# PIMA COUNTY
WASTEWATER MANAGEMENT

## PART IV
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REVISED: APRIL 1988
STANDARD PILE CAP

NOTE: SPECIAL CORROSION PROTECTION MEASURES MAY BE CALLED FOR ON THE PLANS.

D.I.P. SIZE AS CALLED FOR ON PLANS.

PLAN VIEW

7/8" THD'D ROD W/ (2) CUT WASHERS AND W/ (2) HEX NUTS

1/2" THICK NEOPRENE CONTINUOUS, AROUND PERIMETER OF PIPE, BETWEEN PIPE AND SADDLE

CUT HP TO CONFORM TO OUTSIDE SURFACE PERIMETER OF PIPE

FINISH INVERT ELEV.

3" (MIN.)

3/4" (MIN.)

6 HP TO PIPE O.D.

1 1/2"

1/2"

HP SADDLE AS CALLED FOR ON PLAN

SECTION A-A

SIDE VIEW

NOTES:

1. ALL STEEL PLATES AND SADDLES TO BE ASTM A-36

2. ALL WELDING ELECTRODES SHALL CONFORM TO ASTM 233-62T AND AWS A5.1 GRADE E-70XX.


PIMA COUNTY
WASTEWATER MANAGEMENT
SEWER MAIN REPAIR

ENDS OF NEW AND EXISTING PIPES SHALL BE CUT SQUARELY PRIOR TO JOINING WITH COUPLING

REMOVE DAMAGED PIPE AND REPLACE WITH NEW PIPE (SIZE AND MATERIAL SHALL BE THE SAME AS THE EXISTING PIPE)

EXISTING SEWER MAIN

BAND-SEAL* OR SMITH-BLAIR COUPLING, OR APPROVED EQUAL

*(6" THROUGH 12" ONLY)

UNDISTURBED SOIL

EXISTING SEWER MAIN

NOTES:

1. IF, WHEN THE DAMAGED PORTION OF THE EXISTING MAIN IS REMOVED, SATURATED SOIL IS FOUND, THE SATURATED SOIL SHALL BE EXCAVATED, REMOVED FROM THE SITE AND REPLACED WITH IMPORTED BEDDING MATERIAL MEETING CURRENT PIMA COUNTY WASTEWATER MANAGEMENT STANDARDS.

2. ALL SEWER REPAIRS SHALL BE INSPECTED BY PIMA COUNTY DEPARTMENT OF WASTEWATER MANAGEMENT OR AUTHORIZED REPRESENTATIVE PRIOR TO BACKFILL.

3. COMPACTION OF BACKFILL SHALL BE 95% UNDER PAVEMENT AND 90% IN UNPAVED AREAS, OR AS REQUIRED BY THE AGENCY WITH JURISDICTION OVER THE RIGHT-OF-WAY.
NOTE:
PIPES MADE FROM UNLIKE MATERIALS SHALL BE COUPLED TOGETHER USING AN APPROPRIATELY SIZED AND TYPED BAND-SEAL, SMITH-BLAIR OR APPROVED EQUAL TRANSITION COUPLING.

*(6" THROUGH 12" ONLY)*
RIGID PIPE BEDDING FOR SANITARY SEWERS

PIPE COVER LIMITATION TABLE
(MAXIMUM TRENCH WIDTH 30" AT TOP OF PIPE)

<table>
<thead>
<tr>
<th>SIZE</th>
<th>MATERIAL</th>
<th>TYPE AND MIN. CLASS</th>
<th>TYPE 1</th>
<th>TYPE 2</th>
<th>TYPE 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot;</td>
<td>V.C.</td>
<td>EXTRA STR.</td>
<td>4-10</td>
<td>4-26</td>
<td>4-30</td>
</tr>
<tr>
<td>10&quot;</td>
<td>V.C.</td>
<td>EXTRA STR.</td>
<td>4-11</td>
<td>4-30</td>
<td>4-30</td>
</tr>
<tr>
<td>12&quot;</td>
<td>V.C.</td>
<td>EXTRA STR.</td>
<td>4-14</td>
<td>4-30</td>
<td>4-30</td>
</tr>
<tr>
<td>15&quot;</td>
<td>V.C.</td>
<td>EXTRA STR.</td>
<td>4-20</td>
<td>4-30</td>
<td>4-30</td>
</tr>
<tr>
<td>8&quot;-16&quot;</td>
<td>D.I.</td>
<td></td>
<td>50</td>
<td>2-17</td>
<td>2-24</td>
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SIEVE ANALYSIS CHART

<table>
<thead>
<tr>
<th>CRUSHED STONE ASTM D-448 GR.67</th>
<th>SAND</th>
<th>SELECT NATIVE MATERIAL</th>
<th>BACKFILL</th>
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</thead>
<tbody>
<tr>
<td>NOM. SIZE</td>
<td>%PASS</td>
<td>NOM. SZ</td>
<td>% PASS</td>
</tr>
<tr>
<td>1&quot;</td>
<td>100</td>
<td>1&quot;</td>
<td>100</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>90-100</td>
<td>#4</td>
<td>60-100</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>20-55</td>
<td>#200</td>
<td>0-5</td>
</tr>
<tr>
<td>#4</td>
<td>0-10</td>
<td>MAX.</td>
<td>P.I. = 5</td>
</tr>
<tr>
<td>#8</td>
<td>0-5</td>
<td>MAX.</td>
<td>LL = 30</td>
</tr>
</tbody>
</table>

ALL SIEVE ANALYESHALL BE CERTIFIED AND SUBMITTED TO PCWMD PRIOR TO STARTING CONSTRUCTION.

