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E 700 PROJECT CONSTRUCTION

During the construction of a project, the engineer must make use of certain other skills in addition to the technical ones required for design. These projects are either contracted by the City or will be owned by the City upon completion. The engineer's relationship with the public, the contractor, the inspector, and the representatives of other agencies involves skills in public relations as well as knowledge of construction methods, City standards of construction, traffic requirements, and other sources of information. This chapter attempts to summarize the design engineer's role during this important period.

A significant portion of the public improvements in the City are constructed by land developers and other property owners. These may range in size from simple driveways to large tract developments, including storm water drainage, sewage disposal, streets and sidewalks, street lights, etc. The Bureau of Engineering has many responsibilities in connection with these improvements. In most cases, these responsibilities are the same as those for projects contracted by the City. Those cases in which they differ will be pointed out as they arise in the course of the discussion that follows.

E 710 CONSTRUCTION CONTROL

The control of construction discussed in this section pertains primarily to street design projects which are contracted by the City. City control of construction involves many City Bureaus, each having specific duties and responsibilities within the scope of the contract:


2. Bureau of Standards—Samples and tests all materials incorporated into the work.

3. Bureau of Engineering—Many Divisions are involved:
   a. Survey Division — Provides the surveys required for construction (for City awarded contracts only).
   b. Utility and Estimating Division — Notifies the owners of public utilities of needed relocations of their facilities.
   c. Coordinating Division — Negotiates supplementary agreements, processes change orders, negotiates extra work costs, etc.
   d. Design Division or District — Makes necessary design changes and decides on the intent of the contract documents. See Section E 722.

E 711.1 Other Bureaus and Departments Indirectly Involved: Some City bureaus and departments act primarily as advisers to the engineer on matters pertaining to their specialties, thus being indirectly involved in the construction of street projects. These bureaus and departments are:

1. Bureau of Assessments (for City awarded contracts only).
5. Bureau of Street Lighting.
6. Department of Traffic.

However, the latter two make the necessary changes for their own facilities affected by the project construction.

E 712 RELATIONSHIPS

In their relations with each other, the contractor, the inspector, and the engineer should not encroach on each other's responsibilities. The contractor must not deviate from the plans and specifications without prior approval from the engineer. The inspector must not make field design changes. The engineer should not stop work without consulting the inspector or unnecessarily restrict the contractor's methods of construction. Whenever a problem arises, all parties involved should be informed so that each party may participate in the solution according to his responsibility.
E 711.1

When street lighting work is included in the City Engineer's plans, the Bureau of Street Lighting will initiate the necessary change orders in coordination with the appropriate District or Division Engineer.

In as much as the Department of Traffic is not under the Board of Public Works that Department must request the City Engineer to issue the necessary change orders if it will furnish any necessary sketches describing the work.
To enhance his work during construction, the most important asset to the engineer is cooperation with the inspector, the contractor, and other agencies — Federal, State, and County. The engineer must continually endeavor to develop and maintain this cooperation without undermining his authority or compromising City standards. Securing this cooperation may be the engineer's most demanding task, but it will attain results most satisfying to himself and most beneficial to the City.

Any complaints or difficulties encountered in the field with other agencies should be brought to the attention of the District or Division Engineer.

E 712.1 Public Relations: It is the policy of the Board of Public Works to furnish information to the general public on matters pertaining to the Department of Public Works. However, the information which the engineer may furnish is necessarily limited to the scope of his functions. The engineer is therefore cautioned to answer only routine inquiries and to be absolutely sure of the accuracy of his information. Inquiries pertaining to policies, procedures, official action of the Department, and cost estimates of future contracts should be referred to the Division or District Engineer. The engineer is especially cautioned against releasing any information which might involve claims or lawsuits to which the City might become a party.

In meeting the public, the engineer is expected to be pleasant and courteous at all times. It is important that he be helpful and considerate in answering the public's questions. If he cannot answer them, he should refer them to the proper authority for accurate information. If a property owner presents a construction problem to the engineer concerning his property, the engineer should discuss the problem with the inspector and the contractor and try to arrive at a mutually agreeable solution. Above all, the engineer should generate a feeling on the part of the property owner that the City is not an impersonal organization, but is responsive to his problems and requests.

E 712.2 Authority and Responsibilities: The Board of Public Works has the final authority in all matters involving contracts. It awards the contract, approves major changes and assignments of the contract, and makes the final acceptance of the construction work.

The engineer is authorized to decide matters pertaining to the interpretation of the contract documents and to approve necessary changes in design or construction. See Section E 712.2. In dealing with the contractor, the engineer should make it clear that he represents the City. When resolving a problem, he must be thorough in his investigation, practical in his solution, firm in his decisions, and sure that his intent is understood by the contractor. Evidence of intimate knowledge of the contract documents and a willingness to be fair in decisions will go a long way in promoting respect for the engineer's judgment.

