



STATE OF ILLINOIS

OFFICE OF THE AUDITOR GENERAL

STUDY

STATE'S CONSTRUCTION
CONTRACTING METHODS

APRIL 2002

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*To the Legislative Audit Commission, the Speaker
and Minority Leader of the House of
Representatives, the President and Minority Leader
of the Senate, the members of the General
Assembly, and the Governor:*

This is our report of the Study of the State's Construction Contracting Methods. The study was conducted pursuant to Senate Resolution Number 147, which was adopted May 29, 2001.

The report is transmitted in conformance with Section 3-14 of the Illinois State Auditing Act.

A handwritten signature in black ink, appearing to read "William G. Holland".

*WILLIAM G. HOLLAND
Auditor General*

*Springfield, Illinois
April 2002*

REPORT DIGEST

STUDY

STATE'S CONSTRUCTION CONTRACTING METHODS

Released: April 2002



State of Illinois
Office of the Auditor General

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SYNOPSIS

Senate Resolution Number 147 directed the Auditor General to study the effects of eliminating the five separate specifications for bidding on State construction contracts. The Procurement Code requires the Capital Development Board to use the "multiple prime" construction contracting method for projects costing at least \$250,000.

- *Multiple prime* means the State contracts with more than one of the five trades (contractors) named in the Procurement Code: general, electric, heating/cooling, plumbing, ventilation.
- *Single prime* means the State contracts with only one contractor for the entire project, typically a general contractor.

In this study, we obtained input from State agencies, contractors, architects/engineers, and other states. These entities had varying perspectives which may have been influenced by their economic interests.

CAPITAL DEVELOPMENT BOARD. CDB provided several cost estimates for adding masonry as a separate (sixth) prime in a fiscal note and during this study – see footnotes in *Digest Exhibit 3*.

Date	Estimate	Cost Basis	Period	Cost/Year*
March 27, 2001 (Fiscal Note)	\$45,000,000	Expenditures	1 year	\$45.0 million
October 25, 2001	\$14,436,480	Appropriations	3-year project cycle	\$4.8 million
February 28, 2002	\$8,922,390	Appropriations	3 years	\$3.0 million

* Column added by the Office of the Auditor General to provide a consistent time period.

Regarding single prime versus multiple prime:

- In 1997, a CDB internal evaluation report said multiple prime costs 5 percent *less* than single prime.
- In 2001, CDB told us multiple prime costs 10 percent *more* and switching to single prime would save the State \$98.9 million over a 3-year project cycle.

CONTRACTORS. General contractors indicated in our survey that costs would remain the same or decrease under single prime while the remaining (or specialty) contractors indicated costs would remain the same or increase under single prime.

STATES. In our mail survey, 26 of 32 states that responded primarily used the single prime method of construction.

DESIGN/BUILD. In our survey, 26 of 32 states that responded used design/build (which has a combined contract for design and construction) for a small percentage of their projects.

The fiscal impact on the State, contractors, and subcontractors by changing to single prime is not conclusive due to a wide range of differing information. Therefore, the General Assembly may wish to consider establishing a pilot program that authorizes CDB to use various construction contracting methods on a limited basis.

REPORT CONCLUSIONS

The Illinois Procurement Code requires the Capital Development Board to use multiple prime contracting for projects over \$250,000 involving the construction or renovation of office buildings, prisons, warehouses, or other structures. The Procurement Code specifies the five prime contractors which are used if the work for two or more trades exceeds \$32,400 (see inset).

We obtained input from State agencies, contractors, architecture/engineering firms, professional trade associations, other states, and other governmental organizations. These entities had varying perspectives which may have been influenced by their economic interests.

CAPITAL DEVELOPMENT BOARD.

CDB said the single prime construction contracting method would be less expensive but it was up to the General Assembly to decide which method should be used by the State.

- ▶ **MULTIPLE PRIME** – used by CDB to obtain competitive sealed bids from up to five prime contractors (trades) named in the Procurement Code:
 - general
 - electric
 - heating/cooling
 - plumbing, and
 - ventilation
- ▶ **SINGLE PRIME** – this method awards the project to one contractor who can subcontract with various trades.

- **COST ESTIMATES.** In March 2001, CDB's fiscal note for Senate Bill 735 said making masonry a separate (and sixth) prime would cost an additional \$45 million per year. CDB officials told us this fiscal note was calculated in a matter of hours and was incorrectly based on 10 percent of all construction projects, not just masonry projects.
 - R** In October 2001, CDB provided us a revised cost estimate of \$14.4 million over a three-year project cycle (or \$4.8 million per year) based on projects in the system at the time.
 - R** In February 2002, CDB provided us another revised cost estimate of approximately \$8.9 million over a three-year project cycle (or \$3 million per year) based on actual new appropriations for fiscal years 1999-2001. It excluded pass-through funds, projects that were single prime (21%), and the increased administration cost that was included in CDB's fiscal note.
- **PROJECTED SAVINGS.** CDB stated that single prime would save the State 10.3 percent from each specialty trade eliminated for a total savings of \$98.9 million over a project cycle (3 years).

CDB's March 2001 fiscal note estimated a cost of \$45 million for adding masonry as a sixth prime contractor.

In February 2002, CDB provided us a revised cost estimate of \$8.9 million over a 3-year project cycle, or \$3 million per year.

R CDB's August 24, 2001 memorandum to the Auditor General listed 10 factors and assigned each factor precise costs of between 0.1 percent and 2.0 percent based on the experience of its staff.

R We could not corroborate these estimates due to a lack of supporting documentation for the memo.

CDB's 1997 report said multiple prime contracting was 5% less expensive.

CDB's current position is that multiple prime is 10% more expensive.

- **INTERNAL REPORT.** In 1997, a CDB report said that multiple prime was five percent less expensive than single prime. CDB has distanced itself from the report claiming management at the time restricted the report's scope.
- **TEST.** CDB did a test in 1993 and obtained both single and multiple prime bids for two University of Illinois projects in Chicago. Both projects received higher bids of at least 5½ percent for single prime.
- **DATA.** CDB had difficulty providing us a list of construction projects and change orders for projects closed in fiscal year 2001. CDB officials said their system had difficulty extracting the data and they were in the process of upgrading their software.

CONTRACTORS. General contractors indicated cost would remain the same or decrease under single prime while the remaining (or specialty) contractors indicated cost would remain the same or increase under single prime.

STATES. In our survey, 26 of 32 responding states said they primarily used the single prime construction contracting method.

DESIGN/BUILD. Design/build is a method which combines the contracts for architects and engineers (A/E) and construction into one contract. Over 80 percent (26 of 32) of the states responding to our survey used design/build for a small percentage of their projects, typically projects that need to be completed quickly. CDB and the University of Illinois would like the authority to use design/build for some projects.

The General Assembly may wish to establish a pilot program that authorizes various construction contracting methods on a limited basis.

\$250,000 THRESHOLD. The Procurement Code requires using multiple prime contracting for projects exceeding \$250,000. The Capital Development Board, the Department of Corrections, the University of Illinois, and the A/E associations indicated that the \$250,000 threshold requiring multiple prime contracting was low. The \$250,000 threshold has not been adjusted for inflation since it was established in 1995.

MATTER FOR GENERAL ASSEMBLY. The fiscal impact on the State, contractors, and subcontractors by changing to the single prime construction contracting method is not conclusive due to widely differing

information. Therefore, the General Assembly may wish to consider establishing a pilot program that authorizes the Capital Development Board to use on a limited basis various construction contracting methods. (pages 1-4)

BACKGROUND

Senate Resolution Number 147 directed the Auditor General to study the effects of eliminating the five separate specifications for bidding on State construction contracts. In March 2001, the Capital Development Board (CDB) issued a fiscal note for Senate Bill 735 which said making masonry a separate (sixth) prime would cost the State an additional \$45 million per year. The request for this study was a result of the fiscal note.

During fiscal year 2001, CDB completed a total of 248 projects that had 458 contracts using the five trades listed in the Procurement Code (see Digest Exhibits 1 and 2). The expenditures for these 248 projects were \$195,033,681: approximately 21 percent were single prime, while the remaining 79 percent were multiple prime. Most of the expenditures were for general contractors (\$117,985,180).

Digest Exhibit 1							
CONTRACTS BY TYPE OF PRIME							
Fiscal Year 2001							
Prime (Trade)	Single Prime		Multiple Prime		Total		
	Contracts	Expenditure	Contracts	Expenditure	Contracts	Expenditure	% of \$
General	122	\$29,670,581	86	\$88,314,598	208	\$117,985,180	60%
Electrical	13	\$3,041,172	70	\$21,001,572	83	\$24,042,744	12%
Heating	13	\$4,150,615	41	\$17,013,455	54	\$21,164,070	11%
Plumbing	11	\$3,804,163	60	\$14,904,846	71	\$18,709,009	10%
Ventilation	2	\$233,156	40	\$12,899,522	42	\$13,132,678	7%
TOTAL	161	\$40,899,688	297	\$154,133,994	458	\$195,033,681	100%
Note: Totals may not add due to rounding.							
Source: CDB data analyzed by the Illinois Auditor General's Office.							

Out of the 134 projects that were greater than \$250,000, there were 101 projects that were between \$250,000 and \$1 million; they totaled \$48 million. The remaining 33 projects were at least \$1 million each and totaled \$131 million, or 67 percent of \$195 million. Digest Exhibit 2 shows that 3 of the million dollar projects were single prime while the remaining 30 projects, totaling \$127 million (65%), were multiple prime.

33 of 248 projects totaled 67% of the expenditures. Each of these 33 projects were at least \$1 million.

CDB had difficulty providing all the data on projects closed during fiscal year 2001, including their change orders. CDB officials said the problem was in extracting specific data, including the fields we had requested, and they were in the process of upgrading their computer software. (pages 9-13)

Digest Exhibit 2						
PROJECTS BY SIZE						
Fiscal Year 2001						
Size	Single	Expenditure	Multiple	Expenditure	Total	Expenditure
Up to \$250,000	104	\$14,165,272	10	\$1,417,558	114	\$15,582,830
\$250,000 to \$999,999	54	\$22,669,758	47	\$25,713,718	101	\$48,383,477
\$1 million and more	3	\$4,064,658	30	\$127,002,717	33	\$131,067,375
TOTAL	161	\$40,899,688	87	\$154,133,994	248	\$195,033,681
Note: Totals may not add due to rounding.						
Source: CDB data analyzed by the Illinois Auditor General's Office.						

FISCAL NOTE

During the 92nd General Assembly, Senate Bill 735 was introduced to amend the Illinois Procurement Code and add masonry to the list of separate specifications required for building construction projects in excess of \$250,000.

In March 2001, CDB issued a fiscal note for Senate Bill 735 which said that making masonry a sixth prime would increase the State's construction cost by \$45 million per year. CDB said the fiscal note was calculated in a matter of hours and was not correct because it was based on 10 percent of all construction projects, not just masonry projects (see Digest Exhibit 3).

In the fall of 2001, CDB provided a revised cost estimate of \$14.4 million based on projects that were in the system at the time, if masonry was added as a sixth prime (or \$4.8 million per year). In February 2002, CDB provided an estimate based on appropriations for fiscal years 1999-2001 and excluded single prime contracts (21%). This revised estimate for making masonry a sixth prime was approximately \$8.9 million (or \$3 million per year). (pages 15-19)

Digest Exhibit 3 RANGE OF COSTS FOR MASONRY AS A SIXTH PRIME				
Date	Estimate	Cost Basis	Period Covered	Cost/Year
March 27, 2001 (Fiscal Note)	\$45,000,000	Expenditures	1 year	\$45.0 million
August 24, 2001	\$14,436,480	Appropriations	Not specified	n/a
October 25, 2001	* \$14,436,480	Appropriations	3-year project cycle	\$4.8 million
February 28, 2002	** \$8,922,390	Appropriations	** 3 years	** \$3.0 million
	*** \$6,415,212	Expenditures	3 years	\$2.1 million
Note: The Cost/Year column was added by the Office of the Auditor General to provide a consistent time period for perspective.				
* CDB estimate based on projects that were in the system at the time.				
** CDB estimate based on actual new appropriations for fiscal years 1999-2001. Excludes pass-through funds, projects that were single prime (21%), and the increased administration cost that was included in CDB's fiscal note. CDB said that ". . . construction does not occur neatly over a one year period, but rather varies anywhere from 1-6 years"				
*** CDB provided an estimate based on expenditures in response to our fieldwork summary but said the focus should be on the total funds appropriated for a project rather than the years over which expenditures are actually incurred.				
Source: CDB data analyzed by the Illinois Auditor General's Office.				

CDB provided a range of cost estimates for adding masonry as a sixth prime contractor.

COST OF MAKING MASONRY A SIXTH PRIME

CDB's Executive Director wrote to the Auditor General on August 24, 2001 that adding masonry as a sixth prime contractor would increase the cost of masonry by 10.3 percent due to 10 factors. CDB assigned each factor precise costs ranging from 0.1 percent to 2 percent.

CDB added that single prime would save the State 10.3 percent for eliminating each of the four specialty trades for a total of \$98.9 million.

We learned the memos were based on CDB's experience and professional knowledge in addition to discussions with other states and contractors; therefore, supporting documents were not available with the exception of published reports and some information about other states.

Because CDB also used these 10 factors to project \$98.9 million in savings to the State under a single prime method, it was important to verify CDB's methodology. If there had been supporting documentation for the memo, we could have:

Supporting documents were not available for CDB's cost estimate.

- Verified CDB's methodology (e.g., calculations, source of information), including how CDB assigned precise weights (which ranged from 0.1% to 2.0%) to each factor.
- Verified if the specific weights were valid.
- Determined if CDB considered cost shifting (from the State to the contractor).
- Determined if there were errors in assumptions or logic as there were in CDB's fiscal note.

Under single prime, the State has only one contractor to hold responsible.

CDB's August 24, 2001 memo listed the advantages of single prime and multiple prime construction contracting methods. CDB later stated that the memo "*was taken from over five written reports and information gathered from forty states*":

- Single prime is used by private businesses and federal government because they find that multiple prime results in "*higher bid costs, increased administration, more change orders and poor quality work . . .*"
- General contractors are experienced in hiring and coordinating subcontractors and suppliers "*. . . into a coordinated schedule. Moreover, the owner has one point of contact to hold responsible . . .*"
- Multiple prime allows direct payments so subcontractors' funds are not held by general contractors which can cause hardship.
- Multiple prime decreases bid shopping which is a major concern to specialty contractors who believe direct bids give the State the best price. (pages 17-26)

Under multiple prime, subcontractors are paid directly by the State so their payments are not held by general contractors.

PREVIOUS REVIEWS

An internal evaluation conducted by CDB in 1997 concluded that the State saves five percent by using multiple prime contracting. CDB has now distanced itself from the report and CDB officials said the evaluation team looked at construction contracting methods from an administrative standpoint and were directed to work within the existing statutes.

We also reviewed reports regarding single versus multiple prime from New York City, North Carolina, Illinois Mechanical and Specialty Contractors Association (IMSCA), and others. These reports came to differing conclusions (see inset).

OVERALL CONCLUSIONS

- ▶ **New York City** – Single is less expensive.
- ▶ **North Carolina** – Single and multiple both cost the same.
- ▶ **IMSCA** – Multiple is less expensive.

A 1995 report for the national Electrical Contracting Foundation/Mechanical Contracting Foundation, which concluded that multiple prime was more than five percent less expensive than single prime, said that “. . . preferences seemed to be driven largely by the particular interest of the parties in question whether general contractors, specialty contractors or construction authorities.”

CDB did a test in 1993 and obtained both single and multiple prime bids for two University of Illinois projects in Chicago. Both projects received higher bids of at least 5½ percent for single prime.

- CDB and University of Illinois officials said that specialty contractors did not provide competitive bids for single prime because they wanted to keep multiple prime contracting.
- A representative of the Illinois Mechanical and Specialty Contractors Association said that “*You cannot put any more or any less importance to them other than they show two instances where the separately bid price of a public project is less than a single bid price. . . . it is a basic business tenet that the more the risk the more the cost. I think the analogy of a bond rating and the bond's rate holds true here. A job where there is no risk for bid shopping will get the lowest price.*” (pages 27-34)

CONTRACTORS AND A/Es

In response to our mail survey questionnaire, the larger general contractors said single prime would have a positive or no impact on them, while the medium and small contractors said single prime would have a negative impact on them (see Digest Exhibit 4).

The professional trade representatives of specialty contractors and architects/engineers said the following:

- Illinois Mechanical and Specialty Contractors Association (IMSCA) representatives feel that multiple prime is the most cost effective method for the State. They said that changing to single prime would reduce competition, increase cost, increase bid shopping, increase administrative costs for general contractors (which would be passed on to the State), and give general contractors more control over payments to subcontractors.
- A/E representatives from the American Institute of Architects of Illinois, Consulting Engineers Council of Illinois, and Illinois Society of Professional Engineers said the effect on the design profession would be minimal but the effect on the State would be

Larger general contractors said single prime would have a *positive* impact on them.

Medium and small contractors said single prime would have a *negative* impact on them.

mixed. They said an advantage of single prime is efficiency in project management while an advantage of multiple prime is that the State can pay direct attention to the five prime contractors.

- The Central Illinois Builders of AGC [Association of General Contractors] said the association represents both general and specialty contractors who have different views: *“Nearly all of our general contractor members are in favor of the single contract method. They think this method allows them more control of a project. However, our specialty contractor members feel as strongly in support of multiple prime contracts. There are good points on both sides. Clearly, it is a very divisive issue for the industry.”* (pages 35-42)

Digest Exhibit 4				
SURVEY OF CONTRACTORS AND A/ES				
<i>Effect on Cost if State Switched to Single Prime</i>				
		Increase	No Change	Decrease
1. Design Cost	General	7%	68%	25%
	Specialty	23%	69%	8%
	Others	11%	78%	11%
	Total Contractors	14%	71%	14%
	A/Es	4%	39%	57%
2. Construction Cost	General	31%	23%	46%
	Specialty	74%	22%	5%
	Others	40%	43%	17%
	Total Contractors	50%	28%	23%
	A/Es	39%	29%	32%
3. Change Order Cost	General	31%	41%	28%
	Specialty	75%	22%	3%
	Others	43%	48%	9%
	Total Contractors	51%	35%	13%
	A/Es	14%	50%	36%
4. Litigation Cost	General	8%	57%	36%
	Specialty	50%	45%	5%
	Others	25%	64%	11%
	Total Contractors	29%	54%	17%
	A/Es	4%	58%	38%
5. Coordinating Contractor Cost	General	32%	27%	41%
	Specialty	69%	23%	8%
	Others	50%	43%	7%
	Total Contractors	51%	30%	19%
	A/Es	36%	46%	18%
Notes:				
<ul style="list-style-type: none"> • “Others” refers to contractors who were not clearly general or specialty contractors. • May not total to 100% due to rounding. 				
Source: Illinois Auditor General’s survey of contractors and A/Es (2001).				

SURVEY OF STATES

In our survey, 26 of 32 states that responded said they primarily used single prime. Only five responding states, including Illinois, use multiple prime. One state (Florida) primarily uses the “construction manager at risk” method in which the contractor assumes the risk for completing the project for the projected cost.

26 of 32 states responding to our survey use single prime contracting.

States wrote that single prime holds one contractor responsible, avoids gaps and overlaps between contracts, and simplifies management. They also noted that multiple prime improves payment to subcontractors and reduces bid shopping but is more difficult to coordinate and results in more administrative overhead. (pages 43-47)

DESIGN/BUILD

Over 80 percent of the states (26 of 32) who responded to our survey said they used design/build, however, only for a small percentage of their projects. Federal government agencies also use design/build for some projects. For example, the General Service Administration uses it for approximately 10 percent of its projects.

Design/build is a construction method that combines design and construction into one contract. States often use design/build for uncomplicated projects or for projects that need to be completed quickly. The Capital Development Board and the University of Illinois would like the authority to use design/build for some projects. Currently, the Illinois Procurement Code does not specifically authorize design/build. (pages 49-53)

THRESHOLD OF \$250,000

The Capital Development Board, the Department of Corrections, the University of Illinois, and the A/E trade representatives indicated that the \$250,000 threshold requiring multiple prime contracting was low. In fiscal year 2001, CDB completed 248 projects that had 458 contracts:

- The average for the 248 total projects which used 458 contractors was 1.8 contractors per project.
- The average for the 101 projects between \$250,000 and \$1 million was also 1.9 contractors per project (189 contractors).
- The average for the 33 projects greater than \$1 million that were multiple prime (which used 144 contractors) was 4.4 contractors per project.

CDB, Corrections, University of Illinois, and A/Es said the threshold requiring multiple prime contracts for projects over \$250,000 is low.

CDB noted that a reduction in administration could allow its project managers to devote more time to the larger, more complex projects. CDB officials noted that their project managers' job is paper intensive as they spend considerable time reviewing forms and bills and attending meetings. They said that single prime would free up project managers' time for more on-site monitoring. A higher threshold may also increase the opportunities for minority and female subcontractors. (pages 55-57)

CHANGE ORDERS

CDB has used change orders to settle disputes between contractors. This could be expensive because change orders may have a 26½% mark-up.

CDB officials said the agency has used change orders to avoid litigation and to settle disputes. Settling problems by using change orders also may not be the least expensive method for the State given the mark-up that must be paid. As shown in Digest Exhibit 5, change orders could have a 26½ percent mark-up. Change orders are not required to be competitively bid which may result in the State not getting the best price.

A mark-up is also permitted on deduct change orders to cancel work that had been bid. For example, a project had a deduct change order after the A/E developed a method to save the State \$450,000, however, the agency had to pay the contractor 18 percent (or \$81,000) for doing no work.

CDB did not keep records of such change orders to show the total amount paid for resolving disputes. Making payments through change orders, especially without tracking (e.g., coding, summarizing, reporting, authorizing) has the potential to become problematic if project managers pay to resolve disputes without making upper management fully aware of the real reason for the change. Change orders up to \$50,000 do not require the Director's review. (page 58)

Digest Exhibit 5 CONTRACTORS' MARK-UP	
18%	Contractors and subcontractors may add 18% for overhead and profit to the direct costs of the work performed by their firm.
6%	The contractor or subcontractor may add 6% to the cost of work performed by all lower tier subcontractors.
2½%	The coordinating contractor may be allowed a fee not exceed 2½% of any adjustment to the assigned contractor's contract if coordination duties are performed in a proper and timely manner.
26½%	Total
Source: CDB's Standard Documents For Construction, Procedure 760.2.B. and Procedure 812.5.D.7.	

HEATING/COOLING AND VENTILATION

University of Illinois officials said there are two related but separate primes that could be combined to save the State money. These

two primes are heating/cooling and ventilation contractors. University officials said the primes were separate decades ago when the industry was using steam and it now makes sense to combine the two primes because they must interact together and may even be bid by the same company. University officials noted that frequently there is a “gap” between the ventilation and heating/cooling which would be eliminated if these prime contracts were bid as one package.

North Carolina, Ohio, and New York, which are among the states that use multiple prime, combine heating/cooling and ventilation. (page 59)

University of Illinois officials suggested combining the prime contractors for heating/cooling and ventilation into one prime contractor to eliminate gaps.

CONCLUSION

According to CDB's fiscal note for Senate Bill 735 in March 2001, the State expends approximately \$450 million per year on construction projects managed by the Capital Development Board. These projects are for many different State agencies, including the University of Illinois and the Illinois Department of Corrections which have many construction projects.

During this study, we: obtained information from federal, State, and local organizations; surveyed other states, construction contractors, and architects and engineers; and met with the representatives of the professional trade associations for contractors and A/Es on CDB's Industry Advisory Committee.

These entities had differing perspectives regarding the various construction contracting methods. Even when the overall percentage for a group favored a certain method, the responses were not homogeneous and there was variance in the group. In order to provide an overall perspective, they may be broadly summarized as follows:

- The federal government generally uses single prime, along with some design/build, for its projects.
- 26 of 32 states responding to our survey primarily used single prime.
- Capital Development Board and the University of Illinois said single prime would be less expensive than multiple prime and want the option to use various methods. The University of Illinois also noted that single prime would take less time to administer than multiple prime.
- Department of Corrections favored single prime except for very large projects.
- Large general contractors said they would benefit from single prime.

There were differing views on the various construction contracting methods. CDB favored single prime.

- Medium and small contractors said they generally benefit from multiple prime.
- General contractors often said single prime would be less expensive for the State.
- Specialty contractors said single prime would be more expensive for the State.
- Architect and engineer associations said there would be little change in the cost to the State under either single or multiple prime.
- A/Es responding to our survey said project design would cost less. (pages 59-60)

**MATTER FOR CONSIDERATION
BY THE GENERAL ASSEMBLY**

Since the fiscal impact on the State, contractors, and subcontractors under the single prime construction contracting method is not conclusive due to widely differing information, the General Assembly may wish to consider establishing a pilot program to evaluate the effectiveness of various construction contracting methods that:

- Authorizes the Capital Development Board to use on a limited basis various construction contracting methods that may include, but need not be limited to the following: single prime, single prime with protected subcontractors, construction manager at risk, multiple prime, and design/build;
- Requires the Capital Development Board to keep complete and accurate records for the pilot program; and
- Requires the Capital Development Board to submit regular reports on the results of the pilot program to the General Assembly. (page 60)

AGENCY RESPONSES

Agency responses to this study are in Appendix L (see pages 137 – 147).

WILLIAM G. HOLLAND
Auditor General

WGH\AD
April 2002

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Chapter One

INTRODUCTION

Senate Resolution Number 147 directed the Auditor General to study the effects of eliminating the five separate specifications for bidding on State construction contracts. The study was also directed to determine the following (see Appendix A):

- Fiscal impact on the State and contractors.
- An analysis of design/build practices for State construction projects.

In March 2001, the Capital Development Board (CDB) issued a fiscal note for Senate Bill 735 which said making masonry a separate (sixth) prime would cost the State an additional \$45 million per year. The request for this study was a result of the fiscal note.

REPORT CONCLUSIONS

The Illinois Procurement Code requires the Capital Development Board to use multiple prime contracting for projects over a specified amount involving the construction or renovation of office buildings, prisons, warehouses, or other structures. Multiple prime contracting means that for a given project the State obtains competitive sealed bids directly from the five different prime contractors (trades) named in the Procurement Code: general, electric, heating/cooling, plumbing, and ventilation.

Multiple prime contracting needs to be used for projects that meet two criteria: the total cost of the project exceeds \$250,000 and there are at least two trades that each exceed \$32,400. Illinois has used multiple prime contracting since 1959.

In fiscal year 2001, CDB completed 248 projects using the five trades named in the Procurement Code which totaled \$195 million. One-third of the projects (87 projects) were multiple prime and totaled \$154 million (79%), while the remaining two-thirds of the projects (161) were single prime and totaled \$41 million (21%). Two-thirds of the expenditures (65%) were for 30 multiple prime projects that totaled \$127 million; each of these projects exceeded \$1 million.

CDB said it would be less expensive for the State to use the single prime construction contracting method (or single prime), which uses only one prime contractor (typically the general contractor) for the entire project. CDB and the University of Illinois wanted the option to use different construction contracting methods for various types of projects and the Department of Corrections favored single prime except for very large projects.

We obtained input from State agencies, contractors, architecture/engineering firms, professional trade associations, other states, and other governmental organizations. These entities had varying perspectives which may have been influenced by their economic interests.

STATES. In our mail survey questionnaire, 26 of 32 responding states said they primarily used single prime. Only five responding states (including Illinois) said they primarily used multiple prime. In addition, CDB said New York and North Dakota, who did not complete our survey, also use multiple prime contracting. One state (Florida) primarily uses the “construction manager at risk” method in which the contractor assumes the risk for completing the project for the projected cost.

CONTRACTORS. We randomly selected 400 construction contractors and 100 architects and engineers (A/Es), who were prequalified with CDB, and mailed them a survey questionnaire. The survey asked what effect single prime would have on the cost of design, construction, change orders, litigation, and coordination. General contractors indicated cost would remain the same or decrease under single prime while the remaining (or specialty) contractors indicated cost would remain the same or increase under single prime.

CAPITAL DEVELOPMENT BOARD. CDB said single prime would be less expensive but it was up to the General Assembly to decide which method should be used by the State. We reviewed current and past information at CDB that was relevant to this study, including the fiscal note to Senate Bill 735, past evaluations, and projected savings under single prime, along with several estimates provided by CDB on the cost of masonry (shown below). We believe that for decision makers to have perspective, a consistent time period (e.g., one year) is necessary; therefore, we have attempted to annualize dollar estimates in this report and have noted the time period used.

- **COST ESTIMATES.** In March 2001, CDB’s fiscal note for Senate Bill 735 said making masonry a separate (sixth) prime would cost an additional \$45 million per year. In August 2001, CDB officials told us this fiscal note was calculated in a matter of hours and was not correct because it was based on 10 percent of all construction projects, not just masonry projects, and provided us a revised estimate of \$14.4 million. Based on appropriations for fiscal years 1999-2001, CDB estimated in February 2002 that the cost for making masonry a sixth prime would be approximately \$8.9 million per project cycle (or \$3 million per year).

CDB's Cost Estimates for Making Masonry a Sixth Prime			
Date	Estimate	Cost Basis	Period Covered
March 27, 2001 (Fiscal Note)	\$45,000,000	Expenditures	1 year
August 24, 2001	\$14,436,480	Appropriations	Not specified
October 25, 2001	* \$14,436,480	Appropriations	3-year project cycle
February 28, 2002	** \$8,922,390	Appropriations	3 years **
	*** \$6,415,212	Expenditures	3 years

* CDB estimate based on all project dollars that were in the system at the time.
 ** CDB estimate based on actual new appropriations for fiscal years 1999-2001. Excludes pass-through funds, projects that were single prime (21%), and the increased administration cost that was included in CDB's fiscal note. CDB said that ". . . construction does not occur neatly over a one year period, but rather varies anywhere from 1-6 years"
 *** CDB provided an estimate based on expenditures in response to our fieldwork summary but said the focus should be on the total funds appropriated for a project rather than the years over which expenditures are actually incurred.

- **INTERNAL REPORT.** An 11-member CDB Quality Review Team in 1997 reported that the multiple prime construction contracting method (or multiple prime) was five percent less expensive than single prime. CDB has distanced itself from the 1997 report claiming management at the time restricted the scope of their report.
- **TEST.** CDB did a test in 1993 and obtained both single and multiple prime bids for two University of Illinois projects in Chicago. Both projects received higher bids of at least 5 1/2 percent for single prime. CDB and University of Illinois officials said that specialty contractors did not provide competitive bids for single prime because they wanted to keep multiple prime contracting.
- **PROJECTED SAVINGS.** CDB stated in an August 24, 2001 memorandum to the Auditor General that single prime would save the State 10.3 percent from each specialty trade for a total savings of \$98.9 million. In a separate memo on masonry, CDB listed 10 factors that would increase the cost of masonry by 10.3 percent if masonry was made a sixth prime. The memo assigned each of the 10 factors precise additional costs of between 0.1 percent and 2.0 percent based on the experience of its staff. We could not corroborate the specifics in the memo because the agency lacked supporting documentation for the memo.

DESIGN/BUILD. Design/build is a method which combines the design and construction processes into one contract. According to A/E representatives and contractors, the design/build method requires making decisions about a project early on because change orders can be more expensive later.

- Over 80 percent (26 of 32) of the states responding to our survey said they are authorized or have used design/build for a small percentage of their total project dollars, typically for projects that need to be completed quickly.
- CDB and the University of Illinois officials said they would like the authority to use design-build for some projects.

DATA. We requested a list of construction projects and change orders for projects closed in fiscal year 2001; however, CDB had difficulty providing this information. CDB officials said their system had difficulty extracting the data and they were in the process of upgrading their software.

