PERALTA COMMUNITY COLLEGE DISTRICT

LANEY COLLEGE
PAVEMENT REHABILITATION PROJECT

TECHNICAL SPECIFICATIONS

to be supplemented by 2018 Caltrans Standard Specifications

100% SUBMITTAL

JUNE 2020

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT

APP: 01-119072 INC:

REVIEWED FOR

SS ☐ FLS ☐ ACS ☑

DATE: 08/20/2020

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SECTION 01 55 26 TRAFFIC CONTROL SYSTEM

PART 1 – GENERAL

1.1 OBJECTIVES

A. The Contractor shall provide for safe movement of vehicular, bicycle, and pedestrian traffic, including persons with disabilities in accordance with the American's with Disabilities Act of 1990 (ADA), through and around construction operations. Traffic control requirements set forth herein are the minimum requirements imposed. The Contractor shall be solely responsible for providing all necessary protective measures.

B. Proper traffic movement through the work area depends upon the driver controlling and directing his/her vehicle properly under unexpected situations and pedestrian attention to signs. The means of clarifying such conditions to the public include signs, flaggers, pavement markings, barricades, lights, cones and delineators.

C. No one standard sequence of signs or control devices will suit all conditions, which may result from construction operations. Even for the same work the conditions may vary from hour to hour, requiring adjustment and revision of the traffic control program in effect.

D. The traffic control requirements specified herein are intended to establish general principles to be observed in the control and regulation of traffic through and around construction operations anticipated for this project. All pedestrian and vehicular detours are subject to review by the District.

E. For any impacts to public streets, gain approval from the City of Oakland traffic department, and the Contractor shall revise the detours and traffic controls as ordered at no additional cost.

F. Clean up site each day after completing work and remove all traffic hazards. Daily traffic control measures shall continue until cleanup activities have been satisfactorily completed and all of the Contractor's equipment has been removed from the traveled way area.

1.2 DESCRIPTION OF WORK

A. Work Included:

1. At all times, provide safe and adequate passage for vehicular and pedestrian traffic through, around, and adjacent to all construction operations by use of detours, bridging, backfilling, paving, traffic barriers or other favorably reviewed means.

2. Establish and maintain detours and conduct construction operations in such a manner as to minimize hazard, inconvenience, and disruption to the public.

3. Provide for protection of pedestrians & cyclists and separation of pedestrians & cyclists from construction operations at all times.

4. Direct, divert and detour traffic through, around and adjacent to construction operations in accordance with the Traffic Control and Pedestrian/Bicycle Access Control Plans

(TC&PAC Plans) as specified herein or in accordance with favorably reviewed TC&PAC Plans. Revise the TC&PAC Plans as necessary only with the favorable review of the Engineer.

1.3 REFERENCES

A. Standard Plans and Specifications, California Department of Transportation, latest edition.

B. California Manual on Uniform Traffic Controls (CAMUTCD), California Department of Transportation, latest edition.

C. Work Area Traffic Control Handbook, Building News Incorporated, P.O. Box 3031, Terminal Annex, Los Angeles, California 90051.

1.4 SUBMITTALS

A. Traffic Control and Pedestrian/Bicycle Access Control Plans (TC&PAC Plans):

1. Submit TC&PAC Plans to clearly describe proposed traffic control measures and pedestrian access control measures. The plans shall be in accordance with the Standard Plans and Specifications and the CAMUTCD. When required by the District Engineer TC&PAC Plans shall be prepared by a licensed Civil or Traffic Engineer.

2. The TC&PAC Plans shall provide detailed planning and design for detours and to control traffic through the construction zone, shall conform to Caltrans and District standards, and will be approved by the District Engineer before construction begins.

3. The submittals shall consist of scaled drawings for each situation anticipated to be encountered, i.e., intersections, mid-block (each during working and non-working hours), etc. and necessary details.

4. The scaled drawings shall show signs, traffic control devices, and flaggers as required.

5. Assume a separate TC&PAC Plan submittals for each separate stage of construction. Assume 3 stages of construction.

PART 2 – PRODUCTS

2.1 CONSTRUCTION SIGNS

A. Construction signs shall conform to the standards of the Standard Plans and Specifications and the CAMUTCD.

B. Temporary warning signs in construction areas shall have a black legend and border on an orange background. Color for other signs shall follow the standard for all highway signs.

C. All signs used during hours of darkness shall be retroreflective.

D. After construction, Contractor to restore the sidewalk, landscape, or other existing facilities at the locations of the Construction area signs. Payment for sidewalk or landscape restoration shall be considered included in the construction area sign/traffic control pay items.

2.2 TRAFFIC CONTROL DEVICES

A. General: Traffic control devices shall conform to the standards of the Standard Plans and Specifications and the CAMUTCD.

B. Cones or Delineators:

1. Cones or delineators shall consist of cylindrical or cone shaped plastic devices, which shall be 18 inches to 48 inches in height.

2. Cones or delineators shall have a flexible base of suitable weight, which will ensure stability.

3. Cones or delineators used during hours of darkness shall be affixed with retroreflective sleeves or be internally illuminated meeting the requirements of the CAMUTCD.

C. Barricades:

1. Barricades shall conform to the Standard Plans and Specifications and the CAMUTCD.

2. Barricades used during hours of darkness shall be equipped with flashers.

PART 3 - EXECUTION

3.1 DIVERTING PEDESTRIAN & BICYCLE TRAFFIC

A. Whenever construction operations obstruct the flow of pedestrian & bicycle traffic or present a hazard to pedestrians & cyclists, the Contractor shall take appropriate action to protect and separate pedestrians & cyclists from the work area and to direct pedestrians & cyclists to alternate routes.

B. Such action to protect pedestrians & cyclists may include placement of barricades between pedestrians & bicycles and the work areas, placement of warning signs, and provision of personnel as required to protect pedestrians & cyclists as conditions warrant.

C. Pedestrians and bicyclists will be protected at all times, 24 hours per day and seven days per week.

3.2 DIVERTING VEHICULAR TRAFFIC

A. Whenever construction operations obstruct the flow of vehicular traffic or present a hazard to vehicles operating in the vicinity of construction operations, the Contractor shall take appropriate action to warn, detour and otherwise protect approaching drivers and vehicles.

3.3 TRAFFIC CONTROL DEVICES

A. General:

1. Provide traffic control devices in sufficient quantities and types as required to provide safe and adequate traffic control.

2. During hours of darkness approved lights shall be included, in proper working order, to illuminate signs and hazards and alert approaching traffic.

3. Provide and maintain barricades along all open trenches in contact with traffic.

4. No work may begin on any day or at any time before traffic control devices have been placed, test driven and adjusted.

B. Placement:

1. Place all traffic control devices in accordance with the Standard Plans and Specifications, the CAMUTCD, and approved TC&PAC Plans.

2. Adjust locations of devices to suit the conditions and circumstances of each detour situation. In all cases, place signs to most effectively convey their messages to approaching traffic.

3. The Contractor shall adjust and revise all traffic control devices if determined to be required by the District or Police Department.

4. The Contractor shall provide additional traffic control devices if required to maintain the safe flow of traffic through construction operation.

C. Maintenance of Devices:

1. The Contractor shall maintain all traffic control devices, at proper locations, and in proper working order, at all times during construction operations and whenever a hazard resulting from Contractor's operations exists.

2. The Contractor shall adjust and revise traffic control devices, placement, etc., to suit changing conditions around construction operations.

D. Removal of Devices:

1. Traffic control devices shall remain in place at all times required to alert approaching traffic of upcoming hazards.

2. After hazard has been removed, remove all traffic control devices. Remove signs or completely cover their messages.

3.4 FLAGGERS

A. General: The Contractor shall employ flaggers:

1. As required for each specific detour.

2. At all locations on a construction site where barricades and warning signs cannot control the moving traffic.

B. Placement: Where flaggers are required, they shall be logically placed in relation to the equipment or operation so as to give adequate warning and shall be placed in accordance with the Standard Plans and Specifications, the CAMUTCD, and the approved TC&PAC Plan.

C. Warning Signs:

1. Place warning signs ahead of the flagger in accordance with the Standard Plans and Specifications, the CAMUTCD, and the approved TC&PAC Plans. The distance between signs and the flagger shall be based on the posted traffic approach speed.

2. During hours of darkness, illuminate flagger stations such that the flagger will be clearly visible to approaching traffic. Lights for illuminating the flagger station shall comply with the Standard Plans and Specifications, the CAMUTCD, and the approved TC&PAC Plans.

D. Equipment:

1. Provide flaggers with high-visibility safety apparel in accordance with the Standard Plans and Specifications, and the CAMUTCD at all times. Provide flaggers with hand signs in accordance with the Standard Plans and Specifications, and the CAMUTCD.

2. Provide flaggers with two-way radios for communication when necessary. Red flags shall only be used for traffic control in emergency situations.

3.5 EMERGENCY VEHICLE ACCESS THROUGH DETOURS

A. During construction in or adjacent to roadways in the project site, Contractor shall maintain at least one lane open in each direction of the road to allow emergency vehicle access for police, fire, and ambulance to the project vicinity.

B. During all detours and/or street closures the Contractor shall provide for 10' wide clear for movement of emergency vehicles through the work area.

C. When temporary traffic control is provided by flaggers, they shall be instructed to give immediate passage to emergency vehicles with active lights or sirens.

D. It is essential that the Contractor's work and equipment do not impede ingress and egress from any fire or police station, or hospital, to other areas of their service area.

3.6 ACCESS TO PRIVATE PROPERTY

A. General: The Contractor shall schedule operations to minimize disruption of access to private property.

B. Notice to Residents: Prior to blocking access to any private driveway or parking lot entrance, or impacting parking, the Contractor shall notify the resident or business owner or tenant of pending closure and allow resident to remove vehicles.

C. Nights: During non-working hours no driveway, house, or parking lot shall be denied access to a public roadway.

3.7 DETOURS DURING NON-WORKING HOURS

A. General: The Contractor shall not be permitted to maintain any lane closure or road closure during non-working hours without first obtaining written approval of the Engineer.

