Plan Preparation and Plan Check Guidelines

A Reference for Project Owners, Design Professionals and Public Agencies

American Society of Civil Engineers

Orange County Branch

Approved by the Board of Directors

Orange County Branch

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ACKNOWLEDGEMENT

These guidelines were developed by a task force established in 1990 by, and under the direction of, the ASCE Orange County Branch Professional Practices Committee with the participation of the City Engineers Association.

The information gathered by the Task Force was collected in Orange County and is considered to be representative of Orange County and applicable to Orange County. The Task Force also believes that the guidelines may have application in other areas of Southern California and perhaps nationally.

The Guidelines are intended to apply to infrastructure projects such as highways, bridges, streets, traffic signals, storm drains, water utilities, sewer facilities, and flood control facilities which, following construction, will either be owned by a public agency or will remain private, but serve a community purpose.

The Guidelines offer constructive suggestions to all three parties to the plan preparation and plan check process: owner, design professional, and public agency. The focus is on teamwork between the three participants.

On June 23, 1992 the ASCE Orange County Branch Board of Directors approved the Guidelines and adopted a policy to seek future widespread use of the Guidelines by public agencies, design professionals, and developers in Orange County.

Special thanks to the Task Force members who volunteered their time and effort to serve the profession and the community.

Terry Hartman, VanDell and Associates
Dick Hoffstadt, City of Newport Beach
Steve Huff, Robert Bein, William Frost and Associates
Jerry Otteson, City of Tustin
Dayne Stiles, The Irvine Company
Ron Wallin, City of Fullerton
Jim Williams, County of Orange
Ben Yamada, BSI Consultants

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Neil Morrison, chairman (1990 and 1991)
Allan Yourman, chairman (1992)

and to the Presidents of the Orange County City Engineers Association

Don Webb, president (1990)
Bill Cameron, president (1991)
Bob Hodson, president (1992).

Plan Preparation and Plan Check Guidelines

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Plan Preparation and Plan Check Guidelines

Part I. Executive Summary

There are three participants in the plan preparation and plan check process: owner/developer, design professional, and public agency. They are mutually dependent and teamwork is required between the participants in order to make the process work most effectively.

The time required for plan check of public works projects is a major concern to all three participants and there is wide-spread belief that the process can be made more efficient. These Guidelines have been prepared to enhance the plan preparation and plan check process. The Guidelines recognize that teamwork among the three participants is essential and recommend enhancements that each of the three participants can adopt to improve the process.

These Guidelines were developed by a Task Force of the Professional Practices Committee of the Orange County Branch of the American Society of Civil Engineers. The inspiration for the Guidelines arose from a general membership meeting on plan preparation and plan check sponsored by the Professional Practices Committee. The need for the Guidelines was evident from many discussions on the topic and was confirmed by a survey of many public agencies in Orange County.

The Guidelines fulfill the goal given to the Task Force by the Professional Practices Committee:

> Develop plan-preparation and plan-check guidelines for public-private infrastructure projects, acceptable for use by a wide spectrum of both public and private sector, which will facilitate the plan-check process and reduce the number of plan-check cycles.

The goal limits the Guidelines to public and private infrastructure projects (such as highways, bridges, streets, traffic signals, storm drains, water utilities, sewer facilities, and flood control facilities) which, following construction, will either be owned by a public agency or will remain private but serve a community purpose (as opposed to a single owner). The area of interest includes both facilities funded and constructed by a developer, and facilities funded and constructed by a public agency but designed by a private sector design professional under contract to the public agency. Thus, the Guidelines do not include other types of plan preparation and plan checking such as buildings, geotechnical, or surveying. However, it is anticipated that these Guidelines may be useful in such areas.

The Guidelines are applicable to the county, cities, special districts and units of state government, and hence use the general term "public agencies" for these entities.

The Guidelines are intended to be complimentary and supplementary to Quality in the Constructed Project, ASCE Manual and Report on Engineering Practice No. 73. Quality in the Constructed Project deals with the entire broad spectrum of quality beginning with the scoping of the project by the owner and extending through construction to the completed project. These Guidelines focus on the relationships between plan-preparation and plan-checking and develop recommendations to make that process more effective.

The Guidelines consist of three parts: (l) Executive Summary, (2) the Plan Preparation and Plan Check Guidelines and (3) Appendix. Part 2 is in the form of short bullet statements describing actions by the three players which will enhance the plan preparation and plan check process, supported by six exhibits: role statements and role-process matrix for each participant, a generic checklist intended to assist the design professional and plan checker, and references on Responsible Charge, Quality Assurance/Quality Control and Qualifications Based Selection. An Appendix provides background on the problems and solutions considered by the Task Force and the philosophies which influenced the development of the Guidelines.

It is not possible to develop guidelines adoptable in total by all public agencies, design professionals, and owner/developers. Therefore, the Guidelines are in a general form setting forth suggestions and recommendations.

The Guidelines have been approved by the Board of Directors of the ASCE Orange County Branch. Their adoption and use is recommended to public agencies, design professionals, owner/developers, professional and trade organizations. It is the objective and hope of the ASCE Orange County Branch that all public agencies, design professionals, and owners/developers in the local area will use these guidelines in order to provide a more rational, predictable, and efficient process for plan preparation and plan review.

Individual owners, design professionals, and public agencies will gain from the use of these Guidelines. However, far greater benefit will result if the Guidelines are widely used by the majority of owners, design professionals and public agencies. In order to enhance the synergism that will result from widespread use of the Guidelines, the following support is requested of owners, professional organizations, design professionals, and public agencies.

Professional organizations:

- Adopt in principle and urge members to use these Guidelines.

Owners (Developers):

- adopt in principle
- select design professionals using Qualifications Based Selection (QBS)
- use these Guidelines in managing design activities

Design professionals

- adopt in principle
- encourage QBS by Owners (Developers)
- establish a Quality Assurance/Quality Control process
- use these guidelines in developing the project design and preparing plans

Public Agencies

- adopt in principle
- Develop a plan check process and plan check manual consistent with these Guidelines.

Where all three parties to the process (public agency, design professional, and owner/developer) make use of the guidelines, a reasonable goal is that 90% of the projects should be completed in three plan-check cycles or less.

These Guidelines are not a textbook or substitute for engineering knowledge, experience, or judgment and are neither intended, nor establish, a legal standard of ordinary care for these functions.

Part II. Plan Preparation and Plan Check Guidelines.

1. Introduction

Implementation of these guidelines will facilitate the plan preparation and plan check process and, if followed, should result in 90% of submittals being completed in 3 cycles or less.

ASCE and others describe three participants in the classic building process: owner, design professional, and builder (constructor). In the classic building process the owner retains a design professional to design a facility and the owner contracts with a builder to construct the facility in accordance with the design professional's plans.

A more specialized terminology is used herein that fits better with the portion of the building process which is the subject of these guidelines. The term "owner" does not fit well because ownership changes in the course of the process of subdivision and dedication of public facilities to a public agency. Therefore "owner" is not used and "developer" is substituted. The term "design professional" is consistent with terminology of the classic building process. The term "plan-checker" is used for the third participant. "Public agency" was first considered as the term for the third participant because the third participant is always a public agency (or a private engineer contracting with public agency to provide plan-check services). However, in some circumstances the public agency may participate in all three roles and the mixing of three roles may cause confusion. Therefore the term "plan-checker" was used for the third participant, except where "public agency" can be used with no ambiguity. As indicated above, the "plan-checker" is always a public agency or its contractor.

2. Key Elements of Successful Plan Preparation and Plan Check Process.

a. Role Statements. A detailed Role Statement has been developed for design professional, plan checker and owner and is included as Exhibit A. Exhibit B is a process-oriented matrix of roles. The Role Statement is central to the process and contains many recommendations to developer, design professional, and plan checker. The process works best if each participant understands their role and the role of the other participants. Each participant should understand their role, the other participants role, and put policies in place to support and reinforce their roles. As an early step in each project, the three participants should agree on their roles by concurring with the roles provided in Exhibit A or alternative roles.

b. Checklist. A sample checklist is included for use by design professional and plan checker. The checklist is intended to determine whether a set of plans submitted for plan check is complete and is also intended to assist the preparation and checking of the plans. The public agency should furnish the checklist to the design professional at a preliminary meeting with a requirement that the design professional submit the completed (and signed) checklist with the plan submittal. The checklist is included as Exhibit C.

c. Participation in Tentative Map Process. The unit of the public agency responsible for plan checking must be involved in the tentative subdivision map process and formulate and recommend tentative map conditions of approval. The plan check process for subdivisions is greatly facilitated if major issues are resolved during the tentative subdivision map process. A screen check should resolve major issues and avoid tentative map conditions of approval that require the future resolution of major issues during preparation of improvement plans.

d. Communication. Communication was identified as one of the most important factors in effective plan preparation and plan checking. It was noted that smaller public agencies appear to be more effective communicators than large public agencies, primarily because the small public agency often speaks with a single voice whereas the large public agency often speaks with multiple voices.

Each public agency should have a central point of contact.

To facilitate communication, the process could include a requirement for:

- Pre-design meeting to review project concepts and the plan preparation and plan check process. Also to establish contact people responsible for the project from the public agency, design professional and owner/developer.

- Submittals delivered by design professional (rather than messenger) and a cursory review by the plan checker to immediately determine adequacy of submittal.

