### Section 4 – Storm Drain and Drainage Details

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<tr>
<th>Drawing No.</th>
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<tr>
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<td>Parkway Culvert with Steel Plate Cover</td>
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<td>Inlet Type IX (Checkered Plate)</td>
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<td>Storm Drain Cleanout</td>
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<td>Standard Dry Well</td>
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<td>Timber Bulkheads</td>
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<td>Pipe Supports Across Trenches</td>
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<td>Bedding and Pay Lines</td>
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<td>Catch Basin No. 1</td>
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<td>Catch Basin Steel Plate Galvanized Steel Step</td>
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<td>Removable Protection Bar for Catch Basins</td>
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<td>Detail of Catch Basin Opening &amp; Installation Details</td>
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<td>Standard Drop Step</td>
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<td>Manhole Frame &amp; Cover for Catch Basins</td>
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<td>Manhole Shaft for Cast Pipe</td>
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<td>Standard Pressure Manhole Shaft</td>
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<td>Manhole Frame &amp; Cover – Roadway</td>
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<td>Manhole Frame &amp; Cover – Pressure Type</td>
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NOTES:

1. LOCAL DEPRESSION SHALL BE CONSTRUCTED OF CLASS "B" CONCRETE 6" THICK

2. CURB AND GUTTER SHALL BE CONSTRUCTED PRIOR TO CONSTRUCTING TOP OF CATCH BASIN AND CURB TRANSITIONS.
NOTES:
1. LOCAL DEPRESSION SHALL BE CONSTRUCTED OF CLASS "B" CONCRETE 8" THICK.
2. ELEVATIONS SHALL BE SHOWN ON CONSTRUCTION PLANS. THE OUTER EDGE OF THE LOCAL DEPRESSION SHALL CONFORM TO FINISHED STREET GRADE.
3. SPECIAL DETAILS GOVERNING THE CONSTRUCTION ON A VERTICAL CURVE SHALL BE SHOWN ON CONSTRUCTION PLANS.
CASE A

CASE B

CASE C

NOTES:
1. LOCAL DEPRESSION SHALL BE CASE B UNLESS OTHERWISE SPECIFIED ON GENERAL PLAN.
2. ELEVATIONS AT OUTER CORNERS SHOWN ON GENERAL PLAN. IF NO ELEVATIONS ARE SPECIFIED, THE OUTER EDGE OF THE LOCAL DEPRESSION SHALL CONFORM TO FINISHED STREET SURFACE.
3. A=4 FEET UNLESS OTHERWISE SPECIFIED.
4. SEE STANDARD DRAWING 471 OR 472.
5. WHERE NO CURB EXISTS, CURB SHALL BE CONSTRUCTED BETWEEN ENDS OF LOCAL DEPRESSION. CURB SECTION SHALL CONFORM TO TOWN OF YUCCA VALLEY STANDARD B.S.
6. DEPRESSION SHALL BE CLASS "A" CONCRETE.

Town of Yucca Valley

LOCAL DEPRESSION
NO. 2

STANDARD DRAWING NO. 402
1. LOCAL DEPRESSION SHALL BE:
   (a) CASE "A" FOR CATCH BASIN NO. 4 (SEE STD. DWG. 471) UNLESS OTHERWISE SPECIFIED.
   (b) CASE "B" FOR CATCH BASIN NO. 6 (SEE STD. DWG. 472) UNLESS OTHERWISE SPECIFIED.

2. ELEVATIONS AT OUTER CORNERS SHOWN ON PROJECT DRAWINGS.
   IF NO ELEVATIONS ARE SPECIFIED THE OUTER EDGE OF THE LOCAL DEPRESSION SHALL CONFORM TO THE FINISHED STREET SURFACE.

3. A=4 FEET UNLESS OTHERWISE SPECIFIED.
   T=SEE STANDARD DRAWING 471 OR 472.
   W=SEE STANDARD DRAWING 471 OR 472.

4. WHERE NO Curb EXISTS, Curb SHALL BE CONSTRUCTED BETWEEN EDGES OF LOCAL DEPRESSION. CURB SECTION SHALL CONFORM TO TOWN OF YUCCA VALLEY STANDARD DWGS.

5. DEPRESSION SHALL BE CLASS "B" CONCRETE.

---

Town of
Yuca Valley

LOCAL DEPRESSION
NO. 3

STANDARD DRAWING NO. 403

R.C.E. 27943

APPROVED: TOWN ENGINEER

FRED K. HOLT

APPROVED: DATE

REVISED BY DATE
NOTES:
1. FLOOR OF BOX TO BE TROWELED SMOOTH.
2. WHEN TOE OF SLOPE IS WITHIN THE R/W, INLET TYPE I BEGINS AT THE TOE, RATHER THAN AT THE R/W LINE.
3. FOR OPEN DITCH APPROACH (TYPE II) THE 2' OR MORE IS FROM THE R/W LINE.
4. TOP OF INLET STRUCTURE (TYPE I OR II) TO BE FLUSH WITH ADJACENT SIDEWALK WHERE PRACTICAL.
5. A HEADED STEEL STUD 5/8" X 6 3/8" WITH HEAD 0.1" ATTACHED BY A FULL PENETRATION BUTT WELD MAY BE USED AS AN ALTERNATE ANCHOR.
6. NORMAL CURB AT POINTS M AND Q. B + 5" AT POINTS N AND P.
7. THE 3" LEG OF THE INTERIOR ANCHORS SHALL BE PARALLEL TO THE TOP OF SIDEWALK.
NOTES:
1. CONCRETE SHALL BE CLASS "A"
2. FLOOR OF STRUCTURE SHALL BE GIVEN A STEEL TROWEL FINISH.
3. TOP OF BOX TO HAVE SIDEWALK FINISH.
4. ANCHORS SHALL BE SYMMETRICALLY SPACED AND NOT TO EXCEED 4' BETWEEN CENTERS, AND BE PLACED 4 1/2" FROM EACH END OF THE STEEL ANGLE, A MINIMUM OF 3 ANCHORS IS REQUIRED.
2x2x3/8" W/ 3/16" WELD TO FACE OF ANGLE ONLY

PLAN

1/4" CHECKERED STEEL PLATE (GALV.)

SUPPORT BAR
12" x 1/2" DIA. ROD WELD TO ANGLE

SECTION A-A

6" 6'-0" (MAX.) 6"

1/2" x 6" ANCHOR BAR 12" O.C.

SECTION B-B

#4 BARS 18" O.C.

NOTES:
1. ALL CONCRETE TO BE CLASS "A"
2. ALL STEEL EXCEPT REINFORCING BARS SHALL BE GALVANIZED AFTER FABRICATION.

PARKWAY CULVERT
W/STEEL PLATE COVER

STANDARD DRAWING NO. 406
NOTES:
1. VALUES FOR A, B, C, ELEV. R AND ELEV. S ARE SHOWN ON PROJECT DRAWINGS. TABLE OF VALUES FOR T SHOWN ON THIS PLAN.
2. STATIONS SPECIFIED ON DRAWINGS APPLY AT THE INTERSECTION OF CENTERLINES AT MAIN LINE AND LATERALS, EXCEPT THAT STATIONS FOR CATCH BASIN CONNECTOR PIPE APPLY AT INSIDE WALL OF STRUCTURE.
3. REINFORCING STEEL SHALL BE STRAIGHT BARS 1 1/2" CLEAR FROM INSIDE FACE OF CONCRETE UNLESS OTHERWISE SHOWN.
   W BARS ARE OF SIZE AND SPACING SPECIFIED FOR WALL STEEL ON PLAN AND SHALL BE CUT IN CENTER OF OPENING AND BENT INTO TOP AND BOTTOM OF JUNCTION STRUCTURE.
   OMIT H BARS WHEN SOFFIT OF SPUR IS 12" OR LESS BELOW SOFFIT OF MAIN LINE AND OMIT G BARS WHEN INVERT OF SPUR IS 12" OR LESS ABOVE FLOOR LINE AT MAIN LINE.
4. JUNCTION STRUCTURE SHALL BE POURED MONOLITHICALLY WITH MAIN LINE STORM DRAIN, MANHOLE OR TRANSITION.
5. FLOOR OF STRUCTURE SHALL BE STEEL-TROWELED TO THE SPRING LINE.
6. STRUCTURAL CONCRETE SHALL BE CLASS "A".
7. EMBEDMENT P SHALL BE 5" FOR B = 95° OR LESS AND 8" FOR B OVER 90°.
8. BACKFILL UNDER STRUCTURE WITH 1-3-5 MIX CONCRETE, OR COMPACT SOIL TO RELATIVE DENSITY REQUIRED BY SPECIFICATIONS.
   BACKFILL MAY BE OMITTED IF STRUCTURE IS Laid ON UNDISTurbed EARTH TO STORM DRAIN WALL.
NOTES FOR JUNCTION STRUCTURE NO. 2

1. VALUES FOR A, B, C, D, E, F, G, L, ELEVATION R, AND ELEVATION S SHOWN ON IMPROVEMENT PLAN.

2. PIPE SHALL BE CRADLED IN CLASS A CONCRETE EXTENDING LONGITUDINALLY TO POINTS 1 FT. BEYOND THE LIMITS OF L. H = 1/2 OUTSIDE DIAMETER OF PIPE + 4" AS A MINIMUM. CRADLE MAY BE OMITTED ON SIDE OPPOSITE LATERAL INLET WHEN CONSTRUCTED IN CONNECTION WITH EXISTING STORM DRAIN.

