



Lexington-Fayette Urban County Government  
OFFICE OF INTERNAL AUDIT

Jim Newberry  
Mayor

Joe Kelly  
Senior Advisor for Management

## **INTERNAL AUDIT REPORT**

DATE: June 19, 2009

TO: Jim Newberry, Mayor

CC: Joe Kelly, Senior Advisor for Management  
Mike Webb, Commissioner of Public Works & Development  
Marwan Rayan, Director of Engineering  
Susan Straub, Communications Director  
Urban County Council Members  
Internal Audit Board Members

FROM: Bruce Sahli, Director of Internal Audit

RE: Division of Engineering New Development Process

### **Background**

Within the Division of Engineering, it is the responsibility of the New Development Section (NDS) to monitor infrastructure construction for new subdivisions and commercial development within Lexington and Fayette County. The NDS provides oversight and inspection of privately funded projects, both residential and commercial. On January 1, 2001, the inspection process changed substantially when an LFUCG Ordinance became effective directing the Division of Engineering to cease its practice of performing detailed reviews of development plans (a four to six week process) in favor of a more cursory review taking approximately one to two weeks to complete. This Ordinance was the culmination of a re-evaluation of LFUCG engineering practices ordered by former Mayor Pam Miller, apparently initiated due to the collapse of an eight-foot high retaining wall on June 27, 1995, as described below.

As reported in a June 28, 1995 Herald-Leader article, an eight foot high retaining wall collapsed after heavy afternoon rains, unleashing thousands of gallons of water and severely damaging several homes on a southwest Lexington neighborhood located on Gum Tree Lane. Those articles reported that oversight of the construction phase of new developments was minimal and record keeping haphazard. The Herald-Leader also reported on July 1, 1995 that city officials could not locate test results to document how much water the retaining wall was built to withstand, and alleged problems in the retaining wall's construction.

Subsequent to this event, Commonwealth Technology, Inc. was hired to evaluate LFUCG's engineering practices. The result was a 28-page report titled An Overview of New Development Plan Review and Construction Inspection with Recommendations for Improvements in Fayette County, Kentucky, dated April 11, 1996.

From that study there evolved significant process changes culminating in Ordinances 370-2000 and 371-2000 effective January 1, 2001 that shifted inspection risk from LFUCG engineers to the professional engineers in the private sector, and included the approval of highly detailed engineering manuals designed to instruct private sector engineers in the execution of their duties under the new Ordinance. The cost of developing the Engineering Manuals exceeded \$1,000,000, not including the costs of LFUCG personnel assisting in the process.

Recent developments and issues regarding the Division of Engineering inspection and approval process once again raised questions about the effectiveness of that process, resulting in the Urban County Council requesting the Office of Internal Audit re-examine those processes. This audit is the result of that examination. This is the first audit of that particular process within the Division of Engineering.

### **Scope and Objectives**

The general control objectives for the audit were to provide reasonable assurance that:

- The Division of Engineering NDS inspection process is efficient and effective.
- Field Inspectors and Engineers have the necessary training & experience to perform their required duties.
- Field inspections are completed timely and are adequately documented.
- The field inspection process is sufficiently managed and anomalies are resolved in a timely manner.
- The problem resolution process is effective, sufficiently documented, and communicated to all stakeholders.

The Office of Internal Audit examined samples of projects contained in the NDS database that were dated 2001 to the present.

### **Statement of Auditing Standards**

We conducted our audit in accordance with the International Standards for the Professional Practice of Internal Auditing. Those standards require that we plan and perform the audit to afford a reasonable basis for our judgments and conclusions regarding the organization, program, activity or function under audit. An audit also includes assessments of applicable internal controls and compliance with requirements of laws and regulations when necessary to satisfy the audit objectives. We believe that our audit provides a reasonable basis for our conclusions.

### **Audit Opinion**

In our opinion, the controls and procedures did not provide reasonable assurance that the general control objectives were being met. Opportunities to enhance controls are included in the Summary of Audit Findings.

### **Priority Rating Process**

To assist management in its evaluation, the findings have been assigned a qualitative assessment of the need for corrective action. Each item is assessed a high, moderate, or low priority as follows:

High - Represents a finding requiring immediate action by management to mitigate risks associated with the process being audited.

