CONTRACT DOCUMENTS

FOR

REHABILITATION OF LOCALIZED STREETS, PHASE 24C

MILILANI MAUKA, OAHU, HAWAII

DEPARTMENT OF DESIGN AND CONSTRUCTION
CIVIL DIVISION
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

HAKU MILLES, P.E.
DIRECTOR

JOB NO. 11-24

SOLICITATION NO. RFB-DDC-1883802

FEBRUARY 2025

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JOB NO. 11-24

SOLICITATION NO. RFB-DDC-1883802

REHABILITATION OF LOCALIZED STREETS, PHASE 24C

MILILANI MAUKA, OAHU, HAWAII

THE CONTRACT DOCUMENTS FORMING THE CONTRACT CONSIST OF:

OFFER

_____
Offeror's Legal Business Name

Honolulu, Hawaii
_____, 2025

Director of Budget and Fiscal Services
City and County of Honolulu
Honolulu, Hawaii 96813

The undersigned hereby offers and agrees, if this Offer is accepted, to furnish and pay for all labor, materials, tools, equipment and work as necessary to construct or install, in place complete, the work called for under and in accordance with the true intent of the Contract Documents for:

JOB NO. 11-24

SOLICITATION NO. RFB-DDC-1883802

REHABILITATION OF LOCALIZED STREETS, PHASE 24C

MILILANI MAUKA, OAHU, HAWAII

on file in the Office of the Division of Purchasing, Department of Budget and Fiscal Services, City and County of Honolulu, and that undersigned shall take in payment therefor the unit and/or lump sum prices rounded off to the nearest cent as itemized in the following schedule:

ITEM NO.	ITEM	QTY	UNIT	UNIT PRICE	AMOUNT
1.	Ahohui Street	1	LS	LS	$
2.	Ahoka Place	1	LS	LS	$
3.	Ahoka Street	1	LS	LS	$
4.	Ahokele Street	1	LS	LS	$
5.	Anuanu Place	1	LS	LS	$
6.	Anuanu Street	1	LS	LS	$
7.	Haike Place	1	LS	LS	$
8.	Halekia Street	1	LS	LS	$
9.	Halekua Place	1	LS	LS	$
10.	Halekua Street	1	LS	LS	$
11.	Halelau Place	1	LS	LS	$
12.	Halemalu Street	1	LS	LS	$
13.	Halepio Place	1	LS	LS	$
14.	Hiialo Street	1	LS	LS	$
15.	Hoahele Place	1	LS	LS	$
16.	Hoahiahi Place	1	LS	LS	$
17.	Hoahui Street	1	LS	LS	$
18.	Hoakea Place	1	LS	LS	$

ITEM NO.	ITEM	QTY	UNIT	UNIT PRICE	AMOUNT
19.	Hoakula Street	1	LS	LS	$
20.	Hoaluhi Place	1	LS	LS	$
21.	Hoani Place	1	LS	LS	$
22.	Hoao Place	1	LS	LS	$
23.	Hulumoa Place	1	LS	LS	$
24.	Hunawai Place	1	LS	LS	$
25.	Kuaoa Street	1	LS	LS	$
26.	Kuinehe Place	1	LS	LS	$
27.	Kukini Place	1	LS	LS	$
28.	Lapaiki Street	1	LS	LS	$
29.	Lehiwa Drive (West End)	1	LS	LS	$
30.	Lehiwa Drive (East End)	1	LS	LS	$
31.	Meheu Street	1	LS	LS	$
32.	Paea Strfeet	1	LS	LS	$
33.	Pahaku Place	1	LS	LS	$
34.	Pahaku Street	1	LS	LS	$
35.	Puakai Place	1	LS	LS	$
36.	Ulahea Place	1	LS	LS	$

ITEM NO.	ITEM	QTY	UNIT	UNIT PRICE	AMOUNT
37.	Ulahea Street	1	LS	LS	$
38.	Reconstructed Concrete Curb and Gutter	24	LF	$	$
39.	Reconstructed Rolled Curb and Gutter	53	LF	$	$
40.	Reconstructed Concrete Sidewalk	3,715	SF	$	$
41.	Tree Root Pruning and Canopy Pruning	56	EA	$	$
42.	Tree Removal	1	EA	$	$
43.	New Sign(s) and Post	7	EA	$	$
44.	New Sign(s) on Existing Post	39	EA	$	$
45.	Vehicle Detector Loop	20	EA	$	$
46.	Verification of Construction Vehicles	1	LS	LS	$
47.	As-Built Drawings	1	LS	LS	$
48.	Mobilization (Not to Exceed 6% of the Total Sum of All Items, Excluding the Bid Price for Item Nos. 48 through 64.)	1	LS	LS	$

Additional Work Items (see Section SP 152 for Additional Work description and payment requirements)

49.	Additional Police Officers	ALLOW.*	ALLOW.*	ALLOW.*	$ 20,000.00
50.	Additional Traffic Control Devices	F.A.*	F.A.*	F.A.*	$ 10,000.00
51.	Additional Arboricultural Work	ALLOW.*	ALLOW.*	ALLOW.*	$ 20,000.00

ITEM NO.	ITEM	QTY	UNIT	UNIT PRICE	AMOUNT
52.	Additional Water Pollution, Dust and Erosion Control	F.A.*	F.A.*	F.A.*	$ 10,000.00
53.	Additional Street Survey Monument Frame and Cover, Including Adjustment	F.A.*	F.A.*	F.A.*	$ 15,000.00
54.	Adjustment of Buried Street Survey Monuments, Manhole and/or Valve Box Frames and Covers	F.A.*	F.A.*	F.A.*	$ 5,000.00
55.	Manhole Reconstruction – All Except Precast Sewer	F.A.*	F.A.*	F.A.*	$ 10,000.00
56.	Manhole Reconstruction – Precast Sewer	F.A.*	F.A.*	F.A.*	$ 25,000.00
57.	Subgrade Treatment with Cement	F.A.*	F.A.*	F.A.*	$ 5,000.00
58.	Additional Roadway Excavation for Reconstruction of Pavement Areas	F.A.*	F.A.*	F.A.*	$ 140,000.00
59.	Additional Aggregate Base Course	F.A.*	F.A.*	F.A.*	$ 205,000.00
60.	Additional Geogrid (Material Only)	F.A.*	F.A.*	F.A.*	$ 60,000.00
61.	Additional Geogrid Placement (Installation)	F.A.*	F.A.*	F.A.*	$ 20,000.00
62.	Additional Woven Geotextile (Material Only)	F.A.*	F.A.*	F.A.*	$ 55,000.00
63.	Additional Woven Geotextile Placement (Installation)	F.A.*	F.A.*	F.A.*	$ 20,000.00
64.	Sidewalk Expansion Joint Repair	F.A.*	F.A.*	F.A.*	$ 25,000.00
	TOTAL SUM BID (Items 1 to 64)				$

* Use of and payment for this item authorized only when written authorization for its use is given by the Officer-in Charge. Any unused portions of the Allowance and Force Account items shall remain with the City upon completion of the project. Contractor shall not make a claim in the event the City chooses to delete any Allowance or Force Account item from the Contract.

The undersigned also agrees as follows:

l. That the quantities of work shown herein are approximate only and are subject to increase or decrease, and offers to do the work whether the quantities are increased or decreased at the unit prices stated in the Offer schedule.

2. That the quantities in any item on a LUMP SUM bid in this Offer are approximate only and that payment shall be made only for the item in place complete, regardless of amount of material, equipment and labor necessary to complete the same in a proper and workmanlike manner and in accordance with the plans and specifications. That the quantities shown distributed in the LUMP SUM items are given only for the Offeror's and/or Contractor's convenience and for the purpose of making monthly estimates. The Offeror and/or Contractor shall verify these quantities in any manner they deem necessary or expedient.

3. That the estimated quantities shown on items for which a UNIT PRICE is given in this Offer are only for the purpose of comparing, on a uniform basis, bids offered for the work under this contract, and that they are satisfied with and shall at no time dispute said estimated quantities as a means of comparing the bids. That they shall make no claim for anticipated profit or loss of profit because of a difference between the quantities of the various classes of work done or the materials and equipment actually installed and the said estimated quantities.

4. That if the product of the UNIT PRICE bid by the number of units does not equal the total amount named by the Offeror of any items, it shall be assumed that the error was made in computing the total amount and for the purpose of computing the lowest Offeror, the named UNIT PRICE alone shall be considered as representing the Offeror's intention and the total amount bid on such item shall be considered to be the amount arrived at by multiplying the UNIT PRICE by the number of units.

5. Method of Award. The City shall award a contract to the responsive, responsible Offeror with the lowest Total Sum Bid, considering any applicable preferences. The City shall only consider an Offer with pricing on all items listed. The award is subject to the availability of funding.

6. That the time of completion shall be within 545 consecutive calendar days from the official commencement date of the Notice to Proceed (NTP).

The City anticipates issuing the NTP within 365 calendar days of contract execution. Should the NTP be issued within 365 calendar days of the date of contract execution, no claim for cost escalation shall be considered. The Special Provision on Price Adjustment due to NTP issuance provides clarification on the price adjustments.

Upon written instructions from the Officer-in-Charge, the Contractor shall proceed with preparatory work such as: making submittals and obtaining permits. No work shall be allowed at the job site and no ordering of materials shall be allowed until: (a) the date stipulated in the NTP, or (b) upon earlier written notice from the Officer-in-Charge.

7. That the liquidated damages for each and every calendar day delay in the completion of the contract shall be as specified in the Special Provisions.

8. The undersigned certifies that they are licensed to undertake this project pursuant to Chapter 444, Hawaii Revised Statutes (HRS), relating to licensing of Contractors.

9. Tax Clearance. The apparent successful Offeror shall be required to submit tax clearances from the State Department of Taxation and the Internal Revenue Service upon award of contract.

10. That the Offeror is aware of the applicability of HRS Section 103-55.6, relating to Public Works Construction, Apprenticeship Agreement, and, if applicable, that the Offeror has attached with their bid, written proof of being a party to a registered apprenticeship agreement for each apprenticeable trade the Offeror shall employ to construct this project. Furthermore, the Contractor shall continue to certify monthly in writing that the Contractor is a party to all applicable registered apprenticeship agreement.

11. That the Offeror is aware of the applicability of Section 4.2 of the General Instructions to Offerors (Dated 2/9/17) namely the Certificate of Acceptance of Solicitation Requirements form, which shall be completed, signed by the Offeror, and submitted with the Offeror’s offer.

12. Contractor Performance Records. The City shall maintain records pertaining to the Contractor’s performance on contracts with the City. The Contractor shall be required to participate in performance assessment activities in accordance with a performance assessment plan that shall be prescribed by the City during the performance of the Contract. Contractor performance records may be used to determine a contractor’s responsibility, qualifications, and eligibility for the award of future contracts with the City.

13. Final Payment. Proof of compliance with HRS Section 103D-328 and HRS Section 103D-310 is required for final payment. Proof of compliance may be through Hawaii Compliance Express (HCE) or written clearance issued by the Hawaii Department of Taxation, Internal Revenue Service, Hawaii Department of Labor, and Hawaii Department of Commerce and Consumer Affairs.

14. Enclosed herewith is:

Surety bond	)
Legal tender	)
Certificate of deposit, share certificate,	)(Circle one)
cashier's check, treasurer's check,	)
teller's check, official check,	)
certified check	)

for the sum of _____

DOLLARS ($), being not less than five percent (5%) of the total amount bid.

Respectfully submitted,

_____
Offeror’s Legal Business Name

By _____
Authorized Signature

_____
Print or Type Name and Title of Above

Address:_____

_____

Telephone No.:_____

Fax No.:_____

Email:_____

In accordance with Section 103D-302, HRS, all Offers shall include the name of *each* person or firm to be engaged by the Offeror as a joint contractor or subcontractor in the performance of the contract for construction, and the nature and scope of work to be performed by each joint contractor or subcontractor. Offers that do not comply with this requirement may be evaluated in accordance with Section 103D-302(b) of the HRS.

It is the sole responsibility of the Offeror to review the requirements of this project and determine the appropriate contractor's licenses that are required to complete the project. The Offeror acknowledges that as a general contractor ('A' or 'B' license), the Offeror is prohibited from undertaking any work solely or as part of a larger project which would require the Offeror to act as a specialty contractor ('C' license) in any area in which the Offeror has no specialty contractor's license. The Offeror must have the appropriate specialty contractor's license either obtained on its own, or obtained automatically under HAR §16-77-32.

In determining work that is to be performed by joint contractors or subcontractors, Offerors shall be familiar with HRS 444, relating to licensing of contractors and the Hawaii Administrative Rules, Title 16, Department of Commerce and Consumer Affairs, Chapter 77, Contractors.

General Engineering 'A' Contractors automatically have these 'C' specialty contractor's licenses: C-3, C-9, C-10, C-17, C-24, C-31a, C-32, C-35 C-37a, C-37b, C-38, C-43, C-49, C-56, C-57a, C-57b, and C-61.

General Building 'B' Contractors automatically have these 'C' specialty contractor's licenses: C-5, C-6, C-10, C-12, C-24, C-25, C-31a, C-32a, C-42a, and C-42b.

Contractors that are suspended or debarred by the State of Hawaii, State Procurement Office (SPO) under HRS Chapter 103D, cannot be considered for award during the suspension or debarment. However, suspended or debarred subcontractors may be listed. It shall be the responsibility of the Offeror to check the SPO website for current suspensions and debarments: www.hawaii.gov/spo, or phone (808)587-4700.

Contractors or subcontractors that are suspended or debarred by the State of Hawaii, Department of Labor and Industrial Relations (DLIR) under HRS Chapter 104 are prohibited from performing **any work** on any State or county public works construction project. Therefore, if an Offer involves a contractor or listed subcontractor that is suspended by DLIR, the Offer may be rejected as being nonresponsible. It shall be the responsibility of the Offeror to check the DLIR website for current suspensions and debarments: www.hawaii.gov/labor, or phone: (808)586-8771.

When more than one joint contractor or subcontractor is listed for a category of work, the Offeror shall identify the scope of work each will perform. Joint contractors or subcontractors shall also be listed for work to be completed under additives or alternates.

All work not within the scope of work of the listed joint contractor(s) or subcontractor(s), shall be performed by the Offeror.

List the required joint contractors or subcontractors for this project in the following table. Write in the complete name of the Joint Contractor or Subcontractor, the Contractor License Number, and the Nature and Scope of work to be performed by the firm.

COMPLETE NAME OF JOINT CONTRACTOR OR SUBCONTRACTOR	CONTRACTOR LICENSE NUMBER	SPECIFIC DESCRIPTION OF THE NATURE AND SCOPE OF WORK

ACKNOWLEDGMENT OF LIQUIDATED DAMAGES PROVISION

(Failure to submit this form with the Offer may be cause for rejection.)

PROJECT NAME AND NUMBER:_____

This is to certify that the undersigned understands and agrees to the provisions for Liquidated Damages, Section 3.16 of the General Terms and Conditions, City and County of Honolulu, and that submittal of our Offer constitutes acceptance of the provisions and amount of liquidated damages that may be assessed per calendar day as specified in Section SP 180 – Liquidated Damages.

_____
Offeror’s Legal Business Name

_____
Signature and Title

Dated:_____

CERTIFICATION OF COMPLIANCE
WITH HRS 396-18, SAFETY AND HEALTH PROGRAMS
FOR CONTRACTOR BIDDING ON CITY JOBS

PROJECT NAME AND NUMBER:_____

This is to certify that the undersigned shall comply with the requirements of HRS 396-18, as follows:

(A) Pursuant to HRS 396-18, all bids and offers in excess of $100,000 shall include a signed certification from the Offeror that a written safety and health plan for the job will be available and implemented by the Notice to Proceed dates of the project. The written safety and health plan shall include:

(1) A safety and health policy statement reflecting management commitment;

(2) A description of the safety and health responsibilities of all levels of management and supervisors on the job and a statement of accountability appropriate to each;

(3) The details of:

(a) The mechanism for employee involvement in job hazard analysis;
(b) Hazard identification, including periodic inspections and hazard correction and control;
(c) Accident and "near-miss" investigations; and
(d) Evaluations of employee training programs;

(4) A plan to encourage employees to report hazards to management as soon as possible and to require management to address these hazards promptly; and

(5) A certification by a senior corporate or company manager that the plan is true and correct.

(B) Failure to submit the required certification may be grounds for disqualification of the Offer.

(C) Failure to have available on site or failure to implement the written safety and health plan by the project's Notice to Proceed date shall be considered willful noncompliance and be sufficient grounds to disqualify the award and terminate the contract.

_____
Offeror’s Legal Business Name

Date:_____

_____
Signature and Title

CERTIFICATE OF ACCEPTANCE
OF SOLICITATION REQUIREMENTS

It is understood and agreed that the undersigned acknowledges the following:

1. The Offeror has read this solicitation document including any addenda, in its entirety;

2. The Offeror understands and agrees to furnish, deliver, and perform the requirements of the solicitation in strict compliance with the solicitation document as amended, including any specifications, plans, and scope of work descriptions, without any exceptions, if awarded a contract;

3. The Offeror understands and agrees that no substitution or alternate brands may be furnished without the **written approval** of the City;

4. The Offeror understands that the Contractor shall resolve any noncompliance with the requirements of the awarded contract at the Contractor's own expense;

5. The Offeror shall make all modifications or customizations to the brand and model being offered as necessary to meet all specifications, at no additional cost. Offeror guarantees that all modifications or customizations done to meet specifications shall not affect the quality or operation of the product; and

6. The Offeror understands that **FAILURE TO MEET CONTRACT REQUIREMENTS SHALL CONSTITUTE A BREACH OF CONTRACT THAT MAY RESULT IN SUSPENSION OR DEBARMENT, AND THE EXERCISE OF RIGHTS AND REMEDIES AS PROVIDED BY LAW.** Contract requirements include any specifications, plans, and scope of work descriptions;

7. The undersigned is an authorized representative of the Offeror and can legally obligate the Offeror thereto.

Offeror's Legal Business Name: _____

Signature: _____

Print Name: _____

Title: _____

Date: _____

Business Phone: _____

SURETY BID BOND
(11/17/98)

Bond No. _____

KNOW TO ALL BY THESE PRESENTS:

That we, _____,
(Full Name or Legal Title of Offeror)

as Offeror, hereinafter called Principal, and _____,
(Name of Bonding Company)

as Surety, hereinafter called Surety, a corporation authorized to transact business as a Surety

in the State of Hawaii, are held and firmly bound unto _____,
(State/County Entity)
as Owner, hereinafter called Owner, in the penal sum of _____

_____
(Required Amount of Bid Security)

Dollars ($_____), lawful money of the United States of America, for the payment of which sum well and truly to be made, the said Principal and the said Surety bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS:

The Principal has submitted an offer for _____

_____.
(Project by Number and Brief Description)

NOW, THEREFORE:

The condition of this obligation is such that if the Owner shall reject said offer, or in the alternate, accept the offer of the Principal and the Principal shall enter into a Contract with the Owner in accordance with the terms of such offer, and give such bond or bonds as may be specified in the solicitation or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof as specified in the solicitation then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed this _____ day of _____, _____.

(Seal)

_____
Name of Principal (Offeror)

_____
Signature

_____
Title

(Seal)

_____
Name of Surety

_____
Signature

_____
Title

CONTRACT NO. XX-XXX-XXXXXXX

SOLICITATION NO. XXX-XXX-XXXXXXX

THIS AGREEMENT, made and entered into on _____(Date), by and between the CITY AND COUNTY OF HONOLULU, a municipal corporation existing under and by virtue of the laws of the State of Hawaii, whose principal place of business is 530 SOUTH KING STREET ROOM 208, HONOLULU, HAWAII 96813, hereinafter called the "CITY," and , whose principal place of business is CONTRACTOR'S ADDRESS, hereinafter referred to as the "CONTRACTOR."

WITNESSETH THAT:

WHEREAS, the CITY desires to engage the CONTRACTOR to perform work for the Project Description; and

WHEREAS, a solicitation for bids and the selection of the CONTRACTOR were made in accordance with section 103D-302, Hawaii Revised Statutes (HRS) and the related Hawaii Administrative Rules (HAR). The CONTRACTOR has been identified as the lowest responsible and responsive Offeror, whose offer meets the requirements and criteria set forth in the invitation; and

WHEREAS, the CONTRACTOR is willing and able to provide the services set forth in this AGREEMENT;

NOW, THEREFORE, the CITY and the CONTRACTOR, in consideration of the foregoing and of the mutual promises hereinafter set forth, the sufficiency and adequacy of which are hereby acknowledged, and intending to be legally bound, hereby mutually agree as follows:

1. This Contract and the following documents, appendices and exhibits collectively form the "AGREEMENT" or "Contract Documents", all of which are attached hereto and incorporated herein:

This Contract

Solicitation No. XXX-XXX-XXXXXXX

CONTRACTOR's Offer

The Contract Documents as listed hereinabove are in the order of controlling preference should there be any conflict in the terms; provided, however, that portions in the CONTRACTOR's Offer that exceed specification requirements in the solicitation document shall become the new minimum Contract requirements.

2. The CONTRACTOR shall furnish all services, labor, goods, materials, supplies, equipment and other work reasonably necessary for the successful completion of the work contemplated under this AGREEMENT (Work).

3. The CITY agrees to pay the CONTRACTOR for the satisfactory performance and completion of the Work in accordance with the payments schedule and provisions, all as set

forth in the AGREEMENT. The total amount of this AGREEMENT shall not exceed Dollar Amount Spelled Out ($XX.XX), which is the maximum payable under this AGREEMENT and inclusive of all taxes. The CONTRACTOR shall not pass through any increases in taxes to the CITY.

4. The term of the Agreement shall be the duration as provided in Solicitation No. XXX-XXX-XXXXXXX.

5. The CONTRACTOR shall prosecute said work in an efficient manner so as entirely to complete and perform said work within the time set forth in Solicitation No. XXX-XXX-XXXXXXX.

IN WITNESS WHEREOF, this AGREEMENT is executed herein by the duly authorized officer or agent of the CITY and the CONTRACTOR.

CITY AND COUNTY OF HONOLULU	CONTRACTOR'S LEGAL NAME
BY:	BY:
PRINTED NAME:	PRINTED NAME:
TITLE: Director, Department of Budget and Fiscal Services	TITLE:
DATE:	DATE:

APPROVED AS TO FORM AND
LEGALITY

_____

Deputy Corporation Counsel

TABLE OF CONTENTS OF SPECIAL PROVISIONS

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 2 - GENERAL INSTRUCTIONS TO OFFERORS AND GENERAL TERMS AND CONDITIONS

SP 2.1 GENERAL

The current "GENERAL INSTRUCTIONS TO OFFERORS", and the current "GENERAL TERMS AND CONDITIONS", of the Department of Budget and Fiscal Services, City and County of Honolulu, are by reference incorporated herein and made a part of these specifications. The terms "General Instructions" and "General Conditions" used hereinafter refer to the current "GENERAL INSTRUCTIONS TO OFFERORS", and the current "GENERAL TERMS AND CONDITIONS", respectively. Copies of the General Instructions and General Conditions may be obtained online at **http://www.honolulu.gov/pur**. Any provision of the General Instructions and General Conditions not in conflict with the Hawaii Administrative Rules, Title 3, Department of Accounting and General Services, shall be applicable to this contract.

SP 2.2 GENERAL INSTRUCTIONS

The General Instructions shall be amended as follows:

A. Delete Section 2.19 “Solicitation Addenda” (b)(2) in its entirety.

B. Notwithstanding Section 2.5 “Examination of site” of the General Instructions, every Offeror bidding upon the work shall examine carefully the site and satisfy himself as to the character and amount of work to be performed as indicated on the plans and called for by these specifications and the conditions under which it must be performed. No additional payment shall be granted because of the lack of knowledge of such conditions.

C. Delete Subsection 5.4 (a) relating to Time for Acceptance of offer, in its entirety and replace with the following:

"(a) For City-funded projects or projects funded in whole or in part by the federal government; within one hundred eighty (180) days of the date of solicitation opening or receipt of Offers;"

D. Delete Section 6.9 Cost Analysis Data in its entirety and replace with the following:

“6.9 Cost Analysis Data

The City reserves the right to request cost data to conduct a cost analysis. Pursuant to HRS 103D-312 and HAR 3-122 Subchapter 15, this cost data will be used to determine if the offer is fair and reasonable. Information provided by the Offeror may remain confidential and proprietary in accordance with HRS §92F-13(3).”

SP 2.3 GENERAL CONDITIONS

The General Conditions shall be amended as follows:

A. Section 2.10 Indemnity of the General Conditions is deleted in its entirety and replaced with the following:

"2.10 Indemnity

The Contractor shall perform the work as an independent Contractor and shall indemnify and hold harmless the City, its departments, and all of their officers, employees or agents, from any and all deaths, injuries, losses and damages to persons or property, and any and all claims, demands, suits, action and liability therefor including reasonable attorney fees and cost of defense, caused by error, omissions, negligence or willful or intentional misconduct in the performance of the contract by the Contractor or the Contractor's subcontractors, agents and employees, and this requirement shall survive the termination of contract."

B. Add the following new paragraph (F) to Section 3.11 Price Adjustment in Construction Contracts, Subsection (1) Price adjustment methods:

"(F) In determining the adjustment in price to a lump sum pay item resulting from an increase or decrease in quantities, the Officer-in-Charge shall base the adjustment of the lump sum item on the calculated proportionate unit price, only when the quantity is provided with the pay item. The Officer-in-Charge shall calculate the proportionate unit price by dividing the original contract lump sum price by the quantity established by the contract documents."

C. Section 4.5 Payments, Section (a) is deleted in its entirety and replaced with the following:

"(a) Payments will be authorized by the Director after completion of performance or delivery and acceptance by the Director of all materials, goods, and services stipulated in the contract or Purchase Order and after the invoices, in triplicate, are received by the using agency, Attention: Fiscal Officer. The invoices must list the following information: contract and confirmation purchase order numbers (if any), item numbers, description of items, quantities, unit prices, and extended totals. Payments will be computed in accordance with any applicable unit prices bid. Payments will be made as soon thereafter as the regular course of business will allow; provided, however, that payments shall be made no later than thirty (30) calendar days following receipt of the statement for goods received and services completed."

D. Section 5.2.2 "Payment and Performance Schedules," subparagraph (e)(4) of the General Conditions is deleted in its entirety and replaced with the following:

"(4) The Contractor’s Three (3)-Week Look Ahead Schedule. Contractor shall provide a weekly three week look ahead schedule for the project. The schedule shall include, but not be limited to, all activities, their description, duration, relationship and dependencies necessary to the completion of the contract. If the schedule is not accepted, it shall be revised as directed by the Officer-in-Charge. Changes in the schedule shall be made only with the written acceptance of the Officer-in-Charge."

E. Section 5.2.15 Environmental Pollution and Hazardous Materials, Substances, and/or Waste Control, subparagraph (a) of the General Conditions is deleted in its entirety and replaced with the following:

“(a) Environmental pollution prevention and hazardous materials, substances, and/or waste control shall consist of the protection of human health and the environment from pollution or the release of contaminants during and as a result of construction operations under the contract. The control of environmental pollution and hazardous materials, substances, and/or waste requires the consideration of air, water and land from pollutants, including but not limited to, solid and hazardous waste management, noise, dust, as well as other pollutants. It is the responsibility of the Contractor to investigate and comply with all applicable laws, including but not limited to those relating to control, remediation, and abatement. Unless otherwise advised in writing by the City, the requirements in this section shall be considered necessary to and part of the Contractor's performance of the contract.

However, any subsurface hazardous materials or subsurface environmental hazards discovered at the site differing materially from those indicated in this contract may be considered for price adjustments and/or time for performance for any remediation and abatement.”

F. Section 5.2.26 Final Inspection, subparagraph (e) of the General Conditions, is deleted in its entirety and replaced with the following:

“(e) The Officer-in-Charge shall then make a determination as to whether or not the project is ready for inspection. If the Officer-in-Charge is not satisfied, the Contractor shall be notified in writing of the items that require completion prior to inspection. The Officer-in-Charge shall determine the length of time (remedial time) for the Contractor to correct and address the deficiencies. After the Contractor complies with the instructions of the Officer-in-Charge, the Contractor shall again submit, in writing, a request for inspection.”

G. Section 5.2.26 Final Inspection, subparagraph (h) of the

General Conditions, is deleted in its entirety and replaced with the following:

“(h) The Contractor shall, within seven (7) calendar days after receipt of the punch list, or as determined by the Officer-in-Charge, proceed to complete the items on the punch list. Upon completion, the Contractor shall submit a written request for final inspection, after which, if the Officer-in-Charge finds that all discrepancies are satisfactorily corrected, the Officer-in-Charge shall accept the project as completed, hereinafter referred to as “final acceptance.””

H. Section 5.2.28 As-Built Drawings of the General Conditions, is deleted and substituted with Section SP 181 As-Built Drawings.

I. Notwithstanding Section 5.3.6 of the General Conditions, relating to variations in estimated quantities for unit price bid items, add the following:

"Payment shall be made for the actual quantities of units incorporated into the contract multiplied by the unit prices of the contract items. The actual quantity of any item may vary from the estimated quantity in the Offer."

J. Delete Section 5.4.6 Payment for Delivered Materials or Equipment in its entirety.

K. Delete Section 5.4.7 Final Payment, Section (a)(1) and Section (a)(2) in its entirety.

L. Delete Exhibit L Report of Equipment Purchased with Construction Contracts in its entirety.

M. All other provisions of the General Conditions are unmodified and shall remain in full force and effect."

END OF SECTION SP 2

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 3 – STANDARD SPECIFICATIONS

The "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1986", of the Departments of Public Works, County of Kauai, City and County of Honolulu, County of Maui, and County of Hawaii, of the State of Hawaii, is by reference incorporated herein and made a part of these specifications. The term "Standard Specifications" used hereinafter refers to this "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1986". Copies of the Standard Specifications may be obtained online at https://www.honolulu.gov/rep/site/dpp/rules/standard-specifications-counties-state-hawaii.pdf.

The work embraced herein shall be done in accordance with the Standard Specifications, insofar as they may apply and in accordance with the following Special Provisions. These Special Provisions supplement and modify the General Instructions, General Conditions, and Standard Specifications."

END OF SECTION SP 3

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 4 – STANDARD DETAILS

The "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984", as amended, of the Departments of Public Works, County of Kauai, City and County of Honolulu, County of Maui, and County of Hawaii, of the State of Hawaii, is by reference incorporated herein and made a part hereof. The term "Standard Details" used hereinafter refers to this "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984". Copies of the Standard Details may be obtained online at https://www.honolulu.gov/rep/site/dpp/rules/standard-details-public-works-construction-2000.pdf.

The work embraced herein shall be done in accordance with the Standard Details, insofar as they may apply."

END OF SECTION SP 4

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 5 – CONTRACTOR/SUBCONTRACTOR LICENSE REQUIREMENTS

Implementation of the Hawaii Supreme Courts January 28, 2002 Decision in the Okada Trucking Case. "A" general engineering contractors and "B" general building contractors are reminded that due to the Hawaii Supreme Court's January 28, 2002 decision in Okada Trucking Co., Ltd. v. Board of Water Supply, et al., 97 Haw. 450 (2002), they are prohibited from undertaking any work, solely or as part of a larger project, which would require the general contractor to act as a specialty contractor in any area where the general contractor has no license. Although the "A" and "B" contractor may still bid on and act as the "prime" contractor on an "A" or "B" project *(See, HRS § 444-7 for the definitions of an "A" and "B" project.)*, respectively, the "A" and "B" contractor may only perform work in the areas in which they have the appropriate contractor's license *(An "A" or "B" contractor obtains "C" specialty contractor's licenses either on its own, or automatically under HAR § 16-77-32.)*. The remaining work must be performed by appropriately licensed entities. It is the sole responsibility of the contractor to review the requirements of this project and determine the appropriate licenses that are required to complete the project.

To be eligible to bid, offerors must possess a valid State of Hawaii General Engineering Contractor's "A" license at the time of bid opening."

END OF SECTION SP 5

SECTION SP 12 – ROADWAY EXCAVATION

Make the following amendments to said Sections:

(I) Add the below to the end of Section 12.1 DESCRIPTION:

"Unless otherwise specified herein, all work shall conform to Section 12 (Roadway Excavation) of the Standard Specification."

(II) Add the below to the end of Section 12.4 CONSTRUCTION DETAILS:

"G. Subgrade. Construct transitions/tapers at drop-offs in accordance with Section SP 151.2 PERFORMANCE OF WORK.

If shrinkage cracks appear in the subgrade, the subgrade should be scarified and thoroughly moisture conditioned (between optimum moisture content and 3% wet of optimum moisture content) and recompacted.

If local wet area is encountered in silt or sandy subgrade due to seepage water, the subgrade should be scarified and thoroughly mixed with cement (one (1) bag of cement for 5'x10' area 6" deep) and recompacted.

If any soft areas that exhibit pumping or rutting are encountered, the base/subgrade shall be overexcavated and replaced with 8 inches aggregate base course (or as directed by the Officer-in-Charge), geogrid, and woven geotextile. Refer to the detail called "Soft Subgrade Replacement with Aggregate Base Course".

During construction, the Contractor shall not overstress the subgrade. Heavy trucks or equipment are not allowed to travel on the unprotected subgrade.

Should any soft areas be encountered, the Contractor shall plan their work accordingly in order to open the road up for traffic at the end of the work day. No additional compensation shall be considered for redoing any pavement areas in order to open up the road at the end of the day.

All excess excavated material shall become the property of the Contractor and hauled from the jobsite. All material not used on the project may be reused, recycled, or disposed of in compliance with all Federal, State, and City, and OSHA requirements and regulations. Hauling of wet, dripping material over public streets shall not be permitted."

(III) Delete Sections 12.5 MEASUREMENT and 12.6 PAYMENT in their entirety and replace with the following:

"SP 12.5 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure the accepted roadway excavation for payment. The Officer-in-Charge will not pay for the accepted roadway excavation separately and will consider the cost for roadway excavation as included in the contract price for each respective street lump sum contract bid item as specified in the Offer schedule and in accordance with SP 151 DESCRIPTION OF WORK.

The Officer-in-Charge will pay for any additional roadway excavation for soft area replacement on a force account basis as an Additional Work Item "Additional Roadway Excavation for Reconstruction of Pavement Areas". Additional roadway excavation is the bottom of the ACP or ACB to the revised bottom of excavation. Payment shall be full compensation for the work directed by the Officer-in-Charge and shall be deducted from the force account set in the Offer. The unused portion of the force account item shall remain with the City upon completion of the contract.

If the wet subgrade is scarified and thoroughly mixed with cement and recompacted, the Officer-in-Charge will pay for the accepted subgrade mixed with cement on a force account basis as an Additional Work Item "Subgrade Treatment with Cement". Payment shall be full compensation for the work directed by the Officer-in-Charge and shall be deducted from the force account set in the Offer. The unused portion of the force account item shall remain with the City upon completion of the contract."

END OF SECTION SP 12

SECTION SP 31 – AGGREGATE BASE COURSE

Make the following amendments to said Section:

(I) Delete Section 31.1 DESCRIPTION in its entirety and replace with the following:

"SP 31.1 DESCRIPTION

This work shall consist of furnishing, spreading and compacting untreated aggregate base course on the prepared subbase or subgrade, or on existing improved surfaces and including installation of woven geotextile (Section SP 101) and geogrid (Section SP 100) in conformity with these specifications."

(II) Delete Section 31.3 DETAILS, subparagraph B. in its entirety and replace with the following:

"B. Placing and Compacting Aggregate Base. The base material shall be delivered to the site and spread on the approved prepared foundation by means of vehicles equipped with spreading devices. The material when spread shall be uniform in gradation and free from large pockets of segregated particles. Segregated material shall be remixed until uniform.

Material shall not be stockpiled nor dumped in piles on the road but shall be spread longitudinally and only in such quantity to obtain the required thickness. After watering and compacting, the completed base shall conform to the required grade and cross section within the tolerances specified herein below.

When the specified thickness of the base is 8 inches, the base can be constructed in one (1) lift. When the specified thickness is greater than 8 inches, the base shall be constructed in two (2) or more equal lifts.

The base course shall be compacted until it does not creep or weave in front of the roller or compacting vehicle. When tested, the base course shall have a field California Bearing Ratio (CBR) value of at least 85% or be compacted to attain at least 95% of maximum density.

Wherever necessary, filler material shall be added to the surface. It shall be spread in one (1) or more uniform thin layers. Each layer shall be rolled dry until additional filler cannot be forced into the voids. The surface shall then be sprinkled with water and again thoroughly rolled. All excess filler shall be removed. The sprinkling and rolling shall be continued to secure a thoroughly bonded surface.

Where the aggregate base course is constructed in more than one (1) layer, each layer shall be constructed as specified above except that sprinkling shall be required only in the top layer. Each layer shall be compacted to a field CBR value of not less than 85% or be compacted to attain at least 95% of maximum density."

(III) Delete Section 31.4 MEASUREMENT AND PAYMENT in its entirety and replace with the following:

"SP 31.4 MEASUREMENT AND PAYMENT

The Officer-in-Charge will pay for the accepted aggregate base course on a force account basis as an Additional Work Item “Additional Aggregate Base Course”. Payment shall be full compensation for the work directed by the Officer-in-Charge and shall be deducted from the force account set in the Offer. The unused portion of the force account item shall remain with the City upon completion of the contract.”

END OF SECTION SP 31

Delete Section 32 TREATED BASES in its entirety and replace with the following:

"SECTION SP 32 – TREATED BASES

SP 32.1 GENERAL

This section is for furnishing and placing one (1) or more courses of plant mixed asphalt treated concrete base or recycled plant mix asphalt treated concrete base (ACB) on a prepared subbase and subgrade in accordance with the requirements of these specifications.

SP 32.2 MATERIALS

Plant Mix Asphalt Treated Concrete Base and Recycled Plant Mix Asphalt Treated Concrete Base shall conform to the following:

A. The asphalt cement grade shall be PG 64-16. Performance-graded asphalt binder shall conform to AASHTO M 320.

B. Aggregate shall conform to the requirements of Section 34.2B of the Standard Specifications. Aggregate for ACB shall be crushed and screened basalt free of soft or disintegrated pieces, clay, dirt, and other deleterious substances.

Submit Quality Control Plan (QCP) with detailed process control procedures and type and frequency of sampling and testing. For aggregate used in ACB, minimum frequency of sieve analysis and sand equivalent testing shall be once a day. Provide the Officer-in-Charge access to project-related plant production records and when requested, informational copies of sampling and testing reports.

Coarse aggregate is defined as material retained on No. 4 sieve, and fine aggregate is defined as material passing No. 4 sieve. At least 90 percent, by weight, of material retained on No. 4 sieve shall consist of crushed particles. At least 70 percent of material passing No. 4 sieve and retained on No. 8 sieve shall consist of crushed particles. A crushed particle is defined as particle having at least one mechanically fractured face.

The combined aggregate for ACB, including filler, if any, shall conform to Table 32 IA - ACB Test Requirements and Table 32 IB - ACB Base Course Grading Requirements.

TABLE 32 IA - ACB TEST REQUIREMENTS

Test	Test Method	Requirement
Sand Equivalent	AASHTO T 176	45 Percent Minimum
Los Angeles Abrasion	AASHTO T 96	30 Percent Maximum
Stripping	AASHTO T 182	Above 95 Percent
K-factor	ASTM D 5148	Kc-2.0 Maximum Km-1.7 Maximum

Flat and elongated pieces (Length to thickness ratio of 3)	ASTM D 4791 (By Weight)	25 Percent Maximum
Grading	AASHTO T 11 AASHTO T 27	Job-mix formula based on Table 703.09-2
Soundness	AASHTO T 104 (5 cycles using sodium sulfate)	9 Percent Maximum
Absorption	AASHTO T 84 AASHTO T 85	5 Percent Maximum

If chemical additive resulting in bituminous film retention greater than 95 percent is used, aggregates not meeting stripping test requirements for HMA pavement may be used.

