

KLEINFELDER WEST, INC.

QUALITY SYSTEM GUIDELINES MANUAL

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QUALITY SYSTEM GUIDELINES MANUAL REVISION HISTORY LOG

<u>Revision Date</u>	<u>Pages Revised</u>
January, 1995	Original Quality Control Manual
January, 1996	Manual revised in entirety
January, 1998	Manual name changed to Quality System Manual and revised in its entirety
April 24, 1998	Manual revised in its entirety
May 28, 1998	Revised QSGM Cover Sheet, Revised Table of Contents, Added Page to Table of Contents
July 24, 1998	Entire Manual revised to incorporate ICBO-ES Comments
August 2, 1999	Change to new Corporate office location, paragraph I.A.2 Reference to closed Mexico offices deleted, paragraph I.C.1 Requirements for Competency Verification Record Keeping were revised; paragraphs II.D.2.b, II.E.1.a and II.F.2.
March 21, 2000	Added Table 8 to Appendix B
November 30, 2000	General Corporate Update
April 25, 2001	Updated to show changes in personnel
June 26, 2001	Quality Manager position description refined, Section 2.A.3. The term "Senior Materials Consultant" were changed to read "Chief Materials Engineer," throughout manual to comply with change with corporate terminology
November 1, 2001	Substantial revisions throughout to comply with ICBO-ES requirements related to ISO 17025 requirements.
December 20, 2001	Revisions in response to ICBO-ES comments
December 28, 2001	Up-date of Index page numbers to reflect 12/20/01 changes
March 26, 2002	Up-date of Organization of Our Quality Control Staff
March 9, 2004	The term "Chief Materials Engineer" were changed to read "Principal Materials Engineer," throughout manual to comply with change with corporate terminology; General Corporate Update.
June 6, 2005	Manual revised to incorporate the requirements of both ISO 17025:1999 and AASHTO R-18. Manual revised in its entirety
February 10, 2006	General Corporate Update
August 16, 2006	General Office Update
June 15, 2007	General Office Update
December 7, 2007	Revisions to Organization Chart, QSM signature page
January 17, 2008	Revisions in response to IAS audit

QUALITY SYSTEM GUIDELINES MANUAL

I. Organization and Organizational Policy

A. Legal Name and Address

This manual has been tailored to the specific operations of the local office and laboratory shown from the Kleinfelder Group, Inc. Master Quality System Guidelines Manual. In the remainder of this document, the office listed below is referred to as the *local office*. The policies delineated in this manual shall also apply to work performed at sites away from our permanent facilities, or in associated temporary or mobile facilities.

1. The legal name and address of our local office and laboratory is:
Kleinfelder West, Inc.
2405 140th Avenue NE, Suite A-101
Bellevue, Washington 98005
(425) 562-4200
2. Our Corporate Office is located at:
Kleinfelder Group, Inc.
5015 Shoreham Place
San Diego, California 92122
(858) 320-2000

B. Ownership and Management Structure

1. Ownership:

Kleinfelder, Inc. is a totally employee owned company. Employee ownership consists of direct shareholders and owners through the ESOP (Employee Stock Ownership Plan). Currently, we operate nearly seventy different offices with a company wide staff of over 2,000 (figure 1 in the Appendix A).

2. Management Structure:

a) Organizational Components

The control of Kleinfelder is vested in a Board of Directors, who are actively engaged in the management and technical operations of the firm and are elected annually by the Stockholders. The current Board of Directors and Teamwork Structure is shown in Figure 2 of Appendix A. Kleinfelder is subdivided in Operational Divisions comprised of Regions and other operational units, which are, in turn, comprised of the basic operating units, Area Offices. Many offices are further subdivided into departments, depending upon the management and supervision requirements of that office. The organizational chart for the overall Kleinfelder Seattle Area Organization is shown on Figure 3 in the Appendix A.

b) Management Relationships:

Through a decentralized management system, responsibility and authority for day-to-day management of the basic operating units is delegated to the respective office managers. Office oversight provided is by Regional Managers, supervised by Division Managers, reporting directly to the Chief Operating Officer. Each manager has specific responsibility for assuring that staff, within their operational unit, has the needed training, assistance, and resources to be successful.

c) Management Committees:

The only matrix structure is in the form of Technical Committees and the Planning Advisory Committee. Technical Committees are responsible to the Board of Directors, while the Planning Advisory Board reports to the President.

d) Senior Consultants:

Kleinfelder also utilizes Senior Consultants known as the Technical Resource Center, TRC, as in house consultants to provide specialized expertise in our primary disciplines. These individuals operate as single person offices charged with providing consultation related to their specialty discipline to all offices related to technical, quality assurance and review, operations, and marketing. To encourage program use, Senior Consultant single person offices are not profit centers and are managed to cover costs only. Senior Consultants report directly to a Vice President designated by the board.

e) Program Managers:

Program Managers are also single-person offices established to provide coordinated, company-wide resource allocation and marketing efforts for specific service areas, such as infrastructure, water resources, etc. These single-person offices are not profit centers and report directly to the board.

f) Profit Centers:

Emphasis is placed on the office profit centers being the basic operating unit with a high degree of autonomy within budget and other guideline, which may be imposed by Regional Managers, Division Managers, and the Board. The managers, as a group, are responsible for making decisions to coordinate and conduct firm wide operations in a cohesive manner.

C. Company History

1. Kleinfelder was founded in 1961 in Stockton, California. We currently maintain over sixty offices in the Western United States, including: California, Nevada, Washington, Oregon, Idaho, Utah, Arizona, New Mexico, Colorado, Texas, Kansas, Missouri, Iowa, Nebraska, Connecticut, Maryland, Massachusetts, New Jersey, New York, Pennsylvania, Florida, and Oklahoma.
2. We have grown steadily to our current size of over 2,000 engineers, technicians, scientists, and support staff. The Engineering News Record Magazine currently ranks us as one of the 50 largest engineering firms in the United States.
3. Our growth has been both geographic and in the services offered and the complexity of the services we provide. Our primary service disciplines began as construction materials testing and geotechnical engineering and have expanded to include construction materials engineering, construction management, engineering geology, environmental engineering, and environmental science.
4. Kleinfelder's approach has always been to combine the skills of our professional and technical staff with innovative technology to provide our clients the product they desire at a competitive price. Focus has always been on satisfied clients and a challenged and involved staff.

D. Geographic Area Served

1. Corporation: The geographic area served is shown on Figure 1 in Appendix A.
2. Local Office: The geographic area served is shown on Figure 4 in Appendix A.

E. Materials Services

1. The local office is capable of providing a wide range of technical services to our clients. These services include materials engineering and testing and construction observation, the focus of this manual.
2. Construction materials testing services consist primarily of performing tests on construction materials in accordance with specified standard test procedures. Our objective is to conduct all tests in accordance with the appropriate standards and to perform and report them with an objective and unbiased approach.
3. Presented in Appendix B, Tables 1 and 2 are summaries of the more routine field and laboratory tests performed by Kleinfelder. It is the policy of Kleinfelder to perform tests and inspections in accordance with accepted and applicable industry standards including: ASTM, AASHTO, State Departments of Transportation, ICC (formerly UBC), ACI, AWS, Bureau of Reclamation, etc.

4. Occasionally, special client requests will require development of testing programs not addressed by industry standard procedures. In these cases, testing programs will be developed using sound engineering and materials testing principles. Where non-standard testing procedures are used to evaluate structural components, Kleinfelder works with structural engineering consultants to assure proper structural design parameters are being measured. Where non-standard test procedures are used to evaluate materials or assemblies under the jurisdiction of an authority, such as ICC Evaluation Services, Kleinfelder works with the authority to develop approval of the test procedure.
5. Materials engineering services include the proportioning and analysis of Portland cement concrete, hot mix asphaltic concrete, roller compacted concrete, cement treated base, soil-cement, lime stabilized subgrade and base course, masonry mortar and grout, shotcrete and gunite, aggregate blends, slurry seals, chip seals, and other materials primarily related to civil engineering applications.
6. Failure analysis services are provided under the supervision of our materials engineers, often in collaboration with our geotechnical engineers or outside structural consultants or subconsultants. Our materials engineers often provide consultation regarding the relative significance of materials tests that do not meet project requirements and regarding corrective measures to mitigate problems or limit the possibility of reoccurrence.
7. Construction observation services are provided to increase our clients confidence that the assembled materials comply with the construction contract documents. Our experienced engineers and technicians observe work during construction and after completion that is within the scope of services to compare this work to the requirements of specific construction contract documents, typically plans and specifications. Any discrepancies noted between the work and the contract documents are reported in accordance with the requirements of the client or governing agency.
8. Sampling Procedures: Obtaining samples are performed by two general techniques, depending upon the purpose of the testing: Representative Sampling and Random Sampling. Sampling, similar to testing, is performed whenever possible in accordance with procedures presented in industry reference standards including: ASTM, AASHTO, IBC, UBC, AWS, state departments of transportation, and others depending upon the material.
 - a) Representative Samples: These techniques are designed to obtain a sample whose engineering properties will be similar to the whole product from which the sample was obtained. The individual obtaining the sample investigates the whole product by observation, probing, non-destructive testing, and other techniques to determine the desired sampling location.
 - b) Random Samples: These techniques are used in quality control and assurance programs to develop an overall understanding of products

being produced and delivered. Statistical and random number procedures are used to eliminate bias that could be introduced by the sampler. Statistical analysis can also be used to evaluate the whole product when sample locations are selected in this manner.

F. Quality System Policy

1. Statement of General Policy: The foundation of the Kleinfelder Materials Services Quality System is to provide services with staff that are properly trained, experienced, and educated, using equipment that meets the requirements of applicable standards and is calibrated in a manner that is traceable to the U.S. Department of Commerce, National Institute of Standards and Technology, and performing services in accordance with recognized standards and materials engineering principles, including ISO/IEC 17025:2005
 - a) Personnel training, experience, and education minimums required by Kleinfelder to qualify for specific positions and job responsibilities are presented in detail in this manual and Appendix C, as well as methods for verifying training and competency.
 - b) Methods for assuring the use of proper and calibrated equipment are described in detail in this manual.
 - c) Recognized standards and the Kleinfelder policy for establishing procedures when a recognized standard is not available are presented in detail in this manual.
 - d) Internal and external methods used to monitor compliance with the guidelines presented in this manual are also presented in this manual.
2. Resource Assurance: It is Kleinfelder policy to assure that we have the proper staffing and equipment resources to perform a task before accepting the work and to assure during the performance of the work that the proper resources have been assigned. The Materials Department Manager (defined herein and denoted as the Materials Testing Group Manager and Quality Manager in Figure 6, Appendix A Local Office Materials Department Organizational Chart) has primary responsibility of making the overall determination in this regard, but, as described herein, each individual is additionally responsible to verify they meet QSM competency requirements and that the equipment used is calibrated and conforms to the requirements of the appropriate standard.
3. Quality Systems Guidelines Manual Control:

Each Office shall receive a numbered copy of the company Quality System Guidelines Manual.
4. Quality System Training: Each individual working for Kleinfelder providing Materials Services receives training regarding our Quality System. A supervisor provides this training, which discusses this manual and the systems presented herein section by section with each employee within one

month of initial employment. A record of this training is placed in the employee's personnel file (discussed later).

5. Quality System Review: Each time an internal or external audit or on-site inspection is performed; local management staff will review our Quality System to assure it is current and functioning. If revisions are made, the Revision History Log (following Table of Contents) will be updated.
6. Deviations from Quality System Manual: Deviations from the policies, procedures, and systems presented in this manual must be approved by the Materials Department Manager and noted on related reports, which in turn are signed by authorized individuals.
7. Conflict of Interest:
 - a) Kleinfelder will not knowingly provide services to a client where the outcome of those services affects interests of Kleinfelder. This is considered a conflict with the interests of our client. Examples include where Kleinfelder or its direct personnel or financial interests or where the results of our services may be compared with previous services provided by Kleinfelder. Neither Kleinfelder nor its employees will perform work where remuneration for services is influenced by the results of those services.
 - b) Kleinfelder will not knowingly provide services where the outcome of those services for one client conflicts with the interests of another client who has already employed Kleinfelder. In addition to services that are specifically in conflict, it is also recognized that existing client relationships can project the appearance of inappropriate bias that is also considered by Kleinfelder to create a conflict of interest.
 - c) Kleinfelder will not knowingly assign an individual to work where that individual may have a conflict of interest beyond those of Kleinfelder. Such conflicts would include work that could personally or financially affect an employee or their immediate relations. Kleinfelder may elect, at our discretion, to provide these services with employees that do not have a conflict of interest. Each materials services employee must sign an affidavit documenting their understanding of this conflict of interest provision. This affidavit is filed in the employee's personnel file. It is the responsibility of each employee to inform management when they believe personal, commercial, or financial pressure could create a bias or the potential for the appearance of a bias related to their work assignment.

II. Staff

A. Operational Positions

1. Regional Office: Presented in Appendix A are the regional organizational charts depicting the operational components of Kleinfelder departments and regional managers.

2. Materials Department: Figure 6 in the Appendix A shows the organizational structure of the local office Materials Department. This figure also identifies by name individuals currently in the key department positions.
3. Key Materials Department Positions:
 - a) Materials Department Manager: This individual may be titled Regional, Department, Operations, or Office Manager, Senior Engineer, or Engineer. Depending upon the size and structure of the office and shall meet the minimum requirements for the appropriate position. The Quality Manager is responsible to assure our work conforms to the standards of our industry in the geographic area where those services are provided related to the technical aspects of our work
Registered Engineer In Responsible Charge: A Registered Engineer with 5 years of construction materials experience is in responsible charge of all relevant testing services. This individual may be the Regional, Technical, Department, Senior Engineer, or Quality Systems Manager. Again, this depends upon the office size and the complexity of services provided.
 - b) Technical Manager: The Technical Manager shall have the minimum qualifications required for the Laboratory Manager (see Job Descriptions in Appendix C). This individual has primary responsibility for assuring the Quality System is implemented and maintained as required in this Manual and the maintenance of record keeping and tracking documentation and may be the Regional Manager, Materials Department Manager, Principal, Laboratory Manager, Senior Engineer or Engineer..
 - c) Quality Manager: The Quality Manager shall have the minimum qualifications required for the Laboratory Manager (see Job Descriptions in Appendix C). This individual has primary responsibility for assuring the Quality System is implemented and maintained as required in this Manual and the maintenance of record keeping and tracking documentation and may be the Regional, Technical, Department, Operations, Office or Laboratory Manager, Senior Engineer or Engineer. When acting in the capacity of Quality Manager, this position reports operationally to the Regional Manager and has direct access to the Principal Materials Engineer with respect to these duties and has the authority to stop all or parts of operations believed to be operating contrary to the objectives of this manual until *Diagnostic and Corrective Actions* as detailed in Section VI have been accomplished to the satisfaction of the Regional Manager.
 - d) Laboratory Manager: The Laboratory Manager's qualifications, duties, and supervision exercised and received are detailed in the Job Descriptions in Appendix C. The Laboratory Manager may also be titled Operations, Department, or Project Manager, depending upon

the size of the offices and the complexity of services offered by that office.

- e) Delegation of Duties During Absence: The delegation of any authority or duty represented in the Organizational Chart in Appendix A or the Job Descriptions in Appendix C in the absence from a position of any individual for any reason automatically is assigned to the individual exercising supervision over that position as represented on the Organizational Chart. For extended absences of individuals from positions, delegation of authority may be specifically assigned by written memorandum to the Office or Principal Manager by the individual exercising supervision over that position.

4. Quality System Organizational Structure

- a) The organization structure of the Quality System is as follows: Board of Directors, Principals, Materials Department Manager, Quality Manager, Project or Laboratory Manager, Field or Laboratory Supervisors, and individual employees.
- b) Individual quality task assignments, such as maintaining of records, are detailed throughout this manual and in the job descriptions. If an individual assigned a task is unavailable for any reason (vacation, sick leave, out of office work assignment, etc.) the responsibilities for that task shall be automatically reassigned to the individual next in upward succession in the local office organizational structure. Task succession can be specifically reassigned on a temporary basis by the individual to whom the task is assigned with the approval of the individual next in upward succession in the quality system organizational structure. Succession reassignment is typically performed when the assigned individual will be unavailable for an extended period of time.

B. Job Descriptions (6.2.2)

- 1. Contained in the Appendix C are job descriptions of the various work positions of the local office as depicted in Appendix A, Figure 6, *Local Office Materials Department Organizational Chart*. Each job description states the position; supervision exercised and received, minimum qualifications, and duties. Since this manual focuses on Kleinfelder materials services, only descriptions of jobs directly related to those services are presented. Descriptions for other jobs in Kleinfelder, such as corporate officers and administration staff, are included in separate company manuals available at the local office administration department.

C. Resumes

- 1. Resumes of the key local office materials department personnel shown in Figure 6 are maintained in the local office personnel files and available from the administration department.

D. Training

1. General:

- a) One of the major components of a successful Quality Assurance System is the provision that qualified personnel are involved in both the inspection and testing of a project.
- b) Every individual in the firm is encouraged to improve their skills and continue their professional development. The actual training of our staff to perform the required tests in strict accordance with the appropriate standards is accomplished in several ways.

2. Methods

- a) The basic element of our training program is on-the-job training. Each employee being trained (trainee) is taught the individual, standardized test methods by first reading the test procedure from the applicable standard and then by watching one of our personnel with verified competency perform the test (trainer). The trainee will then perform the test himself under the constant supervision of the trainer, until confidence the test can be properly performed is established.
- b) Finally, the competency of the trainee to perform the test is verified by the trainer observing the trainee perform the test in accordance with the appropriate published test method for that test. The results of this competency verification are recorded on the "Technician Competency Verification Record" and filed in accordance with paragraph II.E "Competency Verification."
- c) Formal training in the way of classes and seminars and outside certification agencies, are also a major part of our training program and competency verification program. Considerable latitude is given for continuing education programs. However, individual improvement is the basic intent of this policy. Training and competency verification, (discussed later) are considered accomplished only on the basis of successful completion of performance testing, whether in-house or by an outside agency.
- d) The application of employment along with the employee's resume and employer verifications provide records of past work experience, qualifications, and training history. This training may be substituted for Kleinfelder training, provided the competency of each individual trained by others to perform tests and tasks will be verified by Kleinfelder before that individual is considered qualified to perform that work independently.

3. Responsible Individual:

- a) The Technical Manager is ultimately responsible to assure all staff is properly trained to perform their assigned task and is progressing in

their technical career by becoming competent in an increasing number of tasks and becoming certified by outside agencies.

- b) Each Laboratory or Project Manager and Supervisory Technician is additionally responsible to assure that individuals assigned to work under their supervision are trained and verified as competent in the tasks which are assigned to them and to provide training and career growth opportunities.
- c) Finally, the responsibility of assuring adequate training and competency rests directly with the individuals assigned to perform the work. It is each individual's responsibility to notify their immediate supervisor if they have not been trained and competency verified to perform a task they are assigned, or are in any way uncomfortable or unsure about their skills. If a supervisor is not responsive to an individual's concerns, the individual shall report their concerns directly to the Materials Department Manager.

