



City and County of San Francisco

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Gavin Newsom, Mayor
Edward D. Reiskin, Director

Department of Public Works
Office of the Director
City Hall, Room 348
1 Dr. Carlton B. Goodlett Place
San Francisco, CA 94102-4645

ORDER NO. . 178,940

Regulations for Excavating and Restoring Streets in San Francisco

Article 2.4 of the Public Works Code requires any person excavating in the Public Right-of-Way to obtain an excavation permit and comply with Orders and Regulations of the Department of Public Works (DPW). This Order establishes rules and regulations for excavating and restoring streets in San Francisco which are under the jurisdiction of DPW.

This Order supersedes:

- Order 135,595 “Street Opening and Pavement Restoration Regulations for Non Moratorium City Streets”
- Order 135,596 “Street Opening and Pavement Restoration Regulations for Newly Renovated City Streets”
- Order 154,501 “Rules and Regulations for Cutting Pavement in the City and County of San Francisco”
- Order 171,442 “Rules and Regulations for Cutting Pavement in the City and County of San Francisco”
- Order 176,707 “Rules and Regulations for Cutting Pavement in the City and County of San Francisco”

This Order takes precedence over the latest DPW Bureau of Engineering Standard Specifications and Standard Plans when differences arise. Otherwise, the Standard Specifications and Standard Plans shall govern excavation and restoration of City streets.

The Department acknowledges the need to upgrade, maintain, replace and install new utility services. The Department also recognizes the disruptive impact these excavations have on neighborhoods and the traveling public. These rules and regulations are designed to balance these competing needs and to preserve and maintain the public health, safety, welfare and convenience.

Edward D. Reiskin.
Director of Public Works

Regulations for Excavating and Restoring Streets in San Francisco

This manual has been prepared as a reference for city agencies, utility companies, contractors and others excavating in the streets of San Francisco.

Its main purpose is to collect the various specifications, rules and regulations governing excavations in the public right-of-way into a single document.

Before excavating in any street in San Francisco, excavators are encouraged to familiarize themselves with the requirements of this manual.

If you have any questions or would like to arrange a training session on this manual please contact: The Department of Public Works, Bureau of Street Use and Mapping at 875 Stevenson Street, Room 460, San Francisco, CA 94103, Phone (415) 554-5810

Prepared by
The Department of Public Works
Bureau of Street-use & Mapping
875 Stevenson, Room 460
San Francisco, CA 94103
Telephone (415) 554-5810

This Manual can be downloaded at dpw web page:

<http://www.sfdpw.org/index.aspx?page=1181>

Regulations for Excavating and Restoring Streets in San Francisco

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 - Appeals
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 - Notice of Violations

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- C. DPW Order 171,378 "Dust Control"
- D. DPW Bureau of Engineering Standard Plans & Specifications, 2000 (excerpts)
- E. DPW Order 175,387 Adopting new Curb Ramp Standards & Prohibiting New Facilities Installment in the Curb Return area

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SECTION 1
Definition of Terms

For purposes of this Order, the following terms shall have the following meanings:

- 1 **"ACWS"** shall mean asphalt concrete wearing surface.
- 2 **"A/C"** shall mean asphalt concrete
- 3 **"Applicant"** shall mean any Owner or duly authorized agent of such Owner, who has submitted an application for a Permit to Excavate.
- 4 **"Article"** shall mean Article 2.4 of the Public Works Code.
- 5 **"AWSS"** shall mean the Auxiliary Water Supply System, the City's high-pressure fire suppression system
- 6 **"Block"** shall mean that part of the Public Right-of-Way that includes the street area from the property line to the parallel property line in width and extending from the property line of an intersecting street to the nearest property line of the next intersecting street in length. For purposes of this definition, an intersection shall also be considered a "Block".
- 7 **"City"** shall mean the City and County of San Francisco.
- 8 **"Department"** shall mean the Department of Public Works.
- 9 **"Deposit"** shall mean any bond, cash deposit, or other security provided by the Applicant in accordance with Section 2.4.40 of this Article.
- 10 **"Director"** shall mean the Director of the Department of Public Works or his or her designee.
- 11 **"DPW"** shall mean the Department of Public Works.
- 12 **"Excavation"** shall mean any work in the surface or subsurface of the Public Right-of-Way, including, but not limited to opening the Public Right-of-Way; installing, servicing, repairing or modifying any Facility(ies) in or under the surface or subsurface of the Public Right-of-Way; and restoring the surface and subsurface of the Public Right-of-Way. Depth shall be measured from the bottom of the base to the bottom of the trench
- 13 **"Facility" or "Facilities"** shall include, but not be limited to, any and all cables, cabinets, ducts, conduits, converters, equipment, drains, handholds, manholes, pipes, pipelines, splice boxes, surface location markers, tracks, tunnels, utilities, vaults, and other appurtenances or tangible things owned, leased, operated, or licensed by an Owner or Person, that are located or are proposed to be located in the Public Right-of-Way.
- 14 **"Inspector" or "DPW Inspector"** shall mean inspectors employed by the Department of Public Works.
- 15 **"Major Work"** shall mean any reasonably foreseeable Excavation that will affect the Public Right-of-Way for more than 15 consecutive calendar days.
- 16 **"Moratorium Street"** shall mean any Block that has been reconstructed, repaved, or resurfaced by the Department or any other Owner or Person in the preceding five year period.

- 17 **"SFMTA"** shall mean the Municipal Railway and/or DPT
- 18 **"Municipal Excavator"** shall mean any agency, board, commission, department, or subdivision of the City that owns, installs, or maintains a Facility or Facilities in the Public Right-of-Way
- 19 **"Owner"** shall mean any Person, including the City, who owns any Facility or Facilities that are or are proposed to be installed or maintained in the Public Right-of-Way.
- 20 **"Permit" or "Permit to Excavate"** shall mean a Permit to perform an Excavation as it has been approved, amended, or renewed by the Department.
- 21 **"Permittee"** shall mean the Applicant to whom a Permit to Excavate has been granted by the Department in accordance with this Article.
- 22 **"Person"** shall mean any natural person, corporation, partnership, any Municipal Excavator, or any governmental agency, including the State of California or United States of America.
- 23 **"Public Right-of-Way"** shall mean the area across, along, beneath, in, on, over, under, upon, and within the dedicated public alleys, boulevards, courts, lanes, roads, Sidewalks, spaces, streets, and ways within the City, as they now exist or hereafter will exist and which are or will be under the permitting jurisdiction of the Department of Public Works.
- 24 **"Rockwheel"** shall mean an automatic pavement breaker/trencher
- 25 **"Sidewalk"** shall mean the area between the fronting property line and the back of the nearest curb.
- 26 **"USA"** shall mean Underground Service Alert, the regional "One-Call Center" for Northern California.
- 27 **"Utility Excavator"** shall mean any Owner whose Facility or Facilities in the Public Right-of-Way are used to provide electricity, gas, information services, sewer service, steam, telecommunications, traffic controls, transit service, video, water, or other services to customers regardless of whether such *Owner* is deemed a public utility by the California Public Utilities Commission.

Section 2 Excavation Permits

2.1 When is an Excavation Permit required?

- A. Anyone doing excavation work in the City's Public Right-of-Way that is under the jurisdiction of the Department of Public Works is required to take out an Excavation Permit including city agencies.
- B. There are exceptions. Excavation Permits are **not** required for:
 - 1. Excavations completed within 24 hours to install:
 - a) Parking meters
 - b) Street lights
 - c) Traffic signs or signals
 - d) Trees
 - e) Utility poles
 - 2. Sub-sidewalk basement work
 - 3. Sidewalk repair work
 - 4. Sidewalk utility box repairs
 - 5. Pothole repairs, crack sealing or slurry sealing of roadways
- C. Although Excavation Permits are not required for the work described above other permits may be required, such as building permits or encroachment permits.

2.2 Are Excavation Permits required for "emergency" excavations?

- A. When an excavator suddenly and unexpectedly finds it necessary to make an excavation to preserve life or property or to restore interrupted essential services, the excavator may begin work before obtaining an Excavation Permit. However, the Excavator must immediately notify:
 - 1. Department of Parking and Traffic. Call:
 - a) 553-1631 and
 - b) 701- 4737 (Traffic Engineering Division).
 - 2. Municipal Railway. If the excavation will interrupt SFMTA service, call:
 - a) SFMTA Street Supervision at 554-9286, and
 - b) SFMTA Central Control at 759-4360
 - 3. Department of Public Works' Street Bureau of Street Use and Mapping, Call: 554-5810.
- B. The excavator must also apply for an Excavation Permit within four hours after the Department's offices open.
- C. An application for an Emergency Permit must include a written statement:
 - 1. Explaining the basis for the emergency action;
 - 2. Describing the excavation work being performed; and
 - 3. Describing any work remaining to be performed.

2.3 When an excavator who has an approved Excavation Permit damages another facility, must the owner of the other facility also obtain an Excavation Permit?

- A. An additional Excavation Permit will **not** be required if:
 - 1. No additional excavation is required; and
 - 2. The original Permittee maintains the excavation site and restores the trench.
- B. An additional Excavation Permit **will** be required if:
 - 1. A new excavation (another trench) is required to repair the damaged facility; or
 - 2. The owner of the damaged facility will be responsible for the restoration of the

trench.

C. Excavation Permits are not transferable.

2.4 How do I get an Excavation Permit?

A. Before applying for an Excavation Permit, you must register with the Department of Public Works. You must provide or have on record with the Department:

- 1 A copy of the legal document (such as a franchise, license, or encroachment permit) authorizing you to occupy and use the Public Right-of-Way for the purpose stated in the Excavation Permit application.
- 2 A current Business Tax Registration Certificate
- 3 Current evidence of insurance (as defined in Section 2.4.23 of the Public Works Code).
- 4 A \$25,000 Deposit (as defined in Section 2.4.40 of the Public Work; Code).
- 5 A 24-hour phone number and name of a person who will respond to emergencies.
- 6 The name, telephone and facsimile numbers and the mailing and email addresses of the person who will receive all official correspondence from the Department
- 7 Written acknowledgment that all materials necessary for construction will be on hand and ready for use so as not to delay the excavation and the prompt restoration of the Public Right-of-Way.
- 8 Written acknowledgment that the Applicant and Owner are in compliance with all Excavation Code requirements, rules, Departmental Orders, Standard Plans and Specifications and are not subject to any outstanding DPW fees or penalties
- 9 Written acknowledgement that the Owner of the facility to be installed is a member of Underground Service Alert

B. After the above documentation has been approved, you will be issued a password that will allow you to apply for Excavation Permits over the Internet. Effective January 4, 1999, excavations in a single block may be applied for over the Internet.

C. For more information call the Bureau of Street Use and Mapping at (415) 554-5810 [for assistance](#).

2.5 Do City Agencies have to comply with all the above requirements?

A. Yes, each Municipal Excavator (City Department) is required to maintain the same records on file, including:

1. a 24-hour emergency number
2. a \$25,000 deposit (work order) from each City Department
3. a five year plan of anticipated Major Work

B. The City is self-insured, but major excavation work is usually done by a private contractor through a City contract. The insurance requirements of the contract must meet the permit requirements.

2.6 For contract work, should the Owner or the contractor take out the Excavation Permit? If the contractor takes out the Excavation Permit, will the contractor have to provide: a) \$25,000 Deposit b) Insurance c) Business tax registration certificate?

A. The Owner of the facility should determine who applies for the Excavation Permit. However, when the Applicant is not the Owner of the facility to be installed, maintained, or repaired, the Applicant must provide documentation that the Applicant is authorized to act on behalf of the Owner.

B. The Permittee (either the Owner or the Applicant) must maintain a minimum \$25,000 deposit with the Department. A single \$25,000 deposit may be used for multiple permits by the same Permittee.

C. Permittees (either the Owner or the Applicant) who fail to maintain a minimum performance deposit as determined by the Director, shall be prohibited from working in the public right-of-

- way unless specifically authorized by the Director.
- D. The Permittee (either the Owner or the Applicant) must provide the required insurance. However, if the Owner is a Municipal Excavator, and the work is being done by contract, the contractor must provide the insurance.
 - E. Both the Owner and the Applicant must provide current business tax registration certificates, unless the Owner is a Municipal Excavator.

2.7 How do I get a permit application?

- A. Call DPW's Bureau of Street Use and Mapping at 554-5810 and we'll send you an application by mail or Fax.
- B. Apply for Excavation Permits in single blocks over the Internet beginning January 4, 1999, provided your registration has been approved.
- C. Write to us or come in our office at:

Department of Public Works
Bureau of Street Use and Mapping
875 Stevenson Street, Room 460
San Francisco, CA 94103

2.8 What information is required on a permit application?

The following information must be provided (Figure 1)

- A. The Applicant's name, mailing address, telephone, and facsimile number and Internet email address if available.
- B. The Owner's name, mailing address, telephone number, facsimile number, and Internet email address if available.
- C. When the Applicant is not the Owner of the facility to be installed, maintained or repaired, the applicant must provide a letter from the Owner authorizing the Applicant to act on the Owner's behalf
- D. The purpose of the excavation.
- E. The purpose of the facility to be installed maintained or repaired.
- F. The method of excavation
- G. The proposed construction start date and duration.
- H. The location of the proposed excavation, including:
 - 1. Specific address, street number and name
 - 2. The nearest cross streets
 - 3. Distance from the face of curb
 - 4. Distance form the property line at the end of a block
- I. The size of the excavation (width and length).
- J. The square footage of asphalt wearing surface to be excavated in each block and intersection.
- K. The square footage of concrete (sidewalk, parking strip, curb or roadway) to be excavated in each block.

SFDPW Utility Excavation Permit System - Microsoft Internet Explorer

Joy Di Franza
Bureau Street Use and Mapping

BSM069025
New Permit
Existing Permit Search
Street Restrictions
SDRF Estimator
User Info
Company Info
Help / Instructions
Excavation Code
Home
Log-In Again
Exit

BSM069025 - Application

Application Blocks Joint Permit Diagram Status Submit Print

check here if this is an EMERGENCY permit

* Service Address / Work Location / Project Name: Tracking #s

Permit #	Permit Status:	Date Received by SCCC:	Approval Date:	1. <input type="text"/>
BSM069025	Application			2. <input type="text"/>

Company: Bureau Street Use and Mapping *Contact Name: Joy Di Franza

Associated Co's: *Contact Phone: 415-554-5813

*Contact Fax: 415-554-6050

*Start Date: (mm/dd/yyyy) after 10/4/2006 *Type of Facility: >>> add to list >>>

*Duration (in days): *Excavation Method: Open Cut Sawcut double-click to remove

*Expiration: (mm/dd/yyyy) *Excavation Reason: *24/7 Contact Number:

Blocks and Square Feet:	Permit Cost:	<input type="button" value="Refresh"/>	
Blocks: 0	Admin Fee:	\$0.00	
Total Asphalt: 0	Inspection Fee:	\$0.00	
Total Concrete: 0	Damage Fee:	\$0.00	Total Cost:
Total Square Feet: 0	Board of Appeals Surcharge:	\$1.02	\$1.02
	Adjustment:	\$0.00	

Additional Comments:

Figure 1
Depicts the on-line permit application

2.9 Must a plan of the excavation be included with the application?

Yes, all applications must include a plan or attachment indicating the following:

- A. The location of the proposed excavation indicating:
 - 1. Name of street to be excavated and the cross streets.
 - 2. Distance from the face of curb
 - 3. Distance from intersection.
- B. The size of the proposed excavation (width and length).
- C. The location of any above ground facilities to be installed.
 - 1. Distance from curb, and any street furniture
 - 2. The purpose of the facility
 - 3. The size (width, length and height)
 - 4. Location of doors and door swing.
 - 5. Statement explaining why the facility can not be placed on private property or underground
- D. The location of underground facilities to be installed.
 - 1. Conduit, pipes, manholes, vaults, etc.
 - 2. Structural details and additional information for the installation of structure such as manholes or vaults must accompany the application and include:
 - a. The construction method of the structure to be installed (pre-cast or poured in place)
 - b. Construction details, location, size, design criteria
 - c. Purpose of facility
 - d. For all non-Franchise agencies an explanation as to why the facility can not be

placed on private property.

E. Cross section of a typical trench indicating (Figure 2)

1. The depth of the facility to be installed (top of pipe to bottom of concrete base)
2. Thickness of the concrete base
3. Thickness of the asphalt concrete wearing surface

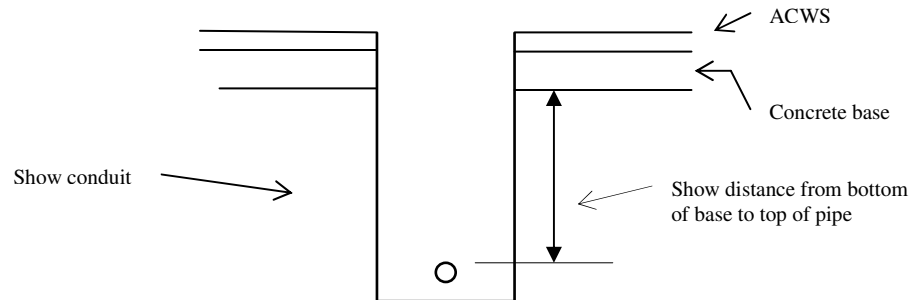


Figure 2
Showing minimum information required

- F. Plans, structural details, and the trench cross section must be signed and stamped by a licensed civil engineer, when legally required.

2.10 What does an Excavation Permit look like?

Excavation Permit will look similar to the application. An approval date and number will be on the Permit. Special conditions may be added where appropriate (Figure 3).

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Utility Excavation Permit

City and County of San Francisco, Department of Public Works, Bureau of Street-Use and Mapping
875 Stevenson Street, Room 410, San Francisco, CA 94103 Telephone (415) 554-SCCC(7222) Fax(415) 554-5865

Permit Status: **Approved**
Approved on: **10/2/2006 10:49:20 AM**

Permit Number: **BSSR069010**

Service Address: **1425 Taylor / Jackson** Tracking #1:
Number of Blocks: **1** Tracking #2:

Square Footage: **75** Construction Start Date: **10/5/2006**
Concrete: **0** Construction Duration: **9**
A/C: **75** Permit Expires on: **10/13/200**

Permit Fee: **\$295.24**
Admin: **\$69.22**
Inspection: **\$0.00**
SDRF: **\$225.00**
Board of Appeals Surcharge: **\$1.02**

Associated Companies:

Bureau of Street & Sewer Repair

Permission, revocable at the will of the Director of Public Works, is hereby granted to:

Company:	Bureau of Street & Sewer Repair	Contact:	William Twomey
Address:	2323 Army Street	Phone:	415 695 20
City/State/Zip:	San Francisco, CA 94107	Fax:	415 695 20

24 Hour / 7 Day Contact Number: **4156952020**

to excavate and restore the street(s) in compliance with the rules and regulations as set forth in Article 2.4 of the Public Works Code for the purpose of:

Type of Facility to be Excavated: **Sewer**

Excavation Reason: **Replace Service -**

Excavation Method: **Open Cut: Sawcut**

**Figure 3
Excavation Permit obtained online**

2.11 Is excavation allowed in newly paved streets and other specially designated streets?

- A. No. The Excavation Code establishes a 5-year plan moratorium on excavating in streets that have been reconstructed, repaved or resurfaced in the preceding 5 years. Facility owners should determine alternative methods of making necessary repairs to avoid excavating in newly paved streets.
- B. However, waivers to the moratorium may be granted by the Director for “good cause” such as:
 - 1. To repair leaks
 - 2. To respond to emergencies
 - 3. To provide services to buildings where no other reasonable means of providing service exists
 - 4. For deployment of new technology “...as directed pursuant to official City policy”.
 - 5. Other situations deemed by the Director to be in the best interest of the general public.
- C. To request a waiver, the Applicant must request permission in writing to excavate in a moratorium street. The request must include:
 - 1. The location of the excavation.
 - 2. Description of work to be performed.
 - 3. Why the work was not performed before the street was paved.
 - 4. Why the work can not be deferred until after the moratorium
 - 5. Why the work can not be performed at a different location
- D. Permits to excavate in moratorium streets will include extra fees for mandatory inspections and to recover the costs related to the diminishment in value of the pavement wearing surface due to the excavation and will include special conditions, such as:
 - 1. Special coordination with other excavations
 - 2. Special paving requirements
 - 3. Additional soil compaction test reports
 - 4. Mandatory Inspections
 - 5. Other requirements
- E. A decision concerning a request to excavate in a moratorium street will be provided in writing. The Director’s decision is final.

2.12 How long does it take to get a permit?

- A. Once the registration is complete and accepted, and the account is in good standing an application to excavate in a single block with no special request or special conditions will be acted on (approved, denied or conditionally approved) within 72 hours.
- B. When special requests are made, such as permission to excavate in a newly paved roadway, or to use special equipment, a decision (approved, denied or conditionally approved) will be made within 10 business days.
- C. If an account is past due a permit can not be issued until the account is brought into good standing. An account is past due when an invoice has not been paid in 60 days.

2.13 When is a Pre:-application Meeting required?

For major projects (projects lasting 15 or more calendar days), a Pre-application Meeting is required to coordinate approval of all necessary permits (such as Special Traffic or Night Noise Permits) and to minimize the impact of construction on the public.

2.14 How long is a permit valid?

- A. A permit is valid from the construction start date specified on the approved permit until the specified expiration date.
- B. Excavation Permits are not valid if all required approvals (such as a Special Traffic or Night Noise Permits or SFMTA approval) have not been obtained or required notifications given (such as public notifications or USA).
- C. Excavation permits are not valid during the hours of 8 pm to 7 am, unless a

Night Noise Permit is obtained.

- D. Some permits may be valid only for specific dates. For coordination purposes, permits may be approved with special conditions specifying the dates:
 - 1. When work may not be done
 - 2. When work must be completed
 - 3. Before which work may not start

2.15 When does a permit expire?

Permits expire and become void:

- A. On the 31st day after the approved construction start date stated on the permit, if work has not begun, or
- B. If the project is not being prosecuted diligently, or
- C. When the excavation, including the trench restoration, is not completed within the duration specified on the permit, or
- D. On the date specified on the permit as the expiration date.

2.16 How will the City determine if a project is being prosecuted diligently?

- A. Once a project begins, work must continue on a daily basis, except for weekends, holidays, inclement weather or labor disputes.
- B. Once a project begins, the work must continue uninterrupted until such work no longer affects public convenience, health or safety.
- C. The Permittee is responsible for ensuring that all necessary materials and supplies are on hand and ready for use so as not to delay the excavation and the prompt restoration of the Public Right-of-Way.

2.17 How is an extension to an approved permit obtained?

- A. Request an extension 72 hrs. prior to the expiration date.
- B. Send a letter to the Director of Public Works
 - 1. Specifying the dates you wish to change, and
 - 2. Explaining why you need an extension.
- C. Requests for extensions will be treated and processed in the same manner as a new application.
- D. An Administrative and appropriate Inspection Fees will be charged to recover the cost of processing the request.
- E. An extension may not be granted if there is a conflict with another approved project or to maintain and preserve public health, safety, welfare and convenience.
- F. An extension may be approved with special conditions to require coordination and to maintain and preserve public health, safety, welfare and convenience.

2.18 Can approved permits be revised, or will a new permit be required?

- A. An approved permit may be revised if:
 - 1. Changes to the excavation are a continuation of the same project; and
 - 2. The revision to the excavation occurs in the block approved in the original permit.
- B. To revise an approved permit
 - 1. Indicate changes on the approved permit and plan.
 - 2. Submit the revision for approval.
 - 3. Pay all additional administrative and inspection fees to cover the cost of processing the request.
- C. A new permit is needed when:
 - 1. The revision to the excavation is not related to the permitted project; or
 - 2. The revision to the excavation extends into blocks that were not approved in the original permit; or
 - 3. The square footage of the excavation is larger than identified on the permit.

2.19 If a permit expires and work is still planned, is a new application required?

- A. Yes, conditions change and one of the purposes of the permit process is to enhance coordination. New applications are checked to determine if there are any conflicts or opportunities with other approved permits or with future projects.
- B. An additional Administrative Fee will be charged to cover the cost of processing the application.
- C. An Administrative and appropriate Inspection Fees will be charged to recover the cost of processing the request.

SECTION 3
Excavation Fees

3.1 What fees are charged for Excavation?

- A. An Administrative Fee will be charged to cover the cost of processing applications, issuing Excavation Permits and administering the Excavation Code and related regulations.
- B. Fees adjusted each year to reflect changes in the relevant Consumer Price Index in accordance to DPW Order 175, 537.

	SMALL	MEDIUM	LARGE
	<101 s.f.	>100 and <1001 s.f.	>1000 s.f.
Admin Fee	69.22/permit	87.05/block	115.37/block
Inspection Fee	16.77/permit	57.69/day	84.96/day
Board of Appeals Surcharge	\$1.02	\$1.02	\$1.02

*fees adjusted each year to reflect changes in the relevant Consumer Price Index

Inspection Fee will be charged to cover the cost of inspection, except:

When the excavation is to construct, replace or repair SFMTA Railway tracks within SFMTA jurisdictional area or when the project is inspected by DPW staff as part of Construction Management. DPW staff (BCM, BSSR, and BUF) will receive annual training related to these regulations and the Public Works' Code. The training will be conducted in order to ensure consistent application of these Regulations and the Code.

3.2 How are Excavation Permit fees paid?

- A. All permit fees are due with the submission of an application. Checks should be made out to the Department of Public Works. Make sure to put on the checks:
 - 1. The application number
 - 2. The fee(s) being paid (Administrative and Inspection)
- B. All fees and penalties may be billed to the permit holder on a monthly basis. The invoice will include a detailed explanation of charges and identify any credits applied to the account during the month.
- C. Accounts will become delinquent after 30 calendar days.
 - 1. The applicants will be notified when their account is 10 days past due.
 - 2. Once delinquent, financial penalties will be imposed on the outstanding balance at a rate of 0.5% per month or fraction thereof.
 - 3. If payment is not made by the 60th day new permits will not be issued until the account is brought current.

3.3 If an approved permit is cancelled or an application is withdrawn, are permit fees refunded?

- A. Inspection Fees will be refunded via the billing system only. The Administrative Fee is non-refundable and will be retained.

- B. An additional Administrative fee of \$110 and an inspection fee of \$157.22 will be charged to process a request for refund of an approved permit (total of \$267.32).
- C. To request a refund or account credit, write a letter to:
 - Director of Public Works
 - 875 Stevenson Street, Room 460
 - San Francisco, CA 94103
 - Attn: Request for Refund
- D. The request should include:
 - 1. Request for cancellation or withdrawal of a permit
 - 2. Permit number
 - 3. State if you would like a refund or a credit applied to your account.
- E. A letter acknowledging the request and specifying the amount refunded or credited to your account will be provided.

SECTION 4 Permittee's Obligations

4.1 What obligations do Permittees incur?

By accepting an Excavation Permit, the Permittee and the Owner of the facility(ies) for which the permit was obtained agree:

- A. To follow all rules, regulations, special conditions, and code requirements;
- B. To assure that their employees, contractors, and subcontractors comply with all rules: regulations, permit conditions, and code requirements;
- C. To indemnify the City per Section 2.4.23 of the Public Works Code; and
- D. That the permit may create a possessory interest subject to property taxation.

4.2 What must Owners of underground facilities do to protect their facilities?

- A. State and federal laws require excavators to notify a regional "one call" center before digging. The law also requires owners of underground facilities to join the one call center for the region in which they have underground facilities. When an *owner* of underground facilities is notified of a proposed excavation in the area of their facilities, the *owner* must "locate and mark" its facilities.
- B. Owners of facilities in City streets must join Underground Service Alert (USA), San Francisco's regional one call center.
- C. USA will provide the caller with an inquiry identification number (USA Ticket Number) and will inform registered facility owners of proposed excavations.
- D. Excavation Permittees must call USA two business days before beginning construction, provide USA their Excavation Permit number, and follow all USA requirements.
- E. Excavation permits are not valid unless a USA number is obtained.

4.3 Survey Monuments must have a corner recordation conducted prior to the start of an excavation.

- A. As prescribed in the Section 8773.3 of the State Business and Professions Code a licensed land surveyor or qualified licensed civil engineer shall verify a survey monument has not been disturbed due to construction.
- B. Prior to the commencement of any construction project within 10 feet of an official San Francisco survey monument a corner record shall be made except for those monuments located in the paved roadway. Any construction work within 20 feet of an official San Francisco survey monument located in the paved roadway a corner record shall be made.
- C. At the conclusion of the construction project (post construction survey) a Licensed Surveyor shall file a corner record with the Department's County Surveyor.
- D. The Director may issue a waiver for small and medium permitted projects if the applicant submits a suitable monument preservation plan.

4.4 How must visible facilities be marked?

All visible facilities in the Public Right-of-Way must be marked so that the facility Owner can be readily identified. Each Owner will mark its facilities and notify the Department of the marking used.

4.5 Do permits have to be available at the excavation site?

Yes. Permits are required to be available at all times at the excavation site for the entire duration of the excavation, including the period of final paving. Permits must be shown to any City employees on request.

4.6 Who is responsible for roadway defects appearing after the Permittee restores the trench?

The Owner of the facility repaired, maintained, or installed is responsible for maintaining,

repairing, or reconstructing the site of the excavation until the Department reconstructs, repaves, or resurfaces the block.

4.7 Will the Department notify the person(s) responsible for a roadway defect of the defect?

- A. It is the responsibility of the Owner to maintain trenches and repair any defects that appears.
 - B. When the Department becomes aware of a roadway defect, the Director will determine who is responsible for the defect and will notify that person of a defect and order its repair. The responsible person(s) will receive by facsimile or by mail a "Notice to Repair Roadway Defect" (Figure 5) commonly referred to as an XII04. The notice will include:
 - 1. The location of the defect
 - 2. Description of the defect
 - 3. The required remedy
 - 4. The date by which the defect must be repaired
1. Permittees (either the Owner or the Applicant) that fail to maintain a trench within the time allocated in the X1104 shall forfeit their deposit or portions thereof in order that the Department may make necessary repairs. The cost of such work will be deducted from permittees deposit as described in Section 2.4.72 (a) of the Public Works Code.
 2. City Agencies must maintain a work order with the Department that will be charged to make repairs noted during inspections. The responsible City Department will receive an X1104 including a summary of charges made to the work order.

4.8 What happens if the person(s) responsible for the roadway defect does not make the needed repairs?

- A. If the person responsible for the roadway defect does not make the required repairs, the Department will make the repairs and the responsible person(s) will be charged for all actual costs of the repair, including administration, construction, consultants, equipment, inspection, notification, remediation, repair and restoration.
- B. Repair or restoration by the Department does not relieve the responsible person(s) from liability for future pavement failures.
- C. If the responsible person fails or refuses to pay the cost of the repair, the cost will be deducted from the person's deposit.
- D. The Director's determination of the costs is final.

4.9 If the site of an excavation or a defect is considered a hazard or is a public nuisance, how will the Department respond?

- A. When the Department determines that an excavation or a defect is hazardous or constitutes a public nuisance or other imminent threat to the public health, safety, or welfare, the Director may order the responsible person to remedy the condition immediately.
- B. If the responsible person fails to make the needed repairs immediately, the Department will make the repairs as prescribed in Sec. 4.8.

”

X1104

SECOND NOTICE

X1104 TO REPAIR DEFECT

No. _____

TO: _____

ATTN: _____



1st Notice:
2nd Notice:
STREET:

You are hereby notified and required to repair, reconstruct or improve that portion of street or sidewalk which is damaged. The materials that shall be used must be in accordance with the standard specifications of the San Francisco Department of Public Works.

Please complete work within _____ days, by order of the director of public works under the authority vested by the Department of Public Works code.

AFTER WORK IS COMPLETED, RETURN THIS NOTICE TO 875 STEVENSON STREET, ROOM 460.

Work to be Performed:

Remarks:

Completion Date: _____

Signature: _____

For Street Inspection Use Only	
File / Completion Date _____	Supervisor _____

Location Description

DEPARTMENT OF PUBLIC WORKS

27-Nov-2006

Inspected By:

Figure 4
x1104 Form

SECTION 5

Planning and Coordination

5.1 When are five year plans required?

- A. Five year plans of major work anticipated to be done in the Public Right of-Way must be submitted by Utility and Municipal Excavators on the first day of April and October of each year.
- B. After receipt of five year plans from Utility and Municipal Excavators, the Department will prepare a five year paving plan. The Department will coordinate .the plans to identify conflicts and opportunities for joint work.

5.2 How is work coordinated to encourage excavation is done before a street is paved?

- A. The Department utilizes the following methods to coordinate excavations prior to paving a block:
 1. Utility and Municipal Excavators' 5 year plans are compared with the Department's 5 year paving plan. Paving is scheduled after excavation occurs.
 2. 120 days prior to paving, Utility and Municipal Excavators are notified of the paving construction start date and given another opportunity to coordinate excavations before the street is paved.
 3. The Committee on Utility Coordination for Construction and Other Projects (CULCOP) meets monthly to discuss issues affecting the City and Excavators and to coordinate major projects.
 4. The Street Construction Coordination Center has been formed to coordinate all work in City streets.
- B. Prior to the issuance of an Excavation Permit, the application is checked against 5-year plans and scheduled paving
 1. When there is a conflict with scheduled paving, the permit will be conditioned:
 - a. To coordinate work with the scheduled paving, and
 - b. To complete the work before the paving start date.
 2. When more than one excavation will occur in a block within a five year period, the Excavators are asked to coordinate their work.

5.3 When must Excavation be done jointly?

- A. When two or more Municipal Excavators propose work in the same block within a 5 year period, one Municipal Excavator must perform all the Excavation work.
- B. When two or more Utility Excavators propose work in the same block within a 5 year period, one Utility Excavator must perform all the Excavation work.
- C. When a Municipal Excavator(s) and a Utility Excavator(s) propose work in the same block within a 5 year period, the Excavation Permits will be conditioned to maximize coordination and minimize the total period of construction.
- D. Waivers of joint excavation requirements may be granted by the Director for good cause. The Director shall consider the following factors in deciding whether to grant a waiver:
 1. Impact of the proposed excavation on the neighborhood.
 2. The Applicant's need to provide service.
 3. Facilitating the deployment of new technology as directed pursuant to official City policy.
 4. Public health, safety, welfare, and convenience.

**SECTION 6
Public Notification**

6.1 What public notice must be provided for emergency work?

- A. Post and maintain notices every 100' along the block being excavated as soon as possible, but no later than 24 hours after start of construction.
- B. Notices must contain (Figure 6):
 - 1. The name, address, and telephone number of the Owner and the Permittee.
 - 2. A description of the emergency project.
 - 3. The start and completion dates of the project.
- C. Notices must be printed on 11" x 17" paper in letters at least 1" high.

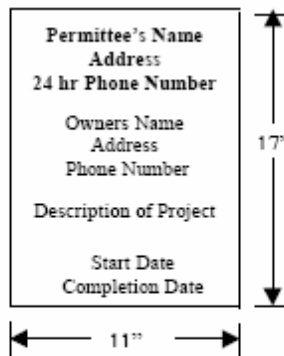


Figure 5

Depicts minimum information and size for public notice sign

6.2 What public notice must be provided for minor projects (lasting 2 to 14 calendar days)?

- A. Post and maintain notices every 100' along the block in which excavation will take place 72 hours prior to starting construction.
- B. Notices must contain (Figure 6):
 - 1. The name, address, and telephone number of the Owner and the Permittee.
 - 2. A description of the project
 - 3. The start and completion dates of the project
 - 4. If cars will be towed during the entire construction period or during a specific time period
- C. Notices must be printed on 11" x 17" paper in letters at least 1" high.

6.3 What public notice must be provided for major projects (lasting 15 calendar days or longer)?

- A. Mail notices at least 30 but not more than 60 calendar days before the start of work to:
 - 1. Property owners on the affected blocks
 - 2. Affected neighborhood and merchant organizations listed in the City Planning Department's "Directory of Neighborhood Organization and Service Agencies".
 - 3. San Francisco Bicycle Coalition and the San Francisco Bicycle Advisory Committee, when excavations occur on designated bicycle routes.
 - 4. Provide the Department with a copy of the mailing list.
- B. At least 10 but not more than 15 calendar days prior to starting construction, post and

maintain notices every 100' along the block to be excavated and deliver the same notices to each dwelling unit on the block.

- C. Notices must contain:
1. The name, address and telephone number of the Owner and the Permittee.
 2. A description of the project
 3. The Start and completion dates of the project
 4. The name, address and 24 hour telephone number of a contact person.

6.4 When are project signs required?

- A. Before starting major work, post and maintain project sign(s):
1. At the site of a single block excavation
 2. At the beginning and end of excavation(s) affecting several blocks
 3. In additional locations as directed by the DPW Inspector
 4. The project sign shall contain the same information using letters at least 2" high. (Figure. 7)
 5. If cars will be towed during the entire construction period or during a specific time period

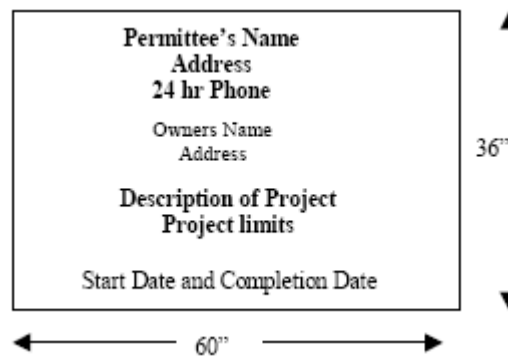


Figure 6

Depicts the minimum information and size for the project sign

SECTION 7
General Conditions

7.1 How much of a street can be closed during excavation?

- A. Rules for traffic routing are contained in the Department of Parking and Traffic's (SFMTA) "Regulations for Working In San Francisco Streets" commonly referred to as the "Blue Book" because of its blue cover. The Blue Book shows how to divert traffic around construction zones, shows how many lanes may be closed on which streets, and provides maps of bicycle routes, holiday restrictions, and other special areas. The book may be purchased from SFMTA. It is also available online at www.sfgov.org, search for "blue book".
- B. Excavation work that complies with the Blue Book do not need any other traffic permits.
- C. Excavators who want to restrict traffic more than the Blue Book allows must obtain a Special Traffic Permit from the Department of Parking and Traffic.
- D. To request a Special Traffic Permit, contact SFMTA Traffic Engineering at 1 South Van Ness Avenue at least two business days before start of construction. (Or call 701-4500 or Fax a request to 701-4737.)
- E. A request for a Special Traffic Permit must include:
 - 1. Excavation Permit Number for the work to be performed.
 - 2. Dates and times of desired restrictions.
 - 3. Reasons for the restrictions.
 - 4. Explanation of why the work must be performed during restricted times.
- F. The Department of Parking and Traffic may refuse to issue or extend a Special Traffic Permit or may cancel a Special Traffic Permit if circumstances change.

7.2 Can construction be done at night?

- A. Construction is prohibited from 8 p.m. until 7 a.m. by the Police Code, unless a special Night Noise Permit is obtained from DPW.
- B. To obtain a Night Noise Permit, call DPW at 554-5810 .

7.3 Are Cal-OSHA permits required for excavation?

A State Industrial Safety Permit from Cal OSHA is required when a person is required to descend into an excavation five (5) feet or deeper.

7.4 Does this Order apply to excavation in streets outside the jurisdiction of the Department of Public Works?

Not at the time this Order was approved. For the latest information, contact:

A. For State Routes:

California Department of Transportation
District 4, Permits Unit
III Grand Avenue, P.O. Box 23600
Oakland, CA 94623
Tel: (510) 285-4402 Fax: (510) 286-4712

B. For streets under Port of San Francisco jurisdiction:

Port of San Francisco
Port Engineering Section
Ferry Building, Room 3100
San Francisco, CA 94111
Tel: (415) 274-0565

C. For streets under Recreation and Park jurisdiction:
Recreation and Park Department
McLaren Lodge, Golden Gate Park
501 Stanyan Street
San Francisco, CA 94117
Tel: (415) 837-2740

7.5 When are Pre-Application Meetings required?

See section 2.13.

7.6 When are Pre-Construction Meetings required?

- A. Pre-Construction Meeting with a DPW Inspector is required for all major projects (project anticipated to last 15 calendar days or longer).
- B. The purpose of the Pre-Construction Meeting is to:
 - 1. Establish a construction schedule;
 - 2. Review special conditions;
 - 3. Confirm proper notification(s);
 - 4. Review site specific issues; and
 - 5. Introduce the DPW Inspector to the Permittee's field personnel.
- C. To schedule a Pre-Construction Meeting, call 554-5810 at least five business days in advance of the planned construction start date.

7.7 When is a Project Close-Out Meeting required?

- A. A Project Close-Out Meeting is required at the end of all major work.
- B. The purpose of the Project Close-Out Meeting is to assure all required work has been properly completed.
- C. The Permittee for any major work must contact the assigned DPW Inspector, inform him/her that work is complete, and arrange for an on-site Project Close-out Meeting.

7.8 When working near SFMTA facilities the following requirements and procedures must be followed.

- A. A clearance permit is required from San Francisco Municipal Transportation Agency (SFMTA) Operations Central Control at (415) 759-4396 for work within 48” (measured transversely) to a rail of SFMTA track. Permits for work may be obtained by contacting SFMTA Operations Central Control at least 72 hours (not including weekends) prior to the commencement of the work. If trenches and excavations for new facilities are within 30” (measured transversely) of the rail of existing SFMTA tracks, the request shall include details of how the Excavator will protect SFMTA facilities.
If worker will be within 48” (measured transversely) to a rail of SFMTA track when rail vehicles will be operating on the track, Excavators shall comply with and train workers per the SFMTA On Track Safety Program, in addition to a clearance permit. Contact the SFMTA Health and Safety Manager at (415) 701 4500 for specifics.
- B. For work that permanently changes or alters SFMTA facilities, approval must be obtained from the SFMTA Change Control Board.
- C. Special pavement requirements are mandated for all work within 12” of SFMTA tracks. Contact (415) 701 4500

SECTION 8
Site Protection and Housekeeping

8.1 What must be done to keep excavation sites safe?

- A. The Permittee is responsible for the safety of the excavation site.
- B. As a minimum, the Permittee shall comply with Section 700.02 "Safety Requirements" of the Standard Specifications of the Department of Public Works and the traffic requirements of SFMTA's "Regulations for Working in San Francisco Streets" (the "Blue Book").
- C. Steel plates shall be used to bridge excavations.
 - 1. Plates shall be coated with a non-skid product that has a friction factor of 0.35 or greater as measured by the California Department of Transportation California Test 342.
 - 2. Plates shall be installed and maintained in a way, which will prevent the plate from bouncing and shifting.
 - 3. Plates must be flush with the roadway, or have edges beveled from the top of the plate to the roadway, or be ramped to the elevation of the adjacent pavement. Temporary ramps shall be constructed of asphalt and shall have gradual slopes.
 - 4. Extra attention is necessary to prepare and secure plates installed along pedestrian paths of travel and designated bicycle routes.

8.2 How can a safe and accessible path of travel be maintained through excavation sites?

- A. The permittee shall provide a minimum of 4 feet of clear walkway for pedestrian traffic around the excavation site at all times.
- B. The path must be properly delineated in accordance with DPW Order 167,840 "Guidelines for the Placement of Barricades at Construction Sites". (Appendix 2)
- C. ADA requirements for path of travel must be observed at all times.

8.3 What must be done to minimize generation of dust and airborne construction emissions?

- A. Each Permittee must comply with DPW Order 171,378 "Dust Control" (Appendix 3).
- B. Excavation sites shall be swept at the end of each work day.

8.4 When can materials, supplies, and equipment be stored on the street?

- A. Material, supplies, and equipment may be stored at the excavation site only if they will be used within 7 calendar days.
- B. Fill material (sand, aggregate, and asphalt coated materials) may be stored only if it will be used within 7 calendars days and only in covered, locked containers.
- C. The use of the public right-of-way for the storage of any materials, supplies, or equipment must comply with all applicable traffic regulations.
- D. Excavated material shall be removed from the job site daily.

SECTION 9 Excavation Requirements

9.1 What are DPW's rules for excavating in City streets?

- A. All excavations shall be made in accordance with the applicable parts of Sections 700, 701 and 702 of the Standard Specifications (Appendix 4).
- B. An excavation site may not exceed 1,200 linear feet at any time. The intent of this requirement is to limit construction to no more than two adjacent blocks at a time. This footage does not include service trenches. The 1200 foot limit does include:
 - 1. Partially or completely backfilled but unpaved trench.
 - 2. Partially or completely excavated trench.
 - 3. Areas where pavement has been removed.
- C. Whenever caving occurs in the sides of any excavation, the pavement above, including the concrete base and the asphalt concrete wearing surface, shall be cut away until the sides of the trench are vertical.
- D. Excavation in concrete pavement, sidewalk, and parking strips shall be in accordance with Section 701.03 of the Standard Specifications, except that excavation in concrete pavement and parking strips which carry traffic at any time, transit stops, and bicycle lanes shall require removal of concrete to an existing joint. Excavation and restoration in these areas shall not result in any new joints in the concrete.
- E. All excavations greater than 6 feet in depth on Moratorium Streets shall require a compaction test report
- F. Excavated material shall be removed from the job site daily.

9.2 What excavation methods are allowed in the Public Right-of-Way?

- A. The preferred method of excavation in the Public right-of-Way is “cut and cover”
- B. Use of alternative trenching methods or equipment such as; tunneling, drilling, jacking, rock wheel, trench-less technology, etc. are unlawful without prior written permission of the Director. Requests to use special equipment and methods must be submitted to the Director in writing. Requests must contain:
 - 1. Proposed method of excavation
 - 2. Reason for proposing alternate method
 - 3. Location
 - 4. Supporting documentation (equipment, processes, prior results, etc.)
- C. Excepting asphalt spreading equipment metal tracked equipment shall not be allowed on the public right-of-way unless the Director grants written approval. The gross vehicle weight of any equipment shall not exceed 500 lbs. per square inch whose surface is in direct contact with the roadway.
- D. All excavations shall protect areas outside of the excavation site. Permit holders shall be responsible for any collateral damage associated with the excavation and will be required to make repairs as necessary.

9.3 What restrictions are there on the location of utility pipes (see Figure 8)?

- A. The top of new conduit or pipes must be placed at least 18" below the bottom of the concrete base.
- B. New conduit or pipe shall not be placed directly over an existing pipe or conduit, except for pipe crossings.
- C. New conduit or pipe shall not be placed closer than 12" horizontal or vertical to existing pipe at closest point, except for pipe crossings.
- D. An *Owner* may not place his facilities inside another *Owner's* facilities without prior written approval of the Director and the other Owner.
- E. In case of conflict between the above requirements and rules of the California State Public Utilities Commission, the more restrictive requirements will prevail.

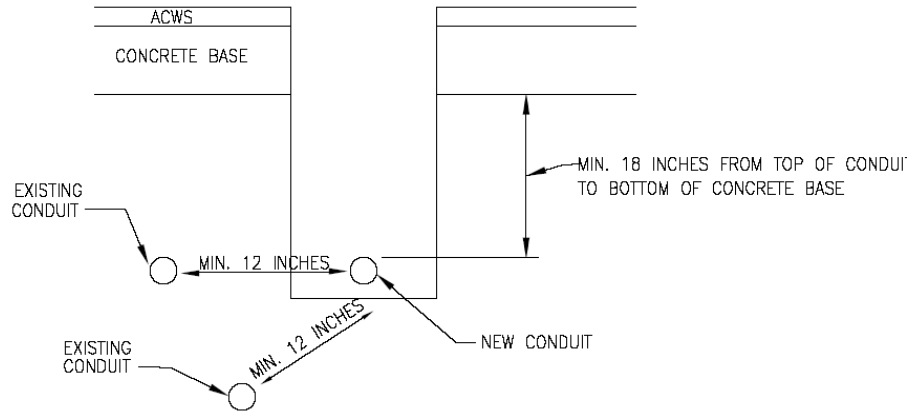


Figure 7

Depicts the minimum distances that must be maintained from underground utilities

9.4 Are there other situations that could affect excavation in the Public Right-of Way?

- A. Excavation near the Auxiliary Water Supply System (AWSS). The City has an Auxiliary Water Supply System, a separate fire suppression system that operates under very high pressure. Use extreme caution in the vicinity of AWSS lines. The following special rules apply to work in streets containing AWSS lines:
1. Contact the San Francisco Fire Department before digging.
 2. Exposed AWSS must be supported and protected.
 3. Maintain a minimum clearance of 5 feet around each high pressure, fire hydrant and 3 feet around other fire hydrants.
 4. New trenches extending 10 feet or more parallel to an existing AWSS must be constructed so that an area defined by 45-degree lines projected from both sides of the bottom of the new trench to the surface clears any AWSS lines (Figure 9).

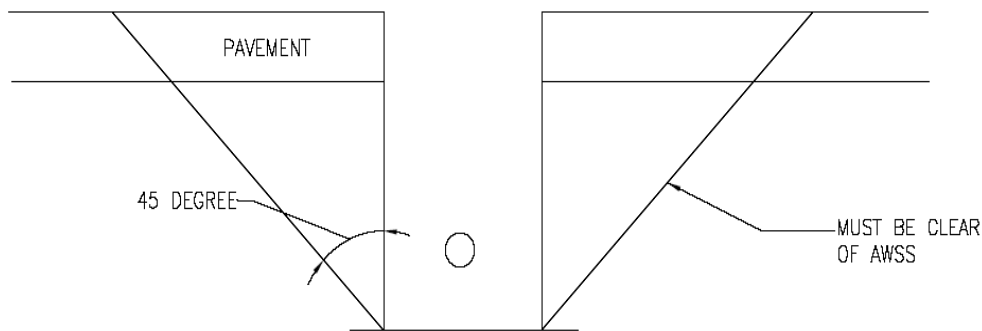


Figure 8

Depicts the minimum distance from a AWSS line

- B. Excavation affecting curb returns.
1. Any excavation (including trenchless technology) encroaching upon any part of

an angular corner requires the installation or reconstruction of curb ramp(s) at the affected corner to current standards by the Permittee. Permittee's are encouraged to contact BSM Inspection Division to determine if curb ramps within a project are compliant or must be replaced at least 45 days prior to the commencement of any work.

2. Curb ramps must be constructed in accordance with current City standards (Drawing Nos. 55,017 Rev. 3; 55,017.1, 55,018 Rev.3; 55,018.1; 55,018.2; 55,018.3 "Exception to Standard Curb Ramps") (Appendix 5).
3. It is the responsibility of the excavator to establish the placement of curb ramps. Any questions should be directed to DPW permitting staff.
4. If a standard curb ramp can not be installed, a request may be made to vary from the standard plan. The request must be submitted in writing to:
DPW Excavation Permit Coordinator
875 Stevenson Street, Room 460
San Francisco, CA 94103
Tel: (415) 554-5810
5. The request must include:
 1. Explanation of the reason(s) for the variance
 2. Type of variance requested
 3. Plans and drawings of the proposed modifications
 4. Alternative studies

- C. Excavation in areas potentially containing hazardous waste. DPW and the Department of Public Health are developing guidelines for excavating in areas that may contain hazardous waste. These rules will be published once work is complete.

SECTION 10
Trench Backfill Requirements

10.1 What are DPW's rules for backfill of trenches?

- A. Backfill and compaction shall be in accordance with Sections 703, 706, and 707 of the Standard Specifications (Appendix 4).
- B. Backfill and compaction shall be completed within 120 hours after the installation or repair of facilities.

10.2 What materials may be used for backfill?

- A. The preferred material for backfill is clean native fill 100% free of organic and deleterious material and meets minimum gradation specifications (Sec. 703 of the Standard Specifications). The Director may require a report verifying compliance with backfill specifications.
- B. Other types of fill such as Class II AB, controlled density fill or concrete slurry may be used, provided prior written approval is obtained from the Department. Requests for approval shall be submitted to the Department in writing and shall include:
 - 1. Material to be used
 - 2. Mix design (aggregate, concrete, PSI)
 - 3. Trench detail indicating the width and depth of the trench
 - 4. Distance from the top of pipe or conduit to the bottom of the concrete base.
- C. Controlled density fill or concrete slurry may NOT be used for the concrete base.

10.3 What are DPW's rules for compaction of fill in trenches?

- A. The backfill material must be compacted to a relative compaction of not less than 95% in the top 3' of the excavation and 90% in the remainder of the excavation.
- B. Compaction tests by a certified material testing laboratory shall be taken as prescribed in these regulations , or as specified by the DPW Inspector. Test results will be provided to the Inspector..
- C. For those trenches greater than 6 feet in depth as defined in the regulations, a compaction test shall be required at 50% and 100% of the backfill height. For trenches parallel to the center line of the roadway and exceeding 25% of the block face length, shall require a minimum of three compaction tests.
- D. The number of tests required shall increase if test results are poor and decrease if good compaction results are maintained, as determined by the Inspector.

10.4 What methods of compaction are acceptable to DPW?

- A. The preferred method of compaction of sand is jetting in accordance with Section 703.08 of the Standard Specifications.
- B. Sand backfill to be jetted shall be placed in horizontal layers not more than 3 feet thick.
- C. Native material used as backfill shall be mechanically compacted by means of tamping rollers, vibrating rollers, stompers (impact-type pavement breakers), wackers, or other hand held mechanical tampers.
- D. All backfill other than sand, controlled density fill, and concrete slurry shall be placed in horizontal layers not more than 8 inches thick before compaction, and each layer shall be satisfactorily compacted by mechanical means.
- E. Prior to mechanically compacting backfill, determine proper moisture content of soil. Optimum moisture in all soil types is necessary to obtain required compaction.

SECTION 11
Pavement Base Restoration Requirements

11.1 What are DPW's rules for restoring pavement base over trenches?

- A. "T" trench shall be the standard restoration practice (see figure 9) for all trenches greater than 18 inches in width. For all trenches the restoration shall be 1' from the edge of the excavation. Pavement base shall be portland cement concrete, unless the surrounding pavement is made of full depth asphalt concrete. In that case, pavement base for trenches shall also be asphalt concrete. In the event a failure occurs in a "T" trench the Director may require additional restoration requirements.

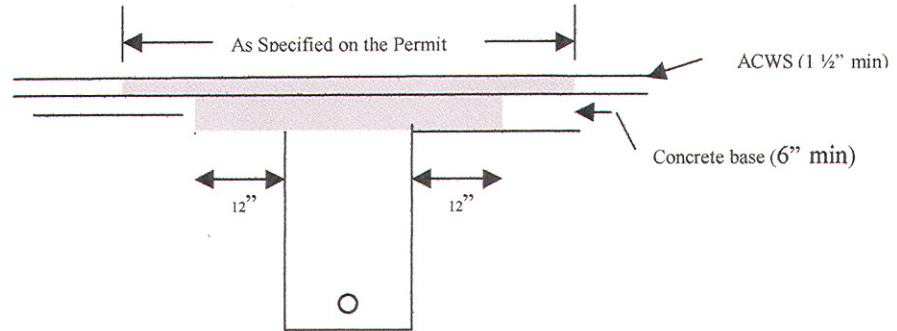


Figure 4. "T" Section

Figure 9

Depicts standard "T" trench restoration design.

- B. Concrete base shall be restored in accordance with applicable parts of Section 207 of the Standard Specifications. Asphalt concrete base shall be restored in accordance with Section 208.
- C. When Trenches or "T" trench base restorations are three feet or less from a concrete curb, track rail, gutter, parking strip, or other joint that remaining portion of the road base shall also be removed and replaced as part of trench restoration unless waived by the Director. (Figure 11)

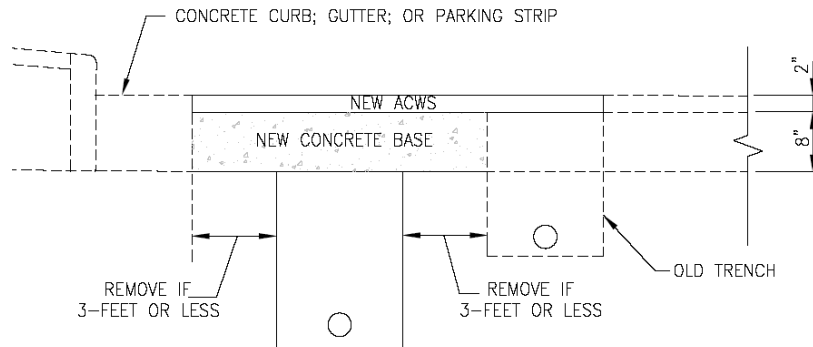


Figure 10

Depicts the restoration area for excavations less than three feet from a concrete gutter, parking strip, or other road base joint including a previously restored excavation.

- D. Placement of pavement base must be completed within 120 hours after the placement and compaction of backfill. The date and time of the base installation shall be spray-painted on the base.
- E. Pavement base shall be restored to the same thickness as adjacent pavement, but shall be no less than eight (8) inches in thickness and placed within one and one half inches of the finished wearing surface.
- F. Concrete base shall be vibrated and leveled so that no lumps or uneven areas will reflect through the new asphalt concrete wearing surface.
- G. All concrete base shall contain accelerants such as calcium chloride or other admixtures unless waived by the Director designed to accelerate setting and shall be cured for at least four (4) hours.
- H. Concrete base with a minimum of 2% calcium chloride or other admixtures, shall be cured for a minimum of four hours by either closing the area to traffic or plating as described in Section 8.1.C. unless waived by the Director. If authorized by the Director concrete base without Calcium Chloride shall be cured for a minimum of seven days or in the case of Bus Stops for fourteen days by either closing the area to traffic or plating as described in Section 8.1.C.
- I. Concrete base shall not be allowed as a temporary wearing surface. Temporary wearing surfaces shall be hot patch ACWS unless waived by the Director or the base is within SFMTA track right-of-way.

11.2 Are there additional requirements for pavement base on SFMTA routes?

- A. Bus Stops shall be restored **in kind** and in some cases with a minimum 10-12 inch concrete base (Figure 12)

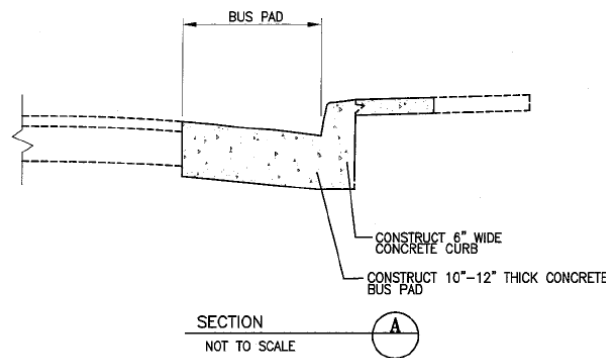


Figure 11

Depicts Special Bus Stop restoration requirements for excavations. Full panel restorations will be required for all affected concrete panels.

- B. Streets designated as SFMTA routes shall have special in kind restoration requirements including the installation of 10 to 12 inch base at the approach to intersections for a distance of 75 feet in the curb lane.

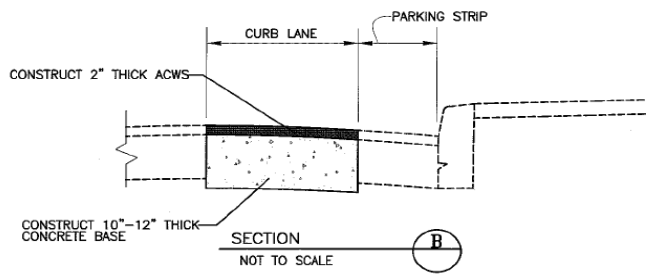


Figure 12
Plan view of enhanced areas on streets designated with SFMTA routes

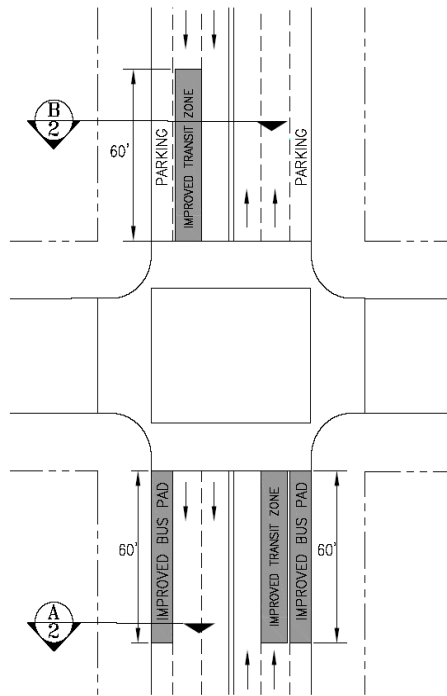


Figure 13
Specification for designated SFMTA route intersection restorations

SECTION 12
Paving Restoration Requirements

12.1 What are DPW's rules for restoring concrete pavement?

- A. Concrete pavement shall be restored in accordance with applicable parts of Section 210 of the Standard Specifications.
- B. Placement of concrete pavement must be completed within 120 hours after the completion of backfill and compaction.

12.2 What are DPW's rules for restoring concrete sidewalks?

- A. Concrete sidewalks shall be restored in accordance with applicable parts of Section 204 of the Standard Specifications.
- B. The permittee acknowledges/accepts the use of standard concrete by the City or public utility companies to replace said special surface UNLESS prior arrangements have been made to replace the special surface in kind at the sole cost of the Permittee.

12.3 What are DPW's rules for restoring asphalt concrete wearing surface (ACWS)?

- A. 25% Restoration Rule: Minimum pavement restoration requirements for trenches exceeding 25% of the length of the block shall include the restoration of all affected lanes for the entire length of the block, except as noted under Sections 12.3.B

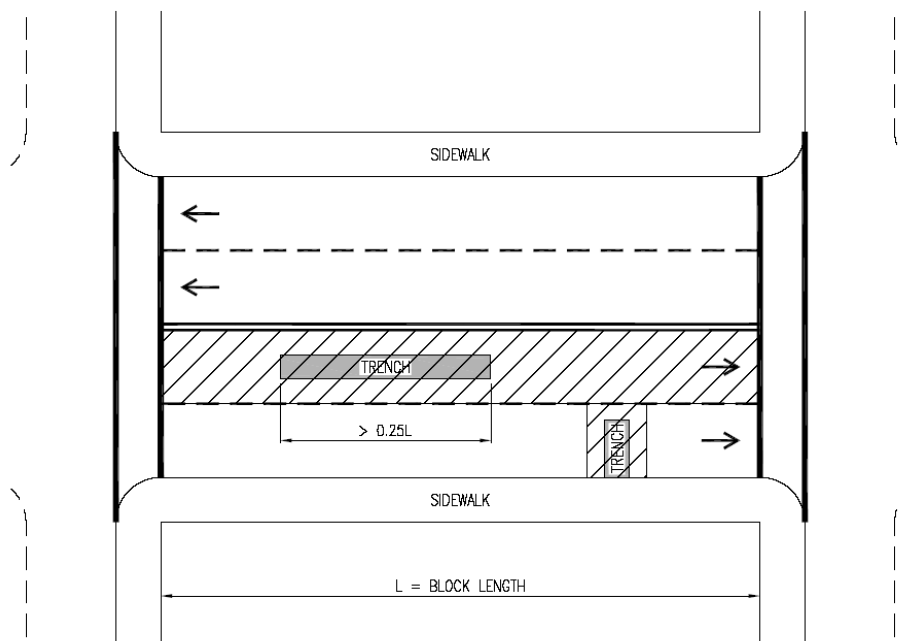
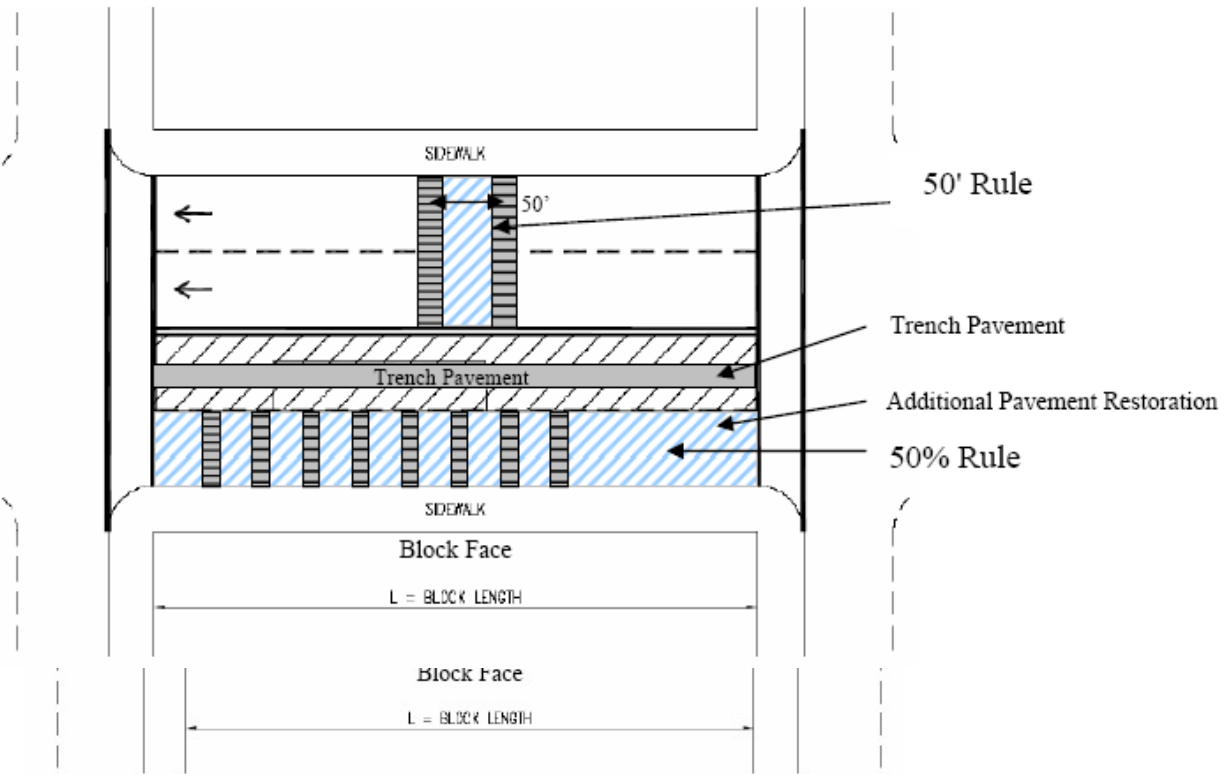


Figure 14

Depicts minimum base and pavement restoration dimensions

- B. Lateral 50% Rule: Lateral excavations that will require the restoration of all affected lanes for the entire block shall be triggered when at least 8 and 50% or more of utility service connections (laterals) are excavated on a block face (one side of the street between intersections). Section 12.3.A (25% Restoration Rule) shall be applied independently from this Section (Figure 15).
- C. 50 foot Rule: When 12.3.B is not in effect, and for lateral restorations less than 50 feet apart (as measured from the center line of each trench), the restoration shall be a contiguous for all affected lanes. When 12.3.B and 12.3.C are not in effect, 12.3.F.1 shall apply (Figure 15).



- D. Asphalt concrete wearing surface (ACWS) shall be installed in accordance with applicable parts of Section 212 of the Standard Specifications.
- E. Placement of asphalt concrete wearing surface must be completed within 120 hours after placement of concrete base.
- F. Prior to restoration of the wearing surface, the trench shall be:
 1. Trimmed by cutting the asphalt concrete wearing surface to the widest part of the trench (but not exceeding 13 feet in width - "13 foot rule" except as prescribed under Sec. 12.3.A, 12.3.B, & 12.3.C) in neat straight lines perpendicular and parallel to the curb. Saw cuts shall not extend into the concrete base. (Figure 16)

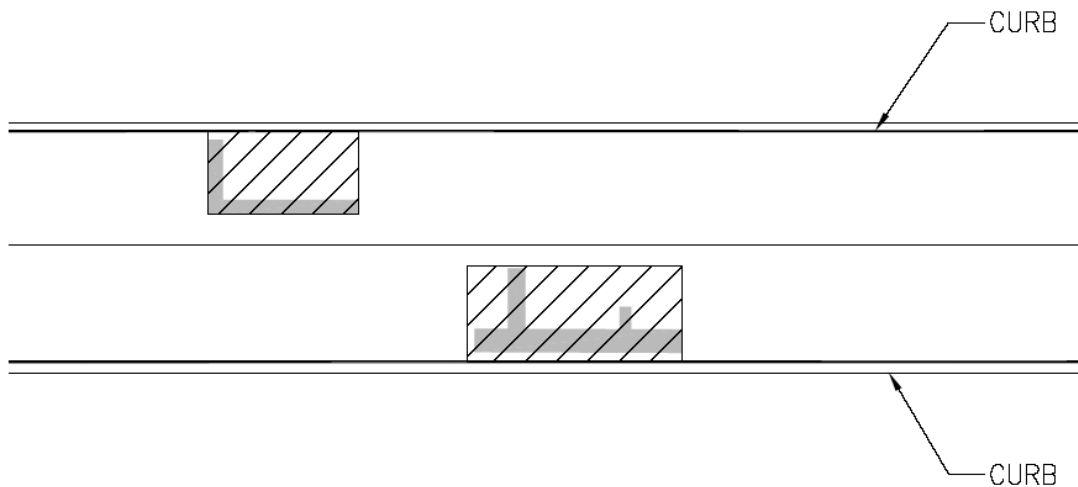


Figure 16
 Depicts acceptable rectangular restoration pattern

2. For excavations on unmarked streets that extend less than 13' from the outside face of curb, the restoration shall be limited to 13' unless the street is a designated MUNI bus route. In such cases, the restoration shall extend to the center line of the street.

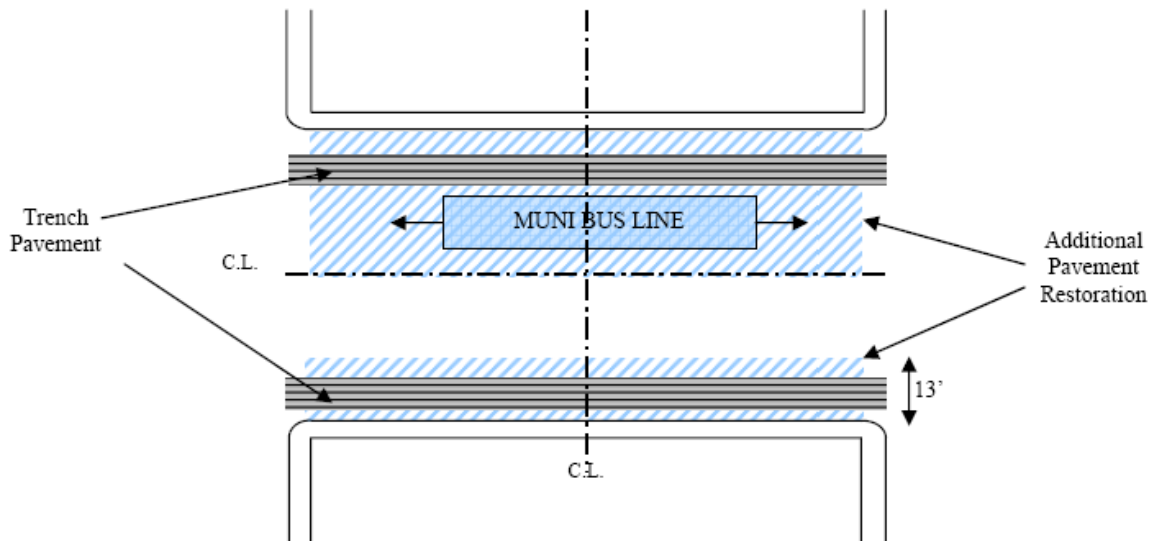


Figure 17

Depicts additional requirements for the 13' Rule on MUNI Routes

3. The existing asphalt concrete wearing surface shall have a vertical face so that new ACWS can be butt jointed. No feathering of new paving to existing is allowed.
 4. The base surface shall be blown or swept clean and a tack coat of SS-1 applied.
- E. When an excavation's alignment moves from 1 lane of traffic to another within a block segment, only the portion of the lane excavated shall be restored, unless over 50% of the length of the lane within the block is excavated. In those cases, the lane for the length of the entire block shall be restored (Figure 18).