TABLE 32 IB - ACB BASE COURSE GRADING REQUIREMENTS

Sieve Size	**Percent Passing by Weight**
1-1/4 Inch	100
1 Inch	85 - 100
3/4 Inch	73 – 92
1/2 Inch	60 - 80
3/8 Inch	52 – 72
No. 4	36 - 55
No. 8	25 – 42
No. 16	18 – 33
No. 30	12 - 24
No. 50	7 - 18
No. 100	4 – 12
No. 200	1 – 8

C. Blending Sand and Mineral Filler shall conform to the requirements of Section 34.2C of the Standard Specifications. Filler shall conform to AASHTO M 17.

D. Hydrate Lime. Hydrate lime shall conform to ASTM C 207, Type N.

E. Recycled Asphalt Treated Concrete Base.

The Recycled Asphalt Treated Concrete Base shall be a uniform mixture of crushed reclaimed asphalt concrete pavement (RACP), virgin aggregate, and asphalt cement.

RACP is defined as removed or reprocessed pavement materials containing asphalt and aggregates. Process RACP by crushing until 100 percent of RACP passes 1-1/4-inch sieve. Size, grade uniformly, and combine materials such that blend of RACP and aggregate material conforms to grading requirements of SP

32.2.B.2). For batch plants, aggregate for ACB may include RAP quantities up to 30 percent of total mix weight. For drum dryer-mixer plants, aggregate for ACB may include RAP quantities up to 40 percent of total mix weight. Use 100 percent virgin aggregate only with written acceptance by the Officer-in-Charge. Furnish only one grade of asphalt cement for the project.

Once the job mix is established, the Contractor shall maintain controls to produce a uniform product as established in the job mix.

F. The Contractor shall submit for review the job mix formula for the Asphalt Treated Concrete Base, virgin material and/or crushed RACP) to be supplied. The job mix formula shall indicate the source of the aggregates, grades of bituminous material and proportion of the crushed glass and/or crushed RACP to be used in the mix. All test data used to develop the job mix formula shall also be submitted. The job mix formula for the mixture shall be in effect until modified in writing by the Officer-in-Charge. Should a change in sources of materials be made, a new job mix formula shall be established and submitted for review before the new material is used.

Design job-mix formula in accordance with procedures contained in current edition of Asphalt Institute's *Mix Design Methods for Asphalt Concrete and Other Hot Mix Types*, Manual Series No. 2 (MS-2) for Marshall Method. Design asphalt content shall be between 3.8 percent and 5.7 percent, based on total weight of mix. Meet job-mix formula design criteria specified in Table 32 III – Marshall Method Mix Criteria (AASHTO T 245).

TABLE 32 III - Marshall Method Mix Criteria (AASHTO T 245)

Compaction (number of blows each end of specimen)	75
Stability, minimum (pounds)	1,800
Flow (x 0.01 inch)	8 - 16
Air Voids (percent)1	4 – 6

Note:
1. Air Voids: AASHTO T 166 or AASHTO T 275; AASHTO T 209, AASHTO T 269.

Minimum percent voids in mineral aggregates (VMA) of job-mix formula shall be as specified in Table 32 IV - Minimum Percent Voids in Mineral Aggregates (VMA).

TABLE 32 IV - MINIMUM PERCENT VOIDS IN MINERAL AGGREGATES (VMA)

Nominal Maximum Particle Size, (Inches)	1-1/2	1	¾	1/2	3/8
VMA, (percent)1	11	12	13	14	15

Note: 1. VMA: See Asphalt Institute Manual MS-2, Chapter 4.

The Contractor shall provide bulk samples of the aggregate in the gradation submitted in the mix design and asphalt binder for each mix design submitted in sufficient quantities to make three (3) samples to test by the Marshall Method.

SP 32.3 CONSTRUCTION DETAILS

A. General. The approximate locations of the areas to be reconstructed are shown on the plans. The exact limits of the areas to be reconstructed will be determined in the field by the Officer-in-Charge. Construct ACB course in accordance with applicable specifications.

Construct transitions/tapers at drop-offs in accordance with Section SP 151.2 PERFORMANCE OF WORK.

The excavated areas shall be reconstructed with Plant Mix Asphalt Treated Concrete Base, or Recycled Plant Mix Asphalt Treated Concrete Base to the existing road grade in accordance with the following:

1. Where the required mat thickness is 6 inches or less, the mixture may be spread and compacted in one (1) layer.

2. Where the required mat thickness is more than 6 inches, the mixture shall be spread and compacted in two (2) or more layers of equal thickness, but the maximum compacted thickness shall not exceed 6 inches for any one layer.

Compact the mixture immediately upon completion of spreading operations to a density of more than 92 percent of the maximum theoretical specific gravity according to AASHTO T 209 (ASTM D 2041) modified by deletion of Section 8 supplemental procedure. Tamp places not accessible to the roller with mechanical tampers.

The thickness of the Asphalt Concrete Base Course, or Recycled Asphalt Concrete Base Course, shall be within 1/4 inch of the planed thickness.

A tack coat shall be applied to all layers of Asphalt Treated Concrete Base, or Recycled Asphalt Treated Concrete Base, upon which a subsequent layer of Asphalt Treated Concrete Base, Recycled Asphalt Treated Concrete Base, or asphaltic concrete pavement is to be placed. The tack coat shall conform to the requirements of the Asphalt Surface Treatment section of these special provision.

B. Traffic. All required work on the reconstructed areas shall be completed by the end of the work day so that the entire roadway can be opened to traffic.

C. Material Transfer Vehicle (MTV). When placing ACB, use of a MTV shall not be required.

D. Compaction. Where compacted thickness is greater than 6 inches, spread and compact mixture in two (2) or more lifts approximately equal in thickness. Maximum compacted thickness of one lift shall be 6 inches. Compact mixture immediately upon completion of spreading operations to density of not less than 92.0 percent of maximum theoretical specific gravity in accordance with AASHTO T 209, modified by deletion of Supplemental Procedure for Mixtures Containing Porous Aggregate.

E. ACB Surface and Thickness Tolerances. Place ACB to a thickness that when thoroughly compacted conforms to shape and dimension indicated in the contract documents. Limit surface deviations to not more than 1/2 inch above or below theoretical grade.

The combined thickness of ACB and asphalt concrete pavement shall be within 1/2 inch of combined thickness indicated in the contract documents.

SP 32.4 SAMPLING AND TESTING OF THE BITUMINOUS MIXTURE

A. The Contractor shall provide laboratory testing for quality control functions during periods of mix productions: One (1) field Marshall Test, asphalt content test, gradation analysis, and specific gravity test for each mixture. All data for the quality control testing shall be submitted. Final acceptance shall be based on the City’s laboratory test results.

B. A composite sample of the total pavement section shall be sampled within seventy-two (72) hours of the final lift of asphalt concrete pavement.

C. Tests necessary to determine the conformance with requirements may be performed by the Officer-in-Charge without cost to the Contractor.

SP 32.5 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure Plant Mix Asphalt Treated Concrete Base and Recycled Plant Mix Asphalt Treated Concrete Base for payment. The Officer-in-Charge will not pay for the accepted Plant Mix Asphalt Treated Concrete Base and Recycled Plant Mix Asphalt Treated Concrete Base separately and will consider the cost for Plant Mix Asphalt Treated Concrete Base and

Recycled Plant Mix Asphalt Treated Concrete Base as included in the contract price for each respective street lump sum contract bid item as specified in the Offer schedule and in accordance with SP 151 DESCRIPTION OF WORK.”

END OF SECTION SP 32

SECTION SP 33 – ASPHALT SURFACE TREATMENT

Make the following amendments to said Sections:

(I) Delete Section 33.2 MATERIAL, subparagraph B. Tack Coat in its entirety and replace with the following:

"B. Tack Coat. Tack coat shall be Type SS-1, SS-1h, CSS-1, or CSS-1h, emulsified asphalt. The bituminous material shall meet the requirements under AASHTO M 140."

(II) Tack coat application shall conform to 33.3 DETAILS, except as modified by the following paragraphs added to the end of Section 33.3 DETAILS, subparagraph B:

"Immediately before applying the tack coat, the surface to be treated shall be swept clean of all loose material, dirt, excess dust or other objectionable material. The tack coat shall not be applied when the street to be treated is appreciably damp or when weather conditions are unsuitable.

Immediately after a street has been resurfaced, the gutter area shall be hand-swept clean of all loose material.

Dilute the emulsified asphalt with water at a rate of one (1) part emulsion to one (1) part of water by volume. Submit the quantity, rate of application, temperature, and areas to be treated for acceptance before applying the tack coat.

The time between the placement of the tack coat and the subsequent paving shall not exceed four (4) hours. In multiple lift construction, the Officer-in-Charge may waive the application of the tack coat provided the placement of the upper lift and lower lift are performed within a twelve (12)-hour period. During curing of tack coat or placement between lifts, vehicle tracking shall not be permitted.

The Officer-in-Charge shall keep traffic except construction equipment directly connected with paving operations off the tack coat. Protect the tack coat from damage until after placing the surface course."

(III) Delete Section 33.4 MEASUREMENT AND PAYMENT in its entirety and replace with the following:

"33.4 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure asphalt surface treatment for payment. The Officer-in-Charge will not pay for the accepted asphalt surface treatment separately and will consider the cost for asphalt surface treatment as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents."

END OF SECTION SP 33

Delete Section 34 ASPHALT CONCRETE PAVEMENT in its entirety and replace with the following:

"SECTION SP 34 - HOT MIX ASPHALT (HMA) CONCRETE PAVEMENT (CITY MIX #4)

SP 34.1 DESCRIPTION

This section describes furnishing and placing HMA pavement on a prepared surface.

SP 34.2 MATERIALS

A. General. HMA pavement shall be plant mixed and shall include mixture of aggregate and asphalt cement, and may include reclaimed asphalt pavement (RAP) or filler, or both.

HMA pavement shall include surface course and may include one or more binder courses, depending on HMA pavement thickness indicated in the contract documents.

RAP is defined as removed or reprocessed pavement materials containing asphalt and aggregates. Process RAP by crushing until 100 percent of RAP passes 1/2-inch sieve. Size, grade uniformly, and combine materials such that blend of RAP and aggregate material conforms to grading requirements of Table 1-34 Asphalt Concrete Composition and Gradation.

In surface and binder courses, aggregate for HMA may include RAP quantities up to 20 percent of total mix weight.

Once established, the proportion of virgin aggregate to crushed RACP shall not be changed. The Contractor shall submit for review any changes to the proportion.

B. Asphalt Cement. The asphalt binder grade shall be PG 64-16. Performance-graded asphalt binder shall conform to AASHTO M 320.

C. Emulsified Asphalt. Anionic emulsified asphalt shall conform to AASHTO M 140, except penetration on residue for Type SS-1 and Type RS-1 shall be 50-120.

Cationic emulsified asphalt shall conform to AASHTO M 208, except penetration on residue for Type CSS-1 and Type CRS-1 shall be 50-150.

D. Aggregate for Hot Mix Asphalt Pavement. Aggregate for HMA pavement shall be crushed and screened basalt free of soft or disintegrated pieces, clay, dirt, and other deleterious substances.

Submit Quality Control Plan (QCP) with detailed process control procedures and type and frequency of sampling and testing. For aggregate used in HMA pavement, minimum frequency of sieve analysis and sand equivalent testing shall be once a day. Provide the Officer-in-Charge access to project-related plant production

records and when requested, informational copies of sampling and testing reports.

Coarse aggregate is defined as material retained on No.4 sieve, and fine aggregate is defined as material passing No. 4 sieve.

At least 90 percent, by weight, of material retained on No. 4 sieve shall consist of crushed particles. At least 70 percent of material passing No. 4 sieve and retained on No. 8 sieve shall consist of crushed particles. A crushed particle is defined as particle having at least one (1) mechanically fractured face.

The combined aggregate for HMA pavement, including filler, if any, shall conform to the tables below

Test	Test Method	Requirement
Sand Equivalent	AASHTO T 176	50% Minimum
Los Angeles Abrasion	AASHTO T 96	30% Maximum
Stripping	AASHTO T 182	Above 95%
K-factor	ASTM D 5148	Kc-2.0 Maximum Km-1.7 Maximum
Flat and elongated pieces (Length to width or width to thickness ratio of 3)	ASTM D 4791 (By Weight)	25% Maximum
Grading	AASHTO T 27	Job-mix formula based on Table 1-34
Soundness	AASHTO T 104 (5 cycle using sodium sulfate)	9% Maximum
Absorption	AASHTO T84 & T85	5% Maximum

If chemical additive resulting in bituminous film retention greater than 95 percent is used, aggregates not meeting stripping test requirement for HMA pavement may be used.

TABLE 1-34 ASPHALT CONCRETE COMPOSITION AND GRADATIONS
Percentage Passing by Weight

Sieve Size	Mix #2 (Coarse)	Mix #3 (Medium)	Mix #4 (Fine)	Mix #5 (Extra Fine)
1-1/4″	100			
1″	85-100	100		
3/4"	---	90-100		
1/2"	60-80	70-90	100	
3/8″	---	---	80-100	100
#4	36-50	40-57	55-75	70-90
#8	26-36	30-46	35-52	45-65
#30	16-25	18-31	13-25	22-38
#100	7-14	8-20	6-15	12-21
#200	1-8	4-10	4-10	6-12
Asphalt Binder (%)	4.5-6.5	4.5-7.0	5.5-7.5	6.0-8.0

E. Filler. A nominal quantity of blending sand and mineral fill shall be permitted with the Officer-in-Charge's approval to obtain the required gradation of the mineral aggregate. The quantity of blending sand and mineral filler used shall not exceed 5% of the total weight of the aggregate.

Natural sand shall be hard-grain, clean and free from loam, clay, organic matter or other deleterious substances. Mineral filler shall consist of thoroughly dry limestone dust or bluish-gray lava rock dust and shall be free of lumps or loosely bonded aggregations. The percentage composition by weight when tested under AASHTO M 29, shall meet the following requirements.

Percentage Passing by Weight

Sieve Size	Blending Sand	Mineral Filler
# 30	90-100	100
#100	5-50	Not less than 85
#200	0-10	Not less than 65

F. Hydrate Lime. Hydrate lime shall conform to ASTM C 207, Type N.

G. Gradation and Composition Requirement. The aggregate gradations for the various mixes of asphalt concrete are shown on Table 1-34. The grading limits specified are grading limits shall be made to compensate for any variations in specific gravity of the individual sizes.

The amount of asphalt binder used in particular mix shall be within the percentage range shown in Table 1-34 based on total weight of the mixture.

H. Job-Mix Formula and Tests. Design job-mix formula in accordance with procedures contained in current edition of Asphalt Institute's Mix Design Methods for Asphalt Concrete and Other Hot Mix Types, Manual Series No. 2 (MS-2) for Marshall Method of Mix Design.

The Contractor shall submit for review, the job mix formula for the Asphalt Concrete to be supplied for the project. The job mix formula shall indicate the source of aggregates, grades of bituminous material and proportion of the RACP to be used in the mix. The total amount of bituminous binder in the mix shall be between 4.5% to 8.0% by weight depending on the specified Asphalt Concrete Mix. All test data used to develop the job mix formula shall also be submitted. The job mix formula for the mixture shall be in effect until modified in writing. Should a change in sources of materials be made, a new job mix formula shall be established and submitted for review before the new material is used.

The bituminous mixtures shall be designed using procedures contained in Chapter III, Marshall Method of Mix Design, of the Asphalt Institute's manual Series No. 2 (MS-2), current edition, and shall meet the requirements of Table I below:

TABLE I
REQUIREMENTS FOR MARSHALL METHOD OF MIX DESIGN

Test Property	Mix #2	Mix #3	Mix #4	Mix #5*
Number of Blows	75	75	75	75
Stability, lb. (minimum number)	1,800	1,800	1,800	1,800
Flow, 0.01 in.	8 - 16	8 - 16	8 - 16	8 - 16
Percent air voids	3 - 5	3 - 5	3 - 5	3 – 5
Percent air voids in mineral aggregate (min.)	13	14	15	18

*NOTE: No RACP shall be used as partial substitute for the gravel in the Mix #5.

Establish and submit job-mix formula for each type of HMA pavement mix indicated in the contract documents as follows:

(1) Design percent of aggregate passing each required sieve size.
(2) Design asphalt content added to aggregate, based on total weight of mix.
(3) Design proportion of processed RAP.
(4) Design temperature of mixture at point of discharge at paver.
(5) Source of aggregate.
(6) Grade of asphalt cement.
(7) Test data used to develop job-mix formula.

With the exception of item (4) from the list above, if design requirements are modified after the Officer-in-Charge reviews job-mix formula, submit new job-mix formula before using HMA produced from modified mix design.

Submit a certificate of compliance for asphalt cement, accompanied by substantiating test data.

Provide HMA within allowable tolerances of reviewed job-mix formula as specified in the following ranges of tolerances:

Sieve Size	Tolerance
Passing No.4 and larger sieves	+/- 7%
Passing No.8 to No.100 sieves (inclusive)	+/- 4%
Passing No.200 sieve	+/- 2%
Asphalt Binder	+/- 0.4%
Mixture Temperature	+/- 20 deg F

The Contractor shall provide bulk samples of the aggregate in the gradation submitted in the mix design and asphalt binder for each mix design submitted in sufficient quantities to make three (3) samples to test by the Marshall Method.

SP 34.3 DETAILS

A. Equipment.

(1) Mixing Plant. Use mixing plants that conform to AASHTO M 156, supplemented as follows:

(a) All Plants.

1. Automated Controls. Control proportioning, mixing, and mix discharging automatically. When RAP is incorporated into mixture, provide positive controls for proportioning processed RAP.

2. Dust Collector. AASHTO M156, Requirements for All Plants, Emission Controls is amended as follows:

"Equip plant with dust collector. Dispose of collected material. In the case of baghouse dust collectors, dispose of collected material or return collected material uniformly."

3. Modifications for Processing RAP. When RAP is incorporated into mixture, modify mixing plant in accordance with plant manufacturer's recommendations to process RAP.

(b) Drum Dryer-Mixer Plants.

1. Bins. Provide separate bin in cold aggregate feeder for each individual aggregate stockpile in mix. Use bins of sufficient size to keep plant in continuous operation and of proper design to prevent overflow of material from one (1) bin to another.

2. Stockpiling Procedures. Separate aggregate into at least three (3) stockpiles with different gradations as follows: coarse, intermediate, and fine. Separate aggregates for Mix #4 into at least two (2) stockpiles. Stockpile RAP separately from virgin aggregates.

(c) Batch and Continuous Mix Plants.

1. Hot Aggregate Bin. Provide bin with three (3) or more separate compartments for storage of screened aggregate fractions to be combined for mix. Make partitions between compartments tight and of sufficient height to prevent spillage of aggregate from one compartment into another.

2. Load Cells. Calibrated load cells may be used in batch plants instead of scales.

(2) Hauling Equipment. Use trucks that have tight, clean, smooth metal beds for hauling HMA.

Thinly coat truck beds with minimum quantity of non-stripping release agent to prevent mixture from adhering to beds. The use of diesel or petroleum-based liquid release agents, except for paraffin oil, shall not be allowed.

Equip each truck with tarpaulin conforming to the following:

(a) In good condition, without tears and holes.

(b) Large enough to be stretched tightly over truck bed, completely covering mix.

(3) Asphalt Pavers. Use asphalt pavers that are:

(a) Self-contained, power-propelled units.

(b) Equipped with activated screed or strike-off assembly, heated if necessary.

(c) Capable of spreading and finishing courses of HMA mixtures in lane widths applicable to typical section and thicknesses indicated in the contract documents.

(d) Equipped with receiving hopper having sufficient capacity for uniform spreading operation.

(e) Equipped with automatic feed controls to maintain uniform depth of material ahead of screed.

(f) Equipped with automatic screed controls with sensors capable of sensing grade from outside reference line, sensing transverse slope of screed, and providing automatic signals to control screed grade and transverse slope.

(g) Capable of operating at constant forward speeds consistent with satisfactory laying of mixture.

(h) Equipped with a mean of preventing the segregation of the coarse aggregate particles from the remainder of the bituminous plant mix when that mix is carried from the paver hopper back to the paver augers. The means and methods used shall be approved by the paver manufacturer and may consist of chain curtains, deflector plates, or other such devices and any combination of these.

The following specific requirements shall apply to the identified bituminous pavers or approved substitutes:

1. Blaw-Knox bituminous pavers shall be equipped with the Blaw-Knox Materials Management Kit (MMK).

2. Cedarapids bituminous pavers shall be those that were manufactured in 1989 or later.

3. Barber-Green/Caterpillar bituminous pavers shall be equipped with deflector plates as identified in the December 2000 Service Magazine entitled “New Asphalt Deflector Kit {6630, 6631, 6640}”.

Prior to the start of using the paver for placing plant mix, the Contractor shall submit for review a full description in writing of the means and methodologies that will be used to prevent bituminous paver segregation. Use of the paver shall not commence prior to receiving review comments from the Officer-in-Charge.

The Contractor shall supply a Certificate of Compliance that verifies that the approved means and methods used to prevent bituminous paver segregation have been implemented on all pavers used on the project and is working in accordance with the manufacturer's requirements.

(4) Rollers. Rollers shall be self-propelled, steel-tired tandem, pneumatic-tired, or vibratory-type rollers capable of reversing without shoving or tearing HMA mixture. Unless otherwise indicated in the contract documents, provide sufficient number, sequencing, type, and weight of rollers to compact mixture to required density while mixture is still in workable condition. Do not use equipment that will excessively crush aggregate. Operate rollers in accordance with manufacturer's recommendations.

(a) Steel-Tired Tandem Rollers. Steel-tired tandem rollers used for initial breakdown or intermediate roller passes shall have minimum gross weight of 12 tons and shall provide minimum 250-pound weight per linear inch of width on drive wheel.

Steel-tired tandem rollers used for finish roller passes shall have minimum gross weight of 3 tons.

Do not use roller with grooved or pitted rolling drum. Replace excessively worn scrapers and wetting pads.

(b) Pneumatic Tired Rollers. Pneumatic-tired rollers shall be oscillating-type, equipped with smooth-tread pneumatic tires of equal size and diameter. Maintain tire pressure within 5 pounds per square inch of designated operational pressure when hot. Space tires so that gaps between adjacent tires are covered by following set of tires.

Equip pneumatic-tired rollers used for breakdown or intermediate roller passes, with ballast capable of establishing an operating weight per tire of not less than 3,000 pounds. Equip rollers with tires having minimum 20-inch wheel diameter. Inflate tires to 70 to 75 pounds per square inch pressure when cold and 90 pounds per square inch when hot. Equip rollers with skirt-type devices to maintain temperature of tires during rolling operations.

Equip pneumatic-tired rollers used for kneading finished asphalt surfaces, with ballast capable of establishing an operating weight per tire of not less than 1,500 pounds. Equip rollers with tires having minimum 15-inch wheel diameter. Inflate tires to 50 to 60 pounds per square inch pressure.

(c) Vibratory Rollers. Vibratory rollers shall be steel-tired tandem rollers having minimum weight of 3 tons. Equip vibratory rollers with amplitude and frequency controls and speedometer. Operate vibratory roller in accordance with manufacturer's recommendations.

(5) Hand Tools, Keep hand tools used in production, hauling, and placement of HMA clean and free of contaminants. Liquids such as diesel or mineral spirits may be used to clean hand tools. Do not contaminate HMA with cleaning liquids. Clean hand tools over catch pan with capacity to hold all the cleaning liquid. Dry hand tools before using with HMA.

(6) Material Transfer Vehicle (MTV).

(a) Usage. Unless otherwise indicated in the contract documents, MTV usage applies to surface courses of paving projects. When placing HMA surface course, use MTV to independently deliver mixtures from hauling equipment to paving equipment. MTV usage shall not be required for the following:

1. Projects with less than 1,000 tons of HMA.

2. Temporary pavements.

3. Bridge deck approaches & Bridges.

4. Shoulders.

5. Tapers.

6. Turning lanes.

7. Driveways.

8. Areas with low overhead clearances.

9. Areas where unable to provide one open lane for traffic.

(b) Equipment. When using MTV, install minimum 10-ton-capacity hopper insert in conventional paver hopper. Provide the following equipment:

1. High-capacity truck unloading system in MTV capable of receiving HMA from hauling equipment.

2. MTV storage bin with minimum 15-ton capacity.

3. Auger mixing system in MTV storage bin, paver hopper insert, or paver hopper to continuously mix HMA prior to discharging to conveyor system.

Coordinate plant production rate, number of haul units, and MTV and paver speeds to avoid stop-and-go operations and to provide continuous, uniform, segregation-free material flow.

(c) Performance Evaluation. The Contractor shall evaluate performance of MTV and mixing equipment by measuring mat temperature profile immediately behind paver screed on first day of paving.

Six (6) temperature profile measurements shall be taken of mat surface using non-contact thermometers at 50-foot intervals behind paver. Each temperature profile shall consist of three (3) surface temperature measurements taken transversely across mat in approximately a straight line from screed while paver is operating. For each profile, temperatures shall be measured approximately 1 foot from each edge and in middle of mat; and difference between maximum and minimum temperature measurements within each temperature profile shall not exceed 10 degrees F. If any two (2) or more temperature profiles exceed allowable 10-degree F temperature differential, halt paving operation and adjust MTV or mixing equipment to ensure that material placed by paver meets specified temperature requirements.

Once adjustments are made, the Contractor shall repeat measurement procedure to verify that material placed by paver meets specified temperature requirements. Terminate paving if temperature profile requirements are not met during repeated measurement procedure.

If equipment fails to meet requirements after measurement procedure is repeated once, equipment replacement shall be required before the Officer-in-Charge conducts any further temperature profile measurements.

The Contractor may perform additional surface temperature profile measurements at any time during project. If two (2) consecutive temperature profiles

fail to comply with specified allowable temperature differential, halt paving operation and adjust MTV or mixing equipment to ensure that HMA placed by paver complies with temperature requirements. The Contractor shall submit a report of all the measurements & adjustments made.

(d) Transport.

1. Trailered MTV. Transport MTV by means of truck-tractor/trailer combination in accordance with Chapter 104 of Title 19, Department of Transportation, entitled "The Movement by Permit of Oversize and Overweight Vehicles on State Highways".

2. Crossing Bridges for Self-Powered MTV. When self-powered MTV exceeds legal axle or total weight limits for vehicles under the HRS, Chapter 291, conform to the following when crossing bridges within project limits unless otherwise indicated in the contract documents:

a. Completely remove mix from MTV.

b. Move MTV at relatively constant speed not exceeding 5 miles per hour. MTV shall not be allowed to stop on bridge.

c. No other vehicle or equipment shall be allowed on bridge.

B. Mixing. Uniformly heat asphalt cement and provide continuous supply of heated asphalt cement from storage to mixer. Do not heat asphalt cement above 350 degrees F. The heat must be applied so that there is no burning of any portion of the asphalt concrete. Live steam shall not be injected into the asphalt.

Preparation of Aggregate. Dry and heat aggregate material at temperature sufficient to produce design temperature of job-mix formula. Do not exceed 350 degrees F. Adjust heat source used for drying and heating to avoid damage to and contamination of aggregate. When dry, aggregate shall not contain more than 1 percent moisture by weight. For batch plants, screen aggregates immediately after heating, and drying into three (3) or more fractions. Convey aggregates into separate compartments ready for batching and mixing with asphalt cement.

After heating to the required temperature, the required amount of asphalt cement shall be added to the heated aggregate in a mixer and the mixing commenced. The minimum mixing period shall be thirty (30) seconds. Measure aggregate and asphalt; or aggregate, RAP,and asphalt into mixer in accordance with job-mix formula. Mix until components are completely mixed and adequately coated with asphalt in accordance with AASHTO M

156. Percent of coated particles shall be 95 percent when tested in accordance with AASHTO T 195. Any mixture which shows an excess of deficiency of asphalt, or any uneven distribution of cement due to insufficient mixing, shall be wasted.

C. Preparing of Surface. All surfaces on or against which asphalt concrete wearing surface course is to be placed shall first be given a tack coat as specified under Asphalt Surface Treatment, except clean surfaces of any course of asphaltic materials laid within the preceding twenty-four (24) hours.

The Contractor shall prepare the existing surface by power brooming to remove all loose particles, dust, sand, and other foreign materials.

Where indicated in the contract documents, bring irregular surfaces to uniform grade and cross section by furnishing and placing one (1) or more leveling courses of HMA Mix #4. Spread leveling course in variable thicknesses to eliminate irregularities in existing surface. Place leveling course such that maximum depth of each course, when thoroughly compacted, does not exceed 2-1/2 inches.

D. Spreading and Finishing. If required by the Officer-in-Charge, a leveling course mixture shall be spread to level irregularities, dips, depressions, sags, and to provide a smooth base of uniform grade and cross section. The leveling course shall not be placed more than one (1) day in advance of placing the surface course.

Prior to each day's paving operation, check screed or strike-off assembly surface with straight edge to ensure straight alignment. Provide screed or strike-off assembly that produces finished surface without tearing, shoving, and gouging HMA.

If the paving machine leaves ridges, indentations, or other marks in the surface that cannot be eliminated by rolling or prevented by adjustment in operation, its use shall be discontinued and another equipment, acceptable to the Officer-in-Charge, shall be furnished by the Contractor.

If more than one (1) course is to be constructed in any area, not more than twenty-four (24) hours shall elapse between the spreading and finishing of any two (2) successive courses in that area. No wearing surface mixture shall be spread during unsuitable weather or when the base is wet.

When a new asphalt lift abuts an existing or previous asphalt lift, the joint shall be trimmed to a neat vertical plane, swept clean of debris and tack coat applied to the vertical face prior to placement of the abutting lift.

When asphalt concrete wearing surface is to abut a concrete gutter, the wearing surface shall be laid so that its surface, after compaction, shall approximately be slightly higher than

the surface of the concrete gutter. At curb ramp locations, the top of asphalt concrete wearing surface shall be flush with the top of concrete gutters.

Maintain HMA at minimum 250 degrees F temperature at discharge to paver. Measure temperature of mix in hauling vehicle just before depositing into spreader.

Deposit HMA in a manner that minimizes segregation. Raise truck beds with tailgates closed before discharging HMA.

Lay, spread, and strike off HMA upon prepared surface. Use asphalt pavers to distribute mixture.

Control horizontal alignment using automatic grade and slope controls from reference line, ski and slope control device, or dual skis.

Obtain sensor grade reference from 30-foot ski for first pass. For subsequent passes, substitution of one (1) ski with joint-matching shoe riding on finished adjacent pavement is acceptable. Use of a comparable non-contact mobile reference system and joint matching shoe is acceptable.

Avoid stop-and-go operation. Minimize changing forward speed of paver during paving operation.

In areas where irregularities or unavoidable obstacles make use of mechanical spreading and finishing equipment impracticable, spread, rake, and lute mixture by hand tools. For such areas, deposit, spread, and screed mixture to required compacted thickness.

Demonstrate competence of personnel operating grade and crown control device before placing surface courses. If automatic control system becomes inoperative during the day's work, the Officer-in-Charge will permit the Contractor to finish day's work using manual controls. Do not resume work until automatic control system is made operative. The Officer-in-Charge may waive requirement for electronic screed control device when paving gores, shoulders, transitions, and miscellaneous reconstruction areas.

When production of HMA can be maintained and when practicable, use pavers in echelon to place surface course in adjacent lanes.

The maximum depth of asphalt concrete which may be spread and rolled in any one (1) course or lift shall not exceed a compacted thickness of 2-1/2 inches as directed by the Officer-in-Charge. Longitudinal joints in any two (2) successive lifts or courses shall be offset a minimum of 6 inches so that one (1) joint shall not be directly over the other.

Construct temporary transitions or tapers at vertical grade differentials in accordance with Section SP 151.2 PERFORMANCE OF WORK.

E. Compacting. Immediately after spreading and striking off HMA and adjusting surface irregularities, uniformly compact mixture by rolling.

Initiate compaction at highest mix temperature allowing compaction without excessive horizontal movement. Temperature shall not be less than 220 degrees F.

Finish rolling using tandem roller while HMA temperature is at or above 175 degrees F.

On superelevated curves, begin rolling at lower edge and progress to higher edge by overlapping of longitudinal rolling parallel to centerline.

If necessary, repair damage immediately using rakes and fresh mix. Do not displace line and grade of HMA edges during rolling.

Asphalt cement sticking to roller wheels tear and damage the asphalt surface; water or diluted mixtures with small amounts of detergent, or other approved release agents shall be applied to the roller wheel surface and/or transverse bar in minimal quantities to prevent the occurrence. Excessive liquid, diesel fuel or other petroleum based products are not allowed under any circumstances.

Along forms, curbs, headers, walls and other places not accessible to rollers, compact mixture with hot hand tampers, smoothing irons, or mechanical tampers. On depressed areas, trench roller or cleated compression strips under roller may be used to transmit compression.

Remove pavement that is loose, broken, or contaminated, or combination thereof; pavement that shows an excess or deficiency in asphalt cement content; and pavement that is defective in any way. Replace with fresh HMA pavement of same type, and compact. Remove and replace defective pavement and compact at no increase in contract price or contract time.

Operate rollers at slow but uniform speed with drive wheels nearest paver. Continue rolling to attain specified density and until roller marks are eliminated.

(1) HMA Pavement Courses 1-1/2 Inches Thick Or Greater. Where HMA pavement compacted thickness indicated in the contract documents is 1-1/2 inches or greater, compact to not less than 92.0 percent nor greater than 97.0 percent of the maximum specific gravity determined in accordance with AASHTO T 209, modified by deletion of Supplemental Procedure for Mixtures Containing Porous Aggregate. The Contractor shall provide daily reports and data indicating compliance at no additional cost to the City.

Place HMA pavement in individual lifts that are within minimum and maximum allowable compacted thickness for various

types of mixture.

(2) HMA Pavement Courses Less Than 1-1/2 Inches Thick. Where HMA pavement compacted thickness indicated in the contract documents is less than 1-1/2 inches, compaction to a specified density shall not be required.

Initiate rolling using non-vibratory, steel-tired, tandem roller. Roll entire surface with minimum of two (2) roller passes. A roller pass is defined as one (1) trip of the roller in one (1) direction over any one (1) spot.

For intermediate rolling, roll entire surface with minimum of four (4) passes of roller.

Finish rolling using steel-tired, tandem roller. Continue rolling until entire surface has been compacted with minimum of three (3) passes of roller, and roller marks have been eliminated.

Do not use rollers that will excessively crush aggregate.

(3) HMA Pavement Courses 1-1/2 Inches Thick Or Greater In Special Areas Not Designed For Vehicular Traffic. For areas such as bikeways that are not part of roadway and other areas not subjected to vehicular traffic, compact to not less than 90 percent of maximum specific gravity determined in accordance with AASHTO T 209, modified by deletion of Supplemental Procedure for Mixtures Containing Porous Aggregate. Increase asphalt content by at least 0.5 percent above that used for HMA pavements designed for vehicular traffic.

In areas where there is a grade differential/drop off/slope at the edge of pavement and shoulder area in the unimproved roadway areas, additional AC quantities may be placed to achieve the compaction requirements of the AC pavement areas. No additional compensation shall be made for any additional AC quantities placed beyond the edge of pavement to address this grade difference/slope situation.

F. Smoothness. The finished surface of the pavement shall be true to grade and cross section, free from depressions and grainy spots, and of uniform texture. It shall not vary more than 3/16 of an inch from any point along the bottom of a 10-foot straightedge laid in any direction except across the crown.

G. Thickness Tolerance. Thickness of finished HMA pavement shall be within 1/4 inch of thickness indicated in the contract documents. Correct pavement exceeding specified tolerances by methods accepted by the Officer-in-Charge, including removal and replacement, at no increase in contract price or contract time.

H. Sampling and Testing of the Bituminous Mixture.

(1) The Contractor shall provide laboratory testing for quality control functions during periods of mix productions: One (1) field Marshall Test, asphalt content test, gradation analysis, and specific gravity test for each mixtures.

(2) Pavement Samples. At the discretion of the Officer-in-Charge, the Contractor shall obtain pavement samples for the Contractor's quality control testing as well as the City's testing for acceptance. The affected areas shall be restored at no extra cost to the City.

a. Quantity, Size and Location. The number of samples to be obtained per street shall be directed by the Officer-in-Charge. The size of the samples shall be directed by the Officer-in-Charge. Core samples shall be minimum 4 inches in diameter, and cut samples shall be minimum 12 inches by 12 inches, consisting of undisturbed, full-depth portion of the compacted mixture. Samples shall be taken to the full depth of the course. The location of the samples shall be directed by the Officer-in-Charge. Only sample the leveling course if 1-1/2 inches or greater.

b. Collection. Samples shall be obtained from compacted HMA pavement within seventy-two (72) hours or the next workday after weekend and holidays. Collection of samples shall be coordinated with the inspector for labeling and handoff.

c. Testing. Samples shall be tested to determine thickness and density of the completed pavements. Final acceptance shall be based on the City's laboratory test results.

d. Restoration. Restore HMA pavement immediately after obtaining samples. Apply tack coat to vertical faces of sample holes. Fill sampled area with new HMA pavement of same type as that removed, and compact. The entire cost of the sampling and restoring the area shall be borne by the Contractor, and no additional compensation shall be made.

SP 34.4 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure HMA for payment. The Officer-in-Charge will not pay for the accepted HMA separately and will consider the cost for HMA as included in the contract price for each respective street lump sum contract bid item as specified in the Offer schedule and in accordance with SP 151 DESCRIPTION OF WORK."

END OF SECTION SP 34

Delete Section 35 ASPHALT CONCRETE RESURFACING in its entirety and replace with the following:

"SECTION SP 35 - ASPHALT CONCRETE PAVEMENT (STATE MIX NO. IV)

SP 35.1 DESCRIPTION

This section describes furnishing and placing hot mix asphalt (HMA) pavement on a prepared surface.

Reference: The State of Hawaii Department of Transportation (HDOT), Highways Division, 2005, Standard Specifications and Special Provisions shall be applicable as referenced in the section.

SP 35.2 MATERIALS

General. HMA pavement shall be plant mixed and shall include mixture of aggregate and asphalt cement, and may include reclaimed asphalt pavement (RAP) or filler, or both.

HMA pavement shall include surface course and may include one (1) or more binder courses, depending on HMA pavement thickness indicated in the contract documents.

RAP is defined as removed or reprocessed pavement materials containing asphalt and aggregates. Process RAP by crushing until 100 percent of RAP passes 1/2-inch sieve. Size, grade uniformly, and combine materials such that blend of RAP and aggregate material conforms to grading requirements of Subsection 703.09 Aggregate for Hot Plant Mix Bituminous Pavement.

In surface and binder courses, aggregate for HMA may include RAP quantities up to 20 percent of total mix weight.

Quantity of filler material to correct deficiencies in aggregate gradation passing the No. 200 sieve shall not exceed 3 percent by weight of fine aggregates.

Conform to the following HDOT 2005 Standard Specification Sections:

702.01 Asphalt Cement

702.04 Emulsified Asphalt

703.09 Aggregate for Hot Plant Mix Bituminous Pavement

703.15 Filler

703.22 Blending Sand

712.03 Hydrated Lime

Asphalt cement shall be PG 64-16.

SP 35.3 JOB-MIX FORMULA AND TESTS

A. Job-Mix Formula. Design job-mix formula in accordance with procedures contained in current edition of Asphalt Institute's

Mix Design Methods for Asphalt Concrete and Other Hot Mix Types, Manual Series No. 2 (MS-2) for Marshall Method of Mix Design.