- If the process is not complete after the third plan check, the participants should meet at the management level to identify and seek to resolve outstanding issues, or consider alternatives.

e. Resolution of conflicting comments. One of the most commonly expressed concerns is the difficulty in resolving conflicting comments made by multiple departments of a single public agency. The process is facilitated when public agencies designate a person with the role and authority to resolve conflicting comments after conflict identification by the design professional. The design professional can best identify conflicting requirements because the design professional has the opportunity to modify the design to serve multiple purposes, and the design professional is best able to recognize when a design modification is not a practical response to different public agency comments. After the design professional has identified a conflict, the conflict should be presented to the public agency lead department who should provide leadership in resolution of conflicting comments.

f. Responsible Charge. Design professional and other project participants should have a clear understanding of the meaning of in-responsible-charge. A reference that sets forth some definitions is included as Exhibit D.

g. Quality Assurance/Quality Control (QA/QC) Plan. For major projects each owner/developer should require the design professional to have a QA/QC plan specific to the project. Exhibit E provides sample criteria for a QA/QC plan.

h. Qualifications Based Selection (QBS). One of the most important steps in producing a quality product is the selection of a quality design professional. ASCE has recognized the importance of selection in their publication "Quality in the Construction Project". QBS is the law (Government Code 4525 et. seq.) for selection of design professionals by public agencies. While not a legal requirement for owners/developers, QBS makes sense for owners/developers also and should be a key ingredient for an enhanced plan preparation and plan check process. Design professionals should be selected by developers using Qualifications Based Selection procedures rather than on the basis of price. A two-step process is recommended: (1) selection on the basis of qualifications, (2) negotiation of a fair and reasonable price. QBS by owner/developer should be encouraged by the public agency. Exhibit F provides references for additional background on QBS.

h. Fee structure. The public agency's plan-check fee structure should be designed to encourage quality work by the design professional. An hourly fee is recommended or a fixed fee for a specified number of plan-check cycles followed by an hourly fee. Further details are provided in paragraph 8 of the Appendix.

3. Exhibits

The following exhibits are included.

Exhibit A - Role Statement. The roles of developer, design professional, and plan checker are defined and a number of recommendations are included in the Role Statement.

Exhibit B - Role Statement Matrix. The role-process matrix is an abbreviated version of the role statement reconfigured into a process-related matrix.

Exhibit C - Plan Preparation Checklist. The model checklist is intended to assist the design professional and plan checker to determine when the plans are complete and is also intended to provide additional detail to assist the design professional in the preparation of the plans and/or to assist the less experienced plan checker.

Exhibit D - Responsible Charge. This exhibit provides a general description and summary of being in "responsible charge" for a project.

Exhibit E - Quality Assurance/Quality Control. This exhibit is intended to provide a generic QA/QC framework which may be customized for a specific project.

Exhibit F - References for Qualifications Based Selection. References are provided for additional information on QBS.

EXHIBIT A

Role Statements

Exhibit A

Role Statements

Roles are emphasized in these guidelines because understanding of roles is central to the success of the process. The roles of each player in the process are described with the intent that the process will work better if each player understands their roles and the roles of each other player in the process. Each role is described in a broad sense. A number of activities may be needed for carrying out each role. Activities are further identified in a model checklist (Exhibit C).

The roles of developer, design professional and plan checker assume that the developer initiates and funds the project; developer retains a design professional; design professional prepares plans, specifications and estimates; developer constructs (or contracts to construct) the facility; and developer dedicates the completed facility to a public agency or homeowner's association. The facility is designed and constructed to public agency standards and the public agency checks the work in anticipation of accepting the completed facility and operating and maintaining the facility for the benefit of the public or as the advocate of a homeowners association that will own and maintain the facility.

A source of potential confusion is the lack of recognition of the several roles which the public agency may play. In addition to the plan-checker role herein, the public agency may fund the project in which case it also has the role of the developer. In publicly funded projects, the public agency may sometimes also be the design professional. Since the three roles are distinctly different, it is very important that the public agency and its assigned staff members understand the role (or roles) the public agency is playing for that specific project. Otherwise, public agency staff experienced in the developer and design professional roles may apply those roles to situations where the public agency role is a plan-checker. In that event, misunderstandings, communication problems or conflict are a probable result.

Depending upon the organization of the particular public agency, the public agency may also have the role of the building official: that role is not described herein.

A. Roles of the developer (owner or client in classic terminology).

Extent of developer's direct role may vary depending upon magnitude of project and level of developer's expertise. Developer may delegate to the design professional some of the developer's roles.

- Select and retain a qualified, experienced design professional.

- Establish realistic, achievable schedules for the project, including plan review.

- Define and communicate realistic goals, design objectives, budget considerations and key criteria for the project.

- Ensure coordination with other project elements or design professionals being directed by developer.

- Verify that the design is practical, cost effective, and other reasonable alternatives have been considered.

- Prior to the initial plan-check submittal, review plans with the design professional for general conformance to project goals, completeness and to discuss design issues and the plan check process.

- At conclusion of each plan review, obtain a briefing from the design professional regarding the general nature and extent of plan review comments, any major issues requiring direction from developer and estimated time-frame for corrections and re-submittal.

- Work closely with the design professional during the plan review process to resolve issues, evaluate alternatives and provide timely direction to facilitate the approval process. Participate directly in a meeting with the design professional and public agency representative to understand major issues, implications and decisions required.

- When multiple agencies are involved in reviewing the project design, developer should participate in a joint meeting if conflicting requirements are identified which require resolution between the agencies or changes to the design proposal.

- Enter into agreements for non-standard improvements or other private improvements within public easements or right-of-way.

- Provide financing for the project.

- Construct, or contract to construct, the improvements in accordance with plans signed by the design professional and approved by the plan-checker.

- Provide direction to the construction contractor, with the advice of design professional, in the event of incomplete plans, plans not representing field conditions, or plan errors.

B. Roles of the design professional.

- Serve interest of the developer (client).

- Safeguard life, health, property, and public welfare pursuant to the practice of civil engineering as defined in the Professional Engineers Act.

- Be in responsible charge as defined by the Professional Engineers Act. Identify the design professional from the firm who will be in responsible charge and who will sign the plans.

- Find out the public agency's criteria and approval process early in the project design.

- Assist in establishing a clear understanding of the project description and requirements with the owner/client and reviewing public agencies.

- Obtain copy of tentative tract map and conditions of approval and integrate with design.

- Obtain developer and public agency approval of all design concepts and deviations from standards before investing substantial time in preparation of plans.

- Identify and assist in resolution of conflicting needs between public agencies and utilities or between different public agencies early in the design process.

- Select and assign competent professional and technical staff suited to the scope-of-work for the project.

- Provide consistent direction and overview to the design team.

- Communicate with public agency staff on a regular basis to resolve questions, comments and concerns that arise during the design and plan-check process. Provide meeting minutes and other documentation for resolution of project issues.

- Consider other reasonable alternatives and evaluate small variances in criteria for their impact on such results as economics, or environmental impact.

- Identify problems, issues, opportunities and constraints that are beyond the contract scope-of-work and recommend solutions or changes in the scope of work to benefit the project.

- Develop practical and cost-effective designs, buildable plans and clear specifications in accordance with good engineering practice, the standard of ordinary care and complying with public agency standards.

- Prepare plans that are complete and clear enough to minimize disputes with the contractor and minimize contract change orders.

- Be responsible for the quality of the design. Provide appropriate internal quality assurance and quality control prior to plan submittal to the public agency (independent review, in-house plan check, etc., and conformance with an established quality management plan).

- Review and interpret plan-check comments from public agency and revise plans as appropriate. Respond to each comment and follow up on suggestions. Identify where comments from different departments of the public agency cannot be resolved by design changes.

- Sign the plans and stamp (or seal) with the expiration date attesting responsible charge under the Professional Engineers Act.

- Be responsible for cost arising out of errors and omissions in preparation of plans and specifications.

C. Roles of the plan-checker (public agency or contract plan-checker).

- On behalf of the public, protect health, safety and public welfare.

- Establish and maintain public agency design and maintenance criteria and standards and make them available on request to the design professional.

- Provide guidelines for the circumstances when deviations from standards may be considered, what supporting documentation is needed, and who will approve requested deviations.

- Develop a written plan-check procedure and make the procedure available to design professionals. The procedure should encourage quality work by the design professional and facilitate an efficient design process.

- Establish an appropriate level of service to be provided, provide desk procedures for plan check service, recruit and train personnel appropriate to that level of service and/or obtain the necessary technical resource by contracting with the private sector.

- Provide supervision to public agency staff required to ensure consistent, quality plan-check.

- Provide goals for plan-check turnaround time, either general or specific to each project. Use best efforts to achieve turn-around goals.

- For major projects provide an opportunity and encourage pre-design and pre-submittal meetings with the design professional.

- Consider establishing different standardized levels of plan-checking which may be selected depending on the circumstances of a specific project. If different standardized levels of checking have been established, select a level of checking appropriate to each specific project. Check to the selected level of detail. Increase level of detail as needed if plans are incomplete or lacking in sufficient quality.

- Within the selected level of checking, provide a complete plan review. Maintain continuity through multiple plan-check steps. Where possible, use same plan checker and/or supervision. Use best efforts to minimize situations where subsequent reviews raise new issues.

- Review submittal for completeness, design concepts and details, public agency liability exposure, conformance with public agency design criteria and standards, conditions of approval, and all other development conditions.

- Track status of the plan check process. At a minimum each submittal should be logged in, referrals to other departments should be logged in and out, and returns to the design professional logged.

  If the plans are checked by several departments, consider creating a master set of check prints to facilitate communication with the design professional.

- Following plan check, meet with the design professional designated as the engineer in responsible charge.

  Provide comments to design professional in a format which is consistent and clearly communicates questions or concerns. Comments should be responsible and professional and should facilitate a professional relationship between design professional and plan checker.

- Resolve conflicting comments made by multiple departments of the plan checking agency.

- Define under what circumstances issues unresolved by multiple checks will be elevated for resolution.

- Sign the plans acknowledging the plans have been reviewed for general conformance with public agency design criteria and conditions.

D. Roles that the players in the design and plan-check process should not undertake.

- The design professional should not intentionally use the plan-checker as either a surrogate designer or a quality control program by submitting incomplete plans.

- The design professional should not knowingly submit incomplete plans for the purpose of meeting client schedules, or getting in queue for plan checking.

- The plan-checker should not seek to play the role of the design professional and should recognize there are many satisfactory ways to design a project. However, while carrying out the roles of the plan-checker, the plan-checker may observe that more practical, cost-effective designs are possible and may offer suggestions to the design professional.

