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.
March, 1997
SAN DIEGO AREA

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January 1997

These standard drawings have been adopted by the San Diego Regional Standards Committee for the benefit of all agencies in the San Diego area. The Regional Standards Committee membership is comprised of the County's sixteen cities, the County of San Diego, various representative districts and private industry organizations, the Pacific Telephone Company and the San Diego Gas and Electric Company as named above. The San Diego County Department of Public Works is currently providing coordination and staff support for the Regional Standards Committee.

REVISIONS

The San Diego Regional Standards Committee will continuously accept proposed revisions and/or proposed new standard drawings for review. They should be submitted to the Regional Standards staff at the Department of Public Works, County of San Diego 5555 Overland Avenue, San Diego, CA 92123, Attention: Design Engineering Section MS 0340. Should the proposed revision be very minor in nature, i.e., a grammatical error, etc., the staff will make the necessary change without taking it to the Committee. Once enough proposals have been submitted to warrant a Regional Standards Committee meeting, the staff will prepare an agenda and schedule a meeting. A blank submittal form is included after this page.

At the meeting the Committee will take one of three possible actions: approve the change, reject the change or recommend that a subcommittee further study of the change and make recommendations to the Committee. The individual or organization who submitted the change will then be notified of the Committee action. After approval of the proposed change by the Regional Standard Committee the staff will print and distribute the change to the government agencies within the San Diego County.

It is intended that the standard drawing package will be reprinted and distributed periodically incorporating all the changes approved by the Regional Standards Committee since the last printing. The reprinting will take place when the Regional Standards Committee determines enough revisions have been approved to warrant issuance of an updated drawing package. It is further intended that the Regional Standards be accepted by all agencies at the earliest possible time.

Timothy N. Stanton
Chairman, Regional Standard Committee
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APPENDIX A
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<td>#4 total 4</td>
</tr>
<tr>
<td>max soil press. (psf)</td>
<td>500 600 800</td>
</tr>
</tbody>
</table>

DATE: 7-66
RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
Coordinator: R.C. E. 19937 Date: 1-24-73

MASONRY RETAINING WALL TYPE 1 (LEVEL BACKFILL)
NOTES
1. See Standard Drawings C-7 and C-8 for additional notes and details.
2. Fill all block cells with grout.
TYPICAL SECTION
over 5'-4"

NOTES
1. See Standard Drawings C-7 and C-8 for additional notes and details.
2. Fill all blockcells with grout.

<table>
<thead>
<tr>
<th>DIMENSIONS AND REINFORCING STEEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>H (max)</td>
</tr>
<tr>
<td>T (min)</td>
</tr>
<tr>
<td>W (min)</td>
</tr>
<tr>
<td>A bars</td>
</tr>
<tr>
<td>B bars</td>
</tr>
<tr>
<td>C bars</td>
</tr>
<tr>
<td>D bars</td>
</tr>
<tr>
<td>E bars</td>
</tr>
<tr>
<td>max. soil press. (psf)</td>
</tr>
</tbody>
</table>

SAN DIEGO REGIONAL STANDARD DRAWING

MASONRY RETAINING WALL TYPE 3
[LEVEL BACKFILL]
TYPICAL SECTION
over 3'-8"

NOTES
1. See Standard Drawings C-7 and C-8 for additional notes and details.
2. Fill all block cells with grout.
TYPICAL SECTION
over 5'-4"

ELEVATION

DIMENSIONS AND REINFORCING STEEL

<table>
<thead>
<tr>
<th></th>
<th>3'-8&quot;</th>
<th>5'-4&quot;</th>
<th>8'-0&quot;</th>
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</thead>
<tbody>
<tr>
<td>H (max)</td>
<td>3'-8&quot;</td>
<td>5'-4&quot;</td>
<td>8'-0&quot;</td>
</tr>
<tr>
<td>T (min)</td>
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<td>0'-10&quot;</td>
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<td>W (min)</td>
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<td>3'-1&quot;</td>
<td>4'-3&quot;</td>
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<tr>
<td>R</td>
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</tr>
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<td>1'-7 1/2&quot;</td>
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</tr>
<tr>
<td>C Bars</td>
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<tr>
<td>D Bars</td>
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<tr>
<td>E Bars</td>
<td>#4 total 5</td>
<td>#4 total 5</td>
<td>#4 total 6</td>
</tr>
</tbody>
</table>

Max. Toe Press. (psf) 774 1,030 1,660

NOTES
1. See Standard Drawings C-7 and C-8 for additional notes and details.
2. Fill all block cells with grout.

SAN DIEGO REGIONAL STANDARD DRAWING
MASONRY RETAINING WALL TYPE 5
(Level Backfill)

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARD COMMITTEE
TYPICAL SECTION

over 3'-8"

DIMENSIONS AND REINFORCING STEEL

| Description | 5'-4" | 3'-8"
|-------------|-------|-------
| H (max)     | 5'-4" | 3'-8"
| T (min)     | 0'-10"| 0'-8"
| W (min)     | 3'-10"| 2'-9"
| A Bars      | #4@16"|       |
| B Bars      | #6@16"| #4@16"
| Max. Toe Press. (psf) | 2,000 | 1,400 |

NOTES
1. See Standard Drawings C-7 and C-8 for additional notes and details.
2. Fill all block cells with grout.
DESIGN CONDITIONS:

Walls are to be used for the loading conditions shown for each type wall. Design H shall not be exceeded. Footing key is required except as shown otherwise or when found unnecessary by the Engineer. Special footing design is required where foundation material is incapable of supporting toe pressure listed in table.

DESIGN DATA:

Reinforced Concrete:

\[ F_c = 1200 \text{ psi} \quad F'_c = 3000 \text{ psi} \]

\[ F_s = 20,000 \text{ psi} \quad n = 10 \]

Reinforced Masonry:

\[ F_m = 600 \text{ psi} \quad F'_m = 200 \text{ psi} \]

\[ F_s = 20,000 \text{ psi} \quad n = 50 \]

Earth = 120 pcf and Equivalent Fluid Pressure = 36 psf per foot of height. Walls shown for 1:1 unlimited sloping surcharge are designed in accordance with Rankine’s formula for unlimited sloping surcharge with \( \phi = 33^\circ \quad 42^\circ \).

REINFORCEMENT:

Intermediate grade, hard grade, or rail steel deformation shall conform to ASTM A615, A616, A617. Bars shall lap 40 diameters, where spliced, unless otherwise shown on the plans. Bends shall conform to the Manual of Standard Practice, A.C.I. Backing for hooks is four diameters. All bar embedments are clear distances to outside of bar. Spacing for parallel bars is center to center of bars.

MASONRY:

All reinforced masonry retaining walls shall be constructed of regular or light weight standard units conforming to the “Standard Specifications for Public Works Construction.”

JOINTS:

Vertical control joints shall be placed at 32 foot intervals maximum. Joints shall be designed to resist shear and other lateral forces while permitting longitudinal movement. Vertical expansion joints shall be placed at 56 foot intervals maximum.

CONCRETE:

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

BACKFILL:

No backfill material shall be placed against masonry retaining walls until grout has reached design strength or until grout has cured for a minimum of 28 days. 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%.

FENCING:

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

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 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 shall attain a minimum compressive strength of 2,000 psi in 28 days and mortar shall attain 1,800 psi in 28 days. 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.

WALL DRAINS:

Wall drains shall be provided in accordance with Standard Drawing C-8.

SOIL:

All footings shall extend at least 12 inches into undisturbed natural soil or approved compacted fill. Soil should be dampened prior to placing concrete in footings.
No surcharge loads within this area for level backfill design.

Filter Material, 1" max. crushed aggregate, 4 cu. ft. per 4" dia. drain or 1 cu. ft. per ft. of open head joints.

4" dia. drain with 1/4" galv. wire mesh screen 8' - 0" on centers, or one row horizontally of open head joints.

Line of undisturbed natural soil

TYPICAL SECTION

Mortar or cast-in-place concrete
Finished ground line

Vertical reinf.
Grout filled block cells

Horizontal reinf. thru bond beam block

2" x 4" (nominal) key

9" 12" block wall
5 1/4" 8" block wall

Vertical reinf.
Top of footing

CAP DETAIL

KEY DETAIL

NOTES:
1. All masonry retaining walls shall be constructed with cap, key and drainage details as shown hereon.
2. 4" diameter drain may be formed by placing a block on its side.
TYPE-A WALL
(Applicable for all types of backfill loadings)

TYPE-B WALL

TYPE-C WALL

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

<table>
<thead>
<tr>
<th>WALL TYPE</th>
<th>HEIGHT</th>
<th>BASE</th>
<th>CONC CF/FT</th>
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<tr>
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<tr>
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TYPICAL ELEVATION

NOTE
See Standard Drawing C-10 for Section A-A, notes and details.
CONCRETE
Concrete shall be 550-C-3250.

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 = 36 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 \( \phi = 33° 42' \).
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

3/4'' dia.
Split permitted

3/8''

RUBBER WATERSTOP
Use only when watertight joint is required.
SPREAD FOOTING SECTION

Place concrete in lee against undisturbed material, except as permitted by the Engineer.

Note:
Quantities vary to Design H portion and exclude the added portion above "Gutter Elevation."

TABLE OF REINFORCING STEEL
DIMENSIONS AND DATA

<table>
<thead>
<tr>
<th>Design H</th>
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<tr>
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<td>1&quot;</td>
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</tr>
<tr>
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<tr>
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<td>10@20</td>
<td>12@18</td>
<td>14@18</td>
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</tbody>
</table>

Note:
Reinforcement detailed is to be placed in addition to that shown for spread footing. All girders shown, see Site Layout on plans.

Notes:
Design H may be exceeded by 6" before going to the next size. Footing key is returned except when found unnecessary by the Engineer. Special footing design is required where foundation material is incapable of supporting toe pressure loads listed in table.

Design Data:
fc = 1300 psi, fs = 3250 psi, f0 = 24,000 psi
n = 10, earth = 100 pcf
Case I: Equivalent fluid pressure = 36 psf max for determination of toe pressure. 27 psf max for determination of heel pressure.
Case II: Earth pressure determined from Rankine's formula with θ = 35° - 40°.

4STPILE FOOTING SECTION

TYPICAL LAYOUT EXAMPLE

For parts required, see Details 3-3 and 3-4, drawing C-15
WEAKENED PLANES

DETAIL 3-2

WEEP HOLE AND PERVIOUS BACKFILL

DETAIL 3-1

Notes:
A. 4" drains # 25 max center to center (8" c/c for Type 3 and 9½" c/c for Type 4 Retaining Walls) For walls adjacent to sidewalks or curbs, provide 4" cast iron or asbestos cement pipe under the sidewalk to discharge thru curb face. Exterior wall drains shall be located 3' above finished grade.
B. 6" square aluminum or galvanized steel wire 4 mesh hardware cloth (Min wire diameter 0.03") Anchor firmly to back face.
C. One cubic foot pervious backfill material in a burlap sack, securely tied.
D. Pervious backfill material continuous behind retaining wall.

WALL EXPANSION JOINTS

AND WEAKENED PLANES

DETAIL 3-3

WATERSTOP

DETAIL 3-6

1/4" premolded expansion joint filler unless other thickness and/or material is shown elsewhere

3/4" chamfer

Front face of wall

Waterstop

3/4" min. thickness

Seal between filler and waterstop

1/4" rod

3/4" min. thickness

Seal between web for wire, rings, etc. The web to "3" reinforcing bars @ 12" max intervals to support the waterstop in proper position during concrete placement. Alternative detail may be submitted for approval of the Engineer.

Holes will be permitted in the outer 1/2" of the web for wire, rings, etc. The web to "3" reinforcing bars @ 12" max intervals to support the waterstop in proper position during concrete placement. Alternative detail may be submitted for approval of the Engineer.

WATERSTOP

DETAIL 3-6

SANDiego REGIONAL STANDARD DRAWING

REINFORCED CONCRETE

RETAINING WALL DETAILS NO. 3

SAN DIEGO REGIONAL STANDARD DRAWING

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Officer in Charge: R.C.E. 1975

Drawing Number: C-15
DRAINAGE SYSTEMS
NOTES:

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 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.
NOTES:
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".
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
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.

LEGEND ON PLANS
15' Type C-1 Inlet

SAN DIEGO REGIONAL STANDARD DRAWING
CURB INLET - TYPE C

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE
Coordinator: R.C.E. 15997
Date: Dec 1975

Drawing Number: D-3
DIMENSIONS

T = 8" unless V is less than 8"
T = 10" if V is 8" or more.
V = 5" unless otherwise specified.
V = D + 32" minimum.
W = 7" unless otherwise specified.
Y = 5" unless otherwise specified.
Width of driveway, W, shall be 10' unless otherwise specified.
Elevation of point N shall be 13" below point H unless otherwise specified.

PLAN

TOP SLAB REINFORCING PLAN

SECTION E-E

Weakened Plane Joint

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 top to be placed at the same time as the s/w curb and gutter.
5. Concrete shall be 560-C-3250
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>
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<tbody>
<tr>
<td></td>
<td>F.C. 4½&quot;</td>
<td>5½&quot;</td>
<td>6&quot;</td>
<td>7½&quot;</td>
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<td>9&quot;</td>
<td>9&quot;</td>
<td>8&quot;</td>
<td></td>
</tr>
</tbody>
</table>

SECTION D-D

SECTION A-A

1" support bolt, see Detail A on drawing D-5.

SAN DIEGO REGIONAL STANDARD DRAWING

CURB INLET - TYPE D
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' - 0" O.C.
6. Adjusting nuts to be tightened and secured in place when steel plate is in proper position.

SECTION A-A MODIFIED
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.
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. See Std. Drawing D-15.

LEGEND ON PLANS

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

DRAWING NUMBER D-8

SAN DIEGO REGIONAL STANDARD DRAWING

CATCH BASIN - TYPE G
NOTES
2. Concrete base shall be 560-C-3250
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 PLANS
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 580-C-3250.
6. Exposed edges of concrete shall be rounded with a radius of 1/2".
7. Manhole cover to be designated "Storm Drain".

LEGEND ON PLANS
**NOTES**

1. Concrete shall be 560-C-3250 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 ACI 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 6’ install 1” Ø 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” Ø steel support bolts, spaced at not more than 5’ o.c.
NOTES

1. Hot dip galvanize all parts after fabrication.
NOTES
1. Hot dip galvanize all parts after fabrication.
2. Dimensions to centerline of bars unless otherwise noted.
3. Weight: 141 pounds.
4. Not to be used in pedestrian areas.
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 well 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.
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.
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 SSI emulsified asphalt), or continuous weld.
2. See Standard Drawing D - 18 for additional notes and details.

SLOTTED DRAIN CONNECTIONS
TO STANDARD INLETS
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 520-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 downdrain in sag condition.

SECTION A-A
- Top of Berm
- Roadway Surface
- Base
- Transition from berm to ditch section.

SECTION B-B
- 2" A.C.
- 6" min
- 34" min
- 18"
- 6"
- Transition from berm to ditch section.

ALTERNATE SECTION B-B
- Type B
- A.C. Berm
- 36"
- 2" A.C.

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.

<table>
<thead>
<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>
<th>L</th>
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<td>8&quot;</td>
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<td>25 1/2&quot;</td>
<td>15&quot;</td>
<td>4 3/4&quot;</td>
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<td>6&quot;</td>
<td>12&quot;</td>
<td>24&quot;</td>
<td>25&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 560-C-3250
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

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

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 D/2 apart.
3. Concrete shall be 520-C-2500
4. Pipe shall be circular asbestos cement, cast iron or rigid plastic.

BLOCK CORNER

Drain shall not occupy the hatched area.
NOTES
2. When "V" exceeds 4', steps shall be installed.

