# UNIFORM STANDARD DETAILS for PUBLIC WORKS CONSTRUCTION

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MARICOPA ASSOCIATION of GOVERNMENTS

2016 REVISION TO THE 2015 EDITION

ARIZONA

## 100 SERIES: GENERAL INFORMATION

| Detail | Revised | Title |
|---|---|---|
| 101 | 2011 | GENERAL INFORMATION |
| 110-1 | 2011 | PLAN SYMBOLS (SYMBOLS) |
| 110-2 | 2011 | PLAN SYMBOLS (LINE TYPES) |
| 112 | 1998 | DIMENSIONING FOR ROAD IMPROVEMENT PLANS |
| 120 | 2015 | SURVEY MARKER |
| 122 | 2011 | PAVEMENT MARKER FOR FIRE HYDRANTS |
| 130 | 2003 | BARRICADES |
| 131 | 1998 | STREET SIGN BASE |
| 140 | 2009 | BOLLARD |
| 141 | 2009 | HAZARD MARKER |
| 145 | 2016* | SAFETY RAIL |
| 150 | 1998 | PRECAST SAFETY CURB |
| 160 | 2013 | 6' CHAIN LINK FENCE AND GATE |

## 200 SERIES: STREET INFORMATION

| Detail | Revised | Title |
|---|---|---|
| 200-1 | 2016* | TRENCH BACKFILL AND SURFACE REPLACEMENT |
| 200-2 | 2016* | TRENCH BACKFILL AND SURFACE REPLACEMENT |
| 201 | 2014 | ASPHALT PAVEMENT EDGE DETAILS |
| 202 | 1998 | ALLEY DETAILS (PAVED AND UNPAVED) |
| 203 | 1998 | SCUPPERS |
| 204 | 1998 | EQUIPMENT CROSSING |
| 205 | 2006 | PAVED TURNOUTS |
| 206-1 | 2007 | CONCRETE SCUPPER |
| 206-2 | 2007 | CONCRETE SCUPPER |
| 206-3 | 2007 | CONCRETE SCUPPER (ISOMETRIC VIEW) |
| 210 | 2012 | RESIDENTIAL SPEED HUMP |
| 211 | 1998 | STANDARD TRENCH PLATING DETAIL |
| 212 | 2015 | UTILITY POTHOLE REPAIR |
| 220-1 | 2007 | CURB AND GUTTER TYPES A, B, C AND D |
| 220-2 | 2007 | CURB AND GUTTER TYPES E AND F |
| 221 | 2014 | CURB AND GUTTER TRANSITION TYPE A TO TYPE C, INTEGRAL ROLL CURB, GUTTER AND SIDEWALK |
| 222 | 2008 | SINGLE CURB - TYPES A, B AND TERMINATION |
| 223 | 1998 | MEDIAN NOSE TRANSITION |
| 224 | 1998 | JOINT FOR DRAINAGE INLETS AND MANHOLE COVERS |
| 225 | 2016* | INTERLOCKING CONCRETE PAVERS |
| 230 | 2014 | SIDEWALKS |
| 234 | 2012 | CURB MODIFICATION AT DETECTABLE WARNING |
| 235-1 | 2012 | CURB RAMPS (TYPE A) |
| 235-2 | 2012 | CURB RAMPS (TYPE B) |
| 235-3 | 2012 | CURB RAMPS (TYPE C) |
| 235-4 | 2011 | CURB RAMPS (TYPE D) |
| 235-5 | 2011 | CURB RAMPS (TYPE E) |

## 200 SERIES: STREET INFORMATION (CONTINUED)

| Detail | Revised | Title |
|---|---|---|
| 240 | 2010 | VALLEY GUTTER |
| 250-1 | 2014 | DRIVEWAY ENTRANCES WITH DETACHED SIDEWALK |
| 250-2 | 2013 | DRIVEWAY ENTRANCES WITH SIDEWALK ATTACHED TO CURB |
| 251 | 2003 | RETURN TYPE DRIVEWAYS |
| 252 | 2005 | BUS BAYS |
| 260 | 2013 | ALLEY ENTRANCE (WITH VERTICAL CURB AND GUTTER) |
| 262 | 2012 | WING TYPE ALLEY ENTRANCE (WITH COMBINED CURB AND GUTTER) |
| 263 | 2002 | WING TYPE ALLEY ENTRANCE (WITH ROLL TYPE CURB AND GUTTER) |
| 270 | 2016* | FRAME AND COVER (AND GRADE ADJUSTMENT) |

## 300 SERIES: WATER INFORMATION

| Detail | Revised | Title |
|---|---|---|
| 301 | 1998 | BLOCKING FOR WATER GATE AND BUTTERFLY VALVES |
| 302-1 | 1998 | JOINT RESTRAINT WITH TIE RODS (DRAWING) |
| 302-2 | 1998 | JOINT RESTRAINT WITH TIE RODS (NOTES) |
| 303-1 | 1998 | JOINT RESTRAINT FOR DUCTILE IRON AND POLYETHYLENE WRAPPED DUCTILE IRON WATER PIPES (DRAWING) |
| 303-2 | 1998 | JOINT RESTRAINT FOR DUCTILE IRON AND POLYETHYLENE WRAPPED DUCTILE IRON WATER PIPES (TABLES) |
| 310 | 1998 | CAST IRON WATER METER BOX COVER NO. 1 |
| 311 | 1998 | CAST IRON WATER METER BOX COVER NO. 2 |
| 312 | 1998 | CAST IRON WATER METER BOX COVER NO. 3 |
| 313 | 1998 | CAST IRON WATER METER BOX COVER NO. 4 |
| 314 | 1998 | CAST IRON WATER METER BOX COVER NO. 5 |
| 320 | 1998 | CONCRETE WATER METER BOXES |
| 321 | 1998 | STANDARD WATER METER VAULT |
| 340 | 2002 | INSTALLING TAPPING SLEEVES AND VALVES |
| 342 | 1998 | CONCRETE PRESSURE PIPE TAPPING SLEEVE |
| 345-1 | 1998 | 3", 4", 6" WATER METER |
| 345-2 | 1998 | 4", 6" WATER METER WITH ON-SITE HYDRANTS |
| 346 | 1998 | FIRE LINE DETECTOR CHECK VAULT |
| 360-1 | 2013 | DRY BARREL FIRE HYDRANT INSTALLATION |
| 360-2 | 2013 | WET BARREL FIRE HYDRANT INSTALLATION |
| 360-3 | 2013 | FIRE HYDRANT INSTALLATION DETAILS |
| 362 | 1999 | LOCATIONS FOR NEW FIRE HYDRANTS |
| 370 | 1998 | VERTICAL REALIGNMENT OF WATER MAINS |
| 380 | 1998 | THRUST BLOCKS FOR WATER LINES |
| 381 | 1998 | ANCHOR BLOCKS FOR VERTICAL BENDS |
| 389 | 2001 | CURB STOP WITH VALVE BOX AND COVER |
| 390 | 1998 | CURB STOP WITH FLUSHING PIPE |
| 391-1 | 2015 | VALVE BOX INSTALLATION AND GRADE ADJUSTMENT |
| 391-2 | 2015 | VALVE BOX INSTALLATION AND GRADE ADJUSTMENT |
| 392 | 2015 | DEBRIS CAP INSTALLATION |