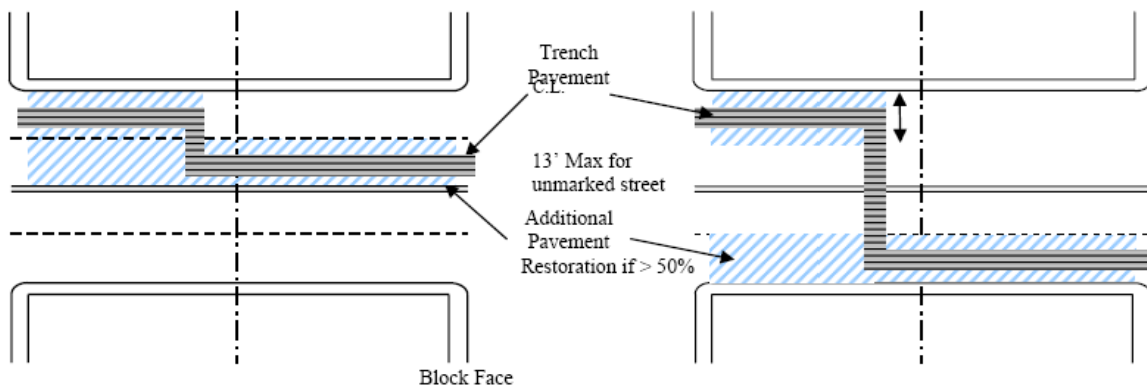


Figure 18

Depicts restorations requirements for excavations that affect multiple lanes within a block segment

Intersection Restorations: Restoration for excavations in intersections that have multiple delineated (striped) lanes of traffic in one direction shall be limited to the affected lanes. Intersections without delineated traffic lanes shall be restored utilizing the 13' rule except in

those instances when Section 12.3.F.2 is in effect. In those instances when additional work beyond the main line is conducted, the affected adjacent quadrants shall be paved in their entirety. Main line excavations with additional work in non-adjacent quadrants shall have the entire intersection restored. The area of restoration shall use existing pavement conform lines for delineation of the area (Figure 19).

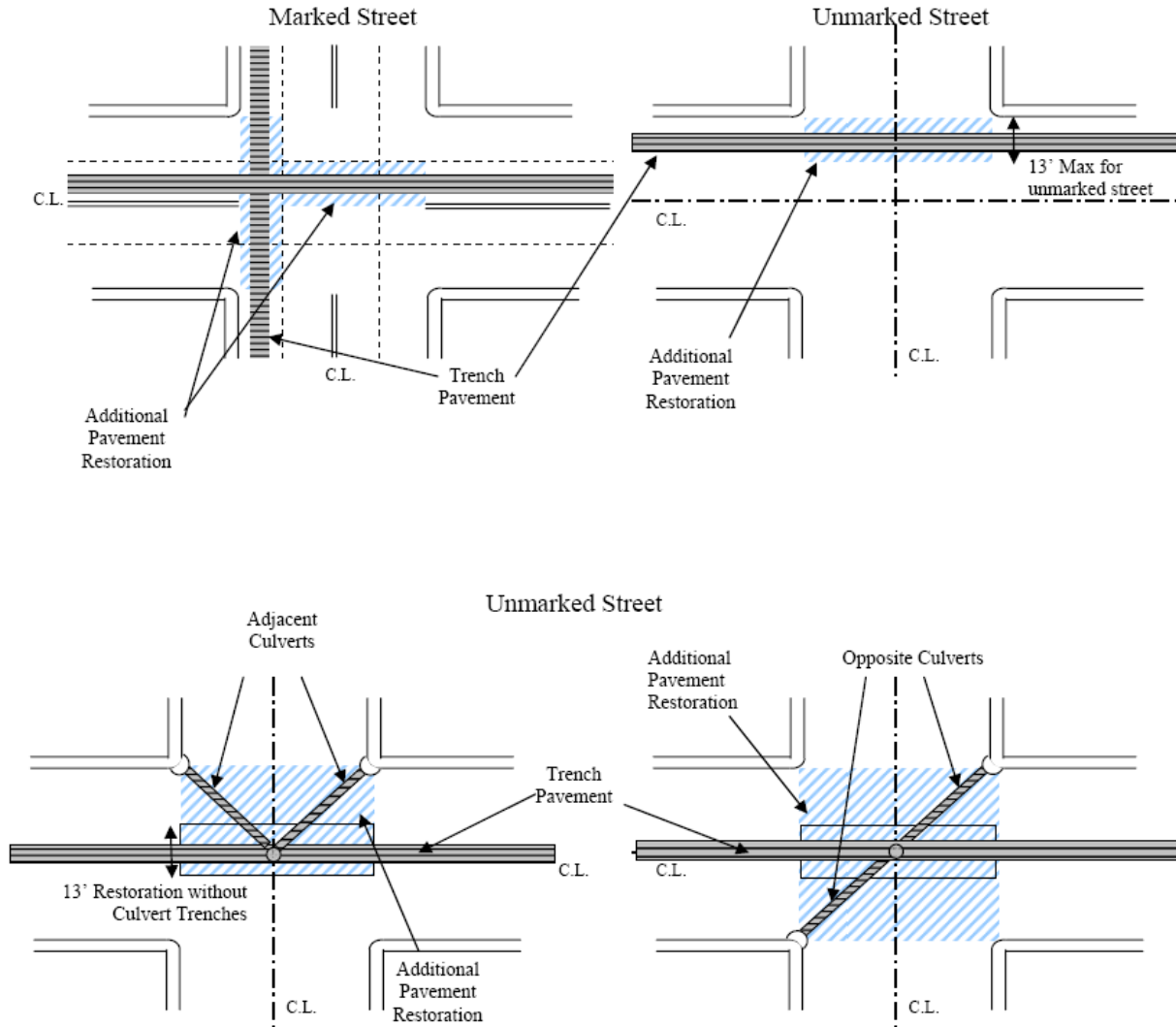


Figure 19

Depicts restoration requirements for intersections that are (non)delineated and when lateral work is also conducted in addition to the main excavation

- F. The new asphalt concrete wearing surface shall:
1. Be 2 inches minimum thickness.
 2. Be applied by a paving machine or spreader box in order to eliminate the uneven, washboard effect that results from hand spreading.
 3. Provide a smooth wearing surface such that there are no irregularities greater than five-sixteenth ($5/16''$) of an inch for 10 feet in any direction.
 4. Achieve a minimum relative compaction of 90%.

5. Have edges which have been hot ironed

12.4 Are there any other requirements for pavement restoration?

- A. ACWS on designated bicycle routes must be removed and restored for the full width of the bicycle lane.
- B. Pavement made of special materials shall be restored in kind.
- C. Traffic striping and markings must be restored in kind upon completion of paving.
- D. Bus Stops and designated streets will require special restoration specifications. (See Figures 12 13, & 14)

SECTION 13

Enforcement

13.1 What is a violation?

- A. Doing work without a permit.
- B. Performing operations that are not included in the permit.
- C. Failing to comply with provisions of the Excavation Code.
- D. Failing to comply with requirements of this Order.
- E. Failing to comply with permit requirements.

13.2 How will these violations be dealt with?

- A. Administrative Penalties.
 - 1. Administrative penalties are shown in Figure 17.
 - 2. A "Notice of Violation" (NOV) may be issued when a violation has been observed. (Figure 19)
 - 3. The NOV will specify:
 - a) The nature of the violation,
 - b) The time by which the violation must be corrected
 - c) The section of the Public Works Code or Order violated, and whether or not a penalty is imposed.
- B. Appealing an Administrative Penalty
 - 1. An appeal of an Administrative Penalty must be made in writing within ten (10) days of the date imposed.
 - 2. Appeals must be addressed to the Director of Public Works.
 - 3. The appeal must state the basis for the appeal:
 - a) Why an Administrative Penalty should not have been imposed; and/or
 - b) Why the amount of the penalty should be reduced or is incorrect.
 - 4. The appeal will be considered at a Director's Hearing. The hearing officer will make a recommendation to the Director.
 - 5. The decision of the Director shall be final.
- C. Enforcement by SFPD. As part of the "Unclog the Streets" program Police officers may issue \$271 citations for blocking traffic. Permittees are urged to limit their work in the Public Right-of-Way to permitted times.
- D. Other Enforcement Methods. Violations of the "Excavation Code" may also be treated as infractions or misdemeanors. Details are contained in the Excavation Code (Appendix 1).

Violation		Penalty (not to exceed amount shown)
1	Excavating without permits Excavation Permits Special Traffic Permit USA Ticket Number	\$10,000/day, stop work and get permit
2	Excavating without providing Public Notice	\$1,000/day, stop work until corrected
3	Beginning a "Major Project" without having a Pre Construction Meeting	\$500 per occurrence and stop work until a Pre-Construction Meeting has occurred
4	Violation of Permit Conditions	\$500 per occurrence per day
5	Improper Site Protection Improper plating, path of travel, barricading, etc.	\$500 per occurrence per day, correct immediately
6	No permit on site	\$250 per occurrence, correct immediately
7	Improper Trimming of Trench	\$100 per block, per day stop excavation until correct
8	Trench length over 1,200 linear feet	\$100 per day over until restoration of trench to satisfy 1,200 linear feet and stop excessive work
9	Improper Public Notice No Project Sign, wrong information on sign/notice, etc.	\$100 per block, per day stop work until Public Notice is provided and validated
10	Non-compliance with 120 hr trench restoration requirements	\$100 per block, per day until trench is restored per requirement stop additional work
11	Improper Housekeeping Failure to remove spoil, dirty site, no sweeping, etc.	\$100 per block, per day, correct immediately
12	Other Excavation Code violations	\$100 per block, per day

Figure 16 Administrative Penalties

DPW
08651

NOTICE OF VIOLATION

Permit #

OF THE SAN FRANCISCO MUNICIPAL CODE REGARDING UNSAFE, NON-COMPLYING OR SUBSTANDARD CONDITIONS AT THIS LOCATION

ADDRESS: _____

Department of PUBLIC WORKS
City and County of San Francisco
Bureau of Street-Use and Mapping
875 Stevenson Street, Room 460
San Francisco, CA 94103
OFFICE: (415) 554-5810
FAX: (415) 554-8161

Date: _____ Time: _____
Company: _____
Contact Person: _____
Contact Phone: _____

You are hereby notified of violation of the Public Works code at the subject address. You are further notified that unless said violation is corrected within the time specified herein, or if the violation is repeated, or new violations occur, such acts shall be constituted as cause for additional Notices and will be subjected to additional fines, and/or other penalties per the D.P.W. Public Works Code. Violations of the conditions for work authorized under a D.P.W. permit are grounds for revocation of said permit.

VIOLATION DESCRIPTION		
DPW Code	Description	Penalty
<input type="checkbox"/>	STOP ALL WORK	
<input type="checkbox"/>	EXCEEDING SCOPE OF PERMIT	
<input type="checkbox"/>	NO PERMIT ON SITE	
<input type="checkbox"/>	NO PERMIT	
<input type="checkbox"/>	NON-COMPLIANCE WITH DPW CODE	
<input type="checkbox"/>	EXPIRED PERMIT	

Corrective Action(s): _____

CORRECTIVE ACTION ON ABOVE VIOLATIONS MUST BE TAKEN WITHIN: _____ HRS. / DAYS
A FINANCIAL PENALTY OF \$ _____ PER DAY PER INCIDENT BY ORDER OF THE DIRECTOR, D.P.W.

Without admitting guilt, I acknowledge receipt of this Notice: _____

ISSUED by INSPECTOR: _____ PHONE: _____
OFFICE HOURS: _____ A.M. AND _____ P.M., MON thru FRI
INSPECTOR SIGNATURE: _____

(SEE REVERSE SIDE FOR ADDITIONAL INFORMATION)

Figure 17 Notice of Violation

Appendix A Article 2.4 Public Works Code

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PAGE 01/30

ARTICLE 2.4: EXCAVATION IN THE PUBLIC RIGHT-OF-WAY

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ARTICLE 2.4: EXCAVATION IN THE PUBLIC RIGHT-OF-WAY

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- Sec. 2.4.2. Permits Required to Excavate.
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- Sec. 2.4.40. Deposit.
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- Sec. 2.4.54. Stop Work Order, Permit Modification, and Permit Revocation.
- Sec. 2.4.55. Restoration of the Public Right-of-Way.

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- Sec. 2.4.91. Identification of Visible Facilities.
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SUBARTICLE I GENERAL PROVISIONS

Page 1 of 3

**SUBARTICLE I
GENERAL PROVISIONS****SEC. 2.4.1. EXCAVATION IN THE PUBLIC RIGHT-OF-WAY.**

This Article 2.4 shall govern excavation in the public right-of-way within the City that is under the jurisdiction and control of the Department of Public Works. The Director of Public Works shall be responsible for managing the public right-of-way.

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.2. PERMITS REQUIRED TO EXCAVATE.

(a) It is unlawful for any person to make or to cause or permit to be made any excavation in any public right-of-way that is under the jurisdiction of the Department of Public Works without first obtaining from the Department a permit authorizing such excavation.

(b) The Department shall issue a permit to excavate only if the owner has the legal authority to occupy and use the public right-of-way for the purposes identified in the application for the permit and the owner and its agent, if any, are in compliance with this Article.

(c) No permit to excavate shall be required when an excavation is to be completed within a period of 24 hours or less to install a parking meter, street light, street tree, traffic sign, traffic signal, or utility pole or to repair a utility box in a sidewalk; or when an excavation is in connection with the construction or maintenance of a subsidewalk basement; or when an excavation is performed for the sole purpose of repairing a sidewalk.

(d) Permit requirements pertaining to emergency excavation are addressed in Section 2.4.22.

(Added by Ord. 341-98, App. 11/13/98; amended by Ord. 33-02, File No. 020051, App. 3/28/2002)

SEC. 2.4.3. DEPARTMENT ORDERS AND REGULATIONS.

In addition to the requirements set forth in this Article, the Department may adopt such orders or regulations as it deems necessary in order to preserve and maintain the public health, safety, welfare, and convenience. Each excavation in the public right-of-way pursuant to this Article shall be performed in accordance with the standard plans and specifications of the Department and any Department orders or regulations, except where the Director, in his or her discretion, grants prior written approval to deviate from such standard plans and specifications, orders, or regulations. The Director shall develop guidelines to implement the granting of waivers authorized pursuant to this Article. Furthermore, excavation in the public right-of-way shall conform to the orders, regulations, and rules of the Department of Parking and Traffic, including, but not limited to, the regulations adopted in accordance with Article 11 of the San Francisco Traffic Code (the "Blue Book").

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.4. DEFINITIONS.

For purposes of this Article, the following terms shall have the following meanings:

(a) "Agent" shall mean a person or persons authorized to assist an owner in the

SUBARTICLE I GENERAL PROVISIONS

permitting process or in the performance of an excavation.

(b) "Applicant" shall mean an owner or duly authorized agent of such owner, who has submitted an application for a permit to excavate.

(c) "Article" shall mean this Article 2.4 of the Public Works Code.

(d) "Block" shall mean that part of the public right-of-way that includes the street area from the property line to the parallel property line in width and extending from the property line of an intersecting street to the nearest property line of the next intersecting street in length. For purposes of this definition, an intersection also shall be considered a "block."

(e) "City" shall mean the City and County of San Francisco.

(f) "Department" shall mean the Department of Public Works.

(g) "Deposit" shall mean any bond, cash deposit, or other security provided by the applicant in accordance with Section 2.4.40 of this Article.

(h) "Director" shall mean the Director of the Department of Public Works or his or her designee.

(i) "Excavation" shall mean any work in the surface or subsurface of the public right-of-way, including, but not limited to opening the public right-of-way; installing, servicing, repairing or modifying any facility(ies) in or under the surface or subsurface of the public right-of-way, and restoring the surface and subsurface of the public right-of-way.

(j) "Facility" or "facilities" shall include, but not be limited to, any and all cables, cabinets, ducts, conduits, converters, equipment, drains, handholds, manholes, pipes, pipelines, splice boxes, surface location markers, tracks, tunnels, utilities, vaults, and other appurtenances or tangible things owned, leased, operated, or licensed by an owner or person, that are located or are proposed to be located in the public right-of-way.

(k) "Large excavation project" shall mean any excavation of more than 1000 square feet.

(l) "Major work" shall mean any reasonably foreseeable excavation that will affect the public right-of-way for more than 15 consecutive calendar days.

(m) "Medium excavation project" shall mean any excavation of more than 100 but no greater than 1,000 square feet.

(n) "Moratorium street" shall mean any block that has been reconstructed, repaved, or resurfaced by the Department or any other owner or person in the preceding five-year period.

(o) "Municipal excavator" shall mean any agency, board, commission, department, or subdivision of the City that owns, installs, or maintains a facility or facilities in the public right-of-way.

(p) "Owner" shall mean any person, including the City, who owns any facility or facilities that are or are proposed to be installed or maintained in the public right-of-way.

(q) "Permit" or "permit to excavate" shall mean a permit to perform an excavation as it has been approved, amended, or renewed by the Department.

(r) "Permittee" shall mean the applicant to whom a permit to excavate has been granted by the Department in accordance with this Article.

(s) "Person" shall mean any natural person, corporation, partnership, any municipal excavator, or any governmental agency, including the State of California or United

SUBARTICLE I GENERAL PROVISIONS

States of America.

(t) "Public right-of-way" shall mean the area across, along, beneath, in, on, over, under, upon, and within the dedicated public alleys, boulevards, courts, lanes, roads, sidewalks, spaces, streets, and ways within the City, as they now exist or hereafter will exist and which are or will be under the permitting jurisdiction of the Department of Public Works.

(u) "Responsible party" shall mean the owner for each excavation involving the owner's facility or facilities. In addition, it shall mean any person who performs an excavation or has a duty or right to manage or participate in the management of an excavation and whom the Director designates as responsible, in whole or in part, for such excavation.

(v) "Sidewalk" shall mean the area between the fronting property line and the back of the nearest curb.

(w) "Small excavation project" shall mean any excavation of 100 square feet or less.

(x) "Utility excavator" shall mean any owner whose facility or facilities in the public right-of-way are used to provide electricity, gas, information services, sewer service, steam, telecommunications, traffic controls, transit service, video, water, or other services to customers regardless of whether such owner is deemed a public utility by the California Public Utilities Commission.

(Added by Ord. 341-98, App. 11/13/98; amended by Ord. 33-02, File No. 020051, App. 3/28/2002)

SUBARTICLE II APPLICATIONS FOR PERMITS TO PERFORM AN EXCAVATION Page 1 of 4

**SUBARTICLE II
APPLICATIONS FOR PERMITS TO
PERFORM AN EXCAVATION****SEC. 2.4.10. APPLICATIONS.**

(a) Applications shall be submitted in a format and manner specified by the Department and shall contain:

(i) The name, address, telephone, and facsimile number of the applicant. Where an applicant is not the owner of the facility to be installed, maintained, or repaired in the public right-of-way, the application also shall include the name, address, telephone, and facsimile number of the owner;

(ii) A description of the location, purpose, method of excavation, and surface and subsurface area of the proposed excavation;

(iii) A plan showing the proposed location and dimensions of the excavation and the facilities to be installed, maintained, or repaired in connection with the excavation, and such other details as the Department may require;

(iv) A copy or other documentation of the franchise, easement, encroachment permit, license, or other legal instrument that authorizes the applicant or owner to use or occupy the public right-of-way for the purpose described in the application. Where the applicant is not the owner of the facility or facilities to be installed, maintained, or repaired, the applicant must demonstrate in a form and manner specified by the Department that the applicant is authorized to act on behalf of the owner;

(v) The proposed start date of excavation;

(vi) The proposed duration of the excavation, which shall include the duration of the restoration of the public right-of-way physically disturbed by the excavation;

(vii) Written acknowledgment that all material to be used in the excavation, installation, maintenance, or repair of facilities, and restoration of the public right-of-way will be on hand and ready for use so as not to delay the excavation and the prompt restoration of the public right-of-way;

(viii) Written acknowledgment that the owner and its agent, if any, are in compliance with all terms and conditions of this Article, the orders, regulations, and standard plans and specifications of the Department, and that the owner and its agent are not subject to any outstanding assessments, fees, penalties that have been finally determined by the City or a court of competent jurisdiction;

(ix) A current Business Tax Registration Certificate issued by the San Francisco Tax Collector pursuant to Section 1003 of Part III of the San Francisco Municipal Code for the owner and its agent, if any;

(x) Evidence of insurance as required by Section 2.4.23 of this Article;

(xi) A deposit as required by Section 2.4.40 of this Article;

(xii) Any other information that may reasonably be required by the Department.

(b) The Department may allow an applicant to maintain documents complying with Subsections (iv), (ix), (x), and (xi) on file with the Department rather than requiring submission of such documents with each separate application.

(Added by Ord. 341-98, App. 11/13/98; amended by Ord. 33-02, File No. 020051, App. 3/28/2002)

SEC. 2.4.11. COORDINATION OF EXCAVATION.

(a) Five-Year Plans.

(i) On the first day of April and October, or the first regular business day immediately thereafter, each utility and municipal excavator shall prepare and submit to the Department a plan, in a format specified by the Department, that shows all major work anticipated to be done in the public right-of-way in the next five years. Any utility or municipal excavator that does not propose major work in the next five years shall submit a plan with a statement that no such major work is anticipated and shall immediately report any major work to the Department as soon as it becomes reasonably foreseeable.

(ii) The Department may disclose information contained in a five-year plan to any utility excavator or municipal excavator only on a need-to-know basis in order to facilitate coordination among excavators and to avoid unnecessary excavation in City streets. To the maximum extent permissible under federal, State, and local laws applicable to public records, the City shall not otherwise disclose to the public any information contained in a five-year plan submitted by a utility excavator that is proprietary, trade secret or is otherwise protected from disclosure; provided, however that the City shall have no duty to decline to disclose any information that the utility excavator has not identified on its face as proprietary, trade secret or otherwise protected from disclosure. The Department shall notify a utility excavator of any request for inspection of public records that calls for disclosure of any five-year plan on which any information has been identified as proprietary, trade secret or otherwise protected from disclosure. The Department shall consult with the City Attorney regarding any such request and shall inform the affected utility excavator either that the Department will refuse to disclose the protected information or, if there is no proper basis for such refusal, that the Department intends to disclose the requested information unless ordered otherwise by a court.

(b) Department Repaving Plans.

(i) The Department shall prepare a five-year repaving plan showing all proposed repaving and reconstruction of the public right-of-way. The Department's repaving plan shall be revised and updated on a semiannual basis after receipt of the five-year plans from utility and municipal excavators. In order to facilitate coordination and minimize the cost of excavation, the Department shall make its repaving plan available for public inspection.

(ii) At least one hundred twenty calendar days prior to undertaking the repaving and reconstruction of any block, the Department shall send a notice of the proposed repaving and reconstruction to each utility and municipal excavator.

(c) Coordination.

(i) The Department shall review the five-year plans and identify conflicts and opportunities for coordination of excavations. The Department shall notify affected owners and permittees of such conflicts and opportunities to the extent necessary to maximize coordination of excavation. Each applicant shall coordinate, to the extent practicable, with each potentially affected owner and permittee to minimize disruption in the public right-of-way.

(ii) When two or more applicants coordinate major work in the same block so that, in the opinion of the Department, such major work minimizes disruption to the affected neighborhood, and is likely to qualify the block for repaving, the Department shall make its best effort to schedule the affected block for repaving. Such scheduling shall occur, to

SUBARTICLE II APPLICATIONS FOR PERMITS TO PERFORM AN EXCAVATION Page 3 of 4

the extent funds are available in the Street Damage Restoration Fund, so that the applicants may qualify for a waiver of the street damage restoration fee under Section 2.4.44(b)(ii). Notwithstanding the foregoing, nothing in this subsection shall interfere with the Department's authority to allocate available repaving resources in a manner that it determines best serves the public interest.

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.12. JOINT EXCAVATION.

(a) **Municipal Excavators.** Whenever two or more municipal excavators propose major work in the same block within a five-year period, such work shall be performed by one municipal excavator. The participants to the excavation shall pay their pro rata share of the work. For purposes of this subsection, the municipal excavators shall be treated as a single applicant and shall submit one application.

(b) **Utility Excavators.** Whenever two or more utility excavators propose major work in the same block within a five-year period, such work shall be performed by one utility excavator. For purposes of this subsection, the utility excavators shall be treated as a single applicant and shall submit one application.

(c) **Municipal Excavator and Utility Excavator.** Whenever a municipal excavator(s) and a utility excavator(s) propose major work in the same block within a five-year period, the Department shall condition permits for such work in a manner that maximizes coordination and minimizes the total period of construction.

(d) **Waiver of Joint Excavation Requirements.** Applicants may seek a waiver of the joint excavation requirements with respect to a particular excavation. Within 30 calendar days of receipt of a written request for a waiver, the Director, in his or her discretion, may grant a waiver to the joint excavation requirements for good cause. In making his or her decision on the request for waiver, the Director shall consider the impact of the proposed excavation on the neighborhood, the applicant's need to provide services to a property or area, facilitating the deployment of new technology as directed pursuant to official City policy, and the public health, safety, welfare, and convenience. The Director shall indicate in written, electronic, or facsimile communication the basis for granting any waiver pursuant to this subsection. The Director may place additional conditions on any permit(s) subject to a waiver, including, but not limited to, the charging of additional fees pursuant to Section 2.4.43. The Director's decision regarding waivers of the joint excavation requirements shall be final.

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.13. TRANSIT, PEDESTRIAN, AND BICYCLE IMPROVEMENTS AS PART OF PLANNING, CONSTRUCTION, RECONSTRUCTION, AND REPAVING PROJECTS.

(a) Whenever the Department or other Municipal Excavator undertakes a project involving the planning, construction, reconstruction, or repaving of a public right-of-way, such project shall include, to the maximum extent practicable and feasible, the following transit, pedestrian, and bicycle improvements:

- (1) Street and pedestrian-scale sidewalk lighting;
- (2) Pedestrian and bicycle safety improvement measures, as established in any official City adopted bicycle or pedestrian safety plan or other City adopted planning documents;
- (3) Appropriate access in accordance with the Americans with Disabilities Act;

**SUBARTICLE III
PERMITS TO EXCAVATE****SEC. 2.4.20. ACTION ON APPLICATIONS FOR PERMITS TO EXCAVATE.**

- (a) After receipt of an application for a permit to excavate, the Department, within a reasonable time period, shall determine whether an application is complete.
- (b) If the application is deemed to be incomplete, the Department promptly shall advise the applicant in a written, electronic, or facsimile communication of the reasons for rejecting the application as incomplete.
- (c) If the application is deemed to be complete, the Department, in its discretion, may deny, approve, or conditionally approve the application.
 - (i) If the application is approved or conditionally approved, the Department shall issue a permit to the applicant. The Department may condition a permit with specified requirements that preserve and maintain the public health, safety, welfare, and convenience. The Department shall inform the permittee of the basis for such requirements.
 - (ii) If the application is denied, the Department shall advise the applicant in a written, electronic, or facsimile communication of the basis for denial.

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.20.1. TERMS AND LIMITATIONS.

The permit shall specify the location, extent, and method of the excavation, the start date and duration of the excavation, the permittee to whom the permit is issued, and any conditions placed on the permit. The terms and conditions of the permit shall include the application, all information submitted therewith, and all Department orders and regulations applicable to the permit. The Department must approve any and all modifications to the permit.

(Added by Ord. 341-98, App. 11/13/98; amended by Ord. 33-02, File No. 020051, App. 3/28/2002)

SEC. 2.4.20.2. DURATION AND VALIDITY.

Permits shall be void if the excavation has not begun within 30 calendar days of the start date specified in the permit, if the excavation is not prosecuted diligently to its conclusion, or if the excavation, including restoration, has not been completed within the specified duration; provided, however, that the Director, at his or her discretion, may issue extensions to the start date, the duration of excavation, or both upon written request from the permittee. Such written requests must explain why the work could not be commenced on the start date, completed in the approved number of calendar days, or both; shall specify the additional number of calendar days required to complete the work; and shall be accompanied by applicable fees specified in Subarticle IV. All requests to modify the start date of an excavation shall be made at least five (5) calendar days prior to the excavation start date. All requests to modify the duration of the excavation shall be made at least five (5) calendar days prior to the permit expiration date. Any extension that the Director grants may be subject to additional special conditions, including, but not limited to, conditions that ensure timely completion and coordination of the project. The Director shall not grant requests for extensions to the start date after the permitted start date nor shall the Director grant requests for extensions to the duration of the excavation after the

SUBARTICLE III PERMITS TO EXCAVATE

permit expiration date.

(Added by Ord. 341-98, App. 11/13/98; amended by Ord. 33-02, File No. 020051, App. 3/28/2002)

SEC. 2.4.20.3. PERMIT AMENDMENTS.

The Director, at his or her sole discretion, may allow amendments to the permit, such as to change the method of construction, to advance the start date of the excavation, or modify permit conditions, upon written request from the permittee. Such requests shall explain the basis for the permit amendment and shall be accompanied by applicable fees specified in Subarticle IV. Any amendments that the Director grants may be subject to additional special conditions, including, but not limited to, conditions that ensure timely completion and coordination of the project. The Director shall not grant requests for amendments to the excavation after the permit expiration date.

(Added by Ord. 33-02, File No. 020051, App. 3/28/2002)

SEC. 2.4.20.4. NONTRANSFERABILITY OF PERMITS.

Permits are not transferable.

(Added by Ord. 341-98, App. 11/13/98; amended by Ord. 33-02, File No. 020051, App. 3/28/2002)

SEC. 2.4.21. MORATORIUM STREETS.

The Department shall not issue any permit to excavate in any moratorium street; provided, however, that the Director, in his or her discretion, may grant a waiver for good cause. The Director is specifically authorized to grant a waiver for an excavation that facilitates the deployment of new technology as directed pursuant to official City policy. The Director shall issue his decision on a waiver within a reasonable period after receipt of a written request for a waiver. The Director may place additional conditions on a permit subject to a waiver, including, but not limited to, the charging of additional fees pursuant to Section 2.4.43. The Director's decision regarding a waiver shall be final.

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.22. EMERGENCY EXCAVATION.

Nothing contained in this Article shall be construed to prevent any person from taking any action necessary for the preservation of life or property or for the restoration of interrupted service provided by a municipal or utility excavator when such necessity arises during days or times when the Department is closed. In the event that any person takes any action to excavate or cause to be excavated the public right-of-way pursuant to this Section, such person shall apply for an emergency permit within four hours after the Department's offices are first opened. The applicant for an emergency permit shall submit a written statement of the basis of the emergency action and describe the excavation performed and any work remaining to be performed.

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.23. LIABILITY AND INDEMNIFICATION.

Each permit, except one obtained by a municipal excavator, shall incorporate by reference and require the owner and its agent, if any, to comply with the liability, indemnity, insurance, and taxable

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possessory interest provisions set forth below in this Section; provided, however, that the Director, with the concurrence of the City Controller and City Risk Manager, may modify the indemnity and insurance provisions as they pertain to a particular permit.

(a) **Liability upon Owner and Agent.** Each owner and its agent is wholly responsible for the quality of the excavation performed in the public right-of-way and both the owner and agent are jointly and severally liable for all consequences of any condition of such excavation and any facilities installed in the public right-of-way. The issuance of any permit, inspection, repair, or suggestion, approval, or acquiescence of any person affiliated with the Department shall not excuse any owner or agent from such responsibility or liability.

(b) **Indemnification, Defense, and Hold Harmless.**

(i) Each owner and agent shall agree on its behalf and that of any successor or assign to indemnify, defend, protect, and hold harmless the City, including, without limitation, each of its commissions, departments, officers, agents, and employees (hereinafter in this subsection collectively referred to as "San Francisco") from and against any and all actions, claims, costs, damages, demands, expenses, fines, injuries, judgments, liabilities, losses, penalties, or suits including, without limitation, attorneys' fees and costs (collectively, "claims") of any kind allegedly arising directly or indirectly from:

(1) Any act by, omission by, or negligence of, owner or its agent, contractors, subcontractors, or the officers, agents, or employees of such entities, while engaged in the performance of the excavation authorized by the permit, or while in or about the property subject to the permit for any reason connected in any way whatsoever with the performance of the excavation authorized by the permit, or allegedly resulting directly or indirectly from the maintenance or installation of any equipment, facility (ies), or structures authorized under the permit;

(2) Any accident, damage, death, or injury to any contractor or subcontractor, or any officer, agent or employee of either of them, while engaged in the performance of the excavation authorized by the permit, or while in or about the property for any reason connected with the performance of the excavation authorized by the permit, or arising from liens or claims for services rendered or labor or materials furnished in or for the performance of the excavation authorized by the permit;

(3) Any accident, damage, death, or injury to any person(s) or accident, damage, or injury to any real or personal property in, upon, or in any way allegedly connected with the excavation authorized by the permit from any cause or claims arising at any time; and,

(4) Any release or discharge, or threatened release or discharge, of any hazardous material caused or allowed by permittee about, in, on, or under the excavation site subject to the permit or the environment. As used herein, "hazardous material" means any gas, material, substance, or waste which, because of its quantity, concentration, or physical or chemical characteristics, is deemed by any federal, state, or local governmental authority to pose a present or potential hazard to human health or safety or to the environment. "Release" when used with respect to hazardous materials shall include any actual or imminent disposing, dumping, emitting, emptying, escaping, injecting, leaching, leaking, pumping, pouring, or spilling.

(ii) Upon the request of San Francisco, the owner or its agent, at no cost or expense to San Francisco, must indemnify, defend, and hold harmless San

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San Francisco against any claims, regardless of the alleged negligence of San Francisco or any other party, except only for claims resulting directly from the sole negligence or willful misconduct of San Francisco. Each owner and its agent specifically acknowledges and agrees that it has an immediate and independent obligation to defend San Francisco from any claims which actually or potentially fall within the indemnity provision, even if the allegations are or may be groundless, false, or fraudulent, which obligation arises at the time such claim is tendered to owner or its agent by San Francisco and continues at all times thereafter. In addition, San Francisco shall have a cause of action for indemnity against each owner and its agent for any costs San Francisco may be required to pay as a result of defending or satisfying any claims that arise from or in connection with the permit, except only for claims resulting directly from the sole negligence or willful misconduct of San Francisco. Owner and its agent agree that the indemnification obligations assumed under the permit shall survive expiration of the permit or completion of excavation.

(c) Insurance.

(i) Each owner or its agent shall maintain in full force and effect, throughout the term of the permit, an insurance policy or policies issued by an insurance company or companies satisfactory to the City's Controller and Risk Manager. Policy or policies shall afford insurance covering all operations, vehicles, and employees, as follows:

- (1) Workers' Compensation with employers' liability limits not less than \$1,000,000 each accident;
- (2) Commercial general liability insurance with limits not less than \$1,000,000 each occurrence combined single limit for bodily injury and property damage, including contractual liability; personal injury; explosion, collapse, and underground (xcu); products; and completed operations;
- (3) Business automobile liability insurance with limits not less than \$1,000,000 each occurrence combined single limit for bodily injury and property damage, including owned, nonowned, and hired auto coverage, as applicable;
- (4) Contractors' pollution liability insurance, on an occurrence form, with limits not less than \$1,000,000 each occurrence combined single limit for bodily injury and property damage and any deductible not to exceed \$25,000 each occurrence.

(ii) Said policy or policies shall include the City and its officers and employees jointly and severally as additional insureds, shall apply as primary insurance, shall stipulate that no other insurance effected by the City will be called on to contribute to a loss covered thereunder, and shall provide for severability of interests. Said policy or policies shall provide that an act or omission of one insured, which would void or otherwise reduce coverage, shall not reduce or void the coverage as to any other insured. Said policy or policies shall afford full coverage for any claims based on acts, omissions, injury, or damage which occurred or arose, or the onset of which occurred or arose, in whole or in part, during the policy period. Said policy or policies shall be endorsed to provide 30 calendar days advance written notice of cancellation or any material change to the Department.

(iii) Should any of the required insurance be provided under a claims-made form, the insured owner or its agent shall maintain such coverage continuously throughout the term of the permit, and, without lapse, for a period of three years beyond the expiration or termination of the permit, to the effect that, should

occurrences during the term of the permit give rise to claims made after expiration or termination of the permit, such claims shall be covered by such claims-made policies.

(iv) Should any of the required insurance be provided under a form of coverage that includes a general annual aggregate limit or provides that claims investigation or legal defense costs be included in such general annual aggregate limit, such general aggregate limit shall be double the occurrence or claims limits specified above in Subsection (c)(i).

(v) Such insurance shall in no way relieve or decrease owner's and its agent's obligation to indemnify the City under Subsection (b) or any other provision of this Article.

(vi) Certificates of insurance, in the form satisfactory to the Department, evidencing all coverages above, shall be furnished to or maintained on file with the Department before issuance of a permit, with complete copies of policies furnished promptly upon the Department's request.

(vii) Where an owner is self-insured, and such insurance is no less broad and affords no less protection to the City than the requirements specified above in Subsection (c), the Department, in consultation with the City's Controller and Risk Manager, may accept such insurance as satisfying the requirements of Subsection (c). Evidence of such insurance shall be provided in the manner specified in Subsection (c)(vi).

(d) Taxable Possessory Interest. Each owner shall acknowledge on its behalf and that of any successor or assign that its permit incorporates the following statements: The owner of the facility(ies) for which the permit to excavate was obtained recognizes and understands that the permit may create a possessory interest subject to property taxation and that owner may be subject to the payment of property taxes levied on such interest under applicable law. Owner agrees to pay taxes of any kind, including possessory interest taxes, if any, that may be lawfully assessed on owner's interest under the permit to excavate or for use of the public right-of-way and to pay other excises, licenses, taxes, or permit charges or assessments based on owner's usage of the public right-of-way that may be imposed on owner by applicable law. Owner shall pay all of such charges when they become due and before delinquency.

(Added by Ord. 341-98, App. 11/13/98; amended by Ord. 33-02, File No. 020051, App. 3/28/2002)

SEC. 2.4.24. PERMIT TO BE AVAILABLE AT EXCAVATION SITE.

The permit or a photo duplicate shall be available for review at the site of the excavation for the duration of the excavation and shall be shown, upon request, to any police officer or any employee of a City agency, board, commission, or department with jurisdictional responsibility over activities in the public right-of-way.

(Added by Ord. 341-98, App. 11/13/98)

SUBARTICLE IV DEPOSITS AND FEES

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**SUBARTICLE IV
DEPOSITS AND FEES****SEC. 2.4.40. DEPOSIT.**

Each applicant shall submit and maintain with the Department a bond, cash deposit, or other security acceptable to the Department securing the faithful performance of the obligations of the owner and its agent under any permit(s) to excavate and the compliance with all terms and conditions of this Article (the "deposit"). The deposit shall be in the sum of \$25,000 in favor of the "Department of Public Works, City and County of San Francisco." Utility and municipal excavators and other frequent applicants may submit a single deposit for multiple excavations so long as a constant balance of \$25,000 is maintained on file with the Department. If the Director has deducted from such a deposit pursuant to Section 2.4.46(c), the utility or municipal excavator or other frequent applicant must restore the full amount of the deposit prior to the Department's issuance of a subsequent permit.

(Added by Ord. 341-98, App. 11/13/98; amended by Ord. 33-02, File No. 020051, App. 3/28/2002)

SEC. 2.4.41. ADMINISTRATIVE FEE.

Each applicant shall pay to the Department a fee of \$66 for each permit issued for a small excavation project, a fee of \$83 for each block contained in a medium excavation project, or a fee of \$110 for each block contained in a large excavation project. Said fees shall compensate the Department for the cost incurred to administer the provisions of this Article. If the Director grants a permit extension or amendment pursuant to Sections 2.4.20.2 or 2.4.20.3, the permittee shall pay a fee of \$66 for any block for which the permit has been extended or amended to cover the cost of additional permit review and administration.

(Added by Ord. 341-98, App. 11/13/98; amended by Ord. 33-02, File No. 020051, App. 3/28/2002)

SEC. 2.4.42. INSPECTION FEE.

Each applicant shall pay to the Department a fee of \$16 for each permit issued for a small excavation project, a fee of \$55 for each calendar day of a medium excavation project, or a fee of \$81 for each calendar day of a large excavation project. Said fee shall compensate the Department for the cost of the inspection and regulatory services provided to such applicant when he or she becomes a permittee pursuant to this Article. No inspection fees shall be collected from a municipal excavator when: (a) the municipal excavator pays the Department to manage and inspect the construction or (b) the excavation is to construct, replace, or repair Municipal Railway tracks. If the Director grants a permit extension pursuant to Section 2.4.20.2, the permittee shall pay \$16 for a small excavation project or the appropriate fees for a medium or large excavation project for each additional calendar day for which the permit is extended to cover the cost of additional permit inspection. If the Director grants a permit amendment pursuant to Section 2.4.20.3 that results in additional permit inspection, the permittee shall pay the fees specified above for permit extensions.

(Added by Ord. 341-98, App. 11/13/98; amended by Ord. 33-02, File No. 020051, App. 3/28/2002)

SEC. 2.4.43. ADDITIONAL FEES FOR EXCAVATION.

In instances where administration of this Article or inspection of an excavation is or will be

SUBARTICLE IV DEPOSITS AND FEES

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unusually costly to the Department, the Director, in his or her discretion, may require an applicant or permittee to pay any sum in excess of the amounts charged pursuant to Sections 2.4.41 and 2.4.42. This additional sum shall be sufficient to recover actual costs incurred by the Department and shall be charged on a time and materials basis. The Director also may charge for any time and materials costs incurred by other agencies, boards, commissions, or departments of the City in connection with the administration or inspection of the excavation. Whenever additional fees are charged, the Director, upon request of the applicant or permittee, shall provide in writing the basis for the additional fees and an estimate of the additional fees.

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.44. STREET DAMAGE RESTORATION FEE.

(a) Calculation of Fee. Each applicant shall pay to the Department a street damage restoration fee to recover the increased repaving and reconstruction costs incurred by the City that are reasonably attributable to the impact of excavation in City streets. The fee shall not generate proceeds in excess of the City's costs of street repaving and reconstruction reasonably attributable to the excavation for which the fee is charged. The amount of the fee shall be calculated as follows:

TABLE INSET:

Age of Block (Years Since Last Resurfacing)	Fee Amount
0--5 years	\$3.50 per square foot of excavation
6--10 years	\$3.00 per square foot of excavation
11--15 years	\$2.00 per square foot of excavation
15--20 years	\$1.00 per square foot of excavation

Where an applicant proposes an excavation in a block whose age is unknown to the Department and the block's pavement condition score recorded in the Department's pavement management and mapping database is greater than 53, the applicant shall be charged the street damage restoration fee at the rate specified for streets 15 to 20 years old.

(b) Exceptions from the Street Damage Restoration Fee to Encourage Coordination. To encourage coordination of excavation with the Department's repaving schedule and to encourage excavation in older blocks and those with lower pavement condition scores:

(i) No fee will be assessed for excavation in blocks with a recorded pavement condition score of 53 or less, or a recorded age of greater than 20 years.

(ii) No fee will be assessed for excavation in a block scheduled to be completed by an applicant less than two years prior to the Department's scheduled repaving of that block.

(c) Fee Waived for Excavation that Includes Repaving. The street damage restoration fee shall be waived for an excavation where an applicant proposes to reconstruct and repave the entire block affected by the excavation or any and all traffic lanes affected by the excavation, where such reconstruction and repaving is performed consistent with all of the standards set forth in orders, rules, plans and specifications of the Department.

(d) Fee Waiver for In-Kind Payment of Fee-Installation of Conduit. With the approval of the Director of the Department of Public Works and the Director of the Department of Telecommunications and Information Services, where it would minimize neighborhood disruption, and where savings in street resurfacing costs through avoidance of future excavation are anticipated to exceed amounts that would otherwise be due from the street damage

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restoration fee, some portion or all of the otherwise applicable street damagerestoration fee may be waived for an excavation in which the applicant installs: (i) conduit for City use or control or (ii) conduit made available via approval and coordination with the Department and Department of Telecommunications and Information Services to other subsequent applicants or excavators such that future excavation is permanently avoided. The City shall make any available space in such conduit available to subsequent applicants to avoid future excavation in the block. The Departments of Public Works and Telecommunications and Information Services shall adopt orders or regulations prescribing circumstances under which in-kind payment of all or some portion of the fee shall be permitted, prescribing specifications for the conduit to be installed, and prescribing terms under which the conduit shall be made available to interested parties on a competitively neutral and nondiscriminatory basis.

(e) Exception for Excavation in Sidewalks, Concrete Blocks, or Unaccepted Blocks. No street damage restoration fee shall be assessed with respect to excavation in a sidewalk, block constructed solely of portland cement concrete, or a block that the City has not accepted for maintenance purposes.

(f) Exception for Excavation to Accommodate the City's Use. No street damage restoration fee shall be assessed for excavation performed to relocate the facilities of a utility excavator to accommodate the City's use of the block.

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.45. REPORT TO BOARD OF SUPERVISORS AND PROCEDURES FOR FEE ADJUSTMENTS.

(a) Street Damage Restoration Fee Adjustment. Within one year after adoption or amendment of the street damage restoration fee set forth in this Subarticle, and every three years thereafter, the Director shall review the proceeds of the street damage restoration fee and any other new information that shall become available, and prepare a report to the Board of Supervisors. Based upon the result of the review, the Director shall recommend to the Board of Supervisors any necessary adjustments to such fee, along with written justification for the recommended adjustment and any necessary legislation. In the event that fee proceeds have exceeded, or are anticipated to exceed, the costs for street repaving and reconstruction reasonably attributable to excavation, the Director shall recommend legislation to the Board of Supervisors that modifies such fee to ensure that fee proceeds do not exceed the costs for street repaving and reconstruction reasonably attributable to excavation. In the event that fee proceeds have undercollected, or are anticipated to undercollect, for the costs for street repaving and reconstruction reasonably attributable to excavation or the City's costs to administer this Article or inspect excavations, the Director may recommend legislation to the Board of Supervisors that modifies the applicable fee to more accurately recover the costs for street repaving and reconstruction reasonably attributable to excavation.

(b) Administrative and Inspection Fees Adjustments. The procedures to review and adjust the fees specified in Sections 2.4.41 and 2.4.42 shall be the procedures for fee review and adjustment set forth in Section 2.1.2.

(Added by Ord. 341-98, App. 11/13/98; amended by Ord. 33-02, File No. 020051, App. 3/28/2002; Ord. 151-03, File No. 030830, 6/27/2003)

SEC. 2.4.46. COLLECTION, RETURN, AND REFUND OF DEPOSIT AND FEES.

(a) Collection of Deposit and Fees. The Director shall establish procedures for billing, collection, and refund of a deposit(s), fees, and other charges provided for in this Article. The Director shall deposit all funds in accordance with Sections 10.117-119 and 10.117-120 of the

SUBARTICLE IV DEPOSITS AND FEES

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San Francisco Administrative Code.

(b) Refunds.

(i) When an application is either withdrawn by the applicant or denied by the Department before the start of construction, the applicant's administrative fee assessed under Section 2.4.41 shall be retained and those fees assessed under Sections 2.4.42, 2.4.43, and 2.4.44 shall be returned to the applicant.

(ii) In the event that the Director determines, after preparing a report pursuant to Section 2.4.45, that there has been an overcollection of any of the fees identified in this Subarticle, the Director shall establish procedures to refund excess fee proceeds in a manner which fairly and reasonably reimburses those excavators who paid the fee during the relevant period consistent with their level of excavation.

(iii) In the event that a project is completed prior to the permit expiration date, a permittee may make a written request for a refund of the inspection fee that is proportionate to the number of calendar days the project was completed early. Prior to the issuance of any refund, the Department shall verify the date of completion, that the project has been satisfactorily completed, that all punch list work has been completed, and that there are no outstanding fines or penalties pending against the permittee or its agent. The Department shall not release the requested refund until any and all outstanding fines or penalties pending against the permittee and its agent have been paid. The permittee seeking a refund shall pay the Department a fee of \$110 for the cost of the calculation and processing of the refund.

(c) Deductions for Deposits. The Director may make deductions from the balance of a permittee's deposit(s) to ensure the faithful performance of the obligations under a permit to excavate, to pay fees, to offset the costs for any excavation done or repairs made by the Department, or to pay any assessed penalties or costs associated with violations of this Article.

(d) Retention of Deposit for Three Years. Each deposit made pursuant to Section 2.4.40 shall be retained by the City for a period of three years after the satisfactory completion of the excavation to secure the obligations in the permit and this Article.

(e) Return of Deposit. Upon expiration of three years from the satisfactory completion of the excavation, a permittee's deposit(s), less the deductions made pursuant to Subsection (c), shall be returned to the permittee or to its assigns.

(Added by Ord. 341-98, App. 11/13/98; amended by Ord. 33-02, File No. 020051, App. 3/28/2002)

SUBARTICLE V EXCAVATIONS

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**SUBARTICLE V
EXCAVATIONS****SEC. 2.4.50. NOTICES.**

Any permittee who excavates or causes to be made an excavation in the public right-of-way shall provide notice as follows:

(a) Two to Fourteen-Day Excavations. For excavations that will be completed and restored in a period exceeding 24 hours but within 14 calendar days of commencement, the permittee shall post and maintain notice at the site of the excavation. The notice shall include the name, telephone number, and address of the owner and its agent, a description of the excavation to be performed, and the duration of the excavation. The notice shall be posted at least every 100 feet along any block where the excavation is to take place at least 72 hours prior to commencement of the excavation.

(b) Notice for Major Work.

(i) At least 30 calendar days prior to commencement of the excavation, the permittee shall provide written notice delivered by United States mail to each property owner on the block(s) affected by the excavation and each affected neighborhood and merchant organization that is listed in the City Planning Department's Directory of Neighborhood Organizations and Service Agencies. The latest City-wide assessor's roll for names and addresses of owners shall be used for the mailed notice. This notice shall include the same information that is required for the posted notice pursuant to Subsection (a) and the name, address, and 24-hour telephone number of a person who will be available to provide information to and receive complaints from any member of the public concerning the excavation.

(ii) The permittee shall post and maintain notice at the site of the excavation at least 10 calendar days prior to commencement of the excavation in the same manner and with the same information as required for posted notice pursuant to Subsection (a). At least 10 calendar days prior to commencement of the excavation, the permittee also shall deliver a written notice to each dwelling unit on the block(s) affected by the excavation. This written notice shall include the same information that is required for the written notice pursuant to this Subsection (i).

(iii) Before commencement of construction, a permittee for major work shall post and maintain excavation project signs at the site of the excavation that describe the excavation being done and bear the name, address, and 24-hour telephone number of a contact person for the owner and its agent. Said excavation project signs shall be in format, quantity, and size specified by the Department.

(c) Notice of Emergency Excavation. For emergency excavation, the permittee, or the applicant if a permit has not been issued, shall post and maintain notice at the site of the excavation during the construction period. The notice shall include the name, telephone number, and address of the owner, permittee, applicant, and its agent, a description of the excavation to be performed, and the duration of the excavation. The notice shall be posted at least every 100 feet along any block where the excavation is to take place.

(Added by Ord. 341-98, App. 11/13/98; amended by Ord. 33-02, File No. 020051, App. 3/28/2002)

SUBARTICLE V EXCAVATIONS

Page 2 of 4

SEC. 2.4.51. NOTICE FOR MARKING OF SUBSURFACE FACILITIES.

In accordance with State law, any person excavating in the public right-of-way shall comply with the requirements of the Underground Service Alert ("USA") regarding notification of excavation and marking of subsurface facilities. Such person shall provide USA with the assigned number for the permit to excavate or other information as may be necessary to properly identify the proposed excavation.

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.52. LIMITS UPON EXCAVATION IN THE PUBLIC RIGHT-OF-WAY.

(a) Scope. It is unlawful for any permittee to make, to cause, or permit to be made any excavation in the public right-of-way outside the boundaries, times, and description set forth in the permit.

(b) Rock Wheel and Trenchless Technology. Use of a rock wheel or trenchless technology to excavate in the public right-of-way is unlawful without prior written approval of the Director.

(c) Single Excavation Maximum of 1,200 Feet. No single excavation site shall be longer than 1,200 feet in length at any time except with the prior written approval of the Director.

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.53. REGULATIONS CONCERNING EXCAVATION SITES.

Each owner and its agent shall be subject to requirements for excavation sites that are set forth in Department orders or regulations. Such orders or regulations shall include, but not be limited to, the following measures:

(a) Protection of the Excavation. Each owner and its agent shall cover open excavation with steel plates ramped to the elevation of the contiguous street, pavement, or other public right-of-way, or otherwise protected in accordance with guidelines prescribed by the Department.

(b) Housekeeping and Removal of Excavated Material. Each owner and its agent shall keep the area surrounding the excavation clean and free of loose dirt or other debris in a manner deemed satisfactory to the Department. Excavation sites shall be cleaned at the completion of each work day. In addition, the owner and its agent shall remove all excavated material from the site of the excavation no later than the end of each work day.

(c) Storage of Materials and Equipment. Materials and equipment that are to be used for the excavation within seven calendar days may be stored at the site of the excavation, except that fill material, sand, aggregate, and asphalt-coated material may be stored at the site only if it is stored in covered, locked containers.

(d) Hazardous Material. Each owner and its agent shall be subject to hazardous material guidelines for date collection; disposal, handling, release, and treatment of hazardous material; site remediation; and worker safety and training. The Department, in consultation with the Department of Public Health, shall develop, prescribe, and update such hazardous material guidelines. The guidelines shall require the owner and its agent to comply with all federal, state, and local laws regarding hazardous material. For purposes of this subsection, "hazardous materials" shall mean any gas, material,

SUBARTICLE V EXCAVATIONS

Page 3 of 4

substance, or waste which, because of its quantity, concentration, or physical or chemical characteristics, is deemed by any federal, state, or local governmental authority to pose a present or potential hazard to human health or safety or to the environment.

(Added by Ord. 341-98, App. 11/13/98; amended by Ord. 33-02, File No. 020051, App. 3/28/2002)

SEC. 2.4.54. STOP WORK ORDER, PERMIT MODIFICATION, AND PERMIT REVOCATION.

When the Director has determined that a person has violated this Article or that an excavation poses a hazardous situation or constitutes a public nuisance, public emergency, or other threat to the public health, safety, or welfare, or when the Director determines that there is a paramount public purpose, the Director is authorized to issue a stop work order, to impose new conditions upon a permit, or to suspend or revoke a permit by notifying the permittee of such action in a written, electronic, or facsimile communication.

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.55. RESTORATION OF THE PUBLIC RIGHT-OF-WAY.

(a) Restoration. In any case in which the sidewalk, street, or other public right-of-way is or is caused to be excavated, the owner and its agent shall restore or cause to be restored such excavation in the manner prescribed by the orders, regulations, and standard plans and specifications of the Department. At a minimum, trench restoration shall include resurfacing to a constant width equal to the widest part of the excavation in accordance with the following diagram; provided, however, that the width of resurfacing need not exceed 13 feet;

(b) Backfill, Replacement of Pavement Base, and Finished Pavement. Activities concerning backfilling, replacement of pavement base, and finished pavement shall be performed in a manner specified by the orders, regulations, and standard plans and specifications of the Department. In addition, these activities shall be subject to the following requirements:

(i) Backfill. Each excavation shall be backfilled and compacted within 72 hours from the time the construction related to the excavation is completed.

(ii) Replacement of pavement base. Replacement of the pavement base shall be completed within 72 hours from the time the excavation is backfilled.

(iii) Finished pavement. Finished pavement restoration shall be completed within 72 hours of replacement of the pavement base.

(c) Modification to Requirements. Upon written request from the permittee, the Director may grant written approval for modifications to the requirements of Subsection (b).

(d) Incomplete Excavation; Completion by the Department. In any case where an excavation is not completed or restored in the time and manner specified in the permit, this Article, or the orders, regulations, and standard plans and specifications of the Department, the Director shall order the owner or its agent to complete the excavation as directed within 24 hours. If the owner or its agent should fail, neglect, or refuse to comply with the order, the Director may complete or cause to be completed such excavation in such manner as the Director deems expedient and appropriate. The owner or its agent shall compensate the Department for any costs associated with the administration, construction, consultants, equipment, inspection, notification, remediation, repair, restoration, or any other actual costs incurred by the Department or other agencies, board, commissions, or departments of the City that were made necessary by said excavation. The cost of such work also may be deducted from the permittee's deposit pursuant to Section 2.4.46(c). The Director's determination as to the cost of any work done or repairs

SUBARTICLE V EXCAVATIONS

made shall be final. In addition, the owner, its agent, or other responsible party may be subject to those enforcement actions set forth in Subarticle VII.

(e) Subject to the limitation set forth in Section 2.4.70, completion of an excavation or restoration by the Department in accordance with Subsection (d) shall not relieve the owner or its agent from liability for future pavement failures at the excavation site.

(Added by Ord. 341-98, App. 11/13/98; amended by Ord. 33-02, File No. 020051, App. 3/28/2002)

**SUBARTICLE VI
POST-EXCAVATION REPAIR,
MAINTENANCE, AND PAVEMENT
FAILURE**

SEC. 2.4.70. REPAIR AND MAINTENANCE OBLIGATION OF OWNER AND AGENT.

Each owner and its agent that excavates or causes to be made an excavation in the public right-of-way shall be responsible to maintain, repair, or reconstruct the site of the excavation so as to maintain a condition acceptable to the Director until such time as the public right-of-way is reconstructed, repaved, or resurfaced by the Department.

(Added by Ord. 341-98, App. 11/13/98; amended by Ord. 33-02, File No. 020051, App. 3/28/2002)

SEC. 2.4.71. SUBSURFACE OR PAVEMENT FAILURES.

In the event that subsurface material or pavement over or immediately adjacent to any excavation should become depressed, broken, or fail in any way at any time after the excavation has been completed, the Director shall exercise his or her best judgment to determine the person(s) responsible, if any, for the failure in the subsurface or surface of the public right-of-way and shall designate such person as the responsible party. The Director shall notify said person(s) of the condition, its location, and the required remedy, and such person(s) shall repair or restore, or cause to be repaired or restored, such condition to the satisfaction of the Director within 72 hours of the notification. The Director may extend the time for the responsible party to repair or restore the affected public right-of-way.

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.72. REPAIR BY THE DEPARTMENT.

(a) In the event that any person(s) fails, neglects, or refuses to repair or restore any condition pursuant to the Director's notice as set forth in Section 2.4.71, the Director may repair or restore, or cause to be repaired or restored, such condition in such manner as the Director deems expedient and appropriate. The person(s) identified by the Director as the responsible party shall compensate the Department for any costs associated with the administration, construction, consultants, equipment, inspection, notification, remediation, repair, restoration, or any other actual costs incurred by the City that were made necessary by reason of the repair or restoration undertaken by the Department. The cost of such work also may be deducted from the permittee's deposit pursuant to Section 2.4.46(c). The Director's determination as to the cost of the repair or restoration performed shall be final. In addition, the responsible party may be subject to those enforcement actions set forth in Subarticle VII.

(b) Subject to the limitation set forth in 2.4.70, repair or restoration by the Department in accordance with this Section shall not relieve the person(s) from liability for future pavement failures at the site of the repair or restoration.

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.73. EMERGENCY REMEDIATION BY THE DEPARTMENT.

SUBARTICLE VI POST-EXCAVATION REPAIR, MAINTENANCE, AND PAVEME... Page 2 of 2

(a) If, in the judgment of the Director, the site of an excavation is considered hazardous or if it constitutes a public nuisance, public emergency, or other imminent threat to the public health, safety, or welfare that requires immediate action, the Director may order the condition remedied by a written, electronic, or facsimile communication to the person(s) responsible, if any, for remedying the condition and shall designate such person as the responsible party.

(b) If the responsible party is inaccessible or fails, neglects, or refuses to take immediate action to remedy the condition as specified in said communication, the Director may remedy the condition or cause the condition to be remedied in such manner as the Director deems expedient and appropriate. The person(s) identified by the Director as the responsible party shall compensate the Department for any reasonable costs associated with the administration, construction, consultants, equipment, inspection, notification, remediation, repair, restoration, or any other actual costs incurred by the Department or other agencies, boards, commissions, or departments of the City that were made necessary by reason of the emergency remediation undertaken by the Department. The cost of such work also may be deducted from the permittee's deposit pursuant to Section 2.4.46(c). The Director's determination as to the cost of any remediation performed shall be final. In addition, the responsible party may be subject to those enforcement actions set forth in Subarticle VII.

(c) Subject to the limitation set forth in Section 2.4.70, remediation by the Department in accordance with this Section shall not relieve the person(s) from liability for future pavement failures at the site of the remediation.

(Added by Ord. 341-98, App. 11/13/98)

SUBARTICLE VII VIOLATION OF ARTICLE

Page 1 of 4

**SUBARTICLE VII
VIOLATION OF ARTICLE****SEC. 2.4.80. VIOLATION OF ARTICLE.**

(a) The Director shall have authority to enforce this Article against violations thereof. Upon the Director's determination that a person has violated any provision of this Article, the standard plans and specifications, notices, orders, or regulations of the Department; any term, condition, or limitation of any permit; or is subject to any outstanding fees, deposits, or other charges, the Director shall serve notice on said person to abate the violation. Any person whom the Director determines to be a responsible party may be subject to any or all of the enforcement mechanisms specified in Section 2.4.81, 2.4.82, and 2.4.83.

(b) Municipal excavators are not subject to the penalties and fines specified in Sections 2.4.82 and .83; however, municipal excavators that violate Article 2.4 may be subject to administrative penalties and costs as specified in Section 2.4.81. The Director is empowered to charge municipal excavators with such penalties and costs, abate violations by municipal excavators, or both. The Director may assess such penalties, costs, and abatement charges against the deposit or budget of the municipal excavator, take other appropriate action against such excavator within the Director's authority, or both.

(Added by Ord. 341-98, App. 11/13/98; amended by Ord. 239-99, File No. 991177, App. 9/3/99; Ord. 33-02, File No. 020051, App. 3/28/2002)

SEC. 2.4.81. ADMINISTRATIVE PENALTIES AND COSTS.

(a) Notice of Violation. Except as specified in Subsections (1) through (3) below, the Director shall notify the responsible party for a violation that he or she has seventy-two (72) hours to correct or otherwise remedy the violation or be subject to the imposition of administrative penalties. The Director's notice of violation shall be a written, electronic, or facsimile communication and shall specify the manner in which the violation shall be remedied.

(1) For those violations subject to the incomplete excavation provisions of Section 2.4.55(d), the responsible party shall have twenty-four (24) hours to remedy the violation or be subject to the imposition of administrative penalties.

(2) For violations that create an imminent danger to public health, safety, or welfare or are otherwise subject to Section 2.4.73, the Director shall notify the responsible party to immediately remedy the violation or be subject to the imposition of administrative penalties.

(3) For violations that cannot be cured within seventy-two (72) hours, including, but not limited to, excavating without a permit, the Director shall notify the responsible party of the Director's imposition of administrative penalties pursuant to Subsection (e).

(b) Amount of Administrative Penalties. Administrative penalties assessed pursuant to Subsection (a) shall not exceed one thousand dollars (\$1,000) per day, per violation commencing with the first day of the violation. Notwithstanding the penalty limitation set forth above, a person who excavates without a valid permit may be assessed a penalty not to exceed ten thousand dollars (\$10,000.00) per day, per violation commencing with the first day of the violation. In assessing the amount of the administrative penalty, the Director may consider any one or more of the following: the nature and seriousness of the misconduct, the number of violations, the persistence of the misconduct, the length of time over which the misconduct

SUBARTICLE VII VIOLATION OF ARTICLE

Page 2 of 4

occurred, the wilfulness of the violator's misconduct, and the violator's assets, liabilities, and net worth.

(c) Enforcement Costs. In addition to the administrative penalty assessed pursuant to Subsection (a), the Director may assess enforcement costs to cover the reasonable costs incurred in enforcing the administrative penalty, including reasonable attorneys' fees. Any enforcement costs imposed and recovered shall be distributed according to the purpose for which the Director imposed them.

(d) Accrual of Penalties and Costs. Penalties and costs assessed under this Section shall continue to accrue against a responsible party until the violation of this Article is corrected or otherwise remedied in the judgment of the Director or the responsible party pays the assessed penalties and costs. If such penalties and costs are the subject of a request for administrative review or an appeal, then the accrual of such penalties and costs shall be stayed until the determination concerning the administrative penalties is final.

(e) Notice Imposing Administrative Penalties. If the responsible party fails to remedy the violation within the time specified in the notice of violation or if the violation is incurable pursuant to Section 2.4.81(a)(3), the Director shall notify in writing the responsible party of the Director's imposition of administrative penalties. This notice shall include the amount of the penalties and costs and declare that such penalties and costs are due and payable to the City Treasurer within thirty (30) calendar days. The notice also shall state that the person designated as the responsible party has the right, pursuant to Subsection (g), to request administrative review of the Director's determination as to the designation of the responsible party and the assessment of penalties.

(f) Finality of the Director's Determination and Collection of Assessed Penalties. If no request for administrative review is filed pursuant to Subsection (g), the Director's determination is final. Thereafter, if the penalties and costs are not paid within the time specified in Subsection (e), the Director is empowered to pursue any method of collection of such penalties and costs authorized by local law including, but not limited to deductions of the permittee's deposit pursuant to Section 2.4.46(c).

(g) Administrative Review. Any Person that is designated as the responsible party for a violation or is subject to an administrative penalty may seek administrative review of the designation or the assessment of the penalty or cost within ten (10) calendar days of the date of the notice imposing administrative penalties. Administrative review shall be initiated by filing with the Director a request for review that specifies in detail the basis for contesting the designation of the responsible party or the assessment of the penalty or cost.

(h) Notice for and Scheduling of Administrative Hearing. Whenever an administrative review hearing is requested pursuant to Subsection (g), the Director, within ten (10) calendar days of the date of receipt of the request, shall notify the affected parties of the date, time, and place of the hearing by certified mail. Such hearing shall be held no later than thirty (30) calendar days after the Director received the request for administrative review, unless extended by mutual agreement of the affected parties. The Director shall appoint a hearing officer for such hearing.

(i) Submittals for the Administrative Review Hearing. The parties to the hearing shall submit written information to the hearing officer including, but not limited to, the following: the statement of issues to be determined by the hearing officer and a statement of the evidence to be offered at the hearing.

(j) Conduct of the Administrative Review Hearing. The administrative review hearing is a public hearing and shall be tape recorded. Any party to the hearing may at his or her own expense, cause the hearing to be recorded by a certified court reporter. During the hearing, evidence and testimony may be presented to the hearing officer. Written decisions and findings shall be rendered by the hearing officer within ten (10) calendar days of the hearing. Copies of the findings and decision shall be served upon the parties to the hearing by certified mail. A notice that a copy of the findings and decisions is available for inspection between the hours of 9:00

SUBARTICLE VII VIOLATION OF ARTICLE

Page 3 of 4

a.m. and 5:00 p.m., Monday through Friday shall be posted at the offices of the Department of Public Works.

(k) Director's Decision on the Hearing Officer's Recommendation. The decision of the hearing officer shall be a recommendation to the Director, and the Director, within five (5) calendar days of receipt of such recommendation, shall adopt, modify, or deny such recommendation. The Director's decision on the hearing officer's recommendation is final. Such decision shall be served upon the parties to the hearing and posted in the same manner as the hearing officer's decision as set forth in Subsection (j). If any imposed administrative penalties and costs have not been deposited at this time, the Director may proceed to collect the penalties and costs pursuant to Subsection (f).

(l) Additional procedures. The Director, by Departmental order, may adopt additional procedures to implement this Section.

(Added by Ord. 341-98, App. 11/13/98; amended by Ord. 239-99, File No. 991177, App. 9/3/99; Ord. 33-02, File No. 020051, App. 3/28/2002)

SEC. 2.4.82. CIVIL PENALTIES AND FEES.

(a) The Director may call upon the City Attorney to maintain an action for injunction to restrain or summary abatement to cause the correction or abatement of the violation of this Article, and for assessment and recovery of a civil penalty and reasonable attorney's fees for such violation.

(b) Any person who violates this Article may be liable for a civil penalty, not to exceed \$500 for each day such violation is committed or permitted to continue, which penalty shall be assessed and recovered in a civil action brought in the name of the people of the City by the City Attorney in any court of competent jurisdiction. In assessing the amount of the civil penalty, the court may consider any one or more of the relevant circumstances presented by any of the parties to the case, including, but not limited to, the following: the nature and seriousness of the misconduct, the number of violations, the persistence of the misconduct, the length of time over which the misconduct occurred, the willfulness of the defendant's misconduct, and the defendant's assets, liabilities, and net worth. The City Attorney also may seek recovery of the attorneys fees and costs incurred in bringing a civil action pursuant to this Section.

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.83. CRIMINAL FINES.

(a) The Director is authorized to enforce the criminal provisions of this Article, to call upon the Chief of Police and authorized agents to assist in the enforcement of this Article, or both.

(b) Any person who violates this Article shall be deemed guilty of an infraction. Every violation determined to be an infraction is punishable by (1) a fine not exceeding \$100 for the first violation within one year; (2) a fine not exceeding \$200 for a second violation within one year from the date of the first violation; (3) a fine not exceeding \$500 for the third and each additional violation within one year from the date of the first violation.

(c) When a government official authorized to enforce this Article pursuant to Subsection (a) has reasonable cause to believe that any person has committed an infraction in the official's presence that is a violation of this Article, the official may issue a citation to that person pursuant to California Penal Code, Part II, Title 3, Chapters 5, 5C, and 5D.

(d) Among other violations, citations may be issued for the following specific violations:

- (i) Excavation without a valid permit;

**SUBARTICLE VIII
MISCELLANEOUS PROVISIONS****SEC. 2.4.90. ABANDONMENT OF UNDERGROUND FACILITIES, REPORTS, AND MAPS.**

(a) Whenever any facility(ies) is abandoned in the public right-of-way, the person owning, using, controlling or having an interest therein, shall, within 30 calendar days after such abandonment, file in the office of the Director a statement in writing, giving in detail the location of the facility(ies) so abandoned. Each map, set of maps, or plans filed pursuant to the provisions of this Article, including those maps or plans required by Section 2.4.11 shall show in detail the location of each such facility(ies) abandoned subsequent to the filing of the last preceding map, set of maps, or plans.

(b) It shall be unlawful for any person to fail, refuse, or neglect to file any map or set of maps at the time, and in all respects as required by this Section.

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.91. IDENTIFICATION OF VISIBLE FACILITIES.