Establish and submit job-mix formula for each type of HMA pavement mix indicated in the contract documents as follows:

(1) Design percent of aggregate passing each required sieve size.
(2) Design asphalt content added to aggregate, based on total weight of mix.
(3) Design proportion of processed RAP.
(4) Design temperature of mixture at point of discharge at paver.
(5) Source of aggregate.
(6) Grade of asphalt cement.
(7) Test data used to develop job-mix formula.

With the exception of item (4) from the list above, if design requirements are modified after the Officer-in-Charge reviews job-mix formula, submit new job-mix formula before using HMA produced from modified mix design.

Submit a certificate of compliance for asphalt cement, accompanied by substantiating test data.

Provide HMA within allowable tolerances of reviewed job-mix formula as specified in the following ranges of tolerances:

TABLE 35 I - RANGE OF TOLERANCES FOR JOB-MIX FORMULA	
Passing No 4 and larger sieves (%)	± 7
Passing No. 8 to No. 100 sieves (inclusive) (%)	± 4
Passing No. 200 sieve (%)	± 3
Bitumen (%)	± 0.4
Temperature of mixture (degrees F)	± 20

The Contractor shall provide bulk samples of the aggregate in the gradation submitted in the mix design and asphalt binder for each mix design submitted in sufficient quantities to make three (3) samples to test by the Marshall Method.

Limit compacted lift thickness and asphalt content of job-mix formula as specified in Table 35 II - Limits of Compacted Lift Thickness and Asphalt Content. Asphalt content limits for porous aggregate may be exceeded only if accepted in writing by the Officer-in-Charge.

TABLE 35 II - Limits of Compacted Lift Thickness and Asphalt Content				
MIX NO.	**II**	**III**	**IV**	**V**
Minimum to Maximum Compacted Thickness for Individual Lifts (Inches)	2.25 - 3	2 - 3	1.5 – 3	1.25 - 3.0

Asphalt Content Limits (% of total Weight of Mix)	3.8 - 6.1	4.3 - 6.1	4.3 - 6.5	4.8 - 7.0

B. Tests. Meet job-mix formula design criteria specified in Table 35 IIIA - Marshall Method Mix Criteria (AASHTO T 245)

Table 35 IIIA - Marshall Method Mix Criteria (AASHTO T 245)	
Compaction (number of blows each end of specimen)	75
Stability, minimum (pounds)	1,800
Flow (x 0.01 inch)	8-16
Air Voids (percent)1	4 - 6
Notes: 1. Air Voids: AASHTO T 166 or AASHTO T 275; AASHTO T 209, AASHTO T 269.	

Minimum percent voids in mineral aggregates (VMA) of job-mix formula shall be as specified in Table 35 IIIB - Minimum Percent Voids in Mineral Aggregates (VMA).

TABLE 35 IIIB - MINIMUM PERCENT VOIDS IN MINERAL AGGREGATES (VMA)					
Nominal Maximum Particle Size, (Inches)	1-1/2	1	3/4	1/2	3/8
VMA, (percent)1	11	12	13	14	15
Notes: 1. VMA: See Asphalt Institute Manual MS-2, Chapter 4.					

SP 35.4 DETAILS

A. Equipment.

1. Mixing Plant. Use mixing plants that conform to AASHTO M 156, supplemented as follows:

a. All Plants.

1) Automated Controls. Control proportioning, mixing, and mix discharging automatically. When RAP is incorporated into mixture, provide positive controls for proportioning processed RAP.

2) Dust Collector. AASHTO M 156, Requirements for All Plants, Emission Controls is amended as follows:

"Equip plant with dust collector. Dispose of collected material. In the case of baghouse dust collectors, dispose of collected material or return collected material uniformly."

3) Modifications for Processing RAP. When RAP is incorporated into mixture, modify mixing plant in accordance with plant manufacturer's recommendations to process RAP.

b. Drum Dryer-Mixer Plants.

1) Bins. Provide separate bin in cold aggregate feeder for each individual aggregate stockpile in mix. Use bins of sufficient size to keep plant in continuous operation and of proper design to prevent overflow of material from one (1) bin to another.

2) Stockpiling Procedures. Separate aggregate into at least three (3) stockpiles with different gradations as follows: coarse, intermediate, and fine. Separate aggregates for Mix #4 into at least two (2) stockpiles. Stockpile RAP separately from virgin aggregates.

c. Batch and Continuous Mix Plants.

1) Hot Aggregate Bin. Provide bin with three (3) or more separate compartments for storage of screened aggregate fractions to be combined for mix. Make partitions between compartments tight and of sufficient height to prevent spillage of aggregate from one (1) compartment into another.

2) Load Cells. Calibrated load cells may be used in batch plants instead of scales.

2. Hauling Equipment. Use trucks that have tight, clean, smooth metal beds for hauling HMA.

Thinly coat truck beds with minimum quantity of non-stripping release agent to prevent mixture from adhering to beds. The use of diesel or petroleum-based liquid release agents, except for paraffin oil, shall not be allowed.

Equip each truck with tarpaulin conforming to the following:

a. In good condition, without tears and holes.

b. Large enough to be stretched tightly over truck bed, completely covering mix.

3. Asphalt Pavers. Use asphalt pavers that are:

a. Self-contained, power-propelled units.

b. Equipped with activated screed or strike-off assembly, heated if necessary.

c. Capable of spreading and finishing courses of HMA mixtures in lane widths applicable to typical section and thicknesses indicated in the contract documents.

d. Equipped with receiving hopper having sufficient capacity for uniform spreading operation.

e. Equipped with automatic feed controls to maintain uniform depth of material ahead of screed.

f. Equipped with automatic screed controls with sensors capable of sensing grade from outside reference line, sensing transverse slope of screed, and providing automatic signals to control screed grade and transverse slope.

g. Capable of operating at constant forward speeds consistent with satisfactory laying of mixture.

h. Equipped with a mean of preventing the segregation of the coarse aggregate particles from the remainder of the bituminous plant mix when that mix is carried from the paver hopper back to the paver augers. The means and methods used shall be approved by the paver manufacturer and may consist of chain curtains, deflector plates, or other such devices and any combination of these.

The following specific requirements shall apply to the identified bituminous pavers or approved substitutes:

1) Blaw-Knox bituminous pavers shall be equipped with the Blaw-Knox Materials Management Kit (MMK).

2) Cedarapids bituminous pavers shall be those that were manufactured in 1989 or later.

3) Barber-Green/Caterpillar bituminous pavers shall be equipped with deflector plates as identified

in the December 2000 Service Magazine entitled “New Asphalt Deflector Kit {6630, 6631, 6640}”.

Prior to the start of using the paver for placing plant mix, the Contractor shall submit for review a full description in writing of the means and methodologies that will be used to prevent bituminous paver segregation. Use of the paver shall not commence prior to receiving review comments from the Officer-in-Charge.

The Contractor shall supply a Certificate of Compliance that verifies that the approved means and methods used to prevent bituminous paver segregation have been implemented on all pavers used on the project and is working in accordance with the manufacturer’s requirements.

4) Rollers. Rollers shall be self-propelled, steel-tired tandem, pneumatic-tired, or vibratory-type rollers capable of reversing without shoving or tearing HMA mixture. Unless otherwise indicated in the contract documents, provide sufficient number, sequencing, type, and weight of rollers to compact mixture to required density while mixture is still in workable condition. Do not use equipment that will excessively crush aggregate. Operate rollers in accordance with manufacturer's recommendations.

   a) Steel-Tired Tandem Rollers. Steel-tired tandem rollers used for initial breakdown or intermediate roller passes shall have minimum gross weight of 12 tons and shall provide minimum 250-pound weight per linear inch of width on drive wheel.

      Steel-tired tandem rollers used for finish roller passes shall have minimum gross weight of 3 tons.

      Do not use roller with grooved or pitted rolling drum. Replace excessively worn scrapers and wetting pads.

   b) Pneumatic Tired Rollers. Pneumatic-tired rollers shall be oscillating-type, equipped with smooth-tread pneumatic tires of equal size and diameter. Maintain tire pressure within 5 pounds per square inch of designated operational pressure when hot. Space tires so that gaps between adjacent tires are covered by following set of tires.

      Equip pneumatic-tired rollers used for breakdown or intermediate roller passes,

with ballast capable of establishing an operating weight per tire of not less than 3,000 pounds. Equip rollers with tires having minimum 20-inch wheel diameter. Inflate tires to 70 to 75 pounds per square inch pressure when cold and 90 pounds per square inch when hot. Equip rollers with skirt-type devices to maintain temperature of tires during rolling operations.

Equip pneumatic-tired rollers used for kneading finished asphalt surfaces, with ballast capable of establishing an operating weight per tire of not less than 1,500 pounds. Equip rollers with tires having minimum 15-inch wheel diameter. Inflate tires to 50 to 60 pounds per square inch pressure.

c) Vibratory Rollers. Vibratory rollers shall be steel-tired tandem rollers having minimum weight of 3 tons. Equip vibratory rollers with amplitude and frequency controls and speedometer. Operate vibratory roller in accordance with manufacturer's recommendations.

5) Hand Tools. Keep hand tools used in production, hauling, and placement of HMA clean and free of contaminants. Liquids such as diesel or mineral spirits may be used to clean hand tools. Do not contaminate HMA with cleaning liquids. Clean hand tools over catch pan with capacity to hold all the cleaning liquid. Dry hand tools before using with HMA.

6) Material Transfer Vehicle (MTV).

a) Usage. Unless otherwise indicated in the contract documents, MTV usage applies to surface courses of paving projects. When placing HMA surface course, use MTV to independently deliver mixtures from hauling equipment to paving equipment. MTV usage shall not be required for the following:

(1) Projects with less than 1,000 tons of HMA.

(2) Temporary pavements.

(3) Bridge deck approaches & Bridges.

(4) Shoulders.

(5) Tapers.

(6) Turning lanes.

(7) Driveways.

(8) Areas with low overhead clearances.

(9) Areas where unable to provide one open lane for traffic.

b) Equipment. When using MTV, install minimum 10-ton capacity hopper insert in conventional paver hopper. Provide the following equipment:

(1) High-capacity truck unloading system in MTV capable of receiving HMA from hauling equipment.

(2) MTV storage bin with minimum 15-ton capacity.

(3) Auger mixing system in MTV storage bin, paver hopper insert, or paver hopper to continuously mix HMA prior to discharging to conveyor system.

Coordinate plant production rate, number of haul units, and MTV and paver speeds to avoid stop-and-go operations and to provide continuous, uniform, segregation-free material flow.

c) Performance Evaluation. The Contractor shall evaluate performance of MTV and mixing equipment by measuring mat temperature profile immediately behind paver screed on first day of paving.

Six (6) temperature profile measurements shall be taken of mat surface using non-contact thermometers at 50-foot intervals behind paver. Each temperature profile shall consist of three (3) surface temperature measurements taken transversely across mat in approximately a straight line from screed while paver is operating. For each profile, temperatures shall be measured approximately 1 foot from each edge and in middle of mat; and difference between maximum and minimum temperature measurements within each temperature profile shall not exceed 10 degrees F. If any two (2) or more temperature profiles

exceed allowable 10-degree F temperature differential, halt paving operation and adjust MTV or mixing equipment to ensure that material placed by paver meets specified temperature requirements.

Once adjustments are made, the Contractor shall repeat measurement procedure to verify that material placed by paver meets specified temperature requirements. Terminate paving if temperature profile requirements are not met during repeated measurement procedure.

If equipment fails to meet requirements after measurement procedure is repeated once, equipment replacement shall be required before the Officer-in-Charge conducts any further temperature profile measurements.

The Contractor may perform additional surface temperature profile measurements at any time during project. If two consecutive temperature profiles fail to comply with specified allowable temperature differential, halt paving operation and adjust MTV or mixing equipment to ensure that HMA placed by paver complies with temperature requirements. The Contractor shall submit a report of all the measurements & adjustments made.

d) Transport.

(1) Trailered MTV. Transport MTV by means of truck-tractor/trailer combination in accordance with Chapter 104 of Title 19, Department of Transportation, entitled "The Movement by Permit of Oversize and Overweight Vehicles on State Highways".

(2) Crossing Bridges for Self-Powered MTV. When self-powered MTV exceeds legal axle or total weight limits for vehicles under the HRS, Chapter 291, conform to the following when crossing bridges within project limits unless otherwise indicated in the contract documents:

(a) Completely remove mix from MTV.

(b) Move MTV at relatively constant speed not exceeding 5 miles per hour. MTV shall not be allowed to stop on bridge.

(c) No other vehicle or equipment shall be allowed on bridge.

B. Mixing. Uniformly heat asphalt cement and provide continuous supply of heated asphalt cement from storage to mixer. Do not heat asphalt cement above 350 degrees F. The heat must be applied so that there is no burning of any portion of the asphalt concrete. Live steam shall not be injected into the asphalt.

Preparation of Aggregate. Dry and heat aggregate material at temperature sufficient to produce design temperature of job-mix formula. Do not exceed 350 degrees F. Adjust heat source used for drying and heating to avoid damage to and contamination of aggregate. When dry, aggregate shall not contain more than 1 percent moisture by weight. For batch plants, screen aggregates immediately after heating, and drying into three (3) or more fractions. Convey aggregates into separate compartments ready for batching and mixing with asphalt cement.

After heating to the required temperature, the required amount of asphalt cement shall be added to the heated aggregate in a mixer and the mixing commenced. The minimum mixing period shall be 30 seconds. Measure aggregate and asphalt; or aggregate, RAP,and asphalt into mixer in accordance with job-mix formula. Mix until components are completely mixed and adequately coated with asphalt in accordance with AASHTO M 156. Percent of coated particles shall be 95 percent when tested in accordance with AASHTO T 195. Any mixture which shows an excess of deficiency of asphalt, or any uneven distribution of cement due to insufficient mixing, shall be wasted.

C. Preparing of Surface. All surfaces on or against which asphalt concrete wearing surface course is to be placed shall first be given a tack coat as specified under Asphalt Surface Treatment, except clean surfaces of any course of asphaltic materials laid within the preceding twenty-four (24) hours.

The Contractor shall prepare the existing surface by power brooming to remove all loose particles, dust, sand, and other foreign materials.

Where indicated in the contract documents, bring irregular surfaces to uniform grade and cross section by furnishing and placing one (1) or more leveling courses of HMA Mix #4. Spread leveling course in variable thicknesses to eliminate irregularities in existing surface. Place leveling course such that maximum depth of each course, when thoroughly compacted, does not exceed 3 inches.

D. Spreading and Finishing. If required by the Officer-in-Charge, a leveling course mixture shall be spread to level

irregularities, dips, depressions, sags, and to provide a smooth base of uniform grade and cross section. The leveling course shall not be placed more than one (1) day in advance of placing the surface course.

Prior to each day's paving operation, check screed or strike-off assembly surface with straight edge to ensure straight alignment. Provide screed or strike-off assembly that produces finished surface without tearing, shoving, and gouging HMA.

If the paving machine leaves ridges, indentations, or other marks in the surface that cannot be eliminated by rolling or prevented by adjustment in operation, its use shall be discontinued and another equipment, acceptable to the Officer-in-Charge, shall be furnished by the Contractor.

If more than one (1) course is to be constructed in any area, not more that twenty-four (24) hours shall elapse between the spreading and finishing of any two successive courses in that area. No wearing surface mixture shall be spread during unsuitable weather or when the base is wet.

When a new asphalt lift abuts an existing or previous asphalt lift, the joint shall be trimmed to a neat vertical plane, swept clean of debris and tack coat applied to the vertical face prior to placement of the abutting lift.

When asphalt concrete wearing surface is to abut a concrete gutter, the wearing surface shall be laid so that its surface, after compaction, shall approximately be slightly higher than the surface of the concrete gutter. At curb ramp locations, the top of asphalt concrete wearing surface shall be flush with the top of concrete gutters.

Maintain HMA at minimum 250 degrees F temperature at discharge to paver. Measure temperature of mix in hauling vehicle just before depositing into spreader.

Deposit HMA in a manner that minimizes segregation. Raise truck beds with tailgates closed before discharging HMA.

Lay, spread, and strike off HMA upon prepared surface. Use asphalt pavers to distribute mixture.

Control horizontal alignment using automatic grade and slope controls from reference line, ski and slope control device, or dual skis.

Obtain sensor grade reference from 30-foot ski for first pass. For subsequent passes, substitution of one ski with joint-matching shoe riding on finished adjacent pavement is acceptable. Use of a comparable non-contact mobile reference system and joint matching shoe is acceptable.

Avoid stop-and-go operation. Minimize changing forward speed of paver during paving operation.

In areas where irregularities or unavoidable obstacles make use of mechanical spreading and finishing equipment impracticable, spread, rake, and lute mixture by hand tools. For such areas, deposit, spread, and screed mixture to required compacted thickness.

Demonstrate competence of personnel operating grade and crown control device before placing surface courses. If automatic control system becomes inoperative during the day's work, the Officer-in-Charge shall permit the Contractor to finish day's work using manual controls. Do not resume work until automatic control system is made operative. The Officer-in-Charge may waive requirement for electronic screed control device when paving gores, shoulders, transitions, and miscellaneous reconstruction areas.

When production of HMA can be maintained and when practicable, use pavers in echelon to place surface course in adjacent lanes.

The maximum depth of asphalt concrete which may be spread and rolled in any one course or lift shall not exceed a compacted thickness of 3 inches as directed by the Officer-in-Charge. Longitudinal joints in any two successive lifts or courses shall be offset a minimum of 6 inches so that one joint shall not be directly over the other.

Construct temporary transitions or tapers at vertical grade differentials in accordance with Section SP 151.2 PERFORMANCE OF WORK.

E. Compacting. Immediately after spreading and striking off HMA and adjusting surface irregularities, uniformly compact mixture by rolling.

Initiate compaction at highest mix temperature allowing compaction without excessive horizontal movement. Temperature shall not be less than 220 degrees F.

Finish rolling using tandem roller while HMA temperature is at or above 175 degrees F.

On superelevated curves, begin rolling at lower edge and progress to higher edge by overlapping the longitudinal rolling parallel to centerline.

If necessary, repair damage immediately using rakes and fresh mix. Do not displace line and grade of HMA edges during rolling.

Asphalt cement sticking to roller wheels tear and damage the asphalt surface; water or diluted mixtures with small amounts of detergent, or other approved release agents shall be applied to the roller wheel surface and/or transverse bar in minimal quantities to prevent the occurrence. Excessive liquid, diesel fuel or other petroleum based products are not allowed under any circumstances.

Along forms, curbs, headers, walls and other places not accessible to rollers, compact mixture with hot hand tampers, smoothing irons, or mechanical tampers. On depressed areas, trench roller or cleated compression strips under roller may be used to transmit compression.

Remove pavement that is loose, broken, or contaminated, or combination thereof; pavement that shows an excess or deficiency in asphalt cement content; and pavement that is defective in any way. Replace with fresh HMA pavement of same type, and compact. Remove and replace defective pavement and compact at no increase in contract price or contract time.

Operate rollers at slow but uniform speed with drive wheels nearest paver. Continue rolling to attain specified density and until roller marks are eliminated.

(1) HMA Pavement Courses 1-1/2 Inches Thick Or Greater. Where HMA pavement compacted thickness indicated in the contract documents is 1-1/2 inches or greater, compact to not less than 92.0 percent nor greater than 97.0 percent of the maximum specific gravity determined in accordance with AASHTO T 209, modified by deletion of Supplemental Procedure for Mixtures Containing Porous Aggregate. The Contractor shall provide daily reports and data indicating compliance at no additional cost to the City.

Place HMA pavement in individual lifts that are within minimum and maximum allowable compacted thickness for various types of mixture.

(2) HMA Pavement Courses Less Than 1-1/2 Inches Thick. Where HMA pavement compacted thickness indicated in the contract documents is less than 1-1/2 inches, compaction to a specified density shall not be required.

Initiate rolling using non-vibratory, steel-tired, tandem roller. Roll entire surface with minimum of two (2) roller passes. A roller pass is defined as one (1) trip of the roller in one (1) direction over any one (1) spot.

For intermediate rolling, roll entire surface with minimum of four (4) passes of roller.

Finish rolling using steel-tired, tandem roller. Continue rolling until entire surface has been compacted with minimum of three (3) passes of roller, and roller marks have been eliminated.

Do not use rollers that will excessively crush aggregate.

(3) HMA Pavement Courses 1-1/2 Inches Thick Or Greater In Special Areas Not Designed For Vehicular Traffic. For

areas such as bikeways that are not part of roadway and other areas not subjected to vehicular traffic, compact to not less than 90 percent of maximum specific gravity determined in accordance with AASHTO T 209, modified by deletion of Supplemental Procedure for Mixtures Containing Porous Aggregate. Increase asphalt content by at least 0.5 percent above that used for HMA pavements designed for vehicular traffic.

In areas where there is a grade differential/drop off/slope at the edge of pavement and shoulder area in the unimproved roadway areas, additional AC quantities may be placed to achieve the compaction requirements of the AC pavement areas. No additional compensation shall be made for any additional AC quantities placed beyond the edge of pavement to address this grade difference/slope situation.

F. Smoothness. The finished surface of the pavement shall be true to grade and cross section, free from depressions and grainy spots, and of uniform texture. It shall not vary more than 3/16 of an inch from any point along the bottom of a 10-foot straightedge laid in any direction except across the crown.

G. Thickness Tolerance. Thickness of finished HMA pavement shall be within 1/4 inch of thickness indicated in the contract documents. Correct pavement exceeding specified tolerances by methods accepted by the Officer-in-Charge, including removal and replacement, at no increase in contract price or contract time.

H. Sampling and Testing of the Bituminous Mixture.

1. The Contractor shall provide laboratory testing for quality control functions during periods of mix productions: One (1) field Marshall Test, asphalt content test, gradation analysis, and specific gravity test for each mixtures.

2. Pavement Samples. At the discretion of the Officer-in-Charge, the Contractor shall obtain pavement samples for the Contractor’s quality control testing as well as the City’s testing for acceptance. The affected areas shall be restored at no extra cost to the City.

a. Quantity, Size and Location. The number of samples to be obtained per street shall be directed by the Officer-in-Charge. The size of the samples shall be directed by the Officer-in-Charge. Core samples shall be minimum 4 inches in diameter, and cut samples shall be minimum 12 inches by 12 inches, consisting of undisturbed, full-depth portion of the compacted mixture. Samples shall be taken to the full depth of the course. The location of the samples shall be directed by the Officer-in-Charge. Only sample the leveling course if 1-1/2 inches or greater.

b. Collection. Samples shall be obtained from compacted

HMA pavement within seventy-two (72) hours or the next workday after for weekend and holidays. Collection of samples shall be coordinated with the inspector for labeling and handoff.

c. Testing. Samples shall be tested to determine thickness and density of the completed pavements. Final acceptance shall be based on the City's laboratory test results.

d. Restoration. Restore HMA pavement immediately after obtaining samples. Apply tack coat to vertical faces of sample holes. Fill sampled area with new HMA pavement of same type as that removed, and compact. The entire cost of the sampling and restoring the area shall be borne by the Contractor, and no additional compensation shall be made.

SP 35.5 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure asphalt concrete pavement for payment. The Officer-in-Charge will not pay for the accepted asphalt concrete pavement separately and will consider the cost for asphalt concrete pavement as included in the contract price for each respective street lump sum contract bid item as specified in the Offer schedule and in accordance with SP 151 DESCRIPTION OF WORK."

END OF SECTION SP 35

Delete Section 36 ADJUSTMENT OF EXISTING UTILITY STRUCTURES TO FINISHED GRADE in its entirety and replace with the following:

"SECTION SP 36 - ADJUSTMENT OF EXISTING UTILITY STRUCTURES TO FINISHED GRADE

SP 36.1 GENERAL

This section is for the adjustment and/or reconstruction of existing manhole and handhole frame and covers, valve boxes, and street survey monument castings to finished grade. This section also covers the inspection and assessment of existing manholes within the roadway for existing debris and identification of any required reconstruction, including replacement of missing covers. Work shall be performed in accordance with the requirements and standards of the respective utility company and agency. The Contractor shall notify, provide updated work schedules, and coordinate their work with the affected utility company and agency, prior to the commencement of work on the existing utilities and final adjustment of utility to finished grades and manhole inspections.

SP 36.2 INSPECTION AND ASSESSMENT

A. Pre-construction. The Contractor shall coordinate and arrange for a field inspection with the various utility company or agency and document the existing condition of the manholes, handholes, valve boxes, and street survey monuments within three (3) weeks of the Notice to Proceed date. An assessment of the existing frame and cover shall also be made at the time of inspection to determine the necessary work to lower or raise the frame and covers to meet the finished roadway grade by either an adjustment or reconstruction of the utility structure. The Contractor shall verify and document existing condition of the street survey monument pin and structure.

The inspection documentation shall include, but is not limited to, photographs; sketches; the amount and type of debris inside the manholes; and existing construction of the utility structure frame and covers and indication of adjustment or reconstruction of the utility structure to meet the finished roadway grades. The Contractor shall submit a copy of the documentation to the City.

If any debris is present, the Contractor shall notify the affected utility company or agency in writing to have the debris cleaned out and removed prior to the Contractor’s work. The Contractor shall follow up with the utility company and agency in the event they are unable to clean out their manholes prior to the Contractor’s work, the Contractor shall document this condition.

B. Post-construction. Upon completion of the Contractor’s work, including the final adjustments/reconstruction of the utility structures, the Contractor shall coordinate and arrange for a post construction field inspection with the various utility company or agency to document and verify that no additional debris from the Contractor’s work are in the manholes.

Similar documentation to the pre-construction inspection shall be prepared and a copy forwarded to the City.

Any debris in the manholes as a result of the construction operations shall be removed immediately by the Contractor or the utility company or agency at the Contractor's expense. The removed debris shall be disposed of at an approved disposal site.

C. The Contractor shall arrange, obtain the street usage permit and provide all traffic controls for the pre-construction and post-construction manhole inspections. The Contractor shall follow the traffic control requirements, as specified in Section SP 191 PROTECTION AND CONTROL OF PEDESTRIANS AND VEHICULAR TRAFFIC.

SP 36.3 CONSTRUCTION REQUIREMENTS

Prior to commencing cold planing and roadway reconstruction operations, the Contractor shall tone and locate any buried frames and covers and exercise due diligence in locating and protecting any buried manhole, handhole and/or valve box frames and covers. The existing buried frames and covers shall be adjusted to finished grades. The Contractor shall be responsible for and shall pay for all damages to existing buried street monument, manhole, handhole and/or valve box frames and covers. The City shall not be responsible for damages to the Contractor's equipment resulting from any conflicts with existing buried manhole, handhole and/or valve box frames and covers.

The Contractor shall photo document any buried street survey monuments, manhole and/or valve box frames and covers. The photos shall clearly show that they were not visible from the surface and labeled with the adjacent street address for reference. Clear and complete documentation is required for payment.

The Contractor shall be responsible for referencing/labeling the existing frame and covers to ensure that the pair is correctly matched during reinstallation and aligned to the pre-existing condition to prevent rattling and/or noise. The means and methods for referencing is the Contractor's responsibility; as such, any rattling shall be addressed by the Contractor.

The Contractor shall furnish and install temporary mechanical plugs or alternate means to prevent and minimize debris from entering existing manholes and handholes, including sewer manholes. Any debris entering the manholes during construction shall be removed immediately by the Contractor or the utility agency at the Contractor's expense. The Contractor shall remove temporary mechanical plugs or alternate means after final adjustment/reconstruction of utility structure to finished grade is complete.

Anytime the Contractor's means and methods deny access by removal, substitution or paving over of manhole and valve boxes; the Contractor shall provide the utility agencies with a 24/7 contact number and named individual or representative of the company. The individual shall be responsible to provide immediate response at all times to provide access whenever required for emergencies and maintenance.

The Contractor shall be held responsible for the actual cost of clean-up, criminal and civil fines resulting from sewer spills, backups, and overflow as a result of the Contractor's work.

The Contractor shall adjust and restore existing manhole and handhole frames and covers, valve boxes, and street survey monument castings to finished grade within forty-five (45) calendar days from the day these structures are removed.

Reconstruction of any manhole shall be performed prior to final paving. The determination of any reconstruction shall be made at the pre-construction inspection of the manholes.

The Contractor shall work around existing street survey monuments. If the Contractor deems it necessary to remove existing street survey monument frame and cover, then the Contractor shall have a licensed surveyor in the State of Hawaii reference the monument **prior** to start of work. If the street survey monument is damaged during construction activities, then the Contractor shall be responsible for all work required to restore the street survey monument at no additional cost to the City. Restoration shall include all surveying work required to restore the street survey monument. No additional contract time shall be considered for this restoration work.

SP 36.4 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure the adjustment of existing street monument castings; storm drain manholes; sewer manholes; traffic signal boxes; Board of Water Supply manholes, water meter boxes, and water valves; telephone manholes and handholes; gas valves, manholes, and handholes; and electric manholes and handholes to finished grade for payment. The Officer-in-Charge will not pay for the accepted adjustment of existing street monument castings; storm drain manholes; sewer manholes; traffic signal boxes; Board of Water Supply manholes, water meter boxes, and water valves; telephone manholes and handholes; gas valves, manholes, and handholes; and electric manholes and handholes to finished grade separately and will consider the cost for adjustments as included in the contract price for each respective street lump sum contract bid item as specified in the Offer schedule and in accordance with SP 151 DESCRIPTION OF WORK.

If the frames and covers of existing street survey monuments are missing or damaged, and require replacements, the Officer-in-Charge will pay for the accepted new street survey monuments' frames and covers and adjustment to finished grade on a force account basis as an Additional Work Item "Additional Street Survey Monument Frame and Cover, Including Adjustment". Payment shall be full compensation for the work directed by the Officer-in-Charge and shall be deducted from the force account set in the Offer. The unused portion of the force account item shall remain with the City upon completion of the contract.

If the buried street survey monuments, manhole and/or valve box frames and covers are properly documented with photos and are labeled, the Officer-in-Charge will pay for the accepted buried street survey monuments, manhole and/or valve box frames and covers on a force account basis as an Additional Work Item "Adjustment of Buried Street Survey Monuments, Manhole and/or Valve Box Frames and Covers". Payment shall be full compensation for the work directed by the Officer-in-Charge and shall be deducted from the

force account set in the Offer. The unused portion of the force account item shall remain with the City upon completion of the contract.

The Officer-in-Charge will pay for the accepted reconstruction of existing manholes other than precast sewer manholes on a force account basis as an Additional Work Item “Manhole Reconstruction – all except precast Sewer”. Payment shall be full compensation for the work directed by the Officer-in-Charge and shall be deducted from the force account set in the Offer. The unused portion of the force account item shall remain with the City upon completion of the contract.

The Officer-in-Charge will pay for the accepted reconstruction of existing precast sewer manholes on a force account basis as an Additional Work Item “Manhole Reconstruction - precast Sewer”. Payment shall be full compensation for the work directed by the Officer-in-Charge and shall be deducted from the force account set in the Offer. The unused portion of the force account item shall remain with the City upon completion of the contract.

The Officer-in-Charge will not measure the pre-construction and post-construction inspection of existing manholes for payment. The Officer-in-Charge will not pay for the accepted pre-construction and post-construction inspection of existing manholes separately and shall consider the cost for this work as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents.

The Officer-in-Charge will not measure the restoration of damaged street survey monuments for payment. The Officer-in-Charge will not pay for the accepted restoration of damaged street survey monuments separately and will consider the cost for this work as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents.”

END OF SECTION SP 36

SECTION SP 41 - CONCRETE CURB AND GUTTER

Make the following amendments to said Sections:

(I) Delete Section 41.1 DESCRIPTION in its entirety and replace with the following:

"SP 41.1 DESCRIPTION

Unless otherwise specified herein, all work shall conform to Section 41 (CONCRETE CURB AND GUTTER), and Section 48 (REINFORCING STEEL) of the Standard Specifications and R-4, R-4A, R-5 and R-8 of the Standard Details.

Description. This work consists of the reconstruction of the reinforced and non-reinforced concrete curb and/or gutter, thru gutter, and rolled curb areas as shown on the project plans and in accordance with this special provision. Exact locations shall be determined in the field by the Officer-in-Charge."

(II) Delete the first paragraph of Section 41.2 MATERIALS and replace with the following:

"SP 41.2 MATERIALS

All curbs and gutters shall be constructed with Class "A" concrete."

(III) Add the following paragraphs to Section 41.3 DETAILS:

"SP 41.3 DETAILS

General. The approximate locations of the areas to be reconstructed are noted on the project plans. The exact limits shall be determined in the field by the Officer-in-Charge.

Removal of curb and/or gutter. In removing the curb and/or gutter to be reconstructed, the junctions with the curb and/or gutters to remain shall be power saw cut along straight lines, preferably along the scored lines, to provide clean, solid, vertical joints. Curb and/or gutter shall be permitted to be removed only on one (1) side of any street at any given time, except as allowed by the Officer-in-Charge. The Contractor shall not be allowed to remove in advance more curb and/or gutter than can be replaced within five (5) working days.

Subgrade. Subsection 41.3A of the Standard Specifications shall govern except as modified herein. Any fill necessary to bring the curb and/or gutter to the proper grade shall be select borrow. After the curb and/or gutter is removed, the subgrade shall be kept in a continuously moist condition. Subgrades with expansive soil that has cracked due to its drying out shall be removed to a depth of 12 inches (maximum) or shall be removed to match existing pavement subgrade, whichever is less, and replaced with select borrow at no additional cost to the City.

Expansion joints. Expansion joints, where their construction are determined to be required in the field by the Officer-in-Charge, shall be considered as included and no measurement for payment will be made."

(IV) Delete Section 41.4 MEASUREMENT AND PAYMENT in its entirety and replace with the following:

"SP 41.4 MEASUREMENT AND PAYMENT (for applicable pay items included in the Offer)

The Officer-in-Charge will measure the reinforced/non-reinforced curb and/or gutter reconstruction per linear foot in accordance with the contract documents. The Officer-in-Charge will pay for the accepted reinforced/non-reinforced curb and/or gutter reconstruction at the contract price per linear foot. Payment shall be full compensation for furnishing the necessary material, equipment, and labor to complete the work in place prescribed in this section and the contract documents.

The Officer-in-Charge will measure the thru-gutter reconstruction per linear foot in accordance with the contract documents. The Officer-in-Charge will pay for the accepted thru-gutter reconstruction at the contract price per linear foot. Payment shall be full compensation for furnishing the necessary material, equipment, and labor to complete the work in place prescribed in this section and the contract documents.

The Officer-in-Charge will measure rolled curb and gutter reconstruction per linear foot in accordance with the contract documents. The Officer-in-Charge will pay for the accepted rolled curb and gutter reconstruction per linear foot. Payment shall be full compensation for furnishing the necessary material, equipment, and labor to complete the work in place prescribed in this section and the contract documents.

The Officer-in-Charge will measure the resetting of existing lava rock curbs per linear foot in accordance with the contract documents. The Officer-in-Charge will pay for the accepted resetting of existing lava rock curbs at the contract price per linear foot. Payment shall be full compensation for furnishing the necessary material, equipment, and labor to complete the work in place prescribed in this section and the contract documents.

For projects with curb ramps, the Officer-in-Charge will not measure reinforced/non-reinforced concrete curb and/or gutter, thru-gutter, or rolled curb transition for payment within the designated curb ramp pay limits, as shown on the project plans. Curbs, gutters, thru-gutters, and curb transitions within the designated curb ramp pay limits shall be included in the contract unit price bid for each type of concrete curb ramp. Payment shall be full compensation for furnishing the necessary material, equipment, and labor to complete the work in place prescribed in this section and the contract documents.

For projects with curb ramps, the following shall apply for curbs, gutters, and transitions outside of the designated curb ramp pay limits. The Officer-in-Charge will pay for the accepted additional curb and/or gutter work outside of the designated curb ramp pay limits, as shown on the project plans, on a force account basis as Additional Work Items "Additional Concrete Curb (for Curb Ramps)" and "Additional Concrete Curb and Gutter, Including Curb and Gutter Transitions (for Curb Ramps)". Payment shall be full compensation for the work directed by the Officer-in-Charge and shall be deducted from the force account set in the Offer. The unused portion of the

force account item shall remain with the City upon completion of the contract.

Select Borrow material for new curb and/or gutter will not be paid for directly but shall be considered as included in the prices bid for curb and/or gutter reconstruction.

Saw cutting and removal of existing curb and/or gutter will not be paid for directly but shall be considered as included in the prices bid for curb and/or gutter reconstruction."

END OF SECTION SP 41

SECTION SP 42 – CONCRETE SIDEWALK

Make the following amendments to said Section:

(I) Delete Section 42.1 DESCRIPTION in its entirety and replace with the following:

"SP 42.1 DESCRIPTION

Unless otherwise specified herein, all work shall conform to Section 42 (CONCRETE SIDEWALK) of the Standard Specifications and R-27 and R-28 of the Standard Details.

This work consists of the reconstruction of the concrete sidewalk areas as shown on the project plans and in accordance with this special provision. This work shall also include the Bus Stop Landing reconstruction."

(II) Add the following paragraphs to Section 42.3 DETAILS:

"SP 42.3 DETAILS

The approximate locations of the areas to be reconstructed are noted in the project plans. The exact limits shall be determined in the field by the Officer-in-Charge.

Removal of existing sidewalks. In removing the existing sidewalks to be reconstructed, the junctions with the concrete sidewalks to remain shall be power saw cut along straight lines, preferably along the scored lines, to provide clean, solid, vertical joints. Existing concrete sidewalks shall be permitted to be removed only on one (1) side of any street at any given time, except as allowed by the Officer-in-Charge. The Contractor shall not be allowed to remove in advance more existing concrete sidewalks than can be replaced within five (5) working days.

Subgrade. Subsection 42.3A of the Standard Specifications shall govern except as modified herein. Any fill necessary to bring the sidewalk to the proper grade shall be select borrow. After the existing concrete sidewalks are removed, the subgrade shall be kept in a continuously moist condition. Subgrades with expansive soil that has cracked due to its drying out shall be removed to a depth of 12 inches (maximum) or shall be removed to match existing pavement subgrade, whichever is less, and replaced with select borrow at no additional cost to the City."

(III) Delete C. and D. of Section 42.3 DETAILS in their entirety and replace with the following:

"C. Placing and finishing. Prior to pouring of concrete, the subgrade shall be dampened. Concrete shall be poured continuously and shall be thoroughly tamped and floated to a smooth and even surface. The pouring and constructing of alternating blocks shall not be permitted.

D. Joints. Expansion joints shall be constructed at fixed structures, such as buildings bridges, or walls, and at the beginning and end of curb returns. The joints shall be constructed with 1/2" thick premolded expansion-type filler,

extending from the bottom of the sidewalk to approximately 1/2″ below the top of the sidewalk, then filled with joint sealer. Expansion joints, where their construction are determined to be required in the field by the Officer-in-Charge, shall be considered as included and no measurement for payment shall be made.

Divide sidewalk between expansion joints into sections approximately 5 feet in length by providing transverse contraction joints.

Where sidewalks are more than 7 feet in width provide longitudinal contraction joints that intersect the transverse contraction joints to obtain secure uniform blocks that are approximately square.

The width of contraction joints shall be at least 1/8″, but not greater than 3/16″.″

(IV) Delete Section 42.4 MEASUREMENT AND PAYMENT in its entirety and replace with the following:

“SP 42.4 MEASUREMENT AND PAYMENT

The Officer-in-Charge will measure the concrete sidewalk per square foot in accordance with the contract documents. The Officer-in-Charge will pay for the accepted concrete sidewalk at the contract price per square foot. Payment shall be full compensation for furnishing the necessary material, equipment, and labor to complete the work in place prescribed in this section and the contract documents.