NOTES:


2. SHADING SHALL BE CAREFULLY PLACED MINIMUM DENSITY 90% OF STANDARD PROCTOR DENSITY.

3. ALL 18" AND LARGER PIPE WILL REQUIRE SPECIAL APPROVAL OF THE DESIGN AND INSTALLATION BY PCWMD.

4. PCWMD RESERVES THE RIGHT TO ADJUST, ON AN INDIVIDUAL CASE BASIS, THESE PIPE BEDDING REQUIREMENTS TO MEET UNEXPECTED FIELD/ SOIL CONDITION.

5. UNDISTURBED EARTH OR SELECT MATERIAL COMPACTED TO 95% OF THE STANDARD PROCTOR DENSITY (T-99).
**SAND BEDDING**

**CRUSHED STONE BEDDING**

**NOTES:**

NOTES 1 THRU 5 ON STANDARD DETAIL NO. 104 (RIGID PIPE) ALSO APPLY TO FLEXIBLE PIPE.

6. MINIMUM TRENCH WIDTH SHALL BE AS FOLLOWS:

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<th>TOTAL WIDTH REQUIRED</th>
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<tr>
<td>COMPARED TO RESISTANCE OF</td>
<td>FIVE PIPE DIAMETERS (O.D.)</td>
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<td>COMPACTED SOIL BESIDE THE PIPE</td>
<td></td>
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<td>TRENCH WALL &lt; COMPACTED SOIL</td>
<td>THREE PIPE DIAMETERS</td>
</tr>
<tr>
<td>TRENCH WALL = COMPACTED SOIL</td>
<td>30 INCHES</td>
</tr>
<tr>
<td>TRENCH WALL &gt; COMPACTED SOIL</td>
<td></td>
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7. WHEN USING A MOVABLE TRENCH BOX, THE INSIDE WALLS OF THE BOX MUST CLEAR THE SEWER PIPE SO AS NOT TO DISTURB THE BEDDING WITHIN TWO PIPE DIAMETERS (O.D.) ON EACH SIDE OF THE PIPE.

8. FOR CRUSHED STONE BEDDING SHOVEL SLICE BEDDING UNDER THE PIPE HAUNCHES TO ENSURE ADEQUATE SUPPORT. USE CARE SO AS NOT TO MOVE PIPE OFF LINE OR GRADE.

9. FOR SAND BEDDING, PLACE SAND FROM BOTTOM OF TRENCH TO 12" OVER THE PIPE IN FOUR LIFTS, WITH EACH LIFT COMPACTED TO 90% STANDARD PROCTOR DENSITY, USING HAND OR MECHANICAL TAMPING. WATER SETTLING OF FLEXIBLE PIPE WILL NOT BE PERMITTED. USE CARE SO AS NOT TO MOVE PIPE OFF LINE OR GRADE.

10. SEE SIEVE ANALYSIS CHART ON STANDARD DETAIL NO. 104 FOR CRUSHED STONE, SAND, SELECT NATIVE AND BACKFILL MATERIALS.

* IN ACCORDANCE WITH ASTM D-2321.
1. All design standard, materials and workmanship for sewers are to be in accordance with the latest adopted edition of the Pima County Wastewater Management Department MANUAL OF ENGINEERING STANDARDS AND PROCEDURES, said Manual is on file in that office.

2. The Contractor shall comply with all applicable Occupational Safety and Health Administration Regulations.

3. The Contractor shall verify locations and elevations of all existing utilities prior to any construction. Call "Blue Stake" 792-2211, two full working days prior to excavating.

4. All changes shall be approved by the Pima County Wastewater Management Department prior to construction.

5. The Contractor shall field verify existing sewer elevations and alignments prior to construction.

6. All rough grading shall be complete prior to the installation of sewers, including fill and compaction as indicated on the plans.

7. Where connections to existing manholes are to be made, the Contractor shall construct new inverts in the existing bench to direct the flow in the proper direction.

8. The Contractor shall furnish, operate and maintain all equipment necessary to provide sewer service to all parties tributary to a live sewer to which a connection is to be made. Notify the Pima County Wastewater Management Department's Operation's Division 48 hours prior to starting any construction that would effect live sewers.

9. Sewer construction shall start at the lowest downstream point and progress upstream, regardless of the stationing shown on the plans.

10. The Contractor shall notify Pima County Wastewater Management Department (Field Engineering, 792-8676) a minimum of three (3) full working days prior to starting any sewer construction.
STANDARD MANHOLE BASE
FOR 2 1/8" AND SMALLER PIPES

90° OR GREATER BETWEEN INCOMING AND OUTGOING LINES

6" MIN. - 12" MAX. FORMED OR FREE FORM (CONTRACTOR'S OPTION)

M.H. RISER

M.H. BASE

ALTERNATE STEP LOCATION

FOR M.H. STEPS SEE STD. DETAIL NOS. 216, 217

PLAN VIEW

RAM-NEK SEAL OR APPROVED EQUAL

SLOPE 1/4"/FT (MIN)

GROUT

CLASS "A" CONCRETE

2/3 PIPE I.D.

