



CITY OF BRISBANE

Department of Public Works - 50 Park Place
Brisbane, California 94005-1310
(415) 508-2130
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Public Works/Engineering Plan Check

Property Address and/or Parcel No.:

Project Description:

Submittal/Plans are:

- ☐ MAKE CORRECTIONS NOTED AND RESUBMIT
☐ CONSULTATION WITH CITY ENGINEER REQUIRED

Date:

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Please return this Plan Check along with your resubmittal.

To assist in providing a timely turnaround, kindly annotate on this Plan Check where/how on the plans the corrections have been made.

City Standard Details are available online at:

www.brisbaneca.org/city-standard-details

NOTE: BMC §12.04.010 requires a separate permit, in addition to this plan check, for any work proposed in the Public Right of Way and for any site grading => 6 cubic yards..

Guidelines for electronic submittal of DPW permits and links to permit forms can be found here:

https://www.brisbaneca.org/sites/default/files/fileattachments/public_works/page/6731/guidance_for_electronic_submittal_of_permit_applications.pdf

The criteria in this plan check template are not necessarily applicable to projects requiring planned development permits and subdivision agreements. Likewise, these standards and criteria are not intended for direct application in the Crocker Industrial Park, Sierra Point Parkway, or on Bayshore Boulevard and Guadalupe Canyon Parkway, or for projects developed by the Engineering Division. While certain criteria may apply (i.e., stopping sight distance on a collector road), other criteria (i.e., pavement structural section)

will not apply due to the unique situations within these areas; accordingly, consultation with the City Engineer may be required in the excepted cases listed above.

A. Plan notes:

- ☐ A.1. Provide a plan view that clearly delineates the limits of right-of-way lines, extent of any existing asphalt-concrete pavement, and extent of any existing curb and gutter along the entire property fronting a public road, including the opposite side of the existing roadway.
- ☐ A.2. When required by the City Engineer, provide the following survey information:
 - ☐ A.2.a Locate property corners using a corner record on file with San Mateo County Surveyor, and identify corner locations on plans. If corners are not found, or if a corner record is not on file, then file a Corner Record and use that information to locate corners on the plans.
 - ☐ A.2.b Provide a Boundary Survey that locates corners, boundary lines and easements on the parcel.
 - ☐ A.2.c Provide a Topographic Survey. (This requirement may be met by providing a Site Planning Survey.)

B. Street improvement/encroachment:

BMC §12.24.010 adopted Caltrans' standard plans, specifications and related handbooks, which are to be applied unless otherwise specified by the City Engineer. Note the following overarching standards:

- Street grades shall not exceed 15%.
 - The street shall be capable of supporting 60,000 pounds (typically confirmed by designing based on a 250 psf surcharge load).
 - Roadway elevation grade breaks shall conform to Fire Department angles of approach and departure.
 - In the case where ROW is required to be offered for dedication to the city, the California Streets and Highways Code §1805 requires a minimum public street right of way width of forty feet (40').
 - Attachment "A" (Engineering Design Criteria) provides additional information for roadway design.
- ☐ B.0. It is recommended that existing or proposed new sidewalk/roadway shoulder conditions be reviewed by a Certified Access Specialist (CAsp) and confirm that conditions are or will be revised to be compliant with ADA/PROWAG requirements for pedestrian facilities, with identified barriers removed to the satisfaction of the City Engineer.
 - ☐ B.1. Show all details for modifications to and encroachment into the existing paved road and to any curb and gutter. Driveway approach shall be per Standard Details (residential: C-1, commercial: C-2).
 - ☐ B.2. When required by BMC Section 15.08.140, applicant shall submit plans for widening roadway along entire property frontage to the minimum street widths specified in BMC Section 12.24.010:
 - ☐ B.2.a Thirty-six feet (36') if parallel parking is permitted on both sides of street
 - ☐ B.2.b Twenty-eight feet (28') if parallel parking is permitted on only one side of street