Removal of the existing sidewalks will not be paid for directly but shall be considered as included in the prices bid for sidewalk reconstruction.

The Officer-in-Charge will pay for the accepted sidewalk expansion joint repair on a force account basis as an Additional Work Item “Sidewalk Expansion Joint Repair”. Payment shall be full compensation for the work directed by the Officer-in-Charge and shall be deducted from the force account set in the Offer. The unused portion of the force account item shall remain with the City upon completion of the contract."

END OF SECTION SP 42

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 61 - PAVEMENT MARKERS, STRIPING AND MARKINGS

SP 61.1 DESCRIPTION

This work shall consist of furnishing all labor, materials and equipment, and installing complete in place pavement markers, reflectorized white and yellow traffic pavement striping and other markings in conformance to the "Manual on Uniform Traffic Control Devices for Streets and Highways", 2009 or current Edition (MUTCD); the Department of Planning and Permitting (DPP) and the Department of Transportation Services (DTS) current requirements, policies, guidelines, standards, and criteria; and these plans and specifications. This work shall also include the removing of existing pavement markers and removing or eradicating existing pavement striping and markings when called for in the plans and/or directed by the Officer-in-Charge.

The Contractor shall be responsible for field verifying all existing striping, pavement markings, and pavement markers and bringing any discrepancies to the Officer-in-Charge's attention. The Contractor shall restore all striping, pavement markings, and pavement markers as shown on the plans upon resurfacing the roadway.

SP 61.2 MATERIALS

All materials shall be lead and chromium free. Pavement markers, striping and markings shall not contain any hazardous materials at levels classified as hazardous waste under Resource Conservation and Recovery Act (RCRA) 40 CFR Part 261 subpart C

A. Qualification of Reflectorized Traffic Paint for Temporary Markings. Only those traffic paints which have qualified in the latest completed prequalification tests conducted by the State Department of Transportation and having a Weighted Rating (W) of at least 6.5 for reflectorized white and 7.0 for reflectorized yellow at the completion of the road test shall be permitted for use on this project. Quick dry paints shall not be used.

   The Contractor may use materials designed for pavement striping, such as adhesive striping, on temporary detours with the acceptance of the Officer-in-Charge. Such materials shall meet the color and reflection requirements for traffic paints.

B. Description of Markers. The markers shall have the shape, dimensions and tolerances as shown on the plans. The markers shall be of uniform composition and free from surface irregularities, cracks, checks, chipping and other physical damage interfering with appearance or application.

   The Contractor shall submit material certification and test results to the Officer-in-Charge and prior to installation of materials.

C. Type of Markers.

1. Type A - Non-Reflective White Markers and Type J Non-Reflective Yellow Markers.

   Class III Ceramic Type. For use on portland cement concrete and asphalt concrete road surfaces.

   Class IV Ceramic Type. For use only on portland cement concrete road surfaces.

   The Class of non-reflective white marker to be used shall be at the option of the Contractor, subject to the above limitations.

2. Type B - Two-Way Clear Reflective Markers.

3. Type C - Red-Clear Reflective Markers.

4. Type D - Two-Way Yellow Reflective Markers.

5. Type E - Yellow-Clear Reflective Markers.

6. Type G - One-Way Clear Reflective Markers.

7. Type H - One-Way Yellow Reflective Markers.

8. Type DB – Two-Way Blue Reflective Markers.

SP 61.3 MARKERS

A. Non-Reflective Markers. Type A and J pavement markers shall have the following characteristics:

1. Composition of Markers. The composition of finished markers shall conform to the following: The Class III and IV pavement markers shall consist of a heat-fired, vitreous, ceramic base and a heat-fired, opaque, glazed surface to produce the properties required in these specifications. The markers shall be produced from any suitable combination of intimately mixed clays, shales, talcs, flints, feldspars, or other inorganic material which shall meet the properties herein required. The markers shall be thoroughly and evenly matured and free from defects which affect appearance or serviceability.

2. Properties of Markers. The properties of finished markers, Class III and Class IV, shall conform to the following:

   a. Finish. The top surface of the marker shall be convex and the radius of curvature shall be between 3-1/2 inches and 6 inches except that the radius of the 1/2 inch nearest the edge may be less. Any change in curvature shall be gradual. The top and sides shall be smooth and free of mold marks, pits,

indentations, air bubbles, or other objectionable marks or discolorations.

The bottoms of the ceramic markers shall be free from gloss or glaze and shall have a number of integrally formed protrusions approximately 0.050 inch projecting from the surface in a uniform pattern of parallel rows.

Each protrusion shall have a face parallel to the bottom of the marker. The area of each parallel face shall be between 0.01 and 0.065 square inches and the combined area of these faces shall be between 2.2 and 4.4 square inches.

The protrusions shall be circular in section.

The number of protrusions should be not less than 48 nor more than 200.

To facilitate forming and mold release, the sides of each protrusion may be tapered. This taper shall not exceed 15 degrees from perpendicular to the marker bottom. Markers manufactured with protrusions whose diameter is less than 0.15 inch may have an additional taper not exceeding 30 degrees from perpendicular to the marker bottom and extending not more than one-half the total height of the protrusion.

The overall height of the marker shall be between 0.68 to 0.80 inch.

b. Glaze Thickness. The thickness of the glazed surface shall be not less than 0.007 inch at any point located more than 1/4 inch from the edge of the marker circumference. The glaze thickness shall be measured on a fractured edge with a calibrated reticle of a microscope of at least 25 power.

c. Moh Hardness. The glazed surface of the marker shall have a hardness of a 6 minimum in the Moh hardness scale. This shall be determined relative to the mineral orthoclase which has a hardness of 6. With moderate hand pressure, it must be possible to scratch orthoclase with the marker but not possible to scratch the marker with the orthoclase.

d. Directional Reflectance (Type A markers only). The 45°, 0° directional reflectance of the marker when tested in accordance with ASTM E 97, shall have the following values:

Glazed Surface	75 minimum
Body of Marker	65 minimum

The test on the glazed surface shall be made on the top of the convex surface of the marker. The test on the body of the marker shall be made on a flat surface of the marker from which the glaze has been removed by grinding with carborundum wheel.

e. Yellowness Index (Type A markers only). The yellowness index of the marker when tested in accordance with ASTM E 313 shall have the following values:

Glazed Surface	0.07 maximum
Body of Marker	0.12 maximum

The test on the glazed surface shall be made on the top of the convex surface of the marker. The test on the body of the marker shall be made on a flat surface of the marker from which the glaze has been removed by grinding with a carborundum wheel.

f. Color (Type J markers only). The chromaticity of the glazed surface of the marker shall be within the following limits:

Purity	76 to 96 percent
Dominant Wave Length	579 to 585 mu
Total Luminous Reflectance (Y value)	0.41 minimum

Chromaticity measurements shall be made in accordance with California Test Method No. 660.

g. Water Absorption. The average water absorption of the ceramic marker when tested in accordance with ASTM C 373 shall not exceed 2.0 percent of the dry weight of the test piece.

h. Autoclave Test. The glazed surface of the marker shall not craze, spall or peel when subjected to one (1) cycle at 100 psi for one (1) hour of the autoclave test when tested in accordance with ASTM C 424.

i. Strength Test. A random sample of five (5) markers of each type and/or class used shall be selected for the load test. Each Class III marker shall support a minimum load of 1500 pounds and each Class IV marker shall support a minimum load of 750 pounds when the load is applied in the following manner: The base of the marker shall be made flat using plaster of paris or some other suitable material. Sufficient amount of material shall be applied to the base of the marker to fill the spaces around the protrusions up to the faces of the protrusions. The protrusions shall not protrude from the prepared finished base. The prepared marker shall

be centered, base down, over the open end of a vertically positioned hollow metal cylinder. The cylinder shall be 1 inch high, with an internal diameter of 3 inches and a wall thickness of 1/4 inch. A load necessary to break the marker shall be applied at a speed of 0.2 inch per minute to the top of the marker through a 1 inch diameter solid metal cylinder centered on the top of the marker. Failure shall consist of a breakage of the marker at a load of less than 1500 pounds when applied to Class III markers or less than 750 pounds when applied to Class IV markers.

j. Sampling. Twenty (20) markers selected at random shall constitute a representative sample for each batch consisting of 10,000 markers or less. Forty (40) markers shall constitute a representative sample for lots consisting of more than 10,000 markers. The lot size shall not exceed 25,000 markers. However, if a batch represents less than 100 markers, the Officer-in-Charge may delete sampling and may accept the markers based on certification of compliance and certified test results.

k. Tolerances.

1) Three test specimens shall be randomly selected from the sample for each test except as noted in (i) above, and tested for compliance in accordance with these specifications. Should any one (1) of the specimens fail to comply with the requirements of these specifications, additional samples consisting of double the number of samples originally taken shall be tested. The failure of any one (1) of these additional samples shall be cause for rejection of the entire lot or shipment represented by the sample.

2) At the discretion of the Officer-in-Charge, a resample may be taken consisting of double the number of samples originally taken. Tolerances for resamples shall be in the same ratio as specified above.

l. Packaging. Shipments shall be made in containers which are acceptable to common carriers and packaged in such a manner as to ensure delivery in perfect condition. Any damaged shipments shall be replaced by the Contractor. Each package shall be clearly marked as to the name of the manufacturer, type, color, quantity enclosed, lot and/or batch number, and date of manufacture.

B. Reflective Pavement Markers. Reflective pavement markers shall be of the prismatic reflector type consisting of a methyl methacrylate or suitably compounded acrylonitrile butadiene styrene (ABS) shell filled with a mixture of an inert thermosetting compound and filler material. The exterior surface of the shell shall be smooth and contain one (1) or two (2) methyl methacrylate prismatic reflector faces of the color specified.

The reflective lens shall not contain any voids or air space and the back of the lens shall be metallized.

The shell shall be fabricated in a manner that shall provide a mechanical interlock between the thermosetting compound and the shell. The thermosetting compound shall bond directly to the backside of the metallized lens surface.

The base of the marker shall be flat (the deviation from a flat surface shall not exceed 0.050 inch), rough textured and free from gloss or substances which may reduce its bond to the adhesive. The presence of a soft or resin-rich film on the surface of the base shall be cause for rejection.

Reflective markers shall conform to the following requirements:

1. Optical Performance. The specific intensity of each reflective surface, when tested at 0.2 degrees angle of divergence, shall not be less than the following specified values:

	Specific Intensity			
	Clear	Yellow	Red	Blue
0° Incidence Angle	3.0	1.5	0.75	-
20° Incidence Angle	1.2	0.60	0.30	-

NOTE:

a. Angle of Incidence. The angle formed by a ray from the light source to the marker and the normal to the leading edge of the marker face.

b. Angle of Divergence. The angle formed by a ray from the light source to the marker and the returned ray from the marker to the measuring receptor.

c. Specific Intensity. The mean candle power of the reflected light at a given incidence and divergence angle for each foot candle at the reflector on a plane perpendicular to the incidence light.

$$SI = \frac{(R_L)(D^2)}{I_L}$$

Where: SI = Specific Intensity
R_L = Reflected Light

I_L = Incident Light

D = Test Distance

d. Test Method. The markers to be tested shall be located with the center of the reflecting face at a distance of 5 feet from a uniformly bright light source having an effective diameter of 0.2 inch. The photocell receptor width shall be 0.05 inch and shall be shielded to eliminate stray light. The distance from the center of the light source aperture to the center of the photocell shall be 0.2l inch. If a test distance of other than 5 feet is used, the source and receptor shall be modified in the same proportion as the test distance.

2. Color. The color of the reflectors when illuminated by an automobile headlight shall be clear, yellow, red, or blue color as required. Off-color reflection shall constitute grounds for rejection.

3. Strength Requirements. A random sample of three (3) markers shall be selected for the load test. The marker shall support a minimum load of 2,000 pounds as applied in the following manner: The marker shall be centered, base down, over the open end of a vertically positioned hollow metal cylinder. The cylinder shall be 1 inch high, with an internal diameter of 3 inches and a wall thickness of 1/4 inch. A load necessary to break the marker shall be applied at a speed of 0.2 inch per minute to the top of the marker through a 1 inch diameter solid metal cylinder centered on the top of the marker. Failure shall consist of either:

   a. breakage or significant deformation of the marker at load of less than 2,000 pounds, or

   b. significant delamination of the shell and the filler material regardless of the load required to break the marker.

4. Sampling. Six (6) markers shall be selected at random from each batch for testing. However, if a batch represents less than 100 markers, the Officer-in-Charge may delete sampling and may accept the markers based on certification of compliance and certified test results.

5. Tolerances. Should any one of the samples selected for strength testing fail to comply with the strength requirements of these specifications, six (6) additional samples shall be tested. The failure of any of these

additional six (6) samples shall be cause for rejection of the entire lot or shipment represented by the samples.

6. Packaging. Shipments shall be made in containers which are acceptable to common carriers and packaged in such a manner as to ensure delivery in perfect condition. Any damaged shipments shall be replaced by the Contractor. Each package shall be clearly marked as to the name of the manufacturer, color, type, lot number, quantity enclosed, and date of manufacture.

7. The Contractor shall use Type DB reflective markers to show fire hydrant locations. The markers shall measure 4 inches by 4 inches (+ ½″) and have a minimum area exposed to traffic of 12.5 square inches. Maximum slope of the reflective faces shall not be more than 30° nor less than 27° from the horizontal.

   The lens shall be a brilliant blue color and be a true cube-corner type reflex reflector molded of optic grade methyl methacrylate (plastic).

   The shell shall be white, molded of high impact acrylonitrile butadiene styrene (ABS).

HYDRANT MARKER LOCATION

Figure 1
TWO LANE STREET

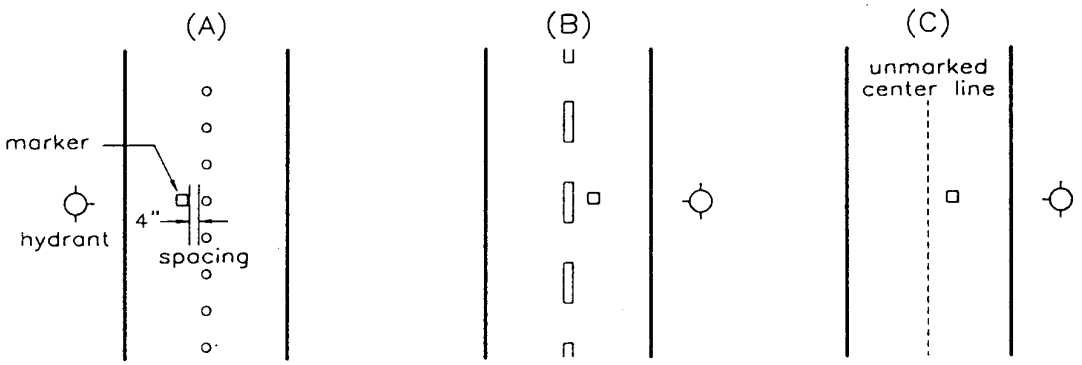


Figure 2
DIVIDED STREET

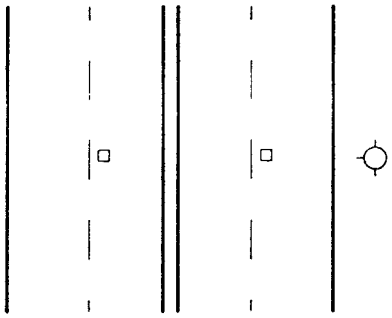


Figure 3
MULTI–LANE STREET WITH
TURN LANE

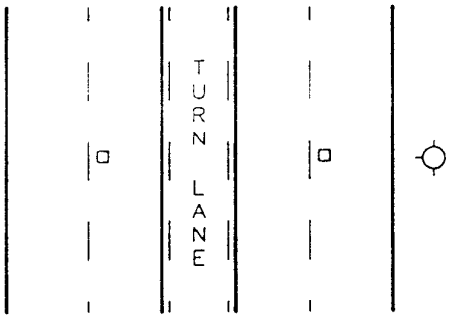


Figure 4
TWO LANE STREET
AT INTERSECTION

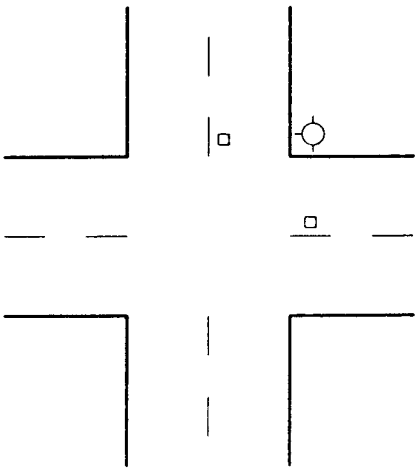


Figure 5
FOUR LANE STREET WITH TURN LANE
AT INTERSECTION

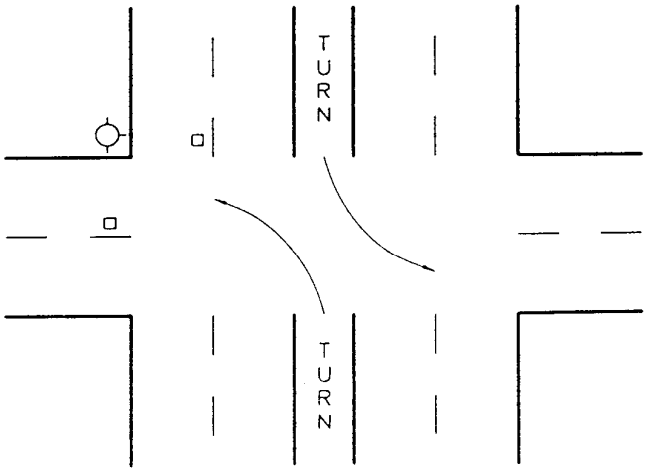


DIAGRAM A: TWO LANE HIGHWAY

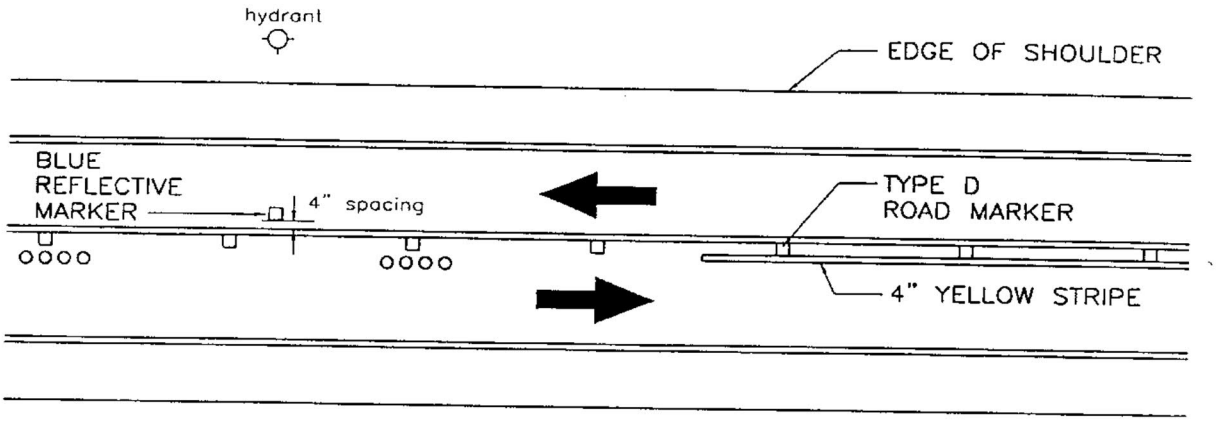


DIAGRAM B: TWO LANE HIGHWAY

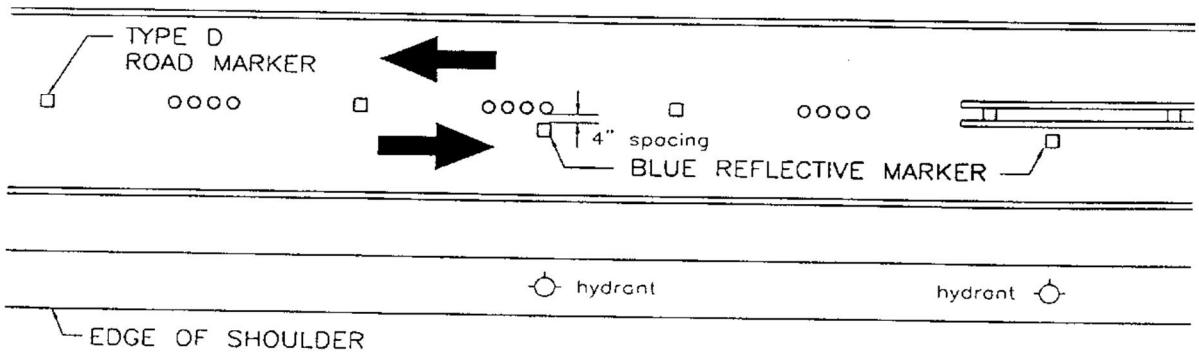
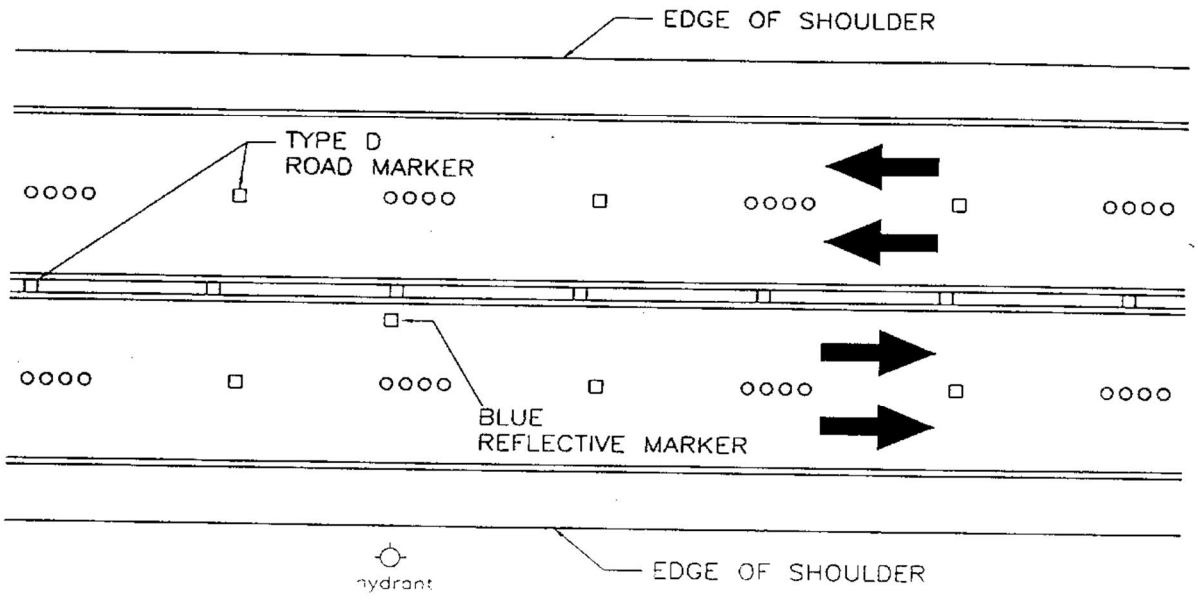


DIAGRAM C: MULTI–LANE HIGHWAY



C. Certification. Prior to installing the pavement markers, the Contractor shall submit to the Officer-in-Charge a certificate of compliance and certified test results indicating that all types of markers conform to the specifications.

SP 61.4 ADHESIVE FOR PAVEMENT MARKERS

Epoxy adhesive or bituminous adhesive shall be used in accordance with this specification. Certificate of compliance and certified test results shall be submitted for pavement marker adhesives.

Epoxy Adhesive

All adhesives shall have a white A epoxy component and a black B curing agent component, each packaged separately. The mixing ratio of Component A to Component B shall be one-to-one by volume. The color of the material when mixed shall be approximately that of Color Nos. 26132 to 21652 of Federal Standard No. 595-A. The Standard Set Type is a compositional specification, together with test requirements. The Rapid Set type is based on laboratory test requirements only. No volatile solvents or thinners shall be present in the epoxy adhesives.

Requirements. The adhesive shall have the following properties:

1. Pot Life. The pot life shall be twelve (12) minutes maximum and seven (7) minutes minimum for Standard Set Type and five (5) minutes minimum for Rapid Set Type when tested as follows at 77°F ±3°F: Mix equal volumes of components A and B in an 8-ounce, unwaxed paper cut 2 inches ±1/4 inch at base to give a 170 grams ±10 grams total mass. Mix 60 seconds ±5 seconds before timing for pot life. Test with a tongue depressor with minimum stirring. Record the time the material becomes unusable as the pot life. With most materials this shall be approximately the time a hard lump forms in the center.

2. Shear Strength. When tested as follows, the shear strength shall be not less than 1,000 psi for Standard Set Type and 900 psi for Rapid Set Type.

   Bond three (3) concrete blocks 2 inch x 3-1/2 inch x 7 inch of 7-sack concrete together with the 7-inch sides parallel forming 2 areas of contact 3-1/2 inch x 3-1/2 inch by overlapping the blocks. The test specimen then has a base of two (2) blocks and a second surface formed by the center block. Apply the adhesive to the contact surfaces and allow to cure for twenty-four (24) hours at 77°F ±3°F. Cap the base of the specimen with capping compound and test at a load rate of 10,000 pounds per minute. A swivel type head must be used at the top of the testing press. Computations are based on a total area of 24.5 square inches (shear strength = total load/24.5).

3. Viscosity. The viscosity of each component when measured in a 3/4 filled standard round quart paint can shall be between 1.0 x 105 and 3.0 x 105 centipoises for Standard Set Type and 0.8 x 105 and 2.2 x 105 centipoises for Rapid Set Type when measured as follows: Stir the components vigorously for thirty (30)

seconds with a spatula. Remove entrained air by vigorously tamping and measure viscosity within 10 minutes after stirring. Use Brookfield Viscometer, Model RVT at 5.0 RPM with a Model C Brookfield Helipath Stand and Helipath TD Spindle or approved substitute having a crossarm length of 0.804 inches for Standard Set Type and T.E. Spindle for Rapid Set Type. Use weight included in spindle set. Component and ambient temperature is to be 77°F ±3°F at time of measurement. Reading shall be taken at approximately the center of the vertical travel of the spindle.

4. Viscosity--Shear Ratio.

$$\frac{\text{Viscosity at 0.5 RPM}}{\text{Viscosity at 2.5 RPM}}$$

This ratio shall be 2.0 minimum for Standard Set Type and 1.8 minimum for Rapid Set Type for Component A and 1.9 minimum for Component B. Take the above viscosities at the same time and conditions as in Subsection 3 above.

5. Bond Strength.

   a. Clean a 4 inch x 4 inch area on a flat surface of a concrete block made with 7-sack concrete and having a tensile strength in excess of 250 psi.

   b. Use the equipment and load described in California Test Method No. 420. Condition test equipment, concrete and epoxy at test temperature for twenty-four (24) hours before test.

   c. Mix adhesive on a tin plate with a trowel or spatula for 60 seconds ±5 seconds. Immediately start timing, place adhesive on pipe cap and press firmly in place on concrete. Just before the required test time, insert the dynamometer hook into pipe cap.

   d. After curing 3-1/3 hours for Standard Set Type and twenty-five (25) minutes for Rapid Set Type at 77°F ±3°F measured from the end of the mixing period, the bond strength shall be at least 200 psi.

6. Weight Per Gallon, Pounds at 77°F ±3°F (Standard Set Type).

Component A	11.5 - 11.8
Component B	11.7 - 12.1

Composition:

STANDARD SET TYPE

Component A	Parts by Weight
Epoxy Resin[1]	100.0
Titanium Dioxide, TT-P-422, Type III or IV	7.31
Resin Grade Asbestos[2]	5.00
Talc[3]	37.64

Component B	
N-Aminoethyl piperazine1	23.16
Nonylphenol5	52.00
Carbon Black, TT-P-343, Form 1, Class B	0.22
Talc3	77.37
Resin Grade Asbestos[2]	1.00

[1]Viscosity, 5-7 poises at 25°C; epoxide equivalent 175-195; Color (Gardner), 5 maximum; manufactured from epichlorohydrin and bisphenol A. The reactive diluent shall be butyl glycidyl ether.

[2]Specific gravity, grams per ml., 2.45; moisture content, % by weight, 2.0 maximum; surface area, square meters per gram, 60 approximately; reflectance, G.E. brightness, 72-76; nature of surface charge, electropositive (cationic); pH in water, 9.5; bulking value, gallons per 100 lbs., 4.8; oil absorption (DOP), pound per 100 lbs., 120; refractive index, n_d 25°C., 1.54-1.56; wet bulk density in water, after dispersion, 2 grams per liter, settling after 1 hr., 100 ml. clear maximum; dry bulk density, pounds per cubic foot, 4.

[3]Percent passing U.S. No. 325 sieve, 94-96; maximum particle size, 70 microns, oil absorption (Gardner-Coleman), 6-7 ml. per 20 grams; fineness in oil (Hegman) 1-2; specific surface, 0.5-0.6 square meter per gram; consistency (40% suspension in linseed oil) 55-60 KU.

[4]Color (ALPHA) 50 maximum; amine value 1250-1350 based on titration which reacts with the 3 nitrogens in the molecule; appearance clear and substantially free of suspended matter.

[5]Color (ALPHA) 50 maximum; hydroxyl number 245-255; distillation range, °C. at 760 mm first drop 295 minimum, 5% 298 minimum, 95% 325 maximum; water, % (K.F.) 0.05 maximum.

Directions for use:

Any settling of fillers or pigments in Components A or B shall be completely redispersed to provide a homogeneous mix before the components are used. Just before use, Components A and B shall be mixed in a one-to-one ratio by volume.

When the Rapid Set Type adhesive is used, the components shall be mixed by a 2-component type automatic mixing and extrusion apparatus. The temperature of the Rapid Set Type adhesive shall be maintained at 65°F. to 85°F. before mixing. The temperature of the Standard Set Type adhesive shall be maintained at 60°F. to 100°F. before mixing. Any heating of epoxy adhesive shall be done by the application of indirect heat.

Packaging and Labeling of Adhesive. Each adhesive component shall be packaged in containers not larger than five (5) gallons in volume. The containers shall be new steel, not less than No. 24 gage and shall otherwise meet Interstate Commerce shipping standards. Each container shall be clearly labeled with designation (Component A or B), type (Standard or Rapid Set), manufacturer's name, date of manufacturer, batch number (a batch shall consist of a single charge of all components in a mixing chamber), directions for mixing, and the following warning:

> "CAUTION
>
> This material will cause severe dermatitis if it is allowed to come in contact with the skin or eyes. Use gloves and protective creams on the hands. Should this material contact the skin, wash thoroughly with soap and water. Do not attempt to remove this material from the skin with solvents. If any gets in the eyes, flush for 10 minutes with water and secure immediate medical attention."

Sampling. One (1) quart sample of each of the components (A and B) from each batch shall be sampled for testing.

Certification. The Contractor shall submit to the Officer-in-Charge a certificate of compliance indicating that all types of adhesives conform to the requirements of the specifications.

Bituminous Adhesive

Bituminous adhesive shall conform to the following requirements:

1. Properties and Test Methods

BITUMINOUS ADHESIVE PROPERTIES AND TEST METHODS			
Property	Min	Max	Test Method
Softening Point, degrees F	200	-	ASTM D 36
Penetration, mm, 100g, 5 sec., 77 degrees F	1.0	2.0	ASTM D 5
Filler Content, percent by weight (Insoluble in 1, 1, 1 Trichloroethane)	65	75	ASTM D 2371
Brookfield Thermosel Viscosity, centipoise, No. 27 Spindle, 20 RPM, 400 degrees F	3000	6000	ASTM D 4402
Flash Point, C.O.C., degrees F	550	-	ASTM D 92

2. Filler Properties. Filler material used in bituminous adhesive shall be Type PC, Grade III, calcium carbonate conforming to ASTM D 1199, and shall conform to fineness specified in the Bituminous Adhesive Filler Fineness table.

BITUMINOUS ADHESIVE FILLER FINENESS

Sieve Sizes	Percent Passing
No. 100	100
No. 200	95
No. 325	75

3. Packaging and Labeling. Adhesive shall be packaged in self-releasing, stacking, cardboard containers, approximately 10-inch cubes. Containers shall have net weight of about sixty-two (62) pounds. Containers shall be labeled with manufacturer, quantity, and batch number. Words “Bituminous Adhesive for Pavement Markers” shall be printed in bold lettering on label.

SP 61.5 REFLECTIVE THERMOPLASTIC COMPOUND PAVEMENT MARKINGS

A. General. Reflective thermoplastic compound pavement markings shall be a substance, free of volatiles (including, but not limited to lead and chromium), which is machine applied to the pavement surface in a hot molten state and which, after cooling to the ambient temperature, and without polymerization or other chemical change, forms a traffic marking stripe of the quality and appearance as specified herein.

The material used shall be an alkyd type product especially compounded for traffic markings.

The installed stripe shall not be slippery when wet.

The compound shall not deteriorate by contact with sodium chloride, calcium chloride, oil content of pavement materials, or from oil droppings from traffic.

In the plastic state, the material shall not give off fumes which are toxic or otherwise injurious to persons or property. The material shall not break down or deteriorate if held at the plastic temperature for a period of 4 hours, or by reason of four (4) reheatings to the plastic temperature.

There shall be no obvious change in color of the material as a result of up to four (4) reheatings, or from batch to batch.

To ensure the best possible adhesion, the compound shall be installed in a melted state of a minimum temperature of 375°F, and the material shall not scorch or discolor if kept at temperatures between 380° to 450° Fahrenheit for up to 4 hours.

The pigmented binder shall be well dispersed and free from all skins, dirt, foreign objects, or such ingredients as will cause bleeding, staining, or discoloration.

After application and proper drying time, the material shall show no appreciable deformation or discoloration under local traffic conditions, and in an air and/or road temperature ranging from 0 to 120° Fahrenheit.

Under this specification, the term "drying time" shall be defined as the minimum elapsed time, after application, when the stripe shall have and retain the characteristics required by the preceding sections. In addition, the drying time shall be established by the minimum elapsed time after application, after which normal local traffic will leave no impression or imprint on the applied marking.

The drying time shall not exceed a characteristic straight line curve, the lower limits of which are two (2) minutes at 50°F, the upper limits of which are fifteen (15) minutes of 90°F, both temperatures measured at a maximum relative humidity of 70 percent.

The stripe shall maintain its original dimensions and placement. The exposed surface shall be free from tack. Cold ductility of the material shall be such as to permit normal movement with the road surface without chipping.

The marking shall have a uniform cross section. Pigment shall be evenly dispersed throughout the material. The density and character of the material shall be uniform throughout its thickness.

The material shall not smear or spread under normal traffic conditions at temperatures below 120°F.

The filler to be incorporated with the resins or binders shall be a white calcium carbonate or approved substitute filler.

The white thermoplastic shall have a pigment containing not less than 6 percent per Titanium Dioxide, and, after setting, shall be pure white, free from dirt or tint.

Yellow reflectorized thermoplastic compound shall be "Federal Yellow".

The binder shall consist of a mixture of non-drying synthetic resins at least one (1) of which is solid at room temperature. The total binder content of the thermoplastic compound shall be not less than 15 percent nor more than 35 percent by weight.

The material shall not change in its color and brightness characteristics after prolonged exposure to sunlight.

During manufacture, reflectorizing beads shall be mixed into the material to the extent of not less than 20 percent nor more than 50 percent by weight of the material. The beads that are applied to the surface of the material shall be automatically applied at a uniform rate of approximately 3 pounds of glass beads to every 100 square feet of line.

The glass beads used in the formulation shall have a refractive index of not less than 1.51 when tested by the liquid immersion method at 25°C; shall consist of 70 percent min. by count of true spheres; shall be free from air inclusions; and shall have the following graduation:

U. S. Sieve Number	Percent Passing
30	90 - 100
40	35 - 100
100	0 - 10

Not less than 70 percent of the spheres shall meet the following requirements:

1. The surface of the spheres shall be smooth, lustrous, and free from film scratch and pits.

2. The spheres shall be clear and transparent and shall not be oviate in shape or fused spheroids.

3. The spheres shall show high autocollimating efficiency. Not more than one percent shall be black, amber, or milky.

The glass beads dropped on the applied marking shall have a refractive index of not less than 1.51 when tested by the liquid immersion method of 25°C., shall consist of 70 percent min. by

count of true spheres; shall be free from air inclusion; and shall have the following gradation:

U. S. Sieve Number	Percent Passing
20	90 - 100
80	0 - 10

Not less than 70 percent of the spheres shall meet the following requirements:

1. The surface of the spheres shall be smooth, lustrous, and free from film scratch and pits.

2. The spheres shall be clear and transparent and shall not be oviate in shape or fused spheroids.

3. The spheres shall show high autocollimating efficiency. Not more than one percent shall be black, amber, or milky.

B. Specifications and Tests.

1. Color.

a. White. Initially white; as demonstrated by a standard color difference meter such as the Gardner Color Difference Meter manufactured by Gardner Laboratories, Inc., Bethesda, Maryland, or approved substitute, the material shall show deviations from a magnesium oxide standard not greater than the following:

Scale Definition	Mag. Oxide Standardized Sample	
Rd Reflectance	100	70 minimum
a Redness-Greenness	0	-5 to +5
b Yellowness-Blueness	0	-10 to +10

b. Yellow. Initially yellow; equal to standard color chips using Federal test method standard 141 Method 4252.

2. Color Retention. The retention of the initial color shall be determined as follows: Specimens shall be prepared and tested from the samples submitted in accordance with ASTM D 620-57T, "Tentative Method of Test for Colorfastness of Plastics". The ultraviolet light source shall be as specified from the test procedure or optionally may be a General Electric 275 watt sun lamp bulb, type RS, with built-in reflector, or approved substitute. After 100 hours of exposure, specimens shall

show no perceptible color change when compared visually with an unexposed specimen.

3. Water Absorption. Material shall have not more than 0.5 percent by weight of retained water, when tested by ASTM D 570, procedure a.

4. Softening Point. Material shall have a softening point of not less than 90°C, as determined by ASTM E 28.

5. Specific Gravity. Specific gravity of compound at 25°C. shall be from 1.9 to 2.5.

6. Impact Resistance. The impact resistance shall not be less than 15 inch-pounds at 77°F. after the material has been heated for four (4) hours at 400°F. and cast into bars of one-inch cross sectional area and three inches long and placed with one-inch extending above the vise in a cantilever beam (Izod Type) tester using the 25-inch pound scale. See ASTM D 256 for description of this instrument.

7. Bond Strength. When two (2) concrete blocks 2 inches by 3-1/2 inches by 7 inches are cemented together on the 3-1/2-inch by 7-inch faces with a 1/16 to 1/8-inch layer of the thermoplastic traffic line material and tested according to ASTM C 321, the bond strength shall not be less than 150 pounds square inch.

8. Indentation Resistance. The reading of the Shore Durometer, Type A, as described in ASTM D 2240 after 15 seconds shall not be less than the amounts herein designated when the material is tested after heating for 4 hours at 400°F., and cooled to the following temperatures:

Temperature	Reading
115°F.	65
77°F.	95
40°F.	95

C. Packaging. Each unit container shall be clearly and adequately marked to indicate the color of the material, the process batch number or similar manufacturer's identification, the manufacturer's name and location of plant, and the date of manufacturer.

The material shall be delivered to a designated area in unit containers as processed by the manufacturer. Each unit container when filled shall weigh no less than 24 lbs. or more than 52 lbs.

