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THE FOLLOWING IS A LIST OF CHANGES:

STANDARD DRAWINGS (REV. 8/6/72) AND

SUPPLEMENTAL INFORMATION DRAWINGS (DRAWINGS ADAPTED FROM CITY OF EDMONTON)

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REPLACED BY M-23; REMOVES REDUNDANCY.

208

REVISED BY 208-1T; UPDATES NOTES; PROVIDE ALTERNATE DRAINS; REMOVES LOT GRADING.

212-2

REVISED BY 212-3T; UPDATES NOTES & CHANGES DIMENSIONS.

218

REVISED BY 218-1; UPDATES NOTES.

219

REVISED BY 219-1; UPDATES NOTES.

G-22, 23, 24

REPLACED BY 207-AT; UPDATES & UNIFIES INTO ONE STANDARD DRIVEWAY DESIGN.

303-1

REVISED BY 303-1; REPLACES CIRCULAR CURB; BY PARABOLIC CURB.

400 TO 409-2

DELETED; REMOVES OUTDATED BUNGS & REPLACED BY A

CHRIS'S STANDARD HINT.

600 TO 608

DELETED; TO BE INCORPORATED INTO A PLANNING MANUAL.
4 of Old
Std. Dug

Change

700-T  Revised  700-T2
701-T   "  "  701-T1
702-T   "  "  702-T2
707-T   "  "  707-T1
708-T   "  "  708-T1
709-T   "  "  709-T1
714-T   "  "  714-T1
7.5     "  "  7.5

NEW Standard Drawings Were Added Are:

Dwg No.

2.25  Ramp for Curb, gutter & Sidewalk
Dw.1.7  Lot Grading
2.82T  Fencing Cut Banks
2.9T.  Joint Trench Utilities Location
4.10T  p.1,2,3  Ornamental Street Lights

ADOPTED CITY DUGS REVISED DUE TO ERRORS & INCONSISTENCIES WITH CO. SPEC.

C-52,57  Remove Foot Refer.
D-4  Revised Note #11
D-734  Add Note on Special Site Fram & Grp'd.
D-20,42,32,31  Remove Foot. to Class "A" P.C.C.
43,44,45,46,47
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The standard drawings listed in this supplemental index, approved and adopted by the Board of Supervisors, are added to the San Diego County Engineer Department Standard Drawings. These drawings are reproductions of the City of San Diego Standard Drawings and will be used for items of construction on County roads and in County subdivision construction on streets and roads being constructed to County standards.

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| C-45 | Cantilever Retaining Wall - Type 2 Construction Details |
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Guard Fence Assembly for Terminating Streets

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       Metal Beam Guard Rail 217
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wait to be used for 1/4'
Unlimited Sloping Surcharge

PLAN
FOOTING STEPS

TYPICAL LAYOUT EXAMPLE

PLAN OF EXPANSION JOINT

Rubber Waterstop
use only when watertight
joint is required

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<th>STANDARD DRAWING</th>
</tr>
</thead>
<tbody>
<tr>
<td>CANTILEVER RETAINING WALL</td>
<td>TYPE 3 CONSTRUCTION DETAILS</td>
</tr>
</tbody>
</table>

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### GENERAL NOTES

**DESIGN**


**CONSTRUCTION**

COUNTY OF SAN DIEGO STANDARD SPECIFICATIONS

**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.

PASSIVE BEARING PRESSURE OF FOOTING KEY SHALL NOT EXCEED ACTUAL TOE PRESSURE.

SPECIAL FOOTING DESIGN IS REQUIRED WHERE FOUNDATION MATERIAL IS INCAPABLE OF SUPPORTING TOE PRESSURE LISTED IN TABLE.

**DESIGN DATA**

\[
F_c = 1200 \text{ psi} \quad F'c = 3600 \text{ psi}
\]

\[
F_s = 20,000 \text{ psi} \quad n = 40
\]

Earth = 120pcf and equivalent fluid pressure = 36 psf per foot of height

WALLS SHOWN FOR 1;1 UNLIMITED SLOPING SURCHARGE ARE DESIGNED IN ACCORDANCE WITH RANKIN'S FORMULA FOR UNLIMITED SLOPING SURCHARGE WITH \( \theta = 33.4^\circ \).

**REINFORCEMENT (Continued)**

ALL BAR EMBEDMENTS ARE CLEAR DISTANCES TO OUTSIDE OF BAR.

SPACING FOR PARALLEL BARS IS CENTER TO CENTER OF BARS.

**RUBBER WATERSTOP**

RUBBER WATERSTOP, WHEN REQUIRED, SHALL BE FURNISHED AND PLACED AS SPECIFIED UNDER SECTION 77, PAR. (L) OF THE STATE OF CALIFORNIA DEPARTMENT OF PUBLIC WORKS DIVISION OF HIGHWAYS STANDARD SPECIFICATIONS LATEST EDITION ON FILE IN THE OFFICE OF THE CITY CLERK.

**CONCRETE**

ALL CONCRETE SHALL BE CLASS A.P.C.C. CONFORMING TO SECTIONS 6 AND 32 OF THE COUNTY OF SAN DIEGO STANDARD SPECIFICATIONS

**EXCAVATION AND BACKFILL**

EXCAVATION AND BACKFILL SHALL CONFORM TO SECTION 6 OF THE COUNTY OF SAN DIEGO STANDARD SPECIFICATIONS

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 TAMPERED, 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 FILTERED. FILTER MATERIAL SHALL CONFORM TO COUNTY OF SAN DIEGO STANDARD SPECIFICATIONS.

**SPECIAL COVERAGE**

WHERE WALLS ARE CONSTRUCTED ADJACENT TO SALT WATER, THICKNESS OF CONCRETE SHALL BE INCREASED TO PROVIDE THREE-INCH COVERAGE BETWEEN STEEL AND EXPOSED SURFACES.

**COUNTY OF SAN DIEGO STANDARD DRAWING**

GENERAL NOTES FOR RETAINING WALLS

SEE DWG. C-42 thru C-51

**SPECIFICATION REFERENCE**

**SCALE**

DRAWING NO.

C-52
4"# drain 6'-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

**KEY DETAIL**

- Vertical reinf.
- Top of footing
- 2"x4" (nominal) Key

**NOTE:** All masonry retaining walls shall be constructed with cap, key and drainage details as shown hereon.
TYP SECTION
OVER 5'-4" max.

ELEVATION

PLAN

NOTES
1. Refer to Standard Drawing C-53 and C-57 for additional notes and details.
2. Fill all block cells with grout.

DIMENSIONS AND REINFORCING STEEL

<table>
<thead>
<tr>
<th></th>
<th>3'-0&quot;</th>
<th>5'-4&quot;</th>
<th>8'-0&quot;</th>
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<td>T (min)</td>
<td>8&quot;</td>
<td>10&quot;</td>
<td>10&quot;</td>
</tr>
<tr>
<td>W (min)</td>
<td>2'-1&quot;</td>
<td>3'-1&quot;</td>
<td>4'-3&quot;</td>
</tr>
<tr>
<td>R</td>
<td>9&quot;</td>
<td>1'-2&quot;</td>
<td>1'-5&quot;</td>
</tr>
<tr>
<td>S</td>
<td>8'-1/2&quot;</td>
<td>1'-0&quot;1/2&quot;</td>
<td>1'-7&quot;1/2&quot;</td>
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<tr>
<td>K</td>
<td>8&quot;</td>
<td>8&quot;</td>
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<tr>
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<td>#4@32 cc</td>
<td>#4@32 cc</td>
<td>#4@32 cc</td>
</tr>
<tr>
<td>E</td>
<td>4 tot 5</td>
<td>4 tot 5</td>
<td>4 tot 6</td>
</tr>
</tbody>
</table>

MAX. SOIL PRESSURE | 774 psf | 1030 psf | 1660 psf

SPECIFICATION REFERENCE: COUNTY OF SAN DIEGO
STANDARD DRAWING: CANTILEVERED MASONRY RETAINING WALL
TYPE CM-5
(LEVEL BACKFILL)

DRAWING NO.: C-54
SCALE: NONE
NOTE:
1. Refer to standard drawings C-53 and C-57 for additional notes and details.
2. Fill all cells with grout.

DIMENSIONS AND REINFORCING STEEL

<table>
<thead>
<tr>
<th></th>
<th>H max</th>
<th>T min</th>
<th>W min</th>
</tr>
</thead>
<tbody>
<tr>
<td>H max</td>
<td>5'-4&quot;</td>
<td>3'-8&quot;</td>
<td></td>
</tr>
<tr>
<td>T min</td>
<td>0'-10&quot;</td>
<td>0'-8&quot;</td>
<td></td>
</tr>
<tr>
<td>W min</td>
<td>3'-10&quot;</td>
<td>2'-9&quot;</td>
<td></td>
</tr>
</tbody>
</table>

(A) bars 4 @ 16"
(B) bars 6 @ 16" 4 @ 16"

Max. toe press. 2000 1400
1 1/2:1 Slope Unlimited

TYPE A WALL
(Applicable for all types of backfill loadings)

TYPE B WALL

NOTE: Maximum top pressure on wall footing = 1 1/2 tons. Special design required where footing material is incapable of supporting this pressure.

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

Rubber waterstop used only where watertight joint is required see C-45 for Rubber waterstop detail.

SECTION A-A

Top extension if specified.

Filter Material 4 cu. ft., min. @ each drain

4" Drains, 6" above outside ground surface. Slope 1/2" per ft.

Locate drains @ 15'-0" c-to-c or as directed by the Engineer

NOTE: Type A wall height may be exceeded by 2 inches before changing to Type B or Type C.

TYPICAL ELEVATION

TYPICAL DRAINAGE

WALL TYPE | HEIGHT | BASE | CONC. CF/FT
--- | --- | --- | ---
A | 1'-6" | 1'-6" | 1.50
 | 2'-0" | 1'-0" | 2.00
 | 3'-0" | 2'-0" | 4.99
 | 4'-0" | 3'-10" | 7.65
 | 5'-0" | 3'-6" | 10.67
 | 6'-0" | 3'-10" | 14.49
B | 3'-0" | 1'-6" | 3.75
 | 4'-0" | 2'-0" | 5.08
 | 5'-0" | 2'-6" | 8.75
 | 6'-0" | 3'-0" | 12.00
C

COUNTY OF SAN DIEGO

GRAVITY RETAINING WALL

STANDARD DRAWING

C-56

SPECIFICATION REFERENCE

DRAWING NO.
GENERAL NOTES

DESIGN

A.S.H.O. latest Revision Edition

CONSTRUCTION

County of San Diego Standard Specifications

DESIGN CONDITIONS

Walls are to be used for the loading conditions shown for each type wall.

Design h shall not be exceeded.

Footings 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:

Fc=1200 psi
Fe=3000 psi
f s=20,000 psi
n=10

REINFORCED MASONRY:

M=300 psi
Fb=200 psi
f s=20,000 psi
m=50

Earthen fill and equivalent fluid pressure=26 psi per foot of height

Walls shown for initial unlimited sloping surcharge are designed in accordance with Rankine's formula for unlimited sloping surcharge with φ = 33°42'

REINFORCEMENT

County of San Diego Standard Specifications

Intermediate grade, hard grade, or rail steel deformation shall conform to ASTM 305.

Bars shall lap 40 diameters, where spliced, unless otherwise shown on the plans.

Bars shall conform to the Manual of Standard practice, A.S.C.I.

Backing for hooks is four diameters.

All bar splices are clear distances to outside of bar.

Spacing for parallel bars is center to center of bars.

CONCRETE

All concrete shall be class "A" P.C.C. conforming to the County of San Diego Standard Specifications.

MASONRY

All reinforced masonry retaining wall shall be constructed of regular or light weight standard grade "A" units conforming to ASTM designation C-60-52 and manufactured in accordance with requirements of the Concrete Masonry Association Specifications. All masonry shall conform to the regulations of the Uniform Building Code.

MASONRY MORTAR

The mortar shall consist of one (1) part portland cement to three (3) parts gravel mortar sand.

Mortar shall be luted with lime putty in an amount not exceeding twenty-five (25) per cent of the volume of the cement.

MASSIVE MORTAR (cont'd)

Mortar in horizontal joints shall fully cover all face shells and web members. Vertical joints shall be putted to a depth greater than the thickness of the face shells of the block. Forming of mortar will not be permitted.

GROUT

The grout shall consist of one (1) part portland cement to three (3) parts clean sand for work less than four inches. In desirably.

Grout to be used in vertical of 1/2" or greater dimensions, may be mixed of one (1) part portland cement to two (2) parts clean sand to two (2) parts water. Per gravel shall be graced such that 100 per cent passes 3/8" sieve and not more than 5 per cent passes the No. 8 sieve. All cells shall be filled with grout.

EXCAVATION AND BACKFILL

Excavation and backfill shall conform to the County of San Diego Standard Specifications.

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 per cent.

No backfill material shall be deposited against masonry retaining walls until the grout has developed a strength of 2,000 pounds per square inch in compression.

OPTIONAL DESIGNS

The wall shown here is not necessarily the most economical solution; it is an acceptable solution for the conditions shown on the drawings. The individual may consult a licensed engineer for more economical solutions for a particular condition.

OPTIONAL MORTAR KEY

Embedment of the first course of block in a poured footing may be omitted by providing a mortar key. The key is formed by embedding a flat 1" by 1" flush with the top of the freshly poured footing. Remove the 1" by 1" after the concrete has started to harden.

OPTIONAL WALL DRAINS

Where the steel spacing is greater than 7/8" center to center, wall drains may be formed by placing a block on its side. However, all cells below and above the said block shall be grouted solid.

FILTER MATERIAL

See County of San Diego Standard Specifications.

COUNTY OF SAN DIEGO - MASONRY, RETAINING WALLS

GENERAL NOTES FOR MASONRY, RETAINING WALLS

SEE DWG. C-58THRU C-59

SPECIFICATION REFERENCE

SCHEDULE

DRAWING NO. C-57
GENERAL NOTES

DESIGN

CONSTRUCTION
County of San Diego Standard Specifications

DESIGN CONDITIONS
Walls are to be used for the loading conditions shown for each type wall.
Design H shall not be exceeded.
Footing 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=2000 psi
c=10
F'c=2000 psi
F'c=20,000 psi
REINFORCED MASONRY:
F'c=200 psi
c=200 psi
F'c=20,000 psi
m=0
Earth:20 psi and equivalent fluid pressure=.36 psi 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 β=33.92°

REINFORCEMENT
County of San Diego Standard Specifications

INTERMEDIATE GRADE, HARD GRADE, OR RAIL STEEL DEFORMATION SHALL CONFORM TO ASTM 305.
Bars shall tap 40 diameters, where spliced, unless otherwise shown on the plans.
Bends shall conform to the Manual of Standard Practice, A.C.I.
Back for hook is four diameters.
All bar spacings are clear distances to outside of bar.
Spacing for parallel bars is center to center of bars.

CONCRETE
All concrete shall be class "A" P.C.C. conforming to sections 6 and 32 of the County of San Diego Standard Specifications

MASONRY
All reinforced masonry retaining wall shall be constructed of light weight standard grade "A" units conforming to ASTM designation C-90-52 and manufactured in accordance with requirements of the Concrete Masonry Association Specifications. All masonry shall conform to the regulations of the Uniform Building Code.

MASONRY MORTAR (cont.)
Mortar in horizontal joints shall fully cover all face shell and web members. Vertical joints shall be buttered to a depth greater than the thickness of the face shells of the block. Forowing of mortar will not be permitted.

GROUT
The grout shall consist of one (1) part portland cement to three (3) parts clean sand for voids less than one inch; if desired, Grout to be used in voids of 4" or greater dimensions, may be mixed of one (1) part portland cement to two (2) parts clean sand to two (2) parts pea gravel. Per gravel shall be graded such that 100 per cent passes 3/8" sieve and not more than 5 per cent passes the No. 8 sieve. All cells shall be poured solid with grout.

EXCAVATION AND BACKFILL
Excavation and backfill shall conform to section 6 of the County of San Diego Standard Specifications

Backfill 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 95 per cent.
No backfill material shall be deposited against masonry retaining walls until the grout has developed a strength of 2,000 pounds per square inch in compression as determined by test.2" cores, or until the masonry retaining wall has cured for a minimum of 14 days.

OPTIONAL DESIGNS
The wall shown here is not necessarily the most economical solution; it is an acceptable solution for the conditions shown on the drawings. The individual may consult a licensed engineer for more economical solutions for a particular condition.

OPTIONAL MORTAR KEY
Emplacement of the first course of block in a poured footing may be omitted by providing a mortar key. The key is formed by spreading a 1:2:1 cement and water mixture. The key is formed by placing a block on top of the freshly poured footing. Remove the block when the concrete has started to harden.

OPTIONAL WALL DRAINS
Where the steel spacing is greater than 24" center to center, wall drains may be formed by placing a block on its side. However, all cells below and above the said block shall be grouted solid.

FILTER MATERIAL
See County of San Diego Standard Specifications.
NOTES:
1. Refer to standard drawings C-53 and C-57 for additional notes and details.
2. Fill all block cells with grout.

DIMENSIONS AND REINFORCING STEEL

<table>
<thead>
<tr>
<th></th>
<th>H (max)</th>
<th>3' 8&quot;</th>
<th>5' 4&quot;</th>
<th>8' 0&quot;</th>
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<tbody>
<tr>
<td>T (min.)</td>
<td>0' 8&quot;</td>
<td>0' 10&quot;</td>
<td>1' 0&quot;</td>
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<tr>
<td>W (min.)</td>
<td>2' 4&quot;</td>
<td>3' 6&quot;</td>
<td>5' 4&quot;</td>
<td></td>
</tr>
</tbody>
</table>

- **A** bars: 4 @ 32
- **B** bars: 4 @ 32
- **C** bars: 4 @ 32

max. soil press. (psi) 500 600 800

SPECIFICATION REFERENCE
COUNTY OF SAN DIEGO
STANDARD DRAWING
CANTILEVERED MASONRY RETAINING WALL
TYPE LM-1
(LEVEL BACKFILL)

SCALE: NONE
DRAWING NO.
C-58
NOTE:

1. Refer to standard drawings C-53 and C-57 for additional notes and detail.
2. Fill all cells with grout.
NOTES:
1. Refer to standard drawings C-53 and C-57 for additional notes and details.
2. Fill all blockcells with grout.

<table>
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<tr>
<td>T min. 0'-8&quot;</td>
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<tr>
<td>W min. 2'-4&quot;</td>
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<tr>
<td>A bars *4@32</td>
</tr>
<tr>
<td>B bars</td>
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<tr>
<td>C bars</td>
</tr>
<tr>
<td>D bars *4@32</td>
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<tr>
<td>E bars *4 tot. 4</td>
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<tr>
<td>max. soil press. (psf)</td>
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</tbody>
</table>
NOTE:
1. Refer to standard drawings C-53 and C-57 for additional notes and details.
2. Fill all cells with grout.

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<th>REINFORCING STEEL</th>
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<tr>
<td>A bars</td>
<td>4 @ 16&quot;</td>
</tr>
<tr>
<td>B bars</td>
<td>6 @ 16&quot;</td>
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<tr>
<td>Surcharge</td>
<td>Slope live load</td>
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<td>C bars</td>
<td>6 @ 8&quot;</td>
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<tr>
<td>K min</td>
<td>1' - 0&quot;</td>
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<tr>
<td>Toe press</td>
<td>2700 psf</td>
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<tr>
<td></td>
<td>1700 psf</td>
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</tbody>
</table>
TYPICAL SECTION

USE REINF. FOR H.--

DRAINAGE DESIGN

4" DRAIN 8" ABOVE GROUND SURFACE. SLOPE 1/2" PER FOOT. DRAINS @ 15'-0" P.C.

ELEVATION

TABLE OF REINF. STEEL, DIMENSION AND DATA

<p>| | | | | |</p>
<table>
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<th></th>
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</table>

COUNTY OF SAN DIEGO STANDARD DRAWING SCALE NO SCALE DRAWING NO.

CANTILEVER RETAINING WALL TYPE "L-1"

FOR GENERAL NOTES SEE DRAWING C-52
TYPICAL SECTION

NOTES:
1. FRONT FACE AND HORIZONTAL REINFORCEMENT NOT SHOWN.
2. NUMBER DESIGNS INDICATE DISTANCE FROM TOP OF FOOTING TO UPPER END OF BAR.

NOTE:
BACKFILL ON TOP OF FOOTING MUST BE PLACED BEFORE BACKFILLING AGAINST STEM.

ELEVATION

TABLE OF REINF. STEEL, DIMENSION AND DATA

<table>
<thead>
<tr>
<th>H</th>
<th>4'0&quot;</th>
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<td>5'5&quot;</td>
<td>5'5&quot;</td>
<td>5'5&quot;</td>
<td>5'5&quot;</td>
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<tr>
<td>F</td>
<td>1'2&quot;</td>
<td>1'3&quot;</td>
<td>1'4&quot;</td>
<td>1'5&quot;</td>
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<td>S</td>
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<td>0'8&quot;</td>
<td>1'0&quot;</td>
<td>1'3&quot;</td>
</tr>
<tr>
<td>K</td>
<td>0'8&quot;</td>
<td>0'8&quot;</td>
<td>1'0&quot;</td>
<td>1'3&quot;</td>
</tr>
</tbody>
</table>

@ bars | 2 1/2" @ 24" | 5 1/2" @ 24" | 9 1/2" @ 24" | 9 1/2" @ 24"

@ bars (short) | 2 1/2" @ 24" | 2 1/2" @ 24" | 2 1/2" @ 24" | 2 1/2" @ 24"

Toe pressure P.S.F. | 810 | 940 | 1000 | 1100 |
Conc. CF/ft. | 9.6 | 11.2 | 20.3 | 27.6 |
Steel lbs/ft. | 13.9 | 17.3 | 25.3 | 42.0 |
GENERAL NOTES
Concrete. All concrete to be Class A
All exposed corners to be chamfered 3/4"
Exposed surfaces to be finished.
'D' = inside diameter of pipe.
Min. denotes Minimum

Legend on plans: ==
# BOX SECTION REINFORCEMENT

<table>
<thead>
<tr>
<th>MAX SPAN &quot;X&quot; or &quot;Y&quot;</th>
<th>DEPTH &quot;V&quot;</th>
<th>THICKNESS &quot;T&quot;</th>
<th>HORIZ B FLR REINS</th>
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<tbody>
<tr>
<td>3'-0&quot; to 4'-0&quot;</td>
<td>4'-0&quot;</td>
<td>6&quot;</td>
<td>4 @ 12&quot;</td>
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<tr>
<td>4'-1&quot; to 6'-0&quot;</td>
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<td>6&quot;</td>
<td>4 @ 12&quot;</td>
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<tr>
<td>6'-1&quot; to 7'-0&quot;</td>
<td>6'-0&quot;</td>
<td>6&quot;</td>
<td>4 @ 12&quot;</td>
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<td>8'-0&quot;</td>
<td>6&quot;</td>
<td>4 @ 12&quot;</td>
</tr>
<tr>
<td>8'-1&quot; to 10&quot;</td>
<td>10&quot;</td>
<td>6&quot;</td>
<td>4 @ 12&quot;</td>
</tr>
<tr>
<td>11&quot; to 12&quot;</td>
<td>12&quot;</td>
<td>6&quot;</td>
<td>4 @ 12&quot;</td>
</tr>
<tr>
<td>13&quot; to 14&quot;</td>
<td>14&quot;</td>
<td>6&quot;</td>
<td>4 @ 12&quot;</td>
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<tr>
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<td>4 @ 12&quot;</td>
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<td>4 @ 12&quot;</td>
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<td>19&quot; to 20&quot;</td>
<td>20&quot;</td>
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<td>4 @ 12&quot;</td>
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<td>22&quot;</td>
<td>6&quot;</td>
<td>4 @ 12&quot;</td>
</tr>
<tr>
<td>23&quot; to 24&quot;</td>
<td>24&quot;</td>
<td>6&quot;</td>
<td>4 @ 12&quot;</td>
</tr>
</tbody>
</table>

**NOTES**

1. Concrete shall be Class "A" with 1/2 inch maximum size aggregate.
2. Unless otherwise specified reinforcing steel shall comply with this drawing.
3. Reinforcing steel shall be intermediate grade deformed bars conforming to latest ASTM specifications.
4. All bonds shall be in accordance with the latest ACI code.
5. Minimum space length for reinforcing shall be 30 diameters.
6. Floors shall have a wood trowel finish and except where used as junction boxes, shall have a minimum slope of 1 inch per foot towards the outlet.
7. Face angle shall be cast in a structure continuous for the full length "L".
8. When structure depth "V" exceeds 5 feet, ladder rungs shall be cast into wall @ 15" intervals from 15" above floor to within 12" of top of structure. Where possible place rungs in wall without pipe opening, directly beneath access opening. See 9-38 for details.
9. Wall thickness and rein steel required may be decreased in accordance with table above as depth "V" to box section is decreased.
10. Face angle and anchor to be hot-dipped galvanized after fabrication.
11. Provide protective steel bar in throat opening when height of opening equals or exceeds 6".
1. Concrete shall be Class "A" with 1/2 inch maximum size aggregate.
2. Unless otherwise specified reinforcing steel shall comply with this drawing.
3. Reinforcing steel shall be intermediate grade deformed bars conforming to latest ASTM specifications.
4. All bonds shall be in accordance with the latest ACI code.
5. Minimum splice length for reinforcing shall be 30 diameters.
6. Floors shall have a wood travel finish and except where used as junction boxes, shall have a minimum slope of 1 inch per foot towards the outlet.

7. Face Angle shall be cast in a structure continuous for the full length "L".
8. When structure depth "V" exceeds 5 feet, ladder rungs shall be cast into wall every 10" intervals from 15" above floor to within 12" of top of structure. Where possible place rungs in wall without pipe opening, directly beneath access opening. See B-34 for details.
9. Wall thickness and reinforcing required may be decreased in accordance with table above as depth "V" to box section is decreased.
10. Face angle and anchor to be hot-dipped galvanized after fabrication.
11. Provide protective steel bar in throat opening when required. See D-37
SECTION C-C

1. Refer Standard Drawing D-4 for additional notes and details.
2. Designate type 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 inch.
4. Surface of top slab shall be finished as specified for sidewalks in the Standard Specifications and shall drain towards street at a slope of 1/4 inch per foot.
5. Concrete gutter to match adjacent gutters.
6. Expansion joint material shall be placed at the ends of the inlet where the curb is to adjoin.
7. Provide 1/2" grooved edge in top slab in line with back of adjacent curb.

