SAN DIEGO AREA

CHRISTIANSEN

REGIONAL

STANDARD

DRAWINGS

STANDARD DRAWINGS FOR AGENCIES IN THE SAN DIEGO REGION

Recommended by the Regional Standards Committee
Maintained and Published by the San Diego County
Department of Public Works
October, 1982
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Concrete consisting of portland cement, concrete aggregate, sand and water is designated in these Standard Drawings by a symbol consisting of a number, a letter and a number; for example, 560-C-3250. The first number is the weight of cement in pounds per cubic yard, the last number is the compressive strength at twenty-eight days and the letter indicates the grading of the aggregate. This designation is in the STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, published by the Building News, Incorporated.

The concrete designations as shown on the following drawing are changed as follows:

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Footings sizes are based on 1000 lb. per square foot maximum soil bearing value.

NOTES:
1. When wall Type II is required, the first four courses of block, regardless of wall height, shall consist of 12" wide masonry units.
2. Horizontal Steel — Two #3 bars shall be placed longitudinally in the footing as shown. One #3 bar or ladder mesh shall be placed longitudinally in the mortar joint every 16 inches as the blocks are laid up.
3. See Standard Drawing C-7.1 for additional requirements.
NOTES:
1. Footing sizes are based on 1000 lbs. per square foot maximum soil bearing value.
2. Wall height is measured from the top of the footing to the top of the wall.
3. Walls shown in the table above, must be designed specifically for the existing condition.
4. See Standing Drawing C-7.1 for additional requirements.
5. When wall Type V is required, the lower 16" of wall height is required to consist of 12" width masonry units.
6. Horizontal Steel: # 3 bars shall be placed longitudinally in the footing as shown.
   # 3 bars or ladder mesh shall be placed longitudinally in the mortar joint every sixteen inches as the blocks are laid up.

Wall Height | Wall Type | H | Footing W | Key Size | "A" Bars | "B" Bars
--- | --- | --- | --- | --- | --- | ---
1'- 4" | III | 3" | 1'- 6" | None | # 3 @ 32" o/c | None
2'- 0" | III | 3" | 1'- 0" | None | # 3 @ 24" o/c | None
2'- 3" | III | 3" | 2'- 0" | None | # 3 @ 24" o/c | # 3 @ 48" o/c
3'- 4" | III | 3" | 2'- 3" | None | # 3 @ 24" o/c | # 3 @ 48" o/c
4'- 0" | III | 3" | 2'- 6" | None | # 3 @ 16" o/c | # 3 @ 32" o/c
4'- 8" | IV | 8" | 3'- 6" | None | # 4 @ 24" o/c | # 4 @ 24" o/c
5'- 4" | IV | 8" | 4'- 0" | 6" x 6" | # 4 @ 16" o/c | # 4 @ 24" o/c
6'- 0" | V | 8" | 4'- 6" | 8" x 8" | # 4 @ 24" o/c | # 4 @ 24" o/c
6'- 8" | V | 1'-1" | 5'- 0" | 8" x 8" | # 4 @ 16" o/c | # 4 @ 16" o/c
8'- 0" | V | 1'-8" | 5'- 2" | 12" x 12" | # 5 @ 16" o/c | # 4 @ 16" o/c

SAND DIEGO REGIONAL STANDARD DRAWING
MASONRY RETAINING WALL
TYPES III IV & V
(LEVEL BACKFILL)
INSPECTIONS

Call for inspections as follows:

A. When the footing has been formed, with the steel tied securely in final position, and is ready for the concrete to be placed.

B. Where cleanout holes are not provided:
   (1) After the blocks have been laid up to a height of 4', or full height for walls up to 5', with the steel in place but before the grout is poured, and...
   (2) After the first lift is properly grouted, the blocks have been laid up to the top of the wall with the steel tied securely in place but before the upper lift is grouted.

Where cleanout holes are provided:
After the blocks have been laid up to the top of the wall, with the steel tied securely in place, but before grouting.

C. After grouting is complete and after rock or rubble wall drains are in place but before earth backfill is placed.

D. Final inspection when all work has been completed.

CONCRETE GROUT AND MORTAR MIXES
Concrete grout and mortar mixes shall be as specified in the "Standard Specifications For Public Works Construction".

All cells shall be filled with grout. Rod or vibrate grout within 10 minutes of pouring to insure consolidation. Bring grout to a point 2" from the top of masonry units when grouting of second lift is to be continued at another time.

MORTAR KEY
To insure proper bonding between the footing and the first course of block, a mortar key shall be formed by embedding a flat 2 x 4 flush with and at the top of the freshly poured footing. The 2 x 4 should be removed after the concrete has started to harden (approximately 1 hour).

A mortar key may be omitted if the first course of block is set into the fresh concrete when the footing is poured, and a good bond is obtained.

FENCING
Safety fencing shall be installed at top of the wall as required by the Agency.

WALL DRAINS
Wall drains shall be provided at 6 foot intervals along the length of the wall and located at the level of the bottom course of block.
The drains shall be 4" in diameter, formed by placing a block on its side, or leaving out every head joint in the first course of block.
Backfill behind wall drains or open head joints shall be loose rubble or gravel.

SOIL
All footings shall extend at least 12" into undisturbed natural soil or approved compacted fill. Soil should be dampened prior to placing concrete in footings.

STEEL LAP
When one continuous bar cannot be used, a lap or splice of thirty bar diameters shall be used.

CONCRETE
Footing concrete shall be 560-C-3250, using B aggregate when placing conditions permit.

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<th>By</th>
<th>Approved</th>
<th>Date</th>
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<td>10-67</td>
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SAN DIEGO REGIONAL STANDARD DRAWING

GENERAL NOTES FOR MASONRY RETAINING WALLS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

DRAWING NUMBER C-71
TYPE-A WALL
(Applicable for all types of backfill loadings)

TYPE-B WALL

TYPE-C WALL

1 1/2 : 1 Slope Unlimited

OR

2’ Level Surcharge (Vehicle Traffic)

1” Chamfer

1” Chamfer

H/2 + 10”

H/2

Level Surface

There shall be no loadings extending above top of wall within a distance equal to height of the wall.

Expansion joint @ 30’ 0” ± centers (max) and/or @ each step.

Top of wall

Finished Ground Line

Level Reference

TYPICAL ELEVATION

NOTE
See Standard Drawing C-10 for Section A-A, notes and details.
CONCRETE
Concrete shall be [564 - C - 3000].

DESIGN CONDITIONS
Walls are to be used for the loading conditions shown for each type wall. Design H may be exceeded by six inches before going to next size.

DESIGN DATA
F_c = 1200 psi  F'_c = 3000 psi
Earth = 120 pcf and equivalent fluid pressure = 28 psf per foot of height

Walls shown for 1 1/2:1 unlimited sloping surcharge are designed in accordance with Rankine's Formula for unlimited sloping surcharge with g = 30° 42'.

Note: Maximum toe pressure under wall footing = 1 1/2 tons. Special design required where footing material is incapable of supporting this pressure.

EXCAVATION AND BACKFILL
Compaction of backfill material by jetting or ponding with water will not be permitted.

Each layer of backfill shall be moistened as directed by the Engineer and thoroughly tamped, rolled or otherwise compacted until the relative compaction is not less than 90 percent.

No backfill material shall be deposited against concrete retaining walls until the concrete has developed a strength of 2,500 pounds per square inch in compression as determined by test cylinders, or until 28 days after wall has been placed.

TYPICAL DRAINAGE
WHEN H IS GREATER THAN 4'-0''

1/2'' Expansion joint, fill with premolded expansion joint filler. Locate joints at 30'-0'' ± centers or as directed by the Engineer.

1/2'' chamfer

Water stop, use only when watertight joint is required, see water stop detail.

SECTION A-A

Embedment 2 3/8'' min.

Split permitted

3/4'' dia.

3/8''

RUBBER WATERSTOP
Use only when watertight joint is required.

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SAN DIEGO REGIONAL STANDARD DRAWING

GENERAL NOTES AND DETAILS
FOR GRAVITY RETAINING WALLS

RECOMMENDED BY "THE SAN DIEGO REGIONAL STANDARDS COMMITTEE" 

DRAWING NUMBER C-10

Revision  By  Approved  Date

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DRAINAGE SYSTEMS
NOTES:
1. See Standard Drawings D-11 & D-12.1 for additional notes and details.
2. Types are designated as follows: (no wing) A, (one wing) A-1, (two wings) A-2.
3. Exposed edges of concrete shall be rounded with a radius of 1/2".
5. Concrete gutter to match adjacent gutters.
6. An expansion joint shall be placed at the ends of the inlet where the curb is to adjoin.
7. Provide 1/4" tooled groove in top slab in line with back of adjacent curb.
8. Surface of top slab shall be smooth to drain toward street at a slope of 1/4° per foot.
9. Maintain 1 1/2" clear spacing between reinforcing and surface unless otherwise noted.

SECTION C-C

SECTION A-A

LEGEND ON PLANS
15' Type A-1 inlet

SAN DIEGO REGIONAL STANDARD DRAWING
CURB INLET - TYPE A

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

DRAWING NUMBER D-1.1
NOTES:
1. See Standard Drawings D-11 & D-12.1 for additional notes and details.
2. Types are designated as follows: (no wing) B, (one wing) B-1, (two wings) B-2.
3. Exposed edges of concrete shall be rounded with a radius of 1/2”.
4. When V exceeds 4” steps shall be installed, See Standard Drawing D-11 for details.
5. Concrete gutter to match adjacent gutters.
6. An expansion joint shall be placed at the ends of the inlet where the curb is to adjoin.
7. Provide 1/4” tooled groove in top slab in line with back of adjacent curb.
8. Surface of top slab shall be sidewalk finished to drain toward street at a slope of 1/4” per foot.
9. Maintain 1 1/2” clear spacing between reinforcing and surface unless otherwise noted.

LEGEND ON PLANS
15’ Type B-1 inlet

SAN DIEGO REGIONAL STANDARD DRAWING
CURB INLET - TYPE B
NOTES:
2. Types are designated as follows: (no wing) C, (one wing) C-1, (two wings) C-2.
3. Exposed edges of concrete shall be rounded with a radius of 1/2".
5. Concrete gutter to match adjacent gutters.
6. An expansion joint shall be placed at the ends of the inlet where the curb is to adjoin.
7. Provide 1/4" tooled groove in top slab in line with back of adjacent curb.
8. Surface of top slab shall be sidewalk finished to drain toward street at a slope of 1/4" per foot.
9. Maintain 1 1/2" clear spacing between reinforcing and surface unless otherwise noted.
10. Where inlet is to be constructed on grade and Standard Drawing D-20 concrete apron is required,
    lift down-grade end of grate as shown on D-20.
11. When G-1 & G-2 grates are used place 3"-5.7 lb. steel i-beam, 3.5’ long.

SLOPE floor 12:1
towards outlet
DIMENSIONS

T = 8" if V is less than 8'.
T = 10" if V is 8" or more.
V = 5" unless otherwise specified.
V = 6" unless otherwise specified.
W = 7" unless otherwise specified.
W = 5" unless otherwise specified.
Width of driveway, W, shall be
10" unless otherwise specified.
Elevation of point N shall be
13" below point K unless otherwise
specified.

PLAN

W

D

Weakened Plane Joint

SECTION E--E

Weakened Plane Joint

Straight Grade

SECTION C--C

NOTES

1. Steel Plate should be of one continuous
piece with curve portion a circular arc.
Length = Width + 18" + circular arc.
2. # 4 rebar 30" long, 1" O.C. shall be
installed in top of walls for ties to top
and gutters.
3. The reinforcing steel in the top slab
shall be # 3 bars 6" O.C. unless otherwise
specified. Clearance shall be 1 1/2" from
the bottom of the slab.
4. Concrete for the inlet too to be placed
at the same time as the s/w curb and
 gutter.
5. Concrete shall be 564 - C - 3000.
6. Exposed edges of concrete shall be rounded
with a radius of 1/2".
7. Surface of top slab shall be sidewalk finished
to drain toward street at a slope of 1/4" per foot.

TABLE A

<table>
<thead>
<tr>
<th>PT</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>K</th>
<th>M</th>
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<tr>
<td>F.C.</td>
<td>4½&quot;</td>
<td>5¼&quot;</td>
<td>6&quot;</td>
<td>7½&quot;</td>
<td>9&quot;</td>
<td>9&quot;</td>
<td>9&quot;</td>
<td>9&quot;</td>
<td>8&quot;</td>
<td></td>
</tr>
</tbody>
</table>

SECTION A--A

1" support bolt, see Detail A
on drawing D-5.
NOTES
1. A plain, round steel protection bar 1" in dia. shall be installed. Bar shall be embedded 5" at each end.
2. Leave 8" hole blocked out in bottom placing of concrete for bolts placed at same time as gutter.
3. All exposed metal parts shall be galvanized.
4. All galvanizing damaged by welding shall receive two coats of aluminum paint.
5. Support bolts shall be spaced at not more than 5' O.C.
6. Adjusting nuts to be tightened and secured in place when steel plate is in proper position.