EXHIBIT B

Role Statement Matrix

PLAN PREPARATION AND REVIEW PROCESS FOR PUBLIC INFRASTRUCTURE PROJECTS - ROLE OF PARTICIPANTS

Participant/ Project Phase	Predesign	Design - Plan Preparation	Plan Review
PLAN CHECKER (Public Agency)	• Establish Standards for Design and Plans • Establish Procedures for Plan Review • Provide Check Lists for Plan Processing • Establish a Precedence of Design Controls, Such as Ordinances, Standards, Design Manuals, etc. • Predesign Meeting with Design Professional including Plan Review Requirements and Process	• Provide Goals for Plan Check Turnaround • Discuss Deviations from Standards and Required Documentation • Maintain Ongoing Project Review Meetings	• Review Plan Submittal for Completeness Prior to Acceptance (Counter check) • Provide a Timely Plan Check • Review Plans for Design Concepts,Details, and Conformance with Criteria and Standards • Review Plans for Conformance with Conditions of Approval • Provide Clear and Consistent Review Comments • Coordinate Various Reviewer Comments and Resolve Conflicting Comments • Sign Plans Acknowledging Review
DESIGN PROFESSIONAL (Engineer)	• Clarify Project Goals • Refine Project Scope of Work and Prepare Schedule and Budget • Select and Assign Qualified Technical and Professional Design Staff • Obtain Applicable Standards • Obtain Public Agency Checklists and Plan Preparation Requirements • Prepare Design Program, including Quality Assurance and Quality Control Plan and Design Team Assignments • Formulate Design Criteria	• Discuss Design Alternatives, if Applicable • Provide Consistent Direction and Overview to the Design Team • Identify Deviations from Standards and Conflicting Requirements • Prepare Plans, Specifications, and Cost Estimates in Accordance with Agency Requirements • Confirm Conformance with "Conditions of Approval" • Provide Internal Quality Assurance and Quality Control, including In-House Plan Check • Sign and Seal Complete Plans Attesting Responsible Charge • Ongoing Project Review Meetings with Developer and Agency	• Submit Complete Plans • Identify and Assist in Resolving Conflicting Needs of Agencies, Utilities, etc. • Respond Fully to All Plan Check Comments • Address New or Changed Requirements • Resolve Design Disputes • Deliver Approved Plans to Developer for Construction
DEVELOPER (Owner)	• Establish Project Goals and Design Guidelines • Define Project Scope and Design Program • Retain Qualified Design Professional and Other Design Professionals • Set Realistic Budgets and Achievable Schedules	• Discuss Design Issues and Alternatives • Monitor Design Progress • Ensure Coordination with Other Project Elements and Design Professionals • Review Cost Estimates • Presubmittal Plan Review with Design Professional	• Identify and Discuss Design Issues Resulting from Plan Review • Review Plans for Conformance to Project Goals and Design Guidelines • Provide Direction to Resolve Issues in the Plan Approval Process • Enter into Agreements for Non-Standard Improvements or other Private Improvements within Public Easements or Right-of-Way

EXHIBIT C

Plan Preparation Checklist

PLAN PREPARATION CHECKLIST

Purpose Statement

The primary purpose of the attached checklist is to provide an outline for uniform, comprehensive plan checks. Consistent use of the checklist should substantially reduce the total time required to review and comment on submittals. This checklist is intended to be a supplement to published design criteria that is available from the public agency. The design professional is required to obtain this published design criteria prior to commencing engineering design. The design professional shall contact the public agency if any deviations from design standards or if any interpretations of design criteria are needed.

The goal of this checklist is to minimize the number of plan checks by providing a detailed and consistent review of format and content of plan submittals as part of the first check. To make the process work, this checklist must be attached to the plans submitted for public agency review. The public agency will return the checklist with the check prints with any comments noted.

Use of Checklist

Certain items are underlined to indicate that public agency revisions may be needed to conform to that public agency's specific requirements.

PLAN PREPARATION CHECKLIST

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YES NO N/A

PLAN PREPARATION CHECKLIST

I. *General Requirements*

___ ___ ___ A. Plans conform to public agency conditions of approval (if not, return plans without further review)

___ ___ ___ B. Verify requirements of Public Agency for electronic submittal.

___ ___ ___ C. Horizontal and vertical alignment conform to public agency geometric design standards, such as: sight distance, minimum centerline radii, minimum and maximum street grades, vertical curve lengths, intersecting street offsets, intersecting street angles, length of tangent between reverse curves, superelevation requirements, etc.

___ ___ ___ D. All sheets signed and properly sealed by the Engineer in responsible charge.

___ ___ ___ E. All sheets prepared in ink on sheets of standard size as determined by the Agency.

___ ___ ___ F. All sheets numbered consecutively, "Sheet ___ of ___", in the lower right corner.

___ ___ ___ G. All plans drawn to a scale of 1" = 40', 1" = 20', or other approved scales. Graphic scale shall be placed on all sheets.

___ ___ ___ H. All lettering 1/10" minimum.

___ ___ ___ I. North arrows should point to top or right of sheet, if possible.

___ ___ ___ J. All stationing shall refer to centerline of street unless otherwise noted and shall increase left to right, and run upstation from south to north or west to east. No negative stationing allowed.

___ ___ ___ 1. Stationing has preference over north arrow.

___ ___ ___ 2. All streets have continuous stationing and shall be consistent with, or continue, prior (existing) street stationing, if applicable.

YES	NO	N/A		
___	___	___		3. Public agency project number shown in lower right hand corner of all sheets.
___	___	___	K.	Construction notes shall be designated by <u>circles</u>.
___	___	___	L.	Curve data shall be designated by <u>hexagons</u>.
___	___	___	M.	Construction removals shall be designated by <u>squares</u>.
___	___	___	N.	Plan revisions indicated by <u>triangle</u> with cloud around revision.
			II.	***Title Sheet*** - The Title Sheet shall include:
___	___	___	A.	Project location on vicinity map.
___	___	___	B.	Index map showing the following:
___	___	___		1. Street configuration within project limits.
___	___	___		2. Lot configurations.
___	___	___		3. Tract boundary.
___	___	___		4. Street names/street signs.
___	___	___		5. Index of sheets.
___	___	___		6. City limit lines, if contiguous to tract.
___	___	___		7. North arrow.
___	___	___		8. Scale.
___	___	___		9. <u>Street lights, if requested.</u>
___	___	___		10. <u>Sewer, water and storm drain improvements (existing and proposed), if requested</u>.
___	___	___	C.	Basis of bearings.
___	___	___	D.	Benchmark - O.C.S. City BM description, date (year of adjustment), and full elevation to three decimal places.

Plan Check Checklist

YES	NO	N/A		
___	___	___	E.	Engineering firm name, address, telephone number, date plans prepared, seal, signature, registration number and expiration date of responsible Engineer registered by the State of California.
___	___	___	F.	Soils engineer firm name, address, telephone number.
___	___	___	G.	Archeologist/Paleontologist firm name, address and telephone number, if applicable.
___	___	___	H.	Public agency name, address, telephone number and contact name.
___	___	___	I.	Developer/owner name, address and telephone number.
___	___	___	J.	Title block containing tract number and tentative tract number, if applicable; otherwise, give street name and limits of improvements.
___	___	___	K.	Water district approval, if applicable.
___	___	___	L.	Sewer district approval, if applicable.
___	___	___	M.	Fire marshal approval, if applicable.
___	___	___	N	Other agency approvals as may be required.
___	___	___	O.	Utility company contacts and phone numbers.
___	___	___	P.	Revision Block.
___	___	___	Q.	General notes.
___	___	___	R.	Separate individual sheet index listing all sheet descriptions.
___	___	___	S.	Underground Service Alert (USA) statement

YES	NO	N/A		
			III.	***Detail Sheet(s)***
___	___	___	A.	Typical sections showing:
___	___	___		1. All geometric dimensions.
___	___	___		2. Existing pavement to be joined or removed.
___	___	___		3. Level line from centerline crown to top of curb with vertical dimension. Cross-fall rates shall also be shown.
___	___	___		4. Structural section to be determined in accordance with public agency Standards. However, figures should be omitted until recommendation in the soils report has been accepted.
___	___	___		5. Parkway and sidewalk widths in accordance with public agency Standards.
___	___	___		6. Rough grading lines, if applicable.
___	___	___	B.	Listing of construction notes.
___	___	___	C.	Construction details not included in standard drawings.
___	___	___	D.	Street intersection details at 1"=10' or 1"=20' showing 0.1 foot design elevations in a grid @ 10' on center with contours.
___	___	___	E.	Street name sign schedule, if applicable.
___	___	___	F.	Summary of quantities.
___	___	___	G.	Miscellaneous details as needed to delineate construction.
			IV.	***Grading Plans***
___	___	___	A.	Grading plans in conformance with the design standards identified in the Orange County Grading Manual and Grading and Excavation Code. Examples of design requirements to be met would include: maximum/minimum slope ratio; minimum slopes for swales, erosion control, etc.

YES	NO	N/A		
___	___	___	B.	Soils Report completed as stated in the Grading Manual or Ordinance.
			V.	***Drainage Plans and Hydrology***
___	___	___	A.	*General*
___	___	___	1.	Criteria utilized for the hydrology and hydraulics shall be as stated in the Hydrology and Design Criteria Manual published by the Orange County Flood Control District, current edition. Frequency of design year storm shall be as stated in the Hydrology Manual.
___	___	___	2.	The use of underground storm drain systems shall be in accordance with the public agency requirements.
___	___	___	3.	Drainage acceptance agreement, if required.
___	___	___	4.	Improvement plans, hydrology and hydraulic calculations sealed and signed by the responsible engineer in charge, registered by the State of California.
___	___	___	B.	*Hydrology Map*
___	___	___	1.	The hydrology map and street plans agree as to the grades and configurations of drainage areas.
___	___	___	2.	The hydrology map is on a topographic map of sufficient scale and quality to allow for readability.
___	___	___	3.	All Q shown (with time of concentration) flowing in the streets. Design year Q to be designated by the public agency.
___	___	___	4.	All street flow confluences shown with their calculations.
___	___	___	5.	All Q approaching, entering and carried over from catch basins shown.
___	___	___	6.	All catch basins identified by numbers or letters as requested by the public agency.