SECTION A-A

Legend on Plans:
15' Type A-1 inlet

PLAN

Length shown on plans

SECTION A-A

1/2" clc.
6' min.

Pour against original
or compacted ground

4 int 4 around pipe

Determined by pipe
size - 4 min., 8 max.

Slope floor 1' per foot
Towards Outlet

Slope gutter 3° or
match existing
roadway surface

CURB INLET - TYPE A

D-5
SECTION C-C

1. Refer Standard Drawing D-4 for additional notes and details.
2. Designate types 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 3/4 inch.
4. Surface of top slab shall be finished as specified for sidewalks in the Standard Specifications and shall drain towards street at a slope of 1/4 inch per foot.
5. Concrete gutter to match adjacent gutters.
6. Expansion joint material shall be placed at the ends of the inlet where the curb is to adjoin.
7. Provide 4" footed groove in top slab in line with back of adjacent curb.

SECTION A-A

CURB INLET-TYPE B
NOTES
1. Refer Standard Drawing D-4 for additional notes and details.
2. Designate types 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 inch.
4. Surface of top slab shall be finished as specified for sidewalks in the Standard Specifications and shall
   drain towards street at a slope of 1/2 inch per foot.
5. Concrete gutter to match adjacent gutters.
6. Expansion joint material shall be placed at the ends of the inlet where the curb is to adjoin.
7. Provide 1/2” tooled groove in top slab in line with back of adjacent curb.
8. A special size frame & grate is required.
NOTES
1. Refer Standard Drawing D-4 for additional notes and details.
2. Designate types 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 inch.
4. Surface of top slab shall be finished as specified for sidewalks in the Standard Specifications and shall drain towards street at a slope of 1/4 inch per foot.
5. Concrete gutter to match adjacent gutters.
6. Expansion joint material shall be placed at the ends of the inlet where the curb is to adjoin.
7. Provide 1/2" foiled groove in top slab in line with back of adjacent curb.
The rounded areas may be built up of Cement Mortar or poured in place with the drainage structure.

\[ R = \frac{\text{INSIDE DIAMETER OF PIPE}}{10} \]
**PLANT**

- **3 1/8"** both ways
- **Bend down 15° (typ.)**

**SECTION A-A**

- **4 1/4 around pipe**

**NOTES**

1. Refer to standard drawing D-4 for additional notes and details.
2. In unpaved areas, except streets, raise cover to 6" min. above finish grade. In streets, raise cover to finish grade.
NOTES: The end of connecting pipe shall not project into the waterway of the larger pipe.

- The larger pipe shall not be less than 24" I.D.
- The smaller pipe shall not be more than 2/3 the size of the larger pipe.
Class A Concrete

Cut pipe end

Grout smooth
with 1:2 mix
mortar

- 6" for pipe sizes 30" and smaller
- 9" for pipe sizes larger than 30"

Legend on Plans
NOTES:
1. Refer to Standard Drawing D-4 for additional notes and details.
2. Type I and type J drop inlets are the same with the exception of the openings.
3. All exposed edges on top of inlet to be rounded to 1/2" radius.
4. Openings on both sides unless shown otherwise on plans.

HANDLE DETAIL:
- 3/4" galv pipe sleeve
- 1/2" galv U-bolt handle
- 1/4" 2 3/8" galv plate
- peen bolt ends after installing nuts.
SAN DIEGO STORM DRAIN

TOP OF FRAME & COVER

SECTION THROUGH RIM

SECTION THROUGH FRAME & COVER

SECTION THROUGH RIB AT MID RADIUS

BOTTOM OF COVER

SECTION THROUGH LUG

Notes:
- The frame and cover shall be cast iron.
- Use in storm drain only in streets and areas not accessible to pedestrian traffic.

COUNTY OF SAN DIEGO STANDARD DRAWING

INLET FRAME AND COVER

D-18
PLAN

SECTION BB

4" minimum, 7" maximum

Drainage Outlet (D-20)

SYMBOL

4" minimum, 7" maximum

CLASS A CONCRETE

Length as shown on plans

Rise 1/2" per foot

1/8" except when shown otherwise

Gutter line

Gutter line 2

Property line 1
WING & U TYPE HEADWALLS FOR 42" TO 84" PIPES (1 3/8" FILL SLOPES)

**GENERAL NOTES**
- Stepped Pipes Dimension W to be increased to take care of increased width at length due to skew or multiple pipes.
- Tops of headwalls on grade curvets shall be placed parallel to profile grade when the grades are 3% or more.
- Quantities shown in tables are for 1 headwall.
- Concrete All concrete to be class A.
- Exposed surfaces to have standard finish.
- Reinforcing Steel: All reinforcing steel to be rounds or deformed bars of structural grade.
- Multiple Pipes to be set with longitudinal center lines 1/2" diameters of pipe apart.

**LEGEND ON PLANS**
- ( )
- [ ]

**COUNTY OF SAN DIEGO**
**STANDARD DRAWING**

**WING & U - TYPE HEADWALLS**
FOR 42" TO 84" PIPES

**SCALE**

**DRAWING NO.**

**D-24**
**TYPE A SPILLWAY INLET**

- 60 GA CORRUGATED METAL 48" WIDE DIKE
- 60 GA CORRUGATED METAL 48" WIDE

**TYPE B SPILLWAY INLET**

- 60 GA CORRUGATED METAL 48" WIDE DIKE
- 60 GA CORRUGATED METAL 48" WIDE

**OUTLET PROTECTION FOR TYPE A ASSEMBLIES**

- STONES TO BE NOT LESS THAN 1 CU. FT. IN VOLUME AND IMBEDDED IN GROUND NOT LESS THAN 6" APRIL TO HAVE A WIDTH OF 4'.

**TYPE C SPILLWAY INLET**

- 60 GA CORRUGATED IRON PIPE, BULKHEADED.
- 60 GA CORRUGATED METAL 48" WIDE

---

**LEGEND ON PLANS**

- = 8
- = 8

**COUNTY OF SAN DIEGO STANDARD DRAWING**

Type A, B & C Spillway Inlets and Underdrain

**DRAWING NO.**

D-25
GENERAL NOTES

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 slope is retained.

The dimension "Y" shall be increased if unstable material is encountered.

Keep the pipe-end clear of obstruction to permit easy placing of culvert extension.

Legend on plans: ———— ———— ————
NOTE: For sections extending deeper than 12'-0" below top of inlet, wall thickness shall be increased to 8". Special design required for "H" greater than 16'-0".

NOTE: When height exceeds 5', cast 5/8" round galvanized iron steps in wall, 15" apart.

NOTE: All concrete shall be Class A. All reinforcing shall be deformed bars.
Angle varies with curb radius
Radius of return shown on plans.

SECTIONAL PLAN
Top of curb
Variable Maximum 12"

ELEVATION

NOTE: For sections extending deeper than 12'0" below top of inlet, wall thickness shall be increased to 8". Special design required for "H" greater than 16'-0".

NOTE: When height exceeds 5', cast 5/8" round galvanized iron steps in wall, 15" apart.

NOTE: All concrete shall be Class A. All reinforcing shall be deformed bars.

Legend on plans:

TYPE G CURB INLET

COUNTY OF SAN DIEGO

STANDARD DRAWING

D-34
Trowel finish top surface and reproduce markings of existing sidewalk and curb.

SECTION A-A

SECTION A-A

NOTES:

All concrete shall be Class A.
Cut sidewalk and curb in accordance with drawing G-33
D = inside diameter of pipe.
Section to be sloped laterally with top conforming to the grades of the existing sidewalk and curb.
The use of this type structure is restricted to locations having had the advance approval of the County Engineer.

Legend on plans.
TYPICAL CROSS SECTION OF DRAINAGE CHANNEL

CLASS A PORTLAND CEMENT CONCRETE

NO SCALE

LEVEL 2

CHANNEL BOTTOM 2

CONCRETE SIDE SLOPE

36°

WEAKEN PLANE JOINTS AT 12 CENTERS

4" VITRIFIED CLAY OPEN BUTT-JOINT SPACED 12 INCHES PEDEST

6" 6"

CONTINUOUS DRAIN

GRADE FILTER MATERIAL

CLAY OPEN BUTT JOINT

SCALE: 1" = 1'

LEGEND ON PLANS

DETAIL

SPECIFICATION REFERENCE

COUNTY OF SAN DIEGO

DRAINAGE CHANNEL

STANDARD DRAWING

AS SHOWN SCALE DRAWING NO.

D-40
5/16" Steel Reinforcing Tension Cable 18" c/c secure ends with cable clamps. NOTE: Secure fence to cable using No.12 galvanized steel wire looped 6" c/c.

2" mesh No.9 gage galvanized wire chain link fence on upstream side of pipes and tension cables.

3" galvanized steel pipe 5.79 lb./ft. Fill with mortar after placing.

No.9 gage wire clips, 9" c/c.

Backfill to natural ground after fence installation.

Length as shown on plans

Class B concrete

24" Min.

Detail of Footing
NOTE: ALL CONCRETE SHALL BE CLASS A.
SEE STD. DWG. G-02 FOR JOINT DETAILS
ADJUST 15' INTERVAL BETWEEN TRANSVERSE JOINTS TO MATCH ADJACENT EXISTING IMPROVEMENTS.

SPECIFICATION REFERENCE
COUNTY OF SAN DIEGO
STANDARD DRAWING

CONCRETE PAVEMENT-ALLEY SECTION
20' width, or less

SCALE: NONE
DRAWING NO.
G-11
NOTE: ALL CONCRETE SHALL BE CLASS A.
SEE STD. DWG. G-42 FOR JOINT DETAILS
ADJUST 15' INTERVAL BETWEEN TRANSVERSE JOINTS TO MATCH ADJACENT EXISTING IMPROVEMENTS.
SIDEWALK: 25

Normal rise 1/4 per foot.
When approved -
Maximum rise or fail:
1/2 per foot.

DRIVEWAY RAMP
Maximum Rise -
-1-1/2 per foot

CLASS A CONCRETE TO
PROPERTY LINE OR 10 FEET
FROM CURB WHICHEVER IS LESS
10'-0'

ELEVATION

PLAN

SECTION

LEGEND ON PLANS

\( \ell \) of Residential driveway

COUNTY OF SAN DIEGO

STANDARD DRAWING

RESIDENTIAL DRIVEWAY

Curb and sidewalk contiguous

SCALE

1/2" = 1'-0"
SIDEWALK
See Dwg G-4

Normal rise 1/4" per foot
When approved, maximum rise 1/2" per foot, maximum fall 1/2" per foot.

DRIVEWAY RAMP
Maximum rise 1/2" per foot

DRIVEWAY
Curb Line

CLASS A CONCRETE TO PROPERTY LINE OR 10 FEET FROM CURB, 10' O" WHICHEVER IS LESS

GUTTER
Width
As shown on plans - See G-40 and G-41

DEPRESSED CURB

ELEVATION
12" radius

PLAN

SECTION

LEGEN ON PLANS

COUNTY OF SAN DIEGO
STANDARD DRAWING
RESIDENTIAL DRIVEWAY
Curb and sidewalk separated

SPECIFICATION REFERENCE

COUNTY ENGINEER

APPROVALS

REVISIONS

DRAWING NO.
G-23

SCALE 1/2" = 1'-0"

H.M. TAYLOR 11-20-22
ELEVATION

SECTION

6" or 8" Curb and Gutter or Type 6 Curb

Finished Grade of Street

Surface Course

VARIABLE
Shown on Plans

1'-6" 5'-0"

COUNTY OF SAN DIEGO STANDARD DRAWING
CUTOFF WALL AT END OF PAVEMENT

G-27
ELEVATION

SECTION

6" or 8" Curb and Gutter or Type G Curb
Finished Grade of Street
Surface Course

VARIES Shown on Plans

1'-6"
5'-0"
1'-6"

Class A Concrete

Legend on plan

GUTTOFF WALL AT END OF PAVEMENT

G-27
Width as shown on plan

Alley Pavement

3' 3' 6'

Elevation

Class A Concrete

Section at E

Legend on plan

COUNTY OF SAN DIEGO

STANDARD DRAWING

CUTOFF WALL

AT END OF ALLEY PAVEMENT

DRAWING NO. G-28
Legend as shown on the plans.

Transitional Area, Depress Toe of Gutter to match Cross Gutter Slope

Type G curb

6" or 8" curb

Type G curb

10' 8' 10'

8'

CROSS GUTTER
1" 4'

GUTTER (SEE DETAIL)

TYPICAL SECTION

NOTES:

Cross gutters shall be constructed in accordance with the County of San Diego Standard Specifications.

Cross gutter to be constructed where the drainage is carried across street and on a grade of at least 0.5%.

Drainage slot shall be constructed only where shown on plans. Slot shall be formed with 2"x3" (S&H).

DRAINAGE SLOT DETAIL
(No Scale)
TYPICAL SECTION

NOTES:
Cross gutters shall be constructed in accordance with Section 8 of the specifications except joint and finishing shall conform to Sections 7-06 and 7-07 of the specifications.

Cross gutter to be constructed where the drainage is carried across street and on a grade of at least 0.5%.

Drainage slot shall be constructed only where shown on plans. Slot shall be formed with 2"x3" (545).

All concrete shall be Class A.

GRADE SHOWN ON PROFILE
DRAINAGE SLOT (2"x3")
DRAINAGE SLOT DETAIL
(No Scale)
NOTES

1. Remove entire curb and gutter section to construct driveway or to replace with new curb.

2. Remove entire depressed curb and gutter section of abandoned driveways and replace with approved standard curb when other driveways are constructed to serve same property.

3. Remove existing 4" sidewalk and replace with 6" P.C.C. at locations of driveways constructed in commercial zones.

4. Remove and replace paved area adjacent to weakened plane or expansion joint when "W" is equal to or less than two feet.
CROSS GUTTERS AND RETURN SEGMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH COUNTY OF SAN DIEGO STANDARD SPECIFICATIONS.

DRAINAGE SLOT SHALL BE CONSTRUCTED WHERE SHOWN ON PLANS. SEE G-32 FOR DETAIL.

CROSS GUTTER AND RETURN SEGMENT TO BE CONSTRUCTED WHERE DRAINAGE IS CARRIED ACROSS STREET.

ALL CONCRETE SHALL BE CLASS A ON ALL CONTACT JOINTS THE TORQUE SHALL BE POURED FIRST. SEE STD. DWG. G-42 FOR JOINT DETAILS.

NOTE: D = DISTANCE SHOWN ON PLANS
R = RADIUS SHOWN ON PLANS
\( \Delta \) = CENTRAL ANGLE SHOWN ON PLANS
O = ELEVATION SHOWN ON PLANS
S = 8' TO 12' AS SHOWN ON PLANS
1-1/2" except where elevations shown indicate otherwise
Toe of Gutter Elevation

Gutter Elevation shown on plans

5" unless shown otherwise on plans

Property Line

Elevation shown on plans

Gutter Line

Gutter Line

ALLEY

Portland Cement

Concrete

NOTE:
BE IN ACCORDANCE WITH THE COUNTY STANDARD SPECIFICATIONS.

P' distance shown on plans;
D' distance shown on plans.

Elevations shown on plans.
NOTE: Finishing shall be in accordance with Sec. 7.07
distance shown on plans
radius shown on plans
Elevations shown on plans

Property Line

Class A Portland Cement
Concrete

Gutter Line

Curb Line

TYPICAL PLAN
SCALE 1:50

Elevation shown on plans
Gutter Elevation shown on plans
Tee of Gutter Elevation shown on plans

C SECTION
SCALE 1:60

Legend on Plans

ALLEY APRON
WEAKENED PLANE JOINT

CONTACT JOINT

EXPANSION JOINT

PAVEMENT

WEAKENED PLANE JOINT

WEAKENED PLANE JOINT

EXPANSION JOINT

SIDEWALK

TOP AND CURB FACE

GUTTER SECTION

WEAKENED PLANE JOINT

TOP AND CURB FACE

GUTTER SECTION

CURB

NOTE: PLACE EXPANSION JOINT FILLER MATERIAL IN TIGHT CONTACT WITH FORMS AND BASE.

WEAKENED PLANE JOINTS MAY BE SAW-CUT.
SEE STANDARD SPECIFICATIONS

PORTLAND CEMENT CONCRETE JOINTS
FOR PAVEMENT, SIDEWALK, CURB
AND CROSS GUTTER

G-42
NOTE:
ADJUST 15' INTERVAL BETWEEN TRANSVERSE JOINTS TO MATCH ADJACENT EXISTING IMPROVEMENTS.
SEE STD. DWG. G-42 FOR JOINT DETAILS.
SEE PROJECT PLANS FOR CURB TYPES.
SEE PROJECT PLANS FOR STREET WIDTH DIMENSIONS.
STREET AND SIDEWALK AREA WIDTHS ARE TO CURB LINE. ISLAND WIDTHS ARE TO GUTTER LINE.
NOTE: ALL CONCRETE SHALL BE CLASS A.
ADJUST 15' INTERVAL BETWEEN TRANSVERSE JOINTS TO MATCH ADJACENT EXISTING IMPROVEMENTS.
SEE STD. ENG. D-22 FOR JOINT DETAILS.
SEE PROJECT PLANS FOR CURB TYPES.
SEE PROJECT PLANS FOR STREET WIDTH DIMENSIONS.
STREET AND SIDEWALK AREA WIDTHS ARE TO CURB LINE. ISLAND WIDTHS ARE TO GUTTER LINE.
NOTE:
SEE DVG. G-42 FOR JOINT DETAILS.
SEE DVG. G-43 FOR TYPICAL PLANS.
NOTE: ALL CONCRETE SHALL BE CLASS A.
SEE DWG. G-42 FOR JOINT DETAILS.
SEE DWG. G-43 FOR TYPICAL PLANS.
NOTE:
SEE DWG. G-42 FOR JOINT DETAILS
SEE DWG. G-43 FOR TYPICAL PLANS

TYPE G & H CURB

1 1/2" EXCEPT WHERE ELEVATIONS SHOWN INDICATE OTHERWISE

VARI ELEVATION (OR CROSS SECTION)
WEAKENED PLANE JOINT

SLOPE

R = 10
R = 15
R = 20
R = 25

1 1/2" TYPE W AREA SQ.FT.
G 24" 1.37
H 30" 1.64

"WITH 6" CURB FACE

SPECIFICATION REFERENCE
COUNTY OF SAN DIEGO
STANDARD DRAWING
CURB SECTIONS
TYPES G & H

G-45
NOTE: ALL CONCRETE SHALL BE CLASS A.
SEE DWG. G-42 FOR JOINT DETAILS
SEE DWG. G-43 FOR TYPICAL PLANS

TYPE G & H CURB

AREA

<table>
<thead>
<tr>
<th>TYPE</th>
<th>W</th>
<th>SQ. FT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>24</td>
<td>1.37</td>
</tr>
<tr>
<td>H</td>
<td>30</td>
<td>1.64</td>
</tr>
</tbody>
</table>

*WITH 6" CURB FACE
**B-1**

AREA = 0.79 SQ.FT.

**B-2**

AREA = 1.29 SQ.FT.

**B-3**

AREA = 0.35 SQ.FT.  
(EXTRUDED TYPE)

**NOTE:**

SEE Dwg. G-42 FOR JOINT DETAILS  
SEE Dwg. G-43 FOR TYPICAL CURB PLANS

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**SPECIFICATION REFERENCE**  
**COUNTY OF SAN DIEGO**  
**STANDARD DRAWING**  
**SCALE - INCHES**  
**DRAWING NO.**

**CURB SECTIONS - TYPE B**

G-46
B-1
AREA = 0.79 SQ.FT.

B-2
AREA = 1.29 SQ.FT.

B-3

B-4
AREA = 0.35 SQ.FT.
(EXTRUDED TYPE)

NOTE: ALL CONCRETE SHALL BE CLASS A.
SEE Dwg. G-42 FOR JOINT DETAILS
SEE Dwg. G-43 FOR TYPICAL CURB PLANS
NOTES:

1. TRANSITION TO A TYPE "G" CURB WILL BE PROVIDED AT ALL CURB RETURNS, AT ALL DRAINAGE STRUCTURES AND AT ALL CUL-DE-SACS WITH DRAINAGE STRUCTURES.
2. ALL CONCRETE SHALL BE CLASS "B".
3. SEE DRAWING G-42 FOR JOINT DETAILS.
4. SEE DRAWING G-43 FOR TYPICAL PLANS.
5. ALL CONCRETE WATER METER BOX COVERS AND LIDS SHALL BE CAST IRON.
TYPICAL SECTION

CURB AREA
2.33 sq ft.

NOTES:
1. TRANSITION TO A TYPE "G" CURB WILL BE PROVIDED AT ALL CURB RETURNS, AT ALL DRAINAGE STRUCTURES AND AT ALL CUL-DE-SACS WITH DRAINAGE STRUCTURES.
2. ALL CONCRETE SHALL BE CLASS "A".
3. SEE DRAWING G-42 FOR JOINT DETAILS.
4. SEE DRAWING G-43 FOR TYPICAL PLANS.
5. ALL CONCRETE WATER METER BOX COVERS AND LIDS SHALL BE CAST IRON.
**ELEVATION**

**NOTE:** All footings shall be class "B" portland cement concrete.

Legend on Plans:

- [ ] Barbed wire
- [ ] Extension arm
- [ ] Top horizontal rail

**EXTENSION ARM AND BARBED WIRE**

No Scale
Distance between gate posts is gate length shown on plans

Length of gate leaf

Fitting
Gate frame
Truss rods
Intermediate member
Truss rods

Gate post
Post top
Gate post
Hinge
Fence

Repeat opposite end
Latch
Stretcher bar
Latch
Fastener
Flange bar
Gate stop
10" diameter stop footing
Omit if roadway is concrete
Roadway or ground

HALF-ELEVATION
DOUBLE SWING GATE

Diameter of post footing = 4 times outside diameter of post

NOTE: All footings shall be class "B" portland cement concrete.

Legend on Plans - oo- x x

NOTE: The following items shall be furnished and installed only when shown on the plans and/or called for in the special conditions:

1. Barbed wire
2. Extension arm

EXTENSION ARM AND BARBED WIRE
No Scale
MANHOLE COVER FRAME
CAST IRON WT. 175 LB.

MANHOLE COVER
CAST IRON WT. 155 LB.

FOR MARK
Sewer Projects Sewerage
Storm Drain Projects Drain
Water Projects Water
Electrical Projects Electric
FOR INNER COVER SEE STANDARD DRWG. NO. M-23

HALF PLAN
FRAME AND COVER

HALF SECTION
FRAME AND COVER

NOTES
1. WEIGHTS:
   INNER COVER - 155 LBS.
   OUTER COVER - 300 LBS.
   FRAME - 330 LBS.
2. MATERIAL: CAST IRON
3. MACHINE SEATS TO PREVENT NOISE
4. FILLET RADIUS TO BE 1/2"
ROADWAY INTERSECTION PLAN

NOTE: This "STANDARD" is a guide only and deviations will be acceptable where conditions dictate. Dimensions shown are desirable but do not govern. The intention is to show the relative position of all utilities.

SPECIFICATION REFERENCE
COUNTY OF SAN DIEGO
STANDARD DRAWING
GUIDE FOR LOCATION OF PIPES CONDUITS AND UNDERGROUND WORK IN STREETS

SCALE AS SHOWN
DRAWING NO. P-24
"5 BAR EACH SIDE OF PIPE FOR VERTICAL TIE TO HORIZONTAL LADDER REINFORCEMENT.

CLASS B CONCRETE OR 8" x 8" x 16" CONCRETE BLOCKS WITH NO 9 LADDER TYPE REINFORCEMENT, FILL CORES OF BLOCKS WITH GROUT

CONCRETE FOOTING

TRENCH WIDTH

BLOCKS LAID TIGHT AS POSSIBLE TO DOWNSTREAM PORTION OF DAP INTO TRENCH WALL

PLAN

NO. 9 WIRE LADDER TYPE REINFORCEMENT IN ALL HORIZONTAL JOINTS.

TRENCH DEPTH

SHELL OF PIPE

SECTION

1-20' MIN

ELEVATION

DETAIL PLANS

LEGEND ON PLANS

CONCRETE ANCHOR S-27
Reflector sign—California Highway Code W21R. Size 18" x 18" - Yellow with nine 3" diameter reflectors.

Location dimension shown on plans.

3/8" Galvanized bolts and washers.

2" x 8" select grade Douglas fir, surfaced four sides.

6" x 6" dense structural grade redwood, surfaced four sides.

GROUND LINE

FRONT VIEW

END VIEW

Type C (Double post without reflector sign)
Type CS (Double post with reflector sign)

NOTE: Install Type CS assembly with one (1) only code W21R sign in head-on position for each approaching lane of traffic.

6" x 6" (See double post assembly)

LEGEND ON PLANS

Type CS
Type DS

G U A R D  P O S T  A N D  F E N C E  A S S E M B L Y
F O R  T E R M I N A T I N G  S T R E E T S

COUNTY OF SAN DIEGO
STANDARD DRAWING

SPECIFICATION REFERENCE

GUARD POST AND FENCE ASSEMBLY
FOR TERMINATING STREETS

SCALE 1/2" : 1'
DRAWING NO. 

T - 9
SECTION AT BERM
NOT TO SCALE

SECTION AT SUPPORT
NOT TO SCALE

SPECIFICATION REFERENCE
COUNTY OF SAN DIEGO
STANDARD DRAWING
METAL BEAM GUARD RAIL INSTALLATION

-scale: 1" = 2'-0"

SCALE AS SHOWN
DRAWING NO.
T-15
NOTES

1. FOR ADDITIONAL CONSTRUCTION DETAILS SEE STD. DWG. 131, "DRAINAGE STRUCTURE STANDARD DETAILS."

2. ALL CONCRETE TO BE CLASS "A"

3. STD. GUTTER DEPRESSION TO BE USED WHEN REQ. BY COUNTY ENGINEER SEE STD. DWG. 254.

4. CONSTRUCT 10° TRANSITION FROM STD. CURB HEIGHT TO DEPRESSED GUTTER AT EACH END OF INLET.

5. INCREASE IN ALLOWABLE DEPTH SUBJECT TO APPROVAL OF COUNTY ENGINEER.

LEGEND ON PLANS

10° TYPE A-2 CURB INLET

SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING
TYPE A-2 CURB INLET

DRAWING NUMBER 100-2
NOTES
1. FOR ADDITIONAL CONSTRUCTION DETAILS SEE STD. DWG. 131, "DRAINAGE STRUCTURE STANDARD DETAILS"
2. ALL CONCRETE SHALL BE CLASS A
3. CURB SUPPORT SPACING: 10' BOX = 1 BAR CENTERED IN OPENING; 15' AND 20' BOXES = 2 BARS EQUALLY SPACED IN OPENING
4. CONSTRUCT 10' TRANSITION FROM STANDARD CURB HEIGHT TO DEPRESSED GUTTER AT EACH END OF INFILL
5. STANDARD GUTTER DEPRESSION TO BE USED WHEN REQUIRED BY COUNTY SURVEYOR. SEE STD. DWG. 224
6. INCREASE IN ALLOWABLE DEPTH SUBJECT TO APPROVAL OF COUNTY SURVEYOR.