D. Warranty. Thermoplastic compound pavement marking material furnished and installed under this specification shall be guaranteed by the Contractor against failure due to poor adhesion resulting from defective materials or methods of application.

E. Equipment. The material shall be applied to the pavement by an extrusion method wherein one (1) side of the shaping die is the pavement and the other three (3) sides are part of the equipment.

The equipment shall provide continuous mixing and agitation of the material. Conveying parts of the equipment shall be constructed to pavement accumulation and clogging. All parts of the equipment which come in contact with the material shall be easily accessible and exposable for cleaning and maintenance.

All mixing and conveying parts including the shaping die shall maintain the material at the plastic temperature.

The equipment shall ensure continuous uniformity in the dimensions of the stripe. The thickness of the material on the pavement shall be no less than 3/32 inch and no more than 3/16 inch measured as an average in any three foot length.

The applicator shall cleanly cut off square stripe ends and shall be capable of applying "skip" lines. The use of pans, aprons or similar appliances which the die overruns shall not be permitted.

Beads applied to the surface of the completed stripe shall be applied by an automatic bead dispenser attached to the liner in such a manner that the beads are dispensed almost instantly upon the completed line. The bead dispenser shall be equipped with an automatic cutoff control synchronized with the cutoff of the thermoplastic material.

The equipment shall be constructed to provide for varying die widths to produce varying widths of traffic markings.

A special kettle shall be provided for melting and heating the composition. The kettle shall be equipped with an automatic thermostatic control device so that heating can be done by controlled heat transfer liquid rather than direct flame, to provide positive temperature control and prevent overheating of the composition.

The applicator and kettle must be equipped and arranged to satisfy the requirements of the National Fire Underwriters.

The applicator shall be mobile and maneuverable to the extent that straight lines can be followed and normal curves can be made in a true arc.

The applicator shall be capable of containing a minimum of 125 pounds of molten material.

F. Application. The Contractor shall clean off dirt, blaze, paint, tape and grease where necessary and as directed by the Officer-in-Charge.

The material may be installed in variable widths from 2 inches to 12 inches.

On pavements containing less than 6 percent bituminous asphalt and on all concrete pavements, the Contractor shall prestripe the application area with a binder material as recommended by the manufacturer.

The compound shall be installed in a melted state at temperatures of 380° to 450° Fahrenheit.

The minimum installed thickness of the line as viewed from a lateral cross section shall be not less than 3/32nds of an inch at the edges, nor less than 1/8th of an inch in the center. The measures shall be taken as an average throughout any 36-inch section of the line.

The new line when applied over an old line of compatible material shall bond itself to the old line in such a manner that no splitting or separation takes place during its useful life.

The finished lines shall have well defined edges and be free of waviness.

SP 61.6 CONSTRUCTION REQUIREMENTS

A. General. Pavement markers and markings shall be applied to surfaces that have been thoroughly cleaned and are free of dirt, dust, curing compound, grease, oil, moisture, loose aggregates, unsound layers and any other material which would adversely affect the bond of the adhesive or paint.

In the installation of pavement markers, the cleaning of portland cement concrete and asphalt concrete surfaces shall be by blast cleaning. Clean, newly placed asphalt concrete need not be blast cleaned unless the surface contains an abnormal amount of asphalt or the surface is contaminated with dirt, grease, oil or any other material which would adversely affect bonding.

Permanent pavement markers, striping and markings shall be applied no sooner than seven (7) calendar days nor later than fourteen (14) calendar days after completion of the pavement. If bituminous adhesive is used, apply pavement markers not less than seven (7) calendar days after completing pavement. If epoxy adhesive is used, apply markers not less than fourteen (14) calendar days after completing pavement.

Unless otherwise specified, the Contractor shall establish control points, satisfactory to the Officer-in-Charge, spaced at intervals that shall insure accurate location of pavement

markers and striping. Markers and markings shall not be applied when moisture or foreign matter is present on the pavement surface or when wind conditions are such as to cause dust to be deposited on the prepared areas or to prevent satisfactory application of the marker adhesive or marking.

The Contractor shall paint temporary guidelines and outline of arrows, legends and crosswalks with a 2" wide brushed line on the day the roadway is opened to traffic which shall be reviewed by the Officer-in-Charge before permanent lines are installed.

The Contractor shall furnish and place all warning and directional signs necessary to direct and control the traffic during marker installation or the striping operations. Warning signs shall be set up before the beginning of each operation and extra signs shall be kept well ahead of the marking equipment.

The Contractor shall install all markers and apply all pavement striping before opening roadways to public traffic except that when connections to existing pavements are made or when temporary detours carry public traffic, the Contractor shall mark or stripe the connecting pavements on the day that the roadway is open to traffic.

If the Contractor is unable to provide the permanent pavement markings and it is necessary to run public traffic over roadways soon after paving, the Contractor shall paint, on the day of each day's paving, temporary guide dashes at the traffic stripe or marker location on the pavement, as guidance for drivers, until the permanent markings can be placed. The Contractor shall maintain and repaint, if necessary, all temporary markings until the permanent striping and/or markers are installed. This work shall be considered as included in the items of paving, pavement markers and/or pavement striping, and no separate payment shall be made therefor.

B. Pavement Markers. Use bituminous adhesive or standard set type epoxy adhesive to bond pavement markers to pavement. If directed by the Officer-in-Charge, the Contractor shall use Rapid Set Type adhesive for the Standard Set Type adhesive at no extra cost to the City.

Submit samples of the markers and adhesives proposed for use to the Officer-in-Charge, for testing and review, at least ten (10) calendar days before the date of their intended use.

Heat and dispense bituminous adhesive from equipment that can maintain required temperature.

The adhesive shall be placed uniformly on the cleaned pavement surface or on the bottom of the marker in a quantity sufficient to result in complete coverage of the area of contact of the marker with no voids present and with a slight excess after the marker has been pressed in place. The marker shall be placed in position and pressure applied until firm contact is made with the pavement. Excess adhesive around the edge of the

marker, excess adhesive on the pavement, and adhesive on the exposed surfaces of the markers shall be immediately removed. Soft rags moistened with mineral spirits conforming to Federal Specification TT-T-291E or kerosene may be used, if necessary, to remove adhesive from exposed faces of pavement markers. No other solvent shall be used. The marker shall be protected against impact until the adhesive has hardened to the degree designated by the Officer-in-Charge.

The adhesive requires that the mixing operation and placing of the markers be done rapidly. When hand mixing or machine mixing the Standard Set Type adhesive, all markers shall be aligned and pressed into place within five (5) minutes after mixing is started. When hand mixing Standard Set Type adhesive, not more than one quart shall be mixed at one time. Any mixed batch which becomes viscous so that the adhesive cannot be readily extruded from under the marker on application of slight pressure shall not be used.

When the Rapid Set Type adhesive is used, the components shall be mixed by a 2-component type automatic mixing and extrusion apparatus, the markers shall be placed within 60 seconds after the adhesive has been mixed and extruded and no further movement of the marker shall be allowed.

Automatic mixing equipment for the epoxy adhesive shall use positive displacement pumps and shall properly meter the components in the specific ratio, ±5 percent by volume of either component. At the beginning of each day and at any other time directed by the Officer-in-Charge, the ratio shall be checked by the Contractor in the presence of the Officer-in-Charge. This check shall be made by disconnecting the mixing heads, or using suitable bypass valves, and filling two (2) suitable containers with the unmixed components. The mixing head shall properly mix two (2) components so that there is no trace of black or white streaks in the mixed material.

The Standard Set Type adhesive shall not be used when either the pavement or the air temperature is less than 50°F. The Rapid Set Type adhesive shall not be used when either the pavement or the air temperature is less than 30°F. No markers shall be installed if the relative humidity of the air is greater than 80 percent or if the pavement is not surface dry. The Officer-in-Charge shall be the judge as to when the adhesive has set sufficiently to bear traffic. Where bituminous adhesive is used, protect marker against impact until adhesive has hardened to the degree designated by the Officer-in-Charge. Where epoxy adhesive is used, protect pavement markers against impact until adhesive has hardened, using the following table as a guide; however, the times shown may vary, depending upon field conditions:

TIME TO BEAR TRAFFIC

Temperature* (°F)	Standard Set Type (Hours)	Rapid Set Type (Minutes)
100	1-1/2	15
90	2	20
80	3	25
70	4	30
60	5	35
50	7	45
40	No Application	65
30	Below 50°F	85
		No Application Below 30°F

*The temperature indicated is either pavement surface or air temperature, whichever is lower. The hardness of the rim of epoxy around the marker shall not be used as an indication of the degree of cure of the epoxy under the marker.

Types A and J pavement markers that are used to delineate 10-foot lane stripes shall be installed in sets of four (4) markers as called for on the plans. Installation of fractional sets (i.e., one (1), two (2) or three (3) markers) shall not be permitted. The length of the 10-foot stripe and 30-foot gap may vary plus or minus 1 foot to properly distribute the spacing of stripes.

No pavement markers shall be installed over longitudinal or transverse joints of the pavement surface.

C. Pavement Striping and Markings. Pavement striping and markings shall be of the length, width and placement specified and shall conform to the Department of Transportation Services Standards. Pavement arrows, legends, and crosswalks shall be applied with appropriate templates (refer to the MUTCD 2009 or current Edition).

No stripe shall be less than the specified width. No stripe shall exceed the specified width by more than 1/2 inch. The length of the 10-foot marked or painted segment for skip stripe may vary plus or minus 1 foot and the 30-foot gap between segments may vary plus or minus 1 foot. The alignment of the stripe shall not deviate from the intended alignment by more than 1 inch on tangents and on curves up to and including one degree. On curves exceeding one degree, the alignment of the stripe shall not deviate from the intended alignment by more than 2 inches.

When necessary to correct a deviation which exceeds the permissible tolerance in alignment, that portion of the stripe so affected shall be removed plus an additional 30 feet in each direction, and a new stripe then provided in accordance with these specifications.

All stripes, segments of stripes and markings shall present a clean cut, uniform appearance. All striping and markings which fail to meet the requirements specified herein, or are marred or damaged by traffic or from other causes, shall be corrected prior to acceptance by the City at the Contractor's expense. All misted areas, drip and spattered paint shall be removed to the satisfaction of the Officer-in-Charge.

The freshly painted temporary stripe shall be protected by cones or other satisfactory devices until the traffic paint is dry and will not transfer to car tires. All stripes damaged by traffic, or pavements marked by traffic crossing wet paint shall be repaired or corrected as specified below.

The Contractor shall submit to the Officer-in-Charge test specimens as requested. Test films shall be applied to a suitable plane rigid surface. The area shall be of sufficient size to permit film thickness measurement to be made at least 1 inch from any edge.

D. Removing Existing Pavement Markers, Striping and Markings for Restriping Applications. Existing pavement markers, striping, and markings shall be removed by methods that cause the least possible damage to the pavement or surfacing. Existing pavement markings and striping may contain lead.

Where specified on the plans, existing pavement striping and markings shall be removed to the fullest extent possible by methods that shall not materially damage the surface or texture of the pavement, or leave impressions on the roadway that could be confused with permanent striping during inclement weather or night driving conditions. Any damage to the pavement or surfacing caused by the removal operations shall be repaired by the Contractor at their expense by methods acceptable to the Officer-in-Charge. Removal, reuse, and disposal of all surplus materials shall be in compliance with all Federal, State, County, and OSHA requirements and regulations. This work shall be considered as included in the items of paving, pavement markers, and/or pavement striping, and no separate payment shall be made thereafter.

Painting over the existing striping and markings shall not be permitted. Burning off existing striping and markings shall be permitted using an acceptable method using excess oxygen.

Sand or other material deposited on the pavement as a result of removing pavement markers, traffic striping and markings shall be removed as the work progresses. Accumulation of sand or other material which may constitute a hazard to traffic shall not be permitted.

Extraneous traffic striping and markings shall be removed before any change is made in the traffic pattern.

SP 61.7 REMOVAL OF TEMPORARY TAPE TRAFFIC MARKINGS

The Contractor shall remove all temporary tape striping placed to delineate traffic lanes, crosswalks, stop bars, etc., prior to the lay down of the finish asphalt concrete mix layer.

SP 61.8 MEASUREMENT AND PAYMENT (for applicable pay items included in the Offer)

All pavement striping, markings, and markers include but are not limited to: raised pavement markers, Thermoplastic pavement striping and markings (including islands, gore striping, curb markings, guide lines, yield lines, stop bar, transverse striping, and speed humps), Thermoplastic International crosswalk markings, pavement arrows, legends, symbols, and words. The Officer-in-Charge will not measure pavement striping, markings, and markers for payment. The Officer-in-Charge will not pay for the accepted pavement striping, markings, and markers separately and will consider the cost for pavement striping, markings, and markers as included in the contract price for each respective street lump sum contract bid item as specified in the Offer schedule and in accordance with SP 151 DESCRIPTION OF WORK.

The Officer-in-Charge will not measure removal of existing extraneous pavement markers/striping for payment. The Officer-in-Charge will not pay for the accepted removal of existing extraneous pavement markers/striping and will consider the cost for this work as included in the contract prices for the various pavement markers/striping contract pay items. The cost is for the work prescribed in this section and the contract documents.

The Officer-in-Charge will not measure the temporary pavement markings installed for the longitudinal guidance of public traffic over reconstructed areas, cold planed surfaces, newly paved surfaces or other unmarked or scarified areas for payment. The Officer-in-Charge will not pay for the accepted temporary pavement markings installed for the longitudinal guidance of public traffic over reconstructed areas, cold planed surfaces, newly paved surfaces or other unmarked or scarified areas separately and will consider the cost for this work as included in the contract prices for the various pavement markers/striping contract pay items. The cost is for the work prescribed in this section and the contract documents.”

END OF SECTION SP 61

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 62 - VEHICLE DETECTOR LOOP

SP 62.1 DESCRIPTION

This work shall consist of installing vehicle detector loops in accordance with this special provision and the project plans. The exact number, locations, and layout will be determined in the field by the Transportation Technology Division of the Department of Transportation Services, telephone (808) 768-8388.

The Contractor shall install new vehicle detector loops within fourteen (14) calendar days after removal of existing vehicle detector loops. For downtime of fourteen (14) to thirty (30) calendar days, the Contractor shall furnish and install approach-only microwave vehicle detector at affected locations. For downtime of thirty (30) calendar days or more, the Contractor shall furnish and install video detection system, or other vehicle detector as directed by the Officer-in-Charge.

Removal and replacement of vehicle loop detectors shall be shown on the Contractor's project performance schedule, and three (3) week look ahead schedules. The Contractor shall not remove existing vehicle loop detectors until the Contractor's performance schedule and three (3) week look ahead schedules are accepted by the Officer-in-Charge.

SP 62.2 MATERIALS

A. Vehicle Detector Loop Cable

Vehicle Detector Loop Cable shall be Type 4 Cable; 12 AWG stranded THHN conductor; 600 volts; inserted into polyethylene tube, 0.25-inch maximum diameter; and IMSA Specification No. 51-5 certified.

B. Sealant for Vehicle Detector Loop

Sealant shall be epoxy sealant, hot applied rubberized sealant, or high performance detector loop sealant. Certificate of compliance and certified test results shall be submitted for sealant.

1. Epoxy Sealant. Epoxy sealant shall be high-viscosity, liquid epoxy formulated primarily for use in sealing inductive wire loops and leads embedded in HMA and portland cement concrete for traffic signal controls and vehicle counters. Epoxy sealant shall cure rapidly. Epoxy sealant shall be placed on grades up to fifteen (15) percent without excessive flow of material.

(A) Composition.

TABLE 62-1 - EPOXY SEALANT COMPONENTS	
Component A	**Parts by Weight**
Epoxy Resin[1]	85.00
Orthocresol Glycidyl Ether[2]	15.00
Titanium Dioxide (ASTM D 476 Type III or IV)	2.00
Colloidal Silica[3]	1.50
Glycerine (ASTM D 1257)	0.50
Silicone Anti-Foam, Type Q	0.01
Component B	**Parts by Weight**
High Functionality Polymercaptan Hardener[4]	40.00
N-Aminoethyl Piperazine[5]	10.00
2, 4, 6-Tri (Dimethyl-aminomethyl) Phenol[6]	4.00
Polysulfide Polymer[7]	48.94
Colloidal Silica[3]	1.00
Glycerine (ASTM D 1257)[8]	0.50

TABLE 62-1 - EPOXY SEALANT COMPOSITION (CONTINUED)	
Carbon Black	0.10
Silicone Anti-Foam, Type Q	0.01

[1] Di glycidyl ether of bisphenol A, viscosity, 100-160 poise at 25 degrees C; epoxide equivalent 180-200. Color, Gardner 1933, 3 max.

[2] Viscosity at 25 degrees C., 5-10 Centipoise. Weight per gallon 9.00-9.10 pounds. Epoxide equivalent 180-200.

[3] $Si0_2$, (moisture-free basis), 99 percent minimum; refractive index, 1.46; surface area, 175-225 square meters per gram; particle size 0.015 microns; pH (4 percent aqueous dispersion), 3.5-4.2; pour density, 2.3 lbs./cu. ft. maximum; free moisture at 105 degrees C., 1 percent maximum.

[4] Liquid polymercaptan resin, viscosity 100-130 poise at 25 degrees C; specific gravity 1.14-1.16; mercaptan value, 3.6 meg/gram. Color, Gardner 1933, 1.

[5] Color (APHA) 50 maximum, amine value 1250-1350 based on titration that reacts with the 3 nitrogens in the molecule; appearance clean and substantially free of suspended matter.

[6] Formula weight 265; specific gravity at 25 degrees C; distillation range 96 percent at 130 degrees C to 160 degrees C (0.5-1.5 mm.); flash point, Tag Open Cup, 300 degrees F minimum; water content 0.06 percent maximum.

[7] Specific gravity, 1.24-1.30 at 20 degrees/20 degrees C; viscosity, 700-1200 centipoises, Brookfield at 25 degrees C; pH water extract, 6.0-8.0; moisture content, 0.1 percent maximum; pour point, -15 degrees F; average molecular weight, 1000; flash point, degrees F, Cleveland Open Cup, 390 minimum; sulfur content, percent, 36-40; color, Hellige, 9-12. The product shall be difunctional mercaptan made from 8 mole percent of bis (2-chloroethyl) phenol and 2 mole percent of trichloropropane.

[8] Surface area, square meters/gram, 80-150; particle diameter millicrons, 18-30; pH, 7.0-8.5; fixed carbon (moisture free), percent, 96-98; volatile matter, 1-4; oil absorption, stiff past endpoint, cc/gram, 0.75-0.90.

(B) Characteristics of Components.

TABLE 62-2 - EPOXY SEALANT COMPONENT CHARACTERISTICS		
Characteristics	**Component A**	**Component B**
Viscosity, Poise, Brookfield	100 – 250	100 - 250
Shear Ratio (minimum)	2.0	1.8

(C) Characteristics of Combined Components.

TABLE 62-3 - EPOXY SEALANT COMBINED COMPONENT CHARACTERISTICS	
Gel Time, minutes (minimum)	13 to 18
On 1/8-inch cast sheet, cured 18 hours at 77 degrees F ±5 hours at 158 degrees F.	
Tensile Strength, psi (minimum)	400
Elongation, percent (minimum)	90
Shore D Hardness (minimum)	45
Color of Mixed Components	Color No. 26081 to Color No. 26173 of Federal Standard No. 595B

(D) Directions for Use. Mixing ratio by volume shall be one (1) part of Component "A" to one (1) part of Component "B". Only the amount that can be used within ten (10) minutes shall be mixed from the time mixing operation starts.

2. Hot Applied Rubberized Sealant. Hot applied rubberized sealant shall be flexible and suitable to seal inductive wire loops embedded in HMA and portland cement concrete pavements for traffic signal work and vehicle counters. Sealant shall be non-tracking under traffic; and at application temperatures, sealant shall be a thin, free flowing fluid that penetrates saw cuts and self-levels to permit uniform applications. Sealant shall be melted and applied to pavements using pressurized application unit. Sealant shall be relatively stiff but remain flexible at low pavement surface temperatures. Test results shall conform to the following:

TABLE 62-4 - HOT APPLIED RUBBERIZED SEALANT

TESTS	SPECIFICATIONS
Penetration, 77 degrees F (maximum)	25 to 35
Flow, 140 degrees F, mm (maximum)	0 to 5
Resilience, 77 degrees F, percent (minimum)	40
Softening Point, degrees F (minimum)	180
Ductility, 77 degrees F, cm, (minimum)	30
Mandrel Bend, 0 degrees F, 180 degrees 5s, 1/2-Inch Diameter	-
Recommended Pour Temperature, degrees F	380
Safe Heating Temperature, degrees F	410
Viscosity, 375 degrees F, poise	30
Unit Weight, pounds/gallon	10.0
Coverage, 1/2-Inch x 1/2-Inch Crack, pounds per 100 foot	13.0

3. High Performance Detector Loop Sealant. Sealant shall provide environmental protection for loop vehicle detection system wires. Sealant material shall have sufficient compressive yield strength to withstand normal vehicular traffic and shall have sufficient flexibility to withstand normal movement in asphalt and concrete road pavements. Sealant material shall protect loop wire from moisture, penetration, fracture, and shear forces.

(A) General. Sealant shall have the following characteristics:

(1) One-part elastomeric compound requiring no mixing, measuring, or application of heat prior to or during its installation.

(2) Cure only in presence of moisture when within its stated shelf life and when contained in original undamaged packaging. Rate of cure depends upon temperature and relative humidity at time of installation. Cool, dry weather will slow curing; warm, humid weather will accelerate curing.

(3) Flow characteristics that ensure complete encapsulation of wires.

(4) Viscosity such that sealant remains in detector sawcut in sloped roadbed areas during or after application.

(5) Enables vehicular traffic to pass over properly filled 1/4-inch- to 3/8-inch-wide sawcut immediately after installation. Sealant shall not pull out of sawcut during curing.

(6) Exhibits minimal shrinkage during curing.

(7) Sealant shelf life, in undamaged containers when stored below 80 degrees F, shall be as follows:

(a) Liter ply packs: Nine (9) months after receipt.

(b) Five (5) gallon pails (containing 4.5 U.S. gallons): Twelve (12) months after receipt.

(c) Gallon drums (containing 50 U.S. gallons): Twelve (12) months after receipt.

(8) Permits cleanup with cleaner that shall not threaten or cause harm to workers or environment.

(B) Retention Test. Percent by weight retention test used to measure non-flow properties of one-component sealant shall conform to the following.

(1) Equipment and Materials:

(a) Balance.

(b) Tongue Depressor.

(c) 2-ounce ointment cans or approved substitute.

(d) 1-inch wide masking tape.

(e) Percent retention (aluminum) test fixture.

(f) Becton Dickinson (B-D) 10 c.c. syringe.

(g) Sample of sealant to be tested.

(2) Procedure:

(a) Put strip of masking tape on both ends of test fixture completely covering slot.

(b) Weigh fixture with masking tape.

(c) Stir sample for one (1) minute prior to testing. Test sample of sealant at 75 to 79 degrees F.

(d) Fill syringe with sample and inject sample into test fixture slot.

(e) Scrape off excess sealant from top of test fixture with tongue depressor. Sealant shall fill test fixture slot and shall be level with top of test fixture.

(f) Re-weigh test fixture with sample material filling slot.

(g) Put fixture on top of two-ounce ointment cans and remove masking tape from sides.

(h) Wipe off and discard sealant on pieces of masking tape. Do not discard pieces of masking tape.

C. Approach-Only Microwave Vehicle Detector

Approach-only microwave vehicle detector shall be capable of detecting motion of every vehicle type, including mopeds, moving in only one direction utilizing a very low power microwave beam.

The detector's range shall be from 3 feet to 100 feet or greater. Base the cone of the detector on a 16 degrees field

of view with a maximum width of 18-1/2 feet at 60 feet. The detector shall have two (2) field adjustment controls, those being range control and time delay extension.

The extension timer shall be capable of extending the detector output from at least 0.5 to 7.5 seconds. Begin the extension with the termination of the detected vehicle output and continue for the duration of the selected extension time interval.

The microwave unit shall have a Federal Communication Commission (FCC) certification. The detector shall work at the frequency of 10.525 Ghz as allowed under the FCC Rules, Part 15. The detector shall be self-contained except for the power source that shall operate at both 10VAC to 24VAC and 12VDC.

The unit shall have an electro-mechanical two AMP SPDT Relay to send a signal to the controller. The unit shall employ a circuit for power failure to put relay to a close position (recall) during a power failure.

The detector shall have a monitoring circuit for the transceiver (Gunn diodes) that will failsafe the relay to a closed position (recall). Except for the range adjustment, tuning will be automatic. The Officer-in-Charge will allow a five (5) minute warm up period for diodes. There shall be no tuning controls of any kind which require an operator.

The detector shall work while installed on the side of a pole, on top of a pole, or overhead at the height of between 12 and 18 feet above the pavement. Encase each detector in a finished fabricated aluminum case with no larger than a 4-inch square, high impact plastic opening in front of the antenna.

Each detector case shall be water resistant without the use of silicone gels or any other materials that will deteriorate with ultra-violet rays. Size of the detector shall be no greater than:

Height:	4.5 inches
Width:	4.5 inches
Depth:	7.5 inches

Mounting bracket supplied shall be for side, top, or overhead mounting. The detector shall be capable of continuous operation over a temperature range of -35 degrees F. to 165 degrees F.

The manufacturer shall test all microwave units to meet FCC specifications. The manufacturer shall supply a medical statement as to the safety of the unit to the general public, specifically to persons with pace-makers.

D. Video Detector System

The video detector system shall be capable of monitoring all licensed vehicles on the roadway, and providing video detection for areas whenever the existing loop detectors become inoperable due to construction.

1. Video Image Processor (VIP). The processor boards shall fit directly into the 170 rack without an interface box. The processor unit shall monitor two (2) cameras. Video inputs to the unit shall enter through the input file detector rack edge connector. The VIP Unit shall be located on one module.

   The VIP unit shall be capable of software download via serial port from an IBM compatible personal computer with a current version of the Microsoft Windows NT operating system.

   The VIP shall meet the following requirements:

   a. two (2) camera inputs.

   b. twenty-four (24) digital outputs, twenty (20) digital inputs.

   c. Fits direct into a 170 rack without additional adapter.

   d. twenty-four (24) direction sensible detector probes zones per camera, including up to six (6) counting probes per camera, standard or turning movement.

   e. Stores counts data, retrievable via RS232 port on the front.

   f. Detection results of all detection probes can be combined with the inputs to the related outputs (AND, OR, NOT).

   g. four (4) configurations stored on board.

   h. Modifications with no interruption on all probes.

   i. Setup via keypad and monitor or laptop computer.

   j. Software update via RS232.

   The video detection (Main) board shall have the following on the front:

   k. One (1) Male DB9 for connection with the first expansion board.

l. One (1) Female DB9 for setup with keypad (Service port).

m. LED’s for outputs on board, power, Video Cam 1 and Video Cam 2, Communication with expansions.

n. One (1) video output for setup via keypad.

o. A switch to select which image to be on the service output.

The input/output expansion board shall have the following on the front:

p. LED’s for power, Expansion communication, In/output activity.

q. Two (2) DB9 ports for communication with Master or other expansion boards.

r. A 8-dipswitch device to select the following:

Input or Output
Range: 1-12 or 13-24
Input or Output Number

2. Video Camera. The unit shall be a high resolution, 1/3 image format CCD camera, designed for professional video surveillance systems. Incorporating the latest in CCD technology, the video camera shall provide detailed video without lag, image retention, or geometric distortion.

Temperature range	-10 to +50 degrees Celsius
Humidity	85% Relative Humidity
Dimensions	47 mm (W) x 47 mm (H) x 83 mm (D)
Weight	200 Grams
Camera Mounting Slots	1/4-20, Top and Bottom
Connectors	BNC for Video Out
Lens Mount	CS
Finish	Off-white
Rated Input Voltage	24 Volts AC, 60 Hertz or 12 Volts DC
Imager	Interline transfer CCD 1/3″ Format

Sync System	Phase Adjustable Line Lock/Internal Selectable
Active Picture Elements	768 H x 494 V
Horizontal Resolution	580 TVL
Signal to noise ratio	> 48 dB
AGC	18 dB
Video out	1.0 volts peak-to-peak +/- 0.1 volt @ 75 Ohms

3. Video Camera Housing. The environmental housing shall be an aluminum enclosure designed for outdoor CCD camera installations. The camera housing shall be non-pressurized.

Temperature range	-40 to +50 degrees Celsius
Dimensions	449 mm (W) x 96 mm (H) x 111 mm (D)
Weight	1350 g
Housing Mounting	Three (3) 1/4-20 tapped holes
Camera mounting	Removable cradle assembly
Cable entry	Three (3) liquid-tight fittings that will accept cable diameters of: One (1) fitting - 2 to 7 mm and Two fittings - 3 to 10 mm
Finish	Off-white semi-gloss polyurethane
Construction	Extruded aluminum housing, aluminum rear-end cap, aluminum front cap with glass faceplate, and aluminum cradle. A sunshield shall be included.
Window	3 mm thick glass that includes a thermostatically controlled window

	heater/ defogger strip
Rated input voltage	115 Volts AC 60 Hertz
Voltage range	108 Volts AC to 132 Volts AC
Output voltage	24 Volts AC 60 Hertz
Nominal power	30 Watts

a. Enclosure Protection. Waterproof and dust-tight in a NEMA-4, IP65, enclosure Type 3.

b. Camera Lens - Motorized Zoom. The camera lens shall be a motorized zoom-auto iris 6.3 mm to 38 mm.

Image format	1/3 inch
Focal length	6.5 - 39 mm
Iris range	f/1.0 - f/360
Focusing range	Inf. To 1.0 m
Back focus length	11.76 mm
Weight	500 g
Lens mount	CS
Iris control	Auto (DC+8~16V: Fixed Voltage, Max. 60 mA)
Focus control	Motorized (DC+4V~12V, Max. 40 mA)
Zoom control	Motorized (DC+4V~12V, Max. 40 mA)
Dimensions	60 mm (W) x 70 mm (H) x 98.9 mm (D)

c. Surge Suppressor. A video interface panel shall be available for installation inside the traffic signal controller cabinet. The panel shall provide coaxial cable connection points and an EDCO CX06-BNCY or approved substitute transient suppressor for each image sensor.

Peak Surge Current (8x20 us)	5KA
Technology	Hybrid, Solid State

Attenuation	0.1db @ 10 MHz
Response Time	<1 nanosecond
Protection	Line to Ground
Shield to Ground	(isolated shield modules)
Clamp Voltage	6 Volts
Connectors	BNC
Impedance	75 Ohms
Temperature	-40 to +85 degrees Celsius
Humidity	0-95% non-condensing
Dimensions	4.5″ x 1.5″ x 1.25″
UL Listed	UL 497B

d. Power/Video Cable. Power/video cable from the signal controller cabinet to the video camera shall be a continuous King Wire #341667-00, 5C #18 AWG stranded 7/26, plus RG-59/U Type Coax 20 AWG, or ACHD approved substitute color coded red, black, blue, white and brown.

SP 62.3 CONSTRUCTION DETAILS

A. Vehicle detector loops shall be installed in accordance with the details shown on the plans.

B. The locations of vehicle detector loops as shown on the project plans are approximate. The exact number, locations, and layout shall be determined in the field by the Traffic Control Branch of the Department of Transportation Services.

C. After reconstruction of pavement area, with a power saw, cut a slot deep enough in the road surface for the number of wires to be installed.

1. Do not cut the slot unnecessarily deep. Keep the loop as close to the surface as possible, away from metal reinforcing.

2. The width of the slot is approximately 3/8 inch.

3. Saw cuts shall be blown clean and dry with compressed air to remove all excess moisture and debris.

4. Knock off all sharp edges or corners of the saw slot that might damage insulation. For repairing damaged saw cuts, all loose spalled material shall be cleaned

away from saw cut, chipping back to sound asphalt concrete or portland cement concrete and all loose material cleaned from loop wires. Sealant shall be used for repair work on existing spalls, cracks, and other deformations in and around saw cuts, housing inductive loops, and leads.

D. Using Type 4 cable, construct the loop.

1. Use three (3) turns per loop, unless otherwise directed by the Officer-in-Charge.

2. Tamp the wire all the way down in the slot using a blunt wooden instrument. (Do not use a screwdriver or sharp object that might skin the insulation.)

3. The wire shall not be pulled tight in the saw slot as a hot joint sealant may cause expansion.

4. After the detector loop is property installed, place sealant in the saw cut slot above the detector loop wire.

E. For vehicle detector loops constructed in portland cement concrete pavement (PCCP), adjust loop layout as needed so each individual detector loop is located entirely within a single PCCP panel. Maintain 18-inch minimum clearance from any PCCP joint to the detector loop.

SP 62.4 MEASUREMENT AND PAYMENT

The Officer-in-Charge will measure vehicle detector loops per each in accordance with the contract documents. The Officer-in-Charge will pay for the accepted vehicle detector loops at the contract price per each. Payment shall be full compensation for furnishing the necessary material, equipment, and labor to complete the work in place prescribed in this section and the contract documents.

The Officer-in-Charge will not measure approach-only microwave vehicle detectors, video detection system, or other vehicle detector directed by the Officer-in-Charge for payment. The Officer-in-Charge will not pay for approach-only microwave vehicle detectors, video detection system, or other vehicle detector ordered by the Officer-in-Charge separately and will consider the cost for approach-only microwave vehicle detectors, video detection system, or other vehicle detector as included in the contract prices for the vehicle detector loops contract pay item. The cost is for the work prescribed in this section and the contract documents."

END OF SECTION SP 62

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 63 – CITY STREET TREE REMOVAL WITHIN ROADWAY RIGHT-OF-WAY

SP 63.1 GENERAL

This section is for removing the existing City tree(s) as shown in the construction documents or as directed by the City's Project Arborist (CPA) or if none is assigned to the project then the City Department of Parks and Recreation Division of Urban Forestry (DPR-DUF). The work shall include, but not limited to, removing the existing tree(s) and all visible surface roots, protecting adjacent tree(s), backfilling the tree and root hole(s), and disposing of the removed tree(s) and debris.

The Contractor shall engage the services of a certified, Qualified Arborist (QA) to oversee and coordinate the tree removal work.

All tree removals shall be conducted within the scope of all American National Standards Institute (ANSI) and Occupational Safety and Health Administration (OSHA) standards.

SP 63.2 CONSTRUCTION REQUIREMENTS

A. Removal of Tree(s)

The Contractor's QA shall notify the CPA or if none assigned to the project then the City's Department of Recreation Division of Urban Forestry (DPR-DUF) a minimum of five (5) business days prior to the scheduled tree work to allow for adequate time to notify affected residents and/or property owners. Notifications to DPR-DUF shall be emailed to duf@honolulu.gov. The Contractor and QA shall consult with the CPA of the recommendations on tree removal if needed.

The Contractor shall cut down the tree, grind the tree stump 12 inches below grade, and take out all visible surface roots. Once removal of a tree has begun, the Contractor shall finish without undue delay. At a minimum, a tree shall be cut flush to the ground surface and removed offsite by the end of the day, unless approved otherwise by the CPA/DPR-DUF.

The Contractor shall protect the adjacent trees from injury and adjacent sidewalks/walls/buildings from damage. The Contractor shall be held responsible for any damages that occur during the tree removal process.

B. Backfill

Following the tree stump removal, surface root removal, and stump grinding, the Contractor shall remove the chips and debris away from the work areas and backfill the tree hole(s) (including where the surface roots were) with top soil and roll. The Contractor shall not leave tree and root holes open overnight.

Planter Strip. For trees located in a planter strip, plant grass in the top soil to match the existing grass or approved substitute. Contractor to water and maintain grass up to 90% coverage.

C. Disposal of Material

The Contractor shall dispose of the removed tree trunk, branches, roots, chips and debris at an authorized disposal site. The disposal shall follow local government regulations.

SP 63.3 MEASUREMENT AND PAYMENT

The Officer-in-Charge will measure City tree removal per each in accordance with the contract documents. The Officer-in-Charge will pay for the accepted City tree removal at the contract price per each. Payment shall be full compensation for furnishing the necessary material, equipment, and labor to complete the work in place prescribed in this section and the contract documents."

END OF SECTION SP 63

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 64 - DIRECTIONAL, REGULATORY AND WARNING SIGNS

The following special provisions for the traffic control system shall supplement and modify the Standard Specifications for Public Works Construction, Department of Public Works, City and County of Honolulu, September 1986, and shall include the current edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways" (MUTCD).

SP 64.1 SCOPE OF WORK

This work shall consist of furnishing and installing signs, sign panels and sign structures, removing and storing signs and performing all work according to the requirements of the contract. The Contractor shall locate and protect existing utilities per SP 150.3 CONTRACTOR'S DUTY TO LOCATE AND PROTECT UTILITY.

SP 64.2 MATERIALS

Concrete for sign structures shall be of class specified on the plans and shall conform to the requirements of Section 39 (PORTLAND CEMENT CONCRETE) of the Standard Specifications. Other materials shall meet the requirements specified in the following sections:

A. Aluminum Traffic Sign Blanks Description. This work shall consist of furnishing traffic sign blanks of the shape and dimensions shown on the plans.

Materials. The aluminum sheets and plates to be used for the fabrication of sign blanks, specified herein, shall conform to ASTM Designations: B209-68, Standard Specification for aluminum-alloy sheet and plate. The materials used shall be such as to produce sign blanks that conform to the following requirements.

(1) Alloy. 6061-T6 flat sheet.

(2) Dimensions:

(a) Holes. Two (2) 3/8-inch diameter holes.

(b) Thickness, Width, Length, Corner Radii and Locations of Holes. As per the "Manual on Uniform Traffic Control Devices for Streets and Highways", 1978 Edition.

(3) Finish. Alodine 1200 conversion coated finish after all fabrication performed to ensure coating of all exposed edges and hole sides except 36" x 36" pentagon blanks which shall be painted with two (2) coats of yellow baked enamel one (l) side. Said pentagon blanks shall be alodine coated prior to the application of the yellow enamel. The yellow

paint shall match Scotchlite Brand Reflective Sheeting No. 2271 Yellow, or approved substitute.

(4) General Quality. All sign blanks shall be flat, free from burrs and rough edges, degreased, cleaned and ready for application for paint and reflective sheeting material over the alodine 1200.

B. Reflective Sheeting Material, Enclosed Lens for Traffic Control signs.

(1) Description.

(a) The reflective sheeting shall consist of spherical lens elements embedded with a transparent plastic having a smooth, flat outer surface. The sheeting shall be weather resistant and shall have a protected precoated adhesive backing.

(b) The reflective sheeting may be applied either mechanically or manually to recommended surfaces such as galvanized steel and/or aluminum. The reflective sheeting adhesive for mechanical vacuum-heat application shall be heat activated and the sheeting shall be pre-perforated. The reflective sheeting adhesive for hand mounting application shall be pressure sensitive and sheeting will not be pre-perforated.

(2) Performance Characteristics.

(a) Film.

1. General. The reflective sheeting shall have sufficient strength and flexibility so that it can be handled, processed and applied according to the recommendations of the sheeting manufacturer without appreciable stretching, tearing, or other damage. It shall permit application over and conformance to moderate, shallow embossing characteristic of certain sign borders and symbols. Following liner removal, the reflective sheeting shall not shrink more than 1/32" in ten (10) minutes nor more than 1/8" in twenty-four (24) hours in any dimension per 9" square at 72°F and 50 percent Relative Humidity (RH).

