

## I. Project Overview

### Project Summary

The Baltimore County corrections system currently consists of two buildings: the Baltimore County Detention Center (BCDC) and the Courthouse Correctional Facility (CCF). These facilities which are located in Towson, Maryland were built or expanded in 1860, 1956, 1980, 1990 and 1994. Combined these facilities have a 1,147 inmate capacity. Over the past two years recent inmate counts have been as high as 1,246. The overcrowding of the current facilities and the declining condition of the CCF has lead to the 2002 construction of the Baltimore County Detention Center Expansion.

The BCDC Expansion is a \$69.9 million dollar addition to the BCDC that will accommodate all of Baltimore County's present correctional facility needs. The expanded facility will be comprised of additional inmate housing (a 366 net increase), administration areas and a parking garage. The construction of the BCDC Expansion began in May 2002 and is to be completed in April 2005.

### Project Delivery Method

The BCDC Expansion project is being delivered under a multiple prime lump sum contract with a construction management agent. The construction manager, Gilbane Building Co. and Architect/Engineer, DMJMHN were hired at a fixed fee while all participating contractors competitively bid for lump sum contracts with the County. The diagram below in Figure 1-1 is a visual representation of the current delivery method used for the BCDC Expansion. With the presented delivery method the project is currently 4 months behind the original schedule and over budget due to numerous change orders.

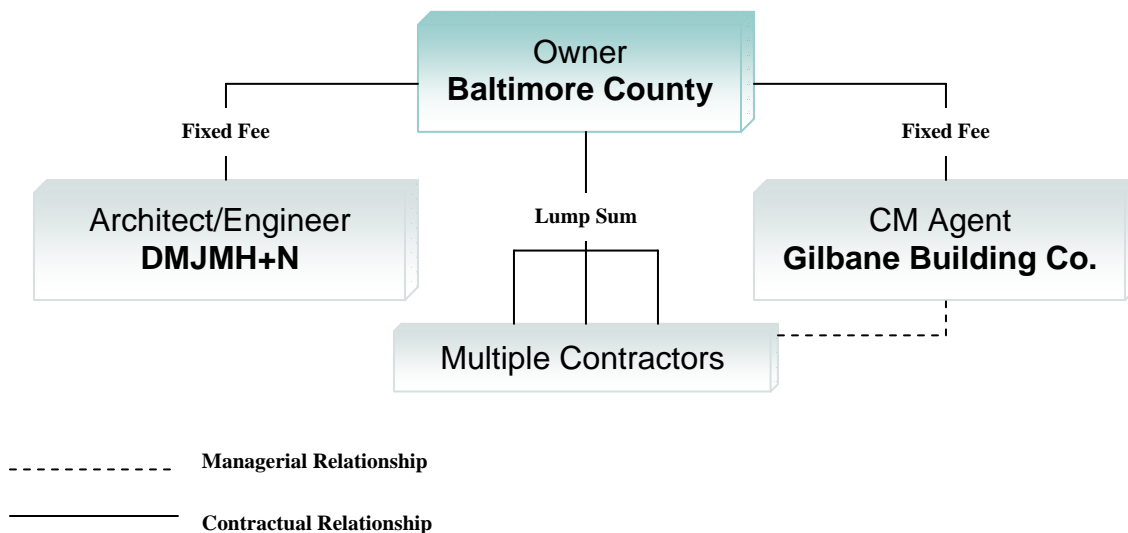


Figure 1-1: Current Delivery Method for the BCDC Expansion – Multiple Prime Contract w/ CM Agency

BALTIMORE COUNTY DETENTION CENTER EXPANSION  
TOWSON, MARYLAND

Project Cost

The BCDC Expansion Project was divided into 16 separate bid packages. Pre-qualified bidders competitively bid each of these packages. The table below in Figure 1-2 is the actual cost for each bid package of the BCDC Expansion. The total cost of the BCDC Expansion is \$69,851,535.