* NEWLY REVISED.

## 400 SERIES: SEWER INFORMATION

| Detail | Revised | Title |
|---|---|---|
| 403-1 | 1998 | PIPE SUPPORT ACROSS TRENCHES |
| 403-2 | 1998 | PIPE SUPPORT ACROSS TRENCHES |
| 403-3 | 1998 | ALTERNATIVE TO PIPE SUPPORT |
| 404-1 | 2006 | WATER AND SANITARY SEWER SEPARATION/PROTECTION |
| 404-2 | 2006 | WATER AND SANITARY SEWER SEPARATION/PROTECTION |
| 404-3 | 2006 | WATER AND SANITARY SEWER SEPARATION/PROTECTION |
| 405 | 1998 | BROKEN SEWER LINE REPLACEMENT |
| 420-1 | 2015 | CONCRETE SANITARY SEWER MANHOLE |
| 420-2 | 2015 | PRE-CAST CONCRETE MANHOLE BASE |
| 420-3 | 2015 | CONCRETE MANHOLE BASE |
| 421 | 2015 | OFFSET MANHOLE 8” TO 30” PIPE |
| 422 | 2015 | MANHOLE FRAME AND COVER ADJUSTMENT |
| 423-1 | 2012 | 24” CAST IRON MANHOLE FRAME AND COVER |
| 423-2 | 2012 | 30” CAST IRON MANHOLE FRAME AND COVER |
| 424-1 | 2012 | 24” CAST IRON WATERTIGHT MANHOLE FRAME AND COVER |
| 424-2 | 2012 | 30” CAST IRON WATERTIGHT MANHOLE FRAME AND COVER |
| 425 | 1998 | 24” ALUMINUM MANHOLE FRAME AND COVER |
| 426 | 2007 | DROP SEWER CONNECTIONS |
| 427 | 1998 | STUB OUT AND PLUGS |
| 429 | 2015 | INDUSTRIAL WASTE CONTROL VAULT WITH MANHOLE |
| 440-1 | 2007 | TYPE ‘A’ SEWER BUILDING CONNECTION - ELECTRONIC BALL MARKERS (STANDARD) |
| 440-2 | 2007 | TYPE ‘B’ SEWER BUILDING CONNECTION - TWO-WAY CLEANOUT AND METER BOX AT R/W |
| 440-3 | 2007 | TYPE ‘C’ SEWER BUILDING CONNECTION - ONE-WAY CLEANOUT AND METER BOX |
| 440-4 | 2006 | SEWER SERVICE CURB CROSSING STAMP DETAIL |
| 441 | 2001 | SEWER CLEANOUT |

## 500 SERIES: IRRIGATION AND STORM DRAIN INFORMATION

| Detail | Revised | Title |
|---|---|---|
| 501-1 | 2012 | HEADWALL |
| 501-2 | 2012 | HEADWALL |
| 501-3 | 1998 | HEADWALL 42” TO 84” PIPE |
| 501-4 | 1998 | HEADWALL IRRIGATION 18” TO 60” PIPE |
| 501-5 | 2014 | HEADWALL DROP INLET |
| 502-1 | 1998 | TRASH RACK |
| 502-2 | 2004 | TRASH RACK |
| 503 | 1998 | IRRIGATION STANDPIPE |
| 504 | 1998 | CONCRETE BLOCK JUNCTION BOX |
| 505 | 1998 | CONCRETE PIPE COLLAR |
| 506 | 1998 | IRRIGATION VALVE INSTALLATION |
| 507 | 1998 | ENCASED CONCRETE PIPE (FOR SHALLOW INSTALLATION) |
| 510 | 1998 | CORRUGATED METAL PIPE AND INSTALLATION |

## 500 SERIES: IRRIGATION AND STORM DRAIN INFORMATION (CONTINUED)

| Detail | Revised | Title |
|---|---|---|
| 520 | 1998 | STORM DRAIN MANHOLE BASE (48” AND SMALLER) |
| 521 | 1998 | STORM DRAIN MANHOLE BASE (51” OR LARGER) |
| 522 | 2015 | STORM DRAIN MANHOLE SHAFT |
| 523-1 | 1998 | PRESSURE MANHOLE |
| 523-2 | 1998 | PRESSURE MANHOLE |
| 524 | 1998 | STORM DRAIN LATERAL PIPE CONNECTIONS |
| 530 | 1998 | 3’-6” CURB OPENING CATCH BASIN - TYPE ‘A’ |
| 531 | 1998 | 5’-6” CURB OPENING CATCH BASIN - TYPE ‘B’ |
| 532 | 1998 | 8’-0” CURB OPENING CATCH BASIN - TYPE ‘C’ |
| 533-1 | 1998 | CATCH BASIN TYPE ‘D’ |
| 533-2 | 1999 | APRON FOR TYPE ‘D’ CATCH BASIN |
| 533-3 | 2007 | FRAME AND GRATE FOR TYPE ‘D’ CATCH BASIN |
| 533-4 | 2007 | 7’-0” CURB OPENING CATCH BASIN TYPE ‘D’ - GRATE DETAILS |
| 534-1 | 1998 | CATCH BASIN TYPE ‘E’ |
| 534-2 | 1998 | CATCH BASIN TYPE ‘E’ (DETAILS) |
| 534-3 | 1998 | CATCH BASIN TYPE ‘E’ (DETAILS) |
| 534-4 | 1998 | CATCH BASIN TYPE ‘E’ (DETAILS) |
| 534-5 | 1998 | ALTERNATE GRATE STYLES, SUMP LOCATION |
| 535 | 2009 | CATCH BASIN TYPE ‘F’ (FOR USE WITHOUT CURB) |
| 536-1 | 1999 | COMMON DETAILS AND SECTIONS FOR CURB OPENING CATCH BASINS |
| 536-2 | 1998 | ALTERNATIVE COVER FOR CURB OPENING CATCH BASINS |
| 537 | 2002 | CATCH BASIN TYPE ‘G’ |
| 538 | 1998 | CATCH BASIN TYPE ‘H’ |
| 539 | 1998 | GRATES FOR CATCH BASINS, TYPE G AND H |
| 540-1 | 1998 | CATCH BASIN GRATES |
| 540-2 | 1998 | CATCH BASIN GRATES |
| 541 | 2005 | CATCH BASIN SUBGRADE DRAIN |
| 545 | 1998 | END SECTION - REINFORCED CONCRETE PIPE |
| 550 | 1998 | SPILLWAY INLET AND OUTLET |
| 552 | 2015 | FORD CROSSING WITH CUT-OFF WALLS |
| 555 | 2010 | EROSION PROTECTION/GABIONS |