2. Surface. The sheeting surface shall be smooth and flat, facilitate cleaning and wet performance, and exhibit 85° gloss meter rating of not less than 40 (ASTM-D-523-62T). The sheeting surface shall be readily processed and compatible with recommended transparent and

opaque process colors and show no loss of the color coat with normal handling, cutting, and application. The sheeting shall permit cutting and color processing at temperatures of 60°-100°F and relative humidities of 20-80 percent. The sheeting shall be heat resistant and permit force curing without staining of unapplied sheeting at temperatures of up to 150°F and up to 200°F in applied sheeting. The sheeting surface shall be solvent resistant such that it may be cleaned with gasoline, VM&P Naphtha, mineral spirits, turpentine, methanol and xylol.

(b) Adhesive. The reflective sheeting shall include a precoated pressure sensitive or tack free heat activated adhesive, either of which may be applied without necessity of additional adhesive coats on the reflective sheeting or application surface. The protective liner attached to the adhesive shall be removed by peeling without soaking in water or other solvents and shall be easily removed after accelerated storage for four (4) hours at 150°F under weight of 2.5 pounds per square inch. The adhesive shall form a durable bond to smooth, corrosion and weather resistant surfaces. The reflective sheeting, applied to cleaned and etched aluminum test panels shall adhere securely, forty-eight (48) hours after application at temperatures of -30° to 200°F. The adhesive bond shall be sufficient to render the applied sheeting vandal resistant and prevent its shocking off when jabbed with a spatula at -10°F. The sheeting shall resist peeling from the application surface when a 5 lb./in. width force is applied as outlined in ASTM-D-903-49.

(c) Color. The diffuse day color of the reflective sheeting shall conform to the requirements of Table 1 and shall be determined in accordance with ASTM E-97-55 "STANDARD METHOD OF TEST FOR 45-DEG DIRECTIONAL REFLECTANCE OR OPAQUE SPECIMENS BY FILTER PHOTOMETRY". (Geometric characteristics must be confined to illumination incident within 10 degrees of, and centered about, a direction of 45 degrees from the perpendicular to the test surface. Conditions of illumination observation must not be interchanged.) The standards to be used for reference shall be the MUNSELL PAPERS designated in Table 1. Papers must be recently calibrated on a spectrophotometer. The test instrument shall be one of the following:

1. GARDENER Multipurpose Reflectometer.

2. GARDENER Model AC-2a Color Difference Meter.

3. MEECO Model V Colormaster.

4. HUNTERLAB D25 Color Difference Meter.

5. Approved substitute.

TABLE 1

CIE CHROMATICITY COORDINATE LIMITS

	x	y	x	y	x	y	x	y
White	.320	.310	.360	.360	.338	.377	.300	.328
Yellow	.482	.450	.532	.465	.505	.494	.475	.485
Red	.602	.317	.664	.336	.644	.356	.575	.356
Green	.140	.354	.179	.372	.147	.435	.120	.420
Blue	.147	.075	.176	.091	.176	.151	.106	.113
Orange	.535	.375	.535	.399	.582	.417	.607	.393

	(Y) Reflectance Limit Min.	Max.	Ref. Std. MUNSELL PAPER
White	34.0		5.1GY6.91/1.2
Yellow	29.0	40.0	1.25Y6/12
Red	8.0	11.0	8.2R3.78/14.0
Green	4.0	7.0	.65/BG2.84/8.45
Blue	1.0	2.4	5.8PB1.32/6.8
Orange	19.77	30.05	2.5YR5.5/14.0

(d) Photometric.

1. Background. The reflective sheeting shall have the following minimum brightness values at .2° and .5° and 1.5° divergence expressed as average candlepower per footcandle per square foot (candle as per lux per square meter) of material. Measurements shall be conducted in accordance with standard testing procedures for reflex-reflectors specified in Federal Specifications L-S-300A, "Sheeting and Tape, Reflective, Non-exposed Lens Adhesive Backing" or as amended.

	White			Yellow		
Div. Ang.	.2°	.5°	1.5°	.2°	.5°	1.5°
Inc. Ang.						
-4°	70	30	4	50.0	25.0	5.0
40°	14.5	8.5	1.5	11.5	7.0	1.5

Red Blue Green

Div. Ang.	.2°	.5°	1.5°	.2°	.5°	1.5°	.2°	.5°	1.5°
Inc. Ang.									
-4°	14.5	7.5	1.0	4	2	0.6	9	4.5	1.0
40°	3.0	1.5	0.3	0.9	0.4	0.08	1.8	1.5	0.2

	Orange		
Div. Ang.	.2°	.5°	1.5°
Inc. Ang.			
-4°	25.0	13.5	1.5
40°	1.0	0.8	0.1

2. Applied or Demountable Copy. Reflective sheeting for all sign copy including letters, numerals, symbols, borders, and route markers shall be white which has been carefully selected by the manufacturer for uniformity of day and night appearance. No further matching shall be necessary.

3. Rainfall Performance. The brightness of the reflective sheeting, totally wet by rain, shall not be less than 90 percent of the above values. Wet performance measurements shall be conducted in conformance with standard rainfall test specified in Federal Specifications L-S-300A.

(e) Durability.

1. Processed and applied to recommended sign base materials in accordance with recommended procedures, the reflective sheeting shall be weather resistant and following cleaning, shall show no appreciable discoloration, cracking, crazing, blistering, or dimensional change and not less than 80 percent of the specified wet or dry minimum brightness values. Exposed under the same conditions, the reflective sheeting shall not support fungus growth and accumulate dirt to the extent that the reflective brightness before cleaning is less than 75 percent of the reflective brightness after cleaning when measured at 0.2° divergence and -4° incidence angles.

2. The sheeting surface may be readily refurbished by cleaning and clear overcoating in accordance with the manufacturer's recommendations.

C. Steel Tube for Sign Post. This work shall consist of furnishing steel tubes for mounting of traffic signs.

Materials: The steel tubes for traffic signs shall conform to the following requirements:

(1) The steel tube shall conform to the standard specification for Cold-Rolled Carbon Steel sheets, commercial quality ASTM Designation A 653.

(2) The cross section of the tube shall be a square tube formed of 12 gauge (.105" U.S.S. Gauge) steel, carefully rolled to size and welded in the corner.

(3) All sides shall have evenly spaced predrilled 7/16" diameter holes 1 inch on center four sides along length of the tube.

(4) Tube shall be 2" x 2" square.

(5) The furnished members shall be straight and shall have smooth uniform finish. It shall be possible to telescope consecutive size of tubes freely with a minimum amount of play. All holes and cut off ends shall be free from burrs.

(6) The length of the tube shall be 12 feet with a length tolerance of ±l/4".

(7) All tubes shall be weather protected by galvanizing. Tubes shall be formed from cold-rolled steel strip which has been zinc coated, commercial quality (1.25 oz.) conforming to ASTM Specification A 525.

D. Fasteners for Signs. Post clips for extruded aluminum sign panels shall be of aluminum conforming to the requirements of ASTM B 108, alloy 356-T6. Post clip bolt assemblies shall have bolts of aluminum conforming to the requirements of ASTM B 211, alloy 2024-T4, lock nuts of aluminum conforming to the requirements of ASTM B 211, alloy 2017-T4, (0.0002-inch anodic coating thickness with dichromate or boiling water seal) and flat washers of aluminum alloy.

SP 64.3 CONSTRUCTION METHOD: MOUNTING SIGNS, REMOVAL OF EXISTING SIGNS AND APPLICATION OF REFLECTIVE SHEETING

Permanent signs shall be erected on post or as shown on the plans or as directed. The post shall be set plumb at the required locations. All work shall be executed in the best workmanlike manner.

Removal of Existing Signs. Existing regulatory and warning signs and markers not to be incorporated in the completed project shall be removed and stored as directed. Remove sign post and base where indicated on the drawing, backfill, and restore areas.

The reflective sheeting may be applied either mechanically or manually to recommended surfaces such as galvanized steel and/or aluminum. The reflective sheeting adhesive for mechanical vacuum-heat application shall be heat activated and the sheeting shall be pre-perforated. The reflective sheeting adhesive for hand mounting application shall be pressure sensitive and sheeting will not be pre-perforated.

SP 64.4 MEASUREMENT AND PAYMENT

The number of sign assemblies will be measured as complete units of the type and design specified in the Offer.

The Officer-in-Charge will measure sign assemblies per each in accordance with the contract documents. The Officer-in-Charge will pay for the accepted sign assemblies at the contract price per each. Payment shall be full compensation for furnishing the necessary material, equipment, and labor to complete the work in place prescribed in this section and the contract documents.

Removal and disposal of existing signs and/or posts will not be paid for directly but shall be considered as included in the prices bid for sign assemblies."

END OF SECTION SP 64

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 100 – GEOGRID

SP 100.1 DESCRIPTION

This section describes furnishing and placing triaxial geogrid as a base reinforcement on a woven geotextile. A triaxial geogrid is a polymeric grid formed by a regular network of integrally connected, oriented in three (3) substantially equilateral directions tensile elements.

SP 100.2 MATERIALS

Tensar InterAx NX850 Geogrid or approved substitute.

Geogrid shall conform to the following:

Identification Properties (1)	General
Aperture shapes	Hexagonal, Trapezoidal, & Triangular
Structure	Coextruded & Integrally Formed
Rib shape	Rectangular
Continuous parallel rib pitch (2), in	3.2
Rib aspect ratio (3)	>1.0
Node thickness (2), in	0.18
Color identification	White/ Black/ White

Notes:
1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4758-02.
2. Nominal dimensions.
3. Ratio of the mid-rib depth to the mid-rib width.

SP 100.3 SUBMITTALS

A. Submit geogrid product data sheet and certification from the manufacturer that the geogrid product supplied meets the requirements specified in this section at least ten (10) work days before the start of construction.

B. Submit manufacturer’s installation instructions at least ten (10) work days before the start of construction.

C. Submit geogrid product sample approximately 4 inches by 7 inches or larger at least ten (10) work days before the start of construction.

SP 100.4 CONSTRUCTION

A. The Contractor shall examine the geogrid upon delivery to verify that the proper material has been delivered. The geogrid shall be inspected by the Contractor to be free of flaws or damage occurring during manufacturing, shipping, or handling.

B. Subgrade Preparation. Prepare subgrade in accordance with the section on Woven Geotextile. The subgrade after placement of woven geotextile shall be level to ensure the geogrid is laid flat and level.

C. Install geogrid in accordance with the manufacturer's recommendations. Unroll geogrid smoothly on prepared surface in longitudinal direction. Do not drag geogrid. Remove wrinkles and folds by stretching and anchoring. Overlap geogrid a minimum of 12 inches at longitudinal and transverse joints. Overlapping along joints between traffic lanes is not required.

D. Geogrid Placement. Align geogrid and pull it taut to remove wrinkles. Anchor geogrid in place with washer and pin or large, heavy-gauge staples in accordance with the manufacturer's recommendation. On curves, fold or cut geogrid to conform to curve, with appropriate overlap or seam. Do not operate tracked or rubber-tired equipment directly on the geogrid.

E. Untreated aggregate base course shall be placed, spread, and compacted in a manner to avoid development of wrinkles in the geogrid and/or movement of the geogrid. A minimum loose base course thickness of 6 inches is required on the geogrid prior to operation of any equipment over the geogrid. Turning of vehicles shall be kept to a minimum to prevent displacing the base course and damaging the geogrid. Sudden braking and sharp turn movements shall be avoided. Do not end dump base course directly onto the geogrid. Spread base course by mechanical means to allow base course to cascade onto the geogrid.

F. Geogrid Exposure Following Placement. Limit time exposure of geogrid to natural elements, between placement and cover, to a maximum of one day. Construction equipment and vehicular traffic shall not be allowed directly on geogrid.

G. Damage Repair. Geogrid shall be considered damaged if it is torn or punctured, if overlaps are disturbed, or if there is evidence of subgrade pumping, intrusion, or roadbed distortion. Repair damaged geogrid by removing material around damaged or displaced area and by replacing damaged geogrid with a patch of same type of geogrid. Overlap existing geogrid a minimum of 3 feet from edge of damaged area. Replace and compact removed untreated aggregate base course material. Repair all damage and replace any roll of geogrid damaged before, during, and after installation at no additional cost to the City.

SP 100.5 MEASUREMENT AND PAYMENT

The Officer-in-Charge will pay for the accepted geogrid material on a force account basis as an Additional Work Item "Additional Geogrid (Material Only)". Payment shall be full compensation for the work directed by the Officer-in-Charge and shall be deducted from the force account set in the Offer. The unused portion of the force account item shall remain with the City upon completion of the contract.

The Officer-in-Charge will pay for the accepted labor and placement

of the geogrid on a force account basis as an Additional Work Item “Additional Geogrid Placement (Installation)”. Payment shall be full compensation for the work directed by the Officer-in-Charge and shall be deducted from the force account set in the Offer. The unused portion of the force account item shall remain with the City upon completion of the contract."

END OF SECTION SP 100

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 101 – WOVEN GEOTEXTILE

SP 101.1 DESCRIPTION

This section describes furnishing and placing woven geotextile as a base reinforcement on a prepared subgrade. Provide a pervious sheet of polypropylene, ultraviolet resistant filaments woven into a nonraveling fabric with uniform thickness and strength. The woven fabric shall have the following manufacturer certified minimum average roll properties as determined by ASTM D4759.

SP 101.2 MATERIALS

Mirafi RS280i Woven Geotextile or approved substitute.

Woven Geotextile shall conform to the following:

Mechanical Properties		**Woven Geotextile Min. Average Roll Value**	
		MD (machine direction)	**CD** (cross machine direction)
A.	Grab tensile strength (ASTM D4632)	450 lbs	320 lbs
B.	Grab tensile elongation (ASTM D4632)	12 percent	10 percent
C.	Trapezoidal tear strength (ASTM D4533)	150 lbs	160 lbs
D.	CBR Puncture strength (ASTM D6241)	1300 lbs	
E.	Flow rate (ASTM D4491)	70 gal/min/ft^2	
F.	Permittivity (ASTM D4491)	0.9 sec^{-1}	
G.	Apparent Opening Size, Maximum (ASTM D4751)	40 U.S. Sieve (0.425 mm)	
H.	Ultraviolet Degradation (ASTM D4355)	90 percent strength retained at 500 hours	

SP 101.3 SUBMITTALS

A. Submit woven geotextile product data sheet and certification from the manufacturer that the woven geotextile product supplied meets the requirements specified in this section at least ten (10) work days before the start of construction.

B. Submit manufacturer’s installation instructions at least ten (10) work days before the start of construction.

C. Submit woven geotextile product sample approximately 4 inches by 7 inches or larger at least ten (10) work days prior to the start of construction.

SP 101.4 CONSTRUCTION

A. Shipping, handling, storage, transportation, and installation of woven geotextile shall be in accordance with the manufacturer’s guidelines.

B. Prior to placement of the woven geotextile, the subgrade shall be cleaned of all loose or soft materials.

Perform additional excavation below the subgrade level to the depth as indicated and in areas as indicated. Clean the excavated subgrade of all loose or soft material. Replace the excavated soil material with compacted aggregate base course after the placement of the woven geotextile. The Contractor shall take steps to minimize disturbing the clayey subgrade. Wheel traffic directly on the subgrade is prohibited. The subgrade shall be protected from exposure to weather elements during grading. Exercise care to minimize drying and cracking of the clayey subgrade soils prior to the placement of the woven geotextile. If shrinkage cracks appear on the subgrade, the subgrade shall be scarified; thoroughly moisture conditioned to between 3 and 6 percent wet of the optimum moisture content, and compacted to close all cracks.

C. Line the prepared subgrade with woven geotextile. Overlap geotextile a minimum of 12 inches at longitudinal and transverse joints. Overlapping along joints between traffic lanes is not required.

SP 101.5 MEASUREMENT AND PAYMENT

The Officer-in-Charge will pay for the accepted woven geotextile material on a force account basis as an Additional Work Item “Additional Woven Geotextile (Material Only)”. Payment shall be full compensation for the work directed by the Officer-in-Charge and shall be deducted from the force account set in the Offer. The unused portion of the force account item shall remain with the City upon completion of the contract.

The Officer-in-Charge will pay for the accepted labor and placement of the woven geotextile on a force account basis as an Additional Work Item “Additional Woven Geotextile Placement (Installation)”. Payment shall be full compensation for the work directed by the Officer-in-Charge and shall be deducted from the force account set in the Offer. The unused portion of the force account item shall remain with the City upon completion of the contract.”

END OF SECTION SP 101

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 104 – COLD PLANING OF EXISTING PAVEMENT

SP 104.1 DESCRIPTION

This section describes removing the existing road pavement by a cold planing or scarifying process.

This work shall also eliminate or minimize any unevenness, i.e., lip, at the edge of the newly resurfaced roadway; and thus, providing a relatively smooth surface for pedestrian traffic.

All manholes and handholes, valve boxes, monument cases, and other pavement penetrations shall be referenced and temporarily adjusted to the Officer-in-Charge's satisfaction to the finished grade. Temporary transitions, where required, shall be constructed before opening the roadway to traffic.

SP 104.2 DETAILS

Cold Planing. The work covered by cold planing shall consist of furnishing all labor, equipment, tools, materials and supervision necessary to complete operations of planing existing asphalt concrete pavements, including removing and reusing, recycling, or disposing of all surplus materials in compliance with all Federal, State, County and OSHA requirements and regulations. Pavement striping and markings may contain lead.

The planing machine shall be self-propelled and be especially designed and built for grinding flexible and rigid pavements. It shall plane without tearing or gouging the underlying surface and blade material into a windrow. The machine shall consist of a 60" minimum width cutting drum with carbide tip teeth. Drum lacing patterns shall permit a grooved or smooth surface finish as selected by the Officer-in-Charge and the drum shall be totally enclosed in a shroud to prevent discharge of any loosened material into adjacent work areas. The machine shall be capable of operating at speeds from 5 to 50 feet per minute and designed so that the operator can observe the work without leaving their control area. A 0" to 3" deep cut to predetermined grade may be required on one (1) pass. The machine shall be adjustable as to crown and depth by tilting the drum axis and a guidance system furnished to assist operator to control grade and match adjacent pavements or cuts. A dust suppression system with l500 gallon minimum water storage tanks and two (2) high pressure spray bars with spiral nozzles shall be standard equipment. The equipment shall be demonstrated to have been operated successfully on similar work completed prior to the award of this contract. The equipment shall meet the standards or be lower than the allowable limits set by the Air Quality Act of 1969 for noise and air pollution.

The Contractor shall furnish one (1) or more planing machines operated by experienced workers. The surface tolerance produced so that a 10-foot straight edge laid laterally will indicate variances of less than 3/8" (except in crown area) and a ten-foot straight edge laid longitudinally will indicate variances of less than 3/16". Removal shall consist of (1) planing and cutting the pavement to form a keyway header cut or full width regrading, plus; (2) removing and disposing of the loosened material.

Construct transitions/tapers at drop-offs in accordance with Section SP 151.2.

If shrinkage cracks appear in the subgrade, the subgrade should be scarified and thoroughly moisture conditioned (between optimum moisture content and 3% wet of optimum moisture content) and recompacted.

If local wet area is encountered in silt or sandy subgrade due to seepage water, the subgrade should be scarified and thoroughly mixed with cement (one (1) bag of cement for 5'x10' area 6" deep) and recompacted.

If any soft areas that exhibit pumping or rutting are encountered, the base/subgrade shall be overexcavated and replaced with 8-inches aggregate base course (or as directed by the Officer-in-Charge), geogrid, and woven geotextile. Refer to the detail called “Soft Subgrade Replacement with Aggregate Base Course”.

During construction, the Contractor shall not overstress the subgrade. Heavy trucks or equipment are not allowed to travel on the unprotected subgrade.

The Contractor shall assume that all existing pavement striping and markings may have been installed with lead containing paint. The Contractor may remove striping and markings with the operations of planing existing asphalt concrete pavement and reuse, recycle, or dispose of all surplus materials in accordance with all Federal, State, County, and OSHA requirements and regulations.

Should any soft areas be encountered, the Contractor shall plan their work accordingly in order to open the road up for traffic at the end of the work day. No additional compensation shall be considered for redoing any pavement areas in order to open up the road at the end of the day.

If gutters with asphalt concrete overlay are encountered, the asphalt concrete overlay shall be removed as directed by the Officer-in-Charge. No additional payment shall be made for this work.

SP 104.3 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure Cold Planing for payment. The Officer-in-Charge will not pay for the accepted Cold Planing separately and will consider the cost for Cold Planing as included in the contract price for each respective street lump sum contract bid item as specified in the Offer schedule and in accordance with SP 151 DESCRIPTION OF WORK.”

END OF SECTION SP 104

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 105 - DRIP PANS

SP 105.1 DESCRIPTION

The Contractor shall place drip pans or absorbent material under all paving equipment during all non-working hours.

The Contractor shall be fully responsible for all Contractor-related damages due to lack of placement of drip pan(s) or absorbent material under any all paving equipment during non-working hours, which results in any type of petroleum or any other environmentally hazardous spill. The Contractor shall be fully responsible for all clean-up or billed for the actual cost of clean-up by the City. Any subsequent fines imposed upon the City by the Environmental Protection Agency (EPA) and/or State Department of Health shall be backcharged to the Contractor.

SP 105.2 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure drip pans or absorbent material for payment. The Officer-in-Charge will not pay for drip pans or absorbent material separately and will consider the cost for drip pans or absorbent material as included in the contract prices for the various asphalt concrete contract pay items. The cost is for the work prescribed in this section and the contract documents."

END OF SECTION SP 105

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 106 - AEROSOL SPRAY PAINT

SP 106.1 DESCRIPTION

The Contractor shall provide six (6) cases of survey marking paint (two (2) high visibility yellow, one (1) black, and three (3) white) or as requested by the City's inspector for use on the project.

Each case shall contain twelve (12) 20 ounce spray cans.

SP 106.2 MATERIAL

High visibility yellow paint shall be "Aervoe Survey Marking Paint – SAI MP YELHIVIS 20 oz" or approved substitute.

Black paint shall be "Aervoe Survey Marking Paint – SAI MP BLACK 20 oz" or approved substitute.

White paint shall be "Aervoe Survey Marking Paint – SAI MP White 20 oz" or approved substitute.

Any paint unused after completion of the project shall become the property of the City.

SP 106.3 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure aerosol spray paint for payment. The Officer-in-Charge will not pay for aerosol spray paint separately and will consider the cost for aerosol spray paint as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents."

END OF SECTION SP 106

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 107 – ASPHALT REMOVAL IN GUTTERS

SP 107.1 GENERAL

This section is for the removal of overlaid asphalt concrete pavement on existing concrete gutters, and to inform the Officer-in-Charge the conditions of the exposed gutters. The Officer-in-Charge will determine if any damaged gutters shall be reconstructed.

This work shall be performed at least three (3) weeks prior to any curb and gutter reconstruction work.

SP 107.2 CONSTRUCTION REQUIREMENTS

The Contractor shall exercise precautions not to damage the existing gutters. The Contractor shall replace any damaged gutters due to their negligence at no additional cost to the City.

Following the asphalt removal, the Contractor shall provide any transitions necessary to adjacent pavement, driveway or gutters in accordance with Section SP 151.2.

SP 107.3 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure the asphalt removal in gutters for payment separately. The Officer-in-Charge will not pay for asphalt removal in gutters separately and will consider the cost for asphalt removal in gutters as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents.

END OF SECTION SP 107

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 108 – ARBORICULTURAL WORK, INCLUDING TREE TRIMMING, ROOT PRUNING AND TREE PROTECTION MEASURES

SP 108.1 DESCRIPTION

The Contractor shall perform any necessary arboricultural work, including tree trimming and root pruning, and ensure that tree protection measures are followed in accordance with this special provision and under the direction of the City's Project Arborist (CPA). The Contractor shall engage the services of a certified, Qualified Arborist (QA) to oversee the tree work at all times. The QA shall coordinate all arboricultural work and the protection of the trees with the CPA and the Department of Parks and Recreation, Division of Urban Forestry (DPR-DUF) prior to any work being done. A specialty contractor is required to perform the arboricultural work.

The CPA will be responsible to oversee all tree work done by the Contractor and tree protection measures. The CPA will serve as the liaison with the Officer-in-Charge, DPR, and the Contractor's QA on all tree issues and protection of the trees on the project site. The CPA will recommend and direct the preventative and mitigative measures to protect the trees.

SP 108.2 CONSTRUCTION DETAILS

A. The Contractor's QA application shall be forwarded to DPR-DUF for approval. The application shall include current credentials for International Society of Arboriculture (ISA) Certified Arborist and ISA Tree Risk Assessment Qualification, and documentation of experience with similar tree work. ISA credentials can be verified at the following website: https://www.treesaregood.org/findanarborist. The QA shall coordinate all tree work and protection with the CPA/DPR-DUF and perform work under the direct supervision of the CPA/DPR-DUF. The QA is required to be at the work site at all times when tree and root pruning work are being performed. The QA must ensure that proper tree protection guidelines are followed to prevent damage to the tree. During the execution of the tree work, the QA shall provide a telephone number to DPR-DUF that they can be contacted at during regular business hours.

B. All work shall be in compliance with ANSI A-300 standards as approved by the Tree Care Industry Association and International Society of Arboriculture (ISA). Proper measures are to be taken to protect the crown and root systems of the trees from unnecessary damage from construction activity. When potentially damaging construction activities arise, i.e. major support root removal, excessive root removal on one (1) or more sides of the tree, major crown branch removal, or tree transplanting, the QA shall closely coordinate with the CPA/DPR-DUF to ensure that such activity is performed in a manner that shall minimize damage to the tree. The QA shall ensure that the trees are provided proper care and retain good health during the demolition and construction period. Alternative procedures may be required on a tree by tree basis

and field decisions by the CPA/DPR-DUF may be required to ensure the safety and health of the trees.

C. The Contractor shall arrange a field coordination meeting prior to the start of construction including the Contractor, QA, Sub-Contractors, Officer-in-Charge, City's Project Consultants, and the CPA/DPR-DUF to review procedures for performing tree-related work, work in the areas around trees, access routes, and storage areas, and what measures may need to be taken to protect trees during construction.

D. Prior to any root pruning or curb reconstruction, the Contractor shall expose tree roots as directed by the CPA first for the CPA/DPR-DUF to evaluate the measures to be taken. The QA shall perform root pruning and installation of any special curb reconstruction following CPA/DPR-DUF's recommendations.

E. Tree Protection Zone. The limits of the "Tree Protection Zone" (TPZ) shall be the area under the tree crown or as determined by the CPA/DPR-DUF. The QA shall limit activities under the crown of the trees to only those activities explicitly required to complete the construction under and/or adjacent to the tree's crown as approved by the CPA/DPR-DUF. All excavation work required under the crown of trees shall be performed under the supervision of the CPA/DPR-DUF and the QA shall be onsite at all times during the excavation. Tree trunks may be protected with the use of Tree Trunk Shields or approved substitute.

Material and topsoil stockpiling, vehicle and equipment parking, temporary roadways, construction material mixing, portable latrines and field offices shall not be located either temporarily or permanently under tree crowns unless areas have been specifically approved by the CPA/DPR-DUF.

Temporary fencing is not required. However, if the TPZ provisions are violated, the project shall stop until appropriate protection is installed either around each planter island or around each tree trunk. The temporary fencing (orange plastic) or tree trunk shield shall remain in place until work is complete unless authorized by the CPA/DPR-DUF. The Contractor shall not be allowed to file a claim for this work stoppage and all cost relating to the temporary fencing/tree trunk shield shall be at the Contractor's expense. No time extensions shall be granted for this additional work.

F. Root pruning. To compensate for pruning of structural roots, pruning of the canopy shall be done prior to root pruning work. If at any time structural roots will be impacted, a minimum of 25% end weight reduction of the canopy shall be required. This work shall be performed under the direct supervision of the QA who shall adhere to the "Industry Tree Pruning Guidelines" for proper tree pruning standards.

Root pruning of roots below the surface shall be done carefully

by exposing them by hand or approved equipment under the supervision of the CPA/DPR-DUF. Any roots damaged during grading or construction shall be exposed to the nearest sound tissue and cut clearly with a sharp saw under the CPA/DPR-DUF's approval. Before grading, preparation of roadbed, curbing and sidewalk, roots that are exposed and greater than 2 inches in diameter must be pruned with a handsaw, rocksaw, narrow trencher with a sharp blade or approved root pruning equipment by the QA or Certified Tree Worker.

G. Tree or root injury. If damage should occur during demolition or construction, the QA shall immediately report the injury to the CPA and DPR-DUF. The CPA and DPR-DUF will evaluate the injury, determine the extent of damage and decide the appropriate treatment. The QA shall submit a written report of the tree injury and treatment to the CPA, DPR-DUF and Officer-in-Charge.

H. Unsafe tree conditions. The QA must immediately report to the CPA and DPR-DUF any unsafe tree conditions and discuss a solution to address the concern.

I. Landscaping. The Contractor shall be responsible for the regrassing of all the grass areas and replacement that have been damaged as the result of the operations. Damaged areas shall be restored to match existing areas and finish grades.

J. Irrigation System. The Contractor, QA and/or landscape subcontractor shall contact the appropriate DPR District Manager, abutting property owner, neighborhood association, or responsible party for the irrigation system and meet at the project site to test and inspect the condition of the existing irrigation system prior to the start of construction. The Contractor shall coordinate with the system owner and relocate as needed, the existing irrigation system to perform the contract work. The Contractor shall repair any damages to the existing irrigation system caused by the construction operations. The Contractor shall be responsible for all coordination, investigation, and all costs related to any needed relocations and damages.

K. Penalties, Compensation and Mitigation. The Contractor shall not work within the TPZ, including sidewalk, planting, and roadway areas without informing the CPA/DPR-DUF of the work to be done. Work performed on or near trees without the supervision of the QA and/or CPA may result in the immediate termination of work. Failure to notify the CPA/DPR-DUF or having the QA on site shall result in penalties of $125.00 for each incident. For partial injury or total tree loss, the Contractor shall pay the City the value of any existing trees, provided that such tree died, sustained damage, and/or required care or removal due to failure of the Contractor to provide adequate protection, or full compliance with the appropriate tree protection measures.

The value of the tree shall be determined by the CPA/DPF-DUF based on the methods of tree appraisal as set forth in *Guide*

for Plant Appraisal (9th edition). Any wound or infliction to trees remaining on site constitutes a partial injury violation. Partial injury includes but is not limited to a) mechanical injuries as breaks, rips, punctures, holes, splits, cracks, tears and other wounds to tree trunk, branches or roots caused by persons, tools, vehicles, equipment or other large object associated with construction activity, b) crushed roots caused by persons or equipment, c) compacted soil caused by vehicles or heavy equipment, d) chemical contamination by persons or equipment on construction site, e) unapproved grade level changes, and f) improper pruning procedures.

L. Reset Existing Tree Well Cover. Prune tree roots/canopies under the direct supervision of the QA. Reset tree well cover shall be flush with surrounding sidewalk grade. If backfill is required to reset tree well cover, provide topsoil/sand mix and compact to required grade. Topsoil/sand mix shall be approximately two (2) parts topsoil to one (1) part sand.

M. Enlarged Tree Well. Prune tree roots/canopies under the direct supervision of the QA. Enlarge existing tree wells according to detail shown in the project plans. Concrete work shall be in accordance with Section SP 42 – Concrete Sidewalk.

SP 108.3 MEASUREMENT AND PAYMENT (for applicable pay items included in the Offer)

The Officer-in-Charge will measure reset existing tree well cover per each tree in accordance with the contract documents. The Officer-in-Charge will pay for the accepted reset tree well cover at the contract price per each tree. Payment shall be full compensation for furnishing the necessary material, equipment, and labor to complete the work in place prescribed in this section and the contract documents.

The Officer-in-Charge will measure enlarged tree wells per each tree in accordance with the contract documents. The Officer-in-Charge will pay for the accepted enlarged tree wells at the contract price per each tree. Payment shall be full compensation for furnishing the necessary material, equipment, and labor to complete the work in place prescribed in this section and the contract documents.

The Officer-in-Charge will measure the root pruning and tree canopy trimming together per each tree in accordance with the contract documents. The Officer-in-Charge will pay for the accepted root pruning and tree canopy trimming together at the contract price per each tree. Payment shall be full compensation for furnishing the necessary material, equipment, and labor to complete the work in place prescribed in this section and the contract documents.

The Officer-in-Charge will not measure the pruning of tree canopies to provide clearance for equipment for payment. The Officer-in-Charge will not pay for the accepted pruning of tree canopies to provide clearance for equipment separately and will consider the cost of tree canopy pruning to provide clearance for equipment as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents.

The Officer-in-Charge will not measure any temporary or permanent relocation or replacement of the irrigation system for payment. The Officer-in-Charge will not pay for the accepted temporary or permanent relocation or replacement of the irrigation system separately and will consider the cost for necessary irrigation system relocation/replacement as included in the contract price for the various contract pay items. The cost is for the work prescribed in this section and the contract documents.

The Officer-in-Charge will not measure the Qualified Arborist's services and related expenses, tree protection measures, and other work prescribed in this section for payment. The Officer-in-Charge will not pay for the accepted Qualified Arborist's services and related expenses, tree protection measures, and other work prescribed in this section separately and will consider the cost for the Qualified Arborist's services and related expenses, tree protection measures, and other work prescribed in this section as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents.

The Officer-in-Charge will pay for any accepted additional arboricultural work as directed by the Officer-in-Charge on an allowance basis. Payment shall be full compensation for the work directed by the Officer-in-Charge. Payment shall be deducted from the allowance set in the Offer and shall be included in the monthly estimate for the progress payment upon submittal of paid invoices, with sufficient documentation to account for the costs of all labor, equipment, materials, and any other items invoiced. The Contractor shall collect and maintain sufficient documentation to validate reimbursement under this Section. The Contractor shall submit records of the work performed at the end of each day to the Officer-in-Charge to justify labor, equipment, and material costs. Individual equipment or tools having a replacement value of eight hundred dollars ($800) or less will not be considered an allowable cost. The Contractor shall be reimbursed for the allowance item plus maximum of ten (10) percent inclusive of any administrative cost, overhead/profit, bond fee, and applicable taxes. The unused portion of the allowance item shall remain with the City upon completion of the contract."

END OF SECTION SP 108

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 132 – CONSTRUCTION VEHICLES

SP 132.1 GENERAL

The Contractor shall verify that any construction vehicles used for this project does not overload any City bridges or culverts. The Contractor shall engage the services of a Structural Engineer licensed in the State of Hawaii to evaluate whether the construction vehicles used by the Contractor meet all of the following requirements and will not overload any City bridges and culverts:

1. The maximum axle load of each vehicle does not exceed 32,000 lbs.
2. The axle configuration of each vehicle falls within the AASHTO HL-93 truck configuration.
3. The weight of each vehicle does not exceed the maximum weight for any of the bridges and culverts within the project limits and en route to the project site. The load limit for the City's bridges and culverts shall be reviewed at the below link.
4. The locations of the City's inventory of bridges and culverts are identified on the Google Earth file provided at the below link. Note that the Google Earth program is required to open the file.

http://www.honolulu.gov/cms-ddc-menu/site-ddc-sitearticles/18204-bridge-status-inventory.html

SP 132.2 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure the verification of construction vehicles on City bridges and culverts and any necessary mitigation measures for payment. The Officer-in-Charge will pay for the accepted verification of construction vehicles on City bridges and culverts and any necessary mitigation measures on a contract lump sum basis. Payment shall be full compensation for furnishing the necessary material, equipment, and labor to complete the work in place prescribed in this section and the contract documents."

END OF SECTION SP 132

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 150 – EXISTING UTILITIES

SP 150.1 DESCRIPTION

This section shall supplement Subsection 12.3 "PROTECTION OF EXISTING IMPROVEMENTS", of the Standard Specifications and Subsection 2.5 (b), "Utilities, underground", of the General Instructions and Subsection 5.2.21 of the General Conditions, and Section 3.9 "Differing Site Conditions for Construction Projects", of the General Conditions.

SP 150.2 Contractor's Duty to Coordinate Utility Work

The Contractor shall contact and cooperate with each affected utility owner in order for the work to progress on schedule and without unreasonable disruption of such utility services. If the work calls for permanent utility service installations or corrections to, or modifications of existing utilities, the Contractor is responsible for scheduling and coordinating such work with appropriate utility owners. If the work required by the contract documents conflicts with the instructions, demands, or requirements of a utility owner, the Contractor shall notify the Officer-in-Charge immediately. The Contractor shall furnish the Officer-in-Charge with evidence that the Contractor has provided all relevant utility owners reasonable opportunity to review the drawings.

When the City has a separate agreement with a utility owner for work to be performed within the worksite, the Contractor shall make available all portions of the work and the worksite necessary for the utility owners to do their work.

The Contractor hereby holds the City harmless against all risks arising from acts or omissions of utility owners that damage the work, or create delays, disruptions, and additional cost to the Contractor in the performance of the work. Contract time for the work may be extended on account of acts and omissions of utility owners that delay the work without fault of the Contractor.

The Contractor accepts the risk of differing site conditions and the Contractor accepts the conditions at the construction site as they may eventually be found to exist. Any damages to existing utilities shall be repaired wholly at the Contractor's own cost and expense. If the Officer-in-Charge determines that the existing site conditions requires a design change to the project, a price adjustment may be permitted by the Officer-in-Charge.

The Contractor may relocate or adjust the utility lines or service connections for its convenience with the permission of the owner of the utility and the Officer-in-Charge at no increase in contract price or contract time.

SP 150.3 Contractor's Duty to Locate and Protect Utility

A. Before beginning any work at the worksite, the Contractor shall research, ascertain and identify the exact horizontal location and depth of all utilities within the project area where a conflict could occur with the proposed work. The Contractor may probe for utilities at critical locations with approval of the Officer-in-Charge, utilize the One-Call Center system, use electromagnetic locating systems, ground penetrating radar systems, or other utility locating systems, research as-built information from the utility

companies/agencies and other development/project plans to obtain the utility information. The location of existing utilities shown on the plans is approximate and does not accurately reflect all the utilities.

B. Within one (1) month after notice-to-proceed (NTP) or at least two (2) weeks prior to proceeding with any work which may affect utilities, the Contractor shall submit to the Officer-in-Charge in writing, all locations where a conflict between an existing utility and the proposed work exists. Based on the redesign and change in work, a time extension may be granted. No cost claims related to the time extension shall be granted.

C. The Contractor shall acquaint all personnel working near utilities with the type, size, location, and depth of the utilities, as well as the consequences that might result from disturbances. The Contractor shall take reasonable steps to protect the utilities and prevent service disruption.

D. Whenever the Contractor damages a utility or causes any interruption to any utility service, the Contractor shall promptly notify the Officer-in-Charge, the affected utility owner, and the appropriate governmental authorities. The Contractor shall be responsible for the safety and protection of the public and the utility. The Contractor shall cooperate with the affected utility owner, and the appropriate governmental authorities in the restoration of service. The Contractor shall be responsible for all costs associated with its repair and restoration of service at no increase in contract price or contract time. No time extensions shall be granted for time delays in coordinating with the utility companies/agency and delays in work being done by the utility companies/agency. Compensation to the utility company/agency for any repair work shall be made directly between the Contractor and the utility company/agency. It is essential that the Contractor thoroughly research and identify all potential conflicting utilities within the one (1)-month period of NTP and exercise caution in excavating near utilities.

SP 150.4 DEPARTMENT OF ENVIRONMENTAL SERVICES

The Contractor shall notify the Department of Environmental Services' Collection System Maintenance Division at (808) 768-7272 immediately whenever a sewer facility is damaged. This number is answered twenty four (24) hours a day, seven (7) days a week.

All Contractor-related damages which are knowingly not reported immediately to the Collection System Maintenance Division, and results in sewer backups, spills, and overflow; the Contractor shall be billed for the actual cost of the clean-up by the City, and any subsequent fines imposed upon the City by the Environmental Protection Agency (EPA) and/or State Department of Health shall be backcharged to the Contractor.