\$250,000 THRESHOLD. The Illinois Procurement Code requires using multiple prime contracting for projects exceeding \$250,000. CDB officials said that multiple prime contracts require considerable time and paperwork which would be reduced under a single prime contract. Many contractors also noted that project management would improve under single prime. Since two-thirds of the construction expenditures were for approximately 10 percent of the projects (33 of 248) that exceeded \$1 million each, the \$250,000 threshold established in 1995 may need to be reassessed.

MATTER FOR GENERAL ASSEMBLY. The fiscal impact on the State, contractors, and subcontractors by changing to the single prime construction contracting method is not conclusive due to the wide range of differing information. Therefore, the General Assembly may wish to consider establishing a pilot program that:

- Authorizes the Capital Development Board to use on a limited basis various construction contracting methods that may include, but need not be limited to, the following: single prime, single prime with protected subcontractors, construction manager at risk, multiple prime, and design/build;
- Requires the Capital Development Board to keep complete and accurate records for the pilot program; and
- Requires the Capital Development Board to submit regular reports on the results of the pilot program to the General Assembly.

BACKGROUND

In fiscal year 2002, CDB's total appropriations were \$3.4 billion, an increase of more than \$500 million over fiscal year 2001. CDB's appropriations have increased significantly in the past several years and have nearly quadrupled since fiscal year 1998 (see Exhibit 1-1).

Approximately \$1.2 billion of CDB's appropriation in fiscal year 2002 was pass-through funds, such as to schools and local governments. CDB's headcount has increased at a slower rate than appropriations while construction awards have been between 502 and 596.

Exhibit 1-1					
APPROPRIATION, HEADCOUNT, AND CONSTRUCTION AWARDS					
Fiscal Years 1998 to 2002					
Fiscal Year	APPROPRIATION			Head Count	Construction Awards
	Total	New	Re-Appropriation		
1998	\$872,834,820	\$116,064,000	\$756,770,820	159	502
1999	\$1,677,191,182	\$745,927,300	\$931,263,882	159	596
2000	\$2,474,381,953	\$1,149,628,500	\$1,324,753,453	179	542
2001	\$2,910,755,084	\$1,218,247,630	\$1,692,507,454	186*	560*
2002	\$3,429,269,838	\$1,363,593,800	\$2,065,676,038	186*	560*
* FY2001 estimated, FY2002 projected.					
Source: Illinois Appropriation and Budget Books.					

CONSTRUCTION CONTRACT REQUIREMENTS

The original Illinois Purchasing Act was approved and enacted on July 11, 1957. The original Act did not address construction contracts let by the State at that time. This Act was amended on July 24, 1959 and added the following four subdivisions of work to be bid separately on contracts of more than \$25,000: plumbing; heating, piping, refrigeration and automatic temperature control systems; ventilating and distribution systems for conditioned air; and electric wiring.

On September 11, 1984, Public Act 83-1364 added general contract work bringing the total subdivisions of work to five. It also provided that if the total estimated cost of all work was less than \$100,000, separate bidding was not required.

In 1993, the Blue Ribbon Auditor General Committee on the State Procurement Code was charged with making recommendations to the General Assembly regarding changes to Illinois' procurement laws. The Blue Ribbon Committee's report included a recommendation to *"Require that separate specifications and awards be made for the five subdivisions of construction work where the project is \$250,000 or more."*

In 1995, Public Act 89-254 amended the Illinois Purchasing Act as a result of the Blue Ribbon Committee. This amendment increased the minimum amount requiring separate and independent bidding from \$100,000 to \$250,000. An additional result of the Blue Ribbon Committee was the elimination of the Purchasing Act and the enactment of today's Illinois Procurement Code. The Procurement Code was phased in and replaced the Purchasing Act in 1998.

Illinois Procurement Code

The Illinois Procurement Code requires State contracts to be awarded by competitive sealed bidding with few exceptions, such as small purchases, sole source procurements, and emergency purchases (30 ILCS 500/20-5).

In addition, the Procurement Code specifies that construction projects in excess of \$250,000 be bid with the five subdivisions of labor (see Exhibit 1-2).

The Procurement Code states that the contract shall be awarded to the lowest responsible and responsive bidder and that any procurement of construction not exceed \$30,000 without competitive sealed bidding (30 ILCS 500/20-15 and 20-20). The \$30,000 amount is adjusted each year for inflation and was \$32,400 when adjusted on January 30, 2001.

Exhibit 1-2 MULTIPLE PRIME REQUIREMENT
<p>“For building construction contracts in excess of \$250,000, separate specifications shall be prepared for all equipment, labor, and materials in connection with the following 5 subdivisions of the work to be performed:</p> <ol style="list-style-type: none"> 1. plumbing; 2. heating, piping, refrigeration, and automatic temperature control systems. . . 3. ventilating and distribution systems . . . 4. electric wiring; and 5. general contract work. <p>. . . All contracts awarded for any part thereof shall award the 5 subdivisions of work separately to responsible and reliable persons, firms, or corporations”</p>
<p>Source: State statute 30 ILCS 500/30-30.</p>

CDB Administrative Rules

The Procurement Code authorizes CDB to establish its own rules regarding construction purchases without competitive sealed bidding. CDB’s administrative rules state that the principles of competitive bidding and economical procurement practices shall apply to its construction contracts unless an exception is authorized by the Procurement Code. Projects in excess of \$250,000 must have separate specifications and bids for the five subdivisions of work specified in the Procurement Code with certain exceptions (contracts not exceeding \$30,000, construction manager services, emergency contracts, sole source and limited source, Illinois Correctional Industries, and art-in-architecture program procurement):

In the event that the work in a particular subdivision is less than \$30,000 or is an amount determined in writing by CDB to be so small as compared to the other contracts that a separate contractor would adversely interfere with scheduling and coordinating of the project, or so small that it is not likely that more than one bidder will bid, the work may be added to another subdivision as appropriate. (44 Ill. Adm. Code 910.130)

ILLINOIS’ CONSTRUCTION PROCESS

A construction project begins when a State agency informs the Capital Development Board that it needs a new building or needs to renovate an old one. The user agency puts together a “wish list” of its request which may be one of two types: programmatic or maintenance. Programmatic projects require new construction while maintenance projects keep an existing structure useable.

- **Budget.** CDB, the Bureau of the Budget, and the user agency develop a budget for the project based on cost estimates by CDB or the user agency. CDB and the Bureau

of the Budget, with user input, rank the maintenance projects requested by all State agencies in order of priority. The Bureau of the Budget then develops a Capital Program. The Capital Program is submitted to the Legislature for consideration. The Capital Program adopted by the Legislature goes to the Governor for approval.

- **A/E Selection.** After the Governor's approval and release of funds for a project, CDB advertises to architects and engineers (A/E). The selection of the A/E is qualification-based. CDB's A/E Selection Committee makes recommendations to the CDB Executive Director who, upon approval, sends a list of qualified firms to CDB's board members for decision. Once an A/E firm has been selected, CDB and the A/E discuss specifics, negotiate a price, and finalize the contract.
- **Design and Bid.** The A/E firm designs the building with input from the user agency and CDB. After design is complete, CDB seeks bids from construction contractors. CDB opens the bids and reviews any proposed product substitutions listed by the lowest responsible bidder before CDB awards the contract.

- **Construction.** Prior to the start of construction, the CDB project manager, the A/E, an A/E observer, the user agency, and all prime contractors participate in a pre-construction meeting to establish responsibilities and working relationships. The A/E and the coordinating contractor, with oversight by CDB, coordinate the work of contractors. In addition, CDB contracts with the A/E firm to hire an observer to record things such as workforce utilization and weather conditions at the work site. The observer files a daily report with the project manager to monitor progress or delays. The project manager has authority over the administration, coordination, and progress of the project and communicates with the user agency, A/E, and prime contractors.

Each month, pay and progress meetings are held involving the project manager, user agency, A/E, A/E's observer, and all prime contractors. They discuss contractors' pay requests, change orders, problems, and anticipated progress for the following month.

- ▶ **COORDINATING CONTRACTOR** – Contractor in charge of the project, frequently the general contractor.
- ▶ **PRIME CONTRACTOR** – Five trades are considered prime contractors by the Illinois Procurement Code: general, electrical, heating/cooling, plumbing, and ventilation.
 - Prime contractors (other than general contractors) are also known as **specialty** contractors or assigned contractors.
 - There are also trades besides these five, such as roofing, insulation, asbestos, etc.
- ▶ **SUBCONTRACTOR** – Contractor selected and hired by a prime contractor; traditionally they include the specialty contractors noted above.

- **Completion.** When a project is sufficiently completed to allow beneficial occupancy or utilization, the A/E will certify "substantial completion." At that time, the user agency, CDB, and the A/E attend a substantial completion inspection where a punch list is prepared outlining items that need to be completed by the contractors. CDB

requires the contractor to notify the A/E in writing when work is completed, including: completion of all punch list items; testing of equipment and systems; removal of tools, equipment, and materials from the site; and inspection by the A/E.

- **Acceptance.** When the project is completed, the A/E certifies that contractors have complied with all requirements of the contract and should receive final payment in full, including all retainage.
 - R The A/E files a Certificate of Final Acceptance and a Contractor Performance Evaluation for each contractor with the CDB project manager.
 - R The contractors submit the operations manuals, as-built drawings, and record drawings of the site, along with a Final Waiver of Liens for the full contract amount.
 - R A final acceptance inspection is required with the project manager, user agency, and all contractors. If the project is accepted as complete, the Certificate of Final Acceptance is signed by all parties.
- **Warranty.** After the user agency has been in the building for nine months, the A/E, user agency, and CDB project manager perform a walk-through of the building to identify any deficiencies. The user agency is responsible for notifying contractors and manufacturers of any warranty claims.

PROJECT MANAGERS

The Capital Development Board employs project managers to oversee the construction of its projects. Project managers are the communication link between the CDB, user agency, and A/Es. CDB's Project Manual Workbook identifies the project manager as central to the successful completion of a project.

According to the position description, project managers are responsible for the successful management of assigned projects from conception to closeout. Their responsibilities include the following:

- Ensuring proper execution of agency policies and procedures to effectively manage and control capital construction activities.
- Coordinating between CDB staff, user agencies, consultants, and contractors.
- Maintaining a current knowledge of applicable codes, cost trends, new construction methods, and new technological applications.
- Ensuring that project funds are spent properly and the project stays within budget.
- Minimizing the number of requests for proposals and change orders.

One way CDB measures the effectiveness of project managers is by their ability to deliver a project on schedule and within budget. The scope of this study did not include examining the role of project managers.

PROJECTS COMPLETED IN FISCAL YEAR 2001

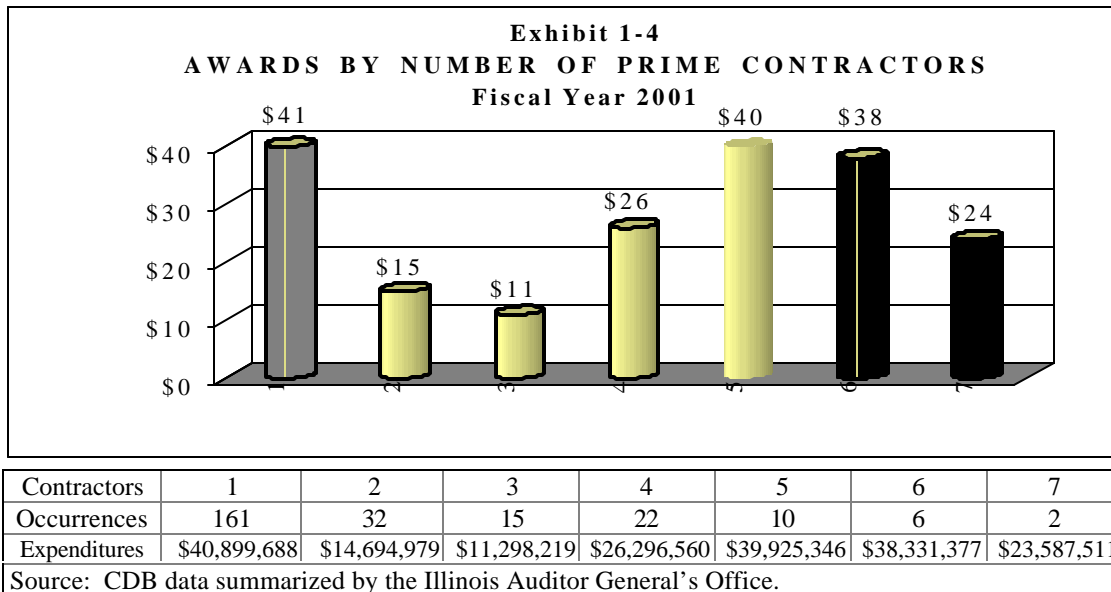
During fiscal year 2001, CDB completed a total of 248 projects that had 458 contracts using one or more of the five trades listed in the Procurement Code (e.g., excludes asbestos projects). The number of contracts for a single project ranged from one to seven. Most of the expenditures (60%) were for general contractors (\$117,985,180); see Exhibit 1-3 and Appendix J.

**Exhibit 1-3
CONTRACTS BY TYPE OF PRIME
Fiscal Year 2001**

Prime (Trade)	Single Prime		Multiple Prime		Total		
	Contracts	Expenditure	Contracts	Expenditure	Contracts	Expenditure	% of \$
General	122	\$29,670,581	86	\$88,314,598	208	\$117,985,180	60%
Electrical	13	\$3,041,172	70	\$21,001,572	83	\$24,042,744	12%
Heating	13	\$4,150,615	41	\$17,013,455	54	\$21,164,070	11%
Plumbing	11	\$3,804,163	60	\$14,904,846	71	\$18,709,009	10%
Ventilation	2	\$233,156	40	\$12,899,522	42	\$13,132,678	7%
TOTAL	161	\$40,899,688	297	\$154,133,994	458	\$195,033,681	100%

Note: Totals may not add due to rounding.
Source: CDB data analyzed by the Illinois Auditor General's Office.

The total expenditures for the 248 projects were \$195,033,681. Approximately 21 percent (\$40,899,688) were single prime (161 projects with one contract each), while the remaining 79 percent (\$154,133,994) were multiple prime (87 projects with 297 contracts); see Exhibits 1-3 and 1-4.



Over one-half of the projects (134 of 248) were greater than \$250,000 and expended 92 percent of the funds: \$179,450,852 out of \$195,033,681. A majority of the projects over \$250,000 were assigned to multiple prime contractors:

- 77 of 134 projects over \$250,000 were multiple prime and expended \$152,716,435 out of \$179,450,852 (85%).
- 57 of 134 projects were single prime and expended \$26,734,416 (15%). Usually projects over \$250,000 would be awarded to multiple contractors; however, the Procurement Code does not require multiple prime contracting in projects over \$250,000 for any trade estimated to cost less than \$32,400.

Out of the 134 projects that were greater than \$250,000, there were 101 projects that were between \$250,000 and \$1 million; they totaled \$48,383,477. The remaining 33 projects were at least \$1 million each and totaled \$131,067,375, or 67 percent of \$195,033,681. Three of the million-dollar projects were single prime while the remaining 30 projects, totaling \$127 million (65%), were multiple prime (see Exhibit 1-5).

Exhibit 1-5 PROJECTS BY SIZE Fiscal Year 2001						
Size	Single	Expenditure	Multiple	Expenditure	Total	Expenditure
Up to \$250,000	104	\$14,165,272	10	\$1,417,558	114	\$15,582,830
\$250,000 to \$999,999	54	\$22,669,758	47	\$25,713,718	101	\$48,383,477
\$1 million and more	3	\$4,064,658	30	\$127,002,717	33	\$131,067,375
TOTAL	161	\$40,899,688	87	\$154,133,994	248	\$195,033,681
Note: Totals may not add due to rounding.						
Source: CDB data analyzed by the Illinois Auditor General's Office.						

The 248 projects completed in fiscal year 2001 had 2,393 change orders which totaled \$19.1 million (9.8%) as shown in Exhibit 1-6. CDB procedures allow contractors to add an 18 percent markup on change orders and an additional six percent on subcontractors' change orders.

- The 87 multiple prime projects, which can be expected to be more complex, had 1,948 change orders that were 10.4 percent of project expenditures, while the 161 single prime projects had 445 change orders that were 7.4 percent of project expenditures.
- The average construction duration of a project was 314 days. Multiple prime projects averaged 351 days and single prime projects averaged 203 days.
- Average delay for projects was 141 days. Multiple prime projects were delayed 152 days and single prime projects were delayed 112 days.

Exhibit 1-6 PROJECTS COMPLETED Fiscal Year 2001			
	Multiple Primes	Single Primes	Total/Average
Projects – Number	87	161	248
Projects – Expenditure	\$154,133,994	\$40,899,688	\$195,033,681
Projects – Average	\$1,771,655	\$254,035	\$786,426
Change Orders – Number	1,948	445	2,393
Change Orders – Expenditure	\$16,058,500	\$3,020,539	\$19,079,039
Change Orders – Percent of Project Expenditure	10.4%	7.4%	9.8%
Construction Duration (Days)	351	203	314
Average Days Delayed	152	112	141
Average Contracts/Project	3.4	1.0	1.8
General	57.3%	72.5%	60.5%
Electric	13.6%	7.4%	12.3%
Plumbing	9.7%	9.3%	9.6%
Heating/Cooling	11.0%	10.1%	10.9%
Ventilation	8.4%	0.6%	6.7%
Total*	100%	100%	100%
* Note: May not total to 100% due to rounding.			
Source: CDB data analyzed by the Illinois Auditor General's Office.			

SCOPE AND METHODOLOGY

The objectives of this study are specified in Senate Resolution Number 147 which directs the study to determine the effects of eliminating the five separate specifications for bidding on State construction contracts. The Resolution also requested the study include the fiscal impact on the State, construction contractors, and subcontractors, and an analysis of design/build practices for State construction projects (see Appendix A).

To address these subjects, this study examined the construction contracting methods used by the Capital Development Board and by other states. We used criteria in statutes, regulations, policies, and procedures, in addition to prudent business practices. We primarily reviewed CDB's projects for fiscal year 2001 and gathered information by using the following methods:

- Met with representatives from CDB, Department of Corrections, and University of Illinois to obtain their perspectives on the various construction contracting methods.
- Analyzed CDB's memoranda to the Auditor General on the effects of adding a sixth prime contractor (masonry) and on the effect of switching to a single prime contractor.
- Reviewed 15 CDB projects closed in fiscal year 2001 to determine if there were change orders, litigation, and delays due to the use of multiple contractors.

- Examined reports by CDB, states, and other entities relating to the use of various construction contracting methods.
- Surveyed states to learn the construction contracting methods they used, including the advantages and disadvantages of various methods (see Appendix I).
- Obtained the perspective of construction contractors, subcontractors, architects and engineers, and their professional trade associations through meetings and mail survey questionnaires regarding construction contracting methods (see Appendices G and H).
- Analyzed the use of design/build for State construction projects.
- Determined the fiscal and other effects of changing from the current multiple prime construction contracting method to single prime.
- Identified possible alternatives to the current construction contracting methods.

ILLINOIS AUDITOR GENERAL'S SURVEYS	
Survey of Contractors	
• Population	1,592
• Sample	400
• Responses	190
Survey of A/Es	
• Population	902
• Sample	100
• Responses	28
Survey of States	
• Population	50
• Sample	50
• Responses	32

We encountered problems in obtaining complete and reliable information which delayed the fieldwork for this study. CDB did not have complete documentation for some important issues being addressed (listed below), revised its estimate twice regarding the fiscal note, rejected the conclusions of its 1997 internal evaluation, and took three months to provide us a complete list of projects closed in fiscal year 2001. Such factors raise questions about weaknesses over these management controls.

- CDB did not have supporting documentation for the methodology used in its memo to the Auditor General which said that making masonry a sixth prime would increase the cost of masonry by 10.3 percent and switching to single prime would decrease the cost of each specialty trade by 10.3 percent.
- After the draft report had been sent to CDB for review in March 2002, CDB informed us that it had located the documentation for its 1997 internal evaluation which said multiple prime was saving the State five percent.
- CDB did not have bid information on the Clinical Sciences Building project at the University of Illinois as it did for the Molecular Biology Laboratory. In 1993, CDB used dual-bidding for these two projects.
- CDB revised the cost of adding masonry as a sixth prime in August 2001 and in February 2002.
- CDB's software did not track settlements with contractors that were awarded using change orders (discussed in Chapter Eight), nor did it track requests for change orders that were denied. CDB officials said it can, however, be done manually.

CDB had difficulty providing all the data on projects closed during fiscal year 2001, including their change orders. CDB officials said the problem was in extracting specific data, including the fields we had requested, and they were in the process of upgrading their computer software. In its February 28, 2002 memo, CDB stated the following:

Our current computer system has met and continues to meet the agency's financial reporting needs. . . . [H]istorically the system has been utilized mainly as a tool to assist with the payment of contractors and architects/engineers rather than a management tool. The Capital Development Board staff is still learning how to use the [COGNOS] system to be sophisticated enough to perform applications of extensive analytics. Therefore, the problem arose not from the data itself, but rather the various ways in which it was requested to be presented

The Capital Development Board has recognized the inflexibility of the reporting capabilities of the system and has been working towards addressing these inadequacies. . . . The agency is in the process of the finalization of the selection of a vendor. The new software should address the need for additional management reports.

. . . At all times the agency made its best effort to supply the Office of the Auditor General with complete and accurate data. The Capital Development Board believes the Office of the Auditor General would have encountered similar difficulties had it attempted to extract the data itself.

Initial inaccuracies occurred because the extraction parameters set for COGNOS [report writer] did not recognize completed phases of a project. Complex projects with various parts are broken into phases, each representing a project. However, within the system they are listed with the same project number but each part is given a unique phase number. . . . Other situations listed [in an OAG draft fieldwork summary] as "inaccurate data", were actually to add fields at the request of the Auditor General's Office.

We met with CDB personnel on September 13, 2001 to request a list of projects completed during the last five fiscal years. After multiple attempts, we received the data on December 12, 2001 and determined there were 87 multiple prime projects completed in fiscal year 2001 ("primes" are the five trades specified in the Illinois Procurement Code – e.g., do not include asbestos removal). These 87 projects included 15 projects we had reviewed earlier. Our review of the 15 projects did not show any had change orders or litigation due to the use of multiple contractors (see Chapter Three); most change orders were coded as user agency changes or undiscovered conditions.

We also found some errors while discussing project delay dates with CDB. Two of seven scheduled substantial completion dates had the wrong year in CDB's computer (e.g., project was completed before it was awarded).

The following chapters of the report address CDB’s fiscal note to Senate Bill 735, impact on the State and contractors by changing to a single prime construction contracting method, methods used by other states, use of design/build, and other issues.

Chapter Two

FISCAL NOTE ON MASONRY

CHAPTER CONCLUSIONS

In March 2001, the Capital Development Board (CDB) issued a fiscal note for Senate Bill 735 which said that making masonry a sixth prime would increase the State's construction cost by \$45 million per year. CDB informed us during the August 24, 2001 entrance conference for this study that their fiscal note should have been \$14,436,480. CDB officials said they prepared the fiscal note in a matter of hours and calculated the cost based on all projects instead of just the masonry component of projects.

- On October 25, 2001, CDB officials said the \$14.4 million cost estimate was based on a "project cycle" that was between 2½ to 3 years. Using a three-year project cycle, the cost of making masonry a sixth prime would equal \$4.8 million per year.
- On February 28, 2002, CDB provided us with an estimate which excluded the 21 percent for single prime contracts and said the estimate for adding masonry as a sixth prime would be approximately \$8.9 million (or \$3 million per year).

FISCAL NOTE

During the 92nd General Assembly, Senate Bill 735 was introduced to amend the Illinois Procurement Code and add masonry to the list of separate specifications for building construction projects in excess of \$250,000 (see Exhibit 2-1). Currently masons are subcontractors to a general contractor unless they bid as a general contractor.

The supporting documents for CDB's fiscal note to Senate Bill 735 stated that making masonry a separate (sixth) prime would raise the cost of construction projects by 10 percent for the following reasons (see Appendix B for details):

Exhibit 2-1 TYPES OF BIDS REQUIRED	
Project Amount	Type of Bid Required
Less than \$32,400	None
\$32,400 to \$250,000	Competitive bid
Greater than \$250,000	Competitive bid with separate sealed bids for the 5 subdivisions of work

Source: Illinois Procurement Code and CMS CPO Bulletin #10.

<u>Cost</u>	<u>Increase</u>	<u>Expenditure Increase</u>
• Design firm costs.....	1%.....	\$4.5 million
• Coordination contractor costs.....	5%.....	\$22.5 million
• Masonry administrative cost	4%.....	<u>\$18.0 million</u>
	10%	\$45.0 million

The fiscal note and CDB’s supporting documentation showed that average spending per year on CDB construction contracts was \$450 million; therefore, the fiscal impact on construction contracts would be \$45 million per year. In addition, the agency’s administrative cost would rise \$1,010,180 the first year, and \$600,000 each year thereafter, for expenses such as 11 additional personnel and their furniture, equipment, computers, and training. Senate Bill 735 did not pass.

Based on an August 2001 CDB estimate, the total expenditure for masonry was \$140,160,000 over a project cycle, or approximately \$47 million per year using a three-year project cycle. Therefore, a fiscal note that said making masonry a separate prime would nearly double (\$45 million) the annual cost of masonry should have raised some questions. However, CDB did not perform a reasonableness review before they submitted the fiscal note to the General Assembly even though CDB officials said they seldom issue such high dollar (e.g., \$45 million) fiscal notes.

At the August 24, 2001 entrance conference for this study, CDB officials said their fiscal note during the spring 2001 legislative session was prepared in only a few hours and calculated the 10 percent increase based on all construction projects, not just projects with masonry.

According to CDB’s written explanation during this study, if masons were made separate prime contractors, additional costs would occur for the following reasons:

- Many projects exceeding \$250,000 have a small amount of masonry work. Masonry covers all brick installation whether the brick is interior or exterior; concrete block, tile, or fired stone; or material set with mortar or grout.
- Making masonry a separate prime would increase the cost because if a mason is not working for the general contractor “*schedules . . . must be coordinated, requiring more negotiation throughout the life of the project.*” In addition, the coordinating contractor receives a mark-up for coordination of all change orders by a prime contractor according to CDB policy, but “*when the mason is a sub[contractor], the coordination mark-up does not exist.*”
- Masons must be pre-qualified to be a separate prime contractor which requires purchasing bonds and insurance that add to their cost.
- If masons were made a sixth prime, CDB would need to administer an additional contract and handle another set of documents for bidding, construction, and billing, thereby increasing the agency’s work load.

MEMORANDA TO AUDITOR GENERAL

CDB's Executive Director wrote two memoranda to the Auditor General on August 24, 2001. The memorandum on the "Review of Adding a Sixth Separate Prime Contract (Masonry) to the Procurement Code" concluded that making masonry a sixth prime would increase the cost of masonry projects by 10.3 percent.

The second memorandum was regarding "Project Delivery Comparisons of a Single Prime/General Contractor Construction Contract Award System Compared to a Multiple Prime/Specialty Contractor Award System." This memo compared the advantages and disadvantages of single and multiple prime construction contracting methods and is discussed in the next chapter. See Appendices C and D for the memoranda.

In its fiscal note, CDB had estimated that adding masonry as a separate sixth prime would cost \$45 million more per year, but in its August 24, 2001 memorandum to the Auditor General, CDB estimated the cost would be \$14.4 million because the agency had not excluded projects without masonry.

CDB changed its calculation from a one-year time period used in the fiscal note to a three-year project cycle in the memoranda to the Auditor General but did not state this change in the memos or in other communications with us.

- | |
|--|
| <ul style="list-style-type: none">▶ MULTIPLE PRIME – This method is used by CDB to bid construction projects over \$250,000 using the 5 trades listed in the Illinois Procurement Code.▶ SINGLE PRIME – This method awards the project to one coordinating contractor who subcontracts with various trades. |
|--|

After we asked questions about this revised amount during an October 25, 2001 meeting, CDB officials stated that the \$14.4 million was over a project cycle that was 2 ½ to 3 years. Using a three-year project cycle, \$14.4 million for making masonry a sixth prime would equal \$4.8 million per year as compared to \$45 million per year as stated in the fiscal note.

CDB's memorandum to the Auditor General regarding the cost of making masonry a sixth prime noted the following:

- 73 percent of CDB's projects have masonry averaging 8 percent of project value. CDB had \$2.4 billion in on-going projects making the value of masonry \$140,160,000: \$2.4 billion x 73 percent x 8 percent = \$140,160,000. [CDB did not exclude the projects that were already single prime in this calculation.]
- Making masonry a separate prime would add 10.3 percent to the \$140,160,000 or \$14,436,480 over a project cycle. [The next chapter discusses the 10.3 percent used in CDB's masonry memo.]

COST OF MAKING MASONRY A SIXTH PRIME

CDB’s 10.3 percent calculation is important not only in determining the effect of making masonry a sixth prime, but also in determining the effect of replacing multiple prime with single prime. CDB officials said single prime would cost the State less than multiple prime.

In its masonry memorandum to the Auditor General, CDB explained how they arrived at the 10.3 percent calculation. The memo listed 10 factors in which construction costs would increase \$14,436,480 if masonry was added as a sixth prime. The second memo also said that eliminating each prime would decrease the cost of that prime by 10.3 percent. We learned the memos were based on their experience and professional knowledge in addition to discussions with other states and contractors; therefore, supporting documents were not available with the exception of published reports and some information about other states.

CDB’s memo calculated the cost of adding masonry based on all active construction projects of \$2.4 billion. Because CDB said these projects span varying number of years (i.e., 1 to 6 years), it was not possible to use this \$2.4 billion appropriation amount to calculate the annual cost of making masonry a sixth prime.

Therefore, if we calculate the cost per year using the average expenditure amount in the fiscal note that CDB submitted to the General Assembly, the cost of making masonry a sixth prime would be \$2,138,404 per year:

\$450,000,000	(CDB’s fiscal note average expenditures per year)
x 79%	(multiple prime projects)
x 73%	(projects with masonry)
x 8%	(value of masonry)
x 10.3%	(CDB’s estimate impact)
= \$2,138,404 per year	

The \$2,138,404 compares to CDB’s fiscal note of \$45 million more per year for making masonry a sixth prime (see Exhibit 2-2).

Although CDB provided cost estimates based on more than one year, we believe that for decision makers to have perspective, a consistent time period is necessary, such as a one-year time period. Therefore, we have attempted to annualize dollar estimates in this report and have noted the time period used.

Exhibit 2-2				
RANGE OF COSTS FOR MASONRY AS A SIXTH PRIME				
Date	Estimate	Cost Basis	Period Covered	Cost/Year
March 27, 2001 (Fiscal Note)	\$45,000,000	Expenditures	1 year	\$45.0 million
August 24, 2001	\$14,436,480	Appropriations	Not specified	n/a
October 25, 2001	* \$14,436,480	Appropriations	3-year project cycle	\$4.8 million
February 28, 2002	** \$8,922,390	Appropriations	** 3 years	** \$3.0 million
	*** \$6,415,212	Expenditures	3 years	\$2.1 million
<p>* CDB estimate based on all project dollars that were in the system at the time. ** CDB estimate based on actual new appropriations for fiscal years 1999-2001. Excludes pass-through funds; projects that were single prime (21%); and the increased administration cost that was included in CDB's fiscal note. CDB said that ". . . construction does not occur neatly over a one year period, but rather varies anywhere from 1-6 years . . ." *** CDB provided an estimate based on expenditures in response to our fieldwork summary but said the focus should be on the total funds appropriated for a project rather than the years over which expenditures are actually incurred.</p>				
Source: CDB data analyzed by the Illinois Auditor General's Office.				