Each visible facility installed in the public right-of-way shall be clearly identified with the name of the owner of the facility. The Department shall adopt orders or regulations to specify other appropriate methods for identification.

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.92. CITY'S OBLIGATION.

In undertaking enforcement of this Article, the City is assuming an undertaking only to promote the general welfare. It is not assuming, nor is it imposing on its officers and employees, an obligation for breach of which it is liable in money damages to any person who claims that such breach proximity caused injury.

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.93. TIME LIMITATION ON COMMENCEMENT OF ACTIONS.

Any action or proceeding to attack, review, set aside, void or annul this Article or any provision thereof shall be commenced within 120 calendar days from the effective date of the ordinance approving this Article; otherwise, the provisions of this Article shall be held to be valid and in every respect legal and incontestable.

(Added by Ord. 341-98, App. 11/13/98)

SEC. 2.4.94. SEVERABILITY.

If any part of this Article, or the application thereof to any person or circumstance, is held invalid, the remainder of this Article, including the application of such part or provision to other persons or circumstances, shall not be affected thereby and shall continue in full force and effect. To this end,

SUBARTICLE VIII MISCELLANEOUS PROVISIONS

provisions of this Article are severable.
(Added by Ord. 341-98, App. 11/13/98)

Appendix B Guidelines for the Placement of Barricades at Construction Sites

City and County of San Francisco

(415) 554-6920
FAX (415) 554-6944
<http://www.sfdpw.com>



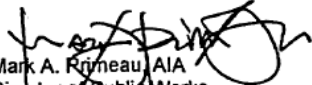
Willie Lewis Brown, Jr., Mayor
Mark A. Primeau, AIA, Director and City Architect

Department of Public Works
Office of the Director
875 Stevenson Street, Room 410
San Francisco, CA 94103-0934

ORDER NO. 171,378

In order to protect the health and safety of the public in general, and schoolchildren in particular, and because excavated material may be contaminated with hazardous or toxic materials that may be dangerous if airborne, the excavator shall adhere strictly to the following requirements to achieve a goal of NO VISIBLE DUST EMISSIONS. In addition to general good housekeeping practices, the excavator shall:

1. Minimize dust generation to reduce health risks to workers and to the public.
2. Mist the immediate excavation area with a water spray to prevent airborne dust particles. Continuous water spraying shall be performed during dust generating activities. All misting/spraying shall be done in such a way as to prevent puddling and/or generation of runoff which could potentially reach storm drains and/or catchbasins.
3. Minimize the amount of excavated material or demolition wastes stored at the site. Remove all excavated material, with the exception of hazardous materials and/or suspected hazardous materials, from the site no later than the end of each workday. Any hazardous materials and/or suspected hazardous materials stored on site shall be stored in accordance with all applicable Cal EPA regulations, including being stored in proper containers and being protected from exposure from the elements. Any such materials shall be removed from the site as soon as possible for disposal/recycling in accordance with all applicable statutes and regulations.
4. Wet all exposed soil surfaces at least three times daily during dry weather or more frequently if dust is blowing or if required by the City. Any serpentine residuals on the street shall be wet swept immediately.
5. Keep the construction site and adjacent area clean and perform wet sweeping at the end of each shift.
6. Haul trucks carrying excavated material shall be loaded so that the excavated material does not extend above the walls or back of the truck bed. The surface of each load shall be tightly covered before the haul truck leaves the loading area, and wetted prior to covering.
7. Clean up all spillage on City streets, directly or indirectly caused by the contractor's operations.
8. Be alerted to Ordinance #175-91, Article 21 Sections 1100 - 1107 or the San Francisco Municipal Code (Public Works Code), restricting the use of potable water for soil compaction or dust control activities to the extent not directly in conflict with any applicable State or Federal Law.
9. Be alerted to Section 123 of Article 4.1, Chapter X of Part II of the San Francisco Municipal Code (Public Works Code), prohibiting the discharge of solids into a manhole, catchbasin or other opening in the City's sewerage system, from any water spraying or spillage clean up activities.
10. Failure to conform to these rules shall subject the excavator to fines of \$1000 per day for each day any violation is not corrected.
11. All fines and penalties must be paid prior to issuance of any additional City permits.
12. If the excavator feels a fine has been imposed unfairly, the excavator may appeal the issuance to the Director. The decision of the Director shall be final.


Mark A. Primeau, AIA
Director of Public Works
and City Architect

Approved: November 18, 1998

"IMPROVING THE QUALITY OF LIFE IN SAN FRANCISCO" We are dedicated individuals committed to teamwork, customer service and continuous improvement in partnership with the community.

Customer Service

Teamwork

Continuous Improvement



**DEPARTMENT OF PUBLIC WORKS
GUIDELINES
For the Placement of Barricades at Construction Sites
ORDER NO. 167, 840**

GUIDELINES

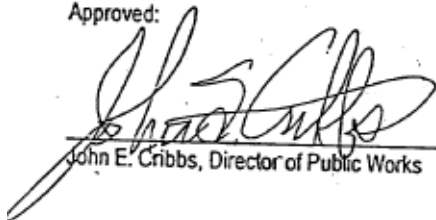
It is the policy of the Department of Public Works that a safe and accessible path-of-travel be provided for all pedestrians, including those with disabilities, around and/or through construction sites.

When erecting barricades, the Contractor shall be conscious of the special needs of pedestrians with physical disabilities. Discretion is given to the contractor to provide protection for pedestrians consistent with all local, state, and federal codes, including the Americans with Disabilities Act and the California Building Code, Title 24.

It is recognized that there are various types of construction activities, including both short-term and long-term projects. Some barricading systems are more appropriate for certain types of construction than others.

The following barricading systems described in the attached document are examples of systems which can be used to provide a safe and accessible path-of-travel around and through a construction site. They are not intended to be all-inclusive. Any barricading system meeting accessibility standards may be considered.

Approved:


John E. Cribbs, Director of Public Works

Nov. 17, 1994
Date

Appendix C Dust Control

City and County of San Francisco



Willie Lewis Brown, Jr., Mayor
Mark A. Primeau, AIA, Director and City Architect

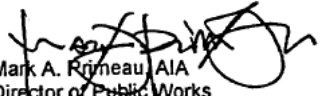
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San Francisco, CA 94103-0934

ORDER NO. 171,378

In order to protect the health and safety of the public in general, and schoolchildren in particular, and because excavated material may be contaminated with hazardous or toxic materials that may be dangerous if airborne, the excavator shall adhere strictly to the following requirements to achieve a goal of NO VISIBLE DUST EMISSIONS. In addition to general good housekeeping practices, the excavator shall:

1. Minimize dust generation to reduce health risks to workers and to the public.
2. Mist the immediate excavation area with a water spray to prevent airborne dust particles. Continuous water spraying shall be performed during dust generating activities. All misting/spraying shall be done in such a way as to prevent puddling and/or generation of runoff which could potentially reach storm drains and/or catchbasins.
3. Minimize the amount of excavated material or demolition wastes stored at the site. Remove all excavated material, with the exception of hazardous materials and/or suspected hazardous materials, from the site no later than the end of each workday. Any hazardous materials and/or suspected hazardous materials stored on site shall be stored in accordance with all applicable Cal EPA regulations, including being stored in proper containers and being protected from exposure from the elements. Any such materials shall be removed from the site as soon as possible for disposal/recycling in accordance with all applicable statutes and regulations.
4. Wet all exposed soil surfaces at least three times daily during dry weather or more frequently if dust is blowing or if required by the City. Any serpentine residuals on the street shall be wet swept immediately.
5. Keep the construction site and adjacent area clean and perform wet sweeping at the end of each shift.
6. Haul trucks carrying excavated material shall be loaded so that the excavated material does not extend above the walls or back of the truck bed. The surface of each load shall be tightly covered before the haul truck leaves the loading area, and wetted prior to covering.
7. Clean up all spillage on City streets, directly or indirectly caused by the contractor's operations.
8. Be alerted to Ordinance #175-91. Article 21 Sections 1100 - 1107 or the San Francisco Municipal Code (Public Works Code), restricting the use of potable water for soil compaction or dust control activities to the extent not directly in conflict with any applicable State or Federal Law.
9. Be alerted to Section 123 of Article 4.1, Chapter X of Part II of the San Francisco Municipal Code (Public Works Code), prohibiting the discharge of solids into a manhole, catchbasin or other opening in the City's sewerage system, from any water spraying or spillage clean up activities.
10. Failure to conform to these rules shall subject the excavator to fines of \$1000 per day for each day any violation is not corrected.
11. All fines and penalties must be paid prior to issuance of any additional City permits.
12. If the excavator feels a fine has been imposed unfairly, the excavator may appeal the issuance to the Director. The decision of the Director shall be final.


Mark A. Primeau, AIA
Director of Public Works
and City Architect

Approved: November 18, 1998

"IMPROVING THE QUALITY OF LIFE IN SAN FRANCISCO" We are dedicated individuals committed to teamwork, customer service and continuous improvement in partnership with the community.

Customer Service

Teamwork

Continuous Improvement

Appendix D DPW Specifications (excerpts)

PART 1

GENERAL PROVISIONS

SECTION 100

DEFINITIONS AND TERMS

Whenever, in these Standard Specifications or in other contract documents, the following abbreviations and terms, or pronouns in place of them, are used, the intent and meaning shall be interpreted as follows:

ABBREVIATIONS

AAN American Association of Nurserymen.
AASHTO American Association of State Highway and Transportation Officials.
ACI American Concrete Institute.
ACWS Asphalt Concrete Wearing Surface.
AISC American Institute of Steel Construction.
AISI American Iron and Steel Institute
ANSI American National Standards Institute.
AREA American Railway Engineering Association.
ASME American Society of Mechanical Engineers.
ASTM American Society for Testing and Materials
AWG American Wire Gage.
AWPA American Wood-Preservers Association.
AWS American Welding Society.
AWSS Auxiliary Water Supply System.
AWWA American Water Works Association.
CAL OSHA California Occupational Safety and Health Act.
CALTRANS Department of Transportation, State of California
EIA Electronic Industries Association.
IEEE Institute of Electrical and Electronic Engineers.
ITE Institute of Traffic Engineers.
NBFU National Board of Fire Underwriters.
NEC National Electrical Code.
NEMA National Electrical Manufacturers Association.
RCP Reinforced Concrete Pipe.
UL Underwriters' Laboratories, Inc.
VCP Vitrified Clay Pipe.

All references to specifications of the above listed agencies or codes are understood to refer to the current specifications as revised or amended at the date of receipt of bids.

APPROVED; DIRECTED; PERMITTED; REQUIRED. - The approval, direction, permission or requirement of the Director.

ACCEPTABLE; SATISFACTORY; NECESSARY. - Acceptable to, satisfactory to, or necessary in the judgment of the Director.

BID. - Same as Proposal. The written offer of a Bidder to perform the specified work, when made out and submitted on a proposal form furnished by the City.

BIDDER. - Any individual, firm, partnership, corporation, or combination thereof, acting directly or through a duly authorized representative, submitting a proposal for the work contemplated.

CHARTER. - The Charter of the City and County of San Francisco as adopted March 26, 1931 (in effect January 8, 1932), including subsequent revisions and amendments thereto.

CITY. - The City and County of San Francisco, State of California.

CITY ENGINEER. - The City Engineer of the City and County of San Francisco, State of California.

COMPACTION, RELATIVE. - The percentage ratio of the field-compacted dry density to the maximum dry density obtainable by compaction at optimum moisture content (ASTM D1557).

CONTRACT. - The written agreement covering the performance of the work. The Contract includes the advertisement calling for bids, the proposal, plans, special provisions, contract bonds, these standard specifications, and all supplemental agreements affecting the work.

CONTRACT COST. - The aggregate amount or price promised to be paid by the City to the Contractor upon fulfillment of the contract, or such aggregate amount adjusted as provided in Section 111 herein. The aggregate amount is the lump sum or total of lump sums bid in the Proposal, or is the sum of the products of the number of units of work in each class, as shown in the Proposal, multiplied by the respective unit prices bid in the Proposal, or is the sum of the combination of the latter two sums.

CONTRACTOR. - The person or persons, firm, co-partnership, corporation, or combination thereof, or his, their or its duly authorized representative, who, as party or parties of the first part, has or have entered into a contract with the City to do the work contemplated.

DATE OF ACCEPTANCE. - The date set forth in the Order of the Department of Public Works accepting the work.

DATE OF CERTIFICATION. - The date the Controller certifies that there is a valid appropriation from which the expenditure

of the amount required for the contract may be made, and that sufficient unencumbered funds are available in the treasury to the credit of such appropriation to pay the amount of such expenditure when it becomes due and payable.

DATE OF COMMENCEMENT. - The official date designated by the Director of Public Works for the commencement of the work. The commencement date will be set by the Director, usually within two weeks of the certification date, but at his discretion under unusual conditions.

DAY. - Calendar day, any and every day shown on the calendar, Sundays and holidays included, unless otherwise designated.

DEPARTMENT OF PUBLIC WORKS or DEPARTMENT. - The Department of Public Works of the City and County of San Francisco, State of California.

DIRECTOR OF PUBLIC WORKS or DIRECTOR. - The Director of the Department of Public Works acting directly or through properly authorized agents limited by the particular duties entrusted to them.

ENGINEER. - The City Engineer of the City and County of San Francisco, State of California, acting directly or through properly authorized agents limited by the particular duties entrusted to them.

LABORATORY, APPROVED. - An independent, recognized, testing laboratory approved by the City.

PLANS. - The drawings, or reproductions thereof, approved by the Engineer, pertaining to the work and made a part of the contract.

PROPOSAL. - Same as Bid. The written offer of a Bidder to perform the specified work, when made out and submitted on a proposal form and documents attached thereto furnished by the City.

SECTION. - The numbered and decimally numbered sections into which the material in these Standard Specifications is divided. Reference to a section shall include reference to all decimally numbered sections thereunder.

SPECIAL PLANS. - Plans drawn especially for a particular contract, as opposed to Standard Plans.

SPECIAL PROVISIONS. - Written directions, terms, provisions and requirements peculiar to the work and supplementary to these Standard Specifications.

SPECIFICATIONS. - The information, directions, provisions and requirements pertaining to the work, and contained in these Standard Specifications, in the Special Provisions, and in all supplemental contract documents. Plans shall also be considered to

be a part of the specifications wherever, in any of the contract documents, the word "specifications" is used without any simultaneous reference to the plans.

WORK. - The improvement, structure, project, or construction, or any part thereof, contemplated in the contract; the furnishing of necessary labor, materials, equipment, tools and other devices, and the doing or performing by the Contractor of any or all things required to be done for the fulfillment of the contract as provided therein.

SECTION 101

INSTRUCTIONS AND INFORMATION FOR BIDDERS

101.01 REQUIREMENTS OF BIDDERS. - Each Bidder and each Subcontractor shall possess a current, valid and appropriate Contractor's State License. Attention is directed to the provisions of Chapter 9 of Division 3 of the State of California Business and Professions Code concerning the licensing of contractors.

Each Bidder shall insert the number of his State Contractors' License in the space provided on the Proposal form. If the successful Bidder fails to list the license number, he shall, when required, furnish proof of possession thereof before the contract is awarded.

In accordance with the provisions of Sections 6.23, 6.46 and 6.47 of the San Francisco Administrative Code, each Bidder, and each Subcontractor listed in his Proposal, shall furnish to the Director information concerning his experience and financial qualifications.

101.02 PAYMENT FOR BIDDING DOCUMENTS. - Plans and Special Provisions, including bidding forms, can be obtained at the Office of the City Engineer, Room 353, City Hall, San Francisco, California, 94102, telephone (415) 554-5807 upon payment of the nonrefundable fee set forth in the "Invitation for Proposals." Such fee shall be paid by cash or check for each set of bidding documents and shall be made payable to the "Department of Public Works." Bidders may make their own arrangements to pick up the bidding documents, or, if they make a request in writing, and submit the required fee, such documents will be shipped or mailed to them C.O.D. C.O.D. will cover only the shipping and mailing costs.

Other than above, no plans or Special Provisions will be issued until after award of the contract, at which time the successful bidder will be eligible for, at no cost to him, up to 6 copies of the plans and Special Provisions. The Contractor shall bear the reproduction costs of additional copies that he may require.

In the event a project is cancelled prior to award, a refund of the fee charged for the plans and Special Provisions will be made automatically to each party who has paid such fee. Mailing and delivery charges paid will not be refunded.

Standard Specifications may be obtained from the office referenced above, on payment of the prescribed purchase price.

101.03 PROPOSAL; SUBMISSION AND RECEIPT OF BIDS. - Each Bidder shall use only the official forms included in the Proposal, shall make out such forms in full, and shall make all entries thereon, including the entries on the Schedule of Bid Prices, in ink or by typewriter.

The completed Proposal, properly signed and attested, and accompanied by the required certified check or corporate surety bid bond and the list of subcontractors, stapled together in the same order as when originally received, shall be enclosed in a sealed envelope addressed to the Director of Public Works, and shall be submitted in the manner, and at the place and time set forth in the advertisement. The envelope shall be endorsed with the superscription indicated on the lower part of the cover of the Special Provisions.

Unless otherwise specified, Bidders shall bid on all Bid Items included in the Proposal. In determining the low Bidder, only the total of all Bid Items will be considered. No award will be made on individual Bid Items.

In case of a discrepancy between unit bid prices and extensions thereof, the unit bid prices shall prevail.

In case of a discrepancy between the sum of the correct extensions and the total, the sum of the correct extensions shall prevail.

No person, corporation or firm will be allowed to make, file, or be interested as a principal in, more than one Proposal or bid for the work.

Any statement accompanying and tending to qualify a bid shall cause rejection of such bid, unless such statement is required in a Proposal embracing alternative bids.

When, in the opinion of the Director of Public Works, the prices in any Proposal are obviously unbalanced, such Proposal shall be rejected.

Bids received from Bidders to whom specifications and plans have not been officially issued will be rejected.

All bids received as herein provided will be opened and publicly read by the Director upon the expiration of the period named in the advertisement. After tabulation, Bidders may inspect the bids.

The Director of Public Works reserves the right to waive technical defects in bidding.

101.04 CERTIFIED CHECK OR CORPORATE SURETY BOND TO ACCOMPANY PROPOSAL. - Each Proposal must be accompanied by a certified check or corporate surety bond for an amount equal to not less than 10 percent of the total amount of the bid. The certified check must be drawn on a solvent bank in the State of California, payable on sight to the City and County of San Francisco. When award of contract is made, all checks or bonds will be returned except the retained check or bond of the successful Bidder, which will be returned upon execution of the contract and filing of the required performance bond and labor and material bond.

When the work proposed to be done under the contract is subdivided into more than one proposition and the form of Proposal

affords the Bidder the opportunity to bid on an optional amount of the total work, the certified check or corporate surety bond specified above shall be for an amount not less than 10 percent of the total price of the maximum amount of work that can be awarded to the Bidder in accordance with the bid prices contained in his Proposal.

101.05 LIST OF SUBCONTRACTORS TO ACCOMPANY PROPOSAL. - In accordance with the requirements of Section 6.48 of the Administrative Code, and Section 101.01 of these Standard Specifications, each Bidder, on the blank form provided for this purpose with his Proposal, shall set forth, for each Subcontractor who will perform any portion of the work in excess of one-half of one percent of the General Contractor's total bid, the following information:

- 1) Name of Subcontractor.
- 2) Address of Subcontractor.
- 3) Brief description of work to be performed under subcontract.
- 4) California Contractors state license number.
- 5) Amount to be paid for Subcontractor's work, labor or service.

101.06 ESTIMATE OF THE AMOUNT OF WORK TO BE DONE. - The amount of work included in a lump sum bid is set forth in the specifications and shown on the plans. The amount of each class of work included in a unit price bid will have been preliminarily estimated, as shown on the schedule of bid prices in the Proposal, and this estimate will be used as a basis for comparing bids. The Director does not expressly, or by implication, agree that the actual amount of work will correspond with the amount so shown or estimated, and reserves the right to increase or decrease the amount of any class or portion of the work, to leave out an entire Bid Item or Items, or to add work of a class not included in the Proposal, when in his judgment such change is best in the interest of the City. No such change in the work shall be considered as a waiver of any other condition of the contract.

The adjustment in compensation for any increase, decrease or deletion in the amount of work shall be in accordance with the applicable provisions of Sections 101.07 and 112.

101.07 INCREASED OR DECREASED QUANTITIES AND DELETED ITEMS. - Increase - Should the total pay quantity of any item of work required under the contract exceed that shown in the Schedule of Bid Prices by more than 25 percent, the work in excess of 125 percent of such quantity will be paid for by adjusting the contract unit price as hereinafter provided, or at the option of the Engineer, payment for the work involved in such excess will be made on the basis of force account as provided in Section 112.05.

Such adjustment of the contract unit price will be the difference between the contract unit price and the actual unit cost, which will be determined as hereinafter provided, of the total pay quantity of the item. If the costs applicable to such item of work include fixed costs, such fixed costs will be deemed to have been recovered by the Contractor by the payments made for 125 percent

of the Schedule of Bid Price quantity for such item, and in computing the actual unit cost, such fixed costs will be excluded. Subject to the above provisions, such actual unit cost will be determined by the Engineer in the same manner as if the work were to be paid for on a force account basis as provided in Section 112.05; or such adjustment will be as agreed to by the Contractor and the Engineer.

When the compensation payable for the number of units of an item of work performed in excess of 125 percent of the Schedule of Bid Price quantity is less than \$5,000 at the applicable contract unit price, the Engineer reserves the right to make no adjustment in said price if he so elects, except that an adjustment will be made if requested in writing by the Contractor.

Decrease - Should the total pay quantity of any item of work required under the contract be less than 75 percent of the Schedule of Bid Price quantity, an adjustment in compensation pursuant to this Section will not be made unless the Contractor so requests in writing. If the Contractor so requests, the quantity of said item performed will be paid for by adjusting the contract unit price as hereinafter provided, or at the option of the Engineer, payment for the quantity of the work of such item performed will be made on the basis of force account as provided in Section 112.05, provided however, that in no case shall the payment for such work be less than that which would be made at the contract unit price.

Such adjustment of the contract unit price will be the difference between the contract unit price and the actual unit cost, which will be determined as hereinafter provided, of the total pay quantity of the item, including fixed costs. Such actual unit cost will be determined by the Engineer in the same manner as if the work were to be paid for on a force account basis as provided in Section 112.05; or such adjustment will be as agreed to by the Contractor and the Engineer.

The payment for the total pay quantity of such item of work will in no case exceed the payment which would be made for the performance of 75 percent of the Schedule of Bid Price quantity for such item at the original contract unit price.

Delete - Should any contract item of the work be deleted in its entirety, payment will be made to the Contractor for actual costs incurred in connection with such deleted contract item if incurred prior to the date of notification in writing by the Engineer of such deletion.

If acceptable material is ordered by the Contractor for the deleted item prior to the date of notification of such deletion by the Engineer, and if orders for such material cannot be canceled, it will be paid for at the actual cost to the Contractor. In such case, the material paid for shall become the property of the City and the actual cost of any further handling will be paid for.

If the material is returnable to the vendor and if the Engineer so directs, the material shall be returned and the Contractor will be paid for the actual cost of charges made by the vendor for returning the material. The actual cost of handling returned material

will be paid for.

The actual costs or charges to be paid by the City to the Contractor for any deleted contract item will be computed in the same manner as if the work were to be paid for on a force account basis as provided in Section 112.05.

101.08 EXAMINATION OF PLANS, SPECIFICATIONS, PROPOSAL, AND SITE OF WORK. - Bidders shall examine carefully the site of the contemplated work, the plans and specifications, and the Proposal and included forms. The submission of a bid shall be conclusive evidence that the Bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and scope of work to be performed, as to the quantities of materials to be furnished, and as to the requirements of the Proposal, plans, and specifications.

Bidders must include in their bid prices the entire cost of the work contemplated in the contract, and it is understood and agreed that there is included, in each lump sum or unit price bid, the entire cost of all work incidental to the completion of that portion of the work.

It is understood that information as to underground, or other, conditions or obstructions, indicated on the plans or in the specifications, has been obtained with reasonable care, and has been recorded in good faith. There is no expressed or implied agreement that such information, or the depths, character of materials or water conditions, are correctly shown. Bidders must take into account the possibility that conditions affecting the cost or quantities of work may differ from those indicated, and shall make any additional subsurface investigation they consider necessary.

Records of existing structures in the vicinity of the site of the work may be on file in the City Engineer's Office, and may be examined by the Bidder. The Bidder should note, however, that these structures may differ from the records on file, or may have been altered, and that no representation is made, nor responsibility taken, by the City as to the accuracy of the locations and other data shown on such records.

101.09 ADDITIONAL INFORMATION PRIOR TO RECEIPT OF BIDS. - If the meaning and intent of the specifications is not clear to a Bidder, he shall request clarification or interpretation from the City Engineer at least 6 working days before the date of receipt of bids. If necessary, a clarifying addendum will be delivered to all parties who obtained specifications, and such addendum will be an incorporated part of the specifications.

The City will not be responsible for oral instructions or information, concerning the specifications or the work, given out by its officers, employees or agents to prospective Bidders.

AWARD AND EXECUTION OF CONTRACT

102.01 AWARD OF CONTRACT. - The Director may reject any and all bids. The award of contract, if made, will be to the lowest reliable and responsible Bidder whose Proposal complies with all the requirements prescribed, and will be made not less than 10 days after the last date of publication of the notice inviting sealed bids, or more than 30 days after the receipt of bids, unless the time for letting the contract be extended by resolution of the Board of Supervisors on recommendation of the Director, except that whenever required to develop, implement or improve a qualifying affirmative action nondiscrimination program as required by Section 12B of the San Francisco Administrative Code, then the City, without said resolution of the Board of Supervisors, shall have an additional 30 days within which to make the award. Assessment improvement contracts, however, must be awarded within not more than 20 days after the receipt of bids.

102.02 EXECUTION OF CONTRACT. - The successful Bidder will be allowed a maximum of 10 calendar days, after the date on which the contract is awarded, in which to deliver the contract with his signature affixed thereto, together with the corporate surety bonds and insurance documents required by Sections 102.03, 102.04, and 102.05, to the Director of Public Works.

If the successful Bidder shall for 10 days after such award fail or neglect so to enter into the Contract, the Director, in accordance with the provisions of Section 6.20 of the Administrative Code, may deposit the corporate surety bond or certified check which accompanied the Proposal of such Bidder with the Treasurer of the City for collection, and the proceeds thereof shall be retained by the City as liquidated damages for the failure of such Bidder to enter into said contract, unless upon recommendation of the Director together with the approval of the Chief Administrative Officer, the Board of Supervisors, by resolution, approves the return of such check or bond.

102.03 BONDS. - Before the execution of the contract, the Bidder to whom the contract is awarded shall file with the Department of Public Works, corporate surety bonds as follows:

- 1) Performance Bond in an amount of not less than 50 percent of the amount of the contract as awarded, as a guarantee of good faith on the part of said Bidder to execute the work in accordance with the terms of the contract;
- 2) Labor and Material bond in an amount of not less than 50 percent of the amount of the contract as awarded, as a guarantee on the part of said Bidder to pay in full all bills and accounts for wages for services engaged, and for materials, supplies and equipment used, in the performance of the work in the contract.

Both bonds shall be executed by guaranty or surety company listed in the latest issue of the United States Treasury Circular 570, and the total bond liability, under the contract, of any company shall not exceed the therein specified underwriting limitation for that company.

102.04 INSURANCE. - Contractor shall maintain in force throughout the term of the contract, insurance as follows:

- 1) Workers' Compensation, including Employers' Liability coverage;
- 2) Comprehensive General Liability Insurance, including Contractual Liability, independent contractors, explosion, collapse and underground (XCU), Personal Injury, Broadform Property Damage, Products and Completed Operations Coverages.
- 3) Comprehensive Automobile Liability Insurance, including owned, non-owned and hired auto coverages, as applicable.

Limits of liability on each of these policies shall be as specified in the Special Provisions.

102.05 INSURANCE - GENERAL CONDITIONS. - With respect to Workers' Compensation, in the event the Contractor is self-insured, he shall furnish Certificate of Permission to Self-Insure signed by Department of Industrial Relations-Administration of Self-Insurance, Sacramento.

If any injury occurs to any employee of the Contractor for which the employee, or his dependents in the event of his death, is entitled to compensation from the City, or for which compensation is claimed from the City, the City may retain out of sums due the Contractor under the contract an amount sufficient to cover such compensation, until such compensation is paid, or until it is determined that no compensation is due, and if the City is compelled to pay such compensation, it will deduct and retain from such sums the amount so paid.

With respect to liability insurance policies, City and County of San Francisco, its officers and employees, and any other parties and their officers and employees specified in the Special Provisions to be additional insureds, shall be additional insureds under the policy, and the policy shall stipulate that this insurance will operate as primary insurance and that no other insurance effected by the City or other additional insureds will be called on to contribute to a loss covered thereunder.

Before the contract is entered into, the Bidder to whom it is awarded shall file with the Department of Public Works, certification of insurance for each required General Liability, Automobile Liability and Workers' Compensation policy (with a complete copy of any policy promptly upon City request).

Each policy and certificate shall provide that no cancellation, major change in coverage, or expiration shall become effective

until at least 30 days after receipt by the Director of Public Works of written notice thereof.

The Contractor, upon notification of receipt by the Director of any such notice, shall file with the Department of Public Works, a certificate of the required new or renewed policy at least 5 days before the effective date of such cancellation, change or expiration, (with a complete copy of said policy promptly upon City request.)

At the time of making application for an extension of time, the Contractor shall submit evidence that the policies will be in effect during the requested additional period of time.

If, at any time during the life of the contract, the Contractor fails to maintain the required insurance in full force and effect, all work under the contract shall be discontinued immediately, and all contract payments due or that become due will be withheld, until notice is received by the Director that the required insurance has been restored to full force and effect and that the premiums therefor have been paid for a period satisfactory to the Director.

Any failure to maintain the required insurance will be sufficient cause for termination of contract.

Insurance required shall be placed in Company or Companies having policyholders' surplus of at least 10 times the amount or limit of liability afforded by the insurance company.

Approval of the insurance by the City shall not relieve or decrease the extent to which the Contractor or any subcontractor may be held responsible for payment of damages resulting from his operations.

SECTION 103

EXTENT OF WORK

103.01 MEANING AND INTENT OF PLANS AND SPECIFICATIONS. - These Standard Specifications, the plans, the Special Provisions and any addenda thereto, contract change orders, and all supplementary documents are essential parts of the contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be self-explanatory and cooperative, and to describe and provide for a complete work.

Should it appear that the work to be done or any of the matters relative thereto are not sufficiently detailed or explained in the plans or specifications, or should there be any questions which may arise as to the meaning or intent of the plans or specifications, the matter shall be referred to the Engineer, who shall interpret the true meaning and intent of the plans and specifications.

If the City Engineer's interpretation of the plans and specifications is that the Contractor is responsible under the contract for work which he did not contemplate doing, the Contractor, immediately upon being directed to, shall do such work, even though he does not agree that it is covered by the contract and feels that there is a reasonable argument against such coverage. The Contractor

may file a claim against the City for payment for the aforesaid work, and the performance thereof shall not constitute a waiver of, or in any way prejudice such claim.

103.02 TITLES, REFERENCES AND DIMENSIONS. - Titles, headings, subheadings and indexes are used primarily for convenience and are not necessarily deemed to be parts of the contract. The misplacement, addition or omission of any word, letter, figure, or punctuation mark shall in no way lessen or change the intent or meaning of the specifications.

The reprinting or repetition in the specifications of certain clauses from any other specification or law or document, to which reference is made herein, shall in no way limit the scope of such reference or the applicability of any such specification, law or document, in its entirety.

Where work is not dimensioned on plans, it shall be executed according to the scale, but figured dimensions shall govern in all cases, although they may differ from the scale dimensions.

103.03 REASONABLY IMPLIED PARTS OF THE WORK SHALL BE DONE THOUGH ABSENT FROM SPECIFICATIONS. - Any part of the work which is not mentioned in the specifications but is shown on the plans, or any part not shown on the plans but described in the specifications, or any part not shown on the plans nor described in the specifications, but which is necessary or normally required as a part of such work, or is necessary or required to make each installation satisfactorily and legally operable, shall be performed by the Contractor as Incidental Work without extra cost to the City, as if fully described in the specifications and shown on the plans, and the expense thereof shall be included in the price bid.

103.04 CONFLICT BETWEEN PARTS OF SPECIFICATIONS. - If there is any conflict between the plans and specifications or between any parts of the specifications, they shall govern in descending order of precedence as follows:

- 1) Addenda, including changes made to the plans by addenda.
- 2) Special Provisions, excluding the Utility Crossing Specifications and excluding the Standard Stipulations, if included therein.
- 3) Special Plans.
- 4) Standard Stipulations
- 5) Utility Crossing Specifications.
- 6) Standard Specifications.
- 7) Standard Plans.

In the case of the plans, the plan bearing the highest Change Number, unless otherwise specified, shall prevail over and be substituted for, such plan bearing a lesser Change Number. Any references to such plan shall be considered to have been changed accordingly.

SECTION 104

UTILITIES IN PUBLIC STREETS

104.01 GENERAL. - If the plans include a utility occupancy plan, or plans, showing the approximate locations in public streets, and other details, of pipes, conduits, structures and other utility facilities owned or controlled by any person, company, firm, corporation or agency, private or governmental, hereinafter referred to as Owners, it is understood that the City makes no representation as to the completeness or accuracy of said plan or plans and assumes no responsibility therefor.

In the absence of such utility occupancy plans, Bidders may inspect in the offices of the Bureau of Engineering, Department of Public Works, such plans and other information relative to Sewer or Auxiliary Water Supply System for Fire Protection facilities, and information regarding other facilities which may have been made available to the City by the Owners. As in the case of utility occupancy plans, the City makes no representation regarding, and assumes no responsibility for, any such information made available to Bidders.

Bidders are cautioned that any contract construction shown on Utility Occupancy and Utility Company and Agency Plans may not properly show such required construction. For construction under the contract the Contractor shall use the appropriate contract construction plans.

Bidders are instructed to satisfy themselves regarding the locations and other details of utility facilities by applying to the Owners for such information as they require.

It shall be the duty of the Contractor to inform the Owners, including City departments, of pipes, wires, conduits and other utility facilities, of his intended operations a reasonable time in advance thereof so as to permit the Owners to make suitable markings on the street surface of the locations of such facilities. After such markings have been satisfactorily made, the Contractor shall maintain them as long as necessary for the proper conduct of the work.

The Contractor shall not hinder, nor interfere with, any company, agency or individual having underground facilities, in removing, relocating, relaying or otherwise protecting such structures, mains, pipes, conduits, lines, or railroad, or other, facilities and appurtenances.

Except as otherwise hereinafter provided, pipes, wires, conduits and other utility facilities located in or over the location of the work shall be removed or adjusted by the Contractor as necessary to permit the prosecution of the work. The Contractor shall perform all work in such manner as to avoid damage to such pipes, wires, conduits and other utility facilities in the process of their removal or adjustment, and also so as to avoid damage to such facilities lying outside of or below a required excavation or trench area and intended to remain in place.

104.02 GOVERNMENTAL FACILITIES. - The Contractor shall satisfactorily support, work around, and protect, as approved by the

Engineer, all facilities, whether shown on the plans or not, which exist within any excavation and which are owned or controlled, and maintained, by a City department or other authority in the exercise of a governmental function. By "facilities owned or controlled, and maintained, in the exercise of a governmental function" is meant such facilities as traffic control, lighting, police communication and fire alarm systems, and all conduits, wiring and related appurtenances for such systems, sewers and sewer structures, low pressure hydrant leads, and pipes and facilities of the Auxiliary Water Supply System for Fire Protection, the Municipal Railway, and Hetch Hetchy Water and Power overhead lines and power feeder systems serving the Municipal Railway.

Municipal Railway facilities and Hetch Hetchy Water and Power facilities serving the Municipal Railway, if encountered, shall be supported in a manner satisfactory to the General Manager of the Public Utilities Commission of the City and County of San Francisco.

Auxiliary Water Supply for Fire Protection facilities, if encountered, shall be supported by a minimum of one cable with turnbuckle, a strongback, and a beam spanning the trench; however, where a joint falls within the trench area, a cable with turnbuckle shall be placed on each side of the joint. All such support work shall be subject to the approval of the Engineer before commencement thereof.

After supports are removed and the pipe is sufficiently supported by partial backfill, but with the joints exposed, the pipe shall be subjected to a hydrostatic field test of 450 psi pressure in accordance with Section 908.22 before final backfill is placed. If a joint is visibly wet, the Contractor shall repair the joint in accordance with Section 910.

In the case of vitrified clay pipe side sewers and culverts he encounters, the Contractor may elect, in lieu of supporting such side sewers and culverts, to cut and restore those portions of the side sewers and culverts which obstruct the prosecution of the work, provided that he complies with the provision of Section 301 regarding the handling and disposal of seepage, storm water and sewage.

Supporting, working around, and protecting existing governmental facilities and cutting and restoring portions of side sewers and culverts, as set forth above, shall be considered Incidental Work and no direct or additional payment will be made therefor.

Any governmental facilities that require removal, adjustment or relocation to avoid direct physical conflict with the facilities to be constructed under the contract shall:

- 1) be removed or adjusted by the Contractor in accordance with the provisions of the plans and specifications;
- 2) in the absence of such provisions, be removed or adjusted by the Contractor as Extra Work as set forth in Section 112; or,
- 3) be removed or adjusted by other suitable procedure at the City's expense.

The adjustment of manhole castings and other castings of governmental facilities, and the paving adjacent thereto, shall be done in accordance with the requirements of Section 217.

104.03 NON-GOVERNMENTAL FACILITIES. - The procedure to be followed with respect to utility facilities owned or controlled by any person, company, firm or corporation, or by City departments such as the Water Department, in the exercise of a proprietary function is covered by Sections 906, 907, 908, 909 and 910 of the Public Works Code (Part II, Chapter X, of the Municipal Code). The Sections read as follows:

"SEC. 906. NOTICE TO REMOVE OR RELOCATE UTILITY FACILITIES.

(a) Whenever any public work is authorized by the Board to be done under the supervision of the Director upon, in, over or under any of the streets, the Director, before the commencement of the work, shall notify in writing any owner or operator having utility facilities of any nature upon, in, over or under the streets to remove or adjust so much of his or their facilities as will allow the prosecution of the public work. The Notice shall be accompanied by a copy of the plans and specifications for the authorized public work showing the location of the work in the streets and describing the same. The Notice shall specify a time within which all affected utility facilities must be removed or adjusted.

(b) The evolution of urban rail, trolley coach and motor bus passenger systems from private operations under franchise operating without tax subsidies to publicly owned and operated systems under federal, state and local policies mandating intra-city passenger service at revenue levels which require a substantial measure of tax support, the paramount right of the people as a whole to use the public streets, and the level of service provided being essential to the circulation, health, safety, comfort and welfare of people in an urban setting, and the need for improved transportation systems to meet increasing demand for development and maintenance of an adequate, safe and efficient transportation system requires that this service be recognized and defined as a governmental activity within the city's policy powers. Accordingly, whenever any public work relating to the Municipal Railway is authorized by the Public Utilities Commission to be done under the supervision of the General Manager upon, in, over or under any of the streets, the General Manager, before the commencement of the work, shall notify in writing any owner or operator having utility facilities of any nature upon, in, over or under the streets to remove or adjust so much of his or their facilities as will allow the prosecution of the public work. The Notice shall be accompanied by a copy of the plans and specifications for the authorized public work showing the location of the work in the streets and describing the same. The Notice shall specify a time within which all affected utility facilities must be removed or adjusted.

"SEC. 907. OWNERS MUST REMOVE IN REQUIRED TIME. Any owner or operator having utility facilities upon, in, over or under the streets upon, in, over or under which any public work is authorized to be done, shall, upon receipt of a Notice pursuant to Section 906, and

at his expense, cause to be removed or to be adjusted within the time specified in the Notice, so much of the affected utility facilities belonging to or under the control of such owner or operator as will allow the authorized work to be prosecuted according to the plans and specifications therefor.

"SEC. 908. FAILURE - WORK MAY BE DONE BY DIRECTOR OR GENERAL MANAGER.

(a) If any owner or operator except the Municipal Railway shall fail, neglect or refuse to comply with the requirements set forth in a Notice issued pursuant to Sec. 906 (a) then, and in that event, the Director shall cause to be removed or be adjusted so much of the utility facilities as may be required for the prosecution of the said authorized public work according to the plans and specifications therefor; and the incidental expenses incurred in the removal or adjustment shall be chargeable to the owner or operator failing, neglecting or refusing to comply with the requirements of the Notice, and may be recovered in an action at law brought in the name of the City against such owner or operator.

(b) If any owner or operator shall fail, neglect or refuse to comply with the requirements set forth in a Notice issued pursuant to Sec. 906 (b) then, and in that event, the General Manager shall cause to be removed or adjusted so much of the utility facilities as may be required for the prosecution of the said authorized public work according to the plans and specifications therefor; and the incidental expenses incurred in the removal or adjustment shall be chargeable to the owner or operator failing, neglecting or refusing to comply with the requirements of the Notice, and may be recovered in an action at law brought in the name of the City against such owner or operator.

"SEC. 909. AGREEMENT WITH OWNER OR OPERATOR. (a)The Director, with the approval of the Chief Administrative Officer, may enter into an agreement with the owner or operator of any utility facility which may require support, protection and working around in order to successfully prosecute the construction of public work, to have any such support, protection and working around included as a part of a contract for public work. The cost of any such support, protection and working around a utility facility shall be borne by the owner or operator thereof.

(b) The General Manager, with the approval of the Public Utilities Commission, may enter into an agreement with the owner or operator of any utility facility which may require support, protection and working around in order to successfully prosecute the construction of public work, to have any such support, protection and working around included as a part of a contract for public work.

The cost of any such support, protection and working around a utility facility shall be borne by the owner or operator thereof.

"SEC. 910. PROVISION FOR ADMINISTRATION, ETC. - COST. (a)Pursuant to Sec. 909 (a) the Department will provide administration and

other necessary services during the progress of the construction. The estimated cost of administration, preparation and supervision of the contract attributable to the work, shall be included in the agreement.

(b) Pursuant to Sec. 909 (b) the Public Utilities Commission for the Municipal Railway will provide administration and other necessary services during the progress of the construction. The estimated cost of administration, preparation and supervision of the contract attributable to the work, shall be included in the agreement."

The method of application of the provisions of these Code sections is described in the following subparagraphs:

1) If the cost of removing or adjusting a utility facility, (a) materially exceeds the cost of so modifying the work that it can be done satisfactorily without the removal or adjustment of the facility, or (b) materially exceeds the increase in the cost of the Contractor's operations that would be occasioned to him by the uninterrupted presence of the facility if it were not removed or adjusted, then, in either case, the City will, if requested by the Owner, waive the requirement that the facility be removed or adjusted and allow it to remain in place, provided that the Owner obtains the consent of the Contractor to such waiver in return for such compensation, if any, by the Owner as may be just and equitable and no expense is occasioned either directly or indirectly to the City by such waiver, and further provided that the Owner agrees to compensate the City for the expense, if any, of revising the plans and specifications as necessary to accomplish the appropriate modification of the work. Should an Owner, in satisfying the requirements of the immediately preceding subparagraph, notify the Contractor of his intention to leave the facility in place, the Contractor shall, within 10 days, furnish to the Owner a quotation covering the entire cost of supporting, working around or protecting, as necessary, such facility. In the event an Owner and the Contractor cannot agree upon the amount of the compensation, if any, to be paid by the Owner to the Contractor, then the Director, with or without the consent of the Contractor, will, if he determines that it would be uneconomic and contrary to the public interest to remove or adjust the utility facility, and if the Owner promises in writing to pay to the City the amount of the expense incurred by the City under the change order next hereinafter mentioned, waive the requirement that the facility be removed or adjusted and will issue an appropriate change order to the Contractor in accordance with the provisions of Section 112 to modify the work or to modify his operations, as the case may be, as necessary to accommodate the continued presence of the facility.

2) The adjustment of manhole castings and other castings of non-governmental facilities and the paving adjacent thereto, shall be done in accordance with the requirements of Section 217.

3) In lieu of the procedures set forth in 1) preceding, agreements have been executed between various utility companies and agencies,

and the City, enabling such companies and agencies to have included in City contracts the work of supporting, working around, and protecting their facilities.

The work of supporting, working around, and protecting such facilities may or may not be included in a contract. Such work, if included in a contract, will be paid for by the various utility companies and agencies directly to the Contractor in conformance with the provisions of the Utility Crossing Specifications included in the Special Provisions. Requirements for performance of this work are also contained in the Utility Crossing Specifications. Such work, if not included in a contract, but encountered in the field, shall be subject to the provisions of this Section 104.03, excluding this subparagraph 3).

Pursuant to the provisions of 1), 2), and 3) herein, Bidders shall not include in their bids any expense on account of the presence, or possible presence, of non-governmental utility facilities, except only that which might be included for boxing out of castings.

These provisions do not apply to abandoned utility facilities. Any increase in the cost of the Contractor's operations occasioned by the presence and/or removal of abandoned facilities shall be at the sole expense of the Contractor and no additional payment will be made by the former owners or by the City, except that removal of abandoned utility facilities, not shown on the plans or specified to be removed, shall be removed by the Contractor as Extra Work, as specified in Section 700.09.

If during the course of the work an unexpected interference by a non-governmental utility facility is discovered, the Contractor shall immediately notify the Owner of the interfering facility so that the required procedure outlined in 1), 2) or 3) hereinbefore, as applicable, may be followed in a manner to cause no delay in the work.

104.04 USE OF PAVEMENT BREAKER ADJACENT TO UTILITY FACILITIES LIMITED. - In accordance with the requirements of Section 373

of the Public Works Code, the Contractor may use pavement breakers or other labor-saving devices; however, the use of any machine or device that breaks pavement by blows struck by a falling or driven hammer or weight is prohibited within a horizontal distance of 6 feet from any gas, sewer, water or Auxiliary Water Supply System pipe, communications duct or any other utility facility.

Such prohibition, however, shall not be construed as barring the use of hand tools or manually operated air tools such as jackhammers.

104.05 LOW PRESSURE FIRE HYDRANT RELOCATIONS TO BE DONE BY SAN FRANCISCO WATER DEPARTMENT. - If low pressure fire hydrants are shown on the plans to be relocated, such relocation shall be done by the San Francisco Water Department at no cost to the Contractor.

It shall be the responsibility of the Contractor to notify the Water Department 7 days in advance of the time he intends to begin work where low pressure hydrants relocation work is to be done.

All pavement, gutter, curb and sidewalk construction required at new and old locations of relocated hydrants, whether or not within the limits designated for pavement construction, shall be done by the Contractor under the appropriate contract Bid Items, or in the absence thereof shall be done as Incidental Work.

The Contractor, at all times, shall maintain access to all gate valves by personnel of the San Francisco Water Department.

SECTION 105

LEGAL REGULATIONS AND RESPONSIBILITY

105.01 LAWS AND REGULATIONS. - The Contractor shall keep himself fully informed of the Charter, Ordinances and regulations of the City, and of all Federal and State laws in any manner affecting the performance of the work or those persons engaged therein, and of all orders and decrees of governmental bodies or officials having any authority or jurisdiction over the same. He shall himself observe and comply with and shall cause all his agents, employees and subcontractors to observe and comply with said Charter and all such ordinances, regulations, laws, orders and decrees. The Contractor shall save harmless and indemnify the City and all its officers and employees against any claim or liability arising from or based on the violation of said Charter or any such ordinance, regulations, law, order or decree, whether by himself, his agents, employees or his subcontractors.

The Contractor's attention is directed to Chapter 10, Article XIX "Divestment", Chapter 12B "Nondiscrimination in Contracts", and Chapter 12D "Minority/Women/Local Business Enterprises", of the San Francisco Administrative Code, and any amendments thereto, which are incorporated into this Standard Specification by this reference thereto, and with which the Contractor must comply as applicable.

All construction and materials, including connections, supports, hangers, fastenings, and the like, shall be furnished, installed, or constructed as the case may be, by the Contractor in full accordance with the requirements of the San Francisco Building Code, The National Board of Fire Underwriters, the Pacific Fire Rating Bureau, the State Fire Marshal, the Safety Orders issued by the Division of Occupational Safety and Health of the State of California, the San Francisco Fire Department Bureau of Fire Prevention and Public Safety, and all other prevailing codes and regulations having jurisdiction over construction or the structure. Work so necessitated, if not covered for payment, shall be done as Incidental Work.

The Contractor, prior to the start of work, shall secure the required plumbing, electrical, or other permits, except the building permit, for the work covered by the specifications. The building permit, if required, will be secured by the Engineer and furnished to the Contractor along with an approved set of plans and specifications. The Contractor shall keep the building permit, and the

approved plans and specifications at the job site, readily available for inspection during regular working hours, for the duration of the job. Department of Public Works contracts are exempt from plumbing and electric permit fees.

105.02 CONTRACTOR'S LEGAL ADDRESS. - The address given in the Bid or Proposal is hereby designated as the legal address of the Contractor, but such address may be changed at any time by notice in writing, delivered to the Director.

The delivering to such legal address, or the depositing in the post office in a postpaid wrapper, directed to the Contractor at the hereinbefore referred to address, of any plan, notice, letter or other communication, shall be deemed to be a legal and sufficient service thereof upon the Contractor.

105.03 DAMAGE TO WORK OR PROPERTY. - The Contractor shall be responsible for the safekeeping of, and shall protect, the work and materials from damage due to the nature of the work, the action of the elements, the carelessness of other contractors, or from any other cause whatsoever, until acceptance of the work. Should any such damage occur, he shall repair it at his own expense, and leave the work in a condition satisfactory to the Director in every particular.

Neither the City nor any of its officers, employees or agent assumes any responsibility for collecting indemnity from the person or persons causing damage to the work of the Contractor.

Any damage, arising from or in consequence of the performance of the contract, to tracks, pavements, curbs, landscaping, sidewalks, footings, walls, stairs, fences, sewerage and drainage structures, mains, pipes, valves, conduits, poles, wires, transformers, to adjoining work, or to any other improvement or property above or below the surface of the ground, whether private or public, shall be repaired at once by the Contractor at his own expense, or upon the occurrence of such damage the Contractor shall obtain from the owner of the damaged property a release from his liability for such damage. If, in the opinion of the Engineer, the best interest of the City requires such repair to be made prior to the execution of any part of the work included in the contract, the Engineer will so notify the Contractor who shall delay or discontinue the performance of that part of the work until the necessary repair has been made. Such delay shall not be considered unavoidable, and no extension of time for completion of the contract will be granted therefor. When ordered by the Engineer to make any such repair, the Contractor shall start work thereon within forty-eight hours and shall prosecute the same with diligence to completion. Upon failure of the Contractor so to comply with such order, or upon his failure to make immediate emergency repairs which are necessary in the best interest of the City or of the public, the Director shall have authority to cause such repair to be made and to deduct the cost thereof from any money due, or which may become due, to the Contractor.

Repair or replacement of damaged work or property by the Contractor shall return such work or property to at least the condition before the damage, with respect to quality, strength, appearance, serviceability for use intended, and finish.

The Contractor shall promptly report to the Engineer and to his Insurance Carrier with copies to the Engineer, all claims submitted by third parties for damages to property alleged to have been caused by project work, and shall submit monthly status reports listing all of these claims until all claims are settled or withdrawn.

The Contractor shall take immediate action to mitigate or correct any damages when in the opinion of the Engineer these damages present a hazard to persons or property. When no emergency exists, corrections shall be made as soon as the Engineer has determined that progress of the work will not cause further damage.

The Engineer may withhold sufficient funds to cover 125% of the Engineer's estimate of the cost of repairs. These funds will be released after receipt of a statement signed by the claimant indicating that the damage has been repaired or other settlement made to the satisfaction of the property owner.

105.04 RESPONSIBILITY OF CONTRACTOR: INDEMNIFICATION. - The City and County of San Francisco and all officers and employees thereof connected with the work, including but not limited to the Director of Public Works, the City Engineer, and parties designated in the Special Provisions and their officers and employees, shall not be answerable or accountable in any manner: for any loss or damage that may happen to the work or any part thereof; for any loss or damage to any of the materials or other things used or employed in performing the work; for injury, sickness, disease, or death of any person, including but not limited to workmen and the public; or for damage to property, resulting from any cause whatsoever, on account of the performance or character of the work.

Consistent with California Civil Code Section 2782, the Contractor shall assume the defense of, and indemnify, and hold harmless the City and all of its officers and employees connected with the work, the Director of Public Works, the City Engineer, parties designated in the Special Provisions, and their officers and employees, from all claims, suits, actions, losses and liability of every kind, nature and description, including but not limited to attorney's fees, directly or indirectly arising out of, connected with or resulting from the performance of the work, the failure to perform the work, or the condition of the work which is caused in whole or part by any act or omission of the Contractor, subcontractor, any one directly or indirectly employed by any of them or any one for whose acts any of them may be liable, regardless of whether or not it is caused in part by the City or any party required to be indemnified hereunder or in the Special Provisions.

With respect to third party claims against the Contractor, the Contractor waives any and all rights to any type of express or implied indemnity against the City, its officers or employees.

Approval of any insurance contracts does not relieve the Contractor, its subcontractors, or any one else directly or indirectly employed by any of them from liability under this Section 105.04.

105.05 CONTRACTOR'S WORKING CONDITIONS. - The Contractor's working conditions shall be governed by the provisions of Section 7.204 of the Charter of the City and County of San Francisco which reads as follows:

"Every contract for any public work or improvement to be performed at the expense of the city and county, or paid out of moneys deposited in the treasury, whether such work is to be done directly under contract awarded, or indirectly by or under subcontract, subpartnership, day labor, station work, piece work, or any other arrangement whatsoever, must provide:

(a) that in the performance of the contract and all work thereunder, eight hours shall be the maximum hours of labor on any calendar day, except that hours of labor in excess of eight hours per day may be permitted when conditions so warrant upon the approval of the department head responsible for the supervision of the contract, provided that compensation for all hours worked in excess of eight hours per day conforms to the requirements of the Labor Code of the State of California and all applicable federal laws;

(b) that any person performing labor thereunder shall be paid not less than the highest general prevailing rate of wages in private employment for similar work;

(c) that any person performing labor in the execution of the contract shall be a citizen of the United States;

(d) that all laborers employed in the execution of any contract within the limits of the city and county shall have been residents of the city and county for a period of one year immediately preceding the date of their engagements to perform labor thereunder; provided, however, that the officer empowered to award any such contract may, upon application of the contractor, waive such residence qualifications and issue a permit specifying the extent and terms of such waiver whenever the fact be established that the required number of laborers and mechanics possessing qualifications required by the work to be done cannot be engaged to perform labor thereunder.

"The term "public work" or "improvement," as used in this section shall, include the fabrication, manufacturing or assembling of materials in any shop, plant, manufacturing establishment or other place of employment, when the said materials are of unique or special design, or are made according to plans and specifications for the particular work or improvement and any arrangement made for the manufacturing, fabrication or assembling of such materials shall be deemed to be a contract or a subcontract subject to the provisions of this section.

"The board of supervisors shall have full power and authority to enact all necessary ordinances to carry out the terms of this section and may by ordinance provide that any contract for any public work or improvement, or for the purchase of materials which are to be manufactured, fabricated or assembled for any public work or improvement, a preference in price not to exceed 10 percent

shall be allowed in favor of such materials as are to be manufactured, fabricated or assembled within the City and County of San Francisco as against similar materials which may be manufactured, fabricated or assembled outside thereof. When any such materials are to be fabricated, assembled or manufactured by any sub-contractor or materialman for the purpose of supplying the same to any contractor bidding on or performing any contract for any public work or improvement, said sub-contractor or materialman manufacturing, fabricating, assembling or furnishing said materials manufactured, assembled or fabricated within the City and County of San Francisco shall be entitled to the same preferential as would any original contractor or materialman furnishing the same if the board of supervisors by ordinance so provide. When any ordinance shall so provide any officer, board or commission letting any contract may in determining the lowest responsible bidder for the doing or performing of any public work or improvement add to said bid or sub-bid an amount sufficient not exceeding 10 percent in order to give preference to materials manufactured, fabricated or assembled within the City and County of San Francisco."

The Contractor's working conditions shall be further governed by the following provisions which are included in Sections 6.36 to 6.43, inclusive, of the San Francisco Administrative Code:

- 1)The Contractor shall pay to all persons performing labor in and about the work provided for in this contract, the highest general prevailing rate of wages as determined and fixed by the Board of Supervisors for the respective crafts and employments, including such wages for holiday and overtime work.
- 2)The Contractor shall insert in every subcontract or other arrangement which he may make for the performance of any work or labor on the work provided for in this contract, a provision that said subcontractor shall pay to all persons performing labor or rendering service under said subcontract or other arrangement, the highest general prevailing rate of wages as determined and fixed by the Board of Supervisors for the respective crafts and employments, including such wages for holiday and overtime work.
- 3)The Contractor shall keep, or cause to be kept, an accurate record showing the name, place of residence, citizenship, occupation and per diem pay, of each person engaged in the execution of this contract, and every subcontractor who shall undertake the performance of any of the work herein required shall keep a like record of each person engaged in the execution of the subcontract. All of said records shall at all times be open to the inspection of an examination by the duly authorized officers and agents of the City and County of San Francisco.
- 4)Should the Contractor or any subcontractor who shall undertake the performance of any part of the work herein required, fail or neglect to pay to the several persons who shall perform labor under this contract, subcontract or other arrangement for the work, the highest general prevailing rate of wages as herein specified, he shall forfeit, and in the case of any subcontractor, so failing

or neglecting to pay said wage, the original contractor and the subcontractor shall jointly and severally, forfeit to the City and County of San Francisco the sum of Twenty Five Dollars (\$25.00) per day for each laborer, workman or mechanic employed for each calendar day or portion thereof, while they shall be so employed and not paid said highest general prevailing rate of wages, and the Director when certifying to the Controller any payment which may become due under the terms of this contract will deduct from said payment the total amount of said forfeiture provided for, and the Controller, in issuing his warrant for any such payment, will deduct from the amount which would otherwise be due on said payment, the amount of said forfeiture or forfeitures as so certified.

5) No person performing labor or rendering service in the performance of any contract or subcontract for the work herein required shall perform labor for a longer period than 8 hours each calendar day, except that hours of labor in excess of eight hours per day may be permitted when conditions so warrant upon the approval of the department head responsible for the supervision of the contract, provided that compensation for all hours worked in excess of eight hour per day conforms to the requirements of the Labor Code of the State of California and all applicable federal laws. (S.F. Charter Section 7.204).

The provisions of California Labor Code Section 1775 shall be fully complied with. Such Section states in part as follows:
"The difference between such prevailing wage rates and the amount paid to each workman for each calendar day or portion thereof for which each workman was paid less than the prevailing wage rate shall be paid to each workman by the Contractor".

All applicable provisions of Sections 6.36 to 6.53, inclusive, of the San Francisco Administrative Code shall be binding upon the Contractor and any of his subcontractors affected thereby, and such Sections, which said Code requires to be incorporated into every contract for any public work or improvement, are by this reference hereby so incorporated and made a part of the contract as if set forth at length therein.

Wage Rate Determination - Payment to workers employed under public works contracts, except as otherwise noted below, shall comply with current General Prevailing Wage Rate Determination made by the Director of the State of California Department of Industrial Relations pursuant to California Labor Code Part 7, Chapter 1, Article 2, Sections 1770, 1771, 1773, and 1777. Payments to crafts or classifications not shown on the General Prevailing Wage Rate Determination shall comply with the wage rate of that craft or classification most closely related to it as shown in the current General Prevailing Wage Rate Determination. Copies of such wage determination are included in the Special Provisions. The Resident Engineer will post a copy of such determination of the prevailing rate of wages at the jobsite as required by Section 1773.2 of the California Labor Code.

The Contractor shall make travel and subsistence payments to each worker needed to execute the work, as such travel and subsistence payments are defined in the applicable collective bargaining agreement filed with the Director of Industrial Relations in accordance with California Labor Code, Section 1773.8.

When federal funds are involved in the Contract, the latest Federal General Wage Determination Decisions are also included in the Special Provisions, and the following shall apply:

1) Where the minimum rate of pay for any classification differs between State and Federal wage rate determinations, the higher of the rates of pay shall prevail.

2) Title 29 Code of Federal Regulations Section 1.7 (b) (2) states:

"All actions modifying a general wage determination shall be applicable thereto, but modifications published in the Federal Register later than ten days before the opening of bids shall not be effective, except when the Federal agency (in the case of Federal-Aid Highway Acts as codified in 23 U.S.C. 113, the State highway department of each State) finds that there is a reasonable time in which to notify bidders of the modification. In the case of contracts entered into pursuant to the National Housing Act, such modifications shall be effective if made prior to the beginning of construction, but shall not apply after the mortgage is initially endorsed by the Federal agency".

3) In the event that the wage determination decision of the Secretary of Labor has been superseded by any subsequent wage determination decision(s) published up to and including 10 days prior to bid opening, the most recent applicable wage decision shall be incorporated by reference, and the successful bidder agrees to be bound by it, regardless of what is contained in the specifications.

105.06 PATENTS. - All fees or claims for any patented invention, article or arrangement that may be used upon or in any manner connected with the doing of the herein proposed work or any part thereof shall be included in the price bid for doing the work herein proposed, and the Contractor and his sureties shall protect and hold any and all departments of the City, together with all its officers and employees, harmless against any and all demands made for such fees or claims and against any and all suits and claims brought or made by the holder of any invention, patent, copyright or trademark, or growing out of any alleged infringement of any invention, patent, copyright or trademark, and before the final payment is made on account of the contract, the Contractor shall furnish acceptable proof to the Director of a proper release from all such fees or claims.

105.07 PAYMENT OF TAXES. - The contract bid prices for the work shall include full compensation for all taxes which the Contractor is required to pay, whether imposed by Federal, State or local government, including, without being limited to, City sales and business and Federal excise taxes. The Contractor shall furnish all proper forms and initiate all procedures to effect any exemption to which

he may be legally entitled as to any tax on labor, services, materials, transportation, or any other work furnished pursuant to the contract. The City will make such certifications as are proper and necessary to the completion of such forms.

105.08 USE OF COMPLETED PARTS OF THE WORK BEFORE ACCEPTANCE. - The City reserves the right to take possession of, connect to, open for public use, or use, completed parts of a project where the use of such completed part is necessary or required for the safety, health or convenience of the public.

Prior to the date of the acceptance of the work by the Director, all necessary repairs or renewals in the work or part thereof so used, not due to ordinary wear and tear, but due to defective materials or workmanship, to damage by the general public, or to the operations of the Contractor, shall be made at the expense of the Contractor.

The use by the City of the work or part thereof as contemplated in this Section 105.08 shall in no case be construed as constituting acceptance of the work or any part thereof. Such use shall neither relieve the Contractor of any of his responsibilities under the contract, nor act as a waiver by the City of any of the conditions thereof.

Upon the request of the Contractor, the Director may relieve him of the duty of maintaining and protecting certain portions of the work, as described below, which have been completed in all respects in accordance with the requirements of the contract and to the satisfaction of the Engineer. In addition, such action by the Director will relieve the Contractor of responsibility for injury or damage to said completed portions of the work resulting from use by public traffic or from the action of the elements or from any other cause but not from injury or damage resulting from the Contractor's own operations or from his negligence.

Portions of the work for which the Contractor may be relieved of the duty of maintenance and protection as provided in the above paragraph include but are not limited to the following:

- 1) A complete unit of traffic control system or of a street lighting system;
- 2) A bridge or other structure of major importance; or
- 3) A completed site in a multiple site contract.

The above relief from maintenance and protection of, and responsibility for injury or damage to, the work, in no way affects the Contractor's responsibility or the dates thereof under Section 105.10, and the therein stated "acceptance of the work", will apply to all parts of the work covered by the contract, and will be the date of issuance by the Director of the Order accepting the work.

105.09 NO WAIVER OF LEGAL RIGHTS. - The City shall not be precluded or stopped by any measurement, estimate or payment, or by acceptance of, and payment for, the work, from showing the true amount and character of the work performed, or from recovering from the Contractor and his sureties such damages as the City may sustain by reason of the Contractor's failure to observe all the terms of the contract.

Neither acceptance of, nor payment for, the work, or any part of the work, nor any extension of time, nor any possession taken by the City, shall operate as a waiver of any portion of the contract, nor shall a waiver of any breach of the contract be held to be a waiver of any other or subsequent breach.

105.10 CORRECTION OF DEFECTS AFTER ACCEPTANCE. - The Contractor shall at his own expense make all necessary repairs and replacements to remedy in a satisfactory manner any and all defects in the work, or damages resulting from such defects, due to faulty materials or workmanship, or due to disturbance of or damage to City improvements by the Contractor's operations under the contract and contrary to the specifications, or due to other failure to comply with the specifications, when such defects occur:

a) in any part of the surface work done under the contract, or in surface improvements of the City such as pavements, curbs, walks, tracks, walls, stairways, poles, mechanical and electrical equipment, materials, appurtenances and accessories, or other surface structures provided that such defect or defects be detected within one year following the date of acceptance of the work;

b) in any part of the subsurface work done under the contract, or in subsurface improvements of the City not included in the work under the contract, such as sewers, side sewers, culverts, other drainage structures, pipes, valves, conduits, conductors, or other subsurface structures, provided that such defects in such subsurface work, or disturbance of or damage to, said other improvements be detected within two years following the date of acceptance of the work.

Should the Contractor, after written notification by the Director, fail to remedy promptly any such defect occurring as set forth hereinbefore under a) or b), or should the best interest of the City require an immediate remedy without the delay incident to such notification, the Director may cause such repairs, replacements or other remedy to be made, and the expenses so incurred, limited in case b) as provided hereinafter, shall be chargeable to, and shall be paid by, the Contractor, provided that such expense so incurred by the Contractor, or incurred by the City and paid by the Contractor, on account of disturbance of or damage to City improvements occurring as set forth under b) next hereinbefore, shall not exceed an amount equal to 50 percent of the contract cost of all work to be done under the terms of the specifications, or such other amount as may be set forth in the Special Provisions, and further provided that the liability of the surety on the faithful performance bond, on account of such disturbance of or damage to City improvements occurring as set forth under b) next hereinbefore, shall likewise not exceed 50 percent of the contract cost of all work to be done under the terms of the specifications, or such other amount as may be set forth in the Special Provisions.

Nothing in this Section shall be construed as a waiver, or impairment of any of the City's rights under the contract, or of any other recourse provided by law.

105.11 FEDERAL AND STATE CONTRACT REQUIREMENTS. - Contract requirements by virtue of Federal or State involvement will be included in the Special Provisions. The Contractor shall comply with such requirements and do all the paper work and other required work therefor, to establish the City's eligibility for a Federal or State grant.

The Contractor shall send to the City Engineer a copy of all letters, relative to the contract, transmitting notifications, reports, certifications, payrolls and the like, that he submits directly to a Federal or State agency.

If the Federal Labor Standards Provisions are included in the contract and the minimum rate of pay therein for any classification differs from that set forth elsewhere in the Special Provisions, the higher of the two rates of pay shall prevail.

SECTION 106

CONTROL OF THE WORK AND MATERIALS

106.01 WORK TO BE DONE IN ACCORDANCE WITH PLANS AND SPECIFICATIONS. - The Contractor shall do all work and furnish all labor, material, equipment and tools necessary or required for the proper performance and completion of the work in an orderly and workmanlike manner within the time specified. The work shall be fully in accordance with the plans and specifications before consideration of acceptance by the Director.

Any change from the general locations and arrangement shown on the plans for mechanical and electrical equipment, ductwork, piping, conduit, appurtenances and the like, will be subject to the approval of the Engineer; further, exact locations thereof will be determined in the field by the Engineer.

The work shall be under the jurisdiction of the City Engineer acting as the representative of the Director.

All materials must be approved by the Engineer prior to their incorporation in the work.

Any defective work, or materials not conforming to the specifications or not equal to approved samples, will be rejected, and such defective work shall be immediately replaced, repaired, or otherwise corrected.

The Contractor shall at once remove from the work and its vicinity all rejected material of whatever kind, and upon his failure to do so within 48 hours after notice from the Engineer, such material may be removed by the Department of Public Works and the cost of removal deducted from any money due or that shall become due the Contractor under the contract.

All payments under the contract may be withheld until such defective work has been remedied and such defective material removed and replaced, as provided hereinbefore.

106.02 ACCESS TO THE WORK. - During the performance of the work under the contract, the Director, the Engineer, and all agents and employees of the City acting within the scope of the duties entrusted to them may at any time, and for any purpose, enter upon

the work, or the shops where such work may be in preparation, and the Contractor shall provide proper and safe facilities therefor, including, if necessary, the stopping of the work.

Other contractors performing work for the City may also, for all purposes which may be required by their respective contracts, enter upon the work, upon approval by the Engineer.

106.03 INSPECTION. - All work (which term includes but is not restricted to materials, workmanship, and manufacture and fabrication of components) shall be subject to inspection and test by the Engineer at all reasonable times and at all places prior to acceptance.

Any such inspection and test is for the sole benefit of the City and shall not relieve the Contractor of the responsibility of providing quality control measures to assure that the work strictly complies with the contract requirements. No inspection or test by the Engineer shall be construed as constituting or implying acceptance. Inspection or test shall not relieve the Contractor of responsibility for damage to or loss of the material prior to acceptance of the completed work.

The Contractor shall, without charge, replace any material or correct any workmanship found by the City not to conform to the contract requirements, unless in the public interest the City consents to accept such material or workmanship with an appropriate adjustment in contract price. The Contractor shall promptly segregate and remove rejected material from the premises.

If the Contractor does not promptly replace rejected material or correct rejected workmanship, the City (1) may, by contract or otherwise, replace such material or correct such workmanship and charge the cost thereof to the Contractor, or (2) may terminate the Contractor's right to proceed in accordance with Section 107.12.

The Contractor shall furnish promptly, without additional charge, all facilities, labor, and material reasonably needed for performing such safe and convenient inspection and test as may be required by the City. All inspection and tests by the City shall be performed in such manner as not unnecessarily to delay the work. The City reserves the right to charge to the Contractor any additional cost of inspection or test when material or workmanship is not ready at the time specified by the Contractor for inspection or test or when reinspection or retest is necessitated by prior rejection.

Should it be considered necessary or advisable by the City at any time before acceptance of the entire work to make an examination of work already completed, by removing or tearing out same, the Contractor shall, on request, promptly furnish all necessary facilities, labor, and material. If such work is found to be defective or nonconforming in any material respect, due to the fault of the Contractor or his subcontractors, he shall defray all the expenses of such examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the contract, an equitable adjustment shall be made in the contract price to compensate the Contractor for the additional services involved in such examination and reconstruction and, if completion of the work has been delayed thereby, he shall, in addition, be granted a suitable extension of time.

106.04 NIGHT AND WEEKEND WORK. - If Saturday, Sunday, Holiday, or overtime work is to be performed, the City Engineer's Office shall be notified at least 24 hours in advance thereof.

Except as specifically set forth in the Special Provisions, the Contractor shall not perform any work between the hours of 9:00 p.m. and 6:00 a.m.

