



**RESTAURANT / RETAIL SIDEWALK EXPANSION PROJECT**

at

**PILLAR POINT HARBOR**

**TECHNICAL SPECIFICATIONS**

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## **SECTION 10 - TECHNICAL SPECIFICATIONS**

### **SECTION 10-1 MOBILIZATION**

#### **10-1.01 GENERAL**

Mobilization shall conform to Section 9-1.16D, "Mobilization", of the State Standard Specifications.

Mobilization shall consist of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to and from the project site; for the establishment of all offices, buildings, on-site sanitary facilities, developing construction water supply and other facilities necessary for work on the project; and for all other work and operations which must be performed or costs incurred prior to commencement of work on the various work tasks on the project site. Furnishing and maintaining project field offices, facilities, facility control and cleanup, developing a construction staging area and plan, storage yard fencing, storage lockers or other items of similar character, and implementing the requirements of Section 4-1.13, "Cleanup" of the Standard Specifications, shall all be classified as mobilization.

Obtaining permits and licenses and paying all related fees, notification to the public, preparation and update of construction schedules, coordination and cooperation, attendance of project meetings, preparation of daily reports, contractor/subcontractor insurance and bonds, and maintaining record documents shall all be classified as mobilization.

A schedule of values shall be submitted, itemizing salient items, costs, and activities involved in each item. Items shall also include maintenance of such facilities and removal and cleanup costs.

Measurement will be made as a percentage of the costs incurred according to the schedule of values submitted, except that not more than 75% of the bid price shall be paid prior to the final estimate for payment being due, said remaining 25% shall be paid upon completion of cleanup and removal with final payment.

Attention is directed to Section 9-1.02, "Extra Work", of these Special Provisions regarding remobilization for extra work.

#### **10-1.02 CONSTRUCTION STAGING AREA**

The District will provide, at no cost to the contractor, a portion of parking lot A2 located west of the restaurant /retail area. The area provided is located along the northern edge of the parking lot, immediately west of the District's fenced in storage area. The staging area consists of ten marked parking spaces, nominally 18' x 90'. Contractor will be responsible for providing any fencing or other temporary or security improvements.

Contractor shall prepare and submit a plan describing any improvements to the construction staging area to the Engineer for approval. Contractor shall not permit any waste or damage to be done to the staging area and shall maintain the area in good condition, free of litter and debris. Upon completion of the work, the area shall be restored to its pre-construction or better condition, including the repair of any damaged pavement, curbs, markings, or other public infrastructure components.

Contractor is responsible for all necessary traffic control involved throughout duration of project. Traffic control must follow California MUTCD where applicable.

### **10-1.03 SANITARY RESTROOM FACILITIES**

Sanitary restroom facilities shall be furnished and maintained by the Contractor, and shall be mounted on a moveable trailer and moved to various locations throughout the project as necessary. The Contractor's proposed locations for restroom facilities shall be reviewed with the Engineer prior to delivery and placement of restroom facilities. Restroom facilities shall be removed from the jobsite every weekend and on holidays.

### **10-1.04 ENVIRONMENTAL REQUIREMENTS**

Contractor shall comply with all air pollution, water quality, and other environmental control rules, regulations, ordinances and statutes that apply to the project and execution of the work performed pursuant to the Contract, including the requirements of the San Mateo Countywide Water Pollution Prevention Program. The major elements of this program are shown on the last Plan Sheet, "Construction Best Management Practices".

Contractor shall implement construction site Best Management Practices (BMP's) for control of non-storm water and point discharges, erosion and sediment control.

A Construction Best Management Practices action plan, Water Pollution Control Program (WPCP) and Storm Drain Inlet protection plan shall be required for the project.

Contractor shall be required to implement temporary construction site best management practices in accordance with the *Construction Site Best Management Practices (BMP's) Manual* issued by the State of California, Department of Transportation. Temporary BMP's required for this Contract shall include, but are not limited to:

- A. Stockpile Management: Implement BMP's, as appropriate, for soil stabilization and sediment control as applicable to stockpiles of various materials.
- B. Mobile Operations: Implement BMP's, as appropriate, for control of equipment fueling and maintenance, concrete mixing and wash out, hauling and storage of materials. BMP's shall control all specific situations that mobile operations can create.
- C. Wind Erosion Controls: Implement BMP's, as appropriate, for all disturbed soils on the project site that are subject to wind erosion when wind and dry conditions exist.

- D. Tracking Controls: Implement BMP's, as appropriate, for control of sediments and debris from the construction site.
- E. Non-Storm Water and Waste Management and Materials Pollution Controls: Implement BMP's, as appropriate, to control the discharge of materials other than storm water to the storm water collection system.

The Contractor shall inspect BMP's regularly. Improperly installed, damaged or ineffective BMP's shall be corrected immediately.

#### **10-1.05 MEASUREMENT AND PAYMENT**

The **lump sum** price paid for "**Mobilization, Demo, Staking**" shall be considered as full compensation for mobilization as specified herein, including but not limited to notifications, project records and documents, obtaining all required permits, licenses, and paying all fees, developing construction schedule, moving on the site any equipment required for the operations, preparatory work, coordination and cooperation, project meetings, developing construction water supply, developing a construction staging area, providing on-site sanitary facilities, offices, subcontractor insurance and bonds, Contractor insurance and bonds, environmental requirements, demobilization, and all other mobilization work, and no additional payment will be allowed therefore.

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## SECTION 10-2 SCHEDULING

### **10-2.01 GENERAL**

Minor deviations from the requirements of this section may be allowed by the Engineer if, in the opinion of the Engineer, prosecution of the contract will be better served and the work expedited. Any request for such deviations by the Contractor shall not be adopted without the Engineer's written approval.

All construction area signs shall be installed prior to starting any work.

All concrete removal and replacement adjacent to the area to be slurry sealed shall be completed prior to any base failure repairs and slurry seal.

Top layer of hot mix asphalt for digouts shall be placed no later than 72 hours after excavation begins on any parking lot.

Contractor shall coordinate slurry seal work so that slurry seal is placed not less than forty-eight (48) hours before garbage pick-up. Contractor shall verify the schedule prior to start of slurry seal work. Contractor will work with the restaurants and businesses to coordinate delivery schedules. Contractor shall provide notice of the slurry seal schedule a minimum of three full business days before slurry seal operations that will, in the opinion of the District, impact deliveries to the restaurants and retail operations.

Permanent pavement stripes, markings and markers shall not be placed for at least seven (7) calendar days, but no later than fourteen (14) calendar days, following slurry seal.

Contractor shall be responsible to verify with District staff if any other projects are expected to be active within, or near, the projects limits. Contractor shall coordinate and cooperate with concurrent projects to minimize conflict and disruption to the public.

Nothing in this section, or on the contract plans, shall be construed as to relieve the Contractor of his/her responsibility to comply with the requirements of Section 7-1.04, "Public Safety", of the State Standard Specifications. Contractor shall provide traffic control devices and measures as he/she believes are necessary to provide for public safety.

Failure to comply with these requirements and provisions shall be sufficient cause for the Engineer to suspend the work in accordance with provisions of Section 8-1.06, "Suspensions", of the State Standard Specifications. In the event the Engineer orders a suspension of work due to failure of the Contractor to comply with the requirements of this section, the days on which the suspension order is in effect shall be considered as working days if such days are working days as set forth in Section 8-1.05, "Time", of the State Standard Specifications. Contractor will not be permitted to resume work until such time as he/she has satisfactorily demonstrated to the Engineer his/her ability to perform the work in accordance with the provisions of the contract.

**10-2.02 MEASUREMENT AND PAYMENT**

Payment for stage construction shall be considered as included in the contract prices bid for the various items of work shown on the Bid Schedule, which prices will be considered as full compensation for all labor, supervision, materials, equipment, tools and incidentals, and no additional compensation will be allowed therefore.



## **SECTION 10-3 SITE PREPARATION AND RESTORATION**

### **10-3.01 GENERAL**

#### WORK INCLUDED

- A. Documenting existing conditions at the site in the vicinity of the work.
- B. Site preparation shall consist of all clearing, stripping, demolition and related work necessary to prepare the project site for construction operations.
- C. Removal of all surface improvements (fences, hardscape, etc.) and landscaping shall be thoroughly coordinated prior to the start of work with the Engineer and County Harbor District, and restored in-kind after the completion of construction activities.
- D. No open burning of debris, lumber, or other scrap will be permitted.
- E. Trees and vegetation shall be protected from damage incident to site preparation and construction operations by the erection of barriers or by such other means as the circumstances require.
- F. Contractor shall also implement the requirements of Special Provisions SP 2 (A), SP 16 and SP 17, "Existing Site Conditions", "Contractor's Use of Premises/Site Appearance" and "Preservation and Restoration of Property", respectively.

#### EXISTING SITE CONDITIONS

Existing site surface conditions consist of pavement, concrete curb and gutter, landscaping, vegetation including flowering plants and lawns, bushes, trees, concrete and paver hardscape, wood, concrete and metal fences, and debris. In some instances, building or other structures exist over or near the storm drain pipe.

### **10-3.02 EXECUTION**

#### DOCUMENT EXISTING CONDITIONS

Prior to the start of work on the site, Contractor shall document existing site conditions at and in the vicinity of the work and along access routes, with an emphasis on identifying cracks or other existing damage to existing improvements. The documentation shall consist of photographs and/or videos and the locations shall be clearly identified.

## DEMOLITION

Remove existing facilities where required to perform the work. Demolition and removal of existing improvements, public or private, shall only be performed to the extent necessary to accommodate the work in conformance with the notes and details shown on the plans. No improvements shall be removed unnecessarily.

## CLEARING

Clearing shall consist of the trimming and cutting of trees, and the removal of downed timber, shrubs, grasses, debris and rubble which will obstruct or otherwise impede construction operations. Trimming or cutting of any tree, and removal of any landscaping, shall be only with prior approval of the County Harbor District.

## PRESERVATION OF PROPERTY

- A. The project area shall be cleared only to the extent necessary to accommodate the work in conformance with the notes and details shown on the Plans. Trees or growth shall not be trimmed back unnecessarily. Attention is directed to Section 3.03 of this Section of the Specifications, regarding the protection of trees.
- B. Contractor shall take extreme care not to damage shrubs, trees, fences, irrigation systems and other improvements of adjacent property owners.
- C. All existing improvements (including landscaping) not specifically designated on the Plans to be removed or relocated shall remain in their original condition and location undisturbed. However, upon written permission by the Engineer, existing improvements may, for the convenience of the Contractor, and at his expense, be removed and temporarily relocated during construction and shall be replaced or reconstructed in their original location in as good or better condition as when the Contractor entered upon the work site.

## PLANT AND TREE PROTECTION

- A. No cutting of any part of County trees, including roots, shall be done without approval of the County Harbor District.
- B. No cutting of any part of private trees, including roots, shall be done without approval of the County Harbor District.

- C. Protect all existing plants and trees at all times from damage by men and equipment. Repair all minor damage to existing trees by using a certified arborist or other personnel approved by the Engineer. Remove such trees permanently disfigured or killed, including roots from the site and replace each such tree or trees with equal sized trees if possible, or reimburse the owner the cost if such replacement is not possible. The Engineer shall be the sole judge of the condition of any tree.

#### DEMOLITION OF SURFACE IMPROVEMENTS

- A. Removal of sidewalks, curbs and gutters, driveways, concrete slabs and pavement if necessary shall be in accordance with the provisions of Section 15-3 of the Caltrans Standard Specifications. Curbs, gutters, sidewalks, driveways, slabs and pavement shall be removed by full depth saw cut to the nearest joint from the lines shown on the Plans or as directed by the Engineer.
- B. Where the Plans indicate pipeline construction under existing asphalt pavement or replacement of existing asphalt pavement, the existing pavement shall be removed and disposed of off-site.

#### REMOVAL OF DEBRIS

- A. All demolished and cleared material shall become the property of the Contractor and shall be legally disposed of by the Contractor.
- B. Removed concrete shall be legally disposed of off the right-of-way at a location provided by the Contractor. Demolished concrete shall not be buried in structure backfill areas.

#### DISPOSAL

Dispose of demolished materials, soil, strippings, and other materials offsite.

#### **10-3.03 MEASUREMENT AND PAYMENT**

Full compensation for conforming to the requirement of this section shall be considered as included in the contract unit prices paid for various items of work requiring site preparation and restoration "in-kind", and no additional compensation will be allowed therefore.

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## **SECTION 10-4 CONCRETE IMPROVEMENTS**

### **10-4.01 GENERAL**

Existing and new concrete facilities including, but not limited to, access ramps, curb, gutter, sidewalk, pavement, slab, valley gutter, and driveways shall be removed and replaced or constructed at the locations indicated on the plans or as directed by the Engineer. All new curb ramps shall have detectable warning surfaces installed as part of the ramp.

### **10-4.02 COORDINATION**

Contractor shall notify the District 48 hours in advance of concrete removal. At some locations, concrete repairs are specified to address damage due to tree roots and to comply with ADA guidelines. Contractor shall obtain approval from the District prior to cutting, pruning or removing any tree roots while performing concrete repairs. Contractor shall allow 48 hours after removal of concrete for District forces to apply root mitigation measures prior to placing new concrete.

### **10-4.03 SUBMITTALS**

The Contractor shall furnish a concrete mix design to the Engineer at least ten (10) working days prior to the start of the work.

### **10-4.04 CONCRETE MIX DESIGN**

The Contractor shall furnish a concrete mix design to the Engineer at least ten (10) working days prior to the start of the work, based on the following guidelines:

All concrete facilities shall be constructed with Class B, 5 Sack mix which meets the following requirements:

Compressive Strength: 3000 psi @ 28 days (2500 psi min in 48 hrs for commercial driveways and valley gutters)  
Maximum Slump: 4 inches  
Lamp Black: 1 lb. / cy

The Contractor shall be responsible for all costs associated with the required mix design.