- ☐ B.2.c Twenty feet (20') if no parking is permitted on street
- ☐ B.3. Sufficient survey information will be required with submitted plans to confirm the following geometric data: as-proposed lane and pavement widths, crown slope, shoulders width, shoulder slope, road grade, side slope on adjacent cuts, cut to right-of-way clearance, horizontal and vertical clearances to nearby obstructions, joins with existing pavement, and directional arrows depicting runoff.
- ☐ B.4. When required by City Engineer, new or replacement curb and gutter shall be Type A2-200, or Type E if approved by City Engineer, per Caltrans Standard Plans. Weakened plane joints shall be provided at regular intervals not exceeding ten feet (10'). Sufficient survey information shall be provided with submittals to confirm percent of fall in gutter and joins with existing gutter. Plans will include directional arrows depicting runoff and connections to the City's storm drain system. Transition to existing or adjoining "rolled" curb and gutter may be necessary, and direction will typically be given on conformance of new "A curb" to rolled curb in the field by the City Engineer and/or Public Works Inspector
- ☐ B.5. When required by City Engineer, new or replacement residential sidewalk shall be four inch (4") thick PCC on four inch (4") Class 2 aggregate base with weakened plane joints at regular intervals not exceeding five feet (5') and expansion joints at beginning of curb return, end of curb return, and around utility poles in sidewalk. Based on California Building Code's (CBC) accessibility standards and requirements of the federal Americans with Disabilities Act (ADA), sidewalk width may vary from four feet (4') to six feet (6') depending on whether or not aboveground utilities are located in or allowed in the sidewalk. All new sidewalks shall comply with the most current edition of CBC/ADA requirements.
- ☐ B.6. Curb ramp requirements shall be per "Attachment B" (Curb Ramps).
- ☐ B.7. Location of fire hydrants and other utilities in the public right of way shall be per "Attachment C".
- ☐ B.8. Utility trench and excavation repairs shall be per "Attachment D".
- ☐ B.9. A request for any parking structure within the unimproved public right-of-way shall comply with all requirements of BMC Chapter 12.05.
- ☐ B.10. When the placement of retaining walls (RW) in the public right-of-way is approved due to required road widening and/or incidental to development of adjacent private property, downhill retaining walls shall be designed per the details shown in City Resolution No. 2000-18. Keystone retaining walls may be used for uphill RW. "H" piles with concrete backfill and timber lagging may be used for uphill or downhill RW. Downhill RW shall include a landscape setback area and a metal beam guardrail or metal fence railing as determined by the City Engineer.

C. Utilities

- ☐ C.1. Clearly show the location and size of the existing (or proposed) potable water meter with corresponding laterals from its point of connection with house plumbing to its final connection with the City's public water system and any proposed changes.

- ☐ C.2. Add a note to the plans, “Obtain City of Brisbane Encroachment Permit and verify in field that the water service complies with City Standard Detail W-3 (residential - install domestic brass ball valve [customer valve] and Christy curb box with lid on downstream side of meter box if one is not present) or W-4B (commercial). Upgrade to current standard as directed.”
- ☐ C.3. In all cases, the size of the water lateral and corporation stop upstream of a water meter (i.e., connection at the main line and lateral leading to the water meter) shall be the same nominal size as the specified/required meter, which is the nominal diameter of the largest downstream service line or section of a line. Downstream laterals split off the service line after the meter, whether for fire service, irrigation, or other approved connections, will be considered as additional system demands and may require upsizing the corporation stop, lateral, and meter. As fire sprinkler systems are allowed to be submitted after building submittals, applicants are encouraged to include the additional water demands of fire service during their initial submittal to Public Works to avoid resubmittal of water service details after approval of fire sprinkler submittals.
- ☐ Residential fire service shall be per City Standard Detail W-4A, or if approved by City Engineer:
 - ☐ W-8D Combined Potable Fire Service
 - ☐ Commercial fire service shall be per City Standard Details W-4C and W-8A
- ☐ C.3.a. Residential applications - provide calculations per Appendix A of the California Plumbing Code to confirm the required size of the potable water meter.
- ☐ C.3.b. Non-residential applications - provide estimated domestic water consumption calculations as average gallons per day, maximum gallons per day, and gallons per year.
- ☐ C.3.c. Sprinkler remodels/new installation must include installation of a new Double Check Detector Assembly, or clearly indicate the presence of an existing one. Where such an assembly is already installed on the fire lateral for remodel projects, the applicant shall indicate the location, size, and manufacturer’s name, model number and serial number for the DCDA.
- ☐ C.4. Clearly show location/installation of backflow prevention device required to be installed between any non-potable lateral and the service line, per Department of Health Services and Division of Drinking Water of California State Water Resources Control Board. (Note: irrigation laterals shall have an RP device installed per City Standard Detail W-8B; see above for fire lateral requirements.)
- ☐ C.5. Submit the “Cross Connection Control Survey” (available at https://www.brisbaneca.org/sites/default/files/fileattachments/public_works/page/6871/2017_crossconnsurvey.pdf) and the proposed plans to San Mateo County Environmental Health for risk assessment and backflow prevention requirements. Return SMCEH approval letter with resubmittal.
- ☐ C.6. Add a note to the plans, “Obtain City of Brisbane Encroachment Permit and verify in field the location of the clean-out required at the property line. Install new clean-out as directed if not located.”
- ☐ C.6.a. Clearly show the location and size of the existing (or proposed) sanitary sewer lateral from its point of connection with house plumbing to its final connection with the City’s public sewer system,