3. A AND B BARS SHALL BE CARRIED TO POINT NOT LESS THAN J DISTANCE FROM CENTERLINE, J = \( \frac{7D}{12} + 6" \).

4. RECTANGULAR OPENING IN MAIN LINE PIPE SHALL BE CUT WITHIN THESE LIMITS NORMAL TO PIPE SURFACE WITHOUT DAMAGING STEEL VALUES FOR F, G, AND L ON IMPROVEMENT PLAN.

5. TRANSVERSE REINFORCEMENT IN PIPE SHALL BE CUT IN CENTER OF OPENING AND BENT TO UNIFORM DISTANCE FROM TOP AND BOTTOM OF JUNCTION STRUCTURE.

6. STRUCTURAL CONCRETE SHALL BE CLASS "A".

7. REINFORCING STEEL SHALL BE ROUND, DEFORMED, STRAIGHT BARS, 1-1/2" CLEAR FROM INSIDE FACE OF CONCRETE UNLESS OTHERWISE SHOWN.

8. STEEL SCHEDULE AS SHOWN.

9. MONOLITHIC ARCH: WHEN JUNCTION STRUCTURE NO. 2 IS SPECIFIED WITH REINFORCED MONOLITHIC ARCH STORM DRAIN, VALUE D SHALL REFER TO THE CLEAR SPAN OF THE ARCH. REINFORCING STEEL SHALL BE CUT AND BENT INTO JUNCTION STRUCTURE THE SAME AS FOR PIPE. CONCRETE CRADLE UNDER REINFORCED MONOLITHIC ARCH IS NOT REQUIRED.

10. FLOOR OF STRUCTURE SHALL BE STEEL-TROWELED TO SPRING LINE.

Robert K. Holt

No. 27943
EXPIRES 03-31-98
STATE OF CALIFORNIA
CIVIL

APPROVED: TOWN ENGINEER

Robert K. Holt
R.C.E. 27943

Town of Yucca Valley

JUNCTION STRUCTURE NO. 2

STANDARD DRAWING NO. 411A
Inlet Pipe Bedding

MIN. BEARING SURFACE EQUALS 0.2

SECTION B-B

MIN. BEARING SURFACE EQUALS 0.2

SECTION C-C

CASE 2—COLUMN SUPPORT
D = 60° OR LESS FOR C.M.P.
D = 30° OR LESS FOR R.C.P. OR C.P.

NOTES:
1. ALL CORRUGATED METAL PIPE AND FITTINGS SHALL BE GALVANIZED.
2. USE JUNCTION STRUCTURE NO. 1 WHERE SIZE OF THE INLET PIPE EXCEEDS DIMENSIONS GIVEN ABOVE.
3. UNLESS OTHERWISE SPECIFIED, CASE 2 SUPPORT SHALL BE USED.
4. ELEVATION "5" SHALL BE SPECIFIED ON PROJECT DRAWINGS.

SECTION D-D

CASE 3—TOP SLAB ENTRANCE
D = 30" OR LESS

1:3:5 MIX CONC., ENCASEMENT WHEN MORE THAN ONE SECTION OF PIPE IS USED

FOR OUTLET SEE STANDARD CATCH BASIN PLANS

1.5" CONCRETE PIPE

CATCH BASIN FLOOR

CUT BARS 2" CLEAR OF HOLE

#5 @ 4" TO BE PLACED 2" CLEAR OF HOLE

#8 @ 4" LENGTH = D IN FT. + 3", PLACED UNDER CUT BARS AND ON TOP OF UN-CUT BARS IN BOTTOM OF SLAB. Omit bars that fall over sidewalks.

DRAWN
ROBERT K. HOLI
No. 27943
03-31-98
CIVIL

REGISTERED PROFESSIONAL ENGINEER
STATE OF CALIFORNIA

APPROVED: TOWN ENGINEER
Robert K. Holt
R.C.E. 27943

APPROVED: DATE

JUNCTION STRUCTURE
NO. 3

STANDARD DRAWING NO. 412

Town of Yucca Valley
**SECTION B-B**

CASE-1

ELEVATION "S" SEE NOTE BELOW

DING OF INLET PIPE

BACKFILL WITH CONCRETE TO SPRING LINE OF LATERAL OR COMPACT SOIL TO RELATIVE DENSITY REQUIRED BY SPECIFICATIONS.

PIPE BEDDING

UNDISTURBED EARTH

MINIMUM BEARING SURFACE EQUALS 1/2 O.D.

CASE-2

CATCH BASIN ABOVE STORM DRAIN

NOTE:

ALL CONNECTOR PIPES (WITHIN THE ANGLES SPECIFIED FOR CASE 2) SHALL THEN BE ENCASED WHEN LAYED WITHIN THE MAIN PIPE EXCAVATED TRENCH OR WHEN LAID ON FILL WHICH HAS NOT BEEN DENSIFIED.

NOTES: CASES 1 & 2


2. Ø OF INLET SHALL BE ON RADIUS OF MAIN STORM DRAIN EXCEPT WHEN ELEVATION "S" IS SHOWN ON THE PROJECT DRAWING PROFILE.

3. THE MINIMUM OPENING INTO THE EXISTING STORM DRAIN SHALL BE THE OUTSIDE DIAMETER OF THE CONNECTING PIPE + 1 INCH.

4. ALL CORRUGATED METAL PIPE AND FITTINGS SHALL BE GALVANIZED.

5. STA. AT F.L. & CENTER OF PIPE, SHOWN ON PROJECT DRAWING PROFILE.

NOTES: CASE-3—SADDLE CONNECTION

1. CONNECTIONS TO PIPES 21" OR LESS IN DIAMETER WITHOUT JUNCTION STRUCTURES OR PRECAST Y BRANCHES SHALL BE MADE WITH SADDLES.

2. TRIM OR CUT SADDLE TO FIT SNUGLY OVER THE OUTSIDE OF THE MAIN PIPE AND SO ITS AXIS WILL BE ON THE LINE AND GRADE OF THE CONNECTING PIPE.

3. THE OPENING INTO THE PIPE SHALL BE CUT AND TRIMMED TO FIT THE SADDLE SO THAT NO PART WILL PROJECT WITHIN THE BORE OF THE SADDLE PIPE.

4. THE CONNECTION PIPE SHALL BE SUPPORTED AS SHOWN IN CASE 1 AND 2.
NOTES:
1. VALUES FOR D, T, ELEV. S, ELEV. R, C, AND STA. X ARE SHOWN ON PROJECT DRAWINGS.
2. REINFORCING STEEL SHALL BE STRAIGHT BARS 1.5" CLEAR FROM FACE OF CONCRETE.

TABLE FOR DIMENSIONS AND BAR SIZES

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SECTION B-B

SECTION C-C

SECTION A-A

APPROVED:

TOWN ENGINEER

JUNCTION STRUCTURE

NO. 5

STANDARD DRAWING NO. 414
NOTES:

1. VALUES FOR D, L, C, E. L, R, & STA. "X" ARE TO BE SHOWN ON PROJECT DRAWINGS.

2. REINFORCING BARS SHALL BE PLACED 1 1/2" CLEAR FROM FACE OF CONCRETE.

3. CONCRETE SHALL BE CLASS "B".

4. PLACE #4-12"x18" BARS WITH SHORT LEG HORIZONTAL IN VERTICAL J.S. WALL. ROTATE LONGER LEG INTO CENTER OF SLOPE PAVING.

5. REINFORCEMENT SHALL BE PROVIDED IN ALL PORTIONS OF THE JUNCTION STRUCTURE AS INDICATED ON DRAWINGS REGARDLESS OF BAR LENGTH MODIFICATIONS REQUIRED TO ACHIEVE PROPER CLEARANCES.
NOTES:

1. The horizontal angle of divergence or convergence, B, shall not exceed 5° 45'.

2. Reinforcing steel bar sizes, spacing, pattern and cover over the steel shall be that of the box section. The bar lengths shall vary uniformly throughout the transition.