106.05 CONTRACTOR'S SUPERINTENDENT, FOREMEN, AND WORKMEN. - The Contractor, prior to starting work in the field, shall notify the Engineer in writing of the name of his authorized representative at the project site responsible for all phases of, and all trades involved in, the work, and shall notify the Engineer in writing of any change of authorized representative. No contract work shall be performed in the absence of such representative and no extension of time will be granted because of any delay to the work occasioned by a shutdown due to absence of the representative. A joint venture shall designate only one representative.

Further, the Contractor shall similarly notify the Engineer of the names and telephone numbers of an authorized representative and an alternate, one of whom will be available nights, weekends and holidays from the start to the completion of the work and will be responsible for the work site, equipment and the work of all trades.

Such authorized representative shall be a superintendent or foreman fully empowered to sign off contract documents.

Only competent and skillful men shall be employed on the work, and whenever the Engineer shall notify the Contractor in writing that any employee on the work is, in the opinion of the Engineer, incompetent, unfaithful, disorderly or refuses to carry out the provisions of the contract, such employee shall be premanently dismissed from the work.

106.06 INTIMIDATION. - Neither the Contractor nor his employees shall intimidate the Engineer or any of his representatives.

Intimidation by an employee of the Contractor shall be sufficient cause, at the request of the Engineer, for permanent dismissal of such employee from the work.

Intimidation by the Contractor shall be due cause for termination of the contract.

106.07 ENGINEER MAY FURNISH ADDITIONAL DRAWINGS. - During the progress of the work, such additional drawings as the Engineer may consider necessary will be furnished to the Contractor and shall be part of the specifications. It is the understanding that all such additional drawings will conform in their general intent with the contract documents.

106.08 CONTRACTOR TO FURNISH DRAWINGS AND LIST OF EQUIPMENT. - The Contractor shall furnish for approval 6 copies of:

The required list of materials;

A complete list of all equipment;

The required descriptive material therefor; and

The required layout, outline, and detail or working drawings, dimensioned and to scale.

All submittals shall be sent to: City Engineer

c/o Construction Management
Room 357, City Hall
San Francisco, CA 94102

Submittals shall be by the prime Contractor only, and accompanied by his letter of transmittal. Submittals not transmitted as specified will be returned to the prime Contractor.

The required drawings, material lists, and descriptive material shall be submitted in time to permit investigation and approval without delay to the work. Any delay in the work occasioned by an incorrect submission, or insufficient data, will be the responsibility of the prime Contractor and will not constitute reason for an Extension of Time.

The length of any Extension of Time allowed because of time taken by the City to return plans, lists, or other material submitted for approval will be limited to the time taken for such return in excess of 21 calendar days.

Resubmissions shall be accomplished as promptly as possible. Any delay in the work caused by resubmissions will not constitute reason for an Extension of Time, unless authorized in writing by the City Engineer.

The extent to which the Contractor is responsible for the submission of lists, descriptive literature, and drawings shall be as described hereinafter.

Construction material of a general unspecialized nature and covered by widely-accepted gradings or standards, such as timber, pipe, steel conduit, and wire insulated for 600 volts or less, if in quality in every respect as specified, need not be listed nor will drawings or descriptive material be required.

Products generally used but intended for a special purpose, or for which there is no widely-accepted standard, such as special pressure pipe, non-metallic conduit, prefabricated structural or trim elements, junction and pull boxes, light bulbs, chain link fence, paint, tile, sprinkler heads, plumbing fixtures and trim, and wire and cable for above 600-volt service, together with the manufacturer's name and trade designation thereof, shall be included in the list of equipment for approval, but drawings and descriptive material will not be required, except that factory test results will be required for the wire and cable.

Materials such as soil sterilizing agents, epoxy adhesives, waterproofing, and liquid compounds for curing concrete shall be listed, and descriptive material therefor, giving, as applicable, physical characteristics, strength of active ingredients, conformance to standards, and manufacturer's recommendations for application and use shall be furnished.

Major special-purpose manufactured or fabricated items, items of which there may be more than one model, reinforcing and structural steel, fabricated miscellaneous iron, equipment requiring maintenance or for which there are replacement parts, including but not limited to pumps, fire escapes, drainage gates, compressors, motors, drive systems, generators, valves, switchboards, heating equipment, boilers, tanks, machinery, traffic signal controllers, cabinets and pedestals, traffic and pedestrian signals including mounting assemblies and standards, traffic safety lights including shaft, bracket arms, shaft caps and luminaires, and mechanical, electrical and electronic

controls and equipment shall be listed, and the applicable of the following descriptive material and drawings therefor shall be furnished:

- Description of operation,
- Physical and performance data,
- Layout, outline, and detail or working drawings, dimensioned and to scale,
- Schematic and wiring diagrams,
- Complete operating and maintenance instructions,
- Complete replacement parts list.

The submitted data shall be fully sufficient for determination of compliance with the specifications.

If equipment furnished is satisfactory, but is in any way different from that approved, the Contractor shall submit corrected descriptive material and drawings for approval, and neither the installation nor satisfactory operation of such equipment will relieve him of the responsibility for furnishing the corrected drawings and other material.

Each drawing submitted shall be one of the following sizes:

28-1/2" x 18-1/2" with 3/4" border making a 30" x 20" drawing.

21" x 15" with 1/2" border, making a 22" x 16" drawing.

The aforementioned drawings shall have a 2-inch binding edge to the left of the border on the short side of the sheet.

14-3/4" x 10" with 1/2" border on three sides and 3/4" border on one 10" side, making a 16" x 11" drawing.

7-3/4" x 10-1/2" with 1/4" border on three sides and 1/2" border on one 10-1/2" side, making a 8-1/2" x 11" drawing.

Catalog sheets meeting the specified requirements may be substituted for the required drawings.

106.09 TRENCH EXCAVATION SAFETY PLANS. - The Contractor's attention is directed to the provisions of Section 6705 of the State of California Labor Code concerning trench excavation safety plans, to Section 6500 of the Labor Code concerning trench and excavation permits, and to the rules, orders and regulations of the State of California Division of Occupational Safety and Health concerning the manner of bracing excavations.

Excavation for any trench 5 feet or more in depth shall not begin until the Contractor has received approval, from the Engineer, of the Contractor's detailed plan for worker protection from the hazards of caving ground during the excavation of such trench. Such plan shall be submitted in accordance with the requirements of Section 106.08 and shall show the details of the design of shoring, bracing, sloping or other provisions to be made for worker protection during such excavation. No such plan shall allow the use of shoring, sloping or a protective system less effective than that required by the Construction Safety Orders of the Division of Occupational Safety and Health and if such plan varies from the shoring system standards established by the Construction Safety Orders, the plan shall be prepared and signed by an engineer who is registered as a Civil or Structural Engineer in the State of California.

106.10 APPROVALS. - Approval of substitutions, shop drawings, schedules, and procedures submitted or requested by the Contractor

shall not affect the contract price, and any additional costs which may result therefrom shall be solely the obligation of the Contractor.

It shall not be the responsibility of the City to provide engineering or other services to protect the Contractor from additional costs accruing from such approvals.

The City is not precluded, by virtue of approvals, from obtaining a credit for construction savings resulting from allowed concessions in the work or materials therefor.

No equipment or material for which listings, drawings, or descriptive material is required shall be installed until the Engineer in the field has on hand approved copies of such lists and drawings.

The approval of drawings by the City Engineer shall apply to general design only, and shall in no way relieve the Contractor from responsibility for errors, or omissions contained therein, nor from furnishing all labor and materials necessary in accordance with the specifications for the proper execution of the work.

One print of each drawing will be returned to the Contractor marked "To be corrected as shown," "Approved," or "Approved, except as noted." To be valid, an approval must bear the signature of the Engineer. Prints marked "Approved, except as noted" need not be resubmitted unless specific request for such resubmission is made. Prints marked "To be corrected as shown" shall be corrected and six (6) copies thereof resubmitted for approval.

The City reserves the right to approve drawings in part only.

106.11 QUALITY OF MATERIALS. - These Specifications contemplate the use of first-class new materials throughout the work, and it is understood that any material for which no particular specification is given shall be the best of its class or kind.

106.12 TRADE NAMES. - Whenever any article or any class of materials is specified by trade names, or by the names of any particular patentees, manufacturers or dealers, it shall be mutually understood that such names are followed by the phrase "or equal," and is used to mean and specify the article or class of materials described, or any other equal thereto in quality, finish and durability and equally as serviceable for the purpose for which it is intended, subject to the approval and acceptance of the Director.

106.13 SUBSTITUTIONS. - The Contractor, within 35 calendar days after the official date for the commencement of the work, or within such shorter period of time dictated by the length of time allowed for completion of the work under the contract, shall submit for approval to the City Engineer 6 copies of a complete list of all materials, articles or equipment which he proposes to substitute in place, and as the equal, of materials, articles or equipment which are specified by trade names or by the names of any particular patentee, manufacturer or dealer. Failure to submit such list within that time will be deemed adequate and reasonable grounds for refusal by the Director to consider any subsequent proposed substitutions. Any items omitted from a duly submitted list

may likewise be barred from subsequent consideration.

It is distinctly understood that: (1) the Engineer is to use his own judgement in determining whether or not any item of equipment or product proposed is equal for the purpose intended in quality to that specified; (2) the decision of the Engineer on all such questions of equality shall be final; and (3) no claim of any sort shall be made or allowed against the City, the Engineer, or any of their agents, employees, or consultants as a result of any final decision approving or disapproving any proposed equipment or product. No approvals as outlined herein will be given prior to the bid opening.

If any equipment or product submitted as a substitution necessitates changes in the work shown on the Plans, it shall be the Contractor's responsibility to bear the cost of labor and materials for making such changes. Engineering to analyze, design, specify, and formulate the Construction changes necessitated by the proposed deviations from the Contract Documents shall be the responsibility of the Contractor.

In addition to the aforementioned list the requirements for obtaining approval of substitutions shall be as specified in Section 106.08.

106.14 SAMPLES AND TEST SPECIMENS. - Test specimens or samples of all materials, appliances and fittings to be used or offered for use in connection with the work shall be submitted to the Engineer at the Contractor's expense, with information as to their sources, with all cartage charges prepaid, and in such quantities and sizes as may be required for proper examination and tests to establish the quality or equality thereof, as applicable.

All samples and test specimens shall be submitted in ample time to enable the Engineer to make any tests or examinations necessary, without delay to the work. The Contractor will be held responsible for any loss of time due to his neglect or failure to deliver the required samples to the Engineer; no Extensions of Time will be granted on account of such loss of time; and, in case of failure to complete the work within the time allowed, the requirements of Section 107.11 with respect to liquidated damages will hold.

Samples also shall be taken during the course of the work, as required by the Engineer.

Laboratory tests and examinations that the City elects to make in its own laboratory will be made at no cost to the Contractor, except that, if a sample of any material or equipment proposed for use by the Contractor fails to meet the specifications, the cost of testing subsequent samples shall be borne by the Contractor.

All tests required by the specifications to be made by an independent laboratory shall be made, and the samples therefor furnished, at the sole expense of the Contractor.

106.15 TESTS. - All tests of completed work required by the specifications, by City Ordinances or by law, shall be made under the direction of the Engineer, by and at the expense of the Contractor, who shall repair, at his own expense, all damage resulting therefrom.

Whenever required by the Engineer, the Contractor shall furnish all tools, labor and materials necessary to make an examination of any work under these specifications that may be completed or in progress. Should such work be found defective, the cost of making such examinations and reconstruction shall be defrayed by the Contractor. Should the work be found to be satisfactory, the work will be paid for by the City, under force account in accordance with the provisions of Section 112.

In order that the Engineer may determine whether the Contractor has complied or is complying with the requirements of the contract which are not readily enforceable by inspection and tests of the work and materials, the Contractor shall upon request submit properly authenticated documents or other satisfactory proof of his compliance with such requirements.

106.16 COST REDUCTION INCENTIVE. - The Contractor may submit to the Engineer, in writing, proposals for modifying the plans, specifications or other requirements of the contract for the sole purpose of reducing the total cost of construction. The cost reduction proposal shall not impair, in any manner, the essential functions or characteristics of the project, including but not limited to service life, economy of operation, ease of maintenance, desired appearance, or design and safety standards.

Cost reduction proposals shall contain the following information:

- 1) A description of both the existing contract requirements for performing the work and the proposed changes.
- 2) An itemization of the contract requirements that must be changed if the proposal is adopted.
- 3) A detailed estimate of the cost of performing the work under the existing contract and under the proposed change. The estimates of cost shall be determined in the same manner as if the work were to be paid for on a force account basis as provided in Section 112.05 "Force Account (Cost Reimbursement)".
- 4) A statement of the time within which the Engineer must make a decision thereon.
- 5) The contract items of work affected by the proposed changes, including any quantity variation attributable thereto.

The provisions of this Section 106.16 shall not be construed to require the Engineer to consider any cost reduction proposal which may be submitted hereunder; proposed changes in basic design of a facility will not be considered as an acceptable cost reduction proposal; the City will not be liable to the Contractor for failure to accept or act upon any cost reduction proposal submitted pursuant to this section nor for any delays to the work attributable to any such proposal. If a cost reduction proposal is similar to a change in the plans or specifications, under consideration by the City for the project, at the time said proposal is submitted or if such a proposal is based upon or similar to Standard Specifications or Standard Plans adopted by the City after the advertisement for the contract, the Engineer will not accept such proposal and the City reserves the right to make such changes without compensation to the Contractor under the provisions of this section.

The Contractor shall continue to perform the work in accordance with the requirements of the contract until an executed change

order, incorporating the cost reduction proposal has been issued. If an executed change order has not been issued by the date upon which the Contractor's cost reduction proposal specifies that a decision thereon should be made, or such other date as the Contractor may subsequently have specified in writing, such cost reduction proposal shall be deemed rejected.

The Engineer shall be the sole judge of the acceptability of a cost reduction proposal and of the estimated net savings in construction costs from the adoption of all or any part of such proposal. In determining the estimated net savings, the Engineer may disregard the contract bid prices, if in his judgment such prices do not represent a fair measure of the value of work to be performed or to be deleted.

The City reserves the right where it deems such action appropriate, to require the Contractor to share in the City's costs of investigating a cost reduction proposal submitted by the Contractor as a condition of considering such proposal. Where such a condition is imposed the Contractor shall indicate his acceptance thereof in writing, and such acceptance shall constitute full authority for the City to deduct amounts payable to the City from any monies due or that may become due to the Contractor under the contract.

If the Contractor's cost reduction proposal is accepted in whole or in part such acceptance will be by a contract change order, which shall specifically state that it is executed pursuant to this Section 106.16. Such change order shall incorporate the changes in the plans and specifications which are necessary to permit the cost reduction proposal or such part of it as has been accepted to be put into effect, and shall include any conditions upon which the City's approval thereof is based if the approval of the City is conditional. The change order shall also set forth the estimated net savings in construction costs attributable to the cost reduction proposal effectuated by the change order, and shall further provide that the Contractor be paid 50 percent of said estimated net savings amount. The Contractor's cost of preparing the cost reduction incentive proposal and the City's costs of investigating a cost reduction incentive proposal, including any portion thereof paid by the Contractor, shall be excluded from consideration in determining the estimated net savings in construction costs.

Acceptance of the cost reduction proposal and performance of the work thereunder shall not extend the time of completion of the contract unless specifically provided for in the contract change order authorizing the use of the cost reduction proposal.

The amount specified to be paid to the Contractor in the change order which effectuates a cost reduction proposal shall constitute full compensation to the Contractor for the cost reduction proposal and the performance of the work thereof pursuant to the said change order.

The City expressly reserves the right to adopt a cost reduction proposal for general use on contracts administered by the City when it determines that said proposal is suitable for application to other contracts. When an accepted cost reduction proposal

is adopted for general use, only the Contractor who first submitted such proposal will be eligible for compensation pursuant to this section, and in that case, only as to those contracts awarded to him prior to submission of the accepted cost reduction proposal and as to which such cost reduction proposal is also submitted and accepted. Cost reduction proposals identical or similar to previously submitted proposals will be eligible for consideration and compensation under the provisions of this Section 106.16 if the identical or similar previously submitted proposals were not adopted for general application to other contracts administered by the City. Subject to the provisions contained herein, the City shall have the right to use all or any part of any submitted cost reduction proposal without obligation or compensation of any kind to the Contractor.

SECTION 107

PROSECUTION AND PROGRESS OF WORK

107.01 SUBCONTRACTING. - Subcontracting shall be in accordance with the governing regulations regarding subcontracts, Section 6.48 to 6.52, inclusive, of the San Francisco Administrative Code, which Sections govern the designation of, failure to specify, and substitution of subcontractors, and assignment, transfer and performance of subcontracts.

The Contractor shall give his personal attention to the faithful prosecution of the work and shall keep the work under his personal control except as provided in the case of subcontracts. No subcontract, however, shall relieve the Contractor of any of his liabilities or obligations under this contract. The Contractor shall not, either legally or equitably, assign any of the moneys payable under this contract, or his claim thereto, unless with the consent of the Director.

107.02 COMMENCEMENT AND PROSECUTION OF THE WORK. - After the signing of the contract, and its certification by the Controller as required by Section 6.302 of the Charter, the Director, in accordance with the provisions of Section 100, will designate the official date for the commencement of the work, and will notify the Contractor thereof. The Contractor shall not commence the work, nor incur any expense in connection therewith, before he is notified by the Director of such official date for the commencement of the work.

The Contractor shall notify the City Engineer, in writing, not less than 2 working days in advance, of the actual date he will start the work to be done under the contract, shall commence such work within 10 calendar days after such official commencement date, and shall prosecute it diligently thereafter at a rate sufficient to enable him to complete the work within the time specified in the Special Provisions. The Contractor shall be entirely responsible for any delay in the work caused by his failure to give notice of the actual date he will start the work.

The employment of sufficient equipment, labor force, and hours and shifts of work, to ensure completion of the work within the time allowed, is the responsibility of the Contractor. All costs occasioned by such implementation will be considered to be included in the prices bid and no direct or additional payment will be made therefor.

The Contractor shall make available full information in advance as to his plans for carrying on each part of the work. If at any time during the progress of the work, the Contractor's actual progress is inadequate to meet the requirements of the contract, the Engineer may so notify the Contractor who shall thereupon take such steps as may be necessary to improve its progress. If within a reasonable period as determined and defined by the Engineer, the Contractor does not improve performance to meet the currently approved Contract Construction Schedule, the Engineer may require an increase in the Contractor labor force, the number of shifts, additional days of work per week, and an increase in the amount of construction plant; all without additional cost to the City. Neither such notice or lack of such notice shall relieve the Contractor of his obligation to achieve the quality of work and rate of progress required by the contract.

Failure of the Contractor to comply with the instructions issued under this section may be grounds for determination by the Engineer that the Contractor is not prosecuting the work with such diligence as will insure completion within the specified time.

Upon such determination, the Engineer may either withhold progress payments for work completed or terminate the Contractor's right to proceed with the performance of the contract, or any separable part thereof, in accordance with applicable provisions of the contract.

Once the Contractor starts on any part of the work which affects public convenience, health, or safety, he shall diligently and expeditiously prosecute such work until it is no longer in any respect a public inconvenience or hazard; and if such considerations make it necessary to accelerate any part of the work, the Contractor shall, when so directed, concentrate his efforts on such part of the work.

Unless otherwise specified by Addendum, the time allowed for completion of the work will not be extended by virtue of provisions of any Addendum amending the specifications.

107.03 TIME OF COMPLETION. - The Contractor shall complete all or any designated portion of the work called for under the contract within the time set forth in the special provisions.

A working day is defined as any day, except Saturdays, Sundays, legal holidays, and days on which the Contractor is specifically required by the Special Provisions to suspend construction operations. Also included in these exceptions are days on which the Contractor is prevented from proceeding with normal operations due to adverse or inclement weather, or storm, or conditions resulting immediately from these, provided that the following conditions are also met:

1) At least 75 percent of the normal labor and equipment force cannot proceed with the current controlling operation or operations;

2)Such restriction is in effect for at least 60 percent of the total daily time; and

3)The Engineer certifies that these two preceding conditions are in effect.

The current controlling operation or operations is to be construed to include any feature of the work, considered at the time by the Engineer and the Contractor, which, if delayed, will delay the time of completion of the contract.

Extensions of time to cover unavoidable delays, other than adverse weather, which prevent the Contractor from proceeding with the current controlling operation or operations will be handled in accordance with the provisions of Section 107.10.

The Engineer will furnish the Contractor a weekly statement showing the number of working days charged to the contract for the preceding week, the number of working days of time extensions being considered or approved, the number of working days originally specified for completion of the contract, the number of working days remaining to complete the contract, and the extended date for completion thereof. The Contractor will be allowed 15 days from the issuance of the weekly statement of working days in which to file a written protest setting forth in what respects he differs from the Engineer, otherwise the decision of the Engineer shall be deemed to have been accepted by the Contractor as correct.

If any portion of a day is a legal holiday, the entire day will be considered a legal holiday for purposes of this Section 107.03.

107.04 PROGRESS SCHEDULE.

General. - Prior to starting the work, the Contractor shall submit to the City Engineer two (2) copies of a progress schedule showing his proposed sequence of operations in the performance of the work, and the estimated dates of starting and finishing the various major parts of the work. The progress schedule shall conform to the specified time for the completion of the work; shall show a reasonable and orderly work sequence that will preclude excessive times for completion of any part thereof; shall show and be in accordance with the order and delivery dates for equipment and materials requiring special fabrication or otherwise not readily available for purchase and affecting, or critical with respect to, such time of completion; and shall be subject to the approval of, and modification by, the Director.

The submission of an amended schedule will not relieve the Contractor of the responsibility for the notification required by Section 6.8 of the San Francisco Administrative Code which Section is included in Section 107.10.

Format for Progress Schedule. - The format to be used for the submission of progress schedules shall be the applicable of the following:

I - IF THE TIME ALLOWED FOR COMPLETION IS LESS THAN 41 WORKING DAYS, THE FOLLOWING IS APPLICABLE:

The progress schedule and any subsequent revised schedule may be submitted in the form of a written statement outlining the

proposed operations.

II - IF THE TIME ALLOWED FOR COMPLETION IS MORE THAN 40 AND LESS THAN 201 WORKING DAYS, THE FOLLOWING IS APPLICABLE:

Within 10 calendar days after the official commencement date, the Contractor shall submit to the Engineer for approval 3 copies of his proposed progress schedule prepared on a City furnished standard form. Copies of this form are available from the Construction Management Division.

The progress schedule shall show the order in which the Contractor proposes to carry out the work, and the dates on which he will start and complete the salient features thereof, including procurement of materials, plant, and equipment.

A revised schedule shall be submitted when one or more of the following conditions occur:

- a) Progress falls behind schedule and the Engineer requests in writing, a revised schedule;
- b) A Change Order significantly affects the contract completion date or the sequence of activities;
- c) The Contractor requests an extension of time of 15 working days or more.

III - IF THE TIME ALLOWED FOR COMPLETION IS MORE THAN 200 WORKING DAYS, THE FOLLOWING IS APPLICABLE:

Within 10 calendar days after the official commencement date, the Contractor shall submit to the Engineer 3 copies of a critical path progress schedule, and subsequent revisions thereto, showing in detail the proposed sequence of activities. The Contractor may, however, within such 10 calendar days, furnish 3 copies of a preliminary progress schedule covering the first 40 working days of the contract and shall submit the required critical path progress schedule and analysis for the entire project within 30 calendar days after the official commencement date.

The preliminary progress schedule shall consist of a bar graph or arrow diagram and shall show the times the Contractor intends to start and complete various work stages, operations, and parts of the work planned to be started during the first 40 working days of the contract.

The critical path analysis shall consist of a graphic network diagram, or a computer printout, or a list of activities. A brief explanation of the proposed schedule shall accompany the critical path analysis.

The Contractor shall submit to the City a complete evaluation of his critical path analysis each month. The Contractor's monthly evaluation of his critical path analysis shall show the following:

- a) percentage of each activity completed;
- b) anticipated completion time of entire work;
- c) description of problem areas;
- d) current and anticipated delaying factors and their impact; and
- e) explanation of corrective action taken or proposed.

The Contractor shall submit to the City a revised critical path analysis when:

- a) A change order affects the completion date or the sequence of activities;
- b) Progress of any critical activity falls significantly behind schedule;
- c) Delay on a noncritical activity changes course of critical path;
- d) Contractor elects to change any sequence of activities affecting the critical path; or
- e) When requested for good cause by the City.

107.05 RECORDS TO BE MADE AVAILABLE. - During the performance of the contract, the Contractor, when requested, shall give the Engineer full and correct information, to the extent required by law, or for force account records, as to the number of persons employed in connection with each subdivision of the work, the classification, rate of pay, citizenship status, and address of each person, and the cost, source, and amount of each class of materials, equipment and tools used in each subdivision of the work.

107.06 COOPERATION OF CONTRACTOR AND COORDINATION WITH OTHER WORK. - Should construction work, or work of any other nature, be underway by other forces or by other contractors within or adjacent to the limits of the work at the time the work was advertised for bids, the Contractor shall cooperate with all such other contractors or forces to the end that any delay or hindrance to their work will be avoided. The cost of such cooperation will be considered as included in the prices bid and no direct or additional payment will be made therefor.

The City reserves the right to perform other or additional work, within or adjacent to the limits of the work specified, at any time by the use of other forces. In the event that the performance of such other or additional work materially increases or decreases the Contractor's costs, the work and the amount to be paid therefor will be appropriately adjusted in accordance with the provisions of Sections 101.06 and 111.

No manhole, vault or other utility appurtenance shall be entered without the permission of the utility company or authority concerned.

107.07 CONTRACTOR TO MAINTAIN TELEPHONE SERVICE. - The Contractor shall maintain, during the continuance of his contract, telephone service at all times whereby either he, or his authorized representative, may be readily available for communication.

107.08 LINE AND GRADE FOR THE WORK. - All the work shall be done in accordance with the lines, elevations and grades shown on the plans. The necessary survey stakes, marks or points for such lines, elevations and grades will be set by the Engineer. Unless otherwise specified or shown on the plans, all elevations refer to San Francisco City Datum, which is 11.67 feet above Presidio Mean Lower Low Water.

The Contractor shall keep the Engineer informed, in advance, of his intended sequence of operations so that the necessary survey stakes, marks, or points may be set, and associated measurements made, with a minimum of inconvenience and delay, and shall, on request clear all poison oak from the area thereof.

The Contractor shall have available at all times either a laser beam instrument or an engineer's level and rod suitable for transferring elevations from established points to the work.

No lines or grades will be furnished when, in the opinion of the Engineer, the Contractor's forces are inadequate to make

the proper progress.

When required by the work, the Contractor shall assist the Engineer in setting survey stakes, marks or points by furnishing temporarily, as Incidental Work, necessary hand tools, stake materials and labor.

Any work required to further reset any stake, mark or point destroyed or disturbed, and once subsequently reset, shall be at the sole expense of the Contractor and will be deducted from moneys due him under the contract.

The Contractor shall make all measurements necessary for the proper prosecution of the work except those specified to be made by the Engineer.

107.09 SURVEY MONUMENTS AND BENCH MARKS. - The Contractor shall bring to the attention of the Engineer all survey monuments, bench marks, property line marks and the like, encountered on the work.

Even though removal of survey monuments, bench marks, or other survey marks or points will be required in the normal prosecution of the work, such monuments, marks or points shall not be removed or disturbed until referenced or relocated by the Engineer or other agency or party having an interest therein, and then removed only at the time and in the manner specifically approved by the Engineer.

The Contractor shall bring all City monument frames within the limits of the work to grade, with the express proviso that any and all work associated with the removal and relocation of such frames, with their covers, shall be under the direct supervision of the Engineer, and all such work shall be considered Incidental Work.

The cost of re-establishing and resetting survey monuments, bench marks or other survey marks or points lost or destroyed through the carelessness or negligence of, or inadvertently by, the Contractor or his employees, shall be at the sole expense of the Contractor and shall be deducted from moneys due him under the contract.

107.10 EXTENSIONS OF TIME ALLOWED FOR COMPLETION OF WORK. - Extensions of the time allowed in the Special Provisions for completion of the work shall be in accordance with and pursuant to the provisions of Sections 6.7 and 6.17, inclusive, of the San Francisco Administrative Code. The Sections read as follows:

"SECTION 6.7. GRANT OF EXTENSION IN TIME; EXTENSIONS TO BE IN WRITING. The awarding officer, board or commission may extend the time for completion of the work under a contract, upon the awarding officer, board or commission finding that such work cannot be completed within the specified time because of an unavoidable delay as restricted in this chapter. Such extensions shall be in writing but in no event shall any extension be granted subsequent to the issuance of a certificate of final acceptance.

"SECTION 6.8. CONTRACTOR TO GIVE NOTICE OF DELAY; NOTICE TO CONSTITUTE APPLICATION FOR EXTENSION. The contractor shall promptly notify the awarding officer, board or commission in writing of all anticipated delays in the prosecution

of the work and, in any event, promptly upon the occurrence of a delay, the notice shall constitute an application for an extension of time only if the notice requests such extension and sets forth the contractor's estimate of the additional time required together with a full recital of the causes of unavoidable delays relied upon. The awarding officer, board or commission may take steps to prevent the occurrence or continuance of the delay, may classify the delay as avoidable or unavoidable, and may determine to what extent the completion of the work is delayed thereby.

"SECTION 6.9. DELAYS DEEMED UNAVOIDABLE.

Unavoidable delay is an interruption of the work beyond the control of a contractor and which interruption the contractor could not have avoided by the exercise of care, prudence, foresight and diligence. Such delays include and are limited to acts of God; acts of the public enemy; adverse weather conditions; fires; floods; windstorms; tornadoes; wars; riots; insurrections; epidemics; quarantine restrictions; strikes; lockouts; sitdowns; slowdowns; other labor trouble; labor shortages; inability of contractor to procure labor; material shortages; inability of contractor to procure material; fuel shortages; freight embargoes; accidents; acts of a governmental agency; priorities or privileges established for the manufacture, assembly or allotment of materials by order, decree, or otherwise of the United States or by any department, bureau, commission, committee, agent, or administrator of any legally constituted public authority; changes in the work ordered by the contracting officer, board or commission insofar as they necessarily require additional time in which to complete the entire work; the prevention by the city and county of a contractor from commencing or prosecuting the work; the prevention of a contractor from commencing or prosecuting the work because of the acts of others, excepting the contractor's subcontractors; the prevention of a contractor from commencing or prosecuting the work because of the failure of the city and county to furnish the necessary materials, when required by the terms of the contract and when requested by the contractor in the manner provided in the contract; and, inability to procure or failure of public utility service. The duration of unavoidable delays shall be limited to the extent that the commencement, prosecution and completion of the work are delayed thereby, as determined by the awarding officer, board or commission.

"SECTION 6.10. EXTENSION OF TIME FOR DELAYS NOT STATED IN PRECEDING SECTION.

Upon the recommendation of the awarding officer, board or commission, the board of supervisors may provide by resolution for extensions of time relating to specific contracts for causes other than those stated in the preceding section which the contractor could not have avoided by the exercise of care, prudence, foresight and diligence.

"SECTION 6.11. AVOIDABLE DELAYS IN COMPLETING CONTRACTS.

Avoidable delays in the prosecution or completion of any work shall include:

(a) all delays which could have been avoided by the exercise of care, prudence, foresight and diligence on the part of the contractor,
(b) delays in the prosecution of parts of the work, which may in themselves be unavoidable but do not necessarily prevent or delay the prosecution of other parts of the work, nor the completion of the whole work within the time specified,
(c) reasonable delays resulting from time required by the city and county for approval of plans submitted by the contractor and for the making of surveys, measurements and inspections, and
(d) delays arising from interruptions occurring in the prosecution of the work on account of the reasonable interference from other contractors employed by the city and county, which do not necessarily prevent the completion of the whole work within the time specified.

"SECTION 6.12. TIME EXTENSION NOT WAIVER OF CITY'S RIGHTS.

The granting of an extension of time because of unavoidable delays shall in no way operate as a waiver on the part of the city and county or the awarding officer, board or commission of the right to collect liquidated damages for other delays or of the right to collect other damages or of any other rights to which the city and county is entitled.

"SECTION 6.13. LIQUIDATED DAMAGES.

Any contract may provide a time within which the contract work, or portions thereof, shall be completed and may provide for the payment of agreed liquidated damages to the City and County for every calendar or working day thereafter during which such work shall be uncompleted. In every contract for construction, repair, or renovation exceeding the amount specified in Section 6.1 of this chapter, there shall be a provision establishing a time for completion in calendar or working days and establishing liquidated damages to the City and County for every calendar day thereafter during which such work shall be uncompleted. The execution of a contract by a contractor shall constitute his or her acknowledgement and agreement that the City and County will sustain damages not less than the amount fixed in the contract for each and every day of delay beyond the expiration of the time fixed for such completion or extensions of such time as have been allowed pursuant to the provisions of this chapter. When the actual progress of the work indicates that completion of the work may be delayed beyond the original or extended contract time for completion of the entire work, a sum representing the projected liquidated damages shall be deducted from any money due or to become due to the contractor should the contractor fail to demonstrate to the contracting authority's satisfaction that the work will be completed within the contract time. Such deduction shall be considered not as a penalty, but as the agreed monetary damage sustained by the people of the City and County because the contractor failed to perform and complete the work within the time fixed for completion or such extensions of such times as have been allowed pursuant to the provisions of this chapter. Should the money due or to become due to the contractor be insufficient to cover such agreed liquidated damages, then the contractor

forthwith shall pay the remainder to the City and County.

"SECTION 6.14. CITY WILL NOT PAY DAMAGES FOR DELAYS EXCEPT UNDER SPECIAL CIRCUMSTANCES.

No damages or compensation of any kind shall be paid to a contractor because of delays in the progress of the work, whether such delays be avoidable or unavoidable; provided, however, the City and County may pay for (1) delays caused to the contractor by the City and County; and (2) such unavoidable delays as may be specifically stated in the contract. Such latter delays will be compensated for only under the conditions specified in the contract.

"SECTION 6.14-1. TERMINATION FOR CONVENIENCE. In all contracts for the construction of any public work or improvement, the awarding officer, board or commission authorized to let or enter into any contract for any public work or improvement may include in the specifications setting forth the terms and conditions for the performance of said contract a provision that the City and County may terminate the performance of work under the contract whenever the awarding officer, board or commission shall determine that such termination is in the best interest of the City and County. Any such termination shall be effected by delivery to the contractor of a notice of termination specifying the extent to which performance of work under the contract is terminated and the date upon which such termination becomes effective. The awarding officer, board or commission is hereby authorized to include within such construction contract the appropriate language to implement this section.

"SECTION 6.15. NO EXTENSIONS GRANTED WHEN CONTRACT BASED ON TIME ESTIMATES; EXCEPTIONS.

When any award of contract has been made in consideration, in whole or in part, of the relative time estimates of bidders for the completion of the work, the provisions of sections 6.9, 6.10 and 6.11 of this Code shall not apply and no extension of time may be granted on such contract beyond the time specified for completion, unless the liquidated damages for each day the work is uncompleted beyond the specified time shall be collected; provided, however, that this shall not apply to unavoidable delays due to acts of God.

"SECTION 6.16. INCORPORATION OF PROVISIONS OF ARTICLE IN CONTRACTS FOR PUBLIC WORK.

The provisions of Sections 6.7 to 6.15 of this Code shall be included in every contract or specification for every public work or improvement, as public work or improvement is defined in Ordinance No. 9.0923 and Part II, Chapter X, Article 3, Section 75 of the San Francisco Municipal Code, whenever such contract and the published notice soliciting sealed bids therefor provide for liquidated damages to the City and County for every day during which the contract is uncompleted beyond a specified time.

"SECTION 6.17. CONTRACT MAY PROVIDE THAT UNAVOIDABLE DELAYS SHALL NOT APPLY.

The awarding officer, board or commission may provide in any particular contract, using specific language, that interruption of the work due to one or more of the causes of unavoidable delays set forth in section 6.9 of this Code is not a cause of an unavoidable delay under that particular contract. The awarding officer, board or commission may also provide in any contract that one or more causes of unavoidable delay set forth in section 6.9 of this Code shall be restricted to circumstances specified in the contract."

107.11 LIQUIDATED DAMAGES FOR DELAY IN COMPLETION OF WORK. - In accordance with the provisions of Section 6.13 of the San Francisco Administrative Code, it is understood, agreed, and provided that liquidated damages of the amount specified in the Special Provisions will be paid by the Contractor to the City for each and every calendar day during which the work shall be uncompleted after the expiration of the time allowed in the Special Provisions for the completion of the work, or after the expiration of such extensions of time as may be granted pursuant to the provisions of the San Francisco Administrative Code. It is also agreed that, in case the work under the contract is not completed within the time allowed in the Special Provisions, it is and will be, impracticable and extremely difficult to ascertain and determine exactly the actual monetary damage which the City will sustain in the event of and by reason of such delay.

107.12 TERMINATION OF, OR DEFAULT ON CONTRACT. - All conditions of the contract are considered material, and failure by the Contractor to comply with any of said conditions shall be deemed a breach of the contract. Upon the occurrence of such breach, the City shall have the right, whether any alternative right is provided or not, to declare the contract terminated, and the issuance by the Director of an order stating that the contract is terminated, and the service of a copy of said order upon the Contractor shall be deemed a complete termination of the contract. Upon the contract being so terminated, the City may retain all sums due under the contract and both the Contractor and his sureties shall be liable upon his bond for all losses, expenses and damages caused to the City by reason of his failure to complete the contract.

Time shall be of the essence of the contract.

If the Contractor fails to begin the work, as required by the contract, or if at any time he refuses, neglects, or fails, in the judgment of the Engineer, to have available on the work a sufficient amount of suitable materials, adequate equipment and a sufficient force of competent workers, to insure completion of the work within the specified time, or if the Contractor fails to perform the work in good faith in an acceptable manner in accordance with the specifications, or if he refuses, neglects or fails for any reason whatsoever to observe any of the conditions and covenants of the contract, or if he abandons the work, the Engineer may give

the Contractor written notice, specifying the default and requiring its correction. Should the Contractor for 24 hours after receipt of such notice of default, fail to proceed in accordance therewith to remedy such default, he shall, when so ordered in writing by the Director, discontinue or not begin the work or any designated part of the work, and any or all payments due or that may become due to the Contractor may be withheld by the City until the completion of all the work included in the contract.

After service on the Contractor of such order to desist from the work or part thereof, the Director may take possession of the work or such designated part thereof, and may use any or all of the Contractor's plant, tools, equipment, materials or other property on the work, none of which shall be removed by the Contractor so long as they may be required for the work, and the Director may by contract or otherwise provide the superintendence, workmen, materials, appliances and equipment necessary for the completion of, and may complete, the work or such designated part thereof. The whole of the expense so incurred for the completion of the work or part thereof, together with all damages, liquidated or otherwise, sustained or to be sustained by the City shall be deducted from the fund or appropriation set aside for the purpose of the contract, and shall be charged to the Contractor as if paid to him. In case the amount of such expenses and damages shall exceed the sum which would have been payable under the contract if completed entirely by the Contractor, the amount of such excess shall be paid to the City by the Contractor, and both he and his sureties shall be liable to the City therefor; and in case the amount of such expenses and damages shall be less than the sum which would have been payable under the contract if completed entirely by the Contractor, he shall be entitled to the amount of the difference, subject to all the terms of the contract.

The Contractor shall continue to prosecute to completion all the work from which he has not, as hereinbefore provided, been ordered to desist, and he shall cooperate with, and in no way hinder or interfere with the forces employed by the City, by contract or otherwise, to do any designated part of the work as hereinbefore specified.

Upon completion of all the work included under the contract, the Contractor shall be entitled to the return of all of his materials which have not been used in the work, of his plant, tools, equipment and other property, provided, however, that he shall have no claim on account of usual and ordinary depreciation, loss, wear and tear.

SECTION 108

INCIDENTAL WORK

108.01 GENERAL. - In accordance with the provisions of Section 101.08, payment for all work included in the specifications

or on the plans, or necessary or required to complete the contract work, but not specifically set forth for payment in the Schedule of Bid Prices, shall be included in the lump sum or unit price or prices bid, and no direct or additional payment will be made for any such Incidental Work.

Set forth in the following decimally numbered Sections are typical examples of Incidental Work and requirements governing such work. In addition, elsewhere in the Standard Specifications or Special Provisions, or on the plans, may be set forth other work, including the furnishing and installation of materials and products, and requirements governing the Contractor's operations. Without exception, all such work not specifically set forth for payment in the Schedule of Bid Prices shall be done as Incidental Work, no direct or additional payment will be made therefor, and the cost thereof shall be included in the price or prices bid.

When there is doubt regarding the proper allocation of cost of any Incidental Work, the Bidder shall include such cost in the price bid for the Bid Item, or Items, he deems most appropriate.

108.02 FIELD OFFICE. - When required in the Special Provisions, the Contractor shall provide, maintain, and subsequently remove as his property, a field office of one of the two standard types, as therein specified, for the free and exclusive use of the Engineer and his representatives.

The field office, equipped as specified, shall be available at the site for the Engineer's use prior to the start of any work in the field under the contract. The field office shall be located where directed, and relocated when necessary. The field office shall be secured with keyed cylinder-type locks. The Contractor shall maintain the field office and its appurtenances in good repair and acceptable appearance and shall provide daily cleaning service and constant maintenance and replenishment, as applicable, of paper towels, paper cups, soap, toilet paper, bottled water service with hot and cold water faucets, telephone service, electric lighting and electric heating.

The Contractor shall be responsible for the safety of engineering instruments and equipment belonging to the City and stored in the field office, and shall provide steel locker space for such storage.

Standard type field offices shall be trailer type mobile structures with the following features:

- All metal frame
- All metal exterior, sides and roof
- Security guard screens on all windows
- Cylinder lock on door, with 2 keys
- Toilet and wash basin in separate compartment in office
- Insulated double walls, floor and roof
- Self contained, built-in electric heater with fan that may be used for cooling
- Fluorescent ceiling lights
- 110-volt electric wall plugs
- Minimum interior height 7 feet
- Minimum interior width 7 feet

Railed stairway to entrance door
 Steel locker attached to wall
 Sign on office reading: "Resident Engineer
 Bureau of Engineering

DPW - S.F." and further containing the project name and specification number;
 and shall have the features and contain the equipment and facilities hereinafter indicated:

	Type A	Type B	
	Large	Small	
Minimum Interior Length			30 feet 15 feet
Doors	2	1	
Windows	4	2	
Bottled water service with hot and cold faucets	1	1	
Wash basin	1	1	
Paper towel dispenser with towels			1 1
Paper cup dispenser with cups			1 1
Desks - 30" x 60"	2	1	
Swivel Chairs	2	1	
Straight Chairs		2	2
Drafting table 3' x 6'	1	1	
Drafting stool	1	1	
4-drawer steel file case with lock			1 0
Plan rack and plan hangers			1 1
Bookcase	1	1	
Waste paper basket	2	1	
Clothes hangers		1	1
First aid kit	1	1	
Telephone - one party unlimited call, with 12-foot cord			1 1

In the event the contract cost exceeds \$1,000,000, or the time of completion exceeds 250 working days, the Contractor shall provide a photocopying machine in addition to the above requirements. The photocopying machine shall be the dry copying type using ordinary, commonly available paper.

108.03 SANITARY CONVENIENCES. - In the event a field office is not required, the Contractor shall provide approved adequate separate sanitary convenience facilities for the exclusive use of the Engineer, either by provision of such facilities at the site or by making arrangements with the owners of existing facilities immediately adjacent to the work.

Separate sanitary conveniences shall also be provided for the use of the workmen.

Sanitary conveniences shall be available for use at the site prior to the start of work in the field under the contract.

The sanitary conveniences shall be maintained, relocated, and removed by the Contractor at the direction of the Engineer. The Contractor shall obey and enforce such sanitary regulations as may be prescribed by the Department of Public Health of the City.

108.04 EXCAVATING. - The Contractor shall do all pavement excavation and all trench, common, and structural excavation, necessary, or required, to satisfactorily accomplish the work, all in accordance with the applicable requirements set forth in Part 7 of these Standard Specifications.

108.05 REMOVAL OF SUBSURFACE OBSTACLES. - The Contractor in accordance with the requirements of Section 700.09, shall remove subsurface obstacles, regardless of size, shape or type of material, and whether or not shown on the plans or specified, which are encountered within the limits of the excavation necessary for the work.

108.06 WATER DAMAGE AND DISPOSAL OF WATER. - The Contractor shall protect the work from water damage, shall keep excavations dry, shall dispose of water from all sources, shall do all necessary pumping, and shall install suitable conduits to remove and divert all sanitary, ground water, tidewater, and storm water flow from the work, in accordance with the requirements of Sections 301 and 700.08.

108.07 LAGGING AND SHEET PILING. - The Contractor shall furnish, install and maintain lagging, sheet piling, timbering, shoring, and bracing, as necessary to safely support the sides of excavations and to prevent any movement of the adjacent ground, pavement, or property, as the case may be.

108.08 BACKFILLING AND CONSTRUCTING EMBANKMENT. - The Contractor shall do all backfilling and constructing embankment necessary, or required, to satisfactorily complete the work and he shall backfill all excavations to the elevations shown on the plans, that of the adjacent existing ground surface, or the required subgrade, as the case may be.

All backfill and embankment shall be, and shall be placed and compacted, in accordance with the applicable of the requirements set forth in Part 7 of these Standard Specifications.

108.09 ADJUSTMENT OF MANHOLE FRAMES AND OTHER CASTINGS. - The Contractor shall set and reset, as applicable, frames and castings of governmental utility structures, including manholes, catchbasins, curb inlets, vaults, handholes and monuments, in accordance with the requirements of Section 217. Such resetting shall include the extending or shortening of the cones, barrels or risers of such structures to adjust the castings to the final pavement elevation.

108.10 DISPOSAL OF MATERIALS.

General. - No material shall be placed on private or public property without proper authority.

The Contractor shall not allow any portion of any refuse, excavated material, surplus concrete or mortar, or any washings therefrom, to be disposed of upon paved streets, into catchbasins or otherwise into the City Sewer System.

Burning at the site is prohibited.

Excavated Materials. - All excavated materials not suitable for backfilling or constructing embankment, and all surplus excavated materials, shall be removed from the site by the Contractor as his property and disposed of in a legal manner.

Removed Equipment and Materials. - The Contractor shall salvage as the property of the City all removed equipment, appurtenances and other materials not specified to be reused in the work except those not wanted by the City which the Contractor shall remove from the site as his property and dispose of in a legal manner.

Waste Materials Subject to Regulatory Control. - The Contractor's attention is directed to Article 17 of the Public Works Code (Part II, Chapter X, of the San Francisco Municipal Code) relating to regulatory control of dumps disposing of waste material derived from the construction or demolition of buildings or from any other source.

The Contractor shall comply with said Article 17, and in particular shall not dispose of any waste material within the City and County of San Francisco in a dump which does not operate under a conditional use permit as required to be issued under said Ordinance.

"Waste material," as defined in Section 850 of Article 17, means non-putrescible debris and waste materials that are combustible in nature in whole or in part, and materials including wood, brick, plaster, glass, cement, plastics and ferrous or metallic materials derived from the construction or the partial or total demolition of buildings or from any other source.

The Contractor's attention is directed to Federal, State, and local laws and regulations that prohibit:

- 1)the polluting of San Francisco Bay waters by dumping refuse therein,
- 2)the menacing of navigation by permitting timber to go adrift in navigable waters, and
- 3)the unapproved placement of fill in, or extraction of material from, San Francisco Bay or areas within 100 feet of the shoreline thereof, or the Pacific Ocean.

Further, the Contractor's attention is directed to Federal, State, and local laws and regulations governing the handling and disposal of toxic wastes derived from the construction process or from any other source.

108.11 DELIVERY OF SALVAGED MATERIALS TO CITY YARD. - All City owned castings, equipment, chain link fence and other materials removed from existing improvements, which, in the opinion of the Engineer, have salvage value, but which are not to be reused in the work, shall be carefully salvaged and delivered to designated City Yards or other locations within the City and there placed where and as directed, all by the Contractor at his expense. The Contractor shall remove from the site as his property all salvaged material not to be delivered as specified hereinbefore.

All patterns especially made under the contract shall be the property of the City, and after use shall be delivered to the designated City Yard, together with any patterns borrowed from the City.

Final acceptance of the work will not be recommended by the Engineer before submission to him by the Contractor of the receipts issued upon delivery of such castings, other materials, or patterns.

108.12 CONTRACTOR TO FURNISH TEST CYLINDER MOLDS FOR CONCRETE.

- The Contractor shall furnish at the worksite, standard test cylinder molds for concrete, with covers, in the quantities required by the Engineer.

108.13 SAFETY REQUIREMENTS.

General. - The Contractor shall do whatever work is necessary to adequately safeguard the public and the personnel employed at the site by taking all necessary, or required, precautions to prevent loss of life and personal injury, and he shall conduct his operations with a proper regard for the convenience of the public.

All work, equipment, and materials, including the installation thereof, shall be in full accordance with the requirements of the National Board of Fire Underwriters, the State Fire Marshal, City and State laws, and rules and regulations pertaining to safety established by the State of California Division of Occupational Safety and Health, and any other prevailing codes and regulations pertinent to adequate protective measures and the prevention of hazardous conditions.

The performance of all work and all completed construction, particularly with respect to ladders, platforms, structure openings, scaffolding, shoring, lagging, machinery guards and the like, shall be in accordance with the Safety Orders issued by the Division of Occupational Safety and Health.

During construction, the Contractor shall construct or provide and at all times maintain satisfactory and substantial temporary chain link fencing, solid fencing, railing, barricades or steel plates, as applicable, at all openings, obstructions, surface irregularities, unramped grade changes, or other hazards in streets, sidewalks, floors, roofs, walkways, and the like. All such barriers shall have adequate warning lights as necessary, or required, for public safety.

Safety requirements for excavations are set forth in Section 700.02.

Requirements for traffic safety are included in Section 110.

Noise. - The Contractor shall conduct his operations in a manner to cause the least possible noise consistent with normal construction efficiency. Any operation, or the use of any equipment, that makes excessive or unusual noise will not be permitted.

Compressors shall have satisfactorily effective mufflers, and be mounted and insulated so that the noise of operation thereof is at a practicable minimum. In any event, all operations conducted by the Contractor shall be in conformance with the requirements of Article 29 "Regulation of Noise" of the Police Code.

108.14 ILLUMINATION OF WORK. - When any work is performed at night, or in a tunnel or in any other place where daylight is shut off or obscured, the Contractor shall at his own expense provide artificial illumination sufficient for the proper conduct and

thorough inspection of the work.

108.15 WATCHMEN. - The Contractor, where necessary to safeguard the work and equipment, shall employ a licensed, uniformed, armed watchman or watchmen, physically capable of adequately patrolling the whole of the work, who shall be at the site of the work at all times, except during ordinary working hours, from the beginning to the date of acceptance of the work.

108.16 EQUIPMENT TO BE PUT IN OPERATION AND FAILURE OR FAULTY PERFORMANCE THEREOF CORRECTED. - Before acceptance of the work, the Contractor shall put the mechanical and electrical systems and all related equipment and appurtenances installed, relocated, modified or repaired, as the case may be, to the extent of the work actually performed under the contract, in satisfactory and legal operation.

He shall do all testing, timing, adjusting and other operations necessary to insure proper functioning of such systems and equipment in all respects in the manner contemplated.

Final adjustment of equipment shall be as determined in the field by the Engineer.

Failure or faulty performance of any equipment, furnished, installed, relocated, modified, or repaired, as the case may be, under the contract, will be considered "defects in the work" as specified in Section 105.10.

The Contractor shall furnish all labor, materials, equipment and tools, and shall defray all other expenses in connection therewith, to satisfactorily repair or replace, as necessary, as determined by the Engineer, all equipment, auxiliaries and appurtenances, to the extent of the hereinbefore defined responsibility therefor, that have failed or have performed in a faulty manner, and shall thereupon put such equipment and appurtenances into satisfactory operation.

108.17 MAINTENANCE OF SITE, PREVENTION OF DUST NUISANCE, AND FINAL CLEANUP. - The Contractor shall at all times maintain the site of the work, including field offices and construction sheds, in an orderly and satisfactorily neat and clean condition, and shall at suitable intervals, in street areas at the end of each working day, remove from the site as his property all accumulations of rubbish or refuse material, surplus concrete, mortar, and excavated materials not required or suitable for backfill, and shall not dump any portion thereof, or any washings from concrete mixers or mixing boxes, upon paved streets.

The Contractor shall take adequate measures to prevent the impairment of the operation of the sewer system. He shall prevent construction material, pavement, concrete, earth, or other debris from entering a sewer, catchbasin, storm water inlet or any other sewer or sewer related structure.

In order to protect the public from dust nuisance and property from dust damage, the Contractor shall keep the entire site of the work, inclusive of vehicular and pedestrian traffic routes through the work, continuously free of dirt and dust by adequate periodic blading, power brooming, watering or other approved means.

The Contractor may store materials and equipment in available space at the site, at locations that will not interfere with the normal use of the area, as determined by the Engineer.

Those parts of public streets, ways and sidewalks that are occupied by the Contractor shall be immediately vacated by him and returned to public use when his use thereof is no longer necessary for the prosecution of the work.

Upon completion and before final acceptance of the work, the Contractor shall remove all rubbish, surplus or discarded material, falsework, forms, temporary structures, signs not a part of the work, and all his equipment and machinery, and shall leave the entire site in a satisfactorily neat and clean condition. Buildings constructed, altered, or worked in by him shall be left "broom clean," and he shall remove all stains and other blemishes resulting from his operations, such as dropped or splattered plaster and paint, from floors, walls, ceilings, windows, finished brickwork and all other exposed surfaces.

108.18 OTHER EXAMPLES OF INCIDENTAL WORK. - For the guidance of the Contractor and to avoid unwarranted claims for extras, examples of other Incidental Work, in addition to the examples set forth in the preceding decimally numbered Sections, are given hereinafter, and it is understood and agreed that, no complete enumeration of such work being possible due to the diversity thereof, the omission of any such work herefrom is inadvertent and no ground for any claim that such work is other than incidental and included in the price bid. Typical examples of such Incidental Work are the following: all work pursuant to orders, regulations, resolutions, ordinances and laws of Governmental bodies having jurisdiction; pavement restoration; work pursuant to the satisfaction of, relative to Federal or other Agency requirements specified in the contract to be the responsibility of the Contractor; all work including paperwork and all costs entailed by provision of administration, supervision and overhead by the Contractor as required by the contract; preparing estimates and negotiating for Extra Work; provision of necessary shop or detail drawings, samples and test specimens; provision of equipment for, and the making of, tests and adjustments; traffic routing; providing project signs if specified; clearing, grubbing and site preparation; grading and common excavation; removing, plugging, and filling existing sewers; maintaining sewer service; connecting sewers, culverts and side sewers; constructing and removing brick bulkheads in sewers; constructing sand bed for pipe sewers and other facilities; furnishing and placing drains, crushed rock and filter materials; removing and replacing unsound subgrade materials within the specified limits; cutting; patching; altering existing conduits; steel work; concrete work; providing admixtures for concrete; masonry work; mechanical work; electrical work; constructing embankment; compacting; providing redwood headers; galvanizing; painting; restoring landscaping; furnishing water and electrical power necessary for the conduct of operations under the contract; and furnishing and installing all materials, including appurtenances and accessories such as anchor bolts, bracing, brackets, hangers, clamps, inserts,

gaskets, etc., not specified nor shown on the plans but necessary, or required, to satisfactorily complete the contract work, and produce a legally and satisfactorily operable facility.

108.19 CONTRACTOR TO FURNISH WATER. - The Contractor shall furnish all water necessary for the conduct of operations under this Contract.

Should it be necessary to use City water from low pressure hydrants, the Contractor shall first obtain a permit from the Chief of the San Francisco Fire Department for use of hydrants for authorized purposes. The permit shall then be filed with the Water Department together with the application for water supply.

Payment of deposit shall be made to the Commercial Division of the Water Department at 425 Mason Street. Issuance of meter will be at the Meter Shop at the Water Department Corporation Yard, 1900 Newcomb Avenue.

Meter readings to determine the charge for the water usage will be made periodically and at the time the meter is returned to the Meter Shop.

Use and operation of hydrants and construction meters shall be in strict conformity with requirements of the San Francisco Fire Department and the Water Department.

Construction water for consolidation of backfill and other non-essential uses will be subject to approval of the San Francisco Water Department. Approval, as required, shall be obtained from the Water Conservation Division of the Department.

SECTION 109

RESTORING PAVEMENTS AND RELATED IMPROVEMENTS

109.01 GENERAL. - The Contractor shall satisfactorily reconstruct or replace in accordance with the requirements for the construction thereof, pavements and related improvements, such as sidewalk, curb, gutter, and side sewer vents and traps, destroyed, disturbed, damaged, undermined or removed by the Contractor, or as a result of his operations.

Backfill underlying pavements to be restored shall have been compacted in accordance with the applicable requirements of Section 707, and, as applicable, the subgrade therefor prepared as specified in Section 200.

Compaction tests, as required by the Engineer, will be conducted and evaluated by the City at no cost to the Contractor.

Cutting of the existing pavement for trenches shall be by sawcutting or other approved means and shall be in neat straight lines to allow for proper placement of the new pavement section. Pavement outside the original trench lines that is damaged shall be removed to lines perpendicular to or parallel to the original trench lines. No diagonal cuts will be allowed.

Concrete roadway pavement (non-asphalt topped) shall be restored with concrete using a thickness equal to the thickness of the existing pavement, except that the new pavement shall be a minimum of 6 inches thick.

Asphalt topped roadway pavement in major streets shall be restored with an 8-inch thick concrete base and a 1-inch thick asphalt concrete wearing surface. Major streets are defined as Federal Aid Urban System Streets.

Asphalt topped roadway pavement in streets that are not in the Federal Aid Urban System shall be restored with a 6-inch thick concrete base and a 1-inch thick asphalt concrete wearing surface.

Two pounds of calcium chloride per sack of cement shall be added to concrete used to restore street pavement over trenches.

Concrete shall be cured for at least 4 hours before traffic is allowed thereon and, if concrete is placed after 12 noon, the trench shall be covered with steel plates.

Pavement shall be restored within 7 working days from the time the trench is backfilled. The asphalt concrete wearing surface shall be placed on the concrete base in a trench within 2 working days after placement of concrete base.

The thickness of any restored concrete sidewalk shall be equal to the thickness of the existing sidewalk, except that the minimum thickness of new concrete shall be 3 inches.

Concrete shall be of the appropriate class for the type of improvement being restored.

Pavements and related improvements that are constructed of special material or color shall be replaced in kind. A sample of each special material and 3 samples of each color shall be submitted to the Engineer for approval.

Where curbs, gutters, and sidewalks are replaced, junctions with the existing improvements shall be made by sawcutting or other approved means and shall be along straight lines, at score lines or at construction joints, as applicable.

Handicap ramps shall be constructed where any portion of the curb at a legal pedestrian crosswalk or any portion of the sidewalk in immediate contact with such curb is removed, except where there is an existing handicap ramp in the crosswalk or where there is a subsidewalk basement behind the crosswalk.

109.02 PAYMENT. - Restoring pavements and related improvements shall be done as Incidental Work and payment therefor shall be included in the price or prices bid; except for the following:

1) If the Schedule of Bid Prices contains a unit price bid item for asphalt concrete wearing surface, then any asphalt concrete used in restoring pavements will be paid for under said bid item.

2) If the Schedule of Bid Prices contains a unit price bid item for construction of handicap ramps, then any handicap ramp constructed where none previously existed will be paid for under said bid item. If the Schedule of Bid Prices does not contain a unit price bid item for construction of handicap ramps, then any handicap ramp constructed where none previously existed will be paid for as Extra Work in accordance with Section 112.

SECTION 110

TRAFFIC ROUTING WORK

110.01 GENERAL. - The Contractor shall provide for the safe and proper routing of vehicular and pedestrian traffic in a manner that will minimize congestion and delay thereof. He shall furnish, install and maintain all temporary signs, lights, barricades, cones, guard rail, runways, pavement, bridges, stairs, and other devices and facilities necessary to safeguard the general public and the work, where and as required by conditions at the site of the work, and in addition to the requirements shown on the plans.

Upon determination by the Engineer that a site is inadequately protected, the Contractor shall furnish, place and maintain additional protective devices as required. Such devices and facilities shall be relocated as necessary to accomplish the proper routing of traffic as the work progresses and, upon conclusion of the need therefor, shall be removed from the site of the work as the Contractor's property.

The Contractor shall conduct his operations with proper regard for the convenience and safety of the public and shall not unnecessarily obstruct any public street, way, sidewalk, or access to properties.

Additional safety requirements are included in Section 108.13.

110.02 MAINTENANCE OF TRAFFIC. - The Contractor shall cause the least possible interference with traffic. He shall not obstruct nor close any roadway to vehicular or pedestrian traffic, except in the immediate vicinity of the work, and then only to the extent allowed by Article II, Chapter XI (Traffic Code), Part II of the San Francisco Municipal Code and any Department Orders adopted pursuant thereto by the Director of Public Works.

Where more than one-half the width of roadway pavement is to be excavated, the Contractor, unless otherwise specified, shall restrict such pavement excavation to one-half the width of the roadway until the portion of the roadway excavated has been repaved and is ready for use by traffic.

Storage, stockpiling, or placement of any equipment, materials or supplies within the area of any public street or alley, including the sidewalks thereof, will be allowed only if with such storage, stockpiling or placement, the work is prosecuted in accordance with the provisions of Section 108.17, this Section 110, and does not in any way obstruct any lane or passageway intended for vehicular or pedestrian traffic.

If the Engineer determines that such storage, stockpiling or placement causes a violation of the foregoing or of any law or order of any regulatory body having jurisdiction, the Contractor shall cease or modify the storage, stockpiling or placement as necessary to comply with the specifications, laws and orders.

Those parts of public streets, ways and sidewalks that are occupied by the Contractor shall be immediately vacated by him

and returned to public use when his use thereof is no longer necessary for the prosecution of the work.

The Contractor, except as hereinafter provided, shall not impede, at any time, free access for vehicles and pedestrians to warehouses, stores, service stations, dwellings, garages and other properties in the vicinity of the work and on adjacent streets, including those properties fronting on streets allowed or stipulated by the Special Provisions to be closed to through vehicular traffic.

He shall provide for such local access by phasing his operations, bridging, or employing other procedures approved by the Engineer.

The Contractor shall obtain written permission of each affected property or business owner, or responsible building or business manager, for any proposed period of prohibition or impediment of such access. Prohibition or impediment of access to any building or property for which the Engineer does not have a copy of the specified signed permission will not be allowed. The closing of any street shall not prevent nor impede access by emergency vehicles, including those of the Fire Department, the Police Department, and ambulances.

Access to fire hydrants, to assure their immediate and unhampered use at all times, shall not be impaired by the Contractor.

No debris, materials or equipment shall be placed within 10 feet of any fire hydrant.

The Contractor shall not block the movement of pedestrian traffic. Where necessary, the Contractor shall provide for such movement by phasing his operations, providing 4-foot wide temporary bridges across the trenches, or establishing 4-foot wide passageways in the sidewalk or roadway area, as applicable. Each bridge or passageway shall be bordered with safe and adequate railings or barricades, which shall be adequately lighted at night, and which shall remain in place until all work at the particular location has been completed and the sidewalk, walk, or crosswalk has been opened to the safe transit of pedestrian traffic. On barricades which direct pedestrians around the site of the work or to crosswalks not closed, the Contractor shall post, where directed by the Engineer, "NO PED CROSSING USE CROSSWALK" Code R49 signs with appropriate directional arrows. Railings or barricades which border passageways located in roadway areas shall be adequately reflectorized on the side facing oncoming traffic.

In the downtown area bounded by Market, Taylor, Pine, Front, Fremont, Folsom, and Eighth Streets, and in the area bounded by Spear, Steuart, Mission and Howard Streets, including the boundary streets, no obstructions to traffic shall be created, no street or sidewalk excavating shall be commenced or done, nor shall any other contract work be done in street or sidewalk areas, except for emergency work, from the day after Thanksgiving to January 1, inclusive, during the hours of 7 a.m. to 10 p.m.

In addition, in all other business districts, like restrictions apply from the day after Thanksgiving through January 1, inclusive, during the hours of 7 a.m. to 10 p.m.

A business block is a block in which at least 50 percent of the frontage is devoted to business. Establishments in this category are retail stores, bars, restaurants, banks, service-type business, non-residence type hotels, and wholesale businesses.

In the above areas during the periods specified, all openings in the street and in the sidewalk must be closed by backfilling and paving or by plating over, providing safe and adequate passage for vehicles and pedestrians.

The Contractor shall cooperate with commercial establishments and shall conduct and schedule his operations in a manner to cause the least possible interference with activities attributable to the Holidays, such as the seasonal increase in shopping, business, and vehicular and pedestrian traffic. The Contractor shall cover over any existing excavations in order to accommodate such increase in traffic.

If it is necessary in the opinion of the Engineer, the Contractor shall stop work in order to comply with the requirements set forth hereinbefore. An extension of time will be granted for such shutdown. However, all expenses occasioned by, and related to, shutting down and restarting work shall be borne by the Contractor.

110.03 DIVERTING OF VEHICULAR TRAFFIC. - When it becomes necessary to close one or more lanes to vehicular traffic or to otherwise divert such traffic from its normal paths, the Contractor shall clearly delineate temporary centerlines separating two-way traffic, and dividing lines for other temporary traffic lanes, by employing cones, barricades, flags, reflectors, or other approved methods or devices. Placing of devices shall commence sufficiently in advance of the obstruction or other cause of the diverting of traffic to minimize congestion and shall enable traffic to enter, traverse and leave the site of the work without abrupt or unwarranted changes in direction. Unless otherwise specified or approved, each temporary traffic lane shall be not less than 10 feet clear width.

High rise warning flag units, each displaying three flags mounted at the height of 9 feet, to provide advance warning for traffic approaching the work, will be required in all cases where motorists' visibility of the work is limited or obscured.

110.04 BRIDGING OVER TRENCHES AND EXCAVATIONS AND PHASING OF OPERATIONS. - The Contractor shall, by constructing temporary bridges across excavations, by phasing his operations, or by employing a combination of these two methods, provide and maintain safe and adequate passage for vehicular and pedestrian traffic over and adjacent to trenches and other excavations and provide and maintain the number of traffic lanes specified.

Bridges for vehicular traffic shall be installed, where necessary, across trenches and excavations or other work on public streets, at street crossings, and at entrances to residential, commercial, or industrial property, access to which is to be maintained.

Each bridge installed on a public street shall be at least two feet wider than the total minimum width of the traffic lanes accommodated on the bridge.

All bridges for vehicular use shall be adequate for AASHTO HS20-44 loading and shall be constructed with approved metal plates, or timber planking not less than 3 inches thick. Bridges shall be constructed with wheel guards and railings where

necessary for safety.

In order to provide smooth transit over timber bridges, they shall be satisfactorily beveled at the ends, or shall be constructed flush with the roadway by recessing the pavement and lagging. "Satisfactorily beveled" shall mean that the change in elevation between the wearing surface of the street and the top surface of the said 3-inch timber planking shall occur in a distance of not less than 4 feet. This beveling may be accomplished by means of temporary pavement. A bridge "flush with the roadway" is defined as one whose surface is not more than 3/4 of an inch above or below the surface of the existing pavement.

Phasing of construction of any reinforced concrete structure shall have the prior approval of the Engineer; further, any required sequence of construction shown on the plans or specified in the Special Provisions shall take precedence over such phasing of construction.

110.05 TEMPORARY PAVING OVER BACKFILLED TRENCHES AND EXCAVATIONS. - Vehicular travel over backfilled but unpaved and unbridged trenches and other excavations will not be permitted. The Contractor shall construct, before use of pavement by vehicular traffic, and thereafter satisfactorily maintain, a smooth, regular, temporary wearing surface, not less than 1 inches thick, over backfilled areas for the safe passage of vehicular traffic. All excess materials shall, at the same time, be removed and the street cleaned.

The temporary wearing surface shall be in accordance with the requirements of Section 211.

When pavement is broken prior to trench excavation in a lane to be left open to traffic, the excavation of such trench must proceed within 48 hours from the time the pavement is broken. If the preceding condition cannot be met, the broken pavement fragments must be removed and replaced with temporary wearing surface in accordance with the requirements of Section 211.

Temporary pavement shall be constructed as Incidental Work except that if the contract includes a Bid Item for temporary pavement, then all temporary pavement necessary pursuant to the requirements of traffic routing work shall be construed only with prior approval of the Engineer, and shall be in accordance with, and will be paid for under, such Bid Item for temporary pavement.

The Contractor shall restore each section of permanent pavement and each flag of sidewalk as soon as practicable following the completion of the work for which that section of pavement or flag of sidewalk was removed.

110.06 PROHIBITION OF STOPPING. - The Contractor may prohibit stopping of vehicles where and when necessary to provide the required temporary traffic lanes. The Contractor shall prohibit stopping where and when necessary to keep project, loading, and storage areas clear. Such prohibition shall be for the least time practicable.

Prohibition of stopping will require the approval of the San Francisco Police Department. The Contractor shall, in this regard, contact the San Francisco Police Department Traffic Bureau, Telephone 415-553-1195, 48 hours in advance of the start of the work.

After approval of the stopping restriction, the Contractor shall furnish and place approved "NO STOPPING" signs where directed.

So that the stopping prohibition will be effective and enforceable, the messages on the signs shall include the dates and times of the required prohibition. Printed overlays on the signs may be used for this purpose. Section 22,651 of the California State Vehicle Code requires a sign to be in place 24 hours before it becomes legally enforceable.

110.07 MASS TRANSIT VEHICLES. - The Contractor shall not interrupt or otherwise interfere at any time with the passenger transportation service of mass transit vehicles such as streetcars, cable cars, busses and trolley coaches. Unless specifically stipulated in the Special Provisions, no detouring of mass transit vehicles will be permitted.

The Contractor is reminded that all mass transit facilities constitute governmental utility facilities as set forth in Section 104. Any additional construction, necessitated solely for the purpose of accommodating the passenger transportation service of mass transit vehicles, shall be done as Incidental Work in accordance with the provisions of such Section 104.

Temporary lanes made available for vehicular traffic by the Contractor shall be located so as to include an adequate and allowable travel path for the coach lines. In order to accomplish the foregoing, the Contractor shall familiarize himself with the routes of all coach lines that operate within the limits of the work. The extreme touring range of the center line of a trolley coach is 10 feet from the center line of the trolley wires.

If construction necessitates temporary relocation of trolley wires or other work by the Municipal Railway, the Contractor, before starting any work in the affected street, shall notify the Engineer and the General Manager, Municipal Railway, in writing, at least five days in advance of the date he intends to start such work, so that the proper arrangements for operation of trolley coaches can be made.

110.08 EXISTING TRAFFIC SIGNAL SHUTDOWN. - Where it is necessary to shut down existing traffic signals at any intersection, the Contractor shall notify the Engineer and the San Francisco Police Department Traffic Bureau twenty-four hours in advance of the start of each such shutdown, so that arrangements may be made to have a police officer on duty to control traffic.

