

**FAC 4111 Bulk Liquid Fuel Storage**

RUC: \$59.92 BL

Source: Special study conducted in 2008/2009

Weighted average of PACES-based estimates for 50K, 80K and 150K BL tanks; weighting based upon number of records of each in inventory.  
In V12, Tri-Service and USACE PAX Newsletter values were updated while all other values were inflated only.

Capacity (BL)	Direct Cost	Unit Cost	# Tanks	% Tanks	Weighted Cost
50000	\$ 3,524,281	\$ 70	184	0.673993	47.50679
80000	\$ 4,652,940	\$ 58	54	0.197802	11.50452
150000	\$ 7,280,054	\$ 49	35	0.128205	6.222268
			273		65.23358

SUC: \$4.75 BL

Source: Special study conducted in 2008/2009

## **Parametric Cost Engineering System (PACES) Project Detail Report**

**Project** DESC 50,000 BL Tank

**Location:** ARLINGTON, VIRGINIA

**Description:**

**Comments:**

**Estimate Date:** 12/08/2008

**Estimate By:** R&Kfjk

**Agency:** Air Force

**Report Date:** 02/25/2009  
09:35 AM

**Construction Start Date:** 04/01/2009

**Construction Midpoint:** 11/01/2009

**Construction End Date:** 07/01/2010

**Escalation Rate:** 7.96% Based on Project Construction Midpoint

**Database Version:** Jan 2006 Cost Book

**PACES Version:** 7.0.11

## Project Detail Report

**Facility:** 50,000 BL Tank**Type** Supporting**Model:** Installation Pipe Line

<u>Assembly</u>	<u>Description</u>	<u>Qty</u>	<u>UOM</u>	<u>Mtrl</u>	<u>Labor</u>	<u>Equip</u>	<u>Unit Cost</u>	<u>Total</u>
19004028	12" Exterior Coated Carbon Steel Pipe, SCH 40	3000	LF	\$22.97	\$3.98	\$0.51	\$27.47	\$82,396
19094116	Above Grnd Pipe Support, Stl And Reinforced Concrete	3000	LF	\$4.66	\$9.51	\$0.33	\$14.50	\$43,501
19094301	Isolation Valve	6	EA	\$72,250.49	\$6,240.53	\$0.00	\$78,491.02	\$470,946
19094402	Above Ground Pipe Seismic Reinforcing	3000	LF	\$24.28	\$4.42	\$0.22	\$28.92	\$86,750

**Model** Installation Pipe Line **\$683,593**

**Model:** Storage Tank

<u>Assembly</u>	<u>Description</u>	<u>Qty</u>	<u>UOM</u>	<u>Mtrl</u>	<u>Labor</u>	<u>Equip</u>	<u>Unit Cost</u>	<u>Total</u>
19092001	Earthwork, Vertical Abv Grd Tank	5162	CY	\$8.98	\$6.77	\$0.15	\$15.89	\$82,010
19092101	Concrete, Vertical Abv Grd Tank	151	CY	\$215.89	\$159.41	\$1.16	\$376.46	\$56,846
19092201	Pipes And Fittings, Vertical Abv Grd Tank	1178	LF	\$17.50	\$20.67	\$0.15	\$38.31	\$45,131
19092301	Electrical, Vertical Abv Grd Tank	12756	LF	\$7.81	\$5.44	\$1.33	\$14.58	\$186,045
19092401	Controls, Vertical Abv Grd Tank	63	EA	\$442.06	\$75.50	\$9.89	\$527.45	\$33,229
19092505	Tank, 6558200 L (55000 bbl), Vertical Abv Grd Tank	1	EA	\$560,293.53	\$379,807.53	\$50,333.71	\$990,434.77	\$990,435
19092701	Concrete Covered Berm	952	LF	\$48.70	\$87.72	\$24.61	\$161.03	\$153,256
19092703	Concrete Covered Basin	42460	SF	\$3.58	\$4.49	\$0.83	\$8.90	\$377,710
19092902	Tank Reinforcing	11	TON	\$1,652.43	\$498.56	\$182.00	\$2,332.99	\$25,663