After the auditors provided CDB a draft fieldwork summary, CDB replied on February 28, 2002 that the actual increase in the cost of making masonry a sixth prime over the "life of the projects" would have been over \$6 million using expenditures as a cost basis:

The Capital Development Board recognizes and we hope the Auditor General does as well, the difficulty in making assessments regarding construction projects. The difficulty arises from the fact that unlike most procurement, construction does not occur neatly over a one year period, but rather varies anywhere from 1-6 years including planning, design, construction and close out of a project. The average time it takes to complete a project fluctuates as well depending on the existing projects currently in the pipeline. In arriving at its original estimate in the Fiscal Note (\$45,000,000), the Capital Development Board utilized as its dollar basis an approximate average of annual project expenditures over the last 2 years to arrive at \$450,000,000 (Actual figures for FY00 and FY01, including A/E fees were \$416,662,956 and \$483,801,217 respectively). The Capital Development Board then applied the 10% increase in cost basis to this number to arrive at a cost of \$45,000,000. In the limited time the Capital Development Board had to review the request and prepare the fiscal note, the agency utilized total project costs rather than the costs strictly associated with masonry. In fact, given the limited time, even if the Capital Development Board had detected this, it would not have had a number available for masonry work since it is not tracked separately by the agency. In utilizing the total project dollars, the Capital Development Board's number actually reflected the impact of multiple primes across all trades, rather than a specific trade. The Capital Development Board brought this fact to the attention of the Auditor General's Office at the opening conference. Following the Capital Development

Board’s original Fiscal Note calculation method, had the appropriate estimated masonry dollars been utilized, the actual increase in cost over the life of the projects would have been \$6,228,360.

Average Expenditures FY00 and FY01	\$450,000,000
Multiple Prime Projects *79%	\$355,500,000
Projects with Masonry Work *73%	\$259,515,000
Total Dollar Value Masonry Work *8%	\$20,761,200
Fiscal Note estimate *10%	\$2,076,120
Fiscal Note Impact over life of Project	\$6,228,360
CDB’s Estimated Impact *10.3%	\$2,138,404
CDB’s Estimated Impact over Life of Project	\$6,415,212

The Auditor General does recognize the difficulty in making assessments regarding construction projects. The difficulty was compounded when CDB did not state in its two August 24, 2001 memos that it was using a different time period (project cycle) than the fiscal note (one year). It was only after we asked questions during the October 25, 2001 meeting that CDB officials said the estimate was for a project cycle and that the project cycle was 2½ to 3 years.

To ensure we understood correctly, the minutes of our October 25, 2001 meeting were sent to CDB for review on November 15, 2001. CDB made a few changes to the minutes on December 4, 2001 but did not make any changes to the three-year project cycle period. In February 2002, CDB offered other cost estimates if masonry was made a sixth prime (e.g., \$3 million) and said that construction does not occur neatly over a one year period, but rather varies anywhere from 1-6 years. The length of the project cycle needs to be clearly specified and used consistently so that purported savings can be given some perspective.

Chapter Three

IMPACT OF SINGLE PRIME CONTRACTING ON THE STATE

CHAPTER CONCLUSIONS

CDB stated in an August 24, 2001 memorandum that using a single prime construction contracting method would save the State 10.3 percent for eliminating each of the four specialty trades and save the State a total of \$98.9 million. CDB said single prime would be less expensive but it was up to the General Assembly to decide which method should be used by the State.

CDB listed 10 factors that would save the State money and each factor was assigned precise costs ranging from 0.1 percent to 2 percent. There was a lack of documentation to support the specifics in CDB’s memo and other information indicated that the savings may not materialize.

COMPARISON OF SINGLE VS. MULTIPLE PRIME

In an August 24, 2001 memorandum to the Auditor General, CDB compared single versus multiple prime contracting construction contracting methods. The memo was titled “Project Delivery Comparisons of a Single Prime/General Contractor Construction Contract Award System Compared to a Multiple Prime/Specialty Contractor Award System” (see Appendix D). The memo also listed the advantages of single prime and multiple prime construction contracting methods (see below). CDB wrote in a February 28, 2002 memo that the August 24, 2001 memo “*was taken from over five written reports and information gathered from forty states.*”

Single Prime	Multiple Prime
<ul style="list-style-type: none">• Single prime is preferred by private businesses and federal government because they find that multiple prime results in <i>“higher bid costs, increased administration, more change orders and poor quality work”</i>• According to general contractors, separate bids result in more delays and litigation: <i>“The threat of litigation occurs when one contractor’s problems affect the schedules of up to five other contractors who all must</i>	<ul style="list-style-type: none">• Allows direct payments so subcontractors’ funds are not held by general contractors which can cause hardship.• Decreases bid shopping which is a major concern to specialty contractors who believe direct bids give the State the best price.• Results in fewer change orders according to specialty contractors who add that

Single Prime	Multiple Prime
<p><i>cooperate to allow a schedule to work for the State. If just one of these contractors chooses not to work together, a coordination general contractor is severely limited to motivating a specialty contractor to cooperate”</i></p> <ul style="list-style-type: none"> • General contractors are experienced in hiring and coordinating subcontractors and suppliers “. . . into a coordinated schedule. Moreover, the owner has one point of contact to hold responsible” • General contractors believe they can save by obtaining the best low price and hiring “firms they know will work well together with them.” Quality, schedule and cost are the key items that are required for effective use of State construction projects. 	<p>changes cost less because a mark-up does not need to be paid to a general contractor.</p> <ul style="list-style-type: none"> • Those who favor multiple prime do so because they believe public owners are not good at managing projects: “<i>Those in favor of separate prime contracts also agree that management and coordination of the construction process is critical to [the] project, but note that it is not the bidding process but the absence of capable management by the public owners that cause[s] the problems in schedule delays and problems in installing and coordinating up to five different contractors’ services on a single project.</i>”

The memo notes that CDB is currently managing 1,200 projects valued at approximately \$2.4 billion with approximately 40 percent of the work (or \$960 million) being performed by specialty contractors. The memo adds that the four specialty trades usually even out in value per project so each trade has approximately \$240 million worth of work. The memo concludes with the following:

As established by the ten detailed items in the masonry review, it is clear that 10.3% savings can be achieved by bidding all construction work under the single competitive bid of a general contractor per project, versus the current method of directly contracting with four additional specialty contractors.

The 10.3% translates into savings from each specialty trade of \$24,720,000. In total, \$98,880,000 can be saved for the State of Illinois by going to a single competitively bid general contract delivery method.

CDB said single prime would be less expensive but it was up to the General Assembly to decide which method should be used by the State. The next section discusses the 10.3 percent memo, including questions about its accuracy.

CDB’S TEN FACTORS

CDB’s Executive Director wrote two related memoranda to the Auditor General dated August 24, 2001 regarding the State’s construction methods. Earlier we discussed the memo on the advantages and disadvantages of single prime contracting. The other memo listed 10 factors that would increase the cost of masonry by 10.3 percent if masonry was made a sixth prime (see Exhibit 3-1 and Appendix C).

CDB also used this masonry memo for calculating savings to the State, if a single prime construction contracting method was used, by reversing the logic and the percentage. In other words, adding a prime increases the State's construction cost for that prime by 10.3 percent and subtracting a prime decreases the construction cost for that prime by 10.3 percent.

Exhibit 3-1
CDB'S 10 COST FACTORS
FOR ADDING MASONRY AS A SIXTH PRIME

1. Coordination of the project by the General Contractor of an additional prime contractor. (.5% = \$700,800)
2. Coordination of the prime masonry contract in the field with the cost difference of a foreman leading a masonry crew, versus a project manager or superintendent of a qualified prime contractor capable of managing other general and specialty contractors. (.5% = \$700,800)
3. The liability of the 2.5% assignment fee that could go to the general contractor as the management fee assigned between the base contract and the value of change orders for a possible masonry trade. (.1% = \$140,160)
4. The design firms have to break out additional, separate specifications and drawings for bid packages, field administration, pay packages and closeout activities. (1.6% = \$2,242,560)
5. The overhead associated with the Masonry contractor to supply staff to be able to function as the coordinating contractor, coordinate bonds, payment requests, insurance and all other CDB requirements. (1.6% = \$2,242,560)
6. The bonding costs for a smaller contractor are proportionately higher for small firms with limited general contracting experience than for strong general contractors. (.2% = \$280,320)
7. There is a lack of masonry contractors throughout the state that will bid jobs as a prime contractor. This will result in significantly higher bids due to the lack of competition. (2% = \$2,803,200)
8. CDB's costs will increase due to additional coordination, increased bidding, increased billing and voucher processing, increased prequalification review and many additional functions too numerous to mention. (.7% = \$981,120)
9. Additional litigation will result when you add another prime contractor. The result will be more delay claims due to additional coordination of the trades. (1.1% = \$1,541,760)
10. Bid Shopping/Peddling occurs throughout the industry as a way to control project costs. Currently, general contractors will shop the masonry price to several masonry subcontractors to achieve the lowest cost. The bid process for a separate masonry trade will result in higher costs to the State. (2% = \$2,803,200)

Source: CDB's August 24, 2001 memo to the Auditor General.

DOCUMENTATION

The Capital Development Board provided the Auditor General a memo which listed 10 factors that would cost the State 10.3 percent more if masonry was made a separate (sixth) prime contractor. However, CDB did not have supporting documentation for the methodology used to derive its 10 factors.

Because CDB also used these 10 factors to project \$98.9 million in savings to the State under a single prime method, it was important to verify CDB's methodology. If there had been supporting documentation for the memo, we could have:

- Verified CDB's methodology (e.g., calculations, source of information), including how CDB assigned precise weights (which ranged from 0.1% to 2.0%) to each factor.
- Verified if the specific weights were valid.
- Determined if CDB considered cost shifting (from the State to the contractor).
- Determined if there were errors in assumptions or logic as there were in CDB's fiscal note.

We could not determine if CDB factored in such considerations without the supporting documentation; therefore, we tried to corroborate the information with CDB personnel, contractors, A/Es, trade associations, and other governmental agencies as discussed below:

- **Litigation.** We reviewed 15 multiple prime projects closed in fiscal year 2001 and CDB indicated only one (Decatur Correctional Center – \$703,965) had settlements resulting from the use of multiple prime contracting. CDB agreed there was no litigation or settlement due to multiple prime for the remaining 14 projects.
 - R CDB officials said they looked at settlements in the past three years to determine which were due to delays caused by multiple prime contractors. CDB said major settlements for all projects (not just those due to the use of multiple primes) totaled \$11.7 million for last year. CDB failed to provide any documents supporting their \$11.7 million tabulation.
 - R In addition to the Decatur Correctional Center, CDB identified another project closed in fiscal year 2001 which had settlements or litigation (Joliet Correctional Center – \$438,729). Multiple prime contracting may have made the situation more difficult, however, CDB documents indicated the settlements were partly due to user agency changes, undiscovered conditions, and asbestos which may have been the same whether the project was single prime or multiple prime.
 - R In our surveys, 54 percent of the contractors and 58 percent of the A/Es said there would be no change in litigation by switching to a single prime (see Exhibit 5-1).

- **Competition.** CDB officials said they contacted general and specialty contractors to ask if the contractors would be interested in bidding on masonry as a prime contractor and only 13 contractors said they would be interested which indicated a lack of competition to CDB. If masonry was made a separate prime and opened for bidding, more subcontractors may become interested in submitting bids directly to the State.
 - R Even if there are not sufficient masonry contractors who could bid as a prime contractor, this may not apply to the other four prime contractors (i.e., electrical, plumbing, heating/cooling, and ventilation).
 - R In our survey, 22 contractors said that if the State switched to single prime they would no longer bid on CDB projects.
 - R Larger projects might also result in higher bonding costs for some bidders and that may further reduce the number of bidders.
 - R Under a single prime method, a general contractor might only choose selected subcontractors which could make it difficult for others to bid on a project and thus decrease competition.

- **Bonding.** Bonding agents we contacted said the financial condition, worth, liquidity, and experience of the contractor affects bonding rates. Currently, subcontractors who work for prime contractors may need to be bonded in some cases if the State switched to a single prime method. The prime contractors would become subcontractors under single prime and may still need to be bonded in some cases.

- **Bid Shopping.** CDB officials said bid shopping/peddling saves general contractors money which the State would not be able to save if masonry was made a sixth prime. CDB officials said actual savings from bid shopping are two percent to eight percent but they used the lower number of two percent. The State may be able to lower its costs if subcontractors were selected before the contract is awarded and if the coordinating contractor passed the savings from bid shopping to the State. Subcontractors, however, are not always selected before the bids are submitted and the coordinating contractors may not pass the savings to the State.
 - R In our survey, 20 of 52 (38%) general contractors who answered the question on bid shopping said bid shopping could or would increase under a single prime method. Bid shopping is a way for general contractors to lower cost by getting subcontractors to bid against each other.
 - R Many specialty contractors said in our survey that bid shopping would have a negative effect (e.g., general contractors would increase their own profits by decreasing the amount paid to subcontractors and by not passing the savings to the State). Some said that bid shopping lowers the amount paid to subcontractors and that may lead to lower quality.

- **Coordinating Costs.** In our survey, 51 percent of responding contractors (32 percent general contractors and 69 percent specialty contractors) said the cost of coordinating the project would increase in a single prime system (see Exhibit 5-1). A plurality of the general contractors (41%) said that coordination costs would decrease under single prime.
- **Mark-up.** In a 1997 CDB internal study of alternative contracting methods (discussed in next chapter), CDB concluded that the mark-up by general contractors is the “*main reason*” why multiple prime contracting is less costly.

Certain construction costs may be largely fixed, such as materials and labor, therefore, the 10.3 percent cost savings identified by CDB would have to come from administration, overhead, and profits. CDB could not provide an average for the cost of labor and materials for projects.

The University of Illinois also calculated savings to its own projects under a single prime construction contracting method. The University said it reviewed 28 completed projects at the Urbana campus in calendar year 2001 totaling \$79.5 million and analyzed the potential savings in eliminating the assignment fee and the change order mark-up fee. The University noted the following areas of potential savings:

- Decreases administrative burden on the owner and A/E.
- Eliminates the owner’s involvement in division of work coordination disputes.
- Decreases general conditions cost previously covered by all divisions of work bidding to owner.
- May increase overall quality due to greater interest of the single prime contractor.
- Allows project managers to manage more effectively with single point responsibility.

The University of Illinois’ review concluded that there is a potential 2.8 percent savings under the single prime construction contracting method (see Appendix E).

Chapter Four

PREVIOUS REVIEWS

CHAPTER CONCLUSIONS

An internal evaluation conducted by CDB in 1997 concluded that the State saves five percent by using multiple prime contracting. CDB has now distanced itself from the report and CDB officials said the evaluation team looked at construction contracting methods from an administrative standpoint and were directed to work within the existing statutes.

A test conducted earlier in 1993 by CDB bid two University of Illinois projects using both multiple and single prime construction contracting methods. Multiple prime received the lowest bids for both projects. CDB and the University of Illinois said that specialty contractors did not provide competitive bids for single prime because they wanted to keep multiple prime contracting. A representative for the Illinois Mechanical and Specialty Contractors Association (IMSCA) attributed the lower price for multiple prime to a lack of risk for bid shopping.

We reviewed reports regarding single versus multiple prime contracting, including those identified by CDB, University of Illinois, and survey respondents. Additionally, reports by New York, North Carolina, IMSCA, and others came to differing conclusions.

CDB'S INTERNAL EVALUATION

In 1997, CDB completed its own evaluation of construction contracting methods and concluded that using the multiple prime method saves the State five percent over the single prime method. At our request, CDB officials searched for the report's supporting documents but said they found none until March 25, 2002, the day prior to the exit conference for this study.

CDB distanced itself from the report during our meetings. CDB officials said that the 11-member evaluation team looked at construction contracting methods from an administrative standpoint, and they were directed to work within the existing statutes and "*to not look outside the box.*" Below is a summary of the report's mission, methodology, and conclusions.

- **MISSION STATEMENT.** The report titled "QRT8 – Alternative Contracting Methods" (March 28, 1997) had a comprehensive mission:

The following mission statement was drafted by the QSC [Quality Steering Committee] and accepted by the team:

The team should conduct extensive research and develop recommendations on alternatives to the current CDB model of contracting for construction projects. The QRT [Quality Review Team] should make recommendations about which alternatives should be given serious consideration in a test environment. In addition, a legal review should be conducted to determine if any rules or statutes would need to be changed.

- **METHODOLOGY.** The Executive Summary states on page 1 that QRT team members conducted “*extensive interviews*” and “*extensive literature search.*” The report adds that CDB called other states, contractors, design firms, and industry representatives.
- **CONCLUSION.** The report discusses alternative methods of contracting (e.g., single prime, single prime with protected subcontractors, multiple prime, design build), and compares them to the existing system:

R Single Prime Is More Expensive. “*As a contracting model for all projects the team found single prime contracting to be more expensive than our current system and its use on projects more than \$250,000 conflicted with current statutes. As a primary method of contracting it should be pursued no further.*”

R Recommendation. A report recommendation states that “*After a full review of the above pros and cons . . . The system of bidding multi-prime contracts for projects over \$250,000 should be continued. This system’s pros far outweighed all the other systems that were considered.*”

R Second Recommendation: “*Given all the previously mentioned pros and cons, the team recommend[s] that bidding multiple prime contracts be retained as the primary delivery method on projects more than \$250,000.*” The report also recommended that project managers be allowed to “. . . combine a small trade with another appropriate trade” and called this a “*regional issue (Chicago versus downstate) . . .*”

**Advantages of Single Prime
in the QRT8 Report**

“*Administering a single contract should be less cumbersome, the project should be completed in a more timely fashion, and there should be fewer disputes about which contractor is responsible for which work. A/E’s should have an easier time in design as the project would have one general contractor responsible for the total project.*”

The report explained that single prime contracting costs more due to the prime contractor’s mark-up: “*The single prime with protected subcontractor method would continue to incur the assigned prime contractor’s markup (which is the main reason multiple prime contracts are less costly).*”

The report went on to say that multiple prime saves the State approximately five percent:

There are many reports comparing the cost of multiple prime contracts v.s. single prime contracts. Though all of the data is not in agreement, the majority indicate in test bidding an overall cost savings in bidding multiple primes. The findings

range from a few percent to double digits, but an average of 5% is most probable in Illinois. To illustrate the size of this savings conservatively, in FY92 through 94, \$225,058,000 worth of projects were bid with 3 or more trades Assuming a 5% savings with multiple prime bidding, the team reduced our construction costs by \$11,253,000.

CDB officials told us in 2001 the five percent savings was a guess based on professional opinion and their familiarity with construction in Illinois.

TEST PROJECTS

In June 1993, CDB participated in a dual-bidding test with the University of Illinois to build a Molecular Biology Lab on the Chicago Campus. CDB said that a change by PA 87-860 to the Purchasing Act on July 1, 1992 allowed them to conduct this test. Projects could only be awarded to multiple prime contractors according to State law, but CDB requested bids from both single and multiple prime contractors.

The Illinois Mechanical and Specialty Contractors Association (IMSCA) prepared a study to compare the dual-bidding methods. The study reported that in both cases multiple prime bids were lower than single prime bids by 5.5 percent and 6.3 percent (see Exhibit 4-1).

As shown in Exhibit 4-2, the cost of the Molecular Biology Lab project was \$1.9 million less under multiple prime: \$39.6 million vs. \$41.5 million. The bids for alternates (e.g., products that can accomplish the goal but differ by quality, model number, or application) were also lower by multiple prime contractors: \$4.9 million vs. \$5.2 million.

Exhibit 4-1 BIDDING COMPARISON: UNIVERSITY OF ILLINOIS PROJECTS		
	Clinical Sciences Building	Molecular Biology Lab*
Multiple Prime Low Bid	\$5,789,125	\$39,253,724
Single Prime Low Bid	\$6,180,000	\$41,525,000
Dollar Savings	\$390,875	\$2,271,276
Percentage Savings	6.3%	5.5%
* The total low multiple prime bid for the Molecular Biology Lab is \$338,500 lower in the IMSCA report than in CDB's data shown in Exhibit 4-2.		
Source: Illinois Mechanical and Specialty Contractors Association report "The Case for Separate Bids: Advantages for Illinois Tax Pavers."		

After adding the alternates to the total for the Molecular Biology Lab project, multiple prime would have been \$2.2 million less expensive at \$44.5 million vs. \$46.7 million for single prime. CDB did not have similar detailed information on the Clinical Sciences Building project at the University of Illinois.

Exhibit 4-2			
UNIVERSITY OF ILLINOIS MOLECULAR BIOLOGY LAB (1993)			
Single Prime			
<i>Trade</i>	<i>Bid</i>	<i>Alternates</i>	<i>Total</i>
Total	\$41,525,000	\$5,207,000	\$46,732,000
Multiple Prime			
<i>Trade</i>	<i>Bid</i>	<i>Alternates</i>	<i>Total</i>
Electrical	\$5,175,000	\$454,274	\$5,629,274
Ventilation	\$2,666,000	\$365,600	\$3,031,600
Temperature Control	\$395,500	\$66,940	\$462,440
Heating	\$3,287,724	\$165,755	\$3,453,479
Sprinklers	\$378,000	\$32,256	\$410,256
Plumbing	\$4,465,000	\$560,800	\$5,025,800
General	\$23,225,000	\$3,257,000	\$26,482,000
TOTAL	* \$39,592,224	\$4,902,625	\$44,494,849
* The low multiple prime bid total for the Molecular Biology Lab is \$338,500 lower in the IMSCA report shown in Exhibit 4-1 than in CDB's data.			
Source: CDB bid information and contracts for Molecular Biology Lab project.			

CDB officials said that one of the problems with the 1993 University of Illinois test was that the prime contractors knew it was a test so they did not give the single bidders their best price; this resulted in the cost of single bids being higher than multiple bids. In its February 28, 2002 memo, CDB explained this as follows:

In regards to the University of Illinois Project #830-020-051 (Molecular Biology Project), the Capital Development Board received bids that reflected a large gap between the base bids, which normally does not occur. Specifically, the Capital Development Board received a base **single contractor** bid of \$41.5MM and a combined **multiple bid base** of \$39.5MM or more than \$2MM dollars on the table. This is a significant difference in the base bid for what should be the same work per the contractors working under the same conditions providing materials, labor and profit to complete the same specifications and drawings. The low bid multiple prime bid left \$4MM in contingency funds and allowed the award of over \$2MM in alternates which proves that the specialty contractors worked very hard to win this bid. No one can survive long in the construction business and leave that much money in base award on the table. Firms go bankrupt engaging in this type of bidding. The University of Illinois appears to agree with the Capital Development Board on this issue

University of Illinois provided us similar comments based on the notes of the University's project manager soon after the bids were opened. The notes said that specialty contractors gave few bids to the general contractors probably because these ". . . contractors want to continue bidding projects by the multiple bidding method and therefore, would not be interested in the competition. Mechanical/electrical trades did indicate to at least one general contractor that if they did bid to them, that number would not be as competitive as the number they would submit by division, thus rendering the competition results unreliable."

Regarding the 1993 University of Illinois projects, a representative of the Illinois Mechanical and Specialty Contractors Association said that *“You cannot put any more or any less importance to them other than they show two instances where the separately bid price of a public project is less than a single bid price. . . . it is a basic business tenet that the more the risk the more the cost. I think the analogy of a bond rating and the bond's rate holds true here. A job where there is no risk for bid shopping will get the lowest price.”*

OTHER REPORTS

Several evaluations have been conducted on the various construction contracting methods. These evaluations, prepared by New York City, North Carolina, Illinois Mechanical and Specialty Contractors Association (IMSCA), national Electrical Contracting Foundation, Washington state, Construction Industry Institute (CII), and Greater Peoria Contractors and Suppliers Association are discussed below.

- OVERALL CONCLUSIONS**
- ▶ **NYC** – Single is less expensive.
 - ▶ **North Carolina** – Single and multiple both cost the same.
 - ▶ **IMSCA** – Multiple is less expensive.
 - ▶ **Electrical Contractors** – Multiple is less expensive.
 - ▶ **Peoria** – Single is less expensive.
 - ▶ **CII** – Design/build is less expensive
 - ▶ **Washington** – General contractor as contract manager is less expensive.

CDB noted that a 1987 study conducted by the New York City School Construction Authority found single prime could save up to 30 percent over multiple prime; however, New York is still using multiple prime.

New York City

In 1994 and 1999, the New York City School Construction Authority released studies that compared the effect of the Wicks Law which requires multiple prime contracting. These studies compared similar structures built under the Wicks Law with those built earlier and found that projects using multiple prime contractors cost more and took longer to complete. Another study conducted by the New York State Division of the Budget in 1987 indicated multiple prime costs 24 percent to 30 percent more than non-Wicks construction.

- The 1987 study compared structures of similar construction in three different categories: university structures, medium security prisons, and fire stations. The 1987 study indicated savings of 24 percent to 30 percent using non-Wicks construction.
- The 1994 study compared 412 buildings constructed between 1981 and 1993 in New York City. The structures were wide ranging: college buildings, housing units, sanitation garages, schools. All structures were constructed within New York City, including 60 percent which were built under the Wicks Law requiring multiple prime. The study used regression analysis to compare such statistics as construction costs per square foot and time to complete based on square footage.

The 1994 study found that projects built under the Wicks Law cost 13 percent more and took an average of 15 months longer to complete.

- An additional report was released in 1999 and analyzed projects between 1981 and 1997. A total of 522 projects were analyzed using regression analysis to control for project differences. The study also involved numerous buildings constructed by many agencies within New York City. The study stated that costs were as much as \$10 more per square foot and that projects took almost 13 months longer to complete under Wicks Law which requires multiple prime.

North Carolina

North Carolina released a study on projects bid simultaneously by both multiple and single prime construction contracting methods during 1989-1994. The report indicated that insufficient data existed to draw overall conclusions and noted the following:

Time to Completion. In considering all projects surveyed, there appears to be no statistically significant difference between single and multi-prime contracting forms

Bid Price . . . The average difference in the lowest bid prices for the two types of contracts (on projects bid both ways), however, was fairly small: about \$15,000, or less than 1.6 percent of mean project cost.

Administrative Costs. There were significant problems in interpreting the meaning of “verifiable administrative costs” on the survey forms [and] no statistically reliable conclusions on administrative costs can be drawn

Change Orders. There are no substantive differences in the pattern of change orders in single and multi-prime projects.

Illinois Mechanical and Specialty Contractors Association

A report by the Illinois Mechanical and Specialty Contractors’ Association (IMSCA) cited a 1993 test by CDB on two University of Illinois projects (discussed above) that requested both multiple prime and single prime bids. In both cases multiple prime bids were lower than single prime bids by 5.5 percent and 6.3 percent.

Electrical Contracting Foundation and the Mechanical Contracting Foundation

A 1995 report prepared for the national Electrical Contracting Foundation and the Mechanical Contracting Foundation stated that public construction projects with multiple primes have lower direct construction costs for equivalent projects than single prime. The study stated that “. . . preferences seemed to be driven largely by the particular interests of the parties in question whether general contractors, specialty contractors or construction authorities.” The study concluded the following:

Based on a statistical analysis of project bid and final costs from a national sample of state construction projects, this study finds *separate prime contracting to have lower direct project costs.* Comparing final project costs to estimated

costs, separate prime jobs were *more than 5 percent cheaper* than single prime jobs, and the overwhelming share of that difference (83 percent) was due to relatively lower bid costs.

Greater Peoria Contractors and Suppliers Association, Inc.

The Greater Peoria Contractors and Suppliers Association, Inc. issued a position statement in 1999 which favored single prime. It noted that this method (which they call the general contracting method) provided a “*seamless delivery system Jobsite management responsibilities are clearly identified Over the long term, subcontractors prefer working on projects managed by the same general contractors. These efficiencies result in lower cost for the owner.*”

Construction Industry Institute

In 1998, the Construction Industry Institute (CII) released a study which analyzed 351 construction projects by comparing cost, schedules, and quality for three project delivery systems: design/build, design/bid/build, and construction manager at risk.

CII mailed 7,600 surveys requesting project information and received a reply on 351 projects: 44 percent used design/build, 33 percent used design/bid/build, and 23 percent used construction manager at risk. These 351 projects were submitted by the following:

- 32% from private and public owners.
- 32% from general contracting or construction management firms.
- 28% from design/build entities.
- 8% from architects and designers.

CII generally concluded that design/build beat design/bid/build and construction manager at risk in the areas of cost and schedule, while providing equal or better quality.

One limitation noted in the study was that cost and time required for owner planning, management, advertisement, procurement, and administration activities were not collected. The report specifically notes that while “*accurate comparisons have been made regarding the base building, these factors may provide a more complete view of project delivery performance.*”

<p>▶ DESIGN/B ID/B UILD – A traditional method where the design documents are completed prior to bidding construction services. <u>Single and multiple prime are two types of design/bid/build methods.</u></p> <p>▶ CONSTRUCTION MANAGER AT RISK – The construction manager assumes all the liability and responsibility of the general contractor to complete the project on cost and schedule.</p>

Washington State

In 1994, Washington authorized three state agencies and nine local governments to use alternatives to the design/bid/build contracting method on a pilot basis. The alternatives, general contractor/construction manager (GC/CM) which assigns project

management to the general contractor, and design/build were authorized. The Alternative Public Works Methods Oversight Committee was directed to report its findings and recommendations by December 2000.

- The report said that *“75% of project participants rated GC/CM as meeting or exceeding their expectations for overall project cost, schedule, owner’s requirements, performance and quality, public value, and safety; 77% rated them as equal to or exceeding those under traditional design-bid-build.”*
- Only seven projects used design/build so data was limited to draw any significant conclusions, but *“the few DB [design/build] project participants who reported endorse the process.”*

Chapter Five

CONTRACTORS AND A/Es

CHAPTER CONCLUSIONS

In our surveys of contractors and architects and engineers (A/Es), the general and specialty contractors differed on the effect on the State by switching to the single prime construction contracting method. Overall, general contractors said single prime would cost the same or less, while specialty contractors said single prime would cost the same or more.

As for the impact on contractors, the larger general contractors said single prime would have a positive or no impact on them, while the medium and small contractors said single prime would have a negative impact on them. The contractors' written comments in our survey indicated that project management would improve under single prime but also indicated concerns about bonding, bid shopping, and payment delays under single prime.

IMPACT ON PROJECT COST

Since the Senate Resolution directed the Auditor General to report the impact on contractors, we selected a random sample of 400 out of 1,592 from CDB's list of pre-qualified contractors. CDB's list did not separate general contractors from specialty contractors and CDB said there was no way of separating them; our survey asked the contractors to specify their trade.

We mailed the survey questionnaire in November 2001 and 190 contractors responded. We removed six contractors because they do asphalt/paving work only, not building construction, and removed three contractors because their businesses closed in 2000. The remaining 181 contractors were as follows (91 percent said they have worked on a State contract in the last five years):

- 63 General contractors
- 69 Specialty contractors (electrical, plumbing, heating/cooling, and ventilation)
- 49 Other contractors (e.g., contractors who said the majority of their work was a trade other than one of the five primes, such as masonry, roofing, asbestos, sprinklers, earth moving, or who were not clearly general or specialty contractors)

These 181 contractors responding to our mail survey questionnaire classified themselves as follows:

- 30 Small (less than \$1 million in average **total** business per year – not just business with the State of Illinois)

- 123 Medium (between \$1 million and \$20 million in average **total** business per year)
- 28 Large (more than \$20 million in average **total** business per year)

We also selected a random sample of 100 A/E firms from CDB's list of 902 pre-qualified firms and mailed them survey questionnaires in November 2001; a total of 28 A/Es completed and returned the survey. Approximately 77 percent of these firms said they have worked on a State project in the past five years.