BP #	Description	Total Cost	Cost / SF
1	Site Work	\$4,607,570	\$13.49
2	Foundations	\$885,000	\$2.59
3	Concrete Garage	\$2,940,000	\$34.36
4	Elevators	\$1,411,000	\$4.13
5	Pre-Cast Concrete	\$9,990,000	\$39.03
6	Housing C.I.P. Concrete	\$3,739,500	\$14.61
7	Structural Steel/ Metals	\$2,493,000	\$9.74
8	Electrical	\$4,883,000	\$14.30
9	Mechanical & Plumbing	\$9,598,000	\$28.10
10	Security & Detention Equip.	\$9,198,179	\$26.93
11	Glass & Glazing	\$1,136,500	\$4.44
12	Fire Protection	\$1,184,000	\$3.47
13	Building Controls	\$1,485,000	\$4.35
14	Masonry	\$3,064,000	\$11.97
15	Roofing	\$572,253	\$2.24
16	General Trades	\$3,975,970	\$11.64
17	Landscaping	\$131,081	\$0.38
18	Food Services & Laundry Equip.	\$510,518	\$1.99
<b>Subtotal</b>		\$61,804,571	\$180.95
<b>VE</b>		<b>(\$1,780,000)</b>	<b>(\$5.21)</b>
<b>Actual Building Construction Cost</b>		<b>\$55,417,001</b>	<b>\$162.25</b>
<b>Design Cost</b>		\$4,516,779	
<b>Contractor Fee</b>		\$2,718,185	
<b>FF&amp;E</b>		\$2,592,000	
<b>Total Project Cost</b>		<b>\$69,851,535</b>	

Figure 1-2: Actual Cost for the BCDC Expansion

# BALTIMORE COUNTY DETENTION CENTER EXPANSION TOWSON, MARYLAND

## Project Schedule

The BCDC Expansion started construction in May 2002 and is to be completed in April 2005. The original schedule showed a completion date of January 2005, however, delays by the owner for a value engineering process have delayed the project four months. The schedule shown below in Figure 1-3 (a-d) is broken down for the schedule of each bid package.