The Contractor shall comply with the "lamp black" ADA color requirements.

### **10-4.05 QUALITY ASSURANCE FIELD TESTING**

Field testing shall include testing for concrete slump as per ASTM C-143 and compressive strength (C39). Such testing shall be at a frequency determined by the Engineer and shall be

performed by the Owner's laboratory at the Owner's expense. The Contractor shall furnish the concrete necessary for casting test cylinders.

#### **10-4.06 EXECUTION**

All work shall conform to the provisions of Section 90 of the Standard Specifications. All handicap access ramps shall comply with Title 24 and current UBC requirements, as well as County Standard Details included herein.

Concrete removal work shall conform to the provisions in Section 15-1.03B, "Removing Concrete," of the State Standard Specifications and these Technical Specifications. The existing concrete shall be sawcut full depth prior to removal. Any concrete broken due to the Contractor's failure to comply with these requirements shall be removed and replaced at the Contractor's expense. All concrete removed shall become the property of the contractor to be disposed of outside the right of way, each day work occurs.

The line and grade of the replaced facilities shall conform to the existing facilities. In most instances, this will consist of a straight line between existing facilities. In instances where existing sidewalk has been raised by tree roots, the line and grade may be adjusted to avoid tree roots, as directed by the Engineer.

The Contractor shall water test all repaired curbs and gutters, cross gutters, and other repaired drainage facilities in the presence of the Inspector.

**Contractor shall provide a safe pathway to at least one business entrance (per business) for business owners during demolition and curing process. Contractor shall coordinate with business owners to determine best times to access entrances.**

Access ramps shall be constructed at intersections such that ramp landing falls within the limits of the striped crosswalk or just past the painted stop bar or limit line.

In situations where access ramp is retrofitted into existing sidewalk, removal and replacement for new ramp shall include sidewalk as well as adjacent curb and gutter.

In situations where an existing curb ramp is to remain, but to be retrofitted with detectable warning surface, the scope of work shall include sawcutting existing ramp surface, removing existing concrete, and replacing new concrete with truncated domes material set into new concrete. Surface applied matting systems for truncated domes (i.e. glued and screwed mats) shall not be allowed for retrofitting a detectable warning surface to an existing ramp.

The curb and gutter, sidewalk, curb ramp, valley gutter work includes sawcutting and removing existing concrete improvements to the nearest score joint, scarifying, moisture conditioning, grading, and compacting the subgrade to the specified relative compaction; and placing, moisture conditioning, grading, and compacting Class 2 aggregate base to the specified relative compaction. The subgrade elevation and depth of aggregate base shall be as shown on the Details and as shown on the Plans. Doweling to the existing improvements to remain

shall be as shown on the Details. Care shall be taken to prevent any damage or concrete spillage to the existing adjacent improvements, including but not limited to landscaping and irrigation, and curb, gutter and sidewalk to remain.

The subgrade and aggregate base under sidewalk and curb ramps shall be compacted to at least 90% relative compaction. The subgrade and aggregate base under curb and gutter, and shall be compacted to at least 95% relative compaction.

Work shall include temporary asphalt concrete patch paving at gutter lips.

Attention is directed to the requirements of Section 90-1.03C, "Protecting Concrete", of the State Standard Specifications.

#### **10-4.07 PROTECTION OF EXISTING FACILITIES**

The contractor shall protect existing facilities from damage, and discoloration from concrete splash. Adjacent concrete facilities shall be covered during concrete placement to prevent concrete splash and excess concrete from staining the adjacent concrete. After initial placement, strikeoff and finishing, the protection shall be removed and the adjacent concrete cleaned.

Vertical existing facilities such as light poles, walls, etc. shall be protected with plastic extending a minimum of three feet above the concrete surface. After initial placement, strikeoff and finishing, the protection shall be removed and the vertical surfaces cleaned.

#### **10-4.08 SUBGRADE**

After the subgrade is prepared, moisture conditioned, and compacted to 90% relative compaction at zero to three percent over optimum moisture content, the Contractor shall continuously maintain the sub-grade in a uniform condition at the moisture content obtained during sub-grade compaction until the concrete is placed.

In locations where existing concrete improvements are being replaced, existing base material may be re-compacted and used without over excavation and placement of additional baserock. For new concrete improvements, over excavation and placement of base material in accordance with the County's Standard Details shall be required.

#### **10-4.09 FORMING**

Wooden forming shall be of two-inch nominal thickness staked at two-foot intervals. The maximum gap at the bottom of the forms shall be 1-3/4 inches.

#### **10-4.10 TOLERANCES**

The maximum variation from design elevation shall not exceed +/- 0.02 feet. In some instances, particularly in critical drainage areas, tolerances may be reduced to zero. Concrete facilities shall be installed to maintain or provide positive drainage. Questions regarding applicable tolerances shall be directed to the Engineer forty-eight hours in advance of the work.

When shown on the drawings, the concrete shall be set at the design elevations. When existing facilities are to be removed and replaced, they shall conform to the existing elevations and grades. Generally, this will be at a straight line between the start and end points of the removal.

#### **10-4.11 ADJUSTING UTILITY BOXES, MANHOLES, AND VAULTS IN SIDEWALK, DRIVEWAYS AND RAMPS**

The work shall consist of the raising or lowering to grade of utility boxes and covers in areas indicated for changing the grade of adjacent asphalt concrete.

Work by the Contractor shall include locating, referencing, and setting sufficient marks prior to raising facilities to enable their subsequent retrieval by the Contractor.

Utility boxes and manholes shall be raised or lowered to finished grade by removing the existing concrete collar, adjusting the frame and cover to finished grade, and constructing a new concrete collar.

For all adjusted structures, the top surface of the adjusted facility shall be within 1/8 inch of the adjacent finished grade.

#### **10-4.12 PLACING AND FINISHING**

The concrete shall be deposited on a moist grade/base in such a manner as to require as little re-handling as possible. Workmen shall not be allowed to walk in the freshly mixed concrete with boots or shoes coated with earth or foreign substances.

In general, adding water to the surface of the concrete to assist in finishing operations shall not be permitted.

Before final finishing is completed and before the concrete has taken its initial set, the edges shall be carefully finished with the radius shown on the plans or a radius to match the existing construction.

New concrete promenade (exclusive of five-foot sidewalk) shall be finished with score lines spaced 2.5 feet on centers to delineate business property. New concrete sidewalk shall be finished with score lines placed at 5.0' spacing perpendicular to the adjacent curb. Score lines shall be placed 6" behind the face of curb and at the midpoint of the remaining sidewalk width.



Concrete shall be thoroughly consolidated against and along the faces of all forms and adjacent concrete. After the forms are removed, excess concrete below the form surface shall be removed to be flush with the form face.

All new concrete shall match existing facilities in texture, color, and appearance. Surfaces shall be broom finished transversely to the line of pedestrian traffic. The Contractor shall clean at his expense all discolored concrete. The concrete may be cleaned by abrasive blast cleaning or other methods approved by the Engineer. Repairs shall be made by removing and replacing the entire unit between score lines or joints.

#### **10-4.13 CONCRETE PROTECTION**

The Contractor shall always have materials available to protect the surface of the fresh concrete against rain. These materials shall consist of burlap, curing paper, or plastic sheeting. If plastic sheeting is used, it shall not be allowed to contact finished concrete surfaces.

The Contractor shall also protect the concrete against traffic and vandalism. If the concrete is damaged or vandalized, the Contractor shall make the necessary repairs at its own expense. The repair procedure for damaged or vandalized concrete shall be approved in advance by the Engineer.

#### **10-4.14 CURING**

Concrete shall be cured by protecting it against loss of moisture, rapid temperature change, and mechanical injury for at least three days after placement. White or clear liquid membrane compound shall be used. After finishing operations have been completed, the entire surface of the newly placed concrete shall be covered by the curing medium. The edges of the concrete exposed by the removal of forms shall be protected immediately to provide these surfaces with continuous curing treatment.

The concrete shall be allowed to cure for seventy-two hours prior to placing adjacent asphalt concrete.

#### **10-4.15 JOINTS**

Control joints shall be placed at a maximum spacing of ten feet.

Control joints in all PCC facilities, except sidewalks, shall be formed by tooling a deep joint or by using expansion joint material. If expansion joint material is used, a minimum of two 1/2 inch by eighteen-inch dowels shall be used with additional dowels placed every twenty-four inches.

Control joints in sidewalks may be made using a tooled joint which shall extend a minimum of 1/4 of the depth of the concrete and shall not be less than 1-1/2 inches in depth.

In sections of new curb and gutter adjacent to an existing tree, a deep joint shall be placed through the curb and gutter, aligned with the center of the tree trunk.

Expansion joints shall be required at a maximum of forty-foot intervals on curbs, curbs and gutters, cross gutters, swales, and sidewalks. Expansion joints shall also be required on all corners of curbs, curbs and gutters, sidewalks, at the outside boundary of access ramps, and other locations with discontinuities or reentrant corners which may cause cracking.

#### **10-4.16 CLEANUP AND BACKFILL**

After the concrete is placed, cured, and the forms have been removed, the Contractor shall clean the site of all concrete and forming debris. The aggregate base shall be replaced to match the existing base and compacted to 95% relative compaction. The pavement shall be restored in accordance with "Base Failure Repair" of these Technical Provisions. A minimum of two lifts shall be used, none of which shall exceed three inches, and the top lift shall be a minimum of 1-1/2 inches thick. The total thickness of the restored pavement shall match that of the existing pavement.

For pavements to be overlaid or resurfaced, the aggregate base and asphalt concrete may be replaced with cement sand slurry in conformance to Section 19-3.03F, 'Slurry Cement Backfill', of the State Standard Specifications.

After curing has been completed and the forms have been removed from the new curb and gutter or sidewalk, the void between the new concrete and the existing parkway shall be filled with clean native material or imported topsoil and the entire parkway left in a clean and orderly condition.

For concrete removed but not replaced, the resulting void after excavation shall be backfilled with clean native material or topsoil.

#### **10-4.17 DETECTABLE WARNING SURFACE (DWS)**

All curb ramps shall have a detectable warning surface installed in conformance with Caltrans Standard A-88A, the most current edition of the California Building Code, and local County requirements.

Detectable Warning Surface shall be yellow (federal color no. 33538) in color, and shall be a set-in-concrete style of truncated domes. No surface-applied matting systems (i.e. glued and screwed) style of DWS shall be allowed.

Existing ramps shall be removed in their entirety and replaced with a new ramp as identified on the project plans. A DWS product shall be installed at each new ramp, in conformance with these Technical Provisions. Locations for this work are identified on the project plans.

#### **10-4.18 MEASUREMENT AND PAYMENT**

The contract price paid for Concrete Improvements shall include full compensation for performing the scope of work specified in Technical Specifications "Concrete Improvements", including, as appropriate, but not limited to, sawcutting of existing concrete or pavement, removal and disposal of existing materials (including adjacent items such as; pavement, base, curb, gutter, walk, wall, ramp, driveway, structure, landscaping, earth and any other item that is required for the specified concrete work), installation and removal of formwork, construction of concrete improvements, adjustment of any utility boxes, vaults, and manholes to match finished grade, finishing, application of curing compound, restoration of surrounding improvements including planting, irrigation repairs, asphalt concrete repairs, etc., painting of curbs to match pre-construction conditions, replacement of engraved curb markings, ADA compliant slopes, truncated domes, landings and markings at curb ramps, vehicular and pedestrian accommodations, notification of adjacent residents, posting of no parking signs and clean-up. Asphalt concrete repairs shall include but not limited to replacement of asphalt concrete at conforms and concrete formwork in the installation of concrete ramps, driveway, sidewalk, curb & gutter.

"Construct Case A Ramp", "Construct Case C Ramp", and "Construct Case CM Ramp" shall be measured and paid per **each** up to a total removal and replacement area of 100 square feet of sidewalk and 20 linear feet of curb and gutter. Limit of ramp is defined from the grade break lines as shown on plans. Retaining curbs (if necessary) at the edge of sidewalk, at the back of certain curb ramps shall be included as part of the per each cost of the access ramp. Any cost for adjacent labor and materials such as asphalt concrete, aggregate base, concrete, structure, vegetation, earth, materials and miscellaneous items needed for installation of access ramp shall be included per ramp. Replace a minimum asphalt concrete of four (4) inches in depth for any existing asphalt removed for the purpose of the concrete improvement.

Adjustments for excessive conforms at curb ramps - When the work at any single ramp location requires the removal and replacement of sidewalk in excess of 100 square feet or the removal and replacement of curb and gutter in excess of 20 linear feet, the total payment amount for that ramp shall be adjusted. The amount of adjustment will be calculated from the value of the ratio of actual quantity of sidewalk divided by 100 square feet and the ratio of actual quantity of curb and gutter divided by 20 linear feet. The amount of adjustment will be the average of the two calculated ratios multiplied by the unit cost of the bid item. The method of adjustment in total payment will be in adjusting the quantity of the item.

"Minor Concrete - PCC Promenade," "Minor Concrete - PCC Sidewalk," and "Minor Concrete - Valley Gutter," shall be measured and paid per **square foot**.

"Minor Concrete - Curb and Gutter," and "Minor Concrete - Vertical Curb." shall be measured and paid per **linear foot**.

"Adjust Utility Box" shall be measured and paid per **each**.

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## **SECTION 10-5 – CLOSED CIRCUIT TELEVISION INSPECTION**

### **10-5.01 GENERAL**

- A. This specification covers closed circuit television (CCTV) inspection performed to determine conditions in a pipeline. Inspections shall be performed when required by these specifications and as needed by the Contractor.
- B. **Pre-rehabilitation inspection** shall be performed to identify, locate, and record all existing conditions that may have to be corrected to allow proper functioning of the pipeline or which would interfere with the rehabilitation including cracks, protruding laterals, offset joints, sags (1/8" of standing water or more), exposed reinforcing steel, root intrusion, debris, etc.
- C. **Post-rehabilitation inspection** shall be performed to determine if the work was completed in accordance with the Contract Documents, and that all required service connections (laterals) have been reinstated or reconnected and backfilled properly with no damage to the main or laterals.

