# CITY OF SANTA BARBARA
## CONSTRUCTION STANDARD DETAILS

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**REV. DATE:** 11/12  
**DETAIL:** G-01.0
### 1. Hardscapes (Streets)

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GENERAL CONCRETE NOTES:

1. Improvements constructed under this Standard shall conform to Section 303-5 and other applicable provisions of the Standard Specifications for Public Works Construction (current adopted addition of Green Book) Title 24, and City Special Districts.

2. Concrete shall be minimum of 520-C-2500 or greater where specified, per Standard Specifications for Public Works Construction (Greenbook).

3. Concrete shall have a light broom finish, except as noted. Broom direction shall be perpendicular to path of travel. All exposed edges shall be tool finished with a ½ inch radius.

4. Compact native soil 8 inches deep to 90% relative compaction. Under all concrete improvements except sidewalk, place crushed aggregate base 6 inches compacted to 95% relative compaction before placing concrete. Under sidewalk, place minimum of 4" crushed aggregate base compacted to 95% relative compaction. At City Engineer or designee’s discretion, 2" of sand may be allowed under sidewalk in place of crushed aggregate base. Crushed miscellaneous base may be substituted for crushed aggregate base at City Engineer or designee’s discretion.

5. Clear drying fugitive dye curing compound shall be applied to all exposed surfaces immediately after finishing.

6. Calcium chloride shall not be added to concrete unless approved by the City Engineer or designee.

7. Sawcut and remove a 18" minimum width or more of existing asphalt concrete pavement adjacent to all new concrete as directed by the City Engineer or designee. After constructing new concrete, replace pavement with asphalt concrete and aggregate base to match existing, but not less than 3 inch asphalt concrete over 8 inch aggregate base. Where concrete section exists, replace to match existing, overlaid with 2 inch minimum asphalt concrete. Tack coat all vertical surfaces with SS-1h emulsion where asphalt is to be placed.

8. All concrete shall be placed within forms except where it is poured directly against existing sawcut concrete.

9. City monuments within the limits of work shall be referenced and tied out prior to construction by a licensed land surveyor. Monuments lost or disturbed shall be replaced at contractor’s expense by a licensed land surveyor or civil engineer in accordance with section 8771 of the State of California Professional Land Surveyor’s Act.

10. Asphalt concrete shall be laid in courses not exceeding 4 inches in thickness. Asphalt concrete shall be Class C2 Grade PG 64-10 for finish courses, Class D1 Grade PG 64-10 for leveling courses, and Class B Grade PG 64-10 for base courses.
STANDARD NOTES:

1. All curbs and gutters shall be placed monolithically.
2. Premolded 0.25 inch thick expansion joints shall be placed at the ends of curb returns. Provide 1.5 inch deep contraction joints in all curb and gutter at approximately 10 foot intervals to match score marks in existing sidewalk.
3. The top edge of curb, the gutter flow line and the gutter edge shall have 0.5 inch radius, unless otherwise noted.
4. Minimum 6 inch crushed aggregate base under curb and gutter.
5. Compact native soil to a depth of 8 inches beneath aggregate base below curb and gutter, to 90% relative compaction.
6. Standard curb and gutter shall be used for all new construction unless other types are approved by the City Engineer.
7. Cuts in existing curbs and gutters shall be made at right angles to the face of curb.
8. Where existing curb height varies, match existing or adjacent curb for short reaches.
9. Extruded or slip-formed curb and gutter is not permitted.

FAUX SANDSTONE CONCRETE CURB AND GUTTER NOTES:

1. Mix sifted yellow sand into concrete for faux sandstone curb and gutter as needed to match existing sandstone or faux sandstone curbs.
2. Use textured matte finish to achieve faux sandstone finished look on top of curb and curb face portion only. Gutter shall be broom finished with the exception of a 4" steel trowel finish along the gutter flow line.
3. Geometry shall match that of the Standard curb and gutter.

CURB AND GUTTER
STANDARD & FAUX SANDSTONE
30" ROLLED CURB AND GUTTER

MATCH EXISTING ASPHALT CONCRETE THICKNESS, 3" MIN.

CRUSHED AGGREGATE BASE

COMPACTED NATIVE SOIL

4% SLOPE

18" MIN.

14" 14"

MATCH EXISTING ASPHALT CONCRETE THICKNESS, 3" MIN.

BRUSH FINISH

30"

16"

14"

CRUSHED AGGREGATE BASE

COMPACTED NATIVE SOIL

4% SLOPE

6" 6"

36" ROLLED CURB AND GUTTER

MATCH EXISTING ASPHALT CONCRETE THICKNESS, 3" MIN.

BRUSH FINISH

36"

24"

12"

3"

R=6"

R=12"

CRUSHED AGGREGATE BASE

COMPACTED NATIVE SOIL

6"

6"

4% SLOPE

6"-8" MATCH WITH EXISTING

6"-8" MATCH WITH EXISTING

CURB WITH VARIABLE GUTTER

NOTES:

1. Non-Standard curb and gutter should only be used to replace existing non-standard curb and gutter in-kind.

2. For standard curb and gutter notes, see Standard Detail H-02.0.

CURB AND GUTTER

NON-STANDARD
NOTES:

1. Sandstone curb shall be as dimensioned and shall be of a uniform minimum segment length of 3 feet. Sandstone shall be of a quality, hardness and denseness matching "Montecito Sandstone". Curb edge shall be squared off and joints shall be grouted with a maximum thickness of 3/4 inch.

2. All gutters shall be constructed in accordance with Standard Detail H-02.0.

3. Premolded 0.25 inch thick expansion joints shall be placed in gutter at 30 foot intervals and at curb returns. 1.5 inch deep contraction joints shall be provided in gutter at approximately 10 foot intervals at joints in the stone curb.

4. Cuts in existing curbs and gutters shall be sawcut and made at right angles to the face of curb.

5. Scarify and compact native soil to 90% relative compaction to a depth of 8 inches beneath aggregate base.
ISOMETRIC VIEW

NOTES:

1. Use 9"L x 3/4" thick varied width steel plate. Bevel edge as directed and weld #4 bars to plate using a full penetration weld. Galvanize after fabrication per Greenbook Standard Section 210-3.

2. Mount plate flush with top of curb and curb face.

3. Steel plate width shall be sufficient to extend 0.2' minimum below the flowline.

4. There shall be a minimum of 1.5" concrete cover over all rebar.

TOP VIEW

FRONT VIEW
NOTES:

1. This driveway is to be used in residential areas, when plans showing such use are approved by the City Engineer, or designee, and for replacement of driveway only.

2. Driveway width (W) shall be 10 feet minimum and 16 feet maximum. Any driveway or combination of driveways which exceed the maximum width must be approved by the City Transportation Planning Manager, City Engineer, or designee.

3. Where driveway width exceeds 12 feet, provide a 1.5 inch deep contraction joint in center.

4. The driveway slab shall be 6 inches thick. The sidewalk within the driveway width shall be 6 inches thick (see note 5 for exceptions).

5. Driveway with 8 inch slab thickness shall be used when serving three or more residences, or when plans showing such use are approved by the City Engineer or designee.

6. Gutter width shall match adjacent gutter.

7. Flare width (X) shall be 1 foot for each 2 inches of curb height.

8. Driveway flares, slabs and gutters shall be placed monolithically.

9. Where existing gutter has been overlaid, and a new driveway is being installed, the new gutter shall be installed to match existing gutter. Asphalt concrete shall be placed over the new gutter to the grade of the existing pavement.

10. Driveway approach consists of gutter, ramp, and sidewalk portions, placed monolithically.

11. See detail H-06.1 for sidewalk.

12. Where existing gutter exceed 3 feet, and concrete is in good condition, an 18" cut into existing gutter may be made if approved by City inspector.

13. Provide a minimum 5' wide sidewalk across driveway at 2% slope.
NOTES:

1. Driveway width (W) shall be 12 feet minimum and 35 feet maximum.

2. Driveway shall be 8 inches thick. Slab within sidewalk area shall be 8 inches and placed monolithically with driveway.

3. Where driveway width exceeds 16 feet, provide a 2 inch deep contraction joint in center.

4. Gutter width shall match adjacent gutter.

5. Flare width (X) shall be 1 foot for every 2 inches of curb height.

6. Where existing gutter has been overlaid, the new driveway gutter shall be installed to match the existing gutter, and asphalt placed over new gutter to grade of existing pavement.

7. Driveway flares, slabs and gutters shall be placed monolithically.

8. Provide minimum 5 feet of sidewalk width across driveway at 2% slope.

9. Use 560-C-3250 for all commercial driveways.
NOTES:
1. Concrete slab shall be in line with the back of sidewalk and shall conform to alley V-section.
2. Curb returns, slab and gutters shall be placed monolithically.
3. Slab, gutter, and curb returns shall be broom finished and flow lines shall be steel trowel finished.
4. Alley approach slope shall not exceed 8.33%. Depress sidewalk to meet maximum alley approach slope. Sidewalk depression shall not exceed 8.33% maximum slope.
5. Use 560-C-3250 concrete.
6. At discretion of City Engineer or Traffic Operations Supervisor, alley entrance may be constructed in the style of Standard Detail H-03.1 Commercial Driveway.

PLAN VIEW

SECTION A-A

ALLEY ENTRANCE

REV. DATE: 11/12 DETAIL: H-C4.0

STREETS:
TRANS OPS:
FACILITIES:
WATER RESOURCES:
CITY ENGINEER
PUBLIC WORKS DIRECTOR
NOTES:
1. Curb return radius shall be as shown on the plans.
2. Gutter and spandrels shall be 8 inches thick.
3. Curb return and spandrel shall be placed monolithically.
4. Concrete shall be 560-C-3250
5. Finish shall be steel float, lightly broomed on gutter and spandrels, brush on curb returns and steel trowel at flow lines.
6. Asphalt concrete taper from crown section to cross gutter shall be a minimum of 20 feet.
7. Deep score joints shall be a minimum of 2 inches deep.

SECTION A-A

PLAN VIEW

SECTION B-B

CROSS GUTTER
TYPE A:
(FOR USE IN RESIDENTIAL AREAS)

TYPE B:
(NOT FOR NEW CONSTRUCTION, SPECIAL APPROVAL REQUIRED)

TYPE C:
(FOR USE IN COMMERCIAL AREAS)

SIDEWALK PLAN VIEW

1. Type "A" sidewalk shall be used in residential areas.
2. Type "B" sidewalk may be used during reconstruction as an alternate to Type "A" in residential areas, when approved by the City Engineer or designee.
3. Type "C" sidewalk shall be used in commercial areas.
4. Sidewalk width shall be as shown, unless otherwise specified on the plans.
5. Provide 1.5 inch deep score joints @ 10 feet (30 feet if trees present), and 0.25 inch scoremarks at 5 foot spacing, and isolation joints at all adjacent structures, or match existing score pattern.
6. Exposed edges, joints and score marks shall be round-finish with an approved tool.
7. All survey monuments shall be identified, protected, and reset by a licensed land surveyor. (See General Note 9 on Standard Detail H-01.0).
8. Where necessary to replace existing sidewalk, cold joint shall be made at existing joint, or min. 1.5 inch sawcut at nearest score mark.
9. In special districts of the City, sidewalk shall match scoring and color of existing decorative sidewalk. (i.e., State Street, Carrillo Street, Chapala Street).
10. All utility boxes shall be placed at the back of curb.
11. Minimum of 4' clear space shall be provided around all tree wells, utility boxes/poles, benches, and other obstructions (5' preferred).

*R/W = Right of Way
**PMP = Pedestrian Master Plan
NOTES:

General
1. All access ramps shall be constructed in accordance with Title 24 of the Americans with Disabilities Act (ADA) and these Standard Details.
2. Field layout shall be made by a professional engineer or land surveyor.
3. Ramp thickness shall be 4 inches in residential areas and 6 inches in commercial areas.
4. Transitions from ramps to sidewalks, gutters, or streets shall be flush and free of abrupt changes. Maximum slopes of adjoining gutters and road surface immediately adjacent to the curb ramp shall not exceed 1:20.
5. The minimum width of a diagonal curb ramp shall be 48 inches, exclusive of flared sides. The minimum width of a directional curb ramp shall be 60 inches, exclusive of flared sides.
6. Ten working days prior to commencing demolition activities the Contractor shall contact the City's Survey Party Chief to tie out any City monuments and other recorded survey markers.
7. Existing survey monuments located adjacent to and outside of construction areas shall be adequately protected from any damage that may result from the Contractor’s operations. Survey monuments damaged or displaced by Contractor shall be replaced in accordance with Section 8771 of the Professional Land Surveyor’s Act.
8. Existing street name stamps located in concrete to be demolished or removed shall be carefully removed, preserved, and relocated into the adjacent parkway area.
9. Existing curb paint shall be repainted to existing condition on all new or retrofit curbs.
10. Use 560-C-3250 concrete.

Style
11. In general, proposed ramps in high volume pedestrian areas in the commercial core, and in areas with sidewalks with no parkways shall general be diagonal style ramps. In areas with lower pedestrian volumes and sidewalks with parkway, generally, dual directional ramps shall be used. Contact City Traffic Engineer for direction.
12. When constructing one new ramp at an intersection, selected ramp standard shall be most consistent with existing ramps.