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING

CATCH BASIN - TYPE I

DRAWING NUMBER D-29
NOTES
1. Concrete shall be 560-C-3250
2. All reinforcing steel #4 bars. All vertical and horizontal tie bars 18” maximum spacing.
NOTES
1. Concrete shall be 560-C-3250
2. All reinforcing steel #4 bars. All vertical and horizontal tie bars 18" maximum spacing.
### Double Pipe Elevation

- **D/2 (1' min)**
- **L**

### Single Pipe Elevation

### Section A-A

- **10''**
- **H**
- **D**
- **A**
- **B**

- **Rounded Pipe Ends, see drawing D-61.**

### Table

<table>
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<tr>
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<th>B</th>
<th>H</th>
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<th>DOUBLE</th>
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<td>C.Y.</td>
<td>L</td>
<td>C.Y.</td>
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### Notes

1. Concrete shall be 560-C-3250
2. Exposed corners to be chamfered 3/4”.

### Legend on Plans

- [Diagram]

---

**Recommended by the San Diego Regional Standards Committee**

**San Diego Regional Standard Drawing**

**Straight Headwall - Type B**

(Circular Pipe)

**Drawing Number:** D-32

**Revision:**

**By:** J.M. 7-86

**Approved:**

**Date:** 7-86

**Conc.:** 7-86
NOTES
1. Concrete shall be 560-C-3250
2. Exposed corners to be chamfered 3/4".
ELEVATION

SECTION B-B

<table>
<thead>
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<th>E</th>
<th>F</th>
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<th>L TYPE</th>
<th>WING TYPE</th>
<th>CONC STEEL</th>
<th>CONC STEEL</th>
<th>W</th>
<th>DOUBLE PIPE</th>
<th>L TYPE</th>
<th>WING TYPE</th>
<th>CONC STEEL</th>
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<td>1'3&quot;</td>
<td>1'0&quot;</td>
<td>2.00</td>
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<td>0.82</td>
<td>53</td>
<td>0.90</td>
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<td></td>
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<td></td>
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<td>1'9&quot;</td>
<td>1'2&quot;</td>
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<td>2'3&quot;</td>
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<td>1.05</td>
<td>1.29</td>
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</table>

NOTES:
1. Concrete shall be 560-C-3250
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
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 560-C-3250
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
- = T
- = W

SAN DIEGO REGIONAL STANDARD DRAWING
WING AND U TYPE HEADWALLS FOR 42" TO 84" PIPES

DRAWING NUMBER D-35
ELEVATION  

SECTION

**NOTES**
1. Concrete shall be 560-C-3250
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 D/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**

---

**SAN DIEGO REGIONAL STANDARD DRAWING**

**L TYPE HEADWALLS**

**CIRCULAR PIPES**

**DRAWING NUMBER** D-36
ELEVATION  SECTION

---

**C.S.P. ARCH SIZE**  | **H**  | **L/2**  | **LENGTH OF W**  | **3' 4"'**  | **4' 10"'**  | **6' 4"'**  | **7' 10"'**  | **9' 4"'**
---|---|---|---|---|---|---|---|---
18"x11"  | 2'-7"  | 2'-9"  | 50  | 0.84  | 60  | 1.03  | 70  | 1.21  | 80  | 1.39  | 90  | 1.57  
21"x15"  | 2'-11"  | 3'-3"  | 60  | 1.00  | 65  | 1.18  | 75  | 1.38  | 80  | 1.58  | 90  | 1.77  
24"x18"  | 3'-2"  | 3'-9"  | 60  | 1.07  | 70  | 1.32  | 80  | 1.53  | 90  | 1.74  | 110  | 1.94  
28"x20"  | 3'-4"  | 4'-3"  | 70  | 1.26  | 80  | 1.47  | 90  | 1.68  | 100  | 1.90  | 115  | 2.11  
35"x24"  | 3'-8"  | 5'-3"  | 100  | 1.51  | 110  | 1.74  | 120  | 1.97  | 140  | 2.20  | 155  | 2.42  
42"x29"  | 4'-1"  | 6'-3"  | 115  | 1.82  | 130  | 2.06  | 140  | 2.31  | 155  | 2.55  | 170  | 2.83  
49"x33"  | 4'-5"  | 7'-3"  | 130  | 2.12  | 145  | 2.37  | 155  | 2.64  | 170  | 2.90  | 185  | 3.15  
57"x38"  | 4'-10"  | 8'-6"  | 145  | 2.52  | 160  | 2.79  | 175  | 3.07  | 190  | 3.35  | 205  | 3.61  
64"x43"  | 5'-3"  | 9'-6"  | 185  | 2.88  | 200  | 3.11  | 215  | 3.48  | 235  | 3.77  | 250  | 4.06  
71"x47"  | 5'-7"  | 10'-6"  | 200  | 3.25  | 215  | 3.56  | 235  | 3.86  | 250  | 4.17  | 270  | 4.48  

**NOTES**

1. Concrete shall be 560-C-3250
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 S/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)

**DRAWING NUMBER** D-37
PIPE DIAMETER | X    | Y    | Z    |
-------------|------|------|------|
12" to 24"   | 1'-0" | 2'-0" | 10"  |
21" to 36"   | 1'-6" | 2'-6" | 12"  |
39" to 48"   | 2'-0" | 3'-0" | 12"  |
51" to 60"   | 2'-6" | 3'-0" | 14"  |
63" & Larger | 3'-0" | 3'-0" | 14"  |

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 560-C-3250
3. Keep the pipe-end clear of obstructions to permit easy placing of culvert extension.

LEGEND ON PLANS

---

CURTAIN WALL

SAN DIEGO REGIONAL STANDARD DRAWING

DRAWING NUMBER D-38

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

"O. A. Rockwell" Dec. 1973
Commission R.E.C. 15837" Cure

CONCRETE

CURTAIN WALL

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

"O. A. Rockwell" Dec. 1973
Commission R.E.C. 15837" Cure

CONCRETE

CURTAIN WALL

NOTE:

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 560-C-3250
3. Keep the pipe-end clear of obstructions to permit easy placing of culvert extension.

LEGEND ON PLANS

---
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 end section can not be utilized.

4. Place weep holes when required by the Agency.

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING

INLET APRON FOR CULVERTS UP TO 42" DIAMETER

DRAWING NUMBER D-39
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 p.c.f.
   Maximum Outlet Velocity = 35 f.p.s.

2. Concrete shall be 560-C-325B

3. Reinforcing shall conform to ASTM designation A615 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 pipe grades not exceeding 20%, inlet box may be omitted.

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

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

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

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

9. Rip rap and subbase classification shall be as shown on plans.

<table>
<thead>
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<th>Pipe Dia (in)</th>
<th>Area (sq.ft.)</th>
<th>Max. Q (cfs)</th>
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</tr>
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</table>

SANDiego Regional STANDARD DRAWING

CONCRETE ENERGY DISSIPATOR

DRAWING NUMBER D-41
END SILL ELEVATION

HEADWALL ELEVATION

SECTION A–A

SECTION C–C

NOTES
1. Place reinforcing, as noted, at center wall (or slab).
2. Match location of reinforcing with that in headwall, end 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 contractor's option.
3. Match location of headwall or end sill reinforcing.

**SAN DIEGO REGIONAL STANDARD DRAWING**

**Concrete Energy Dissipator (Reinforcement)**

**36” to 72” Diameter Pipe**

**Drawing Number**: D-43
NOTES:
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".
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. Maintain 1 1/2" clear spacing between reinforcing and surface unless otherwise noted.
NOTES
1. For trenching on improved streets see Standard Drawing G-24 or G-25 for resurfacing details.
2. (*) indicates minimum relative compaction.
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.
2. Concrete shall be 560-C-3250.
3. Where gap exceeds 3" but is not more than 6" an internal form shall be used.
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.
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

SAN DIEGO REGIONAL STANDARD DRAWING

MINOR DRAINAGE CHANNEL
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 560-C-3250
NOTES
1. Concrete shall be 560-C-3250
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

PIPE TO CHANNEL CONNECTION

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

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 AGENTY REQUIREMENTS

LEGEND ON PLANS
BROW DITCH

3" 470-C-2000 concrete or 3" 2500 psi, air placed concrete with 1\(\frac{1}{2}\)"x1\(\frac{1}{2}\)" 17 gage stucco netting.

TYPE A

TERRACE DITCH

3" 470-C-2000 concrete or 3" 2500 psi, air placed concrete with 1\(\frac{1}{2}\)"x1\(\frac{1}{2}\)" 17 gage stucco netting.

TYPE C

NOTES
1. Longitudinal slope of lined ditch shall be 2% minimum.
2. Over slope down ditches shall employ 6" thickened edge section at both sides of ditch.

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING

DRAINAGE DITCHES

DRAWING NUMBER D-75
### Single Box Culvert Details No. 1

**San Diego Regional Standard Drawing**

**Drawing Number:** D-76A

### Span 
#### Height

<table>
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</tbody>
</table>

### Span 
#### Height

<table>
<thead>
<tr>
<th>Strength Classification</th>
<th>12&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Slab B’</td>
<td>6</td>
</tr>
<tr>
<td>Bottom Slab B’</td>
<td>6</td>
</tr>
<tr>
<td>Size Bar #1</td>
<td>6</td>
</tr>
<tr>
<td>Size Bar #2</td>
<td>6</td>
</tr>
<tr>
<td>Size Bar #3</td>
<td>6</td>
</tr>
<tr>
<td>Size Bar #4</td>
<td>6</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.
TYPICAL SECTIONS 2' THRU 6' SPANS

For cover less than 2 feet, provide #4 @ 18 ea. way & adjust quantities.

Provide paving notch when top is exposed and where PCC pavement or approach slab is used.

TYPICAL SECTION 7' THRU 12' SPANS

For cover less than 2 feet, provide #4 @ 18 ea. way & adjust quantities.

Provide paving notch when top is exposed and where PCC pavement or approach slab is used.

FLAT INVERT
V INVERT
TRAPEZOIDAL INVERT

ALTERNATIVE INVERTS
(When shown)

SINGLE BOX CULVERT DETAILS NO. 2
## SAN DIEGO REGIONAL STANDARD DRAWING

### DOUBLE BOX CULVERT

#### DETAILS NO. 1

<table>
<thead>
<tr>
<th>SPAN</th>
<th>2'</th>
<th>4'</th>
<th>5'</th>
<th>6'</th>
</tr>
</thead>
<tbody>
<tr>
<td>2'</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4'</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5'</td>
<td></td>
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</tr>
<tr>
<td>6'</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

| Concrete C/Per Lin Ft. | 847/0.51 | 735/0.51 | 623/0.51 | 511/0.51 |

<table>
<thead>
<tr>
<th>2'</th>
<th>3'</th>
<th>4'</th>
<th>5'</th>
<th>6'</th>
</tr>
</thead>
<tbody>
<tr>
<td>4'</td>
<td>3'</td>
<td>2'</td>
<td>1'</td>
<td>0'</td>
</tr>
</tbody>
</table>

### Note:

For bars of height less than that shown in table, use next greater table height slabs, wall dimensions and reinforcing steel and make necessary changes in number of spacers and quantities. Number of "b" bars in table is slab total for both cells.

**Dr.**

**Me.**

**Enlarg. By**

**Approved On**

**Date**

**8-38**
For cover less than 2 feet, provide #4 @ 18 ea. way and adjust quantities.

Provide paving notch when top is exposed and where PCC pavement or approach slab is used.

Typical Section
(Showing reinforcement for interior walls 8" and over)

For reinforcement clearance, except at bottom, see "Miscellaneous Details."

"Flat Invert" Alternative
(When shown)
## SAN DIEGO REGIONAL STANDARD DRAWING

### TRIPLE BOX CULVERT DETAILS NO. 1

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

#### DRAWING NUMBER D-78A

---

### Table: Span Height

<table>
<thead>
<tr>
<th>SPAN</th>
<th>2'</th>
<th>4'</th>
<th>6'</th>
</tr>
</thead>
<tbody>
<tr>
<td>12'</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>10'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6'</td>
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<tr>
<td>4'</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2'</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### Table: Strength Classification

<table>
<thead>
<tr>
<th>MAX FILL OVER TOP</th>
<th>2'</th>
<th>4'</th>
<th>6'</th>
</tr>
</thead>
<tbody>
<tr>
<td>12'</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>10'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8'</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>6'</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>4'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2'</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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### Table: Concrete CY per lin ft

<table>
<thead>
<tr>
<th>Length</th>
<th>Concrete CY per lin ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>6'</td>
<td>0670.010</td>
</tr>
<tr>
<td>8'</td>
<td>0670.010</td>
</tr>
<tr>
<td>10'</td>
<td>0670.010</td>
</tr>
</tbody>
</table>

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### Table: Span

<table>
<thead>
<tr>
<th>Span</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>6'</td>
<td>0824.000</td>
</tr>
<tr>
<td>8'</td>
<td>0824.000</td>
</tr>
<tr>
<td>10'</td>
<td>0824.000</td>
</tr>
</tbody>
</table>

---

### Note:

For bars 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 "a" bars in table is slab total for all three cells.
For cover less than 2 feet, extend "c" bars full length, top slab only. Provide additional #4 spacers @ 18" and adjust quantities.

Provide paving notch when top is exposed and where P.C.C. pavement or approach slab is used.

For reinforcement clearance, except at bottom, see "Miscellaneous Details."

"FLAT INVERT" ALTERNATIVE
(When shown)
TYPICAL SECTION
H=4' THRU 12'

Design Notes:
- Unit Stresses: f_s = 20,000 psi, f_y = 12,000 psi, n = 10
- Maximum Toe Pressure = 1/2 tons/sq. ft.
- Elevation, length, and angle of flares of wings may be varied by the Engineer to suit conditions encountered in the field. Walls designed for 2 live load surcharge, 1/2'1 sloping surcharge, not to exceed 2' in elevation plus 2' live load surcharge, or unlimited 2' surcharge.
- Dimensions "H", "L", "M", "N", Elev "o" and "Angle of flare" (as apply) shown on the plans.

REINFORCED CONCRETE WINGWALLS

<table>
<thead>
<tr>
<th>H</th>
<th>4'</th>
<th>5'</th>
<th>6'</th>
<th>7'</th>
<th>8'</th>
<th>9'</th>
<th>10'</th>
<th>11'</th>
<th>12'</th>
<th>13'</th>
<th>14'</th>
<th>15'</th>
<th>16'</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>3'2</td>
<td>3'4</td>
<td>4'4</td>
<td>5'2</td>
<td>5'8</td>
<td>6'2</td>
<td>6'8</td>
<td>7'2</td>
<td>7'8</td>
<td>8'2</td>
<td>8'8</td>
<td>9'2</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>2'2</td>
<td>2'6</td>
<td>2'10</td>
<td>3'2</td>
<td>3'6</td>
<td>4'2</td>
<td>4'6</td>
<td>5'2</td>
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<td>7'2</td>
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<tr>
<td>F</td>
<td>1'2</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Batter
- 1/10 | 1/12 | 1/14 | 1/16 | 1/18 | 1/20 | 1/22 | 1/24 | 1/26 | 1/28 | 1/30 | 1/32 | 1/34 |
- 3'2 Bars 4824 | 4860 | 4896 | 4932 | 4968 | 5004 | 5040 | 5076 | 5112 | 5148 | 5184 | 5220 | 5256 |
- 4'6 Bars 4860 | 4905 | 4950 | 4995 | 5040 | 5085 | 5130 | 5175 | 5220 | 5265 | 5310 | 5355 | 5400 |

Typical Layout Example

BOX CULVERT WINGWALL
TYPES A, B & C
DETAILS NO. 2

SAN DIEGO REGIONAL STANDARD DRAWING

DRAWING NUMBER D-79B
**WARPPED WINGWALLS**

<table>
<thead>
<tr>
<th>Element</th>
<th>&quot;H&quot;</th>
<th>8&quot; or less</th>
<th>10&quot;</th>
<th>12&quot;</th>
<th>14&quot;</th>
<th>16&quot;</th>
<th>18&quot;</th>
<th>20&quot;</th>
<th>22&quot;</th>
<th>24&quot;</th>
<th>26&quot;</th>
<th>28&quot;</th>
<th>30&quot;</th>
<th>32&quot;</th>
<th>34&quot;</th>
<th>36&quot;</th>
<th>38&quot;</th>
<th>40&quot; or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/3</td>
<td>Front face rent</td>
<td>4 &amp; 1/2</td>
<td>4 &amp; 1/2</td>
<td>4 &amp; 1/2</td>
<td>4 &amp; 1/2</td>
<td>4 &amp; 1/2</td>
<td>4 &amp; 1/2</td>
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<td>4 &amp; 1/2</td>
<td>4 &amp; 1/2</td>
<td>4 &amp; 1/2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rear face rent</td>
<td>4 &amp; 1/2</td>
<td>4 &amp; 1/2</td>
<td>4 &amp; 1/2</td>
<td>4 &amp; 1/2</td>
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<tr>
<td>7/4</td>
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<td>4 &amp; 1/2</td>
<td>4 &amp; 1/2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rear face rent</td>
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<td>4 &amp; 1/2</td>
<td>4 &amp; 1/2</td>
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<td>4 &amp; 1/2</td>
<td>4 &amp; 1/2</td>
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</tr>
<tr>
<td>1/2</td>
<td>Front face rent</td>
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<td>4 &amp; 1/2</td>
<td>4 &amp; 1/2</td>
<td>4 &amp; 1/2</td>
<td>4 &amp; 1/2</td>
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<td></td>
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<td>4 &amp; 1/2</td>
<td>4 &amp; 1/2</td>
<td>4 &amp; 1/2</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- Walls designed for 2' surcharge, earth load = 1200 psi. Equivalent fluid pressure = 38.9 psi.
- Vary Q of warped wall uniformly from that at cut-off wall to that at culvert, for max. "H" = 12'.
- Where abrasion is anticipated, increase apron thickness to 7" min. to provide 2" min. reinforcement coverage.
- Dimensions "L",'W', "H", "M", "N", Elev 'a', "Angle of flare", and "Slope (as apply)" are shown on the plans.
- Concrete shall be class 560-8-3250.

**ALTERNATIVE WARPPED WINGWALL**

Use where additional protection to top of embankment is required.
GENERAL NOTES

QUANTITIES: Quantities are for the sloped invert slab and do not include splices in longitudinal bars, nor temperature reinforcement for exposed top culvert, nor concrete or reinforcement for parapets or cutoff walls.