SECTION A-A MODIFIED

Curb Inlet - Type D (Details)
NOTES
2. When V exceeds 4', steps shall be installed. See Standard Drawing D-11 for details.
3. Exposed edges of concrete shall be rounded with a radius of 1/2''.
4. Maintain 1 1/2'' clear spacing between reinforcing and surface.
5. Type E inlet to be used only with rolled curb. See Standard Drawing G-4.1
6. Transition 10'' to curb Section B-B at inlet, both sides.

LEGEND ON PLANS
# 4 @ 6" both ways

Rounded pipe ends
See drawing D-61

Elev shown on plans
11" unless shown otherwise on plans

4 - # 4 around pipes

Slope floor 12:1 towards outlet

SECTION A-A

SECTION B-B

4 - # 4 around opening

2'

PLAN

NOTES
2. When V exceeds 4" steps shall be installed. See Standard Drawing D-11 for details.
3. Exposed edges of concrete shall be rounded with a radius of 1/2".
4. Openings on both sides unless otherwise shown on plans.
5. Maintain 1 1/2" clear spacing between reinforcing and surface.

LEGEND ON PLANS

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SAN DIEGO REGIONAL STANDARD DRAWING

CATCH BASIN - TYPE F

DRAWING NUMBER D-7.1
NOTES
2. When V exceeds 4", steps shall be installed. See Standard Drawing D-11 for details.
3. Maintain 1 1/2" clear spacing between reinforcing and surface.
4. Increase in allowable depth subject to approval by Agency.
5. Section A-A shows 3 sizes and shall not imply that an interior wall is to be built for the structures with double or triple frame and grate.
6. Exposed edges of concrete shall be rounded with a radius of 1/2".
8. Only end bearing grates shall be used, Types G-3 and G-4. See Standard Drawing D-14.1 and D-15.1

For frame and grate details, see dwgs. D-13, D-14.1, D-15.1

ELEVATION

SECTION A-A

LEGEND ON PLANS

CATCH BASIN - TYPE G
NOTES
2. Concrete base shall be SJECA - C - 3000.
3. All precast components shall be reinforced with 1/4" diameter steel, wound spirally on 4" centers.
4. All joints shall be set in Class C mortar.
5. Maintain 1 1/2" clear spacing between reinforcing and surface unless otherwise noted.
6. Exposed edges of concrete shall be rounded with a radius of 1/2"

LEGEND ON PLAN:
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SAN DIEGO REGIONAL STANDARD DRAWING
STORM DRAIN CLEANOUT - TYPE A
DRAWING NUMBER D-9
NOTES
2. All joints shall be set in Class C mortar.
3. All precast components shall be reinforced with 1/4" diameter steel wound spirally on 4" centers.
4. Maintain 1 1/2" clear spacing between reinforcing and surface.
5. Concrete base shall be 564 - C - 3000.
6. Exposed edges of concrete shall be rounded with a radius of 1/2".
NOTES
1. Concrete shall be 564 - C - 3000 unless otherwise noted.
2. Reinforcing steel shall comply with this drawing unless otherwise specified.
3. Reinforcing steel shall be intermediate grade deformed bars conforming to latest ASTM specifications.
4. Bends shall be in accordance with latest A.C.I code.
5. Minimum splice length for reinforcing shall be 30 diameters.
6. Floor shall have a wood trowel finish and, except where used as junction boxes, shall have a minimum slope of 1” per foot toward the outlet.
7. Depth V is measured from the top of the structure to the flowline of the box.
8. Wall thickness and reinforcing steel required may be decreased in accordance with table above.
9. Wall thickness shall be stepped on the outside of the box.
10. When the structure depth V exceeds 4’, steps shall be cast into the wall at 15 inch intervals from 15” above floor to within 12 inches of top of structure. Where possible place steps in wall without pipe opening, otherwise over opening of smallest diameter.
11. Alternate step may be an approved steel reinforced polypropylene step.
NOTES:
1. Face angle shall be cast into structure continuous for the full length "L".
2. All exposed metal parts to be hot-dipped galvanized after fabrication.
3. When curb inlet opening height (H) exceeds 10", install 1" # steel protection bar.
4. Install additional bars at 3 1/2" clear spacing above first bar when opening exceeds 13".
5. When curb inlet opening length exceeds 8' install 1" # steel support bolts, spaced at not more than 5' o.c.
NOTES:
1. Hot dip galvanize all parts after fabrication.
2. Dimensions to Centerline of bars unless otherwise noted.
3. Type G-1 and G-2 grates are not to be used in areas subject to bicycle traffic.
NOTES:
1. Hot dip galvanize all parts after fabrication.
2. Dimensions to Centerline of bars unless otherwise noted.
3. Weight: 141 lbs.
Punch 1" hole in CSP. Place pipe so bars of grate will be parallel with main surface flow.

SECTION A-A

TYPE A

SECTION C-C

TYPE B

NOTES
1. All components shall be galvanized.
2. Inlet and outlet pipes shall be set at factory and positioned as shown on plans.
3. Ladders and Steps: None required where "H" is 3'-6" or less. Where "H" is between 3'-6" and 4'-11" place one step 16" above the floor. If "H" is 5'-0" or more install a ladder placing the lowest rung 16" above the floor and the highest rung not more than 14" below top of inlet. Place single step or ladder in wall without wall opening.
5. Grate to be provided when specified.
6. Grate detail shall be as shown on drawing D-17 unless otherwise approved by Agency.

SAN DIEGO REGIONAL STANDARD DRAWING

CORRUGATED STEEL PIPE INLETS
TYPES A AND B

Revised By Approved Date

Notes

Drawing Number D-16
GRATE DETAILS

ALTERNATIVE CAST NODULAR IRON GRATE OR CAST STEEL

GRATE BAR SPACING TABLE

<table>
<thead>
<tr>
<th>Type</th>
<th>No. Bars</th>
<th>Clear Bar Spacing</th>
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<th>1½&quot; Spacing</th>
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<td>13/16</td>
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<td>Cast</td>
<td>13</td>
<td>2</td>
<td>2 1/8</td>
<td>3 1/8</td>
</tr>
</tbody>
</table>

CROSS BAR DETAIL
GRATE (WELDED STEEL)

CROSS BAR DETAIL
ALTERNATIVE CAST NODULAR IRON GRATE OR CAST STEEL GRATE

STEP DETAIL
H = 3' - 8" to 4' - 11"

LADDER DETAIL
H = 5' - 0" or GREATER

Corrugated Steel Pipe Inlets Details
NOTES

1. Drain seams may be riveted or resistance spotwelded at equal centers, continuous helical lock seam or helical welded seam.

2. Each drain section shall be assembled with standard coupling bands.

3. Cross bar spacer of grate shall be pressure fusion or plug welded to bearing bars in such a manner as to develop the strength of the cross bar spacer.

4. Cross bar spacer (Section E–E) may differ from that shown provided section area is equal or greater.

5. Grate material shall be a weldable grade of steel complying to the requirements of ASTM A 36.

6. The maximum variance from a straight line from the extreme top corners of the bearing bar shall be 1/2" in 20 feet.

7. Installation lengths shall be 10 feet or multiples thereof.

8. Either field joint sealed with a pliable mixture of sand, portland cement and emulsified asphalt (Mixture of 1 part portland cement, 3 - 5 parts sand and 1 1/2 parts SSI emulsified asphalt), or continuous weld.
C.S.P. Slotted Drain

6"

Grate

SECTION A-A

CATCH BASIN

C.S.P. INLET

4"

finish grade

1" ± max

SECTION B-B

ALTERNATE SECTION B-B

INLETS

NOTES
1. Either field joint with a pliable mixture of sand, portland cement and emulsified asphalt (mixture of 1 part portland cement, 3 - 5 parts sand, and 1 1/2 parts SS1 emulsified asphalt), or continuous weld.
2. See Standard Drawing D-18 for additional notes and details.

SAN DIEGO REGIONAL STANDARD DRAWING
SLOTTED DRAIN CONNECTIONS TO STANDARD INLETS

DRAWING NUMBER D-19
NOTES:
1. Curb and apron to be placed monolithically.
2. Use of false header at valleys and slope break line is optional.
3. Extend vertical steel from inlet structure into concrete apron as required.
4. Screed Direction
5. Concrete shall be 517-C-2500.

LEGEND ON PLANS
NOTES
1. A.C. spillway may be used when fill is 10' or less, and where fill slope is 1/1.2/1 or flatter.
2. Use 10' min. length of gutter transition on each side of drain at in sag condition.

SECTION A-A
NOTE
Cross-sectional area of ditch may be rounded, or trapezoidal.

SECTION B-B

ALTERNATE SECTION B-B

LEGEND ON PLANS
sag cond.
NOTES
1. Downdrain flume may be used where fill slope is
   1 1/2 : 1 or flatter.
2. Use 10' min length of gutter transition on each side
   of downdrain in sag location.
3. All metal parts to be galvanized after fabrication.
SECTION A-A

PLATE DETAIL

Dimensions to be as tabulated below for Assembly:

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<tr>
<th>Dia</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
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<td>28&quot;</td>
<td>34&quot;</td>
<td>5&quot;</td>
<td>9&quot;</td>
<td>20&quot;</td>
<td>12&quot;</td>
</tr>
</tbody>
</table>

NOTES
1. All metal parts for anchor assemblies shall be galvanized after fabrication.
2. One anchor assembly required per length of pipe. When final length exceeds 10 ft, two anchors shall be required.

LEGEND ON PLANS

Sag Cond.
NOTES
1. Concrete shall be 564-C-3000.
2. D=inside diameter of pipe or depth of channel.
3. Section to be sloped laterally with top conforming to the
   grades of the existing sidewalk and curb.
4. Manhole frame and cover may be deleted with open channel.
5. Trowel finish top surface and reproduce markings of existing sidewalk and curb.
6. Trowel finish floor of outlet.

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING
CURB OUTLET - TYPE A

DRAWING NUMBER D-25
NOTES
1. Pipe shall be one continuous length from property line to curb line.
2. Multiple pipes to be set a minimum distance of 0/2 apart.
3. Concrete shall be S17-C-2500.
4. Pipe shall be circular asbestos cement, cast iron or rigid plastic.

**APPROVED DRAIN PIPE SIZES**

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Curb Face</th>
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<tbody>
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<td>3&quot;</td>
<td>6&quot; to 8&quot;</td>
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<td>8&quot;</td>
</tr>
<tr>
<td>5&quot;</td>
<td>10&quot;</td>
</tr>
</tbody>
</table>

**SECTION B–B**

**SECTION A–A**

**BLOCK CORNER**

**SAN DIEGO REGIONAL STANDARD DRAWING**

**SIDEWALK UNDERDRAIN PIPE**

**DRAWING NUMBER**: D-27
NOTES

1. See Standard Drawings D-11 & D-12.1 for additional notes and details.

2. This inlet shall not be used with any pipe over 18" I.D.

3. Surface of top slab shall be finished as specified for sidewalks in the Standard Specifications and shall drain towards streets at a slope of 1/4" per foot.

4. Exposed edges of concrete shall be rounded with a radius of 1/2".

5. Concrete gutter to match adjacent gutter.

6. Expansion joint material shall be placed at the ends of the inlet where the curb is to adjoin.

7. Provide 1/4" tooled groove in top slab in line with back of adjacent curb.

8. Transition to normal curb height in 10' unless noted otherwise.

9. Construction joint (Standard Drawing D-12.1) may be eliminated if inlet and gutter are constructed concurrently.

LEGEND ON PLANS

SANS DIEGO REGIONAL STANDARD DRAWING

CURB INLET, SHALLOW - TYPE H

DRAWING NUMBER D-28.1

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

San Diego Regional Standards Committee

10-32

REFERENCE

By

Approved

Date

5/4/70
NOTES

2. When "V" exceeds 4', steps shall be installed.

SECTION A-A

Finish Grade:
For frame and grate detail,
see Std. Dwg. D-13, D-14.1 & D-15.1

T
3'-9"

3'-6"

10"

3" Fillet

10'/2"

10'/2"

4'-4"

4' around pipe opening

T

SECTION B-B

Rounded Pipe Ends,
see Std. Dwg. D-61

Elevation shown on plan

T

1%"

1%"

T

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING

CATCH BASIN-TYPE I

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

DRAWING NUMBER D-29.1
ELEVATION DOUBLE HEADWALL

ELEVATION SINGLE HEADWALL

SECTION

NOTES
1. Concrete shall be S84-C-3000.
2. All reinforcing steel #4 bars. All vertical and horizontal tie bars 18" maximum spacing.