Detectable Warnings
1. Dome height and size shall be minimum allowed by ADA, dome spacing shall be maximum allowed by ADA (2.35" spacing from dome to dome center).
2. Detectable warning surfaces shall extend 24 inches minimum in the direction of travel and the full width of the curb ramp.
3. For new construction, detectable warnings shall be Tekway Dome-Tiles or an equivalent approved by the City Engineer.
4. For retrofit installations, detectable warnings shall be SafetyStepTD or an equivalent approved by the City Engineer.
5. Color shall be Terracotta (Tekway) / Colonial Red (SafetyStep TD) for installations in gray concrete. Other colors will be considered for installation anywhere other than in gray concrete.
SECTION A-A
N.T.S.

MATCH EXISTING SIDEWALK

TAPER "0 GRADE. VARIABLE HEIGHT RETAINING CURB TO BE BUILT ONLY IF DEEMED NECESSARY BY CITY INSPECTOR.

12' MAX.

5%*

4' MINIMUM LANDING

VARIES

2% MAX.

8.33% MAX.

SECTION B-B
N.T.S.

MATCH CURBS HEIGHT AND EXISTING GUTTER WIDTH, TYP.

EXIST. SIDEWALK

MATCH CURBS HEIGHT AND EXISTING GUTTER WIDTH, TYP.

CONCRETE PARKWAY (USE FLARED WING)

PLANTED PARKWAY

(USE CONCRETE CURB)

R=3, TYP.

R=1', TYP.

5' MIN.

1.5 INCH DEEP CONTRACTION JOINTS

INSTALL NON-GROUTED RED BRICK PAVERS IN ISLAND. MINIMUM AREA OF PAVERS SHALL BE 10 SQUARE FEET. WHEN APPROPRIATE, CURB RADIUS MAY BE ADJUSTED TO MEET THIS REQUIREMENT.

PACIFIC CLAY BEAR PATH PAVERS, OR AN EQUIVALENT APPROVED BY THE CITY ENGINEER, (2.5/8"TX4"WX6"L) IN HERRING BONE PATTERN. VIBRATE SAND INTO VOIDS. SEAL WITH WATER SEALANT.

BEDDING SAND (1/2")

2"-4" (TYP.)

3/4" : 6" BATTER

4" THICK CLASS 560-C-3250 P.C. CONCRETE

A.C. ROADWAY

RECOMPACT EXISTING AGGREGATE BASE OR EXISTING SOIL TO 95% RELATIVE COMPACTION FOR A MINIMUM OF 12".

SECTION C-C
N.T.S.

ACCESS RAMP DETAILS
DUAL DIRECTIONAL

STREETS:

TRANS OPS:

APPROVED:

WATER RESOURCES:

REV. DATE: 11/12

DETAIL: H-07.1

FACILITIES:

CITY ENGINEER

PUBLIC WORKS DIRECTOR
Directional curb ramps shall match the width and alignment of adjoining sidewalk.

4' MINIMUM
LANDING

2% MAX.

8.33% MAX.

RETAINING CURB, 6" AT EDGE OF GUTTER. CURB SHALL BE BUILT AS FAR AS NECESSARY TO MAINTAIN POSITIVE PARKWAY SLOPE. SEE SIDEWALK STANDARD DETAIL FOR SIDEWALK SECTIONS.

SECTION A-A
N.T.S.

TAPER TO GRADE. VARIABLE HEIGHT RETAINING CURB TO BE BUILT ONLY IF DEEMED NECESSARY BY CITY INSPECTOR.

EXISTING SIDEWALK

PLANTED PARKWAY

R=3'

MATCH CURB HEIGHT AND EXISTING GUTTER WIDTH, TYP.

5' MIN
RAMP WIDTH

*USE FLARED WING FOR CONCRETE PARKWAY, SEE STANDARD DETAIL H-07.1.

ACCESS RAMP DETAILS
ONE-WAY DIRECTIONAL

STREETS:  
REV. DATE: 11/12  DETAIL: H-07.2
TRANS OPS:  
APPROVED:  
CITY ENGINEER
WATER RESOURCES:  
PUBLIC WORKS DIRECTOR
SECTION A-A
N.T.S.

SECTION B-B
N.T.S.

SECTION C-C
N.T.S.

STANDARD DIAGONAL ACCESS RAMP

ACCESS RAMP DETAILS
DIAGONAL
SIGN POST INSTALLATION
SQUARE TUBE

LATERAL CLEARANCE PER STANDARD DETAIL H-08.2
SEE DETAIL A

SIGN

POST

%\(\frac{1}{16}\)" Ø CORNER BOLT WITH %\(\frac{1}{16}\)" SELF LOCKING NUT

DETAIL A
SIGN MOUNTING

POST

SLEEVE

ANCHOR

%\(\frac{1}{16}\)" Ø CORNER BOLT WITH %\(\frac{1}{16}\)" SELF LOCKING NUT

DETAIL B
ANCHOR ASSEMBLY

SEE DETAIL B
TWO HOLES SHALL BE EXPOSED

POST SHALL BE EMBEDDED IN CONCRETE

6" MIN.

30° MIN.

3" MIN.

12" MIN.

TABLE

<table>
<thead>
<tr>
<th>POST, SLEEVE, &amp; ANCHOR SHALL BE GALVANIZED STEEL</th>
<th>POST SIZE</th>
<th>SLEEVE SIZE</th>
<th>ANCHOR SIZE</th>
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</thead>
<tbody>
<tr>
<td>POST SIZE</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>UP TO 2000 SQ. IN. OF SIGN FACE</td>
<td>2&quot; x 2&quot;</td>
<td>2(\frac{3}{8})&quot; x 2(\frac{3}{8})&quot; x 18&quot;</td>
<td>2(\frac{3}{8})&quot; x 2(\frac{3}{8})&quot; x 18&quot;</td>
</tr>
<tr>
<td>12 GAUGE</td>
<td>12 GAUGE</td>
<td>12 GAUGE</td>
<td>12 GAUGE</td>
</tr>
<tr>
<td>&gt;2000 SQ. IN. OF SIGN FACE (DOUBLE POST)</td>
<td>2 - 2&quot; x 2&quot;</td>
<td>2 - 2(\frac{3}{8})&quot; x 2(\frac{3}{8})&quot; x 18&quot;</td>
<td>2 - 2(\frac{3}{8})&quot; x 2(\frac{3}{8})&quot; x 18&quot;</td>
</tr>
<tr>
<td>12 GAUGE</td>
<td>12 GAUGE</td>
<td>12 GAUGE</td>
<td>12 GAUGE</td>
</tr>
</tbody>
</table>
NOTES:

1. Secondary sign mounted below another sign shall not be installed less than 7 feet in height.

2. In cases where curbs or sidewalks do not exist, height of signs shall be measured from road surface.

3. A minimum offset of 1 foot may be used where sidewalk width is limited or where existing poles are close to the curb.
NOTES:

1. Secondary sign mounted below another sign shall not be installed less than 7 feet in height.

2. In cases where curbs or sidewalks do not exist, height of signs shall be measured from road surface.

3. A minimum offset of 1 foot may be used where sidewalk width is limited or where existing poles are close to the curb.

SIGN HEIGHTS AND LATERAL CLEARANCES

STREETS:

REV. DATE: 11/12  DETAIL: H-08.2

CITY ENGINEER

PUBLIC WORKS DIRECTOR
NOTES:

1. Concrete shall be Class 560-C-3250 per Standard Specifications for Public Works Construction (Green Book).

2. Bus pocket slab, curb and gutter shall be poured monolithically. Optional - 3 foot gutter may be placed first for control of flowline, however, dowels will be required for second pour.

3. Bus pocket slab shall be 8" thick.

4. Pre-molded 0.25" thick steel expansion joints shall be placed at beginning and end of bus pocket. 1.5 inch deep contraction joints shall be placed at 30' intervals.

5. All concrete edges shall have 0.5 inch radius unless otherwise noted.

6. Clear drying fugitive dye curing compound shall be applied to all exposed surfaces immediately after finishing.

7. Height of the curb face to be 6-inch standard unless otherwise noted.

8. Joints and sawcuts in existing curbs shall be at right angles.
CONCRETE BUS POCKET
REVERSE TAPER - GEOMETRICS

<table>
<thead>
<tr>
<th>L</th>
<th>L/6</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>R</th>
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<tr>
<td>60.00'</td>
<td>10.00'</td>
<td>8.00'</td>
<td>7.56'</td>
<td>1.76'</td>
<td>4.00'</td>
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<tr>
<td>30.00'</td>
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<td>7.58'</td>
<td>1.71'</td>
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# DRAINAGE

<table>
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<tr>
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<tr>
<td>D-01.0</td>
<td>DROP INLET NOTES</td>
</tr>
<tr>
<td>D-01.1</td>
<td>DROP INLET - TYPE 1</td>
</tr>
<tr>
<td>D-01.2</td>
<td>DROP INLET - TYPE 2</td>
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<tr>
<td>D-02.0</td>
<td>DROP INLET DETAIL NOTES</td>
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<td>D-02.1</td>
<td>DROP INLET THROAT AND STEP DETAIL</td>
</tr>
<tr>
<td>D-03.0</td>
<td>GUTTER DEPRESSION - TYPE A</td>
</tr>
<tr>
<td>D-03.1</td>
<td>GUTTER DEPRESSION - TYPE A1</td>
</tr>
<tr>
<td>D-04.0</td>
<td>GUTTER DEPRESSION - TYPE B</td>
</tr>
<tr>
<td>D-04.1</td>
<td>GUTTER DEPRESSION - TYPE B1</td>
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<tr>
<td>D-05.0</td>
<td>CURB OUTLET DRAIN - TYPE A</td>
</tr>
<tr>
<td>D-05.1</td>
<td>CURB OUTLET DRAIN - TYPE B</td>
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<tr>
<td>D-05.2</td>
<td>CURB OUTLET DRAIN - TYPE C</td>
</tr>
<tr>
<td>D-06.0</td>
<td>PIPE HEADWALL</td>
</tr>
</tbody>
</table>
DROP INLET NOTES:

1. All concrete shall be Class 560-C-3250 per Standard Specifications for Public Works Construction. (GREEN BOOK)
2. The curb opening shall be as shown on plan, but not less than 4 feet for Type 1, 10 feet for Type 2.
3. Install step when required, per Standard Detail D-02.0 and D-02.1.
4. Connector pipe shall be placed on the back or side wall as shown in plans, to be clear of future drop inlet filter baskets.
5. Provide 3 inch radius rounded edge at pipe inlet.
6. The width of gutter depression shall be 4 feet unless otherwise shown on plans.
7. Manhole frame and cover shall be Alhambra Foundry A-1530B lettered with the words "City of Santa Barbara Storm Drain" unless otherwise specified in plans.
8. Top slab surface shall be a light broom finish.
10. Gutter depression shall be Type A, Standard Detail D-03.0 unless otherwise specified on plans.
11. Reinforcing steel in the top slab shall be #4 @12 inches on center.
12. Wall thickness (T) and reinforcing requirements shall be per Table A, Standard Details D-01.1 and D-01.2.
13. Clear drying fugitive dye curing compound shall be applied to all exposed surfaces immediately after finishing.
14. Aggregate base shall be placed 6 inches deep and compacted to 95% minimum relative compaction on undisturbed native soil before placing concrete.
15. Manhole shall be set 6 inches from inside wall of inlet.
16. All interior walls, floor, and top shall be sacked and patched upon completion.
17. Extend top slab rebar 4" into walls of drop inlet and 12" into adjacent curbs.
18. Install "Drains to Ocean" medallion on top slab per Standard Details D-01.1 and D-01.2.
19. Where required, an American Storm Water "Surf Gate" catch basin debris screen shall be installed.
SECTION A-A

SECTION B-B

DROP INLET

TABLE A
DROP INLET DETAIL NOTES:

1. Face plate shall be Alhambra Foundry A-3912 or approved equal, embedded 3 inches into side walls.

2. Support bolts shall be installed, when curb opening exceeds 7 feet and shall be spaced evenly not more than 7 feet and not less than 5 feet on center.

3. 3/4 inch diameter longitudinal protection bar assembly shall be installed when inlet curb face is more than 9 inches. The protection bar shall be fitted to each support bolt.

4. Steps are not required when H is 3.5 feet or less (see Standard Details D-01.1 and D-01.2). Install one step 16 inches above the floor when H is greater than 3.5 feet but less than 5 feet. Install steps at 12 inch intervals when H exceeds 5 feet. Steps shall be non-slip polypropylene plastic coated reinforcing steel complying with all current ASTM standards. Any exposed metal parts shall be galvanized after fabrication.

5. Inlet opening shall be equal to the existing curb height plus 3 inches.

19. Where required, an American Storm Water "Surf Gate" catch basin debris screen shall be installed.
NOTE: FIRST RUNG SHALL BE MOUNTED NO GREATER THAN 12 INCHES BELOW THE TOP EXTERIOR OF THE DROP INLET

TYPICAL SECTION OF DROP INLET THROAT

STEP DETAIL

DROP INLET TOP SLAB

#4 @ 12" O.C. REINFORCING BARS

1/2" DIA. ANCHORS

GALVANIZED FACE PLATE

5/16"

5/16"

3/4" DIA. GALV. STEEL STEP

GUTTER DEPRESSION

ROUND EDGE 3" RAD.