In the event that the Police Department cannot assign an officer to the intersection, the Contractor shall, with the approval of the Engineer, place the signals on flashing operation for the duration of the shutdown. If flashing operation is not possible, the Contractor shall provide a portable flashing unit and shall make all necessary, or required, connections to effect flashing operation.

The operation, and interconnected functioning, of such existing traffic signals shall not be disturbed before 9:00 a.m., and the traffic signals shall be returned to normal working conditions before 4:00 p.m. of the same day.

110.09 WORK AROUND PARKING METERS. - The Contractor shall notify the Engineer at least two working days before starting any

work that may result in damage to parking meters, so that arrangements may be made by the City to have the meters removed at no cost to the Contractor.

Parking meters and parking meter standards damaged or loosened by the Contractor's operations will be repaired or replaced as necessary by the City; however, all expenses in connection therewith shall be borne by the Contractor.

110.10 TEMPORARY CONSTRUCTION AND TRAFFIC SIGNS, LIGHTS AND DEVICES. - Temporary signs, lights, barricades and devices shall be in accordance with the California Department of Transportation "Manual of Traffic Controls, Warning Signs, Lights and Devices for Use in Performance of Work Upon Highways."

The Contractor, before starting any work which will affect the normal flow of traffic, shall furnish, install where and as necessary, or directed, and maintain, temporary signs, mounted on barricades or other suitable supports as necessary.

Barricades shall be furnished and maintained by the Contractor along and around all work in contact with traffic, and shall not be removed until the roadway is ready for use.

Traffic cones shall be at least 28 inches in height and, when used to delineate traffic lanes or separate opposing traffic movements, shall be spaced at not greater than 20-foot intervals.

All signs and equipment shall be installed where and as directed. Signs and equipment in addition to those indicated hereinbefore shall be as described in the Special Provisions. Signs for use at night shall be reflectorized.

All temporary construction and traffic signs, lights, devices, barricades and cones, upon completion of the need therefor, shall be removed from the site by the Contractor as his property, unless otherwise specified.

110.11 RELOCATION AND REMOVAL OF EXISTING PERMANENT TRAFFIC CONTROL AND OTHER SIGNS. - The Contractor shall temporarily relocate all traffic control, street name, and other City signs, as required for the prosecution of the work and to prevent interference with traffic signal installations, and shall satisfactorily maintain such signs in place at all times. He shall similarly relocate, or remove and salvage as City property, the standards for such signs. The Contractor shall salvage standards in their entirety, and shall remove any concrete therefrom.

The temporary relocation of each arterial "STOP" or other traffic regulatory sign shall be done immediately upon its removal, and to a location as close as possible to the original position of such sign, or where directed by the Engineer.

The Contractor shall remove, and salvage as City property, existing arterial "STOP" or other signs superseded by traffic signals installed by him, immediately upon being notified by the Engineer that such signals will remain in operation.

At least 5 working days prior to the time the Contractor's work will be done to the point that permanent installation of the signs temporarily relocated by him can be done, he shall notify the Bureau of Traffic Engineering and Operations Sign Shop, telephone

415-558-2096. The signs will be permanently reinstalled at no cost to the Contractor.

When specifically shown on the plans, the Contractor shall either permanently relocate traffic control and other signs and standards to the locations shown, or shall remove, salvage, load, haul, and deliver them as City property to the Bureau of Traffic Engineering and Operations Sign Shop at 1999 Bryant Street, telephone 415-558-2096, and there place them where directed.

110.12 FLAGMEN. - In order to avoid danger and delay to the public, the Contractor shall, during the entire time of any approved temporary use by him of any part of the roadway specified to remain open for traffic, provide competent flagmen, whose sole duty shall be to direct and control the movement of traffic through or past the work, as applicable.

The flagmen shall be provided with appropriate apparel and equipment and shall use hand signals and equipment in accordance with the California Department of Transportation "Manual of Traffic Controls, Warning Signs, Lights and Devices for Use in Performance of Work Upon Highways."

110.13 CONTRACTOR TO TAKE ADDITIONAL PRECAUTIONS AND DO OTHER WORK AS NECESSARY. - The requirements set forth hereinbefore, in the Special Provisions, and on the plans, shall not necessarily be all the precautions the Contractor shall take nor all the work he shall do, to properly protect the public and the work, and they shall in no way relieve the Contractor from taking additional precautions and doing other work as necessary or required for such protection. Such additional precautions and other work shall in any case be done as Incidental Work.

Where trucks leave the jobsite and enter paved public streets, the Contractor shall maintain a suitable truck wheel washing or cleaning installation and crew or equivalent means of controlling loose dirt or mud on vehicles. All hauling trucks or other construction vehicles leaving the site shall be cleaned of mud or dirt, including mud or dirt clinging to exterior body surfaces or wheel rims before traveling on public streets outside the assigned work limits of the Contract.

All trucks coming to or leaving the site with materials or loose debris shall be loaded in a manner which will prevent dropping of materials or debris on streets. Spillage resulting from hauling operations along or across any public traveled way shall be removed immediately at the Contractor's expense.

110.14 PAYMENT. - Traffic routing work shall be done as Incidental Work and payment therefor shall be included in the price or prices bid, except that if the Proposal includes a Bid Item for traffic routing work, such work will be paid for at the lump sum price bid therefor prorated over the life of the contract.

SECTION 111

MEASUREMENT

111.01 GENERAL. - In addition to the general requirements hereunder, Bidders are directed to the more specific requirements in the individual Sections of these Standard Specifications covering the methods of measuring and paying for particular materials and types of work.

Except where payment for the work is made at the lump sum price or prices bid therefor, payment shall be based on measurements of the completed work in accordance with, and by instruments and devices calibrated to, United States Standard Measures, and the units of measurement for payment, and the limits thereof, shall be as shown on the plans or specified in the Special Provisions, or in the absence thereof, as set forth in these Standard Specifications. The Engineer will make the measurements at no cost to the Contractor except as otherwise specified.

In estimating progressive payments and final quantities, all lengths and areas shall be based on horizontal measurements, unless otherwise specified. The polar planimeter may be used for measurement of areas in estimating quantities under the contract.

Volumes of excavation and embankment, unless otherwise specified, shall be computed by the method of average end areas and appropriate horizontal distances.

111.02 WEIGHT MEASUREMENTS. - Material paid for by the ton, if local material or material not shipped by rail, shall be weighed on platform scales furnished by the Contractor, or on public scales at the expense of the Contractor. A ton shall consist of 2,000 pounds avoirdupois. The platform scales shall be of sufficient size and capacity to concurrently weigh the load and the vehicle carrying the load. The Contractor shall furnish the Engineer with a Certificate of Inspection from the Sealer of Weights and Measures of the County having jurisdiction, or from the Bureau of Weights and Measures of the State of California, attesting to the accuracy of the scales furnished by him; and further, he shall furnish additional certificates as often as the Engineer may deem necessary to assure the continued accuracy of the scales; all at no cost to the City.

If the Contractor elects to use public scales they shall bear a current valid seal of approval of the Sealer of Weights and Measures.

Whenever material is weighed on scales used for any commercial purpose, the scales shall be operated by a weighmaster licensed in accordance with the provisions of Division 5, Chapter 7 of the California Business and Professions Code. The Contractor shall furnish a Public Weighmaster's certificate, or a Private Weighmaster's certificate, or certified daily summary weigh sheets. A representative of the City may, at the discretion of the Engineer, be present to witness the weighing and to check and compile the daily record of such scale weights.

The City reserves the right to require that no weighing shall be done on scales furnished by the Contractor or on public scales,

except in the presence of an authorized representative of the Engineer and further reserves the right to check the tare weight of each truck used to haul materials paid for by weight at any time specified by the Engineer.

The weight of aggregate, crushed rock, or aggregate base to be paid for by the ton will be determined by deducting from the weight of the material incorporated in the work, the weight of water in the material at the time of weighing, in excess of that allowed by the specifications.

111.03 TRUCK MEASUREMENTS. - Material specified to be measured by "Truck Measurement" or similar designation indicating that the material shall be measured by volume in the transporting vehicles, shall be hauled in approved vehicles of such type that the actual cubic contents can be readily and accurately determined. Such vehicles shall be made available to the Engineer for the purpose of measurement prior to use. The water level volume of each truck body, to the top of side boards, shall be determined by actual measurements checked and approved by the Engineer. Unless all such approved vehicles are of uniform capacity, each shall bear a plainly legible identification mark indicating the specific approved capacity.

All vehicles shall be loaded to at least the approved capacity. In the event of a controversy, and when requested by the Engineer, all loads under dispute shall be struck off to a level surface at the point of delivery.

Loads will be tallied by truck numbers and respective truck capacities, on the site of work by the Engineer. All trucks shall be tallied and inspected before being dumped, and shall be dumped where directed.

111.04 MISCELLANEOUS MEASUREMENTS. - When concrete is specified in the Special Provisions to be paid for by volume, the volume shall be the actual volume within the neat lines of the structure shown on the plans. A deduction of one cubic foot of concrete will be made for each linear foot of piling, other than sheet piling, projecting into the concrete. No deduction will be made on account of the displacement of concrete by reinforcing steel, by structural steel shapes used in encasement work, by dowels, or unless otherwise specified in the Special Provisions, by conduits, raceways or ducts.

When steel, cast iron or other metals, or metal products, are specified in the Special Provisions to be paid for by weight, the weighing thereof shall be done on shop scales in the presence of the Engineer or his authorized representative. Payment will be made at the price bid per pound.

SECTION 112

CHANGES AND EXTRAS

112.01 GENERAL.

Contract Change Order. - The City reserves the right to make such alterations, deviations, additions to or omissions from the plans and specifications, including the right to increase or decrease the quantity of any item or portion of the work or to omit any item or portion of work, as may be deemed by the Engineer to be necessary or advisable and to require such extra work as may be determined by the Engineer to be required for the proper completion or construction of the whole work contemplated.

Any such changes will be set forth in a contract change order which will specify, in addition to the work to be done in connection with the change made, adjustment of contract time, if any, and the basis of compensation for such work. A contract change order will not become effective until approved by the Engineer.

Upon receipt of an approved contract change order, the Contractor shall proceed with the ordered work. If ordered in writing by the Engineer, the Contractor shall proceed with the work so ordered prior to actual receipt of an approved contract change order therefor. In such cases, the Engineer will, as soon as practicable, issue an approved contract change order for such work and the provisions in "Procedure and Protest", below shall be fully applicable to subsequently issued contract change order.

When the compensation for an item of work is subject to adjustment under the provisions set forth herein, the Contractor shall, upon request, furnish the Engineer with adequate detailed cost data for such item of work.

Procedure and Protest. - A contract change order approved by the Engineer may be issued to the Contractor at any time. Should the Contractor disagree with any terms or conditions set forth in an approved contract change order which he has not executed, he shall submit a written protest to the Engineer within 15 days after the receipt of such approved contract change order. The protest shall state the points of disagreement, and, if possible, the contract specification references, quantities, and costs involved. If a written protest is not submitted, payment will be made as set forth in the approved contract change order and such payment shall constitute full compensation for all work included therein or required thereby. Such unprotested approved contract change orders will be considered as executed contract change orders.

When the protest concerning an approved contract change order relates to compensation and/or time, the Contractor shall keep full and complete records of the cost and time of such work and shall permit the Engineer to have such access thereto as may be necessary to assist in the determination of the compensation payable for such work.

112.02 LESSENER TIME FOR COMPLETION: ACCELERATION OF WORK. - If the City Engineer determines that it is necessary for the health, safety, or convenience of the public, or in the City's interest, to lessen the time allowed for the completion of the work, he may order the Contractor to accelerate the work and direct him to employ additional material and equipment, labor, shifts of work, or hours of work.

The Contractor and the Engineer shall attempt to mutually agree in writing upon the adjustment to be made in the contract price in consideration for the execution of the work on an accelerated basis. In order to facilitate the Contractor's and the Engineer's reaching a mutual agreement, the Contractor shall cooperate and submit estimates as necessary or required to substantiate his proposed price for accelerating the completion of the work. The preparation of such estimates shall be done as "Incidental Work."

In the event that the Contractor and the Engineer should fail to agree upon the amount of the contract price adjustment for the acceleration of the work, the Engineer under such circumstances shall determine the contract price adjustment and issue a contract change order in accordance with the provisions of Section 112.01 herein which adjustment shall be determined as follows:

1) In the case of overtime work, the City will pay the difference between the labor cost at straight time rates and such cost at the applicable overtime rates, computed as outlined in numbered paragraph 1) of Section 112.05, for the labor force, including foremen, engaged in such overtime work, plus an amount equal to 20% of the hereinbefore specified difference to compensate for inefficiency of the work during overtime.

2) In the case of additional equipment and labor force, the City will pay an amount equal to 10% of the cost of such additional equipment and labor force, including foremen, computed as outlined in numbered paragraphs 1), 3), 4), and 5) of Section 112.05 to compensate for inefficiency occasioned by the employment of more or larger crews and more equipment.

3) In the case of additional shifts of work, the City will pay the difference between the labor cost at straight time rates and such cost at the occasioned premium and differential rates, computed as outlined in numbered paragraph 1) of Section 112.05 for the labor forces, including foremen, engaged on such additional shifts, plus an amount equal to 15% of the cost of such difference to compensate for inefficiency occasioned by the employment of additional shifts of work.

For purposes of determining liquidated damages, the specified time for completion of the contract work shall be the accelerated date of completion.

112.03 NOTICE OF POTENTIAL CLAIM. - The Contractor shall not be entitled to the payment of any additional compensation that may be claimed due to him, unless he has given the Engineer due written notice of potential claim, as hereinafter specified.

The written notice of potential claim shall set forth the reasons for which the Contractor believes additional compensation will or may be due him, the nature of the costs involved, and, insofar as possible, the estimated amount of the potential claim.

The said notice shall be given before the Contractor has performed the work giving rise to the potential claim for additional compensation.

It is the intention of this Section 112.03 that differences between the parties arising under and by virtue of the contract be brought to the attention of the Engineer at the earliest possible time in order that such matters may be settled, if possible,

or other appropriate action promptly taken. The Contractor hereby agrees that he shall have no right to additional compensation for any claim for which no written notice of potential claim as hereby required was filed.

Any claim which is based on differences in measurements or errors of computation of contract quantities is exempted from the requirements of this Section 112.03.

112.04 CITY'S RIGHT TO AUDIT. - The Director of Public Works shall have the right to audit all records in the possession of the Contractor relating to activities covered by the Contractor's claims for a modification to the Contract, including force account work, before payments on the claims are made.

Further, the Director shall have the right to audit, inspect, or copy all records, including financial records, in the possession of the Contractor relating to any transaction or activity occurring or arising out of, or by virtue of, the Contract. If the Contractor is a joint venture, the right of the Director shall apply collaterally to the same extent to the records of the joint venture sponsor, and those of each individual joint venture member.

112.05 FORCE ACCOUNT (COST REIMBURSEMENT). - When "extra work" is to be paid for on a force account (Cost Reimbursement) basis the labor, materials and equipment used in the performance of such work shall be subject to the approval of the Engineer and compensation will be determined as set forth herein.

1. Labor. - The Contractor will be paid the cost of labor for the workers (including foremen when authorized by the Engineer) used in the actual and direct performance of the "extra work". The cost of labor, whether the employer is the Contractor, subcontractor or other forces, will be the sum of the following:

a. Actual Wages. - The actual wages paid shall include any employer payments to or on behalf of the workers for health and welfare, pension, vacation and similar purposes.

b. Labor Surcharge. - To the actual wages, as defined in the preceding paragraph, will be added a labor surcharge to cover all payments imposed by City, County, State and Federal laws and ordinances, and all other payments made to, or on behalf of, the workers, other than actual wages, as defined in the preceding paragraph such as taxes and insurances. The labor surcharge shall be as set forth in the California Department of Transportation official labor surcharges schedule which is in effect on the date upon which the work is accomplished and which is a part of the contract.

2. Materials. - The City reserves the right to furnish such materials as it deems advisable, and the Contractor shall have no claims for costs and markup on such materials. Only materials furnished by the Contractor and necessarily used in the performance of the "extra work" will be paid for. The cost of such materials will be the cost, including sales tax, to the purchaser (Contractor, subcontractor or other forces) from the supplier thereof, except as the following are applicable:

a. If a cash or trade discount by the actual supplier is offered or available to the purchaser, it shall be credited to the City notwithstanding the fact that such discount may not have been taken.

b. For any materials salvaged upon completion of the extra work, the salvage value of said materials shall be deducted from the cost, less discount, of said materials.

c. If the cost of a material is, in the opinion of the Engineer, excessive, then the cost of such material shall be deemed to be the lowest current wholesale price at which such material is available in the quantities concerned delivered to the job site, less any discounts as provided in subsection 2a above.

3. Equipment Rental. - For Contractor or subcontractor-owned equipment, payment will be made at the rental rates listed for such equipment in the California Department of Transportation official equipment rental rate schedule which is in effect on the date upon which the work is accomplished and which is a part of the contract. For rented equipment, payment will be made based on actual rental invoices. Equipment used on force account work shall be of the proper size and type. If, however, equipment of unwarranted size or type and cost is used, the cost of the use of such equipment shall be calculated at the rental rate for equipment of the proper size and type.

The rental rates paid, as provided in the preceding paragraph, shall be deemed to cover the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals.

Unless otherwise specified, manufacturer's ratings, and manufacturer approved modifications, shall be used to classify equipment for the determination of applicable rental rates. Individual prices of equipment or tools not listed in said publication and having a replacement value of \$100 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefor as payment is included in subsection 4.a. Labor.

Rental time will not be allowed while equipment is inoperative due to breakdowns.

a. Equipment on the Job Site - The rental time to be paid for equipment shall be the time the equipment is in operation on the "extra work" being performed or on standby as approved by the Engineer. The following shall be used in computing the rental time of equipment:

(1) When hourly rates are listed, less than 30 minutes of operation shall be considered to be 1/2 hour of operation.

(2) When daily rates are listed, less than 4 hours of operation shall be considered to be 1/2 day of operations.

b. Equipment Not on the Job Site - When equipment has to be brought to the job site to be used exclusively on the "extra work", the cost of transporting the equipment to the job site and its return to its original location shall be determined as follows:

(1) The City will pay for the costs of loading and unloading such equipment.

(2) The cost of transporting equipment in low bed trailers shall not exceed the hourly rates charged by established haulers.

(3) The cost of transporting equipment shall not exceed the applicable minimum established rates of the California Public Utilities Commission.

(4) Payment for transporting, and loading and unloading equipment as above provided will not be made if the equipment is used on the work in any other way than upon the "extra work".

The rental period shall begin at the time the equipment is unloaded at the site of the "extra work" and terminate at the end of the day on which the Engineer directs the Contractor to discontinue the use of such equipment. Excluding Saturdays, Sundays, and legal holidays unless the equipment is used to perform "extra work" on such days, the rental time to be paid per day shall be 4 hours for 0 hours of operation, 6 hours for 4 hours of operation and 8 hours for 8 hours of operation, the time being pro-rated between these parameters. The hours to be paid for equipment which is operated less than 8 hours due to breakdowns, shall not exceed 8 less the number of hours the equipment is inoperative due to break-downs.

4. Mark Up. - To the total direct costs computed under subsections 1, 2 and 3 above there will be added the following markups:

- a. Labor - 24%
- b. Materials - 15%
- c. Equipment Rental - 15%

The above mark-ups shall constitute full compensation for all overhead costs, profit and all other costs.

When extra work paid for on a force account basis is performed by forces other than the Contractor's organization, the Contractor shall reach agreement with such other forces as to the distribution of the payment made by the City for such work. No additional payment therefor will be made by the City by reason of the performance of the work by a subcontractor or other forces.

5. Owner Operated Equipment. - When owner-operated equipment is used to perform "extra work" the Contractor will be paid for the equipment and operator as follows:

a. Payment for equipment will be made in accordance with subsection 3 "Equipment Rental".

b. Payment for the cost of labor will be made at the rates for such labor established by collective bargaining agreements for the type of worker and location of the work, whether or not the owner-operator is actually covered by such an agreement.

A labor surcharge will be added to the cost of labor as noted in subsection 1.b.

c. The mark-ups for equipment and labor noted in subsection 4 will be added to these costs.

6. Work Performed by Special Forces or Other Special Services. - When the Engineer and the Contractor, by agreement, determine that a special service or an item of "extra work" cannot be performed by the forces of the Contractor or those of any of the subcontractors, such service or "extra work" item may be performed by a specialist. Invoices for such service or item of "extra work" on the basis of the current market price thereof may be accepted without complete itemization of labor, material, and equipment rental costs when it is impracticable and not in accordance with the established practice of the special service industry to provide such complete itemization. In those instances wherein a Contractor is required to perform "extra work" necessitating a fabrication or machining process in a fabrication or machine shop facility away from the job site, the charges for that portion of the "extra work" performed in such facility may, by agreement, be accepted as a specialist billing. The Engineer must be notified in advance of all off site work.

To the specialist invoice price, less a credit to the City for any cash or trade discount offered or available, whether or not such discount may have been taken, will be added 15 percent in lieu of the mark-ups provided in subsection 4.

7. Records. - All force account (cost reimbursement) charges shall be recorded daily upon report sheets prepared by the Engineer, furnished to the Contractor and signed by both parties. The daily report sheet shall itemize the material used, shall provide names or identifications and classifications of workers and hours worked by each, and also the size, type and identification number of equipment, and hours operated, and shall indicate work done by specialists.

All original invoices substantiating materials and specialist charges shall be submitted upon the conclusion of the "extra work" but not later than 30 days after the completion of the "extra work".

SECTION 113

PAYMENT

113.01 GENERAL. - The Contractor shall accept the compensation provided in the contract as full payment for furnishing all labor, materials, equipment and tools necessary, or required, to satisfactorily complete all work, including all Incidental Work, contemplated and embraced under the contract; also for loss or damage arising from the nature of the work, or from the action of the elements, or from any unforeseen difficulties which may be encountered during the prosecution of the work until the acceptance by the Director and for all risks of every description connected with the prosecution of the work, also for all expenses incurred in consequence of the suspension or discontinuance of the work as provided in the contract. Neither the payment of any estimate nor

of any retained percentage shall relieve the Contractor of any obligation to make good any defective work or material.

No compensation will be made in any case for loss of anticipated profits.

It is understood and agreed that the standard method, unit, or measurement, for payment set forth in these Standard Specifications may be modified or superseded in the Special Provisions which shall prevail.

If certain necessary or required work, normally considered to be unit Bid Items, are not listed in the Schedule of Bid Prices, such work shall be done as Incidental Work or included for payment in the lump sum price bid, as applicable.

113.02 PROGRESS ESTIMATES BY ENGINEER. - In order to assist the Contractor to prosecute the work advantageously, the Engineer, on or about the last day of each month, will make an estimate of the value of the work done and equipment and materials incorporated into the work by the Contractor; and the Engineer will also make such an estimate on or about the 15th day of the month when in his judgment the value of the work done and equipment and materials incorporated would result in a mid-month payment of \$50,000 or more.

These estimates will be of the value of the labor done and equipment and materials incorporated into the work since the Contractor commenced the performance of the contract. Such estimates need not be made by strict measurements, but may be approximate only, and shall be based upon the whole amount of money that will become due according to the terms of the contract when the whole of the work shall have been completed.

Further, in accordance with the provisions of Section 7.202 of the Charter, the estimate will include the value of acceptable equipment and materials not yet incorporated into the work, provided that all of the following conditions are met:

1. The advertisement for sealed proposals specifies that the contract provides for progressive payments for acceptable equipment and material purchased by the Contractor for the project and stored by the Contractor prior to actual physical incorporation into the project.
 2. The acceptable equipment and materials are listed in the Special Provisions as eligible for partial payment as equipment and materials.
 3. Such acceptable equipment and materials are either furnished and delivered to the site, or furnished and stored for use on the contract and such storage is within a 100 mile radius of City Hall.
 4. Prior written approval by the Engineer shall be obtained for each delivery to the site or warehouse.
 5. Title to stockpiled material shall be vested in the City at time of delivery to the site or warehouse.
 6. The Contractor shall obtain a negotiable warehouse receipt, endorsed over to the City, for material stored in an off-site warehouse.
- No payment will be made until endorsed receipts are delivered to the Engineer.
7. Stockpiled material shall be available for inspection by the City's authorized agents.
 8. After delivery of material, if any inherent or acquired defects are discovered therein, material shall be removed and replaced with suitable material at the Contractor's expense.

9. At his expense, the Contractor shall insure material against theft, fire, vandalism and malicious mischief, and shall deliver policy or certificate of such insurance to the Engineer naming the City as insured. Insurance shall not be cancellable for at least 30 days and cancellation shall not be effective until certificate thereof is given to the City.

10. Contractor shall submit bills of sale or invoices for all items on which he is requesting payment.

11. Nothing in the above ten (10) conditions shall relieve the Contractor of his responsibility for incorporating the material in the work in conformity with the Contract Documents.

12. The maximum payment for materials and/or equipment qualifying under the above paragraphs 1 through 11 will be 85% of the approved monthly estimate listing such materials and/or equipment. Such payment will in no case exceed the bid price for the item of work for which the material and/or equipment are furnished.

In making progress estimates, the Engineer may use the unit prices bid by the Contractor in his proposal. In case the said unit prices do not represent, in accordance with the provisions of Section 7.202 of the Charter, the actual value of the work, labor, equipment and materials furnished, the Engineer may estimate progressive payments based on prices reflecting such actual value.

In order to assist the Engineer in making the progress estimate on a lump sum contract or on a lump sum bid item, the Contractor shall submit to the Engineer within 15 days after award of the contract, a detailed schedule of the costs that comprise the lump sum contract or bid item. The schedule will be used only as a basis for determining progress estimates and shall equal in total the lump sum bid. The schedule shall be in such form and sufficiently detailed as to satisfy the Engineer that it correctly represents a reasonable apportionment of the lump sum.

113.03 PROGRESSIVE PAYMENTS. - Upon completion of each progress estimate made by the Engineer as set forth in the immediately preceding Section, the City will, subject to the provisions of Section 113.04 of these Standard Specifications, Section 7.202 of the Charter, or as otherwise specified in the Special Provisions, pay or cause to be paid to the Contractor in the manner provided by law, a progressive payment.

Each progressive payment will be in an amount equal to 90 percent of the Engineer's progress estimate, less previous payments made. However, when the Director determines that the contract is 50 percent or more complete, the Contractor is making satisfactory progress and there is no specific cause for greater withholding, progress payments may be made not to exceed in amount the lesser of either 95 percent of the value of the work and labor and equipment and material furnished or 95 percent of the contract price, and further, when the Director determines that the contract is 95 percent complete, funds withheld may be reduced to an amount equal to 125 percent of the estimated value of the work yet to be completed as determined by the Director.

When the amount of progressive payment calculated is less than \$1,000, such payment will be deferred until the amount due, based on subsequent estimates, is \$1,000 or more.

If the time allowed for completion is 45 or more working days, progressive payments will be made monthly.

If the time allowed for completion is more than 22 and less than 45 working days, only one progressive payment will be made.

This payment will be made when the Engineer's estimate shows that 90 percent or more of the work has been done.

If the time allowed for completion is 22 working days or less, no progressive payments will be made. However, if an extension of time of ten days or more is granted by the Director, one progressive payment will be made.

In the case of assessment contracts, no progressive payments will be made regardless of the time allowed for completion.

Payments requiring approval of an agency other than the City may be subject to the delay caused by obtaining such approval.

All estimates and payments made shall be subject to correction in any subsequent estimate and payment. Under no circumstances shall the making of a progressive payment be construed as an acceptance of any of the work under the contract.

113.04 PAYMENT MAY BE WITHHELD. - Payments may be withheld at any time if the work is not proceeding in accordance with the contract, or if, in the judgment of the Engineer, the Contractor is not complying with the requirements of the contract and specifications.

It is hereby understood and agreed that the City, before making each progressive payment, shall have received from the Contractor all required progress schedules and evaluations due.

113.05 FINAL INSPECTION, ACCEPTANCE AND FINAL PAYMENT. - Upon notification by the Contractor that the work is completed and ready for final inspection, the Engineer will make such inspection.

As soon as all necessary measurements and computations have been made, the Engineer will prepare the final estimate of the total value of the work done in accordance with the terms of the contract. The amount of the final estimate shall be the contract cost adjusted as provided in Section 112.

If the Engineer finds, after final inspection, that the work covered by the contract has been fully and satisfactorily completed, and upon the completion of his final estimate, and if such estimate is agreeable to the Contractor, the Engineer will so notify the Director, and recommend the acceptance of the work and final payment of the entire balance due the Contractor.

The issuance by the Director of the Order of the Department of Public Works accepting the work, and the receipt of a copy of such order of acceptance in writing, shall be authority for the Controller of the City and County of San Francisco to complete any payment due the Contractor under the contract. Promptly after the issuance of the Order, the Director will cause a copy thereof to be recorded in the Office of the Recorder of the City and County of San Francisco.

Acceptance of the work as provided hereinbefore, however, may be withheld if the final estimate made by the Engineer is not agreeable to the Contractor. In the event agreement on the final estimate cannot be reached, the Contractor shall immediately so inform the Engineer and within ten (10) days thereafter shall present his version of the final estimate and supporting calculations and data in writing to the Director. The Director will, within ten (10) days after receipt of such presentation, inform the Contractor of his decision which shall be final.

The final payment shall be the amount of the final estimate, less the sum of all progressive payments made as provided in Section 113.03 and less the amount of any sum or sums deducted in accordance with the provisions of the contract, and shall be made in the manner provided by law.

END PART 1

PART 2

STREETS AND HIGHWAYS

SECTION 200

PREPARATION AND COMPACTION

OF SUBGRADE

200.01 GENERAL. - Subgrade is the plane, curved, or warped surface on which subbase, base, pavement or sidewalk is to be placed. There may also be other subgrades, as that for the replacement of unsound subgrade material; the top of a layer of a material placed, considered the subgrade for the material to be placed immediately thereon; and trench subgrade.

Pavement subgrade, where untreated rock subbase is specified to be placed, will be the subgrade for such subbase.

Reference to any subgrade other than that for pavement subbase or base shall be particular and specific.

The Contractor shall do all the necessary or required shaping, grading and compacting so that the finished subgrades and graded ground within the limits of the work, will present a smooth, uniform surface and conform to the alignment, grades and contours shown on the plans and cross sections. The surfaces shall contain no local depressions that will hold water, and at intersections with undisturbed ground shall, by means of a uniform transition, conform thereto.

Areas to be paved shall be prepared to a subgrade at the proper depth below the required surface of the finished pavement.

Except as otherwise specified in the Special Provisions or shown on the plans, the elevation and cross section of the subgrade shall be such that the finished roadway pavement surface will be 6 inches below the top of sidewalk curb at the gutter, and will have a crown of 1.0, 0.8, or 0.6 percent of the roadway width between sidewalk curbs, when the street grade is respectively, 0 to 3 percent, greater than 3, to 6 percent, or greater than 6 percent.

Subgrade in cut shall be compacted in accordance with the requirements therefor of Section 707.

Where compacted native material would produce unsound subgrade, such material shall be removed as specified in Section 700.10.

Replacement backfill therefor, and the compaction thereof, shall be in accordance with the requirements of Sections 706 and 707.

Subgrade elevations shall not be raised or adjusted to compensate for anticipated settlement under the weight of the pavement.

Before pavement base or pavement is constructed adjacent thereto, the Contractor, unless otherwise specified or specifically allowed, shall construct the concrete curb required to replace existing concrete curb or granite curb that is not true to line or grade and payment for such work will be made under the appropriate Bid Item, if the Proposal contains such Bid Item.

The Contractor, immediately prior to placing the pavement or pavement base, shall check the subgrade for irregularities by means of a rigidly constructed, spiked template furnished by him. The spikes shall be placed at intervals not greater than 3 inches, center to center. The length and shape of the template and the protruding length of the spikes shall be such that the points of the spikes, when the template is moved along the headers or previously constructed pavement, as applicable, will accurately delineate the crown curve of the portion of subgrade being checked.

No pavement or base material of any kind shall be placed upon any section of subgrade not approved by the Engineer.

Unless otherwise specified in the Special Provisions, not less than 200 linear feet of subgrade shall be prepared in advance of paving operations. After a section of subgrade has been approved for pavement or pavement base construction, the Contractor, by adequate barricading, shall keep the section free of equipment and all traffic, and shall repair at his sole expense damage to any prepared subgrade from any cause whatsoever.

Where necessary, the subgrade shall be properly wetted down with water immediately in advance of laying the pavement.

200.02 PAYMENT. - Preparation of subgrade shall be done as Incidental Work and payment therefor shall be included in the price or prices bid.

SECTION 201 (Blank)

SECTION 202

CONCRETE CURB

202.01 GENERAL. - The Contractor shall construct concrete curb, complete in place, including depressed curb, doweled curb, that combined with concrete parking strip, and that to replace existing concrete curb or granite curb that is defective, out of line or not at proper grade; all where, as, and to the lines and grades shown on the plans, and where directed, and including excavating, preparing the subgrade, constructing and removing forms, providing required keyways, providing the longitudinal and grouted vertical reinforcing in doweled curb, the required verifying and marking of side sewer and Y-branch locations, providing construction joints, protecting, curing, backfilling, restoring pavement, painting, and all other Incidental Work. Unless otherwise specified, the nominal height of curb measured from gutter to top of curb shall be 6 inches.

Curb shall be depressed at automobile runways and driveways as shown on the plans. The fall across the curb at the driveways shall not be less than 3/4 of an inch. The length of the driveway depression shall be 9 feet exclusive of side slopes, except where directed by the Engineer, but shall not exceed 30 feet in length.

Existing sidewalk flags immediately adjacent to curb to be replaced, except over sidewalk basements, shall be removed to neat flag lines to facilitate construction of curb to the required lines and grades, and to insure that sidewalk will conform to such curb.

After the curb has been constructed and prior to the replacement of the sidewalk, the Engineer, to achieve more appropriate conform, may order additional flags of sidewalk removed. If the Proposal contains a Bid Item for pavement excavation and for sidewalk, removal and replacement of the sidewalk will be included for payment under such Bid Items.

Under no circumstances shall concrete curb and concrete sidewalk be constructed monolithically.

202.02 COMBINED CONCRETE CURB AND PARKING STRIP. - Concrete parking strip constructed monolithically with the curb will not be included for payment under a Bid Item for curb but will be paid for as concrete pavement. The line of demarcation for the purpose of payment shall be the intersection of the curb face with the concrete pavement at the gutter line. No additional payment will be made for monolithic construction.

202.03 SUBGRADE. - Subgrade for curb shall be prepared in accordance with the applicable requirements of Section 200, and at the level of the subgrade of the adjacent pavement or gutter. When untreated rock subbase is to be provided for the adjacent pavement, the subgrade for curb constructed prior to the laying of such subbase shall be level with the bottom of such subbase; if the subbase is constructed prior to the construction of curb then such compacted subbase shall extend to a line 18 inches behind the curb line and the surface thereof shall be the required subgrade for the curb.

202.04 FORMS. - The forms shall be smooth on the edges and on the sides against which concrete is to be placed. They shall be of sufficiently heavy material to be rigid, and shall be set securely so that the curb, when completed, shall conform accurately to the lines and grades given. No concrete shall be placed before the forms are in position for at least 50 feet ahead, or for the entire length of curb to be placed. They shall be thoroughly cleaned before each setting. All wooden forms shall be wetted before concrete is deposited against them. Except as otherwise shown on the plans, or required, the top of the curb shall be 6 inches above the adjacent gutter.

The forms shall extend to the full depth of the curb and all joints must be tight and even. On the front, the plank or metal must be of one piece to a depth of 3 inches below the gutter grade. The forms must be so set that the finished curb will be 6 inches wide on top, extend at least to the full depth of the pavement, and have a batter of 1 inch in 4 inches on the front. Conform to adjoining vertical curb shall be made with a 4-foot transition from battered to vertical face. The back face shall be vertical.

If the plans show that concrete curb shall contain keyways it shall be so constructed.

202.05 MARKING ON CURB FOR SIDE SEWERS, Y-BRANCHES AND OTHER LOCATIONS TO BE VERIFIED. - After setting the forms for concrete curb and before placing concrete, the Contractor, by exposing the top 3 inches of the redwood stake placed at the end of the side sewer in conformity with the provisions of Section 307.06, shall verify the locations of all side sewers constructed, reconstructed, or replaced, as the case may be, by him, but which are not to be placed in immediate service. If, for any reason, the stake is not found, the Contractor shall excavate and expose the pipe. The Contractor shall not cover the exposed stake or pipe, as the case may be, before the concrete work on the curb has been fully completed, nor before being directed to do so by the Engineer.

The letter "S" shall be stamped in the top of the curb over each side sewer which is not yet in service, as required in Section 307.06.

The letter "Y" shall be stamped in the top of the curb opposite each Y-branch from which a side sewer has not been constructed, as required in Section 316.05.

202.06 CONCRETE. - The concrete shall be Class 6-3000-3/4 as specified in Section 800.11.

202.07 PLACING CONCRETE. - The concrete shall be well-spaded close to the forms, properly vibrated, tamped and consolidated so that there will be no rock pockets in either the front or back surface for the full depth of the curb.

The top of the concrete shall be so tamped that an excess of mortar will be brought to the surface.

202.08 CONSTRUCTION JOINTS. - Construction joints shall be cold joint, or shall be constructed through the curb, at each street property line, and at intervals of 15 feet along the block, and shall be placed in alignment with dummy joints in existing concrete pavement or pavement base. In curb returns, the construction joints shall be so spaced that the perimeter shall, unless otherwise specified, be divided into equal lengths of not more than 16 feet, nor less than 5 feet. The joints along the straight curb shall be perpendicular to the top and face of the curb, and those along circular curbs shall be on radial lines. The edges at the joints shall be rounded to 1/8 inch radius with the proper edging tool.

202.09 FINISHING. - The front forms shall not be removed in less than two hours nor more than six hours after placing concrete therein; the back forms shall not be removed in less than twenty-four hours after such placement. Immediately after removing the front forms, the face and top of the curb shall be floated until the surface is true, even, and of a uniform color.

The front and back edges of the top of the curb shall be rounded to a radius of approximately 3/4 inch. These edges shall be straight and to a true grade, and no lip or shoulder shall be left between the rounded edge and the forms.

Curb shall then be troweled to smooth dense surfaces, the rounded edges thereof restored, and finally the surfaces shall be given a brush finish to achieve a non-slip slightly grainy texture.

The top and face of the finished curb shall be true and straight, and the top surface of curbs shall be of uniform width, free from humps, sags, or other irregularities. When a straightedge 10 feet long is laid on the top or face of the curb, the surface shall not vary more than 0.01 foot from the edge of the straightedge, except at grade changes or curves.

202.10 PROTECTION AND CURING. - The concrete shall be cured as specified in Section 800.16.

As soon as the back forms have been removed, the back of the curb shall be backfilled and an 18-inch wide berm constructed to the full height of the curb. Where curb has been constructed on fill, or the sidewalk area is below subgrade, the berm shall be at least 3 feet wide. Such protection shall be done as Incidental Work, and shall remain in place until the sidewalk is constructed.

202.11 DOWELED CURB. - Doweled concrete curb shall be constructed on the existing pavement where and as shown on the plans or specified. It shall be secured by No. 4 reinforcing bars grouted vertically with Class "B" mortar into holes drilled into the pavement at a spacing not greater than 4 feet on centers measured along the centerline of the curb. Such bars shall be 10 inches long and the holes therefor 6 inches deep. The Contractor shall reinforce the curb longitudinally with a continuous No. 4 bar seated one inch below the top of the vertical reinforcing and tied to it with No. 14 wire.

All requirements of this Section 202, to the extent that they reasonably can apply to the construction of doweled curb, apply in every respect.

Payment for doweled curb shall include full compensation for required longitudinal and grouted vertical reinforcing bars.

202.12 REPAIR AND REPLACEMENT. - Where any curb requires repair before acceptance, the repair shall be made by removing and replacing the entire section between joints and not by refinishing the damaged portion, or resetting a displaced section. Where the plans provide for the removal of existing curb and construction of curb, and the limit of the work specified does not fall on a curb joint, the curb constructed shall join the old curb at the first curb joint beyond the said specified limit.

202.13 PAINTING. - After all other work under the contract has been completed, the face and top of 8-inch concrete curb, including 8-inch doweled curb, shall be completely and uniformly painted with one coat of white traffic lacquer, or approved equal, applied in accordance with the manufacturer's recommendations.

202.14 PAYMENT. - Concrete curb and doweled curb, satisfactorily constructed as specified, each will be paid for at the respective

price bid per linear foot, measured horizontally along the curb line, including drop curb and the full curb return.

SECTION 203

COMBINED CONCRETE CURB AND GUTTER

203.01 GENERAL. - The Contractor shall construct concrete curb and gutter where, of the dimensions, and to the lines and grades shown on the plans, or where directed, complete in place, including excavating, backfilling, pavement restoration, and all other Incidental Work and in accordance with all applicable requirements of Section 202, except that, in the gutter area, the joints that are truly construction joints shall be as specified for such joints in Section 210.07 and shall be keyed, and other joints, spaced at 15-foot centers, shall be dummy joints as specified in Section 210.08.

The edge of the gutter shall be rounded with an 1/8-inch radius edging tool.

The back of the curb shall contain keyways except in drop curb sections. The longitudinal edge of the gutter shall contain keyways if shown on the plans.

Where the gutter grade is less than one percent, the concrete forming the gutter, for the entire length thereof, shall be carefully hand steel troweled for a distance of one foot out from the curb.

203.02 PAYMENT. - Combined concrete curb and gutter, satisfactorily constructed as specified, will be paid for at the price bid per linear foot, measured horizontally along the curb line, including drop curb and the full curb return.

SECTION 204

CONCRETE SIDEWALK

204.01 GENERAL. - The Contractor shall construct concrete sidewalk 3-1/2 inches thick, where and as shown on the plans or where directed, including excavating, backfilling, preparing the subgrade, constructing and removing forms, providing the specified joints and doing the required finishing, marking, protecting, curing and all other Incidental Work.

The concrete shall be Class 5.5-2500-3/4, as specified in Section 800, and shall be darkened by the addition thereto at the mixer of either:

- 1) lampblack in dry form, in accordance with the requirements of ASTM "Standard Specifications for Lampblack," Designation D209, in the proportion of from 1/2 to 3/4 pound per cubic yard of concrete; or
 - 2) an approved liquid or semi-paste black colorant intended for use integrally in concrete mixes.
- The proportion required, generally

from 10 to 40 ounces liquid measure per cubic yard of concrete, may be affected by the colorant used. Curing in this case shall be by the pigmented curing compound method.

The proportion of lampblack or other approved colorant, to a great extent dependent on the color of the cement used in the mix, shall be that required to properly darken the concrete to reduce glare, and shall be subject to the approval of the Engineer.

The proportion in batches for adjacent sidewalk shall be identical.

Sidewalk shall in no case be constructed monolithic with curb.

The limits of sidewalk removal and construction will be specified or shown on the plans. Beyond such limits, the removal and construction of sidewalk will be included for payment under Bid Items for such work only where specifically ordered by the Engineer.

Existing sidewalk flags immediately adjacent to curb to be reset or replaced, except over sidewalk basements, shall be removed to neat flag lines to facilitate the installation of curb to the required lines and grades, and to insure that sidewalk will conform to such curb. After the curb has been installed, and prior to the replacement of the sidewalk, the Engineer, to achieve more appropriate conform, may order additional flags of sidewalk removed. If the Proposal contains Bid Items for excavation and for sidewalk, removal and replacement of sidewalk will be included for payment under such Bid Items.

204.02 SUBGRADE. - The subgrade for sidewalk shall be prepared at least 3 inches below the required elevation of the sidewalk surface. The Contractor shall obtain a relative compaction of not less than 90 percent for the top six inches of sidewalk subgrade.

204.03 FORMS. - Forms shall be not less than 3 inches in depth, clean, smooth on the upper edge and on the side against which concrete is to be placed, shall be of sufficiently heavy material and braced so as to be rigid, and shall be set so that the sidewalk, when completed, will conform accurately to the required alignment and grades. The forms shall remain in place for not less than twelve hours after the finishing has been completed.

204.04 SLOPE. - Unless otherwise specified, the finished surface of the walk shall rise 1/5 inch per foot from curb grade to property line.

204.05 CONSTRUCTION. - Immediately before placing concrete, the forms and subgrade shall be thoroughly wetted. Immediately after the concrete has been placed it shall be thoroughly tamped so that the mortar will flush to the top, and the surface shall then be struck off with a straight edge.

All standards, street and traffic signs, parking meters, sewer trap vent frames and covers, including adjusting the length of riser therefor, oil tank filler pipe covers, and the like, that require resetting to the new sidewalk level, shall be reset by the Contractor to the proper elevations as Incidental Work.

204.06 FINISHING. - When the concrete has sufficiently set, it shall be floated to a true and uniform surface and finished with a steel trowel, after which the smooth surface shall be brushed transversely across the sidewalk with a bristle brush to produce a uniform, non-skid, texture. On grades over 10 percent a rougher surface will be required. This may be attained by lifting a wood float straight up from the surface of the concrete.

The surface shall be marked, with an 1/8-inch radius edging or scoring tool as applicable, into rectangles not less than 2.5 nor more than 4 feet on a side. These markings shall be made at every construction and weakened plane joint and the intervening space marked off equally. The markings in the completed sidewalk shall be well defined.

204.07 JOINTS. - Transverse joints in sidewalk shall extend across the entire width of the walk at right angles to the curb line. They shall be provided across sidewalk at the points of beginning and end of all curb returns, at lot lines, and additionally approximately 30 feet apart. Except for the lot line requirement, joints shall be located opposite a construction joint in concrete curb.

When the entire width of sidewalk is being replaced the Contractor shall place a transverse joint therein butting each end of each group of pull boxes.

Joints may be constructed by:

- 1) placing the concrete against -inch thick expansion joint filler material suitably supported perpendicular to the subgrade; or
- 2) cutting a neat straight line to a minimum depth of 2-inches, using an approved concrete saw; or
- 3) forming a weakened plane by use of a 2-inch x 2-inch x -inch steel tee; or
- 4) use of a keyed construction or "cold" joint.

No joint filler shall be installed when methods 2); 3) or 4) are employed.

No expansion joint material shall be placed at the juncture of the sidewalk with the curb.

204.08 STREET NAMES. - On all sidewalks constructed at street intersections the names of the intersecting streets shall be impressed, opposite the crosswalk or crosswalks, as approved by the Engineer, in letters and numerals 4 inches high and -inch deep.

204.09 PROTECTION AND CURING. - The protection and curing of concrete sidewalk shall be as specified in Section 800.16.

204.10 3--INCH CONCRETE PAVEMENT.

General. - 3--inch concrete pavement used to pave traffic islands shall be identical to 3--inch concrete sidewalk, except that the concrete shall not be darkened by lampblack or other colorant. Bidders shall include in the price bid for pavement all charges for the following Incidental Work.

Sand Fill. - Where islands are to be constructed over existing pavement, the Contractor shall furnish and place sand fill to subgrade for the 3--inch concrete pavement.

Painting. - After all other work in the area has been completed, the surface of the return areas at the ends of 3--inch concrete center islands 4 feet or less in width shall be completely and uniformly painted with one coat of white traffic lacquer, or approved equal, applied in accordance with the manufacturer's recommendations.

204.11 PAYMENT. - Concrete sidewalk and 3--inch concrete pavement, satisfactorily constructed as specified, each will be paid for at the respective price bid per square foot, measured horizontally.

The area of curb adjoining sidewalk, and areas occupied by curb inlets will not be included in measurements of area of sidewalk.

The areas of poles, standards, other fixtures, and of boxed-out locations for manhole and other castings and facilities, regardless of ownership thereof, will not be deducted from the areas of concrete sidewalk or 3--inch concrete pavement for which payment will be made.

SECTION 205

AGGREGATE BASE AND SUBBASE

205.01 GENERAL. - The Contractor shall construct mineral aggregate base or subbase, unless otherwise specified, 6 inches thick after compaction, spread and compacted to the lines, grades and dimensions shown on the plans and cross sections, and where directed, including preparing the subgrade and doing the required watering, shaping, smoothing and other Incidental Work.

205.02 MATERIALS. - The aggregate shall be free from vegetable matter and other deleterious substances. Aggregate for aggregate base shall consist of material of which at least 60 percent by weight shall be crushed particles as determined by Test Method No. Calif. 205.

The percentage composition by weight of aggregate base shall conform to one of the following gradings when determined by Test Method No. Calif. 202.

Unless otherwise specified in the Special Provisions, the particle size distribution shall be in accordance with the grading specified for 3/4-inch maximum size aggregate.

Sieve Sizes	Percentage Passing	
	1-1/2"	3/4"
	Maximum	Maximum
2"	100	.....
1-1/2"	90-100	.....
1" .....	.....	100
3/4"	50-85	90-100
No. 4	25-45	35-55

No. 30	10-25	10-30
No. 200	2-9	2-9

The aggregate base shall also conform to the following quality requirements:

Tests	Test Method	
	_No.Calif.	Requirements
Resistance (R-value)*	301	78 Min.
Sand Equivalent	217	30 Min.
Durability Index	229	35 Min.

*The R-value requirement will be waived provided the aggregate base conforms to the specified grading and durability and has a sand equivalent value of 35 or more.

The aggregate shall not be treated with lime, cement or other chemicals before the Durability Index test is performed.

Material yielding a maximum dry density of less than 112 pounds per cubic foot when tested in the laboratory in accordance with ASTM "Standard Methods of Test for Moisture-Density Relations of Soils, Using 10-lb. Rammer and 18-in. Drop," Designation D 1557, shall not be used.

Any rock, including red rock, meeting all the requirements of this Section will be acceptable. Such rock shall be plant processed at an approved processing plant.

205.03 SAMPLES AND TESTING. - At least ten working days prior to the use thereof, the Contractor shall submit to the Engineer a 120-pound sample of aggregate, graded as intended for use. This requirement shall be complied with for each aggregate and grading thereof that has not been approved. The Engineer will test the sample at no cost to the Contractor, and will determine the acceptability of the aggregate.

205.04 SPREADING. - Aggregate base material shall be delivered to the roadbed as uniform mixtures and each layer shall be spread in one operation.

At the time aggregate base is spread it shall have a moisture content sufficient to obtain the required compaction. Such moisture shall be uniformly distributed throughout the material.

The material shall be spread upon the subgrade prepared in accordance with the requirements of Section 200, by means of vehicles equipped with approved spreading devices at a uniform quantity per linear foot, which quantity will provide the required compacted thickness within the tolerances specified in Section 205.05.

Depositing and spreading shall commence at that part of the work farthest from the supply of base material and shall progress continuously without breaks, unless otherwise directed by the Engineer.

Where the required thickness is 6 inches or less, the base material may be spread and compacted in one layer. Where the required thickness is more than 6 inches, the base material shall be spread and compacted in two or more layers of approximately equal thickness,

and the maximum compacted thickness of any one layer shall not exceed 6 inches. Each layer shall be spread and compacted in a similar manner.

Base material placed in areas inaccessible to the spreading equipment, may be spread in one or more layers by any means that will make possible the specified compaction and surface.

When the subgrade for aggregate base consists of cohesionless sand, and written permission is granted by the Engineer, the base material may be dumped in piles upon the subgrade and spread ahead from the dumped material.

The base material, after spreading, shall be shaped by means of a blade grader to such thickness that after watering and compacting, the completed base will conform to the required grade and cross section within the tolerances specified in Section 205.05.

Segregation of aggregate shall be avoided and the base shall be free from pockets of coarse or fine material.

205.05 COMPACTING. - Immediately following spreading, shaping and smoothing, the full width of the base material shall be watered as ordered by the Engineer, and compacted by rolling with a minimum of two pieces of self-propelled reversible equipment.

Compaction shall be as follows:

1) For initial rolling use a 3-wheel steel-tired roller, weighing not less than 12 tons distributed so that the rear wheels will apply

to the surface being rolled not less than 325 pounds per linear inch of rear tire width. Rolling shall commence by covering completely the outer edge of the material. Subsequent passes shall lap at least 25 percent on previously rolled material.

2) For subsequent rollings use a pneumatic-tired roller of the oscillating type, having a width of not less than 4 feet and equipped with tires of equal size and diameter. Wobble wheel rollers will not be permitted. The tires shall be so spaced that the entire gap between adjacent tires will be covered by the tread of the following tire. The tires shall be inflated to 90 pounds per square inch minimum.

3) To compact all areas inaccessible to the rollers, use compressed air, or gas, powered tampers.

The foregoing equipment requirements serve as a standard of adequacy.

Subject to the condition that the Contractor shall notify the Engineer at least ten days in advance, and shall secure approval for the use of each piece of compacting equipment other than that specified, selection thereof and obtainment of the specified compaction throughout the volume of base, and the specified surface, shall be solely the responsibility of the Contractor.

If compaction is not uniform or tests show it to be inadequate, or if the surface is unsatisfactory, the Engineer may require the use of other or additional equipment.

Should low or high spots develop during rolling operations, such spots shall be smoothed out by blading with a self-propelled and pneumatic-tired motor grader having a wheelbase not less than 15 feet long and a blade not less than 10 feet long.

Aggregate base shall be watered after compaction. Water shall be applied at the rate and in the quantities ordered by the Engineer.

The relative compaction of aggregate base, determined by tests of the in place, field compacted base shall be not less than 95 percent of the maximum compaction at optimum moisture content determined by ASTM Methods of Test, Designation D 1556 and Method C of Designation D 1557. The tests will be conducted and evaluated in the laboratory by the City at no cost to the Contractor.

The surface of the finished aggregate base at any point shall not vary more than 0.05 foot above or below proper grade, and such surface shall contain no ridges, valleys or sharp breaks.

Finished base that does not conform to the foregoing requirement shall be reshaped or reworked, watered, and thoroughly recompact to conform thereto.

The Contractor shall not allow any completed untreated rock base to be subjected to public or construction traffic, except the latter necessary to the completion of the overlying surface course.

205.06 PAYMENT. - Aggregate base, or subbase, of the specified thickness after compaction, satisfactorily constructed as specified, will be paid for at the price bid per square foot, measured horizontally, or at the price bid per ton, as specified in the Schedule of Bid Prices.

If paid for by the square foot, aggregate base or subbase constructed adjoining curb will be measured from the face of the curb at a depth of 6 inches below the top of curb, irrespective of the actual depth.

If paid for by the square foot, the areas of poles, standards, other fixtures, and of boxed-out locations for manholes and other castings and facilities, regardless of ownership thereof, will not be deducted from the areas of aggregate base or subbase for which payment will be made.

If paid for by the ton, the weight of all water above that contained by the aggregate at optimum moisture content will be deducted from the weight to be paid for.

If paid for by the ton, all satisfactorily completed aggregate base or subbase constructed in conjunction with the setting and resetting, as the case may be, of castings and, in accordance with the requirements of Section 217, specified to be done by the Contractor, will be paid for under the Bid Item for aggregate base or subbase.

SECTION 206

CEMENT TREATED AGGREGATE BASE

206.01 GENERAL. - The Contractor shall construct cement treated aggregate base, unless otherwise specified 6 inches thick after compaction, where and to the lines and grades shown on the plans or directed, including submitting the required aggregate samples,

preparing the subgrade, doing the required watering, spreading, compacting, and trimming, furnishing and applying curing seal, and doing other Incidental Work.

206.02 PORTLAND CEMENT. - Portland cement shall be in accordance with Section 800. The quantity of cement to be added to the aggregate shall be between 2- percent and 5 percent by weight of the dry aggregate. The actual percentage to be used shall be as required to achieve design strength.

206.03 MINERAL AGGREGATE. - Aggregate for cement treated aggregate base, immediately prior to mixing, shall conform to the following requirements:

Aggregate shall be clean and free from vegetable matter and other deleterious substances, and shall not be treated with lime, cement or other chemicals prior to being tested for Sand Equivalent value.

The aggregate, prior to mixing with cement, shall have a Sand Equivalent of not less than 30 when tested by Test Method No. Calif. 217.

Aggregate shall be of such quality that when mixed with portland cement in an amount not exceeding 5 percent by weight of the dry aggregate and compacted at optimum moisture content, the compressive strength of a sample of the compacted mixture shall not be less than 750 pounds per square inch at 7 days, when tested by Test Method No. Calif. 312 modified as follows:

1)Optimum moisture content of the cement treated aggregate base shall be determined using the procedures outlined in ASTM "Standard Methods of Test for Moisture-Density Relations of Soils, Using 10-lb. Rammer and 18-in. Drop," Designation D 1557.

2)Compaction of the test specimens shall be as outlined for Method C in ASTM Methods of Test, Designation D 1557.

3)Capping compound shall be sulphur instead of plaster of Paris.

The percentage composition by weight of aggregate shall conform to the following grading when determined by Test Method No. Calif. 202, modified by Test Method No. Calif. 105 when there is a difference in specific gravity of 0.2 or more between the coarse and fine portion of the aggregate or between blends of different aggregates. Coarse aggregate is material retained on the No. 4 sieve and fine aggregate is material passing the No. 4 sieve.

Sieve Sizes	Percentage Passing
1"	.....100
3/4"	.....90-100
No. 4	.....40- 70
No. 30	.....12- 40
No. 200	.....3- 15

206.04 MIXING. - Cement treated aggregate base shall be mixed at a central mixing plant by either batch type mixing using

revolving blade or rotary drum mixers or continuous mixing. Weight or volumetric proportioning may be employed. The resulting mix shall be equal to that produced by weight proportioning and batch type mixing.

The water shall be proportioned by weight or volume and there shall be means by which the Engineer may readily verify the amount of water per batch or the rate of flow for continuous mixing. The time of the addition of water or the points at which it is introduced into the mixer, shall be as approved by the Engineer.

Cement shall be added in such a manner that it is uniformly distributed throughout the aggregates during the mixing operation.

The mixers used must be able to produce uniformly mixed batches. The charge in a batch mixer, or the rate of feed to a continuous mixer, shall not exceed that which will permit complete mixing of all the material. The materials shall be mixed for not less than thirty seconds after all the ingredients are in the mixer.

The mixer materials shall be protected by covers against moisture loss while being transported to the site.

206.05 SPREADING. - The subgrade, prepared in accordance with the requirements of Section 200, shall be moistened immediately prior to the spreading operation.

The mixing materials shall be deposited and spread with a self-propelled spreader, ready for compaction with a minimum of shaping with a motor grader. Equipment not propelled by the unloading vehicle will be considered self-propelled. The spreader shall be provided with a screed that strikes off and distributes the materials to the required width and thickness.

Depositing and spreading shall commence at that part of the work farthest from the supply of base material and shall progress continuously without breaks, unless otherwise directed by the Engineer.

If a spreader box is used, it shall at all times during the simultaneous operation thereof and receipt of materials thereby, push the vehicle that has transported the cement treated base material in a manner such that the latter exerts a downward force on the spreader box sufficient to force spreading and screeding at the proper grade with no "riding up" on the deposited material. Further, in all cases there shall be positive provision preventing the spreader box from contacting the rear wheels of the transporting vehicle during the pushing operation.

The mixed materials shall be deposited and spread in one lift if the thickness is to be not more than 6 inches, and in this case depositing in layers will not be allowed. If the thickness is to be more than 6 inches, the base shall be spread and compacted in two layers of approximately equal thickness, and the surface of the compacted material shall be kept moist until covered with the next layer.

Cement treated aggregate base placed in areas inaccessible to the spreading equipment may be spread by any means that will achieve the specified compaction and surface.

206.06 COMPACTING. - Immediately following the spreading operation, the mixed materials shall be compacted in the manner and to the degree and accuracy of surface specified in Section 205.05, except that the shifting of material by a motor grader to smooth low and high spots that develop during rolling will not be allowed, nor will any reshaping or reworking of the cement treated aggregate base, although high spots may be trimmed, provided the excess material is removed and immediately disposed of, no loose material is left on the base, and the area is again rolled.

Except for the aforementioned trimming, cement treated aggregate base, the finished surface of which is outside the specified tolerances, or which is otherwise unsatisfactory, shall be neatly cut out, immediately removed from the site and replaced with fresh material properly compacted as hereinbefore specified.

When cement treated base is spread and compacted in more than one layer, each lower layer shall be compacted to the required degree of compaction before placing the next layer.

Not more than two hours shall elapse between the time water is added to the aggregate and cement, and the time of completion of initial rolling. Not more than three hours shall elapse between the time water is added to the aggregate and cement and the time of completion of final rolling after any required trimming.

The surface of the compacted cement treated aggregate base shall be kept moist until the curing seal is applied.

The Contractor shall not allow any completed cement treated aggregate base to be subjected to public or construction traffic, except the latter necessary to the completion of the overlying surface course.

206.07 CONSTRUCTION JOINTS. - At the end of each day's construction and when cement treated base operations are delayed or stopped for more than two hours, a construction joint shall be made in the thoroughly compacted material, normal to the centerline of the roadway. Additional material shall not be placed until the construction joint has been approved by the Engineer.

Longitudinal joints when necessary shall be constructed by cutting vertically into the existing edge for approximately 3 inches.

Material cut away may be disposed of in the adjacent area to be constructed. The face of the cut joints shall be moistened in advance of placing the adjacent base.

206.08 CURING SEAL. - The complete surface of the cement treated aggregate base shall be covered with an emulsified asphalt curing seal. Emulsified asphalt shall be as specified in Section 212.06, and in accordance with the specifications for Grade SS-1 of the Asphalt Institute. Application shall be at the rate of 0.15-gallon per square yard.

The emulsion may be diluted with water up to a ratio of one to one, as required, as determined by the Engineer, for the application of a thin uniform coat. The rate of application of the originally specified emulsion, however, shall remain 0.15-gallon per square yard regardless of dilution.

The curing seal shall be applied as soon as possible, but not later than eight hours after completion of final rolling.

206.09 PAYMENT. - Cement treated aggregate base of the specified thickness after compaction, satisfactorily constructed as specified, will be paid for at the price bid per square foot, measured horizontally.

Cement treated aggregate base constructed adjoining curb will be measured from the face of curb at a depth of 6 inches below the top of curb, irrespective of the actual depth.

The areas of poles, standards, other fixtures, and of boxed-out locations for manhole and other castings and facilities, regardless of ownership thereof, will not be deducted from the areas of cement treated aggregate base for which payment will be made.

SECTION 207

CONCRETE BASE

207.01 GENERAL. - The Contractor shall construct concrete base where and as shown on the plans, 6 inches thick unless otherwise specified, including preparing subgrade, constructing and removing side forms, providing the specified joints, and calcium chloride in the mix if required or used, and doing the required finishing, protecting, curing and other Incidental Work. The concrete therefor shall be properly and uniformly distributed and thoroughly and adequately vibrated, screeded and tamped by a machine or machines, self-propelled and supported on the required side forms, or on adjacent pavement base or pavement in accordance with the hereinafter specified restrictions on such support. Vibrators independent from the self-propelled machine shall not rest on the side forms.

207.02 SUBGRADE. - The adjustment of manhole frames and other castings and the preparation of subgrade shall be as specified in Sections 200 and 217, respectively. The Contractor shall obtain a relative compaction of not less than 95 percent for the top 6 inches of subgrade for concrete base.

207.03 SIDE FORMS. - Side forms shall be used. Wood forms shall be a minimum of 2 inch nominal thickness and shall be properly supported by blocking or other approved means so that no settlement occurs. They shall be clean, straight, of uniform section, free from defects, and shall be constructed to form parallel strips not more than 24 feet, nor less than 4 feet, wide. Side forms shall be of the required depth in one piece, and be such as to form the keyway hereinafter specified for longitudinal joints. The strips shall be constructed to coincide with vehicular traffic lanes unless otherwise specified or shown.

Where, as specified in Section 207.05, a self-propelled vibrating, screeding and tamping machine is not required, the maximum width of strip shall be reduced to 14 feet.

The forms shall be placed true to line and grade and rigidly stayed. There shall be no lateral or vertical movement of the forms while the concrete is being spread or finished.

Top surfaces of side forms shall be set to the same elevation as that of the finished concrete base. The depth of side forms shall be equal to the specified thickness of the concrete base.

After the side forms have been accurately and securely set to line and grade, the Contractor shall check the subgrade with a scratch template as specified in Section 200.01. The template shall be supported on the side forms, previously poured concrete strips, or both, as applicable, and shall be carefully drawn the full length of the subgrade to check the grade. High spots shall be cut down to grade and low spots filled and satisfactorily compacted to grade.

At least 200 feet of subgrade and side forms shall be prepared in advance of the placement of concrete. After the subgrade and side forms for any strip have been prepared and accepted, barricades shall be so placed that there will be no equipment or traffic of any kind thereon.

No adjustment shall be made in the subgrade to allow for anticipated settlement under the pavement load, and no direct or additional payment will be made for additional concrete used, or claimed to have been used, on account of such settlement.

207.04 CONCRETE. - Concrete for concrete base shall be Class 5.5-3000-1, in accordance with the requirements of Section 800.

The Contractor, with the approval of the Engineer, may use the admixture of 2 pounds calcium chloride per sack of cement to accelerate the setting of the concrete in accordance with the provisions of Section 800.08.

207.05 PLACING CONCRETE. - The use of an approved self-propelled, mechanical, concrete vibrating, screeding and tamping machine will be required unless otherwise specified in the Special Provisions, or unless restricted space does not permit the use thereof.

Immediately before placing concrete, the subgrade shall be watered with a spray nozzle to the extent that it will not absorb any moisture from the concrete, but there shall be no standing water on the subgrade. After the subgrade has been wetted in the manner set forth hereinbefore, the concrete shall be placed in accordance with the requirements of Section 800.14, and spread so that the vibrated, screeded and tamped base will be of the required thickness and cross section and at the required grade.

The self-propelled, mechanical, concrete vibrating, screeding and tamping machine used shall have, in addition to the spreading, screeding, and vibratory compaction action, a tamping or kneading action, and shall produce a surface satisfactory to the Engineer.

The machine may ride on adjacent existing or newly constructed pavement base or pavement. Such arrangement, however, must satisfy the Engineer, and the Contractor shall make any required correction to the surface of such base or pavement and provide required protection of the surface and of the edge thereof.

The concrete shall be evenly distributed in front of the machine to prevent unequal loads against the front cut-off screed or screeds.

The machine shall be maintained in perfect operating condition, and the screeds shall hold their crown as set.

Coordination of the forward speed of the machine and the lateral movement of the screeds must be such as to prevent ridging of the concrete surface.

The final action of the vibrating, screeding and tamping machine shall in all cases be accomplished by the use of burlap, leather or other approved type of flexible drag, attached properly to the rear of the machine. The drag shall leave the surface of the concrete ridgeless, even and uniform. Should there be any rock pockets or voids in the surface after the passage of the machine, they shall be immediately repaired by adding concrete, thoroughly working it in, and restoring the surface of the base.

The finished surface of the concrete base shall be smooth and free from texture disfigurations caused by floats or any other type of equipment or tools used to remove surface defects. Such tools may be used, but after their use a final pass must be made with the machine.

The vibrating, screeding and tamping machine shall back up and pass over the surface as many times as are necessary to establish a true and even crown and a ridgeless, even and uniform surface over the entire pavement base area.

If an approved vibrating, screeding and tamping machine is not used, all concrete placed shall be vibrated in accordance with the requirements of Section 800.14, and then tamped with a transverse tamper until the surface is dense and smooth. Should there be any rock pockets or voids in the surface after tamping, they shall be immediately repaired by adding concrete, thoroughly working it in, and retamping to restore the surface of the base.

207.06 CONSTRUCTION JOINTS.

General. - At the beginning and end of every strip not in contact with existing pavement base, at the end of each day's construction, or where the placing of concrete is interrupted for a period of one hour or more, a vertical construction joint shall be provided prior to the resumed placing of concrete. The construction joint shall be formed by finishing the base square across the strip against a header, 3 inches thick, of a width equal to the depth of the base, and shaped so that it will form a keyway as shown on the plans.

The header shall conform to the correct cross section of the base, shall be placed perpendicular to the subgrade, and its top shall be at all points at the correct elevation at the top of the base.

The concrete shall not be edged.

Prior to the resumption of work, surplus concrete on the subgrade shall be cleared away, and the header shall be removed in such a manner as to avoid damage to the edge of the concrete.

Longitudinal Joints. - Longitudinal joints between adjacent pours of concrete base, between concrete base and concrete parking strip or gutter, and between concrete base and curb, shall be keyed as shown on the plans.

The keyway shall be formed in the first of adjacent pours.

Where adjacent pours are 8-inch thick concrete base and concrete parking strip or gutter, the vertical position of the keyway and key shall be as shown on the plans.

The concrete shall not be edged.

207.07 DUMMY JOINTS.

General. - Transverse dummy joints shall be placed at 15 feet on centers, for the full width of the pavement, in alignment with the joints of adjacent concrete pours, and at right angles to the centerline of the street. Each joint shall be constructed by forming a transverse groove in the pavement base and installing therein a formed strip of joint insert, as shown on the plans.

Joint Filler Strip. - Each joint filler strip shall be an approved one-piece premolded strip at least 1-3/4 inches, and not more than 2 inches, wide, sufficiently long to extend the full width of the pavement less 1/2-inch. Splicing of a joint filler strip will not be permitted, except that where pour widths exceed 12 feet one splice will be permitted. The thickness of the strip shall not exceed 1/4-inch and shall be uniform within a variation of not more than 10 percent.

Joint filler strip shall be in accordance with the requirements of ASTM "Standard Specifications for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction," Designation D 1751.

Construction. - Following the pass of the vibrating and screeding equipment, but before the final dragging or brushing, the joint groove shall be formed by means of an iron cutter with a blade at least 3 inches in depth and 1/4-inch thick. The cutter shall have some means of controlling the depth of insertion and shall not have any horizontal surfaces, except the edge, that contact the concrete. A movable bridge supported on the forms or adjacent concrete shall be provided to assure minimum disturbance to the concrete during joint construction operations. The bridge shall be at least 2 inches clear of the concrete surface when loaded with 300 pounds at its center and supported on the forms or adjacent pavement.

The depth of the groove shall be at least equal to, and not more than 1/4-inch greater than the width of the filler strip to be used.

The steel cutter shall be cleaned after each insertion into the concrete, or the Contractor may use any means approved by the Engineer that will prevent adherence of mortar and aggregate to the cutter and resultant disturbance of the concrete during cutting operations.

The steel cutter shall be mechanically vibrated at a rate of 3,500 vibrations per minute by use of at least one vibrator.

At all times during the cutting operations, such vibrators shall be activated.

The joint filler strip shall then be placed in the groove by means of a metal installing device consisting of sheet metal backing plates with one side the full depth of the strip and the other side extending down 3/4-inch along the opposite side of the strip. The ends of the installing device shall be equipped with an adjustable gauge resting on each side form to control the depth to which the strip is placed. The installing device shall be sufficiently rigid to hold the strip in exact position, and the overall thickness shall not be greater than that necessary to install and release the strip readily.

The Engineer reserves the right to order discontinued, the use of any equipment or material which in his opinion fails to produce a satisfactory joint under the methods employed by the Contractor.