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<thead>
<tr>
<th>O</th>
<th>H</th>
<th>SINGLE</th>
<th>DOUBLE</th>
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<td>2' 8&quot;</td>
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<td>5' 11&quot;</td>
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<tr>
<td>54&quot;</td>
<td></td>
<td>6' 2&quot;</td>
<td>17' 0&quot;</td>
</tr>
</tbody>
</table>

LEGEND ON PLANS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

SAN DIEGO REGIONAL STANDARD DRAWING

STRAIGHT HEADWALL - TYPE A (CIRCULAR PIPE)

DRAWING NUMBER D-30

Revision By Approved Date
ELEVATION DOUBLE HEADWALL

ELEVATION SINGLE HEADWALL

SECTION

<table>
<thead>
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<th>C.S.P. ARCH SIZE</th>
<th>SINGLE</th>
<th>DOUBLE</th>
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<tbody>
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<td>71&quot; x 47&quot;</td>
<td>5'-7&quot;</td>
<td>21'-0&quot;</td>
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</table>

NOTES
1. Concrete shall be 564-C-3000.
2. All reinforcing steel #4 bars. All vertical and horizontal tie bars 18" maximum spacing.

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING

STRAIGHT HEADWALL - TYPE A
[C.S.P.-ARCH]

DRAWING
NUMBER D-31
NOTES
1. Concrete shall be 564 C: 3000.
2. Exposed corners to be chamfered 3/4".

LEGEND ON PLANS

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<table>
<thead>
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<th>D</th>
<th>A</th>
<th>B</th>
<th>H</th>
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<td>6'-0&quot;</td>
<td>10'-0&quot;</td>
<td>2.41</td>
</tr>
<tr>
<td>36&quot;</td>
<td>3'-0&quot;</td>
<td>2'-0&quot;</td>
<td>7'-0&quot;</td>
<td>12'-0&quot;</td>
<td>3.74</td>
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</tbody>
</table>

---

SAN DIEGO REGIONAL STANDARD DRAWING

STRAIGHT HEADWALL - TYPE B
(CIRCULAR PIPE)
**DOUBLE PIPE ELEVATION**

**SECTION A-A**

**SINGLE PIPE ELEVATION**

<table>
<thead>
<tr>
<th>C.S.P. ARCH SIZE</th>
<th>A</th>
<th>B</th>
<th>H</th>
<th>SINGLE L</th>
<th>Conc C.Y.</th>
<th>DOUBLE L</th>
<th>Conc C.Y.</th>
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<tr>
<td>18&quot; x 11&quot;</td>
<td>2&quot;</td>
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<td>1&quot;-2&quot;</td>
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<td>21&quot; x 15&quot;</td>
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<td>1&quot;-4&quot;</td>
<td>4'-1&quot;</td>
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<td>1.08</td>
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<td>0&quot;</td>
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<td>5'-4&quot;</td>
<td>10&quot;</td>
<td>2.56</td>
<td>14'-5&quot;</td>
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</table>

**NOTES**
1. Concrete shall be S64 - C - 3000.
2. Exposed corners to be chamfered 3/4".

**LEGEND ON PLANS**

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<table>
<thead>
<tr>
<th>Revision</th>
<th>By</th>
<th>Approved</th>
<th>Date</th>
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**SAN DIEGO REGIONAL STANDARD DRAWING**

**STRAIGHT HEADWALL - TYPE B**

(C.S.P. ARCH)

**DRAWING NUMBER** D-33

**RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE**

[Signature]

Ref 1975

Engineer: T.C.E. 16907
NOTES:
1. Concrete shall be 554 - C - 3000.
2. Exposed corners to be chamfered 3/4".
3. Multiple pipes to be set a distance of D/2, with a 1' minimum between outside diameters of pipes.
4. Top of headwall shall be placed approximately parallel to profile grade when the grade is 3% or more.
5. Skewed pipes: Dimension W to be increased in width or length due to skew or multiple pipes.
6. For pipe wall thickness greater than 3" use alternate Detail C.

LEGEND ON PLANS

---

SAN DIEGO REGIONAL STANDARD DRAWING

WING AND U TYPE HEADWALLS
FOR 12" TO 36" PIPES

DRAWING NUMBER D-34
NOTES
1. Skewed Pipes: Dimension W to be increased to take care of increased width or length due to skew of multiple pipes.
2. Tops of headwalls, on grade culverts, shall be placed parallel to profile grade when the grades are 3% or more.
3. Concrete shall be 594-C-3000.
4. Exposed corners shall be chamfered 3/4".
5. Multiple pipes shall be set a distance of D/2, with a 1' minimum, between outside diameters of pipes.
6. For pipe wall thickness greater than 3" use Alternate Detail-C.

LEGEND ON PLANS

---

**SAN DIEGO REGIONAL STANDARD DRAWING**

**WING AND U TYPE HEADWALLS FOR 42" TO 84" PIPES**

<table>
<thead>
<tr>
<th>Revision</th>
<th>By</th>
<th>Approved</th>
<th>Date</th>
</tr>
</thead>
</table>

**DRAWING NUMBER** D-35
ELEVATION  

SECTION  

LENGTH OF W  

<table>
<thead>
<tr>
<th>D</th>
<th>H</th>
<th>L/2</th>
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</thead>
<tbody>
<tr>
<td>12&quot;</td>
<td>2'</td>
<td>8&quot;</td>
</tr>
<tr>
<td>15&quot;</td>
<td>2'</td>
<td>11&quot;</td>
</tr>
<tr>
<td>18&quot;</td>
<td>2'</td>
<td>2&quot;</td>
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<tr>
<td>21&quot;</td>
<td>3'</td>
<td>5&quot;</td>
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<tr>
<td>24&quot;</td>
<td>3'</td>
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<tr>
<td>30&quot;</td>
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<tr>
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<tr>
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<td>11&quot;</td>
</tr>
<tr>
<td>54&quot;</td>
<td>6'</td>
<td>2&quot;</td>
</tr>
</tbody>
</table>

NOTES  

1. Concrete shall be 564 C 3000.  
2. All reinforcing steel 4 bars. All vertical and horizontal tie bars 18" maximum spacing.  
3. When multiple pipes are used, the distance between pipes shall be 0/2 (1" min.). Dimension L/2 is from the center of the pipe nearest to the end of the headwall as shown.

LEGEND ON PLANS

---
**NOTES**

1. Concrete shall be 564 - C : 3000.
2. All reinforcing steel # 4 bars. All vertical and horizontal tie bars 18” maximum spacing.
3. When multiple pipes are used, the distance between pipes shall be 5/2 (1’ min.). The dimension L/2 is from the center of the pipe nearest to the end of the headwall as shown.

**LEGEND ON PLANS**

---

**SAN DIEGO REGIONAL STANDARD DRAWING**

**L TYPE HEADWALLS**

(C.S.P. ARCH)

**RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARD COMMITTEE**

7/25/79

**DRAWING NUMBER**

D-37
NOTES:
1. A curtain wall shall be used in place of a headwall at culvert ends where extension of the culvert is considered imminent or no fill is retained.
2. Concrete shall be 564-C-3000.
3. Keep the pipe-end clear of obstructions to permit easy placing of culvert extension.
NOTES

1. When more than one pipe is used the profile view shown shall hold for the distance across all pipe openings. Sections A-A and B-B shall be from the outermost pipe. The distance between pipes shall be D/2 for round and Span/3 for arch pipe. (12” minimum)

2. Culvert shall be cut off even with apron surface when required by the Agency.

3. Use Inlet Apron only where a flared and section cannot be utilized.

4. Place weep holes when required by the Agency.

LEGEND ON PLANS

Revised: D-39.1 D-39.1

SAN DIEGO REGIONAL STANDARD DRAWING

INLET APRON FOR CULVERTS
UP TO 42” DIAMETER
NOTES:

1. Plans shall specify:
   A) Rock class and thickness (T).
   B) Filter material, number of layers and thickness.

2. Rip rap shall be either quarry stone or broken concrete (if shown on the plans.) Cobble is not acceptable.

3. Rip rap shall be placed over a filter blanket which may be either granular material or plastic filter cloth.

4. See standard special provisions for selection of rip rap and filter blanket.

5. Rip rap energy dissipators shall be designated as either Type 1 or Type 2. Type 1 shall be with concrete sill; Type 2 shall be without sill.
**NOTES**

1. Design:
   
   Equivalent Fluid Pressure = 60 g.f.s.
   
   Maximum Outlet Velocity = 35 f.p.s.

2. Concrete shall be 584 - C 3000.

3. Reinforcing shall conform to ASTM designation A-615 and may be grade 40 or 60. Reinforcing shall be placed with 2" clear concrete cover unless noted otherwise. Splices shall not be permitted except as indicated on the plans.

4. For grain sizes not exceeding 20%, inlet box may be omitted.

5. If inlet box is omitted, construct side collar as shown.

6. Unless noted otherwise, all reinforcing bar bends shall be fabricated with standard hooks.

7. Five-foot high chain link fencing, emplaced post 18" deep in walls and encase with Class 9 mortar.

8. In Sandy and Silty soil:
   
   a) Riprap and aggregate base cutoff wall required at the end of rock sump.
   
   b) Filter cloth (Polyfilter X or equivalent) shall be installed on native soil and base, minimum of 1 ft. overlaid at joints.

9. Riprap and subbase classification shall be as shown on plans.

---

**SECTION A-A**

**PLAN**

Note: Riprap not shown.

**PICTORIAL VIEW**

**SECTION B-B**

**Revised By Approved Date**

| Note | 9 | 2.5  | 7-7 |

---

**SAN DIEGO REGIONAL STANDARD DRAWING**

**CONCRETE ENERGY DISSIPATOR**

**DRAWING NUMBER D-41**
END SILL ELEVATION

HEADWALL ELEVATION

SECTION A-A

SECTION C-C

SECTION D-D

NOTES
1. Place reinforcing, as noted, at center wall (or slab).
2. Match location of reinforcing with that in headwall, and sill and foundation slab.
3. All reinforcing shall be placed with 2" concrete cover, unless noted otherwise.
NOTES
1. Match location of sidewall reinforcing.
2. Dowels having same size and spacing as wall reinforcing may be used in lieu of continuous bars at contractors option.
3. Match location of headwall or end sill reinforcing.
NOTES:
1. See Standard Drawings 0-11 & 0-12.1 for additional notes and details.
2. Dimension shown becomes 2'-0" when opening on both sides. Adjust manhole as required.
3. Exposed edges of concrete shall be rounded with a radius of 1/2".
4. When V exceeds 4' steps shall be installed. See Standard Drawing 0-11 for details.
5. Concrete gutter to match adjacent gutters.
6. An expansion joint shall be placed at the ends of the inlet where the curb is to adjoin.
7. Provide 1/4" troweled groove in top slab in line with back of adjacent curb.
8. Maintain 1 1/2" clear spacing between reinforcing and surface unless otherwise noted.

LEGEND ON PLANS
4' Type J Inlet

SECTION A--A

SECTION B--B

SAN DIEGO REGIONAL STANDARD DRAWING
CURB INLET-TYPE J MEDIAN

DRAWING NUMBER  D-45
NOTES

1. For trenching on improved streets see Standard Drawing G-24.1 or G-25.1 for resurfacing details.
2. (*) indicates minimum relative compaction.

SECTION

1" max graded aggregate.

4" clearance (min)

8" min
12" max

invert elevation

1' - 0" min

Pipe O.D.
NOTE
The rounded areas may be built up of cement mortar or poured in place with the drainage structure.

R = Thickness of pipe

R = Inside diameter of pipe
NOTES:
1. Pipe collar does not have to be finished if covered, but must have a minimum of 6" of concrete around joint.
2. Concrete shall be 564 - C - 3000
NOTES
1. The end of connecting pipe shall not project into the waterway of the larger pipe.
2. The larger pipe shall not be less than 24" I.D.
3. The smaller pipe shall not be more than 2/3 the size of the larger pipe.
4. Concrete shall be 470 - C - 2000.

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING
CONCRETE LUG

DRAWING NUMBER D-63
NOTES
1. A.C. or clay pipe may be substituted for plastic pipe at weep holes.
2. Weakened plane joints shall be placed every 12' to 15'. Expansion joints shall be placed at all changes of section and at ends of curves.
3. Cutoff walls shall be constructed at each end of the channel along the full width of section. See Standard Drawing D-72.
4. Chainlink fence shall be as required by Agency.
5. For bottom widths greater than 8 feet see Standard Drawing D-71.
6. Reinforcement shown is minimum.

