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# WASTEWATER MANAGEMENT

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

PLAN VIEW

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

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

FINISH INVERT ELEV.

CUT HP TO CONFORM TO OUTSIDE SURFACE PERIMETER OF PIPE

SECTION A-A

1 3/4" (MIN.) 6 HP TO PIPE O.D.

1 1/2" (MIN.) HP PILE AS CALLED FOR ON THE PLANS

SIDE VIEW

2'-0" (MIN.) 5'-0" (MAX.)

FLOW

HP SADDLE AS CALLED FOR ON PLAN

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

REMOVE DAMAGED PIPE AND REPLACE WITH NEW PIPE ACCEPTABLE TO P.C.W.M.D.

EXISTING SEWER MAIN

BEDDING

UNDISTURBED SOIL

MISSION REPAIR COUPLING *
ROMAC COUPLING, SMITH-BLAIR COUPLING, OR APPROVED EQUAL COUPLING SUITABLE FOR WASTEWATER APPLICATIONS. SEE DETAIL 103.

*(6” THROUGH 12” ONLY)

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 WASTEWATER MANAGEMENT DEPARTMENT OR AUTHORIZED REPRESENTATIVE PRIOR TO BACKFILL.

3. COMPACTION OF BACKFILL SHALL BE IN ACCORDANCE WITH SECTION 923 OF THE LATEST EDITION OF THE PIMA COUNTY / CITY OF TUCSON STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS.
### 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>6&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>
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<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>
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<tr>
<td>8&quot;-16&quot;</td>
<td>D. I.</td>
<td>SEE NOTE 3</td>
<td>2-17</td>
<td>2-24</td>
<td>2-30</td>
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### SIEVE ANALYSIS CHART

<table>
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<th>CRUSHED STONE</th>
<th>SAND</th>
<th>SELECT NATIVE MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOM. SIZE</td>
<td>%PASSING</td>
<td>NOM. SZ.</td>
</tr>
<tr>
<td>1&quot;</td>
<td>100</td>
<td>1&quot;</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>90-100</td>
<td>#4</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>20-55</td>
<td>#200</td>
</tr>
<tr>
<td>#4</td>
<td>0-10</td>
<td>MAX. P.I.=5</td>
</tr>
<tr>
<td>#8</td>
<td>0-5</td>
<td>MAX. L.L.=30</td>
</tr>
</tbody>
</table>

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

### NOTES:

1. COMPACTION OF BACKFILL SHALL MEET SECTION 923 OF THE LATEST EDITION OF THE PIMA COUNTY / CITY OF TUCSON STANDARD DETAILS & SPECIFICATIONS FOR PUBLIC IMPROVEMENTS UNLESS OTHERWISE NOTED ON PLANS.

2. SHADING SHALL BE CAREFULLY PLACED. MINIMUM DENSITY TO BE 95% OF THE DRY DENSITY DETERMINED IN ACCORDANCE WITH ARIZONA TEST METHODS 225, 226, 230 OR 231 AND 232.

3. ALL DUCTILE IRON PIPE AND ALL PIPE 18" IN DIAMETER AND LARGER WILL REQUIRE SPECIAL APPROVAL OF THE DESIGN AND INSTALLATION BY P.C.W.M.D.

4. P.C.W.M.D. RESERVES THE RIGHT TO ADJUST, ON AN INDIVIDUAL CASE BASIS, THESE PIPE BEDDING REQUIREMENTS TO MEET UNEXPECTED FIELD/SOIL CONDITIONS.

5. UNDISTURBED EARTH OR SELECT MATERIAL COMPACTED TO 95% OF THE DRY DENSITY DETERMINED IN ACCORDANCE WITH ARIZONA TEST METHODS 225, 226, 230 OR 231 AND 232.

6. CRUSHED STONE BEDDING SHALL NOT BE USED WITH DUCTILE IRON PIPE UNLESS SPECIAL APPROVAL IS GIVEN BY P.C.W.M.D.
SAND BEDDING

CRUSHED STONE BEDDING

NOTES:

NOTES 1 THRU 6 ON STANDARD DETAIL NO. 104 (RIGID PIPE) ALSO APPLY TO FLEXIBLE PIPE.

7. MINIMUM TRENCH WIDTH SHALL BE AS FOLLOWS:

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<th>TOTAL WIDTH OF TRENCH REQUIRED</th>
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<tr>
<td>COMPARED TO RESISTANCE OF</td>
<td>TRENCH WALL &lt; COMPACTED SOIL</td>
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<td>COMPACTED SOIL BESIDE THE</td>
<td>TRENCH WALL = COMPACTED SOIL</td>
</tr>
<tr>
<td>PIPE</td>
<td>TRENCH WALL &gt; COMPACTED SOIL</td>
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8. 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.

9. 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.

10. 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.

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

12. IF CRUSHED STONE IS USED FOR THE BEDDING MATERIAL, SAND SHALL BE USED FOR THE SHADING MATERIAL. THE SAND MAY ALSO NEED TO BE Flooded WITH WATER TO FLUSH IT INTO THE VOID SPACES LOCATED IN THE CRUSHED STONE IF DEEMED NECESSARY BY P.C.W.M.D.

