



City of New York

OFFICE OF THE COMPTROLLER

John C. Liu
COMPTROLLER



FINANCIAL AUDIT

Tina Kim

Deputy Comptroller for Audit

A Compilation of Audits of Three City
Agencies Efforts to Recoup Design
Error and Omission Change Order
Costs

7E13-099S

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TABLE OF CONTENTS

REPORT IN BRIEF	2
Report Findings and Conclusions.....	2
Report Recommendations	3
Background.....	4
Why Design Errors and Omissions Occur	5
How the City and Agencies Have Tried to Address These Issues.....	6
Audits of Change Order Recoupment Completed by the New York City Comptroller’s Office	7
Summaries of Design Error and Omission Audits Extracted from the Original Audit Reports.....	8
Recoupment of Change Order Costs by the Department of Design and Construction: Audit #7E11-063A (issued June 20, 2011)	8
Department of Environmental Protection’s Recoupment of Change Order Costs for the Bowery Bay Water Pollution Control Plant Upgrade: Audit #7E12-101A (issued November 19, 2012).....	9
Department of Parks and Recreation’s Oversight of Capital Projects: Audit #7E12-067A (issued January 11, 2013).....	9
Recommendations.....	11

THE CITY OF NEW YORK OFFICE OF THE COMPTROLLER FINANCIAL AUDIT

A Compilation of Audits of Three City Agencies Efforts to Recoup Change Order Costs

7E13-099S

REPORT IN BRIEF

Given the amount of taxpayer money spent on capital construction projects—\$9.1 billion in Fiscal Year 2011 and \$8.4 billion in Fiscal Year 2012—the Comptroller’s Office has dedicated a portion of the resources of the Audit Bureau to conduct audits that examine the way that City agencies carry out construction and engineering work. One topic that the Audit Bureau examined was the effort by City agencies to recoup the cost of change orders that were necessitated by design error and design omissions. Various City agencies such as the Departments of Design and Construction, Environmental Protection, and Parks and Recreation are involved in the design and construction of capital projects.

According to the City’s Procurement Policy Board Rules, change orders are “any alteration, change, amendment, or modification to any contract or agreement approved as required by law or rule.” Contract changes are classified in various categories that include changes that are brought about by errors and omissions by project designers and consultants. If a construction contractor executes work based on an erroneous design by a design consultant, the contractor may be asked to subsequently remedy the deficient work under a change order. In these cases, the City’s Directive 47 and internal agency procedures require that an agency seek recoupment from the design consultant for any additional costs that individually exceed \$3,000 due to design errors or omissions. This requirement is intended to ensure that the City is not held liable for these costs. (Officials of the three City agencies examined challenged Directive 47’s \$3,000 threshold as inadequate and outdated.)

Audits conducted by the Comptroller’s Office engineering audit division between Fiscal Years 2011 and 2012 have documented instances in which three City agencies (the Department’s of Design and Construction, Environmental Protection, and Parks and Recreation) did not adhere to procedures for recovering the cost of these types of change orders.

Report Findings and Conclusions

For this compilation report we reviewed the results of audit reports for three City agencies that examined the recoupment of change order costs that were necessitated by design errors and omissions. Based on our evaluation, we conclude that the three audited agencies did not adhere to procedures for recovering over \$13 million in change orders that were necessitated by design consultant errors and omissions.

Additionally, we identified problems pertaining to reducing the frequency of design errors and omissions, ensuring that change order classification and amount information is accurately transcribed and recorded in agency computer systems, and establishing and complying with guidelines which require that change orders be categorized with a single classification.