1. THESE DETAILS HAVE BEEN PREPARED IN AN EFFORT TO STANDARDIZE THE CONSTRUCTION DETAILS USED BY VARIOUS CONTRACTING AGENCIES IN MARICOPA COUNTY. THEY ARE TO BE USED IN CONJUCTION WITH THE CURRENT EDITION OF THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" SPONSORED AND DISTRIBUTED BY THE MARICOPA ASSOCIATION OF GOVERNMENTS.

2. MANY NOTES WITHIN THESE DETAILS REFER TO VARIOUS SECTIONS OF THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION." WHERE THIS REFERENCE IS MADE, ONLY THE ABBREVIATION "SECT." IS USED. AN EXAMPLE OF THIS REFERENCE WOULD BE: "CLASS 'A' CONCRETE PER SECT. 725."

3. MANY NOTES WITHIN THESE DETAILS REFER TO OTHER DETAILS WITHIN THIS BOOK. WHERE THIS REFERENCE IS MADE, THE ABBREVIATION "DETAIL" IS USED. AN EXAMPLE OF THIS WOULD BE: "SEE DETAIL 391 FOR VALVE BOX INSTALLATION."

4. MANY DETAILS COVER MORE THAN ONE SHEET. THESE SHEETS HAVE BEEN GIVEN THE SAME NUMBER WITH A SUFFIX NUMBER, EXAMPLE: 391–1 AND 391–2.

5. AN EFFORT HAS BEEN MADE TO INCLUDE THE MOST COMMONLY USED CONSTRUCTION DETAILS IN THIS BOOK. ITEMS WHICH REQUIRE DESIGN CONSIDERATION BY THE DESIGNING ENGINEER HAVE NOT BEEN INCLUDED.

6. SOME OF THE DETAILS PRINTED HEREIN MAY BE USED BY SOME OF THE AGENCIES BUT NOT OTHERS. THE DESIGNING ENGINEER SHOULD THEREFORE CONTACT THE AGENCY WITHIN WHOSE JURISDICTION HE IS WORKING FOR DIRECTION AS TO WHICH DETAIL OR PORTIONS OF DETAILS SHOULD BE USED.

7. DETAIL DRAWINGS ARE NOT TO SCALE.

SEWER CLEANOUT

FIRE HYDRANT

WATER METER

UTILITY MANHOLE

IRRIGATION STANDPIPE

UTILITY VALVE

SEWER SERVICE CONNECTION

MONITORING WELL

REDUCER

WOOD UTILITY POLE

STEEL UTILITY POLE

CONCRETE UTILITY POLE

STREET LIGHT ON MAST ARM

POLE MOUNTED LIGHT

ELECTRIC, GAS METER

TRANSFORMER

DOWN GUY & ANCHOR

SURVEY MONUMENT

SURVEY MONUMENT IN HANDHOLE

MAIL BOX

SIGNAL POLE

SINGLE POST SIGN

DOUBLE POST SIGN

STREET NAME SIGN

VIDEO DETECTION CAMERA

PULL BOX

CELLULAR TOWER

BITUMINOUS (SECTION)

CONCRETE (SECTION)

AGGREGATE BASE COURSE (SECTION)

RIPRAP (PLAN & SECTION)

OBLITERATE PAVEMENT

TAPERED MILL

UNIFORM MILL

EARTH (SECTION)

## NOTES:

1. PLAN SYMBOLS FOR EXISTING FEATURES ARE TO BE DASHED, GRAY SCALED, OR DRAWN USING THIN LINEWORK.
2. ADD LABELS TO PLAN SYMBOLS AS NEEDED FOR CLARITY.

| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 110-1 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | PLAN SYMBOLS | | 01-01-2011 | 110-1 |

SECTION LINE

R/W

EASEMENT

PROPERTY LINE (OPTION 1)

PROPERTY LINE (OPTION 2) — PL

JURISDICTIONAL BOUNDARY (OPTION 1)

JURISDICTIONAL BOUNDARY (OPTION 2)

ROADWAY CENTERLINE

UNDERGROUND ELECTRIC BURIED CABLE — E

UNDERGROUND ELECTRIC CONDUIT — E (CONDUIT)

UNDERGROUND ELECTRIC DUCT BANK — E (DUCT BANK)

OVERHEAD ELECTRIC — OHE

UNDERGROUND TELEPHONE LINE — T

OVERHEAD TELEPHONE LINE — OHT

FIBER OPTIC — FO

CABLE TELEVISION — TV

OVERHEAD CABLE TELEVISION — OHTV

TELEPHONE DUCT BANK — T (DUCT BANK)

CHAIN LINK FENCE

BARBED WIRE FENCE

BLOCK WALL

WOOD FENCE

GAS LINE (12" & SMALLER) — 4" G (MATERIAL)

GAS LINE * (GREATER THAN 12") — 15" G (MATERIAL)

SEWER LINE (12" & SMALLER) — 8" S (MATERIAL)

SEWER LINE * (GREATER THAN 12") — 18" S (MATERIAL)

NEW STORM DRAIN PIPE *

STORM DRAIN * (GREATER THAN 12") — 18" SD (MATERIAL)