YES	NO	N/A			
—	—	—		7.	All Q entering and leaving the project shown with their time of concentration and verified with legible contours or other adequate means. If previous studies were used, they must be referenced. Need for comparative analysis of interim and ultimate flow rates for off-site drainage to be determined by the public agency.
—	—	—		8.	North arrow and scale shown.
—	—	—		9.	Names or some other designation for all streets in and around the project shown.
—	—	—		10.	Tract number shown, if applicable.
—	—	—		11.	Show storm drains with design year flow rates.
—	—	—		12.	Drainage areas acreage shown.
—	—	—		13.	Initial areas limited to 10 acres with a maximum flow path of 1,000 feet.
—	—	—	C.	*Hydrology Calculations*	
—	—	—		1.	Time of travel, rainfall intensity, runoff coefficient, soil group, allowable flooded width, and catch basin interception requirements in conformance with the current edition of the Hydrology and Design Criteria Manuals published by Orange County Flood Control District.
—	—	—	D.	*Hydraulic Calculations*	
—	—	—		1.	Design criteria for hydraulic calculations and format for presentation of the calculations shall be in conformance with the public agency requirements (i.e. catch basin free board, catch basin interception, use of grate type catch basins and parkway culverts, etc.)
—	—	—	E.	*Storm Drain Improvement Plan Preparation*	
—	—	—		1.	Storm drain alignment, grade and easements in conformance with the public agency requirements (i.e. horizontal location relative to curb, minimum pipe size

YES	NO	N/A		
				and depth of cover, manhole locations and spacing, minimum grades, and velocities, minimum radius, maximum velocities relative to requirements for additional steel clear cover, existing facility abandonment procedures, etc.).
—	—	—	2.	Reinforced Concrete Box (RCB), Reinforced Concrete Channel (RCC) improvement plans, details and reinforcing schedule in conformance with public agency requirements.
—	—	—	3.	Hydraulic grade line plotted on profile.
—	—	—	4.	Prepare hydraulic elements table showing design year storm, Q, Vn, Dn, Dc, Vc, n, Fr, slopes, pipe size, and pertinent stationing and place on each relevant plan sheet.
—	—	—	5.	All storm drain laterals shown in profile.
—	—	—	6.	D-loads for all pipes.
—	—	—	7.	Curve data and bearing for storm drain centerlines.
—	—	—	8.	Pertinent storm drain stationing and equations, including reference to street station at BC, EC, and manholes. Stationing shall increase from downstream to upstream.
—	—	—	9.	Identification of existing facilities showing public agency plan file numbers.
—	—	—	10.	Applicable construction notes.
—	—	—	11.	Catch basin type and sizes including length and height.
—	—	—	12.	Easement lines and widths shown and checked to make sure they conform with easement document and are an adequate width for maintenance as determined by the public agency.

Plan Check Checklist

YES	NO	N/A		
			VI.	***Street Plan and Profile Sheets***
___	___	___	A.	Profile shall be on top half of sheet and include:
___	___	___		1. Centerline profile.
___	___	___		2. Existing ground at centerline (not necessary if site has been mass graded).
___	___	___		3. Top of curb profiles including curb returns. Rate of grade shown on profiles to be based on centerline stationing rather than true length of curves (except for curb returns, cul-de-sacs and knuckles).
___	___	___		4. Scale (horizontal and vertical).
___	___	___		5. Vertical curves, including tangent grades, BVC, EVC, P.I.V.C. station and elevation, and elevations every 25 feet. Indicate resultant design speed of the vertical curve.
___	___	___		6. Elevations on curb returns at ECR and BCR locations and at 1/4 delta points.
___	___	___		7. Limits of superelevation, if applicable. A separate sheet may be required to show actual superelevation diagram.
___	___	___		8. Identification of existing improvements showing public agency plan file numbers, if requested.
___	___	___		9. Utility line crossings and substructures which could interfere with road and other underground construction. (Check potential conflicts and advise if potholing is warranted).
___	___	___		10. Curb height transitions.
___	___	___		11. For pavement widening projects, profile of existing edge of pavement with elevations at a minimum of 50 foot intervals.

Plan Check Checklist

YES	NO	N/A			
___	___	___	B.	Plan View shall include:	
___	___	___		1.	North arrow.
___	___	___		2.	Existing improvements shown (dashed).
___	___	___		3.	Improvements to be constructed.
___	___	___		4.	Approved street names.
___	___	___		5.	Station equations at all intersections.
___	___	___		6.	Stations at each 100 feet marked on all construction centerlines and aligned with profile.
___	___	___		7.	Bearings for all street centerlines. Curve data for all curves.
___	___	___		8.	Existing and proposed utilities, including, but not limited to, valves, manholes, vaults, poles, meters, etc.
___	___	___		9.	Tract number, boundary and lot lines for each adjacent parcel.
___	___	___		10.	Applicable construction notes shown on each sheet.
___	___	___		11.	Match lines clearly shown and referenced.
___	___	___		12.	Identification of all storm drain lines.
___	___	___		13.	Approved street lighting layout, if applicable.
___	___	___		14.	Removals.
___	___	___		15.	Local depression details showing top of curb elevations and curb height and width transitions.
___	___	___		16.	Centerline station reference of all BC's, EC's, PCC's; angle points, etc. in the curb or edge of pavement line.
___	___	___		17.	Identify limits of new paving, old paving, overlay and removal using appropriate shading to delineate areas.

Plan Check Checklist

YES NO N/A

VII. ***Water System Plan and Profile Sheets***

A. *Plan Preparation*

___ ___ ___ 1. Water main alignment, grade and easements in conformance with public agency requirements (i.e. horizontal location relative to curb, minimum pipe size and depth of cover, water valve locations and spacing, location of thrust blocks, hydraulic requirements, existing facilities abandonment procedure, etc.)

___ ___ ___ 2. Water main shown in profile as determined by the public agency.

___ ___ ___ 3. Identify type and class of water main.

___ ___ ___ 4. Curve data and bearing for water main.

___ ___ ___ 5. Pertinent water main stationing and equations including reference to street station at BC's. EC's and valves, etc.

___ ___ ___ 6. Applicable construction notes.

___ ___ ___ 7. Water main parts labeled including fitting types and sizes.

___ ___ ___ 8. Easement lines and widths shown and checked to make sure they conform with easement document and are an adequate width for maintenance as determined by the public agency.

___ ___ ___ 9. Water service laterals and fire hydrant laterals (hydrant spacing as required by the public agency).

___ ___ ___ 10. Separate details as required .

___ ___ ___ 11. Utility crossings identified in profile or reference to crossing elevations in plan view if profile is not required by the public agency.

___ ___ ___ 12. Concrete encasement, if required.

YES NO N/A

VIII. ***Sewer System Plan and Profile Sheets***

A. *Plan Preparation*

___ ___ ___ 1. Sewer main alignment, grade and easements in conformance with public agency requirements (i.e. horizontal location relative to curb, pipe size and allowable depth of flow, depth of cover, manhole locations and spacing, minimum and maximum grades; minimum and maximum velocities; existing facilities abandonment procedure, etc.)

___ ___ ___ 2. Sewer main and manholes shown in profile.

___ ___ ___ 3. Identify type and size of sewer main.

___ ___ ___ 4. Sewer laterals.

___ ___ ___ 5. Pertinent sewer main stationing and equations including reference to street station at BC's. EC's and manhole locations, etc.

___ ___ ___ 6. Applicable construction notes.

___ ___ ___ 7. Easement lines and widths shown and checked to make sure they conform with easement document and are an adequate width for maintenance as determined by the public agency.

___ ___ ___ 8. Separate details as required.

___ ___ ___ 9. Utility crossings identified in profile, with elevations.

___ ___ ___ 10. Concrete encasement if required.

IX. ***Signing/Striping Traffic Control Plans***

___ ___ ___ A. General Notes and Details

___ ___ ___ B. Identify disposition of existing signs (i.e. remain, remove, salvage, etc.).

YES	NO	N/A		
___	___	___	C.	Warning, guide and regulatory signs shall be conformance with the State Standards.
___	___	___	D.	Temporary construction signing and striping in conformance with the most current edition of the Work Area Traffic Control Handbook, OSHA requirements and State Standards.
___	___	___	E.	Striping in conformance with State Standards.
___	___	___	F.	Identification of appropriate State Standard Detail for striping shown (i.e. Detail 9, etc.).
___	___	___	G.	Label turn pocket lengths, flare lengths, transition rates and taper lengths.
___	___	___	H.	Identify BC, EC and angle points in striping consistent with street improvement plans.
___	___	___	I.	Identify type, size and location of street name signs.
___	___	___	J.	Provide detail of non-standard signs that may be needed.
___	___	___	K.	Bikeways, if required, in conformance with the public agency Master Plan of Bikeways.
			X.	***Miscellaneous***
___	___	___	A.	Separate Utility Improvement or Relocation Plans, if requested.
___	___	___	B.	Cross-sections at 50' or 100' intervals for review of pavement widening join conditions and/or earthwork calculations, if requested.
___	___	___	C.	Retaining wall plans and details, if required.
___	___	___	D.	Traffic Signal Plans and details, if required.
___	___	___	E.	Quantity summary and back-up in a format as required by the public agency.
___	___	___	F.	Special Provisions, if applicable.

Plan Check Checklist

YES	NO	N/A		
___	___	___	G.	Cost Estimate, as required by public agency.
___	___	___	H.	All required permits, rights-of-entry, etc. have been obtained.

EXHIBIT D

Responsible Charge

Exhibit D

Responsible Charge

It has been observed that some design professionals who sign the plans do not recognize a duty to be in-responsible-charge. It is also observed that some engineering firms use senior executives, with only a casual knowledge of the plans, to the sign the plans. These situations may arise from a lack of understanding of the term, "responsible charge." This appendix provides background on the meaning of the term.

Responsible charge of work means the independent control and direction, by the use of initiative, skill, and independent judgment, of the investigation or design of professional engineering work or the direct engineering control of such projects (Business and Professions Code 6703).

All civil engineering plans, specifications, reports or documents... shall be signed by the registrant to indicate registrant's responsibility for them. In addition to the signature, all final civil engineering plans, specifications, reports, or documents shall bear the seal or stamp of the registrant (Business and Professions Code 6735).

The courts have supplemented the Professional Engineers Act with the following clarification. "The difference between an engineer who must be registered and a subordinate who need not be registered is responsibility, and a high degree of personal involvement, is required on the part of an engineer who is claimed to be in responsible charge of a project."

Responsible charge has been further clarified by Section 16:404.1 of the California Code of Regulations.

"As used in the Professional Engineers Act, the term "responsible charge" directly relates to the span or degree of control and direction of professional engineering work, and to the engineering decisions which can be made only by a professional engineer.

(a) Span of Control. The span of control necessary to be in responsible charge shall be such that the engineer:

(1) Personally makes engineering decisions, or reviews and approves proposed decisions prior to their implementation, including consideration of alternatives, whenever engineering decisions which could affect the health, safety or welfare of the public are made.