SPECIAL COVERAGE: Box standard plans are not to be used for culverts in a corrosive environment or where there is a severe abrasive flow condition.

DESIGNATION: Show on plans as span x height - strength classification x length thus 4 x 4 - A - 160, followed by alternatives.

ALTERNATIVES: Invert will be sloped unless "trapezoidal invert," "flat invert" or "V invert" is included in designation. Ends of culvert will be rounded unless "square ends" are designated. Parapets will be as shown unless "--" FT. PARAPET" is designated in plans. Such designations may be different for inlet and outlet ends.

REINF. PLACEMENT: Main reinforcement is positioned transverse or, for curved culverts, radial, when radial reinforcing spacing is measured along the C.

CONSTRUCTION NOTES

CONCRETE:

BOTTOM SLAB & WALLS SHALL BE CLASS 360-B-3250
STOP SLAB SHALL BE CLASS 360-C-3250

EXPANSION JOINTS:

BOTTOM SLAB - No expansion joints shall be placed.
STOP SLAB AND WALLS - When cover is less than span length, place 1/4" expansion joint filler at 50" centers outside the paved roadway lanes and place bridge detail 3-2 at 50" centers under paved roadway lanes. When cover is more than span length, place 1/4" expansion joint filler at 50" centers and additional 1/2" expansion joints at locations of change in foundation character, as directed by the engineer.

CONSTRUCTION LOADS:

Not permitted until concrete has reached a strength of 3,000 P.S.I. or age of 28 days, whichever occurs first, and falsework plans have been submitted by the contractor, to the engineer, and approved.

CONSTRUCTION JOINTS:

Temporary joints may be permitted if normal (or radial) to C of RCB. Otherwise, the contractor is to submit a proposal for consideration.

USE OF STANDARD DRAWING

"STRENGTH CLASSIFICATION" Symbolized by the letters "A", "B", "C", etc., at the top of the data table is merely a convenient designation for a particular structural section for a culvert of any given opening. It is dictated by the cover or depth fill over the top slab.
PARAPET DETAILS FOR SINGLE SPAN CULVERTS

PARAPET DETAILS FOR MULTIPLE SPAN CULVERTS

PARAPET DETAIL FOR SKEWED CULVERTS W/O WINGWALLS

CULVERT EXTENSION

20° SKEW MAXIMUM
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 5/18" diameter steel at 18" c/c secured at ends with cable clamps. Secure fence to cable with No. 12 galv. steel wire looped at 6" 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

SAN DIEGO REGIONAL STANDARD DRAWING

DEBRIS FENCE
ELECTRICAL SYSTEMS
DIRECT BURIAL FOUNDATION

<table>
<thead>
<tr>
<th>POLE HEIGHT</th>
<th>MOUNTING HEIGHT</th>
<th>LAMP SIZE (WATTS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25' ± 2'</td>
<td>27' ± 1'</td>
<td>170 M.V.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100 H.P.S.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>90 L.P.S.</td>
</tr>
<tr>
<td>28' ± 2'</td>
<td>30' ± 1'</td>
<td>400 M.V.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>250 H.P.S.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>180 L.P.S.</td>
</tr>
<tr>
<td>23' - 0'</td>
<td>26' - 9'</td>
<td>70 H.P.S.</td>
</tr>
<tr>
<td>26' - 6'</td>
<td>30' - 0'</td>
<td>150 H.P.S.</td>
</tr>
</tbody>
</table>

Anchor bolts must not protrude.

ANCHOR BASE FOUNDATION

1/4" minimum bolt clearance

Anchor bolts (4 req.) 1"x36"x4" hook, galvanized. Use two leveling nuts with washers (all galv.) on each bolt.

560 - C - 3250 P.C.C. Anchor base square or round, add 1' to each dimension for loose soil or soft clay conditions.
STEEL CONDUIT

#8 copper wire grounded to pole steel with lug

NON-METALLIC CONDUIT

#8 copper wire grounded to pole steel with lug

DIRECT BURIAL FOUNDATION

See Detail A

STEEL CONDUIT

1/2" Rigid steel Conduit

NON-METALLIC CONDUIT

Attach ground wire under anchor nut

ANCHOR BASE 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.

DETAIL A

Steel Conduit

Anchor Rods
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.

1" galvanized steel conduit for service ground (where required).

Grout cap protrusion to be sloped for drainage.

3/4" x 8" copper covered steel ground rod.

NOTE:
Concrete shall be class 560-C-3250
GENERAL SURFACE IMPROVEMENTS
NOTES:
1. Concrete shall be 520-C-2500.
3. Slope top of curb 1/4" per foot toward street.

LEGEND ON PLANS
6" curb

CURBS AND GUTTER - SEPARATE
NOTES:
1. Concrete shall be 520-C-2500.
3. Slope top of curb 1/4" per foot toward street.

LEGEND ON PLANS
NOTES
1. Concrete shall be 520-C-2500.
3. Monolithic curb, gutter and sidewalk is to be used with Agency approval only.

LEGEND ON PLANS

Revision | By | Approved | Date
--- | --- | --- | ---
Thickness | 3" | O.S. | 3-79
Thickness | 3/4" | M.B. | 6-28
Conc. | S" | M.B. | 5-84

SAN DIEGO REGIONAL STANDARD DRAWING

MONOLITHIC CURB, GUTTER AND SIDEWALK

DRAWING NUMBER G-3
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.
2. See Standard Drawing D-6.1 for Rolled Curb Inlet.
3. Concrete shall be 520-C-2500.

Legend on Plans

Recommended by the San Diego Regional Standards Committee

San Diego Regional Standard Drawing
Curb and Gutter-Rolled

Drawing Number G-4

Revision By Approved Date
X-Sect. M.B. 10-72
Conc. MB 5-76
TYPE A-SECTION

Height 6", 8", or 9" as indicated on plans

TYPE B-SECTION

TYPE C-SECTION

TYPE D-SECTION

TYPE E-SECTION

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

TYPE F-SECTION

ALL TYPES – SIDE VIEW

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.

APPROX. DIKE QUANTITIES

<table>
<thead>
<tr>
<th>TYPE</th>
<th>TONS/LIN. FT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.0250</td>
</tr>
<tr>
<td>B</td>
<td>0.0375</td>
</tr>
<tr>
<td>C-6&quot;</td>
<td>0.0375</td>
</tr>
<tr>
<td>C-8&quot;</td>
<td>0.0583</td>
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<tr>
<td>D</td>
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<tr>
<td>E</td>
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LEGEND ON PLANS

Type A Dike
\[ s = \frac{-y}{k} + \frac{3}{2} - 1.5 \]

**B-1**

**AREA = 0.79 SQ.FT.**

**B-2**

**AREA = 1.29 SQ.FT.**

**B-3**

**AREA = 0.29 SQ.FT.**

**B-4**

**AREA = 0.35 SQ.FT.**

**NOTES**

1. Concrete shall be 526-C-2500.
3. Extruded type B-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 B-1, B-3, B-4 Curb
NON-CONTIGUOUS

CONTIGUOUS

NOTES
1. Concrete shall be 520-C-2500.

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<th>By</th>
<th>Approved</th>
<th>Date</th>
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LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING

SIDEWALK - TYPICAL SECTIONS

DRAWING NUMBER G-7
NOTES
1. Expansion Joints — at curb returns, adjacent to structures and at 45' intervals.
   (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.

SAN DIEGO REGIONAL STANDARD DRAWING

SIDEWALK JOINT LOCATIONS

DRAWING NUMBER G-9
**CONCRETE JOINT DETAILS**

**EXPANSION JOINT**

1/8" R

1/2" (Pavement)
3/8" (Sidewalk)

**CONTACT JOINT**

1/8" R

1/2" x 24" Smooth, Greased or Oiled Bar, 30" c.c.

**WEAKENED PLANE JOINT**

**GUTTER AND PAVEMENT**

Preformed Joint filler

2" 1/4" 1/8"

**WEAKENED PLANE JOINT**

**CURB AND SIDEWALK**

2" 1/8" 1/8"

**KEYED JOINT**

1/8" R

1/2" 1/2" 2" 1/2" 1 5/8"
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.
NOTES:

1. Concrete shall be 56D-C-3250.
2. \( \Delta / 4 \) (typ.) = Weakened plane joints.
3. \( \Delta / 4 \) (typ.) = Typical flowlines.
4. ○ Elevations to be shown on plans.
5. Return segments to be 7" Thick.
6. Curb between P.C.R.'s shall be considered as part of cross gutter.
7. In all cases subgrade shall be compacted to 95% min relative compaction to a depth of 12".
Transitional area, depress toe of gutter to match cross gutter slope.

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.
4. In all cases subgrade shall be compacted to 95% minimum relative compaction to a depth of 12".
1. No concrete shall be placed until forms and subgrade are inspected by the Agency.
2. Concrete shall be 520-C-2500.
4. Driveway ramp to extend to 10 feet from curb face or to property line whichever is less. (For commercial driveways only)
5. See Standard Drawings G-2 and G-10 for curb and joint details.
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
4. Driveway ramp to extend to 10 feet from curb face or to property line whichever is less. (For commercial driveways only)
5. See Standard Drawings G-2 and G-10 for curb and joint details.

SAN DIEGO REGIONAL STANDARD DRAW

CONCRETE DRIVEWAYS
(Non-contiguous Sidewalk)
NOTES
1. No concrete shall be placed until forms and subgrade are inspected by the Agency.
2. Concrete shall be 520-C-2500.
4. Driveway ramp to extend to ≤10 feet from curb face or to property line whichever is less. (For commercial driveways only).
5. See Standard Drawings G-2 and G-10 for curb and joint details.
NOTES:

1. Concrete shall not be placed until forms and subgrade are inspected and approved by Engineer.
2. Concrete shall be 520-G-2500.
4. Driveway ramp to extend to 10 feet from curb face or to property line, whichever is less.
5. See Standard Drawing G-2 and G-10 for curb and joint details.
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 more than 25', curb openings may encroach upon each end of the return a distance equal to 12 1/2% or 1/8 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.

---

SANDIEGO REGIONAL STANDARD DRAWING

DRIVEWAY LOCATION - ADJACENT TO CURB RETURNS AND STREET LINES

RECOMMENDED BY THE SANDIEGO REGIONAL STANDARDS COMMITTEE

[Signature]
Coordinator M.E. 150007 Date

DRAWING NUMBER G-15
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 less than 45' are entitled to one 12' 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

Elevation shown on plans

1/2" R

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

G 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).
5. ---- = 1/2" expansion joints.

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING

ALLEY APRON

DRAWING NUMBER G-17
NOTES:
1. Concrete shall be 560-C-3250.
3. Adjust 15" interval between Transverse Joints to match adjacent existing improvements.
NOTES
1. Concrete shall be 500-C-3250.
3. Adjust 15' interval between Transverse Joints to match adjacent existing improvements.
NOTES
1. Concrete shall be S60-C-3250.
2. See Standard Drawing G-10 for Joint Details.
3. Adjust 15' interval between Transverse Joints to match adjacent existing improvements.
TYPICAL SECTION

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 560-C-3250
3. Adjust 15' interval between Transverse Joints to match adjacent existing improvements.
Curb and Gutter

Surface Course

Expansion Joint

Base Course

1'-8"

5'-0"

ELEVATION

520-C-2500 Concrete

8"

SECTION A-A

LEGEND ON PLANS

CUTOFF WALL AT END OF PAVEMENT
Width As Shown On Plan

3' 3' 6'

Allay Pavement

A

ELEVATION

Thickness shown on plans

560-C-3250 Concrete

8"

SECTION A--A

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING

CUTOFF WALL AT END
OF ALLEY PAVEMENT

DRAWING NUMBER G-23
NOTES
1. Trench edges to be cut a minimum of 6" wider than trench for trenches 3' wide or less, and 12" wider for trenches over 3' wide.
2. 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.
3. Base material shall be replaced to depth of existing base. A.C. may be substituted for base material.
4. A tack coat of asphaltic emulsion or paving asphalt shall be applied to existing A.C. at all contact surfaces, prior to resurfacing.
5. Asphalt 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.
6. 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.
7. Type B shall not be used on lateral crossings.
8. Sloughing of trench under pavement shall be cause for requiring additional pavement and base.
GENERAL 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. Sloughing of trench under pavement shall be cause for requiring additional pavement and base.
3. Trench edges shall be cut a minimum of 6” wider than trench for trenches 3’ wide or less, and 12” wider for trenches over 3’ wide.

NOTES TYPE-C
1. Concrete shall be colored black where required to match existing pavement, method to be specified by Agency.
2. Minimum concrete thickness:
   Alleys and local residential street --------------5 inches
   Major streets and highway ----------------------7 inches
   Trench resurfacing in P.C.C. pavement shall have the above minimum thickness or match the existing concrete thickness plus one inch, whichever is greater.

NOTES TYPE-D
1. A.C. shall be hot plant mix.
2. A tack coat of asphaltic emulsion or paving asphalt shall be applied to the existing A.C. at all contact surfaces and to portland cement concrete prior to placing new A.C.
3. A.C. resurfacing shall be seal coated with an emulsified asphalt and covered with sand. Chip sealing shall be applied as required by Agency.

SAN DIEGO REGIONAL STANDARD DRAWING
TRENCH RESURFACING
TYPES C & D

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

DRAWING NUMBER G-25
NOTES

1. No concrete shall be placed until forms and subgrade are inspected by the Agency.
2. Concrete shall be 520-C-2500.

LEGEND ON PLANS

| Q of Alt. Commercial Driveway | 5-85 |

SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE DRIVEWAY

COMMERCIAL ALTERNATE

DRAWING NUMBER G-26
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**CONSTRUCTION NOTES**

1. Set false header for back of ramp at curb height above gutter grade to maximum 6".
2. Where shown on the plans, construct monolithic curb for retention of street drainage or to meet adjacent improvements.

**NOTE**

See Standard Drawing G-32 for general notes.
### TABLE A

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### SECTION A-A

- **NOTES**
  1. If inadequate R/W exists to provide 4’ landing, side slopes shall be increased to 12:1 per side slope "Z1" in Table A. Landing shall be 3’ minimum in all other cases.
  3. Type A-1 is a designation for ramp at curb return.
  4. Type B-1 is a designation for ramp at straight curb.

---

**SAN DIEGO REGIONAL STANDARD DRAWING**

**PEDESTRIAN RAMP**

**TYPES A-1 AND B-1**

*(For Existing Sidewalk)*
NOTES:

1. Type C ramps are only to be used to mitigate existing conditions where inadequate right of way exists to use Standard Drawing G-28, or G-30 and are not to be used in new construction.

Meet existing Curb & Gutter

12" wide border with 1/4" grooves approx. 3/4" O.C.

Meet existing sidewalk

Exist. Top of Curb

Existing Gutter

Meet existing sidewalk

PLAN VIEW

ELEVATED VIEW

SECTION A-A

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<td>8&quot;</td>
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</tbody>
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NOTES
2. X = Design Curb Height as shown on plans.
3. Curb transition (CT) shall be 1'-0" for each one inch difference between existing curb height and design curb height.

See Detail-B
Std. Dwg. G-32

Design Curb Height

5% max. apron slope

5% max. apron slope

Review by:  
Approved by:  
Date:  
R.M. 7/95
TYPICAL PLAN

Property side "Z" dimension and/or grooves may be eliminated by the Engineer and replaced by a retaining curb flush with existing ground and sidewalk.

PLAN VIEW

12" wide border with 1/4" grooves approx. 3/4 " O.C..

SECTION A-A

NOTE
See Standard Drawing G-32 for general notes.

See Detail-B
Std. Dwg. G-32

San Diego Regional Standard Drawing

Pedestrian Ramp
Type D

Revision
By
Approved
Date

SAN DIEGO REGIONAL STANDARD DRAWING

Recommended by the San Diego Regional Standards Committee

Chairman: R.C.E. 25902 Date

Drawing Number

G-31
1. The removal of existing concrete curb, gutter, sidewalk and pavement for pedestrian ramp installation shall comply with Standard Drawing G-11.

2. Areas shown thus: \[\text{\text{\tiny \HRule}}} \] shall have a heavy broom “ripple” texture finish, transverse to axis of ramp contrasting visually with adjoining surfaces.

3. Areas shown thus: \[\text{\text{\tiny \HRule}}} \] are the minimum required for a complete ramp installation and shall be concrete class 520-C-2500.

4. If obstructions such as inlets, utility poles, fire hydrants, etc., are encountered, the ramp locations may be adjusted upon the approval of the Resident Engineer.

5. Ramp slope shall be a minimum grade of 15:1.

6. The ramp slopes will be measured relative to the sidewalk slope, see Detail A below. Adjoining slope beyond ramp shall not exceed 20:1 (5%).