LEGEND ON PLANS

10' TYPE B-2
CURB INLET

SAN DIEGO COUNTY SURVEYOR — ROAD DEPARTMENT
STANDARD DRAWING
TYPE B-2 CURB INLET

DRAWN BY:
CHECKED BY:
RECOMMENDED BY:
APPROVED BY:

DATE:

DRAWING NUMBER

101-2
Cement in place with 1/2 mix cement mortar

Legend on plans □

SECTION

Set core in a thick bed of 1/2 mix cement mortar.
8" c to c both ways.

Diagonal "4 bars
"3 bars, 8" c to c both ways

Rounded Pipe Ends

Elevation of centre shown on plans.

6" 3"
Lap 15"

PLAN

"3 Bars, 8" c to c both ways
"4 Bars on types C, D, E

Lap 15"

NOTE
When height exceeds 4', cast 3/8" round wrought
iron steps in wall a maximum of 15" apart. See San Diego
County Dwg 15: "Drainage Structure Standard Details"
Note: All reinforcing shall be deformed bars. All concrete shall be Class A.
When height exceeds 4', cast 3/8" round wrought iron steps in wall a maximum of 15" apart. See San Diego County Dwg. 131 "Drainage Structure Standard Details"
1. All concrete shall be Class A.
2. Curb openings longer than 7' shall have one curb support bar for each 7' increment or fraction thereof, evenly spaced.
3. Construct 1' transition from std. curb height to depressed gutter at each end of inlet.
4. Std. gutter depression to be used when required by County Surveyor. See std. dwg. 224.
5. For additional construction details, see std. dwg. 131.
7. 1/2 galvanized steel bars spaced evenly between curb support bars, 21' maximum.

SAN DIEGO COUNTY SURVEYOR-ROAD DEPARTMENT
STANDARD DRAWING

TYPE K CURB INLET

LEGEND ON PLANS

SECTION A-A

SECTION B-B

DRAWN BY

CHECKED BY

RECOMMENDED BY

APPROVED BY COUNTY SURVEYOR

DATE: 10/24/89

REVISED BY

APPROVED DATE

SCALE

DRAWING NUMBER

104-2
NOTES
1. FOR ADDITIONAL CONSTRUCTION DETAILS SEE
   STD. DWG 131 "DRAINAGE STRUCTURE STANDARD
   DETAILS"
2. ALL CONCRETE SHALL BE CLASS "A".
3. STANDARD GUTTER DEPRESSION TO BE USED
   WHEN REQUIRED BY THE COUNTY ENGINEER.
   SEE STD. DWG 223-1.
4. CONSTRUCT 10' TRANSITION FROM STD CURB
   HEIGHT TO DEPRESSED GUTTER AT EACH
   END OF INLET.
5. INCREASE IN ALLOWABLE DEPTH SUBJECT TO
   APPROVAL BY COUNTY ENGINEER.
6. 1 1/2" GALVANIZED STEEL BARS SPACED
   EVENLY BETWEEN CURB SUPPORT BARS,
   21" MAXIMUM.

PLAN
SLOPE & FINISH SURFACE
IN ACCORDANCE WITH
SIDEWALK STANDARDS.

SECTION A-A

LEGEND ON PLAN

STD. SPEC. SEC. 51, 52, 73, 90
DRAWN BY: __________
CHECKED BY: __________
RECOMMENDED BY: __________
APPROVED BY: COUNTY ENGINEER

SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING
TYPE K-I CURB INLET
DRAWING NUMBER 105-2
TYPE I DROP INLET

SECTION A-A

PLAN

SECTION B-B

NOTES:
1. USE CLASS "A" CONCRETE AND DEFORMED REINFORCING BARS.
2. TYPE I AND J DROP INLETS ARE THE SAME EXCEPT FOR SIDE OPENINGS.
ELEVATION

NOTES
1. ALL CONCRETE SHALL BE CLASS "A"
2. FOR ADDITIONAL CONSTRUCTION DETAILS
   SEE STD. DWG. 131 "DRAINAGE STRUCTURE
   STANDARD DETAILS.
3. INCREASE IN ALLOWABLE DEPTH SUBJECT
   TO APPROVAL BY COUNTY ENGINEER.

SECTION A-A

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 & GRATE.
DETAIL A
RECESS FOR GRATE REMOVAL

SLOPE & FINISH IN ACCORDANCE WITH SIDEWALK STDS.

PLAN

M=5 1/2" WITH 6" CURB & STD. GUTTER
M=3 1/2" WITH 8" CURB & STD. GUTTER
M=2 1/2" WITH STD. GUTTER DEPRESSION

ELEVATION

NOTES:
1. ALL CONCRETE SHALL BE CLASS 'A'
2. CONSTRUCT 10' TRANSITION FROM STD. CURB HEIGHT TO DEPRESSED GUTTER AT EACH SIDE OF INLET.
3. FOR ADDITIONAL CONSTRUCTION DETAILS SEE STD. DWG. 131. "DRAINAGE STRUCTURE STANDARD DETAILS"
4. INCREASE IN ALLOWABLE DEPTH SUBJECT TO APPROVAL OF COUNTY SURVEYOR.

SECTION A-A

LEGEND ON PLANS

SAN DIEGO COUNTY SURVEYOR — ROAD DEPARTMENT
STANDARD DRAWING

TYPE H CURB INLET

DRAWING NUMBER 108-1
NOTE: SPECIAL DESIGN REQ. FOR H OVER 16'

LEGEND ON PLANS

NOTE: All Concrete To Be Class "A"

SAN DIEGO COUNTY SURVEYOR—ROAD DEPARTMENT
STANDARD DRAWING

TYPE G CURB INLET

DRAWING NUMBER 109-1
Note: The end of connecting pipe shall not project into the waterway of the larger pipe.
Notes:
1. Grate type shown on plans.
2. Grate type G-1 or G-3 shall be used in all cases.
3. Grate type G-2 or G-4 shall be used only with the approval of the County Engineer.
Notes:
1. Grate type shown on plans.
2. Grate type G-1 or G-3 shall be used in all cases.
3. Grate type G-2 or G-4, & G-5, G-6 shall be used only with the approval of the County Engineer.
NOTES
1. All exposed corners to be chamfered ¼”.
2. Exposed surfaces to be finished.
3. For culverts larger than 18” diameter use standard reinforced concrete headwall.

CURTAIN WALL

NOTES
1. A curtain wall may be used in place of a headwall at culvert ends where extension of the culvert is considered imminent, or no fill slope is retained.
2. Keep the pipe-end clear of obstruction to permit easy placing of culvert extension.

SECTION B-B

Legend on plans: = = =

<table>
<thead>
<tr>
<th>Curtain Wall Dimensions</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>18” to 24”</td>
<td>1”</td>
<td>3”</td>
<td>12”</td>
</tr>
<tr>
<td>24” to 35”</td>
<td>1”</td>
<td>6”</td>
<td>12”</td>
</tr>
<tr>
<td>35” to 45”</td>
<td>2”</td>
<td>6”</td>
<td>12”</td>
</tr>
<tr>
<td>45” to 60”</td>
<td>2”</td>
<td>8”</td>
<td>14”</td>
</tr>
<tr>
<td>63” or larger</td>
<td>3”</td>
<td>8”</td>
<td>14”</td>
</tr>
</tbody>
</table>

Legend on plans: = = =

SAN DIEGO COUNTY SURVEYOR & ROAD DEPARTMENT

STANDARD DRAWING

GRAVITY TYPE HEADWALL FOR 18” CULVERTS
CURTAIN WALL

112-1
WING & U-TYPE HEADWALLS FOR 42" TO 84" PIPES (1 1/2:1 FILL SLOPES)

<table>
<thead>
<tr>
<th>Diam of Pipe</th>
<th>Dimensions</th>
<th>Single Pipe</th>
<th>Double Pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>U Type</td>
<td>Wing Type</td>
<td>U Type</td>
</tr>
<tr>
<td></td>
<td>W Type</td>
<td></td>
<td>W Type</td>
</tr>
<tr>
<td></td>
<td>Diameter</td>
<td></td>
<td>Diameter</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>42&quot;</td>
<td>3-1 1/4</td>
<td>2-1 1/4</td>
<td>3-1 1/4</td>
</tr>
<tr>
<td>48&quot;</td>
<td>3-1 1/4</td>
<td>2-1 1/4</td>
<td>3-1 1/4</td>
</tr>
<tr>
<td>60&quot;</td>
<td>3-1 1/4</td>
<td>2-1 1/4</td>
<td>3-1 1/4</td>
</tr>
</tbody>
</table>

NOTE - Dimensions E and L apply to Wing Type only.

GENERAL NOTES:
- Shored Pipes. Dimension W to be increased to take care of increased width or length due to shore or multiple pipes.
- Tops of headwalls on grade culverts shall be placed parallel to profile grade when the grades are 3% or more.
- Quantities shown in tables are for 1 headwall.

LEGEND ON PLANS:
- Concrete all concrete to be class A.
- All exposed corners to be chamfered 3/4".
- Exposed surfaces to have standard finish.
- Reinforcing Steel. All reinforcing steel to be round deformed bars of intermediate grade.
- Multiple Pipes to be set with longitudinal center lines 1 3/8 diameters of pipe apart.

SPECIFICATION REFERENCE:
- Section: 31.52.90
- County Surveyor: D. K. Speer, P.E., 2023

SAN DIEGO COUNTY STANDARD DRAWING

WING & U-TYPE HEADWALLS FOR 42" TO 84" PIPES

SCALE:
- Drawing No.: 113
<table>
<thead>
<tr>
<th>DIA.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OF</td>
</tr>
<tr>
<td>PIPE</td>
</tr>
<tr>
<td>D</td>
</tr>
<tr>
<td>L</td>
</tr>
<tr>
<td>E</td>
</tr>
<tr>
<td>F</td>
</tr>
</tbody>
</table>

**ELEVATION**

**SECTION B-B**

<table>
<thead>
<tr>
<th>DIAMETER</th>
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<tbody>
<tr>
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</tr>
<tr>
<td>48</td>
</tr>
<tr>
<td>54</td>
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<tr>
<td>60</td>
</tr>
<tr>
<td>66</td>
</tr>
<tr>
<td>72</td>
</tr>
<tr>
<td>76</td>
</tr>
<tr>
<td>84</td>
</tr>
</tbody>
</table>

**PLAN**

1. **WING TYPE HEADWALLS**

   - **FOR 42" TO 84" PIPE**

**NOTES**

1. ALL CONCRETE TO BE CLASS "A".
2. ALL EXPOSED CORNERS TO BE CHAMFERED 90°.
3. MULTIPLE PIPES TO BE SET WITH LONGITUDINAL SEPARATION OF 1 1/2 TIMES THE DIAMETERS APART.
4. TOPS OF HEADWALLS ON GRADE CULVERTS SHALL BE PLACED PARALLEL TO PROFILE GRADE WHEN THE GRADE IS 3% OR MORE.

**LEGEND OF PLANS**

**SINGLE PIPE**

<table>
<thead>
<tr>
<th>U TYPE</th>
<th>WING TYPE</th>
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<tbody>
<tr>
<td>CONC. CY</td>
<td>STEEL LBS</td>
</tr>
<tr>
<td>42</td>
<td>1.57</td>
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<tr>
<td>48</td>
<td>1.97</td>
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<tr>
<td>54</td>
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<td>72</td>
<td>4.40</td>
</tr>
<tr>
<td>76</td>
<td>5.00</td>
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<tr>
<td>84</td>
<td>6.21</td>
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</table>
WELDED STEEL FRAME
PLAN

FABRICATED GRATES

<table>
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<tr>
<th>GRATE</th>
<th>WGT</th>
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<tr>
<td>G-5</td>
<td>261</td>
</tr>
<tr>
<td>G-6</td>
<td>173</td>
</tr>
<tr>
<td>FRAME</td>
<td>159</td>
</tr>
</tbody>
</table>

END VIEW

W = 2 7/8" for G-6 (Except end section)
W = 1 5/8" for G-5

SEC. A-A

ALTERNATE SPACER

Notes:
1. Grate type shown on plans.

SAN DIEGO COUNTY ENGINEER DEPARTMENT
FRAME & GRATES
FOR DRAINAGE STRUCTURES

STD. SPEC. SEC. 55.70
SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING

DRAWN BY: CHECKED BY: DRAWING NUMBER: 111-4T
RECOMMENDED BY: APPROVED BY COUNTRY ENGINEER
APPROVED BY COUNTY ENGINEER

DATE: Sept 28, 1931
NOTES:
1. ALL CONCRETE SHALL BE CLASS A.
2. SECTION TO BE SLOPED LATERALLY WITH TOP CONFORMING TO THE GRADES AT THE EXISTING SIDEWALK AND CURB.
TYPICAL CROSS SECTION OF DRAINAGE CHANNEL

CLASS A PORTLAND CEMENT CONCRETE

WEAKEN PLANE JOINTS AT 12" CENTERS

4" VITRIFIED CLAY OPEN BUTT JOINT SPACED TEN FEET

CONCRETE SIDE SLOPE

LEVEL CHANNEL BOTTOM

4" CLAY OPEN BUTT JOINT

DETAIL

LEGEND ON PLANS

SPECIFICATION REFERENCE

SAN DIEGO COUNTY

STANDARD DRAWING

DRAWING NO.

FILE 11-25
NOTES:
1. ALL CONCRETE SHALL BE CLASS A.
2. ALL EXPOSED CORNERS TO BE CHAMFERED 3/4".
3. MULTIPLE PIPES TO BE SET WITH LONGITUDINAL CENTERS OF PIPE 1/2 DIAMETERS APART.
4. TOP OF HEADWALL SHALL BE PLACED APPROXIMATELY PARALLEL, TO PROFILE GRADE WHEN THE GRADE IS 3% OR MORE.
INLET FRAME AND COVER SHALL BE CAST IRON

TOP OF INLET FRAME & COVER

BOTTOM OF INLET COVER

SECTION THRU FRAME AND COVER

SECTION THRU RIM

SECTION THRU LUG

SECTION THRU RIB AT MID RADIUS

SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING

INLET FRAME & COVER
SIZE & ELEV. SHOWN ON PLANS

Pipe

4'-0"
6"

2'-6"
3'

6"

3 bars 6" C/C both ways

3 bar lapped 12" wrapped with 1/4 "Mic

4'-0"

1'-11½"

COVER PLAN

Top Elevation shown on plan

7" x 6 bars
2'-6" Long 4" C/C
(Not deformed)

1'-10"
3¼"
6"

Size and invert elevation of pipe shown on plans.

ELEVATION & SECTION

SECTION - "AA"

4 x 1 1/2" bar
(Not deformed)

2'-6"

1" x 3" bars 6" Long

2'-6"
3/4" ch.

2½ ch

3" Manhole (Limit Pipe Offset @ Floor Elevation)

11-3/9 bars

Legend on Plans: [Legend Diagram]

SPECIFICATION REFERENCE
SAN DIEGO COUNTY
STANDARD DRAWING

STANDARD TYPE "C" DROP INLET
With end opening grate & Concrete cover

Scale: NONE

File 11-25
CLASS B CONCRETE

Rise 1/4" per foot

Gutter line

Rise 1/4" per foot

Gutter line

VARIABLE

A PLAN

VARIABLE

SECTION BB

W = 4, 5, 6.

DRAINAGE OUTLET

SYMBOL

1/4"Except when shown otherwise
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>3</td>
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<td>5</td>
<td>9&quot;</td>
<td>20&quot;</td>
</tr>
<tr>
<td>15&quot;</td>
<td>21&quot;</td>
<td>30</td>
<td>23</td>
<td>4</td>
<td>5</td>
<td>6&quot;</td>
<td>12&quot;</td>
<td>24&quot;</td>
</tr>
</tbody>
</table>

**Spot weld and make watertight with asphaltic plastic cement**

**PLAN**

Bulkhead and taper to be galvanized corrugated metal of the same gage as the outlet pipe.

**ENTRANCE TAPER ALTERNATIVE A**

14 gage smooth galv. bulkhead and taper with reinforcing beads. Taper joints may be welded or riveted.

**END VIEW**

**ENTRANCE TAPER ALTERNATIVE B**

Anchor assembly alternative B

Anchor assembly alternative A

NOTES
1. For payment purposes, an anchor assembly shall include 2 pipe stakes.
2. All metal parts for anchor assemblies shall be galvanized after fabrication.
3. Products similar in design and purpose may be used.
4. Use L dimension on each side of downdrain in sag location.
SINGLE

<table>
<thead>
<tr>
<th>D</th>
<th>h</th>
<th>$l_2$</th>
<th>Vert. Steel Conc.</th>
<th>L1</th>
<th>Vert. Steel Conc.</th>
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</thead>
<tbody>
<tr>
<td>10</td>
<td>3</td>
<td>4.5</td>
<td>0.71</td>
<td>8</td>
<td>0.71</td>
</tr>
<tr>
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<td>4.5</td>
<td>0.71</td>
<td>8</td>
<td>0.71</td>
</tr>
<tr>
<td>11.5</td>
<td>3</td>
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<td>0.71</td>
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<td>4.5</td>
<td>0.71</td>
<td>8</td>
<td>0.71</td>
</tr>
</tbody>
</table>

DOUBLE

<table>
<thead>
<tr>
<th>D</th>
<th>h</th>
<th>$l_2$</th>
<th>Vert. Steel Conc.</th>
<th>L1</th>
<th>Vert. Steel Conc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>3</td>
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<td>0.71</td>
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<td>11.5</td>
<td>3</td>
<td>4.5</td>
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<td>3</td>
<td>4.5</td>
<td>0.71</td>
<td>8</td>
<td>0.71</td>
</tr>
</tbody>
</table>

Use headwall tables for concrete pipe and for CIP. No deduction in quantities for variations in thickness of pipe walls.

STRAIGHT HEADWALLS.
(Round Pipe)

STRAIGHT HEADWALLS.
(Arch Pipe)

LEGEND ON PLANS

1. Extend vertical bars 5" into base.
2. All steel reinforcing shall be #4 deformed bars.
3. Steel shall have not less than 2" concrete cover.
4. When more than 2 pipes are used, the length of headwall shall increase by $\frac{1}{2}D$ for round or $\frac{1}{2}S$ for arch pipe for each additional pipe. Quantities of concrete & steel shall be increased as required.

SAN DIEGO COUNTY SURVEYOR—ROAD DEPARTMENT
STANDARD DRAWING

STRAIGHT HEADWALL
SINGLE AND DOUBLE

126-1
"L" HEADWALL FOR ROUND PIPE

Note: When more than one pipe is used, the distance between pipes shall be 80 or 12" min. for round pipe and 3/4 or 12" min. for arch pipe. Dimensions $L_1$ & $L_2$ are from the center of the pipe nearest to the end of headwall as shown.

*When $h$ or $h_a$ is greater than 4'-6", add pairs of horizontal bars as shown. Vertical spacing shall be equal.

LEGEND ON PLANS

show length of W on plans.

TYPICAL STEEL PLACEMENT DETAIL

---

Standard Specifications
Sections: SI 52.10

SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT
STANDARD DRAWING

"L" HEADWALL.
SECTION A-A

END ELEVATION OF PIPE

Legend on plan

1. Shape shall conform to outlet channel.
2. Channel or pipe outlet rock slope protection shall be used when outlet velocity exceeds 10 F.P.S. and soil at outlet is susceptible to erosion.

SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT

CHANNEL OR PIPE OUTLET FOR ROCK SLOPE PROTECTION AND FLOW INTERRUPTION

Revision 4.0, Approved 2-27-63

Drawing No. 128-1
NOTE:

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 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 County Engineer.

3. Applicable only where flared end section cannot be utilized.
FLARED INLET - CORRUGATED METAL PIPE

SIDE VIEW SECTION

END VIEW

Note: Wall thickness, steel, & material shall conform to Std. reinforced Conc. pipe.

FLARED INLET - REINFORCED CONCRETE PIPE

36" x 240" CMP. (12ga) with flared metal inlet (d = 36"; D = 4.2")

INSTALLATION EXAMPLE

General Notes:

1. Type of pipe, class or gauge & protective coating shall conform to the plans and standard specifications.

2. L dimension equals 8' unless noted otherwise.

3. Diameters of a flared section shall be shown on the plans.

4. The difference between the diameters D and d shall be 6' unless noted otherwise.
CURB FACE ANGLE

1. FACE ANGLE SHALL BE CAST INTO THE STRUCTURE CONTINUOUS FOR THE FULL LENGTH OF STRUCTURE.
2. ANCHORS SHALL BE PLACED 3" FROM EACH END OF THE STRUCTURE; MAX SPACING 3'-6" WITH NO LESS THAN 3 ANCHORS PER STRUCTURE.
3. FACE ANGLE AND ANCHORS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.

CURB SUPPORT BAR

1. CURB SUPPORT SPACING AS SHOWN ON DRAINAGE STRUCTURE PLAN. MAX SPACING 7' BETWEEN SUPPORTS.
2. NUTS AND CURB SUPPORT BAR SHALL BE HOT-DIP GALVANIZED.
3. WHEN VERTICAL INLET OPENING LARGER THAN 6" IS APPROVED BY THE COUNTY SURVEYOR, INSTALL ONE 3/4" DIAMETER GALVANIZED PROTECTION BAR HORIZONTALLY ACROSS THE ENTIRE LENGTH OF OPENING THROUGH LOOPS OF 3/4" DIAMETER STEEL WELDED TO CURB SUPPORT BAR. BEND PROTECTION BAR BACK 4" INTO INLET WALL ON EACH SIDE.

STEPS

1. WHEN HEIGHT OF STRUCTURE EXCEEDS 4 FT. CAST 5/8" ROUND WROUGHT IRON STEPS IN WALL AT 15" VERTICAL SPACING.
### Table 1: Span vs. Height

<table>
<thead>
<tr>
<th>Span</th>
<th>Height</th>
<th>2'</th>
<th>3'</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>
</tr>
</thead>
<tbody>
<tr>
<td>2'</td>
<td>1.5</td>
<td>2.0</td>
<td>2.5</td>
<td>3.0</td>
<td>3.5</td>
<td>4.0</td>
<td>4.5</td>
<td>5.0</td>
<td>5.5</td>
<td>6.0</td>
<td>6.5</td>
<td>7.0</td>
</tr>
<tr>
<td>3'</td>
<td>1.8</td>
<td>2.2</td>
<td>2.7</td>
<td>3.2</td>
<td>3.7</td>
<td>4.2</td>
<td>4.7</td>
<td>5.2</td>
<td>5.7</td>
<td>6.2</td>
<td>6.7</td>
<td>7.2</td>
</tr>
<tr>
<td>4'</td>
<td>2.1</td>
<td>2.5</td>
<td>3.0</td>
<td>3.5</td>
<td>4.0</td>
<td>4.5</td>
<td>5.0</td>
<td>5.5</td>
<td>6.0</td>
<td>6.5</td>
<td>7.0</td>
<td>7.5</td>
</tr>
<tr>
<td>5'</td>
<td>2.4</td>
<td>2.8</td>
<td>3.3</td>
<td>3.8</td>
<td>4.3</td>
<td>4.8</td>
<td>5.3</td>
<td>5.8</td>
<td>6.3</td>
<td>6.8</td>
<td>7.3</td>
<td>7.8</td>
</tr>
<tr>
<td>6'</td>
<td>2.7</td>
<td>3.1</td>
<td>3.6</td>
<td>4.1</td>
<td>4.6</td>
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<td>5.6</td>
<td>6.1</td>
<td>6.6</td>
<td>7.1</td>
<td>7.6</td>
<td>8.1</td>
</tr>
</tbody>
</table>

**Note:**
For spans of height less than that shown in table, use scant greater table height stock, wall dimensions and reinforcing steel, and make necessary changes in bar lengths, number of spacers and quantities.

### Diagram

1. **Alternative Flat Invert**
2. **Alternative V Invert**
3. **Alternative Trapezoidal Invert**

**Typical Sections 2' thru 6' Spans**

**Typical Section 7' thru 12' Spans**

**Key Details:**
- Provide paving patch for culverts at grade where PCC approach paving is used.
- Optional const. Jt.
- See Def. 'A'
- Option const Jt.
- Provide paving patch for culverts at grade where PCC approach paving is used.
- Keyed const. Jt.

**Spacing in Table:**
- 4 Spacers @ 18"
- Provide paving patch for culverts at grade where PCC approach paving is used.
- Min. 3" Bars
- Min. 4" Bars
- Min. 5" Bars
- Min. 6" Bars
- Min. 7" Bars
- Min. 8" Bars

**Typical Dimensions:**
- Typical dimensions for spans 2' to 12' are provided in the table above.

**Design Calculation:**
- Design calculations for spans 2' to 12' are shown in the table above.

**Steel Design:**
- Steel design for spans 2' to 12' is shown in the table above.

**Concrete Design:**
- Concrete design for spans 2' to 12' is shown in the table above.

**Reinforcement:**
- Reinforcement details for spans 2' to 12' are shown in the table above.

**Paving:**
- Paving details for spans 2' to 12' are shown in the table above.
<table>
<thead>
<tr>
<th>SPAN</th>
<th>4'</th>
<th>4'</th>
<th>5'</th>
<th>5'</th>
<th>6'</th>
<th>6'</th>
<th>7'</th>
<th>7'</th>
<th>8'</th>
<th>8'</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Notes:**
- For boxes of height less than the given in table, choose the next greater table height holes, use dimensions and reinforcing steel, and make necessary changes in bar lengths and number of spacers and quantities.
### Standard Triple Box Culverts

**San Diego County Surveyor - Road Department**

**Standard Drawing**

**Standard Triple Box Culverts**

**Dimensions and Design:**
- **Spans:** 2', 3', 4', 5', 6', 7', 8'
- ** Depths:** 5'

**Table: Span and Height Dimensions**

<table>
<thead>
<tr>
<th>Span</th>
<th>Height</th>
<th>4''</th>
<th>5''</th>
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<th>7''</th>
<th>8''</th>
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</thead>
<tbody>
<tr>
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<td></td>
<td></td>
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<td></td>
</tr>
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<tr>
<td>8'</td>
<td>5'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- Boxes of height less than that shown are real, use next greater box height, adjust dimensions and reinforcing steel, and make necessary changes in box lengths, number of spacers and quantities.
- For culverts of grade, extend 'c' bars full length, provide additional spacers and adjust quantities.