3. The concrete thickness shall be that of the box section unless the wall thickness of the pipe plus 4 inches is greater, in which case the concrete thickness shall vary uniformly from that of the box section to that of the pipe wall plus 4 inches.

4. The interior surface shall be smooth and vary uniformly between the two adjoining sections.

5. At the pipe junction, embedment P shall be 5 inches for pipe sizes of 96 inches or less, and 8 inches for pipe over 96 inches.

6. Construction joints of the same dimensions as those of the box may be carried through the transition structure at contractor's option. See Sec. B-B above.

7. The transition structure shall be constructed in accordance with the general construction notes applying to Box as shown on the project drawings.

8. Structural concrete shall be Class "A".
NOTES:

1. THE HORIZONTAL ANGLE OF DIVERGENCE OR CONVERGENCE, θ SHALL NOT EXCEED 5°45'.'
2. THE REINFORCING STEEL BAR SIZE, SPACING AND COVER OVER THE STEEL OF STRAIGHT TRANSVERSE BARS IN TOP OR BOTTOM SLABS, OF L-BARS IN TOP OR BOTTOM CORNERS, OF STRAIGHT VERTICAL BARS IN SIDE WALLS, AND OF LONGITUDINAL DISTRIBUTION AND TIE BARS IN TOP OR BOTTOM SLABS OR SIDE WALLS SHALL BE THOSE OF WHICH-EVER ADJOINING BOX SECTION PROVIDES THE GREATER STEEL AREA FOR EACH TYPE OF BAR. THE BAR LENGTH SHALL VARY UNIFORMLY THROUGHOUT THE TRANSITION.
4. STRUCTURAL CONCRETE SHALL BE CLASS "A".
5. THE TRANSITION STRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE GENERAL STRUCTURAL NOTES APPLYING TO BOX STRUCTURES, SHOWN ON THE PROJECT DRAWINGS.
6. DETAILS OF CONSTRUCTION JOINTS SHALL BE AS SHOWN ON THE PROJECT DRAWINGS FOR SINGLE BARREL BOX STRUCTURES.
**TABLE**
FOR DIMENSIONS AND BAR SIZE

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**NOTES:**
1. The horizontal angle of divergence or convergence, $\theta$, shall not exceed 5°45'.
2. Values for $A$, $B$, $C$, $D_1$, $D_2$, ELEV. R and ELEV. S are shown on improvement plan. The length of the structure may be increased to meet pipe ends using D bars in extended portion of same diameter and spacing as specified.
3. Concrete shall be Class "A." Floor of the structure shall be steel-troweled to spring line structure shall be poured in one continuous operation, except that the contractor shall have the option of placing at the spring line a construction joint with a longitudinal keyway.
4. Reinforcing steel clear cover shall be 1 1/2" on inside. Tie bars shall be No. 4 and spaced 18" O.C.
5. When dimension C is not specified the spur shall not be constructed and A and B bars shall be omitted.

---

**Town of Yucca Valley**

**TRANSITION STRUCTURE**
**NO. 3**

**STANDARD DRAWING NO.** 422
NOTES:

1. THE HORIZONTAL ANGLE OF DIVERGENCE OR CONVERGENCE, B SHALL NOT EXCEED 3° 45'.

2. REINFORCING STEEL BAR SIZE, SPACING AND OUTSIDE COVER SHALL BE THAT OF DOUBLE BOX SECTION. FOR CURVED TRANSITIONS, SPACE BARS ON CENTERLINE AND PLACE TRANSVERSE STEEL RADially. THE BAR LENGTHS AND DIMENSIONS SHALL VARY UNIFORMLY THROUGHOUT TRANSITION. LONGITUDINAL BARS SHALL BE CONTINUED THROUGH JOINTS WITH THE TRANSITION STRUCTURE.

3. THE CONCRETE THICKNESS SHALL BE THAT OF THE DOUBLE BOX SECTION.

4. PLAN AS SHOWN IS FOR DOUBLE BOX SECTION DOWNSTREAM. WHEN DOUBLE BOX SECTION IS UPSTREAM, TAPER THE LAST 2 FT. OF CENTER WALL TO END IN 1-1/2 INCH RADIUS.

5. STRUCTURAL CONCRETE SHALL BE CLASS "A".

6. TRANSVERSE JOINT KEYWAYS AS DETAILED FOR LONGITUDINAL JOINT KEYWAYS AT BASE OF OUTER WALLS ON THE PROJECT DRAWINGS, SHALL BE PLACED IN BOTH SLABS AND WALLS AT THE END OF EACH FOUR.
TYPICAL SECTION

CONNECTOR PIPE COLLAR

NOTES:
1. CONCRETE SHALL BE CLASS "B" CONCRETE.
2. 1/2" PREFORMED BITUMINOUS JOINT MATERIAL.
3. 2' WITH MIN. 6" BELOW GRADE OR AS DIRECTED BY ENGINEER.
NOTES:

1. A CONCRETE COLLAR IS REQUIRED WHERE THE CHANGE IN GRADE EXCEEDS 0.10 FT. PER FOOT, OR IF CHANGE IN ALIGNMENT EXCEEDS 0.10 FT PER FOOT.

2. WHERE PIPES OF DIFFERENT DIAMETERS ARE JOINED WITH A CONCRETE COLLAR, L AND T SHALL BE THOSE OF THE LARGER PIPE. D=D1 OR D2 WHICHEVER IS GREATER.

3. FOR PIPE LARGER THAN 66" A SPECIAL COLLAR DETAIL IS REQUIRED.

4. FOR PIPE SIZE NOT LISTED USE NEXT SIZE LARGER.

5. OMIT REINFORCING ON PIPES 24" AND LESS IN DIAMETER AND ON ALL PIPES WHERE ANGLE "A" IS LESS THAN 10°.

6. WHERE REINFORCING IS REQUIRED, THE DIAMETER OF THE CIRCULAR TIES SHALL BE D+(2x WALL THICKNESS)+8".

7. WHEN D1 IS EQUAL TO OR LESS THAN D2, JOIN INVERTS AND WHEN D1 IS GREATER THAN D2, JOIN SOFFITS.

8. PIPE MAY BE CORRUGATED METAL PIPE, CONCRETE PIPE, OR REINFORCED CONCRETE PIPE.
HEADWALL SHALL BE MONOLITHIC, LAP ALL BARS AT CORNERS 30 DIAMETERS IF NOT CONTINUOUS.

ELEVATION

REINFORCING DETAIL

SECTION A-A

NOTES:

1. HEADWALL SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE.

2. REINFORCING STEEL SHALL BE #4 BARS FOR "W" UP TO 50". ABOVE "W"=50" #5 BARS SHALL BE USED. 2" MINIMUM CLEARANCE, 30 DIAMETER LAP, ALL STEEL.

3. ADJACENT SLOPES SHALL BE 1-1/2 TO 1 OR FLATTER.

4. MULTIPLE PIPES TO BE SET WITH LONGITUDINAL CENTERS 1-2/3 DIAMETERS APART.

5. ALL EXPOSED CORNERS TO BE ROUNDED 3/4" RADIUS.

6. W SHALL BE INCREASED WHEN MULTIPLE PIPES OR PIPES ON SKEW ARE USED.

Town of Yucca Valley

HEADWALL
WING - TYPE

STANDARD DRAWING NO. 440
NOTES:
1. REINFORCING STEEL IN WALLS AND BASE SHALL BE THE SAME AS STD. NO. 440.
2. NOTES SHALL BE THE SAME AS STD. NO. 440.
3. SECTION A--A IS THE SAME AS STD. NO. 440.
NOTE: 12" OF AGGREGATE BASE REQUIRED ON GRADED ROADS.

DIKE DIMENSIONS AND LENGTH SHOWN ON PLANS.

SECTION A-A

12" THICK RUBBLE APRON OR B" CLASS "B" CONC.

0.00% SLOPE

CLASS "B" CONC.