IRRIGATION LINE (12" & SMALLER) — 4" IRR (MATERIAL)

IRRIGATION LINE * (GREATER THAN 12") — 15" IRR (MATERIAL)

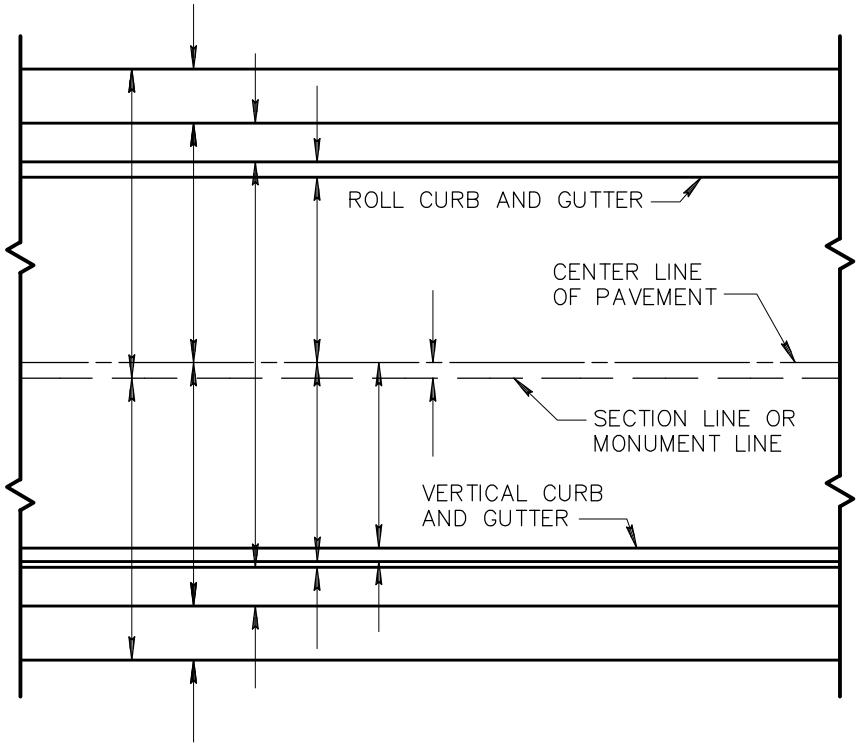
NEW IRRIGATION LINE *

WATER LINE (12" & SMALLER) — 4" W (MATERIAL)

WATER LINE * (GREATER THAN 12") — 36" W (MATERIAL)

* SCALE TO ACTUAL WIDTH

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 110-2 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | PLAN SYMBOLS | 01-01-2011 | 110-2 |



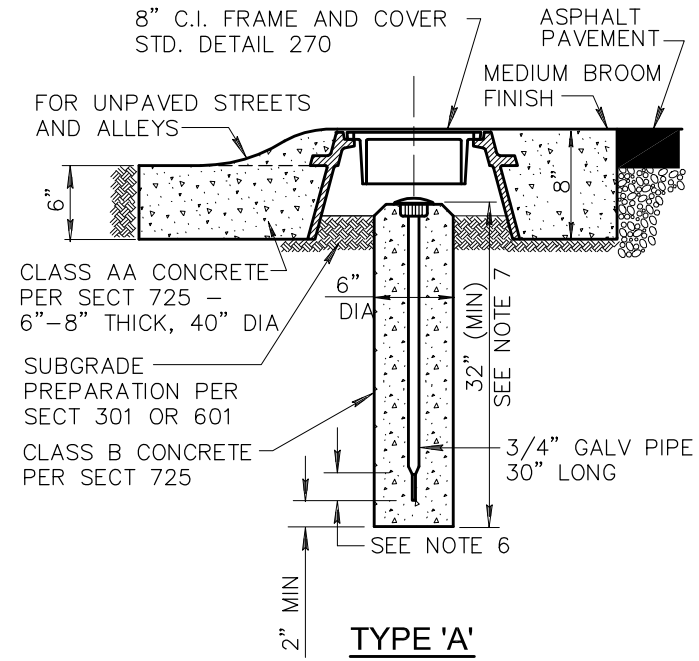

DIMENSION SHOULD BE GIVEN ONCE ON EACH SHEET AND SHOULD BE PLACED NEAR THE CENTER OF THE SHEET. IF ANY OF THE GIVEN CONDITIONS CHANGE, THEY SHOULD BE REDIMENSIONED AT THE POINT OF CHANGE.

GIVEN DIMENSIONS IN ORDER STARTING WITH THE LONGEST AND ENDING WITH THE SHORTEST, AS SHOWN IN THE SKETCH.

GIVE COMPLETE DIMENSIONS.

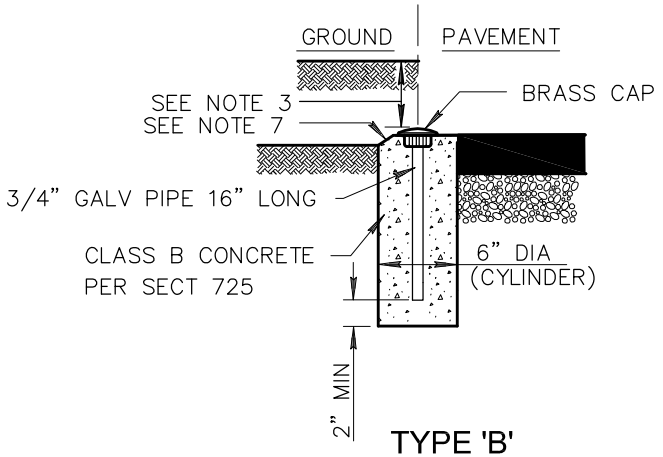
IF THE CENTERLINE OF PAVEMENT DOES NOT FALL ON THE SECTION LINE OR MONUMENT LINE OF THE STREET, DIMENSION AS ABOVE AND SHOW THE DIFFERENCE BETWEEN THE SECTION OR MONUMENT LINE AND THE CENTERLINE.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 112 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | DIMENSIONING FOR ROAD IMPROVEMENT PLANS | 01-01-1998 | 112 |




## TYPE 'A'

(WITH FRAME)