**TYPICAL SECTION**

- Provide piers as noted for culverts of grade where P.C.E. approach piers are used.

---

**Technical Drawing and Design:**

- **Specifications and Details:**
  - **Concrete:**
  - **Steel Bars:**
  - **Spacers:**
  - **Design Discharge:**
  - **Materials:**
  - **Elevation and Plan:**
  - **Sections:**

---

**Reference:**

- **142-1**
### Box Culverts

<table>
<thead>
<tr>
<th>Span Type</th>
<th>Min. Cover</th>
<th>Struts Req'd</th>
<th>B Spacing</th>
<th>Span Type</th>
<th>Min. Cover</th>
<th>Struts Req'd</th>
<th>B Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2' x 16'</td>
<td>4'</td>
<td>3'</td>
<td>2' x 16'</td>
<td>4'</td>
<td>3'</td>
<td>3'</td>
</tr>
<tr>
<td>A</td>
<td>8' x 16'</td>
<td>4'</td>
<td>3'</td>
<td>2' x 16'</td>
<td>4'</td>
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<td>3'</td>
</tr>
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### R.C. Pipes & Metal Culverts

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<th>Min. Cover</th>
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<th>B Spacing</th>
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<th>Min. Cover</th>
<th>Struts Req'd</th>
<th>B Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2' x 16'</td>
<td>4'</td>
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<td>2' x 16'</td>
<td>4'</td>
<td>3'</td>
<td>3'</td>
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<td>8' x 16'</td>
<td>4'</td>
<td>3'</td>
<td>2' x 16'</td>
<td>4'</td>
<td>3'</td>
<td>3'</td>
</tr>
<tr>
<td>A</td>
<td>10' x 16'</td>
<td>4'</td>
<td>3'</td>
<td>2' x 16'</td>
<td>4'</td>
<td>3'</td>
<td>3'</td>
</tr>
<tr>
<td>A</td>
<td>14' x 16'</td>
<td>4'</td>
<td>3'</td>
<td>2' x 16'</td>
<td>4'</td>
<td>3'</td>
<td>3'</td>
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</table>

### R.C. Arch Culverts

<table>
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<th>Min. Cover</th>
<th>Struts Req'd</th>
<th>B Spacing</th>
<th>Span Type</th>
<th>Min. Cover</th>
<th>Struts Req'd</th>
<th>B Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2' x 16'</td>
<td>4'</td>
<td>3'</td>
<td>2' x 16'</td>
<td>4'</td>
<td>3'</td>
<td>3'</td>
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<td>A</td>
<td>8' x 16'</td>
<td>4'</td>
<td>3'</td>
<td>2' x 16'</td>
<td>4'</td>
<td>3'</td>
<td>3'</td>
</tr>
<tr>
<td>A</td>
<td>10' x 16'</td>
<td>4'</td>
<td>3'</td>
<td>2' x 16'</td>
<td>4'</td>
<td>3'</td>
<td>3'</td>
</tr>
<tr>
<td>A</td>
<td>14' x 16'</td>
<td>4'</td>
<td>3'</td>
<td>2' x 16'</td>
<td>4'</td>
<td>3'</td>
<td>3'</td>
</tr>
</tbody>
</table>

### Notes:
1. Limits of strutting to be determined by engineer, but shall not be less than as shown in sketch. Reference: State of California BTO, Box Culverts dated Oct. 4, 1950.
2. Impact = 50% of design load. Timber posts & bills to be D.F., 1450 F. Bills to be glued - laminated or solid timbers.
3. All strutting and removal to be at expense of the contractor.

---

**Standard Construction Loads on Culverts**

SD County Surveyor - Road Department

**Standard Drawings**

Approved by: [Signature]

[Signature]

[Date]

[Page 147-1]
### MAX. SAFE HEIGHTS OF OVERFILLS AND CAGE FOR FACTORY-RIVETED CORRUGATED METAL PIPE

<table>
<thead>
<tr>
<th>Diameter inches (inside pipe)</th>
<th>Heights of Overfills in feet</th>
<th>Span &amp; rise inches (arch pipe)</th>
<th>Min. required gage</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>16, 16, 16, 16, 16, 16, 16, 16</td>
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<td>66</td>
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<tr>
<td>72</td>
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<td>72 x 44</td>
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</tr>
</tbody>
</table>

- Use field assembled plate: culverts

### STRENGTH & USES OF REINFORCED CONCRETE PIPE

<table>
<thead>
<tr>
<th>Class</th>
<th>Diameter inches</th>
<th>Cracking D - Load</th>
<th>Principal Highway Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>60 - 108</td>
<td>8000</td>
<td>Not adequate for highway uses</td>
</tr>
<tr>
<td>II</td>
<td>12 - 108</td>
<td>10000</td>
<td>Use outside the roadway. Under moderately low depths of cover. This class is used for pipe shaft maintenance &amp; drop inlets.</td>
</tr>
<tr>
<td>III</td>
<td>12 - 108</td>
<td>13500</td>
<td>Intended for normal culvert &amp; stream drain uses</td>
</tr>
<tr>
<td>IV</td>
<td>12 - 84</td>
<td>20000</td>
<td>Same as Class III but will sustain higher overfills</td>
</tr>
<tr>
<td>V</td>
<td>12 - 72</td>
<td>30000</td>
<td>High strength pipe for severe loading conditions</td>
</tr>
</tbody>
</table>

### MAX. SAFE HEIGHTS OF OVERFILL IN FEET FOR R.C.P.

<table>
<thead>
<tr>
<th>Class</th>
<th>Diameter inclusive inches</th>
<th>Method</th>
<th>A. Backfill</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>12 - 108</td>
<td>12</td>
<td>23</td>
</tr>
<tr>
<td>III</td>
<td>12 - 108</td>
<td>13500</td>
<td>23</td>
</tr>
<tr>
<td>IV</td>
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<td>23</td>
</tr>
<tr>
<td>V</td>
<td>12 - 72</td>
<td>30000</td>
<td>23</td>
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</tbody>
</table>

### MINIMUM THICKNESS OF COVER

<table>
<thead>
<tr>
<th>Surface</th>
<th>Pipes</th>
<th>Arches</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCP</td>
<td>RCP</td>
<td>RCP</td>
</tr>
<tr>
<td>CMP</td>
<td>CMP</td>
<td>CMP</td>
</tr>
</tbody>
</table>

Notes:
1. All pipe shall conform to current A.S.T.M. designation C-76.
2. For box culverts see standard drawings pertaining thereto.
### MAX SAFE HEIGHTS OF OVERFILLS FOR FIELD ASSEMBLED PLATE PIPES

#### STRUTTED CONDITION

**STANDARD 6" x 2" CORRUGATIONS**

<table>
<thead>
<tr>
<th>Diameter inches</th>
<th>1-5</th>
<th>6-10</th>
<th>11-15</th>
<th>16-20</th>
<th>21-25</th>
<th>26-30</th>
<th>31-35</th>
<th>36-40</th>
<th>41-45</th>
<th>46-50</th>
<th>51-55</th>
<th>56-60</th>
<th>61-70</th>
<th>71-80</th>
<th>81-90</th>
<th>9-100</th>
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</thead>
<tbody>
<tr>
<td>Height of Cover (Ft)</td>
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<td></td>
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<td>3</td>
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</tbody>
</table>


**Notes**

1. Table gives minimum gage of side and top plates with not less than 4 bolts per foot of longitudinal seam. Live load not to exceed H-20 to H-20.5-4.
2. Insert plates shall be of at least one step thicker gage than the rest of the barrel.
3. The pipe diameter is measured from the inside crests.
4. Limiting height of cover may be increased 50% when 1½ bolts per foot of longitudinal seam are provided.

### SPACING IN FEET OF TIMBER STRUTS FOR CORR. METAL PLATE ASSEMBLED PLATE PIPE

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Strut Height</th>
<th>Strut Height</th>
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</thead>
<tbody>
<tr>
<td>48</td>
<td>0.9</td>
<td>6.0</td>
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<tr>
<td>60</td>
<td>1.2</td>
<td>7.2</td>
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<td>72</td>
<td>1.5</td>
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<td>84</td>
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<td>96</td>
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</table>

### Upper Sills (continuous)
- Compression cap 12″
- Long, soft even grained wood
- Alternative wire strut
- Strut spaced as shown in table

### Lower Sills (continuous)
- Compression caps & sills to be same dimension timber as struts
- Timber for struts & sills shall be Douglas Fir common.

### STRUT DETAILS

---

#### SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT

**STANDARD DRAWING**

**SAFE OVERFILLS FOR FIELD ASSEMBLED PLATE PIPE**

**Drawing No.** 181-1
NOTES:
1. CURB MAY BE FORMED OR EXTRUDED.
2. CLASS B: CONCRETE SHALL BE USED FOR FORMED CURBS. CONCRETE FOR EXTRUDED CURBS SHALL CONFORM TO SECTION 73-1.06 OF THE STD. SPECIFICATIONS.
3. CURB SHALL BE PLACED ON COMPACTED-BASE MATERIAL OF A THICKNESS EQUAL TO THE STREET STRUCTURAL SECTION MINUS THAT PORTION OF CURB BELOW GRADE. MINIMUM BASE THICKNESS BENEATH CURBS SHALL BE 2".
4. EXPANSION JOINTS SHALL BE PLACED AT 60' INTERVALS AND AT ENDS OF CURB RETURNS. WEAKENED-PLANE JOINTS SHALL BE PLACED AT 15' INTERVALS BETWEEN EXPANSION JOINTS.
5. NO CONCRETE SHALL BE PLACED UNTIL FORMS ARE APPROVED BY COUNTY INSPECTOR.

CURB QUANTITIES

<table>
<thead>
<tr>
<th>TYPE</th>
<th>CY./LIN.FT.</th>
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<tbody>
<tr>
<td>A</td>
<td>0.03086</td>
</tr>
<tr>
<td>B</td>
<td>0.02932</td>
</tr>
<tr>
<td>C</td>
<td>0.01075</td>
</tr>
<tr>
<td>E</td>
<td>0.05054</td>
</tr>
<tr>
<td>F</td>
<td>0.05440</td>
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</tbody>
</table>

LEGEND ON PLAN
TYPE A, B, C
TYPE E, B, F
(LABEL TYPE)
NOTE:
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.

SLOPE END OF DIKE 1:1 WHEN NOT JOINING OTHER IMPROVEMENTS

SIDE VIEW

APPRAOX. DIKE QUANTITIES

<table>
<thead>
<tr>
<th>TYPE</th>
<th>TONS/LIN. FT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.02500</td>
</tr>
<tr>
<td>B</td>
<td>0.02031</td>
</tr>
<tr>
<td>C-6&quot;</td>
<td>0.03750</td>
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<tr>
<td>C-8&quot;</td>
<td>0.05833</td>
</tr>
<tr>
<td>C-9&quot;</td>
<td>0.07031</td>
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</table>
NOTE:
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>
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<tbody>
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<td>0.02500</td>
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<tr>
<td>B</td>
<td>0.03740</td>
</tr>
<tr>
<td>C - 6&quot;</td>
<td>0.03750</td>
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<tr>
<td>C - 8&quot;</td>
<td>0.05833</td>
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<td>C - 9&quot;</td>
<td>0.07031</td>
</tr>
<tr>
<td>D</td>
<td>0.000586</td>
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</tbody>
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REDUCED SCALE
USE SCALE BELOW

1/2 INCH = 2 FT
3 INCHES ON ORIGINAL PLAN

LEGEND ON PLAN
LABEL TYPE OF DIKE
Aggregate Base Thickness shown on plans
Asphalt Concrete thickness shown on plans
Elev. shown on profile
6" p.c.c. gutter

INVERT ALLEY SECTION
COMPOSITE CONSTRUCTION - A.C., P.C.C. & Base

ALLEY SECTION (Normal Crown)
A.C. over base with std. P.C.C. Curbs

Expansion Joint

4" radius

"4 x 22" Nondeformed tie bars spaced at 30"

WEAKENED PLANE JOINT

Contact Joint Alternate 1

Expansion Joint Filler

CONTACT JOINT Alternate 2

Groove shall be poured first.

TRANVERSE EXPANSION JOINT

Pavement thickness shown on plans
1/2" radius

20'-0" min - 30'-0" max.

PCC ALLEY SECTION

20'-0" min - 30'-0" max.

Base thickness shown on plans

1. Interval between transverse joints may be less than dimensions shown to allow matching of joints in adjacent existing improvements.
2. Transverse contact joints shall be constructed at end of pour.
3. Alternate weakened plane joint may be power driven saw cut, 2" min depth, 1/8" max width.

SANDIEGO COUNTY SURVEYOR - ROAD DEPARTMENT

STANDARD DRAWING

PAVEMENT FOR ALLEY SECTIONS

202-1
Curb, gutter, and segment shall be monolithic pour. Class "B" concrete, 6" min. thickness.

Weakened plane joint. Contact joint.

Expansion joint. Weakened plane joint.

Return segment of curb. 2-4 x 22" nondeformed tie bars spaced at 30°.

Alternate 1: Weakened plane joint. Contact joint.

Alternate 2: Expansion joint. Contact joint.

Roadbed grading plane. Class "B" concrete.

Legend on plans:

W D
4' 0.04'
6' 0.06'
8' 0.08'
10' 0.10'
12' 0.12'

Section A-A

Note: Base material beneath cross gutter and return segment shall match structural section of street. Thickness (S) determined by extending roadbed grading plane under cross gutter and return segment. S = 4" min.

Legend on plans:

W D
4' 0.04'
6' 0.06'
8' 0.08'
10' 0.10'
12' 0.12'
DRIVEWAY APPROACH SHALL EXTEND FROM CURB FACE TO PROPERTY SIDE OF SIDEWALK, OR, IF THERE IS NO SIDEWALK, TO WITHIN 6' OF PROPERTY LINE.

FINISH AND ROUND ALL MARGINS AND EDGES WITH 1/4" RADIUS EDGING TOOL.

THIS JOINT NOT REQUIRED IF CURB AND RAMP ARE MONOLITHIC.

6" OR LESS

DRIVEWAY

EXPANSION JOINT AT CURB AND SIDEWALK

AT SIDEWALK GRADE, 1/8 RISE PER FOOT TO BACK EDGE OF SIDEWALK, VARIABLE BEHIND SIDEWALK, 1 10% MAXIMUM.

CLASS B CONCRETE

RELATIVE COMPACTION OF SUBGRADE SHALL BE NOT LESS THAN 90% TO A DEPTH OF 6".

SECTION A-A

NOTE:
1. THICKER CONCRETE, CLASS 'A' CONCRETE AND REINFORCEMENT ARE PERMISSIBLE. 6" BASE AGGREGATE (S.E. 30 + ) RECOMMENDED.
2. WEAKENED-PLANE JOINT REQUIRED ON DRIVEWAY A FOR DRIVEWAYS 16'-25' Wide.
3. ASPHALTIC JOINT SEALER SHALL BE 40-100 PENETRATION ASPHALT OR Poured Filler A.S.T.M. D1190 OR EQUIVALENT.
4. ALTERNATE WEAKENED-PLANE JOINT MAY BE POWER DRIVEN SAW CUT, 1/2 MINIMUM DEPTH, 1/4 MAXIMUM WIDTH, FILLED WITH ASPHALTIC JOINT SEALER.
5. SEE STANDARD DRAWINGS 305-1 AND 306-1 FOR LOCATION AND WIDTH REQUIREMENTS.
DRIVeway APPROACH SHALL EXTEND FROM CURB FACE TO PROPERTY SIDE OF SIDEWALK, OR, IF THERE IS NO SIDEWALK, TO WITHIN 6" OF PROPERTY LINE.

FINISH AND ROUND ALL MARGINS AND EDGES WITH 1/4" RADIUS EDGING TOOL.

THIS JOINT NOT REQUIRED IF CURB AND RAMP ARE MONOLITHIC.

DRIVeway Width Shown on Plans
MINIMUM 12

MAXIMUM 20

DRIVeway Width Shown on Plans
MINIMUM 10

MAXIMUM 20

DRIVeway Width Shown on Plans
MINIMUM 10

MAXIMUM 20

EXPANSION JOINT AT CURB AND SIDEWALK

AT SIDEWALK GRADE,
1/4 RISE PER FOOT TO BACK EDGE OF SIDEWALK, VARIABLE BEHIND SIDEWALK,
± 1 1/2" MAXIMUM.

CLASS A CONCRETE

RELATIVE COMPACTION OF SUBGRADE SHALL BE NOT LESS THAN 90% TO A DEPTH OF 6".

SECTION A-A

NOTE:
1. THICKER CONCRETE, CLASS "A" CONCRETE AND REINFORCEMENT ARE PERMISSIBLE. 6" BASE AGGREGATE (B.E. 30%) RECOMMENDED.
2. WEAKENED-PLANE JOINT REQUIRED ON DRIVEWAY & FOR DRIVEWAYS 15-20' WIDE.
3. ASPHALTIC JOINT SEALER SHALL BE 40-100 PENETRATION ASPHALT OR Poured Filler ASTM C 1390 OR EQUIVALENT.
4. ALTERNATE WEAKENED-PLANE JOINT MAY BE POWER DRIVEN SAW CUT, 1" MINIMUM DEPTH, 1/4" MAXIMUM WIDTH, FILLED WITH ASPHALTIC JOINT SEALER.
5. SEE STANDARD DRAWINGS 305, 306 FOR LOCATION & WIDTH REQUIREMENTS.

SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING

CONCRETE
RESIDENTIAL DRIVEWAY

DRAWING NUMBER 207-3
DRIVEWAY APPROACH SHALL EXTEND FROM CURB FACE TO PROPERTY LINE.

FINISH AND ROUND ALL MARGINS AND EDGES WITH 1/4" RADIUS EDGING TOOL.

THIS JOINT NOT REQUIRED IF CURB AND RAMP ARE MONOLITHIC.

DRIVEWAY RAMP
MAX. RISE 1/4" PER FOOT.
MAX. LENGTH 10'.
RAMP SHALL MEET SIDEWALK GRADE WITHIN 5' OF CURB FACE.
WITH NO SIDEWALK PLACE EXPANSION JOINT HERE.

EXPANSION JOINT AT CURB AND SIDEWALK WITH SIDEWALK, EXPANSION JOINT HERE.

AT SIDEWALK GRADE, 1/4" RISE PER FOOT TO PROPERTY LINE.

SECTION A-A

NOTE:
1. THICKER CONCRETE, CLASS "A" CONCRETE AND REINFORCEMENT ARE PERMISSIBLE. 6" CLASS III AGGREGATE BASE RECOMMENDED FOR HEAVY SERVICE.
2. WEAKENED-PLANE JOINT REQUIRED ON DRIVEWAY 6" FOR DRIVEWAYS 15'-20' wide.
3. ALTERNATE WEAKENED-PLANE JOINT MAY BE POWER DRIVEN SAW CUT, 1 1/2" MINIMUM DEPTH, 1/4" MAXIMUM WIDTH.
4. SEE STANDARD DRAWINGS 305, 306 FOR LOCATION & WIDTH REQUIREMENTS.
TYPICAL CUT SLOPE

All fill must be compacted to a minimum of 90% of the maximum density with the exception of the outer 8" of the slope surface which may be grid rolled to 85% density.

TYPICAL FILL SLOPE

The longitudinal drainage slope shall be not less than 2%.

TYPICAL FINISHED GRADING

1. ELEV. A to be rough graded at a slope of 2% higher than ELEV. B finish grading must provide positive drainage to the street.

2. A paved swale, a catch basin and pipe, or other similar drainage device is required when a stoop, fireplace, or portion of the building extends within 5 feet of the property line.

DETAIL A
TYPICAL PAVED BROW DITCH

DETAIL C
TYPICAL BEAM AT TOP OF ALL FILL SLOPES

DETAIL B
TYPICAL TERRACE DRAIN

NOTE: ALL SLOPE SURFACES TO BE PROTECTED BY APPROVED EROSION CONTROL.
PROPERTY LINE SETBACKS

PROPERTY LINE

BUILDING SETBACKS

REQUIRED SETBACKS

<table>
<thead>
<tr>
<th>H. FEET</th>
<th>0 - 15</th>
<th>15 - 30</th>
<th>OVER 30</th>
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<tbody>
<tr>
<td>a</td>
<td>1' - 6&quot;</td>
<td>3'</td>
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</tr>
<tr>
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<td>5'</td>
<td>5'</td>
<td>5'</td>
</tr>
<tr>
<td>d</td>
<td>3'</td>
<td>5'</td>
<td>5'</td>
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a. Distance from toe of slope to property line
b. Distance from edge of foundation to toe or top of slope.
d. Distance from top of slope to property line.
H. Total slope height measured vertically.
NOTE: Widths shown on plans are to curb line.

SECTION
Scale 1/2" = 1'-0"

Fill with Asphalitic Joint Sealer

Curb Elevation

Width Shown on Plans

Toe of Gutter Elevation
1-1/2" except where elevations shown indicate otherwise

1/2" Expansion Joint at End of Return and at 60° intervals

TYPICAL PLAN
Scale 3/4" = 1'-0"

CLASS B CONCRETE

20'

NOTE: 1/2" Expansion Joint at End of Return and at 60° intervals

EXPANSION JOINT
Scale 3" = 1'-0"

WEAKENED PLANE JOINT

2a' interval between transverse joints shall be varied to allow matching of joints in adjacent existing improvements.
DRIVEWAY APPROACH SHALL EXTEND
FROM CURB FACE TO PROPERTY SIDE
OF SIDEWALK, OR, IF THERE IS NO
SIDEWALK, TO WITHIN 6" OF PROP-
ERTY LINE

FINISH AND ROUND ALL
MARGINS AND EDGES
WITH ¼" RADIUS
EDGING TOOL

THIS JOINT NOT
REQUIRED IF CURB AND
RAMP ARE MONOLITHIC

6" OR LESS

DRIVEWAY RAMP
MAX. RISE 1¼ PER FOOT
MAX. LENGTH 10'
RAMP SHALL MEET
SIDEWALK GRADE
WITHIN 10' OF CURB
FACE.

EXPANSION JOINT AT CURB AND SIDEWALK

AT SIDEWALK GRADE,
¼" RISE PER FOOT TO BACK EDGE OF
SIDEWALK, VARIABLE BEHIND SIDEWALK,
± 10 %, MAXIMUM.

CLASS "B" CONCRETE

RELATIVE COMPACTON OF SUBGRADE
SHALL NOT BE LESS THAN 90 % TO
A DEPTH OF 6".

SECTION A-A

1. THICKER CONCRETE, CLASS "A" CONCRETE, REINFORCEMENT, AND 6" BASE AGGREGATE (SE 301) ARE RECOMMENDED FOR HEAVY SERVICE.

2. WEAKENED-PLANE JOINT REQUIRED ON DRIVEWAY E FOR DRIVEWAYS 18'-35' WIDE.

3. ASPHALTIC JOINT SEALER SHALL BE 40-100 PENETRATION ASPHALT OR POURED FILLER ASTM D1190 OR EQUIVALENT.

4. ALTERNATE WEAKENED-PLANE JOINT MAY BE POWER DRIVEN SAW CUT, ½" MINIMUM DEPTH, ½" MAXIMUM WIDTH, FILLED WITH ASPHALTIC JOINT SEALER.

5. SEE STANDARD DRAWINGS 305-1 AND 306-1 FOR LOCATION AND WIDTH REQUIREMENTS.

NOTES:

SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT

DRAWN BY:  D.R.
CHECKED BY:  R.A.

RECOMMENDED BY:  J.M.

APPROVED BY:  COUNTY SURVEYOR

DATE:  JULY 14, 1966

CONCRETE COMMERCIAL DRIVEWAY

STANDARD DRAWING

SCALE:  NONE

REVISION  BY  APPROVED  DATE

DRAWING NUMBER  211-1
TYPICAL SECTION

LOCATE TRANSVERSELY AT 60 FT. INTERVALS AND AT RETURNS.

EXPANSION JOINT

WEAKENED-PLANE JOINT

NOTES:

1. ALL CONCRETE SHALL BE CLASS "B".

2. WHERE TRAVERSED BY DRIVEWAYS, SIDEWALKS SHALL CONFORM TO DRIVEWAY REQUIREMENTS.

3. CURB AND SIDEWALK SHALL BE POURED SEPARATELY, EXCEPT THAT WHEN EXPANSIVE SOILS ARE ENCOUNTERED A MONOLITHIC POUR SHALL BE USED.

4. SPECIFIED INTERVALS BETWEEN TRANSVERSE JOINTS SHALL BE VARIED TO MATCH ADJACENT EXISTING IMPROVEMENTS.

5. SIDEWALK SHALL BE MARKED TRANSVERSELY AT 5 FT. INTERVALS BETWEEN EXPANSION AND WEAKENED-PLANE JOINTS WITH A SCORING TOOL THAT WILL LEAVE THE EDGES ROUNDED.

6. SIDEWALK LOCATION MAY BE VARIED, SUBJECT TO APPROVAL BY THE COUNTY ENGINEER, TO MATCH EXISTING ADJACENT IMPROVEMENTS.
TYPICAL SECTION

LOCATE TRANSVERSALLY AT 60 FT. INTERVALS AND AT RETURNS.