**Model** Storage Tank **\$1,950,323**

**Facility:** 50,000 BL Tank **\$2,633,916**

# Project Detail Report

**Facilities Total (Direct Cost): \$2,633,916**

**Project Direct Cost: \$2,633,916**

Markups	33.8	%	\$890,365
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**Project Marked Up Cost: \$3,524,281**

Contingency	5.0	%	\$176,214
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SIOH	5.7	%	\$210,928
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**Project Cost: \$3,911,423**

Design/Indirect Cost:	0.0	%	\$0
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**Total Project Cost: \$3,911,423**

**Construction Start** 04/01/2009

**Construction Midpoint:** 11/01/2009

**Construction End Date:** 07/01/2010

**Escalation Rate:** 7.96% Based on Construction Midpoint

**Database Version:** Jan 2006 Cost Book

**PACES Version:** 7.0.11

## Parametric Cost Engineering System (PACES) Project Detail Report

**Project** DESC 80,000 BL Tank  
**Project No.:** 4111-80,000  
**Location:** ARLINGTON, VIRGINIA

**Description:**

**Comments:**

**Estimate Date:** 12/08/2008  
**Estimate By:** R&Kfjk

**Agency:** Air Force

**Report Date:** 02/25/2009  
09:33 AM

**Construction Start Date:** 04/01/2009  
**Construction Midpoint:** 11/01/2009  
**Construction End Date:** 07/01/2010

**Escalation Rate:** 7.96% Based on Project Construction Midpoint

**Database Version:** Jan 2006 Cost Book  
**PACES Version:** 7.0.11

Project Name: DESC 80,000 BL Tank

## Project Detail Report

02/25/2009

09:33 AM

Project No: 4111-80,000

**Facility:** 80,000 BL Tank

**Model:** Installation Pipe Line

### Type Supporting

<u>Assembly</u>	<u>Description</u>	<u>Qty</u>	<u>UOM</u>	<u>Mtrl</u>	<u>Labor</u>	<u>Equip</u>	<u>Unit Cost</u>	<u>Total</u>
19004028	12" Exterior Coated Carbon Steel Pipe, SCH 40	3000	LF	\$22.97	\$3.98	\$0.51	\$27.47	\$82,396
19094116	Above Grnd Pipe Support, Stl And Reinforced Concrete	3000	LF	\$4.66	\$9.51	\$0.33	\$14.50	\$43,501
19094301	Isolation Valve	6	EA	\$72,250.49	\$6,240.53	\$0.00	\$78,491.02	\$470,946
19094402	Above Ground Pipe Seismic Reinforcing	3000	LF	\$24.28	\$4.42	\$0.22	\$28.92	\$86,750

**Model** Installation Pipe Line **\$683,593**

**Model:** Storage Tank

<u>Assembly</u>	<u>Description</u>	<u>Qty</u>	<u>UOM</u>	<u>Mtrl</u>	<u>Labor</u>	<u>Equip</u>	<u>Unit Cost</u>	<u>Total</u>
19092001	Earthwork, Vertical Abv Grd Tank	7504	CY	\$8.98	\$6.77	\$0.15	\$15.89	\$119,218
19092101	Concrete, Vertical Abv Grd Tank	219	CY	\$215.89	\$159.41	\$1.16	\$376.46	\$82,445
19092201	Pipes And Fittings, Vertical Abv Grd Tank	1713	LF	\$17.50	\$20.67	\$0.15	\$38.31	\$65,628
19092301	Electrical, Vertical Abv Grd Tank	18530	LF	\$7.81	\$5.44	\$1.33	\$14.58	\$270,249
19092401	Controls, Vertical Abv Grd Tank	92	EA	\$442.06	\$75.50	\$9.89	\$527.45	\$48,525
19092506	Tank, 9539200 L (80000 bbl), Vertical Abv Grd Tank	1	EA	\$814,524.08	\$552,152.00	\$73,172.85	\$1,439,848.93	\$1,439,849
19092701	Concrete Covered Berm	1148	LF	\$48.70	\$87.72	\$24.61	\$161.03	\$184,834
19092703	Concrete Covered Basin	61760	SF	\$3.58	\$4.49	\$0.83	\$8.90	\$549,396
19092902	Tank Reinforcing	16	TON	\$1,652.43	\$498.56	\$182.00	\$2,332.99	\$37,327