UNDISTURBED EARTH OR COMPACTED SELECT MATERIAL (95%)

SECTION A - A

PIMA COUNTY
WASTEWATER MANAGEMENT

REVISED: APRIL 1988
STD.
DEP.
NO.
REINFORCED CONCRETE MANHOLE BASE
( FOR 24"Ø AND LARGER PIPE )

PLAN VIEW

SECTION A - A

NOTES:
1. SPECIAL DETAILS SHALL BE REQUIRED IN THE FOLLOWING CASES:
   A. IF P.V.C.-LINED PIPE IS USED.
   B. AT DEFLECTION MANHOLES.
   C. IF THE SEWER MAIN IS LARGER THAN 48" DIAMETER.
2. THESE SPECIAL DETAILS MUST BE APPROVED BY P.C.W.M.D.

SECTION B - B

PIRA COUNTY
WASTEWATER MANAGEMENT

REVISED: APRIL 1988
STD. DET. NO. 202
MANHOLE STUB-OUT AND BLOCK-OUT

PLAN VIEW

SECTION A-A

PIMA COUNTY
WASTEWATER MANAGEMENT

REVISED: APRIL 1988
STD. DET. NO. 203
NOTES:

1. COMMON HARD-BURNED BRICK (ASTM C-32) TO BE LAID IN 1:3 CEMENT MORTAR. SOLID BRICK CONFORMING TO GRADE MM OR MS MUST BE USED.

2. STRIKE OFF MORTARED JOINTS INSIDE.
STANDARD 4' DIA. PRECAST CONCRETE M.H.

- STANDARD 24" FRAME AND COVER
  SEE STD. DETAIL NO. 213

- FIN. GROUND SURFACE
- PAVEMENT
- MORTAR
- ADJUSTING RING SET IN MORTAR BED
- CONE SECTION
  (ASTM C-478)
- M.H. STEP (SEE STD. DETAIL NOS. 216, 217)
- RAM-NEK OR APPROVED
  EQUAL AT ALL JOINTS
- BARREL SECTION
  (ASTM C-478)
- GROUT
- STANDARD M.H. BASE
  SEE STD. DETAIL NO. 201

NEW M.H. BASE SHALL BE PLACED
ON UNDISTURBED EARTH OR COMPACTED (95%)
SELECT MATERIAL
STANDARD 5' DIA. PRECAST CONCRETE M.H.

FIN. GROUND SURFACE

2 1/2''

4'-0''

5'-0''

FOR 12'' THRU 36'' Ø PIPE

6'' (MIN.)

NEW M.H. BASE SHALL BE PLACED ON UNDISTURBED EARTH OR COMPACTED (95%) SELECT MATERIAL

M.H. BASE
(TYPE DETERMINED BY PIPE SIZE)
SEE STD. DETAIL NOS.201,202

RAM-NEK SEAL OR APPROVED EQUAL ON ALL JOINTS

GROUT

BARREL SECTION *
(ASTM C-478)

TRANSITION SECTION
(ASTM C-478)

RAM-NEK SEAL OR APPROVED EQUAL

BARREL SECTION *
(ASTM C-478)

CONCRETE M.H.

PAVEMENT

ADJUSTING RING SET IN MORTAR BED

MORTAR

2'-0''

FIN. GROUND SURFACE

3'-6''

VARIES

3'-0'', 3'-6'', OR 4'-0'', 9'' (MIN.)

VARIES

2'-0''

6''(MIN.)

FIN. GROUND SURFACE

STANDARD 24'' OR 30'' FRAME AND COVER
SEE STANDARD DETAIL NOS.213,214

* MINIMUM HEIGHT OF INDIVIDUAL BARREL SECTIONS USED TO MEET MINIMUM RISER HEIGHTS SHALL BE 1'-6''.

PIMA COUNTY
WASTEWATER MANAGEMENT

DIRECTOR P.C.W.M.D. 5-5-83 DATE

CHIEF ENGINEER P.C.W.M.D. 4 MGR.83 DATE

REVISED: APRIL 1988 STD. DET. NO. 206
SHALLOW MANHOLE

30" M.H. FRAME AND COVER
SEE STANDARD DETAIL NO. 214

FINISHED GROUND
SURFACE

2 1/2"

30" Ø ADJUST. RINGS (SEE STD.
DETAIL NO. 305) SET IN MORTAR
BED AS REQUIRED TO OBTAIN
CASTING ELEVATION

M.H. BASE - SEE STD.
DETAIL NO. 201

PIPE

GROUT

6" (MIN.)

VARI...
4' DIA. FLAT TOP MANHOLE

PLAN VIEW

STANDARD 24" M.H. FRAME AND COVER
(SEE STD. DETAIL NO.213)

ADJUSTING RING
SET IN MORTAR BED
CLASS "A" CONC. SLAB

PRECAST CONCRETE M.H.
SECTION (ASTM C-478)

RAM-NEK SEAL OR APPROVED EQUAL
ON ALL JOINTS.

NEW M.H. BASE SHALL BE PLACED
ON UNDISTURBED EARTH OR
COMPACTED (96%) SELECT MATERIAL

SECTION A-A

PIMA COUNTY
WASTEWATER MANAGEMENT

DIRECTOR
P.C.W.M.D.

REvised: APRIL 1988
STD.
DET.
NO.

208

5-26-83
DATE

4-6-83
DATE

CHIEF ENGINEER
P.C.W.M.D.
5' DIA. FLAT TOP MANHOLE - TYPE "A"

PLAN VIEW

FIN. GROUND SURFACE

STANDARD 24" M.H. FRAME AND COVER (SEE STD. DETAIL NO.213)

PAVEMENT

MORTAR

ADJUSTING RING SET IN MORTAR BED

CLASS "A" CONC. SLAB

NO. 6 REBAR AT 6" O.C. EA. WAY

8"

2 1/2"

6" (MIN.)

