

REPORT

ON

THE PRACTICE OF FORENSIC ENGINEERING

FOR

**THE COLORADO STATE BOARD OF LICENSURE
FOR PROFESSIONAL ENGINEERS AND
PROFESSIONAL LAND SURVEYORS**

BY

THE FORENSIC ENGINEERING TASK FORCE

APRIL 3, 2006

SUMMARY

The Task Force on Forensic Engineering recommends the State Board of Licensure for Professional Engineers and Professional Land Surveyors adopt a new Rule 3.1.2 titled "Ethical Conduct", that revisions be made to Rule 3.3.2 titled "Serving as Expert or Technical Witness", and that guidelines be adopted defining "Responsibilities of Engineers Providing Forensic Engineering Services, Expert Testimony and Litigation Consulting" as new Rule 5.4.

INTRODUCTION

At its March, 2004 meeting the State Board of Registration for Professional Engineers and Professional Land Surveyors voted to establish a task force for the purpose of reviewing the practice of Forensic Engineering in the State of Colorado.

The decision to establish a task force was to address concerns expressed by registrants regarding current practices by engineers in the State of Colorado related to Forensic Engineering.

In addition, through regulations that require engineers involved in malpractice claims to report them to the Board, the Board regularly reviews the reports of professional engineers acting as expert witnesses. There was a general feeling among the board members that some of these reports were becoming advocacy theses for the professional engineer's client instead of statements of fact and therefore in violation of Section 12-25-108 of the Colorado Revised Statutes and Board Rules 5.0 and 5.8. These reports used in litigation can result in erroneous legal findings that harm the health, safety, and public welfare of the people of Colorado.

BACKGROUND

Once the Task Force began meeting it became apparent that the reason the Task Force had been requested was due to the large variation in the different expert reports on the same projects, primarily in the construction claims field. This coincided with the Board's own experience in reviewing the expert witness reports received in malpractice reports.

It also became apparent from the large and vocal attendance at the initial meetings that the engineering community felt that current practices needed improvement. The majority of attendees at the task force meetings were practicing engineers, including those engaged in forensic engineering services, representatives of engineering organizations, and attorneys. The majority of the people present were those who work in building construction and construction claims litigation. Although the charge given to the Task Force had its genesis in complaints that originated in the building construction and design practices, these proposed rules and guidelines may have applicability to the general practice of professional engineering and to those professional engineers engaged in forensic practice in other engineering disciplines.

After the issues had been openly discussed in the large meeting format and changes to the Board Rules along with guidelines recommended it was determined that the Task Force work could only be conducted by establishing a smaller committee.

The results of the committee work are the proposed rule changes.

It is important to note that the committee did not establish a formal voting structure. Therefore, the proposed rule changes do not represent just a majority opinion. Each of the items were discussed and re-discussed until a consensus of the Committee was reached.

PROCEEDINGS

Initial open meetings of the Task Force were held in the summer and fall of 2004 with as many as 35 people in attendance. Attendees were professional engineers that practice in the area of forensic engineering, representatives of Colorado engineering organizations, and attorneys that retain the services of professional engineers. The majority of attendees indicated a broad interest in the current practice of forensic engineering and supported the decision to establish a task force.

These initial meetings gave attendees a chance to voice their concerns about the current practice of Forensic Engineering in Colorado and to provide their recommendations for improvement. Recommendations ranged from doing nothing to the Board forming a tribunal to rule on which forensic engineer's conclusions were correct.

These meetings began to explore the opportunities and limitations that the State Board might have in enhancing the practice of Forensic Engineering in Colorado. Most of the opinions reflected felt that the greatest issue was ethics, especially as related to advocacy.

Although ethics and advocacy were identified as major concerns, it was conceded that ethics is very difficult to regulate. Nevertheless, the Task Force decided to review this issue.

In order to establish a basis, it was decided to review the current Colorado Statutes and Board Rules along with the ASCE "Guidelines for Forensic Engineering Practice". Mr. Larry Mott, P.E. compiled an excellent comparison of the current Board Rules, especially the Board's Rules of Conduct and Board Rule 5.2 Engineer's Certification and the Guidelines established by ASCE. Attached in Appendix "A" is the comparison. At the completion of reviewing the above, it was found that many of the fundamental statements concerning ethics, advocacy, etc., are contained in the Board's existing rules.

Although it was agreed that the existing Board Rules address ethics, it was felt that additional language in the Rules to assist in defining appropriate forensic practice was necessary and would be helpful to the Board in regulating practice.

In order to make the first step and put a proposal on paper, a group of engineers including Mr. Michael West, P.E., Mr. Al Claybourn, P.E., and Mr. James Royston, P.E., put together a draft of proposed rule changes for committee consideration. The initial draft of these changes is attached in Appendix "B". Once this proposal was put forth and discussed, a "straw poll" of the people attending the meeting was taken on the question of "should the committee continue and work toward the revisions?" It is important to note that the split was almost even on whether the committee should proceed. At this point, the decision was made to proceed based on the strong feelings of one group and not wanting to waste the energies put forth to date. It was felt a momentum had begun that could have positive results.

Once this proposal was put forth for specific changes it was determined that the recommendations could not be analyzed, edited, and agreed upon in the large open meeting format. This led to the formation of a committee of approximately nine to ten members. The membership of this smaller committee was selected to represent a balance of viewpoints in the professional engineering community.

This committee met in two-hour sessions approximately ten times over the course of ten months to arrive at the recommended rule changes.

Although the rule changes may appear to be small, the amount of discussion that went into each item was extensive. A great deal of discussion of Rule 3.2.1 "Practice Only Within Expertise" centered on the words education and experience. On one hand, a strong argument can be put forth that both education and experience is required, especially of forensic engineers. There are also lessons that can only be learned by experience. On the other hand, some issues have only been dealt with academically, requiring only education. In the end, the committee decided to stay with the current language.

The major changes to Rule 3.3.2 that were agreed upon are to add language concerning the expert witness being an advocate only of his opinion, requiring analysis of facts, and requiring expertise in the appropriate field.

Most of the committee's time and energy was spent arriving at the guidelines that are recommended to become Rule 5.4. It is felt that these guidelines will be useful to all engineers in addition to those providing forensic engineering.

In addition, many issues that are not directly reflected in the proposed changes were discussed. These include:

1. Should the name of the task force have been changed from one on Forensic Engineering to one on Engineering in the Legal System?

This really speaks to how closely the practice of forensic engineering is connected to the legal profession. The forensic engineer expert is retained by an attorney representing one side of a dispute. The attorney is generally an advocate for his clients. It is understandable that the forensic engineer can be lured into seeking the best result for his client and become an advocate also.

The current practice generally has each attorney involved in a case retaining only one forensic engineer in each area of expertise. With this practice, the same engineer acts as an advisor to the attorney as well as his expert witness. On the other hand, there have been cases where attorneys have retained engineers for advice that is different than the testifying expert (i.e. consulting experts as opposed to expert witnesses).

The committee concluded that the State Board probably has little influence to change the roles of the forensic engineer in the legal system. With this the committee decided to concentrate on "practice guidelines".

2. The Task Force Committee considered whether it should try to define two types of reports to be prepared by forensic engineers with one type of report being written as advice to legal counsel and the second providing only professional opinions of fact. The committee concluded this option was not plausible.
3. The committee discussed the formation of a rule or guideline defining the "Standard of Care." For assistance in this discussion, several attorneys with construction litigation experience were contacted (See Appendix C). After review of the attorneys' comments and additional discussion, it was determined that existing Rules 3.1.1 and 3.1.7, while not labeled "Standard of Care," address the intent and nothing further was to be recommended.

There was also discussion concerning the differences between the "Standard of Care" and the "Standard of Practice." As new expertise is gained in a field and the knowledge is available but not used by the engineering community the "Standard of Practice" may be less than the "Standard of Care." Just as the committee decided it could not define the "Standard of Care," it could not predetermine which standard should apply.

4. The committee also discussed if every “code” violation should be considered a defect that must be repaired. As with the above, the committee felt this was an item that could not be predetermined.

PROPOSED RULE CHANGES

The Task Force recommends the following modifications to the “Bylaws and Rules of the State Board of Licensure for Professional Engineers and Professional Land Surveyors”:

- 1) Insertion of the following as Rule 3.1.2 with renumbering of the remaining Items in 3.1:

3.1.2 - Ethical Conduct. Licensees shall conduct the practice of engineering in an ethical manner and shall be familiar with appropriate recognized codes of engineering ethics.