including the clean-out required at the property line, and any changes proposed to the existing sewer lateral.

- ☐ C.6.b Per the City's Municipal Regional Stormwater Permit, all new or rebuilt swimming pools, hot tubs, spas and fountains shall have a connection to the sanitary sewer to facilitate draining events.
- ☐ C.7. A private sewer lateral that serves multiple residences or that is not installed in a properly recorded easement per the requirements of BMC Sections 13.04.420.I and 13.04.430 will not be allowed. This restriction typically requires downhill residences to lift sewer waste to the City's public sewer system in the street uphill of the residence.
- ☐ C.7.a. Non-residential applications - provide estimated sanitary sewer discharge calculations as average gallons per day, maximum gallons per day, and gallons per year.
- ☐ C.8. When required by BMC Section 15.08.140 or by a change in water meter size, obtain a Sewer Lateral Certificate as specified in BMC Section 13.04.452 et seq.
- ☐ C.9. The discharger/user is required to obtain a wastewater discharge permit from the San Francisco Public Utilities Commission and include the approved permit with the final project submittal.

Wastewater Discharge Permits info and the applications are here:

<http://www.sfwater.org/index.aspx?page=498>

Industrial user permits applications are here:

<http://sfwater.org/Modules/ShowDocument.aspx?documentID=3369>

Instructions here:

<http://infrastructure.sfwater.org/fds/fds.aspx?lib=SFPUC&doc=619091&data=238350035>

- ☐ C.10. Clearly show the location and size of the existing (or proposed) storm drain pipe from its point of connection with house plumbing (i.e., roof leaders, downspout leaders) to its final connection with the City's public storm drain system, and any changes proposed.
- ☐ C.11. New development applications shall provide calculations to show quantity of stormwater resulting from impervious area (existing and new) and show piping to connect this water to the City's public storm drain system. Utilize the rational method, $Q = CIA$ ($C = 0.9$, $I = 2.9$ in/hr, A = impervious area in acres; note: Q is in cfs, multiply x 449 for gpm).

For downhill residences, this requirement typically results in a collection system at the bottom of the lot, and a low head pump to lift the storm water to the curb and gutter or to a drain inlet on the uphill street.

The requirement to install new drainage inlets and the location of same shall be determined based on the procedures found in the U.S. Department of Transportation, Federal Highway Administration Publication No. FHWA-NHI-01-021, August 2001, Hydraulic Engineering Circular No. 22, Second Edition, "Urban Drainage Design Manual", Section 4.4.6. For purposes of performing the computations found in this reference, the following criteria apply:

Intensity shall be 2.9 inches per hour (taken from Chart 1, November 2003 City of Brisbane Storm Drainage Master Plan, for a ten-year event and a time of concentration of 5 minutes – a longer duration may be allowed only if approved by the City Engineer).

The allowable spread of water on the roadway for the ten-year event shall be calculated based on the City's Storm Drainage Master Plan design criteria of providing combined street and pipe storm drain capacity while maintaining a drivable lane width:

For streets with a crown and minimum 2% cross slope away from the crown, allowable spread shall be calculated as one half of width from centerline to adjoining contributory roadway, minus ten feet.