EXPANSION JOINT

WEAKENED-PLANE JOINT

NOTES:

1. ALL CONCRETE SHALL BE CLASS "B".
2. WHERE TRAVERSED BY DRIVeways, SIDEWALKS SHALL CONFORM TO DRIVeway REQUIREMENTS.
3. MONOLITHIC CURB, GUTTER AND SIDEWALK MAY BE USED WITH SPECIFIC APPROVAL OF THE COUNTY ENGINEER.
4. SPECIFIED INTERVALS BETWEEN TRANSVERSE JOINTS SHALL BE VARIED TO MATCH ADJACENT EXISTING IMPROVEMENTS.
5. SIDEWALK SHALL BE MARKED TRANSVERSALLY AT 3 FT. INTERVALS BETWEEN EXPANSION AND WEAKENED-PLANE JOINTS WITH A SCORING TOOL THAT WILL LEAVE THE EDGES ROUNDED.
6. SIDEWALK LOCATION MAY BE VARIED, SUBJECT TO APPROVAL BY THE COUNTY ENGINEER, TO MATCH EXISTING ADJACENT IMPROVEMENTS.
7. SIDEWALK LOCATION AND WIDTH MAY BE VARIED TO ALLOW FOR ENCOACHING UTILITIES, SUBJECT TO APPROVAL BY THE COUNTY ENGINEER.
8. WHERE EXPANSIVE SOILS ARE ENCOUNTERED A MINIMUM OF 4" CLASS 3 AGGREGATE BASE WILL BE REQUIRED AS DIRECTED BY THE COUNTY ENGINEER.
9. EXPANSION JOINT TO BE INSTALLED AT BEGINNING AND ENDING OF SIDEWALK RETURNS.
**SIDEWALK SECTION**

- Area to be removed
- 2' minimum

**SIDEWALK PLAN**

**PAVEMENT SECTION**

- Existing weakened plane or expansion joint
- Area to be removed
- 2' minimum

**CURB PLAN**

**ALTERNATE #1**

Removal of complete section of curb & gutter.

**ALTERNATE #2**

When approved by County Surveyor curb may be removed full height, gutter remaining undisturbed.

**SECTION**

Showing Cut

**PORTLAND CEMENT CONCRETE**

- Area to be removed
- Curb line
- Gutter line

**Cut with abrasive type cutting wheel remaining edge to be smooth and true with no abrupt change in thickness**

**SCALE: NONE**

**DRAWING NO.**

213
Reflector sign - California Highway Code W21R.
Size 18" x 18" - Yellow with red 3" diameter reflectors

Location dimension shown below

2" x 8" select grade
   Douglas fir, surfaced four sides
6" x 6" dense structural grade redwood, surfaced four sides

END VIEW

Location dimension shown on plans

Type C (Double post without reflector sign)
Type CS (Double post with reflector sign)

PLAN - LOCATION

LEGEND ON PLANS

Type D  Type DS

COUNTY OF SAN DIEGO
GUARD FENCE ASSEMBLY FOR TERMINATING STREETS

SPECIFICATION REFERENCE
Section: 51, 93, 90
County Surveyor
D. E. Speer, R. E., 1969

STANDARD DRAWING
SCALE 1/8" = 1'-0"
DRAWING NO 214
NOTES:
1. WHERE NO CURB EXISTS, BEGIN 45° ALLEY RIGHT-OF-WAY TAPER 15' FROM EDGE OF SURFACED ROADBED.
2. RADIUS SHOWN ON PLANS.
3. CLASS 'O' CONCRETE MINIMUM SHALL BE USED.

R/W WIDTH
20' MIN. - 30' MAX.

TYPICAL PLAN

SECTION

BASE TO EQUAL BASE OF STREET

LEGEND ON PLANS

SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING

ALLEY APRON

DRAWN BY: CHECKED BY:
RECOMMENDED BY:
APPROVED BY COUNTY ENGINEER:
DATE: 1/15/68
Transitional Area, Depress Toe of Gutter to match Cross Gutter Slope

Legend as shown on the plans

TYPICAL SECTION.

Cross gutter to be constructed where the drainage is carried across street and on a grade of at least 0.5%. All concrete shall be Class "B".

<table>
<thead>
<tr>
<th>Width</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>6'</td>
<td>.05</td>
</tr>
<tr>
<td>8'</td>
<td>.06</td>
</tr>
<tr>
<td>10'</td>
<td>.07</td>
</tr>
<tr>
<td>12'</td>
<td>.08</td>
</tr>
</tbody>
</table>

FILE 11-25 216
LENGTHS OF BARRIERS TO BE IN MULTIPLES OF 12'-6" AS SPECIFIED BY COUNTY TRAFFIC ENGINEER.

METAL BEAM GUARD RAILING

REET: 8"x8' block separater not required for dead end.

TERMINAL SECTION

SECTION THROUGH RAIL ELEMENT

CLEARANCE MARKER

END

TREATMENT FOR WIDENING SECTIONS

TREATMENT FOR DEAD END

* Over all length of guard rail shall be specified on the plans depending on width of roadway, but shall be of such length that standard increments can be used.
BLACKEN SURFACE OF CONCRETE COLLAR WITH BLACK COAT OF EMULSIFIED ASPHALT WHILE CONCRETE IS FRESH.

CI COVER (BOTTOM VIEW)
COVER TO BE BROOKS NO. 4'TT OR EQUAL AND TO HAVE WORD "MONUMENT" CAST IN LID. BOX TO BE BROOKS 6"-4'TT OR EQUAL.

CONCRETE

MONUMENT MARKER
SOLID BRASS, 2" DIA. TOP, 3/4" x 2 1/2" SHANK, LIETZ 526 OR APPROVED EQUAL, * TO BE SET IN FRESH P.C.C. TOP OF MONUMENT TO BE APPROX. 6" BELOW STREET SURFACE.

SURVEYOR'S NOTE
EXACT POINT TO BE DETERMINED BY ACCURATE SURVEY AND CLEARLY PUNCHED IN TOP OF BRASS MARKER TOGETHER WITH R.E. OR L.S. NUMBER IN 1/8" NUMERALS.

MONUMENT NOTE:
MONUMENT MAY BE FORMED BY METAL SLEEVE, WAXED CARTON OR BY DRILLING THRU HOLE MADE FOR MONUMENT. IF THERE IS AN OVERCUT, THEN OVERCUT SHOULD BE FILLED WITH CONCRETE TO SAND LEVEL.

NOTE:
ALL REQUIRED SURVEY MONUMENTS OR MARKINGS MUST BE COMPLETE AND IN PLACE WITHIN 30 DAYS AFTER COMPLETION OF SUBDIVISION IMPROVEMENTS. (SEE STANDARD DRAWING NO. 218-1)

OTHER REQUIRED SURVEY MARKERS:
△ EVERY MAP OF SUBDIVISION SHALL SHOW THE FOLLOWING MONUMENTS WHICH SHALL BE SET BY A LICENSED SURVEYOR OR ENGINEER:

BOUNDARY MONUMENTS: THE EXTERIOR BOUNDARY OF THE SUBDIVISION SHALL BE MONUMENTED WITH PERMANENT MONUMENTS NOT SMALLER THAN TWO INCH (2") IRON PIPES AT LEAST TWENTYFOUR INCHES (24") LONG SET AT EACH CORNER, AT INTERMEDIATE POINTS ALONG THE BOUNDARY NOT MORE THAN ONE THOUSAND FEET (1000') APART AND AT THE BEGINNING AND END POINTS OF ALL CURVES; PROVIDED, IF ANY EXISTING RECORD AND IDENTIFIED MONUMENT MEETING THE FOREGOING REQUIREMENTS IS FOUND AT ANY SUCH CORNER OR POINT, SUCH MONUMENT MAY BE USED IN LIEU OF A NEW MONUMENT.

LOT CORNER MONUMENTS: ALL LOT CORNERS, EXCEPT WHEN COINCIDENT WITH EXTERIOR BOUNDARY CORNER, SHALL BE MONUMENTED WITH PERMANENT MONUMENTS OF ONE OF THE FOLLOWING TYPES: (1) THREE-FOURTH INCH (3/4") DIAMETER IRON PIPE AT LEAST EIGHTEEN INCHES (18") LONG, (2) ONE-HALF INCH (1/2") DIAMETER STEEL PLUG AT LEAST TWELVE INCHES (12") LONG, (3) LEAD PLUG AND COPPER IDENTIFICATION DISKS SET IN CONCRETE SIDEWALKS OR CURBS.
Cover to be Brooks No. 4TT or equal and to have word "Monument" cast in Lid. Box to be Brooks 6" 4TT or equal.

**Monument Note**
Monument may be formed by metal sleeve, waxed cardboard or by drilling thru hole made for monument box. If there is an overcut, then overcut should be filled with concrete to sand level.

Blacken surface of concrete collar with black coat of emulsified asphalt while concrete is fresh.

**Monument Marker**
Solid brass, 2" dia. top, 3/4"x2 1/2" shank, Lietz 526 or approved equal to be set in fresh RCC. Top of monument to be approx. 6" below street surface.

**Surveyor's Note**
Exact point to be determined by accurate survey and clearly punched in top of Brass Marker together with R.E. or L.S. Number in 1/8" numerals.

**NOTE**
All required survey monuments or markings must be complete and in place within 30 days after completion of subdivision improvements. (See Standard Drawing No. 219).

**OTHER REQUIRED SURVEY MARKERS**
All exterior subdivision boundary points not common to points in previously established subdivisions or records of survey are to be monumented by 2" iron pipes at least 24" long set flush with the ground. All subdivision lots will be marked by 3/4" oives 18" long set flush with the ground, all pipes to be marked with metal discs stamped RCE _______ or L.S. _______. Markers in concrete sidewalks to be lead and discs marked L.S. or RCE _______. Offsets for lead and discs to be on prolongation of lot lines for lot corners, and on radial lines for points of curve for streets.
1. STREET SURVEY MONUMENT:

   FOR DETAILS OF PLACEMENT AND CONSTRUCTION, SEE STANDARD DRAWING NO.218-1

   (a) SET ON ALL CENTERLINE INTERSECTIONS UNLESS ACTUAL LOCATION IS MODIFIED BY THE COUNTY SUBDIVISION ENGINEER AND SHOWN IN MODIFIED LOCATION ON MAP WHEN CENTER LINE INTERSECTION IS IMPractical, OFFSET 5 FEET ON CENTER LINE OF MAJOR STREET. (See detail above). IF NEITHER CENTER LINE CAN BE OCCUPIED, TWO MONUMENTS WILL BE SET IN LINE AROUND THE POINT ON THE PERIMETER OF A 10-FOOT DIAMETER CIRCLE, WHOSE CENTER IS THE POINT.

(b) SET ON CENTER LINE AT INTERVALS NOT EXCEEDING 1000 FEET ON STRAIGHT RUNS.

(c) SET ON CENTER LINE AT POINTS OF CURVATURE.

(d) SET ON CENTER AT CENTER POINTS OF CUL-DE-SACS.

   (e) SET ON CENTER LINE WHEN CENTER POINT OF CUL-DE-SAC IS OFFSET FROM CENTER LINE.

   (f) THESE STANDARDS MAY BE MODIFIED AT THE DISCRETION OF THE COUNTY ENGINEER IN CASES WHERE STRICT COMPLIANCE THERewith RESULTS IN MORE MONUMENTS THAN HE CONSIDERS NECESSARY. THE FOLLOWING TECHNIQUE FOR REDUCING THE NUMBER OF MONUMENTS WILL BE ROUTINE.

   (g) SUBSTITUTE 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.

2. PRESERVATION OF MONUMENTS:

   WHERE PLANS ARE SUBMITTED, IT SHALL BE THE RESPONSIBILITY OF THE ENGINEER OF WORK TO SHOW ALL MONUMENTS OF RECORD WHICH IT MAY BE NECESSARY TO MOVE. THE PERMITTEE SHALL NOT DISTURB ANY MONUMENTS OF RECORD FOUND ON THE LINE OF IMPROVEMENT WITHOUT PERMISSION FROM THE COUNTY ENGINEER, AND THE PERMITTEE SHALL BEAR THE EXPENSE OF RESETTING ANY MONUMENT OR STAKES WHICH MAY BE DISTURBED.

3. COMPLETION TIME:

   ALL REQUIRED SURVEY MONUMENTS OR MARKINGS MUST BE COMPLETE AND IN PLACE WITHIN 30 DAYS AFTER COMPLETION OF SUBDIVISION IMPROVEMENTS.

4. CALIFORNIA COORDINATE SYSTEM:

   ALTHOUGH THE USE OF THE CALIFORNIA COORDINATE SYSTEM IS OPTIONAL, SAN DIEGO COUNTY WOULD PREFER ITS USE. IF THE ENGINEER OR SURVEYOR WILL USE COORDINATE PROCEDURE, THE COUNTY WILL PROVIDE THE NEEDED TIES AND COORDINATES.
24'x2' Galv. Iron Pipe with cement core and metal disc stamped
L.S. No. ________ or
R.C.E. No. ________

18'x3/4' Galv. Iron Pipe with cement core and metal disc stamped
L.S. No. ________ or
R.C.E. No. ________

Legend on Plans: 0

SUBDIVISION BOUNDARY MONUMENT

PROPERTY CORNER MONUMENT

Legend on Plans: 0

STREET

Existing Street

Alternate locations of monument. Ties distances shown on final Subdivision Map if alternate location used

LOCATION OF STREET SURVEY MONUMENT. (Std. Dwg. No. 218)

TYPICAL INSTALLATION

NOTES

1. Street Survey Monument:
   For details of placement and construction, see Standard Drawing No. 218.
   (a) Set on all center line intersections unless actual location is modified by the County Subdivision Engineer and shown in modified location on map. When center line intersection is impractical, offset 5 feet on center line of major street. (See detail above). If neither center line can be occupied, two monuments will be set in line around the point on the perimeter of a 10-foot diameter circle, whose center is the point.
   (b) Set on center line at intervals not exceeding 1000 feet on straight runs.
   (c) Set on center line at points of curvature.
   (d) Set on center at center points of cul-de-sacs.
   (e) Set on center line when center point of cul-de-sac is offset from center line.

2. Preservation of Monuments:
   Where plans are submitted, it shall be the responsibility of the Engineer to show all monuments of record which may be necessary to move. The permittee shall not disturb any monuments of record found on the line of improvement without permission from the County Surveyor, and the permittee shall bear the expense of resetting any monuments or stakes which may be disturbed.

3. Completion Time:
   All required survey monuments or markings must be complete and in place within 30 days after completion of subdivision improvements.

4. California Coordinate System:
   Although the use of the California Coordinate System is optional, San Diego County would prefer its use. If the Engineer or Surveyor will use coordinate procedure, the County will provide the needed ties and coordinates.
LEGEND

- Structure Excavation
- Structure Backfill
- Roadway Excavation
- Roadway Embankment
- Ditch Excavation
- Original Ground

EXCAVATION

BACKFILL

CULVERT IN TRENCH

Original Ground Line

Top of Box

Roadway Embankment

Grading Plane

GRADE TOP OF CULVERT

BOX CULVERTS

Plan

NOTE: Slopes & dimensions may vary as shown on the plans or in the special provisions.

SECTION

RECESSES AT CULVERT INLETS

PIECE HEADWALLS

- Note: When concrete is being paid for as class A concrete, minor structures and the cost of excavation and backfill is included in the price paid for class A concrete (minor structures).

PIEVE CULVERTS, RODS & DEADMEN except underdrains & overside drains

PIEVE CULVERTS IN NEW EMBANKMENT

Height of top of embankment before excavating for pipe shall be as follows:

For pipes 24" dia. or less: 6" above top of pipe or 30" max.
For CMC over 24" to 90" dia: 30" above bottom of pipe.
For COP over 90" dia: 10% point of dia. above bottom pipe.
For RCP over 24" dia: 30" above bottom of pipe.

For field assembled plate culvert: top of pipe above bottom of pipe. Structure backfill 6" above top of pipe.

For payment quantities excavation & backfill concrete pipe T = min. wall thickness as shown in AASHTO M170 for class III pipe, wall A. For CMC T = 0.00.

RETAINING WALLS

Note: If roadway excavation is involved at the wall, structure excavation will be measured from the original grade.
PLAN OF WING WALL

EXCAVATION
Roadway embankment
Backfill

SECTION A-A

PLAN OF WARPED WINGWALL

EXCAVATION
Roadway embankment
Backfill

SECTION A-A

Structure Excavation

WING WALL

Section B-B

Original Ground
Ditch excvation

PAVED DITCH

Ditch excavation
Top of cut ditch

SLOPE Rounding
Payment for excavation included in the price for roadway excavation

DIKE & GUTTER
Payment for excavation and backfill included in the price for dikes

ROADWAY PRISM

Excavation

Embankment

Embankment for any slope of gutter

ROADWAY EXCAVATION, EMBANKMENT, & DITCH EXCAVATION

EXCAVATION
Roadway or ditch excavation

BACKFILL
Roadway or ditch embankment

EXCAVATION
Roadway or ditch excavation

BACKFILL
Roadway or ditch embankment

CONCRETE SLOPE PROTECTION

MONOLITHIC CONCRETE SLOPE PROTECTION

LEGEND

<table>
<thead>
<tr>
<th>Structure Excavation</th>
<th>Roadway Excavation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure Backfill</td>
<td>Roadway Embankment</td>
</tr>
<tr>
<td>Ditch Excavation</td>
<td>Original Ground</td>
</tr>
</tbody>
</table>

SAN DIEGO COUNTY SURVEYOR - ROAD DEPARTMENT
STANDARD DRAWING

EXCAVATION AND BACKFILL
ROADWAY, WING WALLS & SLOPE PROTECTION

221-1
When bridge piers are in water course, quality and compaction requirements for backfill will be waived and full compensation for backfilling the excavation will be considered as included in the price paid for structure excavation.

Notes: If no roadway excavation is involved at bridge, structure excavation will be measured from the original ground.
Notes:

1. W = width of depressed apron, variable 3" to 6" (use 4" unless noted otherwise).
   D = gutter depression. It shall be 4" unless noted otherwise.
   C.H. = curb height.
   S = straight grade, downward slope.
   G = gutter direction of flow.

2. Gutter depression to be class A "PCC 6" thick.
3. Refer to standard drawing 104-A type K curb inlet or 105-A type K-1 curb inlet for curb opening.
4. Where cross slope of gutter is not the same as cross slope of adjacent pavement, dashed slope break lines also apply.
5. When adjacent pavement is "PCC", corners shall be 90°. For A.C. pavement corners shall be formed at 45° as shown.
Notes:
1. $W$ = width of depressed apron, variable 3' to 6' (use 4' unless noted otherwise).
2. $D$ = gutter depression. It shall be 4' unless noted otherwise.
3. C.H. = curb height.
4. $40\text{ }=\text{ straight grade, downward slope.}$
5. $\text{ } = \text{ gutter direction of flow.}$
6. Gutter depression to be class "A" P.C.C., 6" thick.
7. This standard drawing shall apply to all standard curb inlets with grate.
8. When adjacent pavement is P.C.C., corners shall be formed at 90°. For AC. pavement, corners shall be formed at 45° as shown.
NOTES:

1. IF OBSTRUCTIONS SUCH AS INLETS, UTILITY POLES, FIRE HYDRANTS, ETC. ARE ENCOUNTERED THE LOCATION AND DIMENSIONS MAY BE ADJUSTED UPON THE APPROVAL OF THE COUNTY ENGINEER.

2. TEXTURE TO BE HEAVY BROOM FINISH TRANSVERSE TO AXIS OF RAMP.

3. THE RAMP SHOWN IN DETAIL B SHALL BE CENTERED IN THE CROSSWALK.
NOTES:

1. IF OBSTRUCTIONS SUCH AS INLETS, UTILITY POLES, FIRE HYDRANTS, ETC. ARE ENCOUNTERED THE LOCATION AND DIMENSIONS MAY BE ADJUSTED UPON THE APPROVAL OF THE COUNTY ENGINEER.

2. TEXTURE TO BE HEAVY BROOM FINISH TRANSVERSE TO AXIS OF RAMP.

3. THE RAMP SHOWN IN DETAIL B SHALL BE CENTERED IN THE CROSSWALK.

5/8" LIP ON DEPRESSED CURB SECTION WILL BE SLOPED AT 45°
SECTION

BASE MATERIAL TO MATCH STRUCTURAL SECTION OF STREET.
THICKNESS (T) • 6" OR THE THICKNESS DETERMINED BY EXTENDING THE ROADBED GRADING PLANE UNDER THE CURB, WHICH EVER THICKNESS IS GREATER.

LOCATE TRANSVERSELY AT 60' INTERVALS AND AT RETURNS.

Preformed Joint Filler

EXPANSION JOINT

THE SPECIAL MOUNTABLE CURB MAY BE USED ONLY WHERE THE FOLLOWING CONDITIONS ARE PRESENT:

1. FOR COMMERCIAL AND INDUSTRIAL ACCESS ALONG INDUSTRIAL, INDUSTRIAL CUL-DE-SAC AND INDUSTRIAL COLLECTOR STREETS WHERE CURB PARKING IS PROHIBITED.

2. FOR RESIDENTIAL ACCESS WHEN:
   a.) LOT WIDTH IS LESS THAN 40'.
   b.) THE STREET IS CLASSIFIED RESIDENTIAL ONLY.
   c.) THE STREET GRADE DOES NOT EXCEED 5% AND ADEQUATE DRAINAGE IS PROVIDED FOR.

NOTES:
ALL CONCRETE TO BE CLASS 'B'.
SIDEWALK WILL BE INSTALLED AT PROPERTY LINE.
ALL CURB RETURN RADII TO BE TYPE E CURB & GUTTER WITH MINIMUM 10' TRANSITION TO ROLL CURB PROVIDED FROM END OF RETURN.

LOCATION ON PLANS

SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING

SPECIAL MOUNTABLE CURB

DRAWING NUMBER 226
NOTES:

1. DRIVEWAYS WITH GRADES GREATER THAN 15% SHALL BE SURFACED WITH ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE.

2. MAXIMUM GRADE BREAK 14%.

3. SEE STANDARD DRAWING 207 & 211 FOR CONCRETE DRIVEWAYS.

4. SEE STANDARD DRAWING 305 & 306 FOR LOCATION & WIDTH REQUIREMENTS.
NOTES:
1. ELEV. A IS TO BE DETERMINED FOR THE MOST REMOTE CORNER OF THE LOT FROM
   THE ORIGIN POINT. ELEV. A = ELEV. B PLUS 1% TIMES ONE-HALF THE PERIMETER OF THE LOT.
2. MIN. 1% SLOPE TO STREET OR OTHER DISCHARGE POINT.
3. ALL SLOPE SURFACES TO BE PROTECTED BY APPROVED EROSION CONTROL.
FENCING CUT BANKS

NOTES:

1. CHAIN LINK FENCE OR ALTERNATE ACCEPTABLE TO THE COUNTY ENGINEER SHALL BE INSTALLED ALONG THE TOP OF SLOPES EXCEEDING 15 FEET VERTICAL HEIGHT AND 3 TO 1 SLOPE RATIO, AND ALONG THE TOP OF WALLS EXCEEDING 4' VERTICAL HEIGHT.

2. RETAINING WALLS AND CHAIN LINK FENCE OR ALTERNATE SHALL BE CONSTRUCTED IN ACCORDANCE WITH COUNTY OF SAN DIEGO STANDARD SPECIFICATIONS.
CURB FACE

PROPERTY LINE
Widths shown on plans

R = 3'

SIDEWALK INTERSECTION DETAIL
NON-CONTIGUOUS

Curb Face

"C"

Radius = curb radius minus C dimension, as shown on plans.
Curb radius

Widths as shown on plans.

PROPERTY LINE

0.5'

SIDEWALK INTERSECTION DETAIL
TRANSITION—CONTIGUOUS to NON-CONTIGUOUS

Specification Reference
COUNTY SURVEYOR

SAM DIEGO COUNTY
STANDARD DRAWING

SIDEWALK RETURNS

NO SCALE

302
SIDEWALK INTERSECTION DETAIL
NON-CONTIGUOUS

NOTE:
1. SEE STANDARD DRAWING 212 FOR CONSTRUCTION DETAILS.
NOTES:
1. ALL CURVATURES, WITH THE EXCEPTION OF THOSE WHICH HAVE A RADIUS SHOWN, USE THE TYPICAL PARABOLIC LAYOUT ABOVE.

2. SEE STANDARD DRAWING G-44, G-46 FOR CURB DETAILS.
GENERAL DRIVEWAY REQUIREMENTS

1. DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND DRAWINGS OF THE COUNTY OF SAN DIEGO.

2. A RESIDENTIAL DRIVEWAY IS ONE THAT SERVES THREE (3) DWELLING UNITS OR LESS OR FARMS OR RANCHES NOT USED AS RETAIL OUTLETS. ALL OTHER DRIVEWAYS ARE CLASSIFIED AS COMMERCIAL DRIVEWAYS.

3. STANDARD DRIVEWAY WIDTH SHALL BE TOTAL WIDTH OF CURB OPENING EXCLUDING CURB TRANSITIONS.

4. THE MAXIMUM WIDTH OF RESIDENTIAL DRIVEWAYS SHALL BE 20 FEET, MINIMUM 12 FEET.

5. THE MAXIMUM WIDTH OF COMMERCIAL DRIVEWAYS SHALL BE 30 FEET, MINIMUM 12 FEET. (RECOMMENDED 17 FEET MINIMUM)

6. PORTLAND CEMENT CONCRETE DRIVEWAY APPROACHES SHALL EXTEND TO PROPERTY SIDE OF SIDEWALK OR, IF THERE IS NO SIDEWALK, TO WITHIN SIX INCHES OF THE PROPERTY LINE.

7. WHERE PORTLAND CEMENT CONCRETE CURBS ARE NOT INSTALLED, DRIVEWAY APPROACHES SHALL NOT BE CONSTRUCTED OF PORTLAND CEMENT CONCRETE.

8. LOCATION AND EXTENT OF ALL COMMERCIAL DRIVEWAYS SHALL BE SUBJECT TO APPROVAL OF THE COUNTY ENGINEER.

9. 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 COUNTY ENGINEER.

10. DRIVEWAYS, EXCEPT 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.

11. NOT MORE THAN 60% OF THE PROPERTY FRONTAGE MAY BE ALLOCATED FOR DRIVEWAYS ON ANY ONE LOT, EXCEPT THAT LOTS HAVING FRONTAGE OF 25 FEET OR LESS ARE ENTITLED TO ONE 15 FOOT DRIVEWAY.

12. DRIVEWAY LOCATIONS AND GRADES SHALL NOT INTERFERE WITH PLANNED ULTIMATE GRADING WITHIN THE RIGHT OF WAY.

13. PORTLAND CEMENT CONCRETE CURB OPENINGS (DEPRESSED CURBS) WILL BE PERMITTED ONLY IN THOSE LOCATIONS WHERE COMPLETE STANDARD PORTLAND CEMENT CONCRETE DRIVEWAYS ARE TO BE CONSTRUCTED CONCURRENTLY.

14. NO CONCRETE SHALL BE PLACED UNTIL FORMS AND SUBGRADE ARE INSPECTED BY THE COUNTY ENGINEER DEPARTMENT OR BUILDING INSPECTION DEPARTMENT.