SP 150.5 HAWAIIAN ELECTRIC COMPANY (HECO)

A. The Contractor shall exercise extreme caution when the excavation and construction crosses or is in close proximity of underground electrical facilities and maintain adequate clearance for their equipment while working close to and/or under the overhead facilities.

B. The Contractor shall comply with the directions of the State of Hawaii Occupational Safety and Health Law.

C. The Contractor shall obtain an excavation permit from HECO Mapping and Records Division, 4th floor, 820 Ward Avenue, two (2) weeks prior to start of construction.

D. For verifying the location of underground duct lines and for assistance in providing proper support and protection of the underground duct lines, the Contractor shall contact HECO Underground Division at (808) 548-7846 a minimum of seventy-two (72) hours in advance. Should a HECO inspector be required on the job site, call (808) 543-7920.

E. Should it become necessary, any work required to relocate and/or repair HECO facilities except perhaps raising of manholes shall be done by HECO forces. The Contractor shall be responsible for all coordination.

F. The Contractor shall be liable for any damages to HECO'S existing facilities.

G. The Contractor shall report any damages to HECO's facilities to the HECO Trouble Dispatcher at (808) 548-7961.

SP 150.6 HAWAIIAN TELCOM

The Contractor shall call HAWAIIAN TELCOM's Inspection Branch at (808) 546-6960 a minimum of forty-eight (48) hours prior to adjusting HAWAIIAN TELCOM structures.

Prior to commencing cold planing and reconstruction operations, the Contractor shall verify and locate underground communication lines, including fiber optic lines. The Contractor shall exercise due diligence in toning, locating, and protecting these communication lines. The Contractor shall be responsible for and shall pay for all damages to existing communication lines.

SP 150.7 BOARD OF WATER SUPPLY (BWS)

A. Unless otherwise specified, all materials and construction of water system facilities and appurtenances shall be in accordance with the Honolulu BWS WATER SYSTEM STANDARDS, Volume 1, and the APPROVED MATERIAL LIST AND STANDARD DETAILS FOR WATER SYSTEM CONSTRUCTION, Volume 2, dated 2002.

B. Prior to any excavating, the Contractor shall verify in the field the location of existing water mains and appurtenances.

C. The Contractor shall notify the BWS one (1) week prior to commencing work on the water facilities.

Windward Area – (808) 748-5671
Metropolitan Area – (808) 748-5601
All Other Areas – (808) 748-5611

D. Whenever any brick type water meter box with a cast iron frame and cover to be adjusted is encountered, the following shall apply:

1. The Contractor shall salvage the frame and cover and deliver them to the BWS, Kalihi Yard, at 2442 Kini Place.

2. The BWS shall replace the frame and cover, one for one, with a concrete type water meter box.

3. The Contractor shall install the concrete type meter box to the new sidewalk grade.

4. Whenever any Type III brick type meter box or bigger is encountered, the Contractor shall furnish the frame and cover.

5. Any adjustments to the existing water system required during construction to meet requirements of BWS Standards, whether shown on the plans or not, shall be done by the Contractor at no cost to the BWS.

SP 150.8 DEPARTMENT OF TRANSPORTATION SERVICES (DTS)/DEPARTMENT OF INFORMATION TECHNOLOGY (DIT)

A. The Contractor shall notify the Traffic Control Branch, Department of Transportation Services at (808) 768-8388, seventy-two (72) hours prior to any construction within any signalized intersection.

B. Prior to commencing cold planing and reconstruction operations, the Contractor shall verify and locate underground traffic signal and communication lines/conduits, including fiberoptic lines/conduits. The Contractor shall exercise due diligence in toning, locating, and protecting these traffic signal and communication lines/conduits. The Contractor shall be responsible for any and all damages to existing traffic signal and communication lines/conduits, including vehicle detector loops, as a result of the work. All damages shall be repaired by the Contractor at no additional cost to the City.

C. The Contractor shall notify, immediately, any damages to existing traffic signal lines/conduits and loop detectors to the Traffic Control Branch at (808) 564-6101.

SP 150.9 CHARTER COMMUNICATIONS, INC. (aka SPECTRUM)

A. The location of cable television (CATV) facilities shown on the plans are from existing records with varying degrees of accuracy as to its actual fixed location. The Contractor shall use extreme caution when working in close proximity of CATV facilities.

B. For any field assistance or verification of CATV facilities, the Contractor shall call the OSP Engineering Hotline at (808) 625-8570 or send an email to: haw.engineering.research@charter.com.

C. Any work required to relocate CATV facilities shall be done by Charter Communications, Inc., and the Contractor shall be responsible for all coordination requirements and associated applicable costs.

D. Any damage to Charter Communications, Inc.'s facilities shall be reported immediately to Charter Communications, Inc.’s Regional Operation Center at (808) 625-8169.

SP 150.10 HAWAII GAS

A. Hawaii Gas gas pipelines in the project area are plastic coated and cathodically protected. The Contractor shall be extremely careful when working near these gas pipelines.

B. Written clearances must be obtained from Hawaii Gas, Maps and Records Department, 515 Kamakee Street, at least five (5) working days prior to starting excavation near these gas pipelines.

C. Since gas line locations on field maps are approximate, the Contractor, after obtaining written clearance, shall call Hawaii One Call Center a minimum of five (5) working days before starting excavation to arrange for field location of existing gas pipelines. The telephone number is 811 or (866) 423-7287.

D. The Contractor shall excavate and backfill around gas pipelines in the presence of a representative of Hawaii Gas. All backfill within six (6) inches of any gas pipeline shall be select cushion material approved by Hawaii Gas.

E. For relocation of any gas pipeline, the Contractor shall notify Hawaii Gas five (5) working days before starting work. The telephone number is (808) 535-5933. The Contractor shall provide the necessary excavation and backfill, obtain traffic permits, and restore pavement, sidewalks, and other facilities. Any relocation of gas facilities shall be done by Hawaii Gas and paid for by the Contractor.

F. The Contractor shall notify Hawaii Gas immediately after any damage has been caused to existing gas pipelines, coatings, or its cathodic protection devices. The telephone number is (808) 526-0066, twenty-four (24) hours a day. The Contractor shall be liable for any damage to Hawaii Gas facilities. Repair work on such damage shall be done by Hawaii Gas with payment for this work to be borne by the Contractor.

G. Minimum vertical and horizontal clearance between the gas pipelines and other pipelines, conduits, ductlines, or other facilities shall be twelve (12) inches. Adequate support and protection for gas pipelines exposed in the trench shall be provided by the Contractor and approved by Hawaii Gas.

H. The Contractor shall work in an expeditious manner in order the keep uncovered gas pipelines exposed for as short a period of time as possible.

SP 150.11 HAWAII-AMERICAN WATER COMPANY

For field assistance or verification of the sewer system facilities in the Hawaii Kai area, the Contractor shall call Hawaii American Water Company. The telephone number is 1-888-237-1333, twenty-four (24) hours a day.

SP 150.12 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure coordinating, locating, and protecting existing utilities for payment. The Officer-in-Charge will not pay for coordinating, locating, and protecting existing utilities separately and will consider the cost for coordinating, locating, and protecting existing utilities as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents."

END OF SECTION SP 150

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 151 - DESCRIPTION OF WORK

SP 151.1 EXTENT OF WORK

The project scope consists of the following, but not limited to:

A. Cold planing, demolition, removal and disposal of existing pavements, curbs, gutters, sidewalks, trees, and other work necessary to install all new work as called for on the plans.

B. Construction of new concrete curbs and/or gutters and sidewalks, as indicated on the plans.

C. Resurfacing pavement with Asphalt Concrete Pavement, Hot Mix Asphalt, City Mix #4, and reconstructing pavement with Asphalt Concrete Pavement, State Mix No. IV and Asphalt Treated Concrete Base.

D. Adjustment of street monuments, storm drain manholes and handholes, sewer manholes and handholes, Board of Water Supply manholes, valve boxes, and handholes, Hawaiian Telcom manholes and handholes, Hawaiian Electric Company, Inc. manholes and handholes, Hawaii Gas manholes and handholes, and all other manhole/box frames and covers and valve boxes on all streets being resurfaced/reconstructed under this contract.

E. Restoration of all traffic signal vehicle loop detectors; and pavement striping, markings, and markers.

F. Provision of traffic control during construction.

G. Provision of access to all businesses during all business hours.

H. Tree and root trimming and canopy pruning, as necessary.

Contractors must visit the site prior to bidding to verify the characteristics, extent, and amount of work to be performed, and the conditions under which it must be performed.

The Contractor shall provide pavement adjustments to existing driveways and ensure that the drainage is maintained. The final paving should not create any drainage/ponding problems. Ponding within the resurfaced pavement area shall not be accepted.

SP 151.2 PERFORMANCE OF WORK

Once resurfacing of a given street has begun, it shall be pursued to completion without undue delay. The Contractor shall not be allowed to cold plane in advance more pavement than can be resurfaced within the same working day.

The Contractor may be allowed to cold plane and complete the resurfacing later in the week provided the Contractor shall be responsible for all complaints; safety, such as pedestrian crossings, pavement markings, temporary pop-up RPMs, traffic control, access, manhole and handhole frames, etc.; and maintaining the roadway surface, including addressing raveling, dust, base failures, transitions and removal. All cold planed areas shall be resurfaced by the end of each workweek, prior to the weekend.

The Contractor shall resurface lane-by-lane, beginning from the outer curb lanes and progress toward the inner center lane(s).

At the end of each workday, the Contractor is responsible to provide safe, temporary transitions or tapers with hot mix AC or similar stable material at all longitudinal and transverse pavement vertical grade differentials such as, but not limited to, at curb ramps, crosswalks, bus pads, driveways, gutter edges, and at any utility/other structures protruding above the roadway grade at the end of the day, or as directed by the Officer-in-Charge. The Contractor is also responsible to provide additional temporary warning signs and markings to alert drivers and pedestrians of the transitions or tapers. The Contractor shall be responsible for all complaints, safety, and liability, for all areas with and without temporary transitions or tapers within the project limits. Use 6:1 maximum slope for longitudinal transitions or tapers or as approved otherwise by the Officer-in-Charge. Use 48:1 maximum slope for transverse transitions or tapers or as approved otherwise by the Officer-in-Charge. Use 48:1 maximum slope within intersections for all temporary transitions or tapers or as approved otherwise by the Officer-in-Charge. Temporary transitions or tapers shall be trimmed vertical, removed and disposed of before placing adjoining sections.

SP 151.3 PAVING PLAN

The Contractor shall submit a paving plan within thirty (30) calendar days of NTP to the Officer-in-Charge. The paving plan shall include the following:

1. Work phasing and sequencing, location, and integrated with traffic control plans.

2. Description and extent of work to be done per work day.

3. Schedule of work activities.

4. Construction means and methods of performing work, including proposed equipment, differences in grades, etc.

5. How finish grades will be ensured.

6. Equipment staging area.

Paving operations shall not begin until the paving plan is reviewed by the Officer-in-Charge. Submit revised paving plan to the Officer-in-Charge prior to conducting work that deviates from previously

reviewed paving plan. Paving operations shall not continue until the revised paving plan is reviewed by the Officer-in-Charge.

SP 151.4 COORDINATION WITH REFUSE OPERATIONS

The Construction project manager shall invite Refuse Collection Branch Administrators to participate in the project preconstruction meeting.

Contractors to contact ENV Refuse Collection Branch Administrators ahead of conducting road work. Call Department of Environmental Services - Refuse Division at (808) 768-3401.

Refuse Collection Branch Administrators will put the Contractor in direct contact with the Superintendent at the appropriate refuse collection yard for daily/weekly coordination.

The Contractor shall provide the refuse collection yard with a work schedule. The Contractor shall plan and schedule their road work to take advantage of non-refuse collections days as much as possible. The Contractor can obtain the schedule days of refuse collection from the assigned refuse yard Superintendent.

The Contractor shall understand that all work cannot be scheduled around trash collection days and that there are delays due to weather and other factors. Therefore should road work need to occur on a refuse collection day, the Refuse Yard Superintendent shall be notified in advance (twenty-four (24) hours notification if possible). The Superintendent can schedule trucks to service that area first in the morning at 6am ahead of the road work.

SP 151.5 MEASUREMENT AND PAYMENT

The Officer-in-Charge will pay for the accepted pay items listed below at the contract lump sum price, as shown in the Offer schedule. Roadway intersections shall be paid under through streets as identified on the plans. Payment shall be full compensation for furnishing the necessary material, equipment, and labor to complete the work in place prescribed in this section and the contract documents.

Pay Item	Pay Unit
STREET NAME	Lump Sum

The Officer-in-Charge will pay in accordance with the following:

5% of the contract bid price upon completion, submittal, and acceptance of the existing asphalt concrete berms height and location report. (If no berms are present on the street, this amount shall be included with the paving work.)

70% of the contract bid price upon completion of cold planing and unclassified excavation, curb and gutter reconstruction, resurfacing and reconstruction of the asphalt concrete pavement and asphalt treated concrete base, restoration of asphalt concrete berms/curbs, and speed humps. (This amount shall be

75% of the lump sum bid amount if there are no berms present on the street.)

10% of the contract bid price upon installation of the pavement striping, markings, and markers; and vehicle detector loops.

5% of the contract bid price upon completion of the manhole frames and covers, valve boxes, and street monument adjustments to finish grade.

5% of the contract bid price upon completion of the corings.

5% of the contract bid price upon submittal of the Contractor's "As-Built" Drawings.

Partial payment of the individual percentage breakdown may be made however, only when all work described for each percentage breakdown is completed for that requested percentage of the street.

The Officer-in-Charge will not measure the temporary transitions or tapers and paving plan for payment. The Officer-in-Charge will not pay for the accepted temporary transitions or tapers and paving plan separately and will consider the cost for the temporary transitions or tapers and paving plan as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents."

The Officer-in-Charge will not measure temporary warning signs and markings to alert drivers and pedestrians of the transitions/tapers for payment. The Officer-in-Charge will not pay for temporary warning signs and markings to alert drivers and pedestrians of the transitions/tapers separately and will consider the cost for temporary warning signs and markings to alert drivers and pedestrians of the transitions/tapers as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents.

END OF SECTION SP 151

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 152 – ADDITIONAL WORK

SP 152.1 GENERAL

Additional Work pay items in the Offer schedule will be used only when directed by the Officer-in-Charge. See Section SP of the Additional Work pay item for description of the work.

SP 152.2 MEASUREMENT AND PAYMENT

The Officer-in-Charge will pay for the accepted Additional Work as described in the Additional Work Items in the Offer and in the respective Section SP of the work item on a force account or allowance basis. Payment shall be full compensation for the work directed by the Officer-in-Charge and shall be deducted from the force account or allowance set in the Offer. The unused portion of the force account or allowance item shall remain with the City upon completion of the contract."

END OF SECTION SP 152

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 153 - DELETION OF WORK

The Officer-in-Charge reserves the right to delete any portion of the work in the Offer and no payment shall be made for the deleted work."

END OF SECTION SP 153

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 154 – PRICE ADJUSTMENT DUE TO NTP ISSUANCE

The City may issue the Notice to Proceed (NTP) up to 365 calendar days after the execution of the contract. Should the NTP be issued within 365 calendar days of the date of contract execution, no claim for any delays or cost escalation shall be considered.

If the NTP is issued more than 365 calendar days after the date of contract execution, the Contractor may submit a request to adjust any unit bid price(s) and/or lump sum bid price(s) contained in the Offer. The price adjustment shall be based on the *"20-City Average Construction Cost Index (CCI)"* from the latest weekly publication of the *Engineering News Record* magazine. The adjusted amount will be determined by computing the average yearly rate of increase in the *20-City Average CCI* over the previous twelve (12) months. Each price adjustment is subject to the availability of funds. The adjusted bid prices must be used for payment of services provided.

Once the NTP has been issued, no further price adjustments will be given and the Contractor must perform all work at the latest readjusted prices."

END OF SECTION SP 154

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 155 – PRICE ADJUSTMENT FOR SUBSURFACE HAZARDOUS MATERIALS

SP 155.1 GENERAL

Price adjustments for subsurface materials reasonably believed to be hazardous to human health or the environment may be permitted by the Officer-in-Charge under the following conditions:

(A) Notification. The Contractor shall promptly provide proof of subsurface hazardous materials and notify the Officer-in-Charge of subsurface hazardous materials at the site differing materially from that indicated in this contract. Proof of subsurface hazardous materials shall be the Contractor's documentation of material conditions reasonably believed to be hazardous to human health or the environment. Proof shall be provided as soon as these material conditions are encountered, either through research or physical means.

(B) Adjustment of price or time for performance. After receipt of the notice, the Officer-in-Charge shall promptly investigate the site, and if it is found that subsurface hazardous materials do materially so differ and cause an increase in the Contractor's cost of, or the time required for, performance of any part of the work under this contract, whether or not changed as a result of the conditions, an adjustment shall be made and the contract modified in writing accordingly. The adjustment in price or time may include testing, control, remediation, abatement, and disposal. Performance of the work shall be in compliance with all Federal, State, City, and OSHA requirements, regulations and laws.

(C) Timeliness of claim. No claim of the Contractor under this clause shall be allowed unless the Contractor has given the notice required in this clause; provided, however, that the time prescribed therefore may be extended by the Officer-in-Charge.

(D) No claim after final payment. No claim by the Contractor for an adjustment shall be allowed if asserted after final payment under this contract.

(E) Knowledge. Nothing contained in this clause shall be grounds for an adjustment in compensation if the Contractor had actual knowledge of the existence of such conditions prior to the submission of bids."

END OF SECTION SP 155

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 160 - SURVEYS AND CONSTRUCTION STAKES, LINES AND GRADE

SP 160.1 GENERAL

Notwithstanding the commencement requirements of the General Conditions, the following also applies:

SP 160.2 CONTRACTOR RESPONSIBILITIES

The Officer-in-Charge shall identify bench marks and control points for the Contractor's guidance. The Contractor shall furnish all other land surveys and construction stakeout necessary for the completion and acceptance of this project. All survey work shall be laid out and checked by a Surveyor or Civil Engineer licensed in the State of Hawaii. The Contractor shall furnish a certificate or document signed by the Surveyor or Civil Engineer certifying that the completed lines, levels and elevations are in conformity with the contract.

The Contractor shall verify all lines, levels and elevations indicated in the contract before any excavation or construction begins. Any discrepancy shall be immediately brought to the attention of the Officer-in-Charge and any change shall be made in accordance with this instruction. The Contractor shall not be entitled to any additional payment if they fail to report the discrepancies before proceeding with work within the area affected by the discrepancies.

SP 160.3 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure the work under this section for payment. The Officer-in-Charge will not pay for the work under this section and will consider this work as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents."

END OF SECTION SP 160

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 170 - CERTIFICATION OF COMPLIANCE

The Officer-in-Charge may permit use prior to sampling and testing of certain materials or assemblies accompanied by Certificates of Compliance stating that such materials or assemblies fully comply with the requirements of the contract; when requested by the Officer-in-Charge, substantiating test data shall be furnished with the Certificate of Compliance. The certificate shall be signed by notarized signature of a person having legal authority to bind the manufacturer. Each lot of such materials or assemblies delivered to the work must be accompanied by a Certificate of Compliance in which the lot is clearly identified. Material or assemblies used on the basis of Certificate of Compliance may be sampled and tested at any time and if found not to be in conformity with contract requirements will be subject to rejection whether in place or not."

END OF SECTION SP 170

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 180 - LIQUIDATED DAMAGES

SP 180.1 GENERAL

When the Contractor fails to complete the work or any portion of the work within the time or times specified in the Contract or any extension thereof, it is agreed that the Contractor shall pay to the City the amount specified below.

Liquidated damage per calendar day of delay: $275.00

The Contractor hereby agrees to pay the amount as liquidated damages, and not by way of penalty, to the City and further authorizes the City to deduct the amount of the damages from monies due the Contractor under the Contract, computed as previously mentioned. If the monies due the Contractor are insufficient or no monies are due the Contractor, the Contractor shall pay the City the difference or the entire amount, whichever may be the case, upon demand by the City."

END OF SECTION SP 180

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 181 – AS-BUILT DRAWINGS

SP 181.1 GENERAL

The following replaces the As-Built Drawings subsection of the General Conditions:

A. The Contractor shall maintain at the job site one (1) set of full size contract drawings, marking them in red documenting all construction changes, alterations and/or deletions indicated or specified in the contract documents and buried or concealed construction, including location and depth of existing utilities toned.

B. Where a choice of material or method is permitted herein or where variations in scope of or character of work from that of the original contract are authorized, the drawings shall be marked to define the construction actually provided. Where equipment installation is involved the size, manufacturer's name, model number, power input or output characteristic applicable shall be shown on the as-built construction.

C. The representation of such change shall conform to standard drafting practice and shall include such supplementary notes, legends, and details as necessary to clearly portray the as-built construction. The changes shall be shown in legible block print. The language shall be clear and concise using industry standard terminology to eliminate need for interpretation by others.

D. The drawings shall be maintained and updated on a monthly basis and are subject to review by the City. The update is a condition of payment for the work performed.

E. Upon completion of the work, the Contractor shall deliver the marked-up drawings and letter of certification to the Officer-in-Charge indicating the construction is in accordance with City Standards, Specifications and as represented in attached "As-Built Drawings". The City will review the changes, alterations, and/or deletions to the original bid set. If Record Drawing tracings will be prepared, the Contractor shall also sign the following stamp in permanent black ink on the title sheet of the Record Drawing tracings:

RECORD DRAWING TRACINGS

CONTRACTOR

As-Built Drawings
Certified by: _____ **Date:** _____
Print Name: _____
Company: _____

LICENSED PROFESSIONAL ENGINEER

Prepared by: _____ **Date:** _____
Print Name: _____
Company: _____

THIS SET OF "RECORD DRAWINGS" IS BASED ON INFORMATION PROVIDED BY THE CONTRACTOR AS "AS-BUILT" DRAWINGS AND HAS NOT BEEN FIELD VERIFIED BY THE LICENSED PROFESSIONAL ENGINEER. "RECORD DRAWINGS" ARE DRAWINGS DEFINED AS RECORD DOCUMENTS PREPARED BY THE LICENSED PROFESSIONAL ENGINEER UPON THE COMPLETION OF CONSTRUCTION. THESE DRAWINGS ARE BASED UPON THE DRAWINGS AND OTHER DATA FURNISHED BY THE CONTRACTOR AND OTHERS SHOWING THE FINAL CONSTRUCTED IMPROVEMENTS, REPRESENTING ALL FIELD MARKUPS, DESIGN CHANGES, AND CHANGES IN THE WORK MADE DURING CONSTRUCTION. THE LICENSED PROFESSIONAL ENGINEER IS NOT RESPONSIBLE FOR FIELD VERIFICATION OF THE ACCURACY AND/OR COMPLETENESS OF THIS INFORMATION AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS ON THESE DRAWINGS RESULTING FROM ERRONEOUS INFORMATION PROVIDED BY OTHERS.

SP 181.2 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure As-Built Drawings for payment. The Officer-in-Charge will pay for the accepted As-Built Drawings on a contract lump sum basis. Payment shall be full compensation for furnishing the necessary material, equipment, and labor to complete the work in place prescribed in this section and the contract documents."

END OF SECTION SP 181

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 190 – PRESS RELEASE

SP 190.1 DESCRIPTION

The Contractor shall provide project information for a press release to the Officer-in-Charge prior to the start of work on this project. This information shall be submitted to the Officer-in-Charge for review by the Director of the Department of Design and Construction before being publicized. It shall contain, but not be limited to, the following:

1. Map of project area, identifying the street(s) to be affected, together with a general description of work to be undertaken.

2. Date work will start and approximate date of completion.

3. Working hours and days of work.

4. Detour pattern(s), if any, and two-way traffic flow in detour area.

5. Suggestion that motorists use alternative routes, and drive with caution in construction area.

6. If the project will be constructed in phases, include phases and anticipated start and completion date.

7. Posting of No-Parking signs by the Contractor one (1) week prior to construction in the work area.

8. Telephone number for questions related to the project.

9. Any other information which will be of help to the public.

Within seven (7) calendar days from the acceptance of the performance schedule, the Contractor shall submit the schedule together with maps identifying the affected street(s) to the Neighborhood Board(s).

SP 190.2 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure the providing of press release information for payment. The Officer-in-Charge will not pay for the providing of press release information separately and will consider the cost for providing the press release information as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents."

END OF SECTION SP 190

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 191 - PROTECTION AND CONTROL OF PEDESTRIANS AND VEHICULAR TRAFFIC

SP 191.1 GENERAL

The Contractor shall, during the progress of the work, use proper precautions and methods of procedure and construction for the protection and control of pedestrians and vehicular traffic in accordance with Subsection 5.2.13 of the General Conditions and as supplemented herein.

SP 191.2 ACCESS

During the progress of the work, the Contractor shall provide free access to water meters, water valves, and abutting public and private property. No material or obstruction of any sort shall be placed within 25 feet of any fire hydrant. Fire hydrants must be readily accessible to the Fire Department at all times.

The Contractor shall provide proper traffic bridges where necessary so that all streets, roads, lanes, alleys, driveways, and garages shall be accessible to traffic at all times. These bridges shall be constructed so that their decks are flush with the pavement, and maintained free from projecting nails, splinters, or rough edges. In lieu of the traffic bridges, the Contractor may use suitable steel plates. The bridges and/or steel plates shall be able to support all legal highway loads permitted by law and shall have a non-skid surface.

Special attention is called to private and public rights-of-way. Driveways shall be kept open unless the owners of the property using these rights-of-way are otherwise provided for satisfactorily. During the construction of driveways and driveway ramps, satisfactory accesses shall be provided by the Contractor.

In the event of the Contractor's failure to comply with the foregoing provisions, the City may, with or without notice, cause the access to be provided, and deduct the costs of such work from any moneys due or to become due the Contractor under this contract, but the performance of such work by the City shall serve in no way to release the Contractor from their liability for the safety of the public or the work.

SP 191.3 TRAFFIC CONTROL, PEDESTRIAN WALKWAYS AND WARNING SIGNS

The Contractor shall be responsible for preparing the site specific traffic control plans (TCPs) and obtaining City reviews and approvals. The TCPs are required to obtain a street usage permit.

The Contractor shall become familiar with and shall meet the latest requirements of the Department of Planning and Permitting – Traffic Review Branch (DPP) and the Department of Transportation Services (DTS) for traffic control plans. After the execution of the contract, the Contractor shall submit a traffic control plan to the DPP for review and approval in conjunction with the application for a street usage permit. The TCPs shall meet all DPP and DTS requirements, including preparation by, or under the supervision of, a licensed professional engineer.

A Street Usage permit shall be obtained from the DTS before work on any portion of a public street or highway may begin. All traffic controls shall conform to the requirements of the Department of Transportation Services, the current Traffic Code for Honolulu, the "Administrative Rules of Hawaii Governing the Use of Traffic Control Devices at Work Sites On or Adjacent to Public Streets and Highways in the State of Hawaii", adopted by the Director of Transportation, the Federal Highway Administration's "Manual on Uniform Traffic Control Devices for Streets and Highways, Part VI - Traffic Controls for Street and Highway Construction and Maintenance Operations", and the provisions hereunder. The Contractor shall notify the Department of Transportation Services at least five (5) working days prior to removal of any existing City traffic control sign or device.

The Contractor shall so conduct their operations as to minimize inconvenience to traffic and they shall have under construction no greater amount of work than they demonstrate that they can handle properly with due regard for the rights of the public.

The Contractor shall cooperate with the Officer-in-Charge, the Department of Transportation Services and other authorized persons in locating all warning signs, lights, walkways and detours required under this section. If the Contractor fails to promptly provide adequate warning signs, lights, walkways and detours, the City may, at its option, so provide them at the Contractor's expense. The Contractor shall pay the cost of such work to the City, or the City may deduct the cost from any moneys due the Contractor from the City.

The Contractor shall provide and post signs banning parking on streets to be worked on twenty-four (24) hours prior to the work. The Contractor shall also cover all existing parking regulation signs and uncover them after the completion of resurfacing. The signs shall conform to the following requirements.

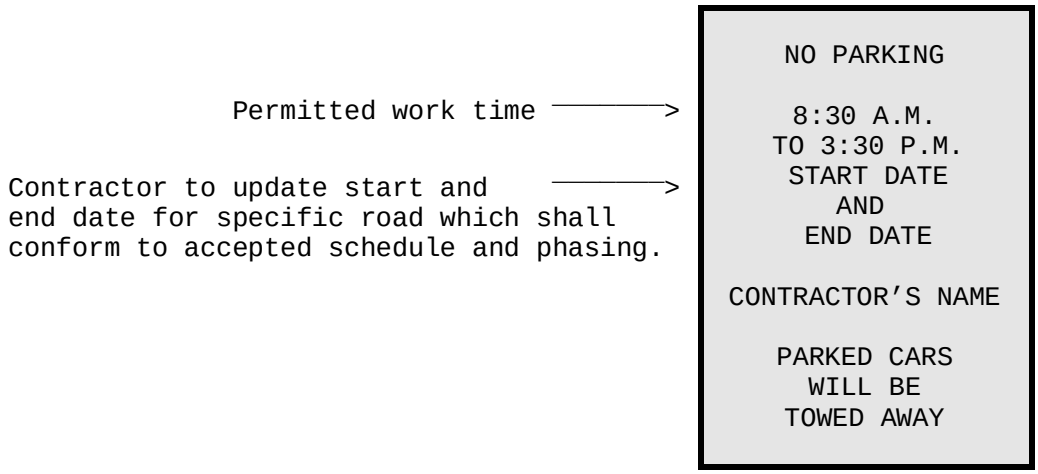
Signs shall be mounted on 4-foot high portable stands.

Size--18" x 24" x 0.063" with 1-1/2" radius corners.

Materials--Aluminum conforming to ASTM Designation B 209-68. Paint shall be 3M Scotchlite Process Color or approved substitute.

Color--Red lettering on white reflectorized background except at the upper left corner where the word "No" shall be white lettering on red background.

Information on Signs--The signs shall contain the information noted and conform to the layout as shown on the following schematic drawing.



The type of sign required is available for examination at the Division of Road Maintenance Office at 99-1077 Iwaena Street.

Sample--The Contractor shall submit to the Officer-in-Charge for review, a full scale sample of the sign and stand, not later than three (3) calendar days after formal execution of the contract.

Number of Signs--The Contractor shall have a minimum of twenty-five (25) signs available for posting at locations to be determined by the Officer-in-Charge.

SP 191.4 RESTRICTIONS

While construction is in progress within any City street, the Contractor shall provide and maintain traffic lanes in good condition in accordance with the following requirements.

A. Normal Hours: 8:30 a.m. to 3:30 p.m., Monday to Friday.

1. During working hours, the Contractor shall provide two (2) lanes of roadway open to traffic at all times. On streets too narrow to make this practicable, the Contractor may work in one-half the roadway, keeping the other half open to traffic. The Contractor shall take adequate measures to ensure that service by the buses of the Oahu Transit

Service of Honolulu, Inc. is not interrupted by this project.

2. During non-working hours, all trenching located within the existing pavement area shall be covered and all lanes shall be opened to traffic. The Contractor shall construct proper bridges and approach ramps as required (non-skid steel plates may be used) to provide for the smooth flow of traffic. All trenches within the sidewalk areas shall be covered, providing safe passageways for pedestrians.

3. The Contractor shall notify the Honolulu Police Department, Honolulu Fire Department and Oahu Transit Services of Honolulu, Inc. fourteen (14) calendar days prior to any work blocking any City street during construction.

4. The Contractor shall notify the Traffic Control Branch, Department of Transportation Services, telephone (808) 768-8388, seventy-two (72) hours prior to any construction within any signalized intersection. The Contractor shall be responsible for any and all damages to existing traffic signal conduits and loop detectors as a result of their work. All damages shall be repaired by the Contractor.

B. Failure to open lanes to traffic. Rental fees shall be assessed for failure to open lanes to traffic during peak hours. Morning and afternoon peak hours shall be from 5:30 a.m. to 8:30 a.m. and 3:30 p.m. to 6:30 p.m., respectively, Monday through Friday.

In addition to all other remedies available to the City for Contractor's breach of the terms of the contract, the Officer-in-Charge will assess the rental fees in the amount of $100.00 for every one-to fifteen-minute increment for each roadway lane closed to the public use or occupied beyond the time periods authorized in the contract or by the Officer-in-Charge. The maximum amount assessed per day shall be $1,000.00. The City may, at its discretion, deduct the amount from monies due or that may become due under the contract. The rental fee may be waived in whole or part if the Officer-in-Charge determines that the unauthorized period of lane closure or occupancy was due to factors beyond the control of the Contractor.

SP 191.5 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure the traffic control for payment. The Officer-in-Charge will not pay for the accepted traffic control separately and will consider the cost for traffic control as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents.

Additional traffic control devices and additional police officers are only required as directed by the Officer-in-Charge. Additional traffic control devices and additional police officers are not to be used for additional quantities or work items that are needed to do the required work.

The Officer-in-Charge will pay for the accepted additional traffic control devices on a force account basis. Payment for the maintenance and removal operations for additional devices will also be on a force account basis. Payment shall be full compensation for the work directed by the Officer-in-Charge and shall be deducted from the force account set in the Offer. The unused portion of the force account item shall remain with the City upon completion of the contract.

The Officer-in-Charge will pay for any accepted additional police officers as directed by the Officer-in-Charge on an allowance basis. Payment shall be full compensation inclusive of administrative fees charged by the Honolulu Police Department for the work directed by the Officer-in-Charge. Payment will be deducted from the allowance set in the Offer and shall be included in the monthly estimate for the progress payment upon submittal of paid invoices, with sufficient documentation to account for the costs of all labor, equipment, materials, and any other items invoiced. The Contractor shall collect and maintain sufficient documentation to validate reimbursement under this Section. The Contractor shall submit records of the work performed at the end of each day to the Officer-in-Charge to justify labor, equipment, and material costs. Individual equipment or tools having a replacement value of eight hundred dollars ($800) or less will not be considered an allowable cost. The Contractor shall be reimbursed for the allowance item plus maximum of twenty (20) percent inclusive of any administrative cost, workers' compensation, insurance fee, overhead/profit, bond fee, and applicable taxes. The unused portion of the allowance item shall remain with the City upon completion of the contract."

END OF SECTION SP 191

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 192 – PRIOR NOTICE OF REMOVAL OF SURFACE ENCROACHMENT

Wherever the project requires the removal of surface encroachments such as privately-owned plants and shrubbery from the City's right-of-way, the Contractor shall notify the affected owners of the impending action. The notice shall be given at least two (2) weeks in advance of the commencement of the removal. It shall contain the construction starting date and the location of plants or other encroachments to be removed for each owner. This requirement may be modified or waived by the Officer-in-Charge when conditions warrant or if acceptable alternatives are submitted by the Contractor."

END OF SECTION SP 192

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 193 – NOTIFICATION OF PROPERTY OWNERS AFFECTED BY THE PROJECT

SP 193.1 DESCRIPTION

The Contractor shall notify all owners of properties, tenants, and businesses abutting the project site and along any detour routes of the impending construction work in writing (notification flier) at least fourteen (14) calendar days prior to commencing construction.

In addition to the above, when work within private property is required, the Contractor shall notify each property owner affected by such work of the approximate starting date and total duration of the work within their property. This notification shall also be made in writing (notification flier) at least fourteen (14) calendar days prior to commencing the work.

In either case, a draft letter of the notification shall be submitted to the Officer-in-Charge for review.

SP 193.2 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure notification of property owners affected by the project for payment. The Officer-in-Charge will not pay for notification of property owners affected by the project separately and will consider the cost for such notification as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents."

END OF SECTION SP 193

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 194 - PERMITS AND REGULATIONS

SP 194.1 GENERAL

The Contractor shall obtain all permits and licenses; pay all charges, fees, and taxes; give all notices; and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified.

These may include, but, are not limited to, the following:

A. Demolition permit.

B. Solid Waste Permits.

C. Grading and trenching permit.

D. Stockpiling permit.

E. Traffic (street usage) permit.

F. Community Noise permit.

G. City Park Right-of-Entry permit.

H. Environmental Permits/Certification

As applicable, the Contractor shall be familiar with the latest requirements of the National Pollutant Discharge Elimination System (NPDES) Permits (Form C, Form G, Form F), Clean Water Act, Section 401 Water Quality Certification (WQC), Department of the Army Permits, Stream Channel Alteration Permit (SCAP), Coastal Zone Management Permit (CZM), and all other required environmental permits. If the required permits or certification have not been obtained by the City, or if the Contractor triggers a permit by their means and methods, the Contractor shall apply for and obtain the required permits or certification and pay for the applicable filing fees.

(a) NPDES Permit Authorizing Discharges of Storm Water Associated with Construction Activity

(1) NPDES Permitted Projects. The City will apply for the NPDES Notice of General Permit Coverage (NGPC) or NPDES Individual Permit from the State of Hawaii, Department of Health, Clean Water Branch (DOH-CWB) authorizing discharges of storm water associated with construction activity and will prepare the required Storm Water Pollution Prevention Plan (SWPPP). The Contractor shall complete the SWPPP. The permit will be issued for the disturbed areas and discharge points identified in the NPDES Notice of Intent (NOI) and NPDES Permit. The Contractor shall be responsible to comply with all requirements and conditions of the NPDES Permit, including, but not limited to, updating, completing, and submitting to the Officer-in-Charge for acceptance, the updated construction schedule

and SWPPP, which includes a Site-Specific Best Management Practices (BMP) Plan.

The Contractor shall assess whether they will be triggering another NPDES Permit per their means and methods; and if so, the Contractor shall be responsible for preparing the required NPDES NOI application and shall be responsible for all related fees.

(A) NPDES General Permitted Project – If there is any additional disturbed area as defined by the NPDES Program, or any additional discharge points, an NPDES General or NPDES Individual Permit Authorizing Discharges of Storm Water Associated with Construction Activity is required for the project. The Contractor shall prepare the State Department of Health, Clean Water Branch, NPDES NOI Form C, as required by the project, and any other documents such as the SWPPP for the Officer-in-Charge's review and acceptance. After receiving approval, the Contractor shall submit the permit application to the DOH-CWB.

(B) NPDES Individual Permitted Project – The Contractor shall keep track of any additional disturbed area as defined by the NPDES Program.

If the total additional disturbed area is less than one (1) acre, and there are no additional discharge points, the Contractor shall submit an amendment to the SWPPP to include the additional disturbed area to the Officer-in-Charge for review and acceptance. The Contractor shall not work in the additional disturbed area until the SWPPP Amendment is accepted by the Officer-in-Charge.

If the total additional disturbed area is one (1) acre or more, and/or if there are any additional discharge points, another NPDES Permit is required for the project. The Contractor shall prepare and submit NPDES NOI Form C and any other documents including the SWPPP for the Officer-in-Charge's review and acceptance.

(2) Non-NPDES Permitted Project. If the project has less than one (1) acre of disturbed area, a NPDES Permit Authorizing Discharges of Storm Water Associated with Construction Activity is not required. The Contractor shall complete the SWPPP template included in the SPs.

The Contractor shall document the total acreage of disturbed area as defined by the NPDES Program. Disturbed area for the project is cumulative. If the total disturbed area becomes one (1) acre or more, an NPDES Permit Authorizing Discharges of Storm Water Associated with Construction Activity is required for the project. The Contractor shall apply for and obtain the appropriate NPDES permits required by the DOH-CWB.

The Contractor shall prepare and submit the NPDES NOI Form C and the SWPPP and any other documents for the Officer-in-Charge's review and acceptance. The NPDES NOI Form C shall not be submitted to the DOH-CWB until the Officer-in-Charge has reviewed and accepted it. Submit all supplemental documentation and the final NPDES NGPC or NPDES Individual Permit to the Officer-in-Charge.