The inspector, who represents the Board of Public Works, is responsible for enforcing compliance with the contract documents and with the regulations and laws of the City, State, and Federal governments; for determining the acceptability of materials and workmanship; and for reporting the progress of construction.

The contractor is responsible for the construction of the project in accordance with the terms of the contract documents, including work which he subcontracts and articles which he is required to furnish.

E 713 DUTIES OF THE ENGINEER

The engineer is the project technical adviser during construction. When construction is progressing according to plan, he should not interfere. However, when construction is stopped due to an unforeseen technical problem, he must resolve the problem as quickly as possible so that work may be resumed. The engineer's decision must not only be in accordance with the intent of the plans and specifications, but it must also be equitable to the City and the contractor. The engineer's duties during construction are summarized as follows:

1. To make design changes and prepare change orders necessary to correct changed conditions revealed during construction.

2. To approve or disapprove alternate materials or articles of construction when so requested by the contractor.
3. To interpret the plans and specifications when they are found to be in conflict or their intent is found to be obscure.

4. To keep the Division Engineer or District Engineer posted on the progress and problems of the project.

5. To observe and learn from problems which occur during construction, so as to improve future designs.


**E 713.1 Change of Design:** These changes are required whenever field conditions on the project subject to City inspection are such that construction cannot be performed according to the contract documents. See Section E 722. Design changes during construction are issued as change orders in accordance with Subsection E 733.1. It is the general policy of the City to restrict changes to those actually required to complete the work contemplated at the time the contract documents were approved.

The City Engineer or his representative is the only person authorized to make a design change. However, no work beyond the scope of the project should be authorized by the engineer. Only such changes as those necessary to correct unanticipated conditions which affect the construction, or corrections required to ensure the proper functioning of the facility, are acceptable alterations. The contractor, the inspector, and the engineer should anticipate the required changes far enough in advance of construction to allow for the preparation and issuance of a change order with a minimum stoppage of work. The engineer should not depend on change orders to correct an oversight or improper design known prior to construction. Such changes should be corrected before the receiving of the bids by the City rather than during construction. See Sections E 731 and E 732.

The engineer in resolving a design change should be aware of the contractor’s problems as well as the terms of the contract documents. See Section E 722. A discussion with the contractor and the inspector should reveal to the engineer all aspects of the difficulty. Also, a review of the contractor’s bid prices and extra work prices should resolve the question of whether or not the cost of the change must be negotiated with the contractor. Any unusual aspects of a proposed change should be brought to the attention of the Change Order Section of the Coordinating Division to ensure consistency in this Bureau’s approach to and solution of the problem.

**E 713.2 Approval of Alternate Materials:** For convenience, certain materials or articles of construction may be designated on the plans or in the specifications by a manufacturer’s name or trade name with the phrase *or equivalent* added. Subject to the approval of the engineer, this phrase allows the use of alternatives of equal quality which have the required characteristics of the article named. All materials or articles should be new and unused except when otherwise specifically authorized by the plans or specifications. The engineer must investigate the product to satisfy himself that the alternative is of comparable quality and suitability to the original product. This may be done by reviewing the manufacturer’s specifications, by comparing the product to the City’s standard specifications, or by visual inspection. See Section E 020B. Also, he may request the assistance of the Bureau of Standards. He should diligently pursue his investigation to approve or disapprove a product or article in order to prevent delaying work if possible.

The contractor may be required to furnish information about or tests of the product or article at his own expense. It is the contractor’s responsibility to request approval far enough in advance of construction to allow for a proper investigation.

**E 713.3 Interpretation:** As the project technical adviser, the engineer makes all interpretations of the contract documents. See Section E 722. In case of a discrepancy between these documents, or a question as to their intent, his decision will be final. In making such decisions, he must consider the contractor’s viewpoint as well as the City’s, endeavoring to make his decisions fair and just to all parties concerned. He should base his decisions upon the rules of reason and prudence, avoiding decisions based upon the mere existence of a doubt or upon technicalities. In case the question arises which of two contract documents should control, the order of precedence given in Section 2-5.2 of the *Standard Specifications, 1970*
Edition, should be consulted. See Sections E 020B
and E 722.

E 713.4 Construction Progress: Each Design
Division or District Engineer should arrange in
person or through responsible members of his
staff to visit projects during construction in order
to secure full information as to the acceptability
of the work performed. This inspection should be
made at important stages of construction. Upon
discovery of any deficiencies or irregularities, the
engineer should inform the inspector immediately
or, upon his return to his office, instruct the
Bureau of Contract Administration to notify the
inspector so that the deficiencies or irregularities
can be immediately corrected. He should keep
records on file indicating conditions observed and
keep his superiors fully informed of all important
facets of the work. Refer also to Section E 740.
The Bureau of Contract Administration's daily
assignment sheet for job progress should be used.
Corrections may be less costly during rather than
after completion of construction.
The bid document is the official advertising literature used for bidding purposes. This includes the notice inviting bids and the bid proposal.