### **10-5.02 SUBMITTALS**

Contractor shall submit television inspection logs, photographs, **color** digital video recordings on portable hard-drive, and length reports, all as described in the "Documentation" section below, immediately upon completion.

### **10-5.03 EQUIPMENT**

The television camera used for the inspection shall be a color camera specifically designed and constructed for inspection of pipelines. A pivot head, pan and tilt camera capable of spanning 360-degrees circumference and 270-degrees horizontal axis shall be used for all pipelines that are 6-inches in diameter or greater to allow detailed inspection of laterals and defects. The camera shall be operative in 100% humidity conditions. The camera shall have a resolution of at least 350 lines per inch. Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. Digital format equipment shall be used to record the inspection on DVD's. Lighting and camera shall be capable of showing a clear, in-focus image of the entire periphery of the pipe for a minimum distance of six feet. The camera, television monitor, and other components of the video system shall be capable of producing picture quality to the satisfaction of the County Harbor District's Representative. Unsatisfactory equipment shall be removed and no payment will be made for an unsatisfactory inspection.

**10-5.04 EXECUTION**

- A. The **pre-rehabilitation inspection** shall be conducted after the storm drain pipe main is cleaned, and if required, after the sewage bypass is installed and operating.
- B. The **post-rehabilitation inspection** shall be conducted after the new pipe is installed, and all related work such as restoring laterals or reconstruction of manhole to accommodate the new pipe is completed. The post-rehabilitation inspection shall be performed in the presence of the County Harbor District's Representative. The post-rehabilitation inspection shall be completed and the work tentatively accepted by the County Harbor District's Representative before the sewage bypass is disassembled.
- C. The television inspection shall be completed in the same direction each time. The inspection shall be done one complete pipeline section at a time from start point manhole centerline to stop point manhole centerline.
- D. The camera shall be moved forward through the line in either direction at a moderate rate, stopping when necessary to permit proper documentation of the condition of the storm drain pipe. In no case shall the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable, and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the pipe conditions shall be used to move the camera through the pipelines. Stop the camera at each lateral or other penetration point and aim the camera up into the line.
- E. When manually operated winches are used to pull the television camera through the line, telephones or other suitable means of communication shall be set up between members of the crew.
- F. Accurately measure the location of defects, and periodically check the accuracy of the measuring device by use of a walking meter, roll-a-tape, or other suitable device.

**10-5.05 DOCUMENTATION**

- A. Television Inspection Logs: Prepare a written record that documents the location of the inspection, date and time of the inspection, type and diameter of the pipe, direction of travel, and location and type of conditions observed including any

laterals, roots, storm sewer connections, broken pipe, cracks, offset joints, sags, scale and corrosion, and other discernible features.

- B. Photographs: The Contractor shall capture digital still images of all observations made during every inspection.
- C. Digital Video Recordings: Prepare a digital visual and audio record of the inspection to document conditions observed. Recording playback shall be at the same speed in which it was recorded. Slow motion or stop-motion playback features may be supplied at the option of the Contractor. The Contractor shall have all recordings and necessary playback equipment readily accessible for review by the County Harbor District during the project. Each segment of the submitted final recording shall begin and end at a manhole or cleanout, which shall be identified by the nomenclature used in the Drawings. If the recordings have errors or are of such poor quality that the Engineer is unable to evaluate the condition of the storm drain pipe or lining, the Contractor shall re-televiser the storm drain and provide a new recording of good quality at no cost to the County Harbor District.
- D. Digital recordings shall be labeled and individually numbered, beginning with the project name followed by Disc #01, #02 etc. Labels shall be typewritten and include project title, dates(s) of recording, disc number, and segment (including MH#).
- E. Recordings shall include the following:
  - 1. Data View Before the Inspection: Location, Date and time of video inspection, type and diameter of the pipe, direction of travel.
  - 2. Data View During Inspection: Location, date and current distance along reach.
  - 3. Audio shall include:
    - Date and time of video inspection
    - Verbal confirmation of upstream and downstream manhole numbers
    - Verbal description of pipe size, type and pipe joint length
    - Verbal description of location of each defect
    - Verbal description of location of each service connection point
- F. Length Report: Prepare a written report identifying the length of each segment of pipeline measured from centerline of manhole to centerline of manhole. If a difference of more than ten feet is found from the distance shown on the Drawings, notify the County Harbor District's Representative and re-measure the distance in his/her presence.

### **10-5.06 MEASUREMENT AND PAYMENT**

The **lump sum** price paid for "**Closed Circuit Television Inspection (CCTV)**" shall be considered as full compensation for services as specified herein, including but not limited to notifications, project records and documents, obtaining all required permits, licenses, and paying all fees, developing construction schedule, moving on the site any equipment required for the operations, preparatory work, coordination and cooperation, developing a construction staging area, demobilization, and all other mobilization work, and no additional payment will be allowed therefore.



## **SECTION 10-6 - TRENCHING & BACKFILLING**

### **10-6.01 GENERAL**

#### WORK INCLUDED

- A. Perform all excavations, shoring, dewatering, backfilling, compaction, grading, and full pavement restoration per the San Mateo County Details, all as necessary or required for the construction of the work as covered by these Specifications and as show on the Project Drawings. The excavation shall include the removal and disposal of all materials of whatever nature encountered, including water and all other obstructions that would interfere with the proper construction and completion of the required work.
- B. Work included in this section also includes excavating, backfilling, and surface restoration for the purposes of exposing utilities within 2 ft of the edge of new sanitary sewer pipes to prevent damage to those utilities from pipe bursting activities.
- C. Trenching and backfilling shall be performed in accordance with the San Mateo County's Technical Provisions for Public Works Construction, Section 5 and Section 8.04 "Excavation and Backfill". In case of discrepancies, notify the Engineer immediately.

#### REFERENCES

- A. American Society for Testing and Materials (ASTM).
- B. State of California, Department of Transportation, Standard Specifications (Standard Specifications).
- C. State of California, Department of Transportation, Manual of Test (California Test).

### **10-6.02 SUBMITTALS**

- 1. Sheeting and Shoring Plan: Refer to Paragraph 1.06 below.
- 2. Potholing Report as described in Paragraph 3.02.
- 3. Samples and Test Results: Furnish such quantities of import materials as may be required by the County Harbor District for test purposes. Cooperate with the County Harbor District and furnish necessary facilities for sampling and testing of all materials and workmanship. Submit test results for import materials. Tests shall be performed within 30 days of the submission. All material furnished and all work performed shall be subject to rigid inspection, and no material shall be delivered to the site until it has

been favorably reviewed by the Engineer, or used in the construction work until it has been inspected in the field by the County Harbor District.

4. Name and qualifications of independent testing laboratory.
5. Construction staging plan

### **10-6.03 QUALITY ASSURANCE**

Source Quality Control: Test import materials proposed for use to demonstrate that the materials conform to the specified requirements. Tests shall be performed by an independent testing laboratory.

Field Quality Control:

- a) The Owner will review materials proposed for use.
- b) The Owner will inspect placement and compaction.
- c) Contractor will conduct field materials placement test (e.g. compaction) as directed by the Engineer using an approved independent testing laboratory. Contractor shall be responsible for all associated costs.

Testing Methods:

1. Laboratory Compaction: ASTM D1557, Method A or C.
2. In-Place Density: ASTM D1556 or ASTM D6938.

Relative Compaction: In-place dry density divided by the maximum dry density laboratory compaction express as a percentage.

### **SUBSURFACE INVESTIGATIONS**

- A. Prior to making any drillings or excavations, the contractor shall secure permission from the County Harbor District.

### **ADDITIONAL SAFETY RESPONSIBILITIES**

- A. The Contractor shall select, install and maintain shoring, sheeting, bracing, and sloping as necessary to maintain safe excavations. The Contractor shall be responsible for ensuring such measures: (1) comply fully with 29 CFR Part 1926 OSHA Subpart P Excavations and Trenches requirements, (2) provide necessary support to the sides of excavations, (3) provide safe access to the Engineer's sampling and testing within the excavation, (4) provide safe access for backfill, compaction, and compaction testing, and (5) otherwise maintain excavations in a safe manner that shall not endanger property, life, health, or the project schedule. All earthwork shall be performed in strict accordance with applicable law, including local ordinances, applicable OSHA, CalOSHA, California Civil Code, and California

Department of Industrial Safety requirements.

#### **10-6.04 MATERIALS**

- A. Crushed Rock: Class 2, 3/4-inch maximum aggregate base, Standard Specifications Section 26.
- B. Bedding Materials: Standard Specifications, Paragraph 68-1.025 Class I, Type A, permeable material. At least 75% of the particles shall have one or more fractured faces.
- C. Import Backfill: Imported non-expansive soil with liquid limit no greater than 40% and a plasticity index no greater than 15%, free from clods or rocks larger than 2 inches in greatest dimension, and free from organic material.
- D. Native Backfill: Native soil free from rocks larger than 2 inches in greatest dimension, and free from organic material.
- E. Materials for repaving shall be as specified in the County's Technical Provisions for Public Works Construction.

#### **10-6.05 EXECUTION**

##### CONTROL OF WATER

- A. All excavations shall be kept free from water and all construction shall be in a dry environment.
- B. It should be presumed that the presence of groundwater will require dewatering operations. Furnish, install, maintain, and operate all necessary pumping and other equipment for dewatering all excavations. At all times have on the project sufficient pumping equipment for immediate use, including standby pumps for use in case other pumps become inoperable.
- C. Provide a sufficient number of pumps so as to hold the groundwater level at an elevation of not less than 1 foot below the lowest elevation of the pipe.
- D. Dispose of water in such a manner as to cause no injury or nuisance to public or private property, or be a menace to the public health, and in conformance with applicable NPDES regulations.

- E. The dewatering operation shall be continuous, so that the excavated areas shall be kept free from water during construction, while concrete is setting and achieves full strength, and until backfill has been placed to a sufficient height to anchor the work against possible flotation.
- F. Continue dewatering during backfilling operations such that the groundwater is at least 1 foot below the level of the compaction effort at all times. No compaction of saturated materials will be allowed.
- G. Dewatering devices must be adequately filtered to prevent the removal of fines from the soil.
- H. The Contractor shall be responsible for any damage to the foundations or any other parts of existing structures or of the new work caused by failure of any part of the Contractor's protective works. After temporary protective works are no longer needed for dewatering purposes, they shall be removed by the Contractor.
- I. If pumping is required on a 24-hour basis, requiring engine drives, then engines shall be equipped in a manner to keep noise to a minimum.
- J. Prevent disposal of sediments from the soils to adjacent lands or waterways by employing whatever methods are necessary, including settling basins.
- K. The Contractor shall be responsible for furnishing temporary drainage facilities to convey and dispose of surface water falling on or passing over the site.

## EXISTING UTILITIES

- A. General: The known existing buried utilities and pipelines are shown on the Drawings in their approximate location. The Contractor shall exercise care in avoiding damage to all utilities as he will be held responsible for their repair if damaged. There is no guarantee that all utilities or obstructions are shown, or that locations indicated are accurate. Utilities are pipes, conduits, wires, cables, poles, ducts, manholes, pull boxes and the like, located at the project site and along the pipeline right-of-way.
- B. Check on Locations (General Potholing & Exposing Utilities Within 2' of New Sewer Pipe):
  - 1. Contact all affected utility owners and request them to locate their respective utilities prior to the start of "potholing" procedures. The utility owner shall be given 7 days written notice prior to commencing potholing. If a utility owner is not equipped to locate its utility, the Contractor shall locate it.

2. Clearly paint the location of all affected utility underground pipes, conduits and other utilities on the pavement or identify the location with suitable markers if not on pavement. In addition to the location of metallic pipes and conduits, non-metallic pipe, ducts and conduits shall also be similarly located using surface indicators and shall then be similarly marked.
3. Coordinate with the utility owner to have an inspector present during excavation, if required.
4. After the utility survey is completed, commence "potholing" to determine the actual location and elevation of all utilities where crossings, interferences, or connections to the new pipelines are shown on the Drawings, marked by the utility companies, or indicated by surface signs. Prior to the preparation of piping shop drawings, or the excavation for any new pipelines or structures, the Contractor shall locate and uncover these existing utilities including services and laterals to a point 1 foot below the utility. Submit a report identifying each underground utility and its depth and station. Any variation in the actual elevations and the indicated elevations shall be brought to the Engineer's attention.
5. Excavations around underground electrical ducts and conduits shall be performed using extreme caution to prevent injury to workmen or damage to electrical ducts or conduits. Similar precautions shall be exercised around gas lines, telephone and television cables.
6. Excavations for potholing shall be minimized. Air spades and vacuum excavators shall be used to limit the size of excavations and damage to adjacent facilities. Backfill after completing potholing. In existing streets, temporarily pave with 1 inch of cutback.

C. Interferences:

1. If interferences occur at locations other than shown on the Drawings, the Contractor shall notify the Engineer, and a method for correcting said interferences shall be supplied by the Engineer. Payment for interferences that are not shown on the plans, nor which may be inferred from surface indications, shall be in accordance with the provisions of the General Conditions. If the Contractor does not expose all required utilities prior to shop drawing preparation, he shall not be entitled to additional compensation for work necessary to avoid interferences, nor for repair to damaged utilities.
2. Any necessary relocations of utilities, whether shown on the Drawings or not, shall be coordinated with the affected utility. The Contractor shall perform the relocation only if instructed to do so in writing from the utility and the Engineer.