* IN ACCORDANCE WITH ASTM D-2321
1. All design standards, materials and workmanship for public sanitary sewers are to be in accordance with the latest edition of the Pima County Wastewater Management Department’s MANUAL OF ENGINEERING STANDARDS AND PROCEDURES, and the Pima County / City of Tucson Standard Details and Specifications for Public Improvements, said Manuals are on file at Pima County Wastewater Management offices at 201 N. Stone Avenue, 8th floor.

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, a minimum of two (2) full working days prior to excavating.

4. All changes that might affect the sewerage system (both conveyance as well as treatment) shall be approved by the Pima County Wastewater Management Department prior to their construction.

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

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 smoothly direct the flow in the proper direction.

8. The Contractor shall furnish, operate and maintain all equipment necessary to provide continuous 24 hr./day 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 Collection System Maintenance Section at (326-4333) 48 hours prior to starting any construction that could either adversely impact the flow within a live sewer, or involve connection to a sewer fifteen (15) inches in diameter or larger.

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 make full payment of the involved inspection fees and obtain a Wastewater Management sewer construction permit from the Pima County Development Services Department (Planning, 740-6586) a minimum of three (3) full working days prior to starting any sewer construction.

11. All ductile iron pipe, fittings and metal couplings shall have both a polyethylene interior lining and polyethylene exterior wrapping or approved equals. Pipes made from unlike materials shall be coupled together in accordance with standard detail 103.

12. The horizontal distance between a public water pipe and a sewer main shall not be less than six (6) feet. Vertical clearance between water and sewer lines shall be a minimum of 24 inches. (If these criteria cannot be met, design changes will be required.)

13. All ductile iron pipe joints shall be caulked in accordance with Pima County Wastewater Management Specifications. This caulkng shall be applied in sufficient quantity and at the proper location such that when the spigot end of the pipe is inserted into the bell end of another pipe, an impermeable seal is developed between the spigot end of one pipe section and the barrel to bell transition point of the other pipe section.
SECTION A-A

END VIEW

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<tr>
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<th>B (INCHES)</th>
<th>D (INCHES)</th>
<th>R (INCHES)</th>
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<tbody>
<tr>
<td>8&quot;</td>
<td>2</td>
<td>2.4 - 8</td>
<td>7.28</td>
<td>6.28</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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<tr>
<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>
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<td>18&quot; AND OVER</td>
<td></td>
<td>SUBMIT SHOP DRAWING</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.
VERTICAL SEPARATION

GRAVITY SEWER CROSSING
(SEWER UNDER WATER MAIN)

PRESSURE SEWER CROSSING
(SEWER UNDER WATER MAIN)

GRAVITY OR PRESSURE SEWER CROSSING
(SEWER ABOVE WATER MAIN)

NOTES:

1. WHERE A WATER MAIN CROSSES ABOVE A GRAVITY SEWER WITH 2' OR GREATER VERTICAL CLEARANCE (OUTSIDE SURFACE TO OUTSIDE SURFACE), NO EXTRA PROTECTION IS REQUIRED. WHERE A WATER MAIN CROSSES ABOVE A PRESSURE SEWER WITH 6' OR GREATER VERTICAL CLEARANCE, NO EXTRA PROTECTION IS REQUIRED.

2. WHERE A WATER MAIN MUST CROSS ABOVE A GRAVITY SEWER WITH LESS THAN 2' OF CLEARANCE OR ABOVE A PRESSURE SEWER WITH LESS THAN 6' OF CLEARANCE, CONSTRUCT OR REPLACE THE SEWER LINE WITH DUCTILE IRON PIPE (D.I.P.) OR APPROVED EQUAL. THE D.I.P. SHALL HAVE A "PUSH-ON" JOINT OR APPROVED EQUAL IF THE SEWER JOINTS ARE LOCATED 6' OR MORE BEYOND THE OUTSIDE SURFACE OF THE WATER MAIN. IF A JOINT IS LOCATED LESS THAN 6' FROM THE OUTSIDE SURFACE OF THE WATER MAIN, THEN A RESTRAINED JOINT OR APPROVED EQUAL SHALL BE USED. SEE THE PLAN VIEWS ON SHEET 3 FOR REFERENCE. IN NO CASE SHALL THE WATER MAIN BE LESS THAN 1' ABOVE A GRAVITY SEWER OR 2' ABOVE A PRESSURE SEWER.

3. WHERE A WATER MAIN CROSSES BELOW EITHER A GRAVITY SEWER OR A PRESSURE SEWER, CONSTRUCT OR REPLACE THE SEWER LINE WITH D.I.P. OR APPROVED EQUAL FOLLOWING THE GUIDELINES GIVEN IN NOTE NO. 2. IN NO CASE SHALL THE WATER MAIN BE LESS THAN 2 FEET BELOW EITHER A GRAVITY OR PRESSURE SEWER LINE.
HORIZONTAL SEPARATION

SEWER LINE ——— 6' MIN. ——— WATER MAIN

SEWER / WATER SEPARATION
( PARALLEL ALIGNMENTS )

SEWER MANHOLE ——— 6' MIN. ——— WATER MAIN

SEE SHEET 1 OF 3 OF THIS DETAIL

NOTES (CONTINUED):

4. THE MINIMUM HORIZONTAL CLEARANCE WITHOUT EXTRA PROTECTION BETWEEN A WATER MAIN AND A PRESSURE OR GRAVITY SEWER LINE SHALL BE 6' OUTSIDE SURFACE TO OUTSIDE SURFACE.