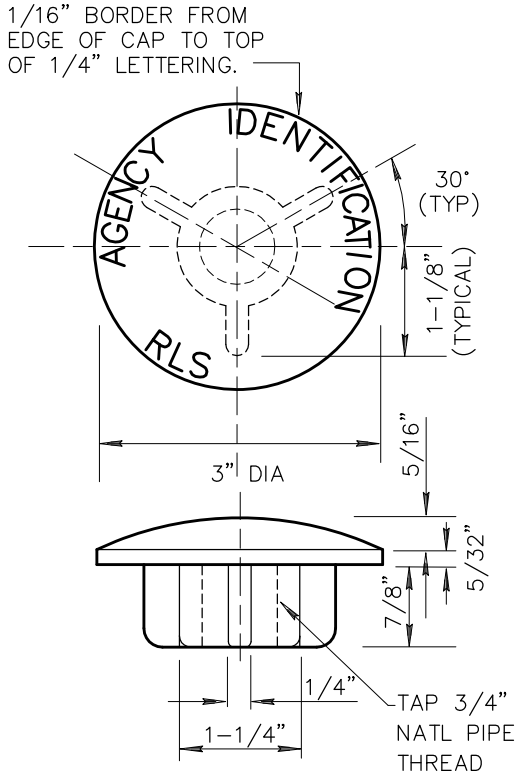



## TYPE 'B'

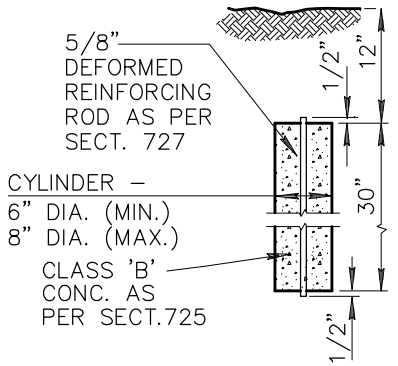
(WITHOUT FRAME)

## NOTES:

1. TYPE 'A' TO BE USED AT INTERSECTIONS OF MAJOR STREETS & COLLECTOR STREETS, SECTION CORNERS, SECTION 1/4 CORNERS, CENTER OF SECTIONS, AND AT OTHER POINTS AS SHOWN ON PLANS.
2. TYPE 'B' TO BE USED (EXCEPT WHERE TYPE 'A' IS SPECIFIED) AT INTERSECTION OF STREET CENTERLINES, PC'S, PT'S AND PI'S OF CURVES, SECTION 1/16 CORNERS, SUBDIVISION CORNERS, CHANGE IN ALIGNMENT OF SUBDIVISION BOUNDARIES, AND AT OTHER POINTS AS SHOWN ON PLANS.
3. FOR UNPAVED STREETS AND ALLEYS SET TOP OF MARKER SIX INCHES BELOW FINISHED GRADE.
4. CAP TO BE CONSTRUCTED OF RED BRASS OR BRONZE.
5. LETTERS TO BE APPROX. 1/32" WIDE & 1/32" DEEP.
6. FLATTENING THE BOTTOM 2" OF THE GALVANIZED PIPE IS OPTIONAL.
7. TOP OF CONCRETE POST IS CHAMFERED 3/4" EXCEPT WHEN SET FLUSH WITH PAVEMENT.
8. THE CAP SHALL SHOW THE POINT SURVEYED BY A PUNCH MARK OR SCRIBED CROSS AND THE CAP SHALL BE STAMPED WITH THE YEAR AND THE REGISTERED LAND SURVEYOR'S (RLS) REGISTRATION NUMBER.
9. WHEN APPLICABLE, THE CAP SHALL BE STAMPED WITH THE APPROPRIATE PUBLIC LAND MARKING PER CURRENT MANUAL OF INSTRUCTIONS FOR THE SURVEY OF PUBLIC LANDS OF THE UNITED STATES, PREPARED BY THE BUREAU OF LAND MANAGEMENT.
10. SUBMIT TO THE ENGINEER A COPY OF THE RECORDED CORNER RECORD OR RESULTS OF SURVEY TO DOCUMENT COMPLIANCE WITH THE ARIZONA BOARD OF TECHNICAL REGISTRATION REQUIREMENTS.

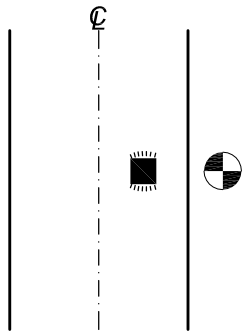



## CAP DETAIL

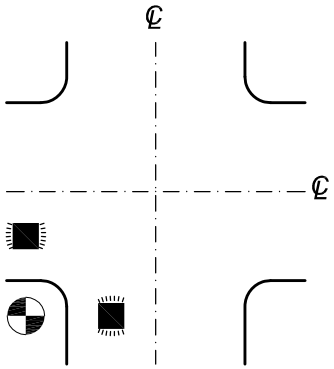



## TYPE 'C'

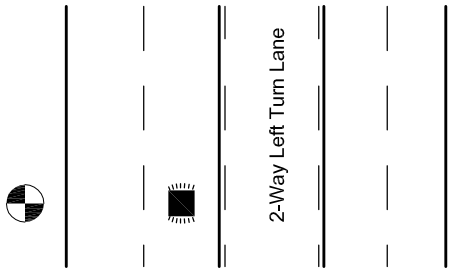
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 120 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | SURVEY MARKER | 01–01–2015 | 120 |