In making engineering decisions, the engineer must be physically present or through the use of communication devices be available in a reasonable period of time.

(2) Judges the qualifications of technical specialists and the validity and applicability of their recommendations before such recommendations are incorporated in the work.

(b) Engineering Decisions. The term "responsible charge" relates to engineering decisions within the purview of the Professional Engineers Act and does not refer to management control in a hierarchy of professional engineers except as each of the individuals in the hierarchy exercises independent engineering judgment and thus responsible charge. It does not refer to such administrative and personnel management functions as accounting, labor relations, performance standards, marketing of service and goal setting. While an engineer may also have such duties in this position, it should not enhance or decrease one's status of being in responsible charge of the work. The phrase does not refer to the concept of financial liability.

Engineering decisions which must be made by and are the responsibility of the engineer in responsible charge are those decisions concerning permanent or temporary work which create a hazard to life, health, property or public welfare, and may include, but are not limited to:

(1) The selection of engineering alternatives to be investigated and the comparison of alternatives for engineering works.

(2) The selection or development of design standards or methods, and materials to be used.

(3) The selection or development of techniques or methods of testing to be used in evaluating materials or completed works, either new or existing.

(4) The review and evaluation of manufacturing, fabrication or construction methods or controls to be used and the evaluation of test results, materials and workmanship insofar as they affect the character and integrity of the completed work.

(5) The development and control of operating and maintenance procedures.

Such engineering decisions are those generally made at the project level or higher.

(c) Responsible Charge Criteria. As a test to evaluate whether an engineer is in responsible charge, the following must be considered: The professional engineer who signs engineering documents must be capable of answering questions asked by equally qualified engineers. These questions would be relevant to the engineering decisions made during the individual's participation in the project, and in sufficient detail to leave little question as

to the engineer's technical knowledge of the work performed. It is not necessary to defend decisions as in an adversary situation, but only to demonstrate that the individual (in responsible charge) made them and possessed sufficient knowledge of the project to make them.

Examples of questions to be answered by the engineer could relate to criteria for design, methods of analysis, methods of manufacture and construction, selection of materials and systems, economics of alternate solutions, and environmental considerations. The individual should be able to clearly define the span or degree of control and how it is exercised both within the organization and geographically and to demonstrate that the engineer is answerable within said span or degree of control."

EXHIBIT E

Quality Assurance/Quality Control

Exhibit E

Quality Assurance/Quality Control

The wording below is believed to be sufficiently generic that it can fit all contracts or projects with work products. It may not fit (or be necessary) in service contracts that do not produce a work product. While it is anticipated that the wording below is directly applicable to design, plan preparation, and project reports, users may wish to develop alternative wording more appropriate to other types of contracts.

The wording below the asterisk line assumes that the owner has contracted with the design professional and is intended to be suitable for inclusion in the contract or scope of work.

Items considered optional are italicized.

* * * * * * * * * * * * * *

Design professional shall prepare a QA/QC plan for the project as described herein. The definition of QA and QC shall be as defined in Quality in the Constructed Project of the American Society of Civil Engineers, first edition (1990).

- "Quality Assurance (QA) comprises all those planned and systematic actions necessary to provide confidence that items are designed and constructed in accordance with applicable standards and as specified by contract."

- "Quality Control (QC) comprises the examination of services provided and work done, together with management and documentation necessary to demonstrate that these services and work meet contractual and regulatory requirements."

A QA/QC program may vary depending on the size and complexity of the project. The comprehensiveness and structure of a QA/QC plan may vary significantly depending on the make-up or corporate structure of each individual firm. Therefore, development of a QA/QC plan has been left up to the design professional subject to the QA/QC plan meeting the following minimum specifications.

1. The QA/QC plan shall be prepared by the design professional and submitted to owner for approval. The submittal shall be an early item of work and shall be an item identified on the project schedule which is to be submitted by design professional.

2. The QA/QC plan shall be specific to the project and may include organizational elements already in place within design professional's organization.

3. The QA/QC plan shall include a preliminary phase, which will identify and resolve known significant issues, shall consider: alternatives, maintainability, environmental requirements, compatibility to future/existing improvements, right-of-way, and public disruption. Also to be considered is the sensitivity of minor changes in criteria on cost

and results. The preliminary phase shall be approved by the owner prior to beginning detailed design.

4. The QA/QC plan shall define design guidelines and identify standards and criteria to be used.

5. The QA/QC plan shall include regular meetings with public agency staff. Minutes of the meetings shall be prepared by the design professional.

6. The QA/QC plan shall identify project milestones, where design professional's work must go through QA/QC process before proceeding to the next milestone. For example, on a bridge PS&E contract the milestones may be to establish geometrics of channel and highway, select bridge type, etc.

7. The QA/QC plan shall establish a time-frame/schedule where project milestones must be coordinated, reviewed or approved by other agencies, utility companies, cities, property owners, etc.

8. *The QA/QC plan shall identify milestones in the design for update of cost estimates and application of corrective strategies if estimated cost exceeds budget.)*

9. The QA/QC plan shall assure a high degree of involvement of the engineer signing the plans and shall insure that the engineer signing the plans meets the definition of "responsible charge" in the Professional Engineers Act.

10. The QA/QC plan shall name a licensed professional engineer responsible for QA/QC. The QA/QC design professional should be a person (or group) outside of the project team in order to ensure an independent review. The quality control person (or group) generally looks at the outgoing plans and typically has no role in receiving comments from the public agency.

11. The QA/QC plan shall assure that submittals are checked, including the following:

    - Verify that criteria and manuals have been followed.

    - Identify proposed deviations from public agency's criteria and manuals.

    - Check structural calculations, hydraulic calculations and alignment calculations.

    - *Verify that quantities are accurate.*

12. If changes introduced by owner and/or public agency requirements in the QA/QC plan result in changes in project scope and schedule, the contract will be re-negotiated upon approval of the changed QA/QC plan.

EXHIBIT F

References for Qualification Based Selection

Exhibit F

References for Qualification Based Selection

1. Guide for the Selection of Professional Engineer and Land Surveyor Consultants by Public Agencies. Published 1990. Available from California Council of Civil Engineers and Land Surveyors. This booklet was prepared as a project of a joint liaison committee composed of members of the following organizations:

- The League of California Cities Public Works Officer's Institute.
- The County Engineers Association of California
- The California Council of Civil Engineers and Land Surveyors

2. Qualifications Based Selection, A Guide for the Selection of Professional Consultant Services for Public Owners. Published 1991. Prepared and published by the organizations listed below and available from the American Society of Civil Engineers - Los Angeles Section.

- **American Society of Civil Engineers (ASCE)**
  c/o Gussie Hayes, 2550 Beverly Boulevard, Los Angeles, CA 90057 (213)386-6291
- **California Council of Civil Engineers & Land Surveyors (CCCE&LS)***
  1303 J Street, 3rd Floor, Sacramento, CA 95814 (916) 441-7991
- **The American Institute of Architects (AIA)**
  1303 J Street, Suite 200, Sacramento, CA 95814 (916) 448-9082
- **California Geotechnical Engineers Association (CGEA)**
  P.O. Box 431, Yorba Linda, CA 92686 (714) 777-3423
- **California Society of Professional Engineers (CSPE)**
  1005 12th Street, Suite J, Sacramento, CA 95814 (916) 442-1041
- **Consulting Engineers Association of California (CEAC)***
  925 L Street, Suite 870, Sacramento, CA 95814 (800) 442-2322
- **Structural Engineers Association of California (SEAOC)**
  3926 Oak Hurst Circle, Fair Oaks, CA 95628 (916) 445-0584

- **American Society of Landscape Architects**
(ASLA), P.O. Box 161025, Sacramento, Ca 95816 (916) 447-7635

  * Organizations have merged on 7/1/92 into Consulting Engineer and Land Surveyors of California (CELSOC) 1303 J Street, 3rd Floor, Sacramento, CA 95814 (916) 441-7991

APPENDIX

Background and Philosophy

Appendix: Background and Philosophy

Table of Contents

1. Need for guidelines and benefits.

The time required for plan check of public works projects is a major concern to both public agencies, the private-sector design professional, and developers. There is wide-spread belief that the process can be made more efficient and that improvements can be made on both the public agency and design professional sides of the process.

In recognition of that concern, the Professional Practices and Legislation Committee (PPLC) American Society of Civil Engineers sponsored a seminar at the April 1990 general membership meeting with Dick Hunsaker and Pat Stanton discussing the plan-check process. The reception to the program was very favorable.

The PPLC, with the encouragement of the Orange County Branch Board of Directors, determined that the issue should not close with the presentation of the program. Consequently, the PPLC began further efforts directed toward implementing some of the ideas and good intentions displayed at the April 1990 meeting. Following the April meeting, the PPLC recommended (and the Board of Directors concurred) that the PPLC should build on the momentum of the April meeting by developing and implementing guidelines for plan preparation and plan checking. A Plan Preparation and Plan Check Task Force was created by the Professional Practices & Legislation Committee in December 1990 with the following goal.

> Develop plan-preparation and plan-check guidelines for public-private infrastructure projects, acceptable for use by a wide spectrum of both public and private sector, which will facilitate the plan-check process and reduce the number of plan-check cycles.

The goal limits the guidelines to public and private infrastructure projects (such as highways, bridges, streets, traffic signals, storm drains, water and sewer facilities and flood control facilities) which following construction will either be owned by a public agency or will remain private but serve a community (as opposed to a single owner) purpose. The area of interest includes both facilities funded and constructed by a developer, and facilities funded and constructed by a public agency but designed by a private sector design professional under contract to the public agency. Thus, the Guidelines do not include other types of plan preparation and plan checking such as buildings, grading, geotechnical, or surveying. However, it is anticipated that these guidelines may be useful in such areas.

The Task Force has a diverse representation (including public agencies, a consultant who furnishes plan-checking services to public agencies, design professionals, and an owner/developer) in order that the results will be acceptable to a wide spectrum of the public and private sectors. The Task Force is composed of the following members.