D. Shutdowns: Planned utility service shutdowns shall be accomplished during period of minimum use. In some cases this may require night or weekend work. Such work shall

be at no additional cost to the Owner. Program work so that service will be restored in the minimum possible time, and shall cooperate with the utility companies in reducing shutdowns of utility systems to a minimum.

1. Disconnections: No utility shall be disconnected without prior written approval from the utility owner. When it is necessary to disconnect a utility, the Contractor shall give the utility owner not less than 72 hours notice when requesting written approval. The Contractor shall program his work so that service will be restored in the minimum possible time.

- E. Not all existing gas, water, sewer, telephone house and other utility laterals are specifically shown on the Drawings but may exist within the project limits. Protect all service laterals from damage due to construction operations. If any laterals are damaged, notify the Engineer and the affected utility immediately. The cost of repair shall be borne by the Contractor.

#### TRENCH / ACCESS PIT EXCAVATION

- A. Open Trench Limitations: The Engineer shall have the authority to limit the amount of trench to be opened or left open at any one time. In public roads, excavation and pipe laying shall be coordinated to the end that a minimum of interference with public traffic will result. In existing streets, no more than 100 feet of trench shall be open at any time on any single heading. An open trench in existing streets shall be defined as any trench which has not been completely backfilled, satisfactorily compacted, and capped with at least 1-inch of temporary paving (cutback) or first lift of permanent pavement.
- B. Trenches and access pits shall be as wide as necessary for sheeting and bracing and the proper performance of the work up to the maximum width permitted by the County's Standard Plans. The sides of the trenches shall be vertical in existing streets. Should the Contractor desire to use other equivalent methods, he shall submit his method of construction to the Engineer for favorable review prior to its use.
- C. Do not over excavate. Accurately grade the bottom of the trenches to provide uniform bearing and support for each section of the pipe at every point along its entire length, except for the portions of the pipe sections where it is necessary to excavate for bell holes and for the proper sealing of pipe joints, and as hereinafter specified. Dig bell holes and depressions for joints after the trench bottom has been graded, and, in order that the pipe rest on the bedding for as nearly its full length as practicable, bell holes and depressions shall be only of such length, depth and width as required for properly making the joint. Remove stones to eliminate point bearing.

- D. Backfill and compact overexcavations to 95% relative compaction with bedding/backfill material. There shall be no additional payment to the Contractor for overexcavations not directed by the Engineer. Remove unsatisfactory material encountered below the grades shown as directed by the Engineer.
- E. Grade trenches so that they are uniformly sloped between the pipe elevations shown on the Drawings. Comply with the minimum and maximum trench widths shown on the Drawings. Notify the Engineer if the trench width exceeds the maximum allowable width for any reason.
- F. Provide ladders for access to the trench by construction and inspection personnel.
- G. Treatment of Roots: Do not cut roots unnecessarily during excavating or trenching operations. Expose major roots (larger than 2-inches in diameter) encountered in the course of excavation and do not sever. Wrap them in burlap as a protective measure while exposed and request Engineer's direction regarding their continued protection and removal. In the event Engineer grants permission to remove, neatly trim major roots at the edge of the excavation or trench and paint them with a heavy coat of an approved tree seal.

#### BACKFILL AND COMPACTION

- A. Place bedding and backfill in accordance with the County's Standard Plans. Place bedding and backfill materials in horizontal lifts not to exceed 6 inches in thickness measured before compaction. The difference in level on either side of a pipe shall not exceed 4 inches.
- B. Backfill material shall not be placed over the pipe until after it has been inspected by the Engineer.
- C. It shall be incumbent upon the Contractor to protect the pipe from damage during the construction period. It shall be his responsibility to repair broken or damaged pipe at no extra cost to the Owner. Tamping of backfill over the pipe shall be done with tampers, vibratory rollers and other machines that will not injure or disturb the pipe.
- D. Do not allow construction traffic nor highway traffic over the pipe trench until the trench backfill has been brought back even with existing adjacent grade.
- E. Add water to the backfill material or dry the material as necessary to obtain the optimum moisture content for the required compaction. If the Engineer determines that the nature of the ground in which the trench lies precludes compaction of the backfill to the specified density, the backfill shall be compacted to the maximum practicable

density. Employ such means as may be necessary to secure a uniform moisture content throughout the material of each layer being compacted. After the material has been moisture conditioned, compact it with compaction equipment approved by the Engineer to achieve specified compaction. The Contractor shall be responsible for obtaining the densities specified. Should he fail, through negligence or otherwise, to compact to specified density, or to backfill and compact to surface grade, thus permitting saturation of the backfill material from rains or from any other source, the faulty material shall be removed and replaced with approved material which shall be compacted to the specified density at optimum moisture content, and no additional payment will be made for doing such work or removal and replacement.

F. Compaction by flooding, ponding or jetting will not be permitted.

#### SUPPORT OF EXCAVATIONS

- A. Adequately support excavation for trenches and structures to meet all applicable requirements in the current rules, orders and regulations. Excavation shall be adequately shored, braced and sheeted so that the earth will not slide or settle and so that all existing structures and all new pipe and structures will be fully protected from damage. Keep vehicles, equipment and materials far enough from the excavation to prevent instability.
- B. Take all necessary measures to protect excavations and adjacent improvements from running, caving, boiling, settling, or sliding soil resulting from the high groundwater table and the nature of the soil excavated. Attention is directed to Section 832 of the Civil Code of the State of California relating to lateral and subjacent supports, and wherever structures or improvements adjacent to the excavation may be damaged by such excavation, the Contractor shall comply with this law.
- C. The support for excavation shall remain in place until the pipeline, duct or structure has been completed. During the backfilling of the pipeline or structure, the shoring, sheeting and bracing shall be carefully removed so that there shall be no voids created and no caving, lateral movement or flowing of the subsoils.

#### DISPOSAL OF EXCAVATED MATERIAL

- A. Off-haul and dispose of unsuitable material or excavated material in excess of that needed for backfill offsite in accordance with the requirements of General Conditions.
- B. All excess excavated material shall become the property of the Contractor and shall be handled, transported, and disposed of from the site in accordance with laws and



regulations at the Contractor's expense. Contract may assume, for bidding purposes only, that excavated soil is non-hazardous. However, such assumption does not relieve contractor for full and complete responsibility for complying with laws and regulations. Contractor shall promptly confer with the Engineer if any evidence of soil contamination is observed.

#### **10-6.06 MEASUREMENT AND PAYMENT**

- A. Full compensation for conforming to the requirements of this section (trench excavation and backfilling) for sewer lateral reconnections and relocation of the sanitary sewer main shall be included in the contract unit prices paid for various items of work requiring open-cut trenches, and no additional compensation will be allowed therefore.
- B. Payment for excavation and backfill of access pits shall be included with the various items of work requiring access pits (pipe bursting/reaming/HDD), and no additional compensation will be allowed therefore.

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## SECTION 10-7 – PIPE BURSTING

### **10-7.01 GENERAL**

Furnish all labor, materials, equipment, facilities, transportation and services to replace existing storm drain pipe by Pipe Bursting Methods as shown on the Plans and/or specified herein.

Reference: PPI Handbook Chapter 16: Pipe Bursting

Consult all other sections of these specifications to determine the extent and character of the work specified elsewhere but related to that included in this section. Work specified herein shall be properly coordinated with that specified.

Pipe material is specified in Section 10-9 “Storm Drain System”.

Contractor/subcontractor Experience: Pipe Bursting Contractor or subcontractor shall have been actively engaged in the installation of pipelines by pipe bursting methods for at least three years. The contractor or subcontractor shall have the equipment and expertise, appropriate for pipe bursting installations. **The contractor or subcontractor shall also have the experience in safety and dependability installing, in similar geology, similar size and length of piping involved.**

### **10-7.02 SUBMITTALS**

- A. Experience: Submit documentation to demonstrate compliance with requirements as stated in Special Provisions.
- B. Drawings indicating the proposed locations of access pits for pipe bursting, if any.
- C. Emergency Spill Response Plan

### **10-7.03 MATERIALS**

A method of installing a pipe within an existing pipe where a bursting head is pushed and/or pulled through the existing pipe, splitting and/or breaking the pipe, forcing the pieces into the adjacent ground, and increasing the size of the opening as needed to accommodate the new pipe that is pulled behind the head.

For pipe segments located in close proximity to buildings or other permanent structures such as retaining walls, the Contractor shall determine the appropriate method (static vs. pneumatic) based on the surface and subsurface conditions surrounding the storm sewer pipe, and his experience with similar soils and general site conditions. Alternative methods of

pipe replacement, such as pipe reaming (Section 10-8) shall be used if better suited to the project site to prevent damage to existing structures.

The pipe bursting equipment unit shall be designed and manufactured to force its way through the existing line by fracturing the pipe and compressing the broken pieces into the surrounding soil as the equipment progresses. The bursting unit shall generate sufficient force to burst and compact the existing pipeline. In each case the pipe bursting unit shall pull the HDPE pipe with it as it moves.

#### **10-7.04 EXECUTION**

Refer to sections 10-5 "Closed Circuit Television Inspection" and 10-9 "Storm Drain System", for all work to be done prior to the start of bursting activities.

Existing Conditions: The Contractor shall, prior to submitting his/her bid, visit the site and become familiar with actual site and soil conditions. No allowance will be made by the County Harbor District for any unfavorable conditions or events which could have been foreseen from a thorough examination of the Contract Documents, the geotechnical report, the site and working conditions.

Utility Protection: If existing live utilities are encountered within 2' of the edge of the new storm drain pipe, or are deemed by the contractor or the County Harbor District's inspector to interfere with the work, or may be impacted by the work in any way, the utilities are to be protected from damage and the proper utility company shall be notified immediately. Service shall not be interrupted except as directed or accepted by the proper utility owner. Contractor shall allow sufficient time for utility companies to arrange for continuation of service.

Record unmarked utility locations on Record Drawings.

Open excavations, trenches, and the like are to be protected with fences, barricades, covers and railings as required. Every precaution shall be taken to prevent spillage when hauling on or adjacent to any Public Street. Any spillage will be promptly removed.

Pipe Bursting pipe installation should be installed as follows:

- A. Excavation of insertion and extraction pits (if needed) shall be at locations determined by the Contractor. Select access pit locations to minimize damage to existing improvements in easements and work areas on private property, and to minimize the size and number of pits. Insertion pits shall be of sufficient length to allow the bursting head and new HDPE pipe to enter the host pipe at an angle that will maintain the grade of the existing storm drain pipe.

- B. Excavate at laterals and crossing utilities within two feet of the host pipe in accordance with Section 10-6 "Trenching and Backfilling". Disconnect the laterals from the host pipe.
- C. Clean the storm drain pipe to remove debris, roots, or other obstructions that will interfere with bursting.
- D. Modify existing manhole walls, floors, and channels as needed to allow passage of the bursting equipment per the project drawings. After pipe rehabilitation is complete, the annular space and any other voids or cracks shall be sealed at each manhole with the restoration mortar. Restore manhole wall around new main with min. 6-sack 2,500 psi concrete. Joint shall be air and watertight. A waterstop shall be placed around the main tie-in point before placing concrete collar. Manhole floor shall be watertight and smooth.
- E. For manholes located at the ends of a work segment, the new HDPE pipe shall extend a minimum of six (6) inches into each manhole at the time of installation, to be cut flush with the manhole wall after thermal retraction. Smooth transition along invert with mortar.
- F. Immediately before bursting perform a CCTV inspection to verify that the host pipe is in a suitable condition to be burst, and submit the documentation to the County's Harbor District Representative for confirmation before proceeding per Section 10-5 "Closed Circuit Television Inspection".
- G. Utilize a constant tension static, hydraulic, or pneumatic bursting system to break the pipe and form a void large enough to accommodate the outside diameter of the new pipe. Install the new pipe immediately behind the bursting head.
- H. If concrete encasements are encountered, a point repair shall be performed to excavate and break out concrete prior to the bursting operation to allow the steady and free passage of the pipe bursting head, with approval from the Engineer. Separate payment for this work will be made and it is not considered incidental to the pipe bursting process.
- I. Allow a minimum of twelve hours before connecting the pipe to the manholes, laterals, or other structures to allow the pipe to adjust for temperature and strain.
- J. Anchor the pipe to manholes and other structures using a water stop or flange adaptor that is embedded into the wall of the repaired manhole or structure.

Execution includes work necessary to modify storm drain inlet affected during construction via mortaring (and other preventative measures) to prevent pipe and inlet from being damaged.

### **10-7.05 TESTING AND INSPECTION**

- A. Following installation of the replacement storm drain pipe, but before laterals are connected, perform the following low pressure air test in accordance with Paragraph 306.1.4.4 of the Standard Specifications for Public Works Construction (Greenbook).
- B. Following installation of the replacement storm pipe, reconnection of laterals, and backfill of excavations, but before replacing surface improvements perform the following tests and inspection:

Deflection Test: Mandrel test each section of storm drain pipe with a mandrel 95% of the HDPE pipe average inside diameter.

Final CCTV Inspection: Perform a post-rehabilitation CCTV inspection in accordance with Section 10-5 "Closed Circuit Television Inspection". If leakage or deflection exceeds the allowable, remedy the condition and retest until compliance is reached. Even if the allowable leakage is less than the allowable, correct any leaks that are observed.