5. THE MINIMUM HORIZONTAL CLEARANCE BETWEEN A WATER MAIN AND A SEWER MANHOLE SHALL BE 6' FROM THE OUTSIDE SURFACE OF THE WATER MAIN TO THE CENTERLINE OF THE MANHOLE.

6. WHERE A 6' HORIZONTAL CLEARANCE CANNOT BE MAINTAINED WITH A GRAVITY SEWER, CONSTRUCT OR REPLACE THE SEWER LINE WITH D.I.P. OR APPROVED EQUAL FOLLOWING THE GUIDELINES GIVEN IN NOTE NO. 2. IN NO CASE SHALL A GRAVITY SEWER LINE BE LOCATED LESS THAN 2' HORIZONTALLY FROM A WATER MAIN.

7. IN NO CASE SHALL A PRESSURE SEWER LINE BE LOCATED LESS THAN 6' HORIZONTALLY FROM A WATER MAIN.

NOTES (CONTINUED):


11. IN GENERAL, WHEN UNUSUAL CONDITIONS SUCH AS, BUT NOT LIMITED TO, HIGHWAY OR BRIDGE CROSSINGS PREVENT THE WATER AND SEWER LINE SEPARATIONS REQUIRED BY THIS DETAIL FROM BEING MET, THE PIMA COUNTY WASTEWATER MANAGEMENT DEPARTMENT WILL REVIEW AND MAY APPROVE (SUBJECT TO ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY'S APPROVAL), REQUESTS FOR AUTHORIZATION TO USE ALTERNATE CONSTRUCTION TECHNIQUES, MATERIALS AND JOINTS ON A CASE-BY-CASE BASIS.

12. ALL DUCTILE IRON PIPE SHALL BE INTERNALLY LINED TO MEET THE MOST RECENT PIMA COUNTY WASTEWATER DEPARTMENT SPECIFICATIONS.
FOR 21"Ø 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

PLAN VIEW

RAM-NEK SEAL OR APPROVED EQUAL

GROUT

2" COVER (MIN.)

2" CLR. TYP.

2/3 PIPE I.D.

CLASS "S" CONCRETE TYPE II PORTLAND CEMENT REQUIRED

UNDISTURBED EARTH OR COMPACTED SELECT MATERIAL (95%)

* NOTE:
REINFORCING STEEL IS OPTIONAL FOR MANHOLES LESS THAN 20' DEEP FROM INVERT TO TOP OF COVER

2" CLR. TYP.

VARIABLES

6" MIN.

12" MAX. (TYP.)

4'-0" OR 5'-0"

SLOPE 1/4"/FT (MIN.)

1'-3" TYP.

PIPE T.D.

*REINFORCING STEEL #5 AT 10" EACH WAY

SECTION A-A

ISSUED:
8/92

REvised:
11/94

STANDARD DETAIL
STANDARD MANHOLE BASE

DETAIL NO.
WWM 201

SHEET 1 OF 1
(FOR 24" Ø AND LARGER PIPE)

PLAN VIEW

CROWN OF STUB TO MATCH THE CROWN OF THE INCOMING PIPE

M.H. RISER (ASTM-C-478)

GROUT REMOVABLE PLUG

PIPE I.D. (VARIES)

SENTION A-A

2-NO.6

BELL OF STUB SHALL BE FLUSH WITH SIDE OF BASE

NO.5 AT 5"

NO.6 AT 5"

NO.6 AT 18"

NO.5 AT 7 1/2"

NO.6 AT 18"

NO.5 AT 7 1/2"

RAM-NEK SEAL OR APPROVED EQUAL

1/4" PER FT. SLOPE

2'-6"

5'-0"

2-NO.6

NO.6 AT 12"

NO.4 AT 12"

3" CLR.

NO.5 AT 12"

CLAY "S"

CONCRETE TYPE II

PORTLAND CEMENT REQUIRED

UNDISTURBED OR COMPACTED SELECT MATERIAL (95%)

FLOW

VARIABLE

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.

ISSUED:
8/92

REvised:
11/94

STANDARD DETAIL
REINFORCED CONCRETE MANHOLE BASE

DETAIL NO.
WWM
202

SHEET 1 OF 1
PLAN VIEW

SECTION A-A

STUB-OUT

BELL OF STUB EVEN WITH OUTSIDE SURFACE OF BASE

2" (MIN.) COVER

M.H. RISER

RAM-NEK SEAL OR APPROVED EQUAL

2" (MIN.) MORTAR COVER

PIPE I.D.