---

**Diagram:**

- **Detail A:**
  - X:Y slope
  - Where X is level plane
  - Sidewalk
  - Line of Curb

- **Detail B:**
  - Remove & reconstruct pavement as shown on plans to provide 5% max. slope within 4' of sidewalk limit.
NOTES

1. Concrete encasement or sand cement slurry backfill shall have a maximum slump of 4 inches.
2. Concrete encasement and sand cement slurry backfill shall be thoroughly consolidated to encase conduits. Tamper or vibrators shall be used.
3. Concrete shall be screeded off to match existing pavement grade and floated to assure proper edge match.
4. A tack coat shall be applied to the concrete and existing asphalt pavement prior to placing the new asphalt pavement wearing surface.
5. Existing A.C. pavement will not require sawcutting when using rockwheel for excavation.
6. Concrete trench cover shall be a minimum 5 1/2 inches thick in alleys or local residential streets and 7 inches thick in all other streets.
7. Allow concrete backfill or concrete trench cover seven calendar days minimum but no longer than thirty calendar days to cure and dry before applying the asphalt concrete wearing surface.
8. In major or prime arterial streets, an approved set accelerating admixture, such as Calcium Chloride, may be used only with prior approval of the agency's Engineer.
10. Select material with a minimum sand equivalent of 50 shall be backfilled to 3" min. above the conduit. Sand cement slurry backfill (100-E-100) may be substituted for select material.

SAN DIEGO REGIONAL STANDARD DRAWING
NARROW TRENCHING TYPES A & B
BACKFILL & RESURFACING

DRAWING NUMBER G-33
NOTES:

1. Cement Slurry Backfill:
   a. Cement slurry backfill shall have a maximum slump of 4 inches.
   b. Cement slurry backfill shall be thoroughly consolidated to encase conduits.
      Tampers or vibrators shall be used.
   c. Cement slurry backfill shall be as follows:
      Alleys and local residential streets ...... Class (190-E-400)
      All other streets ....................... Class (380-E-800)

2. A tack coat shall be applied to the cement slurry backfill and existing asphalt pavement prior to placing the new asphalt surface.

3. Asphaltic Concrete Resurfacing:
   Type C
   a. Allow cement slurry backfill 48 hours minimum to cure before resurfacing, unless approved by the Engineer.
   b. Thickness shall match the existing A.C. with a minimum of 2 inches.
   c. A.C. shall be hot mix.
   Type D
   a. Allow cement slurry backfill seven days minimum to cure before planing.
   b. Plane existing asphalt pavement and slurry backfill, one half thickness of existing A.C., (1 inch minimum not to exceed 2 inches).
   c. A.C. shall be hot mix.

4. A.C. resurfacing shall be sealed or chip sealed when required by the agency's Engineer.

5. Existing A.C. pavement will not require sawcutting when using rockwheel for excavation.
NOTES

1. Concrete backfill or sand cement slurry backfill shall have a maximum slump of 4 inches.

2. Concrete backfill and sand cement slurry backfill shall be thoroughly consolidated to encase conduits. Tamper or vibrators shall be used.

3. Concrete shall be screeded off to match existing pavement grade and floated to assure proper edge match.

4. Concrete trench cover shall be a minimum of 5 1/2 inches thick in alleys or local residential streets and 7 inches thick in all other streets.

5. Existing concrete pavement will not require sawcutting when using rockwheel for excavation.

6. In major or prime arterial streets, an approved set accelerating admixture, such as Calcium Chloride, may be used only with prior approval of the agency's Engineer.

7. Only Type E shall be permitted for supply cables of 750 volts or less. See California Public Utility Commission General Order No. 128, Rule 33.4 D. (1) (b).

8. Select material with a minimum sand equivalent of 50 shall be backfilled to 3" min. above the conduit. Sand cement slurry backfill (100-E-100) may be substituted for select material.
NOTES:
1. Trench resurfacing shall be done according to governmental (permitting) Agency's requirements.

2. The sand used for the slurry backfill shall meet the requirements for fine aggregate Subsection 400-1.3 listed in the Standard Specifications for Public Works Construction. Slurry must be firm prior to trench resurfacing.

3. Slurry backfill may be used in permeable soils and shall not be used where it will impede subsurface drainage.
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.
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.
4. Anti-drain/Excess Flow Valve shall be installed under all heads unless heads have a "Built-in" Anti-drain or check valve.

LEGEND ON PLANS
Show a number to indicate type of head.
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.
5. Anti-drain/Excess Flow Valve shall be installed under all heads unless heads have a "Built-in" Anti-drain or check valve.

ELEVATION

LEGEND ON PLANS
Show a number to indicate type head: ⊗
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. ( )

SAN DIEGO REGIONAL STANDARD DRAWING

QUICK COUPLING VALVE

DRAWING NUMBER 1-5
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 6" 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

SAN DIEGO REGIONAL STANDARD DRAWING
BACKFLOW PREVENTER
ATMOSPHERIC VACUUM BREAKER
(2" & SMALLER)
Continuous Pressure Vacuum Breaker Assembly (with brass test cocks)

Red Brass Short Nipple
Red Brass Ground Joint Union
Red Brass Riser

Finished Grade

12" minimum

6" min.

See drawing I-12 for sleeve details.

Gate Valve, remove valve wheel and replace with cross.

P.V.C. Sch. 40 Female Adaptor

Red Brass 6" Nipple

1 1/2 Cu. Ft. 470-C-2000 Concrete

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 shall be flanged.
2. Buried cast iron pipe and fittings shall be polyethylene wrapped with 2 inch wide plastic backed adhesive tape (8 mil thickness). Use 1/2 inch overlap.
3. Cast iron pipe and fittings shall be cement mortar lined.
4. All exposed cast iron shall be painted with one coat of primer and two coats of exterior enamel.
5. Concrete pad shall be 24 inches wide.
6. Backflow preventer assembly shall be tested upon installation by a certified backflow device tester. Contractor shall provide Engineer with written test results completed by certified backflow tester prior to the backflow preventer assembly's acceptance by Engineer.
7. Adapt inlet and outlet fittings to main as required.

LEGEND ON PLANS

---

SAN DIEGO REGIONAL STANDARD DRAWING

BACKFLOW PREVENTER
REDUCED PRESSURE PRINCIPLE
ASSEMBLY-LARGER THAN 2"
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
X G.V.
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.
5. Locking cap shall be mounted flush with finish grade in turf areas & 1 inch above finish grade in shrub areas.

LEGEND ON PLANS
M.C.V.

SAN DIEGO REGIONAL STANDARD DRAWING
MANUAL VALVES

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

DRAWING NUMBER 1-13
NOTES:
1. Splicing shall be made in valve boxes and pull boxes only. See Standard Drawing I-15 for splice details.
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 globe 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.
6. Valve/controller identification shall be painted on the valve boxes. Use only aluminum asphaltic base water proof paint.
7. Clearance between piping and valve box shall be 1" to 2" typical.

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 resin and shall be completed water-proof.
6. All spare wire ends shall be insulated in the same manner as wire splices.
7. If specified, all splices shall be soldered with metallic alloy solder prior to installing connectors.
8. Wire bundles inside pull boxes shall be at least 4 inches from the underside of the box cover. Minimum size pull box shall be as shown above. Larger boxes may be necessary to meet 4 inch clearance requirement.

LEGEND
P.B.

SAN DIEGO REGIONAL STANDARD DRAWING
ELECTRICAL PULL BOX
FOR DIRECT BURIAL CONTROL WIRES AND SPlice DETAILS

DRAWING NUMBER 1-15
NOTE
See Standard Drawing I-25 or I-26 for water line trench details.

NORMAL LOCATIONS OF CONTROL WIRES

ALTERNATE LOCATION OF CONTROL WIRES

1. Bedding material shall have a sand equivalent of 50, minimum
2. Place a 3" wide red continuous plastic tape trench marker, 9" to 12" below finish grade, directly above the direct burial control wires.
Steel enclosure as approved by Agency. Enclosure shall be painted inside and out with zinc rich primer coat and two finish coats of exterior enamel, as approved by Agency.

Anchor bolts, 1/2" dia., 4" long, cadmium plated, hook length 1" (4 places).

3/4" exterior grade AB plywood backboard. Prime and paint with two coats of exterior enamel, as approved by Agency. Paint both sides and edges of backboard.

1 1/2" x 1 1/2" x 1/4" galv. steel angle stiffeners. Secure controller and backboard with cadmium plated 3/16" stove bolts, six places minimum. Set stiffeners 6" apart.

Controller
Power ON-OFF Switch for Controller
Conduit (Type T)
Double Receptacle (ground fault type)

3/4" Sch. 40 P.V.C. Conduit

Slope to drain away from Controller
4" Thick Concrete Pad
Concrete Foundation

3" PVC Sch. 40 Conduit
90° Sweep Ell

NOTES:
1. Install in each enclosure, one 25 watt incandescent lamp in a two-prong plug in light socket. Install in receptacle.
2. A 15 amp (minimum) circuit is required at each double receptable (120 V).
3. Each controller shall have a power ON-OFF switch, with lock-out, tag-out facility.
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)

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.
4. Each controller shall have a power on/off switch, with lock-out, tag-out facility.

LEGEND ON PLANS

---

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

J. A. B. 1-18

IRRIGATION SYSTEMS
ELECTRIC CONTROLLER CLOCK
WALL MOUNTING

SAN DIEGO REGIONAL STANDARD DRAWING

DRAWING NUMBER I-18

Revision  By  Approved  Date

Note 4  7F  6/2 5/92
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 ¼" overlap.

LEGEND ON PLANS

- M.C.V.
- G.V.
NOTE
Swing Joints shall be used at each change of grade.
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. Backfill material shall be compacted to a relative compaction of 90% or more.
2. All P.V.C. pipe shall lay free in the trench with no induced strain and with sufficient allowance for expansion and contraction as recommended by the manufacturer.
3. Teflon tape, 3/4" wide shall be used on all threaded connections.
4. The letter W shall be stamped or chiseled on the improvement (curb-sidewalk) directly above the pressure pipeline.
5. All plastic pipe under pavement shall be installed in a P.V.C. sleeve.
6. Minimum clearance between pressure pipes shall be 2 inches.

MULTIPLE PIPE INSTALLATION DETAIL
(non-pressure pipe only, see Note 6 for pressure pipe)
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 chisled 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.

SAN DIEGO REGIONAL STANDARD DRAWING

TRENCH DETAIL — ASBESTOS CEMENT PIPE AND 4" AND LARGER P.V.C.
WATER

Plan

3/8" Notch
Provide 6" concrete pad in paved areas.

Elevation

Concrete Pavement
Valve Well Cap
A.C. Pavement

45° chamfer

8" A.C. pipe
Class 150

Top of Bonnet
Wood Blocks

BASE

CAST IRON VALVE WELL CAP

3/16" Relief
Symmetrical about axis

3/16" 13/16"

6 1/4"

7 1/2"

5/8"

1"

4 3/4"

3 3/4"

3/4"

6"

1/4"

1/2"

LEGEND ON PLANS

SANDIEGO REGIONAL STANDARD DRAWING

VALVE WELL AND COVER

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

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

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SAN DIEGO REGIONAL STANDARD DRAWING

CONNECTION DETAIL FOR
NEW ASBESTOS CEMENT SUPPLY MAINS

DRAWING NUMBER I-28
May Be: Bronze, double strap service clamp; cast iron tapped clamp coupling with stainless steel bolts; cast iron boltless tapping sleeve; or cast iron (cement mortar lined) cutting in tapped tee.

Shut-Off Valve. See drawing I-12 or I-13 for details.

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. 80 (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

1/2" dia. Galvanized Pipe Stake
Impact Head
Galvanized Coupling with set screw
Galvanized Riser (length noted on plan)
Two stainless steel hose clamps
Swing Joint
6" Nipple
Swing joint
Anti-Drain / Excess flow valve
NOTES:
1. All risers, unions, elbows and nipples shall be red brass.
2. Close nipples shall not be used.
3. Teflon tape 3/4" wide shall be used on all threaded connections.
4. Concrete pad shall be 18" wide.
5. Backflow preventer assembly shall be tested upon installation by a certified backflow device tester. Contractor shall provide the Engineer with written test results completed by certified backflow tester prior to the backflow preventer assembly's acceptance by the Engineer.

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING
BACKFLOW PREVENTER
REDUCED PRESSURE PRINCIPLE
ASSEMBLY - 2" AND SMALLER

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Drawing Number I-31
NOTES:
1. All pipes shall be 1 1/2-inch diameter galvanized schedule 40 steel.
2. X dimension shall be sized to accommodate type of backflow device being protected.
3. Paint entire fence with one coat metal primer and two coats of exterior yellow colored enamel.
4. Guard fence shall be centered on backflow device.
NOTES

1. Typical remote control valve assembly: All nipples, risers, tees and elbows are to be red brass.
2. Install largest remote control valve adjacent to gate valve and maintain uniform decrease.
3. Close nipples are not allowed.
4. Install individual valve boxes for each remote control valve.
5. Locations of Quick Coupler valves shall be as shown on plans.
6. Tee vertically from Mainline intersection to reach the 15” maximum depth.
NOTES:
1. All fittings shall be P.V.C. Sch. 40 (except as noted).
2. All nipples shall be P.V.C. Sch. 80 (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 head type

SAN DIEGO REGIONAL STANDARD DRAWING
SHRUB SPRINKLER HEAD
ROTARY TYPE
Chamfer as needed to eliminate soil sluffing.

Do not remove side growth along trunk. Prune to reduce crown weight when necessary.

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.

---

TREE PLANTING - SLOPES

---

TREE PLANTING - LEVEL GROUND

---

SHRUB PLANTING - SLOPES

---

SHRUB PLANTING - LEVEL GROUND

---

SAN DIEGO REGIONAL STANDARD DRAWING

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

DRAWING NUMBER  L-1
Hose: Loop shall be 1" greater in diameter than tree trunk

No. 12 galvanized wire, min.

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
NOTES:

1. Rebar shall be continuous with 12 inch overlap at splices.
2. Concrete shall be class 520-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.
NOTES:
1. The location and species of each tree shall have prior approval of the Agency.
2. Sidewalk to be removed for each tree planting shall be saw cut full depth.
3. Fill below grate with 3/4" x No.4 clean crushed rock. If the grate is used for security, all bolts, nuts and washers shall be hot dipped galvanized. All steel items shall be hot dipped galvanized after fabrication.
4. Grate shall be two separate pieces, 2' x 4' in size, unless otherwise specified on the plans. Slot openings in grate design shall have 3/8" maximum width. Grates are to be designed in accordance with the latest edition of the Uniform Building Code, with a minimum uniform live load of 250 pounds per square foot in sidewalks, and have a method of symmetrical interior expandable rings/openings (detailed on the plans) as selected and approved by the agency.
5. Immediate notification shall be given to the Engineer of any below grade improvements encountered.

TREESIZE

SECTION A-A

SAN DIEGO REGIONAL STANDARD DRAWING

STEEL GRATE
TREE WELL COVER

REVISED 1-11-79

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

DRAWING NUMBER L-4
NOTES:
1. See Electric Plans for fixture/pole/footing details.
2. Use monolithic pour for new construction.
3. Poles shall be 6'-0" from face of curb, where applicable.
4. Pole pads shall drain at 2% minimum in same direction as sidewalk.
5. Concrete for pad shall be the same as specified for sidewalk.
MANHOLE COVER FRAME

MANHOLE COVER

NOTES:
1. Frame and cover shall be cast iron. Cast iron shall conform to ASTM 48, Class 35B.
2. Weights:
   - Frame: 166 - 193 lbs.
   - Cover: 147 - 171 lbs.
3. Machine all matching surfaces and seats of frame and cover to prevent rocking.
4. Imported frames and covers shall have the country of origin marked in compliance with federal regulations.

FOR MARK
- Sewer Projects: Sewer
- Storm Drain Projects: Storm Drain
- Water Projects: Water

SAN DIEGO REGIONAL STANDARD DRAWING
24" MANHOLE FRAME AND COVER
HEAVY DUTY

DRAWING NUMBER M-1
Notes:
1. Frame and cover shall be cast iron. Cast iron shall conform to ASTM 48, Class 30.
2. Frame and cover for use in non-traffic area only.
   Cover 95 - 110 lbs.
4. Imported frames and covers shall have the country of origin marked in compliance with federal regulations.
HALF PLAN FRAME & COVER

HALF SECTION FRAME & COVER

NOTES:
1. Frame and cover shall be cast iron. Cast iron shall conform to ASTM 48, Class 358.
   outer Cover 285 - 330 lbs.
   Inner Cover 147 - 171 lbs.
3. Machine all matching surfaces and seats of frame and cover to prevent rocking.
4. Imported frames and covers shall have the country of origin marked in compliance with federal regulations.
M-1 Detail:
COVER TO FRAME

M-3A Detail:
INNER COVER TO OUTER COVER

M-3B Detail:
OUTER COVER TO FRAME

NOTES:
1. 0.625" X 20 UNC THREAD, 316 STAINLESS STEEL SOCKET HEAD CAP SCREW AND 1.50" O.D. X 0.637" I.D. X 0.078" THICK 316 STAINLESS STEEL WASHER.
2. 0.25" NEOPRENE O-RING GASKET SHALL BE GLUED INTO MACHINED GROOVE. GLUE SHALL MEET THE REQUIREMENTS OF MIL-M-81288 (AMEND. 1)
3. BOLTDOWN PATTERNS:
   • M-1 DETAIL (24" COVER & FRAME);
     INSTALL TWO (2) BOLTS AT 180 DEGREES.
   • M-3A DETAIL (CONCENTRIC COVERS);
     BETWEEN INNER AND OUTER COVERS INSTALL TWO (2) BOLTS AT 180 DEGREES.
   • M-3B DETAIL (OUTER COVER & FRAME);
     BETWEEN OUTER COVER & FRAME INSTALL FOUR (4) BOLTS AT 90 DEGREES.
Distance between gate posts is gate length shown on plans

Length of gate leaf

Gate Frame

Truss Rods

Intermediate Member

Galv. Chain-link, 2" mesh, 9 ga.