### **10-7.06 MEASUREMENT AND PAYMENT**

Payment for pipe bursting or pipe reaming practices shall be included with the contract prices paid for installation of the various items of work requiring trenchless installation, and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in installing storm drain piping by pipe bursting method (including excavation of insertion and/or extraction pits), and all incidentals necessary for performing the scope of work specified in the following Technical Specifications Sections:

- Section 10-3 "Site Preparation and Restoration"
- Section 10-6 "Trenching and Backfilling"
- Section 10-7 "Pipe Bursting"
- Section 10-8 "Pipe Reaming"
- Section 10-9 "Storm Drain System"
- Section 10-15 "Stormwater Pollution Prevention"

## **SECTION 10-8 – PIPE REAMING**

### **10-8.01 GENERAL**

- A. Furnish and install, complete and in place, high density polyethylene (HDPE) pipe by the pipe reaming method as shown on the drawings (as an optional method) and specified herein. Pipe reaming consists of removal of the existing pipe with directional drilling equipment while installing new HDPE pipe. The Contractor shall provide all materials, labor, equipment, and services necessary for bypass pumping and/or diversion of sewage flows (if necessary), installation of HDPE pipe, modifications and repairs to existing manholes, and CCTV inspection and testing of the completed pipe system.
  
- B. All fees or claims for any patented invention, article, or arrangement that may be used upon, or in, any manner connected with the performance of the work or any part thereof shall be included in the price bid for doing the work, and the Contractor and its sureties shall defend, protect, and hold the County Harbor District or its appointed Representative, and Design Consultants, together with all their officers, agents, and employees harmless against liability of any nature or kind for any and all costs, legal expenses, and damages made for such fees or claims and against any and all suits and claims brought or made by the holder of any invention or patent, or on account of any patented or unpatented invention, process, article, or appliance manufactured for or used in the performance of the Contract, including its use by the County Harbor District, unless otherwise specifically stipulated in the Contract. Before final payment is made on the Contract, the Contractor shall furnish an affidavit to the County Harbor District regarding patent rights for the project. The affidavit shall state that all fees and payments due as a result of the work incorporated into the project or methods utilized during construction have been paid in full.

### **WORK SPECIFIED UNDER OTHER SECTIONS**

- A. Consult all other sections of these specifications to determine the extent and character of the work specified elsewhere but related to that included in this section. Work specified herein shall be properly coordinated with that specified.
  
- B. Pipe material is specified in Section 10-9 “Storm Drain System”.

### **10-8.02 QUALITY ASSURANCE**

- A. Contractor shall have a minimum of three (3) pipe reaming projects of similar diameter, length, soil type and installation conditions successfully completed

within the last 3 years.

- B. Pipe insertion equipment shall be operated only by technicians who have a minimum of three (3) years experience in the installation of the reamed pipe as specified herein. The technician's experience shall be documented in the HDPE pipe submittal.

### **10-8.03 SUBMITTALS**

- A. The Contractor shall submit catalog cuts, specifications, dimensioned drawings, the proposed diameters of pipe reaming pipe, sealant, clamps, couplings, fittings, adapters, saddles, and service connection materials and methods to be used for each pipe size manufacturer's recommendation for installation, installation details and sketches, breakaway device detail and calculations, and other pertinent information for the HDPE pipe installation work. All materials provided shall be fully in accordance with the requirements of the reference specifications specified herein.
- B. The Contractor shall submit detail drawings and a written description of the construction procedure, sequence to bypass sewage flow (if required), install pipe, and reconnect lateral sewers.
- C. The Contractor shall submit pre and post installation TV Inspection videos of all sanitary sewer mains within the scope of work. See Section 10-5, Closed Circuit Television Inspection.
- D. Calculations and connection details of "weak link" or breakaway device used to protect pipe from excessive pulling forces.

### **ROYALTIES**

- A. Use of pipe reaming equipment may require that royalties to be paid. Royalties are the responsibility of the Contractor. Any and all royalties owed by the Contractor for use of pipe reaming technologies and equipment shall be included in the unit price per foot for the pipe to be installed. In no case will royalties be considered as an additional cost to the County Harbor District.

### **PRODUCTS**

Refer to other sections for products.



## **10-8.04 EXECUTION**

### GENERAL

- A. Preparation – All work shall be performed as specified herein and supervised by personnel experienced in the installation of the pipe by the pipe reaming method.
- B. Installation guidelines from the pipe supplier shall be followed for all installations.

The Contractor shall protect facilities from damage by forces generated by the pipe equipment.

### PIPE JOINING

- A. Pipe Joining: Sections of polyethylene pipe shall be joined into continuous lengths on the job site above ground. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations and per Section 10-9 "Sanitary Sewer System". The inside weld bead shall be removed by cutting the bead away without scoring the inside wall of the pipe.

### PIPE INSTALLATION

- A. The Contractor shall provide Pre and Post Construction Television Inspection in accordance with Section 10-5 "Closed Circuit Television Inspection".
- B. Insertion/Receiving Pits: Insertion/receiving pits shall be prepared and backfilled in accordance with Section 10-6 "Trenching and Backfilling". All pits shall be adequately shored and braced, to ensure safe work areas.
- C. When not indicated in the Contract Documents, the locations for the insertion/receiving pits are to be determined by the Contractor and approved by the County Harbor District. In considering locations for insertion/receiving pits, the Contractor shall consider the size of the existing sewer and new pipe, locations of obstructions and services, locations of manholes, pulling distances, traffic conditions, and locations of utilities. If existing manholes are destroyed or damaged while constructing the insertion/receiving pits, they shall be reconstructed and/or repaired at no cost to the County Harbor District.
- D. The Contractor shall backfill all points where the new pipe has been exposed, such as insertion pits, outside of manholes, lateral connections, critical utility crossings, etc. The backfill material shall be compacted according to the surface restoration required as outlined in these Specifications and on the Project Drawings.
- E. The Contractor shall physically disconnect all laterals from the existing main prior to pipe reaming any mainlines.

- F. The Contractor shall utilize a “weak link” or breakaway device at the leading end of the HDPE pipe to protect the pipe from excessive pulling loads. The weak link device shall be installed between the drilling head and the regular pipe. Connection details and calculations used to determine the weak link material and size shall be subject to the approval of the County Harbor District or its appointed Representative.
- G. Contractor shall prepare the site for use of a directional drill with pavement cuts or other surface preparations prior to beginning the construction. Contractor shall provide and install all pulleys, rollers and other alignment control devices required to protect the pipe from damage during installation. Under no circumstances shall the pipe be stressed beyond the manufacturer’s recommendations.
- H. New HDPE pipe shall be inserted immediately behind the reaming head in accordance with the reaming head manufacturer’s recommended procedures. Any proposed changes in installation procedures shall require submittal of revised procedures, bearing the approval of the reaming head manufacturer, and shall be subject to approval and acceptance by the County Harbor District or its appointed Representative.
- I. Contractor shall supply all materials and equipment required for lubricating fluid during installation. Unit prices for pipe reaming shall include supply and handling of lubricating fluid.
- J. Slurry generated by the reaming procedure shall be collected by a vacuum truck or slurry pump and removed from the site. Costs for removing and disposing of the slurry shall be included in the cost of pipe installation and shall not be considered additional cost to the County Harbor District.
- K. The Contractor may utilize existing manholes where practical. Manhole inverts and bottoms may be removed to permit access for installation equipment. Manholes must be fully restored upon completion of the work.
- L. Existing Manhole Base Modifications: Modifications to the existing invert of flow channels of existing manholes shall be made as needed to accommodate the new pipe and maintain a smooth surface and positive slope through the length of pipe. If the existing manhole base is broken during modifications, it shall be repaired or replaced by the Contractor to the satisfaction of the County Harbor District or its appointed Representative at no additional cost.
- M. The Contractor shall anchor the pipe to concrete structures or manholes after the pipe has been installed along the length of sewer replaced. The Contractor shall use a water stop or flange adapter, as supplied by the pipe

manufacturer, that is firmly seated perpendicular to the pipe axis, around the pipe exterior and cast into the structure base or near the structure wall center. The structure or manhole connection shall be made after adequate time has been allowed for the pipe to relax from the applied tension forces, as specified herein.

- N. New pipe must be completely watertight at the manhole connections. If a sealing material is required to obtain and assure a watertight seal, the material shall be compatible with the HDPE pipe in every way and shall require the approval of the County Harbor District or its appointed Representative. The sealing system shall be a continuous filler, no more than ½” across, placed along the entire circumference of the new liner pipe on all surfaces in contact with the manhole channel, interior wall, and rehabilitated host pipe. The sealant system and materials shall conform to the requirements of Section 210-2.3.3 of the Standard Specifications for Public Works Construction (Greenbook).
- O. Lateral Reconnection: The Contractor shall be responsible for disconnecting and reconnecting all live laterals to the main pipe.

**STRESS AND STRAIN RELIEF OF HDPE PIPE AFTER PULLING OPERATIONS**

- A. The Contractor shall allow the pipe to return to its original length and shape in the unstressed state prior to trimming the excess pipe in the manholes. The pipe manufacturer's recommendations shall be followed regarding the relief and normalization of stress and strain due to temporary stretching or elongation after pulling operations are completed. Contractor shall consider temperature and pulling time required when calculating required time for stress and strain relief. The structure or manhole connection shall be made a after adequate time has been allowed for the pipe to relax from the applied tension forces, as specified herein.
- B. The Contractor shall allow a minimum of six (6) hours to elapse after pipe reaming mainlines prior to connecting permanent lateral connections to the new main, in order to allow the pipe to relax from the applied tension forces. The Contractor shall provide temporary lateral connections and or bypassing as required to prevent overflows from side sewers.

**FINAL TESTING, CLEANING AND TELEVISION INSPECTION**

- A. All tests shall be completed and approved prior to placing of permanent resurfacing.
- B. Testing of pipe shall be in conformance with the Section 10-7, “Pipe Bursting”.

- C. After completion of construction of the pipeline and prior to final pavement restoration, the Contractor shall inspect all new pipelines for obstructions and shall clean all new lines. The Contractor shall inspect the new lines by television camera in accordance with Section 10-5, "Closed Circuit Television Inspection" and submit logs and videos to the County Harbor District. Television inspection shall be witnessed by the County Harbor District or its appointed Representative.
- D. Any lines showing unacceptable pipe construction such as offset joints  $>1/2$ " or deformed pipe shape (ovality  $>7\%$  of pipe diameter) will be rejected and contractor will be required to repair those deficiencies at their own cost.
- E. If the post-CCTV inspection indicates that sag(s) may be present which pond water greater than 1 inch in depth for pipes less than ten (10) inches in diameter, or sags greater than two (2) inches for larger piping, then the Contractor shall notify the County Harbor District of its appointed Representative immediately.
- F. If it is determined by the County Harbor District or its appointed Representative that there is a sag or hump in the installed piping after completion of pipe reaming and repair is required, then the Contractor shall repair the sag for the length directed by the County Harbor District. The sag repair piping shall be performed in accordance with the Standard Drawings.

#### **10-8.05 MEASUREMENT AND PAYMENT**

Payment for pipe reaming practices shall be included with the contract prices paid for installation of the various items of work requiring trenchless installation, and shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in installing sanitary sewer piping by pipe reaming method (including excavation of insertion and/or extraction pits), as specified in the Standard Specifications and these Technical Provisions, and as directed by the Engineer, and no additional compensation will be allowed therefore.

## SECTION 10-9 - STORM DRAIN SYSTEM

### **10-9.01 GENERAL**

#### WORK INCLUDED

Replacement of existing storm drain pipe.

#### REFERENCE STANDARDS

ASTM D-1248	High Density Polyethylene Pressure Pipe
ASTM D-3350	Standard Practice for Polyethylene Plastic Pipe and Fittings
ASTM F-2619	High Density Polyethylene Pipe Line
ASTM F-2620	Standard Practice for Heat Fusion of Polyethylene Pipe and Fittings

#### METHODS

Except where noted specifically otherwise on the Drawings, the storm drain pipes shall be replaced by pipe bursting or reaming methods.

#### QUALITY CONTROL

The Engineer may request verification that the pipe used is represented by the certified quality control data. Additional test results showing the pipe does not meet appropriate ASTM Standards will be cause for rejection of the pipe.

Pipe and fittings may be rejected in whole or part for failure to meet any requirements of this Section.

Competent personnel shall supervise all aspects of pipeline fabrication and installation, including fusion pipe joining.

Operators of the fusion equipment shall have certification from the pipe manufacturer or supplier that the operators have been trained in the use of the equipment and have had at least two years of experience operating the equipment.

#### SUBMITTALS

- A. Submit catalog cuts and/or certifications to demonstrate the products proposed for use comply with the specifications (piping system, pipe wrap, etc.)
- B. Submittals for HDPE pipe shall include the manufacturer's recommended maximum tensile stress and minimum bending radius.
- C. Certification for fusion equipment operators.
- D. Fusion Logs

- E. A debanding process for use in removing the internal bead for the newly joined HDPE pipe sections.

### **10-9.02 PRODUCTS**

Storm drain pipe shall be High Density Polyethylene Pipe (HDPE):

1. Pipe shall be 12" HDPE (DIPS sizes, minimum inside diameter of 11.16"), DR 17.
2. HDPE pipe shall have a smooth interior wall and be made of high density, extra high molecular weight polyethylene with a standard thermoplastic material designation code of PE 4710 and have a cell classification of 445574C/E per ASTM D3350. The pipe shall be manufactured in accordance with ASTM F714 and/or ASTM D3035. The manufacturer's certification shall state that the pipe was manufactured from one specific resin. The Dimension Ratio (DR) shall be DR 17. The outside diameter and wall thickness of pipe and fittings shall conform to ASTM D2122 when measured.
3. Pipe shall be marked three-foot intervals or less with the manufacturer's name or trade mark, the designation ASTM D3350 and ASTM F714, including the year of issue, the letters "PE" followed by the cell classification number of the raw material compound used, the DIPS size in inches, the dimensional ratio, and the manufacturer's code identifying the resin manufacturer, lot number and date of manufacture. The pipes shall be properly stored and handled in accordance with the manufacturer's recommendations and shall be less than two (2) years old at the time of installation.
4. Interior pipe color shall be gray unless otherwise specified in these contract documents.
5. Joints shall be made by thermal butt fusion.