2'-0" (MIN.)

VARES

2'-0" (MAX.)

6" (MAX.)

5'-0"

1'-8"

2'-0"

6" (MAX.)

M.H. BASE (SEE STD. DETAIL 201, 202)

NEW M.H. BASE SHALL BE PLACED ON UNDISTURBED EARTH OR COMPACTED (95%) SELECT MATERIAL

PRECAST CONCRETE M.H. SECTION (ASTM C-478)

GROUT

RAM-NEK SEAL OR APPROVED EQUAL ON ALL JOINTS

SECTION A - A

PIMA COUNTY WASTEWATER MANAGEMENT

REVISED: APRIL 1988

STANDARD DET. NO. 209
5' DIA. FLAT TOP MANHOLE - TYPE "B"

PLAN VIEW

NO. 6 REBAR AT 6"
O.C. EA. WAY
FIN. GROUND SURFACE
6" (MIN.)
1'-0" (MAX.)
2 1/2"

STANDARD 24" M.H.
FRAME AND COVER
(SEE STD. DETAIL NO. 213)

NO. 5 DIAGONALLY
2" CLEARANCE (TYR)

MORTAR
ADJUSTING RING
SET IN MORTAR BED

CLASS "A" CONCRETE SLAB
TRANSITION
SECTION (ASTM C-478)

NO. 6 REBAR AT 6"
O.C. EA. WAY
2'-0"
8"

RAM-NEK SEAL OR
APPROVED EQUAL ON
ALL JOINTS

BARREL SECTION
(ASTM C-478)

6" (MAX.)
1'-8" (MAX.)
2'-0"
4'-0"

5'-0"

VARIES
6" (MIN.)

GROUT

RAM-NEK SEAL OR
APPROVED EQUAL

M.H. BASE
(SEE STD. DETAIL
201, 202)

NEW M.H. BASE SHALL BE
PLACED ON UNDISTURBED EARTH
OR COMPACTED (95%) SELECT
MATERIAL

SECTION A - A

PIMA COUNTY
WASTEWATER MANAGEMENT

DIRECTOR
P.C.W.M.D.

CHIEF ENGINEER
P.C.W.M.D.

5-5-83
4 MAY 83

REVISED: APRIL 1988
STD. DET. NO.

210
5' DIA. FLAT TOP MANHOLE - TYPE "C"

PLAN VIEW

6'' (MIN.)
1-0'' (MAX.)

NO. 6 REBAR AT 6''
O.C. EA. WAY

STANDARD 24'' M.H.
FRAME AND COVER
(SEE STD. DETAIL NO. 213)

FIN. GROUND
SURFACE

PAVEMENT

ADJUSTING RING
SET IN MORTAR BED

BARREL SECTION
(ASTM C-478)

TRANSITION
SECTION
(ASTM C-478)

RAM-NEK SEAL OR
APPROVED EQUAL ON
ALL JOINTS

GROUT

RAM-NEK SEAL OR
APPROVED EQUAL

M.H. BASE (SEE STD.
DETAIL 201, 202)

NEW M.H. BASE SHALL BE PLACED
ON UNDISTURBED EARTH OR
COMPACTED (95%) SELECT MATERIAL

SECTION A-A

PIMA COUNTY
WASTEWATER MANAGEMENT

REvised: April 1988
STD.
DET.
NO. 211
NOTES:
1. USE OF DROP MANHOLES SUBJECT TO SPECIAL APPROVAL FROM P.C.W.M.D.
2. ALL CONCRETE WHICH MAY BE IN CONTACT WITH SEWAGE SHALL BE CLASS "A". OTHER CONCRETE MAY BE CLASS "B".
STANDARD MANHOLE FRAME AND COVER

COVER, PLAN VIEW

SECTION A-A

FRAME SECTION

NOTES:

1. SUBMIT SHOP DRAWINGS (FOR P.C.W.M.D. REVIEW AND APPROVAL) FOR ANY VARIATIONS.
2. FRAME WEIGHT 200 LBS. (APPROX.).
3. ALL CASTINGS SHALL BE OF FIRST CLASS GREY IRON, TOUGH AND EVEN GRAINED.
4. ALL COVERS ARE TO CARRY "PIMA COUNTY SANITARY SEWER". LETTERS SHALL BE STANDARD BLOCK TYPE, RAISED 5/16" AND SHALL BE 2 1/2" HIGH.
5. THE SURFACE NOT OCCUPIED BY RIBS SHALL HAVE 5/16" STUDS, 5/8" SQUARE.
6. ENTIRE CASTING SHALL RECEIVE ONE SHOP COAT (BLACK).
7. COVER WEIGHT 155 LBS. (APPROX.).
8. THE TOPS OF THE COVER AND FRAME SHALL BE FLUSH AND THERE SHALL BE 1/8" CLEARANCE ALL AROUND BETWEEN FRAME AND COVER. THE HORIZONTAL BEARING SURFACES SHALL HAVE A MACHINED FINISH.

PIMA COUNTY
WASTEWATER MANAGEMENT

DIRECTOR P.C.W.M.D. P.O. BOX 213
CHIEF ENGINEER P.C.W.M.D.