We asked contractors and A/Es what the impact would be on certain specified project components if State law was changed to require the Capital Development Board to bid projects using single prime, instead of the current multiple prime construction contracting method. We also obtained information on the impact that single prime would have on the respondents.

Survey Responses

Contractors' responses regarding the change in specific cost components under single prime often depended on whether they were a general or specialty contractor. Details about the responses from contractors and A/Es are shown below and in Exhibit 5-1. Overall, general contractors said single prime would cost the same or less, while specialty contractors said single prime would cost the same or more.

- 1 **Cost to design the project.** A/Es said design costs would *decline* (16 of 28, or 57%) under single prime. A total of 71 percent of responding general, specialty, and other contractors (120 of 168) said there would be *no change* in the cost to design projects.
- 2 **Total construction bid cost of project.** One-half of all the responding contractors (86 of 173) said the total construction bid cost would *increase* under single prime. However, the general and specialty contractors differed on the effect: general contractors (46%) said the total construction bid cost of the project would *decrease* while specialty contractors (74%) said it would *increase*. A/Es (11 of 28, or 39%) said construction costs would *increase* under single prime.
- 3 **Cost of change orders.** A total of 51 percent of all responding contractors (88 of 172) said the cost of change orders would *increase* under single prime. However, the general and specialty contractors differed on the effect: general contractors (41%) said there would be *no change* in the cost of change orders, whereas specialty contractors (75%) said the cost of change orders would *increase*. Other contractors (48%) and A/Es (14 of 28, or 50%) said there would be *no change* in the cost of change orders.
- 4 **Cost of litigation.** A total of 54 percent of all responding contractors (86 of 159) said there would be *no change* in the cost of litigation under single prime. However, the general and specialty contractors differed on the effect: general contractors (57%) said there would be *no change* in the cost of litigation, whereas specialty contractors

(50%) said it would *increase*. Other contractors (64%) and A/Es (15 of 26, or 58%) said there would be *no change* in the cost of litigation.

- 5 **Cost for general/coordinating contractor.** A total of 51 percent of all responding contractors (85 of 167) said the cost for the general contractor would *increase* under single prime contracting. However, the general and specialty contractors differed on the effect: general contractors (41%) said the cost for coordinating by the general contractor would *decrease*, whereas specialty contractors (69%) and other contractors (50%) said it would *increase*. A/Es (13 of 28, or 46%) said there would be *no change* in the cost for the general contractor.

Exhibit 5-2 shows that large general contractors (over \$20 million in business per year) said single prime would have a positive or no effect on their business. Overall, 13 contractors in our survey said single prime would have a positive effect on their business while 47 said it would have a negative effect on their business.

Exhibit 5-1				
SURVEY OF CONTRACTORS AND A/ES				
<i>Effect on Cost if State Switched to Single Prime</i>				
		Increase	No Change	Decrease
1. Design Cost	General	7%	68%	25%
	Specialty	23%	69%	8%
	Others	11%	78%	11%
	Total Contractors	14%	71%	14%
	A/Es	4%	39%	57%
2. Construction Cost	General	31%	23%	46%
	Specialty	74%	22%	5%
	Others	40%	43%	17%
	Total Contractors	50%	28%	23%
	A/Es	39%	29%	32%
3. Change Order Cost	General	31%	41%	28%
	Specialty	75%	22%	3%
	Others	43%	48%	9%
	Total Contractors	51%	35%	13%
	A/Es	14%	50%	36%
4. Litigation Cost	General	8%	57%	36%
	Specialty	50%	45%	5%
	Others	25%	64%	11%
	Total Contractors	29%	54%	17%
	A/Es	4%	58%	38%
5. Coordinating Contractor Cost	General	32%	27%	41%
	Specialty	69%	23%	8%
	Others	50%	43%	7%
	Total Contractors	51%	30%	19%
	A/Es	36%	46%	18%
Notes:				
<ul style="list-style-type: none"> • “Others” refers to contractors who were not clearly general or specialty contractors. • May not total to 100% due to rounding. 				
Source: Illinois Auditor General’s survey of contractors and A/Es (2001).				

Exhibit 5-2 FISCAL IMPACT ON CONTRACTORS DUE TO SINGLE PRIME					
Trade	Size	Positive Effect	No Effect	Negative Effect	Examples of Comments
General	Large	4	3	0	<ul style="list-style-type: none"> • Could increase the volume of our work. • Positive fiscal impact.
	Medium	7	8	12	<ul style="list-style-type: none"> • Bid shopping is a concern. • Increase our costs and limit the size of projects we could bid due to bonding capacity.
	Small	0	2	3	<ul style="list-style-type: none"> • Would eliminate our ability to bid on some jobs. • This could eliminate us from bidding some jobs.
Specialty	Large	1	0	1	<ul style="list-style-type: none"> • We would probably make a higher profit because we could play a number game with the prime contractor. • Would reduce the number of CDB projects we would bid.
	Medium	0	5	18	<ul style="list-style-type: none"> • Decrease volume of total work. • It could put us out of business.
	Small	0	4	6	<ul style="list-style-type: none"> • Would probably lose contracts based on price, not on apples to apples quality of work. • Would definitely bid less projects.
Other	Large	1	4	0	<ul style="list-style-type: none"> • More opportunities to bid.
	Medium	0	13	6	<ul style="list-style-type: none"> • Profit margin would decrease because of bid shopping.
	Small	0	6	1	<ul style="list-style-type: none"> • Would not get any work through a general contractor.
TOTAL		13	45	47	
Source: Illinois Auditor General's survey of contractors (2001).					

Survey Comments

Our survey questionnaire also asked contractors and A/Es to comment on the fiscal and non-fiscal effects if the State switched to single prime. Below is a summary of their comments regarding single prime which indicate project management would improve under single prime but also indicate concerns about bonding, bid shopping, and payment delays under single prime.

<p align="center">General Contractors' Comments on Single Prime</p>	<p align="center">Specialty Contractors' Comments on Single Prime</p>
<ul style="list-style-type: none"> • Better team effort. General contractors can more easily terminate poor performing subcontractors. • Better overall management and responsibility. • Improves completion dates and quality. • Improves communications and scheduling. • Improves project timeliness; possibly decrease cost by 15 to 20 percent. • More general contractors would be interested in State work. <hr/> <ul style="list-style-type: none"> • General contractors add money to the total bid for each subcontractor. • General contractors bid shop after the project bids are opened. • Eliminate small contracts resulting in more State projects for large contractors only. • Small companies would have difficulty getting bonding reducing bidders. 	<ul style="list-style-type: none"> • Better coordination. • Better relationships. • Much more effective because general contractor will probably request bids from subs he normally works with. <hr/> <ul style="list-style-type: none"> • Deals will be made and fairness will suffer. • Would need to rely on general contractors to use fair bidding practices. • General contractors lack ability to coordinate work well. • Increase delays due to unqualified subcontractors and increase future maintenance cost due to poor workmanship. • CDB does a great job of coordinating and pays on time. Payment is the greatest facilitator. General contractors are notorious for holding subcontractors' money. • Small firms would not bid State work because no one could regulate shopping of bids.
<p align="center">Architects and Engineers' Comments on Single Prime</p>	<p align="center">Other Contractors' Comments on Single Prime</p>
<ul style="list-style-type: none"> • Lessen design cost by 20 percent. • Reduce overhead in dealing with multiple contractors by 15 to 20 percent. • Decrease time to produce specifications by 15 percent. • Minimal cost savings in specifications and printing. • General contractors would have full accountability, decreasing disputes, project duration, and time of CDB and A/E staff. • Less paperwork, personnel time, claims, and suits. • Less finger pointing among contractors. Projects more apt to be completed on time. General contractors would have more leverage over subcontractors. Design professional would have a single source to correspond with. <hr/> <ul style="list-style-type: none"> • No change because you are shifting same amount of money into different "pots"; time is the only real issue. • Bid shopping diminishes quality of work and attention to detail, and increases change orders. • Would reduce government work for businesses without connections. • Present coordination between individual contractors does not happen because CDB personnel are not construction managers. 	<ul style="list-style-type: none"> • Decrease cost due to better coordination of subcontractors (less arguments about who is responsible). • More opportunities to bid. <hr/> <ul style="list-style-type: none"> • Reduce participation for minority-owned businesses. • Decrease profit due to bid shopping.

IMPACT ON CONTRACTORS

The majority of general and specialty contractors who commented in our survey said that single prime would have an unfavorable impact on them (as shown in Exhibit 5-2). However, the larger general contractors commented that single prime would have a positive impact on them while the remaining contractors said single prime would have a negative impact on them.

Professional Associations

The Capital Development Board has an Industry Advisory Committee which has members from five professional associations. On October 29, 2001 we sent a written invitation to these organizations to meet with us regarding Senate Resolution Number 147 which could have a direct impact on their members. Four of the organizations accepted the invitation to meet with us:

1. Illinois Mechanical and Specialty Contractors Association
2. American Institute of Architects of Illinois
3. Consulting Engineers Council of Illinois
4. Illinois Society of Professional Engineers

The fifth organization, the Central Illinois Builders of AGC, replied on December 17, 2001 that they were leaving it to their members to contact us directly since the association represents both general and specialty contractors who have different views:

The issue of single contract vs. multiple prime contracts has resulted in much discussion for Central Illinois Builders, both at the committee level and with our Board of Directors.

Nearly all of our general contractor members are in favor of the single contract method. They think this method allows them more control of a project. However, our specialty contractor members feel as strongly in support of multiple prime contracts. There are good points on both sides. Clearly, it is a very divisive issue for the industry.

Our Board of Directors has recommended that Central Illinois Builders, as an association, be neutral on the single contract/multiple prime contract issue.

We also contacted the Design Build Institute of America for their comments but they did not reply to our letter and e-mails.

Illinois Mechanical and Specialty Contractors Association

The Illinois Mechanical and Specialty Contractors Association (IMSCA) representatives stated that the 1993 Blue Ribbon Auditor General Committee on the State Procurement Code kept multiple prime contracting in the Illinois Procurement Code as part of its recommendations. IMSCA feels multiple prime is the most cost effective

method of procuring building construction for the State. They said that changing to single prime would reduce competition, increase cost, increase bid shopping, increase administrative costs for general contractors (which would be passed on to the State), and give general contractors more control over payments to subcontractors.

IMSCA representatives said competition could be hurt if the State changed to single prime. General contractors often work with the same subcontractors which could make it difficult for others to get State business. All contractors now have the opportunity to bid directly to the State. IMSCA representatives noted the following:

- An advantage of having multiple prime contractors is that the State knows exactly who it is selecting and can work with the contractor directly. Each prime contractor is bonded and insured so the State can collect if there is a problem.
- If the State used a single prime contractor, it would make the total contract amount large which would help the large contractors but reduce opportunities for small, minority, and female-owned businesses.
- The current system assures timely payments to specialty contractors. It is not unusual for general contractors to pay subcontractors after 60 to 90 days. In the meantime the general contractor gets an interest free loan at the expense of subcontractors who must meet payroll. Subcontractors may have to delay payments to suppliers affecting their credit ratings and bonding costs.
- Bid shopping would increase under single prime which would benefit general contractors who would make a higher profit by squeezing subcontractors. Subcontractors may have to lower quality or increase change orders to make up the lost profits. When a contractor bids directly to the State, the contractor gets only one opportunity to give the State the best price. When general contractors bid-shop, they tell the subcontractors what bids they have but there is no way to verify their accuracy.

Architects and Engineers

The professional trade association representatives for architects and engineers said the effect on the design profession would be minimal. Some additional designing, coordinating, and scheduling is needed for multiple prime contractors but it is not significant. Multiple prime requires preparing a separate bid package for each trade which contains more details (duplicates of plans, designs, and specifications) that increase A/E cost. Under single prime, it would be the general contractor who would have to break out the plans for subcontractors which would reduce some A/E cost.

The A/E representatives said there may be some advantages to having a single prime contractor, such as efficiency in project management, although the effect on the State could be mixed. An advantage of multiple prime contracting is that the State can pay direct attention to the five prime contractors. Mechanical and electrical systems are

getting more complex and the State needs to ensure that contractors have the ability to do the job. There is a higher probability of having a qualified contractor if the State receives the bids and selects the prime. However, the prime contractors do need to work on a schedule or it can throw off the sequence of work which can become expensive.

Chapter Six

SURVEY OF STATES

CHAPTER CONCLUSIONS

In our survey, 26 of 32 states that responded said they primarily used the single prime construction contracting method. Only five responding states, including Illinois, primarily used multiple prime. One state, Florida, uses a method called “construction manager at risk” in which the contractor assumes the risk for completing the project for the budgeted cost.

States wrote that single prime holds one contractor responsible, avoids gaps and overlaps between contracts, and simplifies management. They also noted that multiple prime improves payment to subcontractors and reduces bid shopping but is more difficult to coordinate and results in more administrative overhead.

SURVEY RESULTS

We mailed a survey questionnaire to all 50 states and received a response from 32 states, including Illinois (see Exhibit 6-1). Most of the responding states (26) primarily used single prime. Seven of the 26 states use single prime with protected subcontractors, a method in which the subcontractors have to be named when the bid is opened.

Only five responding states, including Illinois, primarily use multiple prime. One state, Florida, uses a method called construction manager at risk in which the contractor assumes the risk for completing the project for the projected cost. Several states had experience with more than one method and noted the following:

- **Idaho** said it is trying multiple prime to determine if it will improve the delivery and quality of projects.
- **New Jersey** said it switched from multiple prime to single prime about one and one-half years ago and noted that single appears to be advantageous in terms of costs and administration.
- **Texas** said it uses multiple prime for 10 percent of projects and indicated that design and administrative costs are lower for single but there was no difference in construction costs between single and multiple.
- **Wisconsin** said it uses single prime for five percent of projects and indicated that there was no difference in design costs, but noted that construction and

- | |
|--|
| <ul style="list-style-type: none">▶ CONNECTICUT said it changed from multiple prime to single prime and was very satisfied with the change.▶ NORTH CAROLINA said there was no difference in construction costs between single and multiple prime. |
|--|

administrative costs were lower although officials said they lacked hard statistics to substantiate their opinion.

Over 80 percent of the responding states also use, or are authorized to use, design/build. This method is discussed in the next chapter of the report.

Exhibit 6-1 CONSTRUCTION CONTRACTING METHODS USED BY STATES						
State	Single	Single with Protected Subs	Multiple	Design/ Build	CM at Risk*	Other
1. Alaska		95%		5%		
2. Arizona	100%			**		
3. Arkansas	98%					2%
4. Colorado	100%			**		
5. Connecticut	90%	1%		8%		1%
6. Florida	15%			5%	80%	
7. Georgia	90%			5%	5%	
8. Hawaii		100%		**		
9. Idaho		90%	10%	**		
10. Illinois	30%		70%			
11. Indiana	97%			3%		
12. Kansas	95%			4%		1%
13. Michigan	98%			2%		
14. Minnesota	85%	15%		**		
15. Mississippi	99%			1%		
16. Missouri	99%			1%		
17. Montana	100%					
18. Nebraska	100%					
19. New Jersey		98%	1%	1%		
20. New Mexico		100%				
21. North Carolina	26%		74%	**		
22. Ohio	3%		97%	**		
23. Pennsylvania			99%	1%		
24. South Carolina	20%	80%		**		
25. South Dakota	75%			15%	10%	
26. Tennessee		95%				5%
27. Texas	90%		10%	**		
28. Vermont	95%			5%		
29. Virginia	99%			1%		
30. Washington	65%			2%	33%	
31. Wisconsin	5%		85%	5%	5%	
32. Wyoming	95%			5%		

Note: New York and North Dakota did not respond to the survey but CDB said they also used multiple prime.

* CM at Risk means Construction Manager at Risk.

** Used design/build for some projects.

Source: Illinois Auditor General's survey of states (2001).

GENERAL COMMENTS

Our survey requested states to comment on their construction contracting methods and the following states offered comments about how to manage projects. All of these states, except Wisconsin and Florida, primarily use single prime:

- **Florida** wrote that it recommends other states *“Establish and maintain a qualified ‘Contracts’ staff that review[s] advertisements for consistency and accuracy, verifies that selection criteria have been documented and followed, assist[s] in the negotiations of each contract, maintain[s] a data base of comparable contract negotiations, and controls the vital contract information on a centralized project delivery contract management database.”*

▶ **CONNECTICUT** wrote that the *“State had utilized multiple prime for years; it constantly resulted in problems.”*

- **Indiana** wrote that *“Almost all project delivery systems have merit, however, the key to success is having the latitude to match the best system to each project.”*

- **Michigan** wrote that *“It is necessary to allow sufficient time in the design process to provide for a complete set of bidding documents. Rushed documents are an inviting playground for contractors who thrive on claims and lawsuits.”*

- **New Jersey** wrote that *“Assigning greater resources to the contractor prequalification process yields better projects.”*

- **South Carolina** wrote that *“Bidding with protected subs does not stop bid shopping by subs or general contractors. Our license law requires valid licenses at time of bid, not award. We lose several low bids yearly because general contractors accept quotes from improperly licensed subcontractors.”*

- **South Dakota** wrote that *“We have had good success with Construction Manager at Risk. It permits fast tracking. We have construction expertise involved in the design phase. We let multiple contracts for construction which are held by the construction manager.”*

▶ **WYOMING** wrote that *“Multiple prime bidding is an attorney and accountants’ dream – more and more paperwork. Also, the overall project suffers because there is no clear responsible party for future maintenance questions.”*

- **Vermont** wrote that *“Construction management can be advantageous on really complicated renovations where general contractors find too much risk to bid.”*

- **Wisconsin** wrote that *“We aren’t very happy with design/build and some of the possible permutations (lease/purchase, scope bidding for example). We would like to be able to bid single prime without restriction.”* Currently, Wisconsin statutes require multiple prime but their building commission can authorize alternatives on a project by project basis.

Best Practices

A number of states responded to our survey question which asked for their best practices that could be considered for adoption by other states (all the states listed below use single prime). Their comments addressed subjects such as lease-to-own, general contractor serving as the construction manager, and using the A/E to manage the project:

- **Arizona** wrote that it uses private lease-to-own method for building acquisition. This involves a competitive proposal where the state leases land to a private developer to design, build, operate, and finance the state facility. The state agrees to lease the facility for a term and owns the facility at the end of the term.
- **Colorado** wrote that it uses a general contractor as the construction manager on certain large, multi-phased projects. For small construction projects under \$150,000, it is also using a method called an expedited “documented quote” process.
- **Connecticut** wrote that it uses “*objective criteria*” to eliminate unqualified contractors. These criteria are written parameters that all contractors are required to meet to bid on Connecticut construction projects.
- **Indiana** wrote that it uses a professional staff of architects and engineers to manage projects which virtually eliminates the need for construction managers.

► **WASHINGTON** – Uses a general contractor as the construction manager. The general contractor is selected during the design phase using a combination of qualifications and price factors. All subcontractors are competitively bid and the general contractor guarantees the maximum construction cost.

Advantages and Disadvantages

We asked states who have used more than one construction contracting method in the past 10 years about the advantages and disadvantages of the methods they had used. They offered comments which were for and against multiple prime: multiple prime improves payment to subcontractors, reduces bid shopping, and results in a lower cost; and multiple prime is more difficult to coordinate, results in more administrative overhead, and does not hold one contractor responsible. More specifically, the states said the following:

OTHER STATES' COMMENTS

<p style="text-align: center;"><u>Advantages of Multiple Prime</u></p> <ul style="list-style-type: none"> • Cost effective. • Lower initial bid costs. • Protects multiple prime construction money. • Avoids “trickle down” problem of getting subs paid. • Allows full competition among all licensed contractors for each designated trade. • Usually results in lower total bids. • Reduces general contractor’s ability to “shop” subcontractors. • Helps to control bid shopping. 	<p style="text-align: center;"><u>Disadvantages of Multiple Prime</u></p> <ul style="list-style-type: none"> • No single point of authority and responsibility. • Finger pointing on responsibility. • Poor quality. • Too many contracts. • Gaps/overlaps between contracts. • Additional costs, delays, and arguments about responsibility. • Major coordination issues and legal ramifications. • Requires closer coordination between contractors.
<p style="text-align: center;"><u>Advantages of Single Prime</u></p> <ul style="list-style-type: none"> • Puts responsibility and coordination with one contractor. • Using pre-selected subs means good working relationships. • Reduces gaps/overlaps between contracts. • Avoids disputes about which contractor is responsible for what. • Simplifies owner management. 	<p style="text-align: center;"><u>Disadvantages of Single Prime</u></p> <ul style="list-style-type: none"> • Prevents competition among plumbing, mechanical and electrical trades. • Usually results in higher bids than combined multi-prime bids for the same work.

Chapter Seven

DESIGN/BUILD

CHAPTER CONCLUSIONS

Over 80 percent of the states (26 of 32) who responded to our survey questionnaire said they are authorized or have used design/build, but only for a small percentage of their projects. States often used design/build for uncomplicated projects or for projects that need to be completed quickly. The projects need to be properly planned during design because changes can be more expensive.

The federal government also uses design/build for some projects; for example the GSA uses it for approximately 10 percent of its projects.

The Capital Development Board said it would like to have the authority to use design/build for some projects and so did the University of Illinois. Currently, the Illinois Procurement Code does not specifically authorize design/build.

DESCRIPTION

Design/build is a method that combines design and construction into one contract. The project scope must first be conceptually defined by the owner before firms submit designs and cost estimates. Next the selected firm designs the project with input from the contractor who will construct the project.

Design/build projects may be completed sooner since construction and design can occur simultaneously. In the traditional design/bid/build method used by the State, the construction portion of a project is bid after the design is completed, which may add several months. In design/build the construction contractor and designer are one entity and, therefore, construction can begin before design is finalized.

► **DESIGN/BUILD** – A construction contracting method that combines design and construction into one contract.

The Capital Development Board said it would be interested in having the authority to use design/build for some projects, as did the University of Illinois. The Illinois Procurement Code does not authorize design/build. If the State were to use design/build, it may need to amend the Procurement Code since design/build would merge both A/E and construction. Currently the State does not select an A/E through competitive sealed bidding like it selects the construction contractor through competitive sealed bidding. Designers are selected based on their ability and qualification to perform the work, known as Qualification Based Selection (QBS), while construction contractors are selected based on the lowest responsible competitive sealed bid.

TRADE ASSOCIATIONS

Representatives of the A/E trade associations said their profession is generally pleased with the current construction contracting method and is concerned about using design/build because it may not be in the best interest of the public. They said design/build is more prevalent in private projects.

Project Changes

In design/build, input from the user is obtained at an early stage of a project and there is limited involvement by the users once the design-builder has been hired. A/E representatives said a challenge in design/build would be to get State agencies to use it because it is more difficult to make changes to the project. Most current projects tend to have change orders and they amount to approximately 10 percent of the project cost.

Illinois Mechanical and Specialty Contractors Association representatives said stop-and-go construction resulting from changes is more costly under design/build which has design and construction phases overlap so changes affect both. They said design/build may be less expensive up-front due to lower quality because “*you get what you pay for*” and quality is directly affected by price.

Advantages and Disadvantages

Representatives of the A/E trade associations noted the following advantages of using design/build:

- Easier to administer (only have to deal with one entity that includes both A/E and construction contractor).
- Quicker to complete because construction can start during design.
- Fewer disputes because there is one contractor.
- Less expensive to construct but quality of materials may be sacrificed to lower initial cost. The key is **when** money would be saved, for example:
 - R Using windows with only two panes of glass instead of three would save construction cost but would increase heating and cooling cost.
 - R Using lower quality building components would save construction cost but would increase future repair and replacement cost.

Representatives of the A/E trade associations noted the following disadvantages of using design/build:

- Design/build would result in a limited number of large contractors who are able to bid. It would be necessary to eliminate favoritism since general contractors, who would select subcontractors, could pick particular firms.

- The State is a sophisticated client which has professionals familiar with design and construction who can oversee multiple contractors; CDB is one of the largest construction agencies in the country.
- The State has a responsibility to be fair and provide opportunity for small, minority, and female-owned businesses.

SURVEY OF CONTRACTORS

In our survey, 165 of 181 responding contractors answered the question which asked if they would bid on design/build projects by the State. Approximately one-half of the contractors who answered the question (87 or 53%) said they would bid on design/build projects by the State. The remaining 78 contractors (47%) said they would not bid on design/build projects. Many contractors wrote comments about design/build which included the following:

Advantages of Design/Build

- Allows input from people who do the work which results in higher quality at lower cost with fewer problems.
- Better team effort between general contractor and A/E.
- Faster turnaround of project; more direct involvement and cost control; value engineering.
- CDB would get contractor input into project which could reduce cost and time.
- Best for new building construction.
- One source of responsibility. Better construction methods would be incorporated into design.
- Would not have to get change orders for engineer designs; speed up the project.
- Reduce change orders.

Disadvantages of Design/Build

- Sacrifice quality and longevity
- Too many loop-holes – State may not get quality.
- Hard for CDB to realize a competitive bid from a cheap bid.
- Eliminates good contractors who do not have design capabilities. You will get lesser capabilities and competition.
- Will exclude many small to mid-size general contractors like us who do not have the money, time, or experience to invest in the design process.
- Too many unknowns in retrofit work.
- State would need a 3rd party (i.e., engineer) to watch project workmanship. Risk of inferior materials to increase profits.
- Lower quality – i.e., 10 year mechanical systems in a State building designed for a 75 year life cycle.

GOVERNMENT USERS

Federal and state government entities have used design/build to some extent. This method, which awards a single contract for both design and construction, is used on both new construction and renovation.

An official of the General Services Administration (GSA) said it generally uses the single prime method of construction contracting but does use design/build for approximately 10 percent of its projects. GSA emphasized the need to know exactly what is wanted at the beginning because delays can be costly since they can affect both design and construction which may overlap in the design/build method.

Over 80 percent of the states (26 of 32) who responded to our survey questionnaire said they are authorized or have used design/build, but only for a small percentage of their projects. States often used design/build for uncomplicated projects or for projects that need to be completed quickly. The projects need to be properly planned during design because changes can be more expensive.

In our survey of states, many said they have used design/build with some success (see Exhibit 7-1).

University of Illinois officials said they would like to be able to use design/build for some projects because it could be less costly and because it would shorten the schedule.

Exhibit 7-1				
USE OF DESIGN/BUILD BY OTHER STATES				
State	Extent	When Used	Advantages	Disadvantages
1. Alaska	5%	Depends on scope and schedule of project	Accelerate project delivery	Less owner control
2. Arizona	3 projects	Projects over \$5 million	Flexibility, cost, faster	Needs to be well versed on performance specs
3. Colorado	5%	Projects with multiple repeating units	Single responsibility	Loss of owner input
4. Connecticut	8%	Fast delivery		Not cheaper
5. Florida	5%	Simple structures	Quick and simple	Quality of product
6. Georgia	5%	Based on project needs	Single responsibility	Less owner input
7. Hawaii	Not often	Fast tracking of sensitive projects		
8. Idaho	Seldom	Prison projects	No problems between A/E and contractor	Lack of control of design
9. Indiana	3%	Energy saving projects	Reduced administration	Changes costly
10. Kansas	4%	Special projects	Quicker	Less plan review
11. Michigan	2%	Time critical	Quicker	May cost more
12. Minnesota	Twice	Twice used: once in 1997 and once in 2000	Fast track and kept project within budget	No changes without additional costs and delays
13. Mississippi	1% (Only with specific legislative authority)	Time restraints	Saves some time	More coordination by agency
14. Missouri	1%		Design firm and contractor work together to resolve problems	Final project design not specifically described
15. New Jersey	1%	Emergent fixes for simple projects		Traditional methods easier to manage
16. North Carolina	Limited, with prior approval	Emergencies or specialized project	Speeds final delivery of project	Limits competition
17. Ohio	Limited	Selected organizations only		
18. Pennsylvania	1%	Sole discipline	One contract	
19. South Carolina	Very limited	Mostly on dorms or prison cell blocks	None apparent	More work
20. South Dakota	15%	Tight schedule; criteria is easily defined	Fast track, sole source of liability	Constraints prevent same use as private sector
21. Texas	Just authorized			
22. Vermont	5%	Needed quicker	Faster, lower cost	Quality suffers
23. Virginia	1%	Certain types of buildings	Quicker delivery	Difficulty developing RFP
24. Washington	2%	Unusual funding circumstances	Fewer disputes	High costs
25. Wisconsin	5%	Small, simple projects	Saves time, A/E costs lower	Arguments with bad teams
26. Wyoming	5%	Small projects	No high consultant fees	Only one contractor's expertise

Source: Illinois Auditor General's survey of states (2001).

Chapter Eight

OTHER ISSUES

CHAPTER CONCLUSIONS

During this study, we obtained information from federal, State, and local organizations; other states; construction contractors; architects and engineers; and representatives of the professional trade associations for contractors and A/Es who are on CDB's Industry Advisory Committee. These entities had differing perspectives regarding the various construction contracting methods.

Since the fiscal impact on the State, contractors, and subcontractors under the single prime contracting method is not conclusive due to widely differing information, the General Assembly may wish to consider establishing a pilot program to evaluate the effectiveness of various construction contracting methods.

The Illinois Procurement Code requires that the Capital Development Board use the multiple prime method of construction for projects that exceed \$250,000. However, CDB officials said there is considerable paperwork associated with each project which could be reduced if the \$250,000 threshold was raised to allow more single prime projects.

Several other issues also came to our attention during the course of this study pertaining to the use of change orders instead of settlements, and regarding a suggestion by the University of Illinois to combine heating/cooling and ventilation into one prime contract instead of the current separate prime contracts.

THRESHOLD OF \$250,000

The Capital Development Board, the Department of Corrections, the University of Illinois, and the A/E associations indicated that the \$250,000 threshold requiring multiple prime contracting was low. The current threshold of \$250,000 has not been adjusted for inflation since August 8, 1995 like the threshold which requires competitive sealed bidding for projects exceeding \$30,000; otherwise it would be approximately \$290,000 at the end of 2001 (based on the construction cost index). The Department of Corrections favored raising the threshold to a minimum of \$5 million.

In fiscal year 2001, CDB completed 248 projects using the five prime contractors named in the Illinois Procurement Code. The 248 projects used 458 contractors for an average of 1.8 contractors per project. Exhibit 8-1 shows that as projects become larger, the average number of contractors per project increases from 1.1 for projects up to \$250,000 to 4.4 for projects over \$1 million.

Only 33 projects were greater than \$1 million and they had 144 contractors, or 4.4 contractors per project, as compared to only 1.9 contractors per project for projects between \$250,000 and \$1 million (101 projects with 189 contractors).

Exhibit 8-1 PROJECTS BY EXPENDITURE AMOUNT Fiscal Year 2001							
	Projects	Multiple Prime	Single Prime	Contractors	Average Contracts/Project	Average Project Cost	% of Total \$ Award
Up to \$250,000	114	10	104	125	1.1	\$136,691	8%
\$250,001 to \$500,000	66	25	41	112	1.7	\$212,700	12%
\$500,001 to \$750,000	23	13	10	46	2.0	\$605,646	7%
\$750,001 to \$1 million	12	9	3	31	2.6	\$885,934	6%
Greater than \$1 million	33	30	3	144	4.4	\$3,971,739	67%
All Projects	248	87	161	458	1.8	\$786,426	100%

Source: CDB data summarized by the Illinois Auditor General's Office.

Of the 101 projects between \$250,000 and \$1 million, 54 projects used one contractor (single prime) while the remaining 47 projects used multiple contractors (multiple prime), as shown in Exhibit 8-2.