4. Records

- a) General employment records are maintained in the Personnel Department files. The Laboratory Manager also maintains a training file for Materials Department employees, to include training in specific areas, competency verification, and certifications by outside agencies. Personnel Department files are confidential to the employee and specified managers. The training files may be reviewed by others, such as outside inspection agencies, at the Laboratory Manager's discretion.
- b) It is Kleinfelder's desire to keep these files as complete and up-to-date as possible. Kleinfelder requests each employee keep the Technical Manager fully apprised of new developments that should be included in their personnel file.

E. Competency Verification (6.2.5)

1. Program:

- a) All tests, analyses, or other services performed will be conducted by personnel trained, as described above and competency verified to perform that task. Competency verification will be performed as described above under training and will consist of the technician who is being verified performing the test under the observation of a technician (verifier) with current competency verification or a registered engineer. The verifier will utilize a step by step procedure checklist when observing the technician perform the test and record on the "Technician Competency Verification Record" the date of the verification and the initials of the verifier and whether the technician satisfactorily or unsatisfactorily demonstrated the test performance. Each attempt is recorded on this form which is filed in the technician's training file.

- b) In lieu of in-house competency verification, verification by outside agencies may be used, provided the verification is based upon performance testing in a similar checklist manner. AMRL, CCRL, DOT, and ACI programs meet these criteria. Results must be recorded and filed in the employee's training file.

2. Responsible Individual:

- a) The Materials Group Manager/Quality Manager is ultimately responsible for assuring all staff is currently competency verified to perform their assigned task and is progressing in their technical career by becoming competent in an increasing number of tasks and becoming certified by outside agencies.
- b) Each Laboratory or Project Manager and Supervisory Technician is additionally responsible to assure that individuals assigned to work under their supervision are trained and verified as competent in the tasks which are assigned to them and to provide training and career growth opportunities.
- c) Finally, the responsibility of assuring adequate training and competency rests directly with the individuals assigned to perform the work. It is each individual's responsibility to notify their immediate supervisor if they have not been trained and competency verified to perform a task they are assigned, or are in any way uncomfortable or unsure about their skills. If a supervisor is not responsive to an individual's concerns, the individual shall report their concerns directly to the Technical Manager.

3. Frequency:

- a) Competency will be verified at least annually. At a minimum, the employee's competency verification status will be reviewed during their annual performance review conducted near their employment anniversary date.

4. Records:

- a) Records will be maintained by the Laboratory Manager in the employee's training files as described for Training, above.
- b) Location of Records: Records are maintained in the Laboratory Manager's office.

F. Forms for II.D. and E. (6.2.6):

- 1. Training and Competency Verification Checklist forms are maintained in files in the Laboratory Managers office
- 2. Kleinfelder uses checklists developed by AMRL and ACI whenever possible and has developed others when necessary.

G. Use of External Personnel

1. On occasion, to meet workforce or technical requirements, the office may hire individuals from outside of Kleinfelder. It is Kleinfelder policy that these individuals:
 - a) Are employees of companies complying with the requirements of Section VIII.
 - b) Are competent, certified, and agency approved as appropriate to the specific requirements of the assigned task. The company employing these individuals shall be responsible for competency, certification, and agency approval verification based upon the specific Kleinfelder request.
 - c) Unless otherwise specified by contract or project requirements, Kleinfelder managers or supervisors will perform quality assurance reviews of the work performed by these individuals to monitor compliance with the guidelines of this manual.

III. **Facilities and Equipment (6.3)**

A. General:

1. Presented in this section is the quality system relevant to our laboratory facilities and equipment. Our laboratory facility is completely equipped with florescent lighting and sunlight for proper control of lighting. The lab is also equipped with heating and air conditioning for temperature control, humidifiers and dehumidifiers for humidity control, and ventilation hoods for dust and fume control, as appropriate to the standard test procedures for tests performed by the local office. As required by the standard test procedure, these environmental conditions are monitored, controlled, and recorded. It is our policy to maintain our facilities in a clean, neat, and organized manner with housekeeping conducive to the performance of materials tests in accordance with specified standard procedures. The local office also has all equipment required to perform all tests listed in Appendix B, Tables 1 and 2 in accordance with those standard procedures. This equipment is shown on the local office inventory list.
2. Local Office and Laboratory Floor Plan:
 - a) Presented on Figure 7 of Appendix A is a floor plan of our local office and laboratory facilities. This floor plan gives the general layout for the laboratory work space.
3. Inventory List (6.3.1):
 - a) An *Equipment Inventory List* for the local office is maintained to identify and track equipment. This inventory list includes: equipment name, manufacturer name, serial or other unique identification number, date purchased, date placed in service, and the condition of the equipment as received (new, used, reconditioned).
4. Library and Reference Materials:
 - a) Reference Materials: each Kleinfelder local office also has a complete, up-to-date reference standards library including: ASTM AASHTO, IBC, UBC, ACI, AWS, API, ISO, local and state agency standards, etc., as applicable to the services provided by the local office, including all standard test procedures performed by that office. Many of these applicable standards are listed in Appendix B, Tables 1, 2, and 9. These standards are readily accessible to all personnel performing the tests.
 - b) Maintaining a Current Library: It is the responsibility of the Technical Manager to assure current editions are readily available for use by the individuals performing the tests or services. The Project or Laboratory Manager verifies the proper edition of a standard is being used during the performance of the work.
 - c) Obsolete Standards: As discussed in Section I.E.3., project specifications, contract requirements, or governing agency

requirements may require the use of standards that are not the most current. In these cases, these specific requirements will supercede the guideline to use the most current standard. Standards, which have become obsolete by replacement with a more current edition, are not required to be maintained by the local office, but local offices may retain copies at their discretion for historical reference, or to be used in the event that they are specifically required as discussed above. If obsolete standards are not dated, they shall be suitably marked or discarded.

5. Access Control:

- a) Kleinfelder facilities include work areas for employees and reception and meeting areas for clients and employees.
- b) Clients and other non-employees should be accompanied by an employee when in work areas, including office and administrative areas.
- c) Each office has a guest register in the reception area, where visitors should sign in.
- d) Each employee is encouraged to assist guests in knowledge of and compliance with these access control policies.
- e) Only trained staffs are allowed access to areas where environmental control affects the quality of the tests or work. Where necessary for access control these areas are clearly marked and/or controlled by doorways and sometimes locks.

6. Computer Systems

- a) Information Technology (IT) Department: The IT department of the Kleinfelder Corporation manages all computer functions, including hardware, wide area network (WAN), local area networks (LAN), software, standard operating procedures, security, the world wide web external Kleinfelder Home Page, and the world wide web internal Kleinfelder Web Site.
- b) All hardware system purchases are made through the IT department. This insures system compatibility, functionality, and security. IT assures installed hardware includes equipment for protection from power supply variations and has appropriate system components to support software, security, and operating procedure functions.
- c) IT installs WAN hardware and software and manages the network. The WAN also includes access to the World Wide Web and e-mail capabilities. All regional offices and most area offices are connected to the WAN.
- d) IT also installs and manages the LAN's, which are in all regional and most area offices. LAN systems are all *Novell*.

- e) Office software, including *Microsoft Office*, accounting and management software, *MIDAS* (in-house materials testing and dispatch software), and certain other company licensed software are installed on the LAN and personnel computers by IT. Only software, including engineering software, which has been approved through IT is allowed to be installed on a LAN or on the hard drive of the person (company owned) computers. Reference computer disks, including ASTM, ACI, UBC, and others are available through the WAN on either the CITRIX server or on our internal web site. These resources are available through the approval and licensing with the standards provider. Engineering application software, such as GINT and CAMA, must first be approved by the Technical Manager, then by the Regional Manager, and finally by IT. Technical review assures the program functions accurately and in accordance with recognized materials engineering principles and standards. Regional review extends the technical review and grants purchasing approval. IT approval assures system compatibility, proper licensing, virus scanning, and proper, read only security. IT periodically searches the individual LAN's through the WAN to audit software approval and licensing and performs periodic on-site audits of individual computer hard drives for the same.
- f) IT establishes and monitors system standard operating procedures including drive allocation and use, electronic filing systems, automatic back-up systems, and user privilege scenarios. All work, including work in progress must be stored on the LAN. All reports and other documents distributed to clients must go through our standard reporting system, described herein, and be electronically filed by administrative staff. Electronic files are used only for convenience. Critical documents are always maintained in the "hard copy" project files.
- g) IT also establishes, maintains, and monitors computer security issues. These include password systems and user privileges. They also closely monitor power supply variation protection and back up systems.
- h) Kleinfelder IT maintains two sites on the World Wide Web. One site is available to the general public and one site for use within the company. Through our Home Page, clients given special security codes specific to their project can access and download test data.
- i) Kleinfelder uses application software, particularly *Excel*, to perform testing and engineering calculations and prepare reports. These spreadsheets are subject to the same reviews and requirements discussed in this manual for other reports and are individually checked. Data is not entered into a report unless the test data sheet has been checked and reviewed, as described in this manual, whether the test data sheet is computer generated or not. Whenever possible,

internal check systems are designed into spreadsheets, such as reconciling row and column totals, or weight, volume, or percentage comparison to known starting or ending values.

7. Equipment shall be handled, transported, stored, used, and maintained such that its ability to adequately perform is sustained. Should equipment become damaged to the degree it is not able to meet its performance requirements, it shall be removed from service until repaired and, when appropriate, recalibrated or verified to comply with its performance standards.

B. Calibration and Verification (6.3.2)

1. Inventory List (6.3.2.1): The *Equipment Inventory List* and copies of manufacturer's instructions are maintained by the Laboratory Manager and are located in the Laboratory Manager's office.
2. Time Interval: Kleinfelder has adopted the calibration verification frequency intervals presented in AASHTO Standard R 18 or ASTM Standards C 1077, C 3666 and D 3740, whichever are most frequent. If equipment is not listed in these standards, it will be verified for calibration at least annually. For equipment that is not used as frequently as the required calibration verification frequency, the specified frequency can be extended. However, whenever that piece of equipment is used, it must have had its calibration verified within a time period equal to or less than the specified frequency. Whenever a piece of equipment is outside of Kleinfelder control for whatever reason, upon its return it shall be closely inspected, and, if there is any reason to suspect the equipment may not comply with the requirements of the appropriate testing standard, calibration or verification shall be performed before the equipment is used. If we have reason to suspect equipment is not providing accurate test results, calibration or verification will be performed before the equipment is used.
3. Procedures: All tests are performed using calibrated equipment complying with the requirements of the standard of the test being performed. We have prepared equipment maintenance and calibration forms referencing the appropriate standard to be followed for maintenance and calibration for each piece of test equipment. Each piece of equipment to be calibrated has a summary sheet identifying the piece of equipment, the documented procedure or referenced procedure for calibration, the standards used for the calibration and the results of the calibration. Reference standards for calibrations are traceable to NIST. The NIST reference number is included on the calibration data sheet. If equipment is calibrated externally, the NIST reference number must be provided by the calibrating agency.
4. Records and Location of Records:
 - a) The completed calibration verification records generated by Kleinfelder and by calibration consultants are located in the Laboratory Manager's office. The calibration records and

certification information regarding the traceability to NIST for calibration equipment used are also located in the Laboratory Manager's office.

- b) After three years, at the local office's option, these records may be moved to a permanent storage location.

5. Program Procedures (6.3.2.2)

- a) Method for assuring verifications are current:

- 1.) The Laboratory Manager maintains a calibration log located in the Laboratory Manager's office. This log lists each piece of equipment, the verification frequency, and a log of the dates when calibrations were performed and the next date due. On the first of each month, the *Calibration Log* is reviewed by the Laboratory Manager and a list of equipment requiring calibration that month is generated.

- 2) *Calibration Stickers:* When calibration or calibration verification is performed a sticker is applied to the piece of equipment showing the date the calibration was performed, the date the next verification is due, and the initials of the individual who performed the calibration. These stickers allow individuals using the equipment to verify calibration is current prior to using the equipment.

- b) Responsible Individual:

- 1) The Laboratory Manager is responsible for the equipment calibration verification program and is responsible to assure that all equipment in use is currently verified as calibrated.

- 2) Each individual using a piece of equipment has responsibility for ensuring the equipment is calibrated prior to use

- c) New Equipment Procedures:

- 1) When equipment is received, it is inspected, calibration verified by manufacturer certification or Kleinfelder calibration verification, and added to the *Equipment Inventory List* and the *Calibration Log* by the Laboratory Manager.

- d) Removal From Service and Out of Calibration/Defective Equipment:

- 1) Red tag labels will be affixed to any equipment that needs repair or does not meet calibration criteria. Equipment that has not been calibrated can be identified by the absence of a calibration sticker or the date on the calibration sticker indicating when recalibration is due. This equipment will not be used until repair and/or calibration is performed and the red tag has been removed by the Laboratory Manager.

Equipment removed from service and discarded shall be removed from the *Equipment Inventory List* by the Laboratory Manager.

6. Calibration and Verification Procedures (6.3.2.3):

- a) Kleinfelder performs routine verifications in accordance with the procedures contained in our *Materials Equipment Calibration Guidelines Manual*. For certain calibration and calibration verification requiring specialized equipment not possessed by Kleinfelder, we use outside calibration consultants. A list of these consultants is presented in the Appendix B, Table 5. Equipment manufacturers are also utilized, when necessary, for maintenance, repair, and calibration. Whether calibration and verification is performed by Kleinfelder or others, the procedure shall include measurements traceable to NIST, as discussed in paragraph III.B.7.a) that verify that the equipment complies with the requirements of the associated test standard, and the records shall document the measurement results and show comparison to the test standard requirement used to verify conformity or nonconformity.
- b) Location of Procedures Manual:
 - 1) The Kleinfelder *Materials Equipment Calibration Guidelines Manual* is located in the Laboratory Manager's office. In addition, this manual also contains the calibration forms used for each piece of equipment.
- c) Procedures referenced in applicable standards:
 - 1) Calibration verification of laboratory equipment procedures are designed to utilize the most current issue of the applicable ASTM, AASHTO, or other applicable standard.
- d) Procedures not referenced in applicable standards:
 - 1) Where the applicable standard does not specify calibration procedures, they have been developed by Kleinfelder in accordance with standard materials engineering and testing principles. These are contained in the *Materials Equipment Calibration Guidelines Manual*.
- e) Uncertainty: All calibrations and verifications are performed in conformance with the measurement limits specified in the published standard test procedures, when available. The uncertainty associated with these procedures is inherent in those procedures and understood and accepted by the industry, and the determination of uncertainty is not required. Where a standard procedure is not available and reporting of uncertainty is required, a properly registered Kleinfelder professional will determine and report a reasonable estimation of uncertainty using appropriate mathematical calculations together with knowledge of the procedure, equipment, and the use of the results.

7. In-house Calibration Equipment and Reference Standards (6.3.2.4)
 - a) All equipment used for calibration or verification shall be traceable by an unbroken chain of calibrations and comparisons to the NIST.
 - b) Files for Equipment Certifications, Traceability, etc.
 - 1.) Files are maintained by the Laboratory Manager which contains equipment calibration certifications by outside agencies, in-house equipment calibration verification, concrete curing room temperature and humidity, laboratory accreditations, and NIST traceability standards in the Laboratory Manager's office.
 - c) Use and Storage: Equipment and Reference Standards used for in-house calibration verification should not be used for any other purpose and should be stored in a location that limits the potential for use or accidental contact that might invalidate NIST traceability.
 - d) Reference standards shall be periodically verified and maintenance performed as required.
 - e) Special care shall be taken whenever transporting calibration equipment and reference standard material to assure the traceability and accuracy of the equipment is not compromised. Prior to use of the equipment after transport, it shall be carefully inspected for any evidence of mishandling. If for any reason it is believed that the traceability or accuracy of the equipment is in question, it shall be subjected to re-verification processes as necessary to alleviate these concerns.
- C. Supplies: Tests performed by Kleinfelder often require the use of expendable supplies. The following guidelines apply to these supplies.
 1. General: It is the objective of this guideline to use only supplies that comply with the requirements of the specified test standard.
 2. Purchase: When ordering supplies for which there are specified material requirements, these requirements will be conveyed to the supplier with the purchase order.
 3. Compliance Verification: Kleinfelder will verify compliance of supplies through manufacturer certificates of compliance or, if certificates are not available or if test standards require, Kleinfelder will perform tests and/or measurements to verify compliance of the supplies with the critical properties associated with the standard test procedure.
 4. Storage: Kleinfelder will store supplies as required by the requirements of the manufacturer or standard test procedure. If supplies are found to have been improperly stored, they will not be used in the performance of the related test procedure.

5. Documentation: Kleinfelder will maintain records as required by the related standard test procedure of the compliance verification. Also, if required by the standard test procedure, records related to the storage and storage environment requirements will be maintained.
6. Suppliers: Each local office maintains records of suppliers known to provide reliable materials.

D. Use of Equipment and Facilities Controlled By Others

1. Policy: Occasionally Kleinfelder will use equipment and facilities controlled by others to perform our services, or our services may be to observe and document the work of others, including quality control tests. Examples would be: performing trial batching at a production batch plant or observing a manufacturer perform quality control load testing of a truss. It is our policy to only report work where equipment and facilities are not under our control if we have verified this equipment and facilities meets industry standards, or to report the identified deviations.
2. Verification of Calibration is performed by one of the following two methods and documented in Kleinfelder field report records:
 - a) Verification by Kleinfelder using our NIST traceable tools.
 - b) Verification by observation of certification documentation by a recognized third party, such as a scale certification sticker by a state department of weights and measures.

IV. Test Data and Field Records and Reports (6.4)

A. Methods (6.4.1)

1. Produce, Prepare, Check, Issue:
 - a) While the field or laboratory technician or inspector is performing the test or observation, all pertinent information and results will be recorded on the appropriate test data or field report form and identifiable to the specific task, project, and location within the project. Once the test or observation is completed, the technician or inspector will sign the data or field report form and submit it to the laboratory or field supervisor or manager, who will review the results, checking for completeness, accuracy, and reasonableness of information and data on the form. Some test data sheets do not require the signature of the individual performing the test, but require the identification of this individual by their initials. The supervisor will initial the form when satisfied with the results, prepare a draft report, and forward it to word processing. Any alteration to the original field or test data sheets should be made by crossing out the original entry (not erasing) and entering the change next to the crossed out entry. The individual making the alteration should initial such changes. Word processing

will prepare the test report and return it to the supervisor. The supervisor will then review the typed version with the original form for accuracy and completeness. If satisfied, the supervisor forwards the report to the individual responsible for signature.

