter	$326,400	
Arch RCP		
48" Diameter	$396,000	
Trench Backfill		
Place Backfill	$2,500	
Subbase	$15,125	
Asphalt Paving	$32,750	
Concrete Structures		
Ditch Inlet Structure	$29,600	
Area Inlets	$14,100	
Outlet Section	$46,000	
Manholes	$63,000	
SUBTOTAL:	$5,872,000	
Contingency:	$2,055,000	35%
Construction Subtotal:	$7,927,000	
E & D :	$1,430,000	18%
CM :	$790,000	10%
TOTAL COST:	**$10,147,000**	

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Alt 3 - State Street A - Limited

**Excludes Real Estate & Mitigation Costs

ITEM	ESTIMATED AMOUNT	
Mobilization and Demobilization	$1,175,000	
Pump Station (100 CFS)	$9,225,000	
Trenching		
Saw Cutting	$22,000	
Asphalt Demo	$122,360	
Excavation	$98,400	
Bedding Material	$221,650	
Removal of Existing CMP	$65,130	
Circular RCP		
12" Diameter	$31,080	
15" Diameter	$7,200	
18" Diameter	$7,920	
24" Diameter	$37,620	
30" Diameter	$35,280	
36" Diameter	$129,600	
42" Diameter	$265,824	
48" Diameter	$301,928	
54" Diameter	$40,640	
60" Diameter	$206,720	
Arch RCP		
60" Diameter	$245,560	
72" Diameter	$220,800	
Trench Backfill		
Place Backfill	$148,125	
Subbase	$34,290	
Asphalt Paving	$74,250	
Cleanout Existing Storm Sewer	$28,670	
Concrete Structures		
Manholes	$159,600	
Curb Inlet	$23,500	
SUBTOTAL:	$12,928,000	
Contingency:	$4,525,000	35%
Construction Subtotal:	$17,453,000	
E & D :	$3,140,000	18%
CM :	$1,750,000	10%
TOTAL COST:	**$22,343,000**	

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Alt 4 - State Street B - Max

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**Excludes Real Estate & Mitigation Costs

ITEM	ESTIMATED AMOUNT	
Mobilization and Demobilization	$1,848,000	
Pump Station (175 CFS)	$11,070,000	
Trenching		
Saw Cutting	$79,600	
Asphalt Demo	$508,760	
Excavation	$324,600	
Bedding Material	$812,500	
Removal of Existing CMP	$105,690	
Circular RCP		
12" Diameter	$40,320	
15" Diameter	$2,400	
18" Diameter	$16,368	
21" Diameter	$4,288	
24" Diameter	$49,248	
27" Diameter	$138,528	
30" Diameter	$47,040	
36" Diameter	$295,488	
42" Diameter	$443,040	
48" Diameter	$235,752	
54" Diameter	$1,153,160	
60" Diameter	$273,600	
Arch RCP		
60" Diameter	$245,560	
72" Diameter	$432,000	
84" Diameter	$952,000	
Trench Backfill		
Place Backfill	$283,250	
Subbase	$140,970	
Asphalt Paving	$305,250	
Cleanout Existing Storm Sewer	$31,500	
Concrete Structures		
Area Inlets	$42,300	
Manholes	$374,400	
Curb Inlet	$75,200	
SUBTOTAL:	$20,331,000	
Contingency:	$7,116,000	35%
Construction Subtotal:	$27,447,000	
E & D :	$4,940,000	18%
CM :	$2,740,000	10%
TOTAL COST:	**$35,127,000**	

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Alt 5 - Piat A - Intermediate A - South Ditch

**Excludes Real Estate & Mitigation Costs

ITEM	ESTIMATED AMOUNT
Mobilization and Demobilization	$637,000
Earthwork	
Ditch Excavation	$267,400
Soil Disposal Costs	$30,560
Establishment of Turf	$8,700
Trenching	
Saw Cutting	$28,400
Asphalt Demo	$266,340
Excavation	$161,040
Bedding Material	$812,500
Removal of Existing CMP	$105,690
Circular RCP	
15" Diameter	$11,040
18" Diameter	$12,144
24" Diameter	$43,776
27" Diameter	$129,648
30" Diameter	$39,360
36" Diameter	$207,360
42" Diameter	$122,688
Arch RCP	
54" Diameter	$102,240
60" Diameter	$56,128
72" Diameter	$3,456,000
Trench Backfill	
Place Backfill	$7,500
Subbase	$73,660
Asphalt Paving	$159,500
Concrete Structures	
Area Inlets	$4,700
Outlet Section	$13,300
Manholes	$200,200
Curb Inlet	$47,000
SUBTOTAL:	$7,004,000
Contingency:	$2,451,000 35%
Construction Subtotal:	$9,455,000
E & D :	$1,700,000 18%
CM :	$950,000 10%
TOTAL COST:	**$12,105,000**