B. Restoration of Pavement:

1. During non-working hours the Contractor shall restore travel lanes to their original alignment and configuration by means of backfilling and temporary pavement or bridging

in accordance with the District Standards and approved by the District.

2. The Contractor shall place signs conforming to the Standard Plans and Specifications, and the CAMUTCD at uneven temporary pavement or bridging.

3.8 PARKING RESTRICTIONS

A. General: The Contractor shall post approved "NO PARKING – CONSTRUCTION TOW-AWAY ZONE" signs at all locations necessary to establish work areas and detour traffic.

B. Signs:
1. Signs shall read: "NO PARKING - CONSTRUCTION TOW-AWAY ZONE".
2. Signs shall be placed at least 48 hours in advance of restriction.

3.9 STAGING AREAS

A. The Contractor will be provided a staging area near the south side of Building F on campus as designated by the District Project Manager. Water Pollution Control will be required at the staging area.

END OF SECTION 01 55 26

SECTION 01 71 13 – MOBILIZATION

PART 1 GENERAL

1.1 WORK INCLUDED

A. Mobilization and demobilization

B. Preparatory work and activities those necessary for the movement of personnel, equipment, supplies, and incidentals to the job site

C. Establishment of all offices, building, trailers, and other facilities necessary for work on the project

D. Submittals, bonding and insurance requirements

E. Contacting and notifying utility companies

F. Public notifications in English and Spanish

G. Fabricating and installing project identification signs

H. Private property owner agreement for storage facilities

I. All other work and activities which must be performed or costs incurred prior to beginning work on the various contract items on the project site

1.2 REFERENCES

A. Cal/OSHA – California Division of Occupation Safety and Health

B. Underground Services Alert (USA)

PART 2 – PRODUCTS

NONE

PART 3 – EXECUTION

3.1 MOBILIZATION

A. Mobilization shall consist of preparatory work and activities listed in Part 1.1 above.

B. The Contractor shall ensure that adequate existing sanitation facilities are available or the Contractor shall provide and maintain adequate sanitation facilities. All wastes and refuse from sanitary facilities provided by the Contractor's operations shall be disposed of away from the site in accordance with all laws and regulations pertaining thereto.

C. Mobilization shall also include demobilization upon completion of work and cleanup of the site.

D. The contractor shall provide all labor, materials, equipment and incidentals to prepare the site for the timely start and efficient completion of all work. This includes obtaining all necessary licenses and permits, providing required submittals including but not limited to a detailed project schedule.

E. Mobilization shall also include notifications to all existing utility companies as shown on the Drawings as first order of work.

END OF SECTION 01 71 13

SECTION 31 05 13 CLEARING, GRUBBING, AND DEMOLITION

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Clearing and disposal of all rubbish, debris, and other objectionable material of the entire area within the limits of work.

B. Walk the site and obtain permission from the District prior to removal or altering the existing landscape.

C. Walk the site and obtain permission from the District prior to removal of concrete conforms at driveways/doorways.

D. Stripping and disposal of all vegetation, shrubs, weeds, and other vegetative growth of any nature within the area defined in the limits of work.

E. Preservation, care, and pruning of trees and shrubs to remain in place.

F. Trimming of tree limbs and tree roots as may be required prior to construction of improvements. Work to be performed by licensed professional tree service Contractor.

G. Contractor to coordinate with District arborist or District Project Manager prior to removal or trimming of trees.

H. Dust alleviation and control

I. The work shall include the provision of all labor, materials, equipment and apparatus not specifically mentioned herein or noted on the plans, but which are incidental and necessary to complete the work specified

1.2 JOB CONDITIONS

A. The Contractor will be held responsible for any damage to trees injured during construction, i.e., limb breakage, tearing of bark along trunk or excessive root damage

B. Contractor shall provide adequate dust alleviation and control measures at all times during the course of the work.

PART 2 - PRODUCTS

NONE

PART 3 - EXECUTION

3.1 PERFORMANCE

A. Clearing shall consist of the removal of ground cover including grass, shrubs, weeds, and vegetation that will otherwise impede construction operations, as approved by Engineer.

B. At sites where the excavation has taken place near trees to remain, and many living roots remain exposed to the air, the contractor shall cover the exposed roots within 2 hours with sand, soil, moist burlap or other means acceptable to the Engineer.

C. Spoils from the work site resulting from clearing, grubbing and stripping operations shall be removed from the entire limits of worksite immediately and properly disposed of in accordance with applicable laws and regulations. No stockpiling of soils allowed.

3.2 TREE & LANDSCAPE PROTECTION

A. Construction materials, debris, washout water, and stockpiles shall not be stored within the drip line or protective fencing area under any tree.

B. Vehicles shall not be parked under any tree within the drip line or protective fencing area.

C. Installation of orange protective fencing with stakes around trees that are within 5' of the work limits, and with trunk calipers greater than 6 inches.

D. Where called for on the plans, place storm fence or other approved protective barriers around trees to be saved.

E. Contractor will conduct a site meeting with the District Arborist or District Project Manager prior to removal of any trees. Contractor to assist the District Arborist in tagging the tree, and documenting the Arborist permission to remove tree, prior to any tree removal

3.3 DEMOLITION

A. Demolition work shall conform to the provisions in Section 15, "Existing Facilities", of the Standard Specifications, the Special Conditions and these Technical Specifications. Existing street facilities shown on the plans or marked in the field to be removed shall be removed and salvaged in accordance with the provisions of Section 15, "Existing Facilities", of the Standard Specifications, the contract drawings, the Special Conditions and these Technical Specifications, and as directed by the District.

B. REMOVE ASPHALT CONCRETE PAVING AND BASE

1. Removal of existing asphalt concrete and base shall consist of excavation and removal of asphalt concrete, aggregate base and subsoil to design subgrade as shown on the plans. This work shall include saw-cutting as needed and disposal of asphalt concrete, aggregate base, and subsoil. Resulting holes and depressions shall be backfilled with earthy material selected from excavation, and meeting the requirements for engineered fill. The subgrade will be compacted to the lines and grade established by the Engineer.

2. Before procuring material from or disposing of material on non-public property:

    a) Submit a written agreement from the property owner:
        1. For the use of the property, and
        2. Absolving the District from responsibility in connection with the property
    b) Obtain authorization to start

Before Contract acceptance, submit a document signed by the owner of the material source or disposal site stating that the Contractor has complied with the Contractor-owner agreement.

3. Other entities may perform work at or near the job site and material sources at any time. Coordinate activities to avoid delays. Each contractor or other entity performing work at or near the job or material site is responsible to the other for damage to work, persons, or property and for costs due to unnecessary delays.

4. Contractor may also remove asphalt by cold planing operation. Submit cold planing methodology for approval.

5. In areas of concrete and asphalt concrete removal, Contractor may also be responsible for removing aggregate base. As part of this work Contractor will be required to remove subsoil as needed to achieve subgrade for the new design section.

6. Subsoil Removal **-** Removal of base shall conform to the provisions in Section 19, "Earthwork," of the 2018 edition of the Caltrans Standard Specifications and the following Special Provisions:

   a. All material shall be excavated as shown on the plans.

   b. The accumulation of water in excavated areas shall be prevented by means of pumping or other approved methods. Ground water or storm water must be discharged in accordance with the water pollution prevention plans.

   c. Excavation shall be carried to the exact depth indicated on the drawing or as specified. Should the Contractor, through his negligence or other fault, excavate below the designated lines, he shall replace such excavations with approved materials at his own expense.

   d. Excavated material determined unsuitable for use as an embankment or in excess of the amount required for embankment shall be disposed of in accordance with these specifications and applicable regulations.

3.4 DUST ALLEVIATION AND CONTROL

A. Contractor shall be responsible for providing pollution, dust abatement and dust control measures continuously during the course of the work.

B. Where applicable Contractor shall utilize reclaimed water, or dust palliatives, in compliance with the District's Water Conservation Guidelines.

3.5 DEMOLITION SITE REVIEW

Contractor is expected to perform a thorough site investigation to identify all miscellaneous clearing and grubbing items prior to bidding the project. Any required demolition items not included in a specific bid item will be consider included in CLEARING AND GRUBBING.

3.6 CLEAN-UP

A. Upon completion of clearing and stripping operations, the entire work site shall be cleaned of

all construction debris, excess soil and waste of any nature.

B. Contractor shall repair any damage to the existing irrigation system caused by the work and replace any portion of the existing irrigation system that is removed. Contractor shall incur these costs at own expense.

C. Except where shown or specified otherwise, any existing groundcover area disturbed by the work shall be restored to existing grade and replanted with sod or plants as those removed with Engineers approval.

D. Construction debris, waste and excess soil remaining on-site upon completion of clearing and stripping operations shall become the property of the Contractor, and shall be removed from the work site and disposed of in a lawful manner.

END OF SECTION 31 05 14

SECTION 31 25 00 WATER POLLUTION CONTROL

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Prohibit illicit discharge (non-rainwater) into the storm drain system.

B. Construct any and all necessary systems to eliminate contaminants from entering the storm water system.

C. Clean up and control of work site materials, spoils and debris.

D. Removal of contaminants produced by the project.

E. Contractor shall submit a Water Pollution Control Plan (WPCP) to the District for approval prior to grading.

1.2 APPLICABLE PUBLICATIONS

A. California's General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (General Permit) Order No. 2009-0009-DWQ as amended by Order No. 2010-0014-DWQ (NPDES No. CAS000002) and 2012-0006-DWQ, Waste Discharge Requirements (WDRs) for Discharges of Storm Water Runoff Associated with Construction Activity(herein after referred to as General Permit) issued by the State Water Resources Control Board (State Water Board).

B. Municipal Regional Stormwater Permit, Order No. R2-2015-0049, as amended by Order No. R2-2019-0004, adopted November 18, 2015, issued by the California Regional Water Quality Control Board San Francisco Bay Region.