- b) After review, editing, if necessary, and approval by the individual who will sign the report, the typed report is returned to administrative staff to prepare it for final typing, copying, and mailing to the client. The original of the typed report will be signed by the authorized individual and mailed to the client with copies distributed to client-approved parties and one copy placed in the project files.
- c) Kleinfelder requires all engineering work to be performed under the supervision of a properly registered engineer. Engineering work is defined as services where engineering analysis is performed or where an engineering opinion is expressed. The presentation of test results performed in accordance with a standard procedure together with project or standard specifications and the comparison of the test results to those specifications is not considered to be the expression of an engineering opinion.
- d) Engineering reports are to be signed by the registered engineer. Reports that contain only the results of tests performed in accordance with a standard test procedure may be signed by a Laboratory Supervisor or by a Laboratory, Project, Operations, Materials Department, Office, or Regional Manager. Summary reports of observations performed by certified or governing authority approved inspectors must be signed by the Project Manager and an Operations, Department, Office, or Regional Manager. These reports may also include field and laboratory tests. If an opinion is expressed regarding the overall compliance of a structure (roadway, bridge, building) or part of a structure (pad or fill certification), the report must be cosigned by a registered engineer. Whenever Kleinfelder uses the word certify in a report, it is only to certify the observation and testing work performed by Kleinfelder was performed in accordance with our industry standards for the locality where the work was performed and does not relate to work performed by the contractor, other engineers or surveyors, or others.
- e) Documentation of checking and review performance is maintained on the word processing work order form and filed in the project file.
- f) Where establishing of uncertainty is determined appropriate in accordance with Section III.B.6.e), it should be reported.
- g) Standard Forms: Where standard data or report forms are used, the date the standard form was developed should be shown on the form. If engineering or testing standards are revised, the related forms should be reviewed and modified as appropriate. It is the responsibility of the Technical Manager to assure that the appropriate editions or revisions

of the standard forms are available in their office and the outdated forms are discarded.

B. Typical Report Forms (6.4.2)

1. Typical Format Discussion:

- a) The appropriate standard will be followed in preparing the written results (i.e., required information to be included on the test form). Standard test procedures that were performed will be specifically denoted on test reports. Any deviations from the designated standard procedure shall be noted. If special procedures designed by a properly registered engineer were used, they should be described in detail together with the materials engineering principles used.
- b) Each sample for which test results are presented shall be identified in the report by sample number together with other appropriate identification information, such as materials supplier, materials source, material type, sample location, date sampled, name of party who obtained sample, date received, date tested, tests performed, etc... When required, the method of sampling shall be recorded, as discussed in Section I.E.9. Test results are presented for each sample, and, where applicable, project or other material specifications may be presented and compared to the test results with a pass or fail disposition. Field reports of observations shall include similar project information and identify the nature of the observation, the item being observed, and a precise description of the location of the observation.
- c) Typical laboratory data sheets provide spaces for data to be recorded. This data includes sample measurements and other measurements and values used to calculate test results. Whether handwritten or computerized forms, data spaces shall not be “pre-filled” with typical data. This includes measurements and factors from calibrating or verification of equipment such as mold volumes, dynamometer factors, or specific gravities of materials used in the test. This data shall be input for each test based upon the current calibration or verification of the specific piece of equipment or material used.
- d) Engineering reports typically include the following sections, as appropriate to the scope and complexity of work: Introduction, Scope of Work, Project Approach, Field and Laboratory Investigations, Findings, Engineering Analysis, Conclusions, and Recommendations. Depending upon the complexity of the project, some sections are often combined.

2. Date:

- a) The date of a report denoting the date the report was sent to the client shall be noted on the each page.

3. Amending Reports:
 - a) If it becomes necessary to revise or amend a report, the original report date and the date(s) of revision will be shown on the report.
 - b) Supplemental reports shall clearly be so identified, with the original report being identified in the report introduction.
 - c) All published reports shall be retained in accordance with Section IV.C, including the original, revised, amended, and supplemental reports.
4. Location of Standard Forms:
 - a) Standard report and test data forms are located in the Laboratory Manager's office.
5. Typical Forms:
 - a) Several typical forms are included in the Appendix D.

C. Files and Report Retention:

1. All correspondence, reports, test data, field reports, drawings, specifications, submittals, and other written or electronic communications or information relative to the work performed by Kleinfelder on a project should be stored in our project files. Our office currently uses a two-file system for each project. The first file is the invoice file and contains all financial and contractual data. The second file is the working file and contains all pertinent information to the project necessary to establish a complete record of work performed by Kleinfelder. These two files are maintained in separate file rooms within the local office.
2. Our test record system is set-up to retain test data records and reports for a minimum of three years from the date of the report, including original observations, calculations, and derived data with final test reports. Responsibility for carrying out the policy described herein is assigned to the Technical Manager.

D. Confidentiality:

1. Confidentiality of test reports, both oral and written, is a major professional and ethical concern. Test reports are the property of the client; however, they are copyrighted by Kleinfelder, Inc. to attempt to limit the misuse of the data. Reporting is restricted to the client or client-authorized personnel only. Absolutely no results are distributed to non-client or non-Kleinfelder parties, unless authorized by the client.
2. Only management and designated administrative staff are authorized to access or copy information from project files. Files removed from the file cabinets must be *signed out*. Work in progress is often maintained in laboratory or field files before being permanently filed and field and preliminary lab data reports are often reported prior to publication of final

reports. Staffs involved with these activities are instructed in the confidentiality requirements.

3. Materials department employees must sign an affidavit documenting their understanding of this requirement. This affidavit is on file in the employee's personnel file.
 4. Special Confidential Materials: If the client requests special security of reports and other materials they deem particularly sensitive and confidential, Kleinfelder will comply with these requests, including maintaining these materials in a locked vault.
- E. Electronic Transmission of Results: When test results or reports are transmitted electronically, they shall comply with the requirements set forth in this section. On occasion, based upon a client request, interim reports of test results will be transmitted prior to completion of the review process discussed in this section. In these cases, the electronic transmission should contain a statement regarding the completeness of the review and advising that changes could be made based upon subsequent reviews.

V. Sample Management (6.5)

A. Procedures

1. Identification:
 - a) When samples are received in the laboratory, they are identified in a unique way to distinguish one from another. As each sample is received into the materials laboratory, it is immediately logged into the appropriate sample logbook. There is two log books: one book for compressive and flexural strength testing (concrete, grout, mortar, masonry prisms, soil-cement, etc.) and the second book is for all other testing (soils, aggregates, bituminous concrete, etc.). The primary difference between the two logbooks is that the strength-testing book also assigns test dates for samples that are to be tested at specific ages, such as 7 and 28 days of age.
 - b) Each log book contains a different series of consecutive numbers. As each sample is logged in, it is assigned its own unique number. As a minimum, the following description is also logged into the book: project name, project number, name of supplier, material source, material type, location sampled, date sampled, sampled by name, date received, sample number, test(s) required., and condition of the sample when received.
 - c) The sample number and test date of strength test samples are marked on the side of the sample with indelible ink. All other samples are identified by marking on the side of their container, tags in the container, or both, with the following information, as a minimum: sample number, project name and/or number, and test(s) to be performed.

- d) Samples are observed for defects or abnormalities. If noted, the client should be contacted for further instructions. If any defects or abnormalities are believed to have had a material effect on the test results, the defects or abnormalities should be identified in the report.
2. Storage:
- a) Samples received by the laboratory for analysis or testing are stored and conditioned in accordance with the requirements of the testing procedures that are to be performed on these samples. These conditions include but are not limited to: prevention of moisture loss, drying under a variety of specified conditions, storage at specified temperatures, storage at specified humidity, freezing, soaking in specified mediums, cycling through wetting and drying, freezing and thawing, or saturating and drying in special mediums, and so on.
3. Retention:
- a) Sample retention after testing depends upon the sample type and tests performed. Samples destructively tested are typically disposed upon completion of the tests. Other samples are typically retained from one day to two weeks from the date of the applicable report depending on the project and client requirements.
4. Disposal:
- a) Samples or portions of samples, which have not been altered as a result of testing, may be retained at the discretion of the appropriate Kleinfelder Manager for further testing or reference. Kleinfelder does not, as a matter of policy, assure retention of any sample longer than 24 hours after testing is completed, unless arrangements have been previously made.
5. Shipping and Handling:
- a) As stated above, the original lab number must be conspicuously displayed on all samples or portions of samples at all times until final disposal. Samples or portions of samples sent to another laboratory (internal or external) for particular tests require the following information:
- The name of the originating lab.
 - A transmittal form identifying the sample and the exact testing instructions; sent by mail and with the sample.
 - If the sample is prepared for testing by the originating lab, it should be stated on the transmittal form.

- If a sample could be part of legal proceedings, the transmittal should so note together with any special *chain of custody* or sample retention requirements.
- Certain samples require special care in handling. The receiving laboratory should be notified in advance of shipping of such requirements. Appropriate containers, adequate markings, and adequate care and protection should be provided such that undesired changes do not occur in physical and/or engineering properties as a result of shipment, transport, or handling.

6. Special Sample Management:

- a) As independent consulting engineers with expertise in Construction Materials Engineering, we are sometimes requested to obtain, test, and/or offer expert testimony concerning construction materials involved in litigation. The treatment and traceability of these samples is of utmost importance for credibility in a court of law. Samples from our investigation should be traceable by personal statement or by written document from receipt to disposal or to the courtroom, if they are to become evidence.
- b) The professional who will analyze and testify must directly supervise the testing program. Standard test procedures must be strictly followed. In many cases, the evidence must not be destroyed, or altered during examination without permitting other interested parties prior access and/or concurrent investigation. Photographs of samples prior to, during, and after testing are usually requested for future reference. All samples must be securely stored, preferably in a secured environment to prevent loss or tampering, except during testing or analysis. Shipment of samples to other locations must be well documented. Personal delivery with signed receipts, certified mail or other shipper's receipt can be used to provide traceability. Chain-of-custody forms may be used in the absence of other verifiable documents.

B. Concrete:

1. At the request of our client, a Kleinfelder Field Technician will perform various tests on fresh concrete sampled at the project site. Tests performed may include slump, air content, unit weight and the fabrication of concrete strength specimens.
2. After specimens are fabricated according to the specified standard test procedure, such as ASTM C31, the technician will store the cylinders at the project site in an environment as required by the specified test procedure, such as a moist condition between 60° and 80° F, as required by ASTM C31. Depending on the season, this may be accomplished with field cure boxes,

burying cylinders in damp sand, covering with wet burlap or by placing in environmentally controlled containers or buildings at the project site.

3. Unless otherwise required by the project specifications or specified standard test procedure, the test specimens are stored under the previously described field conditions for up to 48 hours. Test cylinders that are transported to the laboratory before the end of 48 hours will remain in the molds until received at the laboratory. Test cylinders that are not transported within 48 hours will be removed from the molds and then stored in a moist condition under proper temperature conditions with free water maintained on their surfaces until transported as per applicable standards for compressive strength test samples. When specimens are transported to the laboratory, they are carried on cushioned racks, in an upright or testing position, and in molds, containers, or wrapped in plastic to prevent moisture loss.
4. Sometimes, strength test specimen are cast, field cured, and transported to our laboratories by individuals representing companies other than Kleinfelder. In such cases, it is so noted on our reports that samples were delivered to our laboratory and field-testing and other information, such as sample location, date, supplier, etc., were reported to us by others.
5. Upon arrival at the laboratory, each specimen is logged into the previously discussed sample log and a master break book. Each set of cylinders is given a distinctive set number and specimen letter (i.e. 19A). The specimens are removed from their molds and then placed in the thermostatically controlled cure room or curing tank, which conforms to ASTM C511 or other specified test procedure requirements for the designated laboratory curing period.

VI. Diagnostic and Preventative Procedures and Corrective Actions (6.6)

A. Proficiency Sample Programs (6.6.1) and On-site, Third Party Inspections (6.6.1):

1. Kleinfelder encourages participation by local offices in on-site inspection and proficiency sample programs by outside third parties. These third parties include retained consultants administering voluntary programs, such as the AMRL , CCRL, and ICBO, federal government agencies, such as the Corps of Engineers, state government agencies, such as departments of transportation, local governments, such as cities and counties, and associations, such as the Asphalt Paving Association of Southern California. A list of *Local Office Accreditations and Agency Approvals* is included in Table 3, Appendix B, and a list of *External Quality System Diagnostic Programs* in which the local office participates is presented in Table 4 of Appendix B.
2. Proficiency sample test result and on-site inspection reports for the local office are filed in the Laboratory Manager's office.

B. Poor Results or Deficiencies (6.6.1):

1. In the event we receive poor proficiency sample test results (results deviate two or more standard deviations from the population average test value; or

an AMRL/CCRL rating of two or less), we will make every attempt to identify the cause of the problem, implement appropriate corrective actions, and respond to the Program Administrator (AMRL, CCRL, CalTrans, ADOT, etc.) within 60 days. Procedures for resolution of poor results are as follows:

- a) Verify the Program Administrator correctly entered our data on their report.
 - b) Verify we transferred the correct test results onto the report form sent to the Program Administrator.
 - c) Recheck all data calculations leading to the reported test results.
 - d) Verify equipment used conformed to the test requirements.
 - e) Interview the technician who performed the test and determine if the procedures used conformed to the test requirements using the applicable competency verification checklist.
 - f) Take corrective action to repair or take steps to replace defective equipment or instruct the technician of the correct procedures.
 - g) Prepare report summarizing the results of the investigation, identifying causes of the poor results, if determined, and describing any corrective actions taken and forward copy to Program Administrator. The Laboratory Manager shall prepare the report, which shall be approved and signed by the Department, Operations, or Office Manager and filed in the Laboratory Manager's office. A copy of the Program Administrators report and our response, if any, shall be forwarded to the Regional Manager.
2. If deficiencies are noted during third party on-site inspections, the procedures listed below are followed.
- a) Apparatus Deficiencies:
 - 1) Determine if the equipment meets test procedure requirements using the Kleinfelder calibration verification procedures and forms.
 - 2.) Take corrective action procedures as outlined under Calibration Verification Procedures in this Manual.
 - 3) Record Calibration Verification as required by this manual.
 - b) Procedural Deficiencies:
 - 1) Discuss the procedural proficiency with the technician who performed the test.
 - 2) Have the technician review the procedure.

- 3) Reverify the technician's competency to perform the test following the Competency Verification Procedures outlined in this manual.
 - 4) Record the Competency Verification as required by this manual.
- c) Quality System Deficiencies:
- 1) The Technical Manager shall review each deficiency with the responsible employee.
 - 2) An action plan to correct the deficiency will be developed and implemented by the responsible employee as approved and verified by the Department, Operations, or Office Manager.
- d) Reports:
- 1) The Laboratory Manager shall prepare a report that will be approved and signed by the Technical Manager, filed in the Laboratory Manager's office and distributed to the Program Administrator within 60 calendar days. A copy of the Program Administrator's report and our response shall also be distributed to the Regional Manager.

C. Technical Complaints or Non-Conforming Work (6.6.2):

1. The procedure listed below shall be followed when a technical complaint from either internal or external sources is received or work performed by Kleinfelder is discovered to be non-conforming with the objectives of this manual, our contractual requirements, or specified, published standards.
 - a) The Technical Manager shall be notified immediately. If there is a potential for a financial claim against Kleinfelder, the Regional Manager shall be notified, who may in turn notify the Division Manager and a specified member of the board, depending upon the magnitude of the problem and whether or not there is a potential for litigation.
 - b) The complaint is brought to the attention of the appropriate Laboratory or Project Manager and Supervisory Technicians.
 - c) At the assignment of the Technical Manager, a manager or supervisor shall contact the individual who identified the non-conformance or lodged the complaint and verify the details of the concern and establish the expectations regarding resolution and resolution date.
 - d) All reports, records, and pertinent data shall be collected and reviewed; all calculations shall be checked.
 - e) The Kleinfelder employees who performed the work shall be interviewed.

- f) The involved managers and supervisors shall develop and implement an action plan under the direction and approval of the Technical Manager. Such plans may include: determination of the acceptability of Kleinfelder work, resampling, retesting, reinspection, consultation with in-house or outside technical experts, testing by a third party agency, in-house or outside split sample testing, equipment calibration verification, employee competency verification, or development of specialized testing procedures, such as non-destructive or full scale load tests. The plan should also include conditions for the resumption of work.
- g) A designated manager, supervisor, or in-house expert shall report the findings verbally or in writing, depending upon the severity of the concern to the Technical Manager. A manager or supervisor under the direction and approval of the Technical Manger should make an appropriate reply to the individual who identified the non-conformance or lodged the complaint. The Technical Manger shall be responsible for determining when satisfactory resolution has been achieved and authorizing the resumption of work. If satisfactory resolution can be achieve, the Technical Manager shall escalate the concern in accordance with the Quality System Organizational Structure outlined in this manual.
- h) At any point during this process, any manager or technician has the authority to halt continuing work by Kleinfelder believed to be non-conforming with the Quality System Objective, our contractual requirements with our clients, or the specified, published standard.
- i) Where appropriate to the developed action plan, written documentation should be maintained in the project file.

D. Client Reviews:

1. Kleinfelder performs its work under a project team approach. This includes cooperation with our clients in meeting the objectives of our work and, respecting our client confidentiality policies, other project team members, including designers, governing agencies, contractors, and material suppliers.
2. Kleinfelder allows our clients access to our laboratory and other work areas to observe the performance of our work. With the approval of our client, Kleinfelder also allows other project team members this same access. Kleinfelder does not allow video or audio taping of our work without the approval of the Chief Technical Officer.
3. At the request of our client, or other project team members with the approval of our client, Kleinfelder participates in the splitting of

samples for performance of duplicate testing by other firms or by other Kleinfelder laboratories.

4. Kleinfelder provides our clients access to all relevant records related to our work for that client.
5. The Seattle office has developed a Client Feedback Form, which we use to solicit feedback from all Materials Laboratory clients. (Appendix B, Table 10).

E. Responsible Individual:

1. The Technical Manager has ultimate responsibility for diagnostic and preventative procedures and corrective actions. Record keeping related to these activities is the responsibility of the Project or Laboratory Manager. The Regional Manager receives copies of all reports and responses related to these activities.
2. All Records shall be distributed to the Quality Manager, who should monitor resolution progress and assure proper closure. If the Quality Manager disputes the program or has concerns with resolution progress or closure, he should assure the issue is escalated to the proper responsible authority in accordance with Section I.F.2.

VII. Internal Quality System Review (6.7)

A. Scope:

1. The Quality Manager or their designee working under their direct supervision shall perform internal quality system reviews to ensure that the established quality system procedures are being followed and consisting of the following:
 - a) Proficiency sample reports and responses.
 - b) Third party on-site inspection reports and responses.
 - c) Equipment Inventory List
 - d) Equipment calibration verification records.
 - e) Technician training and competency verification records.
 - f) Records of calibration verification of equipment and materials received during the review period, including new equipment, capping compound, concrete cylinder molds, etc.
 - g) Follow-up verification of deficiency corrections noted in previous reviews.