Report Recommendations

To address these issues we make seven recommendations for improvement. Agencies should:

- Consult with the Mayor's Office of Contract Services to revise and update Directive 47's threshold amount by which individual change orders necessitated by consultant design errors and omissions be referred to an agency's General Counsel for review and possible recoupment.
- Ensure that all appropriate change orders necessitated by consultant design errors and omissions be referred to an agency's General Counsel for review and possible recoupment. If the General Counsel believes that recoupment should be sought, the change order should be sent to the Law Department
- Implement and strengthen internal policies and procedures that govern the process of referring change orders to the General Counsel.
- Review all applicable change orders identified in these audit reports that were classified as design errors and omissions and immediately transmit these items to the agency's General Counsel.
- Take steps to reduce the frequency of design errors and omissions.
- Implement procedures to ensure that change order classification and amount information is accurately transcribed and recorded in agency computer systems.
- Establish and comply with guidelines which require that change orders be categorized with a single classification.

BACKGROUND

Various City agencies are involved in the design and construction of capital projects. These include:

- The Department of Design and Construction (DDC), which manages the design and construction of new and renovated City facilities such as firehouses, libraries, courthouses, sewers, and water mains.
- The Department of Environmental Protection (DEP), which is responsible for the design and construction of waste water treatment plants and associated facilities such as pumping stations and combined sewage overflow facilities.
- The Department of Parks and Recreation (DPR), which is responsible for carrying out the design and construction of City-wide capital projects including parks and playgrounds, bike paths, sea walls, outdoor pools, boardwalks, basketball courts, baseball fields, and natural areas.

According to the City's Procurement Policy Board Rules, change orders are "any alteration, change, amendment, or modification to any contract or agreement approved as required by law or rule." Contract changes are classified in various categories that include changes that are brought about by errors and omissions by project designers and consultants.¹ If a construction contractor executes work based on an erroneous design by a design consultant, the contractor may be asked to subsequently remedy the deficient work under a change order. In these cases, City and agency procedures require that the agency seek recoupment from the design consultant for any additional costs due to the design error. This requirement is intended to ensure that the City is not held liable for these costs.

According to DDC's Guidelines for Construction Change Orders and Overruns design errors are: "Design changes resulting from inadequate contract documents requiring the alteration of bid contract work prior to installation or revisions to contract work already installed." Similarly, DPR's Construction Manual states that design errors are "Items of work not in the contract documents or incorrectly included in the contract requiring the alteration of the bid contract work prior to installation or revisions to contract work already installed."

According to DDC and DPR, design omissions are "Items omitted from the contract documents, but required to fulfill the intent of the contract. A change order arising out of a design omission can be issued before or after the construction of the work as originally designed. The design consultant is responsible for the actual cost of installing these omitted items. (Actual cost is the difference between the cost of the additional work as indicated in the change order and the cost of the work had it been included in the original competitive bid.)"

Change order costs are often established through negotiations with a contractor without the benefit of price competition. Consequently, although work would have been paid under a

¹ Other possible change order classifications are, according to DPR's Construction Manual: 1) "Non-Material Scope Change: Any contract change which is within the original scope of the contract such as changes being made in order to accommodate requests by the Agency to add or delete items or specifications requirements to the work as originally designed in the contract documents at the time of bid." 2) "Field Conditions: Changes due to latent or invisible conditions that are not reasonably anticipated by the Contractor, Consultant or the Agency that are revealed during construction." 3) "Administrative Change (scope change): Any contract revision or change due to revised or pending changes in the requirements of regulatory agencies which were not in effect at the time of the bid."

contract had it been included in the original design, the City may pay higher prices for omitted work included in change orders. Moreover, design omission change orders may lead to the extension of an original contract schedule.

Why Design Errors and Omissions Occur

A successful capital construction project should be completed on time, cost within budgeted amounts, and be properly designed. If however, projects contain design flaws, they must be remedied during the course of construction, which may lead to project delays and contractor claims and may increase the cost of a project.