Moderate – Represents a finding requiring timely action by management to mitigate risks associated with the process being audited.

Low - Represents a finding for consideration by management for correction or implementation associated with the process being audited.

## **SUMMARY OF AUDIT FINDINGS**

### **Finding #1. Documentation Standards Should be Established**

**Priority Rating: High**

#### **Condition:**

We examined eight inspections documented in the NDS database indicating grading issues on properties where sod had been laid down for over one year. The NDS database indicated that several of these properties had been purchased for several years before their first documented compliance inspection.

We discussed these anomalies with the responsible field inspector and asked why he reported grading issues at these properties. He could not recall any specifics regarding the inspections, but stated he had made notes on the back of new development plats that would provide sufficient explanations. However, when the plats were examined with the inspector, no such documentation existed. He then stated that there would be explanatory notes in the NDS database under these properties' comment sections. We also examined those comment sections with the inspector, and found no documentation. The field inspector then stated he clearly understood he needed to do a better job of documenting his work. These anomalies were discussed in-depth with the Director of Engineering and the NDS section manager during fieldwork in order to expedite management review and corrective action.

For those files tested in the NDS database, we noted multiple examples where documented inspections did not follow a logical progression. An example of logical progression is that when an inspection identifies an issue requiring corrective action there should be an advisory report, possibly a Notice of Violation, possibly a progress report(s), followed by documentation of compliance (problem resolution). We noted numerous instances where issues documented as in compliance were then re-opened as advisory reports. These documentation concerns existed for two of the four field inspectors, while the other two field inspectors' work clearly demonstrated logical progression on all of their case files examined. Those inspections in

question were discussed in-depth with the Director of Engineering and the NDS section manager during fieldwork in order to expedite management review and corrective action.

In addition, for those files tested, we found no evidence management reviews the results of field inspections documented in the NDS database, nor did we find any documented evidence of management review in their related construction files.

**Effect:**

Subsequent discussions with Division of Engineering management established that there are no specific documentation standards for field inspectors, nor has any specific documentation training been provided to field inspectors. This has resulted in significant inconsistencies in the documentation of inspection results and the inability, in some instances, to be able to sufficiently explain apparent anomalies in the inspection process.

Field inspectors operate independently of management while in the field. Timeliness, accuracy, and thorough documentation are three crucial aspects of the field inspection process. Without sufficient documentation of inspection results, performance accountability issues, including those of the inspectors as well as contractors responsible for corrective action, could go unaddressed and thereby affect the quality of inspection services provided to stakeholders.

This finding also raises questions about the effectiveness of management oversight and review of the field inspection process.

**Recommendation:**

Management should develop standardized documentation requirements for field inspections. Those standards should be sufficient to ensure that results of inspections would satisfy a reasonable person with a basic understanding of the inspection process that inspections were appropriately conducted. Division of Engineering management should also develop procedures designed to provide oversight and monitoring of field inspections to ensure timely, accurate, and thoroughly documented field inspections that comply with all federal, state, and local regulations. Field inspections should be considered thoroughly documented when they can be examined by representatives of independent agencies (e.g., EPA officials) resulting in the same or similar conclusions. We also recommend Division of Engineering management periodically validate reported inspections by conducting random, unannounced field level reviews of inspection work performed.

**Director of Engineering Response:** The Division will develop a standardized inspection form to be used by NDS inspectors. The inspection form will be such that all applicable federal, state and local regulations are complied with. The form will also allow periodic oversight and verification by supervisors and Division management. It should be noted that the Divisions of Engineering and Water Quality have developed and are using a program to document inspections complying with the pending EPA consent decree.

**Commissioner of Public Works Response:** I agree with the recommendation for this finding. There needs to be a minimum amount of required documentation for every official inspection that identifies date of inspection, time of inspection, and all documentation required to meet local, state and federal regulations. These documentation requirements need to be stated in a written procedure. A complete record of the inspection should be maintained in the official records retention file or data base and be available for audit or regulatory inspection upon request.