FL

1" DIA. SUPPORT BOLT

PROTECTION BAR

6"

VARIES, SEE NOTE 6 STD. DET. D-02.0

2

3

10" MIN.

14"
NOTES:

1. Gutter depression, curb transition and structure's top slab shall be poured monolithic.

2. Surface finish of gutter depression shall be light broom finish.

3. Concrete strength and curing compound per Standard Detail D-01.0.

4. Gutter depression shall be 3 inches.

5. Deep joint shall be 2 inches deep.

PLAN - INLET ON GRADE

SECTION AT GUTTER FL

GUTTER DEPRESSION

TYPE A
NOTES:

1. Gutter depression, curb transition and structure's top slab shall be poured monolithic.

2. Surface finish of gutter depression shall be light broom finish.

3. Concrete strength and curing compound per Standard Detail D-01.0.

4. Gutter depression shall be 3 inches.

5. Deep joint shall be 2 inches deep.

PLAN - INLET IN SAG

SECTION AT GUTTER FL

GUTTER DEPRESSION

TYPE A1
NOTES:

1. Gutter depression, curb transition and structure’s top slab shall be poured monolithic.

2. Surface finish of gutter depression shall be light broom finish.

3. The width of the depressed gutter shall match street gutter width.

4. Concrete strength and curing compound per Standard Detail D-01.0.

5. Gutter depression shall be 3 inches.

6. Deep joint shall be 2 inches deep.
NOTES:

1. Gutter depression, curb transition and structure's top slab shall be poured monolithic.

2. Surface finish of gutter depression shall be light broom finish.

3. The width of the depressed gutter shall match street gutter width.

4. Concrete strength and curing compound per Standard Detail D-01.0.

5. Gutter depression shall be 3 inches.

6. Deep joint shall be 2 inches deep.

PLAN - INLET IN SAG

SECTION AT GUTTER FL

GUTTER DEPRESSION

TYPE B1
NOTES:

1. Drain shall be schedule 40 P.V.C.
2. Replace sidewalk per Standard Details H-06.0 and H-06.1
3. Replace curb and gutter per Standard Detail H-02.
4. A maximum 3 inch diameter pipe shall be used in a 6 inch curb, 4 inch pipe in an 8 inch curb.
5. Pipe(s) shall have a minimum 0.5%, maximum 2% positive slope.
6. The number of pipes at any location shall not exceed four. There shall be a 3 inch minimum clearance between all pipes.
7. In commercial areas, sawcut and remove sidewalk, curb, and gutter per plan above.
8. In residential areas, remove a minimum of one panel length of sidewalk, curb, and gutter. Dowel into gutter.
9. Pipe opening may be core-drilled in existing curb in lieu of curb removal.
10. Property owners are responsible for curb drain maintenance.
11. Curb drain shall be placed a minimum of 5 feet (10 feet preferred) from any driveway, City tree, or intersection curb return.

CURB OUTLET DRAIN

TYPE A
NOTES:

1. Drain shall be Alhambra Foundry A-470 Rectangular Cast Iron Pipe.

2. Where curb height is less than 8 inches, sidewalk may be raised such that the curb height reaches 8 inches at the drain outlet if approved by City inspector.

3. Where curb height is less than 8 inches and sidewalk modification is not possible, a Type A (D-5.0) or Type C (D-05.2) drain shall be used.

4. Replace sidewalk per Standard Details H-06.0 and H-06.1.

5. Replace curb and gutter per Standard Detail H-02.0.

6. Pipe(s) shall have a minimum 0.5%, maximum 2% positive slope.

7. In commercial areas, sawcut and remove sidewalk, curb, and gutter per plan above.

8. In residential areas, remove a minimum of one panel length of sidewalk, curb, and gutter. Dowel into gutter.

9. Property owners are responsible for curb drain maintenance.

10. Curb drain shall be placed a minimum of 5 feet (10 feet preferred) from any criveway, City tree, or intersection curb return.
CURB OUTLET DRAIN
TYPE C

NOTES:
1. L - Length of sidewalk drain as shown on Plans.
2. W - Width of sidewalk drain as shown on Plans, 2' maximum. Widths exceeding 2' shall be approved by City Engineer.
3. Concrete - Class 560-C-3250 per Standard Specifications for Public Works Construction.
4. 3/8" X 3/8" steel strip - tack welded to angle at 12".
5. All exposed steel to be galvanized after fabrication.
6. For use only when Type A or B curb outlet drain cannot feasibly be installed.
7. Drain shall be a minimum of 10 feet from any driveway or alley entrance.
NOTES:

1. Concrete - Class 560-C-3250 per Standard Specifications for Public Works Construction (Green Book).

2. Reinforced steel - all horizontal and vertical bars shall be #4 at maximum 18-inch spacing.

3. 3-inch radius around edge at pipe inlet.

4. Double inlet wall - same as single D/2 or 2-foot minimum spacing between pipe inside diameters.
## LIGHTING

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>TITLE</th>
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<tbody>
<tr>
<td>L-01.0</td>
<td>LIGHT STANDARD - TYPE A AND B NOTES</td>
</tr>
<tr>
<td>L-01.1</td>
<td>POLE STANDARD - TYPE A</td>
</tr>
<tr>
<td>L-02.0</td>
<td>POLE STANDARD - TYPE B</td>
</tr>
<tr>
<td>L-02.1</td>
<td>LUMINAIRE STANDARD - TYPE A-08 AND B-08</td>
</tr>
<tr>
<td>L-03.0</td>
<td>POLE STANDARD - TYPE C</td>
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<td>LUMINAIRE STANDARD - TYPE C-08</td>
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<tr>
<td>L-04.0</td>
<td>STREET LIGHT PULL BOX</td>
</tr>
<tr>
<td>L-05.0</td>
<td>LIGHT STANDARD AND SPACING - NOTES</td>
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<tr>
<td>L-06.0</td>
<td>STATE STREET DECORATIVE LIGHT STANDARD</td>
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<td>L-08.0</td>
<td>CARRILLO STREET DECORATIVE LIGHT STANDARD</td>
</tr>
<tr>
<td>L-09.0</td>
<td>METER PEDESTAL</td>
</tr>
</tbody>
</table>
1. Improvements constructed under this Standard shall conform to applicable portions of the Standard Specifications for Public Works Construction, latest Edition.
2. Luminaire shall be LED type, G.E. M-250A2 Power/Door luminaire, Cobra Head Roadway Lighting, 120 volt NPF reactor or lag ballast, with luminaire-mounted photoelectric cell. Lens shall be polycarbonate prismatic refractor, "Dome" style, producing I.E.S. medium type III semi-cutoff distribution. Filter shall be fiber gasket type. Equals must be approved by the City Engineer. Where LED bulbs may not be used, HPS bulbs may be substituted with Engineer's approval. A sticker indicating lamp wattage shall be placed on the underside of the arm nearest the pole. For HPS lamps, the sticker shall be yellow with a black number. Wattages shall be 40, 65, 90, or 135 for LED lamps (70, 100, 150, or 250 for high pressure sodium (HFS) lamps). ANY AND ALL OTHER WATTAGES OR BULB TYPES SHALL BE APPROVED BY THE CITY ENGINEER IN WRITING PRIOR TO INSTALLATION.
3. See L-05.0 for pole type and luminaire selection in residential and commercial areas.
4. Light standards shall be manufactured by a centrifugal spinning process using aggregate consisting of black and white pieces, graded from 3/8 inch to a No. 150 sieve, and Type III portland cement conforming to ASTM Designation C150. Reinforcing steel shall consist of deformed steel bars conforming to ASTM Designation 615, and 7-strand uncoated stress-relieved prestressing cable having a minimum ultimate strength of 250,000 PSI. All reinforcing shall be spirally wrapped with cold-drawn wire. The concrete shall develop a minimum compressive strength of 3,500 PSI before removal from the mold. The exterior shall be sandblasted to develop a "marbelite" finish.
5. Underground electrical conduit shall be 1-1/2 inch minimum Schedule 40 P.V.C. electrical conduit, laid with 18 inch minimum cover behind curb within one foot of the curb face, unless shown otherwise on plans. Conduit shall be bundled tightly in the center of the footing. Conduits shall terminate in footings on the same side as the conduit run. A pull box is required within 5 feet of the street light. Conduit shall be "stubbed" not less than 3 inches and not more than 4 inches above the inside surface of street light or pull box.
6. In unmetered lights, install Tron HEB-AB, HEB A-A 30-Amp 600 Volt waterproof in-line fuse and receptacle in each standard base, with a minimum of 12 inches and a maximum of 18 inches in wiring to permit fuse receptacle to be serviced outside the standard. Metered lights and lighting circuits that have circuit breakers installed shall not have in-line fuses installed as well.
7. In addition, all conductor lengths shall be a minimum of 12 inches and a maximum of 18 inches inside hand holes and pull boxes. Contractor shall contact Southern California Edison Company for requirements of service installation, and shall install such service components as Edison requires to energize the system.
8. Power control point shall be the photoelectric cell (PE) located on cobra head pedestal cabinet. Single light has photocell on top of cobra head. Multiple light has photocell on meter pedestal with a by-pass switch.
10. All exposed steel parts shall be galvanized, stainless, or painted.
11. All power access doors shall be stainless steel and cast aluminum or equivalent. The 3/4 inch screws in the access cover shall be s.s. phillips panhead.
13. All lights shall be tested in the presence of the Public Works Inspector prior to acceptance.
14. If 3 or more lights are to be installed, a CP3B, Milbank 16" x 17" x 48" (TYPE B) commercial pedestal meter, in Malaga Green color matching the RAL Classic System color RAL6005 shall be installed, with the following: Meter socket with test bypass facility, 100 amps, 120/240 V, #3 wire, 1 main circuit breaker, 14 KAIC, 12 circuit load center with load test switch.
NOTES:
1) Install ground rod in pull box.
2) Maximum 2 conduits per fixture. 3 conduits require adjacent pull box.
3) Dissimilar metals separated dielectrically.
4) All bolts, nuts, washers, and hardware shall be galvanized steel.

NOTE - Infield boring in pole may only be in 90° increments in relation to handhole. Locate handhole in minimum 25° clear span.

POLE STANDARD
TYPE B-08

1) Install ground rod in pull box.
2) Maximum 2 conduits per fixture. 3 conduits require adjacent pull box.
3) Dissimilar metals separated dielectrically.
4) All bolts, nuts, washers, and hardware shall be galvanized steel.

NOTES:
2. Order: Pole VBF06.25PL, Victorian Fluted Pole, Pole #89 (2P3S) Santa Barbara Black & White exposed aggregate finish, with flat water sealant coating - ASTM C-150 TYPE III gray cement.
4. Baseplate is included.
5. (4) 3/4"x24"x4" galvanized steel bolts & hardware included.
Description of Components:

Lamp: As specified by Contract requirements. Default shall be LED type.
Optical System: (TH3F), I.E.S. type III hyper-extensive (asymmetrical). Horizontal lamp position in a 15 degree angle. **Weather tightness IP66 rating.** This assembly is toolfree removable from the technical ring.
Ballast: Matching Ballast included with lamp. Connected to 120 volts. Assembled on a utilized removable tray with quick disconnect plug.
Access-Mechanism: A die cast 360 aluminum technical ring with latch and hinge complete with a cast-in reflector. The mechanism shall offer toolfree access to the inside of the luminaire. An embedded memory-retentive gasket shall ensure weatherproofing.
Central Tubing: Made of aluminum tubing, 4½" outside diameter, slip fits over a 4" diameter by 9" long pole tenon, mechanically fastened by two levels of 3/8-16 UNC set-screws & a ½"" Locking Bolt.
Photo Cell: Twist lock type photocell, 120 volts, complete with an orientable cover. (Optional)
Hardware: All exposed screws will be in stainless steel. All seals and sealing devices are made and/or lined with EPDM and/or silicone.
Finish: Lumec custom color **PS311G128 Malaga Green** (SC1TX) or matching RAL Classic System color RAL6005.

NOTES:
2. Order: Luminaire as specified by contract (default shall be LED type), and request arm length as specified by contract. Mid Pole Bracket, if required by contract, is pole specific and includes arm.
3. Post Top, Arm, Mid Pole Bracket and installation hardware, including ½" locking bolt, to be provided by manufacturer.
4. ¾" hole to be drilled in Post Top by Contractor.
5. ¾" bore hole thru pole tenon for locking bolt to be drilled by Contractor.
6. Post Top & Arm, and Mid Pole Bracket alignment typically perpendicular to curbside, must be prior approved by Project Engineer.
7. Mid Pole Bracket location height on pole is set approximately at 14'. Contractor will bore electrical access hole in pole.
8. Optical system to be aligned in field per Manufacturers Streetside direction label identified in fixture.
9. A sticker indicating lamp wattage shall be placed on the underside of the arm nearest the pole. For HPS lamps, the sticker shall be yellow with a black number.

LUMINAIRE STANDARD
TYPE A-08 AND TYPE B-08

[Signature]
PUBLIC WORKS DIRECTOR
POLE STANDARD
TYPE C-08

NOTES:
1) Install ground rod in pull box.
2) Maximum 2 conduits per fixture. 3 conduits require adjacent pull box.
3) Dissimilar metals separated dielectrically.
4) All bolts, nuts, washers, and hardware shall be galvanized steel.