If the 47 multiple prime projects between \$250,000 and \$1 million (which required 135 contractors) had been single prime, CDB may have saved some administrative costs. Reduction in administration could allow CDB's project managers to devote more time to the larger, more complex projects.

Although the threshold for single prime may be raised, large projects may still need to be completed by multiple prime contractors. For example, the Department of Corrections noted that some general contractors may have difficulty obtaining bonding on very large projects which may limit competition. On such large projects, multiple prime contractors may provide increased competition by allowing additional contractors to bid.

Exhibit 8-2 COMPLETED PROJECTS (\$250,000 to \$1 Million) Fiscal Year 2001			
Contracts/Project	Projects	Contractors	Expenditure
1	54	54	\$22,669,758
2	22	44	\$11,717,260
3	11	33	\$5,630,278
4	12	48	\$6,390,694
5	2	10	\$1,975,487
TOTAL	101	189	\$48,383,477

Source: CDB data summarized by the Illinois Auditor General's Office.

If the \$250,000 threshold was raised, it could increase subcontracting which may increase business opportunities for firms who are unable to get State work as prime contractors because they operate as subcontractors, including minority and female business enterprises. CDB's pre-qualified list of 1,592 contractors had only 97 registered as Minority Business Enterprise/Female Business Enterprise (MBE/FBE) firms:

- 19 of these 97 contractors were paid (used) in fiscal year 2001.
- These 19 contractors received \$6,100,507 or 1.5% of \$395,822,531 that CDB expended for construction in fiscal year 2001.
- \$3.4 million of the \$6.1 million (56%) that was paid to MBE/FBE went to two general contractors. Exhibit 8-3 shows the payments by trade.

The information above in Exhibit 8-1 indicates that more than 90 percent of the projects up to \$250,000 were already single prime and more than one-half of the projects (53%) between \$250,000 and \$1 million were also single prime. If the threshold had been \$1 million instead of the current \$250,000, CDB would have had to manage 88 fewer contracts (135 contractors minus 47 projects equals 88).

CDB officials noted that the responsibilities of their project managers are paper intensive as they spend considerable time reviewing forms and bills and attending meetings. Single prime may free up project managers' time for more on-site monitoring. A higher threshold may also increase the number of minority and female subcontractors.

MBE/FBE Certification
To be certified as an MBE/FBE firm, a business must: <ul style="list-style-type: none"> ▶ Be at least 51% owned and controlled by one or more minority persons, females, or persons with a disability, and ▶ Have annual gross sales of \$14 million or less for the most recent fiscal period or apply for a waiver on an individual contract basis.
Source: CDB information summarized by the Illinois Auditor General's Office.

Exhibit 8-3 MBE/FBE EXPENDITURES BY TRADE Fiscal Year 2001		
Trade	Contracts	Expenditure
General	10	\$4,932,952
Electrical	6	\$513,367
Plumbing	2	\$569,608
Ventilation	1	\$84,581
TOTAL	19	\$6,100,507*
* Total does not add due to rounding.		
Source: CDB data summarized by the Illinois Auditor General's Office.		

MANAGEMENT ISSUES

Several issues came to our attention during the course of this study pertaining to change orders that were used in place of settlements and combining heating/cooling and ventilation into one prime contractor instead of keeping them as separate primes.

Change Orders

CDB officials said the agency has used change orders to avoid litigation and to settle disputes. We reviewed change orders for 15 projects that CDB closed in fiscal year 2001. CDB did not keep records of such change orders to show the total amount paid for resolving disputes. Making payments through change orders, especially without tracking (e.g., coding, summarizing, reporting, authorizing) has the potential to become problematic if project managers pay to resolve disputes without making upper management fully aware of the real reason for the change. Change orders up to \$50,000 do not require the Director’s review. Settling problems by using change orders also may not be the least expensive method for the State because of the following reasons:

- CDB allows contractors to add an 18 percent mark up on change orders (see Exhibit 8-4); the University of Illinois allows a lower mark up of 15 percent. A mark-up is also permitted on deductive change orders which cancel work that had been bid. As an example, one State project had a deduct change order after the A/E developed a method to save \$450,000 on the project; however, the contractor was still paid 18 percent (or \$81,000) to deduct this work from the contract.
- If the change order work is done by a subcontractor, the prime contractor gets a six percent mark-up and the project’s coordinating contractor gets a 2½ percent mark-up. In total, change orders could have a 26½ percent mark-up.
- Change orders are not required to be competitively bid which may result in the State not getting the best price.

Furthermore, CDB’s change order forms have codes to explain the reason for the change, although the codes may not always be accurate. The Department of Corrections noted that a change order may be coded as user requested because it is easier to justify than the actual reason for the change. Changes may be a result of A/E errors or omissions, undiscovered conditions, or request by the user.

Exhibit 8-4 CONTRACTORS’ MARK-UP	
18%	Contractors and subcontractors may add 18% for overhead and profit to the direct costs of the work performed by their firm. A minimum fee for overhead and profit of \$100 is allowed on work performed by their firm.
6%	The contractor or subcontractor may add 6% or a minimum fee of \$50 to the cost of work performed by all lower tier subcontractors.
2½%	The coordinating contractor may be allowed a fee not to exceed 2½% of any adjustment to the assigned contractor’s contract if coordination duties are performed in a proper and timely manner.
26½%	Total
Source: CDB’s Standard Documents For Construction, Procedure 760.2.B. and Procedure 812.5.D.7.	

Heating/Cooling and Ventilation

University of Illinois officials said there are two related but separate primes that could be combined into one to save the State money. These two primes are heating/cooling and ventilation contractors. University officials said the primes were separate decades ago when the industry was using steam but now with more sophisticated systems it makes sense to combine the two because they must interact together and may even be bid by the same company. University officials noted that frequently there is a “gap” between ventilation and heating/cooling which would be eliminated if these prime contracts were bid as one package.

As discussed earlier in the report, the Capital Development Board has stated that there would be a cost savings for each trade that was eliminated as a separate prime.

North Carolina, Ohio, and New York, which are among the states that use multiple prime, combine heating/cooling and ventilation.

CONCLUSION

According to CDB's fiscal note for Senate Bill 735 in March 2001, the State expends approximately \$450 million per year on construction projects managed by the Capital Development Board. These projects are for many different State agencies, including the University of Illinois and the Department of Corrections which have many construction projects.

During this study, we obtained information from federal, State, and local organizations; surveyed other states, construction contractors, and architects and engineers; and met with the representatives of the professional trade associations for contractors and A/Es who are on CDB's Industry Advisory Committee.

These entities provided comments and information on a variety of subjects that included the following: access, bid shopping, competition, coordination, cost, litigation, minority/female business enterprise, payments, profits, quality, responsibilities, and timeliness (see Appendix K).

They had differing perspectives regarding the subjects listed above and regarding the various construction contracting methods. Even when the overall percentage for a group favored a certain method, the responses were not homogeneous and there was variance in the group (e.g., most general contractors favored single prime but some favored multiple prime). In order to provide an overall perspective, they may be broadly summarized as follows:

- The federal government generally uses single prime, along with some design/build, for its projects.
- 26 of 32 states responding to our survey primarily used single prime.

- Capital Development Board and the University of Illinois said single prime would be less expensive than multiple prime and want the option to use various methods (e.g., design/build, construction manager at risk). The University of Illinois also noted that single prime would take less time to administer than multiple prime.
- Department of Corrections favored single prime for most construction except for very large projects.
- Large general contractors said they would benefit from single prime.
- Medium and small contractors said they generally benefit from multiple prime.
- General contractors often said single prime would be less expensive for the State.
- Specialty contractors often said single prime would be more expensive for the State.
- Architect and engineer associations said there would be little change in the cost to the State under either single or multiple prime.
- A/Es responding to our survey said project design would cost less.

For simplification, these various entities may be broadly placed on a spectrum as follows:	
Single Prime	<ul style="list-style-type: none"> • Federal government • 26 of 32 states use single prime • Capital Development Board • University of Illinois • Illinois Department of Corrections • General Contractors
	<ul style="list-style-type: none"> • Architects and Engineers
Multiple Prime	<ul style="list-style-type: none"> • Specialty Contractors (electrical, heating/cooling, ventilation, plumbing)

Since the fiscal impact on the State, contractors, and subcontractors under the single prime construction contracting method is not conclusive due to widely differing information, the General Assembly may wish to consider establishing a pilot program to evaluate the effectiveness of various construction contracting methods.

MATTER FOR CONSIDERATION BY THE GENERAL ASSEMBLY	
PILOT PROGRAM	<p><i>The General Assembly may wish to consider establishing a pilot program that:</i></p> <ul style="list-style-type: none"> • <i>Authorizes the Capital Development Board to use on a limited basis various construction contracting methods that may include, but need not be limited to, the following: single prime, single prime with protected subcontractors, construction manager at risk, multiple prime, and design/build;</i> • <i>Requires the Capital Development Board to keep complete and accurate records for the pilot program; and</i> • <i>Requires the Capital Development Board to submit regular reports on the results of the pilot program to the General Assembly.</i>

APPENDICES

APPENDIX A

Senate Resolution Number 147

92SR0147 Enrolled

LRB9208721RHrh

STATE OF ILLINOIS
NINETY-SECOND GENERAL ASSEMBLY
SENATE

Senate Resolution No. 147
Offered by Senator Steve Rauschenberger

WHEREAS, The current Illinois Procurement Code was enacted in 1998 as a comprehensive and sweeping reform of the State's procurement and purchasing practices; and

WHEREAS, The Illinois Procurement Code stipulates that all State construction contracts must be procured through competitive sealed bidding; and

WHEREAS, The Illinois Procurement Code states that all construction contracts that exceed \$250,000 are required to have separate specification and bidding for plumbing, heating, ventilation, electrical wiring, and general contract work; and

WHEREAS, Senate Bill 735 of the 92nd General Assembly was introduced to amend the Illinois Procurement Code and add "masonry" to the list of categories requiring separate bidding for State construction contracts; and

WHEREAS, The Capital Development Board issued a fiscal note for Senate Bill 735 stating that this legislation is expected to raise the costs of projects by as much as ten percent to cover increased design, coordination, and administration costs, with the yearly impact estimated to be \$45,000,000; and

WHEREAS, The Capital Development Board also stated that Senate Bill 735 is expected to raise the Agency's administration costs by approximately \$1,000,000 in the first year and \$600,000 yearly thereafter; and

92SR0147 Enrolled

-2-

LRB9208721RHrh

WHEREAS, Some would question if increasing the number of categories requiring bids would increase State cost by as much as \$45,000,000, if reducing the number of categories requiring separate bidding would decrease the cost of projects by as much as \$45,000,000 per category; therefore, be it

RESOLVED, BY THE SENATE OF THE NINETY-SECOND GENERAL ASSEMBLY OF THE STATE OF ILLINOIS, that the Auditor General shall study the possible effects of eliminating the five separate specifications for bidding on State construction contracts as a means of reducing the cost of State construction projects; and be it further

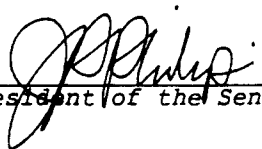
RESOLVED, That the study shall include the fiscal impact on the State of Illinois, construction contractors and construction sub-contractors; and be it further

RESOLVED, That the study shall include an analysis of using design-build practices for State construction projects; and be it further

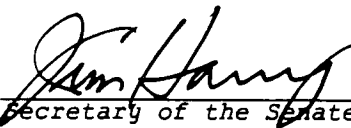
RESOLVED, That the Auditor General shall report its findings and recommendations to the Illinois Senate no later than May 1, 2002; and be it further

RESOLVED, That a copy of this resolution be sent to the Auditor General.

Adopted by the Senate, May 29, 2001.



President of the Senate



Secretary of the Senate

APPENDIX B

**Capital Development Board's
Fiscal Note For SB 735**

SB 735

Fiscal Note

Masonry Trade Addition to Procurement Code

Capital Development Board

Administrative Agency Costs:

	# Staff	\$/month	Total
Contract Technicians	2	\$2,500	\$60,000
Pre-Qual Technician	1	\$2,000	\$24,000
Training Coordinator	1	\$2,500	\$30,000
Clerical	1	\$2,000	\$24,000
Fiscal Technician	1	\$2,500	\$30,000
Project Managers	5	\$4,000	\$240,000
Total	11		\$408,000
Other Personal Services Costs		21%	\$85,680
Equipment for the Above			
Office furniture	11	\$3,000	\$33,000
Computers, printers	11	\$3,500	\$38,500
Other office costs	11	\$3,000	\$33,000
Statewide training conferences 12 @ \$1,000			\$12,000
Computer System Changes:			\$400,000
		Grand Total	\$1,010,180

Impact on Construction Contracts:

Average spending per year on construction contracts:		\$450,000,000
Each 1% cost to state:		\$4,500,000
	%	
Coordinating contractor added cost %:	5	\$22,500,000
Design firm added cost %:	1	\$4,500,000
Masonry administrative added cost %:	4	\$18,000,000
	Total	\$45,000,000

Source: Capital Development Board

APPENDIX C

**Capital Development Board's Memo
to the Auditor General
on
Adding Masonry as a Sixth Prime**

CAPITAL DEVELOPMENT BOARD



KIM ROBINSON * *Executive Director*

Board Members

Raymond Mota
Chairman
Dennis J. Gannon
George Fleischli
Joby H. Berman
Louis Jones
Michael N. Skoubis

MEMORANDUM

TO: William G. Holland, Auditor General
Office of the Auditor General

FROM: Kim Robinson, Executive Director
Capital Development Board

DATE: August 24, 2001

RE: Office of the Auditor General
Review of Adding a Sixth Separate Prime Contract (Masonry)
to the Procurement Code

Please see the revised information regarding the specific costs of adding a masonry contractor as a sixth prime contractor to the current procurement code.

- * The Capital Development Board is currently managing 1,200 projects valued at approximately \$2,400,000,000. Seventy-three percent (73%) of our projects have some type of masonry work included in the project. This masonry work averages 8% of the each respective project's work. Thus, the value of masonry services currently provided is \$140,160,000.
- * The costs of adding a sixth prime contractor to bid masonry work separately would result in a 10.3% or a \$14,436,480 increase in costs in addition to the current material and labor costs of \$140,160,000 dollars.
- * The studies provided by the New York State Division of Budget 1987 report and the 12-year study by the New York City School Construction Authority (completed through 1998) compared hundreds of projects valued at more than \$900,000,000. These studies are included in your support information packet. They clearly compared single prime project delivery methods to multiple prime delivery methods regarding overall project costs and schedule. The respective executive summaries and conclusions of these reports clearly show a cost savings from utilizing the single competitively bid general contractor method that range between 10% and 30%.

Wm. G. Stratton Building
401 South Spring Street
Third Floor
Springfield, Illinois
62706-4050

James R. Thompson Center
100 West Randolph Street
Suite 14-600
Chicago, Illinois 60601-3283

Dunn-Richmond Economic
Development Center
150 East Pleasant Hill Road
Suite 258
Carbondale, IL 62901

217.782.2864
217.524.0565 FAX
217.524.4449 TDD
www.cdb.state.il.us

The breakout of the costs by percentage and dollars of the estimated \$14,436,480 of extra funds necessary to support the creation of a new prime contractor defined as a masonry trade are detailed below:

1. Coordination of the project by the General Contractor of an additional prime contractor. (.5% = \$700,800)
2. Coordination of the prime masonry contract in the field with the cost difference of a foreman leading a masonry crew, versus a project manager or superintendent of a qualified prime contractor capable of managing other general and specialty contractors. (.5% = \$700,800)
3. The liability of the 2.5% assignment fee that could go to the general contractor as the management fee assigned between the base contract and the value of change orders for a possible masonry trade. (.1% = \$140,160)
4. The design firms have to break out additional, separate specifications and drawings for bid packages, field administration, pay packages and closeout activities. (1.6% = \$2,242,560)
5. The overhead associated with the Masonry contractor to supply staff to be able to function as the coordinating contractor, coordinate bonds, payment requests, insurance and all other CDB requirements. (1.6% = \$2,242,560)
6. The bonding costs for a smaller contractor are proportionately higher for small firms with limited general contracting experience than for strong general contractors. (.2% = \$280,320)
7. There is a lack of masonry contractors throughout the state that will bid jobs as a prime contractor. This will result in significantly higher bids due to the lack of competition. (2% = \$2,803,200)
8. CDB's costs will increase due to additional coordination, increased bidding, increased billing and voucher processing, increased prequalification review and many additional functions too numerous to mention. (.7% = \$981,120)
9. Additional litigation will result when you add another prime contractor. The result will be more delay claims due to additional coordination of the trades. (1.1% = \$1,541,760)

Memorandum to William G. Holland, Auditor General
August 24, 2001
Page 3

10. Bid Shopping/Peddling occurs throughout the industry as a way to control project costs. Currently, general contractors will shop the masonry price to several masonry subcontractors to achieve the lowest cost. The bid process for a separate masonry trade will result in higher costs to the State. (2% = \$2,803,200)

APPENDIX D

**Capital Development Board's Memo
to Auditor General**

on

**Single Prime Vs. Multiple Prime
Construction Contracting Method**

CAPITAL DEVELOPMENT BOARD



KIM ROBINSON * *Executive Director*

Board Members

Raymond Mota
Chairman
Dennis J. Gannon
George Fleischli
Joby H. Berman
Louis Jones
Michael N. Skoubis

MEMORANDUM

TO: William G. Holland, Auditor General
Office of the Auditor General

FROM: Kim Robinson, Executive Director
Capital Development Board

DATE: August 24, 2001

SUBJECT: Project Delivery Comparisons of a Single Prime/General Contractor Construction Contract Award System Compared to a Multiple Prime / Speciality Contractor Award System

Current Practices/Research:

After researching the pro's and con's of a competitive bid single prime contract construction project delivery method award versus a multiple prime contract, please considering the following information as you review these two options of project delivery methods researched from various points of reference from the following sources.

1. The Illinois State Procurement Codes, Acts and Law regarding state Building construction bidding from 1987 to 2001
2. Professional Construction and Design Association Interviews within Illinois, especially with individual private general contracting and speciality contractor firms. Also, interviews with private owners who award major construction projects within Illinois.
3. A Nationwide survey of project delivery methods from National Association of State Facilities Administrators which outlined delivery methods of over 24 States and one Canadian Providence.

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4. A follow-up request from Illinois to these States in which 22 States Construction Management and State Architects replied with the latest information on their construction project delivery methods.
5. A New York State University report titled, "Single Vs. Separate Prime Contracting" copyrighted 1995 by the Electrical Contracting Foundation and the Mechanical Contracting Foundation.
6. Public Agencies, School Boards and Municipalities report dated December 17, 1999 from the Great Peoria Contractors and Suppliers Association, Incorporated.
7. The Illinois Mechanical and Speciality Contractors Association report of 1992, titled "The Case for separate Bids: Advantages for Illinois Tax Payers".
8. The Capital Development Board from the State of Illinois report dated 1997 titled, "Alternative Contracting Methods".
9. Fiscal Impacts of the Wick Law Mandate (mandating multiple prime contract delivery methods in New York), Division of the Budget, New York, 1987.
10. Impact of the Wicks Law on Public Construction in New York City, by Mr. Albert Gallardo, Vice President, Program and External Affairs, New York City School Construction Authority, 1994. Summary of Same document with the impact on all public construction in New York City, 1999. Per these study's, 45 states use a competitively bid single prime contracting project delivery method for construction projects .

Current Status:

Illinois is one of only three States out of more than 45 States and one Canadian Province that still uses the multi-prime method of bidding & building as the standard management tool of State Construction projects. The current requirements of requiring multiple bids in Illinois as been in existence since at least 1987.

Multiple-Prime Bid/Project /Delivery Advantages:

- Direct Contracts are given to the five separate firms which allow direct checks and individual bids for projects with an individual value of over \$30,000 (which is adjusted for inflation currently) and an final estimated construction costs of over \$250,000. This avoids funds being held by General Contractors arbitrarily, which cause undo hardship on major sub-contractors.
- The Heating, Electrical, Ventilation, and Plumbing firms involved under current procurement rules do not face normal market construction conditions (bid shopping/bid peddling) and set their determined low price for State Construction. Bid Shopping is a major concern to the speciality contractors as they bid State Construction Projects. The lack of bid shopping results in the best low price for the state per the speciality contractors.
- Speciality contractors point out that the design coordination of five different sections of required parts of bid documents including drawings and specifications will lower the amount of possible field change orders because the designer is forced to provide a better designed project. And if change orders do occur, that the price would be smaller because in small construction projects most general contractors are 'brokers' managing the work of the major sub-contractors (Speciality Contractors in Illinois) and thus, add an additional mark-up on change order work.
- Those is favor of separate prime contracts also agree that management and coordination of the construction process is critical to project, but note that it is not the bidding process but the absence of capable management by the public owners that cause the problems in schedule delays and problems in installing and coordinating up to five different contractors services on a single project.

Single Prime Bid/Project Delivery Advantages:

- As in private work and the Federal Government Acquisition Requirements or (FAR's) the general contractor/single prime bid/project delivery method is preferred of the many available project delivery methods. In the vast majority of this work these owners noted higher bid costs, increased

administration, more change orders and poor quality work would result from multiple prime contractors. In addition, Bid costs are thought to be higher due to the fact that while general contractors who are responsible for overall project coordination increase their bids because they are in fact, given none of the real power to hire/dismiss non performing or withhold payment for speciality contractors for unacceptable quality or non-performance to specifications including schedule.

- Per general contractors, separately bid jobs necessarily result in more delays and litigations. The threat of litigation occurs when one contractors problems affects the schedules of up to five other contractors who all must cooperate to allow a schedule to work for the State. If just one of these contractors chooses not to work together, a coordination general contractor is severely limited to motivating a speciality contractor to cooperate with contractual authority.
- General Contractors are very experienced in hiring hundreds of sub-contractors/suppliers on other projects including the four main sub-contractors of heating, electrical, ventilation and plumbing and then coordinating all of these sub-contractor and suppliers into a coordinated schedule. Moreover, the owner has one point of contact to hold responsible for either bonding, penalty or limiting pre-qualification of future bidding status to be limited for non performance.
- General Contractors strongly believe that they can save percentage points in the overall costs of the project bid because of the market forces of obtaining both the best low price and the responsibility of hiring anywhere from dozens to hundreds of sub-contractors/supplier firms they know will work well together with them. Quality, schedule and Cost are the key item that is required for effective use of State Construction Projects. Only in a single prime method is one party responsible for all of these requirements to the Taxpayers. Included in the research documents is the point that in comparing single prime awards to multiple prime awards, one state found that the multiple prime contractor projects were delayed an average 15.6 Months longer to reach completion.

- All minority and small business goals can be met as they are today in specifying goals that sub-contractor firms and suppliers can supply goods and services.
- The coordination expertise is a requirement for all pre-qualified firms. Many small speciality contractors lack the expertise to manage four other firms on a multi-million dollar contracts successfully.
- Twenty-one of the 24 States that replied to the independent study nationwide noted that they have passed legislation that either require a competitively bid single prime method or use the competitively bid single prime bid award/project delivery method in the majority of it's construction projects. This includes all the states that border Illinois except Wisconsin.

Fiscal Summary:

- The studies provided by the New York State Fiscal Division of Budget 1987 report and the 12 year study by the New York City School Construction Authority (completed in 1998) compared hundreds of projects valued at over \$900,000,000. These studies are included in your support information packet. They clearly compared single prime project delivery methods to multiple prime delivery methods regarding overall project costs and schedule. The respective executive summary's and conclusion's of these reports clearly show a cost savings in utilizing the single competitively bid general contractor method to range between 10% and 30%. Using New York's independent studies, please consider the follow points noted below.
- The Capital Development Board is currently managing 1200 projects valued at approximately \$2,400,000,000. CDB contracts average a 60/40 split of the construction work with 60% percent of the work performed by the general contractor and 40% by the combined remaining work of the other prime speciality contractors of electrical, plumbing, heating and ventilation.
- The 40% split of work equals \$960,000,000 of directly contracted work performed by the speciality contractors. The trades usually even out in value per project, thus dividing this figure by four equals \$240,000,000

Memorandum to William G. Holland, Auditor General
August 24, 2001
Page 6

worth of work completed by each speciality trade under the current procurement code requirements.

- As established by the ten detailed items in the masonry review, it is clear that 10.3% savings can be achieved by bidding all construction work under the single competitive bid of a general contractor per project, versus the current method of directly contracting with four additional speciality contractors.
- The 10.3% translates into savings from each speciality trade of \$24,720,000. In total, \$98,880,000 can be saved for the State of Illinois by going to a single competitively bid general contract delivery method.

APPENDIX E

University of Illinois' Estimated Savings Using Single Prime

Appendix E

ANALYSIS OF POTENTIAL COST AVOIDANCE

**UNIVERSITY OF ILLINOIS CAPITAL IMPROVEMENT PROJECTS
USING DESIGN/BID/BUILD SINGLE-PRIME METHODOLOGY**

31-Jan-2002

DATA ANALYSIS ON COMPLETED PROJECTS				
NBR OF PROJ*	PROJECT BUDGET	CONSTR CONTRACTS	% OF CONSTR TO BUDGET	
28	\$ 79,502,096	\$ 59,471,397	75%	
NBR OF PROJ	TYPE OF PROJECT	CONSTR CONTRACTS	MEP CONTRACTS	% MEP TO CONSTR
18	Remodeling	\$ 20,110,073	\$ 8,508,767	42.31%
3	Additions	\$ 9,701,006	\$ 4,127,351	42.55%
1	New Construction	\$ 16,270,582	\$ 5,546,761	34.09%
22		\$ 46,081,661	\$ 18,182,879	39.46%

* Does not include site projects (4), UI Warehouse, or Football Practice Facility.
Omitted projects contain little or no MEP work and are not representative of a typical project.

DIVISION OF WORK~	BASE CONTRACT	CHANGES TO WORK	% CHANGES TO WORK	% CHANGES TO MEP WK
General Work	\$ 46,625,156	\$ 2,400,758	5.15%	
Plumbing Work	\$ 2,683,218	\$ 363,792	13.56%	
Heating Work	\$ 4,795,149	\$ 385,950	8.05%	
Ventilation Work	\$ 3,606,251	\$ 103,462	2.87%	
Electrical Work	\$ 8,887,446	\$ 599,064	6.74%	
Fire Protection Work	\$ 578,093	\$ 231,267	40.01%	
	\$ 67,175,313	\$ 4,084,293	6.08%	8.19%

~This analysis includes all projects listed above and include site projects (4), UI Warehouse, and the Football Practice Facility.

FUTURE PROJECT PROJECTION BASED ON DATA ANALYSIS	
Future projects (74) at UIUC:	\$ 404,460,622
Expected Construction Cost (75% of project budget):	\$ 307,841,046
Expected GC Work (64% of construction):	\$ 196,561,126
Expected MEP Work (36% of construction):	\$ 111,279,859
Expected MEP Change Orders (8.19% of MEP Work):	\$ 9,113,820
Expected GC Assignment Fee (2.5% of MEP Work):	\$ 2,781,996
Expected Change Order Markup from GC (5% of MEP Chg Orders):	\$ 455,691
Admin Burden Owner (74 contracts x 5 div of wk; 4 CO/contr; 8 pay apps/contr):	\$ 375,584
Admin Burden A/E (74 contracts x 5 div of wk; 4 CO/contr; 8 pay apps/contr):	\$ 375,584
Overall project delivery cost avoidance (1.5% of Construction Cost):	\$ 4,617,616
TOTAL	\$ 8,606,471
Potential Cost Avoidance Using D/B/B Single Prime (\$8.6M/\$307.8M):	2.80%
Overall University of Illinois Capital Improvement Program:	\$ 1,300,000,000
Expected Construction Cost (75% of capital program):	\$ 975,000,000
Potential Cost Avoidance Using D/B/B Single Prime (\$975M x 2.8%):	\$ 27,300,000

Source: Office for Capital Programs-University of Illinois.

APPENDIX F

**Applicable Statutes
and Administrative Rules**

Appendix F
APPLICABLE STATUTES AND ADMINISTRATIVE RULES

30 ILCS 500/20-5 – Method of source selection.

Unless otherwise authorized by law, all State contracts shall be awarded by competitive sealed bidding, in accordance with Section 20-10, except as provided in Sections 20-15, 20-20, 20-25, 20-30, 20-35, 30-15 and 40-20.

30 ILCS 500/20-10 – Competitive sealed bidding.

- g) Award. The contract shall be awarded with reasonable promptness by written notice to the lowest responsible and responsive bidder whose bid meets the requirements and criteria set forth in the invitation for bids, except when a State purchasing officer determines it is not in the best interest of the State and by written explanation determines another bidder shall receive the award. The explanation shall appear in the appropriate volume of the Illinois Procurement Bulletin.

30 ILCS 500/20-20 – Small purchases.

- a) Amount. Any individual procurement of supplies or services other than professional or artistic services, not exceeding \$10,000 and any procurement of construction not exceeding \$30,000 may be made without competitive sealed bidding. Procurements shall not be artificially divided so as to constitute a small purchase under this Section.
- b) Adjustment. Each July 1, the small purchase maximum established in subsection (a) shall be adjusted for inflation as determined by the Consumer Price Index for All Urban Consumers as determined by the United States Department of Labor and rounded to the nearest \$100.
- c) Based upon rules proposed by the Board and rules promulgated by the chief procurement officers, the small purchase maximum established in subsection (a) may be modified.

30 ILCS 500/30-15 – Method of source selection.

- a) Competitive sealed bidding. Except as provided in subsections (b), (c), and (d) and Sections 20-20, 20-25, and 20-30, all State construction contracts shall be procured by competitive sealed bidding in accordance with Section 20-10.
- b) Other methods. The Capital Development Board shall establish by rule construction purchases that may be made without competitive sealed bidding and the most competitive alternate method of source selection that shall be used.
- c) Construction-related professional services. All construction-related professional services contracts shall be awarded in accordance with the provisions of the Architectural, Engineering, and Land Surveying Qualifications Based Selection Act. "Professional services" means those services within the scope of the practice of architecture, professional engineering, structural engineering, or registered land surveying, as defined by the laws of this State.
- d) Correctional facilities. Remodeling and rehabilitation projects at correctional facilities under \$25,000 funded from the General Revenue Fund are exempt from the provisions of this Article. The Department of Corrections may use inmate labor for the remodeling or rehabilitation of correctional facilities on those projects under \$25,000 funded from the General Revenue Fund.

44 Ill. Adm. Code 910.130 – Construction Project Specifications.

- a) Subdivisions of the Work. In construction contracts in excess of \$250,000, separate bidding will be specified for at least the five subdivisions of work enumerated by the Code generally as: plumbing, heating, ventilating, electric, and general. If appropriate to the project and advantageous to the State, additional subdivisions such as sprinkler work (fire protection) may be specified. In the event that the work in a particular subdivision is less than \$30,000, or is an amount determined in writing by CDB to be so small compared to the other contracts that a separate contractor would adversely interfere with the scheduling and coordinating of the project, or so small that it is not likely that more than one bidder will bid, the work may be added to another subdivision as appropriate.
- b) Product Substitutions. Bids for construction projects shall be based on providing all products, subcontractors or suppliers specified in the specifications. However, CDB specifications shall provide that a bidder may propose substitutions of a product, subcontractor or supplier upon review and approval by CDB's project A/E. The product substitution process may be utilized regardless of whether the specification calls for a sole source, and regardless of whether only brand names are listed. Substitutions not approved prior to bidding shall not be accepted after award if acceptance would require a change order increasing the amount of the contract.