LEGEND ON PLANS
NOTES
1. A.C. or clay pipe may be substituted for plastic pipe at weep holes.
2. Weakened plane joints shall be placed every 12" to 15". Expansion joints shall be placed at all changes of section and at ends of curves.
3. Cutoff walls shall be constructed at each end of the channel along the full width of section. See Standard Drawing D-72.
4. Chainlink fence shall be as required by Agency.
5. Reinforcement shown is minimum.
NOTES
1. Thickness and wall depth shall be as shown on plan.
2. Reinforcing in cutoff wall shall be the same as that required in channel.
3. Concrete shall be 564-C-3000.
NOTES
1. Concrete shall be 564-C-3000.
2. Pipe shall connect to channel as high as possible.
3. The maximum angle of connection is 60° downstream.
   In no case shall a pipe angle upstream.

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING
PIECE TO CHANNEL CONNECTION

DRAWING NUMBER D-73
NOTE
The following shall be as required by Agency:

a) Low flow channel
b) Filter blanket
c) Cutoff wall
d) Fence

SELECTED ROCK SLOPE PROTECTION

PER AGENCY REQUIREMENTS

LEGEND ON PLANS
NOTES
1. Longitudinal slope of lined ditch shall be 2% minimum.
2. Over slope down ditches shall employ 5" thickened edge section at both sides of ditch.
### TYPICAL SECTION

(Showing reinforcement for interior walls 8" and over)

#### FLAT INVERT ALTERNATIVE

(When shown)
<table>
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<th>13'</th>
<th>14'</th>
<th>15'</th>
<th>16'</th>
<th>17'</th>
<th>18'</th>
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<tr>
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<td>4'</td>
<td>5'</td>
<td>6'</td>
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<td>11'</td>
<td>12'</td>
<td>13'</td>
<td>14'</td>
<td>15'</td>
</tr>
</tbody>
</table>

### Note
For boxes of height less than that shown in table, use next greater table height slabs, wall dimensions and reinforcing steel, and make necessary changes in bar lengths, number of spacers and quantities. Number of "D" bars in table is slab total for all three cells.

- For reinforcement clearance, except at bottom, see "Miscellaneous Details."
- For exposed top, extend "C" bars full length, provide additional "4" spacers @ 18" and adjust quantities.
- Provide paving match when top is exposed and where PCC pavement or approach slab is used.

### "Flat Invert" Alternative
(When shown)

![Typical Section](image-url)
ELEVATION

NOTES:
1. Fence fabric shall be 2" mesh, 9 gage galvanized wire, chainlink placed on the upstream side of the posts and tension cables.
2. Tension cable shall be 5/16" diameter steel at 18" c/c secured at ends with cable clamps. Secure fence to cable with No. 12 galv. steel wire looped at 8" c/c.
3. Posts shall be 3" diameter steel pipe, 5.79 lb./ft. Fill with mortar after placing.
4. Fence fabric shall be secured to posts with 9 gage wire clips at 9" c/c.

SECTION

LEGEND ON PLANS
DIRECT BURIAL FOUNDATION

ANCHOR BASE FOUNDATION

564 C 3000 P.C.C. Anchor base square or round, add 1' to each dimension for loose soil or soft clay conditions.

Undisturbed Earth
Select Sand, 95% minimum relative compaction.

Core 5' dia 12" high (min).
Hand hole to face street
Slope 30:1
Finished Grade

Light Standard
Mounting Height
175 w 2'/4' = 1'
400 w 3'/6' = 1'

Pole Height
175 W 2'/4' = 2'
400 W 3'/6' = 2'

15" 13"
18" 6"

1/4" minimum bolt clearance

Anchor Bolts (4 req.) 1"x 36" x 4" hook, galv. Use two leveling nuts with washers (all galv.) on each bolt.

FINISHED GRADE
Anchor bolts must not protrude.
#8 copper wire grounded to pole steel with lug

**STEEL CONDUIT**

**DIRECT BURIAL FOUNDATION**

- **1** 3/4" x 8" copper covered steel ground rod.
- **2** Alternate Ground: 15' no. 4 bare stranded copper wire, coiled.
- **3** Approved non-metallic conduit.
- **4** Steel conduit.

**STEEL CONDUIT**

**NON-METALLIC CONDUIT**

Attach ground wire under anchor nut

1/2" Rigid steel conduit

**ANCHOR BASE FOUNDATION**

**DETAIL A**
1 1/4" min. cover for bars and conduits.

1 1/4" x 2" galvanized steel bars.

10" Diameter use Sonotube for smooth finish (Class 1)

Permissible to auger hole and pour against soil.

3/4" x 3" copper covered steel ground rod.

NOTE:
Concrete shall be class 564-C-3000.

Panel Board

Grout cap protrusion to be sloped for drainage.

Ground Line

36" Length

24" min.

2" min.

6' - 3" max.

4' - 6" min.

SECTION A - A
STEEL & CONCRETE
DIMENSIONS

SECTION B - B
CONDUIT & EQUIPMENT

SAN DIEGO REGIONAL STANDARD DRAWING

PEDESTAL FOR
ELECTRICAL EQUIPMENT

DRAWING NUMBER E-33
NOTES:
1. Concrete shall be 517 - C - 2500.

LEGEND ON PLANS

8" curb
NOTES:
1. Concrete shall be S17 - C - 2500.
NOTES
1. Concrete shall be 517-C-2500.
3. Monolithic curb, gutter and sidewalk is to be used with Agency approval only.

LEGEND ON PLANS

MONOLITHIC CURB,
GUTTER AND SIDEWALK

SANT DIEGO REGIONAL STANDARD DRAWING

THICKNESS: 0.5 7.77

THICKNESS: 0.8 5.82

DRAWING NUMBER: G-3.1
CURB AREA
(2.23 sq. ft.)

NOTES:
1. Transition to type G curb at all curb returns, except where sidewalk ramps are provided, and at all cul-de-sacs with drainage structures.
3. Concrete shall be 520-C-2500.
TYPE A-SECTION

TYPE B-SECTION

TYPE C-SECTION

TYPE D-SECTION

Slope end of dike 1:1 when not joining other improvements

APPROX. DIKE QUANTITIES

<table>
<thead>
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<th>TYPE</th>
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<tr>
<td>D</td>
<td>0.0062</td>
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NOTES

1. Dike is to be placed on a minimum 2" of A.C. road surfacing, extending throughout the width of the dike.
2. AR-8000 grade asphalt to be used for all dikes
3. A.C. dikes may be shaped and compacted with an extrusion machine or other equipment capable of shaping and compacting the material to the required cross section.

LEGEND ON PLANS

Type A Dike

DIKES (BERMS) - ASPHALT CONCRETE

SAN DIEGO REGIONAL STANDARD DRAWING

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

DATE: OCT. 1979

DRAWING NUMBER: G-5
NOTES
1. Concrete shall be 517-C-2500.
3. Extruded type 8-3 curb shall be anchored to existing pavement by placing steel dowels and reinforcing steel as shown or by using an approved adhesive.

LEGEND ON PLANS
Type B-2 Curb and Gutter

Type 8-1, 8-3, 8-4 Curb
1. Concrete shall be 517 - C - 2500.

NOTES

LEGEND ON PLANS

SAND DIEGO REGIONAL STANDARD DRAWING

SIDEWALK - TYPICAL SECTIONS

LEGEND ON PLANS

Revised By Approved Date
Thickness 0.2 7.79
Thickness 0.4 6.48
NOTES
1. Expansion Joints ——— at curb returns, and adjacent to structures.
   (See Standard Drawing G-10).
2. Weakened Plane Joints ——— at mid point of curb return, when required,
   and at 15" intervals from P.C.R.'s (See Standard Drawing G-10).
3. 1/4" grooves ——— with 1/4" radius edges at 5" intervals.
NOTE
When distance from, "Area to be removed", to existing joint, edge or score mark is less than minimum shown, "Area to be removed", shall be extended to that joint, edge or score mark.
Contact Joints per Standard Drawing G-10 when separate pours are made

PLAN

SECTION A-A

NOTES:

1. Concrete shall be 560-C-3250.
2. ————=Weakened plane joints.
3. ——Typical flowlines.
4. o=Elevations to be shown on plans.
5. Return segments to be 5/4" thick.

LEGEND ON PLANS
NOTES:

1. Cross gutter to be constructed where the drainage is carried across street.
2. Minimum allowable cross slope is 0.5%.
3. Concrete shall be 560-C-3250.

LEGEND ON PLANS

Transitional area, depress toe of gutter to match cross gutter slope.

5 1/4" unless otherwise shown on plan

1/2" R Typical

Base material as shown on plans
NOTES
1. No concrete shall be placed until forms and subgrade are inspected by the Agency.
2. Concrete shall be 520-C-2500.
3. See standard drawings G-15 and G-16 for width and location requirements.

LEGEND ON PLANS
- - - - - - - - - - Residential
     (Commercial)
Driveway

SAN DIEGO REGIONAL STANDARD DRAWING
CONCRETE DRIVEWAYS

DRAWING NUMBER G-14.1
REQUIREMENT 1
No portion of any curb opening shall be permitted within 6' of the intersection of the prolonged property lines and the curb as shown by arc A.

REQUIREMENT 2
No portion of any curb opening shall be permitted in the curb return where the radius of curb is 25' or less, as shown by arc B.

REQUIREMENT 3
On all curb returns where the radius is 25' or more, curb openings may encroach upon each end of the return a distance equal to 1/2 or 1/3 of the total length of the arc on the curb return, thus leaving at least 75% of the length of arc on the return face free from driveway encroachment, provided Requirement 1 is met.

REQUIREMENT 4
No portion of any curb opening shall be permitted in the curb return where a separate turning movement is provided, as shown by arc C.
NOTES

1. Curb openings, except for joint-use driveways and driveways on lots having 21-foot frontage or less, shall be located at least 3 feet from the side property line extended.

2. Not more than 40% of the property frontage on residential lots, nor 60% of the property frontage on commercial lots may be allocated for driveway curb openings, except that lots having frontage of 25 feet or less are entitled to one 12-foot driveway (18-foot curb opening).

3. All driveways and curb openings shall be a minimum of 3 feet from any obstruction, i.e., poles, hydrants, etc.

4. No portion of any driveway shall be allowed across a line extending normal to the roadway from the front corner of the property, except that joint-use driveways may be permitted in special instances where written approval of both property owners is filed with the Agency.
TYPICAL PLAN

Gutter Elevation shown on plans

Toe of Gutter Elevation

1/2" R

-1 1/2" except where elevations shown indicate otherwise

Q SECTION

NOTES
1. Sidewalk Ramps shall be installed as required by Agency.
2. D = distance shown on plans.
3. R = radius shown on plans (3 ft. minimum).
4. O = elevations shown on plans (top of curb, and gutter elev.).

LEGEND ON PLANS

ALLEY APRON
TYPICAL SECTION

20' maximum
Pavement Width = 40' or less
10' minimum

TYPICAL PLAN

NOTES:
1. Concrete shall be 564-C-3000.
2. See Standard Drawing G-18 for Joint Details.
3. Adjust 15' interval between Transverse Joints to match adjacent existing improvements.

CONCRETE PAVEMENT,
WIDTH 40' OR LESS
NOTES
1. Concrete shall be 564 · C · 3000.
3. Adjust 15' interval between Transverse Joints to match adjacent existing improvements.
NOTES
1. Concrete shall be 564-C-3000.
2. See Standard Drawing G-10 for Joint Details.
3. Adjust 15' interval between Transverse Joints to match adjacent existing improvements.
TYPICAL SECTION

1/2" R

Contact Joint required for pavement width greater than 20'

Pavement Width = 40' or less

TYPICAL PLAN

Weakened Plane Joints

Contact Joints

Transverse Contact Joints shall be constructed at end of pour

Expansion Joints shall be constructed at locations shown on plans

NOTES
1. Concrete shall be 564 - C - 3000.
3. Adjust 15' interval between Transverse Joints to match adjacent existing improvements.
NOTES
1. Existing A.C. shall be cut and removed in such a manner so as not to tear, bulge or displace adjacent pavement. Edges shall be clean and vertical. All cuts shall be parallel or perpendicular to street centerline, when practical.
2. Base material to be replaced to depth of existing base. A.C. may be substituted for base material.
3. A tack coat of asphaltic emulsion or paving asphalt shall be applied to existing A.C. at all contact surfaces, prior to resurfacing.
4. Asphaltic Concrete Resurfacing:
   a) Minimum total thickness shall be one inch greater than existing A.C.
   b) A.C. shall be hot plant mix.
   c) Finish course for Type B resurfacing shall be laid down using a spreader box.
5. All A.C. resurfacing shall be seal coated with an emulsified asphalt and covered with sand. Chip sealing shall be applied as required by Agency.
6. Type B not to be used on lateral crossings.
7. Sloughing of trench under pavement shall be cause for requiring additional pavement and base.
**NOTES:**

1. No concrete shall be placed until forms and subgrade are inspected by the Agency.
2. Concrete shall be 517–C2500.
SPRINKLER IRRIGATION SYSTEMS
NOTES
1. Teflon tape, 3/4" wide, shall be used on all threaded connections.
2. Close nipples shall not be used.