C. California Storm Water Best Management Practice Handbooks, issued by California Stormwater Quality Association:

1. Municipal
2. Industrial/Commercial
3. Construction Activity

D. Alameda County Clean Water Program C.3 Stormwater Technical Guidance Version 6, October 31, 2017.

1.3 QUALITY ASSURANCE

A. All work performed under this contract and all contractors and their associates and/or employees are required to comply with all applicable storm water regulations and to implement Best Management Practices (BMP's) at all times.

B. A Contractor prepared Water Pollution Control Plan (WPCP) must be submitted for the proposed control of contaminants entering the storm water system. The WPCP plan must be approved by the Engineer prior to the commencement of work. WPCP may be a neat red-line mark-up submitted on a color PDF.

C. The Contractor shall prepare and submit a Water Pollution Control Plan (WPCP), which specifies Best Management Practices (BMPs) that will prevent all construction pollutants from contacting storm water and with the intent of keeping all products of erosion from moving off site into receiving waters.

D. The Water Pollution Control Plan provided in the plan set is the minimum requirement for the project and is to be used as an example. Because the actual storm water pollution prevention and erosion control measures are specific to the means and methods, and phasing of construction, the Contractor will prepare his/her own project specific WPC Plan.

E. All employees and subcontractors must be trained on the storm water pollution prevention requirements contained in these specifications.

F. A supply of spill clean-up materials such as Spill Containment Kits must be kept readily accessible on-site.

G. Groundwater from dewatering and foundation drains will need additional certification that the groundwater has been tested or evaluated for the presence of pollutants subject to non-stormwater discharge regulations. In such a case, a Special Sewer Discharge Permit shall be required for the water to be discharged to the Sanitary Sewer System, as directed.

H. The contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting and maintaining the control measures and for removing and disposing of temporary control measures. Prior to each rain event the temporary erosion control features as are necessary to prevent damage during the forthcoming rain event shall be constructed and functioning.

PART 2 - PRODUCTS

NONE

PART 3 – EXECUTION

3.1 RECYCLING

A. At the end of each working day, all scrap, debris and waste material must be collected and materials disposed of properly.

B. Dry, empty paint cans/buckets, old brushes, rollers, rags and drop cloths must be disposed of in approved waste collection.

C. Dumpsters must be inspected for leaks. As leaks are detected, the trash hauling contractor shall be contacted to replace or repair dumpsters that leak.

D. Water from cleaning dumpsters must not be discharged on-site.

E. Regular waste collection must be arranged for before dumpsters overflow.

3.2 HAZARDOUS MATERIAL/WASTE MANAGEMENT/MATERIALS MANAGEMENT

A. Designated areas of the project site shall be proposed by the contractor for approval by the Engineer suitable for material delivery, storage and waste collection as far from catch basins, gutters, drainage courses and creeks as possible.

B. All hazardous materials such as pesticides, paints, thinners, solvents and fuels; and all hazardous wastes such as waste oil and antifreeze must be labeled and stored in accordance with State and Federal regulations.

C. All hazardous materials and all hazardous wastes must be stored in accordance with secondary containment regulations, and it is recommended that these materials and wastes be covered as needed, to avoid potential management of collected rain water as a hazardous waste.

D. The contractor must dispose of all excess thinners, solvents, chemicals, oil-based and water-based paint as hazardous waste.

E. Regular hazardous waste collection shall be arranged for to comply with time limits on the storage of hazardous wastes.

F. Granular materials must be stored a minimum of ten feet from the closest catch basin and curb return. The contractor must not allow these granular materials to enter the storm drain or creek.

G. Warning signs must be posted in areas containing or treated with chemicals.

H. An accurate up-to-date inventory, including Material Safety Data Sheets (MSDS) of hazardous wastes stored on site must be kept and available to assist emergency response personnel in the event of a hazardous materials incident.

I. Maintenance and fueling of vehicles and equipment must be performed in a designated, bermed area, or over a drip pan that will not allow run-off of spills. Vehicles and equipment shall be regularly checked and have leaks repaired promptly. Secondary containment, must be used to catch leaks or spills any time that vehicle or equipment fluids are dispensed, changed or poured.

J. Construction operations shall be carried out in such a manner that erosion and water pollution will be minimized. Contractor shall comply with state and local laws concerning pollution abatement.

K. Sanitary facilities shall be maintained on the site in a manner to prevent inadvertent discharge or leakage of sanitary wastes into the storm drain system either by placing sanitary facilities in locations that do not drain to the storm drain system or by providing secondary containment systems to capture leaked wastes.

L. Extreme care shall be taken when hauling any earth, sand, gravel, stone, debris, paper, or any other substance over any public street, alley or other public place. Occurrences of material blown, spilled, or tracked over and upon said public or adjacent private property are prohibited and shall be immediately remedied. Discharge of debris is prohibited. Non-stormwater discharge is prohibited, except as specified in State Water Resources Control Board (SWRCB) Order 2009-009-DWQ. Discharge of hazardous substances is prohibited.

3.3 CHEMICAL USAGE

A. When rain is forecast within 24 hours, or during wet weather, the Engineer may prevent the contractor from applying chemicals in outside areas.

B. Pesticides or fertilizers shall not be over-applied and material manufacturer's instructions must be followed regarding uses, protective equipment, ventilation, flammability and mixing of chemicals. Over-application of a pesticide constitutes a violation subject to an enforcement action by the local authority.

3.4 DUST CONTROL

A. Contractor shall provide dust control as required by the appropriate federal, state and District requirements.

B. Reclaimed water must be used to control dust on a daily basis or as directed by the District.

C. At the end of each working day, or as directed by the District, the roadways and on-site paved areas must be cleaned and swept of all materials attributed to or involved in the work. Streets must not be washed down into a storm drain or creek in lieu of street sweeping. Water wash may be picked up by a vacuum unit in lieu of sweeping.

D. Dust Control shall conform to the provisions in Section 1, "Dust Palliative," of the Caltrans Standard Specifications and these special provisions.

E. The Contractor shall take the prevailing wind direction into consideration during grinding operations and shall perform grinding operations in such a way so as to minimize dust.

3.5 SAWCUTTING

A. The contractor must cover or barricade catch basins using control measures such as filter fabric, straw bales, or sand bags to keep slurry out of the storm drain system. The contractor shall ensure that the entire opening is sealed.

B. Sawcutting debris and spoils be removed by shovel, absorption, vacuum or pick up of waste prior to moving to the next location or at the end of each working day, whichever is sooner.

C. If slurry enters a catch basin, the slurry must be removed from the storm drain immediately, and the Engineer will be notified immediately.

3.6 DEWATERING OPERATIONS

A. Water shall be routed through a control measure as determined and approved by the Engineer such as a sediment trap or sediment basin to remove settleable solids prior to discharge to the storm drain system. Filtration of the water following the control measure may be required on a case-by-case basis.

B. The filtered water shall be reused for other purposes such as dust control or irrigation to the extent possible.

C. If the project is within an area of known groundwater contamination, the water from dewatering operations must be tested prior to discharge. If the water meets the Regional Water Quality Control Board standards, it may be discharged into the storm drain. With City of Oakland Sanitary Sewer Program or EBMUD permit, water may be discharged into the sanitary sewer. Otherwise, the water shall be treated and hauled off-site for proper disposal.

3.7 CONCRETE GROUT AND MORTAR WASTE MANAGEMENT

A. Concrete, grout and mortar shall be stored away from the drainage areas and ensure that these materials do not enter the storm drain system.

B. Concrete trucks must not be washed out into streets, gutters, storm drains, drainage channels or creeks.

C. Concrete trucks and equipment must be washed out off-site or in a designated area on-site where the water will flow onto dirt or into a temporary pit or bermed area. The water shall percolate into the soil and the hardened concrete placed in a waste container for disposal. If a suitable soil or bermed area is not available on-site, the wash water shall be collected and removed off-site and disposed of properly.

D. Regularly clean the gravel bag inlet protection so that sediment depth never exceeds a maximum of three inches.

E. Remove sediment from sediment traps and restoration to original dimensions when sediment has accumulated to a depth of six inches. Sediment removed from a trap shall be deposited in a suitable area and in such a manner that it will not erode.

3.8 PAVING OPERATIONS

A. Catch basins and manholes must be covered when paving or applying seal coat, tack coat, slurry seal or fog seal.

B. Inlet protection shall be installed at open inlets to prevent sediment from entering the storm drain system. Contractor to protect drainage courses by using control measures such as straw bale and sand bag to divert run-off or trap filter sediment, per the approved WPCP.

C. Excess sand (placed as part of a sand seal or to absorb excess oil) must not be swept or washed down into gutters, storm drains or creeks. The sand shall be collected and returned to the stockpile or disposed of in a trash container or hauled to an approved dump site. Water must not be used to wash down fresh asphalt concrete.

D. All paved areas shall be kept clear of earth material and debris. The site shall be maintained so as to prevent sediment-laden runoff to any storm drainage system, including existing drainage swales and watercourse, to the extent necessary for compliance with applicable numeric action or effluent levels specified in the WPCP. Stockpiling of materials on the street will not be allowed unless otherwise approved by the engineer. The Contractor shall cover with plastic any construction or excavated materials which may possibly erode and enter the storm drain system of paved streets or other paved areas both public and private. Stockpiling of dirt on paved areas will not be allowed.

3.9 PAINTING

A. The cleaning of painting equipment and tools must be performed in a designated area that will not enter the gutters, storm drains or creeks.

B. Excess paint must be removed from brushes, rollers and equipment prior to cleanup.

C. Wash water, from aqueous cleaning of water-based paint tools and equipment, must be disposed of in a sanitary sewer or onto a designated dirt area.

D. Paint thinners and solvents from oil-based paints shall be filtered and re-used when possible. Waste sludge, thinner and solvent from cleaning tools and equipment must be disposed of as a hazardous waste.

3.10 SITE CLEANUP

A. The cleaning of equipment of materials shall not be performed on-site or in the street using soaps, solvents, degreasers, steam cleaning or equivalent methods.

B. All cleanup must be performed in a designated area that will not allow the cleaning rinse to flow off-site or into streets, gutters, storm drains, or creeks.