30 ILCS 500/30-30 – Contracts in excess of \$250,000.

For building construction contracts in excess of \$250,000, separate specifications shall be prepared for all equipment, labor, and materials in connection with the following 5 subdivisions of the work to be performed:

- 1 plumbing;
- 2 heating, piping, refrigeration, and automatic temperature control systems, including the testing and balancing of those systems;
- 3 ventilating and distribution systems for conditioned air, including the testing and balancing of those systems;
- 4 electric wiring; and
- 5 general contract work.

The specifications must be so drawn as to permit separate and independent bidding upon each of the 5 subdivisions of work. All contracts awarded for any part thereof shall award the 5 subdivisions of work separately to responsible and reliable persons, firms, or corporations engaged in these classes of work. The contracts, at the discretion of the construction agency, may be assigned to the successful bidder on the general contract work or to the successful bidder on the subdivision of work designated by the construction agency before the bidding as the prime subdivision of work, provided that all payments will be made directly to the contractors for the 5 subdivisions of work upon compliance with the conditions of the contract. A contract may be let for one or more buildings in any project to the same contractor. The specifications shall require, however, that unless the buildings are identical, a separate price shall be submitted for each building. The contract may be awarded to the lowest responsible bidder for each or all of the buildings included in the specifications.

APPENDIX G

Survey of Contractors

November 27, 2001

Company
Address
City, State ZIP

Dear Contractor:

The Illinois State Senate has requested the Auditor General to conduct a study of Illinois' procurement methods for non-transportation construction projects. Specifically, Senate Resolution Number 147 requesting the study asks for the following:

- The possible effects of eliminating the five separate specifications for bidding on State construction contracts as a means of reducing the cost to the State.
- The fiscal impact on the State, construction contractors, and sub-contractors.
- An analysis of using design-build practices for State construction projects.

Currently, the State of Illinois primarily uses multiple prime contractors for constructing office buildings, warehouses, etc. In other words, a project may be bid to five trades which result in the State having separate contracts for electrical wiring, heating, plumbing, ventilation, and general contract work.

Senate Resolution Number 147 asks about the fiscal impact on contractors and subcontractors if separate specifications for bidding were eliminated. Therefore, we would like to provide you the opportunity to tell how such a change in procurement would affect you. Please complete this survey questionnaire and return it no later than December 20, 2001. A self-addressed return envelope is enclosed for your convenience. Your completed questionnaire will become public information on the date the report is released.

In appreciation for completing the survey questionnaire, we would be happy to provide you with a copy of our report's executive summary. If you have any questions, please contact Ameen Dada (oag26@mail.state.il.us) or Scott Wahlbrink (oag54@mail.state.il.us) at 217\782-6046. Thank you for your assistance.

Yours truly,

WILLIAM G. HOLLAND
Auditor General

Enclosure

Illinois Auditor General's Survey of Contractors

CONSTRUCTION BIDDING METHODS

Enclosed is a self-addressed envelope, please return the completed survey by **December 20, 2001** to:

Ameen Dada, Audit Manager FAX: (217) 785-8222

Illinois Auditor General's Office

740 East Ash Street

Springfield, IL 62703-3154

YOUR NAME AND TITLE:

COMPANY:

ADDRESS:

CITY, STATE, ZIP:

TELEPHONE NUMBER:

()

FAX NUMBER:

()

E-MAIL ADDRESS:

This survey questionnaire pertains to the methods used by the State of Illinois for constructing office buildings, warehouses, and other such capital construction projects that are not related to transportation (i.e., this is *not* a survey about roads or bridges).

1. SIZE. What is the size of your company?
- Small (Less than \$1 million in average **total** business per year – not just business with the State of Illinois)
 - Medium (Between \$1 million and \$20 million in average **total** business per year)
 - Large (More than \$20 million in average **total** business per year)

2. TYPE. What type of construction work is done by your company?
- General contracting: _____%
- Specialty contracting:
- Electrical _____%
 - Heating _____%
 - Ventilation _____%
 - Plumbing _____%
 - Other (specify): _____%
- TOTAL 100%**

3. COST. If State law was changed to require the Capital Development Board (CDB) to bid projects using a single prime method (instead of the current multiple prime method), what impact would this change have on the following:	<i>If your answer is that cost would increase or decrease, please write a percentage ↘</i>			
	Percentage Increase	Percentage Decrease	No Change (✓)	
A. Cost to design the project				
B. Total construction bid cost of the project				
C. Cost of change orders				
D. Cost of litigation				
E. Cost for general/coordinating contractor				
G. Other factors ☹ please specify:				

Multiple prime bidding method means obtaining separate bids from, and contracting separately with, general and specialty contractors for a construction project.

Single prime bidding method means obtaining only one bid from a general contractor for a construction project.

STUDY OF THE STATE'S CONSTRUCTION CONTRACTING METHODS

<p>4. EFFECTS. What would be the non-fiscal effects, if any, on the project if the State changed to a single prime method (e.g., timeliness of completion, work quality)?</p>	
<p>5. FISCAL IMPACT. If State law was changed to require CDB to use the single prime method, please describe the fiscal impact, if any, such a change would have on your company (please quantify any effect if possible).</p>	
<p>6. BIDDING. If State law was changed to require single prime contracting by CDB, what type of work would your company do?</p>	<p>Please circle the appropriate letter: A. Bid on CDB contracts as the overall coordinating contractor B. Work under a coordinating contractor as a subcontractor on CDB jobs C. Both A and B (bid and work as subcontractor) D. Not do any construction work for CDB E. Other ➡ please specify:</p>
<p>7. BID SHOPPING. What effect would a single prime method have on bid shopping and bid peddling by contractors?</p>	
<p>8. DESIGN-BUILD. If the Capital Development Board used the design-build method of constructing, would your company bid?</p> <div style="border: 1px solid black; background-color: #e0e0e0; padding: 5px; margin-top: 10px;"> <p>Design-build means obtaining a combined bid for both A&E design and construction for a project.</p> </div>	<p><input type="checkbox"/> No <input type="checkbox"/> Yes ➡ What would be the advantages and disadvantages of using the design-build method?</p>
<p>9. STATE CONTRACTS. Has your company worked on State construction projects over the past five years?</p>	<p><input type="checkbox"/> No <input type="checkbox"/> Yes ➡ What type of work did you do: <input type="checkbox"/> General contractor <input type="checkbox"/> Specialty prime contractor <input type="checkbox"/> Sub-contractor for a general contractor</p>
<p>10. COMMENTS. Are there any other comments that you would like to make about the State's use of multiple prime versus single prime construction bidding methods?</p>	

Thank you for helping the State of Illinois evaluate its construction bidding method.
 The information you provided will become public when the report is issued.
If you would like a copy of the executive summary, please check (✓) here:

APPENDIX H

Survey of Architects and Engineers

November 28, 2001

Company
Address
City, State ZIP

Dear Architect/Engineer:

The Illinois State Senate has requested the Auditor General to conduct a study of Illinois' procurement methods for non-transportation construction projects. Specifically, Senate Resolution Number 147 requesting the study asks for the following:

- The possible effects of eliminating the five separate specifications for bidding on State construction contracts as a means of reducing the cost to the State.
- The fiscal impact on the State, construction contractors, and sub-contractors.
- An analysis of using design-build practices for State construction projects.

Currently, the State of Illinois primarily uses multiple prime contractors for constructing office buildings, warehouses, etc. In other words, a project may be bid to five trades which result in the State having separate contracts for electrical wiring, heating, plumbing, ventilation, and general contract work.

Senate Resolution Number 147 asks about the possible impact if separate specifications for bidding were eliminated. Since a change may affect you, we would like to provide you the opportunity to tell us about the effects of such a change in procurement by completing the enclosed survey questionnaire no later than December 21, 2001. A self-addressed return envelope is enclosed for your convenience. Your completed questionnaire will become public information on the date the report is released. We obtained your name from the Capital Development Board's list of pre-qualified contractors.

In appreciation for completing the survey questionnaire, we would be happy to provide you with a copy of our report's executive summary. If you have any questions, please contact Ameen Dada (oag26@mail.state.il.us) or Scott Wahlbrink (oag54@mail.state.il.us) at 217\782-6046. Thank you for your assistance.

Yours truly,

WILLIAM G. HOLLAND
Auditor General

Enclosure

**Illinois Auditor General's Survey of Architects and Engineers
CONSTRUCTION BIDDING METHODS**

*Enclosed is a self-addressed envelope, please return the completed survey by **December 21, 2001** to:
Ameen Dada, Audit Manager FAX: (217) 785-8222
Illinois Auditor General's Office
740 East Ash Street
Springfield, IL 62703-3154*

YOUR NAME AND TITLE:			
COMPANY:			
ADDRESS:			
CITY, STATE, ZIP:			
TELEPHONE NUMBER:	()	FAX NUMBER:	()
E-MAIL ADDRESS:			

This survey questionnaire pertains to the methods used by the State of Illinois for constructing office buildings, warehouses, and other such capital construction projects that are not related to transportation (i.e., this is *not* a survey about roads or bridges).

1. COST. If State law was changed to require the Capital Development Board to bid projects using a single prime method (instead of the current multiple prime method), what impact would this change have on the following:	<i>If your answer is that cost would increase or decrease, please write a percentage ↘</i>	Percentage Increase	Percentage Decrease	No Change (✓)
	<ul style="list-style-type: none"> Multiple prime bidding method means obtaining separate bids from, and contracting separately with, general and specialty contractors for a construction project. Single prime bidding method means obtaining only one bid from a general contractor for a construction project. 	A. Cost to design the project		
B. Total construction bid cost of the project				
C. Cost of change orders				
D. Cost of litigation				
E. Cost for general/coordinating contractor				
F. Other factors ↻ please specify:				
2. EFFECTS. What would be the non-fiscal effects, if any, on the project if the State changed to a single prime method (e.g., timeliness of completion, work quality)?				

<p>3. FISCAL IMPACT. If State law was changed to require CDB to use the single prime method, please describe the fiscal impact, if any, such a change would have on your company (please quantify any effect if possible).</p>	
<p>4. DESIGN-BUILD. If the Capital Development Board used the design-build method of constructing, would your company be interested?</p> <p>Design-build means obtaining a combined bid for both A&E design and construction for a project.</p>	<p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes ➔ What would be the advantages and disadvantages of using the design-build method?</p>
<p>5. STATE CONTRACTS. Has your company worked on State construction projects over the past five years?</p>	<p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes</p>
<p>6. COMMENTS. Are there any other comments that you would like to make about the State's use of multiple prime versus single prime construction bidding methods?</p>	
<p>Thank you for helping the State of Illinois evaluate its construction bidding method. The information you provided will become public when the report is issued. If you would like a copy of the executive summary, please check (✓) here: <input type="checkbox"/></p>	

APPENDIX I
Survey of States

November 20, 2001

Name
Title
Agency
Address
City, State ZIP

Dear _____:

The Illinois State Senate has requested the Auditor General to conduct a study of Illinois' procurement methods for non-transportation construction projects. Specifically, Senate Resolution Number 147 requesting the study asks for the following:

- The possible effects of eliminating the five separate specifications for bidding on State construction contracts as a means of reducing the cost to the State.
- The fiscal impact on the State, construction contractors, and sub-contractors.
- An analysis of using design-build practices for State construction projects.

Currently, the State of Illinois primarily uses multiple prime contractors for constructing office buildings, warehouses, etc. In other words, a project may be bid to five trades which result in the State having separate contracts for electrical wiring, heating, plumbing, ventilation, and general contract work.

It is our understanding that most states use a method that is different than Illinois. Therefore, we would like to learn about the method used by your state for this study. We are requesting that you complete this survey questionnaire and return it by December 20, 2001. A self-addressed return envelope is enclosed for your convenience. Your completed questionnaire and any documents your state provides will become public information on the date the report is released.

In appreciation for completing the survey questionnaire, we would be happy to provide you with a copy of our report which will contain information about other states' construction contracting methods.

We sincerely appreciate your time and assistance. If you have any questions, please contact Ameen Dada (oag26@mail.state.il.us) or Scott Wahlbrink (oag54@mail.state.il.us) at 217\782-6046. Thank you for your assistance.

Yours truly,

WILLIAM G. HOLLAND
Auditor General

Enclosure

**Illinois Auditor General's Survey of States
CONSTRUCTION BIDDING METHODS**

*Enclosed is a self-addressed envelope, please return the completed survey by **December 20, 2001** to:*
 Ameen Dada, Audit Manager FAX: (217) 785-8222
 Illinois Auditor General's Office
 740 East Ash Street
 Springfield, IL 62703-3154

YOUR NAME AND TITLE:				
ORGANIZATION:				
ADDRESS:				
CITY, STATE, ZIP:				
TELEPHONE NUMBER:	()	FAX NUMBER:	()	
E-MAIL ADDRESS:				
<p>This survey questionnaire pertains to the methods used by your state for constructing office buildings, warehouses, and other such capital construction projects that are not related to transportation (i.e., this is not a survey about roads or bridges).</p>				
<p>1. METHOD. What is your state's method for bidding construction contracts?</p>	<p>Select all that apply and write the approximate percentage of such contracts based on the total dollar amount of your contracts in FY 2001:</p>	<p>Percent</p>	<ul style="list-style-type: none"> ▪ Single prime bidding method means obtaining only one bid from a general contractor for a construction project. ▪ Single prime with protected subcontractors means the subcontractors need to be identified before the bidder is selected. ▪ Multiple prime bidding method means obtaining separate bids from, and contracting separately with, general and specialty contractors for a construction project. ▪ Design-build means obtaining a combined bid for both A&E design and construction for a project. 	
	▪ Single prime			
	▪ Single prime with protected subcontractors			
	▪ Multiple prime			
	▪ Design-build			
<p>▪ Other ☛ please explain:</p>		<p>100%</p>		
<p>▪ If your state uses more than one construction bidding method, how is the method chosen (e.g., based on type of project, size, dollar amount)?</p>				
<p>2. REQUIREMENT. What requirement prescribes the bidding process to be used?</p>	<input type="checkbox"/> State law ☛ please enclose copy or provide citation: <input type="checkbox"/> Agency regulation ☛ please enclose copy or provide citation: <input type="checkbox"/> Agency's internal decision <input type="checkbox"/> Other ☛ please explain:			
<p>3. COMPARISON. Has your state used multiple prime bidding method <u>and</u> another method in the past 10 years?</p>	<input type="checkbox"/> No ☛ please skip to question 4 <input type="checkbox"/> Yes			
<p>A. If yes, please list the following:</p> <p align="center">Advantages ☛</p> <p align="center">Disadvantages ☛</p>	<p>Multiple Prime</p>		<p>Other Method (specify): _____</p>	

STUDY OF THE STATE'S CONSTRUCTION CONTRACTING METHODS

B. Which method resulted in lower:	Multiple Prime	Other Method Named In Question 3.A.	No Difference	No Basis To Judge
▪ design costs				
▪ construction costs (including change orders and litigation)?				
▪ state agency administration costs				
4. EVALUATION. Has your state conducted any evaluations on the advantages and disadvantages of various bidding methods?	<input type="checkbox"/> No <input type="checkbox"/> Yes ➔ please enclose a copy of the report.			
5. DESIGN-BUILD. Does your state use the design-build method of constructing?	<input type="checkbox"/> No <input type="checkbox"/> Yes ➔ please answer the following: ▪ How extensively is it used? ▪ When is it used? ▪ What are the advantages? ▪ What are the disadvantages?			
6. PRE-QUALIFICATION. Does your state pre-qualify contractors by specific trade?	<input type="checkbox"/> No <input type="checkbox"/> Yes ➔ please specify which trades are pre-qualified: <input type="checkbox"/> Electrical <input type="checkbox"/> General <input type="checkbox"/> Heating <input type="checkbox"/> Plumbing <input type="checkbox"/> Ventilation <input type="checkbox"/> Masonry <input type="checkbox"/> Insulation <input type="checkbox"/> Other ➔ please specify:			
7. BEST PRACTICES. What does your state do related to bidding methods for construction contracts that is exceptional and could be considered for adoption by other states?				
8. COMMENTS. Are there any other comments that your agency would like to make about your construction bidding methods (e.g., lessons learned or things to avoid)?				
9. REPORT. If you would like to receive this study when it is released, please indicate.	<input type="checkbox"/> Executive Summary <input type="checkbox"/> Full Report (includes executive summary) <input type="checkbox"/> E-mail link [fastest way to receive full report] at: _____			

Thank you for providing information on your state's construction bidding methods.
The information you provided will become public on the date that the report is issued.

APPENDIX J

**Capital Development Board's
List of Projects Completed
in Fiscal Year 2001**

APPENDIX J CAPITAL DEVELOPMENT BOARD'S LIST OF PROJECTS COMPLETED IN FISCAL YEAR 2001					
Project Count	Description*	Location*	Contractors Name*	Trade	Total Contract Amount
1	Conversion to correctional facility	Decatur Correctional Center - Macon County	1. Williams Brothers Construction Inc	General	\$11,164,665.88
			2. Bodine Electric of Decatur d/b/a (Rathje Enterprises Inc)	Electrical	\$3,570,008.60
			3. Brinkoetter T A & Sons Incorporated	Plumbing	\$1,831,220.80
			4. T N T Mechanical Contractors Inc	Heating/ Cooling	\$1,679,638.62
			5. L & L Mechanical D/B/A EEI Holding Corp	Ventilation	\$1,180,675.34
			6. Murphy F J & Son Inc	Plumbing	\$315,696.98
			7. Pruitt E L Co	Ventilation	\$273,831.96
2	Classroom expansion	Southwestern IL Community Coll - Belleville	1. Calhoun Construction Inc	General	\$2,199,752.59
			2. K + F Electric Inc	Electrical	\$403,235.79
			3. Belleville Mechanical Inc	Heating/ Cooling	\$378,000.00
			4. Bel-O Sales & Service Inc	Plumbing	\$286,550.07
			5. Belleville Mechanical Inc	Ventilation	\$191,619.00
			6. L & K Fire Protection Inc	Plumbing	\$62,800.00
			7. Cable Masters d/b/a Kenneth Kelly	Electrical	\$49,815.85
3	Construct lab facility	Chicago Forensic Laboratory - Cook County	1. Walsh/Ii In One J.V.	General	\$9,717,905.37
			2. Hyre Electric Company	Electrical	\$2,270,973.63
			3. Connelly G F Mechanical Contractors Inc	Heating/ Cooling	\$2,166,778.00
			4. Irsay Robert Company The	Ventilation	\$1,281,018.93
			5. A & H Plumbing & Heating Co	Plumbing	\$809,444.11
			6. Monarch Fire Protection Inc	Plumbing	\$168,500.00
4	Renovate elm cottage	Murray Developmental Center - Centralia	1. Depew & Owen Builders Inc	General	\$1,361,314.41
			2. Industrial Mechanical Contractors Ltd	Plumbing	\$378,664.89
			3. Kuhn Electric Incorporated	Electrical	\$332,992.19
			4. Industrial Mechanical Contractors Ltd	Heating/ Cooling	\$308,957.00
			5. Belleville Mechanical Inc	Ventilation	\$292,959.00
			6. Murphy F J & Son Inc	Plumbing	\$56,487.00
5	Rehab bldg 5 & 6 for indpndt living	Il School for the Visually Impaired - Jacksonville	1. Siciliano Inc	General	\$807,760.24
			2. Anderson Electric Inc	Electrical	\$157,774.00
			3. Doyle Plumbing and Heating Co	Heating/ Cooling	\$150,776.00
			4. Henson Robinson Company	Plumbing	\$145,898.00
			5. Henson Robinson Company	Ventilation	\$59,818.00
			6. Mc Daniel Fire Systems Inc	Plumbing	\$23,665.00
6	Const office/ Classroom building	Danville Area Community College - Vermilion County	1. Williams Brothers Construction Inc	General	\$4,534,900.55
			2. Leverenz Electric Co., Inc.	Electrical	\$754,853.00
			3. McWilliams Mechanical Services Inc	Heating/ Cooling	\$658,902.44
			4. A & R Mechanical Contractors Inc	Ventilation	\$453,721.00
			5. Nogle & Black Mechanical, Inc.	Plumbing	\$347,223.00
			6. Murphy F J & Son Inc	Plumbing	\$105,476.00

APPENDIX J – CAPITAL DEVELOPMENT BOARD’S LIST OF PROJECTS COMPLETED IN FISCAL YEAR 2001

7	New classroom construction	Lake Land College - Mattoon	1.	Swingler L J & Sons Inc	General	\$3,828,299.98
			2.	Commercial Electric Inc	Electrical	\$739,974.67
			3.	A & R Mechanical Contractors	Ventilation	\$412,567.00
			4.	Nogle & Black Mechanical Inc D/B/A (Comfort Systems USA)	Heating/ Cooling	\$266,912.04
			5.	Boos Plumbing & Heating Co	Plumbing	\$263,031.00
			6.	Mc Daniel Fire Systems Inc	Plumbing	\$56,692.00
8	Constr/Remdl site for campus	Northern Illinois University - Rockford	1.	Ringland - Johnson Incorporated	General	\$3,941,116.85
			2.	Mascal Electric Inc	Electrical	\$627,855.00
			3.	Commercial Mechanical Inc	Heating/ Cooling	\$303,263.00
			4.	Air Systems Of Rockford	Ventilation	\$254,421.12
			5.	Commercial Mechanical Inc	Plumbing	\$204,118.00
			6.	Dan-Car Sprinkler Company	Plumbing	\$86,364.79
9	Horse barn renovation	Illinois State Fairgrounds - Springfield	1.	Siciliano Inc	General	\$2,241,227.00
			2.	Mansfield Electric Co	Electrical	\$396,746.00
			3.	L & L Mechanical D/B/A EEI Holding Corp	Plumbing	\$221,394.77
			4.	Pruitt E L Co	Ventilation	\$214,650.00
			5.	Murphy F J & Son Inc	Plumbing	\$66,686.00
10	Visitors center	Giant City State Park & Lodge - Jackson County	1.	Morgan Commercial Structures d/b/a (Robt L Morgan Bldr Inc)	General	\$666,049.95
			2.	Burke W J Electric Co Inc	Electrical	\$140,248.96
			3.	Howton Plumbing & Heating Inc	Plumbing	\$77,185.47
			4.	H S G Mechanical Contractors Inc	Heating/ Cooling	\$73,600.00
			5.	Mike's Heating and Air Inc	Ventilation	\$30,639.00
11	Expanded bldg/Dietary/ Dining & whs	Dwight Correctional Center - Livingston County	1.	Vissering Construction Company	General	\$3,493,806.38
			2.	Fogarty Constance d/b/a (Fogarty Electric)	Electrical	\$431,467.00
			3.	Dodson Plumbing Heating & Air Conditioning Inc	Ventilation	\$409,233.25
			4.	Rich G A & Sons Inc	Plumbing	\$385,969.46
			5.	Murphy F J & Son Inc	Plumbing	\$56,854.00
12	West cellhouse rehabilitation	Joliet Correctional Center - Will County	1.	Certified Midwest Construction	General	\$4,276,900.42
			2.	Dodson Plumbing Heating & Air Conditioning Inc	Plumbing	\$1,641,658.23
			3.	Halm Electrical Contractors Inc	Electrical	\$1,286,660.66
			4.	Air Design Systems Inc	Ventilation	\$846,373.53
			5.	Voris Mechanical Inc	Heating/ Cooling	\$630,229.43
13	Construct housing unit	Illinois Youth Center - Joliet	1.	Ockerlund Construction Comp.	General	\$4,530,344.40
			2.	Dodson Plumbing Heating & Air Conditioning Inc	Plumbing	\$956,274.15
			3.	U S Electric d/b/a Anneca Inc	Electrical	\$744,431.95
			4.	Dodson Plumbing Heating & Air Conditioning Inc	Ventilation	\$612,760.50
			5.	Havel Bros DbA/Guardian Prot Sys	Plumbing	\$97,640.00
14	A/C, spklr, hndcp, fire safety (703)	Illinois Children's School - Chicago	1.	Markham Electric Contractors	Electrical	\$456,272.75
			2.	Grinnell Fire Protection System/Div	Plumbing	\$226,717.00
			3.	R J Ridolfi & Co Inc	General	\$217,419.00
			4.	Young Bert C & Sons Corp	Heating/ Cooling	\$51,832.00
			5.	Environmental Mechanical Services Inc	Ventilation	\$35,522.81

STUDY OF THE STATE'S CONSTRUCTION CONTRACTING METHODS

15	Const natatorium	Rend Lake College - Ina, Jefferson County	1.	Brieseacher Construction Inc	General	\$1,695,292.47
			2.	Swan Sheet Metal Inc	Ventilation	\$212,550.00
			3.	Clinton Electric Inc	Electrical	\$201,149.00
			4.	Rend Lake Plumbing & Heating	Plumbing	\$172,963.00
			5.	Williams Air Conditioning & Heating Inc	Heating/ Cooling	\$39,910.00
16	Remodl buzzard bld/Const addtn(708)	Eastern Illinois University - Charleston	1.	Williams Brothers Construction	General	\$5,495,196.00
			2.	Commercial Electric Inc	Electrical	\$1,246,475.77
			3.	McWilliams Mechanical Services Inc	Heating/ Cooling	\$1,231,621.00
			4.	Merz Sheet Metal, Inc.	Ventilation	\$1,017,770.70
			5.	McWilliams Mechanical Serv.	Plumbing	\$554,983.05
17	Convert gym for military/ Horrabin h	Western Illinois University - Macomb	1.	Laverdiere Construction Inc	General	\$691,224.00
			2.	Johnson Contracting Company	Ventilation	\$187,500.00
			3.	Commercial Mechanical Inc	Heating/ Cooling	\$153,500.00
			4.	Koener Electric Inc	Electrical	\$134,996.48
			5.	Rampy Warner Plumbing Inc	Plumbing	\$32,440.00
18	Neckers bldg. Renovate 3rd floor	Southern Illinois University - Carbondale	1.	Morgan Commercial Structures d/b/a (Robt L Morgan Bldr Inc)	General	\$592,354.00
			2.	Williams Air Cond & Heating	Ventilation	\$237,979.07
			3.	Southern Illinois Piping Contractors Inc	Plumbing	\$182,496.67
			4.	Southern Illinois Piping Contractors Inc	Heating/ Cooling	\$173,779.20
			5.	Yeager Electric, Inc.	Electrical	\$154,371.94
19	Construct senior center complex	Hickory Hills - Cook County	1.	Daniels Walter Construction Co	General	\$970,371.80
			2.	Public Electric Construction Co	Electrical	\$206,438.78
			3.	Rush Mechanical Contractors Inc	Ventilation	\$174,216.00
			4.	Dawn Companies Inc	Plumbing	\$99,295.00
20	Rehab six racehorse barns	Illinois State Fairgrounds - Springfield	1.	Siciliano Inc	General	\$522,283.90
			2.	Power R J Plumbing & Heating	Plumbing	\$85,624.00
			3.	Ingram Electrical Services Inc	Electrical	\$57,500.00
			4.	Automatic Fire Sprinkler LLC	Plumbing	\$28,900.00
21	Construct shower bldg & restroom	Prophetstown State Park - Whiteside County	1.	Lawrence & Sons Contracting,	General	\$223,669.00
			2.	Loos John A Sons Inc	Plumbing	\$203,891.00
			3.	Loos John A Sons Inc	Ventilation	\$28,478.00
			4.	Engel Electric Co	Electrical	\$27,175.00
22	Rehab concession building	Johnson-Sauk Trail State Park - Henry County	1.	Laverdiere Construction Inc	General	\$206,784.00
			2.	Mechanical Inc	Plumbing	\$57,514.76
			3.	Crawford Heating & Cooling Co Inc	Heating/ Cooling	\$52,213.00
			4.	Dixon Commercial Electric Inc	Electrical	\$29,487.00
23	Visitor center rehab	Illinois Beach State Park - Lake County	1.	The Somers Company Inc	General	\$279,206.06
			2.	Jin Electric Company	Electrical	\$71,000.00
			3.	Peterson Ernie Plumbing Inc	Plumbing	\$20,875.00
			4.	Air Dynamics Inc	Ventilation	\$18,500.00
24	Renovate market house	Old Market House Historic Site - Galena	1.	Prism Corp., Southwest	General	\$342,014.50
			2.	Giese Sheet Metal Company	Ventilation	\$69,940.00
			3.	Morse Electric Inc	Electrical	\$63,050.00
			4.	Mechanical Inc	Plumbing	\$21,014.08
25	Restore sulphur spring hotel	Zimmerman Property - LaSalle County	1.	Fox River Lumber Co., Inc.	General	\$178,095.00
			2.	Rich G A & Sons Inc	Plumbing	\$61,406.73
			3.	J B Contracting Corporation	Electrical	\$21,253.00
			4.	Chapman's Mechanical Systems Inc	Heating/ Cooling	\$6,467.00

APPENDIX J – CAPITAL DEVELOPMENT BOARD’S LIST OF PROJECTS COMPLETED IN FISCAL YEAR 2001

26	Renovation of facility	Suburban North Regional Office Facility - Des Plaines	1.	Argon Electric Company Inc	Electrical	\$1,680,545.00
			2.	Ockerlund Construction Co	General	\$1,443,546.12
			3.	Air Dynamics Inc	Ventilation	\$951,148.38
			4.	A & H Plumbing & Heating Co	Plumbing	\$174,232.00
27	Construct addition to reg off bldg	Marion Regional Office Building - Williamson County	1.	Fager Mcgee Commercial Construction Inc	General	\$1,058,424.38
			2.	Newton R Electric Inc	Electrical	\$224,852.32
			3.	J & J Sheet Metal D/B/A Victor Eck	Ventilation	\$118,584.94
			4.	Litton Enterprises Inc	Plumbing	\$109,068.57
28	Const independent living aptmnt bl	Center for Rehab & Education-Chicago, Roosevelt Road	1.	Dillon Enterprises Limited	General	\$266,311.62
			2.	Markham Electric Contractors	Electrical	\$89,027.23
			3.	Chicago Cooling Corporation	Ventilation	\$30,149.68
			4.	Stutz Plumbing Inc	Plumbing	\$26,933.06
29	Hvac rehab (702)	Med. Cen. Juvenile Research Center - Chicago	1.	P E Environmental Systems Inc	Ventilation	\$232,348.37
			2.	Ideal Heating Company	Heating/ Cooling	\$153,540.00
			3.	Certified Midwest Construction	General	\$117,809.44
			4.	Elmhurst Electric Company Inc	Electrical	\$64,545.20
30	Renovate central stores bldg(711)	Elgin Mental Health Center - Kane County	1.	Ideal Heating Company	Heating/ Cooling	\$563,861.00
			2.	Certified Midwest Construction	General	\$184,554.00
			3.	P E Environmental Systems Inc	Ventilation	\$121,312.47
			4.	Mascal Electric Inc	Electrical	\$87,523.00
31	Renovate dietary	Fox Developmental Center - Dwight	1.	McCoy Construction Co	General	\$1,082,679.30
			2.	Dodson Plumbing Heating & Air	Ventilation	\$180,331.60
			3.	Commercial Mechanical Inc	Plumbing	\$178,912.03
			4.	Mid - Illinois Electric Inc	Electrical	\$159,943.53
32	Ada compliance	Shapiro Developmental Center - Kankakee	1.	McCoy Construction Co	General	\$1,329,009.99
			2.	A-Green Plus Plumbing Inc	Plumbing	\$139,914.69
			3.	Pyramid Electric, Inc.	Electrical	\$103,582.94
			4.	Precision Piping Inc	Heating/ Cooling	\$49,900.00
33	Bay equip bldg, water serv roof 2	Various	1.	B R H Builders/Div Of Eei	General	\$232,024.00
			2.	Meyer Roofing Inc	General	\$101,454.45
			3.	Anderson Electric Inc	Electrical	\$54,000.00
			4.	Doyle Plumbing and Heating Co	Plumbing	\$29,103.74
34	Const maint storag fac/Hdqtrs-Fy92	Elgin/O'Hare Expressway - Kane Co.	1.	Bradley Construction Company	General	\$1,765,609.89
			2.	Young Bert C & Sons Corp	Plumbing	\$569,237.00
			3.	Arlington Electrical Construction	Electrical	\$370,302.00
			4.	Elgin Sheet Metal Company	Ventilation	\$124,426.00
35	Hvac and temperature control r&R	Illinois Math and Science Academy - Aurora	1.	Air Dynamics Inc	Ventilation	\$1,197,446.54
			2.	Applied Controls Inc	Heating/ Cooling	\$596,749.93
			3.	Ortiz Mechanical Contractors Inc	Heating/ Cooling	\$138,970.00
			4.	Fitzgerald's Electrical Contract	Electrical	\$124,770.40
36	Renovate classrooms	Joliet Junior College - Will County	1.	Marian Professional Construct	General	\$527,465.49
			2.	Connelly G F Mechanical Contractors Inc	Heating/ Cooling	\$220,491.26
			3.	Excel Electric Inc	Electrical	\$182,851.00
			4.	Olmen R J Company	Ventilation	\$63,876.00
37	Chiller, refrig, cooling tower r&R	Governors State University - Will County	1.	Voris Mechanical Inc	Heating/ Cooling	\$1,382,331.41
			2.	Chicago Heights Construction	General	\$278,698.25
			3.	Excel Electric Inc	Electrical	\$182,112.72
			4.	Olmen R J Company	Ventilation	\$23,102.75