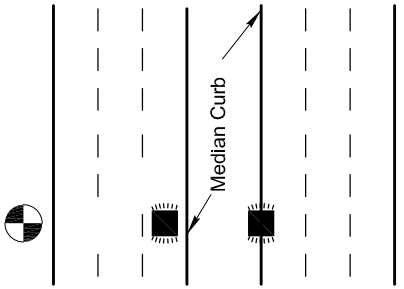
LOCAL STREET



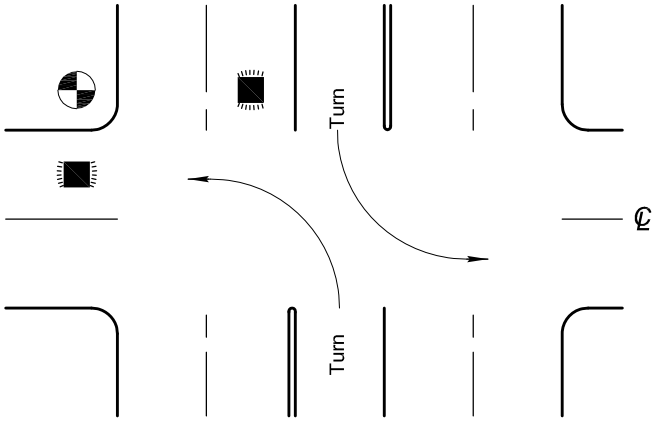
LOCAL CROSS
STREET INTERSECTION



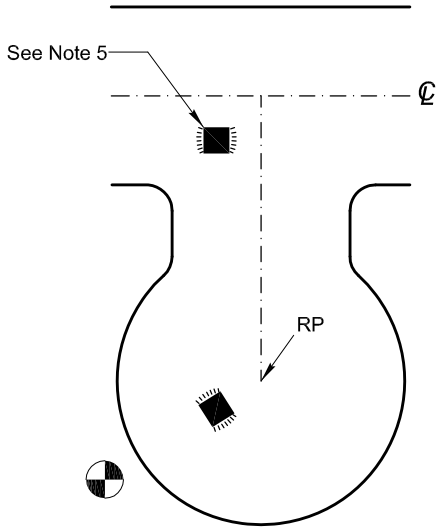

MULTI-LANE STREET
W/ TWO WAY LEFT TURN LANE




MULTI-LANE STREET
W/ RAISED MEDIAN




FOUR LANE STREET
WITH TURN LANE AT INTERSECTION

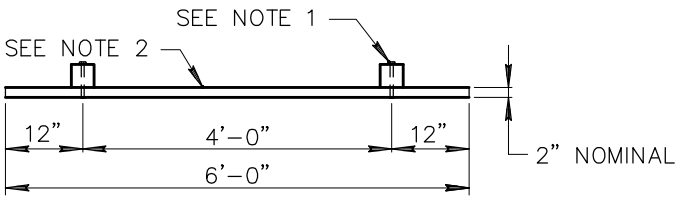


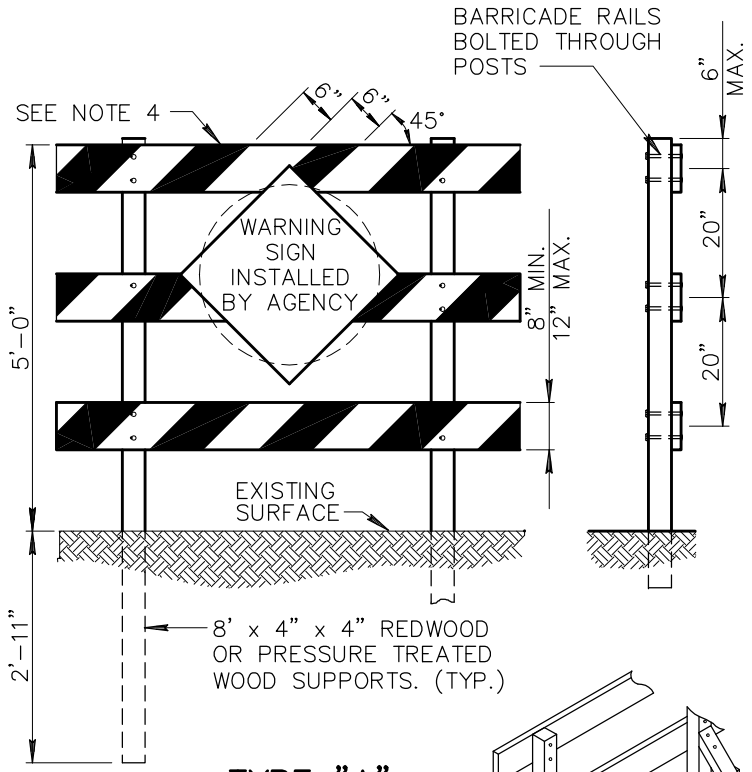

CUL-DE-SAC

## NOTES:

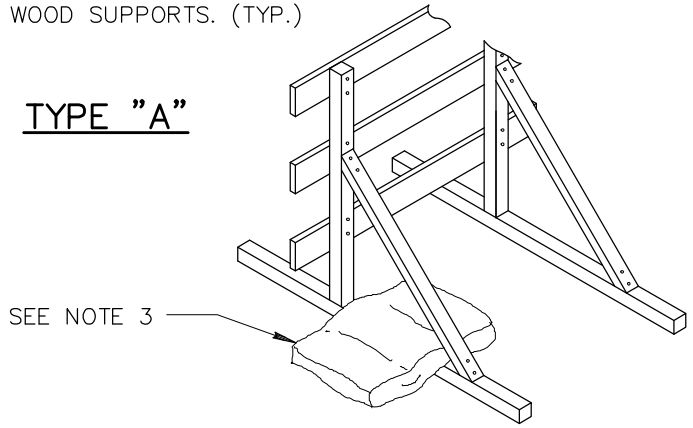
1. LOCATE PAVEMENT MARKER IN CENTER OF TRAVEL LANE AND ALIGN WITH HYDRANT.
2. FOR MULIPLE LANE ROADS LOCATE PAVEMENT MARKER IN LEFT MOST THROUGH TRAFFIC LANE.
3. ADJUST MARKER LOCATION TO BE LOCATED OUTSIDE OF ANY DELINEATED CROSSWALK AREA.
4. FOR HYDRANT LOCATED ON FAR SIDE OF RAISED MEDIAN, LOCATE PAVEMENT MARKER ON TOP OF MEDIAN CURB ALIGNED WITH HYDRANT.
5. OMIT FOR CUL-DE-SAC GREATER THAN 250' IN LENGTH.
6. FIRE HYDRANT PAVEMENT MARKERS SHALL BE 2-WAY RETROREFLECTIVE BLUE: ADOT TYPE BB, 911A-BLUE BY FIRE LITE AMERACE CORPORATION, OR APPROVED EQUAL.