LEGEND ON PLANS
Show a number to indicate type head.

SAN DIEGO REGIONAL STANDARD DRAWING
SHRUBBERY SPRINKLER HEAD
FIXED SPRAY TYPE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

DRAWING NUMBER 1-1
NOTES
1. All fittings shall be P.V.C. Sch. 40.
2. Teflon tape, 3/4" wide, shall be used on all threaded connections.
3. Short nipples shall not be used.

LEGEND ON PLANS
Show a number to indicate type head.

SAN DIEGO REGIONAL STANDARD DRAWING
SPRINKLER HEAD
POP UP SPRAY TYPE

DRAWING NUMBER 1-2.1
3" Nipple (or length as req'd)

PLAN

3" Nipple

-1/2"

Finished Grade

ELEVATION

3" Nipple (or length as req'd)

12" Nipple

15" minimum

21" maximum

NOTES
1. All fittings shall be P.V.C. Sch. 40.
2. All nipples shall be P.V.C. Sch. 80.
3. Teflon tape, 3/4" wide, shall be used on all threaded connections.
4. Short nipples shall not be used.

LEGEND ON PLANS
Show a number to indicate type head.

SAN DIEGO REGIONAL STANDARD DRAWING

LAWN SPRINKLER HEAD
POP UP ROTARY (WITH SWING JOINT)

DRAWING NUMBER 1-3
NOTES
1. Quick coupling valves in lawn areas shall be set to grade.
2. Quick coupling valves in shrub areas shall be set 2 inches above grade.
3. Dimensions of concrete anchors are minimum.
4. Close nipples shall not be used.

LEGEND ON PLANS
Q.C.V. ☺
NOTES
1. Hose bibb shall be loose key operated, all brass or bronze construction, angle pattern with removable bonnet and stem assembly, replaceable seat washers and stem packing glands.

2. Unless otherwise specified, the hose connection thread shall be 3/4" male hose thread (pacific coast), and the riser opening thread shall be 3/4" female I.P.S. Discharge opening shall be 90° to riser opening.

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING
HOSE BIBB
(GARDEN VALVE)
NOTES

1. Atmospheric vacuum breakers shall be installed approximately 5" above the finished grade and above a sufficient number of sprinkler heads closest to the vacuum breaker so that at no time will it be subjected to back pressure or drainage.

2. Close nipples shall not be used.

3. All fittings, including the atmospheric vacuum breaker, shall not be of smaller size than the valve.

4. Teflon tape, 3/4" wide, shall be used on all threaded connections.

5. For use on lines 2 inches and smaller.

LEGEND ON PLANS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

SAN DIEGO REGIONAL STANDARD DRAWING

BACKFLOW PREVENTER
ATMOSPHERIC VACUUM BREAKER
(2" & SMALLER)

DRAWING NUMBER 1-7.1
NOTES
1. Continuous pressure vacuum breakers shall be installed approximately 12 inches above finished grade and at the highest point in the line.
2. Continuous pressure vacuum breakers shall not be subjected to back pressure or drainage.
3. Teflon tape 3/4" wide shall be used on all threaded connections.
4. Close nipples shall not be used.

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING
BACKFLOW PREVENTER - CONTINUOUS PRESS. VAC. BREAKER ASSY.
(2" & SMALLER)
NOTES
1. All fittings on assembly 3" and larger shall be flanged.
2. Cast iron pipe shall be polyethylene wrapped with a 2" wide plastic backed adhesive tape.
   Use 3/8" overlap.
3. Cast iron pipe and fittings shall be cement mortar lined.
4. Pressure vacuum breaker assembly shall be installed above a sufficient number of sprinkler heads
   closest to the vacuum breaker assembly so that at no time will it be subjected to back pressure
   or drainage.
5. All exposed cast iron shall be painted with one coat of red lead and two finish coats of
   exterior enamel.
6. All fittings 2" and smaller shall be red brass.

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING

BACKFLOW PREVENTER REDUCED PRESS. VAC. BREAKER ASSEMBLY

DRAWING NUMBER 1-9.1
NOTES
1. Not for use in traffic areas.
2. All check valves shall have test cocks.
3. Use concrete block supports (2 req’d) when needed to match shallow meter installation.
4. All nipples and pipe fittings shall be red brass.
5. Gate valve handwheel shall be red brass or bronze.

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING
BACKFLOW PREVENTER
DOUBLE CHECK VALVE ASSEMBLY
(2" & SMALLER)
Steel Parkway Cover or Steel Traffic Cover as shown on plans.

Top Section 12" high

A.C. Pipe

Cast Iron Adaptor flange to bell

1/2" thick felt expansion joint material. Cover opening around pipe completely, both ends.

Brass test cocks required all installations.

ELEVATION

Lower Section 27" high

Double Check Valve Assembly Size noted on plans.

Finished Grade

Concrete Block Supports

4" thick reinforced concrete floor slab

Cast Iron Adaptor flange to bell

A

Concrete Utility Box and Concrete Support Blocks. See note 1 for size requirements.

SECTION A-A

NOTES
1. 3" and 4" pipe: 2' 6" x 4' 0" utility box with 4" walls.
   6" and 8" pipe: 2' 6" x 6' 0" utility box with 4" walls.
2. All exposed cast iron shall be painted with one coat of red lead and two finish coats of exterior enamel.

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING

BACKFLOW PREVENTER DOUBLE CHECK VALVE ASSY. (3" & LARGER)
NOTES
1. All valves shall be furnished with a standard manual control valve bronze cross handle.
2. All valves shall be installed within 12" of the water main, unless otherwise shown on the plans.
3. Close nipples shall not be used.

LEGEND ON PLANS

G.V.
ANGEL VALVE

GLOBE VALVE
(special cases only)

ALTERNATE PIPE SLEEVE INSTALLATION

NOTES
1. All Manual Valves shall be furnished with a standard manual control valve bronze cross handle.
2. All valves shall be installed with 12" of the water main, unless otherwise shown on the plans.
3. All Manual Valves shall be furnished with a removable bonnet and packing gland nut.
4. Close Nipples shall not be used.

LEGEND ON PLANS

M.C.V.
NOTES
1. No splicing shall be made outside of the valve box except that made in a pull-box.
2. Close nipples shall not be used.
3. Spare wires terminating in valve boxes shall have their ends insulated, the same as for a splice.
4. When two or more valves are installed in the same location, they shall be in manifold using red brass fittings, with a gate valve installed at the start of the manifold.
5. All valves shall be installed with a union on the downstream side of the valve. The union shall be P.V.C.

LEGEND ON PLANS
\[ R.C.V. \]
NOTES
1. Install pull boxes as shown on plans.
2. At junctions where runs combine, splice common ground in pull box.
3. Pull box cover shall be permanently marked "ELECTRIC".
4. Conductors for each controller clock shall be harnessed separately and at sufficient intervals to maintain a definite bundle.
5. All splices shall be made with a properly set mechanical splice connector entirely enclosed in self-curing epoxy resin and shall be completely water-proof.
6. All spare wire ends shall be insulated in the same manner as wire splices.
NOTE
See Standard Drawing I-25.1 or I-26.1 for water line trench details.

NORMAL LOCATIONS OF CONTROL WIRES

ALTERNATE LOCATION OF CONTROL WIRES
NOTES

1. Where two or more controllers are mounted on a common concrete base, a minimum of three inches shall be left between controller cabinets.
2. Anchor controller pedestal to base as required by manufacturer.
3. Make all electrical connections inside controller cabinet.
4. For location of supply conduit and conductors, see electrical plans.
5. Stiffeners shall be fastened to controller and pedestal cases by 3/16" x 3/4" O.N. cadmium plated stove bolts not more than 12" on center (minimum 6 bolts per stiffener).
6. Controller shall be grounded at power supply by ground wire.

LEGEND ON PLANS

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SAN DIEGO REGIONAL STANDARD DRAWING

IRRIGATION SYSTEMS
ELECTRIC CONTROLLER CLOCK
PEDESTAL MOUNTING

DRAWING NUMBER 1-17.1
Automatic controller clock in a weatherproof, tamperproof, lockable case: wall mounted per manufacturer’s specifications.

.Side View

Where two or more controllers are mounted together, a minimum of three inches shall be left between controller cabinets.

Controller Cabinet

2" Rigid Steel Conduit for Control Wire

Anchor conduit firmly to wall with galvanized pipe clamps using fasteners appropriate for type of wall.

3/4" Rigid Steel Conduit for Power Supply

Valve Control (Bushing)

Power Supply (Coupling, Adapter)

.Elevation

Notes
1. For location of supply conduit and conductor, refer to the plans.
2. Controller shall be grounded at power supply by ground wire.
3. Make all electrical connections inside controller cabinet.
NOTE
Stake shall be placed no greater than 15' apart and at each riser.
NOTE
All Galvanized Pipe, Nipples and Fittings installed underground shall be wrapped with 2" wide plastic backed adhesive tape, use 1/4" overlap.

LEGEND ON PLANS

- M.C.V.
- G.V.
NOTE
Swing Joints shall be used at each change of grade.

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING

SWING JOINT AND PIPE INSTALLATION
ON SLOPES
ABOVE GROUND PIPE INSTALLATIONS

DRAWING NUMBER 1-23
NOTES
1. Double swing joint shall be used where changes of grade and alignment occur simultaneously.
2. Double swing joint shall be used for expansion joint on long runs of galvanized pipe.
   (300' maximum runs)

LEGEND ON PLANS
NOTES

1. Excavation shall be continued to a relative connection of 90% or more.

2. All P.V.C. Pipe shall be filled with a rustless with no included slacks and with
sufficient allowances for expansion and contraction as recommended by the
manufacturer.

4. The latter I will be formed as designed in the improvement (cut-end-sawfly).

5. All plastic pressure pipe under pavement shall be installed in a P.V.C. sheath.

Details not shown

Multiple Pipe Installation Detail

(later pressure pipe only)
NOTES:
1. Backfill material shall be compacted to a relative compaction of 90% or more.
2. All pipeline fittings shall be cast iron, short body, Class 250, cement mortar lined and polyethylene wrapped. All fittings shall have thrust blocks or anchors.
3. The letter W shall be stamped or chiseled on the improvement (curb—sidewalk) directly above the pressure pipeline.
4. No P.V.C. pressure pipeline shall be installed within 3' of any line, unless otherwise specified.
PLAN

3/8" Notch

Provide 6" concrete pad in paved areas.

8"

CAST IRON VALVE WELL CAP

3/16" Relief

Symmetrical about axis

3 3/4"

1 3/4"

6 1/4"

7 1/2"

4 3/4"

CAST IRON VALVE WELL CAP

Legend on plans

Concrete Pavement

Valve Well Cap

A.C. Pavement

45° chamfer

8" min.

Top of Bonnet

8" A.C. pipe Class 150

Wood Blocks

ELEVATION

SAN DIEGO REGIONAL STANDARD DRAWING

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Valve Well and Cover

DRAWING NUMBER 1-27
NOTES
1. Close nipples shall not be used.
2. Cast iron tapped tee shall be short body, class 250, cement mortar lined and polyethylene wrapped.
3. All tapped tees shall have a type - A support block. See Standard Drawing W-19.

LEGEND ON PLANS
-
NOTE
Close nipples shall not be used.
NOTES
1. All fittings shall be P.V.C. Sch. 40 (except as noted).
2. All nipples shall be P.V.C. Sch. 30 (except as noted).
3. Teflon tape, 3/4" wide, shall be used on all threaded connections.
4. Short nipples shall not be used.

LEGEND ON PLANS
Show a number to indicate type head

SAN DIEGO REGIONAL STANDARD DRAWING

IMPACT HEAD
(WITH SWING JOINT)
LANDSCAPING
Chamfer as needed to eliminate soil slumping.

Top of ball 1" above finish grade.

2" Mulch

4" Berm firmly compacted

Prepared Soil Mix

Plant Tab

Prepared soil mix, puddle and settle prior to setting tree.

Scarify soil, add equal amount prepared soil and thoroughly mix.

2 x Ball width

min

2 x Ball depth

min

2 x Ball width

min

2 x Ball depth

min

TREES PLANTING - SLOPES

TREES PLANTING - LEVEL GROUND

Chamfer as needed to eliminate soil slumping.

Top of ball 1" above finished grade.

2" Mulch

4" Berm firmly compacted

Prepared Soil Mix

Plant Tab

Prepared soil mix, puddle and settle prior to setting shrub.

Scarify soil, add equal amount prepared soil and thoroughly mix.