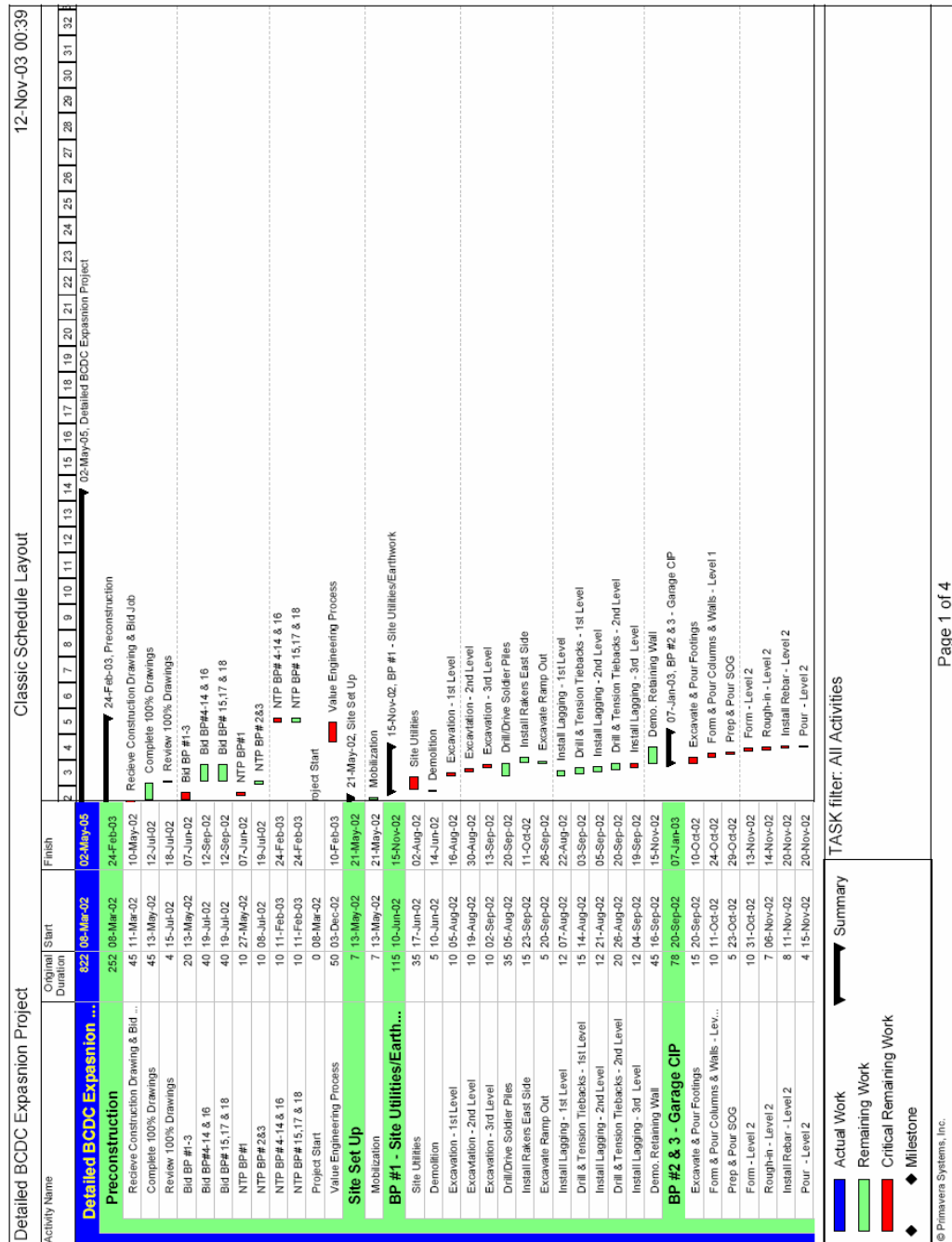


Figure 1-3a: Schedule for BCDC Expansion (page 1 of 4)