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Alt 6 - Piat B - Intermediate B - East Under Highway

**Excludes Real Estate & Mitigation Costs

ITEM	ESTIMATED AMOUNT
Mobilization and Demobilization	$1,519,000
Pump Station (110 CFS)	$9,225,000
Trenching	
Saw Cutting	$16,400
Asphalt Demo	$127,880
Excavation	$117,600
Bedding Material	$552,500
Removal of Existing CMP	$81,900
Circular RCP	
15" Diameter	$11,040
18" Diameter	$12,144
21" Diameter	$33,232
27" Diameter	$129,648
30" Diameter	$39,360
36" Diameter	$57,024
42" Diameter	$149,952
Arch RCP	
54" Diameter	$45,440
60" Diameter	$2,273,184
Trench Backfill	
Place Backfill	$500
Subbase	$35,560
Asphalt Paving	$77,000
Jack and Bore 60" Diameter Arch RCP	$2,018,720
Concrete Structures	
Ditch Inlet Structure	$185,000
SUBTOTAL:	$16,708,000
Contingency:	$5,848,000 35%
Construction Subtotal:	$22,556,000
E & D :	$4,060,000 18%
CM :	$2,260,000 10%
TOTAL COST:	**$28,876,000**

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Alt 7 - Piat C - Max

**Excludes Real Estate & Mitigation Costs

ITEM	ESTIMATED AMOUNT
Mobilization and Demobilization	$1,664,000
Earthwork	
Ditch Excavation	$9,367,925
Soil Disposal Costs	$1,070,620
Establishment of Turf	$139,200
Trenching	
Saw Cutting	$28,400
Asphalt Demo	$266,340
Excavation	$161,040
Bedding Material	$812,500
Removal of Existing CMP	$105,690
Circular RCP	
15" Diameter	$11,040
18" Diameter	$12,144
24" Diameter	$43,776
27" Diameter	$129,648
30" Diameter	$39,360
36" Diameter	$207,360
42" Diameter	$122,688
Arch RCP	
54" Diameter	$102,240
60" Diameter	$56,128
72" Diameter	$3,456,000
Trench Backfill	
Place Backfill	$7,500
Subbase	$73,660
Asphalt Paving	$159,500
Concrete Structures	
Area Inlets	$4,700
Outlet Section	$13,300
Manholes	$200,200
Curb Inlet	$47,000
SUBTOTAL:	$18,302,000
Contingency:	$6,406,000 35%
Construction Subtotal:	$24,708,000
E & D :	$4,450,000 18%
CM :	$2,470,000 10%
TOTAL COST:	**$31,628,000**

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Alt 8 - Harding A - Limited

**Excludes Real Estate & Mitigation Costs

ITEM	ESTIMATED AMOUNT	
Mobilization and Demobilization	$1,438,000	
Earthwork		
Ditch Excavation	$12,533,500	
Soil Disposal Costs	$1,432,400	
Establishment of Turf	$411,800	
SUBTOTAL:	$15,816,000	
Contingency:	$5,536,000	35%
Construction Subtotal:	$21,352,000	
E & D :	$3,840,000	18%
CM :	$2,140,000	10%
TOTAL COST:	**$27,332,000**	

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Alt 9 - Harding B - Intermediate

**Excludes Real Estate & Mitigation Costs

ITEM	ESTIMATED AMOUNT	
Mobilization and Demobilization	$2,360,000	
Earthwork		
Ditch Excavation	$12,533,500	
Soil Disposal Costs	$1,432,400	
Establishment of Turf	$411,800	
Pump Station (131.5 CFS)	$9,225,000	
SUBTOTAL:	$25,963,000	
Contingency:	$9,087,000	35%
Construction Subtotal:	$35,050,000	
E & D :	$6,310,000	18%
CM :	$3,510,000	10%
TOTAL COST:	**$44,870,000**	

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Alt 10 - Harding C - Max

**Excludes Real Estate & Mitigation Costs

ITEM	ESTIMATED AMOUNT	
Mobilization and Demobilization	$3,283,000	
Earthwork		
Ditch Excavation	$12,533,500	
Soil Disposal Costs	$1,432,400	
Establishment of Turf	$411,800	
Pump Station (131.5 CFS)	$18,450,000	
SUBTOTAL:	$36,111,000	
Contingency:	$12,639,000	35%
Construction Subtotal:	$48,750,000	
E & D :	$8,780,000	18%
CM :	$4,880,000	10%
TOTAL COST:	**$62,410,000**	