Same as fence height

Sway Bar

Fastener

Plunger Bar

Gate Stop

10" diameter stop footing.
Omit if roadway is concrete.

HALF ELEVATION DOUBLE SWING GATE

NOTES
1. All footings shall be 520-C-2500 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

LEGEND ON PLANS

Walk gate

Conc.

SAN DIEGO REGIONAL STANDARD DRAWING

CHAIN LINK GATE

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

M-5
NOTES
1. All footings shall be 520-C-2500 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.
CONTINUOUS 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 8" 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 1-1/2" galvanized lag screws.
4. Reflector signs - California Type N. Size 18" x 18" - Yellow with nine (9) - 3/8" reflectors (center mount).
   a. Reflectors shall be red for use on dead end streets, in all other cases they shall be yellow.
   b. Reflectors material shall be plastic or other approved reflectorized material.
   c. Sign material shall be aluminum alloy 6061-T6 or 5052-H38, aluminum thickness 0.063 inches.
5. Six foot long hat section metal post per Caltrans Std. Plan A74-A optional for guard post.

LEGEND ON PLANS

Guard Post

SAN DIEGO REGIONAL STANDARD DRAWING

GUARD POST AND BARRICADE

DRAWING NUMBER M-9
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 plate 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.

Locations of street survey monument.
TYPE-A  TYPE-B

ELEVATION

INSTALLATION IN EXISTING CONCRETE
(Typical for Type A or B)

NOTES
1. Material - Brass A.S.T.M. B-16. All machine tolerances 1/64"±, machine finish.
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.
<table>
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<th>CITY OF SAN DIEGO</th>
<th>PORT OF SAN DIEGO</th>
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</table>

**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".
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. The metal plug shall be anchored 1" deep in sidewalk.

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.
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<td>1 Ton (met)</td>
<td>1.1023 ton</td>
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<td>1 Cu. m.</td>
<td>1.3079 cu. yd.</td>
</tr>
<tr>
<td>1 Liter</td>
<td>61.0250 cu. in.</td>
</tr>
<tr>
<td>1 Liter</td>
<td>0.0353 cu. ft.</td>
</tr>
<tr>
<td>1 Liter</td>
<td>0.2642 gal. (U.S.)</td>
</tr>
<tr>
<td>1 Liter</td>
<td>0.0284 bu. (U.S.)</td>
</tr>
<tr>
<td>1 MM.</td>
<td>0.0394 in.</td>
</tr>
<tr>
<td>1 CM.</td>
<td>0.3937 in</td>
</tr>
<tr>
<td>1 Meter</td>
<td>3.2808 ft.</td>
</tr>
<tr>
<td>1 Meter</td>
<td>1.0936 yd.</td>
</tr>
<tr>
<td>1 Km.</td>
<td>0.6214 mile</td>
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<td><strong>WEIGHT</strong></td>
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<td>1 Grain</td>
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<tr>
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<td>1 Pound</td>
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<td>0.9072 ton (met)</td>
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<td>6.4516 sq. cm.</td>
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<tr>
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<td>0.0305 sq. m.</td>
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<tr>
<td>1 Acre</td>
<td>0.0040 sq. km.</td>
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<tr>
<td>1 Cu. ft.</td>
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<tr>
<td>1 Cu. yd.</td>
<td>0.7646 cu. m.</td>
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<tr>
<td>1 Cu. in.</td>
<td>0.0164 liter</td>
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<tr>
<td>1 Cu. ft.</td>
<td>28.3162 liters</td>
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<tr>
<td>1 Gal.</td>
<td>3.7853 liters</td>
</tr>
<tr>
<td>1 Bu.</td>
<td>35.2383 liters</td>
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<td>25.4000 mm.</td>
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<tr>
<td>1 In.</td>
<td>2.5400 cm.</td>
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<tr>
<td>1 Ft.</td>
<td>30.4800 m.</td>
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<tr>
<td>1 Yd.</td>
<td>0.9144 m.</td>
</tr>
<tr>
<td>1 Mile</td>
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<tr>
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<td>deka</td>
</tr>
<tr>
<td><strong>METRIC</strong></td>
<td><strong>PREFIX</strong></td>
</tr>
<tr>
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</tr>
<tr>
<td>1/1000000</td>
<td>milli</td>
</tr>
<tr>
<td><strong>TEMPERATURE</strong></td>
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</tr>
<tr>
<td>Degrees Fahrenheit = ( \frac{9}{5} \text{ (Degrees Celcius)} + 32 )</td>
<td></td>
</tr>
<tr>
<td>Degrees Centigrade = ( \frac{5}{9} \text{ (Degrees Fahrenheit - 32)} )</td>
<td></td>
</tr>
</tbody>
</table>

**SAN DIEGO REGIONAL STANDARD DRAWING**

**METRIC EQUIVALENTS**

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

**DRAWING NUMBER** M-14

**S F D J 7-77**
NOTES:

1. All dimensions are typical unless otherwise noted.
2. Generally utilities are to be installed under the applicable specifications for the particular utility and the specifications of the owner Agency.
3. The location of utilities as shown by the Standard Drawing shall in no way violate existing codes or regulations applicable to individual utilities.
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 structure crossings.
6. Depth and width of trench varies.
7. CATV main or trunk line conduit required along all streets, except cul-de-sac streets less than 1000' in length which may be served by feeder lines only.
8. CATV 1 1/2" feeder conduit shall run across streets with each power service line and capped at edge of sidewalk.
9. 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 locations of the CATV system.
10. In no case shall CATV conduits be placed within 12" of gas lines. Also conduits are not to be placed directly over gas lines.
11. CATV conduit may be placed with the TELCO conduit provided the TELCO minimum depth is held.
1/4" Steel Plate welded to top and burrs removed

1/4" Expansion Joint

Back of curb or joint in walk

Concrete to be same as walk

4" Diameter Steel Pipe

5" Diameter Steel Pipe Sleeve

18" Diameter

4" Pipe

1/8"

Four links

Three links

Make bowl shaped recess in concrete to accommodate three links of chain

5" Diameter Steel Pipe Sleeve

12" from bottom of post

HASP DETAIL (Showing Welds)

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.
NOTE:
Chain link fabric shall be erected on the interior side of the courts.

CAUTION:
This Standard Drawing 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>
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% min. slope. Keep drain in lawn areas.
4. Item no. 6 is a one inch gate valve. Use red brass bushing reducers to adapt to feed pipe.
MARKERS — Shall be blue 2-way stimsonite life lite 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 PRD’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 6” from centerline or existing markers.
END AND CORNER POST ASSEMBLY

Horizontal brace with truss rod may be used as an alternate to a diagonal brace.

Tension wires

Diagonal brace

Portland cement concrete

10'

LINE POST BRACING

Line posts at 1000' max. intervals braced and trussed in both directions.

Tension wires

Line post

1'

Truss rods

10'

LINE POST BRACING

Gate post

Horizontal brace with 3/8" steel truss rods.

Gate

Length as specified

8' Max.

Gate panel

Vertical stay

Latch post

Diagonal brace or horizontal brace with truss rods

Portland cement concrete

10'

GATE ASSEMBLY
NOTES:
1. Sidewalk shall have a minimum of four (4) foot clear area (path, not including curb) passing pedestals, pullboxes and other structures.
NOTES
1. At catch basin locations, joint trench shall be 4 ft. minimum from back of curb to inside wall of trench. See Standard Drawing M-15 for configuration of utilities in joint trench.
2. Sewer and reclaimed water mains shall be designed to cross under potable water mains. The vertical separation between potable water and reclaimed water shall be a minimum of 12 inches.
3. Sewer and reclaimed water laterals shall cross under potable water main, with a minimum vertical separation of 12 inches.
4. Sewer and reclaimed water mains shall maintain a 10 ft. minimum horizontal separation, O.D to O.D., with any potable water or sewer/reclaimed main. This separation may be reduced utilizing special construction, with special approval from the Agency and the County Health Dept. For sewer or reclaimed water mains less than 24 inches in diameter, only Agency approval is required.
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2-1/4"R And Flush With The All 12" or Tread Width

PLAN AT END OF HANDRAIL

1-1/2" Std. Pipe 7' Max.

Surface Of Ramp or Step Nosing Limit

HANDRAIL BRACKET

5/8"x1-1/2" R 1-1/2" Min. 3/4" Bolts and anchors approved by the Engineer

3/4" Bolts and anchors approved by the Engineer

PIPE HANDRAIL WALL TYPE

1 1/2" Std. Pipe

Guardrail for ramps 3" ± 1"

1/2" Sliding Fit 1/4" Exp. Jr.

1-1/2" Sliding Fit 1/4" Exp. Jr.

1-7/16"±x3" long Rod Sliding Fit

WELDING DETAILS

1/2" 1/2" 1/2" 1/2"

PIPE GUARDRAIL—POST TYPE

RATING NOTES

1. 1/4" Expansion joints @ 15'± centers.
2. Weld and grind smooth all connections.
3. All railing to be hot dip galvanized after fabrication.
4. Pipe shall be seamless steel ASTM 403 Grade A.
5. Maximum 4". Guardrails and handrails for stairs and ramps more than 30" above grade shall have intermediate rails equally spaced such that a sphere 4" in diameter cannot pass through.
6. Handrail extension for stairs, at all bottom risers, shall be 12" plus one tread width.

Treading 8-1/4"R 1-1/2" Std. Pipe 7' Max.

3" Hole

MOUNTING DETAIL

Post shall be grouted in place using non-shrink grout.

SAN DIEGO REGIONAL STANDARD DRAWING

PEDESTRIAN PROTECTIVE RAILING

DRAWING NUMBER M-24
PLAN AT END OF HANDRAIL

1-1/2" Std. Pipe

Surface Of Ramp or Step Nosing Limit

1-1/2" Std. Pipe

3/8" x 5" Dia. R

1-1/2"

5/8" x 1-1/2" R

3/4" bolts and anchors approved by the engineer

 PIPE HANDRAIL WALL TYPE

Guardrail for ramps 3" ± 1"

Less Than

Post shall be centered in stair tread. See Std. Dwg. M-26 for stairs.

WELDING DETAILS

1-1/2" Std. Pipe

1/2"

1-1/2" Sliding Fit

1/4" Exp. Jt.

1-7/16" x 3" long Rod Sliding Fit

PIPE GUARDRAIL-POST TYPE

RAILING NOTES
1. 1/4" Expansion joints @ 16'± centers.
2. Weld and grind smooth all connections.
3. All railing to be hot dipped galvanized after fabrication.
4. Pipe shall be seamless steel ASTM A53 Grade B.
5. Maximum Δ = 4". Guardrails and handrails for stairs and ramps more than 30° above grade shall have intermediate rails equally spaced such that a sphere 4" in diameter cannot pass through.
6. Handrail extension for stairs, at all bottom risers, shall be 12" plus one tread width.

SAN DIEGO REGIONAL STANDARD DRAWING

PEDESTRIAN

PROTECTIVE RAILING

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

Chairman R.C.E 25902 Date

DRAWING NUMBER M-24
GENERAL NOTES

1. Post type guardrails, and handrails for stairs or landings 30 inches or less above grade or floor below shall have only one intermediate rail centered between the step nosing limit (or if specified the top of curb) and top of railing.

2. Post type guardrails, and handrails for stairs or landings more than 30 inches above grade or floor below shall have intermediate rails equally spaced such that a sphere 4 inches in diameter cannot pass through.

3. Where handrail extensions interfere with transverse walkways the horizontal portions shall not encroach but be turned away from stairs and parallel to walkway.

4. The top of guardrails for stairways, exclusive of their landings, may have a height as specified for handrails.
NOTES
1. Broom finish on treads, trowel finish on all other exposed surfaces.
2. 1/4" per 1" slope on treads for drainage.
3. Locate handrails on both sides.
4. Handrail may project into the required width a distance of 3-1/2" from each side of stairway.

Typical three inch border of highly contrasting color placed parallel to and not more than 1" from nose. A painted strip will be acceptable.

SECTION A-A

#4 @ 24" O.C.

120 - 2500 Concrete

520 - C - 2500 Concrete

#4 @ 12" O.C.

#4 @ 24" O.C.

Distance Shown On Plans
The size and number of treads and risers as shown on plans.

Handrail per Std. Dwg. M-24

12" + Tread Width

Extension

12" Extension

Level Landing

Riser = 4" Min.

7" Max.

Tread

11" Min.

1/2 R

3" R on all bends

Nosing Limit

W/O a Landing

12" Max. Rise

4"

4"

3"

3"

6"

6"

3"

3"

16"
NOTES:

1. Provide for adequate drainage.

2. For appropriate ramp alternate to conform to topographical conditions, see Std. Dwg. G-27 through G-31.

3. Slope shall not exceed 2% in any direction unless there is equivalent facilitation.

4. Blue color should match color No. 15090 in the Federal Standard 595a as specified in Section 522(b)2.
NOTES:
1. Provide for adequate drainage
   For appropriate ramp alternate to conform to topographical conditions.
NOTES:
1. Sign shall be constructed of a minimum 0.062" thick aluminum.
2. Lettering, symbol and border shall be reflectorized white, on a blue background.
3. Lettering shall be 1 inch and 2 inches high.
4. Where space is designed for van accessibility, a sign "VAN ACCESSIBLE" shall be installed.
5. Minimum van accessible vertical clearance is 8'-2".

Veh. Code 22511.8(d)
NOTES:
1. Sign shall be constructed of aluminum, 0.062" minimum thickness.
2. Colors: Background—Reflectored Blue
   Border and letters—Reflectored White
   Blue color shall match color No. 15090 in the Federal Standard 595a as specified in Section 522(b).
NOTES:
1. Pavement symbol shall be painted white on a blue background.
2. Blue color should match color No. 15090 in the Federal Standard 595a as specified in Section 522(b)2.

(a) SYMBOL PROPORTIONS

INTERNATIONAL SYMBOL OF ACCESSIBILITY

(b) DISPLAY CONDITIONS
Section A-A
- There is a bolt riveted or 5/8" threaded rod is used to mount rail, no more than 1/2" of thread may be exposed on traffic side of rail.

Section B-B
- "9/16" Button head bolt with nut and fast washer.Rail mounts to block with bolt on approaching traffic side of block and post web.

Rail Splice Details:
- Use 1/2" bolt or No. 5-1/2" bolt with steel block.
- Use roller element in direction of traffic.
- Splice the overlap end of the rail elements with 5/8" 1/2" button head self-drilling bolt and washer. Bolt is recessed hex nut in the 5/8" 1/2" self-drilling bolt, total 8 per rail splice. 4 per top and side sections, and 1 per rail elements in directions of traffic.

Notes:
1. For details of standard hardware used to construct guard railings, see Standard Dwg. M-32.
2. For details of posts and blocks used to construct guard railings, see Standard Dwg. M-33.
3. Guard railing post spacing to be 6'-3" center to center, except as otherwise noted.
4. Top of rail to be 27" above the ground line or shoulder surfacing under the rail element.
5. For guard railing approach flare, see Standard Dwg. M-34 and M-35.
6. For embankment widening details to accommodate guard railing approach flare, see Standard Dwg. M-36.
7. For guard railing end anchor details, see Standard Dwg. M-37 and M-38.
8. For guard railing connection details to bridge railing, retaining walls and abutments, see Standard Dwg. M-40.
9. For guard railing connection details to bridge sidewalks and curbs, see Standard Dwg. M-41.
10. For dike positioning with guard railing installations, see Standard Dwg. M-36.
11. Direction of traffic indicated by →
NOTES
1. Terminal sections will not be installed on the trailing end of guard railing placed adjacent to one-way roadways.
2. Back-up plate to be used between guard rail element and steel block on steel post where there is no rail element splice. See Standard Dwg. M-31.
3. For end section details, see Standard Dwg. M-40.
4. For terminal section Type C, see Standard Dwg. M-38.
NOTES
1. All holes in wood posts and blocks shall be 3/4" 0 ±1/16".
2. All holes in steel posts and blocks shall be 13/16" 0 maximum.
3. Contractor may submit alternative steel post details for Engineer's approval.
4. Dimensions shown for wood post are nominal.