I also agree that the Division of Engineering needs to include an on-going Quality Control/Audit process to validate reported inspections. The process should identify incomplete documentation of inspections, anomalies in process for resolution violations, and all necessary information that needs to be a part of the official file. The Division of Engineering management needs to define this process and make it a written procedure. The process needs to include a quality control component for the field inspection and an audit component for the process flow of all necessary notices and required paper work generated by the inspection process. Management should signoff on each quality control /audit done on the inspection process, required information verifications, and address all issues found, document the actions taken to resolve the issues, and provide adequate follow up to document that the actions taken have resolved the issues found.

## **Finding #2. Bonding Inspection Process Needs Improved Documentation**

**Priority Rating: High**

### **Condition:**

The NDS commonly uses Letters of Credit as a form of bonding to ensure all new development bondable work is completed. A Letter of Credit is a document issued by a bank that essentially acts as an irrevocable guarantee of payment to the LFUCG if a developer does not perform their obligations. Letter of Credit amounts are subsequently reduced based on field inspection results documented on inspection punch lists prepared by NDS personnel.

An examination of NDS inspection punch lists noted that the typical process for documenting these inspections was to draw a line through the completed construction process. The punch lists did not contain any explanatory notes, inspector's signature or initials, date of inspection, or evidence of management review. This was typically the extent of documentation relied upon to reduce Letters of Credit amounts.

### **Effect:**

The reduction of Letters of Credit without adequate documentation and evidence of management review creates a financial risk to the LFUCG. Under these conditions, Letters of Credit amounts could be improperly reduced if field inspection training or performance issues exist or arise. As noted in other findings in this report, there is an overall absence of supervision in the field inspection process that could allow such training and performance issues to go unaddressed.

### **Recommendation:**

Division of Engineering management should establish improved documentation requirements for inspections affecting Letter of Credit amounts. This documentation should, at a minimum, require a brief description of work accomplished that justifies a reduction in a Letter of Credit amount, contain the inspector's signature and date of inspection, and contain the signature of the inspector's supervisor denoting management review and approval. We also recommend Division of Engineering management periodically validate reported inspections by conducting random, unannounced field level reviews of inspection work performed.

**Director of Engineering Response:** The Division will develop a check list to formalize the process for reducing or releasing letters of credit. The check list will include information such as brief description of the completed work, signature of inspector, date of inspection, and verification by supervisor.

**Commissioner of Public Works Response:** I agree with the recommendation for this finding. I would also state that the documentation for a reduction in a Letter of Credit due to work completed needs to be part of a written procedure and reviewed in the Quality Control/Audit process.

**Finding #3. Improvement Needed in NDS Organizational Structure**

**Priority Rating: High**

**Condition:**

During the initial phases of the audit, we were informed that NDS is reorganizing, and that currently 15 NDS positions (five vacant) report directly to the Section Manager while only four positions report to an Engineering Tech Principal.

**Effect:**

This reporting structure places significant supervisory responsibilities upon one employee, and is not an effective reporting structure to ensure proper oversight in a Division where duties are complex, departmentalized, and often involve field level operations with significant autonomy. Of particular concern is that this reporting structure does not provide management the opportunity to effectively oversee the work of field inspectors.

**Recommendation:**

The Division of Engineering NDS reporting structure should be reorganized to provide, at a minimum, the assignment of direct supervision of field level personnel to one supervisor to improve the management and accountability of that function.

**Director of Engineering Response:** A new organizational structure is currently being developed for the New Development Section (NDS). The new structure will place inspectors under a supervisor or supervisors who will, as part of their responsibility, monitor inspectors' field work and checking and verifying the accuracy and timeliness of the inspections and the completeness of all required documents. Random checking of inspectors' field and office work will be conducted by Division management.

**Commissioner of Public Works Response:** Based on the Condition noted, I agree a review of supervisor duties and requirements is in order. I believe the level of supervision given field Inspectors should be determined by the review but also consider the Quality Control/Audit Process established.

**Finding #4. NDS Problem Resolution Tracking Needs Significant Improvement**

**Priority Rating: High**

**Condition:**

The Section Manager could not answer with any reasonable certainty how many NDS issues Division of Engineering personnel had addressed in the past year. A significant contributor to the lack of information appears to be due to the Division of Engineering not having a systematic process for NDS problem tracking and resolution. Builders and contractors typically contact Engineering personnel directly to report and resolve NDS issues. These discussions, e-mails, etc., are not subject to any systematic documentation process, database tracking, or management overview. On those occasions when LexCall is the initial contact, LexCall has only one problem code to cover all NDS issues. In contrast, the Division of Streets & Roads has

approximately 70 problem codes, which greatly improves LexCall's ability to route problems to the correct Streets & Roads personnel for problem resolution.