REVISED: APRIL 1988
STD. DET. NO. 213

GEORGE L. BRUNNER 5/17/88

RETAILER  5/17/88
30" MANHOLE FRAME AND COVER

FRAME, PLAN VIEW

COVER, PLAN VIEW

FRAME SECTION A-A

COVER SECTION B-B

NOTES:
1. FRAME WEIGHT 205 LBS. (APPROX.).
2. COVER WEIGHT 207 LBS. (APPROX.).
3. ALL PERTINENT NOTES FROM STANDARD DETAIL NO. 213 APPLY.
4. TO BE USED FOR MANHOLES INVOLVING MAINS OF 27" Ø OR LARGER.

PIMA COUNTY
WASTEWATER MANAGEMENT

REVISED: APRIL 1988
STD. DET. NO. 214

DIRECTOR: P.C.W.M.D.
CHIEF ENGINEER: P.C.W.M.D.

5/17/88
9-16-82
WATERPROOF MANHOLE FRAME AND COVER

FRAME, PLAN VIEW

COVER, PLAN VIEW

FRAME SECTION A-A

COVER SECTION B-B

NOTES:
1. ALL CASTINGS SHALL BE OF FIRST CLASS GREY IRON, TOUGH AND EVEN GRAINED.
2. ENTIRE CASTING SHALL RECEIVE ONE SHOP COAT (BLACK).
3. FRAME AND COVER ASSEMBLY WEIGHT 412 LBS. (APPROX.).
4. THE COVER SHALL HAVE CONCEALED PICKHOLES AND NO VENT HOLES.
5. SUBMIT SHOP DRAWINGS (FOR P.C.W.M.D. REVIEW AND APPROVAL) FOR ANY VARIATIONS.

PIMA COUNTY
WASTEWATER MANAGEMENT
NOTES:

1. STEPS FOR PRECAST CONCRETE MANHOLES SHALL BE OF STEEL REINFORCED POLYPROPYLENE PLASTIC, M.A. INDUSTRIES INC., NO. PS-1PF OR AN APPROVED EQUAL.

2. STEPS TO BE DRIVEN INTO PRE-FORMED HOLES IN PRECAST CONCRETE MANHOLE SECTIONS BY THE MANHOLE MANUFACTURER PRIOR TO DELIVERY TO THE JOB SITE.


4. LOOSE STEPS SHALL BE CAUSE FOR REJECTION OF THAT MANHOLE SECTION.

5. ALL STEPS WITHIN A MANHOLE SHALL BE ALIGNED VERTICALLY.

6. THESE STEPS CAN BE USED FOR CAST IN PLACE REINFORCED CONCRETE JUNCTION BOXES.
NOTES:
1. STEPS FOR MANHOLES SHALL BE OF STEEL REINFORCED POLYPROPYLEN PLASTIC, M.A. INDUSTRIES, INC., NO. PS-3 OR AN APPROVED EQUAL.
2. STEPS FOR PRECAST CONCRETE MANHOLES SHALL BE CAST INTO THE CONCRETE WALL DURING MANUFACTURE OR MORTARED, WITH NON-SHRINK GROUT, INTO HOLES AFTER CONCRETE HAS SET, AND PRIOR TO DELIVERY TO THE JOB SITE.
3. ALL STEPS WITHIN A MANHOLE SHALL BE OF THE SAME DESIGN, TYPE AND SIZE.
4. ALL STEPS WITHIN EACH MANHOLE SHALL BE ALIGNED VERTICALLY.
5. THESE STEPS CAN BE USED FOR CAST IN PLACE REINFORCED CONCRETE JUNCTION BOXES.
6. LOOSE STEPS SHALL BE CAUSE FOR REJECTION OF THAT MANHOLE SECTION.
NOTES:
1. STEPS FOR BRICK MANHOLES SHALL BE OF STEEL REINFORCED POLYPROPYLENE PLASTIC, M.A. INDUSTRIES, INC., NO. PS-1B OR AN APPROVED EQUAL.
2. STEPS SHALL BE INSTALLED IN MORTAR JOINT OF BRICK MANHOLE.
4. ALL STEPS WITHIN A MANHOLE SHALL BE ALIGNED VERTICALLY.
5. LOOSE STEPS SHALL BE CAUSE FOR REJECTION OF THE MANHOLE.
CONCRETE WEIR

PLAN VIEW

TOP OF BENCH

WEIR TOP ELEVATION AS NOTED ON PLANS

4"

SECTION A-A

BREAK OUT PORTION OF EXISTING M.H. BASE AND THOROUGHLY CLEAN PRIOR TO CONSTRUCTING NEW WEIR INTO AN EXISTING M.H. BASE

PIMA COUNTY
WASTEWATER MANAGEMENT

DIRECTOR
P.C.W.M.D.

DATE

REvised:

DEtl.
NO.
219
NOTES:

1. MAXIMUM DIAMETER OF MAINLINE FOR WHICH A REDWOOD GATE CAN BE USED IS 15". LARGER PIPE REQUIRES A SLUICE GATE.
CONNECTING TO EXISTING MANHOLE
(NON-REINFORCED BASE)

SHAPE NEW CHANNEL TO DIRECT FLOW

NEW INCOMING PIPE (MAINLINE OR PRIVATE H.C.S.)

CONCRETE CORE M.H. RISER TO ACCOMMODATE NEW PIPE

EXISTING M.H. RISER

EXISTING M.H. BASE

SECTION B-B

NEW CHANNEL INVERT

GROUT ALL AROUND TO MAKE WATERTIGHT SEAL

PLAN VIEW

TOP OF NEW BUILT UP BENCH

EXISTING M.H. BASE

EXISTING M.H. RISER

EXISTING BENCH

SECTION A-A

NOTES:

1. EXISTING MANHOLE BENCH TO BE THOROU GHLY CLEANED PRIOR TO CONSTRUCTING NEW BUILT UP BENCH. NEW BENCH SHALL BE CLASS "A" CONCRETE.