- 2) Revision of rule 3.3.2 as follows:

3.3.2 - Serving as Expert or Technical Witness. The licensee, when serving as an expert or technical witness before any court, commission, or other tribunal shall be an advocate only of their professional opinion, and shall express objective and truthful opinions only when founded upon: (1) adequate knowledge and analysis of the facts at issue; (2) a background of technical competence in this subject matter; (3) experience in the appropriate field of engineering; (4) appropriate engineering practice based on sound principals of engineering; (5) and upon honest conviction of the accuracy and propriety of their testimony.

- 3) The Task Force recommends the following guidelines be inserted as Rule 5.4 of the “Bylaws and Rules of the State Board of Licensure for Professional Engineers and Professional Land Surveyors”:

5.4 - Responsibilities of Engineers Providing Forensic Engineering Services, Expert Testimony and Litigation Consulting

5.4.1 - Impartiality. Engineers shall serve as impartial consultants who provide and objectively investigate and explain technical issues to laypersons, litigants, attorneys and the courts. Although engineers are retained by the parties to litigation, engineers are not advocates for the parties. Engineers represent the engineering profession and their specific technical disciplines. Engineers shall act to uphold and enhance the honor, integrity, and dignity of the engineering profession. Engineers shall be professional in explaining their work.

5.4.2 - Attorney Influence/Advocacy. Engineers shall diligently avoid being persuaded by attorneys to advocate legal positions and shall only accept engagements in which the scope of work is to objectively investigate, explain, and clarify technical issues. Engineers shall not allow attorneys or other parties to substantially control, write, or otherwise unduly influence engineering analyses, judgment, reports, opinions, and testimony. Engineers shall not limit inquiry for the purpose of proving the contentions advanced by the attorneys who have retained them. Engineers shall express an opinion only when it is founded on adequate knowledge of the facts, clear identification of all assumptions made, and a description of all additional information considered to provide an opinion. Engineers shall not write, transmit, adopt, or promote opinions, crafted by an attorney or include legal opinions, under the guise of professional engineering opinions.

5.4.3 - Existing Conditions. Findings made by engineers regarding damage and/or potential for damage, when affecting other properties, current engineering practice, and construction practice shall be immediately called to the attention of the engineer's client, and if further action is needed, to responsible authorities and the affected professions/trades/industries.

5.4.4 - Non-Engineers. Before opining on whether a non-engineer's procedures are in keeping with applicable standards, engineers shall perform the reasonable inquiry needed to identify applicable codes, engineering requirements embodied in construction plans and specifications, and other relevant documents governing the conduct of the non-engineer's work. An engineer can identify engineering-related deficiencies in a non-engineer's work, although such deficiencies may not constitute a breach of the standards of the non-engineer's trade.

5.4.5 - Codes and Standards. Engineers shall explain codes, standards and guidelines and their specific applicability to the matters in dispute and their effect. Deviations from codes and standards shall be explained as to why they are specifically relevant to the issues at hand. Local interpretations and variations from codes and standards shall be discussed as appropriate. Repair recommendations for noted deviations from codes and standards shall be based on the engineer's opinions and supporting analyses.

5.4.6 - Damage Predictions. Where required, engineers shall make damage predictions using only methods based on sound rigorous engineering and scientific principles defined by peer-reviewed technical articles presented in technical journals, conference proceedings or other commonly accepted publications and engineering standards. Caution shall be exercised to avoid the use of methodologies that do not have a sound scientific, engineering or empirical basis. Extrapolation and speculation shall be avoided. Predictions shall be based on the probability of predicted damage occurring during the economic life of the

project within a “reasonable degree of engineering certainty.” Engineers shall assure that graphic representations, including models, animations, and other media, are factual in nature. Engineers shall avoid oversimplification, misleading exaggeration, and /or diminution.

5.4.7 - Repair Scope. Engineers recommending repairs and preparing associated cost estimates for litigation purposes or new construction shall be consistent with appropriate engineering and construction requirements. The recommended repair scopes and associated performance requirements shall be explained to provide a basis of opinion for cost of the products and assemblies and to meet the requirements of building codes and accepted standards.

5.4.8 - Level Surveys. The use of level survey data shall be accompanied by: (a) verification that structural movement has occurred; (b) a discussion of original construction tolerances; and (c) a discussion of accuracy/precision of the survey conducted. Surveys shall not be used as the sole basis for opinions and testimony regarding the need for repairs.

5.4.9 - Use of Professional Judgment in Accepting Others’ Opinions as Basis for Own. Engineers shall use their professional judgment to independently determine whether it is appropriate to use the findings of another expert as the basis for their opinions and recommendations.

5.4.10 - Biased Omission. Engineers shall avoid omitting a material fact necessary to keep statements from being misleading.

5.4.11 - Differences of Opinion. When dealing with matters in litigation engineers commonly have differing opinions. Differing opinions among reasonable engineers is understandable and not a reasonable basis for a “complaint.”

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APPENDIX A
EDITED AND COMPILED PRINCIPLES OF ETHICAL CONDUCT
FOR FORENSIC ENGINEERS (source: ASCE)

COMPARED
TO CURRENT P.E. BOARD RULES

PRINCIPLES BY CATEGORY

A. Forensic Engineers and Public Safety

Engineers serving as expert witnesses shall:

1. Hold paramount the safety, health and welfare of the public in the performance of their professional duties. The public interest should be held paramount.
2. Immediately forward knowledge of discovery of any unsafe condition to the proper authority.

3.0 - Rules of Conduct

3.1 - Registrants Shall Hold Paramount the Safety, Health, and Welfare of the Public in the Performance of Their Professional Duties. This rule shall include, but not be limited to, the following.

3.1.1 - Primary Obligation of Registrants. Registrants shall at all times recognize that their primary obligation is to protect the safety, health, property, and welfare of the public. If their professional judgment is overruled under circumstances where the safety, health, property, or welfare of the public is endangered, they shall notify their employer or client and/or such other authority as may be appropriate.

3.1.2 - Responsibility for Seal. Registrants shall be personally and professionally responsible and accountable for the care, custody, control, and use of their seals.

5.2 - Engineer's Certification

5.2.1 - Circumstances and Applicable Actions. When a professional engineer is presented with a certification to be signed and/or sealed, the professional engineer should carefully evaluate that certification to determine if any of the following circumstances apply.

- (a) Matters that are beyond the professional engineer's competence, training, or education.
- (b) Matters that are beyond the professional engineer's services actually provided.
- (c) Matters that were not prepared under the professional engineer's responsible charge.

If any of these circumstances apply, that engineer shall take either of the following actions.

- (i) Modify such certification to limit its scope to those matters that the professional engineer can properly sign and/or seal.
- (ii) Decline to sign such certification.

B. Objectivity of Forensic Engineers

Engineers serving as expert witnesses shall:

1. Be objective, honest and impartial in serving with fidelity the public, their employers and clients.
2. Issue public statements only in an objective and truthful manner.
3. Serve as impartial arbiters who provide and explain information regarding technical matters.
4. Diligently avoid being persuaded by attorneys to advocate their positions.
5. Tell the whole truth.
6. Should not accept compensation in exchange for advocacy. Decline or terminate and engagement when any offer of compensation in exchange for advocacy is made.
7. Avoid giving personal opinions.
8. Only accept engagements whose scope of work is to objectively clarify technical issues.

3.3 - Registrants Shall Issue Professional Statements Only in an Objective and Truthful Manner. This rule shall include, but not be limited to, the following.

3.3.1 - Objectivity and Truth. Registrants shall be objective and truthful in professional reports, statement, or testimony.

3.3.2 - Serving as Expert or Technical Witness. The registrant, when serving as an expert or technical witness before any court, commission, or other tribunal, shall express an opinion regarding matters pertaining to professional practice only when founded upon adequate knowledge of the facts at issue, upon a background of technical competence in this subject matter, and upon honest conviction of the accuracy and propriety of his/her testimony.

3.4 - Registrants Shall Act in a Professional Manner for Each Employer or Client and Shall Avoid Conflicts of Interest. This rule shall include, but not be limited to, the following.

3.4.1 - Conduct that Discredits the Profession. A registrant shall not engage in any conduct in the course of promoting or rendering services for an employer or client that discredits or tends to discredit another engineer or land surveyor and/or the profession of engineering or land surveying.

3.4.2 - Appearance of Impropriety. A registrant shall avoid the appearance of impropriety in the course of representing or rendering services of an employer or client.