For streets with no/minimal crown and less than 2% cross slope from centerline, allowable spread shall be calculated as width from adjoining contributory roadway to adjoining contributory roadway minus ten feet.

For streets with no/minimal crown and an effective cross slope that sheets all water from “high” side of roadway to “low” side of roadway, allowable spread shall not exceed six feet on roadways twenty feet and less in width, and depth of flow in gutter shall not exceed the curb height.

Gutter width shall be actual existing width or width of new/replacement gutter. Grate width shall be minimum two feet.

Maximum spacing between drain inlets shall be no more than 350 feet for maintenance purposes.

The requirement for any additional associated underground storm drain conveyance piping shall be determined by the City Engineer.

- ☐ C.11.a. Any application proposing infiltration and/or retention shall provide calculations (preferably utilizing the procedures described in the CASQA California Stormwater BMP Handbook New Development and Redevelopment for TC-11 Infiltration Basin) demonstrating a 48-hour drawdown time for the Q calculated in C.11 (or proposed for diversion to the infiltration system) and using IDF curves from the city's latest storm drain master plan for a 10-year 5-minute duration storm. Note also that acceptable underlying soils for infiltration include NRCS soil type “A, B or C” only, having infiltration rates equal to or greater than 0.5 in/hr. (This information may be available at the Web Soil Survey site hosted by the US Department of Agriculture's Natural Resources Conservation Service.)

Post-development Stormwater Pollution Reduction:

Compliance with applicable requirements of Provision C.3 (New Development) of the City's National Pollutant Discharge Elimination System (NPDES) most current order issued by the San Francisco Bay Regional Water Quality Control Board will be imposed by the Community Development Department and/or the Public Works Department.

- ☐ C.12. Mark all onsite drain inlets/catch basins with approved “Do Not Dump – Drains to Bay” inlet marker.

- ☐ C.13. All condensate and equipment water drain lines shall be plumbed to the building sanitary sewer line or to a permeable area large enough to infiltrate the estimated discharge.
- ☐ C.14. Place existing and/or proposed public utility facilities (including electrical, phone and cable) underground per BMC 17.32.030.C.

D. Grading (refer to Brisbane Municipal Code references in parentheses for details)

- ☐ D.1. If grading is shown on the plans, or required for construction, submit a separate grading permit application per BMC directly to DPW. Any combined total of 6 CY for demolition, excavation, grading, import, and export will require a grading permit. (BMC §15.01.190, 15.01.140 B)
- ☐ D.2. The following information required to be submitted with the grading permit application is required to complete review of the submitted plans:
 - ☐ D.2.a Application form (BMC §15.01.160)
 - ☐ D.2.b Site Map and Grading Plan¹ (BMC §15.01.170)
 - ☐ D.2.c Interim erosion and sediment control plan (BMC §15.01.180)

Acceptable BMP samples can be found in the California BMP Handbooks located at <http://www.cabmphandbooks.com/>.

Refer to C.6 – Construction Stormwater BMPs Worksheet (attached to Grading Permit application) for additional notes required on plan sheets.

- ☐ D.2.d Final Erosion and sediment control plan (BMC §15.01.190)
- ☐ D.2.e Revegetation plan (BMC §15.01.200)
- ☐ D.2.f Soils engineering report (BMC §15.01.210)
- ☐ D.2.g Engineering geology report (BMC §15.01.220)
- ☐ D.2.h Work schedule and transport routes (BMC §15.01.230)
- ☐ D.2.i Security (BMC §15.01.240)
- ☐ D.2.j Fees (BMC §15.01.250)
- ☐ D.2.i Recycling and diversion of debris permit (BMC §15.01.150 k)

¹ Note that the *Guide to Engineering & Land Surveying for City and County Officials* prepared by the California Board for Professional Engineers and Land Surveyors includes the following Q&A number 47 found on page 17: **Can land surveyors prepare grading plans? (B&P Code §§ 6731, 8728). No, only licensed civil engineers can prepare grading plans. Based on this guidance, grading plans shall be prepared by a licensed civil engineer.**

☐ D.2.i Any other material required by the city engineer (BMC §15.01.150 l):

☐ D.4. The following notes shall be incorporated into the plan sheets:

- a. Applications of pesticides and fertilizers will be permitted only if in full compliance with City's current Integrated Pesticide Management Policy.