### **10-9.03 PREPARATION**

#### **GENERAL**

- A. All storm service lateral connections shall be located on the surface prior to pipe bursting the main by pre-rehabilitation CCTV inspection.
- B. If the pre-rehabilitation CCTV inspection reveals obstructions or pipe materials that will prevent the existing pipe from being burst properly and cannot be removed by conventional cleaning equipment, a point repair will be made by the Contractor, with approval from the Engineer. Separate payment for this

work will be made and it is not considered incidental to the pipe bursting process.

- C. If the pre-rehabilitation CCTV inspections reveals a sag or hump, a sag or hump removal will be made by the Contractor, with approval from the Engineer. Separate payment for this work will be made and it is not considered incidental to the pipe bursting process, unless such point repair is already shown on plan.
- D. Following any point repair, re-do the CCTV inspection for the entire segment.
- E. Before any excavation is done for any purposes, the Contractor shall contact USA North, Underground Service Alert, for determining field locations of existing utilities.

#### **10-9.04 EXECUTION**

##### GENERAL

Install storm pipe and appurtenances in accordance with the provisions of these specifications and in compliance with pipe and bursting equipment manufacturers' recommendations.

Sections of pipe with cuts or gouges in excess of 10% of the wall thickness of the pipe shall be cut out and removed. The undamaged portions of the pipe shall be rejoined by fusion welding.

Care shall be taken in handling, transporting and placing pipe and appurtenant structures to prevent damage to the pipe or structure. No interior hooks or slings shall be used in lifting pipe. All handling operations shall be done with an exterior sling or with a suitable fork lift.

##### INSTALLATION

Refer to Section 10-7 "Pipe Bursting" for installation by trenchless methods.

Install pipe and make butt fusion joints in accordance with the manufacturer's recommendations and ASTM F-2620. Electrofusion shall be used for field closures as necessary.

Threaded or solvent-cement joints and connections are not permitted.

Maintain a fusion log that records the time, hydraulic cylinder pressure, and plate surface temperature for each joint.

Do not bend pipe in excess of the maximum bending radius recommended by the pipe manufacturer.

The butt-fused joint shall be in true alignment and shall have uniform rollback beads resulting from the use of proper temperature and pressure. The joint shall be allowed adequate cooling time before removal of pressure. The fused joint shall be watertight and shall have tensile strength equal to that of the pipe. **All internal beads shall be removed.** All defective joints shall be cut out and replaced at the expense of the Contractor.

#### TESTING AND INSPECTION

Refer to Section 10-7 "Pipe Bursting".

#### **10-9.05 MEASUREMENT AND PAYMENT**

The contract price paid per **linear foot** for replacing the 12-in diameter Polyethylene pipe with 12-in diameter HDPE pipe shall be for each horizontal linear foot, and shall include full compensation for furnishing all labor, materials, tools, equipment, and all incidentals necessary for performing the scope of work.



## **SECTION 10-10 - BASE FAILURE REPAIRS**

### **10-10.01 GENERAL**

In areas designated for base failure repair on the plans, the existing bituminous surfacing (and aggregate base material, depending on existing pavement thickness) shall be removed by cold planing, or sawcut and excavated (or by any suitable combination of methods as selected by the Contractor and approved by the Engineer) to the depth shown on the plans. The resulting excavation shall be backfilled with 3/4" HMA, Type B asphalt concrete, as detailed on the plans and as specified in these Special Provisions.

The proposed locations of base failure repairs are noted on the plans and marked in the field. The actual areas for repair will be verified and designated in the field by the Engineer following the award of contract and prior to the start of construction.

The Contractor shall provide for the public safety and public convenience in accordance with the provisions of Sections 7-1.03, "Public Convenience", and 7-1.04, "Public Safety", of the State Standard Specifications.

### **10-10.02 TIMING**

In repair areas, all excavation and asphalt concrete paving work, shall be sequenced and constructed such that the existing asphalt concrete and base material is removed to the planned depth, the existing base material is graded and compacted, and all layers of asphalt concrete are placed during the same working period (day). Any change from this requirement must be approved in advance by the Engineer. All concrete removal and replacement shall be completed prior to any inlays and slurry seal or any immediately adjacent base failure and pavement repairs.

Access to all driveways shall be maintained at all times. If necessary, excavations shall be temporarily filled at driveways to allow access at the end of the working period and re-excavated the next working period at the Contractor's expense.

### **10-10.03 EXCAVATION**

Where existing asphalt concrete and base material is removed by cold planing, the use of the heater planing method is not allowed. The cold planing machine shall be operated so as not to produce fumes or smoke. The cold planing machine shall be capable of planing the pavement without requiring the use of a heating device to soften the pavement during or prior to the planing operation. The depth, width and shape of the cut shall be as indicated on the typical cross sections and details, or as directed by the Engineer. The final cut shall result in a uniform surface conforming to the typical cross sections, cross sections or details. The outside lines of the planed area shall be neat and uniform. The road surfacing to remain in place shall not be damaged in any way by the planing.

No longitudinal drop-off will be allowed at any time between any adjacent lanes open to public traffic at the end of the working period. When allowed by the Engineer, the Contractor may cold plane the final longitudinal pass between adjacent travel lanes such that a minimum

30:1 slope is maintained between the cold planed surface and the adjacent existing pavement grade when opened to public traffic. There shall be no adjustment in compensation to the Contractor for making additional passes or to comply with this requirement.

All other unsuitable material encountered below the grading plane shown on the Plans shall be excavated and disposed of per Section 19-1.03B, "Unsuitable Material", of the State Specifications and at the direction of removal and disposal of unsuitable material and replacement material shall be paid for as provided in Section 4-1.05, "Changes and Extra Work", of the State Standard Specifications, or in the absence of an executed contract change order, by force account or as agreed to by the Contractor and the Engineer. of the Engineer. Subexcavation shall not begin without the prior approval from the Engineer. The cost

#### **10-10.04 MATERIAL REMOVED**

The material excavated from the roadway surface, including material deposited in existing gutters or on the adjacent traveled way, shall be removed and disposed of outside the street right-of-way in accordance with Section 5-1.20B(4), "Contractor-Property Owner Agreement", of the State Standard Specifications. The Contractor shall provide and operate a street sweeper during the excavation operation. The Contractor shall immediately remove any incidental material resulting from the excavation operation from roadway areas open to public traffic. Stockpiling will not be allowed.

Cold planed material from this project or any other source shall not be used on this project unless otherwise approved by the Engineer.

Roadway excavation material will consist of asphalt concrete and base material. No evidence was found that pavement fabric exist within the project limits. The material to be excavated may contain other typical constituents of asphalt concrete by-products and/or any other naturally occurred deleterious substances encountered with roadway construction. The District makes no guarantee that the material excavated will be reusable, recyclable or disposable to any disposal site designated by the Contractor. No additional compensation shall be allowed to the Contractor if the excavated material is not reusable, recyclable or is required to be disposed of at Class II disposal facilities. Any testing, if required, by the disposal site shall be arranged and paid for by the Contractor.

#### **10-10.05 PREPARATION OF EXISTING BASE AND SUBGRADE**

At locations where all existing AC is removed and aggregate base material is exposed, the aggregate base material shall be compacted prior to placement of HMA. Compaction of the existing aggregate base materials shall conform to Section 19-5, "Compaction", of the State Standard Specifications. The existing base material in pavement inlay areas shall be scarified, graded, and moisture conditioned to obtain optimum moisture content and, compacted to a relative compaction of not less than 95% for a depth of 0.5 feet below the grading plane. The existing base material shall be graded to within 0.05' of the grade established by the Engineer. The second item of paragraph 1 of Section 19-5.03B, "Relative Compaction (95 Percent) ", of the State Standard Specifications shall not apply. A tack coat

of RS-1 asphaltic emulsion shall be applied to the vertical edges of the existing asphalt concrete prior to filling the areas with new asphalt concrete.

After approval of the base material by the Engineer, a tack coat of asphaltic emulsion meeting the grade requirements of SS-1, SS1h, CSS-1, or CSS-1h conforming to Section 94 of State Standard Specifications shall be applied to the vertical edges of the existing asphalt concrete prior to filling the areas with new HMA.

At locations where HMA is to be placed over existing asphalt, the planed surface shall be thoroughly cleaned by utilizing a street sweeper to remove all grinding and dust material. After the planed surface is swept clean, all vertical and horizontal surfaces shall be completely tack coated with an asphaltic emulsion. The application rate for the asphaltic emulsion shall be determined by the Contractor and approved by the Engineer. The completed tacked surface shall be approved by the Engineer prior to placement of HMA. Any deficiencies in the tacked surface shall be corrected prior to placing asphalt concrete.

Prior to placing each layer of HMA, a tack coat shall be applied to the surfaces of all faces of gutters, gutter lips, and vertical curb surfaces against where the new HMA is to be placed

HMA shall be placed in lifts conforming to Section 39-6 of the State Standard Specifications.

Each layer of newly placed asphalt concrete shall be allowed to cool to at least 160°F, prior to placing the next layer of asphalt concrete.

All excavations for base failure repairs or pavement repair shall be backfilled to the existing pavement level the same working period (day) during which the excavation is performed and prior to opening the full roadway to public traffic.

If the Contractor cannot place permanent asphalt concrete the same working period (day), due to unanticipated problems, excavations shall be temporarily filled to the existing pavement level at the end of the working period and re-excavated the next working period at the Contractor's expense.

#### **10-10.06 PUMPING SUBGRADE**

Contractor shall notify the Engineer immediately if "pumping" subgrade is present. In the event that "pumping" subgrade is confirmed by the Engineer, the following procedures shall be followed:

- A. The area shall be subexcavated to a depth to be determined by the Engineer;
- B. Aggregate base material shall be placed to the original subgrade surface and compacted to 95% relative compaction; and,
- C. Asphalt concrete base course(s) shall be placed.

#### **10-10.07 MEASUREMENT AND PAYMENT**

Contract **square foot** price paid for "**Base Failure Repair**" as shown in the Bid Proposal shall include full compensation for furnishing all labor, supervision, materials, tools,

equipment, and incidentals for doing all work involved in the excavation, including, but not limited to, sawcutting or grinding, removal, manual removal where necessary, testing of off-haul material (if required by the disposal site), loading, off-haul, and disposal of existing asphalt concrete and base materials, compacting the existing base materials (if necessary depending on existing AC thickness), protecting and excavating around existing utilities; street sweeping, placing HMA, and all other work as shown on the Plans, as specified in the State Standard Specifications, District Standards and these Special Provisions, and as directed by the Engineer and no additional compensation will be allowed therefore.

Attention is directed to the proposed dimensions and estimated quantities of base failure repair areas shown on the Plans and in the Bid Schedule. These are provided for information only. The District reserves the right to increase or decrease the actual quantity of base failure repair to be done.

## **SECTION 10-11 - AGGREGATE BASE**

### **10-11.01 GENERAL**

This work shall consist of furnishing and placing Class 2 aggregate base, 3/4" maximum, in accordance with Section 26, "Aggregate Bases", of the State Standard Specifications and these Special Provisions.

Class 2 aggregate base shall be furnished, placed, and compacted to the lines and grades necessary for reconstructing concrete curb and gutter, sidewalks, driveways and curb ramps at the locations shown on the Plans and where directed by the Engineer. Aggregate base shall be compacted to 95% relative compaction under curb & gutter and 90% relative compaction under sidewalks and curb ramps. (Compaction per ASTM D1557)

### **10-11.02 MATERIALS**

Material shall consist of Class 2 aggregate base material, 3/4" maximum, in accordance with Section 26-1.02B, "Class 2 Aggregate Base", of the State Standard Specifications.

The use of reclaimed aggregate base material is **not** permitted on this project.

### **10-11.03 MEASUREMENT AND PAYMENT**

Payment for aggregate base for the following items of work requiring aggregate base as shown on the Plans and/or as described in these Special Provision, shall be considered as included in the various contract unit prices paid for those items. The following bid items requiring aggregate base are listed but not limited to: "Construct Case A Ramp," "Construct Case C Ramp," "Construct Case CM Ramp," "Minor Concrete - PCC Promenade," "Minor Concrete - PCC Sidewalk," "Minor Concrete - Valley Gutter," "Minor Concrete - Curb and Gutter," and "Minor Concrete - Vertical Curb." Full compensation for furnishing all labor, supervision, materials, tools, equipment and incidentals to complete the aggregate base work, including but not limited to, furnishing, transporting, placing, spreading, moisture conditioning and compacting the aggregate base material, and all other related work as specified in these Special Provisions, and as directed by the Engineer, shall be considered as included in the contract unit prices paid for those bid items of work, and no additional compensation shall be allowed therefore:

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## **SECTION 10-12: SLURRY SEAL**

### **10-12.01 GENERAL**

This work shall consist of furnishing and placing a slurry seal treatment where shown on the Plans. The work shall be in accordance with the requirements and provisions of Section 37-3, "Slurry Seal and Micro-Surfacing", of the State Standard Specifications .

Slurry Seal shall be placed in a safe, acceptable, and workmanlike manner. Personnel shall be experienced, knowledgeable, and capable in all aspects of performing the work. The completed slurry seal shall leave a homogenous mat, adhere firmly to the prepared surface, and have a skid-resistant surface.

Equipment shall be in good repair and serviceable to operate in a reliable and safe manner. The Contractor shall be responsible for all cleanup of the staging and work areas. The Contractor shall be responsible for referencing, covering and uncovering all structures such as manholes, valves, and monument covers.

Submittals for slurry seal shall be in accordance with Section 37-3.01C, "Submittals", of the State Standard Specifications. This includes a report of test results and proposed mix designs. The proposed mix designs shall be submitted at the Pre-Construction Conference.