M-33
NOTES

1. Posts, blocks and hardware to be used are shown on Standard Dwg. M-32 and M-33.
2. Guard rail post spacing to be 6'-3" center to center, except as otherwise noted.
3. Except as noted, posts shown are 6" X 6" DF, W8 X 8.5 or W8 X 9 steel posts and blocks may be specified for 6" X 8" DF posts and blocks where applicable. Where 10" X 10" DF posts and 8" X 8" DF blocks are shown, W8 X 18 steel posts and Tubular Steel 6" X 6" X 1-2" (0.1875" thick) blocks may be specified where applicable.
4. Top of rail to be 27" above ground line or shoulder surfacing under the rail element.

5. Direction of traffic indicated by ________
6. For connection details see Standard Dwg. M-40 or M-41.
8. Terminal Sections will not be installed on trailing end of guard rail placed adjacent to one-way roadways.
9. Parabola portion of Type 1 Flare used at approach end of guard railing for embankment installations.
10. For embankment widening details to accommodate approach flares, see Standard Dwg. M-39.
11. Sand filled crush cushion, as approved by the Engineer is required for Type 2, 3, and 4 flares, when the end of the guard rail is within 30 feet of the edge of traveled way (ETW) of approaching traffic.
NOTES

1. Post, blocks and hardware to be used are shown on Standard Dwg. M-31 and M-32.
2. Guard rail post spacing to be 6'-3" center to center, except as noted. Guard rail post spacing to be 6'-3" center to center, except as noted.
3. Except as noted, posts shown are 6" X 8" DF, W6 X 6.5 or W6 X 8 steel posts and blocks may be specified for 8" X 8" DF posts and blocks where applicable. Where 10" X 10" DF posts and 8" X 8" DF blocks are shown, W8 X 15 steel posts and Tubular Steel 8" X 8" X 1-1/2" (0.1785" thick) blocks may be specified where applicable.
4. Top of rail to be 27" above ground line or shoulder surfacing under the rail element.
5. A 4'-minimum clearance is required between face of rail and a fixed object located directly behind the guard rail post. A fixed object located behind the rail but not behind a guard rail post requires a 3'-minimum clearance.
6. Where minimum clearance cannot be obtained use approach rail transition details for fixed objects.

6. Direction of traffic indicated by

7. For anchor details see Standard Dwg. M-32.
8. Terminal Sections will not be installed on trailing end of guard rail placed adjacent to one-way roadways.
9. Type 7 flare has been deleted.
10. Sand filled crash cushion, as approved by the Engineer is required for Type 5 and 6 flares, when the end of the guard rail is within 30 feet of the edge of traveled way (ETW) of approaching traffic.

Use with Type 6 and 8 flares when guard rail is less than 4'-6" from fixed object. See Note 5 for details. Use with Type 6 and 8 flares when guard rail is less than 4'-6" from fixed object. See Note 5 for details.
EMBANKMENT WIDENING AND DIKE PLACEMENT DIAGRAM

DIKE POSITIONING

GUARD RAILING DELINEATION

NOTES

1. For guard rail flare details, see Standard Dwg. M-34 and M-35.
2. When necessary to place dike in front of guard rail, only Type "C" dike may be used. For dike details see Standard Dwg. G-S.
4. Guard railing delineation to be used when required by special provisions.
5. Direction of traffic indicated by ->

POST FOOTINGS

Use where standard embedment of railing post is restricted by underground concrete facilities such as heating of thin columns, etc. Use Steel Grade embedment of post is less than 3'-0". See Detail D where embedment of post is between 1'-9" and 3'-0".
1. For typical use of cable anchor assembly (Breakaway, Type A), see Standard Dwg. M-34 and M-35.
2. Cable anchor assembly (Breakaway, Type B) is typically used on the trailing end of guard railing for embankment installations except two-way road beds less than 80 feet in width.
3. Direction of traffic indicated by
4. For details of Terminal Section Type C, anchor plate and 3/4" cable, see Standard Dwg. M-38.
5. Do not use flat plate washers under head of rail mounting bolt at the second anchor post of Type A anchor and next five line posts. Use flat plate washers on other line posts and at the first anchor post of Type A anchor and at the Type B anchor post.
6. For trailing end of guard rail adjacent to one-way roadway omit terminal section.

<table>
<thead>
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<th>REVISION</th>
<th>BY</th>
<th>APPROVAL</th>
<th>DATE</th>
</tr>
</thead>
</table>

**NOTES**
NOTES

ANCHOR CABLE WITH SWAGED FITTING AND STUD
DETAIL E

ANCHOR PLATE DETAIL

SECTION A-A (ALTERNATIVE TYPE II)

SECTION A-A (ALTERNATIVE TYPE II)

REVISION BY APPROVAL DATE
NOTES
1. For typical use of end anchors shown on this plan, see Standard Drawings M-34 and M-35.
2. Anchor cable to be parallel to guard rail for straight runs of rail. Anchor cable may
   have angle point at anchor plate if guard rail is curved.
3. 5'-8" with terminal section. May be less than with return sections if separate rods
   connect to concrete anchor.
4. Anchor rod hooks to be in contact with anchor reinforcement when concrete is placed.
   Wire ties may be used to position anchor rods.
5. Cable clip connection (Detail A) or clevis and bolt connection (Detail B) to be used with
   wood post guard rail installation. For steel post guard rail installations, clevis
   and bolt connection (Detail B) is to be used. Other alternative for attaching cable to
   anchor rod must be approved by the Engineer.

ELEVATION
CABLE ANCHOR ASSEMBLY
See Details

SECTION A-A
ALTERNATIVE TYPE 1
ANCHOR PLATE DETAILS

SECTION A-A
ALTERNATIVE TYPE 2
ANCHOR PLATE DETAILS

ANNUAL CABLE WITH
SWAGED FITTING AND STUD

DEVIATE

ANCHOR CABLE WITH
SWAGED FITTING AND STUD

DEVIATE

DEVIATE

DEVIATE

DEVIATE

DEVIATE

DEVIATE

DEVIATE

DEVIATE

DEVIATE

DEVIATE

DEVIATE
NOTES

1. These connection details apply to bridge rails, abutments and retaining walls. For additional connection details for bridge railing, see the project plans.

2. Where 10" X 10" DF post and 8" X 8" DF blocks are shown, W6 X 15 steel posts and tubular steel 8" X 8" X 1 ½ - 2" (0.1875 inch thick) blocks may be specified where applicable.

3. Additional details of post, blocks and hardware are shown on Standard Dwg. M-32 and M-33.

4. Direction of traffic indicated by ➔.

5. For approach railing details, see Type I Flare on Standard Dwg. M-34 and transition details on this plan.

6. When metal box spacer is installed, place 1-1/4" X 5" and 1-1/4" X 4" pipe spacers on 1" bolts passing through interior of tapered box spacer and 1-1/4" X 6-1/4" pipe spacers on 1" bolts passing through interior of straight box spacer.

7. Terminal Sections will not be installed on trailing end of guard rail placed adjacent to one-way roadways. When terminal section is not installed, use backup plate between rail element and metal box spacer. See Standard Dwg. M-32 for backup plate details.

8. This type of connection may be used for both the approach and departing ends of structures on roadways 28 feet or less in width.

9. Use timer shims without posts where rail to wall or abutment clearance is less than 15 inches.

10. Do Not attach rail to bridge column. Use separate posts as shown on Standard Dwg. M-35.

11. End sections may be cut from Type B terminal section or fabricated.
CONCRETE BARRIER

TYPE 50C

Details similar to Type 50 except as noted.

CONCRETE BARRIER

TYPE 50A

Details similar to Type 50 except as noted.

BARRIER END ANCHOR

SECTION A-A

ELEVATION

CONNECTION TO STRUCTURE

MEDIAN BARRIER Delineation

See Notes (1) and (2)

CONCRETE BARRIER Delineation

For barriers not located in median

See Note (11)

NOTES

2. Opening into existing drainage inlets shall not extend above the 3-inch vertical face at bottom of the barrier.
3. Where the barrier is added to the face of an existing concrete structure, matching existing weep holes.
4. Contractor may submit alternative details for Engineer’s approval.
5. Foaming, or dowels with 2.8X0.8" @ 24. Required at barrier ends and at interruptions in barrier.
7. Expansion joints in concrete Barrier shall be located at all deck, pavement and principal wall joints. Expansion joint filler material shall be the same size as joint or 1/2" minimum.
8. 10" Barrier foaming extends 10" back from structure.
9. For transition to TBB see Standard Dwg. M-34.
10. Where roadway offset is greater than 1-1/2", see Concrete Barrier Type 50C.
11. Barrier delineation to be used when required by the special provisions.
12. Spacing of barrier markers to match spacing of raised pavement markers on the adjacent median edgeline pavement delineation.

REVISION | BY | APPROVAL | DATE
---|---|---|---
NOTES
1. For end treatment, layout and crash cushions, where needed, see Project Plans or Special Provisions.
2. All 3-1/2" gaps at removable panels are to be backed at the base with No. 8X10" dowel or 1" pin each side of joint. See Section K-K.
3. Alternative details for lifting the precast concrete panels of the Temporary Railing may be submitted by the Contractor for the Engineer’s approval.
4. Where Temporary Railing (Type K) is placed on curves and radii that are too severe to connect panels with bailed joints, the railing is to be backed continuously with earth fill. See Section H-H.
5. Attach units to deck slabs when required by Plans.
NOTES

1. Structural steel tubing used for post & sleeves shall be galvanized 12 gauge cold rolled steel, of the nominal dimensions shown hereon and meet the requirements of ASTM A446 Grade A.

2. Galvanizing shall be per ASTM A525. Posts & sleeves shall have 7/16" dia. holes spaced 1" o.c., ±1/8" & shall have no more variation in straightness than 1/16" in 3'. Posts shall be square within ±0.014", have twist no greater than 0.062" in 3' and have corner radii of 5/32" ±1/64".

3. The signs shall be mounted on posts in accordance with Section 56, "Signs" of the State Standard Specifications. All fastening hardware is to be provided by the Contractor.

4. Maximum sign size 5.2 sq. ft.

Rivet Specification
Dimension: 3/8" Dia. Shank
7/8" Dia. Head
Grip Range: .200-.356
Finish: Electro-Galvanize
ASTM-B-633
Type III SCI

3/8" Rivet (Typical)

2 1/4" Anchor Sleeve

Existing Ground

12" 18"
32"

2 1/4" x 2 1/4"
12 Gauge Post

2" x 2"-12 Gauge Post

2" Anchor Post

1 3/4" x 1 3/4"
12 Gauge Post

(Unless Otherwise Shown on Plans)
NOTES:
1. Frame and cover shall be cast iron. Cast iron shall conform to ASTM 48, Class 35B.
2. Weights: Frame 166 - 193 lbs.
   Cover 147 - 171 lbs.
3. Machine all matching surfaces and seats of frame and cover to prevent rocking.
4. Imported frames and covers shall have the country of origin marked in compliance with federal regulations.

FOR

Sewer Projects
Storm Drain Projects
Water Projects

MARK

Sewer
Storm Drain
Water
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.
3. Vertical wall of cone shall be on the upstream side of the manhole.
4. Concrete base shall be 560-C-3250.
5. Approved water stop required for plastic pipe connectors.
6. 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 18" of 3' diameter grade rings/and/or risers.
   C. 5' diameter shaft variable height.
   D. Top step to be 15" Max. from top of frame and cover.
7. Flexible pipe joints shall be required within 12" of inside face of manhole except for plastic pipe.
8. All patching within manhole base shall be epoxy mortar.
9. Prior approval of precast base is required by the Agency.

LEGEND ON PLANS
M.H. No. 2
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 or G-25 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 feet. For cover less than 3 feet, see Standard Drawing S-7 for concrete encasement.
4. See Type A installation for details not shown for Types B and C.
NOTE:
Encase pipe to the nearest flexible joint.

LEGEND ON PLANS
SECTION

480-C-2000 Concrete

6 min. - 8" max. 4" to 18" pipe

D/4

6" min.

3/4" Crushed Rock

Invert Elevation

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

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING

CONCRETE BACKFILL

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARD COMMITTEE

CONSTRUCTION R.C.E. 25902 Date

DRAWING NUMBER S-8
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 jute around pipe.

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

FRONT ELEVATION

SIDE ELEVATION

LEGEND ON PLANS

CONCRETE ANCHOR
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.

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

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

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

Galvanized Corrugated Sheet Metal
18 Gage or heavier to be laid as tightly as possible to downstream side of notch.
Make flush with ground surface

San Diego Regional Standard Drawing

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

S-10

CUTOFF WALL

LEGEND ON PLANS
TYPICAL SECTION

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

LEGEND ON PLANS
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

Angle variable Maximum 45°

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

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

2. Concrete slab to be 560-C-3250

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.

LEGEND ON PLANS

c.o.
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 560-C-3250.
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. 3" to 18" of 3' diameter grade rings/and/or risers.
   C. 4' diameter shaft variable height.
   D. Top step to be 15"Max. from top of frame and cover.
9. All patching within manhole base shall be epoxy mortar.
10. Prior approval of precast base is required by the Agency.
6" Metal tape
Install at top of pipe zone
or a maximum of 36" deep

SECTION

PLAN

Sewer

5'-0''
Varies
Min.

Property line

Curb line

Sewer

Lateral (Typical)

Metal tape

Curb line

Property line

S

Sewer

No Tape

5'-0''
Varies
Min.
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.
2. Note: On steel mains use clamp or weld on coupling as required by Agency.
   Install insulating bushing as required by Agency.
3. Copper Tubing or Plastic Pipe (no intermediate joints permitted without approval of the Agency).
4. Bronze Angle Service Stop with Locking Device and Meter Coupling attached.
5. Meter Box (see Standard Drawing W-15 for location).
6. 90° Elb

SAN DIEGO REGIONAL STANDARD DRAWING

1" WATER SERVICE

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

JANUARY 1977

DRAWING NUMBER W-1
Top tap where permitted by Agency

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

LEGEND ON PLANS

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 (installed with key on side and open tap).
3. Copper Tubing or Plastic Pipe except where otherwise specified by the Agency.
4. Coupling as required by Agency when service is 20' or longer, except on Polyethylene Pipe.
5. 90° Ell
6. Bronze Angle Service Stop with Locking Device and adaptable to 1 1/2" and 2" Meter Flange.
7. Meter Box (see Standard Drawing W-15 for location).

SAN DIEGO REGIONAL STANDARD DRAWING

1 1/2" AND 2" WATER SERVICES

Revision By Approved Date

Notes
1' min R (1" pipe)
90° Ell (2" pipe)

LEGEND ON PLANS

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).
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° Elb
4 90° Sweat Elb
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

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

SAN DIEGO REGIONAL STANDARD DRAWING

1" AND 2" AIR AND VACUUM VALVES

DRAWING NUMBER W-4
See Drawing W-14 for type of Enclosures

Varies - See Plans
(or as approved by Agency)

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° Ells (not required with above ground metal enclosures)

LEGEND ON PLANS

SAN DIEGO REGIONAL STANDARD DRAWING

RECOMMENDED BY THE SAN DIEGO REGIONAL STANDARDS COMMITTEE

4" AND 6" AIR AND VACUUM VALVES

DRAWING NUMBER W-5
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 (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).

LEGEND ON PLANS
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" Nipple (2"x 3")
45° Ell
2" Nipple (2"x 6")
2" Valve
2" Pipe
90° Ell
2" Threaded Cap
Valve Well Installation, See Standard Drawing W-12

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).
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).
Machine 0.18" to 0.25" deep, v-groove. (Equally spaced, 2 places)
Point check valve body and spool to concrete.
0.25" per foot rise from top of curb or edge of road.

4" Thick Concrete Apron, Std.Dwg. W-11
(520-C-2500)
16" R

NOTES:
1. Items 4 & 7 may be cement lined and coated steel pipe where permitted.
2. Extension Spool callouts 3 & 4 maybe combined as one spool.
3. Fire Hydrant
4. 6" Extension Spool (Double Machine Grooved)
5. Break-Off Check Valve Body or Extension Spool as required by agency or shown on plans
6. Extension spool
7. 75" X 3" Hex Head Machine Bolts and Nuts (Typical)
8. Hydrant Elb.
9. Polyvinyl Chloride (PVC) or Ductile Iron (DI) Pipe
10. Valve with Concrete Support, Std. Dwgs. W-19 (Type A)
11. Valve Well and Cover, Std. Dwgs. W-12A & W-12B
12. See Std. Dwg. W-11 for fire hydrant locations and M-19 for fire hydrant marker location as required by agency.

LEGEN ON PLANS
WITH CHECK VALVE

WITHOUT CHECK VALVE
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. The centerline of the hydrant shall be located 5' minimum from curb return and minimum 3'-6" from driveway, pedestrian ramp or any fixed obstruction.
NOTES:
1. Provide valve key extension for all butterfly valves. For gate valves, provide valve key extension where this dimension exceeds 25".
2. The surface of the valve well cover shall match the street cross slope and profile.
NOTES:
1. Extension to be used when top of operating nut is 5 feet or more below finish grade.
2. Paint all finished surfaces with asphalt varnish.
3/16" Steel Cover continuous weld to Cylinder
2 1/2"x 2 1/2" Angle (3 places) weld to Cylinder

PLAN

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

Slope down

NOTE:
Meter boxes shall not be located within driveways.