Design consultants such as architects and engineers usually strive to produce appropriate designs. However, given the large number of stakeholders involved in the City's design process and the complex nature of mechanical, structural, and electrical systems, producing a flawless design can be a difficult task. Accordingly, industry wide practice asserts that "There is no guarantee of a perfect plan or even satisfactory results. Instead, architects and engineers are expected to use 'reasonable and ordinary care' in the practice of their profession."² Design consultants such as architects and engineers:

"are expected to exercise an appropriate standard of care and to provide design products to their client agencies. When these products contain errors or omissions, the agencies must take steps to address the defective designs, plans, specification, or information; identify corrective actions; and resolve the consequences of these design deficiencies."³

Although design consultants are expected to apply an appropriate standard of care in carrying out their work, City agencies can implement various procedures to further reduce the likelihood of design errors and omissions. These procedures include:

- Ensuring that design work is properly reviewed and authorized.
- Conducting periodic meetings with consultants and staff designers.
- Procedures to ensure that consultants carry out preliminary surveys of sites.
- Performing a review to ascertain the "constructability" of the design.
- Evaluating and documenting in the City's VENDEX system the performance of consultants.

Nevertheless, if design errors and omissions occur and result in remedial change order work, responsibility for ensuring that cost recoupment is sought is handled by various agency divisions and bureaus.

Change orders are prepared, reviewed and classified by technical agency staff (DDC's Division of Infrastructure and Division of Structures, DEP's Bureau of Engineering Design and Construction, and DPR's Division of Capital Projects). Agency engineering audit officers are responsible for auditing the validity, cost, and classification of change orders. The agency chief contracting office's role is to ensure that the agency conforms to City regulations for the procurement of goods, services, and construction. An agency's general counsel is responsible

² Donald Guckert and Jeri Ripley King, "Who Pays for the Architect's Mistakes," *Facilities Manager*, September/October 2002, page 2.

³ Michael J. Markow, P.E., *Best Practices in the Management of Design Errors and Omissions*, March 2009, p.4.

for reviewing documentation to ascertain whether recoupment of change order costs is warranted and for subsequently referring the change orders to the City's Law Department.

How the City and Agencies Have Tried to Address These Issues

The City's former Office of the Director of Construction Directive 47, Amendment No. 1 dated September 21, 1992, stipulated that change orders that result from design errors or omissions that individually exceed \$3,000 be referred to the agency's legal counsel for review. Directive 47 further stipulated that "If the agency counsel believes that recoupment should be sought, the change order along with back-up documentation should be sent to the Law Department by the counsel."

Additionally, the three City agencies we audited have implemented specific procedures to handle cases in which a change order is classified as a design error or design omission. DDC procedures require the Agency Chief Contracting Officer to refer to the agency's General Counsel all change orders resulting from design errors or omissions that individually exceed \$3,000. Change order forms contain a "check-off" box certifying that the Agency Chief Contracting Officer referred the change orders to DDC's legal counsel. According to DDC's Guidelines for Construction Change Orders and Overruns "The agency shall seek recoupment without limitation from the design consultant for any additional costs due to the design error as specified in the change order including the cost of demolition or removal (in the case of work already installed), delay damages, additional insurance costs, etc."

In cases in which a change order was classified as a design error or design omission, DEP policy required the respective engineering bureau to contact the agency's Bureau of Legal Affairs by telephone or in writing if a change order was classified as a design error or omission. Legal Affairs was to request written supporting documentation, including a description of the design error/omission, how it came about, the reason a change order was required, and the associated costs. Legal Affairs would review the documentation and, if it agreed that the recoupment claim was timely, meritorious, and warranted, would refer the matter to the City Law Department's Affirmative Litigation Division. DEP procedures also required project engineers to attach a routing form to each change order, which contained a "check-off" box to indicate whether a change order was classified as a design error or omission. According to the routing form, project engineers were to prepare and submit memoranda to the Bureau of Legal Affairs for change orders that were classified as errors or omissions. Finally, for change orders that were classified as design errors or omissions, the Department's engineering audit officer was to verify that the change order classification box was checked and that the project engineer's memorandum to the Bureau of Legal Affairs was attached.

On April 16, 2012, DEP issued Standard Operating Procedure (SOP) 127—(Cost Reimbursement Associated with Error or Omission Change Orders), which established "an Errors and Omissions Panel with a Panel Chair, to oversee implementation of this policy across the capital program." SOP 127 states that a review of change order costs "will only be sought where design errors and omissions change orders exceed a threshold of 5% of the cumulative value of the original construction contracts, or if review shows that the applicable standard of care has not been met."