NOTE - Infield borings in pole may only be in 90° increments in relation to hand hole.

LOCATE HANDLEHOLE IN MINIMUM 26" CLEAR SPACE

HANDHOLE

POLE ORIENTATIONS

POLE TOP DETAIL

POLE SECTION

POLE STANDARD
TYPE C-08

REV. DATE: 11/12
DETAIL: L-03.0

APPROVED: [Signature]

STREETS: [Signature]

TRANS. OPS: [Signature]

FACILITIES: [Signature]

WATER RESOURCES: [Signature]

PUBLIC WORKS DIRECTOR: [Signature]
LUMINAIRE STANDARD
TYPE C-08

Description of Components:

Lamp: As specified by Contract Requirements. Default shall be LED type.
Optical System: (SG2, I.E.S. type II (asymmetrical)). Reflector composed of a chemically brightened multi-faceted anodized aluminum, mounted on a white frame. This assembly allows for a full rotation of the optical system in 90 degree increments.
Ballast: Matching Ballast included with Lamp. Connected to 120 volts. Assembled on a unitized removable tray with quick disconnect plug.
Access-Mechanism: A die cast A380 aluminum technical ring with a cast-in decorative skirt. An integrated hinge and a captive knurled thumb screw offer tool free access to the inside of the luminaire and to the lamp. An embedded memory-retentive gasket shall ensure weatherproofing.
Central Tubing: Made of aluminum tubing, 4 1/2" outside diameter, slip fits over a 4" diameter by 9" long pole tenon, mechanically fastened by two levels of 3/8-16 UNC sets-screws.
Photo Cell: Twist lock type photocell, 120 volts, complete with an orientable cover.
Hardware: All exposed screws will be in stainless steel. All seals and sealing devices are made and/or lined with EPDM and/or silicone.
Finish: Lumec custom color PS311G128 Malaga Green (SC1TX) or matching RAL Classic System color RAL6005.

NOTES:
2. Order: Luminaire as specified by contract (default shall be LED type), and request arm length as specified by contract. Mid Pole Bracket, if required by contract, is pole specific and includes arm.
3. Post Top, Arm, Mid Pole Bracket and installation hardware, including 3/8" locking bolt, to be provided by manufacturer.
4. 3/8" hole to be drilled in Post Top by Contractor.
5. 3/8" bore hole thru pole tenon for locking bolt to be drilled by Contractor.
6. Post Top & Arm, and Mid Pole Bracket alignment typically perpendicular to curblace, must be prior approved by Project Engineer.
7. Mid Pole Bracket location height on pole is set approximately at 14'. Contractor will bore electrical access hole in pole.
8. Optical system to be aligned in field per Manufacturers Streetside direction label identified in fixture.
9. A sticker indicating lamp wattage shall be placed on the underside of the arm nearest the pole. For HPS lamps, the sticker shall be yellow with a black number.

Adapter: Aluminum Clamps, mechanically fastened to pole by stainless steel bolts and nuts. For installation on octagonal tapered cement pole.
NOTES:

1. Pull box shall be Christy N9 pull box with N9T skid resistant Fibrelyte lid with bolt downs unless otherwise specified.

2. Bottom of pull box shall rest firmly on a 12 inch thick bed of 1 inch crushed rock extending 6 inches beyond the outside walls of the box.

STREET LIGHT PULL BOX
NOTES:
1. All ornamental street lighting cable systems shall be underground, rather than overhead.
2. Location of street light standards to be approved by City Building Maintenance (805) 564-5415, prior to installation.
3. Residential light standards shall be spaced on lot lines not more than two hundred-fifty (250) feet apart approximately.
4. Where commercial or industrial lot frontages are involved, light standards shall be spaced one hundred (100) feet apart.
5. All other features of street lighting systems shall meet the requirements of the Public Works Department which shall be established to achieve safety, maximum life, low maintenance cost, adequate illumination and structural soundness.
6. All pull boxes shall be set at the back of the curb. Roadway pull boxes are for replacement purposes only.
7. All pull boxes shall be set in accordance with N.E.C. and CALTRANS Standards.
8. When the distance between street lights is greater than 100 feet, a pull box must be set every 100 feet for pulling wire.
9. Recommended Pole Type and Luminaire for Commercial or Residential Use:

<table>
<thead>
<tr>
<th>Location</th>
<th>Pole Type</th>
<th>Watt - Output</th>
<th>Order Part #: HPS/LED**</th>
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<td>LED: DMS55-135W80LED4K-ES-LE3F-120-(B-LCP-031)-1A-SCZT311G151TX</td>
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<td>HPS: DOS-70HPS-SG2-120-LMS-1A-SC1TX</td>
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<td>LED: DOS-40W30LED4K-ES-LE2F-120-(B-LCP-030)-1A-TS-SCZT311G151TX</td>
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<tr>
<th>Location</th>
<th>Pole Type</th>
<th>Watt - Output</th>
<th>Order Part #: HPS/LED**</th>
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<tr>
<td>Intersection</td>
<td>B</td>
<td>150*</td>
<td>HPS: DMS55-150HPS-TH3F-QTA/120-1A-SC1TX</td>
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</table>

*Alternate Output: 100

**Listed LED Part#'s are HPS Wattage Output equivalents
***In residential and commercial areas where there are two lights diagonal from each other across an intersection, 65 watt LED (or 100 watt HPS) bulbs may be used.
# STATE STREET ORNAMENTAL PARTS LIST

FOR PROPRIETY CITY LIGHTING WITH CITY OWNED MOULDS.
CONTACT FACILITIES MAINTENANCE FOR VENDOR IDENTIFICATION.

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<th>PART NUMBER</th>
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<th># OF PIECES PER STD.</th>
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<td>23-64831</td>
<td>CENTER RING</td>
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<td>23-64820</td>
<td>BOTTOM RING</td>
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<td>23-70903</td>
<td>LONG STAVE</td>
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<tr>
<td>23-90700</td>
<td>TOP COVER</td>
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<td>23-90720</td>
<td>TOP ORNAMENT</td>
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<td>BASE CASTING</td>
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<td>P-28-82-02</td>
<td>LOWER RISER TUBE 6&quot;</td>
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<td>P-28-82-04</td>
<td>UPPER RISER TUBE</td>
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<td>P-28-82-06</td>
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<td>P-28-82-08</td>
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<tr>
<td>N/A</td>
<td>LARGE LEXAN LENS</td>
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**NOTES:**
1. FOR FOOTING, SEE CITY STANDARD L-02.0 RECOMMENDED MOUNTING SETUP DETAIL (TYPE B)
2. CONTACT CITY BUILDING MAINTENANCE AT (805) 564-5415 FOR LIGHT STANDARD INFORMATION.

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**STATE STREET**

**DECORATIVE LIGHT STANDARD**

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**STREETS:**

**REV. DATE:** 11/12

**DETAIL:** L-06.0

**APPROVED:**

**PUBLIC WORKS DIRECTOR:**
LIGHT STANDARD SPECIFICATIONS

FOOTING: SEE STANDARD DETAIL L-02.0
STYLE: LANSING RESIDENTIAL STANDARD
HEIGHT: 11'-9"
BASE: 21'-5/8"
BOLT CIRCLE: 13" DIAMETER
ANCHOR BOLTS: (4) 3/4" X 24" H.D. GALVANIZED STEEL
MATERIAL: 60-45-10 CAST DUCTILE IRON WITH CASTING CERTIFIED ANALYSIS
ACCESS DOOR: 2-3/8" X 8-3/8" X 11"
TENON: 3-1/4" DIAMETER X 3" HEIGHT, CAST-INSIDE TO BE EXACT IN SHAPE AND DIMENSIONS TO THE ORIGINAL KING 0-61 FRENCH DESIGN STANDARD
FINISH: PAINT "MALAGA GREEN" POWDER COAT MATCHING RAL CLASSIC SYSTEM COLOR RAL6005

ORNAMENTAL LUMINAIRES, INSTALL REFRACTOR SYSTEMS, BALLAST KIT, AND LAMPS AS DIRECTED BY ENGINEER. (TYP.)

LIGHT STANDARD
TOP SECTION
SECOND SECTION
TOP VIEW
FIRST SECTION
ORNAMENTAL SECTION
BOTTOM VIEW
BASE DETAILS
FOR FOUNDATION, SEE STANDARD L-03.0 RECOMMENDED MOUNTING SETUP DETAIL

DESIGN B
DETAIL C
DECORATIVE LIGHT FIXTURE
NOT TO SCALE

CHAPALA STREET
DECORATIVE LIGHT STANDARD
WELSBACK LIGHTING FIXTURE

NO. T7PH39D3/SB. PAINT "MALAGA GREEN" COLOR MATCHING THE RAL CLASSIC SYSTEM COLOR "RAL6005"

26" 42-1/2"

HANGING LIGHT FIXTURE

NOT TO SCALE

INSTALL CASTING PLUMB
SO THAT VERTICAL AXIS
OF CASTING IS
COINCIDENT WITH AXIS
OF POLE.

O.D. = 12-1/4" / 14-1/2"

O.D. = 14-1/4" / 16-1/4"

O.D. = 14" / 15"

O.D. = 23-1/2" / 27"

SET BASE IN MORTAR
BED. TRIM MORTAR
FLUSH WITH OUTSIDE
OF BASE. MORTAR
SHALL MATCH
SIDEWALK

CAST BASE DETAIL

NOT TO SCALE

NOTES:

1. Pole is the standard Caltrans type, painted "Malaga Green" color matching the RAL Classic System color "RAL6005"
2. Light standard is 30 feet tall from the sidewalk to the base of the finial.
3. For foundation, see Standard Detail L-01.1 Recommended Mounting Setup Detail.

CAST ALUMINUM BRACKET
PAINT "MALAGA GREEN" COLOR
MATCHING THE RAL CLASSIC SYSTEM COLOR "RAL6005"

DECORATIVE BRACKET

NOT TO SCALE

FINIAL DETAIL

DIA. 3-1/2"

DIAMETER OF TENON SHALL MATCH INSIDE DIAMETER OF POLE

5' 2"

7" X 9" ACCESS PLATE
INSTALL TO ALIGN WITH
SIGNAL POLE ACCESS
PLATE

FINIAL DETAIL

NOT TO SCALE
NOTES:
1. Control cabinet shall be U/L listed "Industrial Control Panel" per UL 508.
2. Construction shall be NEMA 3R.
3. Voltage ratings of service equipment shall conform to the service voltages indicated on the plans.
4. Service equipment enclosure and metering equipment shall meet the requirements of the serving utility. When the serving utility provides both metered and unmetered circuits, a separate bus shall be provided for each circuit. The meter area shall have a sealable, lockable, rainlight cover that can be removed without the use of tools.
5. Service equipment shall be factory wired and conform to NEMA standards.
6. The exterior door shall have provisions for padlocking. The padlock hole shall be a minimum diameter of 11mm.
7. All terminals for incoming service conductors shall be compatible with either copper or aluminum conductors sized to suit the conductors shown on the plan. Terminal lugs shall be copper or tin-plated aluminum. Solid neutral terminal strip shall be rated 125A unless otherwise specified and for use with copper or aluminum conductors. The terminal should include but not limited to:
   A. Incoming terminals (landing lugs)
   B. Neutral lugs
   C. Solid neutral terminal strip
   D. Terminal strips for conductors within the enclosure
8. At least 6 standard single pole circuit breaker spaces (20 mm nominal) shall be provided for branch circuits. Circuit breaker interiors shall be copper. Interiors shall accept plug-in or cable-in/cable-out circuit breakers.
9. Plug-in circuit breakers may be mounted in the vertical or horizontal position. Cable-in/cable-out circuit breakers shall be mounted in the vertical position.
10. Fasteners on the exterior of the enclosure shall be vandal resistant and shall not be removable from the exterior. All nuts, bolts, screws, washers, and hinges shall be stainless steel.
11. Phenolic name plates shall be provided as required.
12. A plastic covered wiring diagram shall be attached to the inside of the front door.
13. Foundation shall be 24"x24"x12" and extend 3" (76mm) beyond edges of enclosure.
14. There shall be at least 36" (914mm) clearance at front and back of meter pedestal as required per N.E.C. 110-16.
15. Front of meter shall not face the street. Directional placement shall be at discretion of inspector.
16. Exterior color of meter pedestal shall be "Malaga Green" matching the RAL Classic System color "RAL 6005"
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<tr>
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</tr>
<tr>
<td>T-02.0</td>
<td>CONTROLLER SERVICE INSTALLATION</td>
</tr>
</tbody>
</table>
NOTES:

1. All Standard Specifications shall comply with latest Caltrans Specification.
2. All intersection approaches shall have Iteris RZ4 or better video detection cameras and EdgeConnect card, plus 60' stop bar in pavement loop detection. Loop detectors shall be CalTrans Type "E", with a leading Type "D" in each lane. Caltrans Standard Plan ES-5A and ES-5B shall be followed when installing.
3. Each roadway crossing shall have two (2) 3" conduits.
4. Traffic signal heads and indications shall be per latest City of Santa Barbara specification.
5. A battery back up system is required at all new intersections. System shall be Clary SP Series Model PD with 52 amp batteries, and McCain battery back up cabinet.
6. Signal cable shall be used for any new or replacement of traffic signal wiring.
7. Communication shall be Ethernet over single mode fiber optic cable (preferred, where connectivity available), Ethernet over wireless, or 6 twisted pair 600 Ohm 19 gauge as determined by the City Supervising Transportation Engineer. Interconnect conduit required to nearest traffic signal where feasible. Ethernet switch shall be Ruggedcom RS900.
8. Push buttons shall be Polara Navigator accessible buttons, with a green finish.
9. 332 traffic signal cabinets in "Malaga Green" color matching RAL Classic System color "RAL6005" shall be used.
11. Traffic signal controllers shall be McCain Coldfire 750.
12. GTT infrared based emergency preemption system required for all approaches. Phase selector card shall be capable of both infrared and GPS based inputs.
TYPE 111-BF SERVICE EQUIPMENT ENCLOSURE
WITH PROVISIONS FOR ONE 100 A METER