**E 721 BID PROPOSAL**

The written form used by the prospective bidder in formally offering his bids for consideration is called the bid proposal. The three types of proposals are designated as:

1. **Cash Contract Proposal** — This is a Capital Improvement Project and is designated by a W.O. 00000 series-number. See Subsections E 132.11, Payment With Gas Tax Funds; E 132.12, Payment With Other Than Gas Tax Funds; E 132.14, Resolution Projects; E 141.11, Capital Improvement Projects (Tentative Estimate — Class “C”); and E 141.12, Assessment Act Projects (Tentative Estimate — Class “C”).

2. **Assessment Contract Proposal** — This in its pure sense is an Assessment Act Project and is designated by an A’11-00000 series number. However, it may be a Combination Project, in which capital improvement money and assessment money are combined for payment of a project. This is designated by a W.O. 21000 series-number. See Section E 810, Assessment Act Projects (Street Improvements Under 1911 Act and 1941 Ordinance); and Subsections E 132.21, Payment; E 141.12, Assessment Act Projects (Tentative Estimate — Class “C”); and E 141.22; Assessment Act Projects (Appropriation Estimate — Class “B”).

3. **“B” Permit Project Proposal** — This type of permit is broken into two parts; the design portion and the construction portion. It may be issued as a design permit and then another issued as a construction permit, or both parts may be issued as one permit. This type of project is usually limited to sewer projects and is designated by a PR-0000 or a PBD-0000 series-number. The PBD-0000 series-number is used when the permittee requests that the City prepare the plans. See Subsection E 733.15. In order to protect itself, the City advertises and receives the bids, but does not award the contract, and instructs the acceptable bidder and permittee to enter into an agreement and contract for construction of the project. The permittee prepares the plans and specifications, and contracts and constructs the project. The Contract Administration Division inspects these jobs. There are other ramifications, but one that is likely to happen is: The City participates by preparing and contracting all the work of a project. After completion the cost is charged to the permittee. This type receives a W.O. 00000 series-number and is called a “B” Permit Project Proposal.

The Administration Division assigns the series of numbers. The different series of numbers that are assigned are outlined in the Bureau's Description of Major Activities and Subactivities with Accompanying Tables, July, 1968 Edition. See Section E 020G.

**E 721.1 Proposal Inclusions:** Any of the three types of proposals in Section E 721 include the following:

1. **Official Job Title** — This also includes the work order designation.

2. **Brief Description of the Work Performed** — This includes, but is not limited to, grading, paving, constructing revetments and sewers, otherwise improving, etc.

3. **Project Plans** — Reference Only. It is the prospective bidder's responsibility to acquire these from the Utility and Estimating Division. He is responsible for the plans until 15 days after the bid date, at which time if they are not returned the receiver will be billed for them.

4. **Attachments:**
   a. **Permits of Other Agencies as May Be Required by Law** — These may include a Los Angeles County Flood Control Permit, a State of California Highway Permit, etc.
   b. **Special Provisions** — These are the supplemental provisions to the Standard Specifications. See Section E 020B. As in item 3, the prospective bidder is responsible for acquiring these provisions.
   c. **Reference Specifications** — These are designations such as ASTM (American Society for Testing Materials), AISI (American Iron and
Steel Institute), Standard Plans of other Agencies, etc.

5. Completion Time — Stated in total number of working days.

6. Bids to Be Received on — This is the closing date bids are to be received by the City.


9. Instructions to Bidders — Form Eng. 3.405B, not shown in this Part of the Manual.

10. Schedule of Work and Prices — Form Eng. 3.405B, not shown in this Part of the Manual.

11. Schedule of Stipulated Unit Prices — Form Eng. 3.405D, not shown in this Part of the Manual.

12. General Instructions and Information for Bidders — Form Eng. 3.405E, not shown in this Part of the Manual.

13. Signature Sheet, Affidavit and Bond — Form Eng. 3.405F, not shown in this Part of the Manual.

The Bureau’s Standard Plans can be purchased from Room 460, City Hall, at cost. The prospective bidder is responsible for acquiring them. They are usually designated in item 3 of this list.

All the above items are included in the bid proposal. However, depending on the circumstances, item 3 or item 4 may or may not be included.