DPR procedures stipulated that the Deputy Chief of Construction notify in writing the agency's Capital Division Legal Counsel about change orders necessitated by design errors and omissions. According to DPR's Construction Manual, change orders that are necessitated by design errors or design omissions that exceed \$3,000 must be submitted for review for possible recoupment by the City's Law Department. However, the Department's informal policy is to

seek recoupment from design consultants for the cost of change orders attributable to design errors or omissions only in cases where the individual change order amount exceeds \$100,000.

Officials of the three City agencies examined challenged Directive 47's \$3,000 threshold as inadequate and outdated. DDC officials stated that "the dollar threshold of \$3,000 has not been adjusted in more than 19 years to match the realities of the costs of litigation and is no longer an appropriate dollar trigger to require a review by legal counsel for potential referral to the Law Department's Affirmative Litigation Division." DEP's position is that a review "will only be sought where design errors and omissions change orders exceed a threshold of 5% of the cumulative value of the original construction contracts, or if review shows that the applicable standard of care has not been met." Finally, DPR' informal policy as noted above is to seek recoupment from design consultants for the cost of change orders attributable to design errors or omissions only in cases where the individual change order amount exceeds \$100,000.

In September 2012, officials of the Mayor's Office of Contract Services (MOCS) advised that it was presently reviewing the applicability of all Mayoral Directives, including Directive 47. According to the MOCS, Directive 47 has not been in active use although it has never been rescinded. MOCS will be discussing its decisions about whether to rescind or revise outstanding directives with the Law Department and the Office of Management and Budget.

The design of City facilities may also be carried out by City agency architects and engineers. Our audit of DDC identified three change orders totaling \$757,100 that were necessitated to resolve errors associated with design work carried out by DDC architects and engineers, and 17 change orders totaling \$2,518,679 that were necessitated to resolve design omissions. Similarly, our audit of DPR found 42 change orders totaling \$878,092 that were necessitated by design errors or omissions that pertained to projects that were designed by DPR's in-house staff. In these cases, cost recoupment is obviously not a feasible alternative. Therefore, City agencies should be particularly careful in monitoring the work of design staff to ensure that the likelihood of design errors and omissions is lessened.

Audits of Change Order Recoupment Completed by the New York City Comptroller's Office

Given the amount of taxpayer money spent on capital construction projects—\$9.1 billion in Fiscal Year 2011 and \$8.4 billion in Fiscal Year 2012—the Comptroller's Office has dedicated a portion of the resources of the Audit Bureau to conduct audits that examine the way that City agencies carry out construction and engineering work. In that regard, one topic that the Audit Bureau examined was the effort by City agencies to recoup the cost of change orders that were necessitated by design error and design omissions.

Audits conducted by the engineering audit division between Fiscal Years 2011 and 2012 have documented instances in which City agencies did not adhere to procedures for recovering the cost of these types of change orders. The division conducted audits of three City agencies (Design and Construction, Environmental Protection, and Parks and Recreation). These audits found that these agencies did not adhere to procedures for recovering over \$13 million in change orders that were necessitated by design consultant errors and omissions. Specifically, at DDC an audit found \$702,580 in costs for 39 change orders that were necessitated by design errors and 64 change orders costs, totaling \$2,211,735 that were necessitated by design omissions. At DEP there were four design error change orders totaling \$89,410 and 44 design omission change orders totaling \$6,501,782. At DPR there were \$4,004,407 for 48 change orders that were necessitated by consultant design errors and omissions. (See Table 1 on page 8.)

Table 1
Summary of Audited Change Orders Necessitated
by Design Errors and Omissions

Agency	No. of Design Error Change Orders	Amount	No. of Design Omission Change Orders	Amount	Total
DDC	39	\$702,580	64	\$2,211,735	\$2,914,315
DEP	4	\$89,410	44	\$6,501,782	\$6,591,192
DPR	*	**	*	**	\$4,004,407
				Grand Total =	\$13,509,914
* There were 48 change orders necessitated by design errors and omissions. Available DPR records did not separate the classifications.					
** Available DPR records did not separate these amounts.					