B. Frequency:

1. Internal quality system reviews are conducted annually.

- C. Individuals Responsible:
 - 1. The Quality Manager is responsible to assure the reviews are performed, that corrective action plans are developed and implemented, and that reports are prepared and distributed.
 - 2. The Laboratory Manager responsible for compliance with the requirements of the quality system, preparation and performance of the corrective action plan, reporting of corrective actions, and recording keeping.
- D. Report Preparation and Distribution:
 - 1. The individual performing the inspection shall prepare a report of their findings, which shall be distributed, to the Laboratory Manager, the Technical Manager, the Quality Manager, and the Office Manager.
- E. Corrective Action:
 - 1. A plan for corrective action shall be developed and implemented by the Laboratory Manager and approved by the Quality Manager. Upon completion of the corrective action plan, a report shall be prepared by the Laboratory Manager and submitted to the Quality Manager and the Office Manager.
- F. Location of Records:
 - 1. The results of all internal reviews and reports of corrective actions are maintained in the Laboratory Managers office.
- G. Preventive Actions: At the time the reports generated under this section are reviewed by the Office Manager, the Office Manager should also consider the records developed under Section VI and consider both the condition of the materials department conformance with the Quality System Objective and the suitability of the guidelines presented in the manual to assist in achieving the Quality System Objective. If system or guideline changes appear appropriate to better assist in achieving the Quality System Objective, the Regional Manager should submit suggestions to the Principal Materials Engineer.
- H. Kleinfelder Quality Procedure for Quality Improvement Program
 - 1. Purpose: The purpose of the Kleinfelder Quality Procedure (KQP) is to describe the process and define responsibilities for the Kleinfelder Quality Improvement Program. The key elements of the Quality Improvement Program are graded approach, risk, Quality Improvement Report (QIR), root-cause analysis, continuous improvement, and stop work. (See Appendix B).

VIII. Subcontracting (6.8)

- A. General:
 - 1. The local office is fully staffed and equipped to provide a wide range of technical services to our clients. Within the large number of

offices/laboratories currently in the Kleinfelder, Inc. organization, we have a substantial pool of equipment and experienced personnel to draw upon for specialized testing apparatus or consultation. For those occasions where the local office is not capable or equipped to perform a certain technical service, we may perform these services through another Kleinfelder office, subcontract the work, or refer the client to another firm.

B. Subcontractor Selection:

1. If services are required that are not provided by another Kleinfelder office, if another Kleinfelder office is unable to assist due to workload or other issues, or if the cost of using another Kleinfelder office is prohibitive to our client (usually due to mobilization costs), additional firms may be used as subconsultants. It is Kleinfelder's policy to select subconsultants on the basis of qualifications to provide services required.
2. Verbal conference calls with this firm and Kleinfelder will take place to evaluate their capability, experience, accreditation, proficiency sample programs, quality system, etc. Written copies of their Statement of Qualifications may be requested as well as possible follow-up calls with current references.
3. It is also Kleinfelder's policy to use subconsultants that meet the requirements of local, state, and federal statutes for licensing, professional licenses, and insurance. Kleinfelder requires subcontractors to comply with all requirements of the contract to which Kleinfelder is bound, including labor provisions, professional and general liability insurance, and etc.. Proof of required insurance is often required. Where required by the Kleinfelder contract with the client, subcontractors should also comply with such standards as: ISO 17025, AASHTO R 18, ASTM D 3666, D 3740, C 1077, or E 39, or similar standards.
4. Equipment calibration/maintenance and quality system reviews are often subcontracted. Firms providing these services are presented in Appendix B, Table 5 and include agencies, specialty consultants, and equipment manufactures. Each agency and specialty consultant is required to provide documentation demonstrating their competency and NIST traceability.
5. When subcontracted services have a substantial technical impact on the services provided, Kleinfelder should notify the client. Where required by the contract with our client, client approval will be obtained. Should it become necessary to subcontract laboratory services, the Laboratory Manager or designated staff will notify the client in writing. For subcontracted services such as coring, drilling, trenching, copying and compiling of reports, or the use of subcontracted labor working under the technical supervision of a Kleinfelder manager or supervisor, clients are not typically notified. Clients are not typically notified of subcontracted services that are not directly related to a specific project, such as general equipment maintenance or calibration.

6. Subcontracts are executed on standard Kleinfelder contact forms. Except where the client specifies subconsultants, or unless expressly stipulated to the contrary by contract, the contractual relationships are between the subcontractor and Kleinfelder, between Kleinfelder and our client.
7. Each local office maintains files for subcontractors used for professional services, including tests and calibrations, indicating compliance with the items listed in this section.

C. Reporting of Results:

1. If a subconsultant is used to provide data or analysis for a report that is submitted to a client by Kleinfelder, the specific data and analysis provided and the subconsultants name shall be clearly noted in our report. Typically, a complete copy of a subconsultant's report is included in the appendix of the report, or attached.

IX. Accreditations and Agency Approvals:

Kleinfelder, Inc. participates and/or submits to audits and on-site assessment services administered by outside agencies and have received accreditation and approvals from these agencies. A list of these agencies, accreditations, and approvals is presented in Appendix B, Table 3 and Table 4.

X. Contracting

A. Requests for Tender: Requests for Kleinfelder services typically come in the form of Requests for Proposals, Statements of Qualifications, and Purchase Orders.

1. Requests for Proposals (RFP): These requests are received from prospective clients and consist of a statement of the scope of work desired and a request to submit information typically including a statement of our qualifications and similar experience, our project work approach, schedule, workforce allocation, references, and sometimes a cost proposal.
2. Statements of Qualifications (SOQ): These are received from prospective clients and typically very similar to RFP's, except they do not include cost proposals.
3. Purchase Orders (PO): These client requests typically consist of only a statement of the scope of work and a request for cost proposal. Many times Kleinfelder will have an indefinite services contract with these types of clients that consists of pre-negotiated contract terms, except for cost.

B. Evaluation

1. Reviewer: the individual receiving the request performs the initial review and determines the approximate dollar value of the work that would be performed under the request. Kleinfelder has pre-established dollar contracting limits, and, depending upon the limit, it will be referred to the appropriate manager for review. These limits are published in separate documents.
2. Review: The appropriate manager, with authority to decide whether or not to respond to the request, reviews the tender with respect to the following items.
 - a) Are the requested services within the scope of the local office expertise?
 - b) Can the office meet the workforce and equipment requirements of the project?
 - c) Does the request clearly define the scope of services required of Kleinfelder? If not, clarifications should be requested. If clarifications are unsatisfactory, the manager may elect not to respond, or to provide clarifications as part of our response.

- d) Is there a previous history of work with this client and has it been positive?
- e) Are the anticipated fee capabilities of this project sufficient to warrant the anticipated quantity of work required?
- f) Are there risks or liabilities associated with this work that would make a response unwise?
- g) If the answer to d) or e) is no or to f) is yes, the manager should chose not to respond to the request, unless these concerns can be resolved.
- h) If the answer to a) or b) are no, should other offices or subconsultants be involved? If the answer is yes, the manager will build the appropriate team. If the answer is no, there should not be a response to the request.
- i) If the manager chooses not to respond, the prospective client may or may not be notified, based upon the discretion of the reviewing manager.

C. Responses:

- 1. Author: Responses are prepared by individuals assigned by the reviewing manager as appropriate to the request.
- 2. Contents: Responses shall be responsive to the specific requests of tender, or delineate the reasons for change.
- 3. Loss Prevention: Responses shall contain Kleinfelder standard loss prevention and disclaimer language.
- 4. Reviewer and Authorized Signature: The response shall be reviewed and signed by the reviewing manager and delivered to the client.

D. Contracts:

- 1. Form: If the client accepts the response, a contract shall be executed between the client and Kleinfelder. This contract should include the request for tender and the Kleinfelder response as attachments or reiterate in detail the statement of the scope of work, fees, payment provisions, general conditions, and other significant components of those documents. It is Kleinfelder policy that contracts be executed on our standard contract forms. If the client requires changes to our standard contract or requires use of their own contract, these issues are forwarded to the appropriate Division Manager for review and determination of whether or not we will accept the contract terms. The client and the Division Manager must specifically approve charges to our standard contract by initialing changes or attachment of and specific contract reference to amending documents to the contract.
- 2. Authorized Signature: Kleinfelder has contract dollar limits for signing authority. The individual signing the contract must have the appropriate authority. These limits are published in separate documents.

3. Changes: In the course of the work, if changes are required, notification should be given to the client. Often, changes are initiated by the client, in which case, the notification would originate from the client to Kleinfelder. If these changes effect contract time or price, contract amendments should be executed detailing the changes in work scope and the time and/or price adjustments. In general the contract amendment process is the same as the contract process; request, review, response, and contract amendment. Typically, contract changes should be issued in writing, however in some cases phone memorandums, e-mails, or letters of confirmation will suffice, at the discretion of the Office Manager.

E. Records:

1. All records related to contracts for a project shall be maintained in the project-billing file. These records include: requests, responses to requests, contracts, any amendments or addenda to requests or responses for requests, contracts, contract amendments related to changes, subcontracts, and any phone or internal memoranda, e-mails, letters of confirmation, review documentation or other correspondence related to any of the previously list documents.

APPENDIX A

FIGURES

Figure 1 *Kleinfelder Country Map*

Figure 2 *Kleinfelder Board of Directors & Officers*

Figure 3 *Corporation Organizational Chart of Operational Components*

Figure 4 *Geographic Area Served by Local Office*

Figure 5 *Region Organizational Chart with Offices and Departments*

Figure 6 *Local Office Materials Department Organizational Chart
Identifying Key Individuals by Name*

Figure 7 *Local Office and Laboratory Floor Plan*

65 Offices Nationwide

ARIZONA Tempe Tucson CALIFORNIA Bakersfield Fairfield Fresno Irvine Long Beach Los Angeles Merced Modesto Oakland Pittsburg Pleasanton Redlands Sacramento	Salinas San Diego San Jose Santa Rosa Stockton Temecula Ventura Victorville Woodland Hills COLORADO Colorado Springs Denver Parker Pueblo CONNECTICUT Hartford	FLORIDA Tampa IDAHO Boise KANSAS Lenexa Topeka MARYLAND Baltimore MASSACHUSETTS Boston MINNESOTA Minneapolis	MISSOURI Kansas City NEBRASKA Omaha NEVADA Carson City Las Vegas Reno NEW JERSEY Trenton NEW MEXICO Albuquerque	NEW YORK Albany Hudson Valley Long Island Rochester Syracuse OKLAHOMA Tulsa OREGON Bend Portland PENNSYLVANIA Pittsburgh West Chester	TEXAS Austin Corpus Christi Dallas Fort Worth Houston Killeen McKinney Midland Round Rock Waco UTAH Salt Lake City WASHINGTON Seattle
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o Kleinfelder Office Locations

KLEINFELDER
 > EXPECT MORE®

WWW.KLEINFELDER.COM

ARIZONA

Tempe
1335 West Auto Drive
Tempe, AZ 85284
(480) 763-1200 Fax (480) 763-1212

Tucson
2015 North Forbes Boulevard, #103
Tucson, AZ 85745
(520) 628-7769 Fax (520) 628-7835

CALIFORNIA

Bakersfield
4400 Ashe Road, Suite 216
Bakersfield, CA 93313
(661) 831-2155 Fax (661) 831-1937

Fairfield
780 Chadbourne Road, Suite D
Fairfield, CA 94534
(707) 429-4070 Fax (707) 429-4162

Fresno
1410 F Street
Fresno, CA 93706
(559) 486-0750 Fax (559) 442-5081

Irvine
8 Pasteur, Suite 190
Irvine, CA 92618
(949) 727-4466 Fax (949) 727-9242

Long Beach
620 West 16th Street, Unit F
Long Beach, CA 90813
(562) 432-1696 Fax (562) 432-1796

Los Angeles
1370 Valley Vista Drive, Suite 150
Diamond Bar, CA 91765
(909) 396-0335 Fax (909) 396-1324

Merced
121 Heron Way, Suite D
Merced, CA 95340
(209) 384-7552 Fax (209) 384-8218

Modesto
1224 6th Street
Modesto, CA 95354
(209) 577-4333 Fax (209) 575-3444

Oakland
1970 Broadway, Suite 710
Oakland, CA 94612
(510) 628-9000 Fax (510) 628-9009

Pittsburg
981 Garcia Avenue, Suite A
Pittsburg, CA 94565
(925) 427-5477 Fax (925) 427-6478

Pleasanton
7133 Koll Center Parkway, Suite 100
Pleasanton, CA 94566
(925) 484-1700 Fax (925) 484-5838

Redlands
1220 Research Drive, Suite B
Redlands, CA 92374
(909) 793-2691 Fax (909) 792-1704

Sacramento
3077 Fite Circle
Sacramento, CA 95827
(916) 366-1701 Fax (916) 366-7013

Salinas
365 Victor Street, Suite L
Salinas, CA 93907
(831) 755-7900 Fax (831) 755-7909

San Diego (Corporate HQ)
5015 Shoreham Place
San Diego, CA 92122
(619) 320-2000 Fax (619) 320-2001

San Jose
2011 North Capitol Avenue
San Jose, CA 95132
(408) 586-7611 Fax (408) 586-7688

Santa Rosa
2240 Northpoint Parkway
Santa Rosa, CA 95407
(707) 571-1883 Fax (707) 571-7813

Stockton
2825 East Myrtle Street
Stockton, CA 95205
(209) 948-1345 Fax (209) 948-0621

Temecula
43174 Business Park Drive, Suite 103
Temecula, CA 92590
(951) 506-1488 Fax (951) 506-1491

Ventura
1534 Callens Road
Ventura, CA 93003
(805) 477-0485 Fax (805) 477-0486

Victorville
18560 Readiness Street
Building 710
Victorville, CA 92394
(760) 530-0825 Fax (760) 530-0826

Woodland Hills
6430 Variel Avenue, Suite 103
Woodland Hills, CA 91367
(818) 226-6900 Fax (818) 226-6910

COLORADO
Colorado Springs
4815 List Drive, Unit 115
Colorado Springs, CO 80919
(719) 632-3593 Fax (719) 632-2648

Denver
611 Corporate Circle, Suite C
Golden, CO 80401
(303) 237-6601 Fax (303) 237-6602

Parker
10044 Granite Hill Drive
Parker, CO 80134
(303) 840-4571 Fax (303) 840-4579

Pueblo
3010 Granada Boulevard
Pueblo, CO 81005
(719) 546-1150 Fax (719) 546-1152

CONNECTICUT
Hartford
99 Lambertson Road, Suite 201
Windsor, CT 06095
(860) 683-4200 Fax (860) 683-4206

FLORIDA
Tampa
5421 Beaumont Center Blvd., Suite 685
Tampa, FL 33634
(813) 867-3900 Fax (813) 867-3922

IDAHO
Boise
2315 S. Cobalt Point Way
Meridian, ID 83642
(208) 893-9700 Fax (208) 893-9703

KANSAS
Lenexa
7802 Barton
Lenexa, KS 66214
(913) 962-0909 Fax (913) 962-0924

Topeka
1601 S.W. 41st Street
Topeka, KS 66609
(785) 267-7131 Fax (785) 267-7145

MARYLAND
Baltimore
1340 Charwood Road, Suite I
Hanover, MD 21076
(410) 850-0404 Fax (410) 850-0049

MASSACHUSETTS
Boston
30 Porter Road
Littleton, MA 01460
(978) 486-0060 Fax (978) 486-0630

MINNESOTA
Minneapolis
7616 Currell Blvd, Suite 200
Minneapolis, MN 55125
(651) 264-3035 Fax (651) 264-3030

MISSOURI
Kansas City
324 East 11th Street, Suite 1810
Kansas City, MO 64106
(816) 474-1810 Fax (913) 962-0924

NEBRASKA
Omaha
9312 G Court
Omaha, NE 68127
(402) 331-2260 Fax (402) 331-2346

NEVADA
Carson City
2701 Conestoga Drive, #120
Carson City, NV 89706
(775) 884-3886 Fax (775) 884-3887

Las Vegas
6380 South Polaris Avenue
Las Vegas, NV 89118
(702) 736-2936 Fax (702) 361-9094

Reno
4835 Longley Lane
Reno, NV 89502
(775) 689-7800 Fax (775) 689-7810

NEW JERSEY
Trenton
1 AAA Drive, Suite 203
Hamilton, NJ 08691
(609) 584-5271 Fax (609) 584-7498

NEW MEXICO
Albuquerque
8300 Jefferson NE, Suite B
Albuquerque, NM 87113
(505) 344-7373 Fax (505) 344-1711

NEW YORK
Albany
7 Airport Park Blvd
Latham, NY 12110
(518) 786-8750 Fax (518) 786-8755

Hudson Valley
1279 Route 300, 2nd floor
Newburgh, NY 12550
(845) 567-6530 Fax (845) 567-6542

Long Island
One Corporate Drive, Suite 201
Bohemia, NY 11716
(631) 218-0612 Fax (631) 218-0787

Rochester
50 Methodist Hill Drive, Suite 800
Rochester, NY 14623
(585) 486-0850 Fax (585) 486-0855

Syracuse
6390 Fly Road
East Syracuse, NY 13057
(315) 413-0181 Fax (315) 413-0207

OKLAHOMA
Tulsa
10926 E. 55th Place
Tulsa, OK 74146
(918) 627-6161 Fax (918) 627-6262

OREGON
Bend
62915 NE 18th Street, Suite 1
Bend, OR 97701
(541) 382-4707 Fax (541) 383-8118

Portland
15050 SW Koll Parkway, Suite L
Beaverton, OR 97006
(503) 644-9447 Fax (503) 643-1905

PENNSYLVANIA
Pittsburgh
260 Executive Drive, Suite 500
Cranberry Township, PA 16066
(724) 772-7072 Fax (724) 772-7079

West Chester
800 East Washington Street
West Chester, PA 19380
(610) 430-7866 Fax (610) 430-7872

TEXAS
Austin
3601 Manor Road
Austin, TX 78723
(512) 926-6650 Fax (512) 926-3312

Corpus Christi
5002 Ambassador Row
Corpus Christi, TX 78416
(361) 854-4774 Fax (361) 854-4924

Dallas
2211 Century Center Blvd., Suite 101
Irving, TX 75062
(972) 870-0808 Fax (972) 870-0802

Fort Worth
6850 Manhattan Blvd., Suite 300
Fort Worth, TX 76120
(817) 429-6692 Fax (817) 429-7869

Houston
10011 West Gulf Bank Road, Suite B
Houston, TX 77040
(713) 896-3190 Fax (713) 896-3191

Killeen
4103 East Stan Schlueter Loop
Killeen, TX 76542
(254) 699-1126 Fax (254) 699-1217

McKinney
2035 Central Circle, Suite 110
McKinney, TX 75069-8202
(972) 542-4362 Fax (972) 542-4366

Midland
8004 W. Hwy 80
Midland, TX 79706
(432) 563-1100 Fax (432) 561-5034

Round Rock
3570 Rocking J Road, Suite B
Round Rock, TX 78664
(512) 246-8919 Fax (512) 246-0273