15. WHEN A DRIVEWAY THROUGH A PORTLAND CEMENT CONCRETE CURB IS ABANDONED OR IS MOVED TO ANOTHER LOCATION SERVING THE SAME PROPERTY, THE OWNER SHALL INSTALL FULL HEIGHT CURB ACROSS THE SUPERFICIAL OPENING AND SHALL FILL THE DEPRESSION BEHIND THE CURB.
GENERAL DRIVEWAY REQUIREMENTS

1. DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND DRAWINGS OF THE COUNTY OF SAN DIEGO.

2. A RESIDENTIAL DRIVEWAY IS ONE THAT SERVES THREE (3) DWELLING UNITS OR LESS, OR FARMS OR RAMSHACKLES NOT USED AS RETAIL OUTLETS. ALL OTHER DRIVEWAYS ARE CLASSIFIED AS COMMERCIAL DRIVEWAYS.

3. RESIDENTIAL DRIVEWAY WIDTH SHALL BE TOTAL WIDTH OF CURB OPENING EXCLUDING CURB TRANSITIONS.

4. THE MAXIMUM WIDTH OF RESIDENTIAL DRIVEWAYS SHALL BE 20 FEET, MINIMUM 12 FEET.

5. THE MAXIMUM WIDTH OF COMMERCIAL DRIVEWAYS SHALL BE 35 FEET, MINIMUM 15 FEET. (RECOMMENDED 17 FEET MINIMUM.)

6. PORTLAND CEMENT CONCRETE DRIVEWAY APPROACHES SHALL EXTEND TO PROPERTY SIDE OF SIDEWALK OR, IF THERE IS NO SIDEWALK, TO WITHIN SIX INCHES OF THE PROPERTY LINE.

7. WHERE PORTLAND CEMENT CONCRETE CURBS ARE NOT INSTALLED, DRIVEWAY APPROACHES SHALL NOT BE CONSTRUCTED OF PORTLAND CEMENT CONCRETE.

8. LOCATION AND EXTENT OF ALL COMMERCIAL DRIVEWAYS SHALL BE SUBJECT TO APPROVAL OF THE COUNTY ENGINEER.

9. 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 COUNTY ENGINEER.

10. DRIVEWAYS, EXCEPT JOINT-USE DRIVEWAYS AND DRIVEWAYS ON LOTS HAVING 20 FOOT FRONTAGE OR LESS, SHALL BE LOCATED AT LEAST 3 FEET FROM THE SIDE PROPERTY LINE EXTENDED.

11. NOT MORE THAN 60% OF THE PROPERTY FRONTAGE MAY BE ALLOCATED FOR DRIVEWAYS ON ANY ONE LOT, EXCEPT THAT LOTS HAVING FRONTAGE OF 25 FEET OR LESS ARE ENTITLED TO ONE 15 FOOT DRIVEWAY.

12. DRIVEWAY LOCATIONS AND GRADES SHALL NOT INTERFERE WITH PLANNED ULTIMATE GRADING WITHIN THE RIGHT OF WAY.

13. PORTLAND CEMENT CONCRETE CURB OPENINGS (DEPRESSED CURBS) WILL BE PERMITTED ONLY IN THOSE LOCATIONS WHERE COMPLETE STANDARD PORTLAND CEMENT CONCRETE DRIVEWAYS ARE TO BE CONSTRUCTED CONCURRENTLY.

14. NO CONCRETE SHALL BE PLACED UNTIL FORMS AND SUBGRADE ARE INSPECTED BY THE COUNTY ENGINEER DEPARTMENT OR BUILDING INSPECTION DEPARTMENT.

15. WHEN A DRIVEWAY THROUGH A PORTLAND CEMENT CONCRETE CURB IS ABANDONED, OR IS REPLACED BY ANOTHER DRIVEWAY SERVING THE SAME PROPERTY, THE OWNER SHALL INSTALL FULL HEIGHT CURB ACROSS THE SUPERFLUOUS OPENING AND SHALL FILL THE DEPRESSION BEHIND THE CURB.

REFERENCE: COUNTY OF SAN DIEGO TECHNICAL ROAD POLICY OF JANUARY 6, 1964.

SAN DIEGO COUNTY ENGINEER DEPARTMENT

STANDARD DRAWING

DRIVEWAY LOCATION AND WIDTH REQUIREMENTS

DRAWING NUMBER 305-2
GENERAL DRIVEWAY REQUIREMENTS

1. DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS AND DRAWINGS OF THE COUNTY OF SAN DIEGO.

2. A RESIDENTIAL DRIVEWAY IS ONE THAT SERVES THREE (3) DWELLING UNITS OR LESS, OR FARMS OR RANCHES NOT USED AS RETAIL OUTLETS. ALL OTHER DRIVEWAYS ARE CLASSIFIED AS COMMERCIAL DRIVEWAYS.

3. DRIVEWAY WIDTH SHALL BE TOTAL WIDTH OF OPENING MEASURED AT THE FULL HEIGHT OF THE CORB.

4. THE MAXIMUM WIDTH OF RESIDENTIAL DRIVEWAYS SHALL BE 25 FEET, MINIMUM 15 FEET. (RECOMMENDED 17 FEET MINIMUM.)

5. THE MAXIMUM WIDTH OF COMMERCIAL DRIVEWAYS SHALL BE 35 FEET, MINIMUM 15 FEET. (RECOMMENDED 17 FEET MINIMUM.)

6. PORTLAND CEMENT CONCRETE DRIVEWAY APPROACHES SHALL EXTEND TO PROPERTY SIDE OF SIDEWALK OR, IF THERE IS NO SIDEWALK, TO WITHIN SIX INCHES OF THE PROPERTY LINE.

7. WHERE PORTLAND CEMENT CONCRETE CURBS ARE NOT INSTALLED, DRIVEWAY APPROACHES SHALL NOT BE CONSTRUCTED OF PORTLAND CEMENT CONCRETE.

8. LOCATION AND EXTENT OF ALL COMMERCIAL DRIVEWAYS SHALL BE SUBJECT TO APPROVAL OF THE SURVEYOR-ROAD COMMISSIONER.

9. 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 SURVEYOR-ROAD COMMISSIONER.

10. DRIVEWAYS, EXCEPT JOINT-USE DRIVEWAYS AND DRIVEWAYS ON LOTS HAVING 21 FOOT FRONTAGE OR LESS, SHALL BE LOCATED AT LEAST 5 FEET FROM THE SIDE PROPERTY LINE EXTENDED.

11. NOT MORE THAN 60% OF THE PROPERTY FRONTAGE MAY BE ALLOCATED FOR DRIVEWAYS ON ANY ONE LOT, EXCEPT THAT LOTS HAVING FRONTAGE OF 25 FEET OR LESS ARE ENTITLED TO ONE 15 FOOT DRIVEWAY.

12. DRIVEWAY LOCATIONS AND GRADES SHALL NOT INTERFERE WITH PLANNED ULTIMATE GRADING WITHIN THE RIGHT OF WAY.

13. PORTLAND CEMENT CONCRETE CURB OPENINGS (DEPRESSED CURBS) WILL BE PERMITTED ONLY IN THOSE LOCATIONS WHERE COMPLETE STANDARD PORTLAND CEMENT CONCRETE DRIVEWAYS ARE TO BE CONSTRUCTED CONCURRENTLY.

14. NO CONCRETE SHALL BE PLACED UNTIL FORMS AND SUBGRADE ARE INSPECTED BY THE COUNTY SURVEYOR-ROAD DEPARTMENT OR BUILDING INSPECTION DEPARTMENT.

15. WHEN A DRIVEWAY THROUGH A PORTLAND CEMENT CONCRETE CURB IS ABANDONED, OR IS REPLACED BY ANOTHER DRIVEWAY SERVING THE SAME PROPERTY, THE OWNER SHALL INSTALL FULL HEIGHT CURB ACROSS THE SUPERFLUOUS OPENING AND SHALL FILL THE DEPRESSION BEHIND THE CURB.

REFERENCES: COUNTY OF SAN DIEGO TECHNICAL ROAD POLICY OF JANUARY 1, 1964

SAN DIEGO COUNTY SURVEYOR – ROAD DEPARTMENT

STANDARD DRAWING

DRIVEWAY LOCATION AND WIDTH REQUIREMENTS

DRAWING NUMBER 305-1
REQUIREMENT 1

No portion of any driveway shall be permitted within the intersection of the prolonged property lines and the curb as shown by arc "A.

When the interior property line angle between two streets is less than 70°, no driveway encroachment into the curb return will be made without approval of the county surveyor-road commissioner.

REQUIREMENT 2

No portion of any driveway shall be permitted in the curb return where the radius of the curb is less than 25 feet, as shown by arc "B.

REQUIREMENT 3

On all curb returns where the radius is 25 feet or more, driveways may encroach upon each end of the return a distance equal to $12\frac{1}{2}$% or $\frac{1}{8}$ 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, and provided the curb encroachment is approved by the surveyor-road commissioner.

No driveway shall be permitted within a curb return within three feet of a regulatory device.

---

San Diego County Surveyor - Road Department

Standard Drawing

Driveway Location

Adjacent to Curb Returns

Drawing Number: 306-1

Date: July 16, 1964
PLAN VIEW OF APPROVED LOCATIONS

PROFILE OF APPROVED LOCATIONS

NOTES
1. FOR CONTIGUOUS SIDEWALK WHERE DISTANCE FROM BACK OF SIDEWALK TO PROPERTY LINE IS 3'-6" MIN., INSTALL AS SHOWN. WHEN DISTANCE FROM HYDRANT TO TOP OR TOE OF SLOPE IS LESS THAN 2'-0", SPECIAL HYDRANT PROTECTION WILL BE REQUIRED.
2. HARDWARE DETAILS WILL BE THOSE OF THE APPLICABLE DISTRICT INVOLVED.
3. A 3'-0" x 3'-0" SPLASH APRON AROUND ALL INSTALLATIONS WHERE NOT PART OF SIDEWALK.

REDUCED SCALE
USE SCALE BELOW

SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING
FIRE HYDRANT LOCATION

DRAWN BY: [Signature]
CHECKED BY: [Signature]
RECOMMENDED BY: [Signature]
APPROVED BY COUNTY ENGINEER: [Signature]
D.P.E. No.: 11458
DATE: Sept. 28, 1971

SCALE: NONE
DRAWING NUMBER: 307
GENERAL NOTES:

1. GENERALLY UTILITIES ARE TO BE INSTALLED UNDER THE APPLICABLE SPECIFICATIONS FOR THE PARTICULAR UTILITY AND THE SPECIFICATIONS OF THE OWNER AGENCY.

2. WHERE MULTIPLE TUBES (OTHER THAN SHOWN) ARE TO BE PLACED A SPECIAL JOINT TRENCH DETAIL SHALL BE DESIGNED AND APPROVED OF PARTICIPATING UTILITIES OBTAINED.

3. GAS MAIN TO BE PLACED ON PROPERTY SIDE OF TRENCH, ELECTRIC PRIMARY SHOULD BE DIAGONALLY OPPOSITE GAS MAIN WHERE POSSIBLE (TYPES C, D & F).

4. INSTALLATION OF SEWER AND/OR WATER UTILITIES ARE NOT PERMITTED IN THE JOINT TRENCH SHOWN ABOVE.

5. MINIMUM DEPTH TO TOP OF GAS PIPE MAY, SUBJECT TO GAS COMPANY INSPECTORS APPROVAL, BE REDUCED TO 24\' WHERE NECESSARY TO CLEAR FOREIGN STRUCTURE CROSSINGS.

6. DEPTH AND WIDTH OF TRENCH VARIES.

7. WHEN APPROVED BY ALL UTILITIES CONCERNED SECONDARY ELECTRIC, TELEPHONE AND CATV MAY BE CONCURRENTLY INSTALLED WITH RANDOM SEPARATION.

8. CATV MAIN OR TRUNK LINE CONDUIT REQUIRED ALONG ALL STREETS EXCEPT CUL-DE-SAC STREETS LESS THAN 2500\' IN LENGTH MAY BE SERVED BY FEEDER LINES ONLY.

9. CATV 1/2" FEEDER CONDUIT SHALL RUN ACROSS STREETS WITH EACH POWER SERVICE LINE AND CAPPED AT EDGE OF SIDEWALK.

10. ALL CATV TERMINALS AND CONDUITS SHALL BE TERMINATED AT GENERALLY ACCEPTED LOCATIONS AND MARKED, A MAP SHALL BE FILLED WITH THE APPROPRIATE AGENCY SHOWING THE LOCATION OF THE CATV SYSTEM.

11. IN NO CASE SHALL CATV CONDUITS BE PLACED WITHIN 12\' OF ELECTRIC OR GAS LINES. ALSO CONDUITS ARE NOT TO BE PLACED DIRECTLY OVER GAS LINES.

12. CATV CONDUIT MAY BE PLACED WITH THE TELCO CONDUIT PROVIDED THE TELCO MIN. DEPTH IS HELD.

13. THE LOCATION OF UTILITIES AS SHOWN ON THIS STANDARD DRAWING SHALL IN NO WAY VIOLATE EXISTING CODES OR REGULATIONS APPLICABLE TO INDIVIDUAL UTILITIES.

14. TYPES A, B & E APPLY WHEN AN ELECTRIC SECONDARY CONDUIT ONLY IS USED. TYPES C, D, AND F APPLY WHEN AN ELECTRIC PRIMARY (2 SECONDARY) CONDUIT IS USED.
# Typical Roadway Section

## Symmetrical about Centerline

<table>
<thead>
<tr>
<th>Type of Road or Street</th>
<th>R/W</th>
<th>Roadbed</th>
<th>Traveled Way</th>
<th>Shoulder</th>
<th>Median</th>
<th>Traveled Way</th>
<th>Shoulder</th>
<th>Parkway Strip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prime Arterial</td>
<td>126</td>
<td>106'</td>
<td>36'</td>
<td>8'</td>
<td>18'</td>
<td>10'</td>
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<tr>
<td>Major Road</td>
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<td>18'</td>
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<tr>
<td>Collector Road</td>
<td>84</td>
<td>64'</td>
<td>24'</td>
<td>8'</td>
<td>0'</td>
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<tr>
<td>Residential Collector Street</td>
<td>60</td>
<td>40'</td>
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<td>Residential Street</td>
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<td>36'</td>
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<tr>
<td>Residential Cul-de-Sac Street</td>
<td>52</td>
<td>32'</td>
<td>12'</td>
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<tr>
<td>Residential Loop Street</td>
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<td></td>
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<tr>
<td>Comm. B. Ind. Collector Street</td>
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<td>68'</td>
<td>24'</td>
<td>10'</td>
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<tr>
<td>Comm. B. Ind. Street</td>
<td>72</td>
<td>52'</td>
<td>16'</td>
<td>10'</td>
<td>0'</td>
<td>10'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comm. B. Ind. Cul-de-Sac Street</td>
<td>72</td>
<td>52'</td>
<td>16'</td>
<td>10'</td>
<td>0'</td>
<td>10'</td>
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<td></td>
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</tbody>
</table>

**Note:**
1. Street classifications (except prime arterial) and typical roadway sections from San Diego County Technical Road Policy (Jan. 6, 1964).
2. Prime arterial section based upon minimum standards "National Committee on Urban Transportation".
3. See San Diego County standard drawings and San Diego County technical road policy for sidewalk, curb, and roadway requirements.
4. Frontage road adjacent to freeway R/W, traveled way and median standard for road classification and/or traffic volume. Shoulder adjacent to freeway 2', roadway strip adjacent to freeway varies from 4' to 10'. Shoulder and roadway strip away from freeway standard for traffic volume and/or road classification.
NOTES:

1. SEE SAN DIEGO COUNTY STANDARD DRAWINGS AND SAN DIEGO COUNTY TECHNICAL ROAD POLICY FOR CURB, SIDEWALK & ROADMWAY REQUIREMENTS.

2. NATURAL SLOPE EXCEEDS 20% AS DEFINED IN SAN DIEGO COUNTY TECHNICAL ROAD POLICY SECT 4.22

3. REQUIRED: ONE 600 SQUARE FOOT PERPENDICULAR PARKING BAY PER LOT. THE SURVEYOR-ROAD COMMISSIONER MAY ALSO ESTABLISH ALTERNATE STANDARD TYPICAL SECTIONS WHICH WILL PROVIDE A MINIMUM OF TWO PARKING STALLS PER LOT.

4. USE OF THIS STREET SECTION LIMITED TO AREAS IN WHICH AT LEAST 80% OF THE lots HAVE A NET AREA NOT LESS THAN 20,000 SQUARE FEET.
NOTES:

1. SEE SAN DIEGO COUNTY STANDARD DRAWINGS AND SAN DIEGO COUNTY TECHNICAL ROAD POLICY FOR CURB, SIDEWALK & ROADWAY REQUIREMENTS.

2. NATURAL SLOPE EXCEEDS 20% AS DEFINED IN SAN DIEGO COUNTY TECHNICAL ROAD POLICY SECT. 4.22

3. USE OF THIS STREET SECTION LIMITED TO AREAS IN WHICH AT LEAST 80% OF THE LOTS HAVE A NET AREA OF NOT LESS THAN 20,000 SQUARE FEET.

4. USE OF HILLSIDE RESIDENTIAL STREET STANDARDS ARE APPLICABLE ONLY TO STREETS CLASSIFIED AS RESIDENTIAL, RESIDENTIAL CUL-DE-SAC, OR RESIDENTIAL LOOP STREETS AND ARE NOT APPLICABLE TO STREETS IN AREAS ZONED FOR COMMERCIAL, INDUSTRIAL OR MULTIPLE RESIDENTIAL USE.
NOTES:

1. SEE SAN DIEGO COUNTY STANDARD DRAWINGS AND SAN DIEGO COUNTY TECHNICAL ROAD POLICY FOR CURB, SIDEWALK & ROAD REQUIREMENTS.

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2. NATURAL SLOPE EXCEEDS 20% AS DEFINED IN SAN DIEGO COUNTY TECHNICAL ROAD POLICY SECT. 4.22

3. MAXIMUM LENGTH BETWEEN CONNECTIONS TO CROSSING TWO-WAY STREETS SHALL BE 1200 FT.

4. USE OF THIS STREET SECTION LIMITED TO:
   A. AREAS IN WHICH AT LEAST 80% OF THE LOTS HAVE A NET AREA OF NOT LESS THAN 20,000 SQUARE FEET.
   B. STREET PATTERN ALLOWS RETURN TO POINT OF ORIGIN IN ONE MILE OR LESS.

5. USE OF HILLSIDE RESIDENTIAL STREET STANDARDS ARE APPLICABLE ONLY TO STREETS CLASSIFIED AS RESIDENTIAL, RESIDENTIAL CUL-DE-SAC, OR RESIDENTIAL LOOP STREETS, AND ARE NOT APPLICABLE TO STREETS IN AREAS ZONED FOR COMMERCIAL, INDUSTRIAL OR MULTIPLE RESIDENTIAL USE.
NOTE:

1. TEMPORARY HAMMERHEAD TURN-AROUND TO BE CONSTRUCTED IN COMPLIANCE WITH REQUIREMENTS FOR CONCRETE RESIDENTIAL DRIVEWAYS, CURRENT SAN DIEGO COUNTY STANDARD DRAWINGS. LOCATION TO BE GOVERNED BY DRIVEWAY LOCATION REQUIREMENTS CURRENT SAN DIEGO COUNTY STANDARD DRAWINGS AND THIS STANDARD DRAWING.

2. FOR USE ON EITHER 36' OR 40' WIDTH STREETS.
NOTE:

1. FOR USE ON EITHER 36' OR 40' WIDTH STREETS.
NOTE: 1. TEMPORARY HAMMERHEAD TURN-AROUND PREFERABLY ON CUT SIDE.
2. TEMPORARY HAMMERHEAD TURN-AROUND TO BE CONSTRUCTED IN COMPLIANCE WITH REQUIREMENTS FOR CONCRETE RESIDENTIAL DRIVEWAYS, CURRENT SAN DIEGO COUNTY STANDARD DRAWINGS, LOCATIONS TO BE GOVERNED BY DRIVEWAY LOCATION REQUIREMENTS CURRENT SAN DIEGO COUNTY STANDARD DRAWINGS AND THIS STANDARD DRAWING.
NOTE: The anchor bolts and nuts shall be galvanized.

TRAFFIC ISLAND DETAIL SHOWING CURB WARNING BEACON INSTALLATION 3/4" x 1'-0"

DETAIL CROSS-SECTION OF CURB WARNING BEACON 3" x 1'-0"

LEGEND ON PLANS - ☀

SAN DIEGO COUNTY STANDARD DRAWING

CURB WARNING BEACON

SCALE NONE

DRAWING NO. 400
MOUNTINGS ON TRAFFIC SIGNAL OR SAFETY LIGHTING STANDARDS

UTILITY POLE MOUNTING

SUFFICIENT WIRE SHOULD BE ALLOWED BY THE CONTRACTOR TO PERMIT S.D.G.B.E. CO. TO MAKE CONNECTION TO SERVICE WIRES.

1" CONDUIT

MIN. LENGTH OF NIPPLE 3"

30A, 125V.
2 POLE
SOLID NEUTRAL RAIN TIGHT SAFETY SWITCH

1/2" CONDUIT, NO. 8 GROUND WIRE INSIDE.

GROUND CLAMP
GROUND ROD 3/4" X 8'-0"

GALV. PIPE STRAPS AND GALV. NAILS.
MOUNTINGS ON TRAFFIC SIGNAL OR SAFETY LIGHTING STANDARDS

UTILITY POLE MOUNTING

SUFFICIENT WIRE SHOULD BE ALLOWED BY THE CONTRACTOR TO PERMIT S.B.S.E.E.CO. TO MAKE CONNECTION TO SERVICE WIRES.

1" CONDUIT

MIN. LENGTH OF NIPPLE 3"

50A, 125V, 2 POLE SOLID NEUTRAL RAIN TIGHT SAFETY SWITCH

1/2 CONDUIT NO. 8 GROUND WIRE INSIDE

GALV. PIPE STRAPS AND GALV. NAILS

GROUND CLAMP

GROUND ROD 3/4 X 6'-0"

SERVICE CONNECTION FOR TRAFFIC SIGNAL SYSTEMS
3/8" BRASS HOLD-DOWN BOLT
WITH HEXAGONAL BRASS NUTS.

2" ON TYPE 3 1/2
BOX ONLY

PRECAST REINFORCED CONCRETE
NO. 8 IRON WIRE HOOPS

SECTION X-X

3/8" BRASS J-BOLT WITH 1" DIA. BEND

SECTION Y-Y

3/8" DEF. STEEL BARS
4" EQUALLY SPACED

COVER
REINFORCING PLAN

MOLDED LETTERS
1/8 DEEP
TRAFFIC SIGNAL

PLAN

<table>
<thead>
<tr>
<th>TYPE</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>
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<tbody>
<tr>
<td>3/8</td>
<td>19</td>
<td>13</td>
<td>14</td>
<td>8.5</td>
<td>16</td>
<td>10</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>25</td>
<td>15</td>
<td>24</td>
<td>11.5</td>
<td>23</td>
<td>13</td>
<td>20</td>
<td>10</td>
</tr>
</tbody>
</table>

NOTE: FOR SAFETY’ LIGHTING INSTALLATIONS LETTERS IN COVER
SHOULD READ "STREET LIGHT HIGH VOLTAGE"

COMPACT EARTH UNDER AND AROUND PULL BOX IN
ACCORDANCE WITH STANDARD SPECIFICATIONS.

LEGEND ON PLANS: • P.B.
FOR TYPE I
STANDARDS ONLY

TRAFFIC SIGNAL FOUNDATION

FOR TYPE XVI & XVII
STANDARDS ONLY

SAN DIEGO COUNTY SURVEYOR-ROAD DEPARTMENT
STANDARD DRAWING

TRAFFIC SIGNAL AND SAFETY LIGHTING FOUNDATIONS — TYPE II AND III

DRAWING NUMBER 407-1
NOTE: When standard is set on Type II
Foundation, 4" pipe to be 6'-4 1/4"
and overall length to be 8'-5".

DETAILED DRAWING
Material: Cast iron
Scale: \( \frac{1}{8} = 1" \)

BASE SECTION

3-1" Dia. Holes
Equally spaced

10 3/16"
15" Dia.
12 1/2" B.C.
8 3/4" Dia.

8" Std. black pipe

2 - 1/4 x 20 Tapped holes

8" x 4" Reducer
Butt welded

\( \frac{3}{4} = 1'-0" \)

Scale: \( \frac{3}{4} = 1'-0" \)
Detailed instructions and specifications for installing ornamental street lights are provided. The diagram illustrates the placement and design considerations for these lights, ensuring a cohesive and aesthetically pleasing installation. Instructions cover the necessary dimensions, materials, and procedures for a safe and proper installation process.

**Foundation Data**

- **Pole Height**
  - Through 25': 4' 0" square
  - Through 30': 5' 0" square
  - Up to 35': 5' 0" square

- **Anchor Bolts**
  - Through 25': 4 - 1" x 36" x 4"
  - Through 30': 4 - 1" x 36" x 4"
  - Up to 35': 4 - 1" x 36" x 4"

Notes:
- Anchor bolts & nuts shall be galvanized.
- Luminaire 6' max. cantilever.
- Luminaire 12' max. cantilever.

**Table of Mounting Heights**

<table>
<thead>
<tr>
<th>Lamp Size</th>
<th>Pole Height</th>
<th>Mounting Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>175 W (7000 Lumen)</td>
<td>25' ± 2'</td>
<td>27' ± 1'</td>
</tr>
<tr>
<td>400 W (20,000 Lumen)</td>
<td>26' ± 2'</td>
<td>28' ± 1'</td>
</tr>
<tr>
<td>1000 W (55,000 Lumen)</td>
<td>35' ± 2'</td>
<td>38' ± 1'</td>
</tr>
</tbody>
</table>

*All lamps shall be improved-color phosphor-coated mercury vapor types.*

**Grounding**

- 16GA. 3/4" perforated copper strap with 1/8" holes
- 12 x 24 brass machine screw (typical)
- See detail
- Ground rod
- 1/2" conduit
- 3/4" x 0.8" copper covered steel ground rod
- Anchor bolts

**Legend on Plans**

- Installation behind contiguous sidewalk
- Installation behind curb

**San Diego County Engineer Department**

**Standard Drawing**

**Ornamental Street Lights**

**Revision by Approved Date**

**Scale:** None

**Drawing Number:** 410-T

**Page:** 1
NOTES

LAMPS
175 WATT (7000 LUMEN) PHOSPHOR-COATED MERCURY VAPOR ANSI LAMP DESIGNATION H39-22KC/DX
or
400 WATT (20,000 LUMEN) PHOSPHOR-COATED MERCURY VAPOR ANSI LAMP DESIGNATION H33-1GL/DX
or
1000 WATT (55,000 LUMEN) PHOSPHOR-COATED MERCURY VAPOR ANSI LAMP DESIGNATION H36-15GW/DX
AS SPECIFIED.