2. ALL CONNECTIONS TO EXISTING MANHOLES SHALL BE INSPECTED AND APPROVED BY P.C.W.M.D.

PIMA COUNTY
WASTEWATER MANAGEMENT

REVISED: APRIL 1988
STD. DET. NO. 301
CONNECTING TO EXISTING MANHOLE
(REINFORCED CONCRETE BASE)

PLAN VIEW

SECTION A-A

NOTES:
1. EXISTING MANHOLE BENCH TO BE THOROUGHLY CLEANED PRIOR TO CONSTRUCTING NEW BUILT UP BENCH. NEW BENCH SHALL BE CLASS "A" CONCRETE.
2. ALL CONNECTIONS TO EXISTING MANHOLES SHALL BE INSPECTED AND APPROVED BY P.C.W.M.D.

PIMA COUNTY
WASTEWATER MANAGEMENT

REVISIRED: APRIL 1988  STD. DET. NO. 302
CONSTRUCTING A NEW M.H. OVER AN EXISTING SEWER

PLAN VIEW

SECTION A-A

NOTES:
1. SPECIAL BEDDING MAY BE REQUIRED TO THE FIRST JOINT BEYOND OPEN TRENCH CONDITIONS (DETERMINED BY DEPTH OF EXCAVATION AND TYPE OF SOIL).
ADJUSTING BRICK M.H. TO NEW FIN. GRADE

FIN. GROUND SURFACE

2 1/2"

9" (MIN.)

1'-9" (MAX.)

STANDARD M.H. FRAME AND COVER (SEE STD. DETAIL NOS. 213, 214)

PAVEMENT

MORTAR

1/2" PLASTER ALL AROUND WITH 1:3 CEMENT MORTAR

NOTES:

1. RECONSTRUCTION OF THE CONE IN ACCORDANCE WITH STANDARD DETAIL NO. 204 WILL BE REQUIRED IF THE REQUIRED AMOUNT OF ADJUSTMENT CAUSES A VIOLATION OF THE DIMENSIONAL RANGE NOTED ABOVE.

2. ANY RECONSTRUCTION OF A PUBLIC MANHOLE FACILITY SHALL BE INSPECTED AND APPROVED BY P.C.W.M.D.
ADJUSTING PRECAST CONC. M.H. TO NEW FIN. GRADE

FIN. GROUND SURFACE

2 1/2"

6" (MIN.)
12" (MAX.)

STANDARD M.H. FRAME AND COVER
SEE STD. DETAIL NO. 213, 214

PAVEMENT

MORTAR

ADJUSTING RING SET IN MORTAR BED
SEE ADJUSTING RING DETAIL BELOW

CONE SECTION
(ASTM C-478)

ALL STEPS SHALL BE ALONG ONE
VERTICAL ALIGNMENT. FOR STEP
SPACING SEE STD. DETAIL NO. 206

BARREL SECTION
(ASTM C-478)

CLASS "A"
CONCRETE

1/2" RAD.

5", 4" OR 6"

6" - 8"

DETAIL

ADJUSTING RING

2 - №3 HOOPS WITH №14 WIRE TIES AT 90°
FOR 3" AND 4" ADJUSTING RINGS,
6" ADJUSTING RING REQUIRES 4 - №3 HOOPS
WITH №14 WIRE TIES AT 90°.

NOTES:

1. RECONSTRUCTION OF THE BARREL/CONE IN ACCORDANCE WITH THIS DETAIL WILL BE REQUIRED
   IF THE REQUIRED AMOUNT OF ADJUSTMENT CAUSES A VIOLATION OF THE DIMENSIONAL
   RANGE NOTED ABOVE.

2. ANY RECONSTRUCTION OF A PUBLIC MANHOLE FACILITY SHALL BE INSPECTED AND
   APPROVED BY P.C.W.M.D.

3. ADDITIONAL OR REPLACEMENT MANHOLE SECTIONS SHALL BE NEW MATERIAL.

4. JOINTS OF THE NEW MANHOLE SECTIONS MUST PROVIDE A SUITABLE MATCH (IN
   CONFIGURATION AND PERFORMANCE) WITH THE EXISTING MANHOLE SECTIONS.

PIMA COUNTY
WASTEWATER MANAGEMENT

DIRECTOR
P.C.W.M.D.
5-5-83
DATE

CHIEF ENGINEER
P.C.W.M.D.
4-4-83
DATE

REVISED: APRIL 1988
STD. NO. 305

REVIEWING 4-14-87
ADJUSTING FLAT TOP M.H. TO NEW FIN. GRADE

NOTES:

1. RECONSTRUCTION OF THE BARREL IN ACCORDANCE WITH APPROPRIATE STANDARD DETAIL WILL BE REQUIRED IF THE REQUIRED AMOUNT OF ADJUSTMENT CAUSES A VIOLATION OF THE DIMENSIONAL RANGE NOTED ABOVE.

2. ANY RECONSTRUCTION OF A PUBLIC MANHOLE FACILITY SHALL BE INSPECTED AND APPROVED BY P.C.W.M.D.
HOUSE CONNECTION SEWER

END OF PLUGGED H.C.S. SHALL BE MARKED BY A #9 WIRE ANCHORED TO A BRICK

PAVEMENT

VARIABLE

CURB

VARIABLE

WATER MAIN

VARIABLE

DEPTH OF H.C.S. AT PROPERTY LINE 4' (MIN.)