**E 722 CONTRACT DOCUMENTS**

The contract documents include, but are not limited to, the notice inviting bids, the proposal, and the formal contract. The formal contract is initiated by the Board, sent to the City Attorney for formalizing, and returned to the Board. Then it is sent to the contractor, who signs it and returns it to the Board for execution, where it is signed and a copy returned to the contractor.

The engineer must not deviate from these documents to meet emergencies in construction. These documents are listed in the *Standard Specifications, 1970 Edition*, in Subsection 2-5.2 in the order of highest precedence of control. They are:

1. Permits from Other Agencies as May Be Required by Law — See Section E 721 for description. These are initiated by the originating Design or District office.

2. Special Provisions — See Section E 721 for description. These are initiated by the engineer and transmitted to the Utility and Estimating Division.

3. Plans — Formally prepared by the Design or District office.


5. Standard Specifications — See Section E 020B.


**E 722.1 Engineer Refers to Most Often:** The three documents the engineer refers to most often in the course of construction are:

1. Project Special Provisions — These give the special and unusual requirements specifically applicable to the project.

2. Project Plans — These are the drawings approved by the City Engineer which delineate the work to be constructed. They include all Standard Plans, shop or supplemental drawings, and specifications referred to on the plans.

3. Standard Specifications — These govern the performance of the contract, set standards, and control the material used and the workmanship or performance required for work ordinarily involved in construction.


E 730  CHANGES IN DOCUMENTS

All changes in documents after the City Engineer signs the plans must be by one of the sequential processes as outlined below. For further discussions, see Part C, Operations and Control, when this Part of the Manual is printed.

E 731 PRIOR TO ADVERTISING FOR BIDS

After the City Engineer signs the plans and before the City advertises for bids, any changes in design must be done on the plans. They must first go through the Division or District Engineer, then to the Engineer of Design for approval.

E 731.1 Revisions of Plans: Each sheet of each set of plans contains a “Revisions and Approvals” block. The “Revisions” portion contains columns headed Date, Description, and By (initials). The “Approvals” portion contains District or Division Engineer, City Engineer, and Date.

On the first sheet only, the description column is used to delineate by reference only the total changes on other sheets for that particular set of plans. Examples are Revised Sht. No.(s) . . ., Deleted Sht. No.(s) . . ., Added Sht. No.(s) . . ., etc. Also, if there are any delineation changes on sheet number one, brief descriptions of these changes are made. All sheets require the date that the change was made, revisions as outlined above, and either hand or mechanical lettering. The project engineer signs his initials opposite the change notation, the Division or District Engineer signs his name, and the City Engineer signs his name with the date of approval.

E 732 PRIOR TO RECEIVING BIDS AND AFTER ADVERTISING FOR BIDS

All prospective bidders are entitled to whatever information the City has which will influence the cost of the job. Changes that will affect this cost and that are not in the bid proposal are frequently known well in advance of the receipt of bids by the City.

It is to the City’s advantage to see to it that any changes not shown on the plans or in the specifications should reach the prospective bidders before the bids are received. Changes made after they are received require the use of change orders and extra work prices, which often puts the City in a disadvantageous bargaining position. If the contractor can show that the bid and extra work prices do not apply, the City may be forced into negotiation. See Section 3-3 of the Standard Specifications, 1970 Edition, and Section E 020B.

E 732.1 Notification to Bidders: The proper way to convey changes prior to the City’s receiving bids is by means of:

1. An Addendum—This is the most formal supplement to the Bid Proposal. This supplement requires Board action as well as the City Engineer’s signature. The changes usually materially alter the project construction costs.

2. A Notice to Bidders—This is a somewhat less formal supplement and does not require Board action but does require the signature of the City Engineer or designee (usually the Utility and Estimating Division Engineer). This supplement usually does not materially alter the project construction costs.

3. An Information to Bidders—This is the least formal supplement and does not require either a Board action or the signature of the City Engineer. It is used primarily to clarify and interpret differences in the bid documents. Also, there usually are no appreciable cost items involved.

The bid documents may require changes or clarification after a job has been advertised and before bids have been received by the City. In such a case, the engineer shall send complete information concerning these documents to the Utility and Estimating Division for writing and processing.

E 733 AFTER CONTRACT IS AWARDED

After the City awards a contract or issues a “B” Permit, any changes in the contract documents require a change order. The engineer should give complete information concerning the proposed change in construction and should direct this information to the contractor.

E 733.1 Change Orders: A change order, as the name implies, is an order to the contractor to do something other than that required by the contract documents. This order should not be phrased in language which implies that the contractor has to change City plans, nor should the
phrasing imply that the work has already been done. Vague and indefinite statements such as *as constructed, the plans should be changed*, etc., should be avoided. The change order must be complete, since it is used for making *as built* corrections on the plans. See Chapter E 900, Construction Plan Preparation, when this Chapter of this Part of the Manual is printed. The engineer should not attempt to put into words what can more readily and understandably be shown on a simple sketch to accompany the change order. See Subsection E 733.12(3).