MASONRY BLOCKS

FILL ALL VOIDS WITH ROCKS, SHAPE INVERT TO DIRECT FLOW IN PROPER DIRECTION

UNDISTURBED EARTH OR COMPACTED (95%) SELECT MATERIAL

BLOCK-OUT

M.H. RISER

BLOCK-OUT SIZE AS CALLED FOR ON PLANS

ARROW SCRATCHED IN TOP SURFACE OF MORTAR BENCH

FOR STEP SEE STD. DETAIL NO. 216, 217

ISSUED:
8/92

STANDARD DETAIL
MANHOLE STUB-OUT AND BLOCK-OUT

REvised:
11/94

DETAIL NO.
WWM 203

SHEET 1 OF 1
(Diagram with notes)

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.

ISSUED:
8/92

REvised

STANDARD DETAIL
STANDARD BRICK MANHOLE

DETAIL NO.
WWM
204

SHEET 1 OF 1
STANDARD 24" FRAME AND COVER
SEE STD. DETAIL NO. 213

FIN. GROUND SURFACE

2 1/2"

9"

PAVEMENT

ADJUSTING RING SET IN MORTAR BED

CONRE SECTION
(AM C-478)

M.H. STEP (SEE STD. DETAIL NOS. 216, 217)

RAM-NEK OR APPROVED EQUAL AT ALL JOINTS

BARREL SECTION
(AM 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

VARES

3'-0", 3'-6", OR 4'-0" 1'-6" (MIN.)

6" (MIN.)

4'-0"

FOR 10" OR SMALLER PIPE

ISSUED:
8/92
REVISED

STANDARD DETAIL
STANDARD 4' DIA.
PRECAST CONCRETE MANHOLE

DETAIL NO.
WWM
205

SHEET 1 OF 1
**STANDARD 24" OR 30" FRAME AND COVER**

**FIN. GROUND SURFACE**

- 2 1/2"
- 18" (MIN.)
- 6" (MIN.)
- 6" (MIN.)
- 3'-6" (MIN.)

**ADJUSTING RING SET IN MORTAR BED**

**CONCRETE BASE (ASTM C-478)**

**BARREL SECTION* (ASTM C-478)**

**TRANSITION SECTION (ASTM C-478)**

**RAM-NEK SEAL OR APPROVED EQUAL ON ALL JOINTS**

**M.H. BASE (TYPE DETERMINED BY PIPE SIZE)**

SEE STD. DETAIL NO. 201, 202

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

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

1. USE OF THIS TYPE OF MANHOLE IS SUBJECT TO SPECIAL APPROVAL FROM P.C.W.M.D.
PLAN VIEW

FIN. GROUND SURFACE

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

PAVEMENT

ADJUSTING RING SET IN MORTAR BED

CLASS "S" CONC. SLAB

MORTAR

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

4'-0"

2" CL

2" MAX.

6" (MAX.)

6" (MIN.)

1'-6" (MIN.)

VARIES

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

GROUT

RAM-NEK SEAL OR APPROVED EQUAL ON ALL JOINTS.

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

SECTION A-A

ISSUED: 8/92
REvised: 11/94
STANDARD DETAIL
4' DIA. FLAT TOP MANHOLE
DETAIL NO. WWM 208
SHEET 1 OF 1
PLAN VIEW

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

2" CLEARANCE (TYR)

FIN. GROUND SURFACE

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

PAVEMENT

ADJUSTING RING SET IN MORTAR BED

CLASS "S" CONC. SLAB

MORTAR

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

1 1/8'' MAX.

5'-0''

2'-0'' MAX.

6'' (MAX.)

6'' (MIN.)

1'-6'' (MIN.)

8''

8''

6'' (MIN.)

6'' (MIN.)

VARRIES

SECTION A - A

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

GROUT

RAM-NEK SEAL OR APPROVED EQUAL ON ALL JOINTS

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

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

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

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

FIN. GROUND
SURFACE

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

2" CL

2-0" (MAX.)

1-8" (MIN.)

2-1/2"

2-0"

3-0"

6" (MIN.)

6" (MAX.)

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

SECTION A-A

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

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

GROUT

RAM-NEK SEAL OR
APPROVED EQUAL

RAM-NEK SEAL OR
APPROVED EQUAL

TRANSITION
SECTION
(UNTESTED C-478)

BARREL SECTION
(UNTESTED C-478)

CLASS "5" CONC.
SLAB

ADJUSTING RING
SET IN MORTAR BED

MORTAR

PAVEMENT

PAVEMENT

STANDARD 24" M.H.
FRAME AND COVER
(SEE STD. DETAIL NO. 2/3)

2" CLEARANCE (TYR)

NO. 5 DIAGONALLY

VARES
NOTES:

1. SUBMIT SHOP DRAWINGS (FOR P.C.W.M.D. REVIEW AND APPROVAL) FOR ANY VARIATIONS.
2. ALL CASTINGS SHALL BE OF CLASS 350 CAST IRON AS PER ASTM A48 AND SHALL ALSO MEET THE AASHTO M306 40,000 LBS. PROOF REQUIREMENTS.
3. ALL COVERS ARE TO CARRY "PIMA COUNTY SANITARY SEWER" LETTERS SHALL BE STANDARD RAISED BLOCK TYPE, AND SHALL BE 1 1/2" - 2 1/2" HIGH.
4. 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.
5. FRAME WEIGHT 180 LBS. (APPROX.).
6. COVER WEIGHT 130 LBS. (APPROX.).
NOTES:

1. SUBMIT SHOP DRAWINGS (FOR P.C.W.M.D. REVIEW AND APPROVAL) FOR ANY VARIATIONS.

2. ALL CASTINGS SHALL BE OF CLASS 35B CAST IRON AS PER ASTM A48 AND SHALL ALSO MEET THE AASHTO M306 40,000 LBS. PROOF REQUIREMENTS

3. ALL COVERS ARE TO CARRY "PIMA COUNTY SANITARY SEWER". LETTERS SHALL BE STANDARD RAISED BLOCK TYPE, AND SHALL BE 1 1/2" - 2 1/2" HIGH.

4. 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.

5. THE COVER SHALL HAVE PICK BARS AND NO VENT HOLES.

6. FRAME WEIGHT 180 LBS. (APPROX.).

7. COVER WEIGHT 130 LBS. (APPROX.).
NOTES:

1. SUBMIT SHOP DRAWINGS (FOR P.C.W.M.D. REVIEW AND APPROVAL) FOR ANY VARIATIONS.

2. ALL CASTINGS SHALL BE OF CLASS 35B CAST IRON AS PER ASTM A48 AND SHALL ALSO MEET THE AASHO M308 40,000 LBS. PROOF REQUIREMENTS

3. ALL COVERS ARE TO CARRY "PIMA COUNTY SANITARY SEWER". LETTERS SHALL BE STANDARD RAISED BLOCK TYPE, AND SHALL BE 1 1/2" - 2 1/2" HIGH.

4. 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.

5. THE COVER SHALL HAVE PICK BARS AND NO VENT HOLES.

6. FRAME WEIGHT 180 LBS. (APPROX.).

7. COVER WEIGHT 130 LBS. (APPROX.).

ISSUED

REVISED

STANDARD DETAIL

24" BOLTED WATERPROOF MANHOLE FRAME AND COVER

DETAIL NO.

WWM

213B

SHEET 1 OF 1
NOTES:

1. TO BE USED FOR MANHOLES INVOLVING MAINS OF 27" DIAMETER OR LARGER.
2. SUBMIT SHOP DRAWINGS (FOR P.C.W.M.D. REVIEW AND APPROVAL) FOR ANY VARIATIONS.
3. ALL CASTINGS SHALL BE OF CLASS 35B CAST IRON AS PER ASTM A48 AND SHALL ALSO MEET THE AASHTO M808 40,000 LB. PROOF REQUIREMENT.
4. ALL COVERS ARE TO CARRY "PIMA COUNTY SANITARY SEWER" LETTERS SHALL BE STANDARD RAISED BLOCK TYPE, AND SHALL BE 1 1/2" - 2 1/2" HIGH.
5. 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 SURFACE.
6. FRAME WEIGHT 200 LBS. (APPROX.).
7. COVER WEIGHT 217 LBS. (APPROX.).
NOTES:

1. TO BE USED FOR MANHOLES INVOLVING MAINS OF 27" DIAMETER OR LARGER.
2. SUBMIT SHOP DRAWINGS (FOR P.C.W.M.D. REVIEW AND APPROVAL) FOR ANY VARIATIONS.
3. ALL CASTINGS SHALL BE OF CLASS 35B CAST IRON AS PER ASTM A48 AND SHALL ALSO MEET THE
   ASHTO M306 40,000 LB. PROOF REQUIREMENT.
4. ALL COVERS ARE TO CARRY "PIMA COUNTY SANITARY SEWER". LETTERS SHALL BE STANDARD RAISED
   BLOCK TYPE, AND SHALL BE 1 1/2" - 2 1/2" HIGH.
5. 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.
6. THE COVER SHALL HAVE PICK BARS AND NO VENT HOLES.
7. FRAME WEIGHT 200 LBS. (APPROX.).
8. COVER WEIGHT 217 LBS. (APPROX.).
(4) 3/4" (19mm) CORED HOLES FOR BOLTING (SEE DETAIL)
(4) 7/8" (22mm) HOLES ON 38 1/2" (927mm) DIA BOLT CIRCLE
(4) 1/2"-13x2" STAINLESS STEEL HEX BOLTS
(4) STAINLESS STEEL WASHERS 1/2" ID X 1 1/4" OD
(4) RUBBER WASHERS 1/2" FLAT

1/4" (6mm) DIAMETER BUTTON RAISED 3/16" (5mm)

2" (51mm) LETTERING 3/16" (5mm) HIGH

PLAN VIEW

FRAME SECTION

13/16" (21mm)
29 5/8" DIA [752mm]
32 9/16" DIA [827mm]
38 3/4" DIA [984mm]