STUDY OF THE STATE'S CONSTRUCTION CONTRACTING METHODS

38	Renovate mechanical systems	Southern Illinois University - Edwardsville	1.	G R P Mechanical Company Inc	Heating/ Cooling	\$655,054.26
			2.	Belleville Mechanical Inc	Ventilation	\$258,355.94
			3.	Wuellner J J & Son Inc	General	\$131,028.46
			4.	Wegman Electric Company	Electrical	\$105,423.32
39	Pharmacodyn resc-Pharmacy #924 90bi	University of Illinois - Chicago	1.	American Construction Mgt	General	\$193,247.42
			2.	Loyola Electrical Construction	Electrical	\$78,046.00
			3.	Hermitage Corporation	Plumbing	\$75,978.88
			4.	Sheet Metal Specialists of Chi	Ventilation	\$17,900.00
40	Pharmacy-Remndl for med chem-92bi	University of Illinois - Chicago	1.	August & Son General Contract	General	\$757,883.49
			2.	Brongiel Plumbing Inc	Plumbing	\$463,112.67
			3.	Abbott & Associates Inc	Ventilation	\$237,855.32
			4.	Automatic Building Controls Inc	Electrical	\$108,397.98
41	Renv comfort stations-Ph 1 (720)	Illinois State Fairgrounds - Springfield	1.	Siciliano Inc	General	\$469,038.00
			2.	Power R J Plumbing & Heating	Plumbing	\$121,744.00
			3.	Ingram Electrical Services Inc	Electrical	\$32,843.00
			4.	Automatic Building Controls Inc	Electrical	\$108,397.98
42	Improve to meet licensure standards	Quincy Veterans Home - Adams County	1.	Fischer A Builders Inc	General	\$71,414.00
			2.	Wand E A Plumbing & Heating	Plumbing	\$53,508.82
			3.	Brown Electric Construction Co	Electrical	\$52,209.82
			4.	Automatic Building Controls Inc	Electrical	\$108,397.98
43	Infrastructure improvements	Illinois Beach State Park - Lake County	1.	Keno John and Company	General	\$734,380.35
			2.	Keno John and Company	Plumbing	\$271,216.27
			3.	Keno John and Company	Electrical	\$185,980.33
			4.	Automatic Building Controls Inc	Electrical	\$108,397.98
44	Renovate building	State Journal-Register Building - Springfield	1.	Vancil Contracting Inc	General	\$592,842.00
			2.	Progressive Electric Inc	Electrical	\$25,118.33
			3.	Neuhoff Heating & Air Conditioning, Inc	Ventilation	\$21,218.00
			4.	Automatic Building Controls Inc	Electrical	\$108,397.98
45	Renovate groundwater storage tank	Dixon Correctional Center - Lee County	1.	Mechanical Inc	Plumbing	\$532,639.06
			2.	Harn Construction Company	General	\$59,560.00
			3.	Morse Electric Inc	Electrical	\$22,521.69
			4.	Automatic Building Controls Inc	Electrical	\$108,397.98
46	Chiller and cooling twr replacement	Vienna Correctional Center - Johnson County	1.	L & L Mechanical D/B/A EEI Holding Corp	Heating/ Cooling	\$410,239.22
			2.	Pruitt E L Co	Heating/ Cooling	\$181,698.80
			3.	Brown Electric Inc	Electrical	\$32,365.00
			4.	Automatic Building Controls Inc	Electrical	\$108,397.98
47	Install freight elevator	James R. Thompson Center - Chicago	1.	Montgomery Kone Inc	General	\$2,271,988.36
			2.	Vee See Construction Company Inc	General	\$772,869.11
			3.	Leroy Robert Enterprises Inc	General	\$32,563.00
			4.	Automatic Building Controls Inc	Electrical	\$108,397.98
48	Repl heating system(702)	Medical Center (Edwards Center) - Chicago	1.	Arrigo Enterprises Inc	Heating/ Cooling	\$256,189.37
			2.	Janus Electric Company	Electrical	\$24,800.00
			3.	Hermitage Corporation	Plumbing	\$22,299.00
			4.	Automatic Building Controls Inc	Electrical	\$108,397.98
49	Upgrd fire/Life safety(715)	Elgin Mental Health Center - Kane County	1.	Mascal Electric Inc	Electrical	\$339,346.00
			2.	Ewing-Doherty Mechanical Inc D/B/A	Plumbing	\$189,678.00
			3.	I H C Group Inc	General	\$155,956.00
			4.	Automatic Building Controls Inc	Electrical	\$108,397.98
50	Power plant renv/Extr tuckptg (708)	Lincoln Developmental Center - Logan County	1.	Petersburg Plumbing & Heating Company	Heating/ Cooling	\$863,747.42
			2.	Siciliano Inc	General	\$318,937.00
			3.	B & B Electric Inc	Electrical	\$39,127.00
			4.	Automatic Building Controls Inc	Electrical	\$108,397.98
51	Convert annex for svp facility	Joliet Sexually Violent Persons Facility	1.	Naal Plumbing & Heating Company	Plumbing	\$196,700.61
			2.	Modern Builders Industrial Concrete Company	General	\$132,322.83
			3.	Block Electric Company Inc	Electrical	\$117,603.48
			4.	Automatic Building Controls Inc	Electrical	\$108,397.98

APPENDIX J – CAPITAL DEVELOPMENT BOARD’S LIST OF PROJECTS COMPLETED IN FISCAL YEAR 2001

52	Renovate inter/Exter/ Site, phs 2	Executive Mansion - Springfield	1. Evans - Mason Inc 2. Pruitt E L Co 3. Progressive Electric Inc	General Plumbing Electrical	\$391,634.00 \$54,629.45 \$25,185.89
53	Julian hall remodeling	Illinois State University - Normal	1. Egizii Electric Inc Div of EEI 2. Standard Heating & Cooling Inc 3. Bishop Brothers Inc	Electrical Heating/ Cooling General	\$143,255.36 \$111,951.85 \$97,153.00
54	Renovate founders memorial library	Northern Illinois University - DeKalb	1. Builders Architectural Products 2. Control Solutions, Inc. - Chicago 3. Morse Electric Inc	General Heating/ Cooling Electrical	\$202,300.00 \$138,895.74 \$21,462.00
55	Ada-East & west campus exterior	University of Illinois/Univ. Ctr. & Med. Sch. Campus-Chicago	1. Builders Architectural Products Inc 2. Stutz Plumbing Inc 3. Airport Electric Company	General Plumbing Electrical	\$336,526.00 \$108,327.00 \$62,235.00
56	Renovate round houses	Du Quoin State Fairgrounds - Perry County	1. H & N Construction Inc 2. Martin Keith	General Electrical	\$422,325.23 \$146,376.00
57	Replace/ Rehabilitate roofs	Illinois State Fairgrounds - Springfield	1. Meyer Roofing Inc 2. Henson Robinson Company	General Plumbing	\$768,064.26 \$57,670.00
58	Stblz bllngs,kilbrn& Myrs(702)	Manteno Veterans Home - Kankakee County	1. Bisailon Excavating Inc 2. La More Electric Inc	Plumbing Electrical	\$541,710.44 \$41,500.00
59	Ust's- Anderson spg,arglyl lake	Statewide Program	1. United Science Industries, Inc. 2. H & G Construction Inc	General General	\$89,051.41 \$52,019.29
60	Ust-Apple r,miss pal,big river	Statewide Program	1. Thermo Engineering Co., Inc. 2. Thermo Engineering, a Division of Williams Power Corp	General General	\$70,859.28 \$13,137.72
61	Ust's-Weldon spgs/Citn lake/Roadsd	Statewide Program	1. Thermo Engineering Co., Inc. 2. Thermo Engineering, a Division of Williams Power Corp	General General	\$49,473.20 \$41,710.08
62	Remove & replace ust	William W. Powers Fish & Wildlife Area - Cook Co.	1. Mankoff, Inc. D/B/A Continental Envir. 2. American Tank Inc	General General	\$41,106.75 \$5,642.00
63	Upgrade campgrounds	Fox Ridge State Park - Coles County	1. Thermo Engineering, a Division of Williams Power Corp 2. M & M Electric d/b/a (Mark Pruemer)	General Electrical	\$147,704.16 \$111,034.04
64	Emergency Storm Damage Repairs	Golconda Marina - Pope County	1. Mathews R Construction Inc 2. Richerson Excavating Service	General General	\$196,239.05 \$17,959.00
65	Well rehabilitation & addition	Union County Conservation Area	1. Reynolds Inc 2. Walters J M & Son Inc	Plumbing Electrical	\$433,641.81 \$46,825.65
66	Provide boat access	Wayne Fitzgerrell State Park - Jefferson County	1. Thomas Construction Management Inc 2. Brown Electric Inc	General Electrical	\$335,685.64 \$28,194.99
67	Upgrade locs & doors	Illinois Youth Center - Harrisburg	1. Fager Mcgee Commercial Cons. 2. Newton R Electric Inc	General Electrical	\$741,745.21 \$72,511.71
68	Remove & replace usts	Dixon Correctional Center - Lee County	1. Thermo Engineering Co., Inc. 2. Thermo Engineering, a Division of Williams Power Corp	General General	\$201,132.51 \$22,901.06
69	Repair and upgrade of freezer bldg.	Hill Correctional Center - Galesburg	1. Schielein Construction Co Inc 2. Loos John A Sons Inc	General Ventilation	\$511,808.21 \$464,071.00

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70	Emerg conversion of joliet r&C ctr	Joliet Correctional Center - Will County	1. Dodson Plumbing Heating & Air Conditioning Inc	Ventilation	\$61,494.00
			2. Dodson Plumbing Heating & Air Conditioning Inc	Heating/ Cooling	\$58,595.00
71	Reception& Classification facility	Menard Correctional Center - Randolph County	1. Southern Illinois Piping Contractors Inc	Heating/ Cooling	\$292,907.82
			2. Spirtas Wrecking Company	General	\$280,270.34
72	Upgrade or replace uests	Statewide Program	1. Thermo Engineering Co., Inc.	General	\$64,914.00
			2. Thermo Engineering,	General	\$56,819.10
73	Powerhouse turbines & boilers(710)	Choate Mental Health and Developmental Center - Anna	1. F W Plumbing & Heating Inc	Heating/ Cooling	\$596,422.81
			2. F W Electric Inc	Electrical	\$302,624.00
74	Repl hvac management control panel	McFarland Mental Health Center - Springfield	1. Automated Controls, Ltd.	Heating/ Cooling	\$234,826.83
			2. Pruitt E L Co	Heating/ Cooling	\$42,450.17
75	Replace absorbers	Singer Mental Health Center - Rockford	1. Oak Brook Mechanical Services Inc	Heating/ Cooling	\$476,936.95
			2. Control Panels, Inc.	Electrical	\$66,745.00
76	Bar screen & sewer system renov	Tinley Park Mental Health Center - Cook County	1. Insituform Midwest, Inc.	General	\$501,760.92
			2. Insituform Technologies USA Inc	General	\$258,094.67
77	Renovate htg system & Replace windows	Camp Lincoln (Springfield) - Sangamon County	1. Brinkoetter T A & Sons Incorporated	Heating/ Cooling	\$279,758.72
			2. Haenig Electric Company, Inc.	Electrical	\$159,036.10
78	Various improvements (Northbrook)	Northbrook Maintenance Storage Facility - Cook County	1. Repking Electric Inc	Electrical	\$102,988.18
			2. Pelar Construction Co Inc	General	\$94,383.92
79	Renovate theater	Lake Land College - Mattoon	1. Wohltman K Construction Inc	General	\$202,695.52
			2. Egizii Electric Inc Div EEI Holding Corp	Electrical	\$166,512.04
80	Construct health/Math bldg	Lewis and Clark Community College - Godfrey	1. Widman Trucking & Excavating Inc	General	\$344,447.33
			2. Wegman Electric Company	Electrical	\$65,298.58
81	Replace piping (703)	Rend Lake College - Ina, Jefferson County	1. Rend Lake Plumbing & Heating Co Inc	Heating/ Cooling	\$463,765.06
			2. Robinson C K Construction	General	\$105,944.21
82	Cfc remediation	University of Illinois Urbana-Champaign	1. A & R Mechanical Contractors Inc	Heating/ Cooling	\$429,516.00
			2. Witte Electric Company	Electrical	\$58,358.94
83	Ada-East & west campus interior	University of Illinois/Univ. Ctr. & Med. Sch. Campus-Chicago	1. A E Berg Co Inc	General	\$245,828.65
			2. Stutz Plumbing Inc	Plumbing	\$79,518.75
84	Ada-East & west campus interior	University of Illinois/ Univ. Ctr. & Med. Sch. Campus-Chicago	1. A E Berg Co Inc	General	\$242,995.61
			2. Stutz Plumbing Inc	Plumbing	\$81,456.00
85	Ada-East & west campus interior	University of Illinois/Univ. Ctr. & Med. Sch. Campus-Chicago	1. Guse Erickson Co	General	\$362,302.00
			2. Airport Electric Company	Electrical	\$118,484.00
86	Upgrd hvac-Biolog res lab-91bi(707)	University of Illinois - Chicago	1. Anderson James H Inc	Ventilation	\$299,157.16
			2. Dynamic Heating & Piping Co	Heating/ Cooling	\$88,277.00
87	Upgrade south access road	University of Illinois - Springfield	1. Merrill's Contractors Inc	General	\$1,538,394.25
			2. Anderson Electric Inc	Electrical	\$198,900.00

APPENDIX J – CAPITAL DEVELOPMENT BOARD’S LIST OF PROJECTS COMPLETED IN FISCAL YEAR 2001

88	Tuckpoint ext & Clean statues & Murals	Supreme Court Building - Springfield	Evans - Mason Inc	General	\$160,047.00
89	Various improvements	Appellate Court Building - Elgin	Ideal Heating Company	Ventilation	\$133,333.00
90	Repair exterior	Appellate Court Building - Ottawa	Fox River Lumber Co., Inc.	General	\$142,120.00
91	Construct educational building	Henry White Experimental Farm (Millstadt, IL)	Calhoun Construction Inc	General	\$184,294.00
92	Renovate hayes house	Du Quoin State Fairgrounds - Perry County	Fager Mcgee Commercial Construction Inc	General	\$175,724.96
93	Replace/ Rehabilitate roofs	Illinois State Fairgrounds - Springfield	Capitol Roofing Contractors Inc	General	\$331,986.23
94	Extend air conditioning system	Manteno Veterans Home - Kankakee County	P E Environmental Systems Inc	Ventilation	\$99,823.00
95	Enclose courtyard	Manteno Veterans Home - Kankakee County	Peak AEC Inc	General	\$145,018.00
96	Emergency Roof Repairs	Manteno Veterans Home - Kankakee County	Crowther Enterprises Inc	General	\$125,033.46
97	Ust removal & replacement	Statewide Program	Thermo Engineering, a Division of Williams Power Corp	General	\$68,748.12
98	Replace roofing system	Waste Management & Research Center - Champaign	Advanced/Wayne Cain & Sons Roof/Sht Metl	General	\$50,702.27
99	Stabilize river bank	Apple River Canyon State Park - Jo Daviess County	Redfearn Earthmoving Inc	General	\$122,333.11
100	Fy98 ada compliance	Apple River Canyon State Park - Jo Daviess County	Louie's Trenching Service Inc	General	\$122,703.12
101	Replace sewage treatment plant	Lake Le-Aqua-Na State Park - Stephenson County	Loberg Excavating Inc	General	\$147,321.00
102	Replace vault toilets	Morrison-Rockwood State Park - Whiteside County	Doyle Dick Excavating Inc	General	\$218,051.60
103	Ada upgrades throughout the park	White Pines Forest State Park - Ogle County	Sjostrom & Sons Inc	General	\$172,197.17
104	Rehab boat access- Putney's landing	Big River State Forest - Henderson County	Smiley Construction Inc	General	\$158,821.00
105	Rehab lock 33 taintor gates	Hennepin Canal Parkway State Park	Trovero Len Construction D/B/A (Leonard J Trovero Sr)	General	\$120,625.00
106	Ada upgrades throughout the park	Illini State Park - LaSalle County	Fox River Lumber Co., Inc.	General	\$271,562.45
107	Ada upgrades throughout the park	Matthiessen State Park - LaSalle County	Carlson Brothers Inc	General	\$313,293.21

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108	Reconstruction of seawall	Starved Rock State Park & Lodge - LaSalle County	Ladd Construction Co	General	\$499,385.37
109	Const access facility	Illinois Beach State Park - Lake County	Building Options, Inc.	General	\$97,503.00
110	Replace vault toilets	Silver Springs State Park - Kendall County	Miller & Sons Masonry Inc	General	\$24,785.00
111	Ada compliance	Moraine Hills State Park - McHenry County	Builders Group Inc	General	\$82,311.86
112	Storage tank remediation	Moraine Hills State Park - McHenry County	Accurate Tank Technologies Inc	General	\$140,126.00
113	Rehabilitate levee sys	Sanganois Conservation Area - Cass County	D & M Earthmoving Inc	General	\$223,478.43
114	Ada upgrades throughout the park	Weinberg-King State Park - Schuyler County	Millard Frank & Co Inc	General	\$303,146.03
115	Upgrade cold storage cooling system	Mason State Forest Tree Nursery - Mason County	Petersburg Plumbing & Heating Company	Heating/ Cooling	\$41,336.00
116	Remove two uests	Conservation World - Springfield	Entler Excavating Co Inc	General	\$6,900.00
117	Expand bldg	Jim Edgar Panther Creek F&WA - Cass Co.	Smiley Construction Inc	General	\$138,009.84
118	Rehabilitate and expand resort	Eagle Creek State Park - Shelby County	Prairieland Construction Inc	General	\$380,748.00
119	Ada upgrades throughout the park	Spitler Woods Natural Area - Macon County	Johnco Construction Inc	General	\$346,256.69
120	Fy98 ada compliance	Weldon Springs State Park - DeWitt County	Triple K Konstruction Co Inc	General	\$591,222.66
121	Repl roofs on site res,garage & Campg	Middle Fork Fish & Wildlife Area - Vermilion Co.	Millar - Baskis Construction Inc	General	\$11,703.20
122	Ada upgrades throughout the park	Dixon Springs State Park - Pope County	H & N Construction Inc	General	\$283,975.72
123	Construct sewage lift station	Golconda Marina - Pope County	Lake Contracting Inc	General	\$48,848.38
124	Repl roofs on site residence & Trace	Red Hills State Park - Lawrence County	Cyde Enterprises Inc	General	\$23,273.00
125	Replace roof on square post buildin	Sam Dale Lake Conservation Area - Wayne County	Cyde Enterprises Inc	General	\$17,000.00
126	Restore exterior	Dana-Thomas House State Historic Site - Sangamon County	Siciliano Inc	General	\$85,435.00
127	Replace maintenance building	Fort De Chartres Historic Site - Prairie Du Rocher	Black's DC Construction Inc D/B/A BDC Construction Inc	General	\$227,567.00
128	Renov village entrance/ Complete vis	Lincoln's New Salem Historic Site - Menard County	Thermo Engineering, a Division of Williams Power Corp	General	\$361,776.75

APPENDIX J – CAPITAL DEVELOPMENT BOARD’S LIST OF PROJECTS COMPLETED IN FISCAL YEAR 2001

129	Rehabilitate courthouse and site	Postville Courthouse Historic Site - Lincoln	R J S Constructors Inc	General	\$248,902.00
130	Replace roofing system	Washburne House Historic Site - Galena	Christiansen S H Inc	General	\$52,288.00
131	Restore sulphur spring hotel	Zimmerman Property - LaSalle County	Fox River Lumber Co., Inc.	General	\$84,770.00
132	Upgrade domestic water system	Illinois Youth Center - Harrisburg	Litton Enterprises Inc	Plumbing	\$903,953.99
133	Replace mechanical bar screen	Western Illinois (Mt. Sterling) Corr. Center - Brown County	Thrifty Supply	General	\$287,165.47
134	Emergency replacement steam absorber	East Moline Correctional Center - Rock Island County	Natkin Service Company D/B/A York International Corporation	Heating/ Cooling	\$99,275.55
135	Replace domestic water line	Hill Correctional Center - Galesburg	Loos John A Sons Inc	Plumbing	\$240,923.00
136	Replace exit doors	Illinois Youth Center - St. Charles - Kane County	Illinois Construction Co Inc	General	\$174,681.00
137	Remove/Replc undergrd storage tanks	Illinois Youth Center - St. Charles - Kane County	Mankoff, Inc.	General	\$168,019.69
138	Cfc chiller replacement	Illinois Youth Center - St. Charles - Kane County	A M S Mechanical Systems Inc	Heating/ Cooling	\$179,119.58
139	Emergency bar screen replacement	Joliet Correctional Center - Will County	Perdel Contracting Corporation	General	\$145,150.90
140	Upgrade doors and locking system	Jacksonville Correctional Center - Morgan County	Vanguard Contractors Inc	General	\$560,860.00
141	Emergency fire damage restoration	Logan Correctional Center - Lincoln	Lawrence R D Construction Co Ltd	General	\$296,911.00
142	Renv dietary & Instll blast chillers	Lincoln Correctional Center - Logan County	Lawrence R D Construction Co Ltd	General	\$424,670.00
143	Upgrade plumbing system	Menard Correctional Center - Randolph County	Southern Illinois Piping Contractors Inc	Plumbing	\$204,205.04
144	Repair masonry & waterproof	Menard Correctional Center - Randolph County	Diecker Construction Co	General	\$295,082.00
145	Upgrade water tower	Menard Correctional Center - Randolph County	Red Dot Construction & Equipment Rental	General	\$296,000.00
146	Emerg repl of steam-condensate lines	Menard Correctional Center - Randolph County	Southern Illinois Piping Contractors Inc	Heating/ Cooling	\$163,034.12
147	Replace locks	Illinois Youth Center - Pere Marquette	Plocher Construction Company Inc	General	\$135,223.90
148	Upgrade hot wtr dist.& htg & shower	Pontiac Correctional Center - Livingston County	Commercial Mechanical Inc	Plumbing	\$329,334.00

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149	Demolish building	Stateville Correctional Center - Joliet	Dore & Associates Contracting Inc	General	\$267,777.48
150	Tuckpoint building	Stateville Correctional Center - Joliet	Gadbois Construction Inc	General	\$101,795.00
151	Emerg replace of back-Up boiler/Valv	Stateville Correctional Center - Joliet	Perella Peter & Co Inc	Heating/ Cooling	\$61,480.00
152	Emerg replace/Main elec feeder/Circ	Stateville Correctional Center - Joliet	Block Electric Company Inc	Electrical	\$161,800.00
153	Replace windows	Illinois Youth Center - Valley View	Schuster Engineering Inc	General	\$410,889.00
154	Install mechanical bar screen	Illinois Youth Center - Valley View	Martam Construction Inc	General	\$210,237.00
155	Ada-Elgin reg off bldg/Elgin garage	Statewide Program	Metropolitan Corp	General	\$75,570.00
156	Upgrade or replace usts	Statewide Program	Action Environmental Inc	General	\$87,446.76
157	Security enhancements	James R. Thompson Center - Chicago	Oakley Construction Company, Inc.	General	\$151,990.00
158	Ada compliance	Rockford Regional Office Building - Winnebago County	Peter J Hartmann Co	General	\$170,139.13
159	Remove & replace usts	Elgin State Garage - Kane County	Pyramid Petroleum Equipment Company	General	\$130,471.06
160	Replace roofing & skylight system	Center for Rehab & Education - Chicago (Wood St.)	Holly K M Construction Co Inc	General	\$108,451.48
161	Com-munications tower cypress/Eaton	Statewide Program	GEM Engineering Company	General	\$688,669.40
162	Replace com-munications towers	Statewide Program	GEM Engineering Company	General	\$268,637.60
163	Hvac & plumbing	State Police Training Academy - Springfield	Murphy F J & Son Inc	Plumbing	\$83,309.00
164	Emergency sprinkler head replacement	Statewide Program	Great Lakes Plumbing & Heating Company	Plumbing	\$12,250.00
165	Replace roofing system	Choate Mental Health and Developmental Center - Anna	Taylor Jim Inc	General	\$253,776.65
166	Hhcc & west campus fire/Life safety	Chicago-Read Mental Health Center - Cook County	Mosele & Associates, Inc.	Plumbing	\$163,748.64
167	Remove/Replc undergrd storage tanks	Chicago-Read Mental Health Center - Cook County	Hydrodynamics, Inc.	General	\$244,383.09
168	Replace roofing systems	Elgin Mental Health Center - Kane County	Elgin Roofing Co./Div Lamp Incorporated	General	\$276,428.00
169	Roof replacement	Elgin Mental Health Center - Kane County	National Roofing Corporation	General	\$90,235.45

APPENDIX J – CAPITAL DEVELOPMENT BOARD’S LIST OF PROJECTS COMPLETED IN FISCAL YEAR 2001

170	Ada compliance	Elgin Mental Health Center - Kane County	R & W Clark Construction Inc	General	\$214,088.00
171	Install windows residences unit 1&V	Howe Developmental Center - Tinley Park	Guse Erickson Co	General	\$736,510.00
172	Rehab boilers(719)	Shapiro Developmental Center - Kankakee	Hayes Mechanical Inc	Heating/ Cooling	\$643,596.30
173	Plan and replace windows	Shapiro Developmental Center - Kankakee	Koch Corporation	General	\$222,615.00
174	Replace roofing systems	Shapiro Developmental Center - Kankakee	Bennett & Brosseau Roofing Inc	General	\$336,985.00
175	Replace watermain and valves	Shapiro Developmental Center - Kankakee	Bisailon Excavating Inc	Plumbing	\$1,366,563.43
176	Roof replacement	Shapiro Developmental Center - Kankakee	Adler J L Roofing & Sheet Metal Inc	General	\$345,556.00
177	Power plant renv/Extr tuckptg (708)	Lincoln Developmental Center - Logan County	Egizii Electric Inc Div of EEI Holding Corp	Electrical	\$118,658.82
178	Instl rethermaliztn food serv sys	Lincoln Developmental Center - Logan County	Vollintine R L Construction Inc	General	\$760,786.35
179	Replace roofs	Lincoln Developmental Center - Logan County	Meyer Roofing Inc	General	\$361,960.85
180	Safety/Security upgrades (707)	Madden Mental Health Center - Hines	Argo Electric Inc	Electrical	\$171,179.46
181	Safety/Security upgrades (707)	Madden Mental Health Center - Hines	Webster Electric Company	Electrical	\$130,000.00
182	Rehabilitate dietary	McFarland Mental Health Center - Springfield	Myers R D & Associates Builders Inc	General	\$342,687.58
183	Repl roofing systems-One building	IL School for the Visually Impaired - Jacksonville	Advanced/Wayne Cain & Sons Roof/Sht Metl	General	\$133,024.00
184	Ada	IL School for the Visually Impaired - Jacksonville	Siciliano Inc	General	\$157,446.00
185	Install security sys/Units i,ii,iii	Illinois School for the Deaf - Jacksonville	Thompson Electronics Company	General	\$63,887.00
186	Replace roofs	Singer Mental Health Center - Rockford	Carlson Roofing Company	General	\$245,991.96
187	Mech imprvments, spruce/Maple hall	Tinley Park Mental Health Center - Cook County	A M S Mechanical Systems Inc	Heating/ Cooling	\$133,075.00
188	Emergency protection & life safety	General Jones Armory - Chicago	Rausch Construction Co., Inc.	General	\$458,734.82
189	Bartonville jafrc vehicle storage	Peoria Armory - Peoria County	McCoy Construction Co	General	\$312,860.00
190	Replace roofing systems	Crestwood Armory - Cook County	American Roofing & Repair Co D/B/A JLL Inc	General	\$503,250.00

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191	Roadway improve, east rd section nth	Camp Lincoln (Springfield) - Sangamon County	Construx Construction of Illinois Inc	General	\$63,870.00
192	Improvements N lenox, minooka, joliet	Various	Kelso W R Co Inc of Illinois	General	\$164,150.00
193	Improvements Caryle, nashvle, e. Stlou	Various	Black's DC Construction Inc D/B/A BDC Construction Inc	General	\$238,343.75
194	Marshall, mattoon, greenup-Roof	Various	Advanced/Wayne Cain & Sons Roof/Sht Metl	General	\$275,228.00
195	Roof mats. Stg bldg- Harrisburg/ Mario	Various	Fager Mcgee Commercial Construction Inc	General	\$64,627.29
196	Repair structure & new roofs	Various	Lake Contracting Inc	General	\$161,365.48
197	Pole bldg. east st louis/Troy	Various	Plocher Construction Company Inc	General	\$202,821.41
198	Various repairs	Various	Wohltman K Construction Inc	General	\$229,966.00
199	Roofs, construct pole bldg	Various	Plocher Construction Company Inc	General	\$298,381.15
200	Various improvements (Elk grove)	Elk Grove Maintenance Storage Facility - Cook County	Guse Erickson Co	General	\$245,955.00
201	Salt dome	I-290	Chadco Inc	General	\$393,500.00
202	Replace metal roof district 1	Monee (Route 57) - Will County	Anthony Roofing Ltd	General	\$183,197.00
203	Salt dome	St. Charles Maintenance Storage Facility - Kane Co.	Chadco Inc	General	\$407,500.00
204	Emergency repairs	District 1 Headquarters - Schaumburg	Metropolitan Corp	General	\$124,057.52
205	Replace roof	I-80 Mississippi Rapids District #2, Rock Island Co.	Renaissance Restoration Inc	General	\$86,312.08
206	Mt. sterling salt dome	IDOT Salt Dome - Mt. Sterling	Ryco Distributing Inc	General	\$111,583.56
207	Remove underground storage tanks	600 S. Hoyne-Chicago	American Tank Inc	General	\$134,659.48
208	Classroom expansion	Southwestern IL Community Coll - Belleville	Calhoun Construction Inc	General	\$274,646.00
209	Replace pool filtration system	Wilbur Wright City College - Chicago	Connelly G F Mechanical Contractors Inc	Plumbing	\$145,817.00
210	Const office/ Classroom building	Danville Area Community College - Vermilion County	Ore W Vacketta & Sons Inc	General	\$160,816.00
211	Remodel for art painting lab	Danville Area Community College - Vermilion County	McDowell Builders Inc	General	\$210,746.50
212	Remodel for art gallery	Richland Community College - Macon County	Siciliano Inc	General	\$109,026.00