“ATTACHMENT A”

Engineering Design Criteria:

The functional road classification shall be the classification assigned to the street in question in the City's Pavement Management Program

Functional Classification: ARTERIAL
Design Speed: 50 MPH (80 KPH)
Curve Radius: 850' minimum
Gradient: 0.5% minimum to 5.0% maximum
Minimum vertical clearance: 14'6"
Crown Slope: 2%
Shoulder Slope: 5% away from median
Stopping Sight Distance: 430'
Superelevation: per Table 202.2 of Caltrans Highway Design Manual
Curb Return Radius: 35' minimum
Traffic Index: 9
Minimum structural section requirements-short reach: 8" AC over 14" AB

Functional Classification: ARTERIAL
Design Speed: 45 MPH (70 KPH)
Curve Radius: 660' minimum
Gradient: 0.5% minimum – 5% maximum
Minimum vertical clearance: 14'6"
Crown Slope: 2%
Shoulder Slope: 5% away from median
Stopping Sight Distance: 360'
Superelevation: per Table 202.2 of Caltrans Highway Design Manual
Curb Return Radius: 35' minimum
Traffic Index: 9
Minimum structural section requirements-short reach: 8" AC over 14" AB

Functional Classification: COLLECTOR
Design Speed: 30 MPH (50 KPH)
Curve Radius: 330' minimum
Gradient: 0.5% minimum – 12% maximum
Minimum vertical clearance: 14'6"
Crown Slope: 2% (may vary from 1.5% - 3%)
Shoulder Slope: 5% away from median
Stopping Sight Distance: 200' minimum
Superelevation: None
Curb Return Radius: 25' minimum, 35' at intersection with arterials
Traffic Index: 7
Minimum structural section requirements-short reach: 6" AC over 10" AB

Functional Classification: COLLECTOR
 Design Speed: 25 MPH (40 KPH)
 Curve Radius: 230' minimum
 Gradient: 0.5% minimum – 12% maximum
 Minimum vertical clearance: 14'6"
 Crown Slope: 2% (may vary from 1.5% - 3%)
 Shoulder Slope: 5% away from median
 Stopping Sight Distance: 150' minimum
 Superelevation: None
 Curb Return Radius: 25' minimum, 35' at intersection with arterials
 Traffic Index: 7
 Minimum structural section requirements-short reach: 6" AC over 10" AB

Functional Classification: LOCAL
 Design Speed: 25 MPH (40 KPH)
 Curve Radius: 230' minimum
 Gradient: 0.3% minimum – 15% maximum
 Minimum vertical clearance: 14'6"
 Crown Slope: 2% (may vary from 1.5% - 3%)
 Shoulder Slope: 5% away from median
 Stopping Sight Distance: 165' minimum
 Superelevation: None
 Curb Return Radius: 25' minimum
 Traffic Index: 5
 Minimum structural section requirements-short reach: 4" AC over 8" AB

“ATTACHMENT B”

Curb Ramps

All ramps shall comply with the most current CALTRANS, ADA, CBC, and DSA standards.

Location. Curb ramps shall be provided wherever an accessible route crosses a curb. The preferred and recommended location for curb ramps is in the center of the crosswalk of each street corner. Where it is necessary to locate a curb ramp in the center of the curb return and the street surfaces are marked to identify pedestrian crosswalks, the lower end of the curb ramp shall terminate within such crosswalk areas. Curb ramps at marked crossings shall be wholly contained within the markings, excluding any flared sides.

Slope. The least possible slope shall be used for any ramp. The maximum slope of a ramp in new construction shall be 8.3%. The maximum rise for any run shall be 30 in. Transitions from ramps to walks, gutters, or streets shall be flush and free of abrupt changes. Maximum slopes of adjoining gutters, road surface immediately adjacent to the curb ramp, or accessible route shall not exceed a 5% gradient within 4' of the bottom of the curb ramp. The cross slope of ramp surfaces shall be no greater than 2%. The side flare slope shall be 10% maximum, or 8.3% maximum if top landing is less than 48". Slopes and counter slopes, when combined should not result in more than 13.3% gradient change in the direction of travel (11% preferred).