**Effect:**

The Section Manager's uncertainty is a direct result of the absence of a systematic process to document, track, and oversee NDS problem resolution practices. The absence of a systematic process is also problematic when projects are reassigned to other NDS personnel, or when issues that may have been dormant for some time re-surface and NDS personnel have insufficient records regarding the issue's resolution status. This condition also limits NDS ability to inform LFUCG Senior Management and the Council of progress made in NDS problem resolution, giving the appearance that NDS management is unaware of or detached from the resolution of NDS problems affecting the public.

**Recommendation:**

The NDS Section of Engineering should coordinate with LexCall to identify the different types of issues encountered during the NDS process. Engineering/NDS management should then develop problem codes enabling LexCall to route the calls to the NDS employee best able to address the problem. This process will provide database tracking allowing management to examine the nature and extent of calls and determine if assigned NDS employees have employed timely and appropriate steps to resolve the issues. This database tracking will also provide NDS management a systematic database history, and remove their dependence on less reliable NDS personnel memories or sporadic documentation regarding issues that may have several years of history associated with them.

**Director of Engineering Response:** NDS will consult and coordinate with LexCall to devise a system that will document all incoming requests, inquiries and complaints and the responses by NDS. The Division management will periodically review the database for the timely resolution of reported issues.

**Commissioner of Public Works Response:** I agree that additional tracking is need. The LexCall problem codes should be explored as a means of providing documentation and tracking.

**Finding #5. Licensed P.E. Needed for Commercial Project Management**  
**Priority Rating: High**

**Condition:**

The Council-approved Engineering Procedures Manual states that the Division of Engineering shall appoint a staff member to function as the Project Coordinator for proposed developments. It further states the Project Coordinator shall be a Licensed Professional Engineer (P.E.), and shall be the contact person for the Developer and the Engineer during the preparation of the Improvement Plans, during construction, and during the final inspection. The Engineering employee currently designated as Project Coordinator for commercial projects is not a P.E. Furthermore, we found no documented evidence of P.E. supervision of this employee's work in the commercial project files.

**Effect:**

The assignment of Project Coordinator duties to an employee who is not a P.E. is a violation of Engineering procedures designed to ensure the highest level of professional competency in the Project Coordinator position.

**Recommendation:**

The duties of Project Coordinator should be assigned to a Licensed Professional Engineer as required by the Engineering Procedures Manual.

**Director of Engineering Response:** Currently all plans for Land Subdivision Projects are being reviewed by a Licensed Professional Engineer. Plans for commercial development are reviewed by an Engineering Technician Principle under the supervision of the Section Manager who is a Licensed Professional Engineer. The new organizational structure will place the inspector for commercial development under the direct supervision of a Licensed Professional Engineer.

Review of plans will be performed by the engineer with help from the inspectors.

**Commissioner of Public Works Response:** I agree with the recommendation for this finding

**Finding #6. Commercial File Documents not Sealed by a Professional Engineer**

**Priority Rating: High**

**Condition:**

Various documents located in the commercial project files did not contain the professional seal of the external P.E. who developed the plans, including Storm Water Management Plans, Storm Water Calculation Reports, Drainage Plans, and Sanitary Sewer Plans. The Engineering Procedures Manual specifically requires these seals for submitted construction plans. This requirement can also be inferred for calculation reports due to reliance on their professional quality.

**Effect:**

Failure to obtain external P.E. seals on these important documents is a violation of Engineering procedures designed to ensure LFUCG's is placing reliance on the highest level of professional competency in development plans, and that such plans represent a final product rather than a draft.

**Recommendation:**

Licensed Professional Engineer seals should be obtained for all of these documents as required by the Engineering Procedures Manual. This should include any amendments to original plans, as amendments supersede the originals and therefore become the new representations of the external engineering firms.

**Director of Engineering Response:** Corrective action has been implemented to ensure that all appropriate documents bear the signature and seal of the design engineer.

**Commissioner of Public Works Response:** I agree with this recommendation for this finding. This should also be an item for review in the Quality Control /Audit Process.