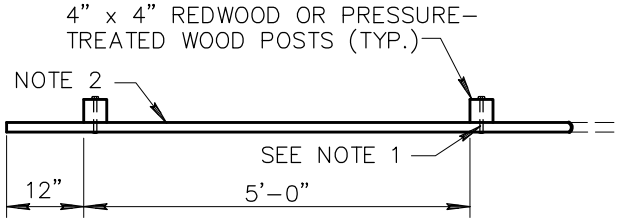
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 122 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | PAVEMENT MARKER FOR FIRE HYDRANTS | 01–01–2011 | 122 |

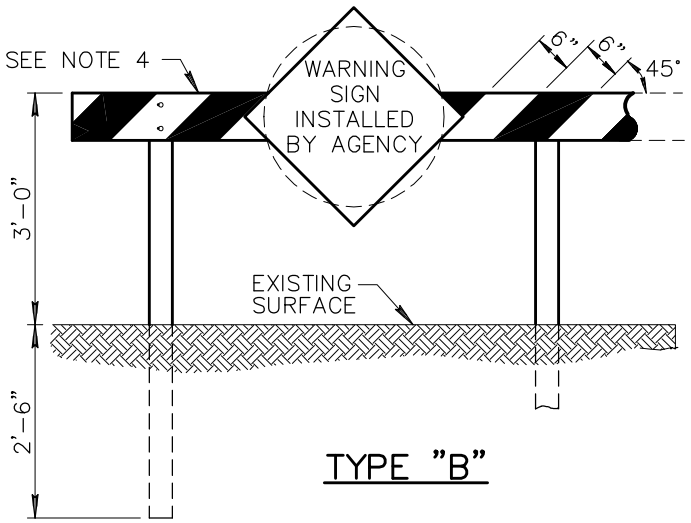



TYPE "A"



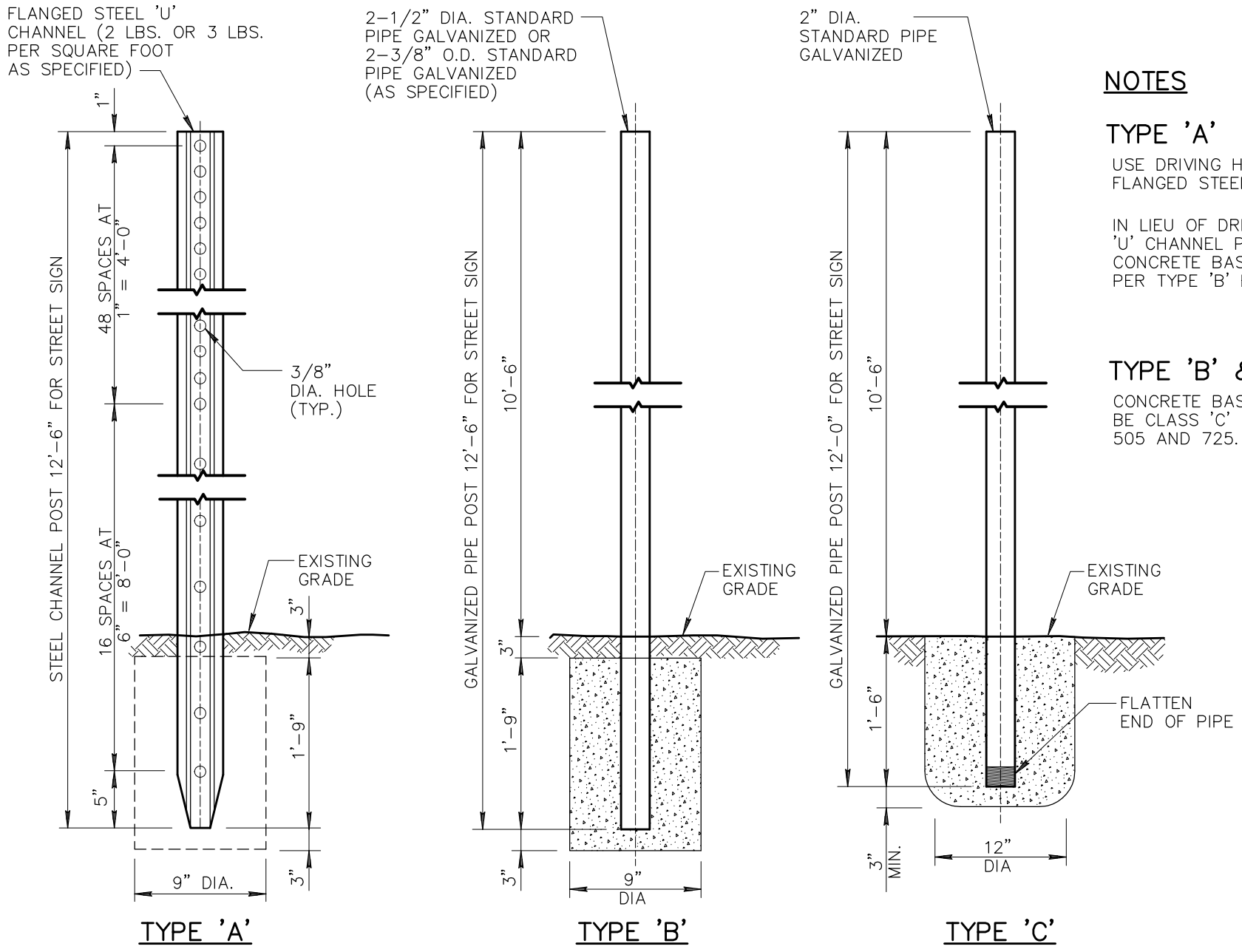




TYPE "B"

## NOTES:

1. FASTEN WITH 1/2" x 5" LAG SCREWS WITH 2 FLAT WASHERS OR (2) 5/8" BOLTS, WITH 4 FLAT WASHERS.
2. 2" x 8" DOUGLAS FIR PLANK (LENGTH TO BE DETERMINED ON PLANS.)
3. WHEN BARRICADE (TYPE "A") IS CONSTRUCTED ON BASES INSTEAD OF POSTS SET INTO THE GROUND, IT MAY BE DESIRABLE TO BALLAST THE BASES WITH SAND BAGS OR BY STAKING TO PROVIDE RESISTANCE TO OVERTURNING DURING PERIODS OF HIGH WINDS.
4. TWO COATS OF WHITE PAINT PER SECTION 790 SHALL BE APPLIED TO ALL EXPOSED SURFACES OF THE BARRICADE. AN ADDITIONAL TWO COATS OF ORANGE PAINT PER SECTION 790 SHALL BE APPLIED TO CREATE THE ALTERNATE ORANGE AND WHITE STRIPES FOR TEMPORARY BARRICADES AND TWO COATS OF RED PAINT PER SECTION 790 SHALL BE APPLIED TO CREATE ALTERNATE RED AND WHITE STRIPES FOR PERMANENT BARRICADES. HIGHWAY SAFETY SPHERES (BEADS) PER ADOT 708–2.02 SHALL BE APPLIED BY HAND TO ALL CROSS MEMBERS, FRONT AND BACK AND ON BOTH COLORS, IMMEDIATELY AFTER PAINTING. THE STRIPES SHALL SLOPE DOWNWARD IN THE DIRECTION TRAFFIC IS TO PASS.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 130 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | BARRICADES | 01–01–2003 | 130 |