The balance of this report consists of extracts from the original audit reports and our overall recommendations from the conclusions based in this compilation report.

Summaries of Design Error and Omission Audits Extracted from the Original Audit Reports

Recoupment of Change Order Costs by the Department of Design and Construction: Audit #7E11-063A (issued June 20, 2011)

In addition to determining whether DDC has appropriate standards to recoup from consultants the cost of change order work that results from design errors and omissions, the audit also examined whether DDC had procedures to reduce consultant design errors and omissions. In Fiscal Years 2009 and 2010, DDC issued 1,560 change orders totaling \$230,525,580. Of these, 51 totaling \$980,633 were classified as design errors and 121 totaling \$5,752,452 were classified as design omissions.

DDC has appropriate standards and procedures to reduce consultant design errors and omissions and recoup from consultants the cost of change order work that results from design errors and omissions. However, DDC did not adhere to the standards for recouping from consultants the cost of change order work that resulted from design errors. Consequently, DDC has foregone an opportunity to recoup from consultants in Fiscal Years 2009 and 2010 up to \$702,580 in costs for change orders that were necessitated by design errors. Moreover—although recovering the costs of design omission change orders may be less likely—DDC did not follow procedures for recouping costs for \$2.2 million in change order work that was necessitated by design omissions. Furthermore, DDC did not always adhere to standards to preclude design errors and omissions from occurring in the first place.

Additionally, the audit identified problems with classifying change orders and with accurately recording information about change order classifications in DDC's Standardized Change Order Record-Contract Overrun Request Entry (SCORE) system.

In its response, DDC agreed with four recommendations and partially agreed with two recommendations. DDC stated that "the dollar threshold of \$3,000 has not been adjusted in more than 19 years to match the realities of the costs of litigation and is no longer an appropriate dollar trigger to require a review by legal counsel for potential referral to the Law Department's Affirmative Litigation Division."

Department of Environmental Protection's Recoupment of Change Order Costs for the Bowery Bay Water Pollution Control Plant Upgrade: Audit #7E12-101A (issued November 19, 2012)

In 2000, the DEP awarded construction contracts totaling \$213.45 million to upgrade the Bowery Bay Water Pollution Control Plant in Queens. The contract schedule was extended to 2010. For the Plant upgrade, DEP classified four change orders totaling \$89,410 as design errors and 44 change orders totaling \$6,501,782 as design omissions.⁴ The combined value of these change orders was \$6,591,192.

DEP did not adhere to procedures for recouping from consultants the cost of change order work that was categorized as a design error or design omission. The audit found that the combined value of change orders that should have been considered for possible recoupment but were not totaled \$6,591,192. Additionally, DEP improperly categorized certain change orders with multiple classifications that included design error or omission. Consequently, due to the multiple classifications, portions of change orders totaling an additional \$9,923,875 that were partly attributable to design errors and design omissions should have been considered for possible recoupment, but were not. DEP's compliance problems can be attributed to a lack of written standards and internal controls governing the recoupment of change orders costs necessitated by design errors and omissions.

DEP officials advised us in August 2012 that they recently established an Errors and Omissions Panel to oversee implementation of a policy to review change orders related to design errors and omissions and the recoupment of associated costs.

In their response, DEP officials stated, "In general, the Department does not dispute the findings or the recommendations of the Draft Report." DEP agreed with three recommendations and disagreed with one recommendation.

Department of Parks and Recreation's Oversight of Capital Projects: Audit #7E12-067A (issued January 11, 2013)

DPR did not adhere to procedures for recouping from consultants the cost of change order work that resulted from design errors or design omissions. Consequently, DPR has foregone an opportunity to recoup from consultants in Fiscal Years 2010 and 2011 up to \$4,004,407 in costs for 48 change orders associated with the 315 completed projects that were necessitated by consultant design errors and omissions. (There were an additional 42 change orders totaling \$878,092 that were necessitated by design errors or omissions that pertained to projects that were designed by DPR's in-house staff. In these cases, cost recoupment is obviously not a feasible alternative.)