* Agency to determine alternate

7-88
San Diego Regional Standard Drawing

Meter Box Locations

Drawing Number W-15
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 teesends, 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.
NOTE
Concrete shall be 470-C-2000.

TYPE-A SUPPORT BLOCK

TYPE-B THRUST BLOCK

Anchor = 5/8" dia. reinf. bars thus
Bricks under hub only
Bearing area as shown on Drawing W-18

Cross hatched area for key into trench wall.
Concrete shall be 470-C-2000.

<table>
<thead>
<tr>
<th>Pipe Nominal Dia</th>
<th>Cubic Ft. Of Concrete Required per 100 P.S.I. Pressure *</th>
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<tbody>
<tr>
<td></td>
<td>45°</td>
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<td>4</td>
<td>7</td>
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<td>8</td>
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<td>**</td>
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</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 or G-25 for resurfacing details.
2. (*) indicates minimum relative compaction.
3. Bedding material shall either be sand, gravel, crushed aggregate or native free draining granular material having a sand equivalent (SE) of not less than (50) and an expansion coefficient, when saturated with water, of not more than 0.5 of one percent (0.5%).

6" Minimum clearance
(4" for steel pipe.)
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. Dwg. W-18 plus the area of the trench opening, except that minimum dimensions shown shall be adhered to.
1. 1" Water service per Dwg W-1
2. 1" Curb stop
3. Main connection X multiple branch connection
4. Brass coupling or 45° elbow
5. Brass nipple - 4" min. length
6. Brass 45° elbow
7. Cast iron cap
8. Asbestos cement pipe
9. Thrust block per Dwg W-17

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

<table>
<thead>
<tr>
<th>Service Connection</th>
<th>Main Connection Item 5</th>
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<tbody>
<tr>
<td>2</td>
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<tr>
<td>3</td>
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<td>4</td>
<td>2&quot;</td>
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<tr>
<td>6</td>
<td>2½&quot;</td>
</tr>
<tr>
<td>8</td>
<td>3&quot;</td>
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SECTION A-A

ELEVATION

Drill and tap to std. thread
NOTE:
Contractor shall provide handholes as required to complete the work
1. Use 2" tape for depths of 30" or less.
2. Use 3" tape for depths greater than 30".
3. Adequately bond service tape to main tape to ensure electrical continuity.
4. Tape shall extend into service box or well casing to allow for mark-out by continuity tester.
NOTES

1. Public water main.
2. 90° ductile iron elbow: flange x flange; flange x ring tight; flange x mechanical joint (uni-flange shall not be used).
3. Flanged ductile iron spool (both ends shall be flanged).
4. 90° flanged ductile iron elbow.
5. Factory assembled Double Checked Detector Assembly/Reduced Pressure Detection Assembly with resilient seat shut off. Valves approved by the Dept. of Health Services, Office of Drinking Water.
6. Backflow preventer assembly shall be tested upon installation by a certified backflow assy tester. Contractor shall provide the Engineer with written test results completed by a certified tester prior to the acceptance by the Engineer.
NOTES:

1. Backflow preventer assembly shall be tested upon installation by a certified backflow device tester. 
   Contractor shall provide the Engineer with written test results completed by a certified backflow 
   tester prior to backflow preventer assembly's acceptance by the Engineer.

2. All pipe below grade shall be wrapped as required by agency.

3. Concrete pad to be 2" above grade unless installed in lawn area where it will be at 1" above grade. 
   Concrete pad shall be 4" thick and 18" wide (min) (520-C-25u) slope to drain.

4. Reduced Pressure Principle Assembly shall be included in the latest edition of the "Approved for 
   Service Isolation in California Public Water Systems" issued by the State of California Department of 
   Health Services, Office of Drinking Water.

5. Regulator may be installed upstream of the backflow preventer assembly when water pressure 
   exceeds backflow preventer assembly rating.

6. Wye strainer and downstream regulator, when required, shall be located downstream of the #2 
   shut off valve.

7. Protective enclosure for backflow preventer assembly shall be used at the discretion of the 
   property owner.

8. Locate preventer assembly as close to meter as practical as approved by the agency.
NOTES:
1. Backflow assembly shall be tested upon installation by a certified backflow assembly tester.
2. All pipe below grade shall be wrapped as required by agency.
3. Concrete pad to be 2" above grade unless installed in lawn area where it will be at 1" above grade. Slope to drain.
4. Protective enclosure for backflow preventer assembly shall be used at the discretion of the property owner.
5. Reduced Pressure Principle Detection Assembly shall be included in the latest edition of the "Approved for Service Isolation California Public Water Systems" issued by the State of California, Department of Health Services, Office of Drinking Water.
6. 90° Flanged cast iron or ductile iron elbow (typ)
7. Flanged ductile iron spool. Both ends shall be flanged (uni-flange shall not be used)
8. 90° ductile iron flanged elbow

LEGEND ON PLANS
brates

RECOMMENDED BY THE SAN DIEGO
REGIONAL STANDARDS COMMITTEE

SAN DIEGO REGIONAL STANDARD DRAWING

BACKFLOW PREVENTER REDUCED
PRESSURE PRINCIPLE DETECTOR ASSEMBLY
3" AND LARGER

DRAWING NUMBER W-28
APPENDIX "A"

TRAFFIC CONTROL PLANS

PAGE 1 OF 41

<table>
<thead>
<tr>
<th>REVISION</th>
<th>BY</th>
<th>APPROVED</th>
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SAN DIEGO REGIONAL STANDARD - APPENDIX "A"  

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<th>TRAFFIC CONTROL PLANS</th>
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TRAFFIC CONTROL PLANS

GENERAL INFORMATION

The Traffic Control Plans depicted in this Appendix are intended to supplement Chapter 5 of the Caltrans Manual in providing guidance and information on preparing traffic control plans in an urban environment. Other references, such as the "W.A.T.C.H." manual, may also provide useful information on traffic control procedures. It should be understood that implementation of traffic control plans must conform with the latest edition of the Caltrans Traffic Manual (Chapter 5).

Chapter 5 of the Caltrans Traffic Manual, Traffic Controls for Construction and Maintenance Work Zones, is published by the State of California, Department of Transportation (Caltrans). This manual is issued to provide the basic standards for uniform types of warning signs, lights, and devices to be placed upon any public roadway or street by a person engaged in performing work which interferes with or endangers the safe movement of traffic upon such highway or street, in accordance with Section 21400 of the California Vehicle Code.

It is the responsibility of the Contractor or Organization performing work on, or adjacent to, a roadway to install and maintain such devices which are necessary to provide safe passage for the traveling public through the work area and for the safety of the workers. Before work begins, traffic control plans for handling traffic through a construction or maintenance project shall be approved by the engineer of the public agency or authority having jurisdiction over the roadway.

Typical plans for intersections that are controlled by a traffic signal or a multi-way stop are not identified in this Appendix. These intersections require special attention in the preparation of traffic control plans. The approving agency should be notified prior to the preparation of traffic control plans when the work is in or near these intersections.

Special attention is also needed on the traffic control plans when the work areas affect bike lanes, sidewalks, pedestrian access, and curved or narrow roadways. Notification of the approving agency is desirable prior to the preparation of the plan when bicycles and pedestrian routes are affected by the work.

Nothing contained in this Appendix shall prevent local jurisdictions from modifying, changing, or adopting new specifications deemed necessary. The text and typical drawings in this Appendix are not a legal standard. Criteria for position, location, and use of traffic control devices is furnished solely for the purpose of guidance and information to assist in the preparation of traffic control plans.

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<thead>
<tr>
<th>Revision</th>
<th>By</th>
<th>Approved</th>
<th>Date</th>
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<td>4-91</td>
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<td>10-4-94</td>
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APPENDIX "A"
SAN DIEGO REGIONAL STANDARD
TRAFFIC CONTROL PLANS
GENERAL INFORMATION

DRAWING NUMBER TC-1
# TRAFFIC CONTROL PLANS

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| TC-5 | TRAFFIC CONTROL PLAN COVER SHEET |
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| TC-12 | CENTER OF ROAD - MULTILANE w/CENTERLINE - ONE LEFT LANE |
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| TC-21 | SIDE OF ROAD - MULTILANE w/RAISED MEDIAN - ONE RIGHT LANE |
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TRAFFIC CONTROL PLANS

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APPENDIX 'A'
SAN DIEGO REGIONAL STANDARD

TRAFFIC CONTROL PLANS

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DRAWING NUMBER TC-3

Revision By Approved Date
DRAWING 04-91
ORIG. 08-91
8-3-94

8-3-94
### TABLE 1

**RECOMMENDED SIGN SPACING FOR ADVANCE WARNING SIGN SERIES**

<table>
<thead>
<tr>
<th>APPROACH SPEED (MPH)</th>
<th>MINIMUM DISTANCE IN FEET BETWEEN SIGNS AND FROM LAST SIGN TO TAPER</th>
<th>MAXIMUM DEVICE SPACING IN FEET</th>
<th>MINIMUM TAPER LENGTHS FOR LANE WIDTHS *</th>
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<tbody>
<tr>
<td>25</td>
<td>150-200</td>
<td>25</td>
<td>105</td>
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<td>30</td>
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<td>265</td>
</tr>
<tr>
<td>45</td>
<td>500-750</td>
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</tr>
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<td>50</td>
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</tr>
<tr>
<td>55+</td>
<td>500-1500</td>
<td>50</td>
<td>550</td>
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* L = WS^2/60 for S of 40 MPH or less; L = WS for S greater than 40 MPH. Taper lengths shown are rounded to nearest 5 feet.

### TABLE 2

**RECOMMENDED TAPER LENGTH AND DEVICE SPACING FOR CHANNELIZING TAPERS**

<table>
<thead>
<tr>
<th>APPROACH SPEED (MPH)</th>
<th>TAPER LENGTH (L) *</th>
<th>SPACING OF CONES ALONG TAPER (FEET)</th>
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<tbody>
<tr>
<td>25</td>
<td>125</td>
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</tr>
<tr>
<td>30</td>
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<td>40</td>
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<tr>
<td>45</td>
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<td>45</td>
</tr>
<tr>
<td>50</td>
<td>600</td>
<td>50</td>
</tr>
<tr>
<td>50+</td>
<td>1000</td>
<td>50</td>
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</table>

(*) Based on 12-foot wide lane. This column is also appropriate for lane widths less than 12 feet.

**NOTES:**

Taper Formula

\[ L = S \times W \] for speeds greater than 40 mph.

\[ L = \frac{W \times S^2}{60} \] for speeds of 40 mph or less.

Where:

- \( L \) = Minimum length of taper
- \( S \) = Numerical value of APPROACH speed prior to work (mph)
- \( W \) = Width of offset (feet)
**TRAFFIC CONTROL PLAN/PERMIT & PERMIT EXTENSION**

<table>
<thead>
<tr>
<th>Revision</th>
<th>DR</th>
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<th>Contractor/</th>
<th>24 Hour Local Phone:</th>
<th>Contractor:</th>
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<tbody>
<tr>
<td>Drawing</td>
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<td>Subcontractor:</td>
<td>Cell Phone:</td>
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<tr>
<td>Date</td>
<td></td>
<td>Fax:</td>
<td></td>
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| Public Utility or Company: | Project Contact: | 24 Hour Local Phone: |
| Address: |             | Cell Phone: |
| City: | State: | Zip Code: |

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<th>JOB LOCATION</th>
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<th>WORK HOURS</th>
<th>SPEED LIMIT</th>
<th>WORK TO BE DONE</th>
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<tbody>
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<td>continuous</td>
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<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
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<tbody>
<tr>
<td>A.M.</td>
<td>P.M.</td>
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</table>

<table>
<thead>
<tr>
<th>START DATE</th>
<th>END DATE</th>
<th>1st WORK DATE EXTENSION</th>
<th>TO NEW END DATE</th>
<th>2nd WORK DATE EXTENSION</th>
<th>TO NEW END DATE</th>
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<tr>
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</table>

**PERMIT WORK EXTENSIONS MUST BE OBTAINED BY THE END OF PERMIT DATE**

**REQUIREMENTS:**

1. The contractor is responsible for promptly restoring the road back to satisfactory condition which includes, but is not limited to, paving, striping, markings, signing, and loop detection.

2. The Agency reserves the right to observe these traffic control plans in operation and to make changes as field conditions warrant.

3. Trenches shall be back-filled or steel-plated during non-work hours. Steel plates shall have an asphaltic ramp on all edges, securely supported so they won't rock and a sign posted near the plates identifying the contractors name and 24 hour emergency telephone number.

4. Any work that creates an undue safety risk or that creates severe congestion will be shut down by the agency.

5. A copy of all traffic requirements and traffic control plans issued by the Agency must be kept on the job site.

6. Approval of this plan does not constitute an official Permit. Contact the Agency for information on obtaining a permit.

7. All travel lanes will typically be a minimum of 12 feet wide, 14 feet if adjacent to bike lanes, unless otherwise specifically approved by the Agency.

8. Flashing arrow boards as required by the Agency.

9. Warning (W) series signs used in work zones shall be black on an orange background.

10. Cones and pylons shall have yellow reflectorized sleeves when placed along the centerline and white reflectorized sleeves along the outside shoulder.

11. If parking is allowed in the advance warning area, advance warning signs shall be mounted on high level devices.

12. The contractor shall post tow-away/no parking signs twenty-four (24) hours in advance, with day of week, date and work hours noted, and shall bag parking meters (where applicable).

**THIS TRAFFIC CONTROL PLAN IS NOT VALID UNLESS AN APPLICABLE AGENCY PERMIT OR APPROVAL IS ATTACHED/AFFIXED**

The applicant is responsible for complete representation of the actual road conditions shown on this plan including, but not limited to, existing striping, signing, sidewalks and bike lanes.

**APPLICANTS:**

Name (Print) _________________________
Address ______________________________
Phone Number __________________________
Signature ______________________________

Agent of: 
- Owner
- Contractor
- Sign/Barricade Co.
- Other ________________________________

**PERMIT APPROVED**

BY: ___________________________ DATE: ____________________

**SUBJECT TO LOCAL AGENCY REQUIREMENTS.**

SEE ATTACHED SHEET(S) OR REFERENCED STANDARD DRAWING(S) THAT MAY BE APPLICABLE.

For hours of darkness, change cones to vertical barricades with steady burn lights.

This plan DOES NOT apply at signalized or multi-way stop intersections. Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

This plan MAY NOT apply when the work areas affect bike lanes, sidewalks, pedestrian access, and curved or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan for these areas.

Nothing contained on this drawing shall prevent local jurisdictions from modifying, changing, or adopting new specifications deemed necessary. Criteria for position, location, and use of Traffic Control Devices is solely for the purpose of guidance to assist in the set up of the Traffic Control Plans.

TC-5 is required for all Traffic Control Plans.
EYE CONTACT MUST BE MAINTAINED BETWEEN FLAGGERS OR USE 2-WAY RADIO COMMUNICATION.

FLAGGER - REFER TO CALTRANS MANUAL 5-07.3

**LEGEND**

- **CONE**
- **BARRICADE**
- **FLAGGER**
- **SIGN**
- **FLASHING ARROW SIGN**
- **WORK AREA**
- **TRAFFIC DIRECTION**

### AGENCY ENGINEER'S COMMENTS

---

### POSTED SPEED LIMIT

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<th>80</th>
<th>60</th>
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### APPROACH SPEED

For hours of darkness, change cones to vertical barricades with steady burn lights.

This plan **DOES NOT** apply at signalized or multi-way stop intersections. Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

This plan **MAY NOT** apply when the work areas affect bike lanes, sidewalks, pedestrian access, and curved or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan for these areas.

Nothing contained on this drawing shall prevent local jurisdictions from modifying, changing, or adopting new specifications deemed necessary. Criteria for position, location, and use of Traffic Control Devices is solely for the purpose of guidance to assist in the set up of the Traffic Control Plans.

TC-5 is required for all Traffic Control Plans.

FLAGGER - REFER TO CALTRANS MANUAL 5-07.3
LEGEND

- CONE ↔ BARRICADE ▼ FLAGGER ▶ SIGN □ FLASHING ARROW SIGN ▀ WORK AREA ← TRAFFIC DIRECTION

GENERAL NOTES

For hours of darkness, change cones to vertical barricades with steady burn lights.

This plan DOES NOT apply at signalized or multi-way stop intersections. Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

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Nothing contained on this drawing shall prevent local jurisdictions from modifying changing, or adopting new specifications deemed necessary. Criteria for position, location, and use of Traffic Control Devices is solely for the purpose of guidance to assist in the set up of the Traffic Control Plans.

TC-5 is required for all Traffic Control Plans.
**GENERAL NOTES**

For hours of darkness, change cones to vertical barricades with steady burn lights.

This plan **DOES NOT** apply at signalized or multi-way stop intersections. Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

This plan **MAY NOT** apply when the work areas affect bike lanes, sidewalks, pedestrian access, and curved or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan for these areas.