1/2+6"

NOTES:
1. ALL CONCRETE TO BE CLASS "B".
2. L= SHOWN ON PLANS. H= 3' MIN., 6' MAX.
3. DRAINAGE EASEMENT REQUIRED.
4. AREA SHOWN THUS ———— SHALL BE COMPACTED TO 90% RELATIVE DENSITY.
5. REINFORCED BLOCK WALL AND FOOTING PERMITTED.
Section B-B

Section C-C

Section F-F

Note:
Pavement shall be constructed of 3" min. thick AR4000 asphalt concrete.
Grate (or checkered optional) see standard drawing 461

L 3" x 2 1/2" x 3/8"

1/4" CLEAR

2" CL.

3" x /2" BARS

1/4"

DETAIL "B"

Rodded end
Lug 3/4" x 1 1/2"
Punch 1" hole in pipe to receive lug.

GRADE 6" MIN. CIRCLE AROUND INLET WHERE POSSIBLE.

NOTE:
OPENINGS ARE OPTIONAL. USE 3E" C.M.P. THICKNESS=0.064 WHEN OPENINGS ARE OMITTED.

SECTION A-A

6 OPENINGS @ L=12"

36" C.M.P.
THICKNESS = 0.109"

1/4-

18"R.P.C. OR C.M.P.

18"C.M.P.
THICKNESS = 0.064"

UNLESS OTHERWISE NOTED ON PLANS

NOTES:
1. PLACE GRATE BARS PARALLEL TO FLOW.
2. GRATE AND FRAME SHALL BE GALVANIZED.

INLET TYPE X
(GRATE DETAILS)

STANDARD DRAWING NO. 460
NOTES:

1. 3/8" x 1 1/2" GALVANIZED BOLTS WITH HEX NUTS. FIELD WELD EACH NUT TO ANGLE.
2. DRILL HOLE 7/16" MATCHED 4 PLACES AS SHOWN IN PLAN.
3. PLATE AND ANGLE ASSEMBLY SHALL BE GALVANIZED.
NOTES:
1. STORM DRAIN CLEANOUT SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE.
2. CLEARANCE FROM I.D. OF PIPE TO CLEANOUT WALL SHALL BE 4" MIN.
3. APPROVED PRECAST CONCRETE MANHOLE SHAFT RINGS WILL BE ACCEPTED IN LIEU OF CAST-IN-PLACE SHAFT.

STEP DETAIL

PLACE 3/4" GALVANIZED IRON STEPS IN WALL A MAXIMUM OF 15" APART
24" DIA. MANHOLE FRAME AND GRATE ALHAMBRA # A-1200 OR APPROVED EQUAL.

1" DIA. HOLE W/ MIRAFI FABRIC BACKING AS SHOWN

CAP DETAIL

NOTES:

1. PRECAST REINFORCED CONCRETE MANHOLE PIPE TO MEET REQUIREMENTS OF ASTM C 478 SPECIFICATIONS WITH INCREASES IN REINFORCEMENT AND WALL THICKNESS TO MEET LOCAL REQUIREMENTS. MINIMUM COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 4000 P.S.I. AT 28 DAYS.

2. DRYWELL DIMENSIONS AND LOCATION SHALL BE VERIFIED BY A LICENSED SOILS ENGINEER.

3. FINAL DESIGN IS SUBJECT TO APPROVAL BY THE TOWN ENGINEER.
TYPICAL FOR DIAMETERS
GREATER THAN 48"

CUT 3"x12" FOR
TIGHT FIT. 3 REQ'D.

3"x12"x(D+2T)"

TYPICAL FOR DIAMETERS
48" AND LESS

CUT 3"x12" FOR TIGHT FIT.
ONE REQ'D.

3"x12"x(D+2T)"

NOTES:
1. NAIL 3"x12" TO VERTICAL SUPPORTS
   WITH 40d GALV. NAILS 3" O.C.
2. ALL LUMBER SHALL BE CREOSOTED
   DOUGLAS FIR, 1500 f CONSTRUCTION
   GRADE.

Town of
Yucca Valley

TIMBER BULKHEADS

STANDARD DRAWING NO. 464
NOTES:
1. NAIL 3" x 12" TO VERTICAL SUPPORTS WITH 40d GALV. NAILS 3" C.C.
2. ALL LUMBER SHALL BE CREGOSATED DOUGLAS FIR, 1500 f CONSTRUCTION GRADE.

SECTION A-A
3" x 12" x (W+2T)

6" x 6" VERT.
SUPPORT

GALV. - L 3" x 3" x 1/4"

GALV. - 4" x 3/8" LAG SCREW

GALV. - 6" x 3/8" ANCH. BOLT

DRILL 3/4" HOLE FOR EA. #4

KEYED CONST. JOINT
#4 @ 12" - 3" LONG WITH EXPOSED ENDS HEAVILY GREASED.

DETAIL A
NOTES:
1. CONCRETE SHALL BE CLASS "B".

2. REINFORCING STEEL SHALL BE CENTERED IN BULKHEAD WITH HORIZONTAL "A" BARS TOWARDS OUTSIDE FACE OF BULKHEAD.

3. WHERE CONCRETE BULKHEAD IS USED WITH RCB, T & "A" BARS SHALL BE DETERMINED BY THE HEIGHT OF THE R.C.B.

4. LIFTS SHALL BE WOVEN STEEL CABLE WITH SAME MIN. DIAMETER (d) AS "A" BARS. WEAVE CABLE THROUGH HORIZONTAL "A" BARS. COAT EXPOSED PORTION OF CABLE LIFTS WITH AN APPROVED BITUMINOUS PAINT PRIOR TO BACKFILLING TRENCH.
GENERAL NOTES:

1. IN THE CASE OF SANITARY SEWER SUPPORTS PER CASE 1, 2, OR 3 OF THIS STANDARD, THE SEWER SHALL BE ENGAGED FOR THE SECTION E-F, AND THE SUPPORT SHALL BE LENGTHENED AND WIDENED TO FULLY SUPPORT SUCH ENGAGEMENT.

2. ANY OF THE CASES SHOWN ON THIS STANDARD MAY BE USED AT THE CONTRACTOR'S OPTION UNLESS OTHERWISE SHOWN ON THE PROJECT DRAWING.

3. THE MINIMUM LENGTHS OF BEARINGS SHOWN AT THE ENDS OF R.C. BEAMS, CAST IRON AND STEEL PIPES SHALL BE INCREASED IF SO DIRECTED BY THE ENGINEER.

4. "S" IN ALL CASES EQUALS THE SPAN OF THE PIPE SUPPORT MEASURED ALONG ITS CENTERLINE, BETWEEN THE SIDES OF THE TRENCH OR TO CENTERLINE OF COLUMN SUPPORTS.

CASE 1 NOTES:

1. WIDTH OF BEAN SHALL BE OUTSIDE DIAMETER OF PIPE PLUS 2".

2. REINFORCING STEEL SHALL BE PLACED 1 1/2" CLEAR FROM THE SIDES AND BOTTOMS OF BEAMS.

3. IF BEAMS ARE PRECAST, ENDS OF BEAMS SHALL BE BIDED IN 1:3:6 MIX CONCRETE TO EIGHT OF TRENCH.

4. 1/2 MIX MORTAR SHALL BE PLACED BETWEEN TOP OF BEAMS AND BOTTOM OF PIPE TO GIVE BEARING.

CASE 2 NOTES:

1. SUPPORTING WALL SHALL HAVE A FIRM BEARING ON THE SUBGRADE AND AGAINST THE SIDES OF THE EXCAVATION.

2. WALL SHALL BE AT LEAST 2' FREE AND CLEAR OF GAS OR WATER MAIN OR OTHER CONDUIT OR DUCT.

3. EITHER TYPE A OR TYPE B CROSS SECTION MAY BE USED AT CONTRACTOR'S OPTION.

4. WHenever so directed by the engineer, the contractor shall pierce the wall with suitable openings to prevent pressure resulting from flooding the backfill. The volume of the pierced opening shall not exceed 1/2 the volume of the supporting wall.