The filler strip shall be placed into the groove completely across the width of the slab, so that the top of the strip is within 1/4-inch of the adjacent concrete surface. Any strip damaged in installing, or during any work on the pavement base, shall be replaced with an undamaged strip.

The concrete shall not be edged and shall be continuous over the insert.

After pavement side forms have been removed, any concrete which has flowed around the ends of the strip shall be removed.

Expansion joints shall not be constructed in concrete base.

207.08 PROTECTION AND CURING. - Concrete base shall be protected and cured in accordance with the requirements of Section 800.16.

No equipment, or public or other traffic shall be allowed on concrete pavement base, nor shall asphalt concrete wearing surface be placed thereon until ten days after the pavement base has been placed, except that when calcium chloride is used in accordance with the requirements of Section 800.08 as an admixture to accelerate the setting of concrete base, public traffic may be allowed thereon only after at least twenty-four hours have elapsed since the completion of all placement of such concrete.

The placement of asphalt concrete wearing surface on such pavement base by use of a self-propelled spreading and finishing machine, however, will not be allowed until forty-eight hours have elapsed since the completion of the placement of the concrete.

In no case shall concrete base remain without wearing surface for more than fourteen days.

207.09 PAYMENT. - Concrete base of the specified thickness, satisfactorily constructed, complete in place as specified, will be paid for at the price bid per square foot, measured horizontally.

Concrete pavement base constructed adjoining curb will be measured from the face of curb at a depth of 6 inches below the top of curb, irrespective of the actual depth.

The areas of boxed-out locations for manhole and other castings and facilities, regardless of ownership thereof, will not be deducted from the areas of concrete pavement base for which payment will be made.

SECTION 208

ASPHALT CONCRETE BASE

208.01 GENERAL. - The Contractor shall construct asphalt concrete base, 6 inches thick unless otherwise specified, consisting of asphalt and graded mineral aggregate proportioned and mixed at a central mixing plant, and spread and compacted to the lines, grades, cross sections and thicknesses shown on the plans, or where directed, including preparing the subgrade, furnishing and applying paint binder, and doing all other necessary or required Incidental Work.

208.02 ASPHALT. - Asphalt shall be AR-4000 steam refined paving asphalt, in accordance with all current applicable requirements and specifications of the Asphalt Instituted and the Uniform Pacific Coast Specifications for Paving Asphalt. The amount thereof to be used shall be between 4 and 5.5 percent by weight of the dry mineral aggregate.

A test report shall be furnished in accordance with the requirements of Section 212.02.

208.03 AGGREGATE. - Mineral aggregate shall be in accordance with the quality requirements set forth in Section 212.03.

The combined dry mineral aggregate shall have a particle size distribution such that the percentage composition by weight, determined by test using standard sieves of square mesh wire construction, will be in accordance with the following grading requirements:

Sieve Sizes	Percentage Passing
1".....	100
3/4".....	95-100
3/8".....	65- 80
No. 4	49- 54
No. 8	36- 40
No. 30.....	18- 21
No. 200	3- 8

208.04 PROPORTIONING AND MIXING. - The mineral aggregate shall be prepared and proportioned, and mixed with the asphalt, as specified in Section 212.05.

208.05 SUBGRADE. - Before placing asphalt concrete base, the subgrade shall be prepared as provided in Section 200. The Contractor shall obtain a relative compaction of not less than 95 percent for the top 6 inches of subgrade for asphalt concrete.

208.06 PAINT BINDER. - Paint binder, mixing type asphaltic emulsion, SS-1, shall be furnished and applied as specified in Section 212.06.

208.07 SPREADING EQUIPMENT AND SPREADING. - Spreading, and equipment therefor, shall be in accordance with the requirements of Sections 212.07 and 212.08, supplemented as follows: Unless the specified thickness of the base after compacting is 3 inches or less the base shall be spread and compacted in two or more courses, each in the manner specified.

No asphalt concrete base shall be spread when the temperature is below 50 Fahrenheit or when the subgrade is wet.

208.08 COMPACTION. - Immediately after the base has been spread it shall be compacted with power rollers in first-class mechanical condition. Roller sprinkler systems shall operate satisfactorily in all respects.

The Contractor shall furnish and use, for each asphalt paver furnished, a minimum of two rollers of the types and employed as follows:

1)Initial or breakdown rolling shall consist of one complete coverage with a steel-tired three-axle tandem, two-axle tandem or three-wheel roller, weighing not less than 12 tons, operating with a drive wheel toward the paver.

2)Final rolling shall follow the initial or breakdown rolling and shall consist of three complete coverages with a pneumatic-tired roller while the temperature of the mixture is at or above 150F.

The pneumatic-tired roller shall be the oscillating type having a width of not less than 4 feet and equipped with pneumatic tires

of equal size and diameter. Wobble-wheel rollers will not be permitted. The tires shall be so spaced that the gap between adjacent

tires will be covered by the tread of the following tire. The tires shall be inflated to 90 pounds per square inch or such lower

pressure designated by the Engineer, and maintained so that the air pressure will not vary more than 5 pounds per square inch from

the designated pressure. The roller shall be so constructed that its total weight can be varied to produce an operating weight per

tire of not less than 2,000 pounds. The total operating weight of the roller shall be varied as directed by the Engineer.

When the total amount of asphalt concrete base included in the contract is 1,000 tons or less, rolling may be in accordance with the following alternative requirements:

The Contractor shall furnish and use a minimum of one steel-tired 2-axle tandem roller, weighing not less than 8 tons, provided it

is demonstrated to the satisfaction of the Engineer that such a roller can perform the work.

Rolling shall consist of sufficient coverages to produce a surface thoroughly compacted, smooth, and free from ruts, humps, depressions, or irregularities.

Restricted areas inaccessible to power rollers may be compacted by rolling with the wheels of a loaded truck of not less than 5 tons capacity, or by hot tampers.

208.09 PAYMENT. - Asphalt concrete base of the specified thickness, satisfactorily constructed, complete in place as specified,

will be paid for at the price bid per square foot, measured horizontally, or at the price bid per ton, as specified in the Schedule of Bid Prices.

If paid for by the square foot, asphalt concrete base constructed adjoining curb will be measured from the face of the curb at a depth of 6 inches below the top of curb, irrespective of the actual depth. The areas of boxed-out locations for manholes and other castings and facilities, regardless of ownership thereof, will not be deducted from the areas of asphalt concrete base for which payment will be made.

If paid for by the ton, all satisfactorily completed asphalt concrete base constructed in conjunction with the setting and resetting, as the case may be, of castings and, in accordance with the requirements of Section 217, specified to be done by the Contractor, will be paid for under the Bid Item for asphalt concrete base.

SECTION 209

ASPHALT CONCRETE BASE - THICK LIFT

209.01 GENERAL. - The Contractor shall construct thick lift asphalt concrete base, consisting of asphalt and graded mineral aggregate proportioned and mixed at a central mixing plant, and spread and compacted in layers not exceeding 5 inches compacted thickness to the lines, grades, cross sections and thicknesses shown on the plans, or where directed, including preparing the subgrade, and doing all other necessary or required "Incidental Work."

The Contractor shall give the Engineer 24 hours notice prior to placing asphalt concrete.

209.02 ASPHALT. - Asphalt shall be AR-4000 steam refined paving asphalt, in accordance with all current applicable requirements and specifications of the Asphalt Institute and the Uniform Pacific Coast Specifications for Paving Asphalt. The amount thereof to be used shall be between 5 and 6.5 percent by weight of the dry mineral aggregate. The exact percent to be used shall be determined by the Engineer.

A test report shall be furnished in accordance with the requirements of Section 212.02.

209.03 AGGREGATE. - Mineral aggregate shall be 3/4-inch maximum aggregate in accordance with the quality and grading requirements set forth in Section 212.03.

209.04 PROPORTIONING AND MIXING. - The mineral aggregates and asphalt binder shall be mixed at a central mixing plant. The aggregates and asphalt binder may be proportioned either by weight or by volume.

Aggregate shall be stored dried, heated and proportioned in a manner that will give a combined grading within the specified grading limits and satisfactory to the Engineer.

Drying shall continue for a sufficient time and at a sufficiently high temperature to reduce the average moisture content so that at the completion of mixing operations and also at the time of spreading the mixture, the amount of moisture in the mixture shall not exceed one percent.

The drier shall be provided with a heat indicating device in order that the temperature of the aggregate leaving the drier may be determined. The heat indicating device shall be accurate to the nearest 10F., and shall be installed in such a manner that a fluctuation of 10F. in the aggregate temperature will be shown by the heat indicating device within one minute.

Any evidence of segregation, degradation, or improper combining of aggregate will be cause for rejection of the asphalt concrete containing such aggregate.

Uniformity of distribution of asphalt will be determined by extraction tests in accordance with Test Methods Nos. Calif. 309 or 310. The weight of asphalt per 100 pounds of dry aggregates shall not vary by more than 5 percent above or 10 percent below the amount designated by the Engineer. This requirement shall apply to samples taken from a single batch, successive batches, at different locations in the plant, or at any location or operation designated by the Engineer.

Paving asphalt used as binder shall be added to the aggregate at a temperature of not less than 275F., nor more than 375F.

When paving asphalt is used as a binder, the temperature of the aggregates at the time of adding the binder shall not be less than 250F., nor more than 325F.

Mixing shall continue until a homogeneous mixture of uniformly distributed and properly coated aggregates of unchanging appearance is produced. In general, the time of mixing shall not be less than 30 seconds, except that the time may be reduced when in the opinion of the Engineer the sizes of aggregate are uniformly distributed and all particles are thoroughly and uniformly coated with asphalt binder.

209.05 SPREADING EQUIPMENT AND SPREADING. - Asphalt concrete base shall be placed and spread with a paving machine or other approved spreading device.

All mixture shall be spread at a temperature not less than 250F., or as directed. The base may be spread and compacted in layers not exceeding 5 inches compacted thickness. The first layer shall be at least 4 inches thick.

209.06 COMPACTION. - Immediately after the base has been spread it shall be compacted with power rollers in the following operating sequence:

Either (1) initial or breakdown rolling with a steel-wheeled roller, final rolling with a pneumatic-tired roller and finish rolling with a steel-wheeled roller, or (2) initial or breakdown rolling with a pneumatic-tired roller and final rolling with a steel-wheeled roller.

A minimum of ten complete rolling coverages shall be completed prior to the time the mix temperature falls below 200F. in the center of the lift. Rolling from the center to the edge will be permitted for layers in excess of 3 inches compacted thickness.

Steel-tired roller shall be three-axle tandem, two-axle tandem or three-wheel roller weighing not less than 12 tons.

Pneumatic-tired roller shall be as follows:

1)for initial rolling, equipped with 9.00 x 20 tires capable of being loaded to 4,000 pounds at 80 pounds per square inch inflation pressure;

2)for final rolling, equipped with 8.0 x 15 tires capable of being loaded to 3,000 pounds at 80 pounds per square inch inflation pressure.

The tires of the pneumatic roller shall be treated with a parting compound or other suitable agent to prevent "pickup."

209.07 PAYMENT. - Asphalt concrete base, satisfactorily constructed, complete in place, as specified, will be paid for at the price bid per ton.

All satisfactorily completed thick lift asphalt concrete base constructed in conjunction with the setting and resetting, as the case may be, of castings and, in accordance with the requirements of Section 217, specified to be done by the Contractor, will be paid for under the Bid Item for thick lift asphalt concrete base.

SECTION 210

CONCRETE PAVEMENT

210.01 GENERAL. - The Contractor shall construct, where and as shown on the plans, concrete pavement 7 inches thick, and concrete parking strip 8 inches thick monolithic with the adjacent concrete curb, unless other thicknesses are specified, including preparing subgrade, constructing and removing side forms, providing the specified joints, and calcium chloride in the mix if required or used and doing the required finishing, protecting, curing and other Incidental Work. The concrete therefor shall be properly uniformly distributed, and thoroughly and adequately vibrated, screeded and tamped by a machine or machines, self-propelled and supported on the required side forms, or on adjacent pavement base of pavement in accordance with the hereinafter specified restrictions on such support. Use of the machine will not be required where the steepness of slope precludes the practical use thereof. Vibrators independent from the self-propelled machine shall not rest on the side forms.

Concrete pavement 3 inches thick shall be constructed as specified in Section 204.10.

Concrete curb constructed monolithic with concrete pavement will not be included for payment under a Bid Item for concrete pavement. No additional payment will be made for monolithic construction.

Where concrete pavement gutter grade adjacent to the curb is less than one percent, the concrete forming the gutter, for the entire length thereof, shall be carefully hand steel troweled for a distance of one foot out from the curb.

210.02 SUBGRADE. - The adjustment of manhole frames and other castings and the preparation of subgrade shall be as specified in Sections 217 and 200, respectively. The Contractor shall obtain a relative compaction of not less than 95 percent for the top 6 inches of concrete pavement subgrade.

210.03 SIDE FORMS. - Metal side forms shall be constructed in accordance with the requirements of Section 207.03, and the other provisions of such Section shall be complied with.

210.04 CONCRETE. - Concrete for concrete pavement shall be Class 5.5-3000-1, in accordance with the requirements of Section 800, except that when construction is monolithic with curb the concrete shall be Class 6-3000-3/4.

The Contractor, with the approval of the Engineer, may use the admixture of 2 pounds calcium chloride per sack of cement to accelerate the setting of concrete in accordance with the provisions of Section 800.08, except the use of calcium chloride will not be allowed in construction monolithic with curb.

210.05 PLACING CONCRETE. - Placing concrete shall be as specified in Section 207.05.

210.06 FINISHING. - The concrete shall be finished with a rigid straight edge float, not more than 18 feet, or less than 16 feet, in length, having a smoothing surface from 8 to 10 inches in width. The straight edge float shall be operated from bridges with its length parallel to the centerline of the pavement, and shall be dragged with a combined longitudinal and transverse motion, planing off the high places and filling in depressions.

The surface shall then be floated with a light wood float of the same length as the aforementioned rigid float, but from 6 to 8 inches in width and 1/2 to one inch in thickness, and equipped with reversible handles at each end. The light wood float shall be operated from bridges with its length parallel to the centerline of the pavement, and shall be dragged transversely across the pavement with its forward edge raised slightly so the smoothing will be done by the back edge.

Immediately following the float finishing, the surface shall be brushed transversely across the pavement with a bristle brush to produce a uniform, nonskid texture. The brushes shall be maintained clean and free from encrusted mortar. Brushes that cannot be cleaned shall be discarded. The brushing shall not be done until the concrete has become slightly sticky. This will require the finishers to remain on the work for a considerable length of time after the spreading so that the concrete will have sufficiently set before being given the final finish.

The finished pavement shall be to the required grade and cross section, and shall not vary from the required surface more than 1/8-inch in 10 feet.

210.07 CONSTRUCTION JOINTS. - The location and forming of construction joints shall be in accordance with the requirements therefor specified in Section 207.06. The concrete shall in no case be edged.

Where concrete pavement base will be poured against concrete parking strip or gutter, the Contractor shall construct the required keyway in such pavement, parking strip or gutter. The longitudinal centerline of the keyway shall be one inch below the horizontal centerline of the vertical face in which it is formed.

210.08 DUMMY JOINTS. - Transverse dummy joints shall be placed at 15 feet on centers, for the full width of the pavement, in alignment with the joints of adjacent concrete pours, and at right angles to the centerline of the street. On curves they shall be constructed on radial lines.

Dummy joints shall be as specified in Section 207.07, shall under no circumstances be edged, and shall be continuous over the insert.

Expansion joints shall not be constructed in concrete pavement.

210.09 PROTECTION AND CURING. - Concrete pavement shall be protected and cured in accordance with the requirements of Section 800.16.

No equipment, or public or other traffic shall be allowed on concrete pavement until ten days after the pavement has been placed, except that when calcium chloride is used in accordance with the requirements of Section 800.08 as an admixture to accelerate the setting of concrete, public traffic may be allowed thereon only after at least twenty-four hours have elapsed since the completion of all placement of such concrete.

210.10 PAYMENT. - Concrete pavement of the specified thickness, satisfactorily constructed, complete in place, as specified, will be paid for at the price bid per square foot of each specified thickness, measured horizontally.

Concrete pavement constructed adjoining curb will be measured from the face of curb at a depth of 6 inches below the top of curb, irrespective of the actual depth.

The areas of boxed-out locations for manhole and other castings and facilities, regardless of ownership thereof, will not be deducted from the areas of concrete pavement for which payment will be made.

SECTION 211

ASPHALT CONCRETE LEVELING COURSE

211.01 GENERAL. - The Contractor shall construct asphalt concrete leveling course, where and of the thickness necessary, to obtain the grades and cross sections shown on the plans, including cleaning existing pavement or preparing the subgrade, as the case may be, and doing all other necessary or required Incidental Work.

211.02 MATERIALS. - Asphalt concrete leveling course materials shall be in all respects in accordance with the asphalt concrete wearing surface specified in Section 212 and the Special Provisions.

211.03 CERTIFICATES OF WEIGHT. - Certificates of weight, if required, shall be furnished to the Engineer in accordance with the requirements of Section 111.02.

211.04 PAYMENT. - Asphalt concrete leveling course satisfactorily constructed complete, in place, as specified, will be paid for at the price bid per ton of asphalt concrete wearing surface.

SECTION 212

ASPHALT CONCRETE WEARING SURFACE

212.01 GENERAL. - The Contractor shall construct asphalt concrete wearing surface, 2 inches thick unless otherwise specified, consisting of asphalt and graded mineral aggregate, proportioned and mixed at a central mixing plant, and spread and compacted to the lines, grades, cross-sections and thicknesses shown on the plans, or where directed, including cleaning the area to be paved; repairing cracks, spalls and chuckholes; furnishing and installing paint binder; and doing all other necessary or required Incidental Work.

Asphalt concrete types are designated by the maximum size particle in the constituent graded aggregate. In general, use shall be as follows: 3/4" Max. on new pavement base. 1/2" Max. for resurfacing and for conform pavement, and 3/8" Max. when the total compacted thickness to be placed is less than 1-1/4 inches or where the surfacing is exclusively for pedestrian use.

Asphalt concrete specified to be used to construct asphalt concrete curb, sidewalk, ditch and dike, if the Proposal contains a Bid Item for asphalt concrete wearing surface, will be included in the quantity thereof for which payment will be made.

The Contractor shall give the Engineer 24 hours notice prior to placing asphalt concrete.

212.02 ASPHALT.

General. - Asphalt shall be AR-4000 steam refined paving asphalt, in accordance with all current applicable requirements and specifications of the Asphalt Institute, and the Uniform Pacific Coast Specifications for Paving Asphalts. The amount thereof to

be used for the three mix types, in percent by weight of the dry aggregate, shall be:

3/4" Max. and 1/2" Max	.....	4	to 6
3/8" Max	.....	5.5	to 6.5

Records of Delivery. - Records of delivery of asphaltic materials to the supplier, showing contract and purchase order numbers, shipment numbers, dates and quantities, and material designations, shall be available for inspection by the Engineer.

212.03 AGGREGATE.

General. - Aggregate for asphalt concrete surface course mixes shall consist of a mixture of coarse and fine aggregates, which shall be clean, hard, durable material, free from decomposed materials, vegetable matter and other deleterious substances.

Coarse aggregate is material retained on the No. 4 sieve and fine aggregate is material passing the No. 4 sieve.

The combined dry mineral aggregate shall consist of material of which at least 60 percent by weight shall be crushed particles as determined by Test Method No. Calif. 205.

Grading. - The combined dry mineral aggregate shall have a particle size distribution such that the percentage composition by weight when tested in accordance with Test Method No. Calif. 202, will be in accordance with one of the grading requirements set forth as follows:

SURFACE COURSE AGGREGATE GRADING REQUIREMENTS
Percentage Passing

Sieve Sizes	3/4"Max	1/2"Max	3/8"Max
1"	100	.....	.....
3/4"	95-100	100	.....
1/2" .....	.....	95-100	100
3/8"	65- 80	75- 90	95-100
No. 4	49- 54	55- 61	73- 77
No. 8	36- 40	40- 45	58- 63
No. 30	18- 21	20- 25	29- 34
No. 200 .....	.....	3- 8	3- 7 3- 10

The gradings specified hereinbefore are based on materials of a uniform specific gravity. Correction of grading limits to compensate for difference in specific gravity of 0.2 or more between portions of the aggregate shall be modified by Test Method No. Calif. 105.

Minimum durability index, when tested in accordance with Test Method No. Calif. 229, shall be 50.

The combined gradings within the specified limits shall be of such uniformity that the materials during any day's run will not vary more than the following:

- Maximum range in the percentage of material passing No. 4 sieve 6
- Maximum range in the percentage of material passing No. 30 sieve 5

212.04 SAMPLES AND TESTING. - At least ten working days prior to the use thereof, the Contractor shall submit to the Engineer a 120-pound sample of aggregate, graded as intended for use. This requirement shall be complied with for each aggregate and grading thereof that has not been approved. The Engineer will test the sample at no cost to the Contractor, and will determine the acceptability of the aggregate.

The combined aggregate shall also conform to the following quality requirements immediately prior to mixing with asphalt binder:

Test Method _____ Tests _____	No. Calif.	Requirements
Loss in Los Angeles rattler (after 500 revolutions) 211	50% Max.	
Both Kc and Kf-Factors (obtained from Centrifuge Kerosene Equivalent Test) 303	1.7 Max.	
Sand Equivalent 217	45 Min.	

The combined aggregate mixed with the required percent of asphalt shall also conform to the following quality requirements:

Test Method _____ Tests _____	No. Calif.	Requirements
Stabilometer Value * 366	35 Min.	
Moisture Vapor Susceptibility (Stabilometer Value) 307	25 Min.	
Swell 305	0.030" Max.	

* When the 3/8" Max. aggregate grading is specified for use, the above Stabilometer Value requirement will be 30 Min.

The exact proportions of aggregate and amount of asphalt binder shall be subject to control by the Engineer and may be varied within the limits set forth in order to produce a satisfactory mix.

In general, within the grading limits, a higher content of material passing the No. 200 sieve will require an amount of asphalt binder closer to the upper limit.

During construction, samples of asphalt concrete aggregate will be collected for grading tests. If the results of grading

tests are not within the requirements, the asphalt concrete represented by these tests shall be removed unless the Engineer determines that said asphalt concrete is structurally adequate and may remain in place. If this asphalt concrete is left in place, the Contractor shall pay to the City \$1.75 per ton for such asphalt concrete. The City may deduct this amount from any payments due, or that may become due, the Contractor under the contract. No single grading test shall represent more than 500 tons of asphalt concrete or one day's paving, whichever is smaller.

212.05 PROPORTIONING AND MIXING. - The mineral aggregates and asphalt binder shall be mixed at a central mixing plant. The aggregates and asphalt binder may be proportioned either by weight or by volume.

Aggregate shall be stored, dried, heated and proportioned in a manner that will give a combined grading within the specified grading limits and satisfactory to the Engineer.

Drying shall continue for a sufficient time and at a sufficiently high temperature to reduce the average moisture content so that at the completion of mixing operations and also at the time of spreading the mixture, the amount of moisture in the mixture shall not exceed one percent.

The drier shall be provided with a heat indicating device in order that the temperature of the aggregate leaving the drier may be determined. The heat indicating device shall be accurate to the nearest 10F., and shall be installed in such a manner that a fluctuation of 10F. in the aggregate temperature will be shown by the heat indicating device within one minute.

Any evidence of segregation, degradation, or improper combining of aggregate will be cause for rejection of the asphalt concrete containing such aggregate.

Uniformity of distribution of asphalt will be determined by extraction tests in accordance with Test Methods No. Calif. 309 or 310. The pounds of asphalt per 100 pounds of dry aggregates shall not vary by more than 5 percent above or 10 percent below the amount designated by the Engineer. This requirement shall apply to samples taken from a single batch, successive batches, at different locations in the plant, or at any location or operation designated by the Engineer.

Paving asphalt used as binder shall be added to the aggregate at a temperature of not less than 275F., nor more than 375F.

When paving asphalt is used as a binder, the temperature of the aggregates at the time of adding the binder shall not be less than 250F., nor more than 325F.

Mixing shall continue until a homogeneous mixture of uniformly distributed and properly coated aggregates of unchanging appearance is produced. In general, the time of mixing shall not be less than 30 seconds, except that the time may be reduced when in the opinion of the Engineer the sizes of aggregate are uniformly distributed and all particles are thoroughly and uniformly coated with asphalt binder.

212.06 PAINT BINDER.

General. - Paint binder shall be applied to all surfaces on or against which an asphalt concrete course is to be laid, except a preceding asphaltic course of the same pavement laid within the preceding 24 hours, or except temporary pavement.

Paint binder shall be emulsified asphalt Type SS-1 in accordance with the Asphalt Institute Specifications.

Before applying paint binder the Contractor shall remove all loose particles, sand, dust, and other foreign materials by power brooming with an approved street sweeping machine.

Large cracks, spalls and chuckholes, particularly reflective cracks occurring in the existing asphaltic surface over the joints of concrete roadway base, shall be thoroughly cleaned and repaired with asphalt slurry mixture or other asphaltic materials as directed by the Engineer.

The repair shall be done at least 24 hours before the paving, unless otherwise directed by the Engineer.

A sample of the slurry mixture or asphaltic materials shall be submitted to the Engineer for approval three working days prior to the repair.

Applying. - Paint binder shall be applied at the rate of 0.05 to 0.10 gallons per square yard by means of a vehicle-mounted pressure-operated, sprayer-type distributor which shall operate at a continuous, even pressure of not less than 20 pounds per square inch.

Paint binder shall not be applied during cold or rainy weather.

Emulsified asphalt or paving asphalt, as applicable, shall be applied at temperatures suitable for uniform and effective binder coat.

Should, from any cause, an excess of paint binder be applied, that excess shall be immediately removed. Paint binder shall be applied by spraying, and not in any other manner.

Paint binder shall be applied to all vertical surfaces of pavements, curbs, gutters, and manhole and catchbasin frames against which asphalt concrete materials are to be placed.

Curbs, sidewalks, and gutters shall be protected from paint binder. Any emulsified asphalt sprayed on adjoining improvements shall be immediately cleaned off.

212.07 SPREADING EQUIPMENT. - Asphalt paving machines shall be self-propelled mechanical spreading and finishing equipment, provided with a screed or strike-off assembly capable of distributing the material to not less than the full width of a traffic lane.

Screed action shall include any cutting, crowding or other practical action which is effective on the mixture without tearing, shoving or gouging, and which produces a surface texture of uniform appearance. The screed shall be adjustable to the required section and thickness. The paving machine shall be provided with either a full width roller or tamper or other suitable compacting devices.

Paving machines that leave ridges, indentations or other marks in the surface that cannot be eliminated by rolling or prevented by adjustment in operation shall not be used.

The asphalt paving machine shall operate independently of the vehicle being unloaded or shall be capable of propelling the vehicle being unloaded in a satisfactory manner and, if necessary, the load of the haul vehicle shall be limited to that which will insure satisfactory spreading. While being unloaded, the haul vehicle shall be in contact with the machine at all times and the brakes on the haul vehicle shall not be depended upon to obtain contact between the vehicle and the machine. The use of a paving machine is mandatory for the construction of more than 800 square feet of wearing surface unless the use thereof is physically impossible.

212.08 SPREADING. - Before placing and spreading asphalt concrete wearing surface the Contractor shall remove all loose particles, sand, dust and other foreign materials by power brooming, by an approved street sweeping machine.

All mixtures, except open graded mixtures shall be spread at a temperature of not less than 225F. and all initial rolling or tamping shall be performed when the temperature of the mixture is such that the sum of the air temperature plus the temperature of the mixture is between 300F. and 375F. Open graded mixture shall be spread at a temperature not less than 200F. and not more than 250F., unless a higher temperature is directed by the Engineer.

The Contractor shall always furnish and always use tarpaulins to cover all loads.

Open graded mixtures shall be placed only when the atmospheric temperature is above 60F. and all other mixtures shall be placed only when the atmospheric temperature is above 40F.

All layers shall be spread with an asphalt paving machine as specified in Section 212.07. Asphalt paving machines shall be operated in such a manner as to insure continuous and uniform movement thereof. Segregation shall be avoided and the surfacing shall be free from pockets of coarse or fine material.

Before placing asphalt concrete wearing surface adjacent to cold transverse construction joints, such joints shall be trimmed to a vertical face in a neat line. The location of the proposed joint shall be tested with a 10-foot straightedge and cut back so that when the straightedge is laid on the finished surface parallel with the centerline of the street, the surface shall in no place vary from the lower edge of the straightedge more than 1/8-inch.

Before placing asphalt concrete adjacent to any existing asphalt concrete, the face of the existing asphalt concrete shall be trimmed to a vertical face in a neat line.

Where asphalt concrete wearing surface is placed adjacent to a Portland cement concrete gutter or parking strip, the asphalt concrete wearing surface shall be so spread that its surface, after compaction, will be approximately 1/4-inch above the surface of the adjacent concrete.

The maximum depth of wearing surface which may be spread and rolled in one course shall not exceed a compacted thickness of

2 inches. Where such thickness exceeds 2 inches, it shall be spread and rolled in courses each not to exceed a compacted thickness of 1-1/2 inches unless otherwise specified in the Special Provisions.

The completed mixture shall be deposited at a uniform quantity per linear foot, which quantity will provide the required compacted thickness without resorting to spotting, picking-up or otherwise shifting the mixture.

Longitudinal joints in the top course shall correspond with the edges of proposed traffic lanes.

At locations where the asphalt concrete is to be placed over areas inaccessible to the specified spreading and rolling equipment, the asphalt concrete shall be spread by handwork to obtain the specified results and shall be thoroughly compacted to the lines, grades and cross sections by means of pneumatic tampers, or by other methods that will produce the same degree of compaction as pneumatic tampers.

212.09 COMPACTION. - Immediately after the wearing surface has been spread it shall be compacted with power rollers in first-class mechanical condition. Roller sprinkler systems shall operate satisfactorily in all respects.

After the first pass of the roller, any low or grainy spots shall be broken up and more material worked in to insure a surface of uniform texture and maximum density.

The Contractor shall furnish and use, for each asphalt paver furnished, a minimum of three rollers, of the types, and employed as follows:

1)Initial or breakdown rolling shall consist of one complete coverage with a steel-tired three-axle tandem, two-axle tandem, or three-wheel roller, weighing not less than 12 tons, operating with the drive wheel toward the paver.

2)Intermediate rolling shall follow the initial or breakdown rolling and shall consist of three complete coverages with a pneumatic-tired roller while the temperature of the mixture is at or above 150F.

The pneumatic-tired roller shall be the oscillating type having a width of not less than 4 feet and equipped with pneumatic tires

of equal size and diameter. Wobble-wheel rollers will not be permitted. The tires shall be so spaced that the gap between adjacent tires will be covered by the tread of the following tire.

The tires shall be inflated to 90 pounds per square inch or such lower pressure designated by the Engineer, and maintained so that

the air pressure will not vary more than 5 pounds per square inch from the designated pressure.

The roller shall be so constructed

that its total weight can be varied to produce an operating weight per tire of not less than 2,000 pounds. The total operating weight of the roller shall be varied as directed by the Engineer.

3)Final rolling shall immediately follow intermediate rolling and shall consist of sufficient coverages with a steel-tired two-axle

tandem roller, weighing not less than 8 tons, to produce a surface thoroughly compacted, smooth, and free from ruts, humps, depressions, or irregularities.

When the total amount of asphalt concrete wearing surface included in the contract is 1,000 tons or less, rolling may be in accordance with the following alternative requirements:

1)The Contractor shall furnish and use a minimum of one steel-tired 2-axle tandem roller, weighing not less than 8 tons, provided it is demonstrated to the satisfaction of the Engineer that such roller can perform the work.
 2)Rolling shall consist of sufficient coverages to produce a surface thoroughly compacted, smooth, and free from ruts, humps, depressions, or irregularities.

Areas inaccessible to power rollers shall be compacted with hot tampers.

The finished surface of the pavement shall be true to grade and cross section, free from high spots, depressions, or grainy spots, and shall show a uniform distribution of aggregate. A straightedge 10 feet long laid on the finished surface parallel to the centerline of the pavement shall disclose no more than the following irregularities per lane-mile in the pavement:

Maximum Allowable	
Irregularity Range_____	Irregularities per Lane Mile_____
3/16 inch to 1/4 inch	200 irregularities
1/4 inch to 5/16 inch	100 irregularities
5/16 inch or greater	0 irregularity

In addition, the above criteria shall be used as a basis for calculating the maximum allowable amount of irregularities for each block throughout the project limits. The maximum allowable amount of irregularities per lane-block shall be calculated by multiplying the maximum allowable number of irregularities per lane-mile by the length of the block in feet and dividing by 5,280 feet.

The City shall have the option of requiring correction of pavement irregularities in excess of the maximum allowable or a reduction of payment due the Contractor based on the official rolling-straightedge report. The reduction of payment shall be as follows:

Payment Reduction	
Irregularity Range_____	Per Each Excess Irregularity_____
3/16 inch to 1/4 inch.....	\$ 10.00
1/4 inch to 5/16 inch.....	\$ 50.00
5/16 inch or greater.....	\$100.00

The Contractor shall transport the City-furnished straightedge from Room 62, City Hall, San Francisco, or other place of storage, to the site of the work and return said equipment to the place of storage when the need therefor has ended.

The City will perform the rolling-straightedge operation at no cost to the Contractor.

The Contractor shall furnish the Engineer with all necessary, or required, labor and equipment, other than 10-foot rolling straightedge, to complete the inspection of the finished pavement.

212.10 CONFORM AREAS. - Conforms shall, where possible, be made along straight or regular lines carefully located to assure a smooth surface and proper crown.

All edges of existing pavement along a trench or butt conform shall be painted with paint binder before depositing asphalt concrete. In areas of the standard butt conform a wedge shaped course, as shown on the plans, shall be laid prior to 4 p.m. of the same day the wearing surface is removed. The new wearing surface shall be placed with the finishing machine within two days of the placing of the wedge.

The asphalt concrete wearing surface shall be spread evenly at the trench or butt conform, to a thickness of at least 1/4-inch above the existing pavement to insure proper rolling and compaction. After the first pass of the roller all low or grainy spots shall be broken up with a hot rake and more material worked in to bring the surface up to the proper level and insure uniform texture and maximum density.

Other conform consisting of asphalt concrete wearing surface placed on areas prepared with paint binder shall be used as a variable thickness pavement course to adjust the surface of existing pavement to the surface of new pavement, or where shown on the plans or directed by the Engineer.

The limit of the paint binder on the existing pavement shall parallel, and shall project 6 inches beyond, the conform line.

The conform pavement shall be raked back to a depth of 1/4-inch to 3/8-inch before rolling.

Particular care shall be taken in the work adjacent to the conform line, where the conform pavement is to be less than 1 inch thick. The existing surface shall be well cleaned and the paint binder properly applied. Very hot hand irons shall be used to smooth the edge of the conform, soften the existing surface and insure a good bond between the new and old materials.

If the Proposal contains a Bid Item for asphalt concrete wearing surface, that used in conform areas will be included in the quantity thereof for which payment will be made.

212.11 CASTINGS. - Temporary and permanent asphalt concrete wearing surface constructed in conjunction with setting or resetting, as the case may be, of castings, will not be included for payment under a Bid Item for asphalt concrete wearing surface, but shall be constructed as work incidental to the setting or resetting of castings.

212.12 CERTIFICATES OF WEIGHT. - Certificates of weight for asphalt concrete wearing surface shall be furnished to the Engineer in accordance with the requirements of Section 111.02.

212.13 PAYMENT. - Asphalt concrete wearing surface satisfactorily constructed, in place, as specified, will be paid for at the price bid per ton.

Asphalt concrete wearing surface constructed over and around areas of excavation required under the contract, for sewer, drainage,

AWSS, electrical and other facilities, where the proposal contains a per ton Bid Item therefor, will be paid for under such Bid Item, regardless of whether such sewers and other facilities are within, or are outside of, the limits for the construction of asphalt concrete wearing surface shown on the plans.

SECTION 213

SEAL COAT

213.01 GENERAL. - The Contractor shall construct, including doing all necessary or required Incidental Work, emulsified asphalt seal coat on roadway or other surfaces shown on the plans, or where directed, and in accordance with the requirements set forth herein.

The seal coat shall consist of two applications of emulsified asphalt and screenings as follows:

		Rate of Application	
		_____ Per Square Yard _____	
Screenings	Emulsified Asphalt		
Size of Screenings	(Pounds)	(Gallons)	
1st Application 1/2" to No. 4	25	0.30	
2nd Application 1/4" to No. 10	15	0.15	

213.02 MATERIALS. - Emulsified asphalt shall be type RS-2, conforming to the provisions of the Asphalt Institute Specifications.

A test report, if requested by the Engineer, shall be furnished in accordance with the requirements of Section 212.02.

Screenings shall consist of broken stone, crushed gravel, or both, shall be hard, tough, durable and sound, and shall be in accordance with the quality requirements set forth in Section 212.03. At least 90 percent by weight of the screenings shall consist of crushed particles as determined by Test Method No. Calif. 205.

Screenings shall be clean, free from deleterious materials, and shall be graded as follows:

Sieve Size	Percentage by Weight Passing Sieves	
	1/2" to No. 4	1/4" to No. 10
3/4"	100	---
1/2"	90-100	---
3/8"	50-80	100
No. 4.....	0-15	60-85
No. 8.....	0-5	0-25
No. 16.....	---	0-5
No. 30.....	---	0-3
No. 200.....	0-2	0-2

Screenings shall also conform to the following quality requirements:

Test Method

Tests	No. Calif. Requirements
Loss in Los Angeles Rattler (after 100 revolutions)	211 10% Max.
Loss in Los Angeles Rattler (after 500 revolutions)	211 40% Max.
Film Stripping	302 25% Max.
Cleanness value	227 80 Min.

213.03 SURFACE PREPARATION. - Immediately before applying the emulsified asphalt, the surface to be sealed shall be cleaned of all dirt and loose material.

When seal coats are to be applied to rock base or other untreated material, a prime coat of the type specified in the Special Provisions shall be applied to the material in place at a rate of from 0.20 to 0.33 gallon per square yard, as specified.

213.04 APPLYING EMULSIFIED ASPHALT. - Emulsified asphalt shall be applied by means of a vehicle-mounted, pressure-operated, sprayer-type distributor which shall operate at a continuous, even pressure of not less than 20 pounds per square inch at a specified rate of application. The distributor shall be equipped with an accurate pressure gauge that can be easily read by a person walking alongside the distributor vehicle.

The distributor system shall be capable of being operated at any width of application less than the maximum width by shutting off individual sprayer nozzles.

In order to secure uniform distribution, the flow of emulsified asphalt shall be halted before the rate of flow decreases due to depletion of the emulsion supply tank. After the supply tank has been refilled, the specified application rate shall be attained at the sprayer nozzles before resuming application.

Emulsified asphalt shall not be applied during cold or rainy weather. No more emulsified asphalt shall be applied to the surface than can be immediately covered with screenings and rolled the same day.

213.05 DISTRIBUTING, SPREADING AND ROLLING SCREENINGS. - Screenings shall be evenly distributed, immediately following the preceding application of emulsified asphalt, by means of approved spreading devices attached to the rear of the haul vehicles. The haul vehicles shall back up while distributing the screenings so that the wheels will not come in direct contact with the emulsified asphalt. Following each application, the distributed screenings shall be carefully spread and trued up with a suitable blade or a drag broom, or other approved equipment, and all high or low spots shall be corrected by the removal or addition of screenings, as applicable. Each application of screenings shall be rolled, with a power roller weighing not less than 6 tons, until a smooth dense even surface has been obtained.

213.06 PAYMENT. - Seal coat, satisfactorily constructed, complete in place, as specified, will be paid for at the price bid

per square yard, measured horizontally.

No deduction will be made from the quantity to be paid for on account of castings, or boxed-out areas therefor, which exist within the limits of the seal coat.

SECTION 214

PLANING EXISTING ASPHALT

CONCRETE SURFACES

214.01 GENERAL. - The Contractor, at each area to be planed, shall furnish, operate on existing asphalt concrete pavement, supply with fuel, maintain, pay all labor costs in connection with, and remove from the site as his property upon conclusion of use thereof, one or more power-driven road surface cold planer machines, satisfactorily remove all planed material, and do Incidental Work.

The exact locations to be planed, within or adjacent to the areas shown on the plans or specified in the Special Provisions and except as hereinafter specified the number and depth of cuts, and other factors affecting the work depending on the type of asphalt concrete paving, will be determined in the field by the Engineer and will be subject to possible minor changes as the work progresses.

The asphalt concrete wearing surface shall be constructed in any one block no later than seven days after the cold planing work has been completed, unless otherwise specified in the Special Provisions.

214.02 COLD PLANER MACHINE. - The machine shall be of a make and design that has operated successfully on work comparable with that proposed to be done under the contract, and shall be operated by an experienced operator.

The machine shall be self-propelled; and shall be equipped with a dust suppression system, a sensing skis device or profile control system to regulate the cutting drum (any device or system which must utilize the curb for control will not be permitted), and a minimum 42-inch wide cutting drum, which can be adjusted laterally for slope and depth, with replacable carbide tip cutting teeth placed in stagger-laced pattern. The machine shall be so designed that the operator, thereof, can observe the cutting drum's operation or as an option, the machine can be equipped with a remote control unit to allow a secondary operator at ground level to control the cutting drum's operation.

The machine shall be capable of operating at speeds from 0- to 125-feet per minute and cutting depths from 0- to 2-inches through the surface material, without producing fumes or smoke, gouging, shoving, or tearing the pavement, to a predetermined grade in one pass for a continuous and smooth surface finish.

The machine to be used under the contract shall be manufacturer equipped. The number of rows, or columns, of cutting teeth

and tooth-spacing of the cutting drum shall be installed and maintained per manufacturer's specifications. A machine with wobble cutting drum will not be permitted.

The type and size of the machine shall be subject to the approval of the Engineer.

214.03 CONDUCT OF THE WORK. - Cuts made with a cold planer machine shall be of the width, depths, and to the alignment shown on the plans or specified, and shall result in a uniform surface conforming to the required cross section.

The juncture of cold planed and unplanned areas shall be neat and uniform.

The material planed from the street surface will be the property of the Contractor and shall be immediately removed by him from the site of the work at his own expense. Any planed material which is deposited on any concrete parking lane shall be immediately removed therefrom by brooming. The removal crew shall follow within 50 feet of the planer unless otherwise directed by the Engineer.

The Contractor shall provide one power broom and one front-end loader for each planing machine to be used in the project.

Further, the Contractor shall provide a minimum of one laborer for each front-end loader to work along side of said loader whenever subject loader is operating. If the Contractor elects to, or is specifically required by the Special Provisions to perform holiday, weekend or night planing work, he shall provide one each additional broom and front-end loader as emergency back-up equipment. For example, if there are two planing machines in operation there shall be three power brooms and three front-end loaders available. Said power brooms and front-end loaders shall be on the jobsite and their working order satisfactorily demonstrated no later than 9:00 A.M. of the last weekday prior to the holiday or weekend that planing work is to be performed.

Planing operations shall not be carried out at any time where, in the opinion of the Engineer, weather conditions do not permit efficient operation.

Cold planer operation, in general, will consist of, and for payment will be divided into work of, one or more of the following types:

1) Operation of the cold planer machine adjacent to the curb, for a 1 inch cut, on a linear foot basis. If underlying concrete, brick or cobblestone pavement base is exposed before the shown or specified depth of curb is attained, the planing shall be terminated.

The quantity to be paid for on this basis shall be that, not including as footage any additional passes of the machine, required

to make a cut 7-foot wide, a minimum of 1-inch deep at the curb, and wedge-shaped in section.

2) Operation of the cold planer machine adjacent to the curb, for a 3/4 inch cut, on a linear foot basis. The quantity to be paid

for on this basis shall be that, not including as footage any additional passes of the machine, required to make a cut 7-foot wide,

a minimum of 3/4-inch deep at the curb, and wedge-shaped in section.

3) Operation of the cold planer machine adjacent to the concrete parking lane or gutter, for a 1/2-inch cut, on a linear foot basis.

The quantity to be paid for on this basis shall be that, not including as footage any additional passes of the machine, required to make a cut 7-foot wide, a minimum of 1/2-inch deep at the parking lane or gutter, and wedge-shaped in section. Asphaltic pavement which has crawled over existing concrete parking lanes and gutters shall be removed as Incidental Work.

4) Operation of the cold planer machine adjacent to the street railway tracks, for a 1/2-inch cut, on a linear foot basis. The quantity to be paid for on this basis shall be that, not including as footage any additional passes of the machine, required to make a cut

7-foot wide, a minimum of 1/2-inch deep on the track side, and wedge-shaped in section.

5) Operation of the cold planer machine in conform areas, for a 1 inch cut, on a linear foot basis. The quantity to be paid for on this basis shall be that, not including as footage any additional passes of the machine, required to make a cut 7-foot wide, a minimum of 1 inch deep, and wedge-shaped in section.

6) Operation of the cold planer machine adjacent to curb, concrete parking lane or concrete gutter, tracks, or other conform areas, 1-inch cut or other specified cut of full-depth rectangular shape in section, on a square foot basis. The quantity to be paid for on this basis shall be that, not including as footage any additional passes of the machine to obtain the required depth of cut.

7) Directed operation on an hourly basis. The time for which payment will be made on this basis, will be the aggregate of the periods during which the machine is actually cold planing.

Conforms and conforms around castings which are deeper than 1-inch shall be immediately ramped with cold-mix asphalt concrete as Incidental Work, all to the satisfaction of the Engineer.

All hand work of asphalt concrete removal around inlets and other castings in the planing area, areas adjacent to curbs, gutters, concrete parking strips and all conform lines will be done as Incidental Work.

No payment will be made for time required for refueling or for moving the machine between areas to be planed, and such refueling and movement will be considered Incidental Work.

As the work progresses, the Engineer may designate other areas to be cold planed. The additional locations, number and depth of cuts, the extent to which cold planing shall be done and the appropriate basis of operation in these areas will be determined by the Engineer.

214.04 PAYMENT. - Planing existing asphalt concrete surfaces, satisfactorily done as specified, will be paid for at the appropriate following unit bid prices:

- 1) adjacent to the curb, at the price bid per linear foot, per inch of depth of cuts;
- 2) adjacent to the curb, at the price bid per linear foot, per 3/4-inch of depth of cut;
- 3) adjacent to the concrete parking lane or concrete gutter, at the price bid per linear foot, per 1/2-inch of depth of cut;
- 4) adjacent to the street railway tracks at the price bid per linear foot, per 1/2-inch of depth of cut;
- 5) in conform areas, at the price bid per linear foot, per 1 inch of depth of cut;

- 6) adjacent to curb; concrete parking lane or concrete gutter; tracks; or conforms, at the price bid per square foot, per 1-inch or other specified depth of cut;
- 7) at the price bid per hour of directed operation.

SECTION 215

RAISED TRAFFIC BARS

215.01 GENERAL. - The Contractor shall fabricate and install raised traffic bars of the dimensions shown, complete in place, and shall clean and place adhesive on the pavement in preparation therefor, all where shown on the plans or directed, and shall do all Incidental Work. The bars shall be of Class 6-3000-3/4 concrete, except with a maximum slump of 3 inches, made with white Portland cement, and may be precast, cast in place, or extruded, at the option of the Contractor. Approved substitute aggregate materials may be used.

215.02 TESTING. - When required by the Engineer raised bars will be tested in the City's laboratory at no cost to the Contractor. After curing, each bar shall be capable of supporting a minimum load of 400 pounds when tested as a simple beam with the base in tension on roller supports at 20-inch centers and loaded at midspan through a saddle one inch wide shaped to conform to the contour of the bar. The load shall be applied at a uniform rate or in increments not in excess of 50 pounds.

215.03 INSTALLATION. - Raised bars shall be placed, cast or extruded, on the finished pavement with an adhesive consisting of polyvinyl acetate emulsion, asphaltic emulsion, or approved equal. If asphaltic emulsion is used, no clay or similar substances shall be used in its manufacture as emulsifying or stabilizing agents. The adhesive shall be of a consistency suitable for heavy trowel application at atmospheric temperature. It shall develop a tenacious bond on setting. Before placing the adhesive, the surface of the pavement shall be cleaned free of dust, loose material or oil. The adhesive shall be applied in such quantity that a firm, uniform bearing is obtained throughout the area of contact. Excess adhesive shall be squeezed from under the bar and the excess shall be removed. When bars are placed over a joint or crack, an open joint shall be made through the bars.

At the conclusion of all other work in the area, the bars shall be painted with one coat of white traffic lacquer, or approved equal, applied in accordance with the manufacturer's recommendations. Adequate precautions shall be taken, and, upon completion of the painting, adjacent and other pavements shall have on them no paint or discoloration caused thereby.

215.04 PAYMENT. - Raised traffic bars, satisfactorily fabricated and installed as specified, will be paid for at the price bid per linear foot of adhered bar, measured horizontally along the longitudinal centerline thereof.

SECTION 216

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SECTION 217

ADJUSTMENT OF MANHOLE FRAMES AND OTHER CASTINGS

217.01 GENERAL. - In order to insure a true, smooth pavement wearing surface, all frames and castings of manholes, catchbasins, curb inlets, vaults, valves, handholes, monuments, and other installations in the street and sidewalk area, hereinafter referred to as "castings," shall be reset accurately to the final finished pavement surface. Resetting includes extending or shortening the cones, barrels or risers of such structures as required for the proper adjustment of the castings. The work to be done by the Contractor and the "Owner," respectively, in connection with the required removal and resetting of such castings and the paving work relative thereto, shall be in accordance with the requirements hereinafter specified. The term "Owner," as used in this Section, means an owner of utilities as defined in Section 104.

In the case of castings owned by the Department of Public Works, Department of Electricity, Police Department, Fire Department, and of the Auxiliary Water Supply System, the Contractor shall perform all necessary work in connection therewith, including the work herein specified to be performed by the Owner. All such castings shall be reset to finished pavement grade, and the subsequent repaving adjacent to the castings shall be completed, not later than 7 calendar days after the surrounding wearing surface has been constructed unless otherwise specified in the Special Provisions.

The Contractor shall restore pavement around each casting after such casting has been properly reset to new pavement grade.

If the pavement around such castings is not restored by the Contractor within twenty-four hours, the Contractor shall provide temporary bridging over each of the casting cut-out areas with a steel plate, approved by the Engineer, ramped to the adjacent pavement and secured against any movement. The bridging, including material and work related to, shall be done at the Contractor's sole expense.

The Contractor may enter into a private agreement with the Owner to do work that is the responsibility of the Owner, provided that such work will be done at no cost to the City.

217.02 CONSTRUCTION OR RECONSTRUCTION OF PAVEMENT. - Where pavement, or pavement base and wearing surface, is to be constructed, or if existing, is to be removed and reconstructed, the Contractor shall construct a box around each casting. The box shall be 5 feet square around sewer and vault manholes and proportionately dimensioned for other castings. The construction of pavement shall be temporarily omitted within the confines of the boxes. The Owner of each casting will then remove his castings, after which the Contractor shall carefully cover the openings in the exposed structures with planks not less than 2 inches thick and shall fill the boxed-out areas with a temporary pavement consisting of at least 4 inches of graded rock and 1 inch of asphalt concrete wearing surface.

After the pavement surrounding the boxes has been constructed, the Owners of the castings will remove the boxes and the temporary pavement from within them and will reset the castings to conform accurately with the finished pavement surface. Resetting will be done in a workmanlike manner using Class 6-3000-3/4 concrete, bricks set in Class "B" mortar, or rings or other approved devices.

After each casting has been satisfactorily reset to the finished pavement surface, the Owner will place, and compact, asphalt concrete in the entire boxed-out area around the casting to within 1 inches of finished pavement grade, upon which he will construct asphalt concrete wearing surface to finished pavement grade.

217.03 RESURFACING--OVER AND IN PLACE OF EXISTING WEARING SURFACE. - Where resurfacing is to be done and asphalt concrete wearing surface is to be constructed over existing pavement wearing surface regardless of type, the Contractor shall construct the wearing surface continuously over all castings, except valve castings. It will be the responsibility of the Owners of the castings so covered to reference them in advance in such manner that they may later be located readily. The Contractor may construct the wearing surface continuously over valve castings provided that he uncovers the valve castings immediately after constructing the wearing surface.

After the resurfacing has been completed, the Owner will cut through the pavement around each casting and reset the casting to conform accurately with the finished pavement surface. Resetting the castings and subsequent repaving in the cut out areas will be done by the Owner in the manner specified hereinbefore.

Where castings exist in an area from which existing wearing surface is to be wholly or partially removed, and the final grade is to be lowered, the Owner shall cut through the pavement and remove each casting. The Contractor shall then provide the planking and a satisfactory temporary riding surface over the openings as specified in Section 217.02, except that the box will not be required.

After the wearing surface surrounding an opening has been constructed, the Owner will remove the temporary pavement from within the cut out area, reset the casting, and repave as hereinbefore specified.

Pavement in cut-out areas around adjusted castings shall be constructed with 1 inches of asphalt concrete wearing surface on 8 inches of concrete base.

217.04 ALTERNATIVE METHODS. - The Owners and the Contractor may agree to any modification of, or alternative to, the hereinbefore specified methods of resetting castings, provided that application for the use of such modification or alternative is made in writing to, and is approved by, the Engineer.

217.05 PAYMENT. - Adjustment of existing City-owned manhole frames and covers and other existing street castings, satisfactorily done complete in place, as specified, including the pavement in cut-out areas around such castings, will be paid for under the appropriate Bid Item, at the respective price bid for a set consisting of a frame and either a cover or a grating. City-owned means Governmentally-owned as opposed to non-Governmentally-owned as defined in Section 104.

If the Proposal contains pavement or pavement base Bid Items, no deduction will be made in the pay quantities thereof because of the presence of, or the adjustment of, castings.

SECTION 218

REDWOOD HEADERS

218.01 GENERAL. - The Contractor shall construct "Heart Structural" grade redwood headers 2 inches thick and of a width equal to the thickness of the pavement or walk which they are to be bound, complete in place, including supporting stakes, scabs, wood preservative treatment, nailing, and Incidental Work. The headers shall be placed on edge, and securely nailed inside of supporting stakes driven into the subgrade. They shall be set so as to conform to the finished surface of the pavement. The supporting stakes shall be "Heart Structural" grade redwood set with their sawed tops conforming with the surface of the finished pavement or walk, of such size and number as may be necessary to rigidly support the headers in place during the construction operations. The headers shall have squared top edges and squared butt joints against the stakes, and shall be held in place with at least 2 galvanized nails of the necessary length in each stake, except at butt joints where not less than 4 shall be used. In sandy or loose soil, or wherever necessary to hold headers to proper line and grade, the joints in the headers shall be reinforced with a 1-inch x 6-inch x 18-inch redwood scab, securely nailed.

Headers shall be placed where indicated on the plans, and along the unprotected edges of all pavements and sidewalks, except concrete sidewalks at property lines, even though not called for on the plans.

After being cut to length, the headers, stakes and scabs shall receive on-the-job treatment with a 5 percent solution of the pentachlorophenol preservative specified in Section 415.06. Preservatives containing arsenic or creosote will not be permitted.

218.02 PAYMENT. - Redwood headers, satisfactorily constructed as specified, will be paid for at the price bid per linear foot, measured horizontally along the line thereof.

SECTION 219

CORRUGATED METAL GUARD RAILING

219.01 GENERAL. - The Contractor shall construct corrugated metal guard railing consisting of galvanized, straight and precurved corrugated metal railing elements and flared terminal sections mounted on treated timber posts, all complete in place, with hardware, and shall do all related Incidental Work. The railing shall be constructed true to the lines and grades therefor designated on the plans and in accordance with the directions of the manufacturer, and after erection shall be cleaned and painted.

219.02 MATERIALS. - Timber posts shall be S4S, 8 inches x 8 inches x 4 feet 8 inches, No. 1 stress grade or better Douglas fir free of boxed heart, chamfered as shown on the plans or specified, and in accordance with the requirements of Section 414.01.

The posts shall be pressure treated with pentachlorophenol in accordance with the requirements of Section 415.06 after being surfaced, chamfered and cut to length. The minimum retention of preservative shall be that specified for ground contact.

The steel plate forming the corrugated rail element shall be rolled from steel from which a 2-inch test specimen shall elongate not less than 12 percent.

The plate shall be shaped into a beam not less than 12 inches wide and with two corrugations not less than 3 inches deep.

The plate shall not be less than 12 gauge, subject to standard mill tolerances for gauge. The manufacturing tolerance for width and depth shall be minus 1/8-inch and the edges of the rail shall be smooth after fabrication.

The rail shall develop a minimum tensile strength of 50,000 pounds for the rail element and joints. A section of rail freely supported at each end, on 12-foot centers, shall support a concentrated load at the center of 1,400 pounds with a maximum deflection of 4 inches.

The ends of each length of railing shall be fitted with a section, also of 12-gauge metal, extending at least 18 inches beyond the center of the end post, and so formed that its end shall be at least 7 inches back of the face of the rail.

Along curvilinear alignments, guard rail elements used shall be shop precurved to radii of curvature such that deviation from the alignment shown on the plans will not at any point exceed 2 inches.

Straight elements may be used where the radius of curvature or the alignment is greater than 110 feet.

The hardware for the guard rail shall consist of:

- 1)at each rail to rail splice, eight 5/8-inch x 1-inch oval shoulder button head splice bolts with nuts and washers;
- 2)at each rail to terminal section splice, four 5/8-inch x 1-inch oval shoulder button head splice bolts, and nuts; and
- 3)at each splice, for fastening to timber post, one 5/8-inch x 10-inch oval shoulder button head post bolt with nuts and washers.

219.03 GALVANIZING. - All guard rail elements, terminal sections, and hardware shall be hot-dip galvanized in accordance with the applicable requirements of Section 807; however, the guard rail elements and terminal sections may be galvanized either before or after fabrication, the total of the weights of the two galvanizing coatings, one on each side of any sheet, element, or section, shall not be less than 2.0 ounces per square foot, and such galvanizing shall be in accordance with the requirements of ASTM "Standard Specification for General Requirements for Delivery of Zinc-Coated (Galvanized) Iron or Steel Sheets, Coils, and Cut Lengths Coated by the Hot-Dip Method," Designation A 525.

219.04 CONSTRUCTION. - The height of the guard rail and of the posts above ground shall be as shown on the plans. Posts shall be placed at equal intervals, not to exceed 12 feet 6 inches, measured horizontally between center lines of adjacent posts.

A post shall be installed at each rail splice and at each terminal section splice.

All posts shall be installed vertically.

After the posts are set, the space around them shall be filled with selected earth free from rock. Fill material shall be placed in layers approximately 4 inches thick, and each layer shall be thoroughly watered and tamped in place to hold the posts securely in position.

All metalwork shall be fabricated in the shop, and no punching, cutting, or welding will be permitted in the field. Metal railing shall be installed in accordance with the directions of the manufacturer of the particular railing.

The railing shall be installed in smooth curves and transitions with no abrupt changes in alignment.

The guard railing in the final position shall be rigid and without any loose joints or connections.

Any rail element dented, bent, broken, warped or otherwise damaged, shall be immediately and satisfactorily repaired or replaced, as applicable, by the Contractor at his sole expense.

Ends of guard railing facing the direction of traffic flow shall be flared and buried in concrete.

219.05 PAINTING. - After erection, corrugated metal guard railing shall be painted in accordance with the requirements of Section 809.

Galvanized surfaces shall not be brushed with copper sulphate solution. The Contractor shall, however, exercise special care to remove, with solvent, all grease or oil film from galvanized surfaces to be painted.

All surfaces of the rail, including the end sections and all hardware, shall be painted with one coat of an approved galvanized metal primer which shall be allowed to dry thoroughly. Two coats of an approved white enamel shall then be applied to all the above primed surfaces.

Timber posts shall be painted with one coat of an approved wood primer and two coats of an approved fast-drying white finish paint for wood, and at least 4 inches of post painted with all coats shall be below the ground surface.

All exposed surfaces of corrugated metal guard railing that become soiled or damaged before acceptance of the work shall be cleaned or repainted at the Contractor's expense.

219.06 PAYMENT. - Corrugated metal guard railing, satisfactorily constructed as specified, will be paid for at the price bid per linear foot measured along the face of straight and precurved corrugated metal elements between extreme ends of each section of railing including terminal sections thereof as constructed.

SECTION 220

CERTAIN PAVEMENT, EXCAVATION, EARTHWORK AND PAVEMENT CONSTRUCTION EXCLUDED FROM PAY QUANTITIES

Pavement excavation, earthwork, and the construction of sidewalk, curb, gutter, parking strip, pavement base and pavement, within the limits shown or specified therefor, will be paid for under the respective Bid Items therefor. Such work, necessary or required as a result of constructing, installing, relocating or removing, structures, and water, sewer, drainage, landscaping, lighting, traffic control, fire alarm, AWSS, and other facilities and appurtenances, and outside the limits within which excavation and construction or pavement elements are shown or specified to be paid for under Bid Items, will not be paid for but shall be done as Incidental Work.

Asphalt concrete wearing surface required to be constructed, if the Proposal contains a per ton Bid Item therefor, will be paid for whether or not the construction thereof is within the limits shown on the plans for the construction of asphalt concrete wearing surface.

Except as otherwise specified in the Special Provisions, asphalt-topped roadway pavement damaged or removed by the Contractor, and not specified for removal as part of the contract, shall be restored with 8-inch thick concrete base and 1-inch thick asphalt concrete wearing surface at the Contractor's expense.

Concrete roadway pavement (non-asphalt-topped) damaged or removed by the Contractor, and not specified for removal as part of the contract, shall be restored with 8-inch thick concrete pavement at the Contractor's expense.

Existing gutter, parking strip, curb and sidewalk, damaged or removed by the Contractor, and not specified for removal as

part of the contract, shall be restored to match the existing in design and material at the Contractor's expense. Damaged or removed sidewalk shall be restored to existing flag lines to match the adjacent existing sidewalk in design and material.

SECTION 221

PAVEMENT REINFORCING FABRIC

221.01 GENERAL. - The Contractor shall furnish and place pavement reinforcing fabric on existing pavement to be resurfaced or between layers of asphalt concrete complete, in place, including all necessary or required Incidental Work, where and as shown on the plans or where directed by the Engineer.

Pavement reinforcing fabrics shall be furnished in protective covers capable of protecting the fabric from ultraviolet rays, abrasion, and water.

221.02 PLACING REINFORCING FABRIC. - Before placing the pavement reinforcing fabric, a binder of paving asphalt shall be applied to the surface to receive the pavement reinforcing fabric at the rate of 0.25-gallon per square yard of surface covered.

The binder shall be applied to a width equal to the width of the fabric mat plus 3 inches on each side.

The fabric shall be stretched, aligned, and placed with no wrinkles that lap. The test for lapping shall be made by gathering together the fabric in a wrinkle. If the height of the doubled portion of extra fabric is 1/2 inch or more, the fabric shall be cut to remove the wrinkle, then lapped in the direction of paving. Lap in excess of 2 inches shall be removed.

Pavement reinforcing fabric shall not be placed in areas of conform tapers where the thickness of the overlying asphalt concrete is 1 inch or less.

If manual laydown methods are used, the fabric shall be unrolled, stretched, aligned, and placed in increments of approximately 30 feet.

Adjacent borders of the fabric shall be lapped 2 to 4 inches. The preceding roll shall lap 2 to 4 inches over the following roll in the direction of paving at ends of rolls or at any break. At fabric overlays, both the tack coat and the fabric shall overlap the previously placed fabric by the same amount.

Seating of the fabric with rolling equipment after placing will be permitted. Turning of the paving machine and other vehicles shall be gradual and kept to a minimum to avoid damage.

A small quantity of asphalt concrete, to be determined by the Engineer, may be spread over the fabric immediately in advance of placing asphalt concrete surfacing in order to prevent fabric from being picked up by construction equipment.

Public traffic shall not be allowed on the bare reinforcing fabric; except that public cross traffic shall be allowed to cross the fabric, under traffic control, after the Contractor has placed a small quantity of asphalt concrete over the fabric.

Care shall be taken to avoid tracking binder material onto the pavement reinforcing fabric or distorting the fabric during seating of the fabric with rolling equipment. If necessary, exposed binder material shall be covered lightly with sand.

221.03 FABRIC. - Pavement reinforcing fabric shall be manufactured from polyester, polypropylene, or polypropylene-nylon material. The fabric shall be nonwoven, and shall conform to the following:

Weight, ounces per square yard	
ASTM Designation: D 1910	..... 3.0 to 8.0
Grab tensile strength (1-inch grip), pounds, min.	
ASTM Designation: D 1117	..... 90
Elongation at break, percent, min.	
ASTM Designation: D 1117	..... 40
Fabric thickness, mils.	
ASTM Designation: D 461	..... 12 to 100

A Certificate of Compliance shall be furnished with each lot of fabric delivered to the work and the lot so certified shall be clearly identified in the certificate. The certificate shall be signed by the manufacturer of the fabric and shall state that the fabric involved complies in all respects with the requirements of the specifications.

Fabric used on the basis of a Certificate of Compliance may be sampled and tested at any time. Fabric used on the basis of a Certificate of Compliance shall not relieve the Contractor of responsibility for incorporating fabric in the work which conforms to the requirements of the plans and specifications, and any such fabric not conforming to such requirements will be subject to rejection whether in place or not.

The City reserves the right to refuse to permit the use of fabric on the basis of a Certificate of Compliance. The form of the Certificate of Compliance and its disposition shall be as directed by the Engineer.

221.04 PAYMENT. - Pavement reinforcing fabric, satisfactorily furnished and placed as specified, including all necessary or required Incidental Work, will be paid for at the price bid per square yard of actual area covered.

END PART 2
PART 2. STREETS AND HIGHWAYS

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 - 202.06 Concrete
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PART 3

SEWERAGE AND DRAINAGE

SECTION 300

GENERAL REQUIREMENTS FOR SEWERS AND RELATED WORK

300.01 GENERAL. - The Contractor shall do all excavating of pavement and earth materials, sheet piling, and lagging, all as set forth in Part 7 of these Standard Specifications, and shall do all other work, including investigation of locations, elevations and flows, traffic routing work, and salvaging of castings, necessary for the satisfactory completion of the required sewer and drainage work, all in accordance with the requirements of the Special Provisions and these Standard Specifications.

The Contractor, in accordance with the requirements of Sections 703, 707 and 109, shall do all backfilling and restore all pavements and related improvements removed, destroyed, damaged or undermined as a result of his operations.

300.02 RECORDS OF EXISTING SEWERS AND SEWER STRUCTURES. - Certain maps and records of the existing sewers and sewer structures in the vicinity of, and interconnected with, the work are on file in the City Engineer's Office, and may be examined by the Bidder.

The Bidder should note, however, that these structures may have been altered by repairs at various times and may differ from the records on file, and that no representation is made nor responsibility taken by the City as to the accuracy of the records or the locations shown thereon.

300.03 ELEVATIONS AND LOCATIONS. - Elevations and locations of existing structures, sewers, side sewers, culverts, and other facilities shown on the plans are approximate only. Exact elevations of connections must be determined in the field before commencing excavation operations. If no manhole opening or other access is readily available for determining the elevation or location of the connection points, the Contractor shall expose the existing sewer or structure, as necessary to make such determinations.

300.04 ELEVATIONAL CONTROL. - The elevational control consists of the slope and the vertical distance above or below San Francisco City Datum to the invert of the sewer or sewer structure.

Approximate Elevation () - Elevations of ground surface and inverts of sewers or sewer structures are shown for informational purposes only. Rim elevations of sewer structures are to be constructed to conform to existing street grades or to match new street grades. See existing elevation and invert/conform elevation on the plans.

Existing Invert Elevation - Elevations of inverts of existing sewers or sewer structures are approximate and are shown on the plans for informational purposes only.

Invert/Conform Elevation - Elevation of the new pipe, channel, or flow surface of sewer or sewer structure to be constructed shall coincide with elevation of the existing pipe, channel, or flow surface of sewer or sewer structure. Field adjustment may be necessary to match existing invert and to determine slope of new pipe.

Invert Elevation - Elevation of the new pipe, channel or flow surface of sewer or sewer structure to be constructed.

Slope - Invert slope of pipe or channel; construction slope of pipe between two invert elevations or invert/conform elevations.

Field adjustment of slope may be necessary after verification by the Contractor of invert/conform elevations of sewers or sewer structures.

The descending order of precedence shall be as follows:

1. Invert Elevation
2. Invert/Conform Elevation
3. Slope
4. Existing Invert Elevation
5. Approximate Elevation

300.05 PAVEMENT CUTTING. - The Contractor shall use, but not limited to, pavement concrete saw cutting or vibratory pavement breaker.

The Contractor may not use any machine or device that breaks pavement by blows struck by a falling or driven hammer or weight.

Such prohibition, however, shall not be construed as barring the use of hand tools or manually operated air tools such as jackhammers.

300.06 DELIVERY OF SALVAGED CASTINGS. - The Contractor shall salvage manhole, catchbasin and storm water inlet frames, covers, and gratings, removed from the work, and not specified to be reused in the work, as City property, and deliver to the City Yard located at 2323 Army Street, San Francisco. The Contractor shall contact the Bureau of Street and Sewer Repair at Telephone No. 415-695-2096, for appointment, 24 hours prior to delivery of such castings. Upon delivery, the castings shall be placed where directed by Yard personnel.

Castings to be salvaged are Standard 26-inch Manhole Frame and Cover and Cast Iron Frame And Grating For Catchbasin Type

A.

All other removed sewer castings shall be removed from the site of the work as the Contractor's property and disposed of in a legal manner.

The delivery of salvaged castings shall be done as Incidental Work.

SECTION 301

HANDLING AND DISPOSAL OF SEEPAGE, STORM WATER AND SEWAGE

301.01 GENERAL. - The Contractor shall dispose of water from all sources; shall keep excavations dry; shall do all necessary work to suitably and adequately divert all sanitary, ground water, tide water, and storm water flow; and shall furnish all necessary pumps and related equipment; all in accordance with the requirements set forth herein and in Section 700.08.

Subdrains and crushed rock, if constructed, shall be in accordance with Sections 321 and 712.

The Contractor will be responsible for familiarizing himself with sewers which are interconnected with the work. Sewer information is available as set forth in Section 300.02.

The Contractor is cautioned that any quantities of flows shown on the plans or included in the Special Provisions are estimated and are furnished to the Contractor for general guidance only, and that the City takes no responsibility for the accuracy of these estimates nor for any deductions or conclusions that the Contractor may make therefrom. In any case, the Contractor will not be relieved of any responsibility for the handling and disposal of water and sewage.

301.02 SANITARY SEWAGE. - All sanitary sewage shall be carried in closed conduits, or other means approved by the Engineer, and will not be allowed to flow exposed on the street, or in gutters, trenches, or excavations. The Contractor may use, to the limit of their capacity, subdrains in accordance with Section 321.

301.03 BACKFLOW. - Should the construction of any dam or dams cause sewage or storm water to back up and flow on private property through side sewers, or by other means, the Contractor shall immediately take corrective measures to stop the backflow, remove the sewage and storm water from the private property, clean and disinfect the premises, and repair any damage caused by backflow.