Waco
2000 South 15th Street
Waco, TX 76706
(254) 754-0369 Fax (254) 754-0478

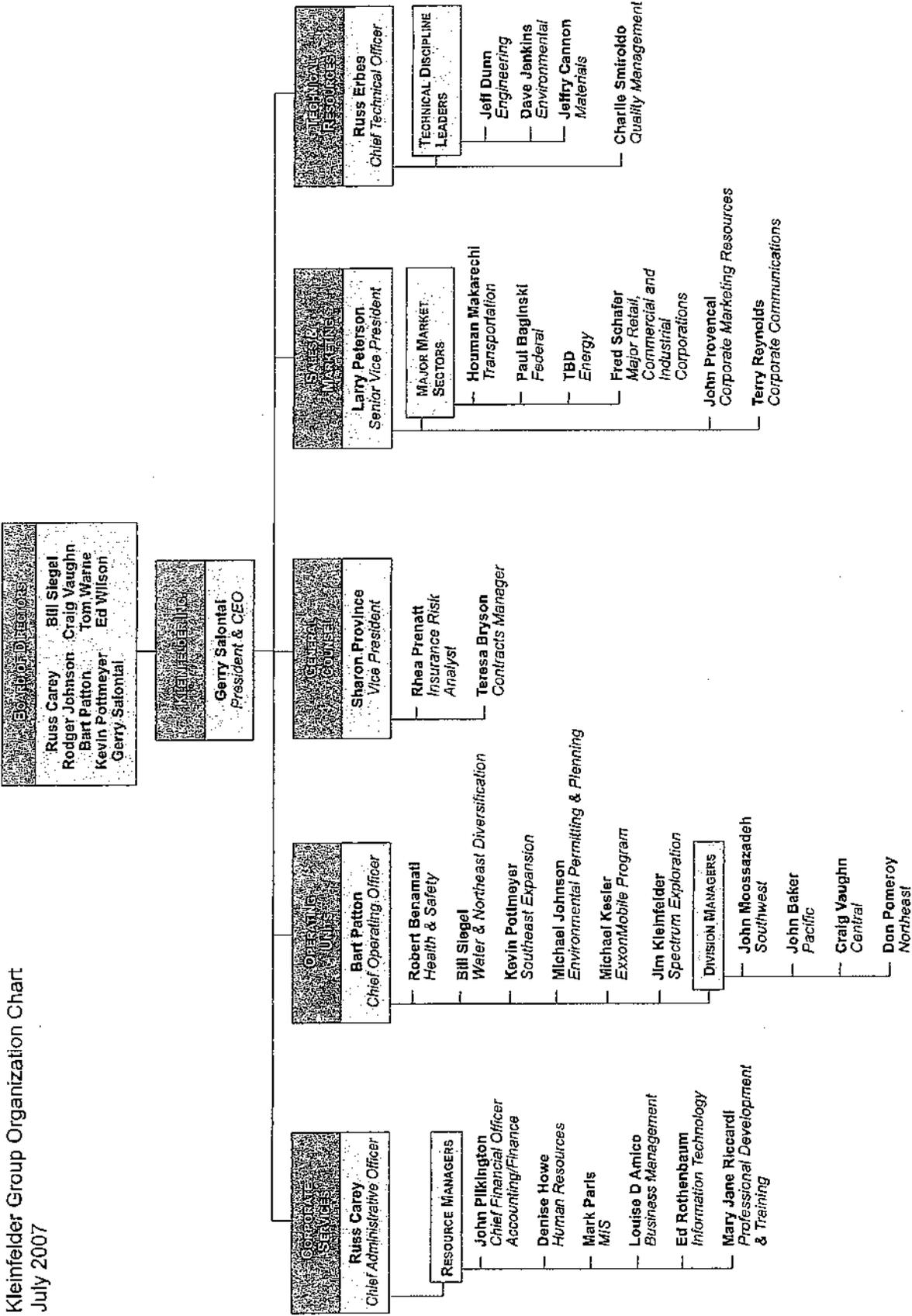
UTAH
Salt Lake City
849 West Levoy Drive, Suite 200
Taylorsville, UT 84123-2544
(801) 261-3340 Fax (801) 261-3306

WASHINGTON
Seattle
2405 140th Avenue NE, Suite A-101
Bellevue, WA 98005
(425) 562-4200 Fax (425) 562-4201

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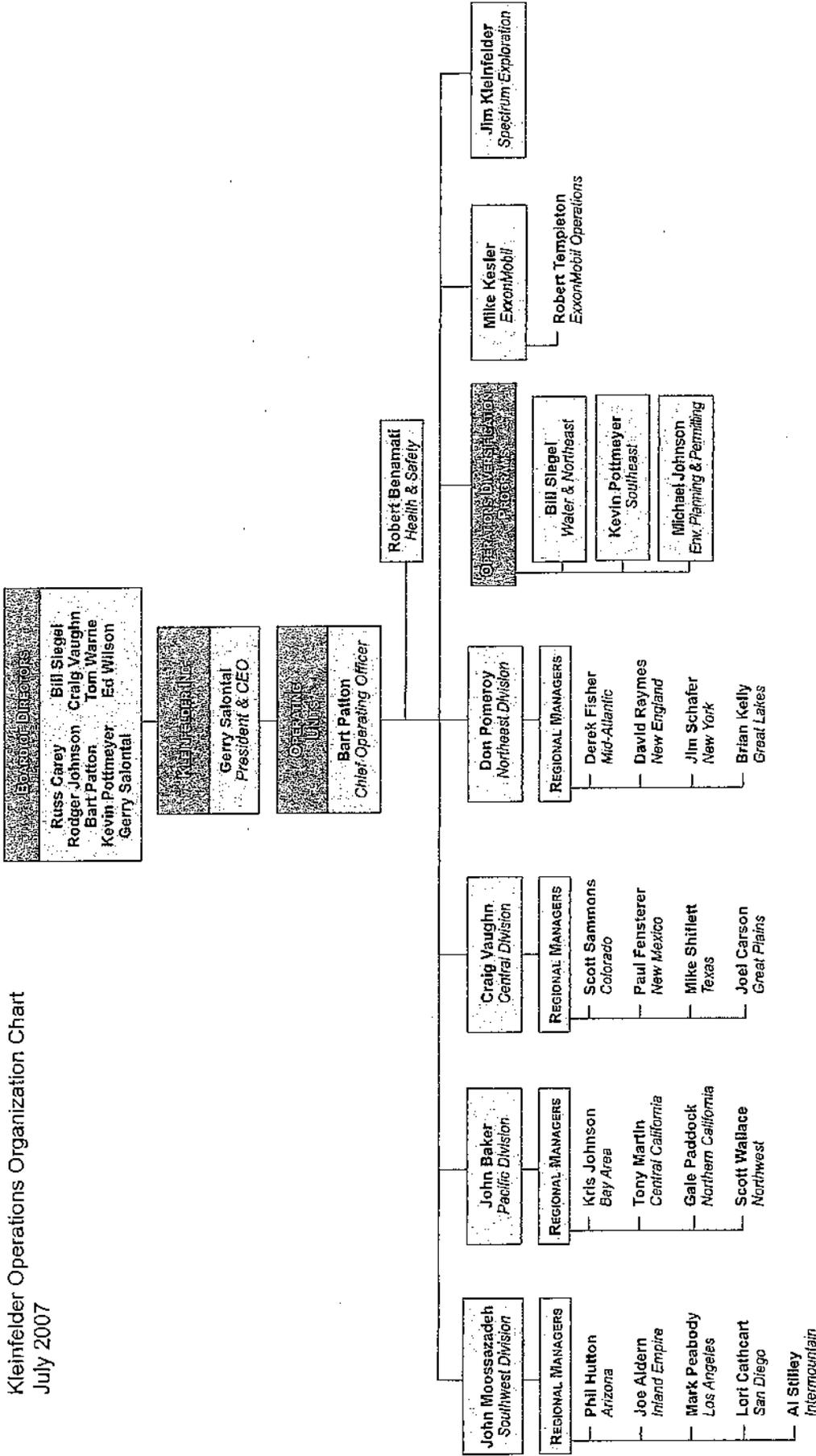
AN EMPLOYEE-OWNED COMPANY

Kleinfelder Group Organization Chart
July 2007

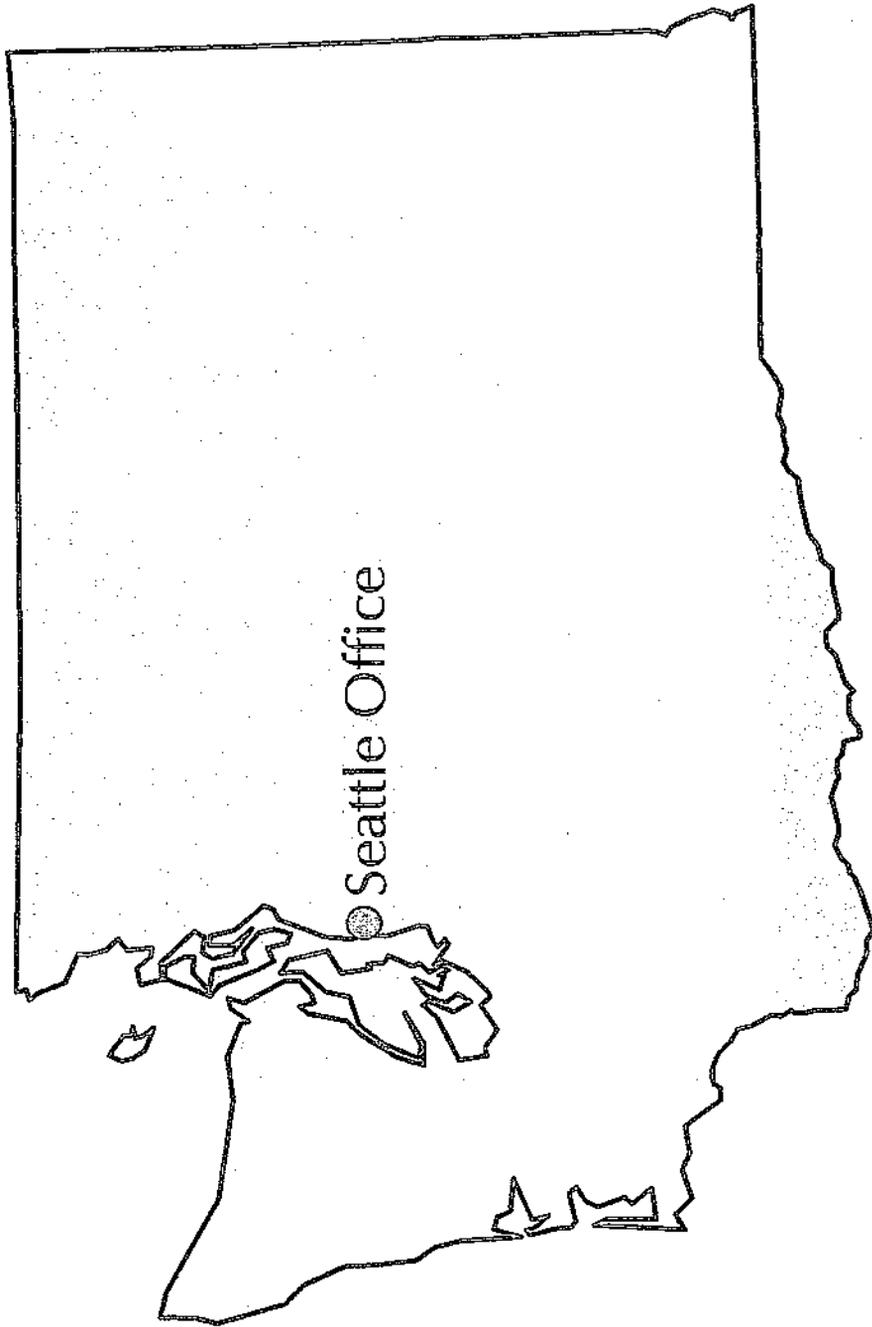


KLEINFELDER
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Kleinfelder Operations Organization Chart
July 2007



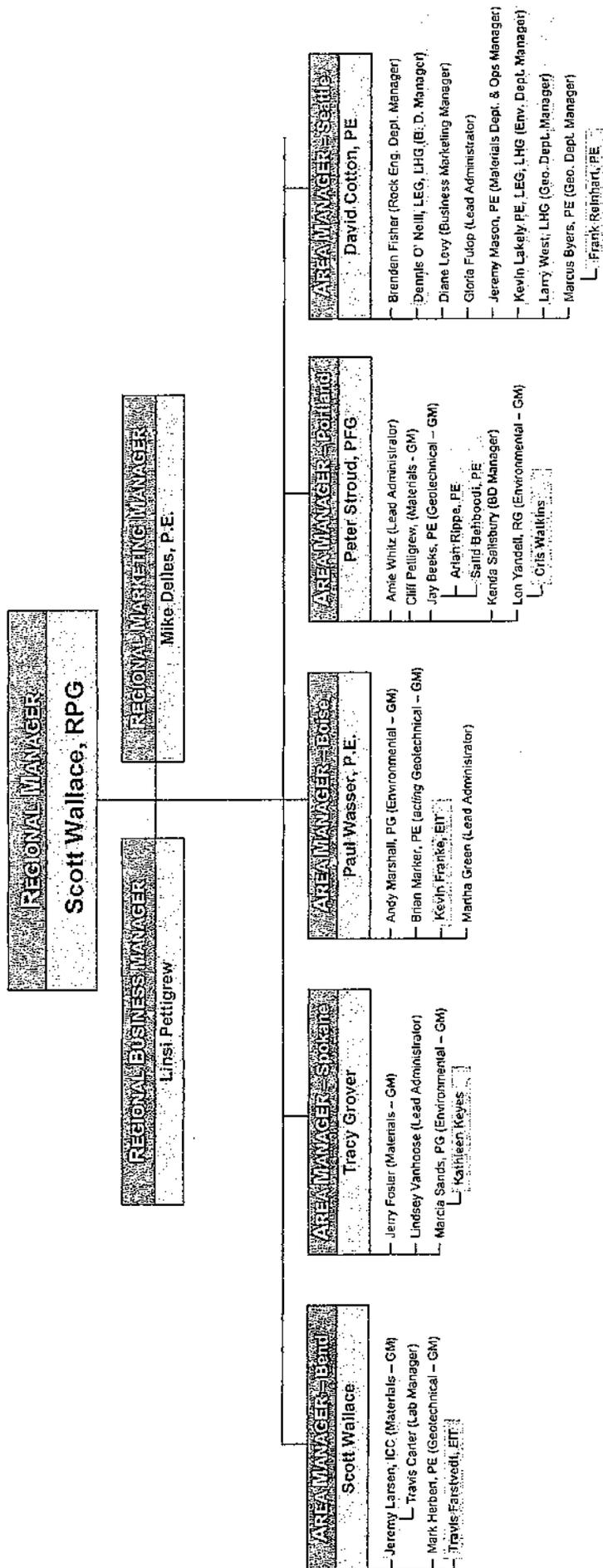
KLEINFELDER
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Washington Service Area

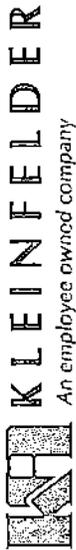
Kleinfelder West, Inc. - Northwest Region Organizational Chart