Quality control and assurance for slurry seal shall be in accordance with Section 37-3.01D(2), "Micro-surfacing", and Section 37-3.01D(4)(c), "Department Acceptance", of the State Standard Specifications. Each aggregate grading and sand equivalent test must not represent more than the lesser of 300 tons or 1 day's micro-surfacing production.

### **10-12.02 SCHEDULE, TIMING AND SEQUENCING**

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 County 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.

Only place slurry seal if both pavement and air temperatures are at least 50 degrees Fahrenheit and rising. Do not place slurry seal if either the pavement or air temperature is below 50 degrees Fahrenheit and falling. Do not place slurry seal if rain is imminent or the air temperature is expected to be below 36 degrees Fahrenheit within 24 hours after placement.

The Contractor shall coordinate with the garbage disposal company to ensure that the slurry seal is placed a minimum of 48 hours in advance of garbage pickup. The Contractor shall verify pickup dates prior to starting slurry seal work.

Sequencing of work will be split into two phases to allow drivers a mode of entry/exit at all times. Cars shall not be allowed to drive on newly resurfaced street until surface has fully cured.

**10-12.03 MATERIALS**

The slurry seal shall be composed of the following materials:

- a. ASPHALTIC EMULSION: 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 latest version of the State of California Standard Specifications.

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.

- b. WATER: The domestic water supply of the County of San Mateo shall be used.
- c. WATER AND RETARDER: Water and retarder shall be used to insure proper workability and to permit traffic on the slurry no more than three hours after placement without occurrence of bleeding, raveling, separation, or scalping.
- d. 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 II in accordance with the provisions of Section 37-2.02C of the latest version of the State of California Standard Specifications.

The aggregate, asphaltic emulsion, and water shall be proportioned approximately as follows:

Aggregate (dry weight)	2000 pounds
Polymer Modified Asphalt Emulsion	33 gallons
Water	8 to 20 gallons

The Contractor shall arrange for storage of materials. Materials shall not be permitted on public or private property without first obtaining a written authorization from the owner or its representative. The authorization shall include the specific terms of the agreement by the owner to allow the Contractor to store these materials.

Stockpiled materials shall be placed on flat, graded surfaces. The Contractor shall protect on-site stockpiles of material from any segregation by wind or rain, or contamination with deleterious materials. Stockpiles of aggregate shall be well drained and not inundated with water. The Contractor shall be responsible for the complete clean up and removal of all materials at stockpile locations.



Aggregate that shall consists of 100% crushed rock with no rounded particles, and be volcanic basalt in origin and black in color.

Slurry seal materials shall conform to Section 37-3.02, "Materials" of the State Standard Specifications.

#### **10-12.04 MIXING AND SPREADING EQUIPMENT**

Slurry seal mix shall be proportioned in accordance with Section 37-3.03B, "Proportioning", of the State Standard Specifications.

Slurry seal mixing and placing equipment shall conform to Section 37-3.03C, "Mixing and Spreading Equipment", of the State Standard Specifications except that only truck mounted mixer spreaders shall be allowed.

#### **10-12.05 PREPARATION**

1. Striping Removal: Prior to placing the slurry seal, all existing thermoplastic striping and markings, painted striping and markings, pavement markers and temporary pavement delineation shall be removed in accordance with the provisions of Sections 15-2.02C, "Remove Traffic Stripes and Pavement Markings", and 15-2.02D, "Remove Pavement Markers", of the State Standard Specifications.

Removal of existing painted or thermoplastic striping/markings shall be performed by grinding. Removal by sand-blasting will not be allowed. All removal shall be completed to the satisfaction of the Engineer.

Any pavement damaged during marker removal shall be repaired to the satisfaction of the Engineer prior to application of the slurry seal. All repair work shall be at the Contractor's expense.

Immediately following the removal of existing pavement striping/markings and pavement markers, the Contractor shall clean and sweep roadways to eliminate all materials attributed to or involved with the removal operations. All materials shall be removed from the roadway prior to the end of each working day. Water shall not be used to flush down streets in place of street sweeping.

If pavement markers, paint, or thermoplastic delineation for control of traffic are removed in advance of the day of slurry seal application, the Contractor shall install temporary pavement delineation in accordance with these Special Provisions.

2. Vegetation Removal: Immediately prior to placing the slurry seal, the surface shall be thoroughly cleaned of all vegetation, loose materials, dirt, mud, and all other extraneous materials.

All vegetation shall be removed from all cracks in the existing paved surfaces and along the edge of pavement or gutter lip.

3. Utility Protection: Prior to placing the slurry seal, the Contractor shall protect all manhole covers, monuments, valve boxes, and other utility lids from the slurry seal. The Contractor

shall mark the locations of all existing utility covers and lids within the streets prior to applying the slurry seal.

All lids and covers shall have a clean surface after slurry seal. All materials used to protect lids and covers shall be removed and disposed of properly after the placement operations.

4. **Street Cleaning:** The surface of each street to be slurry seal shall be adequately cleaned by sweeping as necessary to remove all loose particles of paving, dirt, vegetation, and all other extraneous material, prior to spreading of the slurry seal. All oil and grease stains shall be removed by use of approved cleaning solution or any other procedure approved by the Engineer. The Contractor shall remove oil and grease stains a minimum of seventy-two (72) hours prior to the placement operations.

#### **10-12.06 NOT USED**

#### **10-12.07 APPLICATION**

Slurry Seal shall be placed in accordance with Section 37-3.03D(4), "Placing", of the State Standard Specifications with the following exceptions and additions:.

- a. Slurry seal shall be spread at the rate of ten (10) to fifteen (15) pounds of dry aggregate per square yard.
- b. 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.
- c. 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.
- d. At any time that the quality of the mix or workmanship is not to the satisfaction of the County Inspector, the job shall be discontinued until a correction is made which is satisfactory to the County Inspector. The Contractor shall immediately adjust, clean or replace the drags on the spreader box when requested to do so by the County Inspector. Evidence of solidification of the asphalt, balling or lumping of the aggregate, the presence of uncoated aggregates, or the presence of ridges or washboarding on the finished product shall be cause for rejection of the slurry. Any slurry which is rejected shall be repaired to the satisfaction of the County or shall be removed and replaced at no cost to the County.
- e. 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 Harbor District.

- f. 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.
- g. 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.
- h. Contractor shall provide protection from seal to all existing surface utilities (water valve covers, monument covers, manhole covers, etc.) and shall provide cleaning of slurry from any covers not properly protected. Easily removable paper shall be used to protect all covers except water valve covers. Easily removable plastic bags shall be used to protect water valve covers. Contractor shall not open any sewer/storm manhole covers or monument covers.
- i. 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. Parking shall not be allowed on slurried areas for at least twelve (12) hours after completion. Until all areas slurry-sealed that day are opened to traffic and parking, 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 County Harbor 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.
- j. When transporting material to the jobsites, truck loads must be covered with tarp.

Existing pavement surfaces shall be clean and dry prior to application of the slurry seal. The mixture shall fill all minor cracks, depressions or low areas and leave a uniform surface free from ruts, humps, depressions, or irregularities. Any ridges, indentations, or other objectionable marks left in the surface shall be eliminated by rolling or other means.

The mixture shall be of the desired consistency upon leaving the mixer. A sufficient amount of mixture shall be carried in all parts of the spreader at all times so that complete coverage is obtained. No lumping, balling, or unmixed aggregate shall be permitted. No streaks such as caused by oversize aggregate shall be left in the finished pavement.

Construction joints shall be neat in appearance and shall be tapered or feathered to conform to the existing surfacing. Longitudinal joints shall be made along the centerline crown of the roadway. Joints between adjacent runs shall not overlap no more than three (3) inches, and shall not be located within the wheel path of traffic. All excess materials shall be removed from surfaces upon completion of each run.

Squeegees shall be used to spread the mixture in areas not accessible to the mixer/spreader. Care shall be taken to leave no unsightly appearance from handwork.

Slurry seal shall be spread at a rate of fifteen (15) pounds of dry aggregate per square yard. The completed spread shall be within ten (10) percent of the specified rate. The spreader box shall be pulled at a rate NOT GREATER THAN 270 FEET PER MINUTE.

At limits of work, start or finish, a straight line cut-off shall be obtained by laying down a strip of building paper or other approved material. Such paper and any excess mixture shall be removed and disposed of by the Contractor after application of the slurry seal.

Edge limits of the work on both sides of the street shall be maintained in a neat, straight, and uniform line. Slurry seal or slurry seal shall extend to the gutter lip. In the event that the work extends onto the gutter more than one (1) to two (2) inches or is not in a neat, straight, uniform line, it will be the Contractor's responsibility to remove all excess mixture from the gutters using an appropriate method. Any runs or drips that spill onto any concrete surface shall be removed the same day that the spill occurs. All work associated with the removal of mixture from the concrete surfaces shall be conducted at the Contractor's expense.

A sand blotter may be spread at selected driveways and intersections as shown on the plans and where approved by the Engineer to accommodate pedestrian or vehicular traffic until the work cures. The sand used shall be Lone Star Lupis Luster dried sand grades, #213, 2-16, 16, 120, or an approved equal. Substitutes must be submitted for approval prior to use. Sand blotters shall be swept within fourteen (14) hours of placement or sooner if directed by the Engineer. If the District has the sand removed, the Contractor will be charged the cost of the removal and disposal.

The shall be applied in the order and sequence specified in these special provisions and as shown on the plans.

#### **10-12.08 ROLLING**

Slurry seal on all streets shall be rolled by a self-propelled, 10-ton pneumatic roller with a tire pressure of 50 PSI, equipped with a water spray system. All tires shall be smooth surfaced, and inflated to the same pressure.

The surfaced areas shall be subjected to a minimum of two (2) full coverage passes by the roller or until the material is compacted to a uniform surface.

Rolling shall not commence until the slurry seal or micro-surfacing has cured enough so that it will not pick up on the tires of the roller, but no more than twenty-four (24) hours after placement.

#### **10-12.09 SWEEPING FOLLOWING SLURRY SEAL**

Once the slurry seal has cured and is open to traffic, any excessive raveling of the aggregate from the mixture shall be swept up by the Contractor and the surface maintained until such time as the raveling ceases. This requirement for sweeping shall apply to both roadway surfaces and adjacent sidewalks/pedestrian facilities.

The Contractor shall provide all necessary equipment, skill, and manpower to sweep all completed slurry sealed areas to the satisfaction of the Engineer, and in accordance with

these Special Provisions. Sweeping shall not begin until a sufficient bond has developed between the emulsion and the aggregate. Sweeping shall not dislodge aggregate or patches of applied surface.

The Contractor shall use a commercial sweeper to sweep each street that is slurry sealed.

During the sweeping, the sweeper shall use only the rear broom. The front brooms shall not be used during this sweeping operation. Brooms shall be vertically adjustable so as to avoid excess pressure during sweeping.

Sweeping shall be in accordance with Section 37-3.03D(4)(c)(iii), "Finished Surface" of the State Standard Specifications.

Sidewalks and driveways adjacent to slurry sealed or micro-surfaced streets shall also be swept and kept clean of aggregates or other materials resulting from the application operation.

#### **10-12.10 MEASUREMENT AND PAYMENT**

The contract unit price paid per square yard for "**Slurry Seal**" shall include full compensation for furnishing all labor, supervision, materials, tools, equipment, and incidentals and for doing all work specified in constructing the slurry seal, complete-in-place, including, but not limited to, testing for and furnishing the mix design; cleaning the surface; oil and grease stain removal; preparation; protecting utility covers; fogging roadway surface with water; test strips; slurry sealing; protecting the treatment until it has set; rolling; sweeping; and all other work as shown on the Plans, as specified in the State Standard Specifications and these Special Provisions, and as directed by the Engineer.

Full compensation for removing completely and disposing of all existing thermoplastic and painted traffic stripes, pavement markings, and pavement markers, performed in advance of the slurry seal or micro-surfacing placement, shall be considered as included in the price paid for "**Slurry Seal**" and no additional compensation will be allowed therefore.

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## **SECTION 10-13 TRAFFIC STRIPES, PAVEMENT LEGENDS AND MARKINGS, AND PAVEMENT MARKERS**

### **10-13.01 GENERAL**

Traffic stripes and pavement legends and markings shall conform to the provisions in Section 84, "Traffic Stripes and Pavement Markings", and Section 81, "Miscellaneous traffic Control Devices", of the State Standard Specifications and these Special Provisions. Traffic striping and pavement markers shall be placed in accordance with the applicable details as shown on the latest Caltrans Standard Plans A20A through A20D. Pavement legends and markings shall be placed in accordance with the applicable details of the latest Caltrans Standard Plans A24A through A24E.

All traffic stripes and pavement legends and markings on streets shall be **paint**.

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

### **10-13.02 LOCATIONS AND CONTROL**

Temporary layout marks and "cat tracking" shall be placed by the Contractor for all striping (including limit lines and crosswalks). Layout marks shall be approved by the Engineer prior to "cat tracking". Temporary "cat tracks" shall be approved by the Engineer prior to final striping. Layout marks and "cat tracks" remaining after striping shall be removed. Blacking out with paint will not be allowed.

### **10-13.03 MATERIALS**

Materials used for paint and glass beads shall conform to Section 84-2.02C, "Paint", and Section 84-2.02D, "Glass Beads", of the Standard Specifications.

Paint material for pavement markings shall be applied at a minimum thickness of 0.070-inch.

### **10-13.04 GENERAL APPLICATION**

Existing striping, legends and markings, if indicated for removal, as specified herein or as directed by the Engineer, shall be removed by mechanical means or other methods with prior approval of the Engineer. Sandblasting will not be allowed.

Application shall be in accordance with Section 84 of the State Specifications.

Paint shall be placed as close as possible to utility structures without covering them.

The Contractor shall accurately layout "cat-tracking" of all pavement markings immediately after completing overlay of any street and allow a time period of 2 working days for the Engineer to review the cat-tracking prior to placement of permanent markings.