TYPE 111-BF SERVICE EQUIPMENT ENCLOSURE
WITH PROVISIONS FOR TWO 100 A METERS

TYPE 111-BR SERVICE EQUIPMENT ENCLOSURE

TYPE 111-B SERVICE EQUIPMENT ENCLOSURE FOUNDATION DETAILS

CONTROLLER SERVICE INSTALLATION

REV. DATE: 11/12 DETAIL: T-02.0
## SANITARY SEWER

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<td>PRECAST CONCRETE MANHOLE - NOTES</td>
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<td>PRECAST CONCRETE MANHOLE</td>
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<tr>
<td>S-02.0</td>
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<td>S-06.0</td>
<td>SEWER MANHOLE ADJUSTMENT - NOTES</td>
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<tr>
<td>S-06.1</td>
<td>SEWER MANHOLE ADJUSTMENT</td>
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</table>
PRECAST CONCRETE MANHOLE NOTES:

1. Pre-cast reinforced concrete manhole shall be in conformance with ASTM Designation C-478, of current issue.
2. Pre-cast sections to be of Class 560-C-3250 concrete per Standard Specifications for Public Works Construction (GREEN BOOK).
3. Cast in place base to be Class 560-C-3250 concrete per Standard Specifications for Public Works Construction, (GREEN BOOK) of a thickness 2-inch minimum above and 8-inch minimum below pipe outside diameter.
4. T-wall thickness shall be a minimum of 1/12 of largest manhole inside diameter.
5. Mortar joints on the inside shall be one part cement and two parts sand, uniform thickness not to exceed 3/8 inch, neatly finished at internal wall surface. Mastic shall be used for joints in shafting buildup, except grade rings, with mortar applied to the outsides of joints.
6. Frame and cover shall be Alhambra Foundry A-1254-X-6, or approved equal by engineer, lettered with the word "CITY OF SANTA BARBARA SEWER". Cover shall have a block radial tread pattern, sealed without bolt holes, and having a non-hinged lifting hook recessed in the cover.
7. Standard manhole size shall be 48-inch I.D. of riser, unless otherwise specified on plans. For sewer pipes larger than 18-inch, sewer manholes shall be 60-inches in diameter at the base, with a 30-inch frame and cover.
8. Concentric cones shall be used on all sewer manholes unless one of the following conditions are present:
   A. Manholes with an I.D. of 60-inches or greater shall have eccentric cones
   B. All manholes exceeding 5-feet in depth shall have eccentric cones.
9. Steps are not required unless otherwise specified by the Engineer.
10. Channel bottom may be formed using a continuous length of PVC plastic sewer pipe extended past wall O.D. a minimum of 2 feet. No bends or wyes shall be used. Channel bottom shall not be formed with VCP.
PRECAST CONCRETE MANHOLE

SECTION

FRAME AND COVER
CONCENTRIC CONE
TOP RING 3", 6", AND 16"
24" OR 30" 4' OR 5'
H T
2" MIN 8" MIN.
VARIES
CENTER SECTIONS 12", 16", 24", 32", 36", OR 48" HEIGHT
KEY JOINT, TYPICAL
CONCRETE BASE
GROOVE
TONGUE
MASTIC

JOINT DETAILS

RUBBER "O" RING WATERSTOP, TYPICAL
MANHOLE SHELL
CHANNEL
FLOW

SECTIONAL PLAN

STREETS: REV. DATE: 11/12 DETAIL: S-01.1
TRANS OPS: APPROVED: J. Kelly
FACILITIES: CITY ENGINEER
WATER RESOURCES:
PUBLIC WORKS DIRECTOR
NOTES:

1. Connector pipe shall be of same diameter as sewer pipe.
2. See Standard Detail S-01.0 for manhole notes.
3. Foundation for drop connection is to be poured integrally with manhole base.
4. All pipe and fittings shall be PVC SDR-35 per ASTM 3034.
5. To be used on new construction or when external drop is not functioning properly.
NOTES:

1. Frame and cover shall be Alhambra Foundry A-1240 or equal approved by Engineer.
2. Set frame and cover flush with pavement grade.
3. Cleanout larger than 8-inch shall be provided subject to the approval of the Engineer.
4. All pipe and fittings shall be SDR-35 P.V.C. per ASTM 3034.
SEWER LATERAL NOTES:

1. Factory-fabricated wyes are required on all standard sewer lateral tap connections. Wyes shall point downstream and enter main at an angle of not less than 5-degrees and no more than 45-degrees off the vertical. Contact Water Resources Wastewater Collection System Supervisor for all sewer lateral tap installations. Allow a minimum of 5 workings days for scheduling.

2. Sewer lateral pipe and fittings shall be Bell and Spigot SDR-35 PVC, HDPE SDR-17 or an approved equal by the City Engineer. Sewer lateral pipe shall have a minimum diameter of 4 inches, and a minimum slope of 2%. Grade shall be uniform from main to property line. Changes in grade of lateral shall be made using long-radius bends.

3. Top of curb shall be marked with an "S" directly over lateral. The "S" shall be stamped in new concrete or chiseled into existing concrete, and shall not be less than 3 inches tall, 2 inches wide and 3/16 inch deep.

4. The depth of the lateral at the property line shall be a minimum of 4 feet, without special approval by the City Engineer.

5. Bedding and backfill for laterals shall meet the same requirements for sewer mains. See trench bedding and backfills Standard Details U-01.0 and U-01.1.

6. For water-sewer separation requirements see Standard Detail U-3.0, U-03.1, U-03.2, and U-04.0.

7. All Caulder Couplings shall be "Strong Backs," a band seal type coupling with an outside stainless steel shear ring.

8. When the depth of the sewer main is 12 feet or more, install a Chimney Sewer Lateral per Standard Detail S-05.0.

9. All sewer lateral improvements in the public right of way and all wye connections regardless of location shall require a permit from the City Public Works Department.

10. Sewer laterals are the responsibility of the property owner all the way to the public sewer main, including the lateral wye connection, even through the public right of way.
R/W = Right of Way
The above numbers reference notes from Standard Detail S-04.0

SEWER LATERAL
NOTES:

1. Chimney shall be used when lateral slope exceeds 45 degree or depth of main sewer is 12 feet or more.
2. Concrete cradle required when lateral slope is between 30 and 45 degrees.
3. Chimney size: 4-inch for single dwelling, 6-inch for multiple dwelling; up to 4 laterals may feed on chimney through standard wye.
4. Pipe and fittings shall be P.V.C.
5. Concrete for chimney encasement or cradle shall be Class 520-C-2500 per Standard Specifications for Public Works Constructions.
6. Bedding and backfill for laterals shall be the same as for main sewer.
7. Install wire or metallic strip for locating lateral.
NOTES:

1. GENERAL
   A. All concrete shall be 560-C-3250, all mortar shall be Class "D" per section 201.5.1 of the Standard Specifications for Public Works Construction (Green Book).
   B. Dimension "D" shall match the diameter of the frame and cover: either 24-inches or 30-inches.
   C. Manhole frame and cover shall be manufactured by Alhambra Foundry Company, LTD: A-1254-6 for 24" covers; A-1252 for 30" covers. If existing manhole frame and cover on manholes to be raised are not as specified, the Contractor shall replace the existing frame and cover with a new frame and cover furnished by the City.
   D. When required by the Engineer, existing rungs shall be removed to a depth of 2-inch beyond the inside face of the manhole. Existing voids left by the removal of these rungs shall be filled with mortar or a patching cement such as "Water Plug", or equal approved by the Engineer.
   E. Whenever precast concrete components are to be placed on any part of an existing brick manhole, these components shall be placed and secured by applying mortar. The depth, width, and thickness of the mortar shall be of sufficient dimensions to properly and adequately join and secure the components.
   F. Prior to any work on existing sewer manholes, the Contractor shall place a temporary false bottom inside of the manhole and shall install debris traps in downstream manholes.
   G. All manholes, brick or concrete, shall meet the dimensional requirements shown on Detail S-06.1, Grade rings shall not exceed a total maximum height of 12-inches.

2. RAISING EXISTING PRECAST CONCRETE SEWER MANHOLES: To raise an existing frame and cover on a precast concrete sewer manhole, use a course of brickwork or concrete, grade rings, or a riser shaft unit.

3. RAISING EXISTING BRICK SEWER MANHOLES: To raise an existing frame and cover on an existing brick sewer manhole, use the method specified for raising a frame and cover on an existing precast sewer manhole, or install a new manhole as directed by the Engineer.

4. LOWERING EXISTING PRECAST CONCRETE SEWER MANHOLES: To lower an existing frame and cover on a precast concrete sewer manhole, remove grade rings and/or riser shaft units. Replace the existing cone with a precast concrete eccentric cone unit if the existing core is either concentric, deteriorated, or as directed by the Engineer.

5. LOWERING EXISTING BRICK SEWER MANHOLES: To lower an existing frame and cover on a brick sewer manhole, reset the frame and cover on existing bricks with mortar, remove a sufficient amount of bricks to install a precast concrete eccentric cone unit, or install a new sewer manhole as directed by the Engineer.
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**GENERAL LEGEND:**

- C.I.P. = CAST IRON PIPE
- D.I.P. = DUCTILE IRON PIPE
- C.R. = CURB RETURN
- F.L.G. = FLANGE JOINT
- M.J. = MECHANICAL JOINT
- L.R.G. = LOCKING RETAINER GLAND
- P.E. = PLAIN END

---

**WATER TABLE OF CONTENTS**

**STREETS:**

**REV. DATE:** 8/17  
**DETAIL:** W-00.0

**APPROVED:**

[Signature]

**CITY ENGINEER**

[Signature]

**PUBLIC WORKS DIRECTOR**

[Signature]
1. Fire hydrant for residential installation shall be J. Jones No. 3700 with plastic hose cap J-669.
2. Fire hydrant for commercial installation shall be J. Jones No. J-3765 with 6 hole pattern. Use commercial installation at apartments and condominiums, motels, commercial and manufacturing developed or zoned areas.
3. Fire hydrant assembly breakaway spool shall be used to adjust lower fire hydrant stem within required distance from finish grade. Cadmium plated breakaway bolts shall be installed on fire hydrant and extension. Bolts to be installed heads up. Only one gasketed flange shall be allowed below the surface. Bury, control valve, tee and breakaway spool shall be lined with epoxy, Scotchkote 206N or 134.
4. Fire hydrants shall not be epoxy lined. Before installation, Bronze fire hydrant exterior shall be washed thoroughly with XIM cleaner, and painted with one coat of white XIM primer-sealer 400 and two coats of AERO-PLATE #462 gloss bright yellow (safety yellow). Fire hydrants to be purchased with factory paint.
5. Cutlets shall be positioned perpendicular to curb line or center line of roadway, facing into the roadway.
6. All buried bolts shall be coated with an approved corrosion control coating and wrapped with a 8 mil. thick polyethylene sheet and taped, as specified in A.W.W.A. C-105/A21.5-99-PRINTED.
7. Concrete thrust blocks shall be constructed in conformance with Standard Detail W-012.0.
8. The installation of fire hydrants in concrete sidewalk area shall be per Standard Detail W-02.0.
9. Fire hydrant valve shall be Pratt Groundhog butterfly valve or approved resilient wedge gate valve (preferred) except the butterfly valve shall not be used where the operating water pressure exceeds 200 psi. The gate valve shall be installed so that the bonnet and operating nut do not encroach into any part of the street structural section.
10. All pipe shall be ductile iron with mechanical joints and Megalug retainer glands or approved equal.
11. Fire hydrant spacing shall be according to Fire Department requirements.
12. All ductile iron pipe, including valves and fittings shall be encased with an 8 mil. thick black polyethylene sheet and taped as specified in A.W.W.A. C-105/A21.5-99-PRINTED.
13. Any deviation from this Standard Detail shall be approved by the Water Resources Division of Public Works Department.
14. Hot tapping saddle installation shall be pre-approved by the Water Resources Division of Public Works Department.
NOTES:

1. Fire hydrant installation shall be in accordance with Std. Details W-01.0 and W-01.1.

2. Concrete sidewalk construction shall conform to Std. Details H-06.0 and H-06.1.

3. Any variance to the sidewalk modification to conform to conditions other than shown requires approval of the Engineer.