C. Clean-up shall be performed as each portion of the work progresses. All refuse, excess material, and possible pollutants shall be disposed of in a legal manner off-site and all temporary and permanent BMP devices shall be in place and maintained in good condition.

D. Contractor must remove all construction materials, temporary facilities, temporary BMPs, equipment and construction related materials from the site.

E. The contractor shall sweep the work area and clean up the work site daily before leaving the site.

END OF SECTION 31 25 00

SECTION 32 01 13 SLURRY SEAL SURFACING

PART 1 – GENERAL

1.1 WORK INCLUDED

A. The Contractor shall immediately inform the District of any necessary asphalt patching or repairs, and all other roadway surface preparation work not included in these specifications, but is required in order to archive the required quality of slurry seal work, at any project location.

1.2 SUBMITTALS

A. Contractor shall submit certificates from suppliers stating compliance of materials with the requirements of this section.

1.3 REFERENCES

A. The State of California 2018 Standard Plans and Standard Specifications, and applicable related Standard Special Conditions.
Section 37-3 – Slurry Seals and Micro-Surfacings

PART 2 – PRODUCTS

2.1 MATERIAL

A. General: The slurry seal shall be Type III composed of the following materials.

B. Asphaltic Emulsion:

1. The emulsion shall be polymer modified Type PMCQS1h, containing 2½% Latex additive. The cationic quick-setting asphaltic emulsion (CQS1h) shall conform to the provisions of Section 94 of the Caltrans 2018 Standard Specifications.

2. The Latex to be used for modifier shall have properties and composition similar to “Ultrapave UP 65 K” Cationic Latex Asphalt Modifier, as manufactured by Textile Rubber & Chemical Co. of Ridgefield, Washington, or approved equal.

C. Water: The water shall be free of harmful salts and contaminants.

D. Water and Retarder: Water and retarder shall be used to ensure proper workability and to permit traffic on the slurry no more than three hours after placement without occurrence of bleeding, raveling, separation, or scalping.

E. Aggregate: The mineral aggregate shall consist of a non-plastic granular material such as rock dust or plaster sand, or any other material of similar quality and characteristics. The material shall be tough, durable, sound, and free from vegetable and other deleterious substances. The percentage composition by weight of the aggregate shall conform to the grading requirements for Type III in accordance with the provisions of Section 37-3.02B(4) of the Caltrans 2018 Standard Specifications.

PART 3 – EXECUTION

3.1 SLURRY SEAL

A. The streets and limits of the work are shown on the project plans and shall be sealed with a slurry seal surfacing treatment.

B. All existing thermoplastic striping, pavement markers and all thermoplastic pavement markings on streets to receive slurry seal surfacing shall be removed. These items shall be removed as specified in Section 32 17 00, "Signing and Pavement Delineation". The Contractor is cautioned that some older striping may contain hazardous materials. The Contractor shall dispose of all pavement markings, legends and strips in accordance with applicable local, State and Federal laws at no additional cost to the District.

C. The slurry seal shall be mixed, spread, and placed in accordance with the provisions of Section 37 of the latest version of the State of California Standard Specifications with the following exceptions and additions:

1. The slurry seal mixture shall not be applied prior to 8:00 A.M. Also, the slurry seal mixture shall not be applied after 1:00 P.M., except if approved by the District Inspector. Approval of application after 1:00 P.M. will only be for the purpose of completing the section of work then underway. Beginning a new section of work after 1:00 P.M. will not be permitted. Slurry seal shall not be applied when the atmospheric temperature is less than 60 degrees Fahrenheit, or more than 95 degrees Fahrenheit, which prolongs the curing beyond a reasonable time.

2. Before placing the slurry seal, the pavement surface shall be cleaned by sweeping, drought or other means necessary to remove all loose particles of pavement, all dirt and all other extraneous material.

3. Immediately before commencing the slurry seal operations, all surface metal utility covers (including survey monuments) shall be protected to cover, seal or fill the joint between the frame and cover of the structure. Covers are to be uncovered and cleaned of slurry material by the end of the same work day. Contractor shall not open any sewer/storm manhole covers or monument covers.

4. Hand tools shall be available in order to remove spillage. Ridges or bumps in the finished surfaces will not be permitted. The mixture shall be uniform and homogeneous after spreading on the surface and shall not show separation of the emulsion and aggregate after setting. Any slurry which is rejected shall be repaired to the satisfaction of the District or shall be removed and replaced at no cost to the District.

5. Adequate means shall be provided to protect the slurry seal from damage from traffic until such time that the mixture has cured sufficiently so that the slurry seal will not adhere to and be picked up by the tires of the vehicles.

6. The slurry seal mixture shall be applied up to the lip of gutter; any overlap into the gutter is not to exceed two inches (2") from the lip of gutter toward the face of curb. Any application or spillage beyond this two-inch limit shall be removed or cleaned up by the Contractor at Contractor's expense.

7. Roofing paper or a comparable substitute shall be used at all ends of slurry seal limits to provide for a clean, neat, and straight definition of the end of the slurry.

8. The spreader box shall be pulled at a rate NOT GREATER THAN 270 FEET PER MINUTE. Any areas slurried while the spreader box is exceeding 270 feet per minute will be considered out of specification and will not be paid for by the District.

9. A light sand blotter shall be spread by contractor where required by the Inspector to accommodate pedestrian traffic, to provide access to driveways, and to provide access across intersections on designated streets.

10. Any traffic control devices (barricades, cones, or signs) which are moved in the process of applying the slurry are to be returned to a proper position by the Contractor as soon as possible.

11. The rate of curing of the slurry seal shall be such that a street can be opened to traffic without any damage to the surfacing within six (6) hours after application if street is completed prior to 11:00 A.M., and within four (4) hours after application if street is completed after 11:00 A.M. Until all streets slurry-sealed that day are opened to traffic, the Contractor shall respond and provide any necessary repairs to the slurried areas which are not properly setting up, and this response shall be within thirty (30) minutes of request for such assistance. The Contractor shall be responsible for any additional costs incurred by the District due to the failure of the Contractor to respond within thirty (30) minutes or the failure of a street being sufficiently cured to allow traffic as specified above.

12. Testing shall be undertaken by an independent, third party, testing laboratory/contractor qualified to perform sampling and testing in accordance with Section 37 of the Caltrans 2018 Standard Specifications. Testing shall be paid for by the Contractor.

END OF SECTION 32 01 13

SECTION 32 01 17 CRACK SEALING

PART 1 – GENERAL

1.1 WORK INCLUDED

A. This section applies to the bid allowance for Crack Sealing as identified on the plans. The Crack Sealing length allowance will be confirmed during construction, as encountered by the Contractor, and as approved by the District. Measure and Paint out the areas and provide an excel spreadsheet list of the lengths to be considered for crack sealing. Perform a site walk with the District in slurry seal areas to decide on the crack seal painted areas. Any areas crack sealed prior to approval of the District will not be counted towards the crack seal length allowance.

B. Work covered by this section includes the cleaning out and sealing of cracks within all areas of the project scope. Cracks ¼-inch to 1-inch in width shall be sealed with asphalt rubber crack seal material. Cracks or "pop-outs" of existing asphalt that are greater than 1-inch in width shall be sealed with Type A, 3/8-inch maximum asphalt concrete cement.

C. The Contractor shall notify the District of the cracks the Contractor intends to fill. The District will review the Crack Sealing work proposed by the Contractor and either direct the Contractor to proceed or modify the exact amount and exact location of the Crack Sealing to be performed for each separate segment of asphalt.

1.2 SUBMITTALS

A. Contractor shall submit certificates from suppliers stating compliance of materials with the requirements of this section.

1.3 REFERENCES

A. The State of California 2018 Standard Plans and Standard Specifications, and applicable related Standard Special Conditions.
Section 37-6 – Crack Treatments

PART 2 – MATERIAL AND EQUIPMENT

2.1 HOT APPLIED SEALANT (CRACKS LESS THAN 1")

A. Crack seal material shall consist of a single component, hot-applied, elastically modified asphalt composition specifically produced for effective pavement maintenance joint sealing. The asphalt to be used shall have a maximum penetration of 150 when tested in accordance with procedure outlined by the American Association of State Highway Officials.

B. The granulated crumb rubber (100 percent vulcanized) shall meet the following requirements:

Passing Sieve	Percent
No. 8	100
No. 10	98-100
No. 40	0-100

C. The sieves shall comply with the requirements of AASHTO 92.

D. The specific gravity of the granulated crumb rubber shall be 1.15 + 0.02 and shall be free of fabric, wire or other contaminating materials, except that up to four percent of calcium carbonate may be included to prevent particles from sticking together.

E. The proportions of the two materials by weight shall be 75 percent +2 percent asphalt and 25 percent +2 percent rubber.

F. The materials shall be packed in approximately 60 pound boxes with a polyethylene liner. The boxes shall be placed on pallets and covered with a weather resistant covering.

2.2 ASPHALT CONCRETE MIX (CRACKS LARGER THAN 1" AND NOT IN DIG-OUT AREA)

A. The asphalt to be used shall have a maximum penetration of 150 when tested in accordance with procedure outlined by the American Association of State Highway Officials.

B. Mineral aggregate material for asphalt concrete for sealing cracks larger than 1-inch shall be Type A, 3/8 inch maximum, medium graded aggregate, conforming to Section 39-2, "Hot Mix Asphalt", of the 2018 Caltrans State Standard Specifications.

PART 3 – EXECUTION

3.1 GENERAL

A. Prior to crack seal operations the Contractor shall clean the cracks of all organic material within the limits to be crack sealed.

B. Cracks to be filled shall be completely dry at the time of filling, and in no case shall crack sealing be performed within 24 hours of any precipitation. Sealant shall be applied when the pavement surface temperature exceeds 50°F. Application at lower temperatures may result in reduced adhesion due to possible presence of excess moisture.

C. Cracks 1/4" to 1" wide shall be blown clean of all organic materials with a high pressure air nozzle and/or a mechanical cleaning process to a depth of 1/2" minimum.