SLOPE: 1/4" PER FT.

VARIABLE

PROP. LINE

PLUG OPEN END WITH APPROVED PLUG

REMOVABLE PLUG

H.C.S.

AN INSPECTION CLEANOUT "Y" IS TO BE INSTALLED IMMEDIATELY OUTSIDE THE SADDLE WHEN A SEWER IS TAPPED

MACHINE CUT TAP WITH AN EPOXY JOINED SADDLE

NORMAL AXIS

NO PORTION OF THE TAPPING SADDLE SHALL PROTRUDE INTO THE INTERNAL DIAMETER OF THE PUBLIC MAIN

NOTES:

1. WHERE MINIMUM DEPTHS AND CLEARANCES CAN NOT BE MAINTAINED, A SPECIAL H.C.S. DESIGN WILL BE REQUIRED.

2. H.C.S. CONNECTIONS INTO SEWER MAINS 12" AND LARGER ARE NOT PERMITTED WITHOUT THE WRITTEN APPROVAL OF P.C.W.M.D.

3. H.C.S'S GREATER THAN 4" IN DIAMETER MUST CONNECT INTO A MANHOLE IN ACCORDANCE WITH APPLICABLE STANDARD DETAILS.


5. ALL CONNECTIONS TO PUBLIC SEWERS SHALL BE MADE WITH "Y" OR "T" FITTINGS OR BY A MACHINE CUT TAP.
H.C.S. INTO TERMINUS MANHOLE

PLAN VIEW

NOTES:
1. CROWN OF H.C.S.(S) TO MATCH CROWN OF SEWER MAIN.
HCS TIE-OVER/REPAIR

EXISTING HCS PIPE

MECHANICAL COMPRESSION COUPLING
(MODEL & SIZE TO FIT TYPE(S)
OF PIPE INVOLVED)

EXISTING HCS PIPE

EXCAVATION SHALL
BE EXTENDED UNDER-
NEATH SOUND PIPE

IF WHEN THE DAMAGED PORTION OF THE
EXISTING HCS IS REMOVED, SATURATED
SOIL IS FOUND, THE SATURATED SOIL
SHALL BE EXCAVATED, REMOVED FROM
SITE AND REPLACED WITH GRAVEL OR
SELECT MATERIAL COMPACTED TO 95% DENSITY

FLEXIBLE RUBBER COLLAR

PIPE ENDS TO BE CUT SQUARELY

TAKE-UP BOLT FOR FIELD
INSTALLATION (2)

STAINLESS STEEL
CLAMPS

NOTES:

1. FOR REPAIR OF HCS GREATER THAN 4" Ø SEE STD. DETAIL NO. 102 (SEWER MAIN
REPAIR).

2. NEWLY INSERTED SECTION OF PIPE MATERIAL SHALL BE COMPATIBLE WITH EXISTING
PIPE MATERIAL.
NOTES:
1. THE RELOCATED H.C.S. SHALL BE CONSTRUCTED OF DUCTILE IRON PIPE (D.I.P.) WHERE THE TOP OF THE H.C.S. IS LESS THAN 2 FT. BELOW THE UTILITY OR HAS LESS THAN 4 FT. OF COVER TO FIN. GRADE.

2. THE RELOCATED H.C.S. SHALL BE CONNECTED TO THE H.C.S. PIPE WITH APPROVED COUPLINGS.

3. USE OF CASE "D" TYPE REROUTING DEPENDS ON LEVEL OF FLOW (PRESENT AND FUTURE) WITHIN MAINLINE SEWER—SUBJECT TO CASE BY CASE APPROVAL BY ENGINEER/P.C.W.M.D.

4. MINIMUM SLOPE ON ANY REROUTED SEGMENT OF H.C.S. TO BE 1.00%.

PIMA COUNTY
WASTEWATER MANAGEMENT

REVISED: 404
LIFT STATION - PLAN VIEW

PUMP MANHOLE

VALVE MANHOLE

NOTES:
SHOP DRAWINGS FOR PUMPS, VALVES AND FITTINGS MUST BE SUBMITTED FOR REVIEW AND APPROVAL ON ALL PUMP STATIONS.

PIMA COUNTY
WASTEWATER MANAGEMENT

5-5-83
DIR. P.C.W.M.D.
DATE

4-18-83
CHIEF ENGINEER P.C.W.M.D.
DATE

REVISED: 501
NOTES:

1. SUMP CAPACITY TO BE DETERMINED BY ENGINEER.
2. PIPE SIZE AND MATERIAL SPECIFIED ON CONSTRUCTION PLANS.
3. SWITCH LOCATION SPECIFIED ON CONSTRUCTION PLANS.
4. PUMP SIZE AND TYPE SPECIFIED ON CONSTRUCTION PLANS.
5. PUMP M.H. TO BE TESTED FOR WATER TIGHTNESS.