*P.R.C. - Point of Reverse Curve

BACK OF SIDEWALK OFFSET AT ONE-FOOT INTERVALS

SIDEWALK MODIFICATION AT FIRE HYDRANT
NOTES:

1. Guard posts shall be installed plumb. Concrete for setting guard posts shall be Class 520-C-2500.

2. Concrete shall be placed against firm undisturbed native soil and shall be thoroughly consolidated.

3. Any variance to the guard post layout to conform to conditions other than shown must be approved by the Engineer.
ADJUSTMENT TO GRADE

TYPICAL NEW INSTALLATION

NOTES:

1. Nut shaft extension, fitted with self-centering device and adaptor by Pratt, or approved equal, shall be provided when cover over valve nut exceeds 2.5 feet.

2. If existing valve box is not a standard box, a box will be provided by the City and installed by the Contractor.

3. At no time shall the valve box rest directly on the valve body.
SERVICE CONNECTION NOTES:

1. Contractor shall furnish all material, except meter.
2. James Jones Co. designations are used to identify fittings.
3. Install J-969 saddle with gaskets & Corporation Stop (CC) thread when connecting services to all P.V.C. pipe. Use J-979 when connecting services to D.I.P. pipe.
4. Tap all steel pipe through saddle, welded coupling or approved equal.
5. Minimum distance between services shall be one foot. Multiple taps shall be spaced one foot apart at 10 o'clock or 2 o'clock angle.
6. Services shall be installed perpendicular to the main unless approved by the Engineer.
7. Meter boxes shall not be permitted in driveways. All meter box lids shall be skid resistant.
8. Contractor shall leave an appropriate "meter space" for meter installation by the City (see City Standard Detail W-05.1).
9. All new service installations and all services to be replaced shall be of 1-inch or 2-inch Type "K" copper tubing, using the material specified.
10. Private fire service/private water main distinction:
   A. Private Fire Service: A privately owned and maintained connection from the City distribution system that serves only private fire hydrant(s), fire sprinkler system(s), or other fire protection systems, and does not serve any City water service connections.
   B. Private Water Main: A privately owned and maintained connection from the City distribution system that serves one or more City water service connections, and which may also serve private fire hydrants, fire sprinkler systems, or other fire protection systems.
### METER & DIMENSIONS

<table>
<thead>
<tr>
<th>METER SIZE</th>
<th>ANGLE METER STOP</th>
<th>CORP STOP</th>
<th>BALL VALVE</th>
<th>METER SPACE</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8&quot;</td>
<td>E-1964W</td>
<td>E-1930</td>
<td>E-1900W</td>
<td>7-3/4&quot;</td>
<td>21&quot;</td>
<td>8&quot;</td>
<td>9&quot;</td>
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<tr>
<td>1&quot;</td>
<td>E-1964W</td>
<td>E-1930</td>
<td>E-1900W</td>
<td>11-1/4&quot;</td>
<td>21&quot;</td>
<td>8&quot;</td>
<td>9&quot;</td>
</tr>
<tr>
<td>1-1/2&quot;, 2&quot;</td>
<td>E-1973W</td>
<td>E-1930</td>
<td>E-1912WJ</td>
<td>17-1/4&quot;</td>
<td>18&quot;</td>
<td>12&quot;</td>
<td>12&quot;</td>
</tr>
</tbody>
</table>

### MATERIAL & DIMENSIONS

- **CUSTOMER'S BALL VALVE**
- **E128H 1" METER BUSHING WITH ADAPTER TO FIT 5/8" METER FOR FUTURE UPGRADE**
- **FOR 5/8" AND 1" USE SWIVEL**
- **FOR 1 1/2" AND 2" USE FLANGED**

**INSTALL 90° WROUGHT COPPER ELBOW WITH 2" SERVICE**

**TYPE "K" COPPER TUBING**

**INSTALL E-1529 BRONZE COUPLING OR WROUGHT COPPER COUPLING WITH 15% SILVER SOLDER WHEN NECESSARY TO SPLICE TUBING**

**OPTIONAL:**

**WHEN TYING OVER 3/4-INCH COPPER SERVICE, USE A MUELLER BRASS REDUCER, H-15460, CORPORATION STOP THREAD BY FLARE COPPER PIPE WITH COPPER RING OR WROUGHT COPPER COUPLING WITH 15% SILVER SOLDER FOR 3/4-INCH AND 1-1/2-INCH.**

**NOTE:** USE HORIZONTAL TAP WHEN AN ADJACENT SERVICE IS WITHIN 24"
NOTES:
1. Maximum of eight (8) 5/8-inch meters per manifold. Maximum of two (2) 1-inch meters per manifold. All meter boxes per City Standard Details W-06.0 and W-06.1.
2. All piping to be type "K" copper tubing.
3. All brass service connection fittings to be flared type.
4. Contractors shall meet with Water Resources Distribution personnel prior to installation of property service line to confirm that proposed connections will be sequenced in a manner approved by Water Resources Division and in conformance with approved addresses assigned to the property by the City.
5. Meter boxes shall be placed a minimum of 3" apart.
6. All meter box lids shall be skid resistant.

2-INCH SERVICE CONNECTION MANIFOLD
VERTICAL WATER METER BANK INSTALLATION

*Use nylon bushing between galvanized pipe and brass valve
NOTES:
1. All supply lines and meters shall be sized by a licensed, qualified person to meet projected demands of the project, as defined in the project application to the City Planning Department.
2. Meter layout shall be consecutively ordered by unit number and grouped by floor number.
3. The minimum horizontal separation between meters shall be 12”.
4. A maximum of two rows of meters shall be installed on a vertical wall. When two rows are installed, set the lower row of meters at 3’ above the floor. Set the higher row of meters 3 feet above the lower row. If only one row of meters is utilized, set the meters 5’ above the floor.
5. Meters shall be a minimum of 6” from the wall. Meters shall be a minimum of 12” from any corner.
6. City shall provide the upper and lower meter stop valves for installation by applicant.
7. Meter stop valves are to be Mueller E-1900 series IP thread x swivel, or equal. Valve sizes shall match meter size, except use 3” valve for 5” meter.
8. Service line piping installed by applicant shall include bushings where the meter stop valves connect, to provide a fitting that can be securely clamped by a pipe wrench.
9. Each meter shall be marked with the individual service account address. The applicant shall provide a metallic tag, attached to the meter, indicating the service address. Meters as labeled shall match the layout as shown on the approved plan sheets.
10. Check valves installed shall be drip tight in the normal direction of flow when the inlet pressure is at least 1.0 psi (pound per square inch) and the outlet pressure is zero psi. The check valves shall permit no leakage in the direction which is reverse to normal flow. The closure elements shall be internally loaded to promote rapid and positive closure. The check valves shall have elastomer type, resilient seat with no metal to metal seals. Check valves shall be installed in such a way as to be in-line serviceable and always accessible for maintenance and replacement.
11. Applicant shall not interconnect the services lines within the building. Each metered service shall exclusively supply the address corresponding to the assigned meter.
12. The City shall be responsible for maintenance, repair and replacement of the water supply system up to and including the master meters which shall be located in the public right-of-way. For City authorized public sub-metering installations, the City shall maintain, repair, and replace the meters and the lower shut off valve on the City side of each meter. The remainder of the water service system shall be maintained, repaired, and operated by the applicant.
13. The applicant shall dedicate an easement, on a form to be provided by the City, for access and maintenance activity at sub-meter locations that are not in the public right of way. The easement document shall delineate the maintenance, repairs, and replacement responsibilities of the public and private parties.
14. Meters that are installed vertically shall be 1” or smaller.

VERTICAL WATER METER BANK INSTALLATION

STREETS: REV. DATE: 8/17 DETAIL: W-05.2.5
TRANS. OPS: APPROVED: [Signature]
FACILITIES: CITY ENGINEER
WATER RESOURCES: PUBLIC WORKS DIRECTOR
NOTES:

2. Install backflow device as close to property line as possible.
3. Double check detector assembly (with bypass meter and bypass backflow) may be replaced by a reduced pressure principal assembly with meter depending on degree of hazard and approval by the City's Cross-Connection Specialist. See Standard Details W-12 and W-13 as applicable.
4. Line is privately owned from the valve to the building.
5. Inspection and approval by the City's Cross-Connection Specialist is required.
6. Install J-1529 bronze coupling or wrought copper coupling with 15% silver solder when necessary to splice tubing.
7. OPTIONAL: When tying over \( \frac{3}{4}'' \) copper service, use a Mueller brass reducer, H-15480, corp. stop thread by flare copper pipe with copper ring or wrought copper coupling with 15% silver solder for \( \frac{3}{4}'' \) and \( 1\frac{1}{2}'' \) services.
NOTES:
1. All pipe in the street right-of-way shall be D.I.P. with mechanical joints and "MEGALUG" retainer glands or approved equal.
2. All ductile iron pipe, including valves and fittings shall be encased with a 8-mil. thick black polyethylene sheet and taped as specified in A.W.W.A. C-105/A21.5-99-PRINTED.
3. All City fittings shall be epoxy lined.
4. Fireline beyond the valve to the building is the responsibility of the property owner.
6. Install backflow device as close to property line as possible.
7. Double check valve assembly may be replaced by a reduced pressure principle assembly with meter depending on degree of hazard and approval by the City's Cross-Connection Specialist. See Standard Details W-12 and W-13 as applicable.
8. Inspection and approval of the fireline by a City Public Works Inspector is required.

4-INCH AND LARGER FIRELINE
13 = COMMERCIAL
13D = FIRELINE FOR DOMESTIC DUPLEX - 1/2 FAMILY RESIDENTIAL
13R = HOTEL/MOTEL/3 OR MORE UNITS IN A SINGLE BUILDING
DCDA = DOUBLE CHECK DETECTOR ASSEMBLY
NOTES:

1. Water meter shall be approved by the Water Resources Division of Public Works Department.
2. All piping shall be of the same size as the meter.
3. All pipe in the street right-of-way shall be D.I.P. with mechanical joints and "MEGALUG" retainer glands or approved equal.
4. All ductile iron pipe, including valves and fittings shall be encased with a 8-mil. thick black polyethylene sheet and taped as specified in A.W.W.A. C-105/A21.5-99-PRINTED.
5. All fittings shall be epoxy lined.
6. Service line beyond the valve to the building is the responsibility of the property owner.
7. Install backflow device as close to property line as possible.
8. Inspection and approval by the City's Cross-Connection Specialist is required.
METER BOX
5/8-INCH AND 1-INCH METERS

NOTES:
1. Meter box shall be non skid Polymer Concrete as Manufactured by:
   Armorcast Products Company,
   13230 Saticoy Street,
   North Hollywood, CA 91605,
   (818) 982-3600

2. Bottom of meter box shall rest firmly on a 12 inch thick bed of 1 inch crushed rock extending 6 inches beyond the outside walls of the meter box.

PLAN VIEW

SIDE VIEW
SECTION A-A

1 INCH CRUSHED ROCK BASE

END VIEW
SECTION B-B

1 INCH CRUSHED ROCK BASE

3" x 6" MOUSE HOLE ONE ON EACH END

METER BOX COVER AND LID
PRODUCT NO. A6000484R

METER BOX PRODUCT NO. P6000485

STREETS: REV. DATE: 10/17 DETAIL: W-06.0
TRANS OPS: APPROVED:
FACILITIES: CITY ENGINEER
WATER RESOURCES: PUBLIC WORKS DIRECTOR
NOTES:

1. Meter box shall be non skid Polymer Concrete as Manufactured by:
   Armorcast Products Company,
   13230 Saticoy Street,
   North Hollywood, CA 91605,
   (818) 982-3600

2. Bottom of meter box shall rest firmly on a 12 inch thick bed of 1 inch crushed rock extending 6 inches beyond the outside walls of the meter box.
NOTES:

1. Water meter shall be approved by the Water Resources Division of Public Works Department.
2. All piping shall be of the same size as the meter.
3. All pipe in the street right-of-way shall be D.I.P. with mechanical joints and "MEGALUG" retainer glands or approved equal.
4. All ductile iron pipe, including valves and fittings shall be encased with a 8-mil. thick black polyethylene sheet and taped as specified in A.W.W.A. C-105/A21.5-99-PRINTED.
5. All fittings shall be epoxy lined.
6. Service line beyond the valve to the building is the responsibility of the property owner.
ARMORCAST COVER IN FOREST GREEN OR SANDSTONE (USE SANDSTONE UNLESS LOCATED IN VEGETATION) ARMORCAST P6002002 (36" x 20"Ø)

(2) 2" STREET ELLS AND FITTINGS AS REQUIRED TO CLEAR AIR VALVE. INSTALL SCREENED OUTLET.

MULTIPLEX CRISPEN UNIVERSAL AIR VALVE, OR COMBINATION AIR VALVE AND VAC 1" AND 2" THREADED, EPOXY LINED.

BRASS NIPPLE E-1900 SLOPE TO DRAIN

COPPER TUBING, TYPE "K", SAME SIZE AS AIR VALVE. 2' MIN. COVER. PROVIDE PROTECTIVE TAPE.

E-969 SADDLE (FOR PVC) E-979 SADDLE (FOR D.I.), C.C. THREAD FOR 1" AND 2" AIR VALVE

E-1548 WATER MAIN E-1930 (FOR 1" - 2") LOCATE ON TOP OF PIPE.