CASE 3 NOTES:

1. CLASS 2000-G SPUN REINFORCED CONCRETE PIPE OF THE SAME DIAMETER AS EXISTING PIPE MAY BE USED ONLY WHERE WIDTH OF TRENCH IS 3'-0" OR LESS.
**R.C.P. BEDDING & PAY LINES**

**NORMAL CONDITION**

- Excavation Pay Lines (Typ. Both Sides)
- Backfill Pay Lines (Typ. Both Sides)
- Well Graded Sand

**R.C.P. BEDDING & PAY LINES**

**GROUNDWATER CONDITION**

- Excavation Pay Lines (Typ. Both Sides)
- Backfill Pay Lines (Typ. Both Sides)
- Well Graded Sand

**R.C.B. PAY LINES**

**NORMAL CONDITION**

- Single, Double and Triple Cell R.C.B.
- Excavation Pay Lines (Typ. Both Sides)
- Filter Material

**R.C.B. PAY LINES**

**GROUNDWATER CONDITION**

- Single, Double and Triple Cell R.C.B.
- Excavation Pay Lines (Typ. Both Sides)
- Filter Material

**R.C. CHANNEL PAY LINES**

**NORMAL CONDITION**

- Natural Ground
- Excavation Pay Lines
- R.C. Channel

**R.C. CHANNEL PAY LINES**

**GROUNDWATER CONDITION**

- Natural Ground
- Excavation Pay Lines
- R.C. Channel

*NOTE:*
The normal condition, bedding & pay lines are to be used unless otherwise indicated in the specifications or directed by the engineer.

**APPROVED:**

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<th>BEDDING AND PAY LINES</th>
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NOTES

1. DIMENSIONS, UNLESS OTHERWISE SPECIFIED:
   \[ V = 5'0'' W = 7' \]
   \[ 9'0'' W = 14' \]
   \[ 12'0'' W = 21' \]
   \[ V = \text{SHALL} \text{BE} \text{SHOWN} \text{ON} \text{THE} \text{PLANS} \]
   \[ W = \text{SHALL} \text{BE} \text{SHOWN} \text{ON} \text{THE} \text{PLANS} \]
   \[ (7 \text{ FEET MIN.}) \]
   \[ T = 6 \text{ INCHES} \text{IF} V \text{IS} 4 \text{ FEET} \text{OR} \text{LESS} \]
   \[ T = 8 \text{ INCHES} \text{IF} V \text{IS} \text{LESS} \text{THAN} \text{8} \text{ FEET} \]
   \[ T = 10 \text{ INCHES} \text{IF} V \text{IS} \text{8} \text{ FEET} \text{OR} \text{MORE} \]
   \[ D = 18 \text{ INCHES} \text{UNLESS OTHERWISE SPECIFIED} \]
   \[ A = 36 \text{ INCHES} \text{UNLESS OTHERWISE SPECIFIED} \]


3. THE REINFORCING STEEL SHALL BE NUMBER 4 REINFORCING BARS. CLEARANCE SHALL BE 1 1/2 INCH FROM THE BOTTOM OF THE SLAB. SEE NOTE 7.

4. THE SURFACE OF ALL EXPOSED CONCRETE SHALL CONFORM TO SLOPE, GRADE, COLOR, FINISH AND SANDING IN THE EXISTING OR PROPOSED CURB AND WALK ADJACENT TO THE BASIN. THE BASIN FLOOR SHALL BE GIVEN A LIGHT FLOAT LIFEBE. CURVATURE OF THE LIP AND SIDEWALK AT THE GUTTER OPENING SHALL NOT BE MADE BY PLASTERING THE STEPS. THE OUTLET PIPE SHALL BE TRIMMED TO FINAL SHAPES AND LENGTHS BEFORE THE CONCRETE IS POURED.

5. STEPS:
   3/4 INCH PLAIN ROUND GALLONIZED STEEL STEPS SHALL BE INSTALLED 18 INCHES APART WHEN V EXCEEDS 4 FEET 6 INCHES. THE TOP STEPS SHALL BE 6 INCHES BELOW THE TOP SURFACE AND SHALL BE 2 1/2 INCHES CLEAR FROM THE WALL. ALL OTHER STEPS SHALL BE 4 INCHES CLEAR FROM THE WALL. ALL STEPS SHALL BE INSTALLED IF V IS 4 FEET 6 INCHES OR LESS. ALL STEPS SHALL BE INSTALLED IN THE WALL OF THE BASIN.

6. CURB, GUTTER AND LOCAL DEPRESSIONS SHALL BE CLASS "B" CONCRETE.

7. SEE STANDARD DRAWING 473 FOR WALL & FLOOR STEEL REINFORCING.

SECTION A-A

CATCH BASIN NO. 1

PERSPECTIVE OF

SEE STD. DWGS. 481 & 481A CATCH BASIN INLET FOR DETAILS.

ANCHOR

CURB FACE

CONST. JOINT

STEP: SEE STD. DWG. 402 AND NOTE 5

SLOPE TO OUTLET FROM ALL DIRECTIONS

SEE STANDARD DRAWING NO. 474, SPECIAL CONSTRUCTIONS.
NOTES FOR CATCH BASIN NO. 4

1. DIMENSIONS: UNLESS OTHERWISE SPECIFIED.

- \( V = 3.5 \) FEET.
- \( T = 6 \) INCHES, IF \( V \) IS 4 FEET OR LESS.
- \( T = 8 \) INCHES, IF \( V \) IS BETWEEN 4 FEET AND 8 FEET.
- \( T = 10 \) INCHES, IF \( V \) IS 8 FEET OR OVER.
- \( W = 2 \) FEET, 11\(\frac{3}{8} \) INCHES FOR ONE GRATING.
  ADD 3 FEET, 5\(\frac{3}{8} \) INCHES FOR EACH ADDITIONAL GRATING.

HIKE-UP SHALL BE PARALLEL TO PLANE OF GUTTER – SLOPE 3/4 INCH TO 1 FOOT.
SLOPE OF FLOOR PARALLEL WITH CURB SHALL BE 1 IN 12.

2. CONCRETE SHALL BE CLASS "A" PORTLAND CEMENT CONCRETE (6.0 SACK)

3. THE REINFORCING STEEL SHALL BE NUMBER 4 DEFORMED BARS. CLEARANCE SHALL BE 1-1/2 INCHES FROM TOP SLAB. SEE STD. DWG. 473 AND NOTE 3.

4. THE SURFACE OF ALL EXPOSED CONCRETE SHALL CONFORM TO SLOPE, GRADE, COLOR, FINISH, AND SCORING IN THE EXISTING OR PROPOSED CURB AND WALK ADJACENT TO THE BASIN. THE BASIN FLOOR SHALL BE GIVEN A TIGHT WOOD FLOAT FINISH. CURVATURE OF THE LIP AND SIDEWALLS AT THE GUTTER OPENING SHALL NOT BE MADE BY PLASTERING. THE OUTLET PIPE SHALL BE TRIMMED TO FINAL SHAPE AND LENGTH BEFORE THE CONCRETE IS POURER.

5. STEPS: 3/4 INCH PLAIN ROUND GALVANIZED STEEL STEPS ARE REQUIRED AS FOLLOWS:

- IF \( V \) IS 4.5 FEET OR LESS, NO STEPS ARE REQUIRED.
- IF \( V \) IS MORE THAN 4.5 FEET, AND NOT MORE THAN 5.0 FEET, INSTALL ONE STEP 12 INCHES ABOVE FLOOR OF BASIN.
- IF \( V \) IS MORE THAN 5.0 FEET, INSTALL STEPS 16 INCHES APART WITH THE TOP STEP 6 INCHES BELOW THE TOP OF GRATING.
ALL STEPS SHALL BE 4 INCHES CLEAR FROM THE WALL AND ANCHORED NOT LESS THAN 4 INCHES INTO THE WALL OF THE BASIN.
NOTES:

1. DIMENSIONS: UNLESS OTHERWISE SPECIFIED, V = 4.5 FEET. W = 7.0 FEET.
   T = 6 INCHES IF V IS 5 FEET OR LESS. T = 8 INCHES IF V IS BETWEEN 5 FT. & 8 FEET.
   T = 10 INCHES IF V IS 8 FEET OR MORE. Y = 2 FEET 3 INCHES.

2. CONCRETE SHALL BE CLASS "A" PORTLAND CEMENT CONCRETE (6.0 SACK).

3. THE REINFORCING STEEL SHALL BE NUMBER 4 DEFORMED BARS. CLEARANCE SHALL BE 1 1/2" FROM THE BOTTOM OF THE SLAB. SEE STANDARD DRAWING 473 - NOTE 3.

4. THE SURFACE OF ALL EXPOSED CONCRETE SHALL CONFORM TO THE SLOPE, GRADE, COLOR, FINISH, AND SCORING IN THE EXISTING OR PROPOSED CURB AND WALK ADJACENT TO THE BASIN. THE BASIN FLOOR SHALL BE GIVEN A TIGHT WOOD FLOAT FINISH. CURVATURE OF THE lip AND SIDE WALLS AT THE GUTTER OPENING SHALL NOT BE MADE BY PLASTERING. THE OUTLET PIPE SHALL BE TRIMMED TO FINAL SHAPE AND LENGTH BEFORE THE CONCRETE IS Poured.