# BALTIMORE COUNTY DETENTION CENTER EXPANSION TOWSON, MARYLAND

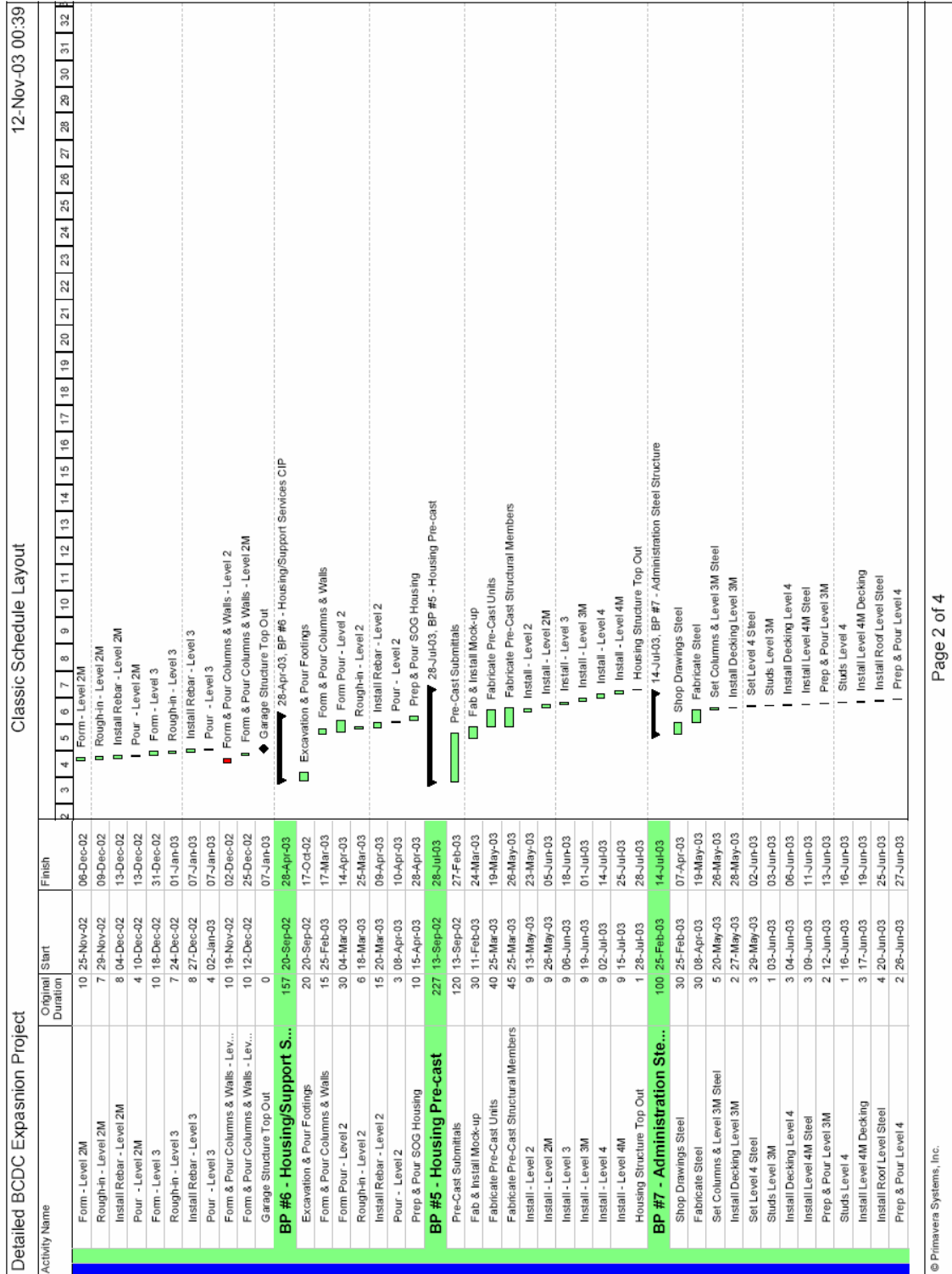


Figure 1-3b: Schedule for BCDC Expansion (page 2 of 4)