D. The asphalt-rubber shall be heated to a minimum temperature of 300□F but not greater than 350□F. The material shall be held in the mixing tank at application temperature until very little separation of the rubber and asphalt occurs when a bead of sealant material is placed on the pavement. Sealant material may be added to the mix as long as the minimum temperature of 300□F is maintained.

E. Asphalt-vulcanized rubber crack sealant material shall be applied to all cracks ¼-inch or greater so as to be flush with the adjacent pavement surface. Cracks shall be sealed from the bottom up. Excess sealant shall be leveled to less than a 1/8-inch thickness with a squeegee or sealing shoe to produce a band which is 2 to 4 inches wide, centered over the crack.

F. Contractor shall not overfill cracks, as excess filler will cause bumps in the overlay and may migrate through the paving surface course during compaction.

G. Traffic shall not be allowed on the material until it has cured or until it has been sanded to prevent

tracking.

H. All crack sealing shall be completed at least one-working day prior to slurry sealing. Reinforcing fabric shall not be placed for at least 24 hours after crack sealing.

3.2 CRACKS LARGER THAN 1”

A. Cracks larger than 1” shall be blown clean of all organic materials with a high pressure air nozzle and/or a mechanical cleaning process to a depth of 1/2" minimum.

B. Cracks shall be filled with Type A, 3/8 inch maximum, medium graded aggregate asphalt concrete mix.

END OF SECTION 32 01 17

SECTION 32 12 16 ASPHALT CONCRETE

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Traffic control as required to divert vehicular and pedestrian traffic around construction.

B. Spreading and compacting asphalt concrete pavement and surfacing.

C. Grinding existing pavement at conforms and for overlaying.

D. GlasPave 25 Paving Mat or approved equal

E. Replacing asphalt concrete surfacing (Digouts).

F. Applying prime coat and tack coat.

G. Dust alleviation and control.

H. Cleanup and disposal of debris.

I. Supplying all labor, materials, equipment and apparatus not specifically mentioned herein or noted on the plans, but which are incidental and necessary to complete the work specified.

1.2 APPLICABLE PUBLICATION

A. The publications listed below form a part of this specification to the extent referenced. The publication is referred to in the text by the general designation only.

B. American Society for Testing and Materials (ASTM) Publication:

D1557 Laboratory Compaction Characteristics of Soil

C. California Department of Transportation Testing Manual:

Test 304 Method of Preparation of Bituminous Mixtures for Testing

Test 375 Determining the In-Place Density and Relative Compaction of AC Pavement

1.3 QUALITY ASSURANCE

A. <u>Codes and Standards</u>

1. Asphalt concrete / Hot Mix Asphalt shall conform to the applicable provisions of Section 39 “Asphalt Concrete” of the Standard Specifications.

2. Spreading and compacting of aggregate base material shall conform to the applicable provisions of Section 26 “Aggregate Bases” of the Standard Specifications.

3. At the discretion of the District, the Contractor shall flood test all asphalt pavement for proper drainage by flooding with water in ample quantity to demonstrate the correct shaping of the pavement. Ponding or bird baths will not be allowed.

4. The finished asphalt should be of uniform smoothness and texture, without segregation, thoroughly compacted, free of humps, depressions, and irregularities as determined by the Inspector of Record.

5. Traffic control and pedestrian and bicycle access control shall conform to these Specifications.

B. Allowable Tolerances

1. Finish surface of the aggregate base or aggregate subbase courses shall not vary more than 0.04 feet from the grade established by the Engineer, or as needed for positive drainage.

2. Finish surface of asphalt concrete when measured with a twelve-foot straight edge shall not vary more than 0.01 feet in the longitudinal direction and 0.02 feet transversely below the lower edge of the straight-edge.

C. Aggregates Testing:

1. Test the quality of aggregates in accordance with the test methods and frequencies shown in Section 39-2.02A(4)(b)(ii), “Aggregates” of the most current edition of the State Standard Specifications.

D. Submittals

1. For aggregate bases, the contractor shall arrange and provide for the following acceptance tests to be performed on samples taken at the job site, based on a frequency of one series of tests per 1000 tons of material placed:

   a. Sieve analysis, per California Test Method 202;

   b. Sand equivalency, per California Test Method 217;

   c. For aggregate bases, the durability index, per California Test Method 229.

2. Provide the Engineer daily with 1 PDF copy of a material certificate signed by material producer certifying that each material item complies with or exceeds the specified requirements for each type of material delivered.

3. Provide the Engineer with 1 PDF copy of certified plant load out slips for each load of material delivered showing net weight of aggregate base, subbase or asphalt concrete delivered to the job site, to be attached to the appropriate material certificate.

4. Submit a TC&PAC Plans: Refer to Traffic Control of these specifications for TC&PAC requirements.

1.4 JOB CONDITIONS & MINIMUM TEMPERATURES

A. Aggregate base or subbase material shall not be placed until the subgrade has been approved.

B. Provide satisfactory dust alleviation and control measures continuously during the course of the work.

C. Prime or tack coat materials shall not be applied unless the ambient temperature is above 50°F and has not been below 35°F during the 12 hours immediately prior to application. Prime or tack coats shall not be applied when the surface to be coated is wet or contains an excess of moisture.

D. Asphalt concrete shall not be applied unless the ambient temperature is above 50° F and rising, the surface is dry, and upon specific approval by the Engineer.

E. Temperature of asphalt concrete shall not be less than 250° F during initial spreading.

F. Maximum lift thickness for asphalt paving shall be 2 inches, unless Contractor has written approval from the Engineer.

PART 2 - PRODUCTS

2.1 AGGREGATE BASE

A. Materials for aggregate base shall conform to the requirements for Class 2 aggregate base contained in Section 26-1.02B of the Standard Specifications.

2.2 ASPHALT CONCRETE

A. Asphalt to be mixed with aggregate to form asphalt concrete shall be steam-refined paving asphalt, grade PG-64-10, conforming to the requirements of Section 92-1.02B "Performance Grade Asphalt Binders" of the Standard Specifications.

B. Aggregate for asphalt concrete shall be Type A conforming to the requirements of Section 39-2.02 "Type A Hot Mix Asphalt" of the Standard Specifications with the following Special Conditions:

1. Grading of combined aggregates for new asphalt concrete pavement, walkways, and overlays 2 inches or more in thickness shall be 3/4 inch maximum size, medium grading.

2. Grading of combined aggregate for asphalt concrete pavement, walkways and overlays less than 2 inches in thickness shall be 1/2 inch maximum size, medium grading.

3. Grading of combined aggregate for asphalt concrete pavement in walkways or bike paths, and Class IV bikeways shall be 1/2 inch maximum size, medium grading.

C. Liquid asphalt for prime coat shall be Grade SS-1 conforming to the requirements of Section 94 "Asphaltic Emulsions" of the Standard Specifications.

D. Asphaltic emulsion for tack coat (paint binder) shall be emulsified asphalt, Type SS-1h conforming to the requirements of Section 94-1.01 through 1.04 of the Standard Specifications.

E. Suppliers certification showing conformance to these specifications shall be delivered with each shipment of materials to the job site.

2.3 GLASPAVE WATERPROOFING PAVING MAT

A. Install GlasPave 25 per manufacture specifications or approved equal
B. Table for GlasPave 25 or approved equal:

Property	Test Method	GP25*
Tensile Strength (Ultimate) (MD X XD)	ASTM D5035 EN-ISO 10319	142 x 142 lbs/in
Tensile Elongation	ASTM D5035 EN-ISO 10319	< 5%
Young's Modulus E		10.6×10^6 psi
Mass/Unit Area	ASTM D5261 ISO 9864	4.0 oz/yd^2
Asphalt Retention	ASTM D6140 EN 15381 Annex C	0.10 gal/yd^2
Melting Point	ASTM D276 EN-ISO 3146	> 450° F
Roll Size		1.27 x 228.6 m 1.91 x 228.6 m 3.81 x 109.7 m
Roll Area		290 m^2 436 m^2 418 m^2
Fiberglass Reinforcement Strand	Maximum Spacing	<0.25 in
Stress Improvement Factor	TTI Overlay Tester	≥3.2 Vs. Control ♠
Permeability	ASTM D5084	≥2.6×10^{-11} cm/sec ◉
Elastomeric Polymer Coated Fiberglass	Temperature Comparison	>Compaction Temperature Vs. Softening Point ▲
Recyclability Without Screening	AASHTO T283-07	Pass Moisture/Rutting Susceptibility ■

Recyclability Without Screening	AASHTO T322-07	Pass Low Temperature Cracking ■

♠ Using a PG64 hot mix AC with a 12.5mm nominal maximum aggregate size at 32 degrees
◉ Using a 2" thick hot mix AC with a permeability > 2.6 x 10^{-11} cm/sec
▲Coating softening point must exceed HMA compaction temperature to protect fiberglass
■ 30% by weight of RAP was used for both the control RAP and RAP containing the milled paving mat

C. Many international manufacturers report average physical property values, which only provides a 50% level of confidence that the material delivered to the project site meets their product data sheet requirements. Whereas Minimum Average Roll Values (MARV) provides a 97.7% level of confidence the material will meet the published data sheet.

D. Millability and Recyclability: The material supplier shall provide proof that the paving mat can be milled and the resulting RAP containing the milled paving mat can be recycled (without screening) back into a new mix. Proof of millability and recyclability for this RAP shall consist of written documentation from an independent asphalt recycling plant and/or testing lab, and samples made with 30% RAP containing the recycled paving mat shall pass the AASHTO testing as listed above. Composite interlayers with paving fabrics and other interlayers that are not pre-coated with elastomeric polymer are not eligible for consideration.

PART 3 - EXECUTION

3.1 AGGREGATE BASE

A. Base material shall be placed, spread and compacted in conformance with the applicable requirements of Section 26-1.03 of the Standard Specifications.

B. Base material shall be compacted to a relative density of not less than 95% when tested in accordance with the requirements of ASTM D1557.