Member	Organization
- Terry Hartman	Van Dell and Associates
- Dick Hoffstadt	City of Newport Beach
- Steve Huff	Robert Bein, William Frost and Associates

- Jerry Otteson/Dana Kasdan	City of Tustin
- Clark Shen	County of Orange/GSA-A&E
- Dayne Stiles	The Irvine Company
- Ron Wallin	City of Fullerton
- Jim Williams, Chairman	County of Orange EMA
- Ben Yamada	BSI Consultants, Inc.

The Task Force has developed these plan-processing and plan-check guidelines. Their use by all public agencies, design professionals, and owners/developers in the Orange County area will provide a more rational, predictable, and effective process for plan preparation and plan review. In situations where both the public agency and the design professional make use of the manual, a reasonable goal is that 90% of the projects should be completed in three plan-check cycles or less.

It is not possible to develop guidelines adoptable in total by all public agencies and design professionals. Therefore, the guidelines are in a general form which may be adopted in principle and should be followed by development of a specific manual, suitable to the policies of each individual public agency and design professional, but incorporating the suggestions and recommendations of the Task Force.

2. What concerns are expressed about the plan-preparation and plan-check process? What is wrong with the plan-preparation and plan-check process?

Following are often asked questions or concerns which this manual seeks to resolve.

a. Concerns relating to purpose of plan checking and roles.

   - o What is the purpose of plan checking? Why do public agencies check plans?
   - o What specifically will the public agency check? What will not be checked?
   - o What are the roles, responsibilities and goals of plan-checker and design professional?
   - o Should engineering be checked or should checking be confined to conformance to public agency criteria?
   - o What is the appropriate level of plan-checking? Can levels be defined?
   - o Who is in "responsible charge" as the term is used in the Professional Engineers Act?

b. Concerns relating to liability.

   - o Where does the responsibility and the liability rest? What is the liability of the design professional: and public agency?

- How does liability and threat of law suits affect the process?

c. Concerns relating to what is wrong with the process

- Why do design professionals submit incomplete plans?
- Why are plan check comments not addressed?
- Why are new issues raised after the first check?
- Why is the design professional left to resolve conflicting requirements between multiple departments speaking for the public agency?
- Why is there a different plan-checker each time plans are submitted?
- How can submittal of incomplete plans be discouraged and complete submittals encouraged?
- Do fees charged to owner by design professional vary depending on the public agency (or person) doing the plan checking?
- What are the reasons for bad submittals (other than poor engineering)?

d. Concerns relating to qualifications and training.

- What should be the qualifications of a plan-checker?
- Should non-licensed personnel be in charge of plan-checking?
- A draftsperson is often the one who makes the changes: why doesn't the project engineer do it?
- What training, qualifications, and supervision of plan check is needed of agency plan checkers?

e. Concerns relating to administration.

- What direction should be given to plan checkers under contract to public agencies? What is the role of contract plan-checkers: is it different than agency plan-checkers?
- Should standards for each public agency be encouraged?
- Should common (among different departments of same agency) process and standards be encouraged?

- o Can a model plan-check process be developed? How can the process stimulate early identification of applicable standards?
- o What are the criteria for deviations from standards? How and when are deviations identified and approved?
- o How can the model process stimulate early identification and decision on exceptions to standards?
- o How are inconsistencies resolved between agency-departments or between agency and designer? What is the appeal process?
- o How can concurrent reviews be encouraged?

f. Concerns relating to how the process should work.

- o How should the plan checking system work in an ideal world?
- o How can coordination between the tentative subdivision map process and the plan preparation and plan check process be improved.
- o What should the design professional expect from public agencies in terms of service versus fees paid?
- o How should a design professional respond when plan-checkers require a different design approach or a "better design" rather than simply conformance to standards?
- o How can public agency and design professional be a team in achieving better processing and quality instead of being on opposite sides of the counter? How can adversarial relationships be minimized?
- o What course of action should be taken by ASCE or the engineering community to improve plan-checking?
- o What quality control is needed by the design professional?
- o How can a public agency encourage better quality by the design professional?
- o How can submittal of incomplete plans be discouraged and complete submittals encouraged?
- o Should there be a mandatory meeting before and/or after plan-check?

3. Public agency questionnaire

The Task Force surveyed the then 29 cities of Orange County. Seventy-nine percent responded. The results and analysis are included in Exhibit A-1. The results showed only slightly more than half have written checklists or procedures. The responses indicate that the primary source of problems is associated with quality or completeness of submittals; such as, incomplete plans, incomplete submittals, or insufficient information. Nearly half identified inadequate communication with the designer as a problem and more than a third cited too many plan review cycles. Ninety-two percent thought the process could be improved and seventy-nine percent thought their city could benefit from a model plan check manual.

4. Why do Public Agencies Check Plans?

Design professionals preparing the plans are licensed and public agencies enjoy design immunity. This has raised the question among design professionals: why do public agencies check plans?

Design immunity has been conferred upon public agencies by Section 830.6 of the California Government Code. The design immunity provision of Section 830.6 rests on three elements: (1) approval of the design or standards in advance of the construction; (2) finding by a court that the design is reasonable; and (3) a causal relationship between the injury and the plan or design.

The design must be reasonable to confer immunity. Prevailing professional standards of design and safety may be looked to by the courts, but the courts do not appear ready to find a design reasonable where no supporting evidence is provided and probably will not find immunity where there is uncontroverted expert evidence that the design failed to comply with "good engineering practices" or where the design contains a hazard to users of the project which should have been obvious to any reasonable person. The availability of the design immunity defense does not modify the need for public agency plan checking: the public agency needs to determine that the design is reasonable.

While design immunity is conferred by Section 830.6 of the Government Code, there are other theories under which plaintiff may seek damages. Given the immunity statute, law suits are often directed towards the other theories. Most prominent are dangerous condition of public property and inverse condemnation.

The State of California licenses civil (and other) engineers. The purpose of the State regulation is to safeguard life, health, property and public welfare. The State determines who is qualified and extends a license to those individuals who meet the State's qualifications. "The State has pre-empted the field of regulating and licensing persons entitled to engage in the occupations of civil engineering ... therefore, municipal ordinance which intends to impose additional or more stringent requirements upon persons engaged in those occupations is invalid..." Under the State licensing laws, the engineer who signs and stamps or seals the plans is defined as being in responsible charge. In addition to State regulation, engineers are subject to liability laws of the State and under those laws are held

to a negligence standard ... i.e., an engineer's work must equal or exceed the standard of ordinary care. However, the engineer is not obligated to furnish error-free plans.

Question. When plans and specifications have been signed and stamped or sealed by licensed civil engineer attesting to be in responsible charge, why does a public agency check the plans?

Response. The public agency plan-check does not in any way minimize the duties of the licensed professional engineer who signs and stamps the plans. The purpose of the public agency plan-check is as follows.

a. Verify that the plans meet public agency objectives. For example, verify that a highway does in fact go between the intended locations and is the intended classification of arterial highway.

b. Verify compliance with ordinances of the public agency. On occasion, verify compliance with other laws.

c. Verify adherence to public agency standards and criteria.

   - policy
   - technical
   - drafting and plan format
   - encumbrances of private property such as severance of access, slope encroachment, drainage concentration

d. Verify that the design is "reasonable" in order to protect the design immunity defense. Verify that there are no unreasonable hazards to public safety.

e. Verify "standard of ordinary care" in order to minimize public agency exposure to liability suits.

f. Verify adequate access for maintenance and a design that does not require excessive maintenance and has a reasonable design life.

g. Verify that design has been coordinated with adjacent projects.

h. Protect the public safety where code or criteria may not specify minimum standards and leaves the decision to the designer.

i. Limit the interpretive differences which can result from different design professionals applying the provisions of the code or criteria.

j. Where the project is publicly funded, verify that the design is cost-effective, all reasonable alternatives have been considered, and design has been tested for sensitivity to small changes in criteria.

k. Where the project is publicly funded, verify that the plans are sufficiently clear to minimize disputes with the contractor and contract change orders.

5. Roles of each player in the plan-preparation and plan-check process

The Task Force devoted considerable effort to the identification of roles of each player in the process. The thinking of the Task Force is that many problems in the process result from a misunderstanding of roles. The complete role statement is provided in the Guidelines and no further background is offered in this Appendix.

6. Does effectiveness vary with the public agency size?

Several Task Force members have suggested that, as a very general rule, effectiveness of public agency plan check may vary with the size of public agency. It is perceived that effectiveness may be a bell-shaped curve with the most effective being the medium-sized public agencies. There are many public agencies that don't fit this generalization. Never-the-less, it may be instructive to consider whether such a variation is explainable and whether the explanation can be useful.

The plan check process can be broken into parts where clearly there are differences between the small and large public agency. Some of these are tabled below and rated on a scale of 0 to 4, with 4 being best.

Attribute	Small	Medium	Large
Administration: detailed policy, procedure and checklist.	+1	+3	+4
Simple organization, single person in charge as compared to fragmented organization (multiple depts.), each part with narrow perspective.	+4	+3	+1
Staff resource, technical expertise, training, level of building activity to support staff expertise.	+1	+3	+4
Ability for design professional to discuss with checker.	+4	+3	+1
Total score	10	12	10
Highest possible score	16	16	16

Although the sample tabulation is only conceptual, it is never-the-less instructive. Note that total scores are substantially less than the highest possible score. Also note that for the attributes listed, the stronger attributes of the small public agency seem to be the weaker attributes of the large public agency and vice versa. This suggests that recognition of these attributes might make possible a considerable improvement in effectiveness.

The thought is offered that effectiveness may be improved if the small public agency can recognize the stronger attributes of the large public agency and seek to acquire these attributes and vice versa. In general, the stronger attributes of the typical small public agency appear to be communications related items and the weaker attributes are in staffing and administration whereas the weaker attributes of the typical large public agency are in communication and stronger attributes are in staffing and administration.

This suggests that typical small public agencies should adopt policy, procedure and checklists, acquire outside expertise and experience. This suggests that typical large public agencies should designate a single person or small control organization to facilitate the process and resolve conflicting perspectives, overcome fragmented organization and enhance communication.

7. Does effectiveness vary between design professionals? Is there need for more QA/QC?

There is considerable variation in the quality of plans by different design professionals, even within the same organization.

- There are significant variations in quality between projects.

- There are significant variations in quality between design firms.

- There are significant variations in quality within the same design firm depending on who the engineer is.

- The variations are not project related. The same engineer on two different projects will produce about the same level of quality on each.