# BALTIMORE COUNTY DETENTION CENTER EXPANSION TOWSON, MARYLAND

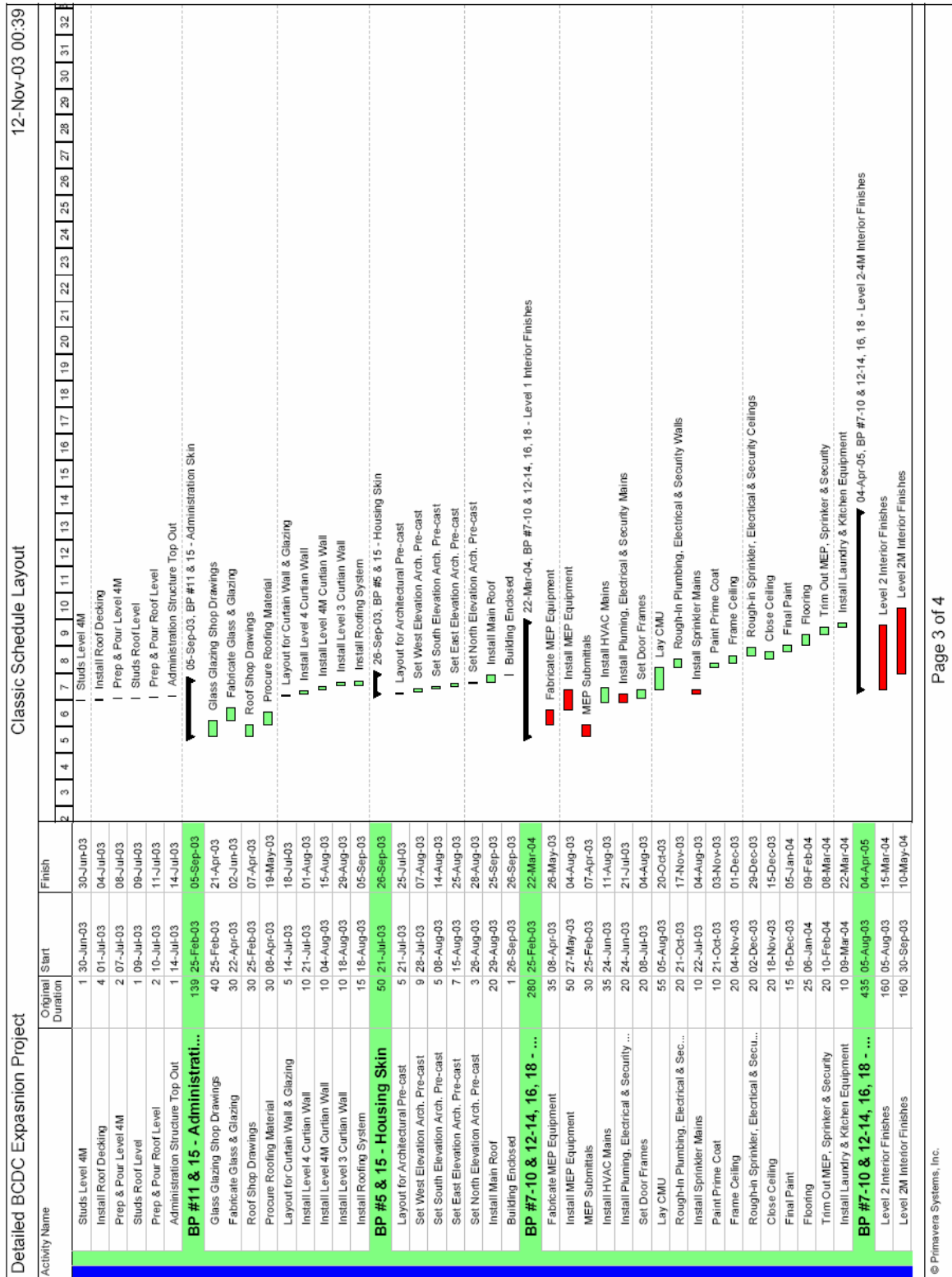


Figure 1-3c: Schedule for BCDC Expansion (page 3 of 4)