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213	Replace roof src/Pe bldgs	College of DuPage - Glen Ellyn	American Roofing & Repair Co D/B/A JLL Inc	General	\$533,801.64
214	Replace plaza pavers	Elgin Community College - Kane County	Bennett & Brosseau Roofing Inc	General	\$203,500.00
215	Misc improvements/Frontier/Olney	Illinois Eastern Community College District	Montgomery E H Construction Co Inc	General	\$163,717.94
216	Renovate natatorium pool	Lincoln Trail College - Robinson	Montgomery E H Construction Co Inc	General	\$101,873.20
217	Renovate theater & child care cente	Joliet Junior College - Will County	M R E Construction	General	\$84,954.41
218	Upgrade exterior lighting	Kankakee Community College	La More Electric Inc	Electrical	\$63,588.00
219	New classroom construction	Lake Land College - Mattoon	Anderson Electric Inc	Electrical	\$481,076.40
220	Upgrade utility line capacity/Linco	Lincoln Land Community College - Springfield	Progressive Electric Inc	Electrical	\$58,056.00
221	Replace hvac units	Morton Community College - Cook County	A M S Mechanical Systems Inc	Heating/ Cooling	\$81,424.66
222	Replace roofs	Oakton Community College - Morton Grove	National Roofing Corporation	General	\$336,182.18
223	Upgrade corridors	Carl Sandburg Community College - Galesburg	Construction Partners Inc of the Heartland	General	\$211,600.00
224	Resurface road	Sauk Valley Community College - Dixon	Rockford Blacktop Construction Company	General	\$125,157.03
225	Repair east campus roads	Triton College - River Grove	Chicagoland Paving Inc	General	\$233,501.38
226	Exterior lighting-95 cdf	Waubonsee Community College - Sugar Grove	Parr Electric Inc	Electrical	\$153,293.00
227	Infrastructure upgrades	Chicago State University - Cook County	Connelly G F Mechanical Contractors Inc	Heating/ Cooling	\$1,098,501.95
228	Water & sewer rehab-95cdf	Northeastern Illinois University - Chicago	North Park Plumbing, Inc.	Plumbing	\$207,022.78
229	Replace cfc chillers	Northeastern Illinois University - Chicago	Team Mechanical Inc	Heating/ Cooling	\$764,275.15
230	Renovate founders memorial library	Northern Illinois University - DeKalb	Builders Architectural Products Inc	General	\$124,740.12
231	Replace boiler/Ssri	Northern Illinois University - DeKalb	Loos John A Sons Inc	Heating/ Cooling	\$372,537.00
232	Replace roof/Physch/ Comp sci & Physic	Northern Illinois University - DeKalb	Sterling Commercial Roofing Company	General	\$702,108.45
233	Music building humidification repai	Northern Illinois University - DeKalb	Double D Mechanical Inc	Heating/ Cooling	\$177,005.04

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234	Fire alarm systems, phase vii	Southern Illinois University - Carbondale	Brown Electric Inc	Electrical	\$371,030.55
235	Upgrade steam plant	Southern Illinois University - Carbondale	Locke Equipment Sales Co., Inc.	Heating/Cooling	\$335,954.21
236	Renovate roofs, 5 building	Southern Illinois University - Carbondale	Shay Roofing Inc	General	\$345,459.00
237	Upgrade condensation drainage/Faner	Southern Illinois University - Carbondale	Litton Enterprises Inc	Plumbing	\$147,036.58
238	Emergency replace b roof/Ag bldg	Southern Illinois University - Carbondale	Vaughn's Roofing	General	\$156,612.22
239	Upgrade fire alarms, iii & iv	University of Illinois Urbana-Champaign	Glesco Electric Inc	Electrical	\$371,054.83
240	Replace roof/Vet med large animal c	University of Illinois Urbana-Champaign	Advanced/Wayne Cain & Sons Roof/Sht Metl	General	\$274,178.10
241	Replace roof/Veterinary med basic s	University of Illinois Urbana-Champaign	Advanced/Wayne Cain & Sons Roof/Sht Metl	General	\$535,545.21
242	Upgrade fire alarm system v	University of Illinois Urbana-Champaign	Glesco Electric Inc	Electrical	\$90,534.00
243	Replace roof/Physical plant service	University of Illinois Urbana-Champaign	Henson Robinson Company	General	\$487,517.00
244	Upgrade electrical systems/Mech eng	University of Illinois Urbana-Champaign	Glesco Electric Inc	Electrical	\$231,536.00
245	Ada compliance	University of Illinois Urbana-Champaign	Duce Construction Company	General	\$423,983.70
246	Fire alarm upgrade	University of Illinois/University Center - Chicago	Broadway Electric Inc	Electrical	\$639,365.31
247	Rehab interior/Hvac, clin sci n	University of Illinois - Chicago	Grove Masonry Maintenance Inc	General	\$1,599,592.25
248	Remove & replace usts	University of Illinois - Rockford	Metro Environmental Contractors Inc	General	\$58,768.00
TOTAL					\$195,033,681.33

* Project description, location, and contractor name in this appendix is presented as it appears on CDB's database from which it was downloaded.

Source: Capital Development Board.

APPENDIX K

Advantages and Disadvantages of Single and Multiple Prime

Appendix K ADVANTAGES AND DISADVANTAGES OF SINGLE AND MULTIPLE PRIME		
Subject	Multiple Prime	Single Prime
Access	<p style="text-align: center;">Illinois Mechanical and Specialty Contractors Association</p> <p>If the State selected only one general contractor, bonding and insurance costs would be higher which would make it difficult for smaller companies to bid. Bonding for a specialty is not as expensive as bonding for a general contractor.</p>	<p style="text-align: center;">Survey of Contractors</p> <p>Specialty Contractor:</p> <ul style="list-style-type: none"> • <i>“May cause specialty subs to lose bidding opportunities directly with CDB.”</i> <p>General Contractors:</p> <ul style="list-style-type: none"> • <i>“As a medium sized company, we would be shut out of certain size projects because of effects of bid shopping and GCs [general contractors] brokering the job.”</i> • <i>“Small to medium contractors who are limited by bonding limits would lose the opportunity to participate on a large number of State projects.”</i> • <i>“Single prime method would deplete the bonding lines of small generals and result in fewer State contracts for this group.”</i>
Bid Shopping	<p style="text-align: center;">Capital Development Board</p> <p>CDB wrote in its August 24, 2001 memo to the Auditor General which listed the advantages of single and multiple prime according to contractors that:</p> <p><i>“The Heating, Electrical, Ventilation and plumbing firms involved under current procurement rules do not face normal market construction conditions (bid shopping/bid peddling) and set their determined low price for State Construction. Bid Shopping is a major concern to the specialty contractors as they bid State Construction Projects. The lack of bid shopping results in the best low price for the state per the specialty contractors.”</i></p>	<p style="text-align: center;">University of Illinois</p> <p>University of Illinois’ officials in the Office of Capital Programs stated that bid shopping is simply a practice of the industry and would be present under either single or multiple prime.</p> <p style="text-align: center;">Survey of Contractors</p> <p>General contractors:</p> <ul style="list-style-type: none"> • <i>“We generally bid with familiar subs whom we feel qualify to the type of project.”</i> • <i>“Would not affect or change any more than present.”</i> • <i>“Bid shopping would be increased tremendously.”</i>
Competition	<p style="text-align: center;">Illinois Department of Corrections</p> <p><i>“Some general contractors may have difficulty with bonding very large</i></p>	<p style="text-align: center;">Survey of Contractors</p> <ul style="list-style-type: none"> • <i>“With time more competition.”</i> • <i>“Willing competition would probably</i>

Appendix K		
ADVANTAGES AND DISADVANTAGES OF SINGLE AND MULTIPLE PRIME		
Subject	Multiple Prime	Single Prime
	<p><i>projects, which may limit competition. Bonding may be difficult with projects over \$30 – 50 million, and this may limit the number of general contractors that can bid projects to 3 – 4. On projects that are very large, multiple prime contractors may provide increased competition by allowing additional contractors to bid.</i></p>	<p><i>increase revenues.”</i></p>
Coordination	Illinois Department of Corrections <p><i>“The present system of assigning contractors to the prime contractor, who is then responsible for coordination, does not guarantee good project coordination. There is no real contractual link between the contractors, only between the prime, or coordinating contractor, and CDB. There is little incentive to perform the necessary coordination and very limited liability if coordination is not adequate.”</i></p>	Survey of A/Es <p><i>“Work on projects would flow at a much better pace. Coordination of all trades would be focused on one entity.”</i></p>
Cost	Capital Development Board <p>CDB wrote in its August 24, 2001 memo to the Auditor General which listed the advantages of single and multiple prime according to contractors that:</p> <p><i>“Specialty contractors point out that the design coordination of five different sections of required parts of bid documents including drawings and specifications will lower the amount of possible field change orders because the designer is forced to provide a better designed project. And if change orders do occur, . . . the price would be smaller because in small construction projects most general contractors are ‘brokers’ managing the work of major sub-contractors (Specialty Contractors in Illinois) and thus, add an additional mark-up on change order work.”</i></p>	University of Illinois <p>University of Illinois’ officials in the Office of Capital Programs stated that single prime would result in a 2.8% savings on total construction costs.</p> <p style="text-align: center;">Survey of Contractors</p> <ul style="list-style-type: none"> • <i>“The State may realize some cost savings because the Prime Contractors exercise better control over who they have as the MEP [mechanical, electrical, plumbing] trades.”</i> • <i>“Increase cost.”</i>

Appendix K		
ADVANTAGES AND DISADVANTAGES OF SINGLE AND MULTIPLE PRIME		
Subject	Multiple Prime	Single Prime
Litigation	<p style="text-align: center;">Illinois Mechanical and Specialty Contractors Association</p> <p>Litigation is rare because no one makes money when there is litigation and it is in the best interest of contractors to get along with members of the other trades.</p>	<p style="text-align: center;">Survey of A/Es</p> <p><i>“Less potential for claims or suits by or with contractors.”</i></p>
Minority/Female Business Enterprise	<p style="text-align: center;">Illinois Mechanical and Specialty Contractors Association</p> <p>Minority and female owned companies would lose opportunities if the State used a single prime system. All contractors now have more opportunities to get State business since the State selects the most responsible bidder.</p>	<p style="text-align: center;">Capital Development Board</p> <p>CDB stated in its August 24, 2001 memo to the Auditor General which listed the advantages of single and multiple prime according to contractors that:</p> <p><i>“All minority and small business goals can be met as they are today in specifying goals that sub-contractor firms and suppliers can supply goods and services.”</i></p>
Payments	<p style="text-align: center;">Capital Development Board</p> <p>CDB wrote in its August 24, 2001 memo to the Auditor General which listed the advantages of single and multiple prime according to contractors that:</p> <p><i>“Direct contracts are given to the five separate firms which allow direct checks and individual bids for projects with an individual value of over \$30,000 (which is adjusted for inflation currently) and . . . final estimated construction cost of over \$250,000. This avoids funds being held by general contractors arbitrarily, which causes undue hardship on major sub-contractors.”</i></p>	<p style="text-align: center;">Prompt Payment Act</p> <p>The State Prompt Payment Act (30 ILCS 540/7) requires contractors to promptly pay subcontractors and material suppliers within 15 days of receipt of payment under the public construction contract:</p> <p><i>“If the contractor, without reasonable cause, fails to make any payment to his subcontractors and material suppliers within 15 days after receipt of payment under the public construction contract, the contractor shall pay to his subcontractors and material suppliers, in addition to the payment due them, interest in the amount of 2% per month, calculated from the expiration of the 15-day period until fully paid.”</i></p>
Profit		<p style="text-align: center;">Survey of Contractors</p> <p>Specialty Contractors:</p> <ul style="list-style-type: none"> • <i>“Many GCs [general contractors] get paid, but hold the subs’ money - increases cost and reduces profit.”</i>

Appendix K		
ADVANTAGES AND DISADVANTAGES OF SINGLE AND MULTIPLE PRIME		
Subject	Multiple Prime	Single Prime
		<ul style="list-style-type: none"> • <i>“We would experience added administrative costs and added financing costs.”</i> • <i>“We have a better chance to acquire work and make a profit when we bid head to head with our competitors.”</i> <p>General Contractors:</p> <ul style="list-style-type: none"> • <i>“We would bid State projects more often so our sales and revenue would increase.”</i> • <i>“Positive fiscal impact. We currently do not bid because of multiple primes.”</i> • <i>“There would be some projects I would not bid on since some prime contractors I don't bid for.”</i>
Quality	A/E Representatives	Survey of A/Es
	<p>Multiple prime bidding is advantageous because it allows proper attention to be placed on specialty areas.</p>	<p><i>“Lower work quality. Subcontractors are squeezed much more by generals resulting in lower costs and lower quality.”</i></p>
Responsibility	Capital Development Board	Capital Development Board
	<p>CDB wrote in its August 24, 2001 memo to the Auditor General which listed the advantages of single and multiple prime according to contractors that:</p> <p><i>“Those in favor of separate prime contracts also agree that management and coordination of the construction process is critical to [the] project, but note that it is not the bidding process but the absence of capable management by the public owners that cause[s] the problems in schedule delays and problems in installing and coordinating up to five different contractors’ services on a single project.”</i></p>	<p>CDB wrote in its August 24, 2001 memo to the Auditor General which listed the advantages of single and multiple prime according to contractors that:</p> <p><i>“General contractors are very experienced in hiring hundreds of sub-contractors/suppliers on other projects including the four main sub-contractors of heating, electrical, ventilation and plumbing and then coordinating all of these sub-contractor[s] and suppliers into a coordinated schedule. Moreover, the owner has one point of contact to hold responsible for either bonding, penalty or limiting pre-qualification of future bidding status to be limited for non-performance.”</i></p>

Appendix K		
ADVANTAGES AND DISADVANTAGES OF SINGLE AND MULTIPLE PRIME		
Subject	Multiple Prime	Single Prime
Timeliness	<p style="text-align: center;">Survey of A/Es</p> <p><i>“Multiple prime bidding saves time in letting bids which means they get started quicker. Single prime usually takes time ‘shopping’ for their subcontractors causing lost time.”</i></p>	<p style="text-align: center;">Capital Development Board</p> <p>CDB wrote in its August 24, 2001 memo to the Auditor General which listed the advantages of single and multiple prime according to contractors that:</p> <p><i>“Per general contractors, separately bid jobs necessarily result in more delays and litigation. The threat of litigation occurs when one contractor’s problems affects the schedules of up to five other contractors who all must cooperate to allow a schedule to work for the State. If just one of these contractors chooses not to work together, a coordination general contractor is severely limited to motivating a specialty contractor to cooperate with contractual authority.”</i></p>
<p>Source: Illinois Auditor General surveys of contractors and A/Es; Capital Development Board; Illinois Department of Corrections; Office for Capital Programs-University of Illinois; and meetings with the trade representatives of contractors and A/Es.</p>		

APPENDIX L

Agency Responses to the Study

CAPITAL DEVELOPMENT BOARD

Subject: Trade Study
Date: Tue, 9 Apr 2002 08:01:11 -0500

The Office of the Auditor General received the following e-mail from CDB's Chief Internal Auditor, which was also sent to CDB's Executive Director, regarding CDB's response to the study of the State's Construction Contracting Methods:

"The Director has advised me that she will not be providing any additional written responses regarding this study. The Capital Development Board believes it has previously voiced its opinions and concerns regarding this matter throughout the course of the study. Thank You."

UNIVERSITY OF ILLINOIS

Chicago • Springfield • Urbana-Champaign

University Office for Capital Programs
807 South Wright Street, Suite 340
Champaign, IL 61820

April 13, 2002

Mr. Ameen Dada
Office of the Auditor General
Iles Park Plaza
740 East Ash
Springfield, IL 62703-3154

Dear Mr. Dada:

Senate Resolution 147
STATE OF ILLINOIS CONSTRUCTION DELIVERY METHODS

Thank you for the opportunity to participate in your office's review of Senate Resolution 147. We feel very strongly about the cost and time saving benefits that would be realized by the State including our University if the bidding of five divisions of work requirement were eliminated. If, in addition, alternative methods of project delivery such as "Design -Build" and "Construction Manger at Risk" were made available to us, it would be an even greater benefit for us and would enable us to significantly reduce project costs, and schedules.

Enclosed is a five page executive summary of the complete University of Illinois response report provided to you in January 2002. We would appreciate the inclusion of our executive summary in your final findings report.

Thanks once again for the courtesy you have extended us, making it possible for our University to be heard in this very important matter.

Sincerely,



Allen R. Edmonson
Assistant Vice President
University Office for Capital Programs

ARE:jml

cc: Craig Bazzani
Steve Rugg
President Stukel
Bob Todd

**State of Illinois Senate Resolution 147
The University of Illinois Response**



Presentation Overview

The following is an outlined version of the presentation regarding the University of Illinois (U of I) Response to Senate Resolution 147. The presentation contains three sections: Background, Analysis of Alternative Project Delivery Methodologies, and Recommendations.

- Background: Objective, Analysis Process, and Current U of I Capital Delivery
- Analysis of Alternative Project Delivery Methodologies: Competitive Sealed Bidding with Design/Bid/Build, Construction Management at Risk, and Design/Build and the Impact on the U of I Capital Delivery.
- Recommendations

Objective

Determine University of Illinois fiscal impact using the following alternative construction delivery methods: Competitive Sealed Bidding (with Design/Bid/Build), Construction Management at-Risk, and Design/Build.

Analysis Process

- Background review of relevant practices and findings from: Federal Agencies, Other States, and Other Universities and their research on this topic
- Apply applicable findings to UI capital program to determine fiscal impact
- Prepare a presentation and informational packet documenting findings and recommendations

Current U of I Capital Delivery Process

- Five Divisions of Work Bid / Mechanical, Electrical, & Plumbing (MEP) Assigned to General Contractor
- One Division of Work Bidding
- Construction Manager (Agency)
 - Multiple bid packages
 - CM coordinates work in field
 - Construction contracts with Owner
- State Code Requirements: All capital delivery follows Illinois Procurement Code (IPC)
- Higher Education Rules: All capital delivery follows Higher Ed Rules 526

U of I Capital Activities

<u>Current Capital Activity (Project \$)</u>		<u>Funded Projects not yet in Construction (Project \$)</u>	
UIUC	\$824,000,000	UIUC	\$404,460,600
UIC	\$502,063,000*	UIC	\$241,870,500
UIS	\$31,300,000	UIS	\$31,300,000
Total	\$1,357,363,000	Total	\$677,631,100
	* Does not include UIC South Campus Development (~\$400,000,000)		(subset of the Capital Activity)

Analysis of Alternative Project Delivery Methodologies: Competitive Sealed Bidding

Defined: Linear process where one task follows the completion of another with no overlap. Plans and specifications are completed, and then advertised for bid. General Contractor bids the project exactly as it is designed with the lowest bidder awarded the work.

- Eliminates the current required bidding of five separate divisions of construction work: Plumbing, Heating, Ventilation, Electrical Wiring & General Contract Work)

Evaluation of the Benefits of Competitive Sealed Bidding (Design/Bid/Build)

Data was gathered and analyzed on five divisions of work bid/assigned to General Contractor (30 completed projects at UIUC in calendar year 2001 totaling \$79.5 M)

Projects Evaluated

- \$79.5 M Project Budget Total
- Construction Contracts \$59.4 M are 75% of project budget
- Construction Contracts are on average: 60% General Work, 40% Mechanical, Electrical, & Plumbing (MEP), and vary by type of construction

Multiple – Prime Contracting Cost

Average rate General Contractor charged to accept Mechanical, Electrical, & Plumbing (MEP) assignment

- 2.5% of MEP Cost (Coordination in field and Bond cost to cover MEP by General Contractor)
- Rate Charged by General Contractor on MEP Change Orders
- 5% (Coordination in field, Bond cost to cover change orders, and Overhead/Profit)

Qualitative Analysis of Competitive Sealed Bidding (Design/Bid/Build)

- Requires change to the Illinois Procurement Code
- Eliminates assignment to General Contractor
- Eliminates Mechanical, Electrical, & Plumbing change order markup
- Reduces owner administration burden
- Reduces Architect/Engineer administration burden
- Solidifies Project Management Responsibilities with General Contractor
- Eliminates the Owners involvement in division of work coordination disputes
- Allows General Contractor pick his/her construction team
- General Contractor is accountable to the Owner for entire project
- Reduces general conditions cost previously covered by all division of work bidding to Owner
- General Contractor takes a greater interest in the “overall quality” of the project

Quantitative Analysis of Competitive Sealed Bidding (Design/Bid/Build)

- Cost Avoidance for the U of I: **2.8% of construction cost**
 - Eliminates assignment fee 2.5% of MEP
 - Reduces change order markup fee 5% of MEP
 - Reduces owner administrative burden # Contracts, CO, Pay Request
 - Reduces Architect/Engineer administrative burden # Contracts, CO, Pay Request
 - Reduces Delivery Costs 1.5% of Construction Contracts
- **Translates to \$27.2 M cost avoidance** on current \$1.3 billion capital construction program

Analysis of Alternative Project Delivery Methodologies

Construction Management at-Risk

Defined: Allows the Owner to interview and select a firm to manage construction before the design is complete. The construction manager and architect work together to develop and estimate the project. The Construction Manager (CM) provides a guaranteed maximum price (GMP). The owner will not pay more than the GMP.

Design/Bid/Build vs. CM at-Risk

CM at-Risk Savings for Owner

- 1.6% of Project Cost and 13.3% faster delivery speed
- **Translates to \$20.8 M cost savings** on current \$1.3 billion capital construction program

Metric*	Design/Bid/Build	CM at-Risk	% Difference	Level of Certainty
Unit cost	\$1.00	\$0.98	1.6% lower	99%
Construction Speed	365 days	344 days	5.8% faster	89%
Delivery Speed	3 years	2.6 years	13.3% faster	88%
Cost Growth	\$1.00	\$1.08	7.8% less	24%
Schedule Growth	100 days	90.8 days	9.2% less	24%

* Data Source: [Selecting Project Delivery Systems](#), by Victor Sanvido and Mark Konchar, © 1999

Analysis of Alternative Project Delivery Methodologies Design/Build

Defined: The builder and architect are one entity hired to deliver a completed building. A guaranteed maximum price is usually furnished at the beginning based on the design criteria prepared by the owner. The architect/builder then designs, bids, and constructs the project within the criteria set by the owner and below the guaranteed maximum price (GMP).

Design/Bid/Build vs. Design/Build

Design/Build Savings for Owner

- 6.1% of Project Cost and 33.5% faster delivery speed
- **Translates to \$79.3 M cost savings** on current \$1.3 billion capital program university-wide

Metric*	Design/Bid/Build	Design/Build	% Difference	Level of Certainty
Unit cost	\$1.00	\$0.94	6.1% lower	99%
Construction Speed	365 days	321 days	12% faster	89%
Delivery Speed	3 years	2 years	33.5% faster	88%
Cost Growth	\$1.00	\$0.95	5.2% less	24%
Schedule Growth	100 days	88.6 days	11.4% less	24%

Data Source: *Selecting Project Delivery Systems* by Victor Sanvido and Mark Konchar, © 1999

Federal Agency Adoption of Design/Build

1967	Department of Defense
1980s	US Army Corps of Engineers
1985	US Navy
1986	US Postal Service
1987	Environmental Protection Agency
1987	General Services Administration
1992	Federal Transportation Authority
1996	Federal Acquisition Reform Act All federal authorities may legally engage in Design/Build projects

Federal Agencies Experience with Design/Build

- Department of Navy: Design/Build (D/B) 15% reduction in project cost and 12% time savings
- Department of Defense: D/B 18% reduction in project cost and 14% time savings and 33% fewer change orders due to design deficiencies (on 40 projects)

University of Minnesota Experience with Design/Build

Univ. of Minnesota - Design/Build

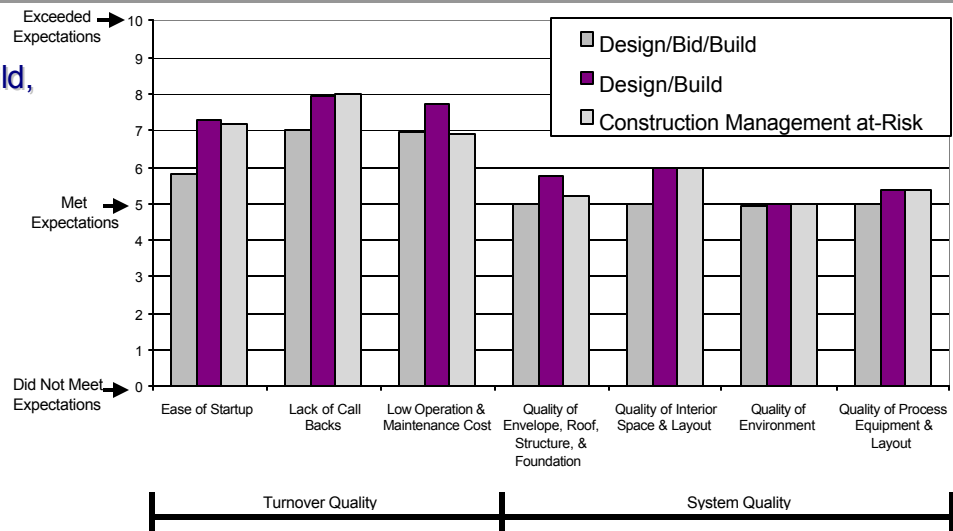
Research Laboratory – 260,000 GSF
Renovation of science dry labs, offices, and classrooms
\$ 21 Million Project (\$81/GSF)
11 Month Construction Duration

Univ. of Illinois - Design/Bid/Build

Engineering Hall – 73,311 GSF
Renovation to provide space for student functions, computer labs, and offices
\$ 14.3 Million Project (\$195/GSF)
21 Months Construction Duration

Quality Analysis for Design/Bid/Build, Design/Build, & Construction Management at-Risk

Data Source: *Selecting Project Delivery Systems* by Victor Sanvido and Mark Konchar, © 1999



Capital Delivery Change and Impact on U of I Process - Use of Competitive Sealed Bidding

- Minimal impact on contract documents
- All design approval milestones unchanged
- Minimal impact on project management staff (small learning curve)
- Quality Assurance / Quality Control / Commissioning by Operations & Maintenance (UIUC) remains
- Delivery may apply across all projects
- Quality Based Selection is not affected
- Change Order Management same as current process
- Full control over Building Standards
- Excellent chance cost avoidance can be delivered immediately

Capital Delivery Change and Impact on U of I Process - Use of CM at-Risk

- Request For Proposal (RFP) at completion of design development
- All design approvals to U of I Board of Trustees (BOT) are unchanged
- Project management staff not familiar with new process (increased learning curve)
- Owner may opt for commissioning
- Construction Management at-Risk only suited to certain projects
- Certain controls over building standards
- Excellent Change Order management possibilities
- No guarantee cost savings can be delivered immediately

Capital Delivery Change and Impact on U of I Process - Use of Design/Build

- Utilize RFP process to select vendor
- Design approval to U of I Board of Trustees (BOT) may be somewhat different
- Project management staff not familiar with new process (increased learning curve)
- Quality Assurance / Quality Control included in Request for Proposal (RFP)
- Commissioning by Vendor
- Design/Build only applicable to certain projects
- Architect/Engineering (A/E) selection inside RFP
- Building standards must be quality-based, not prescriptive
- Excellent Change Order management possibilities
- No guarantee cost savings can be delivered immediately

Recommendations

- Modify the current **Illinois Procurement Code**, Section 30, Construction and Construction-Related Professional Services.
- Through language modifications, provide capital delivery options to the construction agencies that will produce the best overall value.

Recommendation - Competitive Sealed Bidding (D/B/B)

- Eliminate 5 division of work bidding
- Requires Quality Based Selection (QBS) for Architect/Engineer (A/E) selection
- Eliminate separate specification development by the A/E
- Eliminate "assignment" language for Mechanical, Electrical, & Plumbing (MEP) contracts

Recommendation - Construction Management at-Risk

- Require Quality Based Selection (QBS) for Architect/Engineer (A/E) design services (RFP preparation)
- Require QBS for A/E representation (if outsourced by Owner)
- Owner may prequalify Construction Management at-Risk in advance of selection
- CM at Risk may be selected early to consult w/ A/E and Owner prior to price guarantee

- Owner may provide independent inspection/testing/verification necessary for acceptance of the completed facility
- Public solicitation of subcontractor bids/sealed proposals
- Construction Management at-Risk may self-perform work (must submit bid/sealed proposals)

Recommendation - Design/Build

- Requires Quality Based Selection (QBS) for Architect/Engineer (A/E) design services
- Require QBS for A/E representation (if outsourced by Owner)
- Design/Build Vendor selected in 2-step process: Prequalification (RFQ) and Selection (RFP)
- Design/Build Vendor A/E must comply with IL A/E Practice Acts
- Design/Build Vendor must have design approved by Owner
- Owner may provide independent inspection/testing/verification necessary for acceptance of the completed facility
- Performance and Payment Bond not required on design portion of contract
- Design/Build Vendor shall provide record drawings to Owner

Research References in Project Delivery Methodology

The following articles provide a wealth of information on alternative project delivery methodologies. We encourage all those interested in gaining a deeper knowledge on the benefits of using alternative project delivery methodologies to read these articles.

Comparison of U.S. Project Delivery Systems

By Mark Konchar and Victor Sanvido

Journal of Construction Engineering and Management, Vol. 124, No. 6, November/December 1998, pp. 435-444

<http://www.asce.org/publications/databasedisplay.cfm?type=9805123>

“Construction management at risk, design/build and design/bid/build are three principal project delivery systems used in the United States today. This paper empirically compares cost, schedule, and quality performance of these three project delivery systems, using project-specific data collected from 351 U.S. building projects. The study included collecting, checking, and validating industry data, significance testing of univariate comparisons and the statistical development of multivariate linear regression models for predicting average project performance. A nonresponse study verified statistically that collected data were appropriate for analysis and representative of the industry from which they were drawn. Significance testing and multivariate comparisons used nearly 100 explanatory and interacting variables to explain project cost, schedule, and quality performance. Specific comparisons between project delivery systems, performance metrics, and six facility classes are discussed. Results and the level of confidence that surrounds each finding are presented.”

Toward a New Paradigm: Simultaneous Use of Multiple Project Delivery Methods

By John B. Miller, Michael J. Garvin, C. William Ibbs, and Stephen E. Mahoney

Journal of Management in Engineering, Vol. 16, No. 3, May/June 2000, pp. 58-67

<http://www.asce.org/publications/databasedisplay.cfm?type=0001266>

“Since World War II, the American Strategy for infrastructure procurement has evolved to rely primarily upon a single delivery method, design/bid/build. While this strategy was used to implement massive federal investment in highways, transit systems, and wastewater treatment, it has *restricted state and local flexibility in aligning the procurement process to achieve best value for locally funded projects*. The engineering, procurement, and construction community in the United States has now recognized the limitations of a procurement process designed to support a single delivery method. Change is coming, and the transition to a new process will challenge public owners in novel, but meaningful ways. This paper focuses upon shifting from the current paradigm toward a new model that supports simultaneous use of multiple project delivery methods. The discussion and frameworks provided are the result of a variety of research efforts by the Infrastructure Systems Development Research team at the Massachusetts Institute of Technology. Studies of the history of American Infrastructure, analyses of case studies across the country, development of decision support models for capital programming, and real applications to municipal infrastructure planning provide the underpinnings for the results and conclusions presented.”