**Affected areas shall receive permanent stop limit lines, legends markings, markers,**

**parking stalls, and crosswalks no sooner than 7 days or no later than 10 days following resurfacing of the asphalt.**

All work necessary to establish satisfactory lines for markings shall be performed by the Contractor.

Any damage to the newly placed stripes, legends or markings, due to the failure of the Contractor to protect his/her work, and correction of errors shall be repaired by the Contractor at no additional cost.

#### **10-13.05 PAINT APPLICATION**

Paint application shall conform to Section 84-2.03, "Construction", of the State Standard Specifications.

Traffic stripes and pavement markings shall be free of runs, bubbles, craters, drag marks, and debris.

#### **10-13.06 PAVEMENT MARKERS**

Pavement markers shall conform to the provisions in Section 81-3, "Pavement Markers", of the State Standard Specifications and these Special Provisions. Non-reflective pavement markers shall be ceramic.

Adhesive shall be hot melt bituminous adhesive conforming to Section 81-3.02D, "Hot Melt Bituminous Adhesive", of the State Standard Specifications.

Markers shall be placed according to the latest Caltrans Standard Plans A20A - A20D, except as modified by the Plans or the Engineer.

Blue two-way reflectors shall be installed in the traffic lane adjacent to each fire hydrant on all streets within the limits of work in accordance with Figure 3B-102 of the latest edition of the California Supplement to the *Manual on Uniform Traffic Control Devices*. Although every effort was made to locate and show existing fire hydrants on the plans, it is the Contractor's responsibility to locate all existing fire hydrants and install blue markers at each location.

Pavement markers shall not be placed on new asphalt concrete surfacing until the roadway has been opened to public traffic for a period of not less than seven (7) days for hot melt bituminous adhesive.

Any damage to the newly placed markers due to the failure of the Contractor to protect his work and correction of errors shall be repaired by him at no additional cost.

#### **10-13.07 MEASUREMENT AND PAYMENT**

The contract unit **lump sum** price paid for "Parking Lot Striping" shall include full compensation for furnishing all labor, supervision, materials, tools, equipment, and incidentals and for doing all the work involved including, but not limited to, any necessary layout work and "cat tracks"; removal of any and all conflicting existing or temporary striping,



placing traffic stripes, paint material, non-skid paint material; glass beads, markers, and all other work as shown on the Plans, as specified in the State Standard Specifications, District Standard Specifications and these Special Provisions, and as directed by the Engineer and no additional compensation will be allowed therefore. "Parking Lot Striping" shall include all stripes delineating parking stalls, including, but not limited to, parking stall stripes, accessibility legends, landing zone striping and other pavement legends as shown on the plans.

The contract unit prices paid per **linear foot**: "12-Inch White Crosswalk and Stop Bar Stripe" shall include full compensation for furnishing all labor, supervision, materials, tools, equipment, and incidentals and for doing all the work involved including, but not limited to, any necessary layout work and "cat tracks"; removal of any and all conflicting existing or temporary striping, placing traffic stripes, paint material, non-skid paint material; glass beads, markers, and all other work as shown on the Plans, as specified in the State Standard Specifications, District Standard Specifications and these Special Provisions, and as directed by the Engineer and no additional compensation will be allowed therefore.

The contract unit price paid per **square foot**: "Pavement Legends", shall include full compensation for all labor, supervision, materials, tools, equipment and incidentals, including, but not limited to, furnishing and applying paint pavement markings and legends, layout work and marks, and removal of any and all conflicting, existing or temporary striping and all other work as shown on the Plans, as specified in the State Standard Specifications, State Standard Plans, District Standards and these Special Provisions, and as directed by the Engineer and no additional compensation will be allowed therefore. International symbols of accessibility, and miscellaneous parking stall legends are included in the bid item for "Parking Lot Striping".

The contract unit price paid per **each**: "Drains to Bay Inlet Marker"

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## **SECTION 10-14: SIGNS**

### **10-14.01 GENERAL**

Removal, relocation and installation of all traffic (vehicular and pedestrian/bicycle) as shown on the plans.

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

All signing shall conform to the latest edition of the FHWA's Manual of Uniform Traffic Control Devices as amended by the latest CA-MUTCD and these specifications.

Submit for approval by the Engineer the following:

- A. Manufacturer of supplier's certificates of compliance with the specified standards for the products identified below.

### **10-14.02 MATERIALS AND EQUIPMENT**

Materials shall be in conformance with the Standard Specifications Section 56, the Caltrans Standard Sign Specifications and the MUTCD, California Supplement, except that all materials will be supplied by the Contractor.

All signs shall be fabricated from high tensile alloy aluminum with reflective smooth finish. Sign panels shall be a minimum of 0.080 inch thick, cut to size and shape with a tolerance of 1/32 inch. Panels shall be flat and free of buckles, warps, dents, burrs and any other defects resulting from fabrication.

All signs are to be of Diamond grade reflectivity.

Sizes for signs in the street, or signs that serve both bicyclists and vehicles, shall be as required for "Conventional Roads" as defined in Part 2, "Signs," of the CA-MUTCD.

Post shall be 12-gage galvanized steel, 1.75-inch square tube with perforations, weighing 2.09 pounds per linear foot. Posts shall have a bolt installed at the base of the post, as recommended by the manufacturer: Ulti-Mate sign support system with EZ Installation anchor, as manufactured by Western Highway Products, or equal.

Fasteners for posts shall be straight bolts for conventional sign installation and square post system corner-bolts for back to back installation.

Foundation shall consist of a rectangular post anchor assembly consisting of a 2-1/4" square 12 GA x 12" perforated sleeve over a 2" square x 30" perforated anchor with point. All parts shall be galvanized. Telespar anchor base or approved equal.

Provide PCC concrete at ground level for signs located in a paved area. Concrete to be 2500 psi, 6" minimum deep and 12" diameter.

### **10-14.03 EXECUTION**

All sign types, locations and offsets shall be approved by the Engineer prior to installation and shall be installed as shown on the Drawings, unless otherwise detailed or directed by the Engineer. Construction and panel installation shall be per Section 56-2.03 and Section 56-2.04 of the Standard Specifications. Sign panels shall be level and sign posts shall be plumb.

Where required, sign posts shall be set at least 30-inches into the ground.

Sign posts for street signage shall be per the Standard Specifications and the Standard Plans. Signs shall be placed to have a minimum height of 7-ft as measured from the finished ground elevation to the bottom invert of the sign.

All sign locations shall be field verified by the Engineer prior to excavation for the sign foundation.

### **10-14.04 MEASUREMENT AND PAYMENT**

The contract price paid for per **each** "Install New Sign and Post", "Install New Sign", "Remove Sign and Post" and "Bollards" shall include full compensation for performing the scope of work specified in the Technical Specifications including, but not limited to, layout, installing sign foundations and sign posts, and installing sign panels.

## **SECTION 10-15 CONSTRUCTION LAYOUT**

### **10-15.01 GENERAL**

The work in this section includes the furnishing of all labor, supervision, equipment, materials, tools, and incidentals and performing all operations in connection with setting construction survey stakes and marks by the Contractor and all work necessary to provide the limits, lines and alignment required for proper staking layout, construction, and completion of the work.

### **10-15.02 EXECUTION**

The Contractor shall set all stakes and marks to establish the lines and layout required for the completion of the work, as shown on the Plans, as specified in the State Standard Specifications and these Special Provisions.

### **10-15.03 CONSTRUCTION LAYOUT**

The Contractor will provide and establish the necessary lines, grades and marks to layout the horizontal and vertical alignment of all work as shown on the Plans and as specified in this section. As a minimum, the Contractor shall provide suitable lines, staking, and layout markings for all work including, but not limited to, the following:

1. Markings showing the location of each construction area sign.
2. Markings showing and establishing the limits of work for all sawcutting and limits of slurry seal and overlay work.
3. Markings for the layout of all pavement delineation including stripes, legends, markings and markers.
4. All concrete improvements.

The Contractor shall set or establish the necessary construction layout stakes and markings a minimum of two (2) working days in advance of the work, and shall notify the Engineer when such markings have been set.

All reference points made by the Contractor shall be protected and remain undisturbed until project completion.

### **10-15.04 PROTECTION OF MONUMENTS**

Contractor shall protect all monuments, markings, stakes, and survey points in their undisturbed location and condition for the duration of construction.

Contractor shall provide the Engineer with forty-eight (48) hours advance notice, prior to any excavation, in the vicinity of existing monuments. The monuments shall be field referenced by the Contractor.

The Contractor shall furnish, at his/her expense, all the necessary work and operations necessary to replace the existing monument, survey marker, or reference point that may be damaged or disturbed by reason of the Contractor's operation. Replacement shall be made under the direction of the County's Land Surveyor. The Contractor shall provide a minimum of five (5) working days notification for monument work.

**10-15.05 MEASUREMENT AND PAYMENT**

Full compensation for conforming to the requirements of this section shall be considered as included in the bid prices for other items of work, and no additional compensation will be allowed therefore.

## **SECTION 10-16 STORMWATER POLLUTION PREVENTION**

### **10-16.01 GENERAL**

#### WORK INCLUDED:

- A. Prohibit illicit discharge (non-rainwater) into the storm drain system.
- B. Construct, inspect and maintain any and all necessary systems to eliminate contaminants from entering the storm water system as well as the harbor.
- C. Clean up and control of work site materials, spoils and debris.
- D. Removal of contaminants produced by the project.
- E. After job completion, removal of systems installed by the Contractor to control contaminants from entering the storm water system or harbor.
- F. Preparation of water pollution control plans (WPCPs).
- G. 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.

#### REFERENCES, CODES AND STANDARDS:

- A. National Pollution Discharge Elimination System (NPDES), Municipal Regional Permit (MRP) No. CAS612008.
- B. Best Management Practices Construction Handbook, California Stormwater Quality Association, latest version.

#### 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 (BMPs) at all times.
- B. Water Pollution Control Plan
  - a. A plan shall be submitted for the proposed control of contaminants entering the storm water system or harbor. The plan must be approved by the Engineer prior to commencing work.
- C. Training
  - a. All employees and subcontractors shall be trained on the storm water pollution prevention requirements contained in these Specifications. A supply of spill clean-up materials such as rags or absorbents shall be kept

readily accessible on-site.

## **10-16.02 EXECUTION**

### RECYCLING

- A. At the end of each working day, all scrap, debris and waste material shall be collected and materials disposed of properly.
- B. Dry, empty paint cans/buckets, old brushes, rollers, rags and drop cloths shall be disposed of in approved waste collection.
- C. Dumpsters shall 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 shall not be discharged on-site.
- E. Regular waste collection shall be arranged for before dumpsters overflow.

### 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 shall be labeled and stored in accordance with State and Federal regulations.
- C. All hazardous materials and all hazardous wastes shall 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 shall 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 shall be stored a minimum of ten feet from the closest catch basin and curb return. The contractor shall not allow these granular materials to enter the storm drain or creek.
- G. Warning signs shall 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 shall 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 shall 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 shall be used to catch leaks or spills any time that vehicle or equipment fluids are dispensed, changed or poured.

#### CHEMICAL USAGE

- A. When rain is forecast within 48 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 shall be followed regarding uses, protective equipment, ventilation, flammability and mixing of chemicals. Over-application of a pesticide constitutes a "label violation" subject to an enforcement action by the San Mateo County Agriculture Commissioner.

#### DUST CONTROL

- A. Reclaimed water shall be used to control dust on a daily basis as directed by the Engineer.
- B. At the end of each working day, or as directed by the engineer, the roadways and on-site paved areas shall be cleaned and swept of all materials attributed to or involved in the work. Streets shall 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.

#### SAWCUTTING

- A. The contractor shall cover or barricade catch basins using control measures such as filter fabric, straw bales, sand bags and fine earthen dams to keep slurry out of the storm drain system and harbor. 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 shall be removed from the storm drain and the Engineer shall be notified immediately.

#### DEWATERING OPERATIONS

- A. Water shall be routed through a control measure as determined and approved by the Engineer such as a sediment trap, sediment basin or Baker tank to remove settled 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 shall be tested prior to discharge. If the water meets the Regional Water Quality Control Board standards, it may be discharged into the storm drain, if not, the water shall be discharged to the sewer system (with proper approvals from the County Harbor District) or disposed of off-site, depending on test results and levels on contaminants.

#### 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 shall not be washed out into streets, gutters, storm drains, drainage channels or creeks. The wash water must be disposed to a proper concrete washout area or self-contained by the ready-mix concrete truck, both methods shall remove and handle the wash water from the County limits.

#### PAVING OPERATIONS

- A. Catch basins and manholes shall be covered when paving or applying tack coat, chip seal, or microsurfacing.
- B. The Engineer may direct the contractor to protect drainage courses by using control measures such as earth dike, straw bale and sand bag to divert run-off or trap filter sediment.
- C. Excess sand (placed as part of a sand seal or to absorb excess oil) shall 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 shall not be used to wash down fresh asphalt concrete.

#### PAINTING

- A. The cleaning of painting equipment and tools shall be performed in a designated area that will not enter the gutters, storm drains or creeks.
- B. Wash water from aqueous cleaning of water-based paint tools and equipment shall be disposed of in a storm drain pipe or onto a designated dirt area.
- C. 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 shall be disposed of as a hazardous waste.

## 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.

## **10-16.03 MEASUREMENT AND PAYMENT**

Payment for complying with the provisions of this section as well as for furnishing all related labor, materials, tools and equipment for doing all the work identified and required by this section, the project plans, and as directed by the Engineer, shall be considered as included in the contract unit price paid for by the **various other contract items** of work involved for the Base Bid Schedule and no additional compensation shall be made.

**END OF SECTION**

**END OF TECHNICAL SPECIFICATIONS**