Ramp Width. The minimum clear width of a curb ramp shall be 36 in, exclusive of flared sides. Curb ramps lie generally in a single sloped plane, with a minimum of surface warping and cross slope.

Surface and Finish. Finished surface of ramp shall be stable, firm, and slip resistant (medium-broom finish or equivalent.). The finish of curb ramp and flared surfaces shall contrast in color with adjoining surfaces.

Sides of Curb Ramps. If a curb ramp is located where pedestrians must walk across the ramp, or where it is not protected by handrails or guardrails, it shall have flared sides; the maximum slope of the flare shall be 10% (the maximum is 8.3% if top landing is less than 48"). Curb ramps with returned curbs may be used where pedestrians would not normally walk across the ramp.

Detectable Warnings. Detectable warnings shall consist of raised truncated domes with a diameter of nominal 0.9 in, a height of nominal 0.2 in and a center-to-center spacing of nominal 2.35 in and shall contrast visually with adjoining surfaces, either light-on dark, or dark-on-light. Detectable warning domes at curb cuts shall be flushed at the lip. No domes are required in cases where curb ramps do not serve crosswalks and where domes would mislead persons with vision impairments or guide dogs (e.g., at curb ramps serving accessible parking spaces.). The detectable warning shall extend the full width and 3ft depth of the curb ramp. Truncated dome detectable warning surface is provided on running portion of curb ramps that exhibit a slope from between 5% to 6.67%. All detectable warning material should have UL certification (Underwriters Laboratories Inc.) The material used to provide contrast shall be an integral part of the walking surface. Detectable warnings used on interior surfaces shall differ from adjoining walking surfaces in resiliency or sound-on-cane contact.

Diagonal Curb Ramps. If diagonal (or corner type) curb ramps have returned curbs or other well-defined edges, such edges shall be parallel to the direction of pedestrian flow. The lower terminus of diagonal curb ramps shall have 48 in minimum clear space. If diagonal curb ramps are provided at marked crossings, the 48 in clear space shall be within the markings, excluding any flared sides. If diagonal curb ramps have flared

sides, they shall also have at least a 24 in long segment of straight curb located on each side of the curb ramps.

Landings. Ramps shall have level landings at bottom and top of each ramp (maximum 2% slope & cross slope).

Edge Protection. Ramps and landings with drop-offs shall have curbs, walls, railings, or projecting surfaces that prevent people from slipping off the ramp. Curbs shall be a minimum of 4in high.

Outdoor Conditions. Ramps and their approaches shall be designed so that water will not accumulate on walking surfaces.

Pedestrian Signal Push Button. A level 30" x 48" space shall be provided, centered and parallel to the pedestrian signal push button. The height of the pedestrian push button shall be a 48" maximum, 40" preferred. The following shall be provided at the pedestrian signal push button:

- Activating force must be 5 lbs. or less.
- Textured horizontal yellow band 2" wide encircling the pole, and a 1" wide dark border band above and below this yellow band. Color-coding should be placed immediately above the control button.

“ATTACHMENT C”

Location of Fire Hydrants and other utility structures within the right of way

New fire hydrants and other aboveground utility facilities shall be placed behind the sidewalk in all circumstances where existing right of way dimensions accommodate this requirement. Where this requirement cannot be met, the aboveground facility may be placed in the sidewalk with no external feature that does not meet the required vertical minimum clearance of 14'6" closer than eighteen inches (18") to the face of an A-curb or twenty-four inches (24") from the flow line of a rolled curb and gutter. In all cases, the installation of aboveground facilities shall result in a final product that provides the minimum sidewalk clearances required by the CBC/ADA. Sidewalk extensions may be necessary to meet this requirement.

All onsite commercial/industrial fire hydrant laterals shall be installed with a rubber-flapper swing check valve placed in a utility vault at the property line.

All onsite commercial/industrial fire hydrant loop systems shall comply with City Standard Detail W-4A.

Meter boxes and utility access points that will be placed flush with existing finish grade may be placed in the sidewalk provided that the minimum distance between back of curb and the closest portion of the box shall be no less than twelve inches (12").