3.4.3 - Undue Influence. When representing a client or employer, a registrant shall not exert or attempt to exert undue influence over other professionals, contractors, or public officials. Undue

influence means any improper or wrongful exercise of persuasion or control by a registrant in an effort to cause another to do what he or she would not otherwise do if left to act freely.

3.6 - Registrants Shall Exercise Independent Professional Judgment. This rule shall include, but not be limited to, the following.

3.6.1 - Exercise of Judgment. Registrants shall not permit a client, employer, another person, or organization to direct, control, or otherwise affect the registrant's exercise of independent professional judgment in rendering professional services for the client.

C. Competence of Forensic Engineers

Engineers serving as expert witnesses shall:

1. Perform services, and testify in areas only when qualified by education or experience in the technical field of engineering involved.
2. Decline the engagement when their own capabilities are insufficient.
3. Express an engineering opinion only when it is founded upon a background of technical competence.
4. Not affix their signatures or seals to any engineering product dealing with subject matter in which they lack competence by virtue of education or experience.
5. Not affix, their signatures or seals to any engineering product or document not reviewed or prepared under their supervisory control.
6. Before commenting on whether others' procedures are in keeping with the applicable standard of care, experts should perform the reasonable inquiry needed to identify the standard of care and regulations in effect at the time and place other experts' procedures were implemented.
7. Obtain and explain codes, standards and regulations affecting the matters in dispute.
8. Not falsify or permit misrepresentation of their academic or professional qualifications or experience.

3.2 - Registrants Shall Perform Services Only in the Areas of Their Competence. This rule shall include, but not be limited to, the following.

3.2.1 - Practice Only within Expertise. Registrants shall undertake assignments only when qualified by education or experience in the specific technical fields of engineering or land surveying involved.

3.2.2 - Seal and Sign Only Documents under Responsible Charge. Registrants shall only affix their signatures or seals to plans or documents prepared under their responsible charge.

3.2.3 - Sealing and Signing for Entire Projects. For projects encompassing one or more disciplines beyond the registrant's competence, registrants may accept responsibility for, and sign and seal the documents for, the total project only when the registrant has first determined that all phases of the project have been performed by associates, consultants, or employees who are:

- (a) competent and qualified to perform such services; and,
- (b) registered or licensed.

3.3.4. - Statements beyond Engineering and/or Land Surveying. Registrants shall not issue a professional statement in a field of expertise outside of the practice of engineering and/or land surveying unless they hold a proper registration from the lawful authority that issues such registration.

3.3.5. - Land Surveying Statements by Engineers. Registrants holding registration as a professional engineer shall not issue a professional statement requiring expertise in land surveying unless such registrant holds registration as both a professional engineer and a professional land surveyor.

5.2 - Engineer's Certification

5.2.1 - Circumstances and Applicable Actions. When a professional engineer is presented with a certification to be signed and/or sealed, the professional engineer should carefully evaluate that certification to determine if any of the following circumstances apply.

- (a) Matters that are beyond the professional engineer's competence, training, or education.
- (b) Matters that are beyond the professional engineer's services actually provided.
- (c) Matters that were not prepared under the professional engineer's responsible charge.

If any of these circumstances apply, that engineer shall take either of the following actions.

- (i) Modify such certification to limit its scope to those matters that the professional engineer can properly sign and/or seal.
- (ii) Decline to sign such certification.

D. Honesty of Forensic Engineers

Engineers serving as expert witnesses shall:

1. Not knowingly engage in business or professional practices of a fraudulent, dishonest or unethical nature.
2. Be truthful in professional reports, statements, or testimony.
3. Avoid erroneous or exaggerated claims regarding the applicable professional engineering standards-of-care.
4. Not attempt to conceal possible oversights or errors in their own work.
5. and agree with points made by other engineers or through cross-examination when they have been fairly made.

6. Avoid false, misleading, or inflammatory comments.
7. Refrain from distorting or altering the facts in an attempt to justify their decisions.
8. Assure that graphic representations, including models and other media, are factual in nature and avoid oversimplification and misleading exaggeration.
9. Avoid omitting a material fact necessary to keep statements from being misleading.
10. Avoid the use of statements intended or likely to unreasonably or unfairly promote litigation, to create an unjustified expectation or to inflame an existing dispute.
11. Separate with labels or other techniques any opinions from facts on graphic representations (ICED 1996).
12. Concede indisputable facts even when they are adverse to the client.
13. Refrain from hiding, distorting or altering facts.
14. Advise their employers or clients when their studies show that a project will not be successful.

3.1.4 - Maintenance of Confidentiality. Registrants shall not reveal confidential facts, data, or information obtained in a professional capacity without prior consent except as authorized or required by law.

3.1.5 - Caliber of Association. Registrants shall not permit the use of their name or firm name nor associate in business ventures with any person or firm that they have reason or should have reason to believe is engaged in fraudulent or dishonest business or professional practices.

3.1.6 - Cooperation with Board Investigations. Registrants having knowledge of, and/or involvement in, any alleged violation of any of Title 12, Article 25, Parts 1 and 2, C.R.S., or the board's rules, shall cooperate with any investigation initiated by the board and furnish such information or assistance as may be requested.

3.1.7 - Compliance with Applicable Laws, Regulations, and Codes. Registrants shall exercise appropriate skill, care, and judgment in the application of federal, state, and local laws, regulations, and codes in the rendering of professional services and in the performance of their professional duties.

3.3 - Registrants Shall Issue Professional Statements Only in an Objective and Truthful Manner. This rule shall include, but not be limited to, the following.

3.3.1 - Objectivity and Truth. Registrants shall be objective and truthful in professional reports, statement, or testimony.

3.3.2 - Serving as Expert or Technical Witness. The registrant, when serving as an expert or technical witness before any court, commission, or other tribunal, shall express an opinion

regarding matters pertaining to professional practice only when founded upon adequate knowledge of the facts at issue, upon a background of technical competence in this subject matter, and upon honest conviction of the accuracy and propriety of his/her testimony.

3.3.3 - Identification of Interested Parties. Registrants shall not issue professional statements on technical matters that are initiated or paid for by interested parties, unless the registrants have prefaced their statements by explicitly identifying the interested parties on whose behalf they are speaking, and by revealing the existence of any interest the registrants may have in the matters.

5.2 - Engineer's Certification

5.2.1 - Circumstances and Applicable Actions. When a professional engineer is presented with a certification to be signed and/or sealed, the professional engineer should carefully evaluate that certification to determine if any of the following circumstances apply.

(a) Matters that are beyond the professional engineer's competence, training, or education.

(b) Matters that are beyond the professional engineer's services actually provided.

(c) Matters that were not prepared under the professional engineer's responsible charge.

If any of these circumstances apply, that engineer shall take either of the following actions.

(i) Modify such certification to limit its scope to those matters that the professional engineer can properly sign and/or seal.

(ii) Decline to sign such certification.

E. Thoroughness of Investigation by Forensic Engineers

Engineers serving as expert witnesses shall:

1. Refuse or terminate engagements that do not allow them to perform the investigations needed to establish an opinion with a reasonable degree of certainty.
2. Visit the site of the event involved and consider information obtained from witnesses.
3. Obtain and review documents, photographs, models, maps, and other materials relating to an issue before offering comment.
4. Avoid assumption whenever possible.
5. Avoid giving opinions if the investigation was not sufficient to establish a reasonable degree of certainty.
6. Consult other experts' published works and, when appropriate and possible, speak with them directly.
7. Obtain information relative to the events in question in order to minimize reliance on assumptions.

8. Inform their clients of the tests, investigations, or other research they need to conduct in order to formulate their opinions.
9. Speak with the authors of other documents, when doing so is appropriate and possible.
10. Promptly request additional information when it is needed to clarify and inform.
11. Evaluate different explanations of causes and effects.
12. Not limit their inquiry for the purpose of proving the contentions advanced by those who have retained them.
13. Express an opinion only when it is founded upon adequate knowledge of the facts and upon an honest conviction.
14. Conduct tests and investigations personally or direct their performance through qualified individuals who should be capable of serving as expert or factual witnesses.
15. Include all relevant and pertinent information in reports, statements, or testimony.
16. Respect and carefully consider the opposing point of view.

3.1.3 - Work Product Must Be Safe and Meet Accepted Standards. Registrants shall approve and seal only those design documents and surveys that are safe for public health, property, and welfare in conformity with accepted engineering and surveying standards.

3.3.2 - Serving as Expert or Technical Witness. The registrant, when serving as an expert or technical witness before any court, commission, or other tribunal, shall express an opinion regarding matters pertaining to professional practice only when founded upon adequate knowledge of the facts at issue, upon a background of technical competence in this subject matter, and upon honest conviction of the accuracy and propriety of his/her testimony.