2 x Ball width

min

2 x Ball depth

min

2 x Ball width

min

2 x Ball depth

min

SHRUB PLANTING - SLOPES

SHRUB PLANTING - LEVEL GROUND
Hose: Loop shall be 1" greater in diameter than tree trunk
Stake
No. 12 galvanized wire, min.

PLAN

2 stakes and 2 ties. Tie tree trunk 6" above bending moment of tree. Tie should provide flexibility of trunk but not allow rubbing of trunk against stake. Cut stakes off 6" above ties. For single stake trees, place stake on windward side of tree.

TREE STAKING – SLOPES

TREE STAKING – LEVEL GROUND

SAN DIEGO REGIONAL STANDARD DRAWING

TREE STAKING

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

DRAWING NUMBER L-2

Revision By Approved Date
Plan 7.05 7.77

C.R. 16279

SCE 1997

Proc.
TYPE A
SHRUB AREAS

1/2" Radius (typ.)
8"
4"
1/2" (typ.)

TYPE B
UNDER FENCES

1/4" Radius

3/15"

WEAKENED PLANE JOINT
MAX. 20 FT. O. C.

EXPANSION JOINT
MAX. 120 FT. O. C.

Preformed Joint Filler

NOTES:
1. Rebar shall be continuous with 12 inch overlap at splices.
2. Concrete shall be class 517-C-2500 and same color as any adjacent concrete.
3. Install weakened plane joints at each fence post.
4. Install expansion joints where the mowing strip abuts any concrete improvement.
MANHOLE COVER FRAME
CAST IRON WT. 175 LB.

DETAIL

MANHOLE COVER
CAST IRON WT. 155 LB.

NOTES
1. Frame and cover shall be cast iron.

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SAN DIEGO REGIONAL STANDARD DRAWING

24" MANHOLE FRAME AND COVER
HEAVY DUTY

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

M-1
NOTES
1. Frame and cover shall be cast iron.
2. Frame and cover for use in non-traffic area only.
3. Weights: Frame 30 lbs
   Cover 100 lbs

FOR MARK
Sewer Projects   Sewer
Storm Drain Projects   Storm Drain
Water Projects   Water

SAN DIEGO REGIONAL STANDARD DRAWING
24" MANHOLE FRAME AND COVER
LIGHT DUTY
For inner cover, see Standard Drawing M-1.

HALF PLAN FRAME & COVER

HALF SECTION FRAME & COVER

NOTES
1. Weights:
   Inner Cover = 155 lbs.
   Outer Cover = 300 lbs.
   Frame = 330 lbs.
2. Material: Cast Iron
3. Machine seats to prevent noise
4. Fillet radii to be 1/2".
DETAIL PLAN

Drill and tap hole, install 5/8"x 1 1/2" stainless steel, hexagonal socket head cap screw (2 required), Unified National Coarse Thread - 11 per inch - with 1 1/2" O.D. x 11/16" I.D. x .078" thick stainless steel washer.


SECTION A-A

Dashed line indicates outline of outer cover when two concentric covers are to be used.

NOTE
For manhole frame and two concentric covers, see detailed Standard Drawing M-3.

NOTE
For manhole frame and cover details, see Standard Drawing M-1 (single cover).
NOTES
1. All footings shall be 470-C-2000 concrete.
2. The following items shall be furnished and installed only when shown on the plans and/or called for in the special provisions:
   a. Barbed wire
   b. Extension post
3. Chain link fence shall conform to Section 206-6 of the Standard Specifications for Public Works Construction unless specifically noted on this drawing.

EXTENSION POST AND BARBED WIRE

WALK GATE

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING

CHAIN LINK GATE

REV. W.B. 10-88

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

COORDINATOR: R.E. 18687  DATE

DRAWING NUMBER M-5.1
**NOTES**

1. All footings shall be 470-C-2000 concrete.
2. The following items shall be furnished and installed only when shown on the plans and/or called for in the special provisions:
   a. Barbed Wire
   b. Extension Arm
   c. Top Horizontal Rail
3. Chain link fence shall conform to Section 206-6 of the Standard Specifications for Public Works Construction unless specifically noted on this drawing.

**LEGEND ON PLANS**

**CHAIN LINK FENCE**
Toenail with 1-16d gal nail on each side of the block

Cut steel washer

5/8" Carriage bolt with hex nut

6"x 8"x 1'-2" Douglas Fir Block.

6"x 8"x 5'-4" Douglas Fir Post, pressure treated.

Ground Line or Shoulder Surfacing under railing

Flat plate washer

2"

Toe of Bikel/ Face of Curb

SECTION AT SUPPORT

SECTION AT BERM

Post spacing 6'-3" C to C.

LINE POSTS

Rail Splice

6'-3"

Traffic

6"x8" Block between post and rail on all posts

6'-3"

2'-2" Min.

2'-3" Max.

Lap in direction of traffic

Traffic

PLAN

ELEVATION

NOTE
See Standard Drawing M-8 for additional details.
RETURN SECTION

TERMINAL SECTION TYPE "A"

TERMINAL SECTION TYPE "B"

5/8" BUTTON HEAD BOLT

5/8" RECESS NUT

1/16" Dia. x 1/8" deep recess
one or both sides

FLAT PLATE WASHER

RAIL SPLICE

NOTES
1. See Standard Drawing M-7
   for guard rail installation.
2. All metal elements shall be
   galvanized.
CONTINUOUS BARRICADE

SEPARATE BARRICADE

NOTES
1. Posts to be structural grade redwood or pressure treated (with wood preservative) Douglas Fir, surfaced four sides; cross pieces to be 2"x 3" select grade Douglas Fir, surfaced four sides.
2. All exposed portions of barricades shall be painted with two coats of white exterior enamel over prime coat.
3. Connections shall be made with 3/8"x 6" galvanized lag screws with one (1) washer each.
   Reflector sign fasteners to be 3/8"x 1½" galvanized lag screws.
4. Reflector signs - California Type N. Size 18"x 18" - Yellow with nine (9) - 3¾" reflectors (center mount).
   a. Reflectors shall be red for use on dead end streets, in all other cases they shall be yellow.
   b. Reflectors shall be plastic or other approved reflectorized material.
5. Six foot long hat section metal post per Caltrans Std. Plan A74-A optional for guard post.

SAN DIEGO REGIONAL STANDARD DRAWING

LEGEND ON PLANS

Guard Post  Guard Post

GUARD POST AND BARRICADE
SLOPE surface of grout pad to drain away from cover, and to meet existing grade.

PLAN—IN UNPAVED AREA

NOTES
1. Cover and frame to be cast integrally with pipe box.
2. Monument base may be cast in place or precast.
3. Form and taper exposed upper 6" of cast in place base to a top diameter of 5". (Precast base shall be sand backfilled).
4. Monument marker shall be a domed brass, 3" in diameter.
5. Monument Location:
   a) Set on all centerline intersections unless actual location is modified by the Agency and shown in modified location on map. When centerline intersection is impractical, offset 5 feet on centerline of major street, (see detail at right). If neither centerline can be occupied, two monuments will be set in line around the front on the perimeter of a 10-foot diameter circle, whose center is the point.
   b) Set on centerline at intervals not exceeding 1000 feet on straight runs.
   c) Set on centerline at points of curvature.
   d) Set on center at center points of cul-de-sacs.
   e) Set on centerline when center point of cul-de-sac is offset from centerline.
   f) These standards may be modified at the discretion of the Agency in cases where strict compliance therewith results in more monuments than it considers necessary. The following technique for reducing the number of monuments will be routine.
   g) Substitution of one monument on the "Point of Intersection" for monuments at the "Beginning of Curve" and the "Ending of Curve" when the "Point of Intersection" falls within the pavement area.
   h) Deletion of any monument otherwise required by these standards when its position can be determined by turning one angle from a point on a straight line between two other monuments, providing such point is not more than 300 feet from the point on which the deleted monument would have been placed.

TYPICAL MONUMENT SECTION
IN PAVED AREA

LOCATION OF STREET SURVEY MONUMENT
NOTES
2. May be installed in fresh concrete at time of installation of concrete structure.
3. Location—in most stable, permanent location in vicinity, such as in base for street light standard or traffic signal (behind sidewalk), in curb (not near joint, on curve or near trees), on top of drainage headwall, in foundation for building or retaining wall or in concrete pads for transformers, pump stations etc.
COUNTY OF SAN DIEGO  
CITY OF SAN DIEGO  
U.S.C. & G. (LAND)  
U.S.G.S. STAFF  

6.12

PORT OF SAN DIEGO  
U.S.C. & G.  
(BAY CHART)  

9.00

OLD CITY OF  
SAN DIEGO STAFF  
(PRIOR TO MARCH 1963)  

0

HIGHEST TIDE  

-4.91

7.79

1.21

MEAN HIGHER WATER  

2.73

5.61

3.39

MEAN HIGH WATER  

2.01

4.89

4.11

MEAN SEA LEVEL  

0

2.88

6.12

MEAN LOWER  
LOW WATER  

2.88

0

9.00

LLOWEST TIDE  

5.06

2.18

11.16

LEGEND

MEAN HIGH WATER  = Mean of all high water in San Diego Bay.
MEAN HIGHER WATER  = Mean of all higher water in San Diego Bay.
Bay charts and topography up to the mean high tide based on zero at the mean lower low water.

SOURCE

Data based on U.S.C. & G. "Sea Level Datum of 1929".

SAN DIEGO REGIONAL STANDARD DRAWING

DATUMS

RECOMMENDED BY THE SAN DIEGO  
REGIONAL STANDARDS COMMITTEE  

DRAWING NUMBER  M-12

Revision  By  Approved  Date
FOUND MONUMENTS

Found monuments must denote the character of the monument, how it is identified and the record, or no record as applicable.

SET MONUMENTS - Criteria for Locating and Character

On subdivision boundaries, permanent monuments are required; and must be shown on the map at intervals as specified by the local agency. The location of such points that are unacceptable or will be destroyed by construction may be established by ties to permanent reference monuments shown on the final map.

A permanent monument shall be no less substantial than the following:

a. An iron pipe of minimum two inch diameter not less than two feet in length placed upright in the ground so that the top of said pipe is flush with the surface. Said pipe shall be filled with a metal or cement plug at least three inches in depth and centered with a metal tack and disc; or

b. A metal plug with tack and disc set flush with the surface in portland cement concrete sidewalk, curb or pavement; or other monument satisfactory to the City Engineer or County Surveyor.

Lot corners and points of curves along street and alley right of way lines where portland cement concrete sidewalks, curbs or pavement exist, or will be constructed as part of the subdivision requirements, shall be identified with tack and disc set flush with the surface along an extension of the lot line at an approved offset, to be measured radially or at right angles to the right of way line in said sidewalk, curb or pavement. In case the sideline of the lot is not radial or at right angles to the right of way line a disc shall be set along an extension of the sideline at an offset to be measured radially or at right angles to the right of way line. Where no such concrete work exists, and none will be required to be constructed, all lot corners, angle points and points of curve shall be marked with a monument no less substantial than a one-half inch steel rod or pipe, 18 inches long, set flush with the surface.

EXAMPLE OF OFFSET DISCS

LEGEND

- Fd 2" Iron Pipe Marked RCE XXXX or per Map XXX unless otherwise noted
- Fd Street Survey Monument Stamped RCE XXXX or LS XXXX
- Set 2" x 24" Iron Pipe Marked RCE XXXX or LS XXXX
- Set Lead and Disc Stamped RCE XXXX or LS XXXX
- Set ½" x 18" iron Pipe Marked RCE XXXX or LS XXXX
- Set Street Survey Monument Stamped RCE XXXX or LS XXXX per Standard Drawing M-10

The addition of other symbols is permissible where such will result in a clearer map.

The following notes should be used in the legend where applicable.

Unless otherwise shown on this map:

1. All lot corners except as described below will be monumented by a ½ inch by 18 inch iron pin stamped (RCE or LS number).

2. Lot corners along the sideline of dedicated street right of way will be monumented by a disc stamped (RCE or LS number), set along an extension of the lot line at an offset of ___ in the (curb, sidewalk). The offset shall be measured radially, or at right angles, to the right of way line. (See example below.)

3. All points of curve of the sidelines of dedicated streets will be monumented by a disc stamped (RCE or LS number), set at an offset of ___ in the (curb, sidewalk). The offset shall be measured radially.