3.2 PRIME, TACK COATS, AND SURFACE PREPARATION

A. Liquid asphalt prime coat shall then be applied to the aggregate base course in conformance with the requirements of Section 92, "Asphalt Binders" of the Standard Specifications. Prime coat shall be applied at the rate of 0.25 gallons per square yard unless otherwise directed. After the liquid asphalt has penetrated the base course, any excess standing on the surface shall be absorbed to the satisfaction of the Engineer with a suitable coating of clean sand. (For providing a waterproof layer between HMA and base)

B. Tack coat shall be applied to all vertical surfaces of existing pavement, curbs, gutters, catch basins, manhole frames, and construction joints in the surfacing to the horizontal surface of all existing pavements to be resurfaced and other surfaces designated in accordance with Section 39-2.01C(3)(f), "Tack Coat," of the State Standard Specifications. Asphaltic paint binder shall be provided in sufficient quantity to produce a thin, uniform black, glossy coat of asphalt. Pools in unevenly distributed material shall be spread out by squeegee, broom or other means so an even coverage is attained. Immediately in advance of placing HMA, apply additional tack coat to damaged areas or where loose or extraneous material is removed. Do not track tack coat onto

pavement surfaces beyond the job site. Discontinue application of emulsion early enough to comply with lane closure specifications and daily work advancement. (For bonding between HMA and base)

C. Distributed areas shall be redistributed by means of hand brooms. Tack coat shall be applied in conformance with the applicable requirements of Section 39-2.01C(3)(f), “Tack Coat,” of the Standard Specifications.

D. Prior to placing asphalt over existing pavement, sweep the pavement clean of loose dirt to the satisfaction of the Engineer.

3.3 ASPHALT CONCRETE

A. Asphalt concrete shall be proportioned, mixed, placed, spread, and compacted in conformance with the applicable requirements of Section 39-2.02, “Type A Hot Mix Asphalt,” and 39-2.05, “Bonded Wearing Courses,” of the Standard Specifications and the following requirements:

1. Asphalt concrete shall be placed only upon specific approval of the Engineer. When, in the opinion of the Engineer, the surface is too wet, no asphalt concrete shall be placed.

2. No asphalt concrete surface course shall be placed when the ambient temperature is less than 50° F. All compaction shall be completed before the temperature of the mixture drops below 200° F.

3. All longitudinal joints shall be "hot" joints; cold joints are only allowed transversely at discontinuance of the day's run.

4. Asphalt concrete for roadways shall be placed in layers when the total depth called for on the plans and detail drawings exceeds 2 inches. The final layer shall not be less than 1-1/2 inches in compacted thickness no more than 2 inches.

5. Where more than 4-1/2 inches in total compacted thickness are specified, 3 or more layers shall be required. The first lower layer shall not exceed 2-1/2 inches in compacted thickness.

6. All asphalt courses shall be placed by means of an approved self-propelled asphalt paving machine. Contractor may place lower courses and compact all courses with equipment conforming to the requirements of Section 39-2.01C(2) of the State Standard Specification.

7. The window/pick-up machine method for spreading asphalt may be used with the following restrictions:

    a. The machine is self-supporting and may not transmit loads to the paving machine. The use of a track type machine is recommended.

    b. The maximum window length in front of the paving machine shall be 200-feet, and shall not block intersections.

    c. The Contractor shall furnish a “Dump Man” for the control of window distribution.

    d. At the sole discretion of the Engineer, depending on ambient temperature and the

length of haul, the loaded trucks must be covered with a tarp.

e. Any damages to the reinforcing fabric caused by the pick-up machine shall be repaired before the work is allowed to continue.

f. At the sole discretion of the Engineer, depending on traffic control operations, the use of double-bottom dump trucks may be prohibited.

8. Where asphalt paving is to be laid against concrete gutter, the first pass shall start at the gutter and successive passes work towards the center of the street, and the finish surface of the asphalt concrete wearing course shall be constructed to a height 1/4 inch above the abutting edge of the gutter.

9. Trucks, loaded or empty, shall not be allowed on the new surface until the asphalt concrete reaches ambient temperature.

B. The final lift of asphalt paving shall not be placed until all other construction activity, including building construction and landscaping is completed.

C. When placing asphalt over existing pavement, repair large cracks, spalls, and chuck-holes, and clean the pavement surface to the satisfaction of the District Engineer.

D. Asphalt concrete shall be rolled such that compaction after rolling shall be 95% of the density obtained with the California Test 304. Field density tests may be conducted by the Engineer to confirm density using the California Test 375.

E. Failure to meet the specified density may require credits back to the District for non-conformance.

3.4 MISCELLANEOUS CONCRETE WORK

A. All new concrete improvements shall be 3000 psi concrete for pedestrian areas and 4000 psi concrete for vehicular areas. For concrete installations follow City of Oakland Standards or Caltrans Standard Specifications, whichever is more stringent.

3.5 ADJUST MANHOLES, VALVES, AND MONUMENT COVERS

A. Existing manholes, valve and monument covers, frames and grates, inlets, and miscellaneous utility boxes and covers or other such structures in the line of the work shall be adjusted to conform with the new grade after completion of paving operations.

B. The box will be adjusted by removing the existing concrete pad and pouring a new pad of concrete.

C. Manholes, frames and covers shall be adjusted to grade in accordance with the provisions in Section 71-5.03B “Frames, Covers, Grates, and Manholes" of the State Standard Specifications, these Technical Provisions and as directed by the Engineer.

D. Adjusting existing manhole frame and cover to grade shall include adjusting cone sections as necessary. Adjusting existing valve boxes to grade shall include extension of valve stems as necessary.

E. Prior to any work on the sewer manholes, the Contractor shall install false bottoms in the manholes impacted by the work. Upon completion of the work the false bottoms shall be removed.

F. Some of the existing utility facilities may belong to different utility companies. The Contractor shall coordinate with respective utility companies for the adjustment of their facilities.

G. Contractor shall lower the valves and manhole frames & covers, to below the grading activity of the proposed work. Within 2 working days of the final lift of asphalt concrete the valves and manhole frames & covers, shall be raised to the final grade of the asphalt concrete.

H. Where shown on the plans, the Contractor shall protect in place the utility manhole and utility vault during cold in-place recycling and/or grinding operations. Within 2 working days of the final lift of asphalt concrete the utility manhole and vault shall be adjusted to the final grade of the asphalt concrete per typical section shown on plans. In protecting these facilities during cold in-place recycling, adjacent pavement to these facilities shall be treated with AC/base removal and installation of 0.5' deep lift AC.

I. The concrete collar shall be circular and shall be covered with a minimum of 2 inches of asphalt concrete to blend in with the adjacent surfacing.

J. Extension rings will not be acceptable. Contractor shall be responsible for preserving the survey point in its original position.

3.6 ASPHALT PLANING

A. The depth, width, and shape of the cut shall be as shown on the plans by a project-specific detail.

B. Asphalt planing operations shall provide a final cut resulting in a uniform surface conforming to the typical cross sections, and be performed without damage to the surfacing to remain in place.

C. Plane the edges of the asphalt, adjacent to the concrete, extra thick as necessary to allow a minimum overlay of 2 inch to new elevations.

D. Where transverse joints are planed in the pavement at conform lines no drop-off shall remain between the existing pavement and the planed area when the pavement is opened to public traffic. If asphalt concrete has not been placed to the level of existing pavement before the pavement is to be opened to public traffic a temporary asphalt concrete taper shall be constructed. Asphalt concrete for temporary tapers shall be placed to the level of the existing pavement and tapered on a slope of 1:30 (Vertical:Horizontal) or flatter to the level of the planed area.

E. The contractor will be held responsible for any and all damage to trees, plants, and shrubs caused by the grinding operation and shall satisfactorily replace with new material or correct any damage.

F. Ground asphalt concrete shall be removed from the job site and disposed of immediately following the grinding operation.

G. Ground areas shall be overlaid within 1 week of grinding.

H. For bidding purposes the project asphalt planning operations shall be considered "profile grinding" to specific grades, with the necessary surveying to meet the final grades.

3.7 ASPHALT CONCRETE SPOT RECONSTRUCTION

A. This section applies to the bid allowance for spot reconstruction, as identified on the plans and bid form as ASPHALT CONCRETE SPOT RECONSTRUCTION. The spot reconstruction area allowance will be confirmed during construction, as encountered by the Contractor, and as approved by the District. Notify District of areas which may require spot reconstruction, following the grinding operation.

B. Measure and paint out the areas and provide an excel spreadsheet calculation of the areas to be considered for spot reconstruction. The spreadsheet to include length and width = area in square feet. Any areas reconstructed prior to approval of the District will not be counted towards the area allowance.

C. This work, otherwise known as "digouts," shall consist of removing existing asphalt concrete surfacing and underlying base material and replacing the removed surfacing and base material with new asphalt concrete as shown on the plans and specified in these technical specifications.

D. The exact limits of asphalt concrete surfacing to be removed and replaced will be determined by the Engineer. The contractor will first paint the areas to be repaired at the locations shown on the plans. After the paint marks the Engineer and District representative will walk the site to confirm the paint mark locations and quantities prior to performing the removal. Contractor to adjust paint marks, as directed by the Engineer, and provide traffic control during the site walk and the adjustment of paint marks.

E. Existing surfacing and underlying base material removed during a work period shall be replaced before the lane is to be opened.

F. Surfacing and base material shall be removed without damage to surfacing that is to remain in place. Damage to pavement which is to remain in place shall be repaired to a condition satisfactory to the Engineer.

G. The material remaining in place, after removing surfacing and base material to the required depth, shall be graded to a plane, watered, and compacted.

1. The finished surface of the remaining material shall not extend above the grade established by the Engineer

2. Areas of the base material which are below the required depth, as a result of over excavation, shall be filled, at the Contractor's expense, with asphalt concrete.

3.8 TRAFFIC CONTROL AND STRIPING

A. Temporary delineation is required and shall conform to Section titled, "Pavement Delineation," of these Specifications.

B. Conform to all Traffic Control and Pedestrian/Bicycle Access Control Plan requirements included in these Specifications.