**Model** Storage Tank **\$2,797,471**

**Facility:** 80,000 BL Tank **\$3,481,064**

Project Name: DESC 80,000 BL Tank

Project No: 4111-80,000

## Project Detail Report

02/25/2009

09:33 AM

**Facilities Total (Direct Cost): \$3,481,064**

**Project Direct Cost: \$3,481,064**

Markups 33.7 % \$1,171,876

**Project Marked Up Cost: \$4,652,940**

Contingency 5.0 % \$232,647

SIOH 5.7 % \$278,478

**Project Cost: \$5,164,065**

Design/Indirect Cost: 0.0 % \$0

**Total Project Cost: \$5,164,065**

**Construction Start** 04/01/2009

**Construction Midpoint:** 11/01/2009

**Construction End Date:** 07/01/2010

**Escalation Rate:** 7.96% Based on Construction Midpoint

**Database Version:** Jan 2006 Cost Book

**PACES Version:** 7.0.11

## Parametric Cost Engineering System (PACES) Project Detail Report

**Project** DESC 150,000 BL Tank  
**Project No.:** 4111-150,000  
**Location:** ARLINGTON, VIRGINIA  
**Description:** Tank Only  
**Comments:**

**Estimate Date:** 12/08/2008  
**Estimate By:** R&Kfjk

**Agency:** Air Force

**Report Date:** 02/25/2009  
09:14 AM

**Construction Start Date:** 04/01/2009  
**Construction Midpoint:** 01/01/2010  
**Construction End Date:** 10/01/2010

**Escalation Rate:** 8.35% Based on Project Construction Midpoint

**Database Version:** Jan 2006 Cost Book  
**PACES Version:** 7.0.11



Project Name: DESC 150,000 BL Tank

## Project Detail Report

02/25/2009

09:14 AM

Project No: 4111-150,000

**Facility:** 150,000 BL Tank

**Model:** Installation Pipe Line

### Type Supporting

<u>Assembly</u>	<u>Description</u>	<u>Qty</u>	<u>UOM</u>	<u>Mtrl</u>	<u>Labor</u>	<u>Equip</u>	<u>Unit Cost</u>	<u>Total</u>
19004030	16" Exterior Coated Carbon Steel Pipe, SCH 40	3000	LF	\$28.40	\$6.21	\$0.74	\$35.35	\$106,051
19094116	Above Grnd Pipe Support, Stl And Reinforced Concrete	3000	LF	\$4.66	\$9.51	\$0.33	\$14.50	\$43,501
19094301	Isolation Valve	6	EA	\$72,250.49	\$6,240.53	\$0.00	\$78,491.02	\$470,946
19094402	Above Ground Pipe Seismic Reinforcing	3000	LF	\$24.28	\$4.42	\$0.22	\$28.92	\$86,750