LUMINAIRE
HORIZONTAL BURNING TYPE WITH INTEGRAL CONSTANT WATTAGE BALLAST, PHOTOELECTRIC CONTROL,
AND GLASS REFRACTOR.
ANSI SHORT DISTRIBUTION, SEMI-CUTOFF CLASSIFICATION, TYPE II DISTRIBUTION FOR 7000 LUMEN UNITS.
ANSI SHORT DISTRIBUTION, SEMI-CUTOFF CLASSIFICATION, TYPE III DISTRIBUTION FOR OTHER SIZES.

MAST ARMS
TWO-INCH DIAMETER, STANDARD GALVANIZED STEEL OR ALUMINUM, SELF-SUPPORTING, WITHOUT
BRACES, SCROLLS, OR RODS.

DAVIT-STYLE UNITS ARE NOT PERMITTED.

POLE TOPS
GALVANIZED STEEL OR CAST ALUMINUM ALLOY, SECURED BY A MINIMUM OF TWO SCREWS.

MISCELLANEOUS HARDWARE
CADMIUM-COATED, HOT DIPPED GALVANIZED, OR STAINLESS STEEL.

POLES
ROUND PRESTRESSED CONCRETE WITH EXPOSED BLACK AND WHITE MARBLE AGGREGATE FINISH.
HANDHOLE TO FACE STREET.

WIRING
MINIMUM NO. 10 GA. T.W. STRANDED COPPER TO BALLAST.
NEUTRAL LEG OF LIGHTING CONDUCTORS GROUNDED TO BASE OF STANDARD.
HOT LEG OF LIGHTING CONDUCTORS FUSED WITH 10 AMP. SLO-BLO MIDGET FERRULE-TYPE FUSE. (BUSS
FMN 10 OR EQUIVALENT) IN PLUG CONNECTOR (FUSETRON HEB OR EQUIVALENT) IN BASE OF STANDARD.

SPLICES
PERMITTED IN PULL BOXES AND LIGHTING STANDARD BASES ONLY.
SHALL BE MADE USING AN APPROVED CONNECTOR SIMILAR TO SCOTCHLOCK OR CRIMP-TYPE COMPRESSION
TAP SIMILAR TO TXB CAT. NO. 54710, INSERTING THE CONNECTION IN AN EPOXY RESIN MIXTURE
MIXED IN A PLASTIC CONTAINER, ALL SUPPLIED AS A KIT. KIT SHALL BE SIMILAR AND EQUAL
to 3M 60. SCOTCHLOCK NO. 3578 CONNECTOR SEALING PACK.

CONDUIT & CONDUCTORS
ALL ABS PLASTIC CONDUIT SHALL BE 1-1/2" HEAVY WALL, EQUAL TO BALDWIN EXTRUDED PRODUCTS,
INC., BALDWIN ABSOLUTE ABS ELECTRICAL CONDUIT, AND SHALL CONFORM TO THE WESTERN
UNDERGROUND COMMITTEE SPECIFICATION NO. 31.

CABLE-IN-DUCT SHALL CONSIST OF 2 CONDUCTORS PREASSEMBLED WITHIN A PLIABLE 3/4" HIGH DENSITY POLYETHYLENE DUCT. MINIMUM CONDUCTORS SHALL BE A.W.G. SIZE NO. 10, 7-
STRAND COPPER WITH U.S.E. INSULATION OR A.W.G. SIZE NO. 8, 7 STRAND ALUMINUM WITH U.S.E.
INSULATION, WITH ONE BLACK AND ONE YELLOW LEAD UNLESS SHOWN OTHERWISE ON THE PLANS.
CONDUIT AND CONDUCTORS

POLYETHYLENE DUCT SHALL BE HIGH DENSITY, TYPE III POLYETHYLENE RESISTANT TO ABRASION, MOISTURE, ALKALIS, SALTS, DETERGENTS, AND OTHER CHEMICALS. DUCT SHALL NOT ROT, RUST OR CORRODE AND SHALL BE IMPERVIOUS TO ELECTROLYTIC ENVIRONMENT.

CABLE-IN-DUCT SHALL BE LIGHT, EASY TO HANDLE, FLEXIBLE AND SHALL BE SUITABLE FOR INSTALLATION DIRECTLY IN THE GROUND WITHOUT ADDITIONAL PROTECTIVE COATINGS OR WRAPS BEING REQUIRED.

SERVICE LINES SHALL BE LOCATED UNDER SIDEWALKS WHEREVER PRACTICAL.

SERVICE ENTRANCE

CONDUIT SHALL BE 1-1/2" HEAVY WALL ABS PLASTIC.

FOR CABLE-IN-DUCT SERVICE, THE CABLE-IN-DUCT SHALL BE INSTALLED IN THE SERVICE ENTRANCE CONDUIT TO PROVIDE COMPLETE CABLE-IN-DUCT SERVICE TO THE HANDHOLE.

FOUNDATION

SEE DETAIL DRAWING.

GROUNDING

SEE DETAIL DRAWING

MISCELLANEOUS REQUIREMENTS

PRIOR TO INSTALLATION OF ANY PART OF THE STREET LIGHTING SYSTEM, THE CONTRACTOR SHALL FURNISH THE COUNTY ENGINEER, FOR APPROVAL, A COMPLETE CATALOG LISTING OF ALL PROPOSED EQUIPMENT.

UPON COMPLETION OF THE STREET LIGHTING SYSTEM INSTALLATION, THE CONTRACTOR SHALL FURNISH, AT HIS OWN EXPENSE, THE NECESSARY PERSONNEL AND EQUIPMENT TO DEMONSTRATE SATISFACTORY OPERATION OF THE LIGHTING SYSTEM TO THE ENGINEER.
1" x 1" x 6' REDWOOD STAKE FOR TREES 1'-5' HIGH AND TIE WITH PLASTIC TIE TAPE 2 PLACES.
2" x 2" x 10' REDWOOD STAKE FOR TREES 5'-8' HIGH AND TIE WITH HOSE TIE 2 PLACES.
3" x 3" x 12' REDWOOD STAKE FOR TREES 8'-12' HIGH AND TIE WITH HOSE TIE 3 PLACES.
TIEING OF TREES OVER 12' HIGH IS SUBJECT TO INSTRUCTIONS OF COUNTY.

MIN. NO. 20 GALVANIZED WIRE

STAKE

HOSE

DETAIL A - A

REDWOOD STAKE
SAME AS FOR SLOPES

BASIN TWICE WIDTH OF HOLE

TOP OF BALL FLUSH WITH FINISH GRADE
6" MIN. BERM FOR BASIN

NOTE: PLANTING HOLE SAME AS FOR SHRUBS.

TREE PLANTING DETAIL
LEVEL GROUND

SHRUB PLANTING DETAIL

SLOPE

WATER

TOP OF BALL FLUSH WITH FINISH GRADE.

MIN. BERM FOR BASIN.

COMPACTED PLANTING MIX.

MIN. WIDTH = TWO TIMES WIDTH OF BALL.

MIN. DEPTH = 1/2 TIMES DEPTH OF BALL.

SLOPE

WATER

TOP OF BALL FLUSH WITH FINISH GRADE.

MIN. BERM FOR BASIN.

COMPACTED PLANTING MIX.

MIN. WIDTH = TWO TIMES WIDTH OF BALL.

MIN. DEPTH = 1/2 TIMES DEPTH OF BALL.

SAN DIEGO COUNTY SURVEYOR-ROAD DEPARTMENT
STANDARD DRAWING

SHRUB AND TREE PLANTING

DRAWING NUMBER 600
# Plant List

## Plant Name

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<thead>
<tr>
<th>Botanical</th>
<th>Common</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trees</strong></td>
<td></td>
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## Instructions

**Exposure Column** - is the prime basis for selection of all plants within specific climatic zones. Example: If the embankment more nearly faces west than north, refer to the South-West column.

**Spacing Column** - represents the maximum or minimum spacing on center or rate of seed application permitted in planting from top to toe of bank.

**Selection of Plants** - select one or more trees, three or more shrubs, and one or more ground cover plants from the approved list that more nearly meets the zone and exposure limitations indicated.

---

**Coastal Zone**

Page 1/2
## PLANT LIST

<table>
<thead>
<tr>
<th>BOTANICAL</th>
<th>COMMON</th>
<th>EXPOSURE</th>
<th>TYPE</th>
<th>SPACING ON CENTER</th>
<th>CHARACTER</th>
<th>GROWTH</th>
<th>WATER</th>
<th>USEFUL LIFE</th>
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**APPLICATION RATE IN POUNDS PER ACRE**

**INSTRUCTIONS**

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**COASTAL ZONE**
## PLANT LIST

### BOTANICAL | COMMON
--- | ---
**TREES**
Acacia melanoxylon | Blackwood Acacia
Ailanthus altissima (female only) | Tree of Heaven Ailanthus
Brachychiton populneus | Kurrajong Bottle tree
Casurina equisetifolia | Horsetail Beechwood
Eucalyptus citriodora | Lemon Gum
Eucalyptus lehmanni | Lehmann Eucalyptus
Eucalyptus polyanthemos | Red Box Eucalyptus
Gleditsia triacanthos, Inerm. morsine | Moraine Honey Locust
Grevillea robusta | Silky Oak Grevillea
Koelreuteria paniculata | Goldenrain Tree
Melia azedarach unbraculiformis | Umbrella Chinaberry
Platanus acerifolia | London Planetree
Platanus racemosa | California Sycamore
Pinus canariensis | Canary Pine
Pinus radiata | Monterey Pine
Quercus agrifolia | California Live Oak
Quercus ilex | Holly Oak
Robinia pseudoacacia decaisne | Pink Flowering Locust
Shinus molle | California Pepper Tree
Shinus terebinthifolia | Brasil Pepper Tree
**SHRUBS**
Acacia cultriformis | Kooyoora Acacia
Acacia longifolia | Sydney Acacia
Acacia p. floribunda | Gossamer Sydney Acacia
Acacia verticillata | Star Acacia
Callistemon lanceolatus | Lemon Bottle Brush
Ceanothus griseus horizontalis | Carmel Creeping Ceanothus
Ceanothus griseus 'Louis Edmunds' | Louis Edmunds Ceanothus
Clausia carbariensis | White Rockrose
Curtatonia soliana | Selina Pampas Grass

### INSTRUCTIONS

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<tr>
<td>Robinia pseudoacacia</td>
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<td>Pink Flowering Locust</td>
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<td><strong>SHRUBS</strong></td>
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<tr>
<td>Arbutus unedo</td>
<td>Strawberry Madrone</td>
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<td>Thorny Elaeagnus</td>
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<td>Juniperus sabina tamariscoides</td>
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<td>Malus scheideckeri</td>
<td>Scheidecker Crabapple</td>
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<td>Mahonia aquifolium</td>
<td>Oregon Grape</td>
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<tr>
<td>Mahonia pinnata</td>
<td>California Grape</td>
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<td>Photinia serrulata</td>
<td>Chinese Photinia</td>
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</table>

### INSTRUCTIONS

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## PLANT LIST

<table>
<thead>
<tr>
<th>PLANT NAME</th>
<th>BOTANICAL</th>
<th>COMMON</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SHRUBS (cont.)</strong></td>
<td></td>
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<tr>
<td>Pyracantha crenata-serrata</td>
<td>Firethorn</td>
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<tr>
<td>Syringa vulgaris</td>
<td>Lilac</td>
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<tr>
<td><strong>GROUND COVERS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arctostaphylos 'Pt. Reyes'</td>
<td>Pt. Reyes Manzanita</td>
<td>1' 2' 4'</td>
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<tr>
<td>Ceanothus griseus-horizontalis</td>
<td>Carmel Creeping Ceanothus</td>
<td>5' 5' 5'</td>
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<tr>
<td>Cotoneaster conspicua-dorsa</td>
<td>Necklace Cotoneaster</td>
<td>5' 5' 5'</td>
</tr>
<tr>
<td>Cotoneaster horizontalis</td>
<td>Rock Cotoneaster</td>
<td>5' 5' 5'</td>
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<tr>
<td>Euonymus fortunei 'carrierei'</td>
<td>Purpleleaf Wintercreeper E.</td>
<td>3' 5' 7'</td>
</tr>
<tr>
<td>Euonymus fortunei 'glorusus'</td>
<td>Glossy Wintercreeper E.</td>
<td>3' 5' 7'</td>
</tr>
<tr>
<td>Hedra helix - varieties</td>
<td>English Ivy</td>
<td>12' 18'</td>
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<tr>
<td>Hypericum calycinum</td>
<td>Aeroneshord St. Johnswort</td>
<td>18' 24'</td>
</tr>
<tr>
<td>Lonicera japonica-halliana</td>
<td>Hall's J. Honeysuckle</td>
<td>18' 24'</td>
</tr>
<tr>
<td>Teucrium chamaedrys prostratum</td>
<td>Prostrate Germander</td>
<td>12' 18'</td>
</tr>
<tr>
<td>Vinca major</td>
<td>Bigleaf Periwinkle</td>
<td>18' 24'</td>
</tr>
<tr>
<td>Vinca minor</td>
<td>Common Periwinkle</td>
<td>18' 24'</td>
</tr>
<tr>
<td><strong>SEED</strong></td>
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<td></td>
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<tr>
<td>Festuca elatior arundinacea</td>
<td>Alta Fescue</td>
<td>12 15</td>
</tr>
<tr>
<td>Potentilla sanguisorba</td>
<td>Burnet</td>
<td>12 15</td>
</tr>
</tbody>
</table>

**INSTRUCTIONS**

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# Plant List

<table>
<thead>
<tr>
<th>BOTANICAL</th>
<th>COMMON</th>
<th>EXPOSURE COLUMN</th>
<th>TYPE</th>
<th>SPACING ON CENTER</th>
<th>CHARACTER</th>
<th>GROWTH</th>
<th>WATER</th>
<th>USEFUL LIFE</th>
<th>MAINT COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAIUS</td>
<td>Sorrelly Papposum</td>
<td>25%</td>
<td>MISC</td>
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</tr>
<tr>
<td>Cupressocyparis</td>
<td>Arizona Cypress</td>
<td>10%</td>
<td>MISC</td>
<td></td>
<td></td>
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<tr>
<td>Eucalyptus calophylla</td>
<td>Red Box Eucalyptus</td>
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<td>MISC</td>
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<tr>
<td>Eucalyptus camaldulensis</td>
<td>Molokai Eucalyptus (Desertgum)</td>
<td>10%</td>
<td>MISC</td>
<td></td>
<td></td>
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<tr>
<td>Grevillea robusta</td>
<td>Silknk Grevillea</td>
<td>25%</td>
<td>MISC</td>
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<tr>
<td>Mella azedarach var. californica</td>
<td>Bahera Alamodol</td>
<td>25%</td>
<td>MISC</td>
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<tr>
<td>Olea europea fruitless</td>
<td>Fruitless Common Olive</td>
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<tr>
<td>Parkinsonia acilata</td>
<td>Jerusalem Thorn</td>
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<tr>
<td>Pinus balsamifera</td>
<td>Algon Pine</td>
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<tr>
<td>Pistacia atlantica</td>
<td>Mt. Atlas Pistache</td>
<td>20%</td>
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<tr>
<td>Cupressus alata</td>
<td>White Pinus</td>
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<tr>
<td>Populus fremontii</td>
<td>Fremont Poplar</td>
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<td>Schinus molle</td>
<td>California Pepper Tree</td>
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<tr>
<td>Tamarix aphylla</td>
<td>Athal Tamarix</td>
<td>10%</td>
<td>MISC</td>
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<tr>
<td>Ulmus parvifolia sempervirens</td>
<td>Chinese Evergreen Elm</td>
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<tr>
<td>SAGE</td>
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<td>SHRUB</td>
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<tr>
<td>Cotoneaster salicifolius</td>
<td>Sella Ramasgrass</td>
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<td>SHRUB</td>
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<tr>
<td>Encelia farinosa</td>
<td>White Brittlebrush</td>
<td>80%</td>
<td>SHRUB</td>
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<tr>
<td>Juniperus chinensis var. pfitzer</td>
<td>Chinese Juniper</td>
<td>100%</td>
<td>SHRUB</td>
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<tr>
<td>Juniperus sabina var. pfitzer</td>
<td>Texas Juniper</td>
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<td>Larrea tridentata</td>
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<td>Nerium oleander-variety</td>
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<td>50%</td>
<td>SHRUB</td>
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<tr>
<td>Prosopis glandulosa</td>
<td>Honey Mesquite</td>
<td>80%</td>
<td>SHRUB</td>
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<tr>
<td>Prosopis pubescens</td>
<td>Screwbean Mesquite</td>
<td>80%</td>
<td>SHRUB</td>
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<tr>
<td>Punica granatum</td>
<td>Common Pomegranate</td>
<td>80%</td>
<td>SHRUB</td>
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</tbody>
</table>

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# Plant List

## Botanical Name vs. Common Name

<table>
<thead>
<tr>
<th>Botanical Name</th>
<th>Common Name</th>
<th>Exposure</th>
<th>Type</th>
<th>Spacing on Center</th>
<th>Character</th>
<th>Growth</th>
<th>Water</th>
<th>Useful Life</th>
<th>Maint Cost</th>
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<tr>
<td>Pyracantha coccinea pavillons</td>
<td>Sparse Firethorn</td>
<td>E</td>
<td>Deciduous</td>
<td>5' 8'</td>
<td>Moderate</td>
<td>Slow</td>
<td>Moderate</td>
<td>Short</td>
<td>Long</td>
</tr>
<tr>
<td>Tamarix pentandra</td>
<td>Firestamen Tamarisk</td>
<td>E</td>
<td>Deciduous</td>
<td>8' 12'</td>
<td>Moderate</td>
<td>Slow</td>
<td>Moderate</td>
<td>Short</td>
<td>Long</td>
</tr>
<tr>
<td>Tecoma capensis</td>
<td>Cape Honeysuckle</td>
<td>E</td>
<td>Deciduous</td>
<td>5' 8'</td>
<td>Moderate</td>
<td>Slow</td>
<td>Moderate</td>
<td>Short</td>
<td>Long</td>
</tr>
<tr>
<td>Sophora secundiflora</td>
<td>Mescalbean Sophora</td>
<td>E</td>
<td>Deciduous</td>
<td>5' 8'</td>
<td>Moderate</td>
<td>Slow</td>
<td>Moderate</td>
<td>Short</td>
<td>Long</td>
</tr>
<tr>
<td>GROUND COVER</td>
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<tr>
<td>Calocephalis browni</td>
<td>Browns Garlandflower</td>
<td>E</td>
<td>Deciduous</td>
<td>5' 8'</td>
<td>Moderate</td>
<td>Slow</td>
<td>Moderate</td>
<td>Short</td>
<td>Long</td>
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<tr>
<td>Lippia camouens</td>
<td>Creeping Lippia</td>
<td>E</td>
<td>Deciduous</td>
<td>12' 18'</td>
<td>Moderate</td>
<td>Slow</td>
<td>Moderate</td>
<td>Short</td>
<td>Long</td>
</tr>
<tr>
<td>Pyracantha crenata-serrata</td>
<td>Firethorn</td>
<td>E</td>
<td>Deciduous</td>
<td>2' 2'</td>
<td>Moderate</td>
<td>Slow</td>
<td>Moderate</td>
<td>Short</td>
<td>Long</td>
</tr>
</tbody>
</table>

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## PLANT LIST

<table>
<thead>
<tr>
<th>BOTANICAL</th>
<th>COMMON</th>
<th>PLANTING SPECIFICATION</th>
<th>TYPE</th>
<th>CHARACTERISTICS</th>
<th>GROWTH</th>
<th>LIFE</th>
<th>SOIL</th>
<th>WATER</th>
<th>WANT COST</th>
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<tbody>
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<td>Kurrajong Bottletree</td>
<td>30°</td>
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<td>Tree Height</td>
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<tr>
<td>Callistemon lanceolatus</td>
<td>Lemon Bottlebrush</td>
<td>20°</td>
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<tr>
<td>Calodendrum expense</td>
<td>Capechestnut</td>
<td>30°</td>
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<tr>
<td>Ceratonia silqua</td>
<td>Carob</td>
<td>30°</td>
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<tr>
<td>Cajantheodendron platanoides</td>
<td>Monkeypodtree</td>
<td>30°</td>
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<tr>
<td>Camaraeum camphora</td>
<td>Camphortree</td>
<td>30°</td>
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<tr>
<td>Capraea capensis</td>
<td>Cape Red Alder</td>
<td>30°</td>
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<tr>
<td>Cupressochrysostomus</td>
<td>Carrowood</td>
<td>30°</td>
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</tr>
<tr>
<td>Erythrina edulis</td>
<td>Guadalupe Erythra Palm</td>
<td>20°</td>
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<tr>
<td>Erythrina coralloedendron</td>
<td>Giant Coral Tree</td>
<td>20°</td>
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<tr>
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### INSTRUCTIONS

- **PLANTING SPECIFICATIONS COLUMN** are the prime basis for selection of trees in accordance with the COUNTY'S climatic zone map used for this purpose.
- **PARKWAY WIDTH** refers to the median strip; strip between the curb and sidewalk; or the space between the sidewalk and the property line when the sidewalk is adjacent to the curb.
- **SPACING ON CENTER COLUMN** refers to the permitted maximum and minimum spacing on center of trees.
- **TYPE COLUMN** refers to the permitted maximum and minimum spacing on center of trees.

The Surveyor-Connector shall approve the selection and placement of trees before planting.

### COASTAL ZONE

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## Plant List

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<th>Characteristics</th>
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<th>Useful Life</th>
<th>Soil</th>
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<td>Ulmus parvifolia 'siskiyou'</td>
<td>Drake Evergreen Elm</td>
<td>30'</td>
<td></td>
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</tr>
</tbody>
</table>

**Instructions:**

PLANTING SPECIFICATIONS COLUMNS: These columns are for planting designs and specifications according to the COUNTY'S climatic zone map used for this purpose.

PARKWAY WIDTH: Refers to the median strip, strip between the curb and sidewalk, or the space between the sidewalk and the property line when the sidewalk is adjacent to the curb.

SPACING ON CENTER COLUMN: Refers to the permitted maximum and minimum spacing on center of trees.

TREE SELECTION: The Surveyor-Road Commissioner shall approve the selection and placement of trees before planting.
<table>
<thead>
<tr>
<th>PLANT LIST</th>
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</thead>
<tbody>
<tr>
<td><strong>PLANT NAME</strong></td>
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<tr>
<td>-------------</td>
</tr>
<tr>
<td>Allanthus altissima (female only)</td>
</tr>
<tr>
<td>Brachychiton populneus</td>
</tr>
<tr>
<td>Callistemon viminalis</td>
</tr>
<tr>
<td>Casuarina equisetifolia</td>
</tr>
<tr>
<td>Catalpa speciosa</td>
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<tr>
<td>Celtis australis</td>
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<tr>
<td>Ceratonia siliqua</td>
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<tr>
<td>Chamaerops excelsa</td>
</tr>
<tr>
<td>Erythrina crista-galli</td>
</tr>
<tr>
<td>Eucalyptus rostrata</td>
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<tr>
<td>Eucalyptus rudis</td>
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<tr>
<td>Fraxinus velutina</td>
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<tr>
<td>Fraxinus velutina glabra</td>
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<tr>
<td>Grevillea robusta</td>
</tr>
<tr>
<td>Lysiloma latifolia</td>
</tr>
<tr>
<td>Melia azedarach-umbraoliformis</td>
</tr>
<tr>
<td>Morus alba Kingan</td>
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<tr>
<td>Olea europeae</td>
</tr>
<tr>
<td>Olea europeae-fruitless</td>
</tr>
<tr>
<td>Parkinsonia aculeata</td>
</tr>
<tr>
<td>Phoenix canariensis</td>
</tr>
<tr>
<td>Phoenix dactylifera</td>
</tr>
<tr>
<td>Pistacia chinensis</td>
</tr>
<tr>
<td>Populus alba</td>
</tr>
<tr>
<td>Schinus molle</td>
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<tr>
<td>Schinus terebinthifolia</td>
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<tr>
<td>Sophora secundiflora</td>
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<tr>
<td>Tamarix aphylla</td>
</tr>
<tr>
<td>Ulmus parvifolia-spectabilis</td>
</tr>
<tr>
<td>Washingtonia filifera</td>
</tr>
<tr>
<td>Washingtonia robusta</td>
</tr>
</tbody>
</table>

**INSTRUCTIONS**

**PLANTING SPECIFICATIONS COLUMN**-are the prime basis for selection of trees in accordance with the COUNTY'S climatic zone map used for this purpose.

**PARKWAY WIDTH**-refers to the median strip; strip between the curb and sidewalk, or the space between the sidewalk and the property line when the sidewalk is adjacent to the curb.

**SPACING ON CENTER COLUMN**-refers to the permitted maximum and minimum spacing on center of trees.

**TREE SELECTION**-The Surveyor-Road Commissioner shall approve the selection and placement of trees before planting.
PLAN VIEW

SEE IRRIGATION SPECIFICATIONS FOR HEIGHT
FINISHED Grade

P.V.C. SCH. 80 NIPPLE
P.V.C. SCH. 40 FITTING

SPRAY HEAD

P.V.C. SCH. 80 RISER

15" MINIMUM 21" MAXIMUM

P.V.C. SCH. 40 ELBOW

P.V.C. SCH. 80 NIPPLE (3" MINIMUM)

P.V.C. SCH. 40 FITTING

ELEVATION

SYMBOLS:

SHRUBBERY SPRAY
STREAM SPRAY
RECTANGULAR SPRAY

SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING

SHRUBBERY SPRINKLER HEADS
FIXED SPRAY TYPE

DRAWING NUMBER 700-T-2
SEE IRRIGATION SPECIFICATIONS FOR HEIGHT

FINISHED GRADE

SPRAY HEAD
14 GA. GALV. STEEL WIRE

P.V.C. SCH. 80 RISER
1/2" REINFORCING BAR (TO BE USED IN HIGH VANDALISM AREAS OR WHERE SPRINKLERS ARE ADJACENT TO WALKWAYS.)