The following is a list of samples of typical Board Reports, Change Orders, and sketch:

**Figure E 733.1A** — Emergency Change Authorization (to authorize the contractor to proceed with change order work costing up to $4,500).

**Figure E 733.1B** — Board Report (to authorize change order work costing in excess of $4,500). Sheets 1 and 2.

**Figure E 733.1C** — Accompanying Change Order (to establish unit cost and approximate total cost).

**Figure E 733.1D** — Follow-up Change Order(s) (to authorize progress payment(s) or to establish final cost of contract).

**Figure E 733.1E** — Change Order (showing proper form for additions, deductions, and tonnage items).

**Figure E 733.1F** — Accompanying Change Order sketch.

**Figure E 733.1G** — Board Report Containing supplemental agreement (used when a major item, 10 percent or greater of the original contract cost, exceeds the 25 percent limitation). Sheets 1 and 2.

**Figure E 733.1H** — Accompanying Change Order. Sheets 1 and 2.

**E 733.11 Procedure**: As soon as it has been determined that a change order is required for projects under City contract, and that the change order does not conflict with Subsection E 733.14, the originating design office engineer should promptly notify all parties involved of the impending change. This includes the Coordinating Division and any other office or agency involved in cost or work changes. See Section 3-3 of the Standard Specifications, 1970 Edition, and Section E 020B. For example, it is the responsibility of the originating office to notify the Utility and Estimating Division when utilities are known to be affected by a change order. The Utility and Estimating Division will then immediately contact any affected utility owners to insure the proper coordination, relocation, or modification of their facilities.

For Capital Improvement or Assessment Act Projects, the originating office should call the Change Order Section of the Coordinating Division to obtain the change order serial number and the contract number. The contract number is assigned by the Board for Assessment Projects and by the City Clerk for Cash Projects. All Capital Improvement projects awarded by the City and participating projects which involve payment of cash are considered Cash Projects. See Subsection E 733.12(1). The design office should coordinate such requests to avoid assignment of different serial numbers for the same change order. For all "B" Permit projects, a sequential numbering system should be initiated and records kept by the originating design office.

Once initiated, a change order should be prepared, submitted, and processed by the City as soon as possible. Processing by the Coordinating Division includes, but is not limited to, negotiating prices with the contractor, making corrections and redistribution of copies, and obtaining all necessary approvals. Upon approval, the Change Order Section will promptly issue the change order to expedite payment to the contractor. A project cannot be accepted nor final payment made until all change orders have been issued and processed.

**E 733.11 Distribution**: All copies of the change order prepared by the design office should be conspicuously stamped PRELIMINARY and then distributed prior to the City Engineer's signature. This stamp shall read:

**PRELIMINARY CHANGE ORDER**

*THIS IS NOT AN AUTHORIZATION TO PERFORM WORK BUT IS A NOTIFICATION TO NOT PERFORM WORK WHICH MAY CONFLICT WITH THE PROPOSED CHANGE.*

**Figure E 733.11**

The distribution of the preliminary change orders is as follows:
1. Coordinating Division — Original and one copy.
2. Originating Office — Retain one copy.
3. Contractor — One copy.
5. Survey Division — One copy.
6. Utility and Estimating Division — One copy (if utilities are affected).
7. Grade Sheet Section of Utility and Estimating Division — One copy (when that Division is to furnish grade sheets).

E 733.112 Distribution Exceptions: Preliminary distribution shall be withheld until proper approvals have been obtained only for the following cases:

1. Those which are controversial.
2. Those which, due to the type of change being ordered, need approval of the Deputy City Engineer.
3. Those where the Coordinating Division's bargaining position may be affected.
4. Those where change orders are to follow up emergency change authorizations. See Subsection E 733.11.

E 733.12 Preparation Check Points: The change order shall include, among other things, four items as separately numbered paragraphs, with subparagraphs being used when multiple items are needed. Check points for the proper preparation of a change order are listed below:

1. Title Block — Give the correct title and plan reference. The job number is the proper Work Order (W.O.), Assessment Act (A'11), or "B" Permit number. See Section E 721. On those projects in which the City is involved with payment of nonreimbursed funds, the contract number (if required) is obtained from the Coordinating Division along with the change order number. See Subsection E 733.11. The serial number is the change order sequential number for the project. The order number is an engineering document number (not required to be filled in by the engineer) and is a sequential filing number assigned by the Administration Division at the time of issuance of the change order.

2. Item 1 — Reason for Change — Make a brief, clear, and definite statement of the reason for the change. Do not duplicate this statement in Item 2 below. The reason given shall be factual.