BOLT DOWN DETAIL

CLASS 520-C-2500 CONCRETE FOUNDATION PLACED ON NATIVE SOIL COMPACTED TO 90% MIN. RELATIVE DENSITY WITH (2) #3 BARS EACH WAY 18" LONG AT MID DEPTH. 30"x30"x4" 3/8"-16 UNC CARRIAGE BOLT STAINLESS STEEL 3/8"-16 UNC BOLT STAINLESS STEEL ANCHOR IN EPOXY 3" x 3" x 1/4" x 2" ANGLE 3/8" Ø HOLE, TYP. 3" x 3" MIN. TYP. SEE BOLT DOWN DETAIL.

FITTINGS AS REQUIRED 1" TUBING MAY BE BENT.

WRAP 10 MIL TAPE AROUND COPPER

E-1930-2" OR E-1531-1"

AIR/VACUUM VALVE 1-INCH AND 2-INCH
NOTES:
1. Meter box per Standard Detail W-06.1 without bottom. Meter box lid shall be skid resistant.
2. Use silver solder for all sweat joints.

2-INCH BLOW OFF WITH 1-INCH SERVICE
<table>
<thead>
<tr>
<th>MAIN SIZE</th>
<th>PRESSURE (PSI)</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot; OR LESS</td>
<td>0-300</td>
<td>6&quot;</td>
<td>6&quot;</td>
<td>12&quot;</td>
</tr>
<tr>
<td>10&quot;</td>
<td>0-150</td>
<td>6&quot;</td>
<td>6&quot;</td>
<td>12&quot;</td>
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<tr>
<td>10&quot;</td>
<td>150-300</td>
<td>6&quot;</td>
<td>8&quot;</td>
<td>15&quot;</td>
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<tr>
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<td>0-150</td>
<td>6&quot;</td>
<td>6&quot;</td>
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</tr>
<tr>
<td>12&quot;</td>
<td>150-300</td>
<td>6&quot;</td>
<td>10&quot;</td>
<td>18&quot;</td>
</tr>
</tbody>
</table>

*NOTE: THRUST COLLAR NOT TO BE INSTALLED ON P.V.C.*

**NOTES:**

1. Concrete thrust collar shall be placed solidly against firm undisturbed native soil with a soil bearing pressure not less than 1500 psf.

2. Concrete mix shall be CLASS 520-C-2500.

3. All reinforcing bars shall be No. 4.

4. Thrust collars in non-native soil shall be approved by the City Engineer before installation.
CONCRETE THRUST BLOCK NOTES:
1. Concrete mix shall be Class 520-C-2500.
2. Concrete placed against the pipe fitting shall not extend beyond the joints.
3. Concrete thrust blocks shall be installed to the dimensions and configurations as shown. Thrust Block Requirements table is designed for a test water pressure of 150psi and a soil bearing pressure of 2000 psf with a safety factor of 1.5. Thrust blocks for all other values for water pressure and soil bearing must use multiplier tables accordingly, see example below.
4. Concrete thrust blocks shall be placed solidly against firm undisturbed native soil. Soil bearing pressure of unsturbed native soil must be considered in design, see multiplier table below.
5. For configurations with multiple thrust blocks, required bearing area square footage values represent the cumulative total of all thrust block bearing areas.
6. The ratio of thrust block height (H) to length (L) shall be at minimum 1:2 and at maximum 1:1 (square), with preference toward 1:1.
7. All thrust blocks shall extend a minimum of 24” outward from the pipe. Exceptions for small sized thrust blocks may be made at Engineer’s discretion.
8. In locations where the water table is higher than the thrust block, special design is required.

THRUST BLOCK REQUIREMENTS (at 150psi water pressure and 2000psf soil bearing capacity):

<table>
<thead>
<tr>
<th>Pipe inner diameter (in.)</th>
<th>Horizontal Bends (required S.F. bearing area)</th>
<th>Vertical bends (required C.Y.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>90°</td>
<td>45°</td>
</tr>
<tr>
<td>4</td>
<td>2.0</td>
<td>2.9</td>
</tr>
<tr>
<td>6</td>
<td>4.2</td>
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<td>10.2</td>
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<tr>
<td>16</td>
<td>26.8</td>
<td>37.8</td>
</tr>
</tbody>
</table>

SOIL MULTIPLIERS: WATER MULTIPLIERS:

<table>
<thead>
<tr>
<th>Actual Soil Bearing (psf)</th>
<th>Multiplier</th>
<th>Actual Test Water Pressure (psi)</th>
<th>Multiplier</th>
</tr>
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<tbody>
<tr>
<td>1000</td>
<td>2.00</td>
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<td>0.67</td>
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<tr>
<td>1500</td>
<td>1.33</td>
<td>150</td>
<td>1.00</td>
</tr>
<tr>
<td>2000</td>
<td>1.00</td>
<td>200</td>
<td>1.33</td>
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<tr>
<td>2500</td>
<td>0.80</td>
<td>250</td>
<td>1.67</td>
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<tr>
<td>3500</td>
<td>0.57</td>
<td>350</td>
<td>2.33</td>
</tr>
</tbody>
</table>

EXAMPLE:
10” pipe, 90° bend, 250psi test water pressure, 1500psf soil bearing capacity:

From Thrust Block Requirements table, 10” pipe on a 90° bend requires 15.4 S.F. bearing area.

Adjust values using multiplier tables:

Required S.F. = (Table value)(Multiplier, 1500psf soil)(Multiplier, 250psi water)
= (15.4 S.F.)(1.33)(1.67)
= 34.2 S.F. required thrust block bearing area
NOTES:

Proper installation of the assembly is essential to the protection of the water supply. The following are important characteristics of a proper installation.

1. The assembly shall be installed in a horizontal position with a minimum clearance of 18 inches and maximum of 36 inches between the relief valve discharge port and floor or grade, and a minimum of 18 inches of horizontal clearance around the unit for access and ease of testing and maintenance of the relief valve.

2. A Reduced Pressure Assembly shall not be installed in a pit. Flooding of the pit can result in cross connection contamination.

3. Placement of the assembly should be planned where water discharged from the relief port will not be objectionable.

4. The assembly must be purchased and installed with resilient seat valves as approved by the University of California Foundation for Cross-Connection Control and Hydraulic Research (USC). CAUTION: Open and close resilient seated shut-offs slowly to prevent water hammer damage to the system and assembly.

5. Since the reduced pressure assembly is designed to be serviced while in line, the unit need not be removed from the line during servicing. Union connections between the shut-off valves are recommended for ease of removal for damaged units 2 inch and smaller.

6. Ensure the supply water pressure does not exceed the manufacturer's maximum water pressure rating of the assembly to avoid damage to the system or the assembly caused by system pressure. In addition, protection must be provided against thermal water expansion, extreme backpressure and/or water hammer.

7. Most field problems occur because dirt or debris present in the system at the time of installation becomes trapped in the first check seating area, resulting in continuous discharge from the relief valve in a static or backflow condition. THE SYSTEM SHOULD BE FLUSHED BEFORE THE ASSEMBLY IS INSTALLED. If debris is in the water system continues to cause fouling, a strainer can be installed upstream of the assembly.

8. Backflow assembly shall be lead free.
INDOOR INSTALLATION
TOP VIEW

INDOOR/OUTDOOR INSTALLATION WITH DETECTOR
TOP VIEW

OUTDOOR INSTALLATION
TOP VIEW

INDOOR/OUTDOOR INSTALLATION WITH DETECTOR
SIDE VIEW

12" MIN.
24" MAX.
AIR GAP DRAIN SHALL BE A
MINIMUM OF 2 TIMES THE
PIPE DIAMETER (1" MIN.)

SUPPORT 3"
AND LARGER
MAINTAIN APPROVED
AIR GAP DISTANCE

12" MIN.
24" MAX.
AIR GAP DRAIN SHALL BE A
MINIMUM OF 2 TIMES THE
PIPE DIAMETER (1" MIN.)

MAINTAIN APPROVED
AIR GAP DISTANCE

REDUCED PRESSURE PRINCIPLE ASSEMBLY
BACKFLOW PREVENTION ASSEMBLY (TYPE 1)
NOTES:

1. The Double Check Valve Assembly must be installed where it is accessible for periodic testing and maintenance.
2. PRIOR TO INSTALLING IN LINE, FLUSH SUPPLY LINE OF ALL FOREIGN MATERIAL. Failure to flush the lines completely may cause the checks to become fouled and require disassembly and cleaning.
3. The device shall only be installed per manufacturer's specifications.
4. When threading the device in line, place wrench only on ball valve hex ends. Keep pipe dope off interior surfaces of valve. On 2-1/2-inch and larger devices, DO NOT LIFT THE DEVICE WITH GATE VALVE HANDWHEELS OR STEMS. ALSO DO NOT SUPPORT DEVICE FROM ONLY ONE END.
5. After installation, fill device and bleed air from unit. Test to ensure proper operation. If either check fails to hold 1.0 PSI, it is most likely due to fouling. The cap must be removed and the seat and/or seat disc cleaned.
6. The device must be protected from freezing. Thermal water expansion and/or water hammer downstream of the backflow preventer can cause excessive pressure increases. Excessive pressure situations should be eliminated to avoid possible damage to the system and device.
7. All potable dedicated fire lines will be required to have double check detector check.
8. Any backflow prevention assembly installed overhead (5' or more) must have a permanent platform built for accessibility.
9. Refer to Uniform Plumbing Code (UPC) chapter 6, sections 603.00 thru 603.4.20 for more information.
DOUBLE DETECTOR CHECK ASSEMBLY
BACKFLOW PREVENTION ASSEMBLY (TYPE 2)
NOTES:

1. Assembly and installation shall conform to Standard Detail W-13.0.
2. Double check detector required on all potable dedicated firelines.
3. Side clearance shall be 12" minimum from back of backflow device to any wall or other obstruction.
4. Clearance from detector side of backflow assembly shall be a minimum of 24" from all obstructions.
5. Assembly must be installed as a unit.
6. Distance from grade to centerline of the #2 shut off valve shall be a maximum of 5 feet.
7. Minimum of 18" from grade to first flange of #1 shut off valve.
8. Assembly must be an approved assembly from USC list or equivalent.
NOTES:

1. Any variation from that shown must be approved by the City Public Works Inspector.

2. Sewer laterals shall maintain original slope.

3. PVC pipe shall be Class 200 P.V.C. pipe per AWWA C900.

4. Backfill shall be Class I as defined in Standard Detail 7-001.0 and shall be placed in accordance with ASTM D 2321.

5. Mechanical compression coupling shall be a band seal type repair with an outside stainless steel shear ring, "strong back" or approved equal by the Engineer.

MODIFICATION OF SEWER LATERAL OVER WATER MAIN

STREETS: REV. DATE: 11/12 DETAIL: W-14.0
TRANS OPS: APPROVED: KELF
FACILITIES: CITY ENGINEER
WATER RESOURCES: PUBLIC WORKS DIRECTOR
SECTION

2" DIAM. TYPE 'K' COPPER TUBING
(2) #6 METER BOXES, STACKED
BACKFILL UNDER BOX WITH PEA GRAVEL

J-1500 CORP STOP
45° TAP
RECLAIMED WATER MAIN

PLAN

RECLAIMED WATER FILL STATION

STREETS:  TRANS OPS:  APPROVED:
REV. DATE: 11/12  DETAIL:  W-15.0
FACILITIES:  CITY ENGINEER
WATER RESOURCES:  PUBLIC WORKS DIRECTOR
NOTES:

1. Downstream side of pressure type vacuum breaker may be maintained under pressure by a valve, but any backpressure by pump or other means is strictly prohibited.
2. PVB's (Pressure Vacuum Breakers) and SVB's (Spill-Resistant Vacuum Breakers) are designed to protect against back siphonage only; not backpressure.
3. PVB’s and SVB’s shall be installed where occasional water discharge caused by pressure fluctuations is acceptable.
4. PVB’s and SVB’s shall be installed a minimum of 12 inches above the highest downstream piping and/or outlets.
5. PVB’s and SVB’s shall always be installed above the 100 year flood level unless otherwise approved by Engineer or designee.
6. Provide minimum clearances for testing and repair.
ATMOSPHERIC TYPE VACUUM BREAKER

PLAN VIEW

NOTES:

1. Downstream side of atmospheric type vacuum breaker (AVB) shall not contain any means of shut off.
2. AVB's shall not be subject to any backpressure.
3. AVB's are for intermittent use only and shall not be pressurized for more than 12 hours in any 24 hour period.
4. AVB's shall not be installed where occasional dusty or corrosive conditions occur.
5. AVB's shall be installed a minimum of 6 inches above the highest downstream piping and/or outlets.
6. AVB's shall always be installed above the 100 year flood level unless otherwise approved by Engineer or designee.
AIR GAP SEPARATION

FLOAT CONTROL VALVE

SCREENED OUTLET DIAMETER = "D"

AIR GAP SHALL BE A MINIMUM OF 2 TIMES THE PIPE DIAMETER (1" MIN.)

TO NON-POTABLE WATER SYSTEM

PUMP AND MOTOR

OVERFLOW RIM

FLOAT

POTABLE WATER SUPPLY
NOTE: TAPE OVER THE OPENING WITH 10 MIL TAPE AFTER PIPING IS IN PLACE

\[ \frac{3}{4}\text{"} \text{COPPER PIPE} \]

POLE AND SHROUD ASSEMBLY TO BE SUPPLIED BY THE CITY

E1900 W
BALL VALVE \[ \frac{3}{4} \text{"} \]

18"

A MALE THREAD ADAPTER

5 1/2"

3/4" TYPE "K" COPPER TUBING

INSTALL 90° WROUGHT COPPER ELL (TYP.)