F. Relevance of Expert Engineers' Testimony

Engineers serving as expert witnesses shall:

1. Include all relevant and pertinent information in professional reports, statements, or testimony.
2. Testify about professional standards of care only with knowledge of those standards that prevailed at the time in question.
3. Avoid irrelevant testimony or statements.
4. Identify standards of care independent of their own preferences.

5. Not apply present standards of care to past events.
6. Avoid the use of statements containing a material misrepresentation of fact.
7. Avoid over-statements of the applicable standards-of-care.
8. Avoid the use of statements containing prediction of the future.
9. Avoid claims that other procedures should have been used without providing the result of applying the procedure.
10. Avoid statements containing unreasonable predictions.
11. Use only illustrative devices that demonstrate relevant principles without bias.
12. Not participate in untrue, unfair or exaggerated statements regarding engineering.
13. Be responsive to questioning by both sides.

3.1.3 - Work Product Must Be Safe and Meet Accepted Standards. Registrants shall approve and seal only those design documents and surveys that are safe for public health, property, and welfare in conformity with accepted engineering and surveying standards.

3.3.2 - Serving as Expert or Technical Witness. The registrant, when serving as an expert or technical witness before any court, commission, or other tribunal, shall express an opinion regarding matters pertaining to professional practice only when founded upon adequate knowledge of the facts at issue, upon a background of technical competence in this subject matter, and upon honest conviction of the accuracy and propriety of his/her testimony.

G. Compensation and Business Practices of Forensic Engineers serving as expert witnesses shall:

1. Be compensated for the services they render, irrespective of their opinions or the outcome of the issue.
2. Act in professional matters for each employer or client as faithful agents or trustees.
3. Not accept an expert testimony engagement on any basis of contingency.
4. Should not accept compensation in exchange for advocacy (ICED 1996).
5. Not accept compensation from more than one party for services on or pertaining to the same project unless agreed to by all parties (ASCE 1977).
6. Be above suspicion in financial undertakings related to the case,

3.4 - Registrants Shall Act in a Professional Manner for Each Employer or Client and Shall Avoid Conflicts of Interest. This rule shall include, but not be limited to, the following.

3.4.1 - Conduct that Discredits the Profession. A registrant shall not engage in any conduct in the course of promoting or rendering services for an employer or client that discredits or tends to discredit another engineer or land surveyor and/or the profession of engineering or land surveying.

3.4.2 - Appearance of Impropriety. A registrant shall avoid the appearance of impropriety in the course of representing or rendering services of an employer or client.

3.4.3 - Undue Influence. When representing a client or employer, a registrant shall not exert or attempt to exert undue influence over other professionals, contractors, or public officials. Undue influence means any improper or wrongful exercise of persuasion or control by a registrant in an effort to cause another to do what he or she would not otherwise do if left to act freely.

3.4.4 - Conflicts of Interest. Registrants shall disclose all known conflicts of interest to their employers or clients by promptly informing them of any business association, interest, or other circumstances that could influence their judgment or the quality of their services.

3.4.5 - More Than One Source of Compensation. Registrants shall not accept compensation, financial or otherwise, from more than one party for services on the same project, or for services pertaining to the same project, unless the circumstances are fully disclosed to, and agreed to, by all interested parties.

3.4.6 - Solicitation or Acceptance of Compensation. Registrants shall not solicit or accept financial or other valuable consideration, directly or indirectly, from contractors, their agents, or other parties in connection with work for employers or clients for which the registrant is responsible.

H. Conflicts of Interest in Forensic Engineering

Engineers serving as expert witnesses shall:

1. Refuse or terminate involvement in an engagement when fee is used in an attempt to compromise the expert's judgment.
2. Avoid conflicts of interest and the appearance of conflicts of interest.
3. Determine if they or any of their associated have or ever had a relationship with any of the organizations or individuals and reveal any such relationships to their client
4. Promptly inform their employers or clients of any business association, interests, or circumstances that could influence their judgment or the quality of their services.

3.4 - Registrants Shall Act in a Professional Manner for Each Employer or Client and Shall Avoid Conflicts of Interest. This rule shall include, but not be limited to, the following.

3.4.1 - Conduct that Discredits the Profession. A registrant shall not engage in any conduct in the course of promoting or rendering services for an employer or client that discredits or tends to

discredit another engineer or land surveyor and/or the profession of engineering or land surveying.

3.4.2 - Appearance of Impropriety. A registrant shall avoid the appearance of impropriety in the course of representing or rendering services of an employer or client.

3.4.3 - Undue Influence. When representing a client or employer, a registrant shall not exert or attempt to exert undue influence over other professionals, contractors, or public officials. Undue influence means any improper or wrongful exercise of persuasion or control by a registrant in an effort to cause another to do what he or she would not otherwise do if left to act freely.

3.4.4 - Conflicts of Interest. Registrants shall disclose all known conflicts of interest to their employers or clients by promptly informing them of any business association, interest, or other circumstances that could influence their judgment or the quality of their services.

3.4.5 - More Than One Source of Compensation. Registrants shall not accept compensation, financial or otherwise, from more than one party for services on the same project, or for services pertaining to the same project, unless the circumstances are fully disclosed to, and agreed to, by all interested parties.

3.4.6 - Solicitation or Acceptance of Compensation. Registrants shall not solicit or accept financial or other valuable consideration, directly or indirectly, from contractors, their agents, or other parties in connection with work for employers or clients for which the registrant is responsible.

I. Confidentiality of Forensic Engineering Work

Engineers serving as expert witnesses shall:

1. Respect confidentiality about all matters discussed by and between experts, their clients and/or clients' attorneys.
2. Not reveal facts, data or information obtained in a professional capacity without the prior consent of the client or employer except as authorized or required by law or professional Codes of Conduct.
3. Not disclose confidential information concerning the business affairs or technical processes of any present or former client or employer without his consent.
4. Shall not, without consent of all interested parties, participate in or represent an adversary interest in connection with a specific project or proceeding in which the engineer has gained particular specialized knowledge on behalf of a former client or employer.
5. Supply information to the news media only when authorized to do so (ICED 1996).

3.1.4 - Maintenance of Confidentiality. Registrants shall not reveal confidential facts, data, or information obtained in a professional capacity without prior consent except as authorized or required by law.

K. Forensic Engineers' Conduct toward Other Engineers

Engineers serving as expert witnesses shall:

1. Be prepared to explain to the trier of fact the differences that exist with the opinion of other professionals and why a particular opinion should prevail.
2. Refuse to accept any engagement to review the work of a fellow engineer, except with his knowledge.
3. Not review the work of another engineer for the same client without their knowledge or unless the connection of such engineer with the work has been terminated.
4. Not make requests for additional information to delay proceedings or tacitly disparage the value of others' research or findings.
5. Cooperate and communicate with other experts whenever appropriate.

3.4 - Registrants Shall Act in a Professional Manner for Each Employer or Client and Shall Avoid Conflicts of Interest. This rule shall include, but not be limited to, the following.

3.4.1 - Conduct that Discredits the Profession. A registrant shall not engage in any conduct in the course of promoting or rendering services for an employer or client that **discredits or tends to discredit another engineer** or land surveyor and/or the profession of engineering or land surveying. (bold added by LJM)

L. Reporting Apparent Unethical Conduct of Other Forensic Engineers

Engineers serving as expert witnesses shall:

1. Report to the proper authorities any knowledge or belief that other engineers are guilty of unethical, negligent or illegal practices.

3.1 - Registrants Shall Hold Paramount the Safety, Health, and Welfare of the Public in the Performance of Their Professional Duties. This rule shall include, but not be limited to, the following.

3.1.1 - Primary Obligation of Registrants. Registrants shall at all times recognize that their primary obligation is to protect the safety, health, property, and welfare of the public. If their professional judgment is overruled under circumstances where the safety, health, property, or welfare of the public is endangered, they shall notify their employer or client and/or such other authority as may be appropriate.

3.1.6 - Cooperation with Board Investigations. Registrants having knowledge of, and/or involvement in, any alleged violation of any of Title 12, Article 25, Parts 1 and 2, C.R.S., or the

board's rules, shall cooperate with any investigation initiated by the board and furnish such information or assistance as may be requested.

3.1.7 - Compliance with Applicable Laws, Regulations, and Codes. Registrants shall exercise appropriate skill, care, and judgment in the application of federal, state, and local laws, regulations, and codes in the rendering of professional services and in the performance of their professional duties.