Figure 5



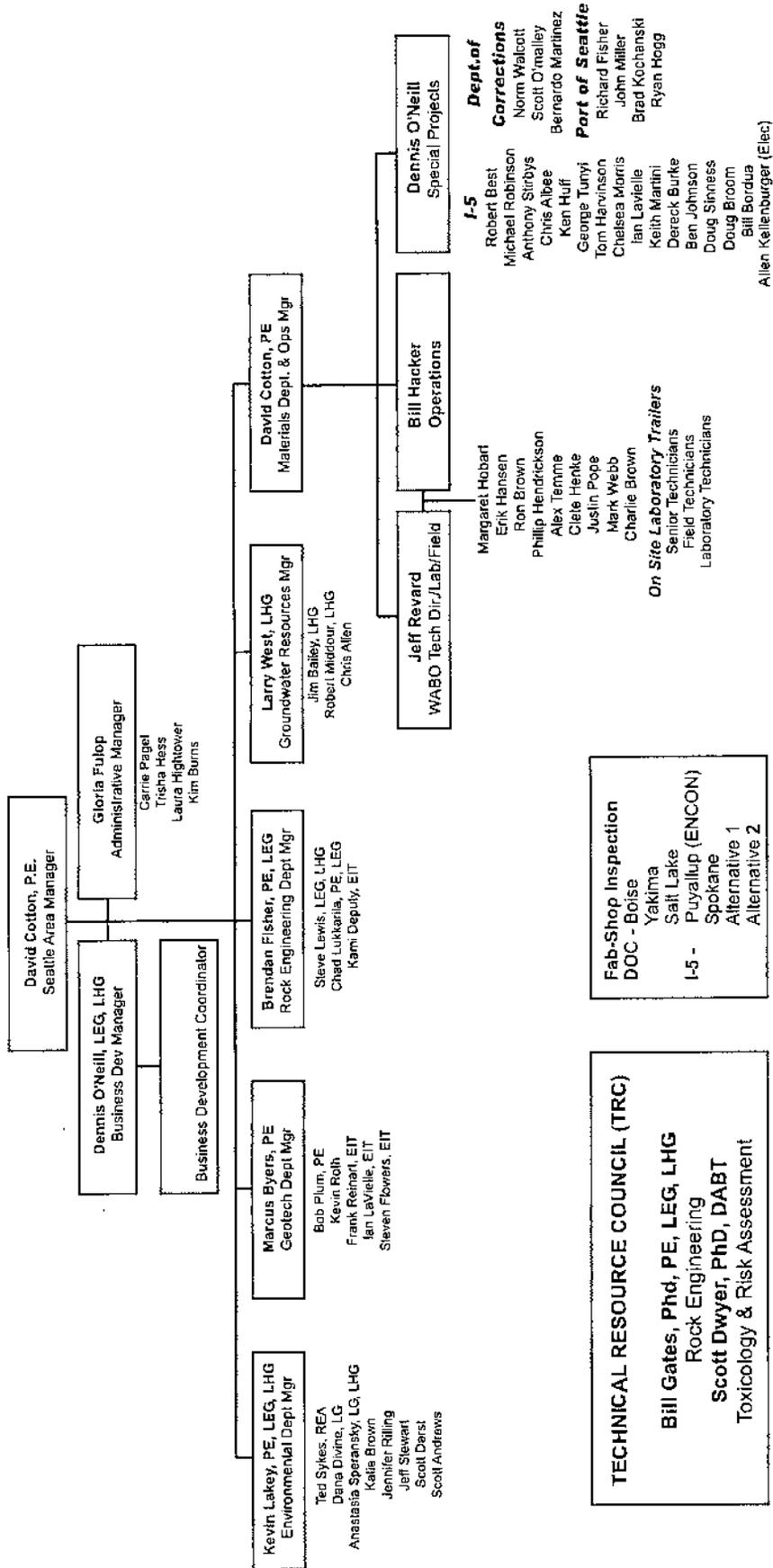
Denotes Principal Professional

Denotes Safety Leader



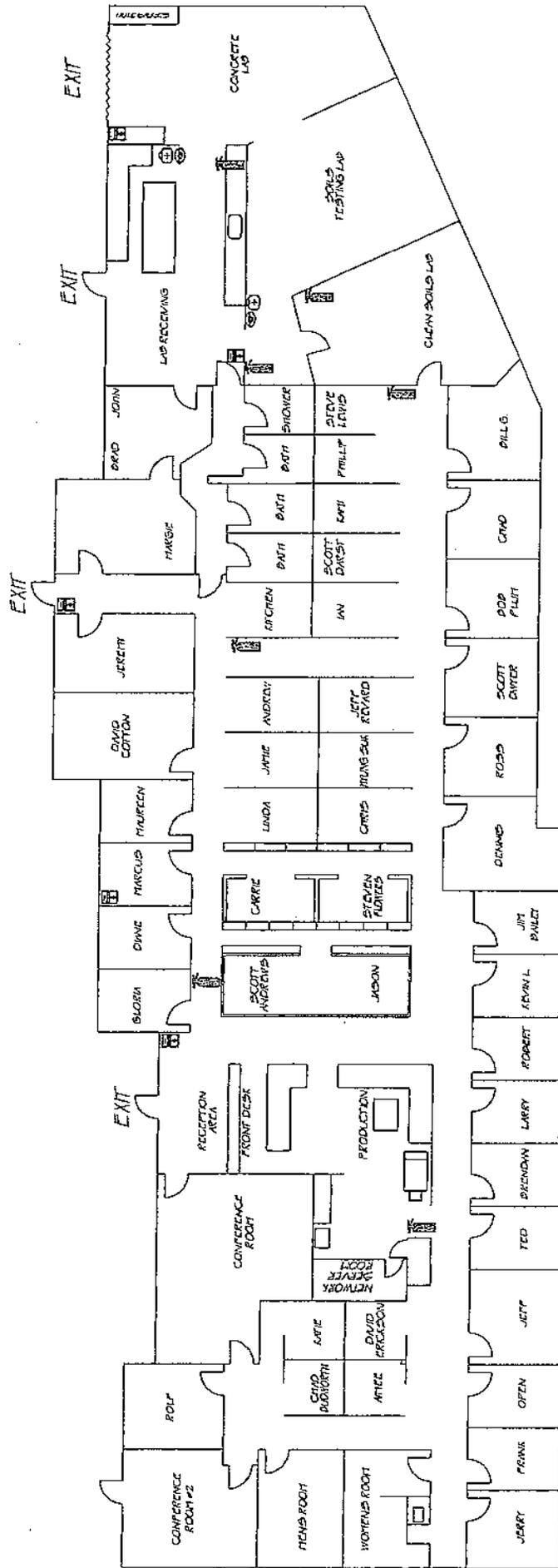
Interim -Seattle Organization Chart

May 2006



BUILDING LAYOUT

2405 140TH AVE. NE SUITE A-101
BELLEVUE, WA 98005



-  FIRE ALARM (PULL)
-  EYE WASH STATION
-  FIRST AID KIT
-  FIRE EXTINGUISHER

APPENDIX B

TABLES

Table No. 1 *Field Materials Testing Services*

Table No. 2 *Routine Laboratory Tests*

Table No. 3 *Local Office Accreditations and Agency Approvals*

Table No. 4 *External Quality System Diagnostic Programs*

Table No. 5 *List of Calibration Consultants*

Table No. 6 *Equipment Calibration/Verification Information*

Table No. 7 *Technician Competency Verification Record*

Table No. 8 *Inventory List Form*

Table No. 9 *Laboratory Quality Assurance Standards and Commitment*

Table No. 10 *Client Feedback Form*

Kleinfelder Quality Procedure for Quality Improvement Program

TABLE NO. 1

FIELD MATERIALS TESTING SERVICES

Soils & Aggregates

Field Density by Sand Cone
Field Density by Nuclear Gage
Shear Strength by Torvane
Permeability
Percolation
Sampling of Stockpiles
Lime or Asphalt Stabilization
Plate Load Bearing Test

Concrete & Fiber Reinforced Concrete

Cast Sample for Compressions Tests
Air Content
Slump Test
Yield of Plastic Concrete
Batch Plant Inspections
Cast Sample for Flexural Beams
Temperature
Evaluate Strength of Hardened Concrete
by Schmidt Hammer
Evaluate Strength of Hardened Concrete
by Windsor Probe
Coring of Concrete Pavement

Geophysical

Seismograph
Resistivity & Conductivity
(Various Types)
Magnetometer
Vibration Monitoring

Asphalt

Field Marshall, Hveem & Superpave Control
Density by Nuclear Gage
Coring by Asphalt Pavement
Smoothness Test
Temperature and Lay down
Batch Plant Inspection

Masonry

Sample & Cast Grout Specimens
Sample & Cast Mortar Specimens
Sample Masonry Units
Coring of Completed Masonry Construction

Bolt Testing

Skidmore Wilhelm Bolt Tension Calibrator
Torque Wrench
Anchor Bolt Testing

Metals

Visual Welding Inspection
N.D.T. Welding Inspection
Sampling
Structural Steel Placement
Reinforcing Steel Placement
N.D.T. Welding and Base Metal Testing
Radiography

Fireproofing

UBC Standard 43-8 Inspection

TABLE NO. 2

ROUTINE LABORATORY TESTS

SOILS AND AGGREGATE TESTSCompaction Curves

Standard
Modified, 4" and 6"
California Impact (CAL-216)

Basic Soil and Aggregate Properties

Sieve Analysis
Specific Gravity (D-854)
Sand Equivalent, Average of 3
Plasticity Index
Liquid Limit
Swell Test (F.H.A. Specifications)
Moisture Determination and Unit
Weight
Permeability Tests
Resistivity of Soil (Laboratory
Measurement)
pH Test (Laboratory Measurement)
Organic Content-Soils
Hydrometers

Shear Strength and Consolidation Tests

Unconfined Compression
Triaxial Compression (CU, UU, CD)
Direct Shear (Quick)
Direct Shear (Consolidated)
Consolidation

Soil and Aggregate Stability

R-Value, California State Highway
Cement, Lime or other Additives
Laboratory Mixed or Re-proportioned
Specimens
Samples
C.B.R. 100% Compaction
C.B.R. Other Compaction Effort
Soil Cement or C.T.B. Mix Design
C.T.B. Compression Test

Aggregate Quality

Injurious Organic Matter
Absorption, Gravel
Absorption, Sand
Unit Weight
Los Angeles Rattler Test
Sulfate Soundness
Mortar Making Properties of Sand
Potential Reactivity Test
Cleanness Test
Crushed Particles on Sieved Sample
Flat and Elongated Particles on
Sieved Sample
Clay Lumps and Friable Particles
on Sieved Sample
Lightweight Pieces of Aggregate
Durability Index-Coarse or Fine

CONCRETE

Concrete Mix Design	Air Content of Freshly Mixed Concrete
Review of Concrete Mix Design	Compression Test, Gunitite
Laboratory Trail Batch	Compression Test on Cored Concrete Specimens
Compression Test, Concrete Cylinders	Drying Shrinkage Test by ASTM or California
Concrete Cylinder Handled and Cured, but not Tested	Test Method
Compression Tests, Lightweight Insulating Concrete	Modulus of Elasticity Test on 6" x 12" Concrete Cylinder
Unit Weight of Concrete Cylinders	Splitting Tensile Strength Test 6" x 12"
Flexural Strength, Concrete Beam	Cement Content of Hardened Concrete

MASONRY

Compression Test-Grout, Mortar, Masonry Units	Compression Strength, Brick
Absorption and Received Moisture, Masonry Units	Modulus of Rupture, Brick
Lineal Shrinkage, Masonry Units	Absorption Test, Brick, 5-Hour with Coefficient
	Shear Test on Masonry Cores
	Tensile Test Masonry Units

FLY ASH, POZZOLAN AND CEMENT

Chemical Analysis	Fineness (% Finer than #325 Sieve)
Pozzolan Activity w/ Cement	Soundness by Autoclave
Specific Gravity	Fineness by Air Permeability (Blaine)

ASPHALT AND HOT MIX ASPHALT

Extraction, % Bitumen	Unit Weight of Asphalt Core
Moisture Content (Xylene Reflux Method)	

STRUCTURAL STEEL

Metals

Tensile
Bend Test Deformation, Reinforcing Steel
and 6G
Pre-Stress Strand, Tensile and Pipe
Elongation
Proof Test on Post-Tension Assembly
Weight of Coating

Bolt Testing

Bolts-Proof Load, Ultimate Load, Hardness
2" Pipe
Nuts-Proof Load, Hardness
Washers-Hardness

Welding Qualifications-Light Gauge

Structural Metals

Plug Weld Test
Light Gauge Butt Weld, Vertical and
Overhead

Bolt Testing

Bolts-Proof Load, Ultimate Load, Hardness
2" Pipe
Nuts-Proof Load, Hardness
Washers-Hardness

Operator Performance Tests

Groove Weld-Limited, Unlimited Thickness
Pipe Welding, 1G, 2G, 5G and 6G Position on 2"

Procedure Tests

Groove Weld-Limited Thickness, Unlimited
Thickness
Pipe Welding-1G, 2G, 5G Position

FIREPROOFING

Density Testing-Spray Applied Fireproofing
Thickness Measurement

**Table No. 3
(Seattle, WA)
Local Office Accreditations and Agency Approvals**

Washington Association of Building Officials (WABO)

International Accreditation Service (IAS)

Washington State Department of Transportation (WSDOT)

ASSHTO Materials Reference Laboratory (AMRL)

Table No. 4

External Quality System Diagnostic Programs

American Association of State Highway and Transportation Officials Materials Reference Laboratory:

Proficiency Sample Program: Soils, Bituminous Concrete, Bituminous and Portland Cement Concrete Aggregates.

On-Site Inspections: Quality System, Soils, Bituminous Concrete, and Bituminous Concrete Aggregates.

American Society of Testing and Materials Cement and Concrete Reference Laboratory:

Proficiency Sample Program: Portland Cement Concrete, Portland Cement Concrete Aggregates.

On-Site Inspections: Quality System, Portland Cement Concrete, Portland Cement Concrete, Aggregates.

Kleinfelder Interoffice Proficiency Sample Program:

Soil Classification and Compaction.

Table No. 5**List of Calibration Consultants**

American Association of State Highway and Transportation Officials Materials Reference Laboratory.

American Society of Testing and Materials Cement and Concrete Reference Laboratory.

Cal-Cert through Kal-Co., Inc. – Jeffery Cannon – 919-366-1701

Hevly Technical Services - Duane Hevly 509-630-2686

Northwest Technical Services – Steve Jacks

Equipment Manufacturers Providing Calibration Services

A & D	George Lucas
Troxler	Ploog
Campbell Pacific Nuclear	Vaprecision
Cox and Sons	Pacific Combustion
Ohaus	Dual Manufacturing
Toledo Scales	Sartorius
Soiltest	Tinius Olson
Humbolt	Blue M
Grainger	Mitutoyo
Gilson	KTA Tater
Davis/Notek	Mannix
Comark	Friesland

TABLE NO. 6
EQUIPMENT CALIBRATION/VERIFICATION INFORMATION
SOILS AND AGGREGATES TEST EQUIPMENT

Kal-Co., Inc. Calibration Procedure Number	Equipment-Test Method	Requirement	Performed By	Interval Months
S100	Mechanical Compactor-T99, T180, D698, D1557	Calibrate	Kal-Co	12
H102	CA Kneading Compactor-T190, D2844	Calibrate	Kal-Co	24
S101	Molds-T99, T134, T135, T136, T180, T190, T193, D698, D558, D559, D560, D1557, D1883, D2844	Ck. Critical Dimensions	Kal-Co	12
S102	Manual Hammer-T99, T180, D698, D1557	Ck. Weight and Critical Dimensions	Kal-Co	12
S103	Liquid Limit Device-T89, D4318	Ck. Wear & Critical Dimensions	Kal-Co	12
S104	Grooving Tool-T89, D4318	Ck Critical Dimensions	Kal-Co	12
S105	Straightedge-T99, T134, T135, T136, T180, D698, D558, D559, D560, D1557	Ck. Critical Dimensions	Kal-Co	6
S106	Hydrometers-T88, D422	Ck. Critical Dimensions	Kal-Co	24
S107	Weighted Foot Assembly-T176, D2419	Ck. Weight	Kal-Co	12
S108	Mechanical SE Shakers-T176, D2419	Calibrate	Kal-Co	12
S109	Annular & Slotted Weights-T193, D1883	Ck. Weight	Kal-Co	12
S110	Penetration Piston-T193, D1883	Ck. Diameter	Kal-Co	12
S111	Standard Metal Specimen-T190, D2884	Ck. Outside Diameter	Kal-Co	12
S112	Metal Follower-T190, D2884	Ck. Diameter	Kal-Co	12
S113	Unit Weight Measures-T19, C29	Calibrate	Kal-Co	12
S114	Sulfate Oven-T104, C88	Ck. Rate of Evaporation	Kal-Co	12
S115	LA Machine-T96, C131	Ck. RPM & Critical Dimensions	Kal-Co	24
S116	Conical Mold and Tamper-T84, C128	Ck. Critical Dimensions	Kal-Co	24
S115	Steel Balls-T96, C131	Ck. Individual & Charge Weight	Kal-Co	24
S116	Sodium Sulfate Containers-T104, C88	Ck. Physical Condition	Kal-Co	12
S117	Sand Cone and Plate-T191, D1556	Calibrate	Kal-Co	12
S118	Speedy Moisture Meter-T217	Calibrate	Kal-Co	12
S119	FA Angularity measure and spatula-T304	Ck. Critical Dimensions	Kal-Co	12
S120	Flat and Elongate Devise-D4791	Ck. Critical Dimensions	Kal-Co	12
S121	Pycnometer-T100, D854	Calibrate	Kal-Co	12
S122	Consol Apparatus/Wts.-T216, D2435	Calibrate	Kal-Co	12
S123	Direct Shear Machine-T236, D3080	Verify Motor Speeds	Kal-Co	12
S124	Mechanical Sieve Shakers-C117, C136	Calibrate	Kal-Co	12
S125	Organic Impurities	Calibrate	Kal-Co	12
S126	Durability Apparatus	Calibrate	Kal-Co	12
S127	California Bearing Ratio	Calibrate	Kal-Co	12
S128	Specific Gravity of Soils-D854	Calibrate	Kal-Co	12

Table No. 7 TECHNICAN COMPETENCY VERIFICATION RECORD

Technician Name: _____

Date of Hire: _____

Employee Number: _____

Years of Experience At Date of Hire: _____

CONCRETE TEST PROCEDURES

TEST PROCEDURE		TEST NAME	CERTIFICATIONS			COMPETENCY VERIFICATION RECORD		
ASTM	AASHTO / Other		DATE	BY	DATE	BY	DATE	BY
ACI GRADE I - CONCRETE								
C 172		Sampling Freshly Mixed Concrete						
C 1064		Temperature of Freshly Mixed Concrete						
C 143		Slump of Portland Cement Concrete						
C 31		Making and Curing Concrete Test Specimens						
C 231		Air Content of Concrete by the Pressure Method						
C 173		Air Content of Concrete by the Volumetric Method						
C 138		Unit Weight, Yield, and Air Content (Grav) of Concrete						
ACI CONCRETE LAB STRENGTH TESTING TECHNICIAN								
C 617		Capping Cylindrical Concrete Specimens						
C 1231		Use of Unbonded Caps for Concrete Cylinders						
C 39		Compressive Strength of Concrete Cylinders						
C 78		Flexural Strength of Concrete						
ACI GRADE I - CONCRETE LAB TESTING TECHNICIAN								
D 75		Practice for Sampling Aggregates (written exam)						
C 702	T 248	Reducing Field Samples of Aggregate to Testing Size						
C 117	T 11	Materials Finer than No. 200 Sieve by Washing						
C 136	T 27	Sieve Analysis of Fine and Coarse Aggregate						
C 29	T 19	Unit Weight and Voids in Aggregate						
C 127	T 85	Specific Gravity and Absorption of Coarse Aggregates						
C 128	T 84	Specific Gravity and Absorption of Fine Aggregates						
C 586	T 255	Test Method for Total Moisture of Aggregate by Drying						
C 40	T 21	Organic Imp in Fine Agg for Concrete (written exam)						
ACI GRADE II - CONCRETE LAB TESTING TECHNICIAN								
C 88	T 104	Soundness of Aggs. by Sodium or Magnesium Sulfate						
C 123	T 113	Lightweight Pieces in Aggregate						
C 131	T 96	Resistance to Degrad of Small Size Coarse Agg by LA						
C 535		Resistance to Degrad of Large Size Coarse Agg by LA						
C 142	T 112	Clay Lumps and Friable Particles in Aggregates						
C 192		Making and Curing Concrete Test Specimens, Lab						
C 470		Molds for Forming Concrete Test Cylinders Vertically						
C 496		Splitting Tensile Strength of Concrete Cylinders						
C 42		Obtain & Test Cores and Sawed Beams of Concrete						
OTHER CONCRETE and AGGREGATE FIELD AND LAB TESTS								
D 546	T 37	Sieve Analysis of Mineral Filler for Road and Paving						
C 1252	T 304	Uncompacted Void Content of Fine Aggregate						
D 3744	T 210	Aggregate Durability Index						
D 2419	T 176	Sand Equivalent <i>See Soils Section</i>						
D 4791		Flat and Elongated Particles in Coarse Aggregate						
D 5821		Fractured Particles in Coarse Aggregate						

Table No. 7 TECHNICAN COMPETENCY VERIFICATION RECORD

Technician Name: _____

Date of Hire: _____

Employee Number: _____

Years of Experience At Date of Hire: _____

SOIL TEST PROCEDURES

TEST PROCEDURE		TEST NAME	CERTIFICATIONS			COMPETENCY VERIFICATION RECORD		
ASTM	AASHTO / Other		DATE	BY	DATE	BY	DATE	BY
KA LEVEL I LAB SOIL TESTING TECHNICIAN								
D 698	T 99	Moisture-Density Relationship						
D 1557	T 180	Moisture-Density Relationship						
D 2216	T 265	Water (Moisture) Content						
D 1140		Material Finer than No. 200 Sieve						
KA LEVEL II LAB SOIL TESTING TECHNICIAN								
D 421	T 87	Dry Preparation of Disturbed Soil Samples for Testing						
D 2217	T 146	Wet Preparation of Disturbed Soil Samples for Testing						
D 4318	T 89	Liquid Limit of Soil						
D 4318	T 90	Plastic Limit of Soil						
D 2419	T 176	Sand Equivalent						
D 854	T 100	Specific Gravity of Soil						
D 422	T 88	Particle Size Analysis by Hydrometer Method						
D 2844	T 190	Resistance (R) Value						
D 1883	T 193	Laboratory (California) Bearing Ratio						
D 2487		Soil Classification (Unified System)						
D 558	T 134	Moisture Density Relationship for Soil-Cements						
D 559	T 135	Wetting-Drying Resistance of Soil-Cements						
D 560	T 136	Freezing-Thawing Resistance of Soil-Cements						
KA LEVEL III LAB SOIL TESTING TECHNICIAN								
D 2434	T 215	Permeability (Granular Soils)						
D 2166	T 208	Unconfined Compressive Strength						
D 2435	T 216	One Dimensional Consolidation						
D 3080	T 236	Direct Shear						
D 5084		Permeability (Flexible Wall)						
D 2850	T 296	Unconsolidated Undrained Triaxial Shear						
D 4767	T 297	Consolidated Undrained Triaxial Shear						
FIELD SOIL TESTING TECHNICIAN								
D 2922	T 238	Density of Soil and Aggregate by Nuclear Method						
D 3017	T 239	Moisture of Soil and Aggregate by Nuclear Method						
D 2488		Soil Classification (Visual Method)						
D 1556		Density of Soil and Aggregate by Sand Cone Method						

Table No. 8

INVENTORY LIST

Equipment	Date Received	Date in Service	Manufacturer	Model	Serial Number or ID #	Condition Received	Calibration Interval	Location of Records/ Manual	Location	Calib/Verif Procedure	Date of next Calibration
CONCRETE UNIT WEIGHT											
CAPPING MATERIAL											
PLASTIC MOLDS											
NEOPRENE CAPS											
MISC. CONCRETE											
SOIL PLASTICITY INDEX											
BOLI TESTER											
SOIL HYDROMETER											
LIQUID LIMIT DEVICE											
SEDIMENTATION CYLINDERS											
GRADUATED CYLINDERS											
SSD APPARATUS											
BEARING BLOCKS											

Date:

Table No. 9

Laboratory Quality Assurance Standards and Commitment

This local office of Kleinfelder, Inc. is committed to compliance with the following "Laboratory Quality Assurance Standards:

- International Standard ISO/IEC 17025: *General Requirements for the Competence of Testing and Calibration Laboratories.*
- American Society of State Highway and Transportation Officials Standard R 18: *Establishing and Implementing A Quality System for Construction Materials Testing Laboratories.*
- The following standards of the American Society of Testing and Materials:

ASTM C 1077,	<i>Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.</i>
ASTM D. 3666,	<i>Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials.</i>
ASTM D 3740,	<i>Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.</i>
ASTM E 329,	<i>Standard Specification for Agencies Engaged in the Testing and-or Inspection of Materials Used in Construction.</i>

Table No. 10**Client feedback form**

At Kleinfelder, we strive to provide the highest level of material testing services to our clients. Your feedback enables us to identify areas for improvement and reward staff who are providing the highest level of service possible.