33 1/2" DIA [851mm]
29 3/4" DIA [756mm]

6" [152mm]

1 3/4" [44mm]

3 1/2" [89mm]
1 3/4" (6mm) DIA [44mm] NEOPRENE GASKET

7/8" [22mm]

31 5/8" DIA [803mm]

180°

COVER SECTION

BOTTOM VIEW

✓ MACHINED SURFACE
BOLTHOLE DETAIL

1/2"-13 x 2" STAINLESS STEEL HEX BOLTS
STAINLESS STEEL WASHER 1/2: ID X 1 1/4" OD
& RUBBER WASHER 1/2" FLAT

5/8" [16mm]

3 3/4" [95mm]

3/4" [19mm]

3 1/16" [78mm]

1 3/4" [44mm]

2 5/16" [59mm]

2 1/2" [64mm]

1" (25mm) DIA X 4" S.S. ROD

PICKBAR DETAIL

NOTES:

1. TO BE USED FOR MANHOLES INVOLVING MAINS OF 27" DIAMETER OR LARGER.

2. SUBMIT SHOP DRAWINGS (FOR P.C.W.M.D. REVIEW AND APPROVAL) FOR ANY VARIATIONS.

3. ALL CASTINGS SHALL BE OF CLASS 35B CAST IRON AS PER ASTM A48 AND SHALL ALSO MEET THE AASHTO M306 40,000 LB. PROOF REQUIREMENT.

4. ALL COVERS ARE TO CARRY "PIMA COUNTY SANITARY SEWER" LETTERS SHALL BE STANDARD RAISED BLOCK TYPE, AND SHALL BE 1 1/2" - 2 1/2" HIGH.

5. 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.

6. THE COVER SHALL HAVE PICK BARS AND NO VENT HOLES.

7. FRAME WEIGHT 200 LBS. (APPROX.).

8. COVER WEIGHT 217 LBS. (APPROX.).
NOTES:

1. STEPS FOR PRECAST CONCRETE MANHOLES SHALL BE OF STEEL REINFORCED POLYPROPYLENE; M.A. INDUSTRIES INC., NO. PS-IPF, LANE INTERNATIONAL CORP. P-10938, OR 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 POLYPROPYLENE 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.
PLAN VIEW

SECTION A-A

CLASS "S" CONCRETE WEIR
W/ TYPE II PORTLAND
CEMENT

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

TOP OF BENCH

WEIR TOP ELEVATION AS NOTED ON PLANS
NOTE:

1. DRILL HOLES, BOTH SIDES, 1/2" DIA. BY 2" DEEP FOR INSERTION OF 3/8" DIA. BY 6" LONG STAINLESS STEEL BOLTS. LOCATE BOLT HOLES TO HOLD GATE IN A POSITION WHICH WILL ALLOW FLOW UNDER GATE OF 1/4 PIPE DIA. AND 1/2 PIPE DIA. CONTRACTOR TO SUPPLY TWO BOLTS PER GATE.

2. MAXIMUM DIAMETER OF MAINLINE FOR WHICH A REDWOOD GATE CAN BE USED IS 15". THE USE OF A REDWOOD GATE ON LARGER DIAMETER SEwers WILL REQUIRE SPECIAL APPROVAL BY P.C.W.M.D.

* SELECT GRADE 2" X 6" REDWOOD BOARDS - ROUGH CUT
EXTERIOR COATINGS -
ONE PRIMER COAT OF TNEMEC 104-1255
(8 MILS, MIN. DRY FILM THICKNESS)
OR EQUAL AND TWO FINAL COATS OF
TNEMEC 71-A162 OR EQUAL (2 MILS
MIN. DRY FILM THICKNESS FOR EACH
COAT) EXPOSED METAL SHALL RECEIVE
AN SSPC-SP10 NEAR-WHITE METAL BLAST
CLEANING BEFORE APPLYING COATINGS.

VENT OPENING TO BE
LOCATED AT LEAST 1'
ABOVE THE 100 YEAR
FLOOD WATER
SURFACE ELEVATION
AND A MINIMUM OF 9'
ABOVE THE FINAL
GRADE ELEVATION

WATERPROOF M.H. FRAME & COVER

COAT END OF PIPE WITH COAL TAR EPOXY PER P.C.W.M.D.
SPECIFICATIONS

MANHOLE

5" MIN.

4'-0" MIN.

1'

FILL LOWER PIPE WITH CONC.
TO INVERT OF HORIZ. PIPE

CLASS "S" CONCRETE

6'-8"

3'-6" MIN.