M. Professionalism of Forensic Engineers

Engineers serving as expert witnesses shall:

1. Act in such a manner as to uphold and enhance the honor, integrity, and dignity of the engineering profession.
2. Recognize that they will be regarded as representatives of their profession.
3. Be dignified and modest in explaining their work and merit, and avoid any act tending to promote their own interests at the expense of the integrity, honor and dignity of the profession.
4. Be an ambassador to the court for the engineering profession.

3.3 - Registrants Shall Issue Professional Statements Only in an Objective and Truthful Manner. This rule shall include, but not be limited to, the following.

3.3.1 - Objectivity and Truth. Registrants shall be objective and truthful in professional reports, statement, or testimony.

3.3.2 - Serving as Expert or Technical Witness. The registrant, when serving as an expert or technical witness before any court, commission, or other tribunal, shall express an opinion regarding matters pertaining to professional practice only when founded upon adequate knowledge of the facts at issue, upon a background of technical competence in this subject matter, and upon honest conviction of the accuracy and propriety of his/her testimony.

Note: The Appendix B material, edited and compiled, was submitted by Mike West and reproduced here unchanged. The material in **RED** is excerpted from the current Colorado P.E. Board Rules and inserted following Appendix B sections for which they are relevant.

Submitted by: L. J. Mott, PE August 20, 2004

APPENDIX B

TASK FORCE REPORT ON FORENSIC ENGINEERING

I. INTRODUCTION

The State Board of Registration for Professional Engineers and Professional Land Surveyors (the Board) created the Task Force on Forensic Engineering (the Task Force) by unanimous vote at its March --, 2004 meeting in response to issues raised by individual registrants, the American Consulting Engineers Council, the Colorado Association of Geotechnical Engineers, and the Structural Engineers Association of Colorado. The Task Force, chaired by Peter Monroe, P.E. met __ times between _____, 2004, and _____, 2004. Larry Mott, P.E., and Kent Petersen, P.E., co-chaired working sessions of the Task Force.

II. OBJECTIVES

The objectives of the Task Force were:

- A. To review and, if necessary, to recommend changes to existing Board bylaws and rules that specifically address the conduct of engineers providing forensic engineering services, engineering expert testimony, and litigation related consulting services.
- B. To develop guidelines useful to the Board in administering forensic engineering practice, engineering expert testimony and litigation related consulting services and which are consistent with existing law and administrative rules/policy.
- C. To develop guidelines useful to individual registrants in providing forensic engineering services, engineering expert testimony, and engineering litigation related support services

III. ENGINEERING RULES, POLICY AND GUIDELINES FOR FORENSIC ENGINEERING PRACTICE, ENGINEERING EXPERT TESTIMONY AND LITIGATION CONSULTING

The Task Force concludes that the enabling legislation and existing Board bylaws and rules adequately define the duties and responsibilities of engineers practicing in Colorado. Nevertheless, apparent problems have developed with respect to forensic engineering, engineering expert testimony, and litigation consulting which either are not addressed specifically by existing rules, policies and guidelines, which are unique to engineering practice in the legal system, or which have evolved from recent litigation in Colorado. The Task Force reaffirms the right of self-determination and the duty of the engineering profession to establish rules and guidelines governing engineering practice.

Based on the deliberations of the Task Force, the Task Force recommends that: (1) the Board adopt changes to rules governing engineering practice outlined in Section IV.A below and (2) the Board adopt specific policy/guidelines for the conduct of forensic engineering practice,

engineering expert testimony, and litigation-related consulting services outlined in Section IV.B below.

A. RECOMMENDED RULE CHANGES

The Task Force identified the following proposed rule changes and commentary related to forensic engineering services, expert testimony and litigation consulting:

- 3.2.1 Practice Only within Expertise. Registrants shall undertake assignments only when qualified by experience in the specific technical fields of engineering or land surveying involved.
- 3.3.2 Serving as Expert or Technical Witness. The registrant, when serving as an expert or technical witness before any court, commission, or other tribunal, shall express an opinion regarding matters pertaining to professional practice only when founded upon: (1) adequate knowledge of the facts at issue; (2) upon a background of technical competence in this subject matter; (3) reasonable experience in the field of engineering or surveying in question, (4) upon generally accepted principles and practices of engineering or surveying; (5) and upon honest conviction of the accuracy and propriety of his/her testimony.

B. RECOMMENDED POLICY/GUIDELINES

The Task Force modeled the following policies and guidelines after Appendix B – Compiled Principles of Ethical Conduct for Forensic Engineers in “*Guidelines for Forensic Engineering Practice*” (Lewis, G.L., ed., 2003) published by the American Society of Civil Engineers and specific documented abuses of engineering discretion. Specifically, the Task Force identified guidelines which are not specifically addressed by existing Board bylaws and policies. Specific guidelines are followed by commentary where appropriate. Redacted documentation cited in the commentaries is available through the Board regarding specific abuses of engineering discretion. The proposed guidelines follow:

Responsibilities of Engineers Providing Forensic Engineering Services, Expert testimony and Litigation consulting. The following should guide professional engineers in the course of providing forensic engineering services, expert testimony, and litigation consulting.

- 1. **Impartiality.** Engineers should serve as impartial consultants who provide and objectively investigate and explain technical issues to laypersons, litigants, attorneys and the courts. Although engineers are retained by the parties to litigation, engineers are not advocates for the parties. Engineers represent the engineering profession and their specific technical disciplines. Engineers should act to uphold and enhance the honor, integrity, and dignity of the engineering profession. Engineers should be professional in explaining their work and avoid any act promoting their own interests, the interests of the attorneys who retained them or parties to litigation at the expense of the integrity, honor and dignity of the profession.
- 2. **Attorney Influence.** Engineers should diligently avoid being persuaded by attorneys to advocate legal positions and should only accept engagements in which the scope of work is to objectively investigate, explain and clarify technical issues.

3. **Area of Expertise.** Engineers should perform services and testify in areas only when qualified by experience in the technical field of engineering involved. Engineers should not affix their signatures or seals to any engineering product dealing with subject matter in which they lack competence by virtue of education and experience. It is the Task Force's opinion that a single registrant is unlikely to possess adequate education and experience to offer competent and qualified opinions, repair recommendations, designs, cost estimates, and expert testimony across multiple engineering disciplines (i.e. geotechnical, structural, hydrology and hydraulics, road/pavement design, etc.) especially on projects which involve multiple engineering disciplines during original design and construction.
4. **Hazardous Conditions.** When in the course of an investigation an engineer encounters or identifies an extreme hazard presenting a significant adverse affect to public health, safety or welfare, the engineer should immediately forward knowledge of such discovery to the proper authorities, agents or other responsible party.
5. **Engineering Standard of Care .** Engineers should avoid erroneous or exaggerated claims regarding the applicable professional engineering standards-of-care. Before commenting on whether other engineers' procedures are in keeping with the applicable standard of care, engineers should perform a reasonable inquiry to identify the standard of care in effect at the time and at that specific location. Engineers should identify standards of care independent of their own preferences and the preferences of attorneys who retain them.
6. **Non-Engineering Standard of Care.** Before commenting on whether a non-engineer's procedures are in keeping with the applicable standard of care, engineers should perform the reasonable inquiry needed to identify applicable engineering standards embodied in plans and specifications, contracts for the conduct of the non-engineer's work, and other relevant documents. In the absence of specific engineering requirements embodied in construction documents, the engineer should avoid assigning an engineering standard of care to a non-engineer. Although an engineer can identify engineering-related deficiencies in a non-engineer's work, such deficiencies do not necessarily constitute a breach of a standard of care by a non-engineer.
7. **Codes and Standards.** Engineers should explain codes, standards and guidelines and their specific applicability to the matters in dispute. It is not sufficient to cite codes and standards with the implication that any deviation from the code or standard necessarily constitutes a construction defect. Codes and standards should be explained as to why they are specifically relevant to the issues at hand and how they relate to damage. Moreover, local interpretations and variations from codes and standards should be discussed as appropriate.
8. **Advocacy.** Engineers should not allow attorneys or other parties to substantially control, write, or otherwise unduly influence engineering analyses, judgment, reports, opinions, and testimony. Engineers should not limit inquiry for the purpose of proving the contentions advanced by the attorneys who have retained them. Engineers should express an opinion only when it is founded on adequate knowledge of the facts clear identification of all assumptions made, and a description of all additional information needed to provide an opinion.
9. **Legal Opinions.** Engineers should not write, transmit, adopt or promote "legal" opinions, crafted by an attorney, under the guise of professional engineering opinions.