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TC-5 is required for all Traffic Control Plans.
For hours of darkness, change cones to vertical barricades with steady burn lights.

This plan DOES NOT apply at signalized or multi-way stop intersections. Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

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Nothing contained on this drawing shall prevent local jurisdictions from modifying or adopting new specifications deemed necessary. Criteria for position, location, and use of Traffic Control Devices is solely for the purpose of guidance to assist in the set up of the Traffic Control Plans.

TC-5 is required for all Traffic Control Plans.
SIDE OF ROAD WORK AREA

LEGEND

- Cone  ← Barricade  ← Flagger  ← Sign  ← Flashing Arrow Sign  ← Work Area  ← Traffic Direction

AGENCY ENGINEER'S COMMENTS

GENERAL NOTES

For hours of darkness, change cones to vertical barricades with steady burn lights. This plan does NOT apply at signalized or multi-way stop intersections. Consult the local jurisdiction when preparing Traffic Control Plans near these intersections. This plan MAY NOT apply when the work areas affect bike lanes, sidewalks, pedestrian access, and curbed or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan for these areas.

Nothing contained on this drawing shall prevent local jurisdictions from modifying, changing, or adopting new specifications deemed necessary. Criteria for position, location, and use of Traffic Control Devices is solely for the purpose of guidance to assist in the set up of the Traffic Control Plans.

TC-5 is required for all Traffic Control Plans.
CENTER OF ROAD WORK AREA

SAN DIEGO REGIONAL STANDARD

LEFT LANE TRAFFIC Closure - THREE Lanes

LEGEND

- CONE  BARRICADE  FLASHER  SIGN  FLASHER ARROW SIGN  WORK AREA  TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

AGENCY USE

GENERAL NOTES

For hours of darkness, change cones to vertical barricades with steady burn lights.

This plan DOES NOT apply at signalized or multi-way stop intersections. Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

This plan MAY NOT apply when the work areas affect bike lanes, sidewalks, pedestrian access, and curved or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan for these areas.

Nothing contained on this drawing shall prevent local jurisdictions from modifying changing, or adopting new specifications deemed necessary. Criteria for position, location, and use of Traffic Control Devices is solely for the purpose of guidance to assist in the setup of the Traffic Control Plans.

TC-5 is required for all Traffic Control Plans.
For sign spacing see TC-4

Temporary 'No Parking' Area

Buffer Space

Chevron Mode

12' Minimum

Taper

See TC-4

RAISED OR PAINTED MEDIAN

W1(RT) C20(RT) C18

See General Notes

Legend

- Cone
- Barricade
- Flagger
- Sign
- Flashing Arrow Sign
- Work Area
- Traffic Direction

Agency Engineer's Comments

General Notes

For hours of darkness, change cones to vertical barricades with steady burn lights.

This plan DOES NOT apply at signalized or multi-way stop intersections. Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

This plan MAY NOT apply when the work areas affect bike lanes, sidewalks, pedestrian access, and curved or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan for these areas.

Nothing contained on this drawing shall prevent local jurisdictions from modifying, changing, or adopting new specifications deemed necessary. Criteria for position, location, and use of Traffic Control Devices is solely for the purpose of guidance to assist in the set up of the Traffic Control Plans.

TC-5 is required for all Traffic Control Plans.

Agency Use

Submitted By:

Name

Company

Address

Phone

Applicant Use
Nothing contained on this drawing shall prevent local jurisdictions from modifying or adopting new specifications deemed necessary. Consult the local jurisdiction when preparing Traffic Control Plans for these areas.

This plan does NOT apply to signalized or multi-way stop intersections. Consult the local jurisdiction when preparing Traffic Control Plans for these intersections.

For hours of darkness, change cones to vertical barricades with steady burn lights. See TC-4 for approach speed limit, approach speed taper length, and spacing of cones. Consult the approving agency when preparing the Traffic Control Plan for these areas.
**LEGEND**

- **CON** | **BARRICADE**
- **FLAG** | **SIGN**
- **FLASHING ARROW SIGN** | **WORK AREA**
- **TRAFFIC DIRECTION**

**GENERAL NOTES**

For hours of darkness, change cones to vertical barricades with steady burn lights.

Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

This plan MAY NOT apply when the work areas affect bike lanes, sidewalks, pedestrian access, and curved or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan for these areas.

Nothing contained on this drawing shall prevent local jurisdictions from modifying, changing, or adopting new specifications deemed necessary. Criteria for position, location, and use of Traffic Control Devices is solely for the purpose of guidance to assist in the set up of the Traffic Control Plans.

TC-5 is required for all Traffic Control Plans.
* RIGHT TURN MOVES MAY BE RESTRICTED.

**LEGEND**

- **CONE** ↔ BARRICADE  ⬤ FLAGGER  ⬪ SIGN  ⬤ FLASHING ARROW SIGN  ⬪ WORK AREA  ➡️ TRAFFIC DIRECTION

**AGENCY ENGINEER'S COMMENTS**

**POSTED SPEED LIMIT** | **APPROACH SPEED** | **TAPER LENGTH** | **SPACING OF CONES** | **SIGN SPACING**

**GENERAL NOTES**

For hours of darkness, change cones to vertical barricades with steady burn lights.

Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

This plan MAY NOT apply when the work areas affect bike lanes, sidewalks, pedestrian access, and curved or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan for these areas.

Nothing contained on this drawing shall prevent local jurisdictions from modifying, changing, or adopting new specifications deemed necessary. Criteria for position, location, and use of Traffic Control Devices is solely for the purpose of guidance to assist in the setup of the Traffic Control Plans.

TC-5 is required for all Traffic Control Plans.
**LEGEND**

- **CONE**
- **BARRICADE**
- **FLAGGER**
- **SIGN**
- **FLASHING ARROW SIGN**
- **WORK AREA**
- **TRAFFIC DIRECTION**

**GENERAL NOTES**

For hours of darkness, change cones to vertical barricades with steady burn lights.

Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

This plan MAY NOT apply when the work areas affect bike lanes, sidewalks, pedestrian access, and curved or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan for these areas.

Nothing contained on this drawing shall prevent local jurisdictions from modifying, changing, or adopting new specifications deemed necessary. Criteria for position, location, and use of Traffic Control Devices is solely for the purpose of guidance to assist in the set up of the Traffic Control Plans.

IC-5 is required for all Traffic Control Plans.
* LEFT TURN MOVES MAY BE RESTRICTED.

LEGEND

- CONE  ➩ BARRICADE  □ FLAGGER  ➩ SIGN  ➩ FLASHING ARROW SIGN  ■ WORK AREA  ➩ TRAFFIC DIRECTION

GENERAL NOTES

For hours of darkness, change cones to vertical barricades with steady burn lights.

Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

This plan MAY NOT apply when the work areas affect bike lanes, sidewalks, pedestrian access, and curved or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan for these areas.

Nothing contained on this drawing shall prevent local jurisdictions from modifying, changing, or adopting new specifications deemed necessary. Criteria for position, location, and use of Traffic Control Devices is solely for the purpose of guidance to assist in the set up of the Traffic Control Plans.

TC-5 is required for all Traffic Control Plans.
FOR SIGN SPACING SEE TC-4 APPLY TO ALL INTERSECTION LEGS

CENTER OF ROAD WORK AREA

SAN DIEGO REGIONAL STANDARD

APPENDIX "A"

INTERSECTION TRAFFIC CONTROL

FOR SIGN SPACING SEE TC-4 APPLY TO ALL INTERSECTION LEGS

- LEFT OR RIGHT TURN MOVES MAY BE RESTRICTED.
- PARKING PROHIBITED APPROACHING INTERSECTION ON ALL 4 LEGS.

LEGEND

- CONE • BARRICADE • FLASHER • SIGN • FLASHING ARROW SIGN • WORK AREA • TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

GENERAL NOTES

For hours of darkness, change cones to vertical barricades with steady burn lights.

Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

This plan MAY NOT apply when the work areas affect bike lanes, sidewalks, pedestrian access, and curved or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan for these areas.

Nothing contained on this drawing shall prevent local jurisdictions from modifying changing, or adopting new specifications deemed necessary. Criteria for position, location, and use of Traffic Control Devices is solely for the purpose of guidance to assist in the set up of the Traffic Control Plans.

TC-5 is required for all Traffic Control Plans.

SUBMITTED BY:
NAME
COMPANY
ADDRESS
PHONE

APPLICANT USE

POSTED SPEED LIMIT
APPROACH SPEED
TAPER LENGTH
SPACING OF CONES
SIGN SPACING

SEE TC-4 FOR SIGN CONE SPACING AND TAPER LENGTH

DRAWING NUMBER TC-27
RIGHT TURN MOVES MAY BE RESTRICTED.

LEGEND
- CONE  BARRICADE  FLAGGER  SIGN  FLASHING ARROW SIGN  WORK AREA  TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT  APPROACH SPEED  TAPER LENGTH  SPACING OF CONES  SIGN SPACING

GENERAL NOTES
For hours of darkness, change cones to vertical barricades with steady burn lights.
Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

This plan MAY NOT apply when the work areas affect bike lanes, sidewalks, pedestrian access, and curved or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan for these areas.

Nothing contained on this drawing shall prevent local jurisdictions from modifying changing, or adopting new specifications deemed necessary. Criteria for position, location, and use of Traffic Control Devices is solely for the purpose of guidance to assist in the set up of the Traffic Control Plans.

TC-5 is required for all Traffic Control Plans.
* LEFT OR RIGHT TURN MOVES MAY BE RESTRICTED.

**LEGEND**

- **CONE**
- **BARRICADE**
- **FLAGGER**
- **SIGN**
- **FLASHING ARROW SIGN**
- **WORK AREA**
- **TRAFFIC DIRECTION**

**GENERAL NOTES**

For hours of darkness, change cones to vertical barricades with steady burn lights.

Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

This plan MAY NOT apply when the work areas affect bike lanes, sidewalks, pedestrian access, and curved or narrow roadways. Consult the approving agency when preparing the Traffic Control Plan for these areas.

Nothing contained on this drawing shall prevent local jurisdictions from modifying, changing, or adopting new specifications deemed necessary. Criteria for position, location, and use of Traffic Control Devices is solely for the purpose of guidance to assist in the setup of the Traffic Control Plans.

TC-5 is required for all Traffic Control Plans.
SIGN SPACING
SEE TC-4
USE FOR ALL INTERSECTION LEGS

* LEFT OR RIGHT TURN MOVES MAY BE RESTRICTED.

LEGEND
- CONE ↔ BARRICADE  FLATCHEW  SIGN  FLASHERING ARROW SIGN  WORK AREA  TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT

APPROACH SPEED

TAPER LENGTH

SPACING OF CONES

SIGN SPACING

GENERAL NOTES
For hours of darkness, change cones to vertical barricades with steady burn lights.

Consult the local jurisdiction when preparing Traffic Control Plans near these intersections.

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TC-5 is required for all Traffic Control Plans.
**LEGEND**

- **CONES**: **BARRICADE**
- **FLAGGER**: **SIGN**
- **FLASHING ARROW SIGN**: **WORK AREA**
- **TRAFFIC DIRECTION**

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USE TC-12 FOR TRAFFIC CONTROL ON THIS LEG

SEE TC-12

C13

C13

SEE TC-4 FOR SIGN SPACING

TAPER CONE ARRANGEMENT AS MUCH AS SPACE ALLOWS

USE TEMP. STRIPE TAPE FOR LEFT TURN GUIDE

RIGHT TURN MOVES MAY BE RESTRICTED

LEGEND

- CONE
- BARRICADE
- FLAGGER
- SIGN
- FLASHING ARROW SIGN
- WORK AREA
- TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

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SIDE OF ROAD WORK AREA

SAN DIEGO REGIONAL STANDARD

LEFT TURN INTERSECTION TRAFFIC CONTROL

APENDIX "A"

SIDE OF ROAD WORK AREA

LEAVE TURN INTERSECTION TRAFFIC CONTROL

LEGEND

- CONE  ← BARRICADE  ← FLAGGER  ← SIGN  ← FLASHING ARROW SIGN  ← WORK AREA  ← TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

POSTED SPEED LIMIT  APPROACH SPEED  TAPER LENGTH  SPACING OF CONES  SIGN SPACING

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SIDE OF ROAD WORK AREA

SAN DIEGO REGIONAL STANDARD

LEFT TURN INTERSECTION TRAFFIC CONTROL

LEGEND

- CONE ↔ BARRICADE ⬤ FLAGGER □ SIGN ⬤ FLASHING ARROW SIGN ⬤ WORK AREA ← TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

AGENCY USE

GENERAL NOTES

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SIDE OF ROAD WORK AREA

SAN DIEGO REGIONAL STANDARD

LEFT TURN INTERSECTION TRAFFIC CONTROL

APPENDIX "A"

USE TC-10 FOR TRAFFIC CONTROL FOR THIS LEG

C18 SEE TC-10

C13

C13

C18

C20(LT)

C18

C18

C21

C30

C30

C18

LANE CLOSED

TAPER CONE ARRANGEMENT AS MUCH AS SPACE ALLOWS

USE TEMP. STRIPE TAPE FOR LEFT TURN GUIDE

* RIGHT TURN MOVES MAY BE RESTRICTED.

LEGEND

- CONE - BARRICADE - FLAGGER - SIGN - FLASHING ARROW SIGN - WORK AREA - TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

GENERAL NOTES

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TC-5 is required for all Traffic Control Plans.

SUBMITTED BY:

NAME

COMPANY

ADDRESS

PHONE

APPLICANT USE

AGENCY USE

DRAWING NUMBER

TC-35
USE TC-10 FOR TRAFFIC CONTROL FOR THIS LEG

**LEGEND**

- CONE  ↔ BARRICADE  ☐ FLAGGER  ☐ SIGN  ☐ FLASHING ARROW SIGN  ☐ WORK AREA  ↔ TRAFFIC DIRECTION

**AGENCY ENGINEER'S COMMENTS**

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USE TC-12 FOR TRAFFIC CONTROL FOR THIS LEG

C18

C13

C18
C20(RT)
TURN

C20(RT)
TURN

SEE TC-4 FOR SIGN SPACING

TAPER CONE ARRANGEMENT AS MUCH AS SPACE ALLOWS

C18
C30
C21

C13

LEFT OR RIGHT TURN MOVES MAY BE RESTRICTED.

LEGEND

- CONE
- BARRICADE
- FLAGGER
- SIGN
- FLASHING ARROW SIGN
- WORK AREA
- TRAFFIC DIRECTION

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USE TC-10 FOR TRAFFIC CONTROL FOR THIS LEG

RIGHT TURN MOVES MAY BE RESTRICTED

LEGEND

CONE • BARRICADE • FLAGGER • SIGN • FLASHING ARROW SIGN • WORK AREA • TRAFFIC DIRECTION

AGENCY ENGINEER'S COMMENTS

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SIDE OF ROAD WORK AREA

RIGHT TURN INTERSECTION TRAFFIC CONTROL

SAN DIEGO REGIONAL STANDARD

APPENDIX "A"

SIDE OF ROAD WORK AREA

AGENCY ENGINEER'S COMMENTS

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RAISED MEDIAN OR DIVIDING STRIP

C18 C20 (RT) W11 (RT)

L

1/2 L

L

C30

CHEVRON MODE

C30

HIGH LEVEL WARNING DEVICE WITH C30 SIGN

WORK AREA

C18 C20 (RT) W11 (RT)

SIGN SPACING SEE TC-4

TABLE 1

TAPER SEE TC-4

TABLE 2

* MEDIAN MAY REQUIRE TEMPORARY PAVEMENT TO CONVEY TRAFFIC VOLUME.

LEGEND

- CONE
- BARRICADE
- FLAGGER
- SIGN
- FLASHING ARROW SIGN
- WORK AREA
- TRAFFIC DIRECTION

GENERAL NOTES

For hours of darkness, change cones to vertical barricades with steady burn lights.

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### LEGEND

- **CONE**
- **BARRICADE**
- **FLAGGER**
- **SIGN**
- **FLASHING ARROW SIGN**
- **WORK AREA**
- **TRAFFIC DIRECTION**

### TRAFFIC ENGINEERS COMMENTS


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### SUBMITTED BY:

- **NAME**
- **AGENCY**
- **ADDRESS**
- **PHONE**
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### LEGEND

- **CONE** ↔ **BARRICADE**  
- **FLAGGER**  
- **SIGN**  
- **FLASHING ARROW SIGN**  
- **WORK AREA**  
- **TRAFFIC DIRECTION**

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Insert comments here.

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### SUBMITTED BY:

**NAME**  
**AGENCY**  
**ADDRESS**  
**PHONE**  

**Drawing No.**  
**Revised**  
**Date**  
**Drafted**  
**Approved**  
**Date**
RAISED MEDIAN

---

LEGEND

- Cone
- Barricade
- Flagger
- Sign
- Flashing Arrow Sign
- Work Area
- Traffic Direction

---

TRAFFIC ENGINEERS COMMENTS

---

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---

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AGENCY __________________________

ADDRESS __________________________

PHONE __________________________

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