# BALTIMORE COUNTY DETENTION CENTER EXPANSION TOWSON, MARYLAND

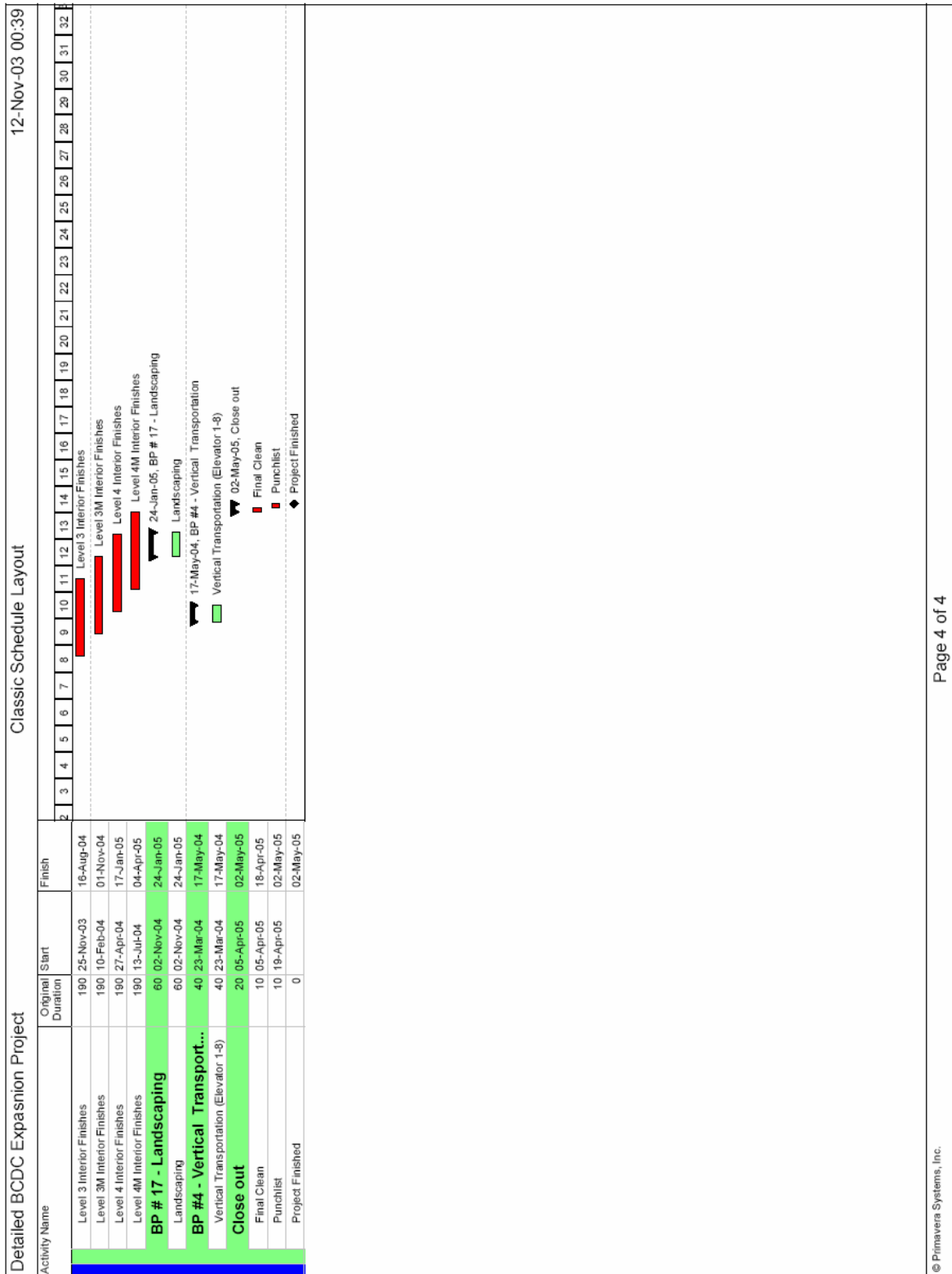


Figure 1-3d: Schedule for BCDC Expansion (page 4 of 4)

BALTIMORE COUNTY DETENTION CENTER EXPANSION  
TOWSON, MARYLAND

Cash Flow

Based on the cost and schedule of each bid package shown above a cash flow curve was compiled. The graph in Figure 1-4a shows the cumulative cost of the project and the cost per month. Figure 1-4b is an enlarged version of the project's monthly cost that will be billed to the owner. The values shown on both of the graphs are based of the cash schedule located in the Appendix A.