Client Name: _____ Attention: _____

Client Address: _____

Client Phone Number: _____ Client Email: _____

Kleinfelder Project Number: _____ Kleinfelder Project Manager: _____

1. Was the project completed:

Sooner than expected On time Not on time

2. If the project was not completed on time, were you notified sufficiently ahead of the deadline?

yes no

3. Please rank the overall customer service provided by Kleinfelder Laboratory Staff

Fair Good Excellent

4. I would like to see the following:

Additional Comments:

Thank you for your feedback.

Kleinfelder Quality Procedure for Quality Improvement Program

KQP-3.1

Revision: 0

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Author: Charles A. Smioldo

Approved By:



Director Quality Insurance

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1.1 PURPOSE

The purpose of this Kleinfelder, Inc. (KA), Quality Procedure (KQP) is to describe the process and define responsibilities for the Kleinfelder Quality Improvement Program. The key elements of the Quality Improvement Program are graded approach, risk, Quality Improvement Report (QIR), root-cause analysis, continuous improvement, and stop work.

2.1 SCOPE

This KQP applies to all Kleinfelder personnel.

A QIR (see Attachment A for an example) shall be used to document and resolve quality problems (other than minor) associated with activities, programs, processes, items, services, plans, procedures, and other parameters that fall within the KA Quality Management Program (KQMP).

Minor quality problems that can be readily corrected on the spot may be identified, documented (e.g., by logging in the field or laboratory notebook), and handled in an expedient manner that may not follow the more formal process described herein. Consult with a Quality Assurance (QA) representative if you are unsure if the quality problem should be documented on a QIR.

3.1 TRAINING

Personnel who evaluate significant quality problems to identify root cause should be familiar with an industry-accepted root-cause analysis process. Training to this procedure and to a root-cause analysis process shall be documented and retained as a quality record.

4.1 TERMS AND DEFINITIONS

Continuous Improvement – A cyclic process for evaluating the quality program with the intent of preventing quality problems. The basic elements of the continuous improvement process involve:

- Planning objectives for quality and the processes to achieve them;
- Doing the appropriate resource allocation, implementation, training, and documentation;
- Checking to see that you are implementing your quality system and that it is effective, and that you are meeting your quality objectives, as planned; and
- Acting to improve the system, as needed.

Corrective Action – The action (e.g., remediation, investigation) taken to rectify and/or correct a quality problem after its occurrence and to prevent its recurrence. Sometimes referred to as remedial action.

Graded Approach – A process by which the level of detail necessary to comply with requirements in analyses, documentation, or actions is commensurate with:

- Relative importance to safety, safeguards, and security;
- Magnitude of any hazard or risk involved;
- Life-cycle stage of a facility or activity;
- Impacts/consequences on the programmatic mission of a facility;
- Particular characteristics of a facility or activity;
- Nuclear safety classification or hazard category of the item or activity;
- Adequacy of existing safety documentation;
- Relative importance of radiological and nonradiological hazards;
- Complexity of products or services involved; and
- Performance history of a facility or activity.

Item – An all-inclusive term used to represent any of the following: appurtenance, assembly, component, environmental sample, equipment, material, module, part, structure, product, software, subassembly, subsystem, system, unit, or support systems.

Lessons Learned – An experience that causes an employee or organization to change a process or an activity to improve the safety, security, or effectiveness of the process or activity.

Preventive Action – A preventive action minimizes, through appropriate design, inspection, procurement, and other process controls and assessment activities, the occurrence of quality problems.

Root Cause – The most basic cause(s) that can reasonably be identified that management has control to fix and, when fixed, will prevent (or significantly reduce the likelihood or consequences of) the issue's recurrence. Root-cause analysis generates preventive action.

Quality Problem – A collective term for an identified problem that is

- A deficiency in an activity, product, service, item characteristic, or process parameter;
- A noncompliance to a requirement; or
- An indeterminate/substandard condition or a suspect/counterfeit item.

Significant Quality Problem – A quality problem that, if left uncorrected, has the greatest potential for

- Posing adverse risk to the environment;
- Posing adverse risk to human health;
- Impacting the safety and reliability of operations and products;
- Affecting the ability to meet customer requirements; or
- Affecting the ability to meet project cost or schedule.

The primary reason for investigating and reporting the causes of a significant quality problem is to attempt to identify corrective action(s) adequate to prevent recurrence of the problem. Thus, a significant quality problem requires a root-cause analysis.

5.1 REFERENCES

[Kleinfelder Quality Management Program](#), Section 3, Quality Improvement

6.1 PROCEDURE

6.1.1 General

The KA quality improvement program is a disciplined management process based on the premise that all work can be planned, performed, measured, and improved. The quality improvement program focuses on improving the quality of KA products, processes, and services by establishing priorities, promulgating policy, promoting cultural aspects, allocating resources, communicating lessons learned, and resolving significant management issues and problems that hinder the KA organization from achieving its objectives.

The KA quality improvement process consists of

- Identifying and documenting a quality problem;
- Taking prompt corrective (remedial) action and documenting that action;
- Evaluating the significance and extent of the problem;
- Assigning responsibility for correcting the problem;
- Analyzing the problem and determining root cause(s);
- Identifying preventive actions, if applicable;
- Reporting and implementing the planned actions;
- Verifying implementation;
- Documenting closure; and
- Determining effectiveness of the corrective and preventive actions.

A flow chart describing the QIR process is provided in Attachment B.

Quality problems may be identified by an internal organization source (e.g., worker, customer, supplier) or by an external source (e.g., customer, regulator). Once identified, quality problems shall be evaluated and tracked to completion.

6.1.2 Graded Approach and Risk

When evaluating a quality problem and determining the scope, depth, and rigor of corrective and preventive actions, a graded approach should be applied whenever possible. The KA graded approach process provides the flexibility to implement controls or actions that best suit the situation. Grading is encouraged if a single or uniform method of applying a requirement does not add value or reduce risk.

The first step in the grading process is to identify the consequences and probability of a failure prior to the work being performed. The second step is to

identify the specific requirements to be applied. The third step is to determine the depth, extent, and degree of rigor necessary in the application of requirements. The final step is to communicate and implement the selected requirements and degree of rigor by means of documented work processes (written procedures, practices, requirements manuals, policy statements, Standing Orders, or other written and controlled means) as deemed appropriate by management. The level of approval of this documentation is also based on the hazards, complexity, and relative risk.

The logic and basis for grading shall be documented, retained as a record, and periodically reviewed in light of changes that may have occurred, and if appropriate, revised to reflect those changes.

The graded approach shall be implemented without compromising the safety of the public, employees, or facilities; adversely affecting the environment; or failing to comply with the [KA Quality Management Program](#) requirements, rules, and regulations.

The graded approach shall not be used to “grade to zero,” which has the affect of eliminating a requirement. Even in the least stringent application, compliance with applicable portions of a requirement is mandatory, unless the Director-QA approves an exemption.

The graded process is dependent on the level of risk associated with the activity, structure, system, or component under consideration. Risk is a fundamental consideration in determining to what extent quality controls should be applied. Risk is a quantitative or qualitative expression of possible impacts or loss (e.g., project, financial, safety) that considers both the probability of an event causing harm or loss and the consequences of the event. Determination (or estimation) of the probability or likelihood of the occurrence should be a part of the risk expression. For example, the procurement of expensive, environmentally sensitive, critical-need laboratory equipment would require more rigorous procurement requirements on suppliers than laboratory scales or weights.

6.1.3 Employee Empowerment

KA management encourages employees to develop and explore new ideas for improving products, processes, and services. Improvement processes are most effective when each employee participates and are not delegated to a particular person or group.

KA employees are empowered and encouraged to

- Identify problems;
- Identify opportunities for improvement;
- Identify “best management practices;”

- Develop alternative approaches for addressing problems and recommend improvements;
- Implement the approved solution;
- Evaluate the improvement;
- Disseminate lessons learned; and
- Report stop-work conditions to management.

6.1.4 Quality Problem Reporting Process

Individual	Action
6.4.1 KA or Third-Party Employee	1. Identifies a quality problem.
	2. Completes QIR Section 1.
	3. Submits QIR to the Director-QA
6.4.2 Director-QA	1. Evaluates the QIR for validity.
	2. If valid, assigns a QIR number to the report from the QIR log. Completes the log information.
	3. If not valid, does not assign a QIR number to the report. Attaches to the QIR the justification for not validating the QIR (e.g., problem previously documented and in process, misunderstanding of a requirement or specification, etc.) and returns the QIR to the initiator.
	4. If appropriate, applies a hold tag to prevent further processing, installation, or inadvertent use of the item.
	5. In the event that the QIR identifies a suspect/counterfeit item, the Director-QA shall make appropriate notifications, direct further actions, and assume responsibility for the QIR.
	6. Evaluates the quality problem for significance.
	7. If the problem is a significant quality problem, requests that a root-cause analysis be performed and preventive action(s) provided.
	8. If conditions warrant and a stop work is not already directed, initiates or requests initiation of a Stop Work Order.
	9. Requests the assistance of a qualified individual to disposition the QIR (hereafter referred to as the dispositioner).
	10. Determines a response due date and a target QIR closure date.
	11. Completes QIR Section 2, initials, and dates.
	12. Records all required information into the QIR tracking log.

	13. Forwards the QIR to the dispositioner with a request for receipt acknowledgement. Distributes copies of the QIR to the initiator, Project Manager (if a project-related problem), and others as determined by the Director-QA.
6.4.3 Dispositioner	1. Acknowledges receipt of the QIR. Promptly notifies the Director-QA if responsibility for dispositioning the QIR is transferred to another individual.
	2. Determines corrective action to remedy the immediate problem. Directs or requests implementation of corrective actions.
	3. For significant quality problems, performs a root-cause analysis and determines the preventive action(s) to prevent recurrence. Directs or requests implementation of preventive actions.
	4. For quality problems related to an item, corrective and preventive actions may involve <ul style="list-style-type: none"> • Documenting dispositions for repairing, reworking, inspecting, or testing items; • Replacing or returning an item to its supplier, scrapping the item, or using it as is; • Changing process parameters or procedures; • Eliminating substandard conditions; or • Changing the management system or methods for achieving compliance.
	5. Provides periodic progress updates to the Director-QA.
	6. Completes QIR Section 3 and returns the QIR and all associated documentation to the Director-QA.
6.4.4. Director-QA	1. Reviews the QIR and associated documentation for completeness, accuracy, legibility, etc.
	2. Performs a verification of corrective and preventive actions.
	3. After all actions are verified as accomplished, completes QIR Section 4, removes hold tag, and annotates the QIR log.
	4. Distributes copies of the closed QIR to the initiator, dispositioner, Project Manager (if applicable), and others as determined by the Director-QA
	5. Forwards the QIR and relevant, associated documentation to the Records Center for retention.
	6. As appropriate, disseminates the results of the root-cause analysis for significant quality problems through a Lessons Learned report.

6.1.5 Determining Significance of a Quality Problem

The Director-QA shall evaluate the quality problem for significance. That is, would the quality problem, if left uncorrected, have had the greatest potential for

- Posing adverse risk to the environment?
- Posing adverse risk to human health?
- Impacting the safety and reliability of operations and products?
- Affecting the ability to meet customer requirements? or
- Affecting the ability to meet project cost or schedule?

6.1.6 Root-Cause Analysis

If a quality problem is determined to be significant, a root-cause analysis is required in order to make every attempt to avoid repeating the problem in the future. Guidance for determining root cause is provided in Attachment C.\

6.1.7 Quality Feedback and Continuous Improvement

The Director-QA is responsible for maintaining an environment that encourages and supports continuous improvement by

- Encouraging and sustaining a supportive management style;
- Promoting values, attitudes, and behavior that foster improvement;
- Setting clear quality-improvement goals;
- Encouraging effective communication and teamwork;
- Recognizing successes; and
- Providing training and education geared toward improvement.

Additionally, the Director-QA shall evaluate input (both positive and negative) to formulate and implement continuous improvement initiatives. Sources of input include

- Management assessment findings;
- Independent assessment findings;
- Lessons Learned;
- quality surveillance findings;
- Third-party assessment findings;
- Quality Improvement Reports;
- Quality professional conferences, seminars, panel discussions, working groups, etc.; and
- Networking among quality peers.

The evaluation shall be performed no less than every six months and more frequently if there are indications that the quality program is not improving.

The Director-QA shall monitor the efficiency and effectiveness of continuous improvement initiatives and make adjustments as necessary.

6.1.8 Stop Work and Resumption of Work

A stop-work condition exists when continuing work would cause one or more of the following:

- Irreparable compromise to the quality of scientific investigation results
- Continued use of an item that does not function as intended due to a nonconformance in processing, installation, modification, or operation
- Continued use of a suspect/counterfeit item
- Significant hazard to the health and safety of workers and/or the public
- Significant breakdown or failure in the implementation of the Quality Management Program requirements
- Compromise the quality of an item or activity important to safety

KA employees are responsible for knowing what constitutes a stop-work condition and are empowered and required to report a stop work condition to an immediate supervisor as soon as the condition is recognized and communications allow.

The supervisor shall immediately stop work if the condition presents, or might present, a significant hazard to the health and safety of workers and/or the public.

The supervisor shall notify the Regional Manager, Area Manager, Project Manager, Director-QA, and/or other management official responsible for the activity of concern.

When work is stopped, no work on the activity of concern shall be performed, and work previously completed on the activity of concern shall not be issued or released.

The Regional Manager, with assistance from others as necessary, shall evaluate the stop work condition.

If a Stop Work Order (SWO) is not required, the Regional Manager shall document, and retain as a QA record, the details and justification for rejecting a stop work action.

If an SWO is required, the Regional Manager shall immediately notify, at a minimum, the

- Client;
- Regulatory agencies with oversight authority;
- KA Director-QA;
- KA Director-Health and Safety;
- Project Manager; and
- Others as determined by the Regional Manager.

The Regional Manager shall issue an SWO in an appropriate format (e.g., letter, form, report), that identifies the

- Deficiency observed;
- Clearly stated description of the work to be stopped;
- Person assigned to oversee correcting the condition; and
- Criteria to be met before resuming work.

The Director-QA shall attach a copy of the SWO to the QIR and close the QIR.

The Regional Manager shall monitor progress, evaluate and approve proposed corrective and preventive actions, and request QA verification of completion before rescinding the SWO.

The Director-QA, or designee, shall verify implementation of corrective and preventive actions and notify the Regional Manager in writing.

The Regional Manager shall rescind the SWO in writing and ensure that the SWO and all associated documentation are retained as a quality record.