This suggests insufficient quality control and the need for an overall quality assurance, quality control plan by each design professional firm and the customizing of such a QA/QC plan for each project. There appears to be insufficient quality control in the design industry. The fact that some firms produce higher quality work is more related to their corporate culture and the type of individual they employ than to a formal QC program. Even within the typical top-tier firm there is significant variance depending on who the engineer is.

There is enough concern about the quality issue that ASCE has recently published (after several years of effort) a new manual: Quality in the Constructed Project.

For major projects, the developer should require a QA/QC plan as an early part of the plan preparation and plan-check process. Exhibit D is a sample QA/QC requirement which one

local public agency incorporates in its contracts with design professionals for design of public works projects.

8. Resolution of conflicts

Of particular concern was the resolution of comment conflicts among multiple departments of the public agency. Is it the design professional's role or the public agency's role to resolve conflict between different departments of the public agency? Many public agencies see the need for resolving conflicts as arising out of the project and therefore see the resolution of conflicts as the design professional's role. Conflict resolution is often a time consuming task and therefore many public agencies are reluctant to assume the role of resolving conflicts between the public agency's departments.

The Task Force recommends that it is the responsibility of the design professional to identify conflicts. The public agency should assume the role of resolving conflicts between its own departments after identification of conflicts by the design professional. The design professional can best identify conflicting requirements because the design professional has the opportunity to modify the design to serve multiple purposes and the design professional is best able to recognize when the design modification is not a practical response to different public agency comments. After the design professional has identified the conflict, the conflict should be presented to the public agency lead department who should provide leadership and resolution of the conflicting comments.

9. Does the Typical Plan-Preparation Plan-Check Cost or Fee Structure Encourage Quality Work?

Too often the plan-check process is characterized by submittal of poor or incomplete plans, incomplete response to public agency comments, and too many cycles of plan-check are required before plans may be approved.

What rewards does the typical plan-check process provide for quality submittals by the design professional? Conversely, what penalties does the typical plan-check process provide for poor quality submittals by the design professional?

- Complete and quality submittals should mean quicker review, easier review, fewer revisions, less engineering cost for revisions and a more predictable schedule. Poor quality submittals mean the opposite. The rewards probably should be sufficient for experienced design professionals with good business practices and a desire for quality products and client satisfaction. Never-the-less, the prevalence of incomplete submittals, incomplete response and excessive cycles of plan-check suggest that for many design professionals the rewards may be insufficient motivation.

Does the typical plan-preparation and plan-check process include cost or fee factors which work against quality submittals?

- Public agency plan-check costs vary but many public agencies charge a fixed fee. Whether the plans are good or bad, complete or incomplete, the fee paid by the

developer (owner) for plan-check is the same. Some design professionals may benefit by submitting incomplete plans to the public agency for plan-check. The more incomplete the plans, the lower the design professional's initial design cost and often the more plan-checking service is provided by the public agency. If the plan-check fee is fixed, the additional plan-check service is provided free to the design professional. In-other-words, a fixed plan-check fee tends to reward poor work by the design professional except where the design professional recognizes the rewards of quality work described earlier in this section.

- Most design contracts between owner and design professional are on a fixed fee basis (or its functional equivalent: an hourly rate with a relatively low price cap). A fixed design fee may provide motivation to invest the least number of engineering hours in the product in order to maximize profit and therefore may discourage quality work.

- The plan-check fee is nearly always paid by the developer. Thus, the design professional has no stake in minimizing public agency plan-check costs.

- Another possible negative factor is that when revisions are needed in the field because plans are not complete, the design professional will typically receive additional fees for the resolution of the field problems (assuming the problem is not an error or omission). Thus, incomplete work may be rewarded in two ways: (l) incomplete work may maximize profit in the fixed design fee portion of the contract and (2) incomplete plans may generate additional work in the hourly field-support portion of the contract.

- Many private sector developers (owners) bid design professional services thus encouraging minimum practical level of design effort.

Can the cost or fee structure be modified to provide additional rewards for good penalties for poor quality?

- The plan-check fee could be based on hourly cost rather than a fixed-fee so that the total plan-check fee is representative of the service provided by the plan-checker. The argument against an hourly fee is that record keeping is required. This argument can be mitigated by charging a fixed fee for small or routine projects and an hourly fee for large or complex projects.

- For public agencies that don't wish to use hourly fees, a fixed fee can be tied to a specified number of plan-check cycles (usually 3 or 4). Thereafter a new fixed fee is charged or an hourly rate is applied. An exception to the specified number of cycles has to be provided for changes made by the public agency.

- The design contract between design professional and developer (owner) could make the design professional responsible for the public agency plan-check fees or costs of plan-check. Most design professionals would not support such a change. A more reasonable approach would be for the contract between the design professionals and the developer (owner) to provide a contract conforming to the concept expressed earlier in this section developer (owner) pays the plan-check fee up to some cost or

number of cycles agreed to be reasonable. Excess plan-check costs or cycles would be at the expense of the design professional.

- The fee paid by the developer (owner) to the design professional could be on a time-and-material basis plus a fixed profit in order to remove any financial rewards to the design professional for minimizing resource applied to the plans. However, this may not be feasible except in special circumstances.

- Rather than bid design professional services, the design professional should be selected using Qualification Based Selection as described in the ASCE Manual, Quality in the Constructed Project.

10. Does the method of selection of the Design Professional by the Owner Encourage Quality Work?

Public agencies are required by State law (Government Code 4525 and following) to select design professionals for design of public facilities using qualifications based selection (QBS). In QBS, the design professional is first selected on the basis of qualifications (without including fee as a factor).

Thereafter a fair and reasonable fee is negotiated. If a fair and reasonable fee cannot be negotiated with the most qualified design professional, negotiations are terminated and negotiations are begun with the second most qualified design professional. In-other-words, a two-step process is used: first, selection based on qualifications, and second the determination of fee.

The law does not apply to selection of design professionals by private owners/developers. Never-the-less, the Task Force believes that selection of the design professional is an important ingredient in the success of the project and recommends that developers utilize QBS. The statement below is a slightly paraphrased version of Senate Report 92-1219 (October 14, 1972) which succinctly states the case for QBS.

> The costs for architectural and engineering services in the construction of a structure or a facility generally represent a very small part of the total cost of construction of the building or facility. The public interest is best served by placing the emphasis on obtaining the highest qualified architectural and engineering services available. There is ample provision for keeping costs under control by requiring negotiation for a fee that is fair and reasonable. Having won the competition on the basis of capability, the winning A-E must then negotiate his fee. He must demonstrate on the basis of projected costs that his fee is fair and reasonable.
>
> The system favors selection of the most skilled and responsible members of these professions. Competition is based on qualifications and experience - terms of competition that qualified members of any profession or field of endeavor are willing to meet. Under this system, A-E's are under no compunction to compromise the quality of the design or the level of effort they will contribute to it in order to meet the lower "fee" quotations of other A-E's. They are free to suggest optimum design

approaches that may cost more to design but can save in construction costs and otherwise increase the quality of the building or facility to be constructed. Failure for any reason to provide the highest quality plans and specifications may well result in higher construction costs, a functionally inferior structure, or troublesome maintenance problems.

11. Design Professional Accountability

More accountability is needed. The term "engineer in responsible charge" is defined by the Professional Engineers Act. The person signing the plans for the private A-E is often an executive and often does not appear to be knowledgeable about the project. The engineer signing the plans may seldom attend meetings. The "engineer in responsible charge" is usually not identified and becomes known only when the plans are signed. It appears that the signature of an executive is more a marketing tool than the exercise of responsible charge.

A related observation is that some design professionals appear to be offering to practice in areas outside of their competence.

12. Exhibit A-1 Analysis of Questionnaire. An analysis is provided of the response received from public agencies in Orange County.

EXHIBIT A-1

Analysis of Questionnaire

Exhibit A-1

Analysis of Questionnaire

I. Respondents

24 out of 29 cities responded (79%)

Population	Number
0 - 50,000	12
50,000 - 100,000	6
100,000 +	6
Total	24

II. Questionnaire Responses

1. Written Plancheck Procedures.

54% of respondents (13 cities) indicated they have some form of written procedures.

2. Written Checklists.

54% of respondents (13 cities) indicate they have some form of written checklists. (Note: These are not always the same cities as #1)

3. In-house Planchecking.

Nearly 90% of the cities responding perform some or all planchecking "in-house" (12 cities - 100% "in-house").

4. Consultant Planchecking.

Approximately 54% of the cities responding utilize private consultants to perform some or all of their planchecking (3 cities - 100%).

Population	In-house	Consultant
0 - 50,000	60%	40%
50,000 - 100,000	85%	15%
100,000 +	85%	15%

In general, the larger the City, the more likely that planchecking will be performed "in-house". Of the 23 cities responding, 11 cities perform essentially all planchecking "in-house" and three cities rely almost exclusively on private consultants. The remaining 9 cities use a combination of resources.

5. **Most Common Planchecking Problems?**

The responses indicate that a primary source of plancheck problems is associated with quality or completeness of submittals: incomplete plans, incomplete submittals or insufficient information. However, nearly half (45%) of the cities identified "inadequate communication with the designer" as a problem and 35% cited "too many plan review cycles."

6. **Number of Plan Review Cycles.**

The number of plan review cycles is at best an "educated guess" by the individual responding to the question and should not be interpreted as conclusive information. However, some trends appear evident:

Population/Cycles	Percent Approved At			
	2	3	4	5
0 - 50,000	31	53	13	3
50,000 - 100,000	53	39	7	1
100,000 +	27	37	23	13

- Small Cities (under 50,000) complete planchecking in 3 or less cycles 84% of the time.

- Medium cities complete in 3 or less cycles 92% of the time. They also reflect a high percentage of approvals following only 2 cycles. These cities indicated 53% approval at 2 cycles.

- Large cities (over 100,000) estimate completion in 3 or less cycles only 64% of the time. One of the large cities reported only a 10% "success rate" and if not included the average rate increased to 65%. Nevertheless, two of the large cities estimated a 90% "success rate" for 3 cycles.

It may be that on average the complexity and size of the public agency adds to the plancheck problem. Also, larger public agencies may deal with more complex projects and a greater volume of projects which could increase the number of plan review cycles.