PIMA COUNTY
WASTEWATER MANAGEMENT

REvised:

502
AIR RELEASE VALVE FOR PRESSURE MAIN

24" M.H. FRAME AND COVER
STD. DETAIL NO. 213
FINISHED GROUND SURFACE
2 1/2"

ADJUSTING RING SET IN MORTAR AS REQUIRED

1" SHUT OFF VALVE

PRECAST M.H. CONE SECTION
(ASTM C-478)

BACK FLUSH HOSE

CONCRETE FOOTING

CRUSHED STONE, SEE
STD. DETAIL NO. 104

TEE SIZE AS NOTED ON CONSTRUCTION PLANS

NOTES:
1. SUBMIT SHOP DRAWINGS

PIMA COUNTY
WASTEWATER MANAGEMENT

DIRECTOR P.C.W.M.D. 5-5-83
CHIEF ENGINEER P.C.W.M.D. 4-4-83
DATE DATE

REVISED: APRIL 1988
STD. DET. NO. 503
PIECE "S" CONCRETE THRUST BLOCKS (CALCULATED SIZE TO BE REVIEWED AND APPROVED BY P.C.W.M.D.) ARE REQUIRED AT LINE DIRECTION CHANGES.

PIPE MATERIAL TO BE P.V.C. OR D.I.P. AS CALLED FOR ON THE PLANS.

ALL FITTINGS TO BE COMPATIBLE WITH PIPE MATERIAL AS CALLED FOR ON THE PLANS.

PLAN VIEW

FINDER TAPE

THRUST BLOCK

PRESSURE MAIN

UNDISTURBED EARTH

BEDDING AS CALLED FOR ON THE PLANS

SECTION A-A

NOTES:
1. A CONTINUOUS IDENTIFYING TAPE AND FINDER MANUFACTURED BY GRIFFOLYN CO. OR APPROVED EQUAL, SHALL BE BURIED 18 INCHES ABOVE THE PRESSURE MAIN. CONTINUOUS PRINTING ON THE TAPE SHALL STATE "CAUTION: SEWAGE PRESSURE LINE".

2. INSTALLATION OF D.I.P. OR P.V.C. PIPE SHALL BE IN ACCORDANCE WITH P.C.W.M.D. STANDARDS.

3. AT 100 FEET EITHER SIDE OF PROPOSED AIR RELEASE VALVE LOCATION(S), THE SEWAGE PRESSURE LINE SHALL TRANSITION FROM 4'-0" (MIN.) COVER TO 5'-0" (MIN.) COVER AT THE PROPOSED AIR RELEASE VALVE LOCATION(S).

4. THE HORIZONTAL LOCATION OF THE PRESSURE LINE SHALL BE IDENTIFIED BY A PERMANENT MARKER ACCEPTABLE TO P.C.W.M.D.

PIMA COUNTY WASTEWATER MANAGEMENT

REVISED: APRIL 1988

STD. DET. NO. 504
CONNECTING PRESSURE MAIN TO MANHOLE

PLAN VIEW

SECTION B-B

NOTES:
1. EXISTING MANHOLE BENCH SHALL BE THOROUGHLY CLEANED PRIOR TO CONSTRUCTING NEW BUILT-UP BENCH. NEW BENCH SHALL BE CLASS "A" CONCRETE.
2. IF CONNECTING TO TERMINAL MANHOLE, BRING PRESSURE MAIN INTO MANHOLE IN STRAIGHT LINE ALIGNMENT WITH OUTLET MAIN.
GO, NO-GO DEFLECTION TESTING MANDREL

SECTION A-A

END VIEW

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>A (INCHES)</th>
<th>B (INCHES)</th>
<th>D (INCHES)</th>
<th>R (INCHES)</th>
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<tr>
<td>8&quot;</td>
<td>2</td>
<td>2.4 - 8</td>
<td>7.28</td>
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<tr>
<td>10&quot;</td>
<td>2</td>
<td>3 - 10</td>
<td>9.08</td>
<td>8.08</td>
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<td>12&quot;</td>
<td>2</td>
<td>3.5 - 12</td>
<td>10.79</td>
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<td>15&quot;</td>
<td>2</td>
<td>4.3 - 15</td>
<td>13.20</td>
<td>12.20</td>
</tr>
<tr>
<td>18&quot; AND OVER</td>
<td>SUBMIT SHOP DRAWING</td>
<td></td>
<td></td>
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</tbody>
</table>

5% DEFLECTION

NOTES:
1. AFTER WELDING IS COMPLETED, TRUE THE OUTSIDE DIAMETER DIMENSION FOR THE FULL LENGTH OF "B" TO ± 0.010" BY TOOL AND LATHE OR GRINDING.
2. FINISHED PART TO BE SAND BLASTED AND RUST-PROOFED WITH PAINT.
3. THE MINIMUM NUMBER OF RIBS IS SUBJECT TO P.C.W.M.D. REVIEW AND APPROVAL OF SHOP DRAWINGS.

PIMA COUNTY
WASTEWATER MANAGEMENT

DIRECTOR
P.C.W.M.D.
S.5-83
DATE

CHIEF ENGINEER
P.C.W.M.D.
4 May '83
DATE

REVISED:

STD.
DET.
NO.

506
Variances

The Director of the Wastewater Management Department and his designated representatives may allow variances to the Design Standards and Standard Details when strict adherence would less adequately provide for the development, maintenance, efficiency, and effectiveness of public sanitary sewerage facilities. The variance shall secure substantially the objectives of the Design Standard or Standard Detail to which the variance is granted. Variances may be allowed when:

- design slopes less than the Standard minimums would eliminate the need for a pump station;
- a substitution for or change in a Standard material results in the use of a material which can be clearly demonstrated to be of equal or superior quality;
- a strict adherence to a Design Standard or Standard Detail would be impractical or impossible because of field conditions such as existing utility facilities or incompatible existing sewerage facilities; or
- an emergency situation prohibits strict adherence to a Design Standard or Standard Detail.