4" STEEL PIPE @ 1.0% SLOPE TOWARD MANHOLE
(WRAP ALL BURIED STEEL PIPE WITH 8 MIL POLYETHYLENE SHEETING & CONCRETE CORE THE
MANHOLE TO ACCOMMODATE THE STEEL PIPE)

NOTES:
1. WATERPROOF MANHOLE COVERS MUST BE USED AT ALL MANHOLE LOCATIONS THAT ARE LOCATED IN A 100 YEAR FLOOD PLAIN AREA.
2. MANHOLE VENTS WILL BE REQUIRED AT EVERY OTHER MANHOLE IF THE MANHOLE SPACING IS EQUAL TO OR LESS THAN 500 FEET.
3. MANHOLE VENTS WILL BE REQUIRED AT EVERY MANHOLE IF THE MANHOLE SPACING IS GREATER THAN 500 FEET.
4. ALL STEEL PIPE SHALL HAVE A 40 MIL COAL TAR EPOXY INTERIOR LINING. THE LINING SHALL MEET P.C.W.M.D. SPECIFICATIONS.
NOTE:

FIBERGLASS GRATING
26" DIA. BY 1" DEPTH
1KG BORDON OR APPROVED EQUAL *

RAM-NEK SEAL OR APPROVED EQUAL

ELEVATION OF PRECAST CONCRETE SLAB SAFETY LANDING AS PER PLANS

6" (MAX.)

6x6" - D6x6

48" OR 60" I.D. MANHOLE

* SUBMIT SHOP DRAWINGS
2 - #5 x 1'-0" LG ALLTHREAD

EXTERIOR MANHOLE WALL
2" x 2" x 5/16" x 4"
1/4"

40 mil COAL TAR EPOXY COATING ON EXPOSED METAL
BAR 3" x 5/16" x 3"

1/4"

2" x 2" x 5/16" x 4"

PRECAST CONCRETE BARREL SECTION

4" WIDE STRIP OF RAM-NEK FOR FULL CIRCUMFERENCE

2 - #5 x 1'-0" LG ALLTHREAD

NOTES:

1. PROVIDE POSITIVE ANCHOR JOINTS AT THE UPSTREAM WASH FACE AND AT THE THREE (3) OTHER POINTS LOCATED 90° AWAY FROM EACH OTHER AND FROM THE UPSTREAM FACE. ANCHOR JOINTS SHALL BE USED ON ALL MANHOLE SECTION-TO-SECTION, SECTION-TO-GRADE RINGS, AND GRADE RINGS-TO-GRADE RING JOINTS AS DETAILED. ALL SECTIONS SHALL BE SECURED. ANCHOR JOINTS SHALL BE USED TO SECURE THE BOTTOM MANHOLE SECTION TO THE MANHOLE BASE.

2. FIELD WELD THE ANCHOR JOINTS AS INDICATED ON THE EXTERIOR OF THE BARREL SECTION AND COAT ALL EXPOSED METAL WITH A 40 mil COAL TAR EPOXY DRY FILM THICKNESS.

3. SECURE THE MANHOLE FRAME TO THE GRADE RINGS.

4. ALL COSTS OF CONSTRUCTION SHALL BE MERGED INTO THE UNIT BID FOR THE 4' OR 5' DIAMETER MANHOLE.

5. ALL WELDS SHALL BE IMMEDIATELY QUENCHED WITH TEN (10) WEIGHT MOTOR OIL AFTER EACH WELD IS COMPLETED.

6. THE ALLTHREAD SHALL BE 5/8", GRADE 2, NON-GALVANIZED, COURSE.

ISSUED
8/92

REVISED
11/94

MANHOLE POSITIVE ANCHOR JOINT

STANDARD DETAIL

DETAIL NO.
WWM 223

SHEET 1 OF 1
NOTES:
1. EXISTING MANHOLE BENCH TO BE THOROUGHLY CLEANED PRIOR TO CONSTRUCTING NEW BUILT UP BENCH. NEW BENCH SHALL BE CLASS “S” CONCRETE W/ TYPE I II PORTLAND CEMENT.

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

3. SHAPE NEW CHANNEL TO PROVIDE FOR A SMOOTH TRANSITION OF FLOW FROM NEW INCOMING PIPE TO OUTGOING MAIN.
NOTE:

1. EXISTING MANHOLE BENCH TO BE THOROUGHLY CLEANED PRIOR TO CONSTRUCTING NEW BUILT UP BENCH. NEW BENCH SHALL BE CLASS "S" CONCRETE W/ TYPE II PORTLAND CEMENT.

2. ALL CONNECTIONS TO EXISTING MANHOLES SHALL BE INSPECTED AND APPROVED BY P.C.W.M.D.
AFTER COMPLETION OF ROUGH BASE AND BENCHES, MACHINE CUT OUT TOP OF PIPE (AT SPRING LINE) AND COMPLETE CONSTRUCTION OF THE MANHOLE IN ACCORDANCE WITH THE APPROPRIATE STANDARD DETAIL(S)

SECTION A-A

1. SPECIAL BEDDING MAY BE REQUIRED TO THE FIRST JOINT BEYOND OPEN TRENCH CONDITIONS (DETERMINED BY DEPTH OF EXCAVATION AND TYPE OF SOIL).
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.
2 - 3 HOOPS WITH #4 WIRE TIES AT 90° FOR 3" AND 4" ADJUSTING RINGS. 6" ADJUSTING RING REQUIRES 4 - 3 HOOPS WITH #4 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.
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.
NOTE:

ALL SANITARY SEWER MANHOLES REQUIRING FRAME AND COVER ELEVATION ADJUSTMENTS SHALL HAVE THE CHANNEL(S) COVERED WITH PLYWOOD OR SIMILAR MATERIAL (APPROVED BY PCWMD) DURING THE MODIFICATIONS TO PREVENT DEBRIS FROM ENTERING THE SEWER LINES. ONCE THE MODIFICATIONS ARE COMPLETE, OR AS DIRECTED BY THE PCWMD INSPECTOR, THE PROTECTIVE COVER SHALL BE REMOVED.
END OF PLUGGED H.C.S. SHALL BE MARKED BY A #9 WIRE ANCHORED TO A BRICK

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

PLUG OPEN END WITH APPROVED PLUG

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

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

NOTES:

1. WHERE MINIMUM DEPTHS AND CLEARANCES CANNOT 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. FOR H.C.S.'S GREATER THAN 4" IN DIAMETER, THE APPROVAL OF P.C.W.M.D. AS TO THE TYPE & LOCATION OF THE CONNECTION SHALL BE ACQUIRED IN ADVANCE.


5. ALL CONNECTIONS TO PUBLIC SEWERS SHALL BE MADE WITH "Y" OR "T" FITTINGS OR BY MACHINE CUT TAP.
SHAPE INVERT CHANNELS TO PROVIDE FOR A SMOOTH TRANSITION OF FLOW FROM EACH H.C.S. TO THE OUTGOING MAINLINE.

PLAN VIEW

NOTES:
1. CROWN OF H.C.S.(S) TO MATCH CROWN OF SEWER MAIN.
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%.
NOTES:

1. A CONTINUOUS MAGNETIC MARKER TAPE APPROVED BY P.C.W.M.D., SHALL BE BURIED 18 INCHES ABOVE THE PRESSURE MAIN AND 18" BELOW GROUND SURFACE AT FINAL GRADE. CONTINUOUS PRINTING ON THE TAPE SHALL STATE "CAUTION: SEWAGE PRESSURE LINE".

2. INSTALLATION OF ACCEPTABLE PRESSURE PIPE MATERIAL TO BE IN ACCORDANCE WITH CURRENT 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.
NOTES:

1. EXISTING MANHOLE BENCH TO BE THOROUGHLY CLEANED PRIOR TO CONSTRUCTING NEW BUILT UP BENCH. NEW BENCH SHALL BE CLASS "S" CONCRETE W/ TYPE II PORTLAND CEMENT.

2. IF CONNECTING TO TERMINAL MANHOLE, BRING PRESSURE MAIN INTO MANHOLE IN STRAIGHT LINE ALIGNMENT WITH OUTLET MAIN.

3. INTERIOR OF MANHOLE TO BE PROTECTED WITH A P.C.W.M.D. APPROVED COATING.
NOTES:

1. THE CONTRACTOR'S SURVEYOR IS TO DO THE FOLLOWING THINGS:
   
   A. ARROW(S) ARE TO BE STAMPED SHOWING THE APPROPRIATE DIRECTION(S) OF WASTEWATER FLOW IN THE PRESSURE SEWER.

   B. THE DIAMETER OF THE PRESSURE SEWER IS TO BE STAMPED ON THE MONUMENT.

2. LETTER SIZE SHALL BE 3/16" FOR ALL LETTERS

3. PRINTED DATA SHALL BE AS SHOWN, EXCEPT THE UNDERLINE MARK IS NOT TO BE CAST OR STAMPED. THIS MARK IS SHOWN ONLY TO CALL ATTENTION TO THE SURVEYOR FOR THE NEED OF A NUMBER TO INDICATE THE PIPE DIAMETER.

Recommend
Monument @ 250' with
Continuity Tracing
wire to test station.
10-11-05

For curved sewer

= middle ordinate

= 624".
FOR _" DIAMETER
PRESSURE OR GRAVITY SEWER

NOTES:
1. THE CONTRACTOR'S SURVEYOR IS TO DO THE FOLLOWING THINGS:
   A. ARROW(S) ARE TO BE STAMPED SHOWING THE APPROPRIATE DIRECTION(S) OF WASTEWATER FLOW IN THE PRESSURE OR GRAVITY SEWER.
   B. THE DIAMETER OF THE PRESSURE OR GRAVITY SEWER IS TO BE STAMPED ON THE MONUMENT.
   2. THE WORD "PRESSURE OR GRAVITY" SHOULD BE USED DEPENDING UPON THE TYPE OF SEWER LINE BEING ABANDONED.

3. LETTER SIZE SHALL BE 3/16" FOR PIMA COUNTY WASTEWATER MANAGEMENT
4. LETTER SIZE SHALL BE 5/32" FOR ALL OTHER LETTERING.
5. PRINTED DATA SHALL BE AS SHOWN EXCEPT THE * AND UNDERLINE MARK ARE NOT TO BE CAST OR STAMPED. THESE MARKS ARE ONLY USED TO CALL ATTENTION TO THE MONUMENT FABRICATOR AND SURVEYOR THAT CERTAIN INFORMATION MUST BE FILLED IN BY THEM.