Revision | By | Approved | Date |
--- | --- | --- | --- |
Notes | 3 | 0.5 | 3.99 |

SAN DIEGO REGIONAL STANDARD DRAWING

SURVEY MONUMENTS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

DRAWING NUMBER M-13
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<tr>
<th>Unit</th>
<th>Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Gram</td>
<td>15.4324 grains</td>
</tr>
<tr>
<td>1 Gram</td>
<td>0.0353 oz.</td>
</tr>
<tr>
<td>1 Kg</td>
<td>2.2046 lb.</td>
</tr>
<tr>
<td>1 Kg</td>
<td>0.0011 ton.</td>
</tr>
<tr>
<td>1 Ton (met)</td>
<td>1.1023 ton</td>
</tr>
<tr>
<td></td>
<td>1 Grain = 0.0648 g.</td>
</tr>
<tr>
<td></td>
<td>1 Ounce = 28.3495 g.</td>
</tr>
<tr>
<td></td>
<td>1 Pound = 0.4536 kg.</td>
</tr>
<tr>
<td></td>
<td>1 Ton = 907.1848 kg.</td>
</tr>
<tr>
<td></td>
<td>1 Ton (met) = 0.9072 ton</td>
</tr>
<tr>
<td></td>
<td>1 Sq. cm. = 0.1950 sq. in.</td>
</tr>
<tr>
<td></td>
<td>1 Sq. m. = 10.7639 sq. ft.</td>
</tr>
<tr>
<td></td>
<td>1 Sq. m. = 1.1960 sq. yd.</td>
</tr>
<tr>
<td></td>
<td>1 Hectare = 2.4710 acres</td>
</tr>
<tr>
<td></td>
<td>1 Sq. km. = 0.3861 sq. mile</td>
</tr>
<tr>
<td></td>
<td>1 Sq. km. = 247.10 acres</td>
</tr>
<tr>
<td></td>
<td>1 Cu. cm. = 0.0610 cu. in.</td>
</tr>
<tr>
<td></td>
<td>1 Cu. m. = 35.3134 cu. ft.</td>
</tr>
<tr>
<td></td>
<td>1 Cu. m. = 1.3079 cu. yd.</td>
</tr>
<tr>
<td></td>
<td>1 Cu. in. = 0.0164 liter</td>
</tr>
<tr>
<td></td>
<td>1 Cu. ft. = 28.3162 liters</td>
</tr>
<tr>
<td></td>
<td>1 Gal. = 3.7853 liters</td>
</tr>
<tr>
<td></td>
<td>1 Bu. = 35.2338 liters</td>
</tr>
<tr>
<td></td>
<td>1 MM. = 0.0394 in.</td>
</tr>
<tr>
<td></td>
<td>1 CM. = 0.3937 in.</td>
</tr>
<tr>
<td></td>
<td>1 Meter = 3.2808 ft.</td>
</tr>
<tr>
<td></td>
<td>1 Meter = 1.0936 yd.</td>
</tr>
<tr>
<td></td>
<td>1 Km. = 0.6214 mile</td>
</tr>
<tr>
<td></td>
<td>1 In. = 25.4000 mm.</td>
</tr>
<tr>
<td></td>
<td>1 In. = 2.5400 cm.</td>
</tr>
<tr>
<td></td>
<td>1 Ft. = 0.3048 m.</td>
</tr>
<tr>
<td></td>
<td>1 Yd. = 0.9144 m.</td>
</tr>
<tr>
<td></td>
<td>1 Mile = 1.6093 km.</td>
</tr>
</tbody>
</table>

**MULTIPLE PREFIX**

- 1000000 mega
- 1000 kilo
- 100 hecto
- 10 deka

**METRIC PREFIX**

- 1/10 deci
- 1/100 centi
- 1/1000 milli
- 1/1000000 micro

**TEMPERATURE**

Degrees Fahrenheit = \( \frac{9}{5} \) (Degrees Celsius) + 32

Degrees Centigrade = \( \frac{5}{9} \) (Degrees Fahrenheit - 32)

---

**SAN DIEGO REGIONAL STANDARD DRAWING**

**METRIC EQUIVALENTS**

**RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE**

**Drawing Number** M-14

---

**Revision By Approved Date**

- **Equation**: 2.5 7.77
NOTES
1. Generally utilities are to be installed under the applicable specifications for the particular utility and the specifications of the owner Agency.
2. The location of utilities as shown by the Standard Drawing shall in no way violate existing codes or regulations applicable to individual utilities.
3. Gas main to be placed on property side of trench. Electric primary should be diagonally opposite gas main where possible (Types D, E and F).
4. Installation of sewer and/or water utilities are not permitted in the joint trench shown above.
5. Minimum depth of gas pipe may, subject to gas company inspectors approval, be reduced to 24” where necessary to clear foreign structure crossings.
6. Depth and width of trench varies.
7. When approved by all utilities concerned secondary electric, telephone and CATV may be concurrently installed with random separation.
8. CATV main or trunk line conduit required along all streets, except cul-de-sac streets less than 2500’ in length which may be served by feeder lines only.
9. CATV 1/2” feeder conduit shall run across streets with each power service line and capped at edge of sidewalk.
10. All CATV terminals and conduits shall be terminated at generally accepted locations and marked. A map shall be filed with the appropriate agency showing the location of the CATV system.
11. In no case shall CATV conduits be placed within 12” of electric or gas lines. Also conduits are not to be placed directly over gas lines.
12. CATV conduit may be placed with the TELCO conduit provided the TELCO minimum depth is held.
13. Types A, B and C apply when an electric secondary conduit only is used. Types D, E and F apply when an electric primary (and secondary) conduit is used.
NOTES
1. Chain to be 1/4" proof coil chain galvanized steel. Weld four links to post and three links to pipe sleeve.
2. All metal to be hot-dip galvanized after fabrication.

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING
DEMOUNTABLE POST
NOTE
Chain-link fabric shall be erected on the interior side of the courts.

CAUTION: This standard is not to be used if any wind screen is to be applied to the fence.

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>MIN. SIZE IN INCHES</th>
<th>MIN. WEIGHT PER LIN FT IN LBS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Post</td>
<td>2.375 O.D.</td>
<td>3.65</td>
</tr>
<tr>
<td>Terminal Post</td>
<td>2.875 O.D.</td>
<td>5.79</td>
</tr>
<tr>
<td>Top Rail</td>
<td>1.660 O.D.</td>
<td>2.27</td>
</tr>
<tr>
<td>Bracing</td>
<td>1.660 O.D.</td>
<td>2.27</td>
</tr>
<tr>
<td>Gate Frame</td>
<td>1.660 O.D.</td>
<td>2.27</td>
</tr>
</tbody>
</table>
1. Drinking Fountain - Haws model 3376 or approved equal.
2. 3/8" dia. expansion anchors with flat (recessed heads) screws 4 places.
3. 1/2" P.V.C. pipe with sweep 90° all connection to fountain drain.
4. 3" x 16" concrete yard box with hinged locking top (Brooks No. 3HL or equal) set on red brick foundation.
5. 4" x 40 ft. perforated underdrain pipe, encased in crushed rock (3/4" size). Pipe to be A.D.S. or equal.
6. 1" gate valve with red brass cross handle and union. Install as per Std. Dwg. l-12.1
7. 2" dia. galv. pipe sleeve with red brass lock cap per Std. Dwg. l-12.1.
8. Rigid copper pipe from gate valve to fountain assembly connection.
9. Concrete pavement.

NOTES
1. Install fountain so that right hand side faces prevailing wind.
2. Hand form a concrete bowl at bottom of yard box to facilitate sand clean out.
3. Perforated drain pipe and trench are to drain away from fountain at 1/3 min. slope. Keep drain in lawn areas.
4. Item no. 8 is a one inch gate valve. Use red brass bushing reducers to adapt to feed pipe.

LEGEND ON PLANS

TYPICAL PLAN
MARKERS – Shall be blue 2-way stimsonite lifesafe 88AB or equal.

ADHESIVE – An ample amount of two part (A&B) epoxy or equal.

SURFACES – Clean and dry prior to installation per manufacturer’s recommendations. Install markers with reflective surfaces facing oncoming vehicles and offset 2” from lane lines toward fire hydrant.

NOTES:
1. Fire Department will provide location(s) for all markers in PRO’s.
   Commercial Lots and other areas outside of Public Right of Way.
2. Markers must be installed at all new and relocated hydrants and within all resurfacing projects.
3. For streets without lane lines or streets with raised pavement markers and no painted lane lines, install markers on centerline or in line with existing markers.

LEGEND ON PLANS

<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marker</td>
<td>■</td>
</tr>
<tr>
<td>Fire Hydrant</td>
<td>●</td>
</tr>
</tbody>
</table>

SAN DIEGO REGIONAL STANDARD DRAWING

FIRE HYDRANT MARKERS

DRAWING NUMBER M-19
SEWERAGE SYSTEMS
NOTES:
1. Manhole frame and all joints shall be set in Class "C" mortar.
2. All precast components shall be manufactured in accordance with ASTM C-478 except step spacing.
3. Vertical wall of cone shall be on the upstream side of the manhole.
4. Concrete base shall be 564-C-3000.
5. Approved water stop required for plastic pipe connections.
6. Flexible pipe joints shall be required within 12" of inside face of manhole, except for plastic pipe.
7. Precast base permitted as approved by Agency.

LEGEND ON PLANS
M.H. No. 2

MANHOLE 4' x 2' DIAMETER
NOTES:
1. Manhole frame and all joints shall be set in Class "C" mortar.
2. All precast components shall be manufactured in accordance with ASTM C-478.
3. Vertical wall of cone shall be on the upstream side of the manhole.
4. Concrete base shall be S64-C-3000.
5. Approved water stop required for plastic pipe connections.
6. Precast sections shall be used within dimension "A" as required, in order of preference listed:
   A. Cone (matched for pipe if dimension "A" is less than 3').
   B. 6" to 24" of 3' diameter grade rings.
   C. 5' diameter shaft to maximum height of 60'.
   D. Additional 3' diameter riser.
7. Flexible pipe joints shall be required within 12" of inside face of manhole except for plastic pipe.

LEGEND ON PLANS
M.H. No. 2

MANHOLE 5' x 3' DIAMETER
NOTES
1. Gate cap shall be labeled "Sewer".
2. Cleanouts may be used for either V.C.P. or plastic sewer mains.
3. Riser to be same diameter as sewer main.
NOTES
1. For trenching in improved streets, see Standard Drawings G-24.1 or G-25.1 for trench resurfacing.
2. (*) indicates minimum relative compaction.
3. Minimum depth of cover from the top of pipe to finish grade for all sanitary sewer installations shall be 3'. For cover less than 3', see Standard Drawing S-7.1 for concrete encasement.
NOTES
1. For trenching in improved streets, see Standard Drawings G-24.1 or G-25.1 for trench resurfacing.
2. (*) indicates minimum relative compaction.
3. Minimum depth of cover from the top of pipe to finish grade for all sanitary sewer installations shall be 3'. For cover less than 3', see Standard Drawing S-7.1 for concrete encasement.
NOTE:
Encase pipe to the nearest flexible joint.

LEGEND ON PLANS
Trench Width

Trench Depth

4700 C. 2000 Concrete

5" minimum - 8" maximum
4" to 18" pipe

Bell

Pipe O.D.

Limit of Aggregate:
4" min beneath pipe or
1" min beneath bell,
whichever is greater.

1" maximum
graded aggregate

Invert Elevation

SECTION

LEGEND ON PLANS
8" min Trench Width 8" min

Blocks to be laid as tightly as possible to downstream side of notch.

PLAN

8"x 8"x 16" concrete block
Fill cores with grout.

1/2" expansion joint material or just around pipe.

No. 9 wire ladder type reinforcement in all horizontal joints.

FRONT ELEVATION SIDE ELEVATION

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING
CONCRETE ANCHOR

DRAWING NUMBER S-9.1
NOTES

Type B:
1. No vertical joints permitted.
2. Horizontal joints must overlay by 2 corrugations.
3. Corrugations to run horizontally.
4. Front Elevation and Plan views similar to Type A.

FRONT ELEVATION

SIDE ELEVATION

ELEVATION

TYPE A

TYPE B

LEGEND ON PLANS

---

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

SAN DIEGO REGIONAL STANDARD DRAWING

CUTOFF WALL

DRAWING NUMBER S-10.1
NOTE
For water line construction encasement shall extend to first joint beyond 2 feet at both sides of trench or to a distance of 4 feet, whichever is less.

SECTION A-A

2 #5 bars required when crossing waterline only.

#5 bars
Maximum 12" c. to c.
Additional #5 bar as required.

TYPICAL SECTION
Standard Wye, or Tee, or "Cut in" connection. Where a "Cut in" connection is used, it shall be surrounded with 4" of Class 470-C-2000 Concrete.

Letter "S" stamped or chiseled in face of curb not less than 1 1/2" high and 3/16" deep.

Wire, #12 or heavier. Extend 2' to 3' above ground at time of backfill.

Surface of street

Rock Anchor

Top of curb measured at 9" ~

Angle variable Maximum 45°

Pipe bedding of 1" maximum aggregate (1" below bell)

Detail showing the manner of connecting opposites laterals to a sewer main. Two connections shall not be made in the same length of pipe.