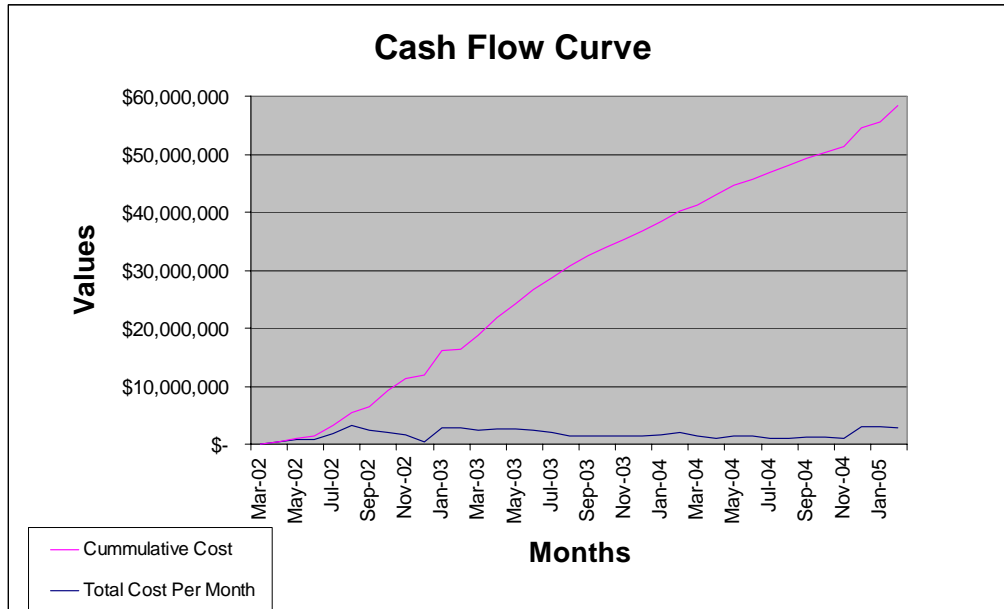


Figure 1-4a: Cash Flow Diagram – Cumulative and Monthly Cost

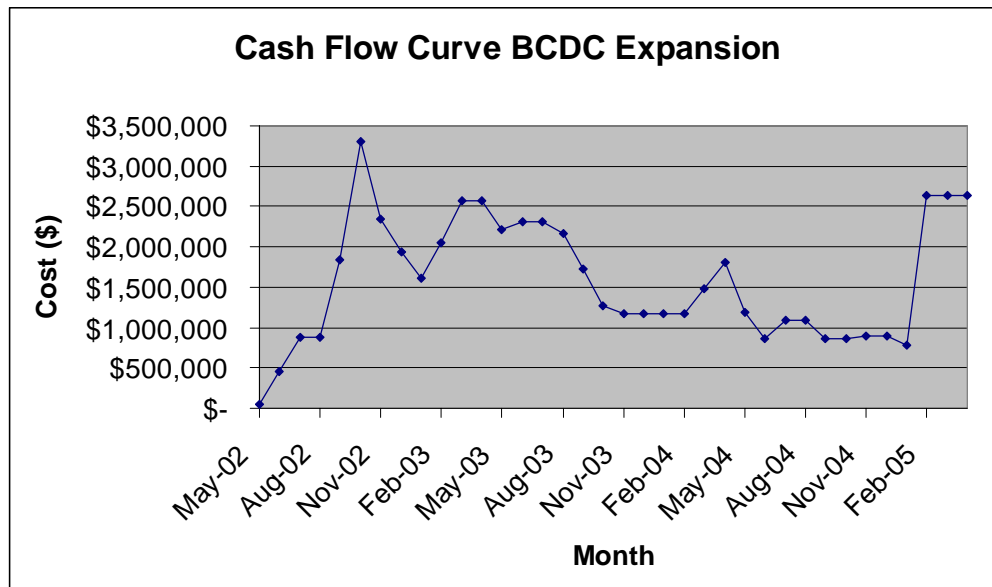


Figure 1-4b: Cash Flow Diagram – Enlarge Monthly Cost

*Thesis Proposal*

Upon completing the above analysis of the delivery method, cost and schedule of the BCDC Expansion the following alternatives have been proposed and analyzed.

This thesis proposes that if the BCDC Expansion project had selected a design-build delivery; new technologies could have been implemented in the construction process, a more economical and constructible design could have been created and alternative energy sources could have been considered. The design-build delivery would have possibly considered:

- The use of 3D AutoCAD drawings in place of physical mock-ups
- A more economical and constructible foundation design
- Extending the active solar system of the existing BCDC to the expansion

These alternatives have been analyzed and accessed in the following sections of this summary book.