301.04 SUBDRAINS. - Where subdrains are used, side sewers cut along the line of the work shall be temporarily connected to the subdrains by means of pipes and fittings. When permanent side sewer connections are re-established, openings for temporary connections shall be sealed with brickwork or concrete, and the pipe and fittings used for such connections removed from the site by the Contractor as his property.

301.05 DIVERSIONS AND DAMS. - The Contractor shall not obstruct the normal flow in any existing sewer, but where necessary

shall divert such flow around or through the work or discharge such flow into other approved sewers or places.

The Contractor shall not divert any flow from any source that will result in additional flow in sewers leading to pumping stations.

All flow including storm water flow shall be carried around or through the work by the Contractor at his own expense by diverting the flow to other sewers, by pumping or by bypassing the work with pipes or other conduits, unless otherwise specified. All sewage flow, including storm water flow, shall be diverted to sewers leading to treatment plants and shall not be diverted to a sewer or structure leading directly to the Bay or Ocean.

The Contractor shall not construct a dam in any sewer or sewer structure without the prior written consent of the Engineer.

Regardless of such consent, the Contractor shall be responsible for any damage resulting from the construction of any dam or dams in the sewerage system.

Dams, diversion devices, or other obstructions placed in sewers or manholes for diverting flow during the work, shall be removed by the Contractor at the completion of the work, or when directed by the Engineer. Any damage to sewerage or drainage facilities resulting from the Contractor's handling and disposing of seepage, storm water, and sewage, shall be satisfactorily repaired by the Contractor at his expense.

301.06 PAYMENT. - Handling and disposal of seepage, storm water, and sewage shall be done as Incidental Work and payment therefor shall be included in the price or prices bid.

SECTION 302

REMOVING, PLUGGING, AND FILLING EXISTING SEWERS AND RELATED STRUCTURES

302.01 GENERAL. - The Contractor shall remove, plug, and fill, or break open, sewers and related structures where and as shown on the plans, or where necessary for the proper completion of the work, including all excavating, backfilling, restoring pavement, and other Incidental Work.

All openings and outlets of sewers or related structures abutting sections to be removed or broken open shall be satisfactorily sealed at all open ends with brick and mortar or concrete and all contained sewage removed unless otherwise specified.

302.02 REMOVE. - Existing sewers, manholes, catchbasins, other sewerage and drainage structures, and appurtenances, including vitrified clay pipe sewers, side sewer and culverts, which have been or are to be abandoned, and lie within a sewer trench or sewer

structure excavation, shall be removed from within the limits of required excavation necessary for the work.

All sewerage facilities, except side sewers and culverts, to be abandoned shall be removed to a depth at least three feet below street grade or ground surface, as the case may be, and all contained sewage removed.

302.03 BREAK OPEN. - Inverts of partially removed facilities shall be broken open to freely drain, and the facility backfilled, or, if specified, filled with slurry grout.

302.04 PLUG AND FILL. - Main sewers 12 inches or greater in diameter to be abandoned, which lie three feet or deeper below street grade or ground surface, shall be thoroughly sealed at all open ends, and at the structures in which they terminate, as applicable, and shall be filled with an approved slurry grout.

The plugging at the ends of sewers and sewer facilities to be filled with slurry grout may be accomplished by the use of temporary plugs or bulkheads which shall be removed after the slurry mix has set.

302.05 PLUG. - 6-inch and 8-inch Side sewers and 10-inch culverts to be plugged shall be sealed at all open ends and at the structures in which they terminate, as applicable, with brick and mortar or concrete plugs.

Plug thicknesses for Sections 302.04 and 302.05 shall conform to the following schedule:

Pipe Diameter Plug Thickness

Smaller than 24"	4" Minimum
24" to 36"	8" Minimum
Larger than 36"	12" Minimum

302.06 FILL WITH SLURRY GROUT. - Sewers 12 inches or greater in diameter and related structures to be plugged and filled shall be filled with a slurry mixture containing a minimum of 2 sacks of Type II cement per cubic yard of mixture.

Filling with slurry may be accomplished by pumping or gravity, at the option of the Contractor, and will be checked by comparing the computed volume of the sewer facility with the volume of mixture used. If the computed volume is more than 10 percent greater than the actual volume of slurry used, the Contractor shall excavate two exploratory holes where directed, and shall do all work necessary to satisfactorily fill any encountered voids.

Any damage to existing facilities resulting from the use of slurry grout shall be satisfactorily repaired by the Contractor at his own expense and no direct or additional payment will be made for such repair.

Side sewers and culverts shall not be filled with slurry grout, unless specified.

302.07 PAYMENT. - The satisfactory removal, plugging, plugging and filling, or opening, of sewers and sewer structures will be paid for at the respective prices bid therefor when such work is set forth for payment in the Schedule of Bid Prices. All such

work shown or specified and not so set forth shall be done as Incidental Work.

SECTION 303

CAST-IN-PLACE REINFORCED CONCRETE SEWER AND SEWER STRUCTURES

303.01 GENERAL. - The Contractor shall construct cast-in-place reinforced concrete sewer and sewer structures including all excavating, lagging, forming, waterproofing, backfilling, restoring pavement and other Incidental Work, necessary or required, for a complete, satisfactory installation, where and as shown on the plans, or where directed. Such sewer and sewer structures shall be of Class 6-3000-3/4 concrete constructed in accordance with the plans, the applicable requirements of Sections 411 and 800, and these specifications. Cement shall be Type II.

All appurtenances for structures, such as manhole-cones, frames, covers, gratings, steps, VCP stub inlets, and VCP stub inverts shall be furnished and installed where and as shown on the plans and as specified.

303.02 FORMWORK. - Lagging or shoring shall not be used as a surface against which concrete is placed unless permitted in the Special Provisions. Sufficient clearance shall be maintained between the formwork and lagging so that the alignment and cross section of the work as shown on the plans can be obtained by adjustment of such formwork.

In the event that the Special Provisions permit concrete to be placed against the lagging or shoring, a bond breaker shall be placed between the concrete and the shoring or lagging and shall be a maximum of 1/4" thick plywood, interior grade, or approved equal. Maximum overpour shall be limited to two (2) inches.

No concrete shall be placed in formwork unless such formwork is constructed to the required alignment, grade and cross sections, and is approved by the Engineer. Such approval shall in no way relieve the Contractor of the responsibility for obtaining, in the completed work, the alignment, grade and cross sections shown on the plans. The Contractor shall provide access for the Engineer to inspect reinforcements prior to pouring the concrete.

The use of twisted wire loops as form ties will not be permitted.

Smooth forms accurate held on line and grade shall be used. Forms and centers may be made of either metal or timber. The surfaces of all timber forms that come in contact with the inside surfaces of concrete sewers and sewer structures shall be laid with close joints and oiled with non-staining mineral oil.

Sharp corners shall be chamfered one inch, and 3/4-inch x 3/4-inch triangular fillets shall be used in all angles of formwork unless otherwise shown on the plans or directed by the Engineer.

303.03 INVERT FORMS. - Inverts of sewers and sewerage structures shall be formed by the use of fixed and rigid forms when the invert radius is 2'-0" or less. Inverts with a radius larger than 2'-0" and smaller than 2'-6" shall also be formed by the use

of fixed and rigid forms unless the Engineer approves otherwise. Such approval will depend on the concrete's slump and its ability to satisfactorily form the invert shape by screeding. When fixed and rigid formwork is required, shaping the inverts with screeds or other means will not be allowed.

303.04 CONSTRUCTION. - The invert of the sewer or structure, up to the key joint, shall be constructed first. The concrete shall be carefully and properly placed and vibrated. No traffic of any kind will be permitted on the invert for at least twenty-four hours after placing. Concrete for the sides and tops of sewers and sewer structures not on piles shall not be placed until at least forty-eight hours have elapsed after the placement of invert concrete; and in the case of sewers and sewer structures on piles not until at least seventy-two hours have elapsed after the placement of invert concrete.

No more wall and top section shall be started than can be completed the same day. Wall and top section construction joints with proper keyways shall be made at the end of each pour. Construction joints in invert and walls shall not be in the same plane, but shall be staggered.

Immediately after the removal of the forms and centers, all rubbish and surplus materials shall be removed from the sewer or structure in order to prevent any possibility of their entering the City's sewer system.

303.05 FORM REMOVAL. - The period of time and the strength of concrete required before the removal of forms shall be in accordance with Section 411.09 except that formwork for arch type concrete sewers and sewer structures need only remain in place for a minimum period of seventy-two hours after the placement of concrete therein. If forms are removed before a period of seven days, extra care shall be taken in the removal of forms in order not to spall the "green" concrete.

Formwork, maximum size of 1/4" plywood, may be left in place, provided it is on the outside of the sewer or sewer structure.

Invert forms shall be removed at the proper time to allow thorough steel troweling.

Unless otherwise specified, all formwork and trench support material shall be removed by the Contractor.

303.06 FINISHING. - Interior concrete surfaces of sewers and sewer structures shall be given an "Ordinary Surface Finish" in accordance with the requirement of Section 411.10, except that the completed work need not be sacked. However, such surfaces shall receive a coat of neat cement mortar applied with a brush, and shall be kept free from sewage for a minimum period of thirty-six hours after the cement has been applied.

Inverts of sewers and sewer structures shall be steel troweled to a smooth uniform surface.

The channelization shall be done with Class "B" mortar.

303.07 CURING. - Cast-in-place reinforced concrete sewers and sewer structures shall be cured by water or impervious membrane curing in accordance with these specifications.

No traffic of any kind will be allowed over the sewer during the curing period. The minimum curing period shall be seven days or until the concrete has attained a compressive strength of at least 2,500 pounds per square inch based on field cured cylinders.

Immediately after the sewer invert has been poured, it shall be covered with wet burlap and kept wet for the curing period.

The Contractor may, after twenty-four hours, replace the burlap with straw, sawdust, or earth kept thoroughly wet until the expiration of the curing period.

The concrete in the top and sides of the sewer or structure shall be cured by being kept continuously moist, either by sprinkling, wet burlap, or wet earth, for the curing period.

Concrete curing by means of an impervious membrane shall be done using an approved liquid which will form an impervious, non-slippery membrane when dry. The liquid shall have a temporary color sufficient to indicate the extent of its application. The membrane shall form a hard film and thoroughly waterproof the concrete surface within thirty minutes.

No membrane will be allowed on steel reinforcement. The Contractor shall protect exposed steel reinforcement during membrane application. Any and all membrane on steel reinforcement shall be removed before additional placement of concrete will be allowed.

Membrane curing liquids shall be applied under pressure with a spray nozzle at such a rate as to seal the surface uniformly and completely. The membrane seal shall be protected from injury for ten days and any breaks in the membrane during this period shall be repaired immediately by a fresh application of the liquid.

303.08 FRAMES, COVERS, AND GRATINGS. - Cast iron frames, covers, and gratings shall be furnished and installed on sewer structures, where and as shown on the plans, or where directed. The cast iron shall be in accordance with the requirements of Section 801.01.

Each casting shall have its weight indicated thereon with white paint.

Care shall be exercised to cast the contact surfaces in a true plane and free from irregularities. These surfaces shall be machined or ground to insure uniform contact between frame and cover or grating.

303.09 TAPER CONES. - The taper cone for precast and cast-in-place manholes shall be of the eccentric type. The vertical wall of the cone shall be upstream or as otherwise directed by the Engineer.

303.10 STEPS. - All steps for sewer structures shall be fabricated from approved Class 316 stainless steel or approved polypropylene conforming to Type II, Grade 16906, and in accordance with the requirements of ASTM D2146 with 1/2-inch grade 60 steel reinforcement conforming to ASTM A615, and in accordance with the details shown on the plans.

303.11 CONSTRUCTION JOINTS. - The Contractor shall construct joints in accordance with Section 800.15, unless otherwise specified, and shall furnish and install approved keylock polyvinyl chloride waterstops and flexible silicon rubber joint filler material in

all transverse construction joints. Water stops and filler material shall be omitted on longitudinal construction joints.

The Contractor shall submit for the Engineer's approval, the manufacturer's specifications for the flexible joint filler material.

303.12 PAYMENT. - Cast-in-place reinforced concrete sewer satisfactorily constructed complete, in place, as specified, will be paid for at the price bid per linear foot, measured horizontally along the centerline of sewer between the outside surfaces of structures, or to the limits as constructed, as applicable.

No deduction will be made from the length of cast-in-place reinforced concrete sewers because of manholes constructed thereon.

Cast-in-place reinforced concrete sewer structures satisfactorily constructed complete, in place, will be paid for at the respective lump sum price bid therefor. Appurtenances, such as manholes, cones, frames, covers, gratings, steps, stub inlets, and VCP inverts shall be considered as part of the structure and no direct or additional payment will be made thereof.

SECTION 304

PRECAST REINFORCED CONCRETE PIPE SEWER

304.01 GENERAL. - The Contractor shall construct precast reinforced concrete pipe (RCP) sewer including all excavating, lagging, backfilling, restoring pavement, and other Incidental Work, necessary or required, for a complete, satisfactory installation, where and as shown on the plans, or where directed.

Precast reinforced concrete pipe shall be manufactured by the Centrifugally Spun or Vertically Cast method with bell and spigot joints in accordance with the plans and ASTM "Standard Specifications for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe," Designation C76, except as modified by the plans, the Special Provisions, and these specifications.

Precast pipe shall have cylindrical interior surfaces and shall be free from fractures, excessive interior surface crazing, and roughness. The interior and exterior surfaces shall be concentric at transverse cross sections.

Precast reinforced concrete pipe shall be furnished from a manufacturer who must have had at least five years experience in manufacturing such pipe. The Contractor shall, if requested by the Engineer, submit a list of representative pipe installations for which the manufacturer has furnished pipe during the last five years.

Each section of pipe shall be plainly painted on the inside surface, at the spigot end, with letters and numerals not less than 1-1/2 inches in height designating the following:

- Project specification number;
- Date of manufacture;
- Method of manufacture;

"D-Load" or "Class" rating;
Top Center (when elliptical reinforcement is used), or alternative markings as approved by the Engineer.

The Contractor shall notify the Engineer in writing a minimum of 5 days prior to beginning the manufacture of the pipe to be supplied. To facilitate inspection and testing, each day's run of pipe shall be marked and stored so that pipe manufactured on any particular day may be easily identified.

The strength requirements of the pipe shall be designated in terms of "D-Load" or "Class". "D-Load" is defined as the load, in pounds per square foot of projected internal diameter, that the pipe will withstand under the standard ASTM 3-edge bearing test before any crack having a width of 0.01 inch or more, and a length of 12 inches or more, occurs.

If precast RCP is specified by Class, the D-Load shall be as follows:

Class	D-Load
I	800
II	1000
III	1350
IV	2000
V	3000

The minimum "D-Load" shall be 2000-D unless otherwise specified.

304.02 CONCRETE. - Cement shall be Type II in accordance with Section 800.02. Concrete shall be in accordance with ASTM Standard Specifications, Designation C76 and shall contain 6 sacks of cement per cubic yard of concrete as therein specified. Pipe shall not be transported from the plant until the full design strength is developed. Each section of pipe shall be steam or water cured, or cured using a combination of the two methods, and shall be kept continuously moist for at least 7 days. Curing shall commence within three hours following fabrication. Compression test specimens shall be made, cured in the same manner as the pipe, and tested in accordance with requirements of ASTM "Standard Specifications for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe," Designation C76, except as modified by the testing specifications of Section 304.13.

304.03 CENTRIFUGALLY SPUN. - Pipe manufactured by the centrifugally spinning method shall have smooth interior surfaces free from excessive brush marks or other rough textures. Float rock or other light materials appearing on the inside surface of the pipe will be cause for rejection, unless such imperfections are repaired to the satisfaction of the Engineer.

304.04 VERTICALLY CAST. - Pipe manufactured by the vertical cast method shall have smooth interior surfaces, relatively free from pits and airholes. The concrete shall be placed between rigid internal and external forms extending the full length of the pipe and compacted by high frequency vibration.

The vibrators shall be rigidly attached to the exterior of the form by bolting, clamping, or welding. The vibrators shall be adequate in size and number and of sufficient frequency to properly compact the concrete.

The vibrators shall be operating at all times during the placement of concrete.

304.05 DIMENSIONS AND TOLERANCES. - Pipe shall be furnished in lengths not less than 6 feet; except for the closing sections to structures, where cast or cut lengths not less than 3 feet in length may be used.

Pipe sections 6 feet in diameter and larger, in which manhole openings are provided, shall be not less than 7 feet long.

The minimum wall thickness of pipe, unless otherwise specified, shall be "B Wall" thickness in accordance with ASTM "Standard Specifications for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe," Designation C76. Pipe 42 inches in diameter and larger shall have a minimum protective covering of concrete over steel reinforcement of 1-1/2 inches from the outer surface and one inch from the inner surface.

The minimum thicknesses of bells at the base and spigots shall be in accordance with the following schedule:

12-inch diameter through 24-inch diameter, inclusive: Pipe bells and spigots each shall be at least 1-3/4 inches thick.

27-inch diameter through 60-inch diameter, inclusive: Pipe bells and spigots each shall be at least 2-1/4 inches thick.

63-inch diameter and larger size diameters, inclusive: Pipe bells and spigots each shall be at least 45 percent of the thickness of the respective pipe barrel wall.

In determining minimum thicknesses no reduction will be made from the thickness of spigots because of normal gasket grooves.

However, in any case, gasket grooves shall not be made so as to leave less than 3/4-inch of concrete cover on reinforcing steel.

304.06 CONTRACTOR TO FURNISH DETAILS. - The Contractor shall furnish to the Engineer for approval six copies of the complete design details of the precast reinforced concrete pipe, including joints, and where applicable, cross-bracing, he intends to furnish.

304.07 HANDLING AND STORING. - Pipe shall be handled and stored so as to prevent damage thereto, or to existing improvements.

Pipe, when stored, shall be properly secured to prevent rolling.

Any pipe which, in the opinion of the Engineer, has been damaged to the extent of being beyond repair, will be marked "rejected" and shall be immediately and permanently removed from the site of the work by the Contractor.

Cross-bracing is required for all precast pipes six feet in diameter and larger. The cross-bracing shall be placed inside the pipe such that no deformation will occur. The cross-bracing shall be installed prior to any transportation or handling of the finished pipe. The cross-bracing shall not be removed until the trench has been fully backfilled and compacted. In no case shall there be less than two sets of cross-bracing installed per pipe length.

304.08 CUTTING PIPE. - Cut lengths of pipe shall be neatly cut to a smooth transverse edge with a masonry saw or other approved means in such manner as to not spall the concrete from the surfaces of the pipe or unnecessarily expose the reinforcing steel.

Any pipe damaged by cutting to an extent that it is unsatisfactory shall be replaced with a new and undamaged length of pipe by the Contractor at his expense, or if allowed by the Engineer, shall be repaired in an approved manner. Spalled areas to be repaired shall be satisfactorily filled with Class "A" mortar and reinforcing steel shall be cut back where necessary and the holes filled, also with Class "A" mortar, so that the mortar covering the steel is not less than 2-1/2 inches thick, measured from the cut face of the pipe.

Hand cutting of pipe will be permitted if holes outlining the line of the cut are cleanly drilled and the intervening concrete satisfactorily cut out with approved hand tools. Light pneumatic chipping hammers that, in the opinion of the Engineer, will cut satisfactorily without shattering the adjacent concrete, may be used. The use of sledge hammers or pneumatic jack hammers will not be permitted.

304.09 JOINTS: GENERAL. - Pipe joints shall be bell and spigot. Spigot ends shall be reinforced concrete with an annular groove formed into the outer surface containing a continuous round neoprene gasket compressed therein by the inner surface of a reinforced concrete bell. The joint shall be self-centering and designed so as to prevent the neoprene gasket from supporting the weight of the pipe.

Each joint shall be watertight, (without imperfections), and approved by the Engineer before another section of pipe is installed.

The location of the neoprene gasket within the completed joint will be determined by the use of a feeler gauge.

While joining sections of pipe, the Contractor shall use a "comealong" to seat the pipe section being installed.

The joint gap on the inside of the sewer between sections of pipe shall not exceed 3/4 inch. If the joint gap is 3/8 inch or more, the Contractor shall fill such gap with an approved epoxy mortar, mixed to stiff consistency, and finished flush with the pipe walls.

Joints connecting pipes to structures shall be integrally cast with the structure or made with Class "A" cement mortar. Imperfections of cast joints shall be repaired with Class "A" cement mortar.

Cement mortar shall be in accordance with the requirements of Section 800.09.

The pipe section that cannot be laid to give a proper joint with the approved overlap shall be replaced with a suitable pipe section or the joint shall be reinforced with an approved concrete collar not less than 6 inches thick and 12 inches long, containing not less than 3-circumferential No. 4 steel reinforcing bars with suitable spacers. The outside surface of the pipe at the joint shall be roughened to provide satisfactory bond with the collar.

A cut end of pipe may only be used for the closing connection with concrete structures and manhole bases. The cut end shall extend into the wall of the structure or manhole base. The wall of the structure or manhole shall be placed around the end of the cut length of pipe.

304.10 BELL AND SPIGOT ENDS OF PIPE. - The outside surfaces of the spigot, and the inside surfaces of the bells, shall be accurately formed to provide readily made close fitting joints, the average clearance of which shall not exceed 0.08 inch.

The taper on the conic surface of the inside of the bell and the outer surface of the spigot shall not be more than 3 degrees measured from a longitudinal trace on the inside surface of the pipe.

The joint lap distance at each spigot shall be at least 3-3/8 inches.

The bell reinforcement and the spigot reinforcement shall each be at least equal in quantity and quality to the steel in the pipe barrel wall with extra steel being added, as necessary, to reinforce ends of pipe against normal construction and shipping stresses.

304.11 BEVEL JOINTS. - Bevel joints, when specified in the Special Provisions, shall be of the bell and spigot type as set forth in Section 304.09 and the horizontal deflection thereof shall not exceed 5 degrees. The longitudinal centerline of pipe at each bevel joint shall be located on the indicated centerline of the sewer. Horizontal deflections will be permitted only at bevel joints or within structures.

304.12 NEOPRENE GASKETS. - Each gasket shall be continuous ring of such size and cross section as to completely fill the groove in the spigot when the pipe joint is assembled. The gasket shall make the joint watertight under normal conditions of service including expansion, contraction, and normal earth settlement. Neoprene gaskets shall be made in accordance with ASTM "Standard Specifications for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets," Designation C443.

Each gasket, the groove containing it, and the inside surface of the bell or collar compressing it, shall be coated with an approved manufacturer's recommended lubricant immediately prior to installation.

304.13 MATERIAL TESTING. - The Contractor shall make available testing equipment and samples, and shall test or have tested precast reinforced concrete pipe by standard 3-edge bearing and compression tests in accordance with ASTM "Standard Specifications

for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe." Designation C76, except as modified by the plans and these specifications.

The Contractor shall furnish the Engineer with Compression Test results for each manufacturer's run, size, and "D-Load" of pipe specified. If the test cylinder fails to reach the design strength, the Contractor shall at his own expense provide core samples where directed by the Engineer. The core shall be cut and tested in accordance with the requirements of Methods ASTM C497. The core holes shall be plugged and sealed in accordance with ASTM C76.

At the option of the Engineer, the Contractor shall furnish complete test data of the pipe he intends to furnish, two standard concrete cylinders, and two core samples from each run, size, and "D-Load" of the specified pipe for testing by the City.

The Engineer may select from each size, "D-Load," or 400-linear feet of pipe one length for 3-edge bearing testing, and at the Engineer's request all tests shall be performed in his presence. The minimum length for 3-edge bearing testing shall be 6-linear feet. For each pipe that fails to meet the "D-Load" requirements two additional lengths of the same run, size, and "D-Load" shall be tested. If these pipes meet the "D-Load" requirements the shipment will be accepted. If these pipes do not meet the "D-Load" requirements, testing shall be continued as determined by the Engineer until he approves or rejects the shipment.

For precast pipe sizes larger than 108-inch diameter the 3-edge bearing test will not be required. In lieu thereof, the Contractor shall submit to the Engineer notarized certificates obtained from the pipe manufacturer to verify:

- 1) The 28-day strength of the concrete, as determined from crushing tests in accordance with ASTM Designation C76 on (a) standard concrete cylinders, or (b) core samples; the latter being in addition to the former and at the option of the Engineer;
- 2) The density of the concrete as in the finished pipe product;
- 3) The strength and type of steel used;
- 4) That production of the pipe is in compliance with ASTM Designation C76, except as modified by the plans and these specifications.

In addition to the samples, tests, and test results required herebefore, the City reserves the right to require additional samples, tests, and test results to properly examine the precast reinforced concrete pipe.

304.14 PAYMENT. - Precast reinforced concrete pipe sewer satisfactorily constructed complete, in place, as specified, will be paid for at the price bid per linear foot, measured horizontally along the centerline of sewer, exclusive of manholes and structures, between the outside surfaces of manholes and structures, or to the limits as constructed if the sewer does not terminate in manholes or structures.

Precast reinforced concrete pipe sewer connecting to a manhole or structure by a collar or boss shall be measured to the outside surface of such collar or boss at the point of connection with the pipe.

No deduction will be made from the measured length of precast reinforced concrete pipe sewer because of collars constructed thereon to reinforce the joint between sections of precast pipe. The collars constructed to reinforce the joint shall be done as
Incidental Work.

No deduction will be made from the measured length of precast reinforced concrete pipe sewer because of manhole cones constructed thereon.

SECTION 305

VITRIFIED CLAY PIPE SEWER

305.01 GENERAL. - The Contractor shall construct vitrified clay pipe sewer (including encasement in reinforced concrete, plain concrete base, or reinforced concrete foundation, as the case may be) including all excavating, lagging, backfilling, restoring pavement, and other Incidental Work, necessary or required for a complete, satisfactory sewer installation, where and as shown on the plans, or where directed.

305.02 PIPE. - Vitrified Clay Pipe (VCP) shall conform to the ASTM "Standard Specifications for Extra Strength Clay Pipe," Designation C700, except as modified by the plans, the Special Provisions and these specifications.

VCP main sewers and fittings for pipe diameter larger than 12 inches shall be of the bell and spigot type.

The minimum thickness of the pipe barrel shall conform to the Regional Western Standard of the Clay Pipe Institute.

305.03 JOINTS. - Bell and spigot joints shall be constructed with factory fabricated compression type gasket joints in accordance with ASTM "Standard Specification for Vitrified Clay Pipe Joints Using Materials Having Resilient Properties," Designation C425. Joints shall be made up in the field in accordance with the manufacturer's recommendations. All joints shall be tight fitting, watertight, and without imperfections. Only factory recommended lubricants shall be used.

Joints connecting pipes to manhole structures shall be made with a short stub. The straight segment of stub barrel may not exceed 6-inch maximum from face of the structure.

Joints for VCP plain-end pipe sewers 12-inch or smaller in diameter may be rubber compression couplings with stainless steel bands type 316. Rubber compression couplings with Class 316 stainless steel bands shall be in accordance with the requirements of ASTM designation C425.

305.04 TESTING. - The Contractor shall test vitrified clay sewer pipe and joints, if required by the Special Provisions, in the presence of the Engineer. The Contractor shall notify the Engineer, at least 48 hours in advance, of the time and place of such tests.

Vitrified clay pipe shall be tested for strength, absorption, and acid resistance, in accordance with ASTM "Specification for Extra Strength Clay Pipe", Designation C700, except that the number of pipes to be tested shall be one.

Joints in VCP pipes shall be tested in accordance with ASTM "Specification for Compression Joints for Vitrified Clay Bell and Spigot Pipe", Designation C425, except that:

- 1)The number of joints to be tested shall be one;
- 2)Duration of hydrostatic shear test shall be 10 minutes;
- 3)The field performance tests will not be required;
- 4)In the event of a failure of a test, two additional joints from the same lot of pipe shall be tested.

305.05 CONTRACTOR TO FURNISH DETAILS. - The Contractor shall furnish to the Engineer for approval prior to shipment of the VCP pipes six copies of the certified report of the actual test results meeting the requirements of ASTM C700.

305.06 HANDLING AND STORING. - Pipe shall be handled and stored so as to prevent damage thereto, or to existing improvements. Pipe, when stored, shall be properly blocked to prevent rolling.

305.07 CONSTRUCTION. - Pipe sections of the main sewer shall be ordered in short lengths, as necessary if "T" or "Y" branches will be used, in order that such branches will be located opposite or within 2 feet down downstream of existing side sewer locations.

Pipe sewers shall be so constructed and the sections so installed that the sections of pipe laid together form a continuous uniform line of pipe with a smooth regular interior surface. Pipe shall be laid uphill from structure to structure with the bell end upgrade. Each pipe shall be laid in the proper position, on a firm 4-inch deep sand bed, and shall have uniform support and bearing for its entire length. Bells shall be cleaned before the spigot of the succeeding pipe is inserted. A bell hole shall be dug at the end of each pipe to accommodate the bell and facilitate the making of the joint.

Pipe sewers shall be laid in conformity to the prescribed lines and grades, which shall be obtained for each pipe by measuring from a tightly stretched line running parallel with the grade and supported over the center line of the sewer by bars placed across the trench. The pipe sections shall be tightly fitted together. All adjustments of pipe to line and grade shall be made by scraping away or filling in and tamping the earth under the body of the pipe, not by blocking or wedging up. Supporting blocks shall not be used under the pipe. Pipe shall not be laid within 4 inches of any rock or other rigid object.

The Contractor shall not lay pipe in water and he shall use crushed rock, subdrains, or some other method approved by the

Engineer to maintain an appropriately dry trench.

Crushed rock bedding for pipe sewers shall be uniformly graded from No. 4 to 3/4-inch sieve size. Compaction shall be obtained by shovel slicing, using care not to disturb the pipe. Jetting will not be allowed to get proper compaction of the crushed rock bedding.

Pipe sewers in encasements or on foundations shall have the bottom reinforcing steel of the encasement or foundation run continuously through all sewerage structures constructed along or at the end of such sewers.

When pipe is being encased in reinforced concrete, the Contractor shall support the pipe during placement of the concrete encasement, shall prevent any "floating" or movement of the pipe, and shall carefully maintain the required line and grade. The support and method thereof shall be approved by the Engineer prior to placing encasement but such approval will not relieve the Contractor of his responsibility for execution of the work so that the pipe will be true in line and grade and satisfactory in every respect.

305.08 PAYMENT. - Vitrified clay pipe sewer (including encasement in reinforced concrete, plain concrete base, or reinforced concrete foundation, as the case may be) satisfactorily constructed complete, in place, as specified, will be paid for at the price bid per linear foot, measured horizontally along the centerline of the sewer, exclusive of manholes and structures, between the outside surfaces of manholes and structures, or to the limits as constructed if the sewer does not terminate in manholes or structures. Supporting piles, and the driving thereof, will not be included for payment under a Bid Item for vitrified clay pipe sewer, but will be paid for under the appropriate Bid Items.

Vitrified clay pipe sewer connecting to a manhole or structure by a collar or boss shall be measured to the outside surface of such collar or boss at the point of connection with the pipe.

No deduction will be made from the measured lengths of vitrified clay pipe sewer because of side sewer connections.

SECTION 306

VITRIFIED CLAY PIPE CULVERT

306.01 GENERAL. - The Contractor shall construct vitrified clay pipe culvert (including encasement in reinforced concrete, plain concrete base, or reinforced concrete foundation, as the case may be) including all excavating, lagging, backfilling, restoring pavement, and other Incidental Work, necessary or required for a complete, satisfactory installation, where and as shown on the plans, or where directed.

306.02 PIPE. - Vitrified clay pipe for culvert shall be the same as specified for main sewers in Section 305.02, except that

the culvert and related fittings may be of the spigot type using composition couplings and stainless steel bands to make the joints.

306.03 JOINTS. - Joints for vitrified clay pipe culverts shall be the same as specified for main sewers in Section 305.03, except that rubber compression couplings with stainless steel bands may be used for the applicable joints. Rubber compression couplings with Class 316 stainless steel bands shall be in accordance with the requirements of ASTM "Tentative Specifications for Compression Couplings for Vitrified Clay Plain-end Pipe", Designation C425.

306.04 CONTRACTOR TO FURNISH DETAILS. - The Contractor shall furnish to the Engineer for approval six copies of the certified report of the actual test results meeting ASTM C700 and design details of the rubber compression couplings.

306.05 HANDLING AND STORING. - Pipe shall be handled and stored so as to prevent damage thereto, or to existing improvements. Pipe, when stored, shall be properly secured to prevent rolling.

306.06 CONSTRUCTION. - Vitrified clay pipe culvert shall be constructed in accordance with the requirements for main sewers as specified in Section 305.07. Culvert shall be laid on a grade of not less than 2 percent (approximately 1/4-inch per foot). Horizontal and vertical bends in side sewer runs shall not exceed 45 degrees (1/8 bend), using approved mitered joints.

306.07 PAYMENT. - Vitrified clay pipe culvert (including encasement in reinforced concrete, plain concrete base, or reinforced concrete foundation, as the case may be) satisfactorily constructed complete, in place, as specified, will be paid for at the price bid per linear foot, measured horizontally along the centerline of the culvert, between the outside surfaces of sewerage and drainage structures, or to the limits as constructed if the culvert does not terminate in sewerage or drainage structures.

SECTION 307

VITRIFIED CLAY PIPE SIDE SEWER

307.01 GENERAL. - The Contractor shall construct vitrified clay pipe side sewer, including all excavating, lagging, backfilling, restoring pavement and other Incidental Work necessary, or required for a complete, satisfactory installation, where and as shown on the plans, or where directed.

307.02 PIPE. - Vitrified clay pipe for side sewers shall be the same as specified for main sewers in Section 305.02, except that the side sewers and related fittings may be of the spigot type.

307.03 JOINTS. - Joints for vitrified clay pipe side sewers shall be the same as specified for main sewers in Section 305.03, except that rubber compression couplings with Class 316 stainless steel bands may be used for the applicable joints. Composition couplings with Class 316 stainless steel bands shall be in accordance with the requirements of ASTM "Tentative Specification for Compression Couplings for Vitrified Clay Plain-End Pipe", Designation C425.

307.04 HANDLING AND STORING. - Pipe shall be handled and stored so as to prevent damage thereto, or to existing improvements. Pipe, when stored, shall be properly blocked to prevent rolling.

307.05 CONTRACTOR TO FURNISH DETAILS. The Contractor shall furnish to the Engineer for approval six copies of the certificate of compliance to ASTM C700 and design details of the rubber compression couplings.

307.06 CONSTRUCTION. - Vitrified clay pipe side sewers shall be constructed in accordance with the requirements for main sewers specified in Section 305.07. Side sewers shall be connected to the main sewer in accordance with the requirements for side sewer connections as specified in Section 316.

Where side sewers are connected to concrete sewers a stub of the proper size shall be installed in the main sewer and the side sewer connected thereto.

Where the diameter of the existing side sewer is smaller than the diameter of a specified connection, such connection shall be made with an appropriate size increaser.

Horizontal and vertical bends in side sewer runs shall not exceed 45 degrees (1/8 bend), using approved mitered joints. Normal joints shall not be deflected greater than that recommended by the manufacturer.

Side sewers shall be laid on a straight grade which grade shall in no case be less than 2 percent (approximately 1/4-inch per foot).

The upper end of each side sewer shall be 12 inches behind the curb line at a depth sufficient to provide adequate sewerage for the property served. In no case shall the depth of the invert of a side sewer at the curb line be less than 4 feet below curb grade.

In connecting new side sewer to existing side sewer, the new side sewer shall be laid on a straight grade from the main sewer to the point of junction with the existing side sewer. The deflection angle at the junction shall not exceed 45 degrees, using approved mitered joints.

The ends of side sewers not in service before the side sewer trenches are backfilled shall be closed with a VCP stopper and marked by the letter "S" placed on the top of the curb directly over the side sewer. The end of each such side sewer shall also be marked by a 2-inch x 2-inch redwood stake running vertically from the bottom of the trench to a point 6 inches below the surface of

walk or ground. In new concrete curbs the "S" shall be stamped in the fresh concrete. In the tops of other curbs it shall be neatly cut.

Before marking the "S" on the curb the Contractor shall verify the location of the side sewer by excavating to the top of the redwood stake. If for any reason the stake is not found, the Contractor shall excavate and expose the pipe. In no case shall probing with a bar, or other method, be permitted as a substitute for actual exposure of the stake or pipe.

307.07 PAYMENT. - If the Proposal contains a side sewer Bid Item, all side sewers necessary or required for the reconnection of existing side sewers within the main sewer trench and to the limits of 12 inches outside the lagging or 12 inches outside the limits of excavation for the main sewer, if not lagged, shall be constructed as Incidental Work. Side sewer, outside such limits, satisfactorily constructed complete, in place, as specified, will be paid for at the price bid per linear foot, measured horizontally along the centerline of the side sewer, from the above limits to the end of the side sewer.

If the Proposal does not contain a side sewer Bid Item, side sewers necessary or required for reconnection of existing side sewers (i.e., replacement of side sewer removed by the operations of the Contractor) within the main sewer trench and to the limits of 12 inches outside the lagging or 12 inches outside the limits of excavation for the main sewer if not lagged, shall be constructed as Incidental Work. Side sewer necessary or required for reconnection outside such limits will be paid for as Extra Work in accordance with Section 112.

If the Proposal does not contain a side sewer Bid Item, the two lengths of side sewer required by Section 316.05 at inlets and branches not in service shall be furnished and installed as Incidental Work.

SECTION 308

DUCTILE IRON PIPE

308.01 GENERAL. - The Contractor shall furnish and install ductile iron sewer pipe, where and as shown on the plans or where directed, including all excavating, lagging, backfilling, pavement restoration, and all other related Incidental Work necessary, or required, for a complete satisfactory sewer installation.

308.02 DUCTILE IRON SEWER PIPE. - Ductile iron sewer pipe shall be bell and spigot, rubber gasketed, water main pipe conforming to the applicable requirements of ANSI/AWWA Standards C101, C104, C106, C110, C111, C150 and C151. Side sewer connections shall be made with fittings or approved saddles.

308.03 CONTRACTOR TO FURNISH DETAILS. - The Contractor shall furnish to the Engineer for approval six copies of the complete design details of the ductile iron pipe, including joints, he intends to furnish.

308.04 PAYMENT. - Ductile iron sewer pipe satisfactorily constructed complete, in place, as specified, will be paid for at the respective prices bid per linear foot for the type and size of pipe installed, measured horizontally along the centerline of the sewer between the outside surfaces of manholes and structures, or to the limits as constructed if the sewer does not terminate in manholes or structures. In the case of connections of these pipes to a manhole or structure by a collar or boss measurement will be to the outside surface of such collar or boss.

No deductions will be made from the measured length of the pipe due to fittings and saddles.

SECTION 309

CORRUGATED METAL PIPE CULVERT

309.01 GENERAL. - The Contractor shall furnish and install galvanized corrugated metal pipe, complete with coupling bands, paving, coating, lining, fittings and end sections, as the case may be, including all excavating, lagging, backfilling, restoring pavement, and other Incidental Work, necessary or required for a complete, satisfactory installation, where and as shown on the plans, or where directed.

309.02 MATERIALS. - Corrugated metal pipe materials shall be galvanized and shall conform to the specifications of AASHTO Designation M36.

The paving of inverts, bituminous coating and lining of pipes shall conform to the specifications of AASHTO Designation M190.

309.03 IDENTIFICATION. - Each section of a pipe shall bear the name of the sheet manufacturer, the brand, or trade mark, and the gauge. This identification shall be stamped on the sheets by the manufacturers of the sheet. Pipe having any sections not so stamped shall be rejected. The manufacturer of the pipe shall roll the sheet so that the identification shall appear on the outside of each section.

309.04 MANUFACTURE. - All pipes shall be circular, unless otherwise specified, of lap joint construction, and all joints shall be fabricated by riveting, welding, or using a continuous lock seam so that jointed pipe shall be straight and rigid.

The corrugations shall be not more the 2-3/4 inches wide and not less than 1/2-inch deep.

309.05 DIMENSIONS AND WEIGHT. - The sheet length before forming, the gauge of the uncoated metal, and the weight per foot of the finished pipe, shall not be less than shown in the following Table. A maximum variation of plus or minus 5 percent will be allowed from the weight specified in the Table.

Nominal Diameter Inches	Length of Sheet Before Forming-Inches	Min. Gauge U.S. Standard Uncoated Metal	Weight Per Foot Finished Culver-Pounds
12.....	41 16	10.8	
15.....	50 16	13.1	
18.....	60 16	19.3	
24.....	79 14	25.4	
30.....	98 14	43.6	
36.....	117 12	52.0	
42.....	136 10	75.6	
48.....	156 10	88.1	
60.....	298 8	136.8	

Where pipe is to be placed under fills 20 feet or more in depth, the gauge of the sheets may be increased, such increase to be noted on the plans or in the Special Provisions.

309.06 RIVETING. - Rivets shall not be less than 5/16-inch in diameter for 14-gauge sheets or lighter, and they shall not be less than 3/8 inch for sheets heavier than 14-gauge. All rivets shall be thoroughly galvanized or sherardized.

Longitudinal joints shall be riveted in each outside groove, and for pipes of 30-inch diameter or larger, double riveted in each outside groove. In the transverse joints, rivets shall be placed uniformly not more than 6 inches apart.

Round heads of rivets shall have a diameter of not less than 1.5 times the diameter of the rivet, plus 1/8-inch, and flat heads shall have a thickness of not less than 3/5 of the diameter of the rivet.

309.07 COUPLING BANDS. - Field connections shall consist of bands not less than 12 inches in width, made from the same material as the pipe. They may be fitted with malleable cast iron lugs, or with angles having minimum dimensions of 1 1/2-inches x 1 1/2-inches and of a length equal to the full width of the band, and provided with galvanized bolts not less than 1/2-inch in diameter. The coupling bands shall be fabricated so that connections may be easily made in the field. A continuous band-type neoprene gasket not less than 7 inches wide by 3/8-inch thick shall be placed between the coupling band and abutting sections.

309.08 CONTRACTOR TO FURNISH DETAILS. - The Contractor shall furnish to the Engineer for approval six copies of the complete design details of the corrugated metal pipe, including joints, and connections, he intends to furnish.

309.09 CONSTRUCTION. - The pipe shall be carefully handled to prevent damage to the galvanizing, and shall in no case be dragged along the ground. Such damage will be sufficient cause for rejection of the pipe. If permitted by the Engineer, small areas, on which the galvanizing is damaged or destroyed, may be repaired by the application of two coats of hot asphaltic paint. The pipe shall be laid on a 4-inch thick sand bed and the trench backfilled in accordance with Section 703.

309.10 PAYMENT. - Corrugated metal pipe satisfactorily constructed complete, in place, as specified, will be paid for at the price bid per linear foot, measured horizontally along the centerline of the corrugated metal pipe between the outside surfaces of structure, or to the limits as constructed, as applicable.

SECTION 310

MANHOLES

310.01 GENERAL. - The Contractor shall construct manholes complete with cones, frames, covers, gratings, steps, VCP stub inlets, and including excavating, lagging, backfilling, restoring pavement and other Incidental Work, necessary or required for a complete satisfactory installation, where and as shown on the plans, or where directed.

Manholes shall be constructed to conform to the improved street surface. In unimproved areas if the ground surface is below the official grade, the manhole shall be constructed to conform to such official grade unless otherwise indicated on the plans; and if the ground surface is above the official grade, the manhole shall be so constructed that the internal diameter, at the proper elevation to conform to the official grade, is 24 1/2 inches, and shall be continued upward, with the same diameter, to conform to the ground surface.

Manholes shall be constructed of precast concrete sections in accordance with the requirements of ASTM "Standard Specifications for Precast Reinforced Concrete Manhole Sections", Designation C478, or cast-in-place in accordance with the applicable requirements of Section 303. Precast concrete manholes shall be supported on a cast-in-place concrete base.

The Contractor shall submit for approval detail drawings of any equivalent alternative method that he may propose, other than that shown on the plans, for installing, anchoring and protecting the required steps in precast manholes.

310.02 SPECIAL MANHOLES. - Drop manholes and other special manholes shall be constructed as shown on the plans and in accordance with the requirements set forth herein. Drop manholes shall include the drop connection and drop pipe as part of its structure.

310.03 MANHOLE FRAMES, COVERS, GRATINGS, TAPER CONES, AND STEPS. - Cast iron manhole frames, covers, gratings, and taper

cones, Class 316 stainless steel or polypropylene Type II, Grade 16906 with 1/2-inch grade 60 steel reinforcement steps shall be furnished and installed as shown on the plans and as specified in Sections 303.08, 303.09 and 303.10.

310.04 PAYMENT. - Manholes, including special manholes, satisfactorily constructed complete, in place, as specified, will be paid for at the unit price bid therefor.

The unit price bid for a manhole on a reinforced concrete sewer shall include all expense due to such manhole, over and above the cost of the sewer without the manhole.

Appurtenances, such as manhole cones, frames, covers, gratings, steps, stub inlets and VCP inverts will be considered part of the manhole and no direct or additional payment will be made therefor.

SECTION 311

FURNISH AND INSTALL FRAMES AND COVERS ON EXISTING MANHOLES

311.01 GENERAL. - The Contractor shall remove and salvage, as City property, the frames and covers from existing manholes, and shall furnish and install in place thereof new manhole frames and covers in accordance with the requirements of Section 303.08, all where and as shown on the plans, or where directed, including all Incidental Work necessary, or required, for a satisfactory installation.

311.02 PAYMENT. - Manhole frame and cover furnished and installed on an existing manhole, complete in place, as specified will be paid for at the price bid for a set, consisting of one frame and one cover.

SECTION 312

CATCHBASINS

312.01 GENERAL. - The Contractor shall construct catchbasins complete with curb inlets, frames, gratings, traps, and including excavating, lagging, backfilling, restoring pavement, and other Incidental Work, necessary or required for a complete satisfactory installation, where and as shown on the plans, or where directed.

Catchbasins shall be constructed of Class 6-3500-1 1/2 concrete precast sections in accordance with the applicable requirements of Section 304 or cast-in-place in accordance with the applicable requirements of Section 303. Precast catchbasins shall be supported on a cast-in-place concrete base.

Unless otherwise shown on the plans, catchbasin gratings shall be 9 inches below curb grade, except that catchbasin gratings to be installed in travel lanes shall conform to the gutter elevations.

312.02 CURB INLETS. - Curb inlets shall be constructed as shown on the plans and shall comply with the requirements for concrete curbs.

When two inlets are specified for catchbasins with multiple curb inlets, the center inlet shown on the Standard Plan shall be eliminated.

The curb inlets, or slabs, as the case may be, shall conform to the adjacent curb and sidewalk.

312.03 CATCHBASIN FRAMES, GRATINGS, AND TRAPS. - Cast iron catchbasin frames, gratings, and traps shall be furnished and installed on catchbasins as shown on the plans. The cast iron shall be in accordance with the requirements of Section 801.01.

Each casting shall have its weight indicated thereon with white paint.

Care shall be exercised to cast the contact surfaces in a true plane and free from irregularities. These surfaces shall be machined or ground to insure uniform contact between the grating and frame.

312.04 PAYMENT. - Catchbasin satisfactorily constructed complete in place, as specified, will be paid for at the unit price bid therefor.

SECTION 313

FURNISH AND INSTALL FRAMES AND GRATINGS ON EXISTING CATCHBASINS

313.01 GENERAL. - The Contractor shall remove and salvage, as City property, the frames and gratings from existing catchbasins, and shall furnish and install in place thereof new catchbasin frames and gratings in accordance with the requirements of Section 312.03, all where and as shown on the plans, or where directed, including all Incidental Work, necessary, or required, for a satisfactory installation.

313.02 PAYMENT. - Catchbasin frame and grating satisfactorily furnished and installed on an existing catchbasin, complete in place, as specified, will be paid for at the price bid for a set, consisting of one frame and one grating.

SECTION 314

STORM WATER INLETS

314.01 GENERAL. - The Contractor shall construct storm water inlets complete with frames, gratings, and including excavating,

lagging, forming, backfilling, restoring pavement, and other Incidental Work necessary or required for a complete, satisfactory installation, where and as shown on the plans, or where directed.

Storm water inlets shall be concrete unless otherwise specified.

314.02 CONCRETE STORM WATER INLETS. - Concrete storm water inlets shall be constructed of cast-in-place Class 6-3500-1 1/2 concrete in accordance with Sections 411 and 800. Construction shall be in accordance with the applicable requirements of Section 303.

314.03 BRICK STORM WATER INLETS. - Brick storm water inlets shall be constructed of common bricks and Class "B" mortar in accordance with Sections 320 and 800.09. The entire inner surface of the brickwork shall be plastered with a smooth coat of Class "A" mortar, which shall be at least 1-inch thick on the invert and 3/8-inch thick on the walls. In soft ground, the foundation slab shall be constructed of Class 6-3500-11/2 concrete.

314.04 STORM WATER INLET FRAMES AND GRATINGS. - Storm water inlet frames and gratings shall be furnished and installed where and as shown on the plans and in accordance with section 312.03.

314.05 PAYMENT. - Storm water inlet satisfactorily constructed complete, in place, as specified, will be paid for at the unit price bid therefor.

SECTION 315

FURNISH AND INSTALL FRAMES AND GRATINGS ON EXISTING STORM WATER INLETS

315.01 GENERAL. - The Contractor shall remove and salvage, as City property, the frames and gratings from existing storm water inlets, and shall furnish and install in place thereof new storm water inlet frames and gratings in accordance with the requirements of Section 312.03, all where and as shown on the plans, or where directed, including all Incidental Work, necessary, or required, for a satisfactory installation.

315.02 PAYMENT. - Storm water inlet frame and grating satisfactorily furnished and installed on an existing storm water inlet, complete in place, as specified, will be paid for at the price bid for a set, consisting of one frame and one grating.

SECTION 316

VCP SIDE SEWER CONNECTIONS TO MAIN SEWERS

316.01 GENERAL. - The Contractor shall connect each side sewer to the main sewer by using:

in VCP main sewer, at his option, a VCP T-branch, a VCP Y-branch, or by tapping the main sewer by drilling a hole and securing therein a VCP stub;

in precast concrete pipe main sewer, a VCP stub inlet; and,

in cast-in-place sewers and sewer structures, a VCP stub inlet;

in each case including all Incidental Work necessary or required for a complete satisfactory installation, where and as shown on the plans or where directed.

VCP stubs and stub inlets shall be vitrified clay and in accordance with the requirements of Section 305.02.

Tapping a VCP sewer will be permitted only where the diameter of the main sewer is at least twice the diameter of the side sewer.

T-branches, Y-branches and stub inlets shall be not less than 6 inches in diameter in residential districts, and not less than 8 inches in diameter in industrial and commercial districts. If any existing side sewer is of larger diameter, the branch inlet shall be of such diameter.

316.02 T-BRANCH OR Y-BRANCH. - T-branches and Y-branches shall be made of vitrified clay in accordance with the applicable requirements of Section 305.02, and installed in accordance with the applicable requirements of Section 305.

316.03 VCP STUB IN TAPPED VCP MAIN SEWER. - The Contractor, in lieu of using T-branches or Y-branches in VCP main sewers, may connect side sewers by drilling the proper size neat round hole in the wall of the main sewer, inserting therein either a rubber and plastic compression fitting with VCP stub or a VCP stub in place with epoxy mortar. The VCP stub shall be cut to fit flush with the inside surface of the main sewer. The clearance between the outside diameter of the stub and the drilled hole shall be such as to properly contain the epoxy mortar and produce a strong, watertight joint.

The epoxy mortar used for bonding the VCP stub and main sewer shall have a set time or curing time not to exceed thirty minutes regardless of temperature. The manufacturer's specifications for epoxy mortar shall be submitted in writing to the Engineer for approval.

Substitute methods or devices for tapping the VCP main sewer and installing a side sewer connection shall be submitted to the City Engineer for approval. The submittal must include manufacturer's specifications and details.

The clear length of VCP main sewer, between drilled holes, or between a drilled hole and the spigot end, shall be not less

than 18 inches.

Each length of VCP main sewer that has been drilled shall be inspected before being placed in the trench and will be rejected if it does not "ring true" when tapped with a hammer. Before VCP main sewer is laid in the trench, the Contractor shall set each VCP stub in the holes in such pipe with an approved epoxy resin joint material applied in accordance with the manufacturer's instructions.

Each VCP stub shall be the proper size for the tapped main sewer and for the side sewer. Aluminum stubs will not be allowed.

316.04 STUB INLET IN CONCRETE SEWER OR STRUCTURE. - Each stub installed in a sewer or structure shall be mortared in place with Class "A" cement mortar, or an approved epoxy mortar.

Stub inlets shall be set with the back of the bell placed as close as practicable to the outside surface of the sewer or manhole, and shall be of such length that the inner spigot end shall be flush with the inside surface. They shall be securely fastened in the formwork of cast-in-place sewers and sewer structures so that they will not be displaced from their correct positions during placing of the concrete. All holes in precast concrete pipe for stub inlets shall be cut in accordance with the plans and the requirements of Section 304.08; the method specified in Section 316.03 may be used. Reinforcing bars within the hole shall be cut so as to clear the stub by not less than one inch.

Where the edge of the hole is less than 18 inches from the end of a pipe, or where the clearance between two holes is less than 18 inches, a ring bar of No. 5 reinforcing steel shall be welded to each cut bar. The hole shall be cut sufficiently large to provide a 1-inch clearance between the ring bar and the stub. Clearance between two cut holes or between a cut hole and the end of the pipe shall not be less than 6 inches.

316.05 STUB INLETS AND BRANCHES NOT IN SERVICE TO BE CLOSED AND MARKED. - The Contractor shall furnish and install two lengths of VCP side sewer connected to the bell ends of all VCP stub inlets, stubs, and branches not in service before backfilling, and shall close the resulting bell ends with vitrified clay stoppers properly secured and made watertight. Each such stoppered bell end to which no connection is made, shall be marked by a 2-inch x 2-inch redwood stake, running vertically from the bottom of the trench at the stoppered bell to a point one foot below the surface of the street. Care shall be taken to maintain the stake in its correct position during backfilling. In addition to the redwood stake, the letter "Y" shall be stamped or neatly chipped in the top of the curb opposite each stoppered bell from which a side sewer has not been constructed.

316.06 SIDE SEWER INVESTIGATION. - The Contractor shall confirm that each property has been provided with a satisfactory connection for all its side sewers.

The Contractor shall perform the following for all side sewers:

1. Confirm connection points of active side sewers by dye-testing at sidewalk vents.
2. Investigate, locate, and confirm active side sewers not identified by sidewalk vents by dye-testing at building fixtures and/or rodding.
 - a) Side sewers rodded to show lengths short of one (1) foot behind the curb shall be considered as inactive.
 - b) Side sewers rodded to show lengths beyond one (1) foot behind the curb are to be assumed as active and shall be connected to the new sewer.
3. Record locations of active side sewers and provide the City with a copy of the record.

316.07 PAYMENT. - VCP side sewer connection to main sewer made by T-branch, Y-branch, VCP stub secured in drilled hole in VCP main sewer, or VCP stub inlet in RCP or cast-in-place main sewer, satisfactorily completed and in place, as specified, and including, if the Proposal does not contain a side sewer Bid Item, furnishing and installing the two lengths of side sewer required at inlets and branches not in service, will be paid for at the unit price bid for a side sewer connection for the respective kind and size of main sewer and size of side sewer.

No deduction in the measured length of main sewer will be made for VCP side sewer connections.

Connection of side sewers to the hereinbefore specified side sewer connections and to existing side sewers shall be done as Incidental Work.

Investigation, locating by dye-testing, abandoning inactive side sewers, if any, and rodding of side sewers shall be done as Incidental Work.

SECTION 317

CONNECTIONS TO AND BETWEEN SEWERS, STRUCTURES AND CULVERTS

317.01 GENERAL. - The Contractor shall make all connections to and between sewerage and drainage structures, sewers, and culverts, where and as shown on the plans, including constructing stub inlets for culverts, and doing all other work necessary or required in order that the completed work will function as an integral part of the sewerage system.

Connections shall be constructed in a manner to produce smooth junctions, and those of new to existing concrete shall be done in accordance with the applicable requirements of Section 800.15.

Unless otherwise specified, where pipe sewer is to be connected to a brick or concrete sewer or structure, the Contractor

shall keep the opening therefor to a practicable minimum, and shall make the joint with Class "A" cement mortar.

Stubs and stub inlets for culvert connections to catchbasins, storm water inlets, manholes and sewer structures shall be 10 inches in diameter unless otherwise specified, and shall be in accordance with the applicable requirements of Section 316.

317.02 PAYMENT. - Connections to and between sewers, sewerage and drainage structures and culverts, including constructing stubs and stub inlets for culverts, shall be done as Incidental Work and payment therefor shall be included in the price and prices bid.

SECTION 318

SIDE SEWER TRAP

318.01 GENERAL. - The Contractor shall furnish and install new vitrified clay pipe side sewer traps, complete with vitrified clay air vent risers, cast iron inlet frames with malleable iron gratings, fittings, connections, extensions, and appurtenances; and including excavating, backfilling, restoring pavement and all other Incidental Work, necessary or required for a complete, satisfactory installation, where and as shown on the plans, or where directed.

Fittings and soil pipe extensions on the house side of the trap connecting the trap to existing facilities shall be of the same type material as existing facilities or of vitrified clay pipe. Extensions connecting side sewer traps to existing facilities shall not extend beyond the property line.

318.02 INSTALLATION. - Traps shall have spigot ends and connections shall be made with rubber compression couplings with Class 316 stainless steel bands as specified for vitrified clay pipe side sewer in Section 307.03, or an approved equal joint connection.

318.03 PAYMENT. - Side sewer trap satisfactorily constructed complete, in place, as specified will be paid for at the unit price bid therefor.

SECTION 319

LOW PRESSURE TESTING

319.01 GENERAL. - The Contractor shall do all low pressure testing specified in the Special Provisions or indicated in the plans, including all Incidental Work, necessary or required, to satisfactorily demonstrate watertightness of the installed system.

319.02 INSPECTION AND TESTING. - The Engineer and the Contractor shall make a visual inspection of each pipe joint prior to backfill. Joints deemed unsatisfactory by the Engineer shall be repaired or remade to a proper standard of workmanship and appearance.

Upon approval by the Engineer the Contractor shall backfill the sewer, leaving the joints exposed, and perform a low pressure, 10 p.s.i.g. hydrostatic test on the pipe for a duration of at least 30 minutes without adding test fluid. The Contractor shall provide all equipment necessary to perform the test. Failure to maintain the test pressure shall be cause for the Engineer to order additional tests and order the remaking of joints and additional tests until all leaks are eliminated.

Balloon plugs may be used at side sewer connections to limit tests to main sewer joints.

If approved by the Engineer, the Contractor may substitute an approved equivalent air test in lieu of the hydrostatic test.

319.03 PAYMENT. - Low pressure testing satisfactorily completed, as specified will be paid for at the price bid therefor when such work is set forth for payment in the Schedule of Bid Prices. Low pressure testing specified on the plans or in the Special Provisions and not set forth for payment in the Schedule of Bid Prices shall be done as Incidental Work, and no direct or additional payment will be made therefor.

SECTION 320

BRICKWORK FOR SEWERS

320.01 GENERAL. - The Contractor shall do all brickwork for sewers, as specified, including all Incidental Work, necessary or required for complete satisfactorily constructed masonry, where and as shown on the plans, or where directed.

Brickwork shall be done in accordance with the requirements of Section 416 and this Section 320.

Mortar for brickwork shall be Class "B" or "C" as required by Section 800.09 and these specifications.

320.02 BRICK. - Brick shall conform to the requirements of ASTM "Standard Specifications for Sewer and Manhole Brick (Made From Clay or Shale)", Designation C32. Inverts and side walls shall use brick graded either "SS" or "SM":

Grade SS - Brick intended for use in structures requiring imperviousness and resistance to the action of sewage carrying large quantities of abrasive material at velocities exceeding 8 ft. (2.4 M)/S.

Grade SM - Brick intended for use in structures requiring imperviousness and resistance to the action of sewage carrying abrasive materials at velocities less than 8 Ft. (2.4M)/S.

Grade of sewer brick shall be as specified in the Special Provisions.
Manhole cone risers and frame supports shall use brick grade "MS".

320.03 CONSTRUCTION. - Excavations for brick shall be sufficient to leave a clear space of not less than 6 inches between the brickwork and the side of the excavation or lagging, to give ample room for plastering.

The brick shall be clean and well wetted before being laid, and every brick shall be laid in a full joint of mortar on bed, end, and side in one operation. Every fifth course of brick shall be a header course, and vertical joints shall be broken. Horizontal mortar joints shall be as uniform as possible, and shall not exceed 3/8-inch in thickness. The bottom of the structure shall consist of a first course of brick laid flat and close on an even surface. This course shall be grouted with thin grout composed of equal parts cement and sand.

Subsequent courses shall be laid in mortar as hereinbefore specified.

Particular care must be taken in forming the channels and shelves of the structures along pipe sewers; they shall be built in strict accordance with the plans, and must conform to the bottoms of the existing sewers. Brick channels shall be built of selected bricks set on edge, laid in Class "C" mortar, and well bonded. The structure floor and the channels shall be plastered with Class "C" mortar 1/2-inch thick, the channels being finished to a true and smooth circular section.

A bull's eye with one rowlock course of brick shall be built into the structure for each entering pipe.

The joints in the brickwork on the inside of the structure shall be neatly struck, and the outside shall be plastered with Class "B" mortar at least 1/2-inch in thickness.

When a brick invert is specified, the brick shall be vitrified brick, and shall be placed as soon as the concrete is sufficiently set, though not less than twenty-four hours after the placing. The brick shall be laid with the better surface exposed, in a full joint of mortar on bed, end, and side in one operation.

The Contractor shall construct brick inverts of new sewers to conform to the inverts of existing sewers so as to provide smooth, straightline changes in invert grades and smooth flow surfaces.

The bricks shall be laid as stretchers, and shall break joints with those of the adjoining courses. The courses shall be kept straight and parallel to the axis of the sewer, and at a true grade, by the use of a template.

Brickwork shall not be constructed upon a concrete foundation until at least twenty-four hours after such foundation has been placed. No brick shall be laid in water, nor shall water be permitted to stand or run on any brickwork until the mortar has thoroughly set.

Upon completion, brick masonry shall be kept continuously damp for at least 2 days.

320.04 PAYMENT. - Brickwork shall be done as Incidental Work and payment therefor shall be included in the price or prices bid.

SECTION 321

VITRIFIED CLAY PIPE SUBDRAIN

321.01 GENERAL. - The Contractor shall furnish and install subdrains complete with tees, risers, burlap, oakum, mortar, concrete, crushed rock, including the subsequent removal or plugging of such facilities, as the case may be, and all other Incidental Work, necessary or required for a complete satisfactory installation, where and as shown on the plans or where directed.

When a Bid Item or Items for subdrains of a specified size or sizes are included in the Proposal, the Engineer will, under such Bid Items, order sufficient subdrains, in his opinion, to maintain an appropriately dry excavation, free from ground water, and to temporarily carry the flow of cut side sewers, if any. Main sewer flow and storm water flow shall be diverted as required in Section 301, except that excess capacity of ordered subdrains may be used to temporarily carry main sewer flow.

Additional or larger subdrains may be used by the Contractor if he so desires but no payment will be made on account of such increase in extent or size of subdrains.

321.02 PIPE. - Subdrain pipe and fittings shall be in accordance with the requirements of Section 305.02.

321.03 CONSTRUCTION. - Subdrains for pipe sewers shall be located at one side of the sewer trench, and subdrains for encased pipe sewers and pipe sewers on concrete foundations shall be located either at one side of the sewer trench or beneath such main pipe sewer. Subdrains for cast-in-place concrete sewers shall underlie or be below and adjacent to the sewer and be connected to the invert by tees and risers placed in a manner which will allow plugging the subdrain upon completion of the sewer.

Upon conclusion of the need therefor, subdrains for pipe sewers, unless specifically required to remain as permanent subdrains, shall be removed or plugged with concrete at intervals not greater than 100 feet.

Subdrains underlying a cast-in-place concrete sewer shall be temporarily connected to the sewer invert by vitrified clay pipe tees and risers of the same diameter as the subdrain at intervals not greater than 100 feet. Before the sewer is put into service the subdrains at the risers, and the risers, shall be permanently plugged with concrete.

Subdrain pipe laid in soil other than sand shall be covered with crushed rock extending at least 6 inches laterally from each side of the pipe and 12 inches vertically above the top of the pipe. Where subdrains pass through areas free of ground water, the joints shall be filled with lean mortar and crushed rock may be omitted. Crushed rock shall be uniformly graded from No. 4 to 3/4-inch sieve size.

When required in the Special Provisions, the aforementioned crushed rock shall be completely dammed with a concrete cutoff wall at specified intervals so as to prevent any possibility of continuity of ground water flow along the line of the sewer or structure.

Cutoff walls shall be not less than one foot thick, shall block the entire width of the rock fill, and shall extend not less than one foot into the ground below the crushed rock. Concrete used for this purpose shall be Class 4-2000-1 1/2 or better. Where tees and risers have been installed, the cutoff walls shall be located at the tees and risers. If the crushed rock is specifically required to remain in use in conjunction with a permanent subdrain no cutoff walls will be required.

Open subdrains joints shall be wrapped with burlap and, in addition, when the pipe is laid in sand, shall be loosely packed with oakum.

321.04 SIDE SEWERS. - Side sewers cut along the line of the work shall be temporarily connected to the subdrain by means of pipes and fittings. When side sewers are permanently reconnected, temporary connections shall be removed from the site by the Contractor as his property and the subdrains shall be plugged with concrete and brickwork at the temporary connection openings.

321.05 PAYMENT. - Vitrified clay pipe subdrain satisfactorily constructed, as specified, will be paid for at the price bid per linear foot, measured horizontally along the centerline of the subdrain within the limits ordered by the Engineer.

No deduction will be made in the measured length because of fittings.

SECTION 322

POLYETHYLENE PIPE SEWER

322.01 GENERAL. - The Contractor shall do all excavating, lagging, backfilling, restoration, and other Incidental Work necessary or required for a complete, satisfactory polyethylene pipe (PEP) sewer liner installation, all where and as shown on the plans, or where directed by the Engineer. Installation plans and procedures shall be submitted for review and approval prior to start of work.

322.02 PEP AND FITTINGS. - The sewer liner pipe and fittings shall be made of a polyethylene pipe compound that meets the requirements for Type III, Class C, Category 5, Grade 34, as defined in ASTM D1348 and D3350.

322.03 JOINTS FOR PEP SEWER. - Joints for PEP sewer shall be made on the job site by butt-fusion in accordance with ASTM D2657 and ASTM D3350, using equipment and procedures recommended by the manufacturer. Closing joints required within the installation

pits may be made using rubber compression couplings with Class 316 stainless steel bands, butt fusion, or shrink sleeves, at the Contractor's option.

322.04 CERTIFICATE OF COMPLIANCE. - Tests for compliance with this specification shall be made as specified herein and according to the applicable ASTM specification.

Upon request, a certificate of compliance with this specification shall be furnished by the manufacturer for all material furnished under this specification.

322.05 SEWAGE DIVERSION. - The Contractor shall divert the sewage around the section or sections of the line that are to be sliplined if the annular space and pulling head openings are incapable of handling the flow.

At the end of each working day, temporary tie-ins shall be made between the relined section and the existing system and the by-pass plug removed.

322.06 LINE OBSTRUCTIONS. - Prior to sliplining, the Contractor shall clean the line that is to receive the polyethylene liner to clear the line of any protruding service connections or solids that might prevent the pulling of the lines through the existing sewer.

322.07 INSERTION TRENCH. - Insertion trench will be required at intermediate manholes, or other intermediate points, where the liner pipe will be "fed" into the existing sewer or where there are minimum utility conflicts.

Where excavations for insertions of the polyethylene liner are made in a line section between two manholes, the polyethylene pipe shall be joined together with a circle seal clamp such as neoprene connector with Class 316 stainless steel bands, or equivalent connection. The exposed liner and clamp shall then be encased with one foot of slurry grout per Section 302.06.

322.08 INSERTION OF LINER PIPE. - Where installation of liner pipe is to be made through an access shaft, the top of the existing main shall be exposed to springline for the full length of the shaft prior to removal of the crown portion of a section of the existing main.

A power winch shall then be connected to the end of the liner by use of a pulling head, so the liner can be fed into the existing sewer. Precautions shall be taken not to damage the liner or break any of the joints.

Length of the liner pipe to be pulled into an existing sewer at any one time shall be governed by the size of sewer being sliplined and condition of the existing sewer.

322.09 SIDE SEWER CONNECTIONS TO PEP SEWER. - After the liner has been pulled into place and secured in the manhole walls and pressure tested, each existing side sewer connection shall be reconnected to the new liner. A portion of the existing sewer around

each side sewer connection shall be removed to expose the liner pipe and provide sufficient working space for making the new service connection.

Side sewer connections to PEP sewer shall be made using polyethylene saddles strapped to the line with Class 316 stainless steel bands or fused to the main line as recommended by the pipe manufacturer.

322.10 PEP CONNECTIONS TO MANHOLES. - The PEP sewer shall be connected to manholes with butt-fused flanges or by removing the top of the liner throughout the length of the manhole.

322.11 STABILIZATION OF LINER. - The polyethylene liner may contract after insertion because of residual stresses imposed during pulling, and thermal stresses from temperature differences between the liner and sewer. Residual stresses can be relieved by pushing or pounding on the end of the liner at the entrance pit until the tension at the winch is relieved. The liner should be allowed to stabilize for 12 hours before grouting the annular space between the existing sewer and the PEP liner, or connecting existing side sewers.

322.12 PLUG AND FILL THE ANNULAR SPACE WITH SLURRY GROUT. - The annular space between the existing sewer and the polyethylene liner shall be plugged at both ends and filled with slurry grout per Section 302.06.

The plugging at the ends of the annular space to be filled with slurry grout may be accomplished by the use of temporary plugs or bulkheads which shall be removed after the slurry mix has set.

322.13 PAYMENT. - PEP sewer satisfactorily furnished and installed complete, in place, as specified, will be paid for at the price bid per linear foot, measured horizontally along the centerline of the PEP sewer between the outside surfaces of manholes and structures, or to the limits as constructed if the sewer does not terminate in manholes or structures.

Plugging and filling of the space between the existing sewers and the new PEP with slurry grout shall be done as Incidental Work.

END PART 3

PART 7

EXCAVATION, BACKFILL AND EMBANKMENT

SECTION 700

EXCAVATION - GENERAL REQUIREMENTS

700.01 GENERAL. - The Contractor shall do all excavating, backfilling, and restoring of pavement necessary or required to properly construct and install the required work and equipment, including the required removal of existing sewers, City-owned or abandoned structures, foundations, pipes and other improvements and equipment. He shall conduct all excavating operations in accordance with the requirements of the applicable Sections of this Part 7. Payment therefor shall be as specified in such Sections subject to the provisions of Section 220.

The requirement that the Contractor obtain a street opening permit is waived for Department of Public Works contracts.

Trenches and other excavations shall be made safe and passable by the use of barricades, bridges, and other improved means.

Traffic routing shall be done in accordance with Section 110.

In accordance with Section 373 of the San Francisco Public Works Code there shall be no limitation on the use of labor-saving devices except at the locations specified in Sections 104.04 and 701.06.