NOTES
1. WALL & FLOORING REINFORCING SHOWN HEREON SHALL BE USED WITH CATCH BASIN STANDARD DRAWINGS.
2. REINFORCING STEEL SHOWN HEREON SHALL BE USED IN ALL CATCH BASINS ON STATE HIGHWAYS REGARDLESS OF BASIN LENGTH OR DEPTH.
3. PROVIDE WALL & FLOOR STEEL REINFORCING WHEN THE FOLLOWING "V" DEPTHS ARE EQUALED OR EXCEEDED:
   BASIN LENGTH=W  BASIN DEPTH=V
   TO 7.0'  10'  
   7' TO 14.0'  7'  
   14' TO 21.0'  6'  
   OVER 21.0'  ALL DEPTHS

WALL AND FLOOR STEEL
CATCH BASIN REINFORCEMENT—"W" TO 14'(INCL.)

GRAVING BASIN REINFORCEMENT

TOWN OF YUCCA VALLEY
CATCH BASIN REINFORCEMENT

STANDARD DRAWING NO. 473
NOTES:

1. REINFORCING STEEL SHALL BE 1 1/2" CLEAR FROM INSIDE FACE OF CONCRETE UNLESS OTHERWISE SHOWN.

2. REINFORCING STEEL FOR INSIDE FACE OF CATCH BASIN WALL SHALL BE CUT AT CENTER OF OPENING AND BENT INTO WALLS OF MONOLITHIC CONNECTION. REINFORCING STEEL FOR OUTSIDE FACE OF CATCH BASIN WALL SHALL BE CUT 2" CLEAR OF OPENING.

3. CONNECTION SHALL BE POURRED MONOLITHIC WITH CATCH BASIN. THE ROUNDED EDGE OF OUTLET SHALL BE CONSTRUCTED BY POURING CONCRETE AGAINST A CURVED FORM WITH A RADIUS OF 3".

4. FLOOR OF STRUCTURE SHALL BE STEEL-TROWELED TO SPRING LINE.

5. CONNECTIONS SHALL BE CONSTRUCTED WHERE (A) PIPES, 12 INCHES THROUGH 72 INCHES IN DIAMETER, INLET OR OUTLET THROUGH CORNER OF CATCH BASIN AT AN ANGLE LESS THAN 40° (B) ANGLE A, FOR PIPES 24 INCHES THROUGH 30 INCHES IN DIAMETER, IS LESS THAN 45°.
"X" (4' MIN.)

For lengths over 7', a support bolt shall be used (see standard No. 480)

2 #4 bars (extra)

Frame & Cover
STD No. 497

1/4" expansion material

Curb Line
Flow Line

SECTION A-A

Curb opening detail STD. No. 480
Local depression
STD. No. 400

Galv. steel steps below manhole
See STD. No. 480A

Pipe type & size shall be shown on plans
Thickness shall be shown on plans for metal pipe.

Detail of reinforcement around pipe

Approved: TOWN ENGINEER
R.C.E. 27943

Town of
Yucca Valley

Type "A"
Catch Basin

Standard Drawing No. 475
1 1/2:1 SLOPE MAXIMUM

CLEAR R/W OF ALL TREES, STUMPS, BRUSH, ETC. CLEAR SLOPES AND DEDICATE SLOPE RIGHTS. NO BRUSH, STUMPS, ETC., TO BE USED IN FILLS.

SEE DETAIL FOR REINFORCED CONCRETE COVER AND LIFT HANDLES.

MIN. COVER 9"  24" MIN. I.D.

MIN. GRADE -0.50%  14 GAGE (MINIMUM) C.M.P. OR REINFORCED CONCRETE PIPE (CLASS III)

NOTES:
FOR CONSTRUCTION DETAILS OF CATCH BASIN SEE STD. NO. 448A.
PLAN

CONCRETE CAP ON BOND BEAM WITH #3 BAR CONTINUOUS.

SEE STANDARD NO. 476 FOR COVER DETAILS

REINFORCEMENTS IN BASE SHALL BE #3 BARS 16" O.C. BENT AS VERTICAL DOWELS

SECTION A-A

NOTES:
1. 8"x8"x16" CONC. BLOCK WITH #3 STEEL 16" O.C. VERT. AND 24" O.C. HORIZ.
2. FILL ALL BLOCKS WITH GROUT.
3. BASE OF CATCH BASIN SHALL BE CONSTRUCTED WITH CLASS 'B' CONCRETE.
4. HORIZONTAL STEEL SHALL BE PLACED IN BOND BEAM BLOCKS.
**NOTES:**
1. CENTER SUPPORT ASSEMBLY SHALL BE USED WHEN TWO OR MORE GRATINGS ARE SPECIFIED.
2. ALL BOLTS USED IN CENTER SUPPORT SHALL BE 1/2".
3. FRAME MAY BE RIVETED OR WELDED.
4. BOLTS (NOT RIVETS OR NUTS) SHALL BE USED TO JOIN TWO OR MORE FRAMES TOGETHER AND TO THE "H" BEAM.
5. DETAIL OF END SPACERS SHOWS FINISHED DIMENSIONS.
6. ALL PARTS SHALL BE OF STRUCTURAL GRADE STEEL, EXCEPT END SPACERS, WHICH MAY BE OF OTHER CAST IRON OR STEEL.
7. ALL EXPOSED METAL PARTS SHALL BE GALVANIZED PRIOR TO ASSEMBLY, WELDING, MACHINING, AND DRILLING SHALL BE DONE BEFORE GALVANIZING. ALL DIMENSIONS ARE FINISHED DIMENSIONS AND INCLUDE GALVANIZING.
8. TOTAL WEIGHT = 500 LBS. FOR GRATE SHOWN.

**GRATE TYPE**
- 25 1/2" AS SHOWN ABOVE
- 24" CALTRANS STD. D77-B

**REVISION**

**STANDARD DRAWING NO.** 477
STEEL ANGLE & SUPPORT BOLT DETAIL

STEEL ANGLE ANCHOR

NOTES:

1. A plain round galvanized steel protection bar 3/4" in dia. shall be installed and embedded 6" at each end.
2. All exposed metal parts shall be galvanized. (except frame and cover)
3. Support bolts shall be uniformly spaced but not to exceed 7' on center.
4. Steel angle shall be bent to match curb alignment.

CATCH BASIN OPENING

STANDARD DRAWING NO. 480
Curb Armor and Support Bolts shall be Alhambra Foundry A-3911 or Equal. Length shall be opening width plus 12 inches.

Catch Basin Steel Plate
To be used only when shown on plans

Notes:
1. For notes and other details see Std. No. 480.
2. Steel plate shall not be used on curves.

Catch Basin Wall

Steps shall be Alhambra Foundry A-3320, A3315 or Equal

Galvanized Steel Step

Notes:
1. Steps - None required where "V" is 3'-6" or less. Install one step 16"± above floor when "V" is more than 3'-6" and less than 5'-0". Where "V" is more than 5'-0" steps shall be evenly spaced @ 12"± intervals from 16"± above the floor to within 12"± from the top of the box. Place steps in wall without pipe openings and under manhole.

Town of Yucca Valley

Catch Basin Steel Plate
Galvanized Steel Step

Standard Drawing No. 480A
FLATTEN ANCHOR SUFFICIENT TO PREVENT TURNING

3/4" STD. GALV. WROUGHT STEEL PIPE
3/8"x1/2" BRASS OR STAINLESS STEEL SOCKET SET SCREW
3/4" GALV. BAR SEE NOTES

VARIABLE

3/4" STD. GALV. WROUGHT STEEL COUPLING
COUPLING FIT SNUG OVER ENTIRE LENGTH
1 3/4" NON-TAPERED STD. PIPE THREAD

DRILL AND TAP FOR 3/8"x1/2" BRASS OR STAINLESS STEEL SOCKET SET SCREW CENTERED ON THE COUPLING

CURB FACE

FOR PROTECTION BAR SPACING DATA, SEE SHEET 1 OF 2

DETAIL OF ANCHOR

TOP OF CATCH BASIN

SEE NOTE 2 BOLT SUPPORT SEE SHT. 1 OF 2

ELEVATION

FLOW

"W"

"X" LENGTH "X" LENGTH "X" LENGTH

SEE NOTES SEE NOTES FLOW

SECTION A-A

SECTION SHOWING LOCATION OF ANCHOR AT WALL OF CATCH BASIN

NOTE: BRASS OR STAINLESS STEEL SOCKET SET SCREW ON INSIDE OF CATCH BASIN

NOTES:
   BAR LENGTHS SHALL NOT EXCEED 21' AND SHALL BE CUT TO FIT IN THE FIELD.
   WHEN "W" IS OVER 21', PROTECTION BAR SHALL CONSIST OF TWO OR MORE SECTIONS
   DEPENDING UPON LENGTH OF BASIN. LOCATION OF SPECIAL SUPPORT BARS AND ADDITIONAL
   SOCKET SET SCREW TO BE DETERMINED BY THE ENGINEER IN THE FIELD.