NOTES

1. In no case shall a lateral connect to the sewer main directly on top of the pipe.
2. Sewer laterals shall have a minimum slope of 2%.
3. All joints on sewer lateral pipe shall be compression type or approved solvent weld.
4. Lateral shall extend to property line unless otherwise shown on plans.

LEGEND ON PLANS
NOTE
All joints on sewer lateral pipe shall be compression type or approved solvent weld.

LEGEND ON PLANS

12 minimum or as directed by Agency

Variable Length

2 - 1/8 Bends

Trench Width

Pipe O.D.

1/8 Bend

470-C-2000 concrete base

2" minimum cover around lateral.

See drawing S-13 for continuation of sewer lateral to property line.

The vertical pipe shall be braced while backfilling trench.
NOTE
For water line construction repair pipe shall extend to first joint beyond
2 ft. at both sides of trench or to a distance of 4 ft., whichever is less.
NOTES

1. Similar polyvinyl chloride components may be used in accordance with A.S.T.M. Standard Specification D-3033.

2. Concrete slab to be 564-C-3000

3. Use heavy duty manhole frame and cover, Std. Dwg. M-1, in areas subject to vehicular traffic; use light duty manhole frame and cover, Std. Dwg. M-2, in all other locations.
SECTION B-B

Road Surface

Manhole Frame and Cover,
See drawing M-3

SECTION C-C

Concrete Encasement or Backfill

Notch as necessary

3" Cone

Slope
1" per foot

2/3 Inside dia of Pipe

Approved steel reinforced
Polypropylene Step

SECTION A-A

NOTES
1. Manhole frame and all joints shall be set in
Class "C" mortar.
2. All precast components shall be manufactured
in accordance with ASTM C-478 except
step spacing.
3. Vertical wall of cone shall be on the upstream
side of the manhole.
4. Concrete base shall be 564-C-3000.
5. Approved water stop required for plastic pipe
connections.
6. Flexible pipe joints shall be required within 12"
of inside face of manhole, (except for plastic pipe)
7. Precast base permitted as approved by Agency.
8. Precast sections shall be used within dimension "A"
as required, in order of preference listed:
   A. Cone (notched for pipe if dimension "A" is less
      than 3"
   B. 6" to 24" of 3" diameter grade rings
   C. 4" diameter shaft to maximum height of 60"
   D. Additional 3" diameter risers.

M.H. No. 2

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING

MANHOLE - 4' x 3' DIAMETER
(FOR 15" MAX. DIA. PIPE)
NOTE:

1. (*) Indicates minimum relative compaction.
WATER SYSTEMS
NOTES
1. Service clamp and gasket required on 4" A.C. pipe.
2. Tap not permitted in milled sections of A.C. pipe.

LEGEND ON PLANS
1. Bronze Corporation Stop (installed with key on side and open tap) and Adaptor as required by Agency.
   Note: On steel mains use clamp or weld on coupling as required by Agency.
   Install insulating bushing as required by Agency.
2. Copper Tubing or Plastic Pipe (no intermediate joints permitted without approval of the Agency).
3. Bronze Angle Service Stop with Locking Device and Meter Coupling attached.
4. Meter Box (see Standard Drawing W-15 for location).
5. 90° Ell

SANDIEGO REGIONAL STANDARD DRAWING
1" WATER SERVICE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

DRAWING NUMBER W-1
Top tap where permitted by Agency

NOTE
Silver Soldered Joints may be used where approved by the Agency.

Bronze Service Clamp (double strap). On steel mains use clamp or weld on coupling as required by Agency. Install insulating bushing as required by Agency.

Bronze Corporation Stop (installed with key on side and open tap).

Copper Tubing or Plastic Pipe except where otherwise specified by the Agency.

Coupling as required by Agency when service is 20' or longer, except on Polyethylene Pipe.

30° Elb.

Bronze Angle Service Stop with Locking Device and adaptable to 1 1/2" and 2" Meter Flange.

Meter Box (see Standard Drawing W-15 for location).
1. Bronze Service Clamp (double strap). On steel mains use clamp or weld on coupling as required by Agency. Install insulating bushing as required by Agency.
2. Bronze Corporation Stop
3. 90° Brass Street Ell
4. Pipe to Tubing Adaptor
5. Copper Tubing
6. Ball Valve
7. Brass Plug
8. Meter Box (see Standard Drawing W-15 for location).

LEGEND ON PLANS
See drawing W-14, for type and location of enclosures

1. Double Strap Bronze Service Clamp. On steel mains use clamp or weld on coupling as required by Agency. Install insulating bushing as required by Agency.
2. Corporation Stop
3. Pipe x Tubing 90° Ell
4. 30° Swivel Ell
5. Copper Tubing
6. Female Adaptor
7. Air and Vacuum Valve
8. 2-90° Els (not required in above metal ground enclosures).

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING

1" AND 2" AIR AND VACUUM VALVES

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

DRAWING NUMBER W-4
1. Flanged Outlet, Cement Lined and Coated Steel
2. Flanged, 90° Ell, Cement Lined and Coated Steel
3. Valve
4. Valve Well and Cap (see Standard Drawing W-12)
5. Steel Pipe, Cement Lined and Coated
6. Air and Vacuum Valve
7. 2 90° Elts (not required with above ground metal enclosures)

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING

4" AND 6" AIR AND VACUUM VALVES

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Oleinik, J.R., Dec. 1975
Coordinator R.E.E. 13997

DRAWING NUMBER W-5
1. **Bronze Service Clamp** (double strap). On steel main use clamp or weld on coupling as required by Agency. Install insulating bushing as required by Agency.
2. **Bronze Corporation Stop** (installed with key on side and open tap) and adaptor as required by Agency.
3. **Copper Tubing**
4. **90° Elb**
5. **Pipe to Tubing Adaptor**
6. **Ball Valve**
7. **Brass 2" Iron Pipe Thread x 2 1/2" Hose Pipe Thread Adaptor.**
8. **2 1/2" Hose Cap with chain, Brass.**
9. **Meter Box** (see Standard Drawing W-15 for location).

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**LEGEND ON PLANS**

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**SAN DIEGO REGIONAL STANDARD DRAWING**

**2" BLOW-OFF ASSEMBLY - TYPE A**

**RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE**

*Drawing Number W-6*
1. Bronze Service Clamp (double strap) or Pretapped Coupling. On steel mains use clamp or weld on coupling as required by Agency. Install insulating bushing as required by Agency.

2. 2" Nipple (2"x 3")

3. 45° Ell

4. 2" Nipple (2"x 6")

5. 2" Valve

6. 2" Pipe

7. 90° Ell

8. 2" Threaded Cap


NOTES
1. Type of installation and materials to be specified by Agency.
2. See Standard Drawing W-6 for end of main detail.
1. Flanged Tee or Welded Saddle.
2. Short Radius 90° Flanged Bend, Cement Lined and Coated.
4. Flanged Valve.
5. Steel Pipe (or P. V. C. Schedule 80 Pipe Where Permitted by Agency).
7. 90° Bend (Same Material as Item 5).

LEGEND ON PLANS
1 Main Size x Flanged Outlet, cement lined and coated.
2 Flanged Gate Valve (F x RT for A.C. Pipe).
3 Cast Iron Pipe or A.C. Pipe (6 1/2" min for A.C. Pipe).
4 F x F 90° Bend (F x RT for A.C. Pipe).
5 Galvanized Iron Pipe, threaded and flanged.
6 10" Class 200 A.C. Pipe Gate Well.
7 Galvanized Iron Coupling, threaded.
8 Galvanized Iron Plug.
9 Gate Well Cap with 4" skirt.
10 Valve Well (see Standard Drawing W-12).
NOTE
Items 2, 3 & 6 may be cement-lined and coated flanged steel pipe where permitted by Agency.

1. Fire Hydrant
2. 12" long Extension Spool
3. Extension Spool
4. 3/4" x 3" Hex. Head Machine Bolts and Nuts, Typical.
5. Hydrant Ell
6. Asbestos Cement Pipe
7. Valve
8. Valve Well Installation (see Standard Drawing W-12)

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING

6" FIRE HYDRANT
NOTES:

1. Apron, where required by Agency, shall be 4″ thick (520-C-2500) concrete.
2. When distance from hydrant to the top or toe of slope is less than 2'-0",
special hydrant installation will be required by Agency.
3. Where hydrant is not protected by a vertical face of curb protective posts are
required. See Standard Drawing W-16 for details.
4. Hydrant shall be located 5′ minimum from curb return and 3′ minimum
from driveway or any fixed obstruction.
NOTES
1. Provide clamp or felt to hold pipe sections (item 2) together during backfill.
2. Pipe shall be saw or machine cut on each end, no beveled sections will be permitted.
3. The final adjustment to finish grade may be made with an asbestos cement ring of 1” minimum height.

1. Valve
2. 8” O.D. Steel Pipe, or 10 Ga. Asphalt Coated and Lined.
3. 8 5/8” O.D. Steel Pipe or 10 Ga. Asphalt Coated and Lined.
4. 8” Valve Well Cap with 4” Skirt

NOTE
Pipe sections shall be tack welded together.

GENERAL NOTES
1. Clearance around cover shall permit lifting by hand without damage to pipe.
   Maximum clearance shall be 3/16”.
NOTES
1. Extension to be used when top of valve nut is 5" or more below finish grade.
2. Paint all finished surfaces with asphalt varnish.
**PLAN**

<table>
<thead>
<tr>
<th>Valve Size</th>
<th>Dia</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot; &amp; 2&quot;</td>
<td>14&quot;</td>
<td>24&quot;</td>
</tr>
<tr>
<td>4&quot;</td>
<td>14&quot;</td>
<td>30&quot;</td>
</tr>
<tr>
<td>6&quot;</td>
<td>16&quot;</td>
<td>36&quot;</td>
</tr>
</tbody>
</table>

**TYPE A**

1. Steel enclosure, paint as specified by Agency.
2. Meter box, see Standard Drawing W-15 for location.
3. 2' x 2' pad, 470 - C - 2000 Concrete

**TYPE B**

**TYPE C**
TYPE *A1
WITH OR WITHOUT COMMERCIAL OR RESIDENTIAL SIDEWALK

Curb or asphalt berm
Meter Box
Sidewalk

TYPE *A2
CONTIGUOUS SIDEWALK

Curb
Sidewalk
Meter Box

TYPE B
NON-CONTIGUOUS SIDEWALK

Property Line

Curb
Meter Box
Sidewalk

TYPE C
NO CURB

Road Surface
Meter Box
Slope up

TYPE D
NO CURB

Road Surface
Meter Box
Slope down

* Agency to determine alternate
4" steel pipe filled with 470 - C - 2000 concrete and painted in accordance with Agency requirements.
NOTES
1. Concrete shall be 470 - C - 2000.
2. See Standard Drawing W-18 for bearing areas.
NOTES
1. Based on 225 psi test pressure and bearing values of dry soils.
2. Values from curves are for tees and deadends, i.e.; straight line thrust.
   For 90° bend: 1.4 value from curve.
   For 45° bend: 0.8 value from curve.
   For 22 1/2° bend: 0.4 value from curve.
3. For conditions not covered by curves, special thrust blocks must be computed and approved.

SAN DIEGO REGIONAL STANDARD DRAWING
THRUST BLOCK BEARING AREAS
NOTE
Concrete shall be 470-C-2000.
Concrete shall be 470-C-2000.

### Table

<table>
<thead>
<tr>
<th>Pipe Nominal Dia</th>
<th>Cubic Ft. of Concrete Required per 100 P.S.I. Pressure*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>45°</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>8</td>
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</tr>
<tr>
<td>10</td>
<td>**</td>
</tr>
<tr>
<td>12</td>
<td>**</td>
</tr>
</tbody>
</table>

* Increase volumes shown in proportion to pressures existing when pressure testing pipeline.

** Special design required.
NOTES
1. For trenching on improved streets see standard drawing G-24.1 or G-25.1 for resurfacing details.
2. (*) indicates minimum relative compaction.
NOTE:
Bearing area shall be the difference between the bearing areas required for thrust anchorage of mains on each side of reducer as found from Std. Owg. W-18 plus the area of the trench opening, except that minimum dimensions shown shall be adhered to.
1" Water service per Dwg W-1
2" Curb stop
Main connection X multiple branch connection
Brass coupling or 45° elbow
Brass nipple - 4" min. length
Brass 45° elbow
Cast iron cap
Asbestos cement pipe
Thrust block per Dwg W-17

NOTE: Nipple lengths to be sufficient to allow service connection to clear thrust block.

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<td>3</td>
<td>1 1/4&quot;</td>
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<tr>
<td>4</td>
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<tr>
<td>6</td>
<td>2 1/4&quot;</td>
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Drill and tap to std. thread

SECTION A-A

ELEVATION
NOTE:
Contractor shall provide handholes as required to complete the work.
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