Engineers should confine opinions to technical matters in which they profess expertise. In general, the citation of court cases, settlements, legal theories, and other legal documents is outside the purview of the engineering profession.

10. **Extreme Damage Predictions.** Engineers should not make extreme damage predictions, based on nonstandard or unproven engineering methods, extrapolation, or conjecture, to justify extensive repairs and associated damage claims. Engineers should avoid the use of false, misleading or inflammatory statements intended likely to promote litigation, to create an unjustified expectation on the part of litigants and attorneys, or to inflame an existing dispute. Engineers should assure that graphic representations, including models, animations and other media, are factual in nature and avoid oversimplification and misleading exaggeration. Predictions, where necessary, should be based upon: (1) standard engineering methodologies; (2) the economic life of the project; and (3) meet the test of a “reasonable degree of engineering certainty.”
11. **Repair Scope.** Engineers recommending repairs and preparing associated cost estimates for litigation purposes should be consistent with generally accepted engineering and construction practices and the recommendations of other engineers working for the same client. Inappropriate repairs, inconsistent repairs and inflated cost estimates should be avoided.
12. **Level Surveys.** The use of level survey data to demonstrate structural movement and to justify extensive repairs should be accompanied by: (a) verification by observation of distress that structural movement has occurred; (b) a discussion of original construction tolerances; and (c) a discussion of accuracy/precision of the survey conducted. Surveys should not be used as the sole basis for opinions and testimony regarding the need for repairs.
13. **Predictions of Future Damage.** Predictions of future damage should not be used as the sole basis for opinions and testimony regarding the need for extensive repairs. Predictions of future damage should be accompanied by a discussion of the probability of such damage occurring and should be based standard accepted engineering practice.
14. **Use of Professional Judgment in Accepting Others’ Opinions as Basis for Own.** Engineers should use their professional judgment to independently determine whether it is appropriate to use the findings of another expert as the basis for their opinions and recommendations.
15. **Qualified by Experience.** Engineers should practice only within their area of expertise. Engineers should only undertake an assignment when he or she has the appropriate educational background and is qualified by experience in the specific field of engineering or land surveying practice involved in the assignment.
16. **Biased Omission.** Engineers shall avoid omitting a material fact necessary to keep statements from being misleading.
17. **Duty to Self-Police.** Engineers should report to the proper authorities any knowledge or belief that engineers or other licensed professionals have engaged in unethical, negligent or illegal practices.

III. RECOMMENDATION

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The Task Force recommends that the Board review and adopt these proposed rule changes. The Task Force also recommends that the Board review and adopt the proposed guidelines under Section 50.0 Policies Concerning the Practice of Engineering.



APPENDIX "C"

①

LEE & ASSOCIATES, PC

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MEMORANDUM

To: Peter Monroe
From: Byrum Lee
CC: Scott Sullan, Phil Cardi
Date: August 8, 2005
Re: Standard of Care

Thank you for allowing me to assist the Task Force with respect to its efforts to define the "Standard of Care". It has been variously defined with many attorneys, as well as other professionals, attempting their own definition. Perhaps the most reliable definition from a standpoint of being legally unassailable is the definition provided in the Colorado Pattern Jury Instructions. CJI, Civil 15:26 for use with architects, engineers, accountants, etc. provides:

15:26 Negligence--Other Professionals

An engineer is negligent when he or she does an act that reasonably careful engineers would not do or fails to do an act that reasonably careful engineer would do.

To determine whether an engineer's conduct is negligent, you must compare that conduct with what an engineer having and using that knowledge and skill of engineers practicing engineering, at the same time, would or would not have done under the same or similar circumstances.

There are, of course, other jury instructions that can and should be used along with 15:26 in conjunction with determining the negligence of an engineer. For example, I have had uniform success in having CJI, Civil 4th 15:4 given. Instruction 15:4 is designed for physicians and reads:

15:4 No Implied Warranty of Successful Outcome

(Unless a physician states or agrees otherwise, a) (A) physician does not guarantee or promise a successful outcome by simply treating or agreeing to treat a patient.

(An unsuccessful outcome does not, by itself, mean that a physician was negligent.) (An exercise of judgment that results in an unsuccessful outcome does not, by itself, mean that a physician was negligent.)

Peter, I have never had a court refuse that instruction when properly modified for an architect or engineer.

Instruction 15:22 designed for use in cases against lawyers is similar and reads:

15:22 No Implied Warranty of Successful Outcome

(Unless the attorney states or agrees otherwise, an attorney does not guarantee or promise success simply by agreeing to provide professional services.

(An unsuccessful outcome does not, by itself, mean that an attorney was negligent.) (An exercise of judgment that results in an unsuccessful outcome does not, by itself, mean that an attorney was negligent.)

Of course, it is also important to understand the manner in which negligence of an engineer is to be judged. In a negligence case against a layman, negligence is determined by the standard of the reasonably prudent man and what this mythical person would or would not do. With regard to engineers and other professionals, the determination of whether or not the engineer was negligent (i.e. failed to meet the standard of care, must be determined by experts. On this point, CJI Civil 4th, 3:15 STATES:

3:15 Expert Witnesses

A witness qualified as an expert by education, training, or experience may state opinions. You should judge expert testimony just as you would judge any other testimony. You may accept it or reject it, in whole or in part. You should give the testimony the importance you think it deserves, considering the witness's qualifications, the reasons for the opinions, and all of the other evidence in the case.

Some courts approve of instructions that combine the elements of more than one stock jury instruction. One example is an instruction the court agreed to give in a case in which I successfully defended MKK. *Kemper Architects, v. McFall, Konkel, Kimball Consulting Engineers*, 843 P 2d. 1178, 1182, (Wyo 1992):

"You are instructed that in performing professional services for a client, an engineer has the duty to have that degree of learning and skill ordinarily

possessed by reputable engineers. It is his further duty to use reasonable skill in the application of his learning in an effort to accomplish the purpose for which he was employed. A failure to perform such duty is negligence. The degree of care, skill and judgment which is usually exercised by an engineer is not a matter within the common knowledge of jurors and lay persons. These standards can only be established by their testimony. You may not speculate or guess what those standards of care, skill and judgment are, but must attempt to determine this from the testimony of engineering experts called for that purpose."

This instruction is not perfect and as with many, represents a compromise instruction that has elements of the original instruction that I proposed to the court merged with wording that the attorney for Kemper Architects insisted on.

All-in-all, the most reliable definition is that contained in the Colorado Pattern Jury Instructions.

If you have additional questions or want to discuss these issues in greater detail, please let me know.

Regards, Byrum

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VANATTA, SULLAN, SANDGRUND & SULLAN

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DEAN R. VANATTA (of counsel)

August 9, 2005

Peter D. Monroe, P.E.
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Avon CO 81620

Re: Forensic Engineering Task Force

Dear Peter:

Thank you for requesting my assistance with regard to the continuing work of the Task Force on Forensic Engineering. I have had an opportunity to review Byrum Lee's memo to you dated August 8, 2005. With regard to the definition of "Standard of Care," I generally agree with Mr. Lee that, "the most reliable definition from a standpoint of being legally unassailable is the definition provided in the Colorado Pattern Jury Instructions, CJI, Civ. 15:26 for use with architects, engineers, accountants, etc." That civil jury instruction states:

15:26 Negligence – Other Professionals

An engineer is negligent when he or she does an act that reasonably careful engineers would not do or fails to do an act that reasonable careful engineer would do.

To determine whether an engineer's conduct is negligent, you must compare that conduct with what an engineer having and using that knowledge and skill of engineers practicing engineering, at the same time, would or would not have done under the same or similar circumstances.

As Mr. Lee points out, a definition such as this may, at the request of the defendant or the plaintiff or both, be tailored by a court to fit the particular facts in any given case. For example, the above jury instruction would be considered controlling with regard to the definition of Standard of Care unless (a) the conduct at issue is not of a type that requires expert testimony (for example an engineer who signs off on and stamps plans without actually reading them), or (b)

where the accused professional admits to his or a standard of care that is more stringent than that set forth in the jury instruction, after which the jury can then decide for itself whether the expressed standard was breached.