2. INSTALL COUPLING AT DOWNSTREAM END OF CATCH BASIN OPENING.
NOTE:
△ = WHEN STEEL FORMS ARE USED, ELIMINATE HOOK AND USE UPSET END.

PLAN VIEW

FRONT ELEVATION

* VARIES TO SUIT DIMENSION SHOWN ON STRUCTURE

3/4" ROUND STEEL BAR, BEND HOT

SECTION A-A
GALVANIZE AFTER BENDING

NOTE:
THIS DETAIL SHALL BE USED WHEREVER STEPS ARE REQUIRED.
NOTES:
2. INSTALL TWO 3/4" x 3/4" ALLEN SOCKET SET SCREWS, 90° TO PICK HOLE, IN HOLES DRILLED AND TAPPED 1" IN DEPTH. GALVANIZE PER A.S.T.M. 153.
3. FRAME AND COVER SHALL BE TESTED FOR ACCURACY OF FIT AND SHALL BE MARKED IN SETS BEFORE DELIVERY. RETAP FRAME AS REQUIRED TO SUIT SET SCREWS.

TOP OF MANHOLE FRAME & COVER
TOTAL WT. = 130 lbs.

BOTTOM OF MANHOLE COVER

CROSS SECTION THRU FRAME & COVER

CROSS SECTION THRU RIB
AT MID RADIUS

CROSS SECTION THRU RIB
EDGES TO BE ROUNDED TO 3" RADIUS

ALL STEEL REINFORCEMENT #4, #4

PLAN
(SHAFT NOT SHOWN)

SECTION B--B

SEE STANDARD DRAWING 462
AND NOTE 6

STREET GRADE

MANHOLE FRAME AND COVER
(SEE STANDARD DRAWING 498)

MIN. 2'-10 1/2" FOR PAVED STREETS
MIN. 3'-0" FOR UNPaved STREETS
(SEE NOTE 3)

MIN. 3'-0"

30" R.C.P.

SECTION A--A

DETAIL N
PLAN
(SHAFT NOT SHOWN, SEE NOTE 3)

ALL STEEL REINFORCEMENT #4, #4

SECTION C--C

STREET GRADE

1'-4" FOR PAVED STREETS
2'-2" FOR UNPaved STREETS

FOR PAVED STREETS
(SEE NOTE 4)

MIN. 18", MAX. 21"

6" X 1" RING SEAT

R.C.E. 27943

STANDARD DRAWING NO. 490
1. HEIGHT H SHALL BE NOT LESS THAN 4'-0" BUT MAY BE INCREASED AT OPTION OF CONTRACTOR PROVIDED THAT THE VALUE OF M SHALL NOT BE LESS THAN THE MINIMUM SPECIFIED AND THAT THE REDUCER SHALL BE USED. FOR H (IN SEC. C-C) SEE NOTE 4.

2. LENGTH L SHALL BE 4' UNLESS OTHERWISE SHOWN ON IMPROVEMENT PLAN. L MAY BE INCREASED OR LOCATION OF MANHOLE SHIFTED TO MEET PIPE ENDS AT THE OPTION OF THE CONTRACTOR, EXCEPT THAT ANY CHANGE IN LOCATION OF MANHOLE MUST BE APPROVED BY THE ENGINEER.

3. SHAFT SHALL BE CONSTRUCTED AS PER SEC. C-C AND DETAIL N WHEN DEPTH M FROM STREET GRADE TO TOP OF BOX IS LESS THAN 2'-10 1/2" FOR PAVED STREETS OR 3'-6" FOR UNPAVED STREETS.

4. DEPTH P MAY BE REDUCED TO AN ABSOLUTE LIMIT OF 6 INCHES WHEN LARGER VALUES OF P WOULD REDUCE H (IN SEC. C-C) TO BE 3'-6" OR LESS.

5. T SHALL BE 8" FOR VALUES OF H UP TO AND INCLUDING 8 FEET. T SHALL BE 10" FOR VALUES OF H OVER 8 FEET.

6. STEPS SHALL BE 3/4" ROUND, GALVANIZED STEEL AND ANCHORED NOT LESS THAN 4" IN THE WALLS OF STRUCTURES. UNLESS OTHERWISE SHOWN, STEPS SHALL BE SPACED 16" ON CENTER. THE LOWEST STEP SHALL BE NOT MORE THAN 2 FT. ABOVE THE INVERT.

7. REINFORCING STEEL SHALL BE NO. 4 AND 1-1/2" CLEAR FROM INSIDE FACE OF CONCRETE.

8. STATIONS REFER TO PLAN AND PROFILE SHEETS. ELEVATIONS AT Q AND PROLONGED INVERT GRADE LINE. SEE NOTE 2 FOR SHIFTING LOCATION.

9. RINGS, REDUCER, AND PIPE FOR ACCESS SHAFT SHALL BE SEATED IN CEMENT MORTAR AND NEATLY POINTED OR WIRED INSIDE SHAFT.

10. FLOOR OF MANHOLE SHALL BE STEEL-TROWELED.

11. CONCRETE SHALL BE CLASS "A".
SIZE AND SPACING OF STEEL AS SHOWN ON IMPROVEMENT PLAN, EXCEPT THAT 5 BARS ON EACH SIDE OF SHAFT SHALL BE NOT SMALLER THAN #5 @ 4" O.C. OR EQUIVALENT.

#5 BARS 5' LONG @ 4" C.C.

SECTION A-A

5 BARS 7' LONG 4" O.C. OF SIZE SHOWN FOR TRANSVERSE STEEL ON IMPROVEMENT PLAN EXCEPT NOT LESS THAN #5. WARP THESE BARS UNDER BARS THAT HAVE BEEN CUT FOR SHAFT OPENING

MANHOLE FRAME AND COVER (SEE STD. DWG. 498)

STREET GRADE

CONCRETE RINGS AND REDUCER (SEE STD. DWG. 494)

SEE STANDARD DRAWING 482 AND NOTE 3

SECTION B-B

5"x2" PIPE SEAT

3'-0" DIA.

2'-0"

NOTE:

1- DEPTH P: WHEN DEPTH P FROM STREET GRADE TO TOP OF PIPE SEAT IS LESS THAN 2'-10 1/2" IN PAVED STREETS OR 3'-6" IN UNPaved STREETS, CONSTRUCT 2 FT. DIAMETER SHAFT USING CONCRETE RINGS AS PER STANDARD PLAN FOR CONCRETE RINGS, OTHERWISE, CONSTRUCT 3 FT. SHAFT AS SHOWN ON THIS PLAN.

2- STATIONS SHOWN ON IMPROVEMENT PLAN REFER TO CENTERLINE OF SHAFT.

3- STEPS SHALL BE 3/4" ROUND GALVANIZED STEEL ANCHORED NOT LESS THAN 4" IN WALLS OF STRUCTURE AND UNLESS OTHERWISE SHOWN, SHALL BE SPACED 16" ON CENTER. THE LOWEST STEP SHALL NOT BE MORE THAN 2 FEET ABOVE THE FLOOR.
NOTES

1. VALUES FOR A, B, C, D₁, D₂, ELEV. R AND ELEV. S ARE SHOWN ON THE IMPROVEMENT PLANS. TABLE OF VALUES FOR F AND T THEREON.

2. LATERALS: IF LATERALS ENTER ON BOTH SIDES OF MANHOLE, ACCESS SHAFT SHALL BE LOCATED ON SIDE RECEIVING THE SMALLER LATERAL.

3. CENTER OF MANHOLE SHAFT SHALL BE LOCATED OVER CENTERLINE OF MAIN STORM DRAIN WHEN D₁ IS 48" OR LESS, IN WHICH CASE PLACE B & E BARS SYMMETRICALLY AROUND SHAFT AT 45° WITH CENTERLINE.