Underground conduits for electric, phone, cable television, etc. shall be placed behind the sidewalk unless approved otherwise by the City Engineer.

No utilities, except for median specific landscaping, shall be allowed in City medians unless approved otherwise by the City Engineer.

“ATTACHMENT D”

Utility trench and excavation repairs

Rocksaws, trenchers, boring equipment, and any other equipment that does not utilize a bucket to perform excavation, are not allowed without the specific permission of the Director of Public Works/City Engineer.

Final street section, backfill above pipe zone, curb and gutter repairs, sidewalk repairs, traffic striping and pavement marking repairs, and repairs to other publicly owned facilities damaged during operations shall be as directed by the City Engineer acting directly or through the City’s Public Works Inspector.

For general guidance, there are two repair sections:

- A. Trenches ≤ 2 feet in width (note no utilities shall have $< 18''$ cover) – this section may be used for conduit at the edge of the roadway; at the discretion of the City Engineer and/or Public Works Inspector, section B repairs may be required.
 - Repair area shall be neatly saw cut $18''$ beyond the trench excavation (minimum width of $5'$). Remove all existing asphalt concrete within the saw cut lines.
 - Adjoining brittle/damaged/“alligatored” sections of roadway may be required to be saw cut and included for repairs.
 - The entire trench shall be backfilled with a one sack cement and sand slurry mix to a depth $1''$ greater than the bottom of existing asphalt concrete section.
 - New asphalt concrete shall be placed to a depth $1''$ greater than existing asphalt concrete.
 - The entire width of streets that are trenched shall receive a Caltrans type slurry seal with an application rate of twelve pounds per square yard. Existing striping, reflective pavement markers, and ceramic pavement markers shall be restored and/or protected in place.
- B. Trenches greater than 2 feet in width (note no utilities shall have $< 18''$ cover)
 - Repair area shall be neatly saw cut $18''$ beyond the trench excavation (minimum width of $5'$). Remove all existing asphalt concrete within the saw cut lines.
 - Adjoining brittle/damaged/“alligatored” sections of roadway may be required to be saw cut and included for repairs.
 - Pipe bedding, pipe zone, and pipe backfill shall be placed to $12''$ above top of pipe per pipe owner’s and/or City specifications.
 - Trench backfill may be native material (unless deemed unsuitable) or Class II AB compacted to 95% relative compaction.
 - Minimum thickness for asphalt concrete/aggregate base lifts shall be existing asphalt concrete thickness + $1''$ /existing aggregate base or sections specified in “Engineering design criteria,” whichever is greater. Compaction requirement for aggregate base is 95% relative compaction.

Regardless of trench width, if trench excavation creates a “floater” section of existing A.C. (i.e., any areas of existing A.C. between a curb/gutter or median where the width of A.C. is less than three feet [$3'$]), then the floater section shall be completely removed and repaired as if it were part of the trench excavation.

The maximum length of any open or traffic-plated trench shall not exceed five hundred (500) feet at any time. For trenches and excavations that will be open for more than one workday, the following requirements apply:

Trenches not protected by K-rail shall be plated at the end of every workday. Only nonskid steel traffic plates shall be used to cover the trench. The edges of traffic plates perpendicular to traffic shall be ramped with cold mix “cut back” A.C. at a ratio of 30:1 for 45 MPH and greater, and 15:1 for less than 45 MPH (measurement for ramp is relative to height of traffic plate above finished grade). The edges of traffic plates parallel to traffic shall be ramped with cold mix “cut back” A.C. at a ratio of 10:1 for 45 MPH and greater, and 5:1 for less than 45 MPH. The contractor shall pin the plates as necessary to prevent shifting, and shall respond to and correct shifting trench plates regardless of the time of day. In all cases, when five or more trench plates are installed contiguously, they shall be tack welded to each other to prevent shifting and rattling. The maximum duration that trench plates may be left in any one location is five (5) working days. Trenches protected by K-rail may be left open at night provided that plastic barricade fencing or other barricade acceptable to the City Engineer is used to secure the open trench and prevent access from unauthorized personnel during non-work hours. All trenches shall be fully restored within ten (10) days of initial opening.