Trenches and other excavations shall be sufficiently wide to allow for the proper construction, installation and inspection of the work, but shall not exceed such necessary width.

Tunneling or jacking shall not be used unless specified or approved in writing by the Engineer.

Where the existing finished pavement surface is concrete, including concrete parking strip, concrete gutter, and concrete sidewalk, all cuts therein between pavements to be removed and those to remain in place shall be made in accordance with the applicable requirements of Section 701.03.

700.02 SAFETY REQUIREMENTS. - All excavating and other earthwork shall be done in conformance with the rules and regulations pertaining to safety established by the California Department of Industrial Relations, Division of Occupational Safety and Health (CAL-OSHA).

The rules and regulations establish minimum standards and prescribe measures to be taken for securing safety in places of employment. The measures shall include the adoption of a Code of Safe Practices for the work, the inauguration and maintenance of an accident prevention program which shall include the inspections, corrective measures, safety meetings, instructions, precautions, illumination, and protective and traffic control measures prescribed by the hereinafter specified rules and regulations.

The Contractor shall do whatever additional work he considers necessary to assure the safety of all persons employed on the work, and of the general public.

Trenches and other excavations shall be guarded against hazard by means of shoring, lagging and bracing in conformance with the applicable Safety Orders issued by CAL-OSHA and the therein prescribed procedures for the installation thereof.

During construction, the Contractor shall construct and maintain satisfactory, substantial, and appropriate barricades and steel plates at all excavations, at locations where materials are stored, and at other hazards. All such enclosures shall have warning lights adequate for public safety.

High rise warning flag units, to provide advance warning for traffic approaching excavations, will be required in all cases where motorists' visibility of the work is limited or obscured. Where required, the Contractor shall provide and maintain safe and adequate passage for vehicular and pedestrian traffic over and adjacent to trenches and other excavations by the use of barricades, bridges and other approved means. Additional traffic safety requirements are included in Section 110.

The Contractor's attention is drawn to the restrictions specified in Section 110.02 on his operations during the Christmas holiday season.

Estimated dates of starting and finishing the various excavations shall show a reasonable and orderly work sequence precluding excessive time for completion of the work at any excavation, and shall be compatible with material and equipment delivery dates.

Excavating shall not be done significantly ahead of the time required for expeditious prosecution of the subsequent work.

The Contractor's operations at excavations, and the work necessitating excavation, shall be prosecuted as continuously as practicable, in order that his operations will be in compliance with the requirements of Sections 107.04, 110.02 and 110.05.

The Contractor shall take adequate measures, commensurate with the danger involved, to prevent unauthorized entry by children or others upon the area of excavation operations. The measures shall include the provision of proper and adequate guard railing, solid or chain link fence, and the placement of a difficult to remove weighted cover on each deep shaft excavation.

If the Contractor encounters material in trench or other excavation which he has reason to believe may be hazardous waste, as defined by Section 25117 of the Health and Safety Code of the State of California, he shall immediately so notify the Engineer in writing. If authorized by the Engineer, excavation in the immediate area of the suspected hazardous material shall be suspended until the Engineer authorizes it to be resumed. If such suspension delays the current controlling operation, the Contractor will be granted an extension of time as provided in Section 107.10. The City reserves the right to use other forces for exploratory work to identify and determine the extent of the hazardous material and for removing such material from the site.

700.03 EXCAVATIONS TO HAVE VERTICAL SIDES. - Unless specific provisions in the contract provide otherwise, all trenches and other excavations shall have vertical sides, and shall be no wider at the top than at the bottom, except as required to accommodate

successive lifts of lagging. In all cases trenches and other excavations shall be constructed in accordance with CAL-OSHA rules and regulations.

700.04 SHEET PILING, LAGGING, BRACING AND COFFERDAMS.

General. - The Contractor shall furnish, install and maintain such sheet piling, bulkheading, cribbing, timbering, lagging, underpinning, shoring, bracing, cofferdams, and other temporary construction as necessary to safely support the sides of excavations and any adjacent structures, and to prevent any movement of adjacent ground, pavement or improvements, or danger to life or property, and such construction shall be carried to adequate depths and heights and made as tight as necessary for the proper performance of work.

The manner of bracing excavations shall be in accordance with the rules, orders and regulations of CAL-OSHA.

The use of vibratory hammers and other vibratory equipment will be subject to the approval of the Engineer. However, such approval does not relieve the Contractor of the responsibility for any damages or injuries resulting from the use thereof.

The use of high frequency vibrating equipment, or sonic equipment, for the driving or withdrawal of sheet piling, is prohibited.

Unless otherwise specifically approved for each particular location by the Engineer, struts, braces and other temporary construction shall be so constructed as not to pass through volumes to be occupied by concrete structures leaving openings in the concrete which must be subsequently filled.

In excavations where sand or other non-cohesive material is encountered, placing of the necessary lagging or sheet piling shall commence before a depth of 5 feet is attained, and thereafter such lagging shall be driven or lowered progressively with the excavating in a manner such that the sides of the excavation will be completely covered and adequately supported.

Should any sheet piling, lagging, or bracing which has been installed be in any way insufficient for its purpose, the Contractor shall at once provide additional and adequate materials. The provision of any additional supports ordered by the Engineer shall in no way relieve the Contractor of his responsibility for the sufficiency of his precautions.

Excavation safety plans shall be submitted and permits obtained, in accordance with the requirements of Section 106.09. The approval of such plans by the Engineer shall in no way relieve the Contractor of any responsibility or liability, including that for structural adequacy, under the contract, and he shall take all precautions he considers proper for the protection of the public and the work.

Any voids that exist between the outside surface of the lagging and the adjacent side of the excavation shall be immediately backfilled in accordance with Section 703.

Lagging shall not be used as a surface against which concrete is placed unless permitted in the Special Provisions. Adequate

space shall be provided within the limits of the excavation, sheet piling, lagging, or bracing, as the case may be, to allow for proper construction of the structure to the alignment and cross sections shown on the plans. If lagging is used for the outside form, the concrete shall be separated from the lagging by a waterproof membrane, or by other means approved by the Engineer, and any excess width of trench caused by misalignment of the lagging shall be offset by increasing the structure wall thickness. No deviation in the interior alignment or dimensions will be permitted.

Unless otherwise specified or approved, sheet piling, lagging, and bracing shall be removed during backfilling. Vacancies left by such removal shall be immediately backfilled with acceptable material compacted into place.

Sheet piling and lagging which during withdrawal fails or breaks, or in the opinion of the Engineer is otherwise incapable of being withdrawn, shall be cut off at least 3 feet below pavement subgrade and the upper part removed.

Payment. - When a bid item exists for trench support or excavation support, such work satisfactorily completed shall be paid for in accordance with the Contractor's bid price. When no bid item exists for trench support or excavation support work, such work shall be constructed as Incidental Work.

700.05 - EXCAVATION ADJACENT TO EXISTING STRUCTURES - HAZARDOUS EXCAVATION. - The Contractor shall engage the services of a registered engineer to determine the methods and construction sequence to be employed, and the precautions to be taken, to prevent earth slippage or damage to, or displacement of, any improvement or facility, and to design the required temporary supports and construction when it is necessary to excavate:

1. adjacent to and below the foundations of existing structures to remain;
2. slopes steeper than 1 horizontal: 2 vertical;
3. where unstable or unsound soil or a potential slide requires that sheet piling or otherwise temporary construction be used to support earth or slopes and safeguard the work, adjacent property or street pavements; or
4. in the area of any existing facility or improvement within or over the required excavation, and specified to be supported, worked around, and protected by the Contractor, other than pipes, mains and ducts the support for which is specified in Section 104.

The Contractor shall submit for review, in accordance with the requirements of Section 106.08, 6 copies of the description or detailed drawings of the proposed methods, construction sequence, and precautionary measures.

The description or drawings shall be signed by a Civil Engineer specializing in soils and foundations, or a Structural Engineer, as applicable, properly licensed by the State of California. Submittal to the City will constitute evidence only that there has been

review by a qualified person of the temporary support design, and will in no way relieve the Contractor of any responsibility or liability under the contract. The Contractor shall take all precautions he considers proper for the protection of the public and the work.

The sequence and scheduling of all construction activities shall be included in the Progress Schedule.

700.06 PROTECTION OF FILL MATERIAL. - The Contractor shall protect fill material during stockpiling by plastic sheeting or other acceptable means, to prevent the entry of water during rains. If the material becomes permeated with water and the required compaction cannot be obtained by the Contractor after drying the material, he shall remove such material from the site and replace it with acceptable material, in accordance with Section 706.02, at no cost to the City.

700.07 STORAGE OF EXCAVATED MATERIALS. - The Contractor shall store excavated materials at the site only at locations and in a manner that will ensure compliance with the requirements of the specifications. The Standard Specification requirements with respect to public safety, site maintenance, and material protection are in Sections 108.13, 108.17 and 700.06, respectively.

The Contractor's attention is particular drawn to the requirements of Section 110.02 with respect to vehicular and pedestrian movements and access to properties, and access by emergency vehicles and to fire hydrants.

700.08 EXCAVATIONS TO BE KEPT DRY - DEWATERING AND DISPOSAL OF WATER.

General. - The Contractor shall conduct his operations with respect to the handling and disposal of water and sewage in accordance with the requirements of Sections 108.06, 301, 321 and 712.

He shall protect the work from water damage, keep excavations dry and, by proper diversion and pumping, remove therefrom and dispose of all water and sewage that enter upon the work. He shall provide, maintain and operate all pumping equipment required for such purpose during the time concrete or other work is being placed and thereafter as required for the protection of the work. The aforesaid requirements shall be observed as necessary or required prior to the completion of drainage facilities specified or ordered to be constructed under the contract.

Dewatering and the rate and manner of lowering the water table shall be such as to minimize any settlement that might be caused thereby.

Pumping operations for excavations shall be continuous and satisfactory from the time drawdown is first accomplished until all the concrete has been placed. The Contractor shall not allow his pumping operations to be interrupted; shall take adequate precautions to such end; and shall assume full responsibility for any damage that occurs due to fluctuating water table in the area influenced by the dewatering.

Pumping from the interior of the excavation shall be done in such a manner that there will be no movement of water through any fresh concrete, and for a period of 24 hours after a pour shall be done from a suitable sump separated from the concrete work by a watertight wall or by other effective means.

The Contractor shall at all times, by the institution of proper precautions, prevent hydrostatic uplift and flotation of the work.

Drains - When specified, shown on the plans, or required by field conditions, the Contractor shall construct permanent or temporary drains and appurtenances adequate to keep excavations and subgrades sufficiently dry to permit proper conduct of his operations.

Unless otherwise specified, pipe to carry such drainage shall be perforated bell and spigot vitrified clay pipe, not less than 6 inches in diameter, and shall be placed with the perforations facing down. The drains shall be placed in filter material in accordance with Section 711, extending at least 6 inches laterally from each side of the pipe and 12 inches vertically above the top of the pipe, with an approved waterproof membrane thereover and acceptable backfill over the membrane.

The Contractor shall not allow water originating on or due to his work, or which he is obliged to handle and dispose of, to discharge upon the work or into the trenches of another contractor.

700.09 REMOVAL OF SUBSURFACE OBSTACLES - DIFFERING SUBSURFACE CONDITIONS.

General. - Subsurface obstacles are defined as foreign, man-made, or man-deposited materials and objects required to be removed in order to construct the contracted for facilities, and are included in one or more of the following categories:

- 1) building and other debris, and rubble, used as fill material;
- 2) boulders obviously not native material;
- 3) abandoned sewers and sewer structures not shown on the plans or specified to be removed;
- 4) iron and steel, including rails and auto bodies;
- 5) wood, steel or concrete, including
 - a) structures;
 - b) walls, foundations and slabs;
- c) abandoned utility facilities, not shown on the plans or specified to be removed;
 - 6) pavement materials;
 - 7) cable care yokes;
- 8) piles, separate from attached material, (not subject to the hereinafter specified initial one cubic yard exclusion);

Subsurface obstacles, regardless of size, shape or type of material, encountered within the limits of the excavation necessary for the work, shall be removed by the Contractor to the extent required and the resulting void backfilled.

Subsurface obstacles shall be removed to not less than 3 feet below subgrade for street pavement, curb and sidewalk.

Within areas where the required subgrade is that for a structure, pipe, or like facility, or where excavation is to graded ground upon which no construction is called for under the contract, removal of subsurface obstacles shall be to not less than one foot below such subgrade or ground surface.

Where the surface serves as subgrade for footings or foundations, the voids left by the removal of subsurface obstacles shall be backfilled with Class 4-2000-1 concrete.

The City assumes responsibility for the correctness of the information shown on the Log of Test Borings plans only at the location of each test boring.

The City assumes no responsibility for the soils investigations or reports, or for any interpretation, deduction or conclusion given therein, or any soil or rock profiles, estimated quantities of rock excavation, etc. which the City or its consultants may have made. Bidders must make their own deductions and conclusions as to the nature and difficulty of excavation of all natural materials.

Conditions for Payment. - The removal of subsurface obstacles and the subsequent backfill of the resulting voids shall be done as Incidental Work except under the following conditions:

- 1)the subsurface obstacles is not shown on the plans, other than the Log of Test Borings;
- 2)the subsurface obstacle is not mentioned in the Special Provisions;
- 3)the subsurface obstacle, except for piles, exceeds one cubic yard in volume; and
- 4)the removal of the subsurface obstacle involves additional cost.

In the event the above conditions are met, the removal of subsurface obstacles shall be done as Extra Work. Payment for the removal of subsurface obstacles will be made even if the Log of Test Borings in the plans, or the soils report, indicates the probability of encountering subsurface obstacles.

Obstacles connected to, or enmeshed with, each other such that work additional to the excavation thereof is required to separate them will be considered a single obstacle.

Each initial cubic yard, except as specified for piles, shall be removed as Incidental Work. The negotiated Extra Work payment for the excavation or removal of, and, if required, backfill for, each subsurface obstacle shall be for 100% of all allowable costs therefor, over and above the cost of normal excavation at the location of the subsurface obstacle.

The City will use the soils investigation as a general indication of the types of materials expected to exist in the excavation.

Normal excavation cost will be based on the Contractor's observed performance in each such type of material. This cost will be used as a base for payment as Extra Work of the herein allowable additional cost of excavating each qualifying subsurface obstacle volume.

Where excavation is designated to be paid for under a Bid Item, no reduction in the pay quantity thereof will be made on account of the presence of any subsurface obstacle.

The Contractor shall give written notice of each claim for subsurface obstacle Extra Work.

700.10 EXCAVATION OF UNSOUND SUBGRADE MATERIAL. - The Contractor, where and as shown on the plans, and where and to the extent directed, shall excavate, as common excavation, all existing topsoil, loam, wet clay, and any other materials determined by the Engineer to be unsound and inferior, encountered at any required subgrade. In place of the unsound materials he shall construct satisfactorily compacted backfill in accordance with Section 707. Payment therefor shall be in accordance with the provisions of Section 714.03.

This provision shall apply to subgrade for embankment as well as to subgrade for any other construction.

If the proposal does not contain a Bid Item for common excavation or excavation, the excavation and disposal of unsound subgrade materials shall be done only where directed by the Engineer.

Such excavation to a depth of 12 inches below the existing or required subgrade, whichever is lower, will, together with the disposal of the material so excavated and the required backfilling, be paid for as Extra Work as set forth in Section 112.01 of the Standard Specifications, to the extent that the excavation of unsound material exceeds 5% of the total area of the work requiring any excavation, grading or filling. The initial 5% shall be done as Incidental Work.

All excavation of unsound subgrade materials below such 12 inch depth, together with the disposal of the materials so excavated and the required backfilling, will be paid for as "Extra Work."

Construction of required backfill shall be done in accordance with the requirements of Sections 703 or 709 as the case may be, and except as hereinafter specified shall be done as Incidental Work.

700.11 DISPOSAL OF EXCAVATED MATERIALS. - All excavated materials not in accordance with or in excess of requirements for the construction of backfill, fill and embankment, and, except as otherwise specified, all trees and other vegetation complete with their entire root structures, and all humus-containing topsoil, shall be removed from the site by the Contractor as his property, as Incidental Work.

Such material shall also include excavated pavement, concrete and masonry, including foundations, slabs, and cable car conduit and yokes, all rails except those specified to be salvaged, all ties, track fittings and appurtenances, and all rubbish and other construction debris.

The Contractor shall not allow any portion of any excavated material or refuse to be disposed of upon paved streets, into catchbasins, or otherwise into the City Sewer System. No materials shall be placed on private or public property without proper authority.

Quantities of surplus material shown on the plans or specified in the Special Provisions, are approximate only. The Contractor shall satisfy himself that there is sufficient material available for the completion of all embankment before disposing of any indicated

surplus material. Any shortage of material, caused by premature disposal of material by the Contractor, shall be replaced by him at no additional cost to the City.

Disposal of excavated and other materials shall be in accordance with the requirements of Section 108.10.

SECTION 701

PAVEMENT EXCAVATION

701.01 GENERAL. - The Contractor shall excavate, remove, and conduct his operations in all respects in accordance with the requirements of Section 700; shall excavate, remove and dispose of, existing concrete curb, sidewalk, pavement and base, stone curb, asphalt concrete base and wearing surface, including the latter at conform points, cement treated rock base, and plain and reinforced concrete and masonry, walls, foundations, coping, sections of manholes, catchbasins and other structures, all where, as, and from within the limits shown or indicated on the plans for pavement excavation, and elsewhere where directed; shall construct compacted embankment in the areas from which, as necessary to obtain the required subgrade, the hereinafter specified materials have been removed; and shall do all other necessary or required Incidental Work.

Payment under a pavement excavation Bid Item will be made based on calculations of the actual volumes of pavement removed within the limits shown on the plans.

In the absence of cross sections, information on the plans or specific limits set forth in the Special Provisions defining lateral limits of excavation, pay quantities shall include only those volumes lying between existing street property lines.

Excavating that shall not be done under a Bid Item for pavement excavating is that:

1. of earth, untreated rock and macadam bases, asphalt paths, basalt block gutters, and cable car conduit and yoke structure;
2. within the limits defined for a Bid Item for excavation in a specified width of existing street railway track area;
3. outside of or beyond, including overbreak, the limits shown on the plans or specified to be done under a Bid Item for pavement excavating.

Materials excavated beyond the shown or specified limits, and overbreak, shall be satisfactorily replaced by the Contractor, at no cost to the City.

Pavement excavation not within the limits shown or specified therefor, including that, as specified in Section 220, necessitated by other work under the contract shall be done as Incidental Work.

Existing concrete, masonry, and pavement necessary to be removed to obtain the required subgrade shall be excavated to 3 feet

below such subgrade and the resulting voids created below subgrade shall be backfilled. In areas where no improvement is to be constructed, such concrete, masonry and pavement shall be excavated to a depth of one foot, measured normal to the slope, beneath the face of the slope.

Abandoned pits, vaults, and basements under pavement or sidewalk areas, to the extent that the walls and slabs thereof are to remain in place, after having been broken or penetrated as required to allow normal water filtration and drainage, shall be backfilled with sand compacted to maximum density.

701.02 REMOVAL OF ASPHALT TOPPED PAVEMENT. - Where existing pavement surface is asphalt concrete, cuts therein, as for trenches, etc., shall be made vertical and to neat regular lines.

701.03 REMOVAL OF CONCRETE PAVEMENT, SIDEWALK AND PARKING STRIP - CONCRETE SAW CUTTING REQUIRED. - Where the existing finished pavement surface is concrete, including concrete parking strip, concrete gutter and concrete sidewalk, cuts therein between pavements to be removed and those to remain in place shall be made by an approved pavement cutting saw before any pavement is jackhammered or broken, and in sidewalk and traffic island pavement shall be to neat flag lines. Similarly, concrete saw cuts shall be made for the full length of the juncture of the portion of existing concrete structure or footing to remain with that to be removed.

Saw cuts shall be 2 inches deep, neat, regular and vertical. The Contractor shall exercise extreme care not to damage the cut edges of the surface. Damaged edges shall be recut to acceptable alignment and vertical surface.

Where the edge of excavation closest to the curb in concrete parking strip or pavement is less than four feet from the curb, the pavement in the area of the cut shall be removed to the curb; if the parking strip in this case is monolithic with curb, removal shall be to within 6 inches of the curb.

When an edge of excavation is less than 4 feet from a construction joint in parking strip or pavement, that portion thereof between the construction joint and the excavation shall be removed.

Cuts to the curb in concrete pavement not monolithic with adjacent curb shall be saw cut to as close to the curb as possible, and extended neatly and regularly thereto by means other than saw cutting.

Saw cuts to the curb in monolithic curb and parking strip shall be terminated as close to the curb as possible, and in the case of trench, with a saw cut parallel thereto, and the work completed by tunneling. If the cut is not for trench, extension thereof shall be as hereinbefore specified for pavement not monolithic with curb.

701.04 REMOVAL OF PAVEMENT AND RAILS WITHIN STREET RAILWAY TRACK AREA. - Pavement excavation in a specified width of existing street railway track area shall include:

1.the excavation, by means of hand tools and hand operated pneumatic tools, of pavement materials and header blocks to the full depth of the rails in preparation for the removal and salvage, under a separate Bid Item, of street railway rails without damage thereto; and after such removal and salvage,

2.the excavation of all rails and railway track materials not to be salvaged, and all pavement materials, ballast, ties and other materials, including concrete rail stringers, if any

all from within the limits of the specified width of track area shown on the plans, and lying within the depth specified or shown on the plans or cross sections, from, and measured normal to the surface of the existing pavement.

701.05 REMOVAL OF CABLE CAR CONDUIT AND YOKE STRUCTURE. - The Contractor shall excavate, remove from the site, dispose of, and construct compacted backfill in place of, all abandoned cable car conduit and yoke structures and elements and appurtenances thereof within the limits of the work, where and as shown on the plans, or where directed by the Engineer.

701.06 CITY MAY LIMIT USE OF PAVEMENT BREAKER. - In accordance with the requirement of Section 373 of the Public Works Code there shall be no limitation on the use of labor-saving devices except at the locations, if any, specified in Section 104.04 or in the Special Provisions, provided, however, that when, during construction operations, an additional location is revealed where, in the judgement of the Engineer, such limitation is necessary to avoid public nuisance or protect public health, safety or facilities, then the limitation shall apply to such additional location and the expense caused to the Contractor by the limitation on his operations in such additional location shall be estimated and paid for as Extra Work in accordance with the requirements of Section 112.

701.07 PAYMENT.

General. - Pavement excavation satisfactorily done, as specified, will be paid for at the price bid per cubic yard measured in place as the aggregate net volume of pavement materials excavated from within the limits shown, specified, or directed, but not including specified exclusions.

The removal of asphalt concrete wearing surface in conform areas, if the Proposal contains a Bid Item therefor, will be paid for at the price bid per cubic yard, or if a specific Bid Item therefor does not exist, the volume of wearing surface removed from conform area will be included for payment as pavement excavation.

Pavement excavation, if there is no Bid Item therefor, will be included for payment as common excavation or excavation.

If the Proposal does not contain a Bid Item for any such work, it shall be done as Incidental Work as set forth under Section

108.

In Specified Width of Track Area. - Pavement excavation within a specified width of track area and depth will be paid for at the price bid per linear foot of such track area satisfactorily excavated, measured horizontally along the centerline of the tracks.

Removal of Cable Car Conduit and Yoke Structure. - Removal of cable car conduit and structure will be paid for at the price bid per linear foot of conduit and structure, satisfactorily excavated, measured horizontally along the longitudinal centerline thereof.

If the Proposal does not contain a Bid Item for such work, it shall be removed as a "Subsurface Obstacle" as set forth under Section 108.05.

SECTION 702

TRENCH EXCAVATION

702.01 GENERAL. - The Contractor shall conduct his operations in all respects in accordance with the requirements of Section 700 and shall do all trenching and excavating, as to the depths necessary, or required, for the proper construction of the work and installation of equipment.

Tunneling or jacking shall not be used unless specified, or approved in writing by the Engineer, except that the Contractor may tunnel under concrete curb and combined concrete curb and gutter. If it required, or if the Contractor elects to remove a portion of the curb or of combined curb and gutter, he shall remove an entire section between construction joints.

702.02 MINIMUM AND MAXIMUM LENGTH OF TRENCH. - The Contractor shall prepare trench subgrade for sewers and pipes not less than 30 linear feet in advance of such sewer and other pipe construction.

The Contractor shall not have more than 500 linear feet of trench, other than side sewer or culvert trench, open at any one time, subject however, to possible further limitations because of traffic routing restrictions. Such maximum footage of open trench shall include backfilled but unpaved trench, partially or completely excavated trench, and area from which pavement has been removed for anticipated trench excavation.

702.03 PAYMENT. - Trench excavation, including saw cutting of concrete pavement and disposal of materials, shall be paid for in accordance with the Schedule of Bid Prices. If no bid item exists for trench excavation, it shall be done as Incidental Work and payment therefor shall be included in the price or prices bid.

SECTION 703

TRENCH BACKFILL

703.01 GENERAL. - The Contractor shall do all backfilling and restoring of pavement necessary, or required, to satisfactorily complete the work, and he shall backfill all excavations to the elevations of the required subgrade or adjacent ground, as the case may be.

Backfilling shall not commence until after sewers, culverts, drains, sewerage and drainage structures, pipe, conduit, and other equipment and appurtenances placed in trench or similar excavations have been properly constructed, or installed as applicable, inspected, and if required, tested.

Backfill shall be placed in a manner not to disturb, damage, nor subject such facilities to unbalanced loads or forces. Restoring of pavement shall be done in accordance with Section 109.

703.02 CONCRETE STRENGTH BEFORE BACKFILLING. - Backfilling over and against sewerage and drainage facilities shall not commence until concrete has attained a compressive strength of at least 2,500 pounds per square inch based on field cured cylinders, nor until all mortar joints are set sufficiently to prevent damage.

703.03 SAND BED FOR PIPE SEWERS AND CULVERTS. - All pipe sewers, and all cast or ductile iron pipe culverts, shall be constructed on a prepared or natural sand bed the width of which shall be at least the full width of the pipe, and not less than 4 inches thick below the line of the bells of the pipe after installation; however, a sand bed will not be required for pipe sewers on concrete foundations, in encasements, or on crushed rock bedding.

703.04 SUBGRADE SURFACES FOR PILE-SUPPORTED CONCRETE. - Subgrade surfaces on which pile-supported concrete is placed shall be adequately prepared to assure proper support for the placed concrete until such concrete has sufficient strength to span and be supported solely by the piles.

703.05 CRUSHED ROCK LAYER IN TRENCH. - Crushed rock shall be furnished and placed where necessary to maintain an appropriately dry trench in accordance with Section 712.

703.06 REQUIRED SAND BACKFILL. - Backfill around all sewers, culverts, sewerage and drainage structures, and all cast or ductile iron pipe, from the bottom of the trench to a height 6 inches above the top of such facilities for the full width of the trench shall be sand only.

Backfill around manholes and catchbasins shall be sand to a level 6 inches above the supporting structure or adjacent sewer or culvert.

703.07 BACKFILL ABOVE REQUIRED SAND. - Backfill material above the required sand shall be in accordance with the provisions of Section 706.02.

703.08 BACKFILL LAYERS. - Each layer of backfill shall be compacted both during placement and following the withdrawal of sheet piling and lagging to the top of the layer being compacted. Withdrawal of sheet piles or other trench support systems shall be done such that voids are not created from loose material under the adjacent pavement entering the trench. After the placing of backfill has been started, the Contractor shall proceed as soon as practicable with densification. All sand backfill to be densified by water shall be jetted, unless flooding is specified or otherwise authorized by the Engineer. Flooding of sand will be prohibited where sewers or structures might be damaged, or adjacent materials softened, by the applied water. The Contractor shall make his own determination that flooding or jetting will not result in damage. Any resulting damage shall be repaired at the Contractor's expense. Sand backfill jetted, flooded, or compacted by other approved means, shall be done in horizontal layers not more than five feet thick.

Jetting of backfill shall be done in accordance with the following requirements:

1. The jet pipe shall consist of a minimum one inch diameter pipe to which a minimum 1-1/2 inch diameter hose is attached at the upper end. The jet shall be of sufficient length to project to within one foot of the bottom of the lift being densified.
2. The Contractor shall jet to within one foot of the bottom of the lift and apply water in a manner, quantity and at a rate sufficient to thoroughly saturate the thickness of the lift being densified. The jet pipe shall not be moved until the backfill has collapsed and the water has been forced to the surface.
3. Voids left by the removal of sheeting, piles and similar sheeting supports shall be immediately backfilled with clean sand which shall be jetted into place to ensure dense and complete filling of the voids.

All backfill other than sand shall be placed in horizontal layers not more than 8 inches thick before compaction, and each layer shall be satisfactorily compacted by mechanical means. Flooding or jetting, in this case, will not be allowed.

In all cases, each layer of backfill material shall be satisfactorily compacted before placing the next layer thereon. Compaction shall be in accordance with the applicable requirements of Section 707.

703.09 PAYMENT. - Trench backfilling shall be done as Incidental Work and payment therefor shall be included in the price or prices bid.

SECTION 704

CLEARING, GRUBBING AND SITE PREPARATION

704.01 GENERAL. - The Contractor shall clear and remove from the site of the work all trees, stumps, roots, brush, grass, rubbish, debris, fences, street improvements, structures, and obstructions of any kind, natural or artificial which, if left in place, would interfere with the construction of the work.

All cleared areas shall be grubbed. Grubbing shall consist of the complete removal of stumps, tap and lateral roots 1 inches or more in diameter, buried logs, and similar objectionable material, if encountered, to a depth of 3 feet below required subgrade, final ground line, or existing ground surface in an area to receive embankment, as the case may be.

The Contractor shall backfill with acceptable material, as specified in Section 706.02, to the elevation of the ground line as it existed prior to the start of the contract or to new subgrade, as the case may be, the voids being created by the hereinafter specified removals. Such backfilling shall be done as Incidental Work and shall be compacted to 95% relative compaction.

The Contractor shall not disturb the existing trees designated to remain. The City reserves the right to remove any trees or plants prior to the clearing and grubbing. Existing improvements, facilities, trees, and shrubbery that are not required to be removed shall be protected from destruction or damage by the Contractor's operations.

If required, sod and loam which is removed shall be properly preserved and stored for use.

All existing abandoned concrete or masonry building walls, footings, copings, stairs, slabs and pavement shall be removed to a depth of 3 feet below required subgrade or final ground line, as applicable. The Contractor shall break up or penetrate, as required, existing slabs and walls which are to remain in place in order to allow normal water filtration and drainage.

The Contractor shall give reasonable notice to occupants of buildings or property adjacent to the work to permit such occupants to salvage or relocate plants, trees, fences, sprinkler systems, or other improvements which they have placed within the limits of the work and which might be destroyed or damaged by the Contractor's operations. Portions of fence, water lines, etc., remaining after site is cleared shall be properly terminated.

Materials, specified on the plans or in the Special Provisions to be salvaged, shall be carefully removed and delivered by the Contractor to the City yard designated on the plans, where a receipt will be issued in duplicate. The Contractor shall furnish one copy of this receipt to the Engineer.

The disposal of all cleared, grubbed and razed materials shall be in accordance with the requirements for excavated materials set forth in Section 108.10.

704.02 PAYMENT. - Clearing, grubbing, site preparation and related backfilling shall be done as Incidental Work. However, if there is a contract Bid Item for "Pavement Excavation," pavement excavation within the street area, i.e., within the existing street property lines, will be paid for at the price bid therefor in accordance with the provisions of Section 701.

If embankment is to be placed in cleared and grubbed areas, the quantity to be paid for will be measured from the original ground line and not the cleared ground line.

SECTION 705

COMMON EXCAVATION

705.01 GENERAL. - The Contractor shall conduct his operations in all respects in accordance with the requirements of Section 700 and shall excavate to bring the existing subgrade or ground surface, as the case may be, to the required subgrades and elevations, where shown on the plans or where directed. The work shall include:

- 1)excavating waterbound macadam, untreated rock base, asphalt paths and basalt block gutters;
- 2)stripping and grading existing slopes;
- 3)removing and disposing of obstructions;
- 4)excavating all concrete and masonry walls, slabs, structures, and pavement materials not specified to be removed under Bid Items, all rubble and debris within the volume specified to be excavated as common excavation, and all material contained by structures and parts thereof which are to be removed as other than common excavation;
- 5)breaking up or penetrating, as required, to allow normal water filtration and drainage, exposed or encountered existing slabs and walls which are to remain in place, and;
- 6)the constructing of drainage ditches necessary or required for the protection of the work.

If the proposal does not include a separate Bid Item for pavement excavation, no differentiation will be made between pavement material and other material excavated, and pavement excavation shall be included under whatever Bid Item, such as excavation, common excavation or embankment, is included in the Proposal.

In the absence of cross sections, information on the plans, or specific limits set forth in the Special Provisions defining lateral limits of excavation and embankment, pay quantities shall include only those volumes lying between street property lines.

Excavating shall not unnecessarily disturb the material below subgrade. Materials excavated beyond the shown or specified limits, and overbreak, shall be backfilled at no cost to the City.

All excavating such as trench and footing excavation, below the required subgrade or final graded ground line, shall be done as Incidental Work.

Not included in this work will be that shown or specified to be done under other Bid Items or as Incidental Work, such as the excavating and removal of grass, shrubs, trees, stumps, roots and other vegetation and fencing. No reduction, however, will be made in the pay quantity of a Bid Item for common excavation or excavation on account of excavating specified to be done under another Bid Item, such as that of those portions of concrete and masonry foundation, walls, slabs, stairs and appurtenances, and cable car conduit and yoke structures, that intrudes into, or occurs within, the volumes specified to be excavated as common excavation or excavation.

Excavation for the purpose of obtaining borrow material shall be done as Incidental Work and payment therefor shall be included in the price or prices bid.

If the proposal contains a Bid Item for earthwork, it will contain a Bid Item for either excavation or embankment, whichever is estimated to exceed in quantity, and other earthwork shall be done as Incidental Work.

If the proposal does not contain a Bid Item or Items for other work required to be done in connection with excavating, all such work shall be done as Incidental Work and payment therefor included in the price or prices bid. Such work includes, but is not limited to, the following:

- 1) Placing and compacting approved material to construct required embankment, or to fill or backfill holes, pits, depressions, and excavations resulting from the removal of subsurface obstacles, structures and other facilities, all to the elevations required to obtain the pavement subgrade or ground surface shown on the plans or cross sections. Such work done with site excavated materials shall include all loading and hauling thereof; if specified or required to be done with imported fill or designated borrow material, or crushed rock, the furnishing of the required material at the proper site location, if the Proposal contains a Bid Item therefor, will be included for payment thereunder.

- 2) All required benching, scarifying, watering or drying of materials to the required moisture content, shaping and finishing constructed subgrade as specified in Section 200, constructing and maintaining the slopes and ditches and stockpiling and replacing topsoil.

If required in order to comply with the traffic routing or other provisions of the specifications or because of the danger of overburdening an existing or potential slide area, materials shall not be stored on the site, nor, in the latter case, on the slopes above or below the site.

The Contractor, at his sole expense, shall remove materials that, on account of the nature or performance of the work, slide into, or slip from, a constructed slope or subgrade, and shall refinish and maintain during the contract period, such slopes and subgrades to the lines and grades shown on the plans and cross sections.

Tops of slopes shall be rounded as shown on the plans. Material removed in rounding excavated slopes will be measured for payment as specified for the material removed. No payment other than the contract unit price governing the applicable earthwork will be made by reason of field modification of slopes.

The Contractor, in accordance with the requirements of Section 108.17, shall wet down any area whenever necessary to prevent dust nuisance.

The Contractor shall not remove from the work, nor waste, any site excavated material that is in accordance with the specified requirements for backfill, and embankment, except that quantity thereof, if any, that may be in excess of the total quantity required to complete all backfilling and embankment as specified in Section 700.11.

705.02 PAYMENT. - Common excavation or excavation, satisfactorily done as specified, will be paid for at the price per cubic yard measured in place within the limits shown, specified, or directed, and computed from cross sections between the existing ground surface, or the lower limit of pavement excavation if the Proposal contains a Bid Item therefor, and the final graded ground surface or constructed subgrade, as applicable, but not including trench, structure, or other excavating below or outside of that required for subgrade for street work.

If the Proposal does not contain a Bid Item for such work, it shall be done as Incidental Work set forth under Section 108.

SECTION 706

EMBANKMENT

706.01 GENERAL. - The Contractor shall prepare the subgrade for, and construct, compacted embankment and fill from earth, concrete pavement, other site excavated concrete materials, borrow materials from designated on-site areas, and from imported fill material if required, all as necessary to complete the work.

The work shall include all common excavation, the furnishing of imported fill materials except as the provisions of a Bid Item for such furnishing otherwise state; all loading, hauling, stockpiling, depositing, watering, aerating, vibrating, tamping and rolling of the embankment and fill material. The work shall further consist of constructing embankment to bring all surfaces, including those of areas where pavements or unsound subgrade materials have been excavated, to the lines, grades and cross sections required

for final graded ground surfaces and subgrades, all where and as shown on the plans and cross sections, including all Incidental Work.

Required topsoil or loam placed on areas of embankment will be paid for as embankment if the Proposal does not contain a Bid Item for loam.

All required benching, scarifying, watering or drying of materials to the required moisture content, shaping and finishing constructed subgrade as specified in Section 200, and constructing and maintaining the required slopes and ditches, shall be done as Incidental Work.

Backfilling of voids, below subgrade, left by the removal of subsurface obstacles, or by the specified removal of facilities, will not be paid for as embankment.

Materials excavated beyond or below the specified limits shall be satisfactorily replaced by the Contractor at no cost to the City.

The construction of embankment and fill not within the limits shown on the plans or cross sections, or specified to be paid for under a Bid Item, shall be done as Incidental Work.

If the Proposal contains a Bid Item for earthwork, it will contain a Bid Item for either excavation or embankment, whichever is estimated to exceed in quantity, and the other class of earthwork shall be done as Incidental Work.

706.02 ACCEPTABLE MATERIALS. - Acceptable embankment, fill and backfill materials, are materials which meet the compaction requirements of Section 707 and are free of debris, wood, other organic or deleterious matter, and from materials that would prevent or adversely affect permanent compaction and stability. The compaction and acceptability of the material will be determined by the City's Materials Testing Laboratory, based on the results of the tests specified in Section 707.01.

Lumps, ballast, rocks and broken concrete measuring 3 inches or less in greatest dimension may be incorporated into backfill and embankment, and if satisfactorily distributed in earth or other fine materials, pieces not greater than 6 inches in greatest dimension may be so incorporated, provided that such latter pieces be not placed within 3 feet of finished grade or subgrade. Rocks, concrete, or hard lumps of earth larger than allowed shall be broken up before compacting.

Rocks, broken concrete or other solid materials, larger than 4 inches in greatest dimension, shall not be placed in embankment areas where piles are to be placed or driven.

706.03 PROCEDURES. - Existing material to remain will be subject to approval and shall be compacted as specified in Section 707.03.

Except in contained volumes, the compacted material upon which embankment is to be constructed shall be scarified to a depth of 6 inches, and in no case shall backfill, fill, or embankment be constructed upon topsoil or other unsound material.

Excavated untreated rock base shall be used prior to the use of any other material for constructing compacted fill and embankment.

Embankment and fill material shall be spread with a bulldozer or other equipment upon which the blade precedes the wheels or tracks. If such material is deposited against an existing slope, the depositing shall be in accordance with the requirements of Section 706.05.

The materials for, and placement of, backfill, fill and embankment above and against structures, sewers and the like shall be as specified in the applicable portions of Sections 703 and 709. The Contractor's attention is directed to the possibility of excessive lateral pressure on, and resultant damage to, retaining walls; he shall, therefore, exercise care in properly placing backfill, fill and embankment behind such walls.

At the time of compaction, materials to be incorporated in backfill, fill, and embankment, shall have the proper uniform moisture content required to obtain the specified relative compaction. The Contractor shall water, or do whatever spreading, mixing and stockpiling is necessary to dry such materials, as the case may be, in order to obtain such proper moisture content.

Fill material that is segregated such that the maximum density of samples thereof varies by more than 5 pounds per cubic foot shall be thoroughly mixed by mechanical means before placement, or shall be compacted in alternate layers of each material, or shall be removed from the site and replaced with acceptable material, in accordance with Section 706.02, at no cost to the City.

Material deposited within two feet of final graded ground surface and of side slopes, the latter measured at right angles to the face of the slope, shall contain clay or other acceptable binder material in a proportion adequate to minimize erosion by wind and rain.

If there are insufficient excavated earth materials for completion of all required backfilling and embankment, the balance of fill material needed to bring the grades to the elevations shown on the plans shall be obtained, at no charge to the Contractor, from a specified on-site "borrow area." If there is no such borrow area, the Contractor shall, as approved by the Engineer, furnish at the site, where and in the quantities required to correct the deficiency, "Imported Fill Material" in accordance with the requirements thereof of Section 714.

Slopes shall be maintained to the grade and cross sections shown on the plans until the acceptance of the contract.

706.04 EMBANKMENT AND FILL LAYERS. - All embankment and fill, other than sand, shall be placed in horizontal layers not more than 8 inches thick before compaction, and each layer shall be satisfactorily compacted as and to the degree specified in Section 707.02 by means of suitable mechanical equipment. Flooding or jetting, in this case, will not be allowed.

Section 707.02 specifies methods of compaction where the material is sand or too sandy to be satisfactorily compacted by the usual tamping and rolling. In the case of compaction of such material by vibratory rollers the maximum thickness of layer may be

increased to 3 feet.

In all cases, each layer material shall be satisfactorily compacted before placing the next layer thereon.

706.05 PLACING MATERIAL AGAINST SLOPES. - Slopes and slide areas upon which embankment or fill is to be placed shall have all loose material removed therefrom, and shall be benched in level terraces separated by vertical or nearly vertical slopes. Such stepped benches shall each be cut 4 feet horizontally into the slope, and may be cut progressively with the construction of embankment. Final cutting of each bench shall be with hand tools to undisturbed, compact, and stable materials. The material so removed may be incorporated in the Embankment, provided such material is in accordance with the requirements of Section 706.02.

706.06 PAYMENT. - Embankment will be paid for at the price bid per cubic yard of compacted embankment satisfactorily constructed, in place, within the limits shown or specified, or where directed, computed from cross sections between the ground surface existing at the start of the contract and the final graded ground surface, or prepared subgrade for the subbase, base, curb, sidewalk, or other construction for which the embankment is required, but not including backfilling specified to be done as Incidental Work.

If the Proposal does not contain a Bid Item for embankment, it shall be done as Incidental Work as set forth under Section 108.

Embankment to bring cleared ground back to the elevations of original ground shall be furnished and placed as Incidental Work.

SECTION 707

COMPACTION

707.01 GENERAL. - The Contractor shall do the work necessary to obtain the required compaction of subgrade, embankment, fill, and backfill materials. Compaction shall be obtained in accordance with the restrictions imposed by the applicable provisions of Sections 703, 706 and 709.

Tests of relative compaction, including determination of optimum moisture content and maximum density of backfill, fill, and embankment materials, will be made in accordance with Method "C" of ASTM "Standard Methods of Test for Moisture-Density Relations of Soils, Using 10-lb. Rammer and 18-in. Drop," Designation D 1557, ASTM "Standard Method of Test for Density of Soil in Place by the Sand Cone Method," Designation D 1556, and Methods "A" and/or "B" of ASTM "Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth)," Designation D 2922. As stated therein, the term "relative compaction," used hereinafter regarding compaction

of backfill or embankment, means the percentage ratio of the field-compacted dry density to the maximum dry density obtainable by compaction at optimum moisture content.

Density and compaction tests of in place compacted backfill, fill, or embankment, as the case may be, and of the materials used, required by the Engineer as the work progresses, will be conducted and evaluated by the City at no cost to the Contractor.

707.02 BACKFILL, FILL, AND EMBANKMENT AREAS. - The Contractor shall obtain a relative compaction of not less than 95% throughout each layer of all backfill, fill, and embankment constructed within 3 feet of pavement subgrade, or adjacent ground, as the case may be. Below the top 3 feet of backfill, fill, and embankment constructed, the relative compaction shall not be less than 90%.

Compaction of material too sandy to be satisfactorily compacted by the usual rolling and tamping shall be effected by watering to the point that the required compaction is obtained by rolling and tamping, or by the use of vibrating rollers or compactors.

707.03 CLEARED OR EXCAVATED AREAS. - The Contractor shall obtain a relative compaction of not less than 95% for the 6-inch layer of undisturbed material underlying all areas cleared, or from which existing pavement or excavated material has been removed, and which serve as subgrade for backfill, embankment, pavement subbase or base, curb, or pavement, as the case may be. Such compaction shall extend for a lateral distance of not less than 3 feet beyond the neat lines of such areas except where confined to a lesser lateral distance by lagging, or by existing construction to remain.

707.04 BACKFILL IN AREAS OF EXCESSIVE EXCAVATION AND AREAS OF REMOVED UNSOUND MATERIAL. - Except as required by Section 708.01, 95% relative compaction shall be obtained in backfilling excavation in excess of that shown on the plans, including overbreak and that from which unsound subgrade materials have been removed.

707.05 FILTER MATERIAL. - When combined aggregate filter material in accordance with the requirements of Section 711 is placed as a layer in backfill, fill or embankment, such material, and the first 12-inch layer of backfill or embankment directly above it, shall be compacted by use of a vibratory compactor.

707.06 EQUIPMENT. - Unless otherwise specified, all compacting equipment shall be power equipment, and shall be capable of obtaining the specified compaction.

If, however, compaction is not sufficiently uniform, or tests show it to be inadequate, the Engineer may require placement in thinner layers or the use of other or additional equipment. Selection of such equipment shall be by the Contractor, and it shall be solely his responsibility to obtain the specified compactions throughout the required volume.

The use of heavy compacting equipment in areas immediately behind retaining walls will not be permitted, and in general only

hand-portable power tampers or vibratory compactors will be approved for such compaction.

If small or hand-portable equipment is used, as for compacting narrow berm, confined areas, or behind retaining walls, the thickness of layers and other conditions shall be adjusted as required to obtain the specified compaction.

707.07 PAYMENT. - Compaction shall be done as Incidental Work and payment therefor shall be included in the price or prices bid.

SECTION 708

STRUCTURAL EXCAVATION

708.01 GENERAL. - The Contractor shall do all excavating necessary to obtain the subgrade required for the foundations, footings, slabs or other structural components of the contract work, including constructing related drainage facilities and doing other Incidental Work, all where and as shown on the plans and in accordance with the requirements set forth herein.

Excavation for the footing or foundation of any structure shall extend to undisturbed material. The last three inches of material excavated for footings and foundations shall be loosened and removed with hand tools to leave an undisturbed bed.

Where the slope of the bottom of the required excavation for footings or foundations is greater than 10 horizontal: 1 vertical, the Contractor, at no additional cost to the City, shall excavate "step footings" having a 4'- 0" minimum length of step and 2'- 6" maximum depth.

Excavations below the subgrade for footings and foundations shall be backfilled to the required subgrade by the Contractor at his own expense. Such backfilling shall be with Class 4-2000-1 concrete.

708.02 PREPARATION OF SUBGRADE. - Subgrade shall be prepared to provide a satisfactory, uniform and compacted bearing surface for the construction.

Subgrade surfaces on which pile-supported concrete is placed shall be adequately prepared to assure proper support for the placed concrete until such concrete has sufficient strength to span and be supported solely by the piles.

708.03 PAYMENT. - Structural excavation shall be done as Incidental Work and payment therefor shall be included in the price or prices bid.

SECTION 709

STRUCTURAL BACKFILL

709.01 GENERAL. - The Contractor shall furnish, place and compact backfill from site excavated or other earth and concrete materials, all as required to bring all surfaces to the lines, grades and cross sections shown on the plans and cross sections, or that of the adjacent existing ground surface, as the case may be, including loading, hauling, stockpiling, depositing, watering and compaction, and all other Incidental Work, all in accordance with the requirements set forth herein.

709.02 STRUCTURAL BACKFILL MATERIALS. - Structural backfill shall consist of approved material, free from debris, wood, and other organic, unsound or deleterious matter, and from all other materials that will prevent or adversely affect thorough and permanent compaction and stability.

Materials, including those excavated at the site, yielding a maximum dry density of less than 112 pounds per cubic foot, when tested in the laboratory in accordance with the compaction test described in Section 707 shall not be used as structural backfill or fill.

The material used for structural backfill behind or around structures and appurtenant facilities shall have a sand equivalent value of not less than 30. The percentage composition by weight shall conform to the following grading:

Sieve Size	Percentage Passing
3-inch	100
No. 4	35-100

Lumps, rocks and concrete pieces measuring 3 inches or less in greatest dimension may be incorporated into backfill; and, if contained in backfill more than 4 feet deep, and satisfactorily distributed in earth or other fine materials, pieces not greater than 6 inches in greatest dimension may be so incorporated, provided that such latter pieces be not placed within 3 feet of finished grade or subgrade, nor in areas where piles are to be driven or drilled.

Rocks, concrete, or hard lumps of earth larger than allowed shall be broken up before compacting.

709.03 PROCEDURES. - All sand backfill, except that behind abutments and except pervious material and backfill behind retaining walls, shall be flooded or jetted, or compacted by other approved means, in horizontal layers not more than 3 feet thick. Flooding shall be such that, after 5 minutes, water will show on the surface.

Backfilling for facilities in street areas such as sewers, sewer structures, and the like, shall be as specified in Sections 703 and 707.

Flooding or jetting of sand will be prohibited where facilities or structures might be damaged, or adjacent materials softened,

by the applied water.

All backfill, other than sand, shall be placed in horizontal layers not more than 8 inches thick before compaction, and each layer shall be satisfactorily compacted as and to the degree specified in Section 707.02, by means of suitable mechanical equipment.

Flooding or jetting, in this case, will not be allowed.

Pervious material, sand, and filter material in accordance with Section 711, behind retaining walls and abutments shall not be flooded or jetted but shall be deposited in 8-inch layers and compacted with mechanical vibrators.

Compaction of sand and of pervious backfill shall be to the degree specified in Section 707.02.

In all cases, each layer of material shall be satisfactorily compacted before placing the next layer thereon.

Backfilling above or against any facilities to be constructed under the contract shall not commence until after such facilities have been properly constructed and inspected. Further, backfilling above or against poured-in-place reinforced concrete structures shall not commence until the concrete has attained a compressive strength of at least 2,500 pounds per square inch based on field cured cylinders. Backfill shall be placed in a manner not to disturb or damage such facilities of structures, nor subject them to unbalanced loads or forces.

Furthermore, structural members shall not be subjected to any live loads until the concrete has attained its 28 day compressive strength.

Backfill in front of a retaining wall shall be placed and compacted prior to backfilling behind such wall.

Backfilling behind the retaining walls shall not commence until a minimum of fourteen days have elapsed after construction of the wall.

At the time of compaction, materials to be incorporated in backfill, except sand, shall have the proper uniform moisture content required to obtain the specified relative compaction. The Contractor shall water, or do whatever spreading, mixing and stockpiling is necessary to dry such materials, as the case may be, in order to obtain such proper moisture content.

The Contractor's attention is directed to the possibility of excessive lateral pressure on, and resultant damage to, retaining walls; he shall, therefore, exercise care in properly placing the backfill behind such walls. The use of heavy compacting equipment in areas immediately behind retaining walls will not be allowed, and all such compaction shall be done with portable equipment.

709.04 PAYMENT. - Structural backfilling shall be done as Incidental Work and payment therefor shall be included in the price or prices bid.

SECTION 710

PERVIOUS BACKFILL MATERIAL

710.01 GENERAL. - Pervious backfill material shall be furnished and placed where specified or shown on the plans and in accordance with the following requirements.

Pervious backfill material shall consist of gravel, crushed gravel, crushed rock, natural sands, manufactured sand, or combinations thereof. Pervious backfill material shall conform to the following grading requirements:

Sieve Size	Percentage Passing
2" 100	
No. 50 0-100	
No. 100 0-8	
No. 200 0-4	

That portion of pervious backfill material passing the No. 4 sieve shall have a Sand Equivalent of not less than 60.

Pervious backfill material shall be placed in horizontal layers along with and by the same methods specified for structural backfill. Pervious backfill material at any one location shall be of approximately the same grading, and at locations where the material would otherwise be exposed to erosion shall be covered with at least a one foot layer of earthy material approved by the Engineer.

710.02 PAYMENT. - Pervious backfill material shall be furnished and placed as Incidental Work and payment therefor shall be included in the price or prices bid.

SECTION 711

FILTER MATERIAL

711.01 GENERAL. - The Contractor shall furnish and place filter material, consisting of 3/4-inch combined aggregate in accordance with Section 800.06, where and as shown on the plans or specified, including doing all Incidental Work necessary or required.

Where specified or shown on the plans, the Contractor shall construct subdrainage facilities within or below volumes of backfill, fill or embankment. He shall furnish and place, in accordance with the requirements of Section 700.08, the required perforated drain pipe with the perforations down, filter material bed, layer of approved impervious material, and riprap drain troughs.

711.02 BEHIND RETAINING WALLS. - The Contractor shall furnish and place filter material behind retaining walls, for drains and otherwise, where and as shown on the plans or specified.

711.03 PAYMENT. - Filter material shall be furnished and placed as Incidental Work and payment therefor shall be included in the price or prices bid.

Filter material, if the Proposal includes a Bid Item therefor, satisfactorily furnished and placed, as specified, and where specified or directed, will be paid for at the price bid per ton, and shall be furnished saturated surface dry, the weight thereof subject to the deduction specified in Section 111.02.

SECTION 712

CRUSHED ROCK LAYER

712.01 GENERAL. - The Contractor shall furnish and install an 8-inch minimum thickness crushed rock layer including all necessary or required Incidental Work.

When a Bid Item for crushed rock is included in the Proposal, the Engineer will, under such a Bid Item, order crushed rock where necessary, in his opinion, to maintain an appropriately dry subgrade. Sanitary and storm water flow shall be handled and disposed of in accordance with the requirements of Section 301.

Crushed rock shall be uniformly graded from No. 4 to 3/4-inch sieve size.

The crushed rock layer shall be placed within the longitudinal limits and widths ordered by the Engineer. Such ordered widths will not exceed the outside width of the sewer, structure, or manhole base, as the case may be, plus two feet. Crushed rock placed in excess of the required minimum thickness, or outside the limits ordered by the Engineer, shall be at the Contractor's sole expense, and no direct or additional payment will be made therefor.

712.02 PAYMENT. - Crushed rock layer satisfactorily furnished and installed, in place, as specified, will be paid for at the price bid per square foot, measured horizontally within the limits ordered by the Engineer.

When subdrains are used in conjunction with a crushed rock layer, no reduction in the quantity of crushed rock will be made because of the construction of subdrains and related appurtenances within the layer.

SECTION 713

RIPRAP

713.01 GENERAL. - The Contractor shall furnish and place riprap to the lines, grades and depths shown on the plans, or where specifically ordered by the Engineer.

713.02 ROCK. - Rock for riprap will be hard, durable and not subject to disintegration by the action of air or water. When

tested for soundness by the sodium sulphate test in accordance with the requirements of ASTM "Standard Method of Test for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate," Designation C 88, not more than 7 percent of the rocks tested after 5 cycles of immersion and drying shall show any of the following types of deterioration: (1) Disintegration; (2) Splitting; (3) Crumbling; (4) Cracking; (5) Flaking. Sound metamorphic sandstone and basalt will pass this test; shale, weathered sandstone and igneous rock subject to splitting in seams will not pass the test.

Percentage by weight of the various individual rock weights shall be as follows:

Percent of Total Weight	Approximate Limits of Rock Weights
40 percent.....	400 lbs to 200 lbs
35 percent.....	200 lbs to 50 lbs
25 percent.....	50 lbs to 2 lbs

No stone shall be less than 2 inches in diameter.

When required by the Engineer, samples of the rock shall be furnished by the Contractor and tested by the City at no cost to the Contractor.

713.03 PLACING. - Rock shall be well graded and placed to form a practicable minimum of voids. In general, the larger rocks shall be dumped first and the smaller rocks shall be dumped and distributed to fill the voids.

713.04 PAYMENT. - Riprap, satisfactorily furnished and placed as specified, will be paid for at the price bid per ton.

SECTION 714

IMPORTED FILL MATERIAL

714.01 GENERAL. - The Contractor shall furnish imported fill material at the site to supplement site-excavated materials required for embankment, fill, or backfill, including that required for backfilling voids left by the removal or abandonment of subsurface obstacles and by the specified removal of facilities and materials from below the required subgrade. The borrow site for imported fill material may be designated by the City.

The work, as applicable, shall include:

- 1) loading and disposing of by the Contractor as his property, a quantity of site-excavated material suitable for use as embankment or fill, equal in volume to the quantity of imported fill material furnished;

2)excavating and disposing of unsuitable material as necessary, in order to excavate from the borrow area, the material required for embankment of fill; and

3) all other necessary or required Incidental Work.

Imported fill material is defined as material to be used for embankment or fill, obtained by the Contractor elsewhere than from the site of the work, and shall be in accordance with the requirements of Section 706.

Before importing any fill material the Contractor shall incorporate into embankment and fill all site-excavated materials that meet the requirements for embankment.

Any satisfactory material required for embankment and removed from the site by the Contractor, or wasted as a result of his operations, shall be satisfactorily replaced at the site by him at his sole expense.

Imported fill material shall not be delivered to the work until the source has been approved and the material tested and approved as hereinafter specified.

Removal from a borrow area shall be in a manner to obtain thereon the grades shown on the plans.

714.02 TESTING. - The Contractor shall notify the Engineer, in writing, 30 days in advance of hauling imported fill material to the site of the work, of the location of the area and the exact portion thereof from which he will obtain imported fill material.

The Contractor, as Incidental Work, shall excavate test pits in the aforementioned area at least 4 feet square and extending 4 feet below the unacceptable overburden, to expose representative samples of the material.

The City, at no cost to the Contractor, will conduct and evaluate tests of samples from the test pits in its laboratory to determine the acceptability of such material.

Material which is not as specified will be rejected.

714.03 PAYMENT.

1.If the Proposal does not contain a Bid Item for imported fill material, or if the contract is on a lump sum basis, the furnishing, placing, and compacting of the quantity of imported fill material specified, or indicated on the plans, shall be done as Incidental Work and included in the price or prices bid.

2.If imported fill material is to be furnished, placed and compacted as Incidental Work, as in 1) above, and more is required than contemplated in the plans and Special Provisions, the furnishing, placing, and compacting of such excess will be paid for as Extra Work in accordance with the provisions of Section 112.

3.If the Proposal contains a Bid Item for imported fill material, such material satisfactorily furnished, placed and compacted where directed will be paid for at the price bid per cubic yard. Measurement for payment will be as set forth in the Special Provisions,

and will be one of the following:

a. The aggregate volume, in place, of material satisfactorily furnished, computed from the cross sections between the ground surface existing at the start of the contract or the lower limit of pavement excavation, and the final graded ground surface or subgrade, as the cases may be.

b. The original volume, in place, of satisfactory material excavated from the borrow area and placed where required, computed by the average end area, or borrow pit, method.

c. Truck measurement, in accordance with the provisions of Section 111.03.

4. If a Bid Item for imported fill material occurs in a contract containing a Bid Item for embankment, the furnishing only of imported fill material to make up the deficiency of proper site excavated material will be paid for by truck measurement. All work to incorporate and compact imported fill material to the lines and grades of originally contemplated embankment or fill, shall be done as Incidental Work.

END PART 7
PART 7

EXCAVATION, BACKFILL AND EMBANKMENT

Section

700 EXCAVATION - GENERAL REQUIREMENTS

- 700.01 General
- 700.02 Safety Requirements
- 700.03 Excavations to Have Vertical Sides
- 700.04 Sheet Piling, Lagging, Bracing and Cofferdams
- 700.05 Excavation Adjacent to Existing Structures - Hazardous Excavation
- 700.06 Protection of Fill Material
- 700.07 Storage of Excavated Materials
- 700.08 Excavations to Be Kept Dry - Dewatering and Disposal of Water
- 700.09 Removal of Subsurface Obstacles - Differing Subsurface Conditions
- 700.10 Excavation of Unsound Subgrade Material
- 700.11 Disposal of Excavated Materials

701 PAVEMENT EXCAVATION

- 701.01 General
- 701.02 Removal of Asphalt Topped Pavement
- 701.03 Removal of Concrete Pavement, Sidewalk and Parking Strip - Concrete Saw Cutting Required

	701.04 Removal of Pavement and Rails Within Street Railway Track	Area
	701.05 Removal of Cable Car Conduit and Yoke Structure	
	701.06 City May Limit Use of Pavement Breaker	
	701.07 Payment	
702	TRENCH EXCAVATION	
	702.01 General	
	702.02 Minimum and Maximum Length of Trench	
	702.03 Payment	
703	TRENCH BACKFILL	
	703.01 General	
	703.02 Concrete Strength Before Backfilling	
	703.03 Sand Bed for Pipe Sewers and Culverts	
	703.04 Subgrade Surfaces for Pile-Supported Concrete	
	703.05 Crushed Rocklayer in Trench	
	703.06 Required Sand Backfill	
	703.07 Backfill Above Required Sand	
	703.08 Backfill Layers	
704	CLEARING, GRUBBING AND SITE PREPARATION	
	704.01 General	
	704.02 Payment	
705	COMMON EXCAVATION	
	705.01 General	
	705.02 Payment	
706	EMBANKMENT	
	706.01 General	
	706.02 Acceptable Materials	
	706.03 Procedures	
	706.04 Embankment and Fill Layers	
	706.05 Placing Material Against Slopes	
	706.06 Payment	
707	COMPACTION	
	707.01 General	
	707.02 Backfill, Fill and Embankment Areas	
	707.03 Cleared or Excavated Areas	

	707.04 Backfill in Areas of Excessive Excavation and Areas of Unsound Material	Removed
	707.05 Filter Material	
	707.06 Equipment	
	707.07 Payment	
708	STRUCTURAL EXCAVATION	
	708.01 General	
	708.02 Preparation of Subgrade	
	709.03 Payment	
709	STRUCTURAL BACKFILL	
	709.01 General	
	709.02 Structural Backfill Materials	
	709.03 Procedures	
	709.04 Payment	
710	PERVIOUS BACKFILL MATERIAL	
	710.01 General	
	710.02 Payment	
711	FILTER MATERIAL	
	711.01 General	
	711.02 Behind Retaining Walls	
	711.03 Payment	
712	CRUSHED ROCK LAYER	
	712.01 General	
	712.02 Payment	
713	RIPRAP	
	713.01 General	
	713.02 Rock	
	713.03 Placing	
	713.04 Payment	
714	IMPORTED FILL MATERIAL	

714.01 General
714.02 Testing
714.03 Payment

Appendix E Curb Ramp Standards

City and County of San Francisco



Gavin Newsom, Mayor
Edwin M. Lee, Director



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Order No. 175,387

ADOPTING REVISED CITY CURB RAMP STANDARDS PLANS NOS. 55,017, Revision No. 3; 55,017.1; 55,018 Revision No. 3; 55,018.1; 55,018.2; 55,018.3; and ALLOWING THE CITY ENGINEER OR HIS/HER DESIGNEE TO GRANT EXCEPTIONS TO DPW CURB RAMP STANDARDS UNDER THE PROVISIONS OF THE TITLE 24 CALIFORNIA BUILDING CODE AND THE AMERICANS WITH DISABILITIES ACT.

PROHIBITING THE INSTALLATION OF NEW UTILITY FACILITIES WITHIN THE CURB RETURN AREA, and REQUIRING THE RELOCATION OF EXISTING UTILITY FACILITIES IN ORDER TO CONSTRUCT DPW STANDARD CURB RAMPS

I. PURPOSE

This Department of Public Works (DPW) Order adopts the following:

- A. Revised City Curb Ramp Standards.
- B. Provides procedures for granting exceptions or accepting alternatives to said Standards under the provisions of the California Code of Regulations (CCR) Title 24, Part II; California Building Code.
- C. Provides procedures for granting exceptions or accepting alternatives to said Standards under the provisions of Title II, Part 35 of the Americans with Disabilities Act of 1990 (ADA), and the Americans with Disabilities Act Accessibility Guidelines (ADAAG), as published in the Federal Register on July 26, 1991, corrected January 14, 1992, 36 CFR Part 1191.
- D. Provides requirements prohibiting the installation of new utility facilities within the curb return area and the relocation of existing utility facilities in order to construct a DPW Standard Curb Ramp(s).

II. NEW CURB RAMP STANDARDS

- A. This Order hereby adopts revised City curb ramp standards as shown on the curb ramp standard plans numbered:

<u>File No.</u>	<u>Revision No.</u>
55,017	3
55,017.1	
55,018	3
55,018.1	
55,018.2	
55,018.3	

- B. Permits issued after the adoption date of this DPW Order shall be constructed per the revised City DPW Curb Ramp Standards.

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- C. Curb ramps constructed under City construction contracts advertised after the adoption date of this DPW Order shall be constructed per the revised City DPW Curb Ramp Standards.

III. PROCEDURE FOR REQUESTING EXCEPTIONS TO CURB RAMP STANDARDS

- A. The City Engineer or his/her designee may grant exceptions to the Curb Ramp Standard.
- B. A Curb Ramp Exception Request shall be a written submission to the City Engineer and shall include the following:
1. An explanation why an exception is requested. Specifically explain how the installation of a standard curb ramp is technically infeasible and how it would create an unreasonable hardship;
 2. An explanation of which standard features are proposed to be altered, how they will be altered and propose an alternative facilitation equivalent;
 3. The name of the person and/or organization requesting the exception;
 4. The contact person's name, phone number and address;
 5. The location of the request for an exception to the curb ramp standard;
 6. A detailed dimensioned plan documenting existing physical and legal constraints; e.g. sidewalk widths, utility poles, fire hydrants, traffic signals, curbs, property lines, traffic lanes, traffic direction, running and cross slopes of roads and sidewalks, etc., also including the location of the proposed alternate or exception type curb ramp; and
 7. Pictures documenting existing physical constraints at the location of the request for an exception.
- C. For purposes of this DPW Order, "technically infeasible" shall apply to publicly funded curb ramps and shall be defined in accordance with ADAAG Sec. 4.1.6; "Means, with respect to an alteration of a building or facility, that it has little likelihood of being accomplished because existing structural conditions would require removing or altering a load-bearing member which is an essential part of the structural frame; or because other existing physical or site constraints prohibit modification or addition of elements, spaces, or features which are in full and strict compliance with the minimum requirements for new construction and which are necessary to provide accessibility." For use for privately funded curb ramps only; "Unreasonable hardship" shall apply to privately funded curb ramps and shall be as defined in Section 222 of the California Building Code [California Code of Regulations (CCR) Title 24, Part II].
- D. DPW will consider such Request only in conjunction with a specific permit or project; including but not limited to a street improvement permit, a re-paving or excavation contract, a utility excavation permit, or any other applicable permits.

IV. GUIDELINES FOR APPROVING REQUEST FOR AN EXCEPTION TO THE CURB RAMP STANDARD

- A. The City Engineer or his/her designee may grant an exception to the Curb Ramp Standard if he/she determines that compliance is technically infeasible or would create an undue burden or administrative expense; provided, however that equivalent facilitation shall be provided through the use of other methods and materials to the extent that it is technically feasible. The City Engineer, in his/her discretion, may impose additional conditions on the grant of an exception. Such conditions may include, but shall not be limited to, relocation of City utility facilities at no cost to the City, and other measures protective of public health, safety, welfare, or convenience.

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V. PROHIBITING NEW FACILITIES IN THE CURB RETURN AREA

- A. New utility boxes, vaults, poles, such as but not limited to telephone, electrical, and cable television conduit, pull boxes, splice boxes, valves, traffic poles, street light poles, MUNI poles, fire alarm call boxes, fire hydrants, etc. shall not be installed within the curb return area. New construction or permits issued after the adoption date of this DPW Order shall adhere to this requirement.

VI. PROCEDURE FOR REQUESTING EXCEPTIONS TO THE PROHIBITION OF INSTALLING NEW UTILITY FACILITIES IN THE CURB RETURN AREA

- A. The City Engineer or his/her designee may grant exceptions to the prohibition of installing utility facilities in the curb return area.
- B. A request for an exception shall be a written submission to the City Engineer and shall include the following:
1. An explanation on why an exception is requested. Specifically explain the type of facility requested to be installed in the curb return area, why it must be installed in the curb return area and why there are no other alternatives;
 2. The name of the person and / or organization requesting the exception;
 3. The contact person's name, phone number and address;
 4. The location of the request for an exception;
 5. A detailed dimensioned plan documenting existing physical and legal constraints; e.g. sidewalk widths, utility poles, fire hydrants, traffic signals, curbs, property lines, traffic lanes, traffic direction, running and cross slopes of roads and sidewalks, etc., also including the location and size of the proposed new utility facility and curb ramp(s); and
 6. Pictures documenting existing physical constraints at the location of the request for an exception.
- C. The above request may only be made and shall only be accepted in conjunction with a specific permit or project; including but not limited to a street improvement permit, a re-paving or excavation contract, a utility excavation permit, or any other applicable permits.

VII. GUIDELINES FOR APPROVING REQUESTS FOR AN EXCEPTION TO THE PROHIBITION OF INSTALLING NEW UTILITIES IN THE CURB RETURN AREA

- A. The City Engineer or his/her designee may grant exceptions to the prohibition of installing utility facilities in the curb return area. The granting of such exceptions shall not interfere with the construction of a DPW Standard Curb Ramp and shall require the applicant to install a DPW Standard Curb Ramp and may require the performance of other work. If the City Engineer or his/her designee determines that a request for an exception to install new utility facilities in the curb return area cannot be granted, the applicant may be required to coordinate relocation of existing facilities, at no cost to the City in order to comply with and construct the curb ramp(s) per DPW Standards. The cost to relocate existing non-municipal facilities will be borne by the owner of the facility. The applicant will bear the cost of relocating municipal facilities which include but are not limited to street light poles, traffic signal poles, pedestrian signal poles, Muni overhead poles, and electrical power poles, traffic control cabinets, catchbasins, and manholes.

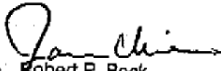
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VIII. ADDITIONAL PERMIT FEES

- A. The Department has determined that processing permits to excavate and install facilities in the curb return area in accordance with the requirements of this Order will require the Department to incur expenses for employee time and materials in excess of those the Department generally incurs to process an application for a Permit. Pursuant to Public Works Code Section 2.4.43, in addition to all other fees required under Subarticle IV of Article 2.4 of the Public Works Code, the Department shall charge an Applicant filing an application for a Permit to excavate and install facilities in the curb return area an initial additional administrative fee of \$75.00 for each curb return review and may require an additional inspection fee. If the City Engineer or his/her designee is required to review the project, there will be an additional \$300 fee.

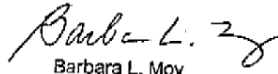
RECOMMENDED:

for 
 Robert P. Beck
 Deputy Director for Engineering
 and City Engineer

APPROVED:


 Edwin M. Lee
 Director of Public Works

RECOMMENDED:


 Barbara L. Moy
 Manager, Street-Use and Mapping

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Approved: May 4, 2005