4. LENGTH L MAY BE INCREASED AT OPTION OF CONTRACTOR TO MEET PIPE ENDS, BUT ANY CHANGE IN LOCATION OF SPUR MUST BE APPROVED BY THE ENGINEER.

5. DETAIL W: WHEN DEPTH OF MANHOLE FROM STREET GRADE TO TOP OF BOX IS LESS THAN 2'-10 1/2" FOR PAVED STREETS OR 3'-6" FOR UNPAVED STREETS, CONSTRUCT MONOLITHIC SHAFT PER DETAIL W. THE CONTRACTOR SHALL MAKE THE OPTION OF CONSTRUCTING SHAFT AS PER DETAIL W FOR ANY DEPTH OF MANHOLE WHEN DIAMETER D₁ IS 48" OR LESS; CENTER OF SHFT SHALL BE LOCATED PER NOTE 3.

6. REINFORCING STEEL SHALL BE ROUND, DEFORMED, STRAIGHT BARS, 1 1/2" CLEAR FROM INSIDE FACE UNLESS OTHERWISE SHOWN. TIE BARS SHALL BE NO. 4 AND SPACED 18" ON CENTERS OR CLOSER.

7. CONCRETE SHALL BE CLASS "A".

8. STEPS SHALL BE 3/4" GALVANIZED STEEL AND ANCHORED NOT LESS THAN 4" IN WALLS OF STRUCTURE. UNLESS OTHERWISE SHOWN THE SPACING SHAL BE 10" ON CENTER. THE LONGEST STEP SHALL BE NOT MORE THAN 2 FT. ABOVE THE INVERT.

9. RINGS, REDUCERS, AND PIPE FOR ACCESS SHAFT SHALL BE SEATED IN CEMENT MORTAR AND NEARLY POINTED OR WIPED INSIDE SHAFT.

10. FLOOR OF MANHOLE SHALL BE STEEL-TROUVED TO SPRING-LINE.

11. BODY OF MANHOLE, INCLUDING SPUR, SHALL BE Poured IN ONE CONTINUOUS OPERATION, EXCEPT THAT THE CONTRACTOR SHALL MAKE THE OPTION OF PLACING AT THE SPRING LINE A CONSTRUCTION JOINT WITH LONGITUDINAL KEYWAY.

** USE D₁ OR D₂, WHICHEVER IS GREATER, OR B.

** IF D₂, D₁, OR B FALLS BETWEEN TABULATED VALUES THEN USE THE NEXT HIGHEST VALUE TO DETERMINE F OR T.

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Town of
Yucca Valley
STORM DRAIN
MANHOLE NO. 4

STANDARD DRAWING NO. 493A

APPROVED:

R.E. 27943

REVISION

BY DATE
VERTICAL SECTION OF PLAIN CONCRETE ECCENTRIC MANHOLE SHAFT

NOTES:

1. ALL JOINTS SHALL BE FILLED WITH 1-2 MORTAR AND NEATLY POINTED OR Wiped INSIDE OF SHAFT.

2. COLLAR OF 1-2 MORTAR AROUND COVER FRAME SHALL BE OMITTED IN ROCK AND OIL STREETS AND IN PAVED STREETS.

3. STEPS SHALL BE 3/4 INCH ROUND GALVANIZED STEEL. TOP STEP SHALL BE PLACED DIRECTLY BELOW THE MANHOLE COVER FRAME. WIDTH OF ALL STEPS SHALL BE 14 INCHES BETWEEN LEG CENTERS. EXCEPT WHERE SHOWN OTHERWISE, SPACING OF STEPS IN SHAFT SHALL BE 16 INCHES ON CENTER.

4. ECCENTRIC MANHOLE SHAFT, REDUCER, AND RINGS MAY BE PLAIN CONCRETE. FOR UNREINFORCED SECTIONS, THE MINIMUM THICKNESS SHALL BE 6 INCHES. THE CONCRETE USED SHALL BE CLASS "A".

CROSS SECTION OF REINFORCED CONCRETE RING

2 1/2 INCH RINGS SHALL BE REINFORCED WITH TWO 1/4 INCH ROUND STEEL HOOPS; 6 INCH AND 8 INCH RINGS SHALL BE REINFORCED WITH FOUR HOOPS, TIED WITH #4 A.S. & W. GAUGE WIRE 8 INCHES ON CENTERS.

INSIDE DIAMETER 124 INCHES

#4 WIRE HOOPS

ECCENTRIC PRECAST CONCRETE CONE

see standard drawing 498 & note 3

STANDARD CONCRETE RINGS, 3", 6" OR 16" THICKNESS

VARIABLE LENGTH PRECAST CONCRETE SECTIONS

MANHOLE FRAME AND COVER SEE STANDARD DRAWING 498

1-2 MORTAR OUT UNDER NOTE 2

VARIABLE

24" DIA.

16"

6"

36" DIA.

6"

24" WID.

6"

36" SPECIAL M.H.R.C.P.

ANY STANDARD PIPE END 5" x 2" PIPE SEAT

VERTICAL SECTION OF REINFORCED CONCRETE ECCENTRIC MANHOLE SHAFT

Town of
Yucca Valley

MANHOLE SHAFT
FOR CAST PIPE

STANDARD DRAWING NO. 494
SECTION A-A

PLAN

#4 HOOP BARS
WHERE H IS MORE THAN 4'-0", D=3'-1 3/4" FOR TOPMOST HOOP IN SHAFT.
EACH LOWER HOOP IN SUCCESSION INCREASES 3 1/2" IN DIAMETER TO A MAXIMUM
OF 4'-0" IN THE VERTICAL PORTION OF THE SHAFT.

NOTES:
1. IF "H" IS LESS THAN 1'-6", W=2'-0"
   IF "H" IS BETWEEN 1'-6" AND 2'-0", W=2'-0"
   IF "H" IS 2'-6" OR MORE, W=3'-0"
   IF "H" IS MORE THAN 4'-0 1/2", BRING WALLS VERTICALLY TO 4'-0 1/2" BELOW SURFACE AND TAPER
   FROM 3'-0" TO 2'-0" AS SHOWN.
2. THIS STRUCTURE SHALL BE USED WITH STANDARD PRESSURE MANHOLE FRAME AND COVER. SEE STD. DWG.
   499. IT MAY BE USED FOR HYDROSTATIC HEADS UP TO 25' ABOVE THE STEEL PLATE.
3. CONCRETE SHALL BE CLASS "A".

APPROVED:

APPROVED: TOWN ENGINEER

R.C.E. 27943

STANDARD PRESSURE
MANHOLE SHAFT

STANDARD DRAWING NO. 495
NOTES:
1. SEATS OF FRAME AND COVER SHALL BE MACHINED TO PREVENT NOISE.
2. TOTAL WEIGHT OF FRAME AND COVER APPROX. 380 LBS.
3. MINIMUM CLEAR OPENING 22" DIA. ALL OTHER DIMENSIONS ARE NOMINAL.

MATERIAL: CAST IRON (ASPHALT COATED)

ALHAMBRA A-1310 OR EQUIVALENT
MATERIAL: CAST IRON (ASPHALT COATED OR GALVANIZED)

NOTES:
1. SEATS OF FRAME AND COVER SHALL BE MACHINED TO PREVENT NOISE.
2. TOTAL WEIGHT OF FRAME AND COVER APPROX. 130 LBS.
3. MINIMUM CLEAR OPENING 22" DIAMETER. ALL OTHER DIMENSIONS ARE NOMINAL.

ALHAMBRA A-1530 OR EQUIVALENT
**Section of Cover**

**Section of Frame**

**Plan of Frame**

Weight = 196 lbs.

**Top Plan of Cover**

Weight = 262 lbs.

**Bottom Plan of Cover**

**Notes:**

1. Manhole frame and cover shall be made of gray cast iron conforming to the latest A.S.T.M. Standard A48, Class 30 or better.

2. All parts of the manhole frame and cover except machined surfaces shall be coated with asphaltum paint.

3. Manhole frame and cover shall be tested for accuracy of fit and shall be marked in sets before delivery. The cover shall fit the frame snugly but not tightly.

4. The weights of the frame and cover shall not vary more than two percent from those given hereon.

5. Covers for manholes located in right of way, easements, alleys, parkways, and all other places except paved streets shall be provided with Allen socket set screw locking devices. The contractor shall drill and tap two holes to a depth of 1" at 90° to pick hole and install 3/4" x 3/4" Allen socket set screws therein.

**Town of Yucca Valley**

**Manhole Frame & Cover**

**Non-Rocking**

**Standard Drawing No. 498**