OPTIONAL:
WHEN TYING OVER 3/4-INCH COPPER SERVICE, USE A MUELLER BRASS REDUCER, H-15480, CORPORATION STOP THREAD BY FLARE COPPER PIPE WITH COMPRESSION RING OR WROUGHT COPPER COUPLING WITH 15% SILVER SOLDER FOR 3/4-INCH AND 1-1/2-INCH SERVICE.

INSTALL E-1529 BRONZE COUPLING OR WROUGHT COPPER COUPLING WITH 15% SILVER SOLDER WHEN NECESSARY TO SPLICE TUBING

1" E-1930 CORP. STOP

45° TAP

HORIZONTAL TAP

WATER MAIN

NOTE: USE HORIZONTAL TAP WHEN AN ADJACENT SERVICE IS WITHIN 24"

WATER SAMPLE STATION SERVICE LINE

STREETS:

TRANS OPS:

REV. DATE: 8/17

APPROVED:

FACILITIES:

DETAIL: W-19.0

WATER RESOURCES:

PUBLIC WORKS DIRECTOR
WATER SAMPLE STATION
LAYOUT AND ELEVATION

SHROUD AND POST TO BE PROVIDED BY THE CITY
POWDER COATED STAINLESS STEEL (MALAGA GREEN)
PROTECT WHILE HANDLING

CUT HOLE FOR PIPE

18"

20" DIAMETER x 24" DEEP
CONCRETE

20" DIAMETER CONCRETE

PAINTED ALUMINUM
PROTECT WHEN HANDLING

1 1/2" PVC DRAIN
FROM CURB FACE

18"

4" O.D.
DIAMETER POST

COVER CONCRETE
WITH SURFACE
TO MATCH EXISTING

1 1/2" PVC DRAIN
FROM POLE THROUGH CURB FACE

2"x3" WINDOW
FOR COPPER PIPE

SET SCREWS

24" DEEP

1/2"

4"

3"

8"

1/2"

7"

1 1/2"

IF NO CURB, DELETE DRAIN

SERVICE LINE

ANGLE STOP

7"

REV. DATE: 8/17  DETAIL: W-19.0
WATER SAMPLE STATION
DISPENSING UNIT

FAUCET AND LOCK TO BE SUPPLIED BY CITY

SUPPORT TAB

3/8" COMPRESSION FITTINGS

3/8" COPPER FEED LINE TO BE SUPPLIED BY CITY

1/2" SOFT COPPER PIPE

90° EL COMPRESSION X THREAD

1/2" DIAMETER MALE THREAD ADAPTER

3/8" X 3/8" COMPRESSION FITTING ELBOW

STREETS:

TRANS OPS:

FACILITIES:

WATER RESOURCES:

REV. DATE: 8/17

DETAIL: W-19.0

APPROVED:

GEO. ENGINEER

PUBLIC WORKS DIRECTOR
## UNDERGROUND UTILITIES

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**SOURCES:**

STREETS: 

TRANS OPS:  

FACILITIES:  

WATER RESOURCES:  

**REV. DATE:** 11/12  

**DETAIL:** U-00.0  

**APPROVED:**  

CITY ENGINEER:  

PUBLIC WORKS DIRECTOR:
TRENCH BEDDING AND BACKFILL NOTES:

1. Improvements constructed under this Standard Detail shall conform to applicable provisions of the Standard Specifications for Public Works Construction, current edition.
2. Trench width shall be as shown, unless otherwise specified on plans.
3. Pipe zone bedding material shall be sand with a sand equivalent greater than 50.
4. Backfill shall have a maximum of 8-inch lifts and meet the requirements of one of the following:
   a. Crushed Aggregate Base;
   b. Crushed Miscellaneous Base;
   c. Backfill material with a sand equivalent greater than 50.
5. The Engineer shall approve all backfill material prior to backfilling trench. Contractor must submit sand equivalent tests, per ASTM D2419, for all backfill and bedding, both native and imported, and identify the source of the material.
6. Bedding and backfill shall be compacted mechanically. Compaction by flooding, ponding, or jetting shall not be permitted.
7. Compaction Test, per ASTM D1557, current revision, will be required by the Engineer at various depths in the trench, at intervals not to exceed 250 feet. All tests shall be paid for by the Contractor, and performed by a laboratory approved by the City, unless otherwise specified.
8. A continuous length of 3-inch wide detectable tape, Terratape or approved equal, shall be placed in a direct line over all pipe, as shown. Tape color shall be blue for water, green for sewer, yellow for electrical, and purple for reclaimed water.
9. The roadway structural section shall be of the same material and thickness as existing, but shall meet minimum pavement depth requirements of Standard Detail U-01.2.
10. New concrete shall be doweled into existing concrete streets according to the following:
    - New #4 reinf. bar @ 32" on center (O.C.) along longitudinal joints
    - New #4 reinf. bar @ 12" O.C. along transverse joints
    - First dowel shall be placed 6" from edge of new concrete panel
    - Dowels shall be placed at ½ of the concrete pavement depth and centered between two connecting panels
    - When doweling into existing concrete street along longitudinal joints, drill ½" diameter by 9" long hole in existing cement concrete. If using pre-coated epoxy dowels, follow manufacturer's specifications for hole size and installation.
    - When doweling into existing concrete street along transverse joints, drill ¾" diameter by 6" long hole in existing cement concrete. If using pre-coated epoxy dowels, follow manufacturer's specifications for hole size and installation.
    - All reinforcing bar installed shall be green epoxy coated.
    - Use chemical adhesive to bond reinforcing bar to existing concrete pavement.
11. Asphalt concrete shall be laid in courses not exceeding 4 inches in thickness. Asphalt concrete shall be Class C2 Grade PG 64-10 for finish courses and Class B Grade PG 64-10.

TRENCH BEDDING AND BACKFILL NOTES

STREETS:

REV. DATE: 11/12 DETAIL: U-01.0

TRANS OCS:

APPROVED: W. Yell

FACILITIES:

CITY ENGINEER

WATER RESOURCES:

PUBLIC WORKS DIRECTOR

City of Berkeley
Department of Public Works

[Signatures]
TRENCH BEDDING AND BACKFILL

TYPICAL SECTION

ROAD STRUCTURAL SECTION
SEE U-01.2 & U-01.3 FOR MATERIAL AND SAWCUTTING DETAILS

FINISH SURFACE

DETECTABLE TAPE TO BE PLACED A MINIMUM OF 6" TO A MAXIMUM OF 12" BELOW THE STRUCTURAL ROAD SECTION

TRENCH ZONE BACKFILL SHALL BE 1-SACK CONCRETE SLURRY FOR TRENCHES UNDER 100 FT. IN LENGTH. EXCEPTIONS MUST BE AUTHORIZED BY THE CITY ENGINEER. ALL OTHER TRENCHES SHALL USE ONE OF THE BACKFILL OPTIONS LISTED IN NOTE 4, DETAIL U-01.0 COMPACTED TO TO 95% RELATIVE COMPACTION.

PIPE ZONE COMPACTED TO 95% RELATIVE COMPACTION

1/4" OF I.D. OR 4" MIN. BEDDING

6" MIN. 12" MAX.

VARIES

NOT FOR HDPE

NON-METALLIC WATER PIPES ONLY: 12 GAUGE INSULATED COPPER WIRE.
STRIP WIRE AND WRAP AROUND EACH COPPER SERVICE FOR DIRECT CONTACT. TAPE WIRE ON PIPE EVERY 10 FEET.

12" MIN.
A.C. OVER CONCRETE

CONCRETE OVER AGGREGATE BASE

NOTES:

1. Full tack coat on all vertical and horizontal surfaces.
2. Width of the trench "T" varies due to site conditions; exact width shall be determined by the engineer or City inspector.
**A.C. OVER AGGREGATE BASE**

**OPTION 1**

**A.C. OVER AGGREGATE BASE**

**OPTION 2**

**NOTES:**

1. Full tack coat on all vertical and horizontal surfaces.
2. Option 1 and Option 2 are both acceptable for existing conditions of A.C. over aggregate base (A.B.)
3. Width of trench "T" varies due to site conditions; exact width shall be determined by the engineer or City inspector.
4. To determine functional classification, see CA Road System Maps located at http://dot.ca.gov/hq/tsip/hseb/crs_maps/

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TABLE A: A.C. DEPTH

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TRENCH PAVING REQUIREMENTS

2 OF 2
NOTES:
1. Concrete shall be Class 450-C-2000 per Standard Specifications for Public Works Construction unless otherwise specified.
2. Support blocks may be of concrete block or brick.
3. Cradle and encasement to be placed on native undisturbed soil, or as directed by the City Engineer or his/her designee.
NOTES:
1. The "California Waterworks Standards" sets forth the minimum separation requirements for water mains and sewer lines. These standards, contained in Section 64630, Title 22, California Administrative Code, specify:
   a. Parallel Construction: The horizontal distance between pressure water mains and sewer lines shall be at least 10 feet.
   b. Perpendicular Construction (Crossing): Pressure water mains shall be at least 4-inches per U-03.1 above sanitary sewer lines where these lines must cross.
   c. Separation distances specified above shall be measured from the nearest edges of the facilities.
   d. Water mains and sewer lines shall be installed in different trenches with appropriate separation.
2. When local conditions, such as available space, limited slope, existing structures, etc., create a situation where there is no alternative but to install water mains or sewer lines at a distance less than that required by these Standards, Detail U-03.1 shall be followed. These Standards are applicable under normal conditions for sewage collection lines and water distribution mains. More stringent requirements may be specified by the engineer if conditions such as high groundwater exist.
3. Sewer lines shall not be installed within 25 feet horizontally of a low head (5 psi or less pressure) water main.
4. New water mains and sewers shall be pressure tested where the conduits are located ten feet apart or less.
5. In the installation of water mains or sewer lines, measures should be taken to prevent or minimize disturbances of the existing line. Disturbance of the supporting base of this line could eventually result in failure of this existing pipeline.
6. Special consideration shall be given to the selection of pipe materials if corrosive conditions are likely to exist. These conditions may be due to soil type and/or the nature of the fluid conveyed in the pipe, such as a septic sewage which produces corrosive hydrogen sulfide.
7. Sewer Force Mains:
   a. Sewer force mains shall not be installed within ten feet (horizontally) of a water main.
   b. When a sewer force main must cross a water line, the crossing should be as close as practical to the perpendicular. The sewer force main should be at least one foot below the water line.
   c. When a new sewer force main crosses under a existing water main, all portions of sewer force main within ten feet (horizontally) of the water main shall be enclosed in a continuous sleeve.
   d. When a new water main crosses over a existing sewer force main, the water main shall be constructed of pipe materials with a minimum rated working pressure of 200 psi or equivalent pressure rating.
SEWER MAIN CONSTRUCTION

PARALLEL CONSTRUCTION

If a sanitary sewer is to be located within 10 feet of a water main or service lateral within any of the indicated zones, sewer construction will be required as shown.

PERPENDICULAR CONSTRUCTION

If sanitary sewer or house sewer lateral crosses a water main or service lateral within any of the indicated zones, sewer construction will be required as shown.

ZONE SPECIAL CONSTRUCTION REQUIRED FOR SEWER

A
Sewer lines parallel to water mains shall not be permitted in zone A without approval from the responsible health agency and the City of Santa Barbara's Water Purveyor.

B
A sewer line placed parallel to a water line in zone B shall be constructed of one of the following:
1. Plastic sewer pipe with rubber ring joints (per ASTM D3034) or equivalent.

C/D
A sewer line crossing a water main zone C or D shall be constructed of:
1. A continuous 20 foot section of Class 200 (DR 14 per AWWA C900) plastic pipe or equivalent, centered over the pipe being crossed.
2. P.V.C. or P.E. sewer pipe within a continuous sleeve.
WATER MAIN CONSTRUCTION

ZONE SPECIAL CONSTRUCTION REQUIRED FOR WATER

A
No water main parallel to sewers shall be constructed in zone A without approval from the responsible health agency and the City of Santa Barbara's Water Purveyor.

B/C/D
If the sewer paralleling the water main does not meet the zone B, C, or D requirements, the water main shall be constructed of one of the following:

1. Ductile iron pipe with hot dip bituminous coating
2. Class 200 pressure rated plastic water pipe (DR 14 per AWWA C900) or equivalent.
3. Class 200 HDPE

NOTE: This construction criteria applies to private sewer laterals that cross above a pressure water main but not to those private sewer laterals that cross below a pressure main.

WATER-SEWER SEPARATION REQUIREMENTS
WATER MAIN CONSTRUCTION

STREETS: REV. DATE: 11/12 DETAIL: U-C3.2
TRANS OPS: APPROVED: 
FACILITIES: CITY ENGINEER
WATER-RESOURCES: PUBLIC WORKS DIRECTOR
ZONES:

1. Utilities shall be installed with a minimum distance of 3' from city piping unless approved by the City of Santa Barbara’s Water Purveyor.

2. No utility crossings shall be installed within 1' of city piping. No exceptions shall be approved.

3. Except for crossing, no utilities shall be installed above or below city piping. No exceptions shall be approved.

NOTE: It is the obligation of the contractor to protect at all times the integrity of city piping and trenches, at any proximity.

SEPARATION ZONES