Mr. Lee cites jury instructions applicable to physicians guaranteeing the outcome of an operation, or lawyers guaranteeing the outcome of a case, which are generally not applicable to engineers. More importantly, those instructions do not define the term "Standard of Care". In most cases, there is a vast difference between the patient/doctor relationship and the relationship of engineers to the public who use facilities designed by engineers. The general public has no direct interaction with engineers who design the dams, buildings, and bridges to which their lives are entrusted. Rather, as a society we rely on the objective application of scientific principles by engineers to create safe designs that will fulfill their intended purpose to protect us. Thus, one of the most basic tenants of engineering ethics is to act in such a manner as to protect the life, health and safety of the public. While the "unsuccessful outcome" instruction may make sense in cases involving doctors who are asked to try to cure a patient with whom they have a direct relationship **and from whom they must obtain an informed consent to any procedure**, the instruction makes no sense when applied to a design engineer asked to calculate the load applied to a simple span beam for a bridge which, due to grossly improper calculations by the engineer, then collapses causing death or injury to unsuspecting members of the public who have never talked to or been informed of the risk by the engineer. Jury Instruction 15:26 does not impose strict liability on an engineer, it merely requires the engineer to act in accordance with the conduct of other reasonably careful engineers. Whether, in a particular case, that instruction should be modified or supplemented cannot be determined without knowing the facts of the case. In some cases, Mr. Lee may be correct in asking for the "unsuccessful outcome" instruction, in others he may not be correct.

The jury instruction cited by Mr. Lee from a case in Wyoming also has no application in Colorado. That jury instruction contains ambiguities which may actually increase the standard of care for engineers in Colorado. For example, the instruction cited by Mr. Lee states that engineers are to "have that degree of learning and skill ordinarily possessed by reputable engineers." "Reputable" is not a defined term nor is it clear what it means in this context. "Reputable" is not a word used in the Colorado Jury Instruction. It would create needless confusion, and conflict, if the ethical rule to which the forensic engineer was held differed in its definition of standard of care from the jury instruction applied by the Courts.

As a general proposition, Mr. Lee's statement that, "all in all, the most reliable definition [of standard of care] is that contained in Colorado Pattern Jury Instruction 15:26" is correct. However, as the content of Mr. Lee's memo suggests, the peculiar factual circumstances in a particular case may dictate that other or modified definitions of the standard of care be used. In fact, Mr. Lee has apparently been successful in convincing some Judges to modify the instruction to fit the facts in a particular case or two. Hamstringing both defendants' and plaintiffs' experts by adopting an inflexible ethical rule defining the Standard of Care is unwise in that it will

Peter Monroe, P.E.
Engineering Task Force
August 9, 2005
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inevitably open up a Pandora's box and let loose the "rule of unintended consequences." Just as surely as I sit here, if the Board adopts a legal definition of standard of care into its ethical rules, a case will arise in the future in which highly competent counsel defending an engineer, such as Mr. Lee or Mr. Cardi, will find themselves or their experts hamstrung by a hard and fast ethical rule that cannot be modified to fit the circumstances of the particular case. In my view, the Board's ethical rules should focus on the ethics of the practice of engineering and leave the legal principles to the courts. This is, of course, what is required by our Constitutional separation of powers between the judicial and regulatory (executive) branches of Colorado State government.

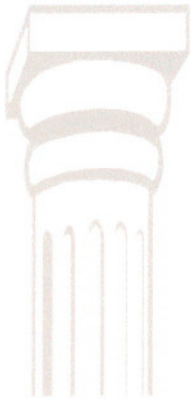
Very truly yours,

VANATTA, SULLAN, SANDGRUND
& SULLAN, P.C.



Scott F. Sullan

SFS/mb
C: Byrum Lee, Esq.
Philip Cardi, Esq.



LEE & ASSOCIATES, PC

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MEMORANDUM

To: Peter Monroe
From: Byrum Lee
CC: Scott Sullan, Phil Cardi
Date: August 8, 2005
Re: Standard of Care

In reading Scott Sullan's response to your request for information regarding the standard of care, I was reminded of a quote from George Bernard Shaw who once said: *If you leave the smallest corner of your head vacant for a moment, other people's opinions will rush in from all quarters.* While age and ego may have dulled my receptiveness to the opinions of others, Scott makes some valid points. However, it is perhaps not surprising that with all due respect, I take issue with certain other of Scott's comments.

Implied Warranty / Guaranteed Outcome

In particular, I am in disagreement with Scott on the issue of "guaranteed outcome". It is my opinion that in virtually every case of professional liability against an engineer the implied warranty instruction (CJI Civil 4th 15:4) will be appropriate.

As Scott and I agree, the yardstick for judging the performance of engineers will normally be "the standard of care". Attempts have been made, however, to graft the doctrine of implied warranty from the law of sales into professional services. Implied warranties and guarantees of a particular outcome should stay in the sales arena.

With nearly virtual unanimity, courts, when requested to extend the doctrine of implied warranty to professional services, have declined to do so. The Florida Court of Appeals was faced with a request to impose liability on an engineer based on a theory of implied warranty in the case of Audlane Lumber & Builders Supply, Inc. v. D.E. Britt Associates, Inc. 168 So. 2d 333 (Fla. App. 1964). In declining to do so, the court stated:

With respect to the alleged 'implied warranty of fitness', we see no reason for application of this theory in circumstances involving professional

liability . . . An engineer, or any other so called professional, does not 'warrant' his services or the tangible evidence of his skill to be 'merchantable' or fit for an intended use'. These are terms uniquely applicable to goods.

A California Court of Appeals in the case of Allied Properties v. John A. Blume & Associates, Engineers, 25 Cal. App.3d 848, 102 Cal. Rptr. 259 (1972) affirmed the view that a professional does not warrant a satisfactory result. The court stated:

The well settled rule in California is that where the primary objective of a transaction is to obtain services, the doctrines of implied warranty and strict liability do not apply Those who sell their services for the guidance of others in their economic, financial, and personal affairs are not liable in the absence of negligence or intentional misconduct.

This rule has been consistently followed in this state with respect to professional services. (Citations omitted).

Those who hire such persons are not justified in expecting infallibility, but can expect only reasonable care and competence. They purchase service, not insurance

The Colorado Court of Appeals in the case of Samuelson v. Chutich, 529 P. 2d 631 (Colo. 1974) first ruled that implied warranty claims were not viable with respect to service contracts. In that case, Veterans Gas and Service, Inc. had installed a gas line to the plaintiff's residence. Several years later, alleged unworkmanlike installation caused an explosion. In refusing to impose liability based upon a warranty theory, the court stated:

We regard it as the better part of wisdom not to extend as a matter of law implied warranties from sales to service contracts. We believe it is the better rule to limit liability to acts of negligence (Citations omitted).

This is the rule of a great majority of courts. (Citations omitted).

Under a doctrine of implied warranties, there could be liability without fault in service contracts. This should not be the court made law in this state. We will just stay with that reliable fellow—the reasonably prudent man.

Any doubt that the reasoning of court in the Samuelson case was intended to be applicable to contracts for professional services was erased by Johnson-Voiland-Archuleta, Inc. v. Roark Associates, 572 P.2d 1220 (Colo. App. 1977). On appeal, the sole contention was that the trial court had erred in ruling that the professional engineering services performed by J-V-A were subject to an implied warranty. In upholding the trial court's ruling, the Court of Appeals stated:

Although there are no Colorado cases dealing specifically with the question of whether professional engineers, in preparing drawings and specifications for construction projects, impliedly warrant that such plans and specifications are fit for their intended use, in Samuelson v. Chutich, 187 Colo.155, 529 P.2d 631, 633 (1974), the Colorado Supreme Court

enunciated the general rule that the doctrine of implied warranties is not applicable to service contracts

Accordingly, since plaintiff's claim, against the defendant was clearly based on the performance of professional engineering services and not on a sale of goods, under the mandate of Samuelson v. Chutich, *supra*, the trial court was correct in concluding that the professional engineering services performed by plaintiff for the defendants were not subject to any implied warranty. The performance of the reasonably prudent engineer remains the standard for imposing liability. A cause of action claiming a right to recover based on an implied warranty is not viable in Colorado.

Thus, my respect for Scott's opinions notwithstanding, I remain steadfast in the position that absent overriding circumstances, the implied warranty instruction (i.e. CJI Civil 4th 15:4) should be given. An example of a circumstance that might trump the right to the instruction is a situation in which the engineer has entered into a contract that guarantees a particular result or otherwise modifies the standard of care. This is the very reason that we have been so vigilant to weed out attempts to contractually modify the standard of care.