3. Item 2 — Description of Change — Make a clear and complete statement of the description of the change. It should be easily understood and should not lend itself to misinterpretation. Stations and dimensions must be complete enough to check quantities in Item 3 below. If a sketch is required, state:

Construct . . . (item) . . . in accordance with Change Order Sketch Serial No. . . .

The sketch serial number is the same as the change order serial number. Do not state "attached", as copies of the change order distributed do not all require sketches. The sketch title must contain the exact job title, the work order or "B" permit number, the change order serial number, the plan reference, and the number of sketch sheets used. This numbering should show the sketch sheet number under "SHEET" and the total number of sketch sheets under "OF", thus:

SHEET OF 1 / 2

Change order sketches shall be drawn on the standard engineering forms (Eng. 3.155A and B)—not shown in this Part of the Manual—whenever possible. Vellum profile or vellum paper may be used only when it is impractical to use the standard forms.

4. Item 3 — Change in Contract Cost — For each item noted in Item 2 above, show the change in contract cost in the following order:

a. Quantity — Rounded off to bid units.
b. Unit.
c. Item description.
d. Unit price.
e. Type of price — In parentheses.
f. Extension.

The type of price shall be the contract unit price, stipulated unit price, or extra work price. Do not consolidate unit prices or bid items.

The design engineers are not to negotiate prices with the contractor, but they should have some
indication as to whether or not the bid or extra work prices will be acceptable when deciding what changes will be ordered. Possible extra costs should be discussed with the Change Order Section of the Coordinating Division, since the format of writing the change order may be affected. All changes in contract cost prior to the work being done where unit prices are not included in the contract or in the schedule of extra work prices shall be negotiated by the Coordinating Division. Extensions of additions and deductions should be kept in separate columns to facilitate checking. When there is more than one item, summarize to show the total net addition or total net deduction. Do not use "Net" unless you show both additions and deductions.

If agreement has been made for the property owner to pay the contractor directly, state this on the change order and attach the letter of agreement to the original order. If there is no letter of agreement, be certain that the contractor is assured of such payment. Also, where applicable, copies of the "Emergency Change Authorization" (Form Eng. 3.154, Figure E 733.1A), "Right of Entry" (Figure E 054.22A), "Consent to Enter Private Property and Assess Same for Work Performed Thereon" (Form Eng. 3.628, Figure E 054-22B), or written requests from other Bureaus must be attached to the change order. See Subsections E 054.22, Right of Entry, and E 733.16.

Prices should be extended for tonnage items as shown on the sample change order, Figure E 733.1E. As indicated on this figure, the following statement should be included:

Final payment will be made under the respective bid item based on actual tonnage laid.

5. Item 4—Change in Contract Time—When the change order work does not affect the contract time, the design engineer shall complete Item 4 as follows:

No change in contract time.

If the contract time is affected, the design engineer shall leave Item 4 blank. The Change Order Section of the Coordinating Division will determine the extension of time required to complete the work indicated by the change order.

Any information of value to the Change Order Section in negotiating construction prices or checking calculations may be briefly stated in an accompanying office memorandum.

**E 733.13 Approvals:** Change orders are subject to various limitations and approvals as listed below and in Subsections E 733.14 and E 733.15.

For Capital Improvement projects and 1911 Assessment Act projects, a change order on which the net estimated deduction or addition in contract cost exceeds $4,500 requires approval by the Board of Public Works before it can be issued. A Board Report shall be prepared by the originating office and forwarded with the change order and sketches (if any) to the Coordinating Division for Processing. The following note should appear near the bottom of such change orders:

Approved by the Board of Public Works on ___________(date)__________

For 1911 Assessment Act projects, the Streets and Highways Code provides that changes exceeding certain limitations require a modification of the proceedings.

For 1941 Assessment Act projects, changes beyond the limitation of the Municipal Code require City Council approval. If negotiation is required and extra work prices are used, the change order must contain the following note:

Approved by _____(signature)______on___(date)____

(Typed contractor's firm name)

The Engineer of Design must approve change orders and sketches (if any) that reflect a deviation from normal design criteria or standard practices, or that require a Board Report. The Board Report must be signed by the Deputy City Engineer. Routine construction changes do not require the approval of the Engineer of Design. However, in cases where the wording on a change order may affect the City's legal position or interest, or the Coordinating Division's bargaining position, approval must be obtained from either the Coordinating Division or the Engineer of Design before preliminary copies are distributed.

The District or Division Engineer signs all change orders and sketches, and initials the required Board Reports, before forwarding them to the Coordinating Division for processing. The remaining signatures shall be obtained by the Change Order Section of the Coordinating Divi-
sion. For most change orders, the District or Division Engineer's approval is sufficient to allow the distribution of preliminary copies of the change order.