P.V.C. SCH. 40 ELBOW

30° MINIMUM

P.V.C. SCH. 80 NIPPLE (6" MINIMUM)

P.V.C. SCH. 40 FITTING

ELEVATION

SYMBOLS:

SHRUBBERY SPRAY
STREAM SPRAY
RECTANGULAR SPRAY

PLAN VIEW

SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING

SHRUBBERY SPRINKLER HEADS
FIXED SPRAY TYPE

DRAWING NUMBER 700-T
NOTES:
1. ALL NIPPLES AND FITTINGS FOR ROTARY POP-UP SPRINKLER TO BE THREADED SCH. 80 P.V.C. PIPE.
2. ALL SPRAY HEADS SHALL CLEAR EDGE OF SIDEWALKS OR OTHER IMPROVEMENTS BY 3".

SYMBOL: ROTARY POP-UP

POP-UP
POP-UP LAWN SPRAY
mounted on swing-joint riser

NOTES:
1. ALL NIPPLES AND FITTINGS FOR ROTARY POP-UP SPRINKLER TO BE THREADED SCH. 80 P.V.C. PIPE.
2. ALL SPRAY HEADS SHALL CLEAR EDGE OF SIDEWALKS OR OTHER IMPROVEMENTS BY 3".

SYMBOL: ROTARY POP-UP

RODARY POP-UP SPRINKLER
mounted on swing-joint riser

FINISHED GRADE

HEADER BOARD or SIDEWALK

1" ABOVE FINISHED GRADE

SCH. 80 P.V.C.

3" NIPPLE

SCH. 80 P.V.C.

6" MIN.

POP-UP SPRINKLER HEADS
POP-UP ROTARY & POP-UP SPRAY TYPES
NORMAL INSTALLATION

NOTE:
USE OF SPECIAL ABOVE-GROUND SPRINKLER INSTALLATION MUST HAVE THOROUGH JUSTIFICATION. INSTALLATION SHALL NOT COMMENCE UNTIL AUTHORIZED IN WRITING BY THE COUNTY ENGINEER.

SYMBOLS: O

SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD, DRAWING

IMPACT SPRINKLER HEAD

DRAWING NUMBER 702-T-2
NORMAL INSTALLATION

NOTE:
USE OF SPECIAL ABOVE-GROUND SPRINKLER INSTALLATION MUST HAVE THOROUGH JUSTIFICATION. INSTALLATION SHALL NOT COMMENCE UNTIL AUTHORIZED IN WRITING BY THE COUNTY ENGINEER.
ELEVATION

NOTES:
1. ALL QUICK COUPLING VALVES INSTALLED IN NEW LAWN AREAS SHALL BE INSTALLED ONE-HALF (1/2) INCH ABOVE THE PROPOSED FINISHED GRADE.
2. ALL QUICK COUPLING VALVES INSTALLED IN SHRUB BEDS SHALL BE INSTALLED FOUR (4) INCHES ABOVE FINISHED GRADE.
GARDEN VALVE
USE ADJACENT TO CURBS

GARDEN VALVE
USE IN OPEN AREAS

BACK OF ISLAND CURB OR
EDGE OF OTHER IMPROVEMENT

A" - 18" MINIMUM  24" MAXIMUM

4"

GARDEN VALVE - VANDAL PROOF
(LOOSE KEY)

RED BRASS RISER

20" MINIMUM

P.V.C. SCH. 80 NIPPLE
(6" MINIMUM)

P.V.C. SCH. 40 FITTINGS

FINISHED GRADE

1/2 CU. FT.;
"DYNAMITE"
(50% CONCRETE
50% CASTING PLASTER)

CONTINUATION SAME AS ABOVE

SYMBOL: 0
ALL MANUAL VALVES SHALL BE FURNISHED WITH A STANDARD MANUAL CONTROL VALVE CROSS REMOVABLE BONNET AND PACKING GLAND NUT.


ORISEAL VALVES, MANUAL CONTROL VALVES, AND OTHER MANUAL VALVES SHALL BE INSTALLED ACCORDING TO THIS STANDARD WITH VALVE SIZES AS SHOWN ON THE PLANS.

UNLESS SHOWN OTHERWISE ON THE PLANS, ALL VALVES SHALL BE INSTALLED WITHIN TWELVE (12) INCHES OF THE WATER MAIN

SYMBOLS:
MANUAL CONTROL ANGLE VALVE \( \times_{MCV} \)
MANUAL CONTROL GLOBE VALVE \( \times_{MCV} \)
ORISEAL VALVE \( \times_{OV} \)
GATE VALVE \( \times_{GV} \)
NORMAL LOCATION OF CONTROL WIRES

SEE IRRIGATION SPECIFICATIONS FOR ADDITIONAL INFORMATION ON TRENCH SIZE, BACKFILL AND DIRECT BURIAL WIRE INSTALLATION.

ALTERNATE LOCATION OF CONTROL WIRES

1" x 6" REDWOOD BOARD (CONSTRUCTION GRADE) ENTIRE LENGTH OF WIRE TRENCH

DIRECT BURIAL CONTROL WIRES
FINISHED GRADE

NORMAL BACKFILL

CLASS "A" BACKFILL

WATER LINE

DIRECT BURIAL CONTROL WIRE - TIE WIRES TO THE SIDE OF PIPE WITH A PLASTIC TAPE EVERY TEN FEET.

NORMAL LOCATION OF CONTROL WIRES

SEE IRRIGATION SPECIFICATIONS FOR ADDITIONAL INFORMATION ON TRENCH SIZE, BACKFILL AND DIRECT BURIAL WIRE INSTALLATION.

1" x 6" REDWOOD BOARD (CONSTRUCTION GRADE) ENTIRE LENGTH OF WIRE TRENCH

DIRECT BURIAL CONTROL WIRES

ALTERNATE LOCATION OF CONTROL WIRES

P.V.C. CONDUIT 12" MIN.-24" MAX.

NORMAL BACKFILL

CLASS "A" BACKFILL

MINIMUM 6"

18"

SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING

DIRECT BURIAL CONTROL WIRE & TRENCH DETAIL

DRAWING NUMBER 706-T
UNMORTARED BRICK FOUNDATION

METER BOX

1" x 6" REDWOOD BOARD
(CONSTRUCTION GRADE)

CONTROL WIRE RUN

PLAN VIEW

PRE-PACKAGED, SELF-CURING
EPOXY RESIN

MECHANICAL TYPE SPLICE
CONNECTOR

SPlice DETAIL

DOUBLE TOGGLE LOCK

FINISHED GRADE

2" MINIMUM

BRASS HINGE PIN

CONCRETE WATER METER BOX WITH HINGED, LOCKABLE
CAST IRON TOP. BOX SIZE, 9 1/2" x 16".

LOOP CONTROL WIRES INTO THE PULL BOX. ALL
SPlices ARE TO BE MADE IN PULL BOXES OR
AUTOMATIC VALVE BOXES.

UNMORTARED BRICK FOUNDATION

1" x 6" REDWOOD BOARD
(CONSTRUCTION GRADE)

CONTROL WIRE RUN

1 CU. FT. CRUSHED
ROCK (MINIMUM)

BEDDING MATERIAL

ELEVATION

NOTES:
1. INSTALL PULL BOXES AS SHOWN ON THE 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 HARNESSSED SEPARATELY
AND AT SUFFICIENT INTERVALS TO MAINTAIN A DEFINITE BUNDLE.

SPECIALIST:

SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING

ELECTRICAL PULL BOX FOR DIRECT BURIAL
CONTROL WIRES & SPLICE DETAIL

DRAWING NUMBER 707-2T
UNMORTARED BRICK FOUNDATION

METER BOX

1" x 6" REDWOOD BOARD (CONSTRUCTION GRADE)

CONTROL WIRE RUN

PRE-PACKAGED, SELF-CURING EPOXY RESIN

MECHANICAL TYPE SPICE CONNECTOR

PLAN VIEW

DOUBLE TOGGLE LOCK

2" MINIMUM

BRASS HINGE PIN

CONCRETE WATER METER BOX WITH HINGED, LOCKABLE CAST IRON TOP. BOX SIZE, 9\frac{1}{2}" x 16".

LOOP CONTROL WIRES INTO THE PULL BOX. ALL SPICES ARE TO BE MADE IN PULL BOXES OR AUTOMATIC VALVE BOXES.

UNMORTARED BRICK FOUNDATION

1" x 6" REDWOOD BOARD (CONSTRUCTION GRADE)

CONTROL WIRE RUN

1 CU. FT. CRUSHED ROCK (MINIMUM)

SAND BEDDING

ELEVATION

NOTES:
1. INSTALL PULL BOXES AS SHOWN ON THE PLANS.
2. AT JUNCTIONS WHERE RUNS COMBINE, SPICE COMMON GROUND IN PULL BOX.
3. PULL BOX COVER SHALL BE PERMANENTLY MARKED "ELECTRIC".
4. CONDUCTORS FOR EACH CONTROLLER CLOCK SHALL BE HARNESS SEPARATELY AND AT SUFFICIENT INTERVALS TO MAINTAIN A DEFINITE BUNDLE.

SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING

ELECTRICAL PULL BOX FOR DIRECT BURIAL
CONTROL WIRES & SPICE DETAIL

DRAWING NUMBER 707-T
UNMORTARED BRICK FOUNDATION

METER BOX

PLAN VIEW

FINISHED GRADE

DOUBLE TOGGLE LOCK

BRASS HINGE PIN

CONCRETE METER BOX WITH LOCKABLE HINGED, CAST IRON TOP. BOX SIZE 9-1/2" x 16"

18" LEAD LENGTH

BRASS PETCOCK FOR MANUAL OPERATION

RED BRASS UNION & NIPPLE

P.V.C. NIPPLES

ELEVATION

NOTE: NO SPLICING SHALL BE MADE OUTSIDE OF THE VALVE BOX EXCEPT THAT MADE IN A PULL-BOX (SEE STD. DWG. 707).

TYPICAL ELEMENTARY DIAGRAM FOR WIRING ELECTRIC AUTOMATIC CONTROL VALVE

SYMBOL: 

A.V. No.  

SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING

AUTOMATIC CONTROL VALVE ———
ELECTRIC (ANGLE VALVE)

DRAWING NUMBER 708-T1
UNMORTARED BRICK FOUNDATION

METER BOX

PILOT WIRE

SPARE WIRE

COMMON GROUND

RED BRASS PETCOCK
FOR MANUAL OPERATION

PLAN VIEW

FINISHED GRADE

DOUBLE TOGGLE LOCK

BRASS HINGE PIN

CONCRETE METER BOX WITH LOCKABLE
HINGED, CAST IRON TOP. BOX SIZE 9-1/2" x 16"  

15" MINIMUM
21" MAXIMUM

P.V.C. SCH. 40
ADAPTER UNION

1 CU. FT. CRUSHED ROCK (MINIMUM)
P.V.C. PIPE (SCH. 80)

CONDUIT (12" MIN. RADIUS)

ELEVATION

NOTE: NO SPLICING SHALL BE MADE OUTSIDE OF THE VALVE BOX EXCEPT
 THAT MADE IN A PULL-BOX (SEE STD. DWG. 707).

SAN DIEGO COUNTY ENGINEER DEPARTMENT

STANDARD DRAWING

AUTOMATIC CONTROL VALVE — —
ELECTRIC (ANGLE VALVE)

DRAWN BY [Signature]
CHECKED BY [Signature]
RECOMMENDED BY [Signature]
APPROVED BY COUNTY ENGINEER [Signature]

DATE: [Date]

STANDARD DRAWING NUMBER: 708-T

SYMBOL: ▽ A.V. No._
NOTE: SEE STD. DWG. NO. 708 FOR ELEMENTARY WIRING DIAGRAM & ADDITIONAL NOTES

Symbol: ▽ A.V. No —

SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING

AUTOMATIC CONTROL VALVE — ELECTRIC (GLOBE VALVE)

REVISION BY APPROVED DATE
SCALE: NONE
DRAWING NUMBER 709-T-1
PLAN VIEW

RED BRASS PET COCK FOR MANUAL OPERATION

METER BOX

UNMORTARED BRICK FOUNDATION

FINISHED GRADE

DOUBLE TOGGLE LOCK

BRASS HINGE PIN

CONCRETE METER BOX WITH LOCKABLE HINGED CAST IRON TOP. BOX SIZE: 9-1/2" x 16".

15" MINIMUM
21" MAXIMUM

P.V.C. SCH. 40 MALE ADAPTER

P.V.C. MALE ADAPTER

1 CU. FT. CRUSHED ROCK (MINIMUM)

ELEVATION

NOTE: SEE STD. DWG. NO. 708 FOR ELEMENTARY WIRING DIAGRAM & ADDITIONAL NOTES

SYMBOL: A.V. NO.
AUTOMATIC CONTROLLER CLOCK IN WEATHER-PROOF, TAMPER-PROOF LOCKABLE CASE MOUNTED ON PEDESTAL CASE.

1 1/2" x 1 1/2" x 1/4" ANGLE IRON STIFFENERS (GALVANIZED AND PAINTED TO MATCH CABINET)

ANCHOR CONTROLLER PEDESTAL TO BASE AS REQUIRED BY MANUFACTURER

SLOPE CONCRETE AWAY FROM PEDESTAL CASE

PEDESTAL BASE
PLAN VIEW

CLASS "A" CONCRETE (MINIMUM 3" ENCASEMENT AROUND CONDUITS)

12" MINIMUM RADIUS

SIDE VIEW

CONTROLLER CABINET

STIFFENERS TO BE FASTENED TO CONTROLLER & PEDESTAL CASES BY 3/16" x 3/4" O.H. CADMIUM PLATED STOVE BOLTS NOT MORE THAN 12" ON CENTER (MINIMUM 6 BOLTS PER STIFFENER).

PEDESTAL CASE

MAKE ALL ELECTRICAL CONNECTIONS INSIDE CONTROLLER CABINET.

1 1/2" MINIMUM RADIUS

2" P.V.C. CONDUIT FOR CONTROL WIRE

3/4" P.V.C. CONDUIT FOR POWER SUPPLY

SLOPE CONCRETE AWAY FROM PEDESTAL CASE

NOTE: WHERE TWO OR MORE CONTROLLERS ARE MOUNTED ON A COMMON CONCRETE BASE, A MINIMUM OF THREE INCHES SHALL BE LEFT BETWEEN CONTROLLER CABINETS.

FOR LOCATION OF SUPPLY CONDUIT AND CONDUCTORS, REFER TO THE PLANS AND THE SAN DIEGO COUNTY ELECTRICAL CODE.

SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING

ELECTRIC CONTROLLER CLOCK
PEDESTAL MOUNTING

SYMBOL: ☑️

DRAWING NUMBER 710-T
AUTOMATIC CONTROLLER CLOCK IN A WEATHER-PROOF, TAMPER-PROOF LOCKABLE CASE. WALL MOUNTED PER MANUFACTURER'S SPECIFICATIONS.

WALL

FOUNDATION OF BUILDING

42"

FINISHED GRADE

18"

12" MINIMUM RADIUS

SIDE VIEW

NOTE: WHERE TWO OR MORE CONTROLLERS ARE MOUNTED TOGETHER, A MINIMUM OF THREE INCHES SHALL BE LEFT BETWEEN CONTROLLER CABINETS.

CONTROLLER CABINET

MAKE ALL ELECTRICAL CONNECTIONS INSIDE CONTROLLER CABINET

ANCHOR CONDUIT FIRMLY TO WALL WITH GALVANIZED PIPE CLAMPS USING FASTENERS APPROPRIATE FOR TYPE OF WALL.

2" RIGID STEEL CONDUIT FOR CONTROL WIRE

3/4" RIGID STEEL CONDUIT FOR POWER SUPPLY

FINISHED GRADE

VALVE CONTROL (BUSHING)

POWER SUPPLY (COUPLING, ADAPTER)

FOR LOCATION OF SUPPLY CONDUIT & CONDUCTOR, REFER TO THE PLANS & THE SAN DIEGO COUNTY ELECTRICAL CODE.

SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING

ELECTRIC CONTROLLER CLOCK
WALL MOUNTING

SYMBOL: W

DRAWN BY: [Signature]
CHECKED BY: [Signature]
RECOMMENDED BY: [Signature]
APPROVED BY COUNTY ENGINEER: [Signature]
DATE: [Date]

DRAWING NUMBER: 711-T
NOTE:
1. ATMOSPHERIC VACUUM BREAKERS SHALL BE INSTALLED APPROX. 6" ABOVE THE FINISHED GRADE AND ABOVE A SUFFICIENT NUMBER OF SPRINKLER HEADS CLOSEST TO VACUUM BREAKER SO AT NO TIME WILL IT BE SUBJECTED TO BACK PRESSURE OR DRAINAGE.

2. ALL FITTINGS INCLUDING THE ATMOSPHERIC VACUUM BREAKER SHALL NOT BE OF SMALLER SIZE THAN THE VALVE.

3. FOR USE ON LINES 2 INCHES AND SMALLER.
CONTINUOUS PRESSURE VACUUM BREAKER ASSEMBLY (WITH BRASS TEST COCKS)

RED BRASS CLOSE NIPPLE
RED BRASS GROUND JOINT UNION
RED BRASS RISER

12" APPROX. 2" P.V.C. PIPE SLEEVE
CAST IRON CAP
FINISHED GRADE

20" MINIMUM
24" MAXIMUM

TO SPRINKLER CONTROL VALVE

FROM SUPPLY

ORISEAL VALVE

90° P.V.C. SCH. 40 ELL
1-1/2 CUBIC FEET CLASS "B" CONCRETE

8" SCH 80 NIPPLE

1. PRESSURE VACUUM BREAKERS SHALL BE INSTALLED ABOVE A SUFFICIENT NUMBER OF SPRINKLER HEADS CLOSEST TO VACUUM BREAKER SO AT NO TIME WILL IT BE SUBJECTED TO BACK PRESSURE OR DRAINAGE.
2. FOR USE ON LINES TWO INCHES AND SMALLER.

SYMBOL: V P.V.B.
CONTINUOUS PRESSURE VACUUM BREAKER ASSEMBLY WITH CHECK VALVES AND BRASS TEST COCKS. SIZE NOTED ON PLANS.

CAST IRON ELL

CAST IRON PIPE, CLASS 150

12" APPROX

FINISHED GRADE

2" GALVANIZED PIPE SUPPORT
GALVANIZED FLOOR FLANGE
6"x12"x12" CLASS 'B' CONCRETE BASE

POLYETHYLENE WRAPPED (SEE NOTE 3.)

SUPPLY MAIN 4" OR LARGER.

ADAPT INLET AND OUTLET FITTINGS TO MAIN AS REQUIRED.

CAST IRON ELL

THRUST BLOCKS

36" MINIMUM FOR 6" & LARGER

30" MINIMUM FOR 4"

NOTES:
1. ALL FITTINGS ON ASSEMBLY SHALL BE FLANGED.
2. CAST IRON PIPE SHALL BE POLYETHYLENE WRAPPED.
3. CAST IRON PIPE AND FITTINGS SHALL BE CEMENT LINED.
4. PRESSURE VACUUM BREAKER ASSEMBLY SHALL BE INSTALLED ABOVE A SUFFICIENT NUMBER OF SPRINKLER HEADS CLOSEST TO VACUUM BREAKER SO AT NO TIME WILL IT BE SUBJECTED TO BACK PRESSURE OR DRAINAGE.
5. FOR USE ON LINES FOUR INCHES AND LARGER.

SYMBOL: xxxx
CONTINUOUS PRESSURE VACUUM BREAKER ASSEMBLY WITH CHECK VALVES AND BRASS TEST COCKS. SIZE NOTED ON PLANS.

CAST IRON ELL

CAST IRON PIPE, CLASS 150 (GALVANIZED)

FINISHED GRADE

2' GALVANIZED PIPE SUPPORT
GALVANIZED FLOOR FLANGE
6'x12'x12' CLASS "B" CONCRETE BASE

POLYETHYLENE WRAPPED
(SEE NOTE 3.)

ASBESTOS CEMENT PIPE
SUPPLY MAIN 4" OR LARGER.

ADAPT INLET AND OUTLET FITTINGS TO MAIN AS REQUIRED.

CAST IRON ELL
THRUST BLOCKS

30' MINIMUM FOR 4'
36' MINIMUM FOR 6' & LARGER

NOTES:
1. ALL FITTINGS ON ASSEMBLY TO BE FLANGED
2. PIPE SUPPORT, CAST IRON PIPE AND FITTINGS TO BE GALVANIZED.
3. CAST IRON PIPE SHALL BE POLYETHYLENE WRAPPED.
4. CAST IRON PIPE AND FITTINGS SHALL BE CEMENT LINED.
5. PRESSURE VACUUM BREAKER ASSEMBLY SHALL BE INSTALLED ABOVE A SUFFICIENT NUMBER OF SPRINKLER HEADS CLOSEST TO VACUUM BREAKER SO AT NO TIME WILL IT BE SUBJECTED TO BACK PRESSURE OR DRAINAGE.
6. FOR USE ON LINES FOUR INCHES AND LARGER.

SYMBOL: ☒☒☒☒
CONCRETE METER BOX with STEEL or CONCRETE COVER

FINISHED GRADE

DOUBLE CHECK VALVE ASS'Y

RED BRASS NIPPLES (3)

FROM WATER METER

20" MIN. 24" MAX.

CRUSHED ROCK

UNMORTARED BRICK OR CONCRETE BLOCK—FULL LENGTH ALONG ALL SIDES.

FROM WATER METER

4" IF Poured IN PLACE

NOTES:

1. NOT FOR USE IN TRAFFIC AREAS.

2. FOR USE ON WATER MAINS OF ALL SIZES.

SYMBOL: O O O O O
CONCRETE CONSTRUCTION BLOCKS—FULL LENGTH ALONG ALL SIDES.
SEE NOTE 1.

FINISHED GRADE

30" FOR 3" & 4" PIPE
36" FOR 6" & 8" PIPE

CAST IRON ADAPTER FLANGE TO BELL

PVC. OR A.C. PIPE

BRASS TEST COCKS

STEEL PARKWAY COVER

DOUBLE CHECK VALVE ASSEMBLY
SIZE NOTED ON PLANS

FINISHED GRADE

6" DEPTH OF 1" CRUSHED ROCK FOR FULL LENGTH AND WIDTH OF UTILITY BOX

NOTES:
1. 3" & 4" PIPE: 2'-6" x 4'-0" UTILITY BOX WITH 4" WALLS.
   6" & 8" PIPE: 3'-2" x 6'-0" UTILITY BOX WITH 4" WALLS.
2. NOT FOR USE IN TRAFFIC AREAS.
3. FOR USE ON WATER MAINS 3" OR LARGER.

SYMBOL: ☑️☑️
DOUBLE CHECK VALVE ASSEMBLY
A.C. PIPE SERVICE
(TYPE IV BACKFLOW PROTECTION)

NOTES:
1. 3" & 4" PIPE: 2'-6" x 4'-0" UTILITY BOX WITH 4" WALLS.
   6" & 8" PIPE: 3'-2" x 6'-0" UTILITY BOX WITH 4" WALLS.
2. NOT FOR USE IN TRAFFIC AREAS.
3. FOR USE ON WATER MAINS OF ALL SIZES.

CONCRETE CONSTRUCTION BLOCKS—FULL LENGTH ALONG ALL SIDES.
SEE NOTE 1.

FINISHED GRADE

CONCRETE UTILITY BOX AND CONCRETE BLOCKS SUPPORT
SEE NOTE 1 FOR SIZE REQUIREMENTS

6" DEPTH OF 1" CRUSHED ROCK FOR
FULL LENGTH AND WIDTH OF UTILITY BOX

STEEL PARKWAY COVER

CAST IRON ADAPTER FLANGE TO BELL

BRASS TEST COCKS

30" FOR 3" & 4" PIPE
36" FOR 6" & 8" PIPE

A.C. PIPE

DOUBLE CHECK VALVE ASSEMBLY SIZE NOTED ON PLANS
FINISHED GRADE

SDC ED D & W P

PAGE 1 OF 3

716-T
CONCRETE WATER METER BOX WITH CAST IRON, HINGED, LOCKABLE TOP. (DOUBLE TOGGLE LOCK.) BOX SIZE 9"x16".
NOTE: IN ALL CASES, THE ASBESTOS CEMENT PIPE SHALL BE SAND BEDDED PER COUNTY ENGINEER STANDARDS.
EXISTING ASBESTOS CEMENT PIPE OR CAST IRON PIPE WATER MAIN.

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.
CONCRETE THRUST BLOCKS
for CAST IRON FITTINGS

NOTES:
1. BEARING AREAS FOR THRUST BLOCKS SHALL DEPEND ON PRESSURE & PIPE SIZE. FOR BEARING AREAS SEE STD. DWG. 721.
2. ALL CONCRETE FOR THRUST BLOCKS SHALL BE CLASS "C".
3. CONCRETE ANCHORS ARE TO BE KEPT CLEAR OF ALL PIPE & VALVE JOINTS.
4. THRUST BLOCKS ARE TO BE USED WHERE PIPE SIZES DIFFER IN CROSS AND WHEN ONE OR MORE OPENINGS ARE PLUGGED.

CAST IRON CAP OR PLUG

WATER MAIN

ELEVATION

PLAN VIEW

BLOW-OFF

8" MIN. ALTERNATE KEYED ANCHOR WHERE SOIL VALUE IS ADEQUATE.

18" TO BLOW-OFF ASSEMBLY

SAN DIEGO COUNTY ENGINEER DEPARTMENT
STANDARD DRAWING

DRAWN BY: JHJ CHECKED: BML
RECOMMENDED BY: RWJ
APPROVED BY COUNTY ENGINEER: JT, R.C.E. 1458
DATE: 3-25-72

REVISION
NUMBER 720-T
NOTES:
1. BASED ON 225 PSI TEST PRESSURE AND BEARING VALUES OF DRY SOILS.
2. VALUES FROM CURVES ARE FOR TEES & DEAD ENDS, i.e. STRAIGHT-LINE THRUST.
   FOR 90° BEND: 1.4 VALUE FROM CURVE.
   45°: 0.8
   22.5°: 0.4
3. FOR CONDITIONS NOT COVERED BY CURVES, SPECIAL THRUST BLOCKS MUST BE
   COMPUTED & APPROVED BY THE COUNTY ENGINEER DEPARTMENT.
4. THRUST BLOCKS DIMENSIONED ON PLANS ARE BASED ON 2000 LB/SQ.FT. BEARING
   VALUES, OR AS OTHERWISE NOTED.
5. FOR LOCATION OF THRUST BLOCKS SEE STD. DWG. 720.