With increasing frequency, owners are insisting upon contract language that alters the yardstick by which the engineer's performance will be judged. Such language takes a wide variety of forms. It may require the engineer to perform consistent with the "highest" professional standards, perform in a manner "consistent with nationally recognized firms with specialized expertise" or in some other manner attempt to elevate the required standard of care. Where such language is employed, the engineer may be liable for breach of contract despite having complied with the standard of care imposed by the law as it would be applied absent a contractual modification. It should be noted that coverage under the engineers professional liability insurance might be jeopardized by a contractually elevated standard of care. In insurance terms, this increased exposure is "liability assumed by contract" and is generally uninsurable absent a specific policy endorsement.

The customary standard of care may also be modified by contract language requiring that a specific result be achieved. Where such language is agreed to by contract, there may be no right to an instruction such as 15:4. As discussed above, the majority rule in the United States, and the rule in Colorado is that professional services are not accompanied by an implied warranty. Contracts that employ such words as "ensure", "guarantee", "warrant", "achieve" and similar variants may be held to elevate the standard of care and create an express warranty. Such language can trump the implied warranty jury instruction. Otherwise, an engineer should generally be entitled to Instruction 15:4 or another instruction that in some way informs the jury that there is no implied warranty accompanying the engineers services.

In response to owners' attempts to elevate the standard of care and include warranty type language, engineers must continue to guard against efforts to incorporate contract provisions that define away the ordinary standard of care and impose express or implied warranties.

Should the Task Force Adopt An "Official" Definition?

10

An "official" definition of the standard of care by the Task Force would likely as often be a sword as a shield. Thus, I agree with Scott that adoption of an official definition should be approached with substantial caution. As both Scott and I agree, the stock jury instructions, while guides, must be applied with care and caution and when approached by competent, experienced lawyer on both sides of the case will usually be modified as dictated by the facts of the case. Nonetheless, I do believe there are ways in which the Task Force can address the matter of a definition that will make it clear that each situation is different. As Instruction 15:26 makes clear, the engineer must in each situation be judged based upon what other engineers would have done "at the same time under the same or similar circumstances."

The Wyoming Instruction

As stated in my memo, I included the sample Wyoming instruction as an example of the manner in which courts sometimes merge and modify instructions to include more than one concept. I agree with Scott that it is not a perfect instruction. Nor is it one that I would suggest to the Task Force as a guide for development of a standard of care definition. If my memo was not clear as to the purpose for including it, I apologize and thank Scott for his comments and clarifications.

Please let me know if I can provide further information or additional clarification.

Regards, Byrum Lee

Peter Monroe

From: Denver E-Mail [denver@monroe-newell.com]
 Sent: Friday, August 12, 2005 3:32 PM
 To: Peter Monroe
 Subject: FW: Further to the Standard of Care

-----Original Message-----

From: Scott F. Sullan [mailto:ssullan@vsss.com]
 Sent: Friday, August 12, 2005 11:10 AM
 To: bcl@lee-law.com; Peter Monroe
 Cc: Phil Cardi
 Subject: RE: Further to the Standard of Care

Peter:

I know I am in trouble when Byrum starts quoting from Ecclesiasticus and George Bernard Shaw!

I have the greatest respect for Byrum and his ability to argue legal issues in a light most favorable to his client base. I suspect that his views on the "guaranteed outcome" issue are received with some favor at the Engineering Board. However, it should be readily apparent from the complicated legal analysis put forth by Byrum that these are matters for the Courts, not for the Engineering Board to decide. More importantly, the issue relating to "guaranteed outcome" is far removed from the simple definition of standard of care that you originally asked about. It seems to me that the issue is simply whether or not you are going to incorporate Jury Instruction 15:26 into the ethical rules for engineers. As Byrum and I agree, at least I think we do, that instruction is not cast in stone and must be viewed in light of the applicable facts and the law in any given case. However, once adopted in your ethical rules, it will lose the flexibility that is available in a judicial forum. While not so eloquent as Byrum, I think this might be covered by the old adage "be careful what you wish for, you just might get it".

Scott F. Sullan

-----Original Message-----

From: Byrum Lee [mailto:bcl@lee-law.com]
 Sent: Wednesday, August 10, 2005 10:31 AM
 To: Peter Monroe
 Cc: Scott F. Sullan; Phil Cardi
 Subject: Further to the Standard of Care

Miss not the discourse of the elders.
 Ecclesiasticus viii. 9.

You are undoubtedly gettin gmore than you bargained for, but, for further "discourse" see attached.

Byrum Lee

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FW Further to the Standard of Care

From: Peter Monroe [pmonroe@monroe-newell.com]
Sent: Monday, August 15, 2005 9:12 PM
To: dgallen@monroe-newell.com
Subject: FW: Further to the Standard of Care

-----Original Message-----

From: Denver E-Mail [mailto:denver@monroe-newell.com]
Sent: Monday, August 15, 2005 9:12 AM
To: Peter Monroe
Subject: FW: Further to the Standard of Care

-----Original Message-----

From: Cardi, Philip [mailto:PCardi@jacksonkelly.com]
Sent: Monday, August 15, 2005 8:35 AM
To: Peter Monroe
Cc: bcl@lee-law.com; Scott Sullan
Subject: RE: Further to the Standard of Care

Peter:

Like Byrum and Scott, I am pleased to offer my thoughts on a definition of the standard of care as it may be applied to engineers and surveyors. Having read the responses of both, I certainly agree with both Byrum and Scott that the most reliable definition of the standard of care is the definition found in Colorado's Pattern Jury Instructions, 15:26. I also agree with Byrum's other comments, including those regarding the absence of any warranty of a result. I disagree with Scott's comments on that issue, but a debate of that issue is not necessary here.

That said, and with all due respect, I would caution the Task Force that anything that it or the State Board adopts along the lines of a definition could create a very real risk to licensees who find themselves in civil suits for damages. Courts and juries, having no expertise in engineering, surveying, or construction, can easily misinterpret and possibly misapply the Board's policies and rules, including any definitions therein. That is especially true when expert witnesses act as advocates, and lead courts and juries in the wrong direction. For that reason, I hope the Board is very careful before adopting any definition of the standard of care, and if it is believed absolutely necessary, to adopt that definition set forth in 15:26 as quoted in Byrum's and Scott's materials.

Thanks again for the opportunity to address this issue.

Philip Cardi
303-390-0007

-----Original Message-----

From: Byrum Lee [mailto:bcl@lee-law.com]
Sent: Wednesday, August 10, 2005 10:31 AM
To: Peter Monroe
Cc: Scott Sullan; Phil Cardi
Subject: Further to the Standard of Care

Miss not the discourse of the elders.
Ecclesiasticus viii. 9.

You are undoubtedly gettin gmore than you bargained for, but, for further

John D. Nelson, Ph.D., P.E.

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August 17, 2005

Mr. Peter D. Monroe
Monroe & Newell Engineers, Inc.
70 Benchmark Road, Suite 204
P.O. Box 1597
Avon, CO 81620

Subject: Standard of Care for Engineers and Other Technical Personnel

Dear Peter:

Having read the letters by Scott Sullan, Byrum Lee, and Phil Cardi, I would like to make the following comments. I appreciate their thoughts and their knowledge on the subject. However, as one would expect they are approaching it from a legal stand point, which is the direction from which one needs to approach it for purposes of trial. However, there are some "engineering" considerations that need to be addressed.

The "standard of care" differs in many instances from the "standard of practice". The standard of practice represents what everyone else is doing even if it is not consistent with the state of knowledge in the field. The standard of care represents what a reasonable and prudent engineer should do consistent with the state of knowledge (as opposed to the state of the art). Although the standard of care includes following the codes and standards, some areas of our profession are not very heavily "codified". Geotechnical engineering is a perfect example of that. In that case the engineers must rely on the advancement of the field through published works, such as technical papers, theses, presentations, etc. to maintain the standard of care.

The standard of care for an engineer or non-engineer doing technical work (e.g., construction, manufacturing, etc.) should represent the state of knowledge in the field. Our committee has adopted a proposed rule change that speaks to the fact that an engineer should be ethical and knowledgeable about his/her field. If an engineer does not keep up with the progression of knowledge in his/her field, they cannot assume that as long as they are doing what other engineers are doing, they are following the standard of care.

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M & N ENGINEERS

Mr. Peter D. Monroe

August 17, 2005

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In considering our suggestions regarding the standard of care, we should not tie it in with "what an engineer doing in the field in that area would have done at that time". Not to beat a dead horse, but there are some practices of our profession in the Front Range area that do not meet the standard of care, and to relate the standard of care to what everyone else is doing would be a big error.

Very truly yours,



John D. Nelson

P E 12422