7.1 RECORDS

The following documents associated with this procedure are quality records:

1. Quality Improvement Report form and associated documentation
2. Graded approach justification
3. Stop Work Order and associated documentation
4. Root-cause analysis documentation

8.1 ATTACHMENTS

Attachment A, Example of Quality Improvement Report Form

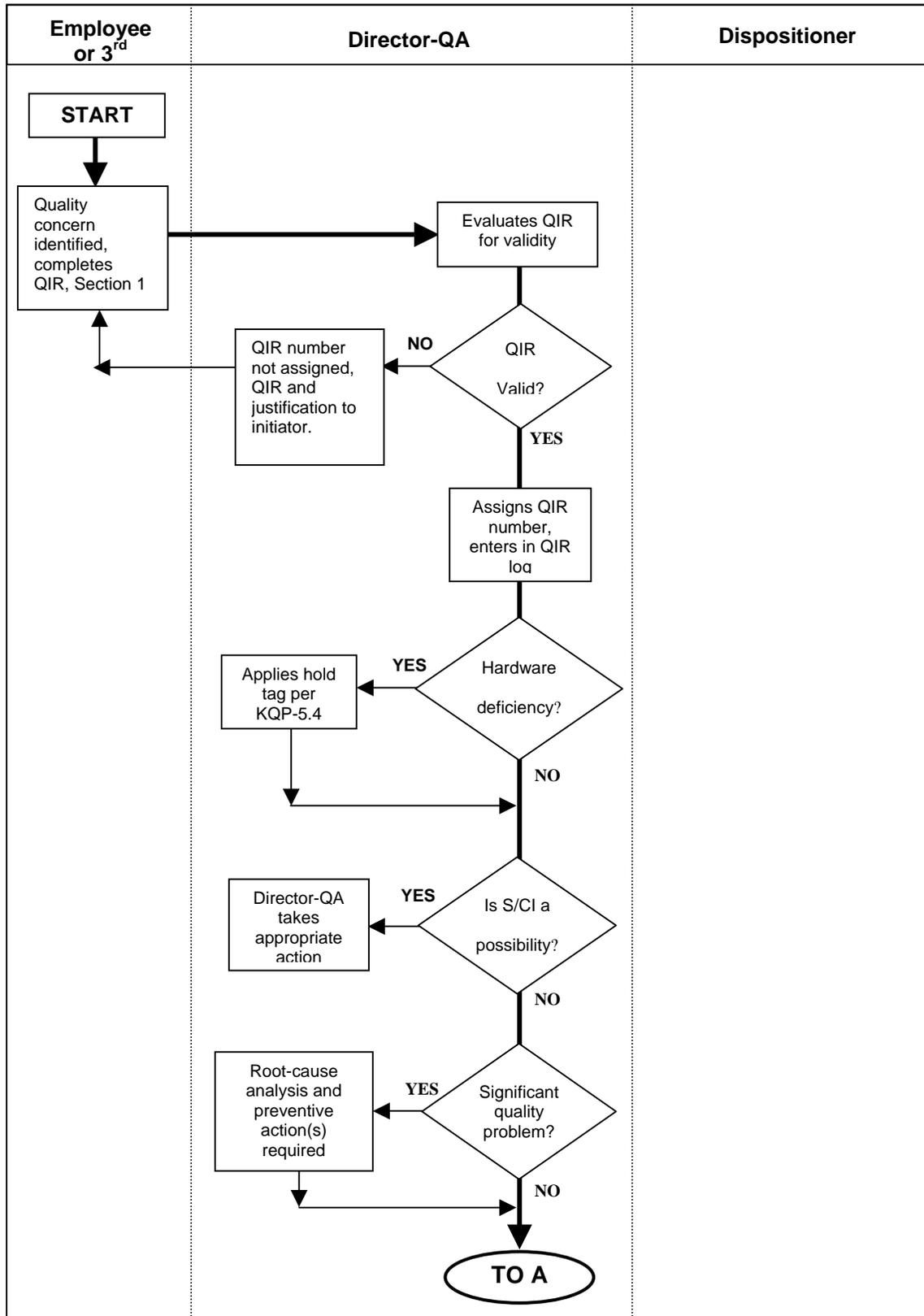
Attachment B, Quality Improvement Report Flow Chart

Attachment C, Guidance for Determining Root Cause

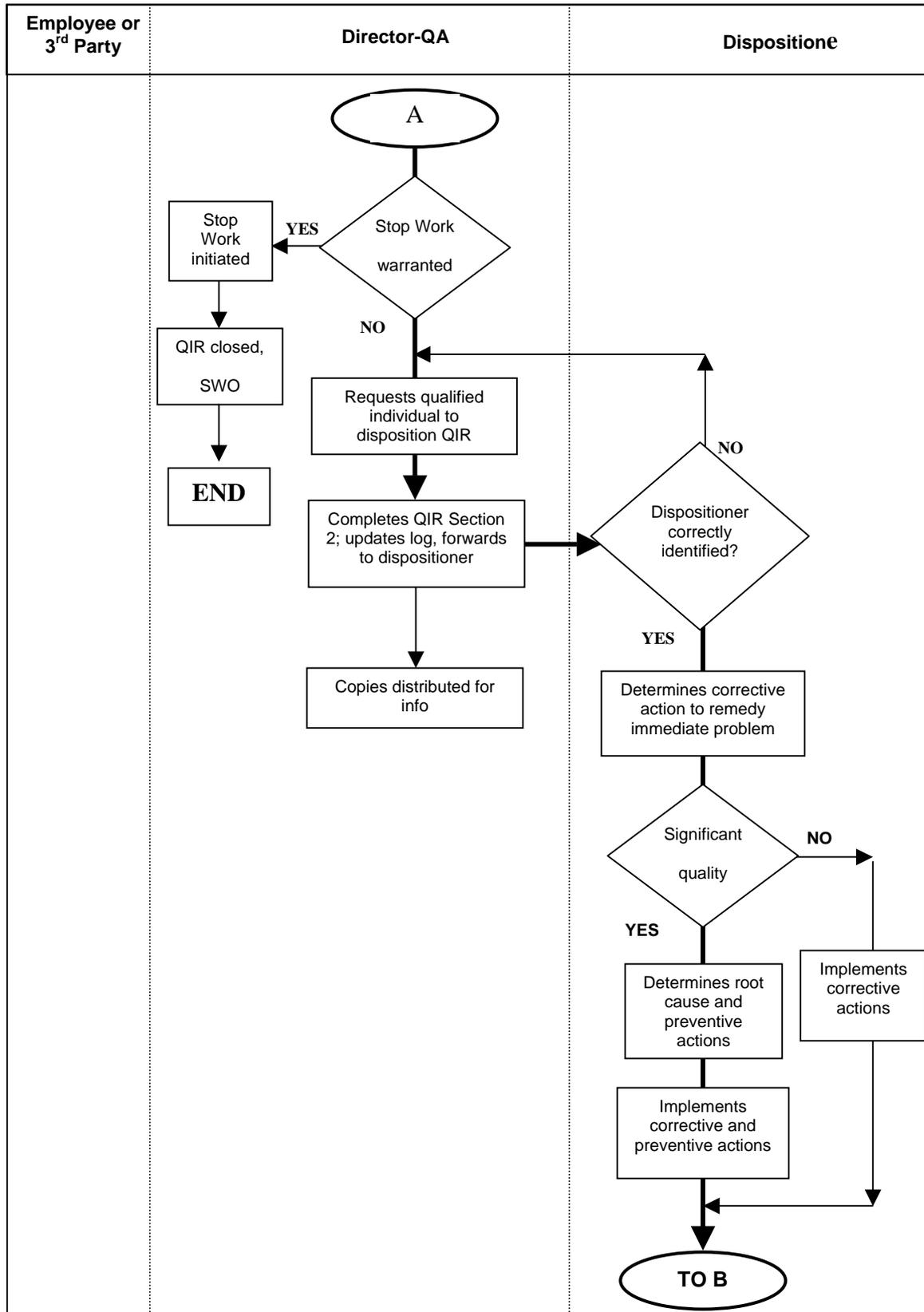
**Attachment A
Example of Kleinfelder Quality Improvement Report Form**

	<h1>QUALITY IMPROVEMENT REPORT</h1>	QIR No. _____
SECTION 1 - ORIGINATOR COMPLETE (Attach additional pages as necessary)		
Originator (Print Name): _____ KA Employee No.: _____		
Document/Drawing/Specification, etc. of Concern: _____ Item of Concern: _____		
Requirement of Concern: _____		
Description of Quality Problem: _____ _____		
Corrective Action(s) Taken: _____		
Work was Stopped: <input type="checkbox"/> NO <input type="checkbox"/> YES Initials / Date: _____		
SECTION 2 – QUALITY ASSURANCE COMPLETE		
Valid Quality Problem: <input type="checkbox"/> NO <input type="checkbox"/> YES (QIR No. Assigned Above)		
Significant Quality Problem: <input type="checkbox"/> NO <input type="checkbox"/> YES (Root-cause analysis Required)		
Hold Tag <input type="checkbox"/> NO <input type="checkbox"/> YES Stop Work Order: <input type="checkbox"/> NO <input type="checkbox"/> YES		
Suspect/Counterfeit Item: <input type="checkbox"/> NO <input type="checkbox"/> YES		
QIR Investigation Requested to be Performed By: _____		
Date Response _____ Target Date to Close QIR: _____		
Distribution: _____ Initials / Date: _____		
SECTION 3 – DISPOSITIONER COMPLETE (Attach additional pages as necessary)		
Corrective Action(s) Taken: _____ _____		
Root <input type="checkbox"/> Cause _____		
Preventive Action(s) Taken: _____ _____		
Initials / Date: _____		
SECTION 4 – QUALITY ASSURANCE COMPLETE		
Corrective Action(s) Verified: <input type="checkbox"/> Hold Tag <input type="checkbox"/> NA <input type="checkbox"/> YES		
Preventive Action(s) Verified: <input type="checkbox"/> Stop Work Order Rescinded: <input type="checkbox"/> NA <input type="checkbox"/> YES		
QIR Closed (Initials and Date): _____ Total No. of Pages: _____		
Distribution: _____ KQP 3.1.1 Rev. 0		

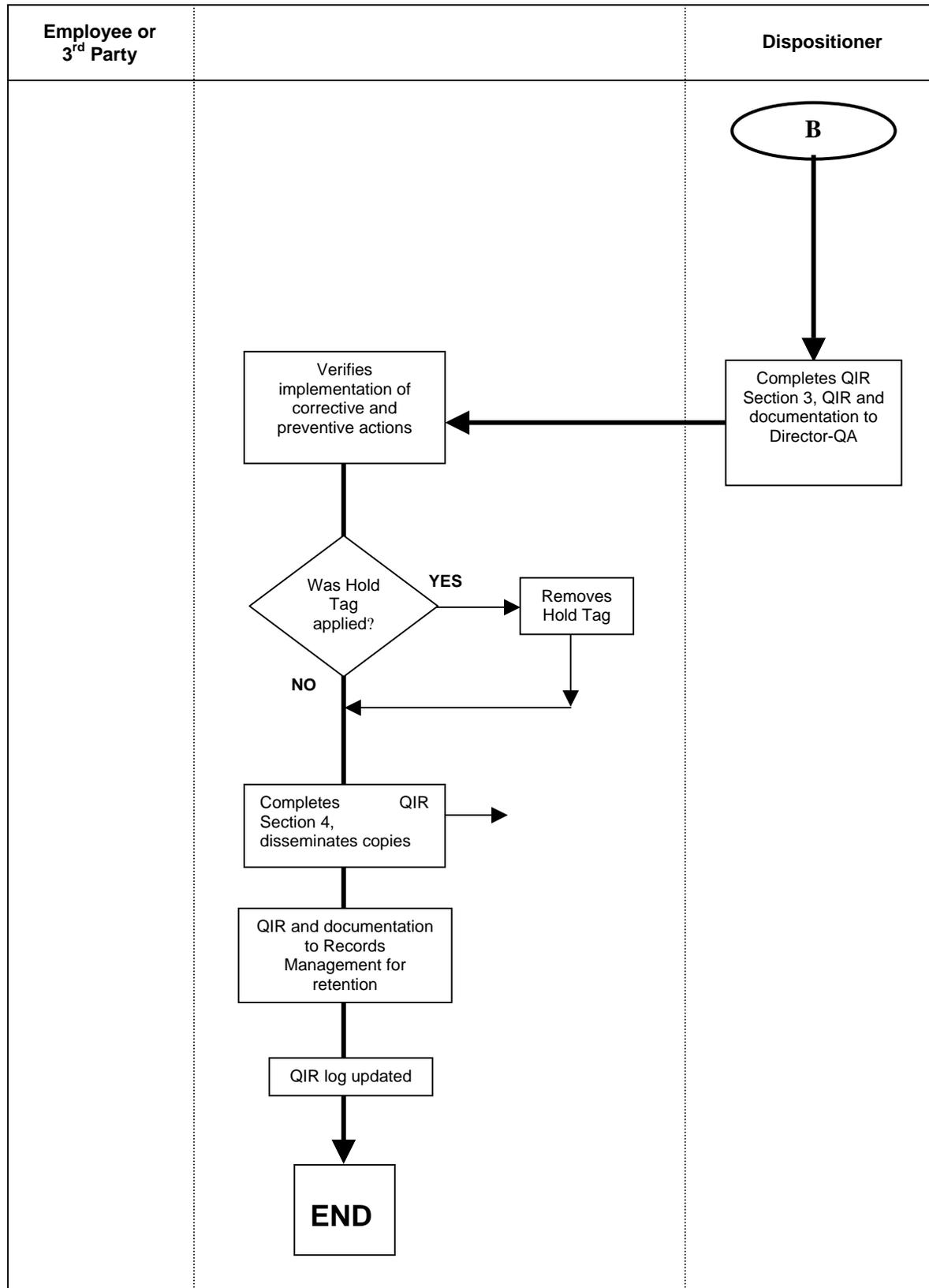
Attachment B Quality Improvement Report Flow Chart



Attachment B (Continued) Quality Improvement Report Flow Chart



Attachment B (Continued) Quality Improvement Report Flow Chart



Attachment C

Guidance for Determining Root Cause

Although quality problems generally stem from multiple causes, correcting only the local cause of a problem is analogous to treating only the symptom and ignoring the "disease." To identify and treat the true ailment, the root cause of the problem must be identified. The process of capturing the root cause is known as root-cause analysis.

Root-cause analysis is any technique that identifies the underlying deficiency that, if corrected, would prevent the same or similar problem from occurring. Root-cause analysis is a systematic process that uses the facts and results of analysis to determine the most important reasons for the problem. The intent of the root-cause analysis is to identify and address only those root causes that can be controlled within the process being investigated, while excluding events or conditions that cannot be reasonably anticipated and controlled, such as some natural disasters.

Root-cause analysis is not an exact science. The success of a root-cause analysis depends on sound judgment, deductive reasoning, and intelligent analysis of the events and causes of the quality problem. Analyzing the events and causes leading up to, during, and after the quality problem was discovered will provide answers to "what," "when," "where," "who," and "how" questions. Root-cause analysis is performed to resolve the question, "Why?"

Therefore, the key steps in a root-cause analysis are to

1. Gather all the relevant facts;
2. Evaluate the events before, during, and after the problem in order to highlight the primary event that directly contributed to the problem;
3. Identify the issue or action that caused the problem within that event;
4. Repeatedly ask yourself, "Why did this issue or action happen?" until you are satisfied that the root of the problem has been identified; and
5. Plan and implement the preventive action.

1. Gather the Facts

To initiate a root-cause analysis, the facts surrounding the quality problem must be known. It is important to begin collecting information as soon as possible to ensure that valid information is not lost. *It is significant to note that, if a root-cause analysis is attempted before all of the facts are known or before the full spectrum of events and causes is determined, it is unlikely that the root cause will be discovered.* Examples of information that should be collected are

- Details of events that happened before, during, and after the problem was discovered;
- Personnel involved, including those who took corrective action;
- Details of actions taken after the problem was discovered;
- Relevant environmental factors; and
- Any other relevant information.

Attachment C (Continued)

Guidance for Determining Root Cause

2. Highlight the Primary Event

In most cases, there will be many events and many details of events to document. The challenge is to differentiate and isolate events that might have led to the problem from events that had no role in the problem. Following is a simple way to determine the importance of an event within a chain of events that led to a significant quality problem.

- A. Examine the first event that immediately preceded the problem and ask, "If this event had not occurred, would the problem have occurred?" If the answer is, "The problem would have occurred whether this event happened or not," then the event is not significant. Proceed to the next event, working backwards from the problem.

- B. If the answer to the evaluation question is, "The problem would not have occurred without this event," then determine whether the event represented normal activities with the expected consequences. If the event was intended and had the expected outcomes, then it is not a significant event. However, if the event deviated from what was intended or had unwanted consequences, then it is a significant event.

3. Determine the Issue or Action That Caused the Problem Within the Event

Once the significant event has been isolated, examine the circumstances of the event. Ask a series of questions about the event, such as

- Why did this event happen?
- What went wrong that allowed the event to occur?
- What conditions within the event led to the problem?
- Why did these conditions exist?
- How did these conditions originate?
- Who had responsibility for the conditions?
- Are there any relationships or similarities between conditions in this event and conditions in other events within the event chain?

The cause (or list of causes) of the problem should become apparent from the answers to these questions.

To aid in identifying causes, here is a list of typical causes arranged by typical types of problems:

Attachment C (Continued) Guidance for Determining Root Cause

<p>A. Equipment/Material Problem</p> <ul style="list-style-type: none"> • Defective or failed part • Defective or failed material • Defective weld, braze, or soldered joint • Error by manufacturer in make or shipping • Electrical or instrument noise • Contamination • Ordinary wear and tear • Improper usage • Improper installation • Improper or no maintenance 	<p>B. Procedure Problem</p> <ul style="list-style-type: none"> • Defective or inadequate procedure • Lack of procedure • Procedure not followed • Procedure unclear • Procedure out of date • Conflicting procedures
<p>C. Personnel Error</p> <ul style="list-style-type: none"> • Inadequate work environment • Inattention to detail • Violation of requirement or procedure • Communication problem between employees • Communication problem between employees and client or regulatory agencies 	<p>D. Design Problem</p> <ul style="list-style-type: none"> • Inadequate man-machine interface • Inadequate or defective design • Error in equipment or material selection • Drawing, specification, or data errors
<p>E. Training Deficiency</p> <ul style="list-style-type: none"> • No training offered • Employee not trained • Insufficient practice or hands-on experience • Inadequate content • Insufficient refresher training • Inadequate presentation or materials 	<p>F. Management Problem</p> <ul style="list-style-type: none"> • Inadequate administrative control • Work organization/planning deficiency • Inadequate supervision • Improper resource allocation • Policy not adequately defined, disseminated, or enforced
<p>G. External Phenomena</p> <ul style="list-style-type: none"> • Weather or ambient condition • Power failure or transient • External fire or explosion • Theft, tampering, sabotage, or vandalism 	<p>H. Regulations and Permits</p> <ul style="list-style-type: none"> • Personnel unaware of the applicability of a regulation • Inconsistent or contradictory regulations • Inconsistent or contradictory interpretation of regulations • Ambiguous regulations

Attachment C (Continued)

Guidance for Determining Root Cause

4. Identify the Root Cause

Once the cause, or causes, has been determined, the challenge is to analyze the factors that led to the cause and ask, “If this factor was corrected, would recurrence be prevented?” Another approach is to ask, “Why was the cause allowed to exist?” until the solution becomes obvious. For example, assume that the cause of the problem is determined to be “Procedure not followed.” The thought process might follow this logic:

- Why was the procedure not followed?
- Because the worker was unaware that a procedure existed for this task.
- Why was the worker unaware that a procedure existed for this task?
- Because the worker failed to attend the kick-off meeting and training session.
- Why didn't the worker attend the kick-off meeting and training session?
- Because the supervisor failed to notify the worker of the scheduled session.
- Why did the supervisor not notify the worker?
- Because the supervisor's roster did not include the worker's name.
- Why was the roster incomplete?
- Because the worker was assigned to the task after the session was held.
- Root cause: The work assignment process allows a worker to be assigned to a task after the kick-off meeting and training session has been held and without notifying the supervisor of that fact.
- Preventive action: Revise the work assignment process to provide for supervisor verification of training before the worker is allowed to start the task.

There may be more than one issue or action that caused the problem and, therefore, more than one root cause may be identified. If more than three or four root causes are thought to exist at the conclusion of the analysis, reexamine the list of causes to determine which causes can be combined to reflect a more fundamental root cause.

5. Determine the preventive action

With a clear understanding of the root cause of the problem, the final step is to plan and implement the steps necessary to remove the root cause. In the example above, the preventive actions might be to

1. Request other supervisors to verify training of workers on active tasks and to take corrective actions, as necessary;
2. Revise procedure KQP-XY.Z, “Assignment of Work”;
3. Provide refresher training to the revised procedure to all applicable employees, including the reported worker; and
4. Evaluate the activities performed by the worker to determine if there are any negative impacts on the quality of work performed as they relate to the procedure not followed and take corrective actions, as necessary.