**Model** Installation Pipe Line **\$707,248**

**Model:** Storage Tank

<u>Assembly</u>	<u>Description</u>	<u>Qty</u>	<u>UOM</u>	<u>Mtrl</u>	<u>Labor</u>	<u>Equip</u>	<u>Unit Cost</u>	<u>Total</u>
19092001	Earthwork, Vertical Abv Grd Tank	12252	CY	\$8.98	\$6.77	\$0.15	\$15.89	\$194,650
19092101	Concrete, Vertical Abv Grd Tank	358	CY	\$215.89	\$159.41	\$1.16	\$376.46	\$134,773
19092201	Pipes And Fittings, Vertical Abv Grd Tank	2797	LF	\$17.50	\$20.67	\$0.15	\$38.31	\$107,158
19092301	Electrical, Vertical Abv Grd Tank	34696	LF	\$7.81	\$5.44	\$1.33	\$14.58	\$506,023
19092401	Controls, Vertical Abv Grd Tank	151	EA	\$442.06	\$75.50	\$9.89	\$527.45	\$79,645
19092508	Tank, 1788600 L (150000 bbl), Vertical Abv Grd Tank	1	EA	\$1,329,914.16	\$901,526.11	\$119,472.33	\$2,350,912.61	\$2,350,913
19092701	Concrete Covered Berm	1572	LF	\$48.70	\$87.72	\$24.61	\$161.03	\$253,094
19092703	Concrete Covered Basin	115801	SF	\$3.58	\$4.49	\$0.83	\$8.90	\$1,030,117
19092902	Tank Reinforcing	30	TON	\$1,652.43	\$498.56	\$182.00	\$2,332.99	\$69,989

**Model** Storage Tank **\$4,726,362**

**Facility:** 150,000 BL Tank **\$5,433,609**

Project Name: DESC 150,000 BL Tank  
Project No: 4111-150,000

## Project Detail Report

02/25/2009  
09:14 AM

**Facilities Total (Direct Cost): \$5,433,609**

**Project Direct Cost: \$5,433,609**

Markups 34.0 % \$1,846,445

**Project Marked Up Cost: \$7,280,054**

Contingency 5.0 % \$364,003

SIOH 5.7 % \$435,711

**Project Cost: \$8,079,768**

Design/Indirect Cost: 0.0 % \$0

**Total Project Cost: \$8,079,768**

**Construction Start** 04/01/2009

**Construction Midpoint:** 01/01/2010

**Construction End Date:** 10/01/2010

**Escalation Rate:** 8.35% Based on Construction Midpoint

**Database Version:** Jan 2006 Cost Book

**PACES Version:** 7.0.11

FAC 4111 Bulk Fuel Tank

Design Life and Representative Size	40	Years	31390		BL
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Component	Fre- quency	Estimated Cost per Occurrence	Occur- ences in design life	Occur- ences rounded	Design Life Cost
<b>Tank</b>					
API 653 External Inspection	5	\$ 20,000	8.0	8.0	\$ 160,000
Spot Painting/Minor Repairs	10	\$ 50,000	4.0	4.0	\$ 200,000
API 653 Internal Inspection	10	\$ 60,000	4.0	4.0	\$ 240,000
Repairs found during API 653 External Inspection	10	\$ 500,000	4.0	4.0	\$ 2,000,000
External Coating	15	\$ 600,000	2.7	2.0	\$ 1,200,000
Clean Tank	5	\$ 50,000	8.0	8.0	\$ 400,000
PM by operator	1	\$ 6,765	40	40.0	\$ 270,600
PM Cathodic Protection System (Impressed voltage)	1	\$ 2,000	40	40.0	\$ 80,000
<b>Piping</b>				0.0	\$ -
API 570 Inspection	3	\$ 15,000	13	13.0	\$ 195,000
Coating (abrasive blast/3 coat epoxy) 2000 FT (610 M)	5	\$ 75,600	8	8.0	\$ 604,800
				0.0	\$ -
<b>Controls</b>				0.0	\$ -
Annual Calibration	1	\$ 20,000	40	40.0	\$ 800,000
			S/T		\$ 6,150,400
			Per Year		\$ 153,760
<b>\$FY-08</b>			Per Unit		<b>\$ 4.90</b>
<b>\$FY-09</b>					<b>\$ 5.00</b>