In cases in which a change order is classified as a design error or design omission, DPR procedures stipulate that the Deputy Chief of Construction notify in writing DPR's Capital Division Legal Counsel. According to DPR's Construction Manual, change orders that are

⁴ The audit covered change orders registered between calendar years 2001 and 2011.

necessitated by design errors or design omissions that exceed \$3,000 must be submitted for review for possible recoupment by the City's Law Department.⁵ This requirement is consistent with the City's former Office of the Director of Construction Directive 47, Amendment No. 1 dated September 21, 1992, which stipulated that change orders that result from design errors or omissions that individually exceed \$3,000 be referred to the agency's legal counsel for review. That Directive has not been superseded.

However, DPR's informal policy is to seek recoupment from design consultants for the cost of change orders attributable to design errors or omissions only in cases where the individual change order amount exceeds \$100,000. Three of the 48 change orders totaling \$3,168,360 exceeded this threshold amount. However, there was no evidence in DPR files that all required notifications were either submitted or that the Legal Counsel carried out reviews of the change orders.

Consequently, DPR has foregone an opportunity to recoup from consultants in Fiscal Years 2010 and 2011 \$353,100 in costs for two change orders that were necessitated by design errors. Moreover—although we understand that recovering the costs of design omission change orders may be less likely—procedures for recouping funds from consultants were not followed for an additional change order totaling \$2,815,260 that was necessitated by a design omission. The combined value of the remedial change orders totaled \$3,168,360, which should have been considered for possible recoupment.

We attribute deficiencies in the process for recouping design error and omission costs to DPR's ambiguity concerning its written and informal standards that spells out the threshold amounts for seeking recoupment from consultants. However, in a related matter, we note that DPR has recently started to notify consultants about change orders that are classified as design errors or omissions, an appropriate step for ensuring that consultants are held accountable for design errors and omissions.

In its response, DPR officials stated "Parks will continue to ensure that all appropriate change orders (those that that exceed \$3,000) necessitated by consultant design errors and omissions are reviewed by our Legal Counsel for possible recoupment by the Law Department."

⁵ Associated with the 315 completed projects were 28 change orders totaling \$44,518 whose threshold amounts were less than \$3,000. These change orders were classified as design errors or omissions and pertained to projects that were designed by private consultants.

RECOMMENDATIONS

We had the following recommendations, which are based on the findings contained in the above noted audits. If these recommendations are implemented on a City-wide basis they would standardize and make consistent the process by which agencies classify and seek recoupment for change order costs necessitated by design errors and omissions.

Agencies should:

1. Consult with the Mayor's Office of Contract Services to revise and update Directive 47's threshold amount by which individual change orders necessitated by consultant design errors and omissions be referred to an agency's General Counsel for review and possible recoupment.
2. Ensure that all appropriate change orders necessitated by consultant design errors and omissions be referred to an agency's General Counsel for review and possible recoupment. If the General Counsel believes that recoupment should be sought, the change order should be sent to the Law Department.
3. Implement and strengthen internal policies and procedures that govern the process of referring change orders to the General Counsel.
4. Review all applicable change orders identified in these audit reports that were classified as design errors and omissions and immediately transmit these items to the agency's General Counsel.
5. Take steps to reduce the frequency of design errors and omissions. In that regard, City agencies should:
 - ensure that design work is properly reviewed and authorized.
 - conduct periodic meetings with consultants and staff designers.
 - ensure that consultants carry out preliminary surveys of sites.
 - perform reviews to ascertain the "constructability" of a design.
 - evaluate and document in the City's VENDEX system the performance of consultants.
6. Implement procedures to ensure that change order classification and amount information is accurately transcribed and recorded in agency computer systems.
7. Establish and comply with guidelines which require that change orders be categorized with a single classification.