3.9 CLEANUP

A. Upon completion of asphalt paving and surfacing operations, the entire work site shall be cleaned of all waste, rubbish, and construction debris of any nature.

END OF SECTION 32 12 16

SECTION 32 17 00 SIGNING AND PAVEMENT DELINEATION

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Cleaning and sweeping of streets before application of markings.

B. Application of temporary and permanent stripes and pavement markings.

C. Application of raised pavement markers.

D. Application of roadway markers, striping and delineators.

E. Restoration of existing improvements.

F. Cleanup and removal of debris.

G. Supplying all labor, materials, equipment and apparatus not specifically mentioned herein or noted on the plans, but which are incidental and necessary to complete the work specified.

1.2 SUBMITTALS

A. For each lot or batch of traffic stripe material, primer, and glass beads, submit Certificate of compliance, including the material name, lot or batch number, and manufacture date

1.3 QUALITY ASSURANCE

A. Manufacturer's certificates showing conformance with this specification shall be delivered with each shipment of materials and equipment delivered to the job site.

B. Only District inspected and approved material may be used for roadway delineation.

C. Codes and Standards

1. The standards, recommended methods and tests contained in the publications cited below shall determine the standards for the work to be done hereunder unless otherwise specifically designated on the plans:

   a. The *California Manual on Uniform Traffic Control Devices* (*California MUTCD*), latest edition.

   b. The regulations, standards, and tests of the State of California Department of Transportation Materials and Research Division.

   c. The State of California Standard Plans and Standard Specifications, and applicable related Standard Special Conditions.

2. Traffic signs, roadway markers and delineators, traffic stripes, pavement markings, and pavement markers shall be placed in the locations shown on the plans and shall conform to the applicable sections of the California MUTCD and the State of California Highway Design Manual.

3. Reference by manufacturers, brands or models is to establish type and quality of materials desired. Substitutions of materials of equal quality will be permitted upon the prior written approval.

1.4 JOB CONDITIONS

B. No striping, markings, or markers shall be applied until pavement surfaces have been approved.

C. Concrete shall be thoroughly cured before application of striping, markings, or markers thereon.

D. Document and measure existing striping to be replaced per these specifications.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

B. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

C. Do not deliver items to project before time of installation. Limit shipment of bulk and multiple-use materials to quantities needed for immediate installation.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Install pavement markers only when ambient temperature and humidity conditions acceptable per manufacturer's specifications.

B. Testing and removal of yellow traffic stripe and pavement markings with hazardous waste residue shall be in conformance with Caltrans Standard Specification 14-11.12.

PART 2 - PRODUCTS

2.1 TEMPORARY PAVEMENT DELINEATION

A. Temporary Pavement Delineation shall conform to Section 12-6, "Temporary Pavement Delineation," and Section 84-2, "Traffic Stripes and Pavement Markings", of the Caltrans Standard Specifications.

B. Short term, temporary pavement markers shall be day/night retroreflective raised pavement markers conforming to the requirements of Section 12-6 of the Standard Specifications and Part 6 of the California MUTCD.

2.2 PAINT

A. Paint for traffic stripes and pavements markings shall conform to Section 84-2, "Traffic Stripes

and Pavement Markings", of the Caltrans Standard Specifications and the following:

1. Waterborne Traffic Line (White, Yellow, Black): Caltrans Standard Specification PTWB-01R2

2. Waterborne Traffic Line for disabled persons' parking, and other curb markings (blue, red, green): Federal Specification No. TT-P-1952D(E)

B. The installation of curb paint shall conform to Section 91, “Paint” of the Standard Specifications and these Special Provisions.

1. The curb shall be painted red at all no parking zones

2.3 PERMANENT PAVEMENT MARKERS AND ADHESIVES

A. Pavement markers shall be the type and description shown, noted or called for on the plans and detail drawings, and shall conform to the requirements of Section 81-3, “Pavement Markers,” of the Standard Specifications and the State Standard Plans.

B. Adhesive for pavement markers shall be either epoxy or hot melt bituminous adhesive conforming to the requirements of Section 81-3 of the Standard Specifications.

C. Submit certificates of compliance showing conformance with these specifications for each load of pavement markers delivered to the job site. Pavement markers must be on Caltrans’ Authorized Material List of signing and delineation materials.

D. Fire Hydrant markers shall be two-way, reflective blue markers.

2.4 PROTECTION

A. The Contractor shall protect the newly installed pavement markers and stripes from damage until the material has cured. Any damage by the elements to the newly stripe or marking due to the failure of any Contractor to protect his work shall be repaired by him at no additional cost. Any over-spray or tracking of fresh thermoplastic material onto unpainted surfacing shall be removed by any methods to the satisfaction of the Engineer.

B. Replace any markers broken, misaligned or otherwise disturbed prior to opening roadway to traffic.

PART 3 – EXECUTION

3.1 LAYOUT, ALIGNMENT, AND SPOTTINGS

A. All layout, spotting and tracking required shall be performed by and at the expense of the Contractor and approved by the District, prior to placement of pavement striping or markings.

B. When no previously applied figures, markings, or traffic striping are available to serve as a guide, suitable layouts shall be spotted in advance of the permanent paint application by any means satisfactory to the District.

C. The Contractor shall mark or otherwise delineate the traffic lanes in the new roadway or portion of roadway, or detour before opening it to traffic.

D. The Contractor shall provide an experienced technician to supervise the location, alignment, layout, dimensions, and application of the delineation or marking.

E. The Contractor shall furnish all equipment, materials, labor, and supervision necessary for installing pavement striping and markings in accordance with the contract plans for temporary detours required for the safe control of traffic through and/or around the project.

F. Standard word markings, letters, numerals, and symbols shall be as shown as on the plans. In the absence of such information, all stencils and templates shall be identical with those used by the District. The Contractor shall obtain stencils for all required legends.

3.2 REMOVAL OF EXISTING MARKINGS

A. Existing striping and pavement markings that will be in conflict with the finish traffic circulation shall be removed as directed by the District in accordance with Section 84-9 of the Caltrans Standard Specifications.

B. The Contractor shall conduct his work so as not to damage existing pavement and public improvements to remain. Any resultant damage determined to be excessive by the District shall be repaired in kind by the Contractor at its sole expense.

C. Damage to the pavement resulting from removal of pavement markers shall be considered as any depression more than 1/4-inch deep and shall be repaired by the Contractor by filling the depression with hot melt bituminous adhesive to the satisfaction of the District.

D. Where blast cleaning is used for the removal of traffic stripes and pavement markings or objectionable material, the residue including dust shall be removed immediately after contact between the sand and the surface being treated. Such removal shall be by a vacuum attachment operating concurrently with the blast cleaning operation.

E. Where removal of traffic stripes and pavement markings is done by grinding or sandblasting methods, the effected pavement surface shall be completely covered by applying asphaltic emulsion conforming to Section 94 of Caltrans Standard Specifications.

F. All reference markings made by the Contractor shall be done with spray chalk.

G. All temporary traffic stripes and pavement markings shall be removed by the Contractor on the same day as placement of the permanent striping and marking

3.3 DOCUMENTING AND MEASURING OF EXISTING STRIPING AND PAINTED CURBS

A. For pavement rehabilitation projects, contractor will be required to restore the existing Roadway/parking lot striping to the original layout, after the completion of the pavement rehabilitation.

B. Prior to demolition, grinding, or impact to the existing striping or painted curb, Contractor to collect photographs, measure striping in the field, and prepare existing striping sketches. The photographs, measurement of striping, and existing striping sketches will be submitted to the

engineer prior to any demolition of striping.

C. Adequate number of photographs and measurements will be collected to document the existing striping and painted curb conditions. Engineer may require the Contractor to collect more measurements and photos prior to construction.

3.4 PAVEMENT MARKER INSTALLATION

A. Pavement markers shall be installed in conformance with the requirements of 81-3, “Pavement Markers,” of the Standard Specifications.

B. Remove undesirable material from the pavement surface. Clean the pavement surface by abrasive blast cleaning when directed by the Engineer.

C. Markers shall be installed accurately to the line established by the Engineer. No markers shall be installed until the surface and layout have been approved by the Engineer.

D. Fire hydrant markers shall be two-way blue retroreflective pavement markers and installed at all fire hydrant locations, as directed by the District.

3.5 REFLECTORIZED MARKER INSTALLATION

A. Reflectorized markers shall be installed in conformance with the requirements of Section 82-5 of the Standard Specifications, except that the metal marker posts shall not be driven in place without prior approval of the Engineer.

B. Reflectorized markers shall be installed accurately at the locations called for on the plans and in the positions specified on the detail drawings.

3.6 PAVEMENT MARKINGS INSTALLATION

A. Placement of all traffic stripes and pavement markings shall be in conformance with Section 84, "Markings" of the Caltrans Standard Specifications, referenced Plans of the Caltrans Standard Plans, with color required as shown on the Drawings and as specified herein.

B. Any overlap, dripping, or tracking of fresh thermoplastic or paint onto unmarked surfacing shall be removed to the satisfaction of the District.

C. Thermoplastic and paint shall be placed as close as possible to existing utility structure and monument frames and covers without covering them.

D. The Contractor shall protect all fresh thermoplastic and paint and shall repair or replace all damage to traffic stripes and pavement markings caused by their failure to do so at its own expense.

E. All traffic stripes and pavement markings, new or existing, within or adjacent to the work limits which become defaced or damaged during the Contractor's operations shall be replaced by the Contractor at its expense concurrently with other traffic marking operations in the immediate area. The District shall be the sole judge as to which stripes or legends are defaced or damaged.

F. Curb painting shall be applied as shown on the plans and as directed by the District. Curb painting

shall include the application of two coats of traffic paint with glass beads incorporated in the second coat. Top and face of curb shall be painted. Color of curb markings shall conform to ASTM D6628.

G. All traffic stripes and pavement markings shall be placed at application rates in conformance with Section 84-2, "Traffic Stripes and Pavement Markings", of the Caltrans Standard Specifications.