(b) NPDES Permit Authorizing Discharges Associated with Construction Activity Dewatering

(1) NPDES Permitted Project. If the NPDES NOI Form G is included in the contract documents, the City has applied for or obtained the NPDES NGPC or NPDES Individual Permit authorizing discharges associated with construction activity dewatering for the project to the State receiving waters identified in the NPDES Permit. The Contractor shall be responsible to comply with all requirements and conditions of the NPDES Permit, including, but not limited to, preparing and submitting to the Officer-in-Charge for acceptance, the updated construction schedule, Site-Specific Dewatering Plan, and any other requirements of the permit.

If the Contractor, per their means and methods, proposes to discharge dewatering effluent into a non-permitted discharge point, the Contractor shall prepare an NPDES NOI Form G and submit to the Officer-in-Charge for review and acceptance prior to submission to the DOH-CWB. After the Contractor receives the Officer-in-Charge's acceptance, submit the permit application (NPDES NOI Form G) to DOH-CWB. Submit copies of all NPDES NOI Form G, as required by the project, and any other documents including amendments to the SWPPP to the Officer-in-Charge. Submit all supplemental documentation and the final NPDES NGPC or NPDES Individual Permit to the Officer-in-Charge.

(2) Non-NPDES Permitted Project. If the project does not have a NPDES Permit Authorizing Discharges Associated with Construction Activity Dewatering and the dewatering activities require discharge of dewatering effluent into State waters or drainage systems, the Contractor shall obtain an NPDES General Permit or NPDES Individual Permit authorizing discharges associated with construction activity dewatering from the DOH-CWB. The Contractor shall prepare an NPDES NOI Form G and submit to the Officer-in-Charge for review and acceptance prior to submission to the DOH-CWB. After the Contractor receives the Officer-in-Charge's acceptance, submit permit application (NPDES NOI Form G) to DOH-CWB. Submit a copies of all NPDES NOI Form G, as required by the project, and any other documents including amendments to the SWPPP to the Officer-in-Charge. Submit all supplemental documentation and the final NPDES NGPC or NPDES Individual Permit to the Officer-in-Charge.

(c) NPDES Permit Authorizing Discharges of Hydrotesting Waters

(1) NPDES Permitted Project. If the NPDES NOI Form F is included in the Special Provisions, the City has applied for or obtained the NPDES NGPC or NPDES Individual Permit Authorizing Discharges of Hydrotesting Waters from the project to the State receiving waters identified in the NPDES Permit. The Contractor shall be responsible to comply with all requirements and conditions of the NPDES Permit, including, but not limited to, preparing and submitting to the Officer-in-Charge for acceptance, the updated construction schedule, Site-Specific BMP Plan, Hydrotesting BMP Plan, and any other requirements of the permit.

(2) Non-NPDES Permitted Project. If work includes removing, relocation or installing waterlines, and the Contractor elects to flush waterline or discharge hydrotesting effluent into State receiving waters or drainage systems, the Contractor shall obtain an NPDES General Permit or NPDES Individual Permit authorizing discharges of hydrotesting waters from the DOH-CWB.

The Contractor shall prepare an NPDES NOI Form F and submit to the Officer-in-Charge for review and acceptance prior to submission to the DOH-CWB. After the Contractor receives the Officer-in-Charge's acceptance, submit permit application (NPDES NOI Form F) to DOH-CWB. Submit a copies of all NPDES NOI Form F, as required by the project, and any other documents including amendments to the SWPPP to the Officer-in-Charge. Submit all supplemental documentation and the final NPDES NGPC or NPDES Individual Permit to the Officer-in-Charge.

Conduct Hydrotesting operations in accordance with the conditions of the NGPC or Individual Permit.

(d) Section 404 and Section 10 Department of the Army Permit. If the Department of the Army Permit is included in the contract documents, the City has obtained a Section 404 and/or Section 10 permit from the Department of the Army, U.S. Army Engineer District, Honolulu. The Contractor shall be responsible to comply with all requirements and conditions of the Department of the Army Permit.

(e) Section 401 Water Quality Certification (WQC). If the Section 401 WQC is included in the contract documents, the City has obtained a Section 401 WQC from the DOH-CWB. The Contractor shall be responsible to comply with all requirements and conditions of the Section 401 WQC, including, but not limited to, implementation of the Applicable Monitoring and Assessment Plan (AMAP).

(f) Stream Channel Alteration Permit (SCAP). If the SCAP is included in the contract documents, the City has obtained a SCAP from the Department of Land and Natural Resources, Commission on Water Resource Management. The Contractor shall be responsible to comply with all requirements and conditions of the SCAP.

(g) Coastal Zone Management (CZM) permit. If the CZM is included in the contract documents, the City has obtained a CZM from the State of Hawaii, Department of Business and Economic Development and Tourism (DBEDT) Office of Planning. The Contractor shall be responsible for complying with all conditions of the CZM permit.

(h) Special Management Area (SMA) Use Permit. If the SMA Use Permit is included in the contract documents, the City has obtained a SMA Use Permit from the City's Department of Planning and Permitting. The Contractor shall be responsible for complying with all conditions of the permit.

SP 194.2 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure permits for payment. The Officer-in-Charge will not pay for the accepted permits separately and will consider the cost for permits as included in the contract prices for the various contract pay items. The cost is for the work described in this section and the contract documents."

END OF SECTION SP 194

The following section shall be made a part of the Standard Specifications:

"SECTION SP 195 - ENVIRONMENTAL POLLUTION CONTROL

SP 195.1 GENERAL

This section shall supplement any provision for Environmental pollution and hazardous materials, substances and/or waste control of the General Conditions.

SP 195.2 DESCRIPTION

The Contractor shall comply with the requirements of Hawaii Administrative Rules (HAR) Chapter 11-54 Water Quality Standards and Chapter 11-55 Water Pollution Control. In addition, the Contractor shall be responsible for updating, completing, and implementing the Storm Water Pollution Prevention Plan (SWPPP), including, but not limited to, the Site-Specific Best Management Practices (BMPs), to prevent polluted run-off from discharging from the project site to any established Municipal Separate Storm Sewer System (MS4), drainage systems, private property, or State receiving waters. The Contractor shall be responsible for updating the SWPPP as required.

This section describes the following:

A. The Contractor shall update and complete a SWPPP using the SWPPP template to reflect their means and methods, including, but not limited to: detailed plans, diagrams, maps and figures, and Site-Specific BMP Plans; constructing, maintaining, and repairing temporary water pollution, dust, and erosion control measures at the project site and project staging areas, including local material sources, work areas and haul roads; removing and disposing hazardous wastes; control of fugitive dust (defined as uncontrolled emission of solid airborne particulate matter from any source other than combustion); and in compliance with HAR 11-54 and HAR 11-55. Potential pollutant identification and mitigation measures are listed in the SWPPP template.

   Requirements of this section also apply to, but are not limited to, the following: construction support activities, including concrete or asphalt batch plants, rock crushing plants, equipment staging yards/areas, material storage areas, excavated material disposal areas, and borrow areas located outside the City Right-of-Way. These requirements apply to construction support activities that are established for the sole benefit and use of the project, and not commercial sources.

B. Work associated with construction storm water, dewatering, and hydrotesting activities and complying with conditions of the National Pollutant Discharge Elimination System (NPDES) permit(s) authorizing discharges of storm water associated with construction activity, discharges associated with construction activity dewatering, and discharges of hydrotesting waters.

C. Determination and characterization of fill material.

SP 195.3 MATERIALS

Comply with applicable materials described in the latest City and County of Honolulu Storm Water BMP Manual Construction. In addition, the materials shall comply with the following:

A. Slope Drains. Slope drains may be constructed of pipe, fiber, mats, erosion control fabric, geotextiles, rubble, portland cement concrete, bituminous concrete, plastic sheets, or other materials acceptable to the Officer-in-Charge.

B. Mulches. Mulches shall be recycled materials include bagasse, hay, straw, wood cellulose, bark, wood chips, or other materials acceptable to the Officer-in-Charge. Mulches shall be clean and free of noxious weeds and deleterious materials.

C. Grass. Grass shall be a quick growing species such as rye grass, Italian rye grass, or cereal grasses. Grass shall be suitable to the area and provide a temporary cover that will not compete later with permanent cover. Alternative grasses are allowable if acceptable to the Officer-in-Charge.

D. Fertilizer and Soil Conditioners. Fertilizer and soil conditioners shall be a standard commercial grade acceptable to the Officer-in-Charge. Fertilizer shall conform to Standard Specification Section 51.2(G) – Commercial Fertilizer.

E. Hydro-mulching. Hydro-mulching used as a BMP shall consist of materials in SP 195(B) - Mulches, 195(C) - Grass, and 195(D) – Fertilizer and Soil Conditioners above. Submit hydro-mulching mix and irrigation plan for the Officer-in-Charge’s acceptance. Potable water shall be used. Submit alternate sources of irrigation water for the Officer-in-Charge’s acceptance. Install non-vegetative controls including mulch or rolled erosion control products while the vegetation is being established. Water and fertilize grass. Apply fertilizer as recommended by the manufacturer. Replace grass the Officer-in-Charge considers unsuitable or sick. Remove and dispose of trash and debris. Remove invasive species. Mow as needed to prevent site or signage obstructions, fire hazard, or nuisance to the public. Do not remove down stream sediment control measures until the vegetation is uniformly established, including no large bare areas, and provides seventy (70) percent of the density of pre-disturbance vegetation. Temporary vegetative stabilization shall not be used longer than one year.

F. Silt Fences. Silt fences shall be synthetic filter fabric mounted on posts and embedded in compacted ground in accordance with contract documents, and shall be in compliance with ASTM D6462, Standard Practice for Silt Fence Installation.

G. Berms. Berms shall be gravel or sand wrapped with geotextile material. Alternate materials are allowable if acceptable to the Officer-in-Charge.

Alternative materials or methods to control, prevent, remove and dispose pollution are allowable if acceptable to the Officer-in-Charge.

SP 195.4 CONSTRUCTION

A. Preconstruction Requirements.

(a) Water Pollution, Dust, and Erosion Control Meeting. The Contractor shall schedule a water pollution, dust, and erosion control meeting after the SWPPP is accepted by the Officer-in-Charge. Meeting shall be scheduled fourteen (14) calendar days before start of construction work. The meeting shall include, but not be limited to, discussion of sequence of work, plans and proposals for water pollution, dust, and erosion control. The meeting shall include, but not be limited to, the Officer-in-Charge, project inspector, the City's design project manager and consultant, the City's environmental consultant, the Contractor, and all subcontractors.

(b) Water Pollution, Dust, and Erosion Control Submittals. The Contractor shall submit a SWPPP to the Officer-in-Charge within thirty (30) calendar days of contract execution. Submission of complete and acceptable SWPPP is the sole responsibility of the Contractor. Additional contract time shall not be issued for delays due to incompleteness. The SWPPP shall include, but is not limited to, the following:

(1) Written description of activities to minimize water pollution and soil erosion into State waters, drainage or sewer systems. The description shall include at a minimum:

(A) An identification of potential pollutants and their sources.
(B) A list of all materials and heavy equipment to be used during construction.
(C) Descriptions of the methods and devices used to minimize the discharge of pollutants into State waters, drainage or sewer systems.
(D) Details of the procedures used for the maintenance and subsequent removal of any erosion or siltation control devices.
(E) Methods of removing and disposing hazardous wastes encountered or generated during construction.
(F) Methods of removing and disposing concrete and asphalt pavement cutting slurry, concrete curing water, and hydrodemolition water.
(G) Spill control and Prevention and Emergency Spill Response Plan.
(H) Fugitive dust control, including dust from grinding, sweeping, or brooming off operations or combination thereof.
(I) Methods of storing and handling of oils, paints and other products used for the project.
(J) Material storage and handling areas, and other staging areas.

(K) Concrete truck washouts.
(L) Concrete waste control.
(M) Fueling and maintenance of vehicles and other equipment.
(N) Tracking of sediment offsite from project entries and exits.
(O) Litter management.
(P) Sanitary Waste facilities.
(Q) Other factors that may cause water pollution, dust and erosion control.

(2) Plans indicating location of water pollution, dust and erosion control devices; plans and details of BMPs to be installed or utilized; areas of soil disturbance in cut and fill, indicate areas used for staging and storage including items (A) through (Q) above, areas for storage of aggregate (indicate type of aggregate), asphalt cold mix, soil or solid waste, equipment and vehicle parking, and areas where vegetative practices are to be implemented. Plans indicating intended drainage pattern, using flow arrows, through work area and staging areas. Include separate drawing for each phase of construction that alters drainage patterns and indicate approximate date when device(s) will be installed and removed.

(3) Construction schedule.

(4) The Contractor shall identify an individual as the designee responsible for the implementation, inspection, and oversight of an approved Erosion and Sediment Control Plan (ESCP) and/or SWPPP during construction and shall be the designated ESCP Coordinator for the project. This individual must have a current ESCP Coordinator Certificate from the City's Department of Planning and Permitting. Include home and business telephone numbers, fax numbers, and e-mail addresses.

(5) Description of fill material to be used.

(6) For NPDES-Permitted projects, information required for compliance with the conditions of the NPDES Notice of General Permit Coverage (NGPC) or NPDES Individual Permit.

(7) Site-Specific BMP Plan (SSBMPP)/SWPPP Review Checklist. The Contractor shall submit the completed checklist to the Officer-in-Charge along with the SWPPP.

The Contractor shall date and sign the SWPPP, and keep an updated and accepted copy on site (i.e. at project office, in foreman's truck, etc.) throughout the duration of the project. The SWPPP shall be made available at the time of an on-site inspection or upon request by the Officer-in-Charge, City Third-Party Inspector, and or DOH/EPA Representative. Modify the SWPPP, if necessary, by creating an Amendment to conform to the revisions. Include the actual date of installation and removal of Site-Specific BMP measures.

Obtain written acceptance by the Officer-in-Charge before implementing revised Site-Specific BMPs in the field. Amendments to the SWPPP shall be kept with the original SWPPP and clearly labeled.

Follow the latest version of the guidelines in the "City and County of Honolulu Storm Water Best Management Practice Manual Construction", in developing, installing, and maintaining BMPs for all projects. The manual can be obtained by downloading from the City website at www.cleanwaterhonolulu.com. Follow City and County of Honolulu's "Rules for Soil Erosion Standards and Guidelines". For any conflicting requirements between the Manual and applicable contract documents, the applicable strictest requirements shall govern. Should a requirement not be clearly described within the applicable contract documents, notify the Officer-in-Charge immediately for interpretation. For the purposes of clarification "applicable contract documents" include the construction plans, standard specifications, special provisions, Permits, and the SWPPP, when applicable.

(A) Non-NPDES Permitted Project - The Contractor shall indicate in their SWPPP, the total acreage of disturbed area as defined by the NPDES Program. Disturbed area for the project is cumulative. If the total disturbed area is one acre or more see SP 194.1.

(B) NPDES Permitted Project – If there is any additional disturbed area as defined by the NPDES Program or any additional discharge points, see SP 194.1.

B. Construction Requirements. Do not begin work until all submittals are completed and accepted by the Officer-in-Charge.

(a) General

(1) Install, maintain, monitor, repair and replace Site-Specific BMP measures, such as for water pollution, dust, and erosion control; installation, monitoring, and operation of dewatering and hydrotesting activities; removal and disposal of hazardous waste, removal and disposal of solid waste, concrete cutting slurry, concrete curing water; or hydrodemolition water. Site-Specific BMP measures shall be in place, functional and accepted by the Officer-in-Charge prior to initiating any ground disturbing activities.

(2) BMP measures shall be in place and operational (such as shaping the earthwork to control and directing the runoff) at the end of workday or as required by the timeframes in Table 195.1. Shaping earthwork may include constructing earth berms along the top edges of embankments if acceptable to the Officer-in-Charge.

(3) Cleanup and remove any pollutant that can be attributed to the Contractor.

(4) Coordinate temporary control provisions with permanent control features throughout the construction and post-construction period.

(5) Limit maximum surface area of earth material exposed at any time to 300,000 square feet. Do not expose or disturb surface area of earth material (including clearing and grubbing) until BMP measures are installed and accepted by the Officer-in-Charge. Protect temporarily or permanently disturbed soil surface from rainfall impact, runoff and wind before end of workday.

(6) Properly maintain all Site-Specific BMP measures.

(7) The Contractor's designated representative specified in Subsection 195.4 A.(b)(4) shall address any BMP deficiencies or administrative non-compliances concerns brought up by the Officer-in-Charge immediately, including weekends and holidays, and complete work to fix the deficiencies and within the timeframes listed in Table 195.1.

(b) SWPPP Amendments. Modify and resubmit plans and construction schedules to correct conditions that develop during construction which were unforeseen during the design and pre-construction stages. Install or modify Site-Specific BMP measures due to change in Contractor's means and methods, or for conditions which require a change to the Site-Specific BMP Plan. All Amendments to the SWPPP shall be submitted to the Officer-in-Charge for acceptance prior to implementation in the field.

(c) Rain Gauge and Rain Gauge Data Log. Furnish and install rain gauge in a secure location prior to starting field work, which includes the installation of Site-Specific BMPs. Provide rain gauge with a tolerance of at least 0.05 inches of rainfall. Install rain gauge at the project site in an area that will not deter rainfall from entering the gate opening. Do not install in a location where rainwater may splash into the rain gauge. The rain gauge installation shall be stable and plumbed. Maintain rain gauge and replace rain gauge that is stolen, does not function properly or accurately, is worn out, or needs to be relocated. Do not begin field work until rain gauge is installed and Site-Specific BMPs are in place. If the Contractor proposes to use a rain gauge nearby, the Contractor shall submit the location and website to the Officer-in-Charge for review and approval. Keep daily rain gauge logs readily available on-site and submit a copy of the rain gauge logs weekly to the Officer-in-Charge.

(d) Inspections and Reporting. The Contractor shall conduct Weekly and Rainfall Event inspections. Inspect, prepare a written inspection report, and make repairs to BMP measures at the following intervals:

(1) Weekly.

(2) Within twenty-four (24) hours of any rainfall of 0.25 inch or greater which occurs in a 24-hour period. If the project has an NPDES Individual Permit, conduct rainfall event inspections as required by the permit.

(3) Daily during periods of prolonged rainfall.

(4) When existing erosion control measures are damaged or not operating properly as required by Site-Specific BMP Plan or SWPPP.

(5) Maintain records of inspections of Site-Specific BMPs. Keep continuous records for duration of the project. Submit copy of Inspection Reports to the Officer-in-Charge within twenty-four (24) hours after each inspection.

(e) Monthly Compliance Reports. The Contractor shall complete a Monthly Compliance Report within two (2) working days of the end of the month. The Monthly Compliance Report shall document any instances of non-compliance and corrective actions, discharges, and major incidents reported to DOH that occurred within the month. The report shall be kept on-site and made available by the end of the next business day when requested by DOH.

(f) Receiving State Waters Inspections Report for NPDES Individual Permits. The Contractor shall inspect, at a minimum of once per week, the receiving state waters, storm water runoff and control measures and BMPs to detect violations of and conditions which may cause or contribute to a violation of the basic water quality criteria as specified in the Hawaii Administrative Rules, Chapter 11-54, Section 11-54-4. The Contractor shall visually inspect storm water discharges and receiving state waters for turbidity, color, floating oil and grease, floating debris and scum, materials that will settle, substances that will produce taste in the water or detectable off-flavor in fish, and inspect for items that may be toxic or harmful to human or other life. If any of these are observed, the Contractor shall conduct an inspection of the project site to determine if there were polluted discharge originating from the site. The Contractor shall notify the Officer-in-Charge immediately upon discovery of discharges from the project site. Any discharge from the site shall be isolated, contained, reported and documented following the procedures in the SWPPP.

The Contractor shall document the inspections of the State Receiving Waters and submit a copy of the inspection reports to the Officer-in-Charge within twenty-four (24) hours of conducting the inspection.

(g) Construction Discharge Report. If a discharge of non-storm water or polluted storm water discharge has or may have

potentially entered a storm drain or Receiving State Waters, if a discharge (e.g. spill) has occurred, if a polluted discharge is observed leaving the projects limits, or if there is evidence of an unreported polluted discharge leaving the projects limits prior to inspection (such as a silty trail, eroded areas beyond project limits), the Contractor shall complete a Construction Discharge Report. If the discharge is a result of construction activities, the Contractor shall immediately stop the activity which caused the discharge and isolate and contain the discharge. The Contractor shall immediately inform the Officer-in-Charge. If the discharge involves hazardous materials or poses a threat to the public or environment, the Contractor shall call 911, and notify the responsible parties and follow the protocols listed in the project's Emergency Spill Response Plan.

The Contractor shall submit a complete Construction Discharge Report to the Officer-in-Charge within twenty-four (24) hours of the discovery of the discharge.

Best Management Practices

The Contractor shall implement as appropriate the following BMPs, but not limited to:

(1) Sediment Track-Out. Install and maintain stabilized construction entrance to minimize tracking of dirt and mud onto roadways. See BMP Manual or construction plans for requirements on size of rock and minimum dimensions. Install and maintain wheel wash, as required. Restrict traffic to stabilized construction areas only. Clean dirt, mud, or other material tracked onto the road, sidewalk, or other paved area by the end of the same day in which the track-out occurs. Modify stabilized construction entrances to prevent dirt or mud from being tracked onto road. Stabilize entire access roads, if necessary.

(2) Dust Control and Sediment Containment. Cover exposed surface of materials completely with tarpaulin or similar device when transporting aggregate, soil, excavated material or material that may be source of fugitive dust.

Cover stockpiles with sheet plastic or similar device and install perimeter control around stockpiles when stockpiles are not in use.

(3) Sanitary/Septic Waste. Provide secondary containment for portable sanitary waste facilities and secure to prevent falling over.

(4) Stabilization. Immediately initiate stabilizing areas with exposed soil upon completion of earth-disturbing activities for areas permanently or temporarily ceased on any portion of the site. Earth-disturbing activities have permanently ceased when clearing and excavation activities within any area of the construction site that does not have permanent structures has been completed. Earth-disturbing activities have temporarily ceased when clearing, grading, and excavation activities within

any area of the site that does not have permanent structures will not resume for a period of fourteen (14) or more calendar days, but such activities will resume in the future. The term “immediately” is used in this section to define the deadline for initiating stabilization measures. “Immediately” means as soon as practicable, but no later than the end of the next work day, following the day when the earth-disturbing activities have temporarily or permanently ceased.

For all projects stabilization shall be as follows:

(i) For construction areas discharging into waters not impaired for nutrients or sediments, complete initial stabilization within fourteen (14) calendar days after the temporary or permanent cessation of earth-disturbing activities.

(ii) For construction areas discharging into nutrient or sediment impaired waters, complete initial stabilization within seven (7) calendar days after the temporary or permanent cessation of earth-disturbing activities.

Any of the following types of activities constitutes initiation of stabilization:

(i) Prepping the soil for vegetative or non-vegetative stabilization;

(ii) Applying mulch or other non-vegetative product to the exposed area;

(iii) Seeding or planting the exposed area;

(iv) Starting any of the activities in items (i) – (iii) above on a portion of the area to be stabilized, but not on the entire area; and

(v) Finalizing arrangements to have stabilization product fully installed in compliance with the deadline for completing initial stabilization activities.

Any of the following types of activities constitutes completion of initial stabilization activities:

(i) For vegetative stabilization, complete all activities necessary to initially seed or plant the area to be stabilized; and/or

(ii) For non-vegetative stabilization, complete the installation or application of all such non-vegetative measures.

If the Contractor is unable to meet the deadlines aforementioned due to circumstances beyond the

Contractor's control, and the Contractor is using vegetative cover for temporary or permanent stabilization, the Contractor shall provide to the Officer-in-Charge a Plan for acceptance and the Contractor shall implement the accepted Plan. The Plan shall consist of the following.

(i) Immediately initiate and provide a timeframe, to complete the installation of temporary non-vegetative stabilization measures to prevent erosion;

(ii) Provide a schedule to complete all soil conditioning, seeding, watering or irrigation installation, mulching, and other required activities related to the planting and initial establishment of vegetation as soon as practicable on the site; and

(iii) Provide a justification to the Officer-in-Charge of the circumstances that prevent the Contractor from meeting the deadlines above for stabilization and the schedule the Contractor shall follow for initiating and completing initial stabilization and as agreed to by the Officer-in-Charge.

(iv) Follow the applicable requirements of the specifications and special provisions including Standard Specifications Section 51 – Planting Trees, Shrubs, Ground Cover and Grass.

(v) Immediately after seeding or planting the area to be vegetatively stabilized, to the extent necessary to prevent erosion on the seeded or planted area, select, design, and install non-vegetative erosion controls that provide cover (e.g., mulch, rolled erosion control products) to the area while vegetation is becoming established. Period of maintenance, final inspection, and acceptance shall be in accordance with the requirements of Subsection 51.5 (Planting Trees, Shrubs, Ground Cover and Grass – Period of Maintenance) and Subsection 51.6 (Planting Trees, Shrubs, Ground Cover and Grass – Final Inspection and Acceptance) of the Standard Specifications unless otherwise specified in the contract documents.

(vi) Protect exposed or disturbed surface area with mulches, grass seeds or hydromulch. Spray mulches at a rate of 2,000 pounds per acre. Add tackifier to mix at a rate of 85 pounds per acre. Apply grass seeds at a rate of 125 pounds per acre. For hydromulch, use the ingredients and rates required for mulches and grass seeds. Submit recommendations

from a licensed Landscape Architect when deviating from the application rates above.

(vii) Apply fertilizer to mulches, grass seed or hydromulch per manufacturer's recommendations. Submit recommendations from a licensed Landscape Architect when deviating from the manufacturer's recommendations.

(viii) Install velocity dissipation measures when exposing erodible surfaces greater than 15 feet in height.

(ix) Chemicals may be used as soil stabilizers for either or both erosion and dust control, if acceptable to the Officer-in-Charge.

(x) Provide temporary slope drains of rigid or flexible conduits to carry runoff from cuts and embankments. Provide portable flume at the entrance. Shorten or extend temporary slope drains to ensure proper function.

(xi) Protect ditches, channels, and other drainageways leading away from cuts and fills at all times by either hydro-mulching the lower region of embankments in the immediate area, installing check dams and siltation control devices, or implementing other methods acceptable to the Officer-in-Charge.

(xii) Provide for controlled discharge of waters impounded, directed, or controlled by project activities or erosion control measures.

(xiii) Protect finished and previously seeded areas from damage and from spillover materials placed in upper lifts of embankment.

TABLE 195.1 Timeframes for Addressing Non-Compliances (BMP Deficiencies)

Type of Non-Compliance	Examples	Timeframe to Complete**
Track Out	Any time vehicles leaving a construction site track sediment/ gravel off-site (e.g., onto the roadway)	End of same work day as it occurs
Drain Inlet Protection	Inlet protection BMPs require maintenance	End of same work day during which it is found
Routine Maintenance	Maintenance of BMPs that were installed per accepted BMP Plan	Close of the next work day
Significant Repair	Repair to BMPs that were heavily damaged (e.g. damaged due to a storm event or other major event)	No later than 7 calendar days from time of discovery
New Sediment Erosion Control BMP	Installation of additional BMPs that were not on the accepted BMP Plan (this requires an amendment)	No later than 7 calendar days from time of discovery
Replacement Sediment Erosion Control BMP	Major replacement of BMPs already installed	No later than 7 calendar days from time of discovery
Stabilization (Non-Vegetative)	Installation of temporary non-vegetative stabilization measures to prevent erosion	7 calendar days
Stabilization (Vegetative)	All activities necessary to initially seed or plant the area to be stabilized	7 calendar days
Note: (**) The Contractor shall commence corrective action immediately and the timeframe to complete these non-compliances may be more stringent if there is an impending storm, if there is potential for imminent discharge, or if the Officer-in-Charge designates a more stringent timeframe.		

(h) Third-Party Inspections. Address any Site-Specific BMP deficiencies brought up by the City's Third-Party Inspector in the timeframes listed in Table 195.1; or as required by the City's Third-Party Inspection Program. The most stringent of these timeframes governs. The Contractor shall take all reasonable measures to minimize or prevent discharge of pollutants. When installation of a new pollution prevention control or a significant repair is needed, complete installation or repair no later than seven (7) calendar days from the time of notification/Contractor discovery or in the timeframe designated by the Officer-in-Charge. Notify the Officer-in-Charge and document why it is infeasible to complete the installation or repair within seven (7) calendar days and complete the work as soon as practicable and as agreed to by the Officer-in-Charge. Address Site-Specific BMP deficiencies discovered by the Contractor within the timeframes listed in Table 195.1.

(i) Failure to Address Deficiencies. The Contractor's failure to satisfactorily address these Site-Specific BMP deficiencies, the Officer-in-Charge reserves the right to employ outside assistance or use the Officer-in-Charge's own labor forces to provide necessary corrective measures. The Officer-in-Charge will charge the Contractor such incurred costs plus any associated project engineering costs. Failure to apply Site-Specific BMP measures may result in one (1) or more of the following: suspension, or cancellation of Contract with the Contractor being fully responsible for all additional costs incurred by the City as well as any fines or penalties.

(j) Discharges of Storm Water Associated with Construction Activity. If an NPDES Permit is triggered due to the Contractors means and methods, see SP 194.1, the Contractor shall not begin construction activities until all required conditions of the permit are met and submittals detailed in this Section and SP 194.1 are completed and accepted by the Officer-in-Charge.

The Contractor shall review the effectiveness and adequacy of the implemented Site-Specific BMP Plans and Erosion and Sediment Control Plan at a minimum of once a week.

If the Officer-in-Charge determines and notifies the Contractor that the Site-Specific BMP Plan(s) and/or the Erosion and Sediment Control Plan are ineffective, inadequate and do not meet the requirements of the NGPC/NPDES Individual Permit, the Contractor shall immediately cease all work and construction activity associated with and contributing to the unauthorized discharge. If the Contractor observes an unauthorized discharge, the Contractor shall immediately notify the Officer-in-Charge of the unauthorized discharge upon discovery and immediately cease the construction activity causing the discharge. The Contractor shall take immediate remedial actions as appropriate to isolate and contain the discharge, investigate the cause, cleanup, and modify the Site-Specific BMP Plans, and Erosion and Sediment Control Plan to prevent the unauthorized discharge to the satisfaction of the Officer-in-Charge.

The Contractor shall prepare and submit a revised written Site-Specific BMP Plan(s) to the Officer-in-Charge for review and acceptance within twenty-four (24) hours from discovery of the unauthorized discharge. All work and construction activity associated with and contributing to the unauthorized discharge shall not resume until adequate mitigative measures are implemented, appropriate corrective actions are taken, and the revised Site-Specific BMP Plan(s) are accepted by the Officer-in-Charge.

(k) Discharges of Hydrotesting Waters. If work includes removing, relocating or installing waterlines, and the Contractor elects to flush waterline or discharge hydrotesting effluent into State waters or drainage systems, see SP 194.1. The Contractor shall not begin hydrotesting activities until DOH-CWB has issued an NPDES Permit and all required conditions of the permit are met and submittals detailed in this Section

and SP 194.1 are completed and accepted by the Officer-in-Charge.

(l) Discharges Associated with Construction Activity Dewatering. If dewatering activities require effluent discharge into State waters or drainage systems, see SP 194.1. The Contractor shall not begin dewatering activities until DOH-CWB has issued an NPDES Permit and all required conditions of the permit are met and submittals detailed in this Section and SP 194.1 are completed and accepted by the Officer-in-Charge.

The Contractor shall conduct dewatering operations in accordance with the conditions in the NPDES Permit.

The Contractor shall review the effectiveness and adequacy of the implemented Site-Specific Dewatering Plan and other related plans during any dewatering operations. The Officer-in-Charge will determine the frequency of review.

The Contractor shall be responsible for monitoring the discharge effluent as indicated in the NPDES Permit, reviewing the monitoring results, and submitting the monitoring results to the Officer-in-Charge immediately when they become available to determine the effectiveness and adequacy of the site-specific plans.

If the monitoring results of the discharge effluent indicate pollutant levels exceeding the discharge limits or if the Officer-in-Charge determines that the site-specific plan(s) are ineffective, inadequate and do not meet the requirements of the NGPC, the Contractor shall immediately cease all discharge of effluent into State receiving waters, and take immediate and appropriate action by modifying the site-specific plan(s).

The Contractor shall notify the Officer-in-Charge immediately after discovering that pollutant levels of the discharge effluent exceeded the discharge limits and provide an explanation of the origin of the pollutant. The Officer-in-Charge will report the monitoring results and pollutant origin to the DOH-CWB within twenty-four (24) hours after becoming aware that pollutant levels exceeded the discharge limit.

The Contractor shall prepare and submit a revised written site-specific plan(s) to the Officer-in-Charge for review and acceptance within twenty-four (24) hours after discovering pollutant levels exceeding the discharge limitations.

The discharge of effluent into State receiving waters shall not resume until adequate mitigative measures are implemented, appropriate corrective actions are taken, and the revised site-specific plan(s) is accepted by the Officer-in-Charge.

(m) Solid Wastes. Submit the signed and dated Solid Waste Disclosure Form for Construction Sites with the SWPPP. If there are any revisions to the information on the Solid Waste Disclosure Form, the form shall be resigned, dated, and submitted to the Officer-in-Charge, prior to taking solid waste to that

facility. Submit monthly a copy of all the disposal receipts from the facilities permitted by the Department of Health to receive solid waste to the Officer-in-Charge. Provide documentation from any intermediary facility where the solid waste is handled or processed, as directed by the Officer-in-Charge.

All material not used on the project may be reused, recycled, or disposed of in compliance with all Federal, State, City, and OSHA requirements and regulations. The Contractor should be aware that the roadway pavement striping and markings may contain lead.

(n) Construction BMP Training. The Contractor and their Sub-contractors responsible for installing or maintaining Site-Specific BMPs in the field shall attend Construction Best Management Practices Training. The Contractor shall keep training logs updated and readily available on-site.

SP 195.5 NON-COMPLIANCE

The Officer-in-Charge will notify the Contractor of any non-compliance with the foregoing provisions and the action to be taken. If the Contractor fails or refuses to comply promptly, the Officer-in-Charge may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No extension of time or payment for excess costs or damages shall be made for the time lost due to such stop action. In addition, the Contractor shall be responsible for all citations, fines, and penalties for any non-compliance.

SP 195.6 SUBMITTALS

The Contractor shall provide to the Officer-in-Charge for the City’s use, six (6) hard copies of the complete certified SWPPP: color copies, single sided, all attachments tabbed, and placed in 3-ring binders. Submit a CD of the PDF file of the complete certified SWPPP, the Word file of the certified SWPPP, and the PDF files of each attachment.

SP 195.7 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure environmental pollution control for payment. The Officer-in-Charge will not pay for the accepted environmental pollution control separately and will consider the cost for environmental pollution control as included in the contract price for each respective street lump sum bid item as specified in the Offer schedule in accordance with SP 151 DESCRIPTION OF WORK.

The Officer-in-Charge will pay for the accepted additional water pollution, dust and erosion control as directed by the Officer-in-Charge on a force account basis as an Additional Work Item “Additional Water Pollution, Dust and Erosion Control”. Payment shall be full compensation for all work prescribed in this section, and any other work directed by the Officer-in-Charge. Payment shall be full compensation for the work directed by the Officer-in-Charge and shall be deducted from the force account set in the Offer. The unused portion of the force account item shall remain with the City upon completion of the contract.

The Officer-in-Charge will not measure for the determination and characterization of fill material. The Officer-in-Charge will not pay for the determination and characterization of fill material but will consider the cost of the determination and characterization of fill material as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents.

No progress payment will be authorized until the Officer-in-Charge reviews the SWPPP, or when the Contractor fails to maintain the project site in accordance with the accepted SWPPP.

For all citations, fines or penalties received from the Environmental Protection Agency (EPA), State Department of Health (DOH), U.S. Army Corps of Engineers (USACE), the City and County of Honolulu, or any other regulatory agency for non-compliances, including, but not limited to, non-compliance with the conditions of the NPDES Permit, 401 Water Quality Certification, and U.S. Army Corps of Engineer Permit(s) or violations of the Clean Water Act, the Contractor shall reimburse the City within thirty (30) calendar days for the full amounts of each of the outstanding costs, or the Officer-in-Charge will deduct the cost from the progress payment."

END OF SECTION SP 195

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 196 - CHARGES FOR OVERTIME INSPECTIONS

Notwithstanding the overtime inspections requirements of the General Conditions, the following also applies:

Pursuant to current Revised Ordinances of Honolulu (link below), the amount to be charged the Contractor by the City for overtime inspections shall be at the rate for the current fiscal year as set by the Department of Budget and Fiscal Services.

https://www8.honolulu.gov/ocs/revised-ordinances-of-honolulu/"

END OF SECTION SP 196

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 198 – SAFETY PRECAUTIONS AND PROTECTION OF PROPERTY

SP 198.1 PROTECTION OF THE PUBLIC

The Contractor shall at all times provide adequate protection to passing pedestrians and vehicular traffic and shall erect and maintain suitable barriers, fences, warning signs and other necessary devices to protect the public in accordance with Subsections 5.2.12 and 5.2.13 of the General Terms and Conditions. The general area must be kept clear at all times.

SP 198.2 DUST NUISANCE

The Contractor shall take proper precautions to minimize the creation of dust during their operations and shall take all necessary steps to prevent dust from entering the adjacent buildings and private property.

SP 198.3 PROTECTION OF PROPERTY

The Contractor shall continually maintain adequate protection for all their work from damage and shall protect all City and adjacent private systems located at or adjacent to the jobsite. All existing fences and stone retaining walls shall be maintained in their existing condition. Any removal or altercation of such walls shall be performed only after receiving written permission of the landowner. A copy of the letter shall be submitted to the Officer-in-Charge seven (7) calendar days prior to modifying the wall. The Contractor shall repair, replace or pay the expense of repair for damages resulting from their fault or negligence.

SP 198.4 MEASUREMENT AND PAYMENT

The Officer-in-Charge shall not measure safety precautions and protection of property for payment. The Officer-in-Charge shall not pay for safety precautions and protection of property separately and shall consider the cost for safety precautions and protection of property as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents."

END OF SECTION SP 198

The following Section shall be made a part of the Standard Specifications:

"SECTION SP 199 - CONSTRUCTION AREA APPEARANCE

SP 199.1 GENERAL

The Contractor shall throughout the duration of the project keep all streets, sidewalks and driveways free from all debris produced from the project. The Contractor shall keep the project and surrounding area neat and free from dust nuisance. The City may require supplementary measures as necessary.

Upon completion of each phase of the project, the Contractor shall immediately remove all excess material and thoroughly clean the affected area.

Work includes, but is not limited to, removal of excess or splashed concrete on covers of utility boxes, street light standards, traffic signal standards and on any structures without discoloring or damaging the existing items.

SP 199.2 COMPLETION OF WORK

Upon completion of the work, the Contractor shall remove all equipment, signs, and unused materials provided for the work and shall restore the project site to a neat and clean condition and do all the other required cleaning as specified above.

SP 199.3 NON-COMPLIANCE

Should the Contractor fail to comply with the foregoing provisions, the City may, with or without notice, cause the cleaning to be done and deduct the cost of such work from any moneys due the Contractor under this contract.

SP 199.4 MEASUREMENT AND PAYMENT

The Officer-in-Charge will not measure work under this section for payment. The Officer-in-Charge will not pay for work under this section separately and will consider the cost for the work as included in the contract prices for the various contract pay items. The cost is for the work prescribed in this section and the contract documents."

END OF SECTION SP 199