On change orders of more than one sheet, signatures shall be made only on the last sheet. The following notation shall be inserted above the signature block at the bottom of all sheets:

Page______ of________

Leaving sufficient space for the contractor's signature, all approval notations shall be placed directly above the page notation or above the signature block for one-sheet change orders. Initials of the person writing the change order, along with the typist's initials, shall be shown in the lower left corner above the signature block. For change orders of more than one sheet, these initials need be shown only on the last sheet.

E 733.14 Financial Limitations: There are limits to the dollar amount for which a change order can be issued. These limits vary with the project financing.

For Capital Improvement (or Cash Contract) projects, a change order on which the net estimated deduction or addition in contract cost exceeds $4,500 requires approval by the Board of Public Works. The Board may approve changes in work up to 25 percent of the original total contract amount, which includes all change orders issued. Additional work which is clearly outside the scope of the original contract and which is not exempted by Section 386 of the City Charter is limited to $5,000.

For assessment act projects under the 1911 Act, the State Streets and Highways Code specifies the following limitations:

1. For a contract not exceeding $100,000 the change order is limited to $1,000.

2. For a contract in excess of $100,000, the change order is limited to one percent of the contract amount.

Such limitations do not apply if a change is requested by a property owner who will be assessed for the work.

Changes exceeding these amounts must be made through the modification procedures (Chapter 8.5 of the Code), which require a resolution of modification, public hearings, and other procedures. The total amount of all changes, through either change orders or the modification procedures, cannot exceed 20 percent of the original contract amount.

For Assessment projects under the 1941 Ordinance of the Municipal Code, the total cost of the project that can be assessed to property owners, including the cost for change orders, cannot exceed 10 percent of the engineer's cost estimate or of the bid price, whichever is lower. For change orders in excess of the above 10 percent, other funds must be provided by the City Council.

For limitations on "B" Permits and Emergency Change Orders, see Subsections E 733.15 and E 733.16.

E 733.15 "B" Permits: A project under a "B" Permit is privately owned construction which, if found to meet City criteria and standards, will be accepted by the City as a public facility upon completion. Although the City checks "B" Permit plans, the private engineer, representing the owner, is responsible for the proper design and construction of the project to completion. During construction, the City provides such services as inspection and the processing of change orders in cooperation with the private engineer.

Change orders for "B" Permit projects may be initiated by a City design engineer or the private engineer, but must be approved by both parties. The City design office having jurisdiction over the project must be sure that the estimated cost of the additional work is covered by bond. "B" Permit change orders are prepared in the manner previously described except for the following differences:

1. The City design office shall originate and insert the sequential change order serial number.

2. If the City is not participating in the cost of the project, Item 3 (Change in Contract Cost) should state as follows:

   This change does (or these changes do) not exceed the 10 percent limitation of the Municipal Code, Section 62.116.

3. If the City is participating in the financing of the project and the change order involves the
City's portion, Item 3 (Change in Contract Cost) shall be completed in the same manner as for a cash project, and the following note shall be inserted above the signature block:

The City's share of this cost addition (or reduction) is ___% of $____________
(cost of change, Item 3) or $____________ in accordance with City Contract No.
__________ between the permittee and the City.

4. There shall be no Item 4 on any “B” Permit change order.

**E 733.151 Distribution:** The distribution of “B” Permit change orders is as follows:

1. Originating Office — Retain one copy.
2. Coordinating Division — Original.
4. Contractor — One copy.
5. Private Engineer — Three copies.

All copies of the change order shall be conspicuously stamped PRELIMINARY CHANGE ORDER when distributed prior to City Engineer approval. See Figure E 733.111 for copy of the “Preliminary Change Order” stamp wording.

**E 733.152 Informal Method:** This method is known as the Interim Change Authorization. It is, in most instances, prepared and submitted by the private engineer and must be approved by the Division or District engineer. In the event of a minor revision, the concurrence of the private engineer may be obtained over the telephone and the form prepared and approved by the Division or District office. Distribution and preparation are similar to those stated in Subsection E 733.111 and E 733.112. See Figure E 733.152, Form Eng. 3.156, for more precise explanations. An accompanying sketch prepared by the private engineer may occasionally be necessary to accompany this form.

Where a major change is involved, a plan revision may be required and processed prior to construction at the option of the Division or District office. Plan revisions are required for changes in a project involving City financial participation. The Division or District office shall make sure that the estimated cost of the additional work is covered by bond.