3.7 TRAFFIC CONTROL SIGNS

A. Traffic control signs shall be installed in conformance with the requirements of the *California MUTCD*, and Section 56 of the Standard Specifications.

B. After erection, damage to traffic sign faces shall be repaired as required.

3.8 RESTORATION OF EXISTING IMPROVEMENTS

A. Existing signs or other markings removed or damaged due to the installation of roadway markers or traffic control signs shall be replaced in kind.

B. Existing landscaping or planting removed, damaged or disturbed due to the installation of roadway markers or traffic control signs shall be replaced in kind.

3.9 CLEANUP

A. Upon completion of the installation of Roadway Markings and Accessories, Contractor shall thoroughly clean the work site of all waste, rubbish and construction debris of any nature.

B. Upon removal of temporary signs, patch holes in walkway or roadway with Portland Cement concrete conforming to these Technical Specifications.

END OF SECTION 32 17 00

SECTION 33 44 00 STORM DRAINAGE FACILITIES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Trenching and other excavation.

B. Ground water control.

C. Pipe bedding.

D. Installation of storm drains and appurtenances.

E. Backfill and compaction of backfill.

F. Dust alleviation and control.

G. Cleanup and restoration of surface in improved areas.

H. Supplying all labor, materials, equipment and apparatus not specifically mentioned herein or noted on the plans, but which are incidental and necessary to complete the work specified.

1.2 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text only by the general designation.

B. American Society for Testing and Materials (ASTM) Publications:

A36 Carbon Structural Steel.

A48 Gray Iron Castings.

A123 Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

C443 Joints for Concrete Pipe and Manholes, using Rubber Gaskets.

C497 Test Methods for Concrete Pipe, Concrete Box Sections, Manhole Sections, or Tile.

D1784 Rigid Poly Vinyl Chloride (PVC) Compounds & Chlorinated Poly Vinyl Chloride (CPVC) Compounds

D3034 PVC Sewer Pipe and Fittings

F477 Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

F679 Poly Vinyl Chloride (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings

1.3 QUALITY ASSURANCE

A. Submit manufacturer's data on pipe, drainage structure and castings to be used.

B. The Engineer may require manufacturer's or supplier's certificates showing conformance with this specification to be delivered with each shipment of material delivered to the job site.

C. D-Load or class of pipe requirements shown or called for on the plans shall be the minimum acceptable.

D. All pipes shall bear the manufacturer's label for the type, specification, and classification of the pipe.

E. All storm drains shall be subject to passing a ball test.

1.4 JOB CONDITIONS

A. Note and conform to conditions and requirements indicated and specified under Section Trenching and Backfill of these Technical Specifications.

PART 2 - PRODUCTS

2.1 POLY VINYL CHLORIDE PIPE

A. PVC pipe for storm drains shall conform to the requirements of ASTM 3034 or ASTM F679 and shall have a DR rating of 26. All pipe and fittings shall be made of PVC plastic having a minimum cell classification of 12454 or 13364 as defined in ASTM D1784. Pipe barrel shall have the words "STORM DRAIN" marked along the longitudinal axis of the outside in 1-5/8" high block letters with permanent ink. The words shall be repeated at 2-foot spacing along the pipe length.

B. The Contractor may substitute pressure-sensitive tape in lieu of stenciling. Adhesive-backed Pipe Labeling Tape shall be PVC Plastic tape manufactured specifically for direct placement onto pipe, cable or conduit for warning and identification. Tape shall be a minimum of 2.2 mils, an adhesive strength of 26 psi, and with tensile strength of 32 lb. per inch of width. Tape shall be of the type provided in rolls, color coded for the utility involved with warning and identification imprinted in bold letters continuously and repeatedly over entire tape length. Code and letter coloring shall be permanent, unaffected by moisture or other substances contained in trench material.

C. Couplings and fittings for use with PVC non-pressure pipe shall be of the same materials and in compliance with the requirements specified for the pipe. Couplings and fittings shall be equipped with rubber rings which fit into individual grooves formed in the inner wall to the requirement of ASTM Designation F477.

2.2 CONCRETE DRAINAGE INLETS

A. Concrete curb inlets for storm drains shall be cast-in-place, reinforced concrete of the form and dimensions shown and detailed on the plans.

B. Concrete used for curb inlets shall conform to Concrete Improvements of these Technical Specifications

C. Forming, placing, and finishing concrete for use on curb inlets shall conform to Concrete Improvements of these Technical Specifications.

D. Reinforcement used in the construction of precast curb inlets shall be deformed steel bars conforming to Concrete Improvements of these Technical Specifications.

E. Miscellaneous steel shapes used in construction of concrete curb inlets shall be structural quality carbon steel conforming to the requirements of ASTM Designation A36 and shall be hot-dip galvanized after fabrication in conformance with the requirements of ASTM Designation A123.

F. Steps for curb inlets, where required, shall be polypropylene to the form and dimensions shown and detailed on the plans.

2.3 CAST-IN-PLACE DRAINAGE STRUCTURES

A. All concrete structures are to be cast in place except where specifically noted on the plans and specifications. However, in all cases the bases of inlets and manholes shall be cast-in-place, unless prior written exception from District.

B. Concrete for cast-in-place drainage structures shall conform to the Concrete Improvements of these Technical Specifications.

C. Forming, placing and finishing concrete, and reinforcement for cast-in-place drainage structures shall conform to Concrete Improvements of these Technical Specifications.

D. Steel for frames and grates or covers for cast-in-place drainage structures shall be structural steel conforming to the requirements of ASTM Designation A36. Frames and grates or covers shall be fabricated to the form and dimensions shown and detailed on the plans and shall be hot-dip galvanized after complete fabrication in conformance with the requirements of ASTM Designation A123. Frames and grates or covers shall be match marked in sets to provide a firm and continuous seat.

E. Welding for frames and grates shall conform to the requirements of the American Welding Society for Arc and Gas Welding in Building Construction.

PART 3 - EXECUTION

3.1 TRENCHING, BACKFILLING AND SHORING

A. Shall conform to Trenching and Backfill of these Technical Specifications.

3.2 POTHOLING

A. Shall conform to Potholing of these Technical Specifications

3.3 PIPE INSTALLATION

A. Installation: Storm drain pipe, underdrains and appurtenances shall be installed in prepared trenches starting at the lowest point, with the bell ends pointing in the direction of the flow.

B. Handling: Pipe shall be carefully handled during hauling, unloading, and placing operations, so as to avoid breakage or damage. Strap-type slings shall be used for lifting and placing; no chains or hooks will be permitted. Broken or damaged pipe including chipped bells of spigots, will be rejected, and shall be removed from the work site.

C. Alignment: All pipe shall be accurately laid in conformity with the prescribed lines and grades established by the Engineer. Each length shall be joined to the preceding section as specified, and after said jointing has been completed, there shall be no movement of the pipe in subsequent operations.

D. Pipe Deflections: The laying of pipe on curved alignment will be permitted only when necessary to conform with the alignment shown or called for on the plans. Joint deflections called for on the plans shall be permitted up to one half of the deflection recommended by the pipe manufacturer.

E. Cleaning**:** Before each new length of pipe is placed, the interior of the preceding pipe shall be carefully cleaned of all dirt and debris. When pipe laying is not in progress, all open pipe ends shall be closed with plugs in a satisfactory manner to the Engineer.

F. Bearing**:** Pipe in the trench shall have continuous uniform bearing along its bottom, except all bell holes. Before lowering pipe into the trench, the Contractor shall remove all stakes, debris, loose rock and other hard material from the bottom of the trench.

G. Positioning: After the final positioning, pipe shall be held in place with cover materials placed equally on both sides so as to hold the pipe section in place. Position plastic pipe with "STORM DRAIN" markings facing up. After joints are completed, the cover material shall be redistributed and compacted as herein required.

H. Closure: At the end of each working day, the open ends of the installed pipe shall be closed with plugs. Openings for appurtenances shall be suitably covered.

3.4 CONNECTIONS

A. Unless separately listed on the bid schedule, make all required pipe connections to existing facilities and improvements, including grout, at no additional cost, and compensation for such work shall be deemed as included in the price bid for pipe installation.

B. At pipe connections to manholes the base will be constructed with concrete channels directed toward outlet pipe.

C. PVC pipes shall be installed into manhole break-out holes and shall be cut flush with the inside surface of the manhole. Use PVC manhole adapters for connecting new PVC pipe to manholes and grout all around to prevent ground water infiltration.

D. For pipe connections, the joint shall be made by properly lubricating the rubber gasket with a suitable vegetable compound soap before it is placed in the groove at the spigot end. The gasket shall be stretched over the spigot end of the pipe and carefully seated in the groove, with care taken to equalize the stress in the gasket around the circumference of the joint. The gasket shall not be twisted, rolled, cut, crimped, or otherwise injured or forced out of position during the

closure of the joint. A feeler gauge shall be used to check the position of the rubber gasket after the joint has been assembled. Where a joint placement is found to be improper, the tested pipe section shall be removed, the gasket checked for damage, a new gasket installed, if necessary, the pipe re-laid and the gasket placement rechecked.

3.5 STRUCTURES

A. Structures and appurtenances shall be installed at the location and to the lines and dimensions shown on the plans and detail drawings.

B. Structures shall be constructed and/or installed in conformance with the applicable requirements of Section 51 of the Standard Specifications. Unless otherwise noted on the plans or detail drawings, all exposed surfaces of poured in place structures and appurtenances shall have a " Class 1 surface finish" in accordance with Section 51-1.03F(3).

C. Frames for manholes and tops of catch basins, inlets and other structures in paved areas shall be accurately placed flush with and in the plane of the finish pavement.

D. All joints and pipe openings on manhole sections, risers, and grade adjustment rings shall be grouted smooth and flush with the interior of the structure.

3.6 STORM DRAIN CLEANING

A. Storm drain pipe and structures shall be cleaned of all dirt, debris, and form work.

B. Pipes shall be balled with an approved rubber ball to insure cleanliness prior to acceptance.

END OF SECTION 33 44 00