**Finding #7. Management Philosophy of Engineering Process Risk**

**Priority Rating: High**

**Condition:**

As noted in the Background section of this report, the Engineering process to perform detailed reviews of development plans has shifted significantly from primary reliance on LFUCG Engineering personnel to

primary reliance on Licensed Professional Engineers employed by the private sector. The cost of developing the Engineering Manuals exceeded \$1,000,000, not including the costs of LFUCG personnel assisting in the process. During the audit, questions were raised by various senior LFUCG personnel whether this has proven to be an effective practice, or if the Division of Engineering should once again bear the primary responsibility of conducting detailed development plan reviews.

The high priority findings thus far identified in this report, coupled with the fact the NDS Section of Engineering has only four Licensed Professional Engineers (which includes the Director), indicates that NDS processes and available NDS personnel are not sufficient to assume those additional responsibilities and the associated risk of liability to the LFUCG.

**Effect:**

In our opinion, financial and compliance risk would likely increase if the LFUCG once again assumed the primary responsibility for detailed reviews of development plans.

**Recommendation:**

In our opinion, LFUCG should continue the current practice of reliance on external Licensed Professional Engineers to provide detailed reviews of development plans, while Division of Engineering personnel continue to perform limited reviews of such plans. Management's development of effective action plans to address the findings in this report should result in significant improvements to this current practice.

**Director of Engineering Response:** We do not disagree with the recommendations of the audit report.

**Commissioner of Public Works Response:** I agree with the recommendation for this finding.

**Finding #8. Commercial Preconstruction Meetings Not Documented**

**Priority Rating: Moderate**

**Condition:**

We noted that commercial preconstruction meetings are not sufficiently documented. We observed the existence of checklists in the property files intended to document such meetings, but the checklists only contained the meeting date and location (typically on-site). There was no documentation of persons in attendance or topics of discussion. A preconstruction meeting is required before a grading permit can be issued (this is one of the first permits to be issued for a new development project).

**Effect:**

Insufficient documentation of meetings that directly affect the issuance of permits weakens the overall accountability of the permit process.

**Recommendation:**

In addition to the existing date and location, preconstruction meeting documentation should, at a minimum, include persons in attendance, significant topics discussed, and an indication the results of the meeting were sufficient to warrant the issuance of a grading permit.

**Director of Engineering Response:** I agree with the audit report. Inspectors and engineers conducting the preconstruction meetings will be required to include more information on the check list for more thorough documentation.

**Commissioner of Public Works Response:** I agree with the recommendation for this Finding. This should also be an item for review in the Quality Control /Audit Process.

**Finding #9. Commercial Inspections not Tracked in Database**  
**Priority Rating: Moderate**

**Condition:**

Commercial field inspections are tracked via a manual checklist. By contrast, residential inspections are documented in the NDS database, which is a more efficient process that provides the benefits of file automation, electronic data retrieval, a history of file updates, improves management's oversight capacity, and provide a secure file backup.

**Effect:**

The use of manual checklists increases the risk of misfiled, lost, or altered documentation that can be largely mitigated by automation.

**Recommendation:**

We recommend Engineering request the services of Information Technology to update the NDS database to accommodate commercial inspection documentation and management needs.

**Director of Engineering Response:** The Department of Environmental Quality is in the process of acquiring a software package that will replace databases for inspections including home building and commercial development. The new software will have broad applications for various divisions within LFUCG including the Division of Engineering. When this software is implemented the existing databases will be abandoned.

**Commissioner of Public Works Response:** I agree with the recommendation for this finding.

**Finding #10. Supplemental Commercial Files Need Checklist Documentation**  
**Priority Rating: Low**

**Condition:**

When a building is replaced or experiences significant reconstruction (e.g., after a fire has occurred), a supplemental file is used for the new shell building. We noted these files did not contain project checklists.

**Effect:**

The absence of these checklists eliminates a simple but effective method to insure personnel are aware of and document compliance with all required project meetings and inspections.

**Recommendation:**

Checklists should be used for all projects, including re-build situations.

**Director of Engineering Response:** A check list for this type of projects will be developed and a file will be created.

**Commissioner of Public Works Response:** I agree with the recommendation for this finding. The Checklist should also be an item for review in the Quality Control / Audit Process.