**E 733.16 Emergency Change Authorization:** In the event that a change in construction is required and it is not practical to delay construction of that portion affected by the change until such time as a regular change order can be issued, an Emergency Change Authorization will be issued in writing in the field. Authorizations to issue such Emergency Change Authorization is limited to personnel at the level of Civil Engineer or higher or such other individual as may be designated in writing by the Division or District Engineer to the Coordinating Division. The estimated increase or decrease in cost ordered by an Emergency Change Authorization is limited to a maximum of $4,500. It is imperative that the Change Order Section of the Coordinating Division negotiate any changes in contract cost of work not included in the bid items before the work is started. Also, the forms shall be completely signed by all parties before starting the work specified therein. The parties necessary to sign this are:

1. Division or District office.
2. Contractor.
3. Coordinating Division.
4. Field Inspector.

An Emergency Change Authorization should be issued only when requested by the contractor or at the discretion of the engineer for emergency situations, and shall be confirmed by a regular change order as soon as possible.
E 740 FINAL INSPECTION

Upon completion of his work, the contractor calls for a final inspection. For City contracts, the Bureau of Contract Administration schedules the final inspection and notifies all parties involved. The inspection party jointly reviews the work in the field and if all agree that the work is satisfactory, the City accepts the work. At such time as all other requirements are met, the contractor is paid; the bonds are released; and the contract is fulfilled.

E 741 AREAS OF INSPECTION JURISDICTION

The design engineer should be aware of the extent to which the City has jurisdiction on final inspections of various types of projects. This section covers these areas of jurisdiction.

E 741.1 Between the City and Other Agencies: City facilities may be constructed under State or County contract. Conversely, State and County facilities may be constructed under City contract. Work for another agency is usually performed under its specifications and is usually reviewed by its own representative at the time of final inspection. The City design engineer should therefore be concerned only with those public works facilities that will be owned and/or maintained by the City.

E 741.2 Between Bureaus: Although the areas of inspection between the Bureaus of Engineering and Contract Administration may overlap to some small degree, the differences are outlined below.

E 741.21 Bureau of Contract Administration: The Bureau is limited to matters involving only construction operations, procedures, finished appearance, correctness of construction, and adequacy of clean-up.

E 741.22 Bureau of Engineering: The Bureau of Engineering is responsible for determining the adequacy of the construction with regard to geometric design standards. This includes grades, sidewalk, slope, cross-gutter depressions, gutter hike-up, curvature, pavement elevations, etc.

E 742 JOINT INSPECTION

Joint final inspections, arranged by the inspector, should be scheduled at least twenty-four hours in advance to ensure joint participation. A responsible engineer should be assigned to make the final joint inspection of the project.

For a small or uncomplicated project the engineer should join the inspector in the job review. The engineer then signs the "Final Inspection Correction List" and receives a jointly signed copy.

For large, complex projects each engineer need jointly review only that portion of the project in which he is directly concerned. If the inspector has previously completed a list of corrections to be made by the contractor, and if there is no disagreement by the inspector, the engineer merely signs the list. He then receives a jointly signed copy. If the inspector has not completed his list, the engineer should make his own correction list. He should then keep one copy for himself and give one signed duplicate copy to the inspector prior to leaving the project site.

The engineer in making his correction list must use sound engineering judgment in his correction requirements. He should not make unreasonable demands or call attention to unimportant details or technicalities. Any unnecessarily stringent demands may result in higher bids on subsequent projects. All necessary explanations should be shown on the correction list.

E 743 AREA OF DISAGREEMENT

If there is an area of disagreement between the engineer and the inspector during the final joint inspection, the engineer must immediately notify his supervisor either while in the field or upon his return to the office. The engineer in charge, without delay, will either reconcile the dispute or report the disagreement to the responsible Deputy City Engineer. In no case will any differences between the engineer and the inspector be discussed in the presence of the contractor or others who may not be acting in behalf of the City's interest.

E 744 CHANGES PRIOR TO FINAL ACCEPTANCE

Occasionally, after the project has been constructed, additional facilities not previously anticipated may be required to provide a satisfactory job. The Bureau of Contract Administration, before accepting the project completion, should be
notified of this pending work by the engineer making the change. See Subsection E 733.1. In addition, where these changes affect more than one office, the other affected offices should be notified. Each of these offices should satisfy itself that the work has been completed in accordance with the City's standards.

**E 745 FINAL ACCEPTANCE**

After the corrections have been made by the contractor, the final inspector will notify the engineer to submit his acceptance and will give the engineer the option of accepting this correction with or without an additional field review. Delays in acceptance of the work result in a delay of form acceptance of the project and the final payment to the contractor. Such delays may therefore contribute to higher bids from contractors on future projects.

The engineer shall therefore prepare a "Project Completion Report" immediately, or on the day following his acceptance of the work, independent of the inspector’s acceptance. This report memorandum shall be transmitted to the Coordinating Division for work order and assessment act projects and to the Street Opening and Widening Division for “B” Permits. This procedure shall be followed even if submitted change orders have not been issued and processed.