Population/# Cities	Cycles Required for 80%+ "Success Rate" 2	3	4	5	Total Cities
0 - 50	1	8	3	0	12
50 - 100	3	2	1	0	6
100 +	1	2	2	1	6
	5	11	6	1	24

There was no apparent correlation between the number of plancheck cycles and whether the plan review was performed in-house or by consultants.

7. **Can Plan Review Process be improved?**

22 cities (92%) replied "Yes." Many of the comments support the use of "guidelines" and better communications as well as to improve quality of submittals.

8. **Would your city benefit from a Model Plan Review Manual?**

19 cities (79%) replied "Yes."

9. **What position (title) has responsibility for the plan review process?**

Note: Answers varied, but tended to be the position actually performing the plan review. Small cities were more likely to identify the City Engineer. Medium and large cities typically responded with: Associate Civil Engineer, Sr. Civil Engineer or comparable positions.

10. **Would your City be interested in reviewing and providing comments on a draft Plan Review Manual? (Provide Contact)**

21 cities (92%) replied "Yes."

11. **Does your city provide incentives for "high quality" plan review submittals?**

12 cities (50%) indicated there are incentives for quality submittals. In almost all cases, these incentives are attributed to faster processing, fewer plan reviews and lower costs for planchecking.

PLAN REVIEW PROCESS QUESTIONNAIRE ANALYSIS MATRIX

NUMBER OF QUESTIONNAIRES SENT: 29
NUMBER OF QUESTIONNAIRES RECEIVED: 24 (LISTING OF RESPONDENTS ATTACHED)

		RESPONSES RANKING (1 - MOST COMMON)											
NO.	QUESTION	Yes	No	NR	1	2	3	4	5	6	7	8	OTHER/COMMENTS
1.	DOES YOUR CITY HAVE WRITTEN PROCEDURES DEFINING ITS PLAN REVIEW PROCESS?	13	10	1									
2.	DOES YOUR CITY HAVE WRITTEN "CHECK LISTS" USED FOR PLAN REVIEW SUBMITTALS AND/OR APPROVALS?	13	11										
3.	DOES YOUR CITY PERFORM PLAN REVIEW "IN-HOUSE"? IF YES, WHAT %__	20	4										89.25% AVG.
4.	DOES YOUR CITY USE PRIVATE CONSULTANTS TO PERFORM PLAN REVIEW? IF YES, WHAT %__	13	11										53.71% AVG.
5.	WHAT ARE THE MOST COMMON PROBLEMS ENCOUNTERED DURING PLAN REVIEW? (PLEASE RANK 1-8, #1 MOST COMMON)												
	INCOMPLETE PLANS				11	5	1	4	3				RANKS NO. 1
	INCOMPLETE SUBMITTALS				7	5	5	1	3	1	1	1	RANKS NO. 3
	INSUFFICIENT INFORMATION				6	7	7	2	1			1	RANKS NO. 2
	DOES NOT CONFORM TO STANDARDS					3	2	6	7	3	3		RANKS NO. 5
	NOT RESPONSIVE TO PRIOR COMMENTS				1	2	2	8	5	2	3	1	RANKS NO. 4
	INADEQUATE COMMUNICATION WITH DESIGNER				2	1	1	1	2	10	6	1	RANKS NO. 6
	TOO MANY PLAN REVIEW CYCLES REQUIRED				2		1		3	5	8	4	RANKS NO. 7
	OTHER, (STATE) (SAMPLE RESPONSES BELOW) - POOR DESIGN BY ENGINEER - COORDINATION WITH UTILITIES - INCONSISTENT REVIEW				1			1	1		2	19	RANKS NO. 8 NOTE: THE NO. 8 RANKING REFLECTS THE FACT THAT 14 RESPONDENTS GAVE NO RANKING TO THIS CATEGORY

PLAN REVIEW PROCESS QUESTIONNAIRE ANALYSIS MATRIX

NUMBER OF QUESTIONNAIRES SENT: 29
NUMBER OF QUESTIONNAIRES RECEIVED: 24 (LISTING OF RESPONDENTS ATTACHED)

		RESPONSES RANKING (1 - MOST COMMON)											
NO.	QUESTION	Yes	No	NR	1	2	3	4	5	6	7	8	OTHER/COMMENTS
6.	HOW MANY PLAN REVIEW "CYCLES" ARE USUALLY REQUIRED FOR APPROVAL? (ESTIMATE %) - TWO CYCLES %												30.3% AVG.
	- THREE CYCLES %												50.4% AVG.
	- FOUR CYCLES %												14.3% AVG.
	- FIVE + CYCLES %												5.0% AVG.
	TOTAL = 100%												TOTAL = 100%
7.	DO YOU BELIEVE PLAN REVIEW PROCESS CAN BE IMPROVED? IF YES, HOW? (SAMPLE RESPONSES BELOW) - EDUCATING ENGINEERS, DEVELOPERS, ARCHITECTS, OWNERS OF PLAN REVIEW PROCESS - PRE-PLAN SUBMITTAL MEETING WITH APPLICANT AND THEIR DESIGN ENGINEERS TO REVIEW CITY DESIGN CRITERIA AND STANDARDS - UNIFORM/STANDARD REQUIREMENTS BETWEEN ALL CITIES - BETTER COMMUNICATION BETWEEN DESIGNER AND PLAN CHECKER WHEN PLAN DEVIATES	22	1	1									
8.	IF A MODEL PLAN REVIEW MANUAL WAS AVAILABLE, WOULD SUCH A MANUAL BENEFIT YOUR CITY?	19	1	1 MAYBE									
	FOR QUESTIONS 9 & 10 SEE QUESTIONNAIRE												

PLAN REVIEW PROCESS QUESTIONNAIRE ANALYSIS MATRIX

NUMBER OF QUESTIONNAIRES SENT: 29
NUMBER OF QUESTIONNAIRES RECEIVED: 24 (LISTING OF RESPONDENTS ATTACHED)

		RESPONSES RANKING (1 - MOST COMMON)											
NO.	QUESTION	Yes	No	NR	1	2	3	4	5	6	7	8	OTHER/COMMENTS
11.	DOES YOUR PROCESS PROVIDE ANY INCENTIVES FOR "HIGH QUALITY" PLAN REVIEW SUBMITTALS? DESCRIBE: (SAMPLE RESPONSES BELOW) - FEES BASED ON HOURLY RATE, POOR PLANS TAKE LONGER TO CHECK, SO PLAN CHECK FEES AMOUNT TO MORE.	12	12										

LIST OF QUESTIONNAIRE RESPONDENTS

5/17/91

1. City of Anaheim
   200 S. Anaheim Blvd.
   P.O. Box 3222
   Anaheim, CA 92805
   Contact: Natalie Lockman
   Phone: 254-5148

2. City of Brea
   1 Civic Center Circle
   Brea, CA 92621
   Contact: John Hogan
   Phone: 990-7657

3. City of Buena Park
   6650 Beach Blvd.
   P.O. Box 5009
   Buena Park, CA 90620
   Contact: Nabil S. Henein
   Phone: 521-9900 ext. 245

4. City of Costa Mesa
   77 Fair Drive
   Costa Mesa, CA 92628-1200
   Contact: Rene Cohen
   Phone: 745-5378

5. City of Cypress
   5275 Orange Ave.
   P.O. Box 609
   Cypress, CA 92628
   Contact: Jim Gorin
   Phone: 229-6748

6. City of Dana Point
   33282 Golden Lantern
   Dana Point, CA 92629
   Contact: Eric Pearson
   Phone: 248-3560

7. City of Fountain Valley
   10200 Slater Avenue
   Fountain Valley, CA 92708-4794
   Contact: Mark Lewis
   Phone: 965-4400 ext. 357

8. City of Fullerton
   303 W. Commonwealth Ave.
   Fullerton, CA 92633
   Contact: Ron Wallin
   Phone: 738-6845

9. City of Garden Grove
   11391 Acacia Parkway
   Garden Grove, CA 92640
   Contact: Bill Patapoff
   Phone: 741-5185

10. City of Irvine
    1 Civic Center Plaza
    P.O. Box 19575
    Irvine, CA 92713-9575
    Contact: Mike Loving
    Phone: 724-6337

11. City of La Palma
    7822 Walker Street
    La Palma, CA 90623
    Contact: No Name Given
    Phone:

12. City of Laguna Niguel
    27821 La Paz Road
    Laguna Niguel, CA 92656
    Contact: Kenneth Rosenfield
    Phone: 643-7000

13. City of Los Alamitos
    P.O. Box 3147
    3191 Katella Ave.
    Los Alamitos, CA 90720-0347
    Contact: Jeff Thompson
    Phone: 568-7300

14. City of Newport Beach
    3300 Newport Blvd.
    P.O. Box 1768
    Newport Beach, CA 92658-8915
    Contact: R.L. Hoffstadt
    Phone: 644-3311

LIST OF QUESTIONNAIRE RESPONDENTS (continued)
4/30/91

15. City of Orange
300 E. Chapman Ave.
P.O. Box 449
Orange, CA 92666
Contact: Jim Brogan
Phone: 744-7200

16. City of Placentia
401 E. Chapman Avenue
Placentia, CA 92670
Contact: Art Burgner
Phone: 993-8131

17. City of San Clemente
100 Avenida Presidio
San Clemente, CA 92672
Contact: Sam Snoucair
Phone: 498-2533 ext. 3407

18. City of Santa Ana
20 Civic Center Plaza
P.O. Box 1988
Santa Ana, CA 92701
Contact: Fred Pohlmeyer
Phone: 667-2723

19. City of Seal Beach
211 8th Street
Seal Beach, CA 90740
Contact: No Name Given
Phone:

20. City of Stanton
10660 Western Avenue
Stanton, CA 90680
Contact: Fred Wickman
Phone: 220-2220 ext. 239

21. City of Tustin
300 Centennial Way
Tustin, CA 92680
Contact: Dana Kasdan
Phone: 544-8890

22. City of Villa Park
17855 Santiago Blvd.
Villa Park, CA 92667
Contact: Ben Yamada
Phone: 568-7300

23. City of Westminster
8200 Westminster Blvd.
Westminster, CA 92683
Contact: Raymond Ware
Phone: (714) 898-3311 ext. 215

24. City of Yorba Linda
4845 Casa Loma
P.O. Box 487
Yorba Linda, CA 92686
Contact: Roy Stephenson
Phone: 961-7170