## NOTES

### TYPE 'A'

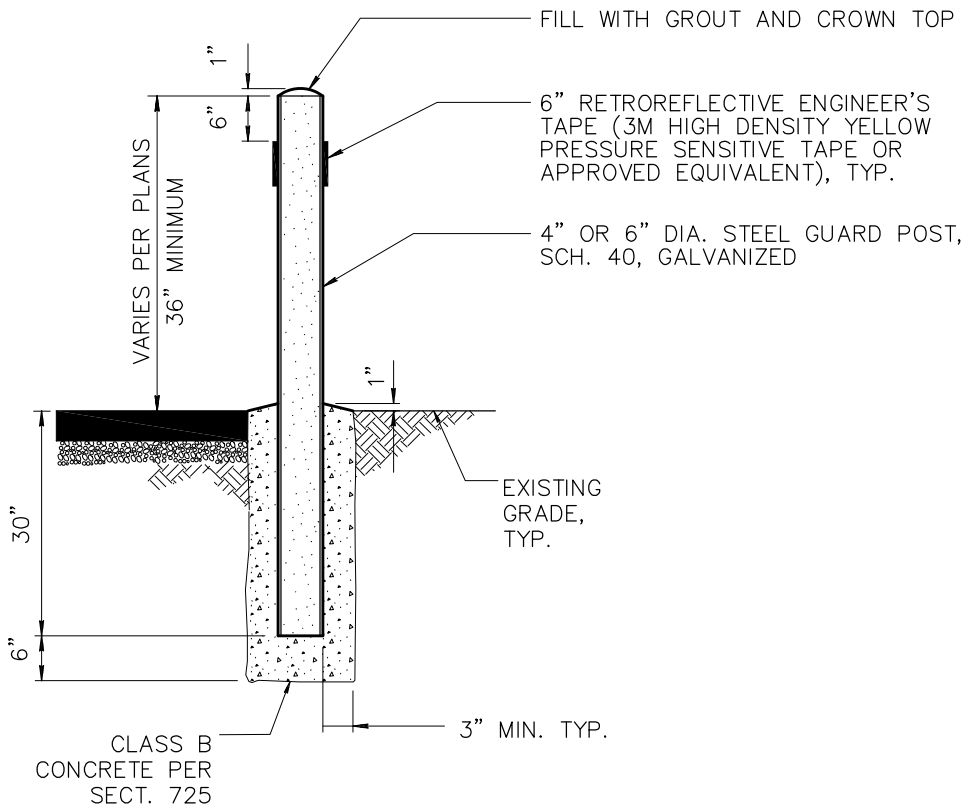
USE DRIVING HEAD FOR DRIVING ALL FLANGED STEEL 'U' CHANNEL POSTS.

IN LIEU OF DRIVING FLANGED STEEL 'U' CHANNEL POSTS MAY BE SET IN CONCRETE BASE FOUNDATION AS PER TYPE 'B' BASE.

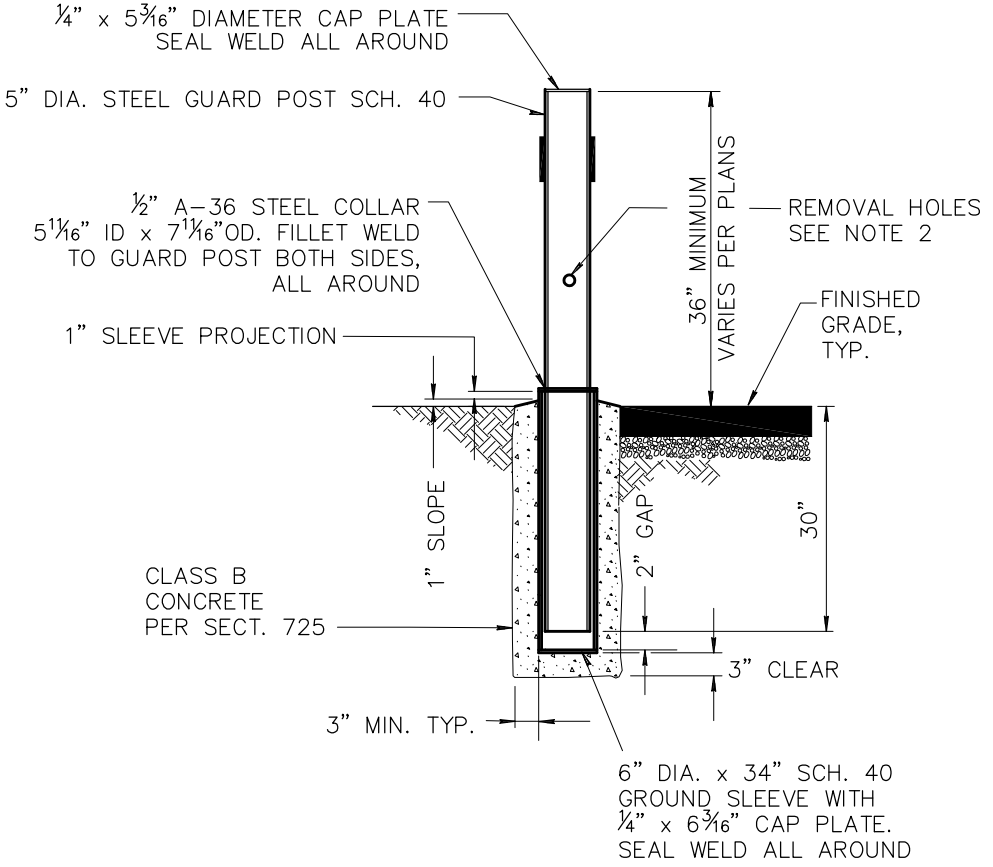
### TYPE 'B' & TYPE 'C'

CONCRETE BASE FOUNDATIONS SHALL BE CLASS 'C' CONCRETE AS PER SECT. 505 AND 725.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 131 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | STREET SIGN BASE | 01-01-1998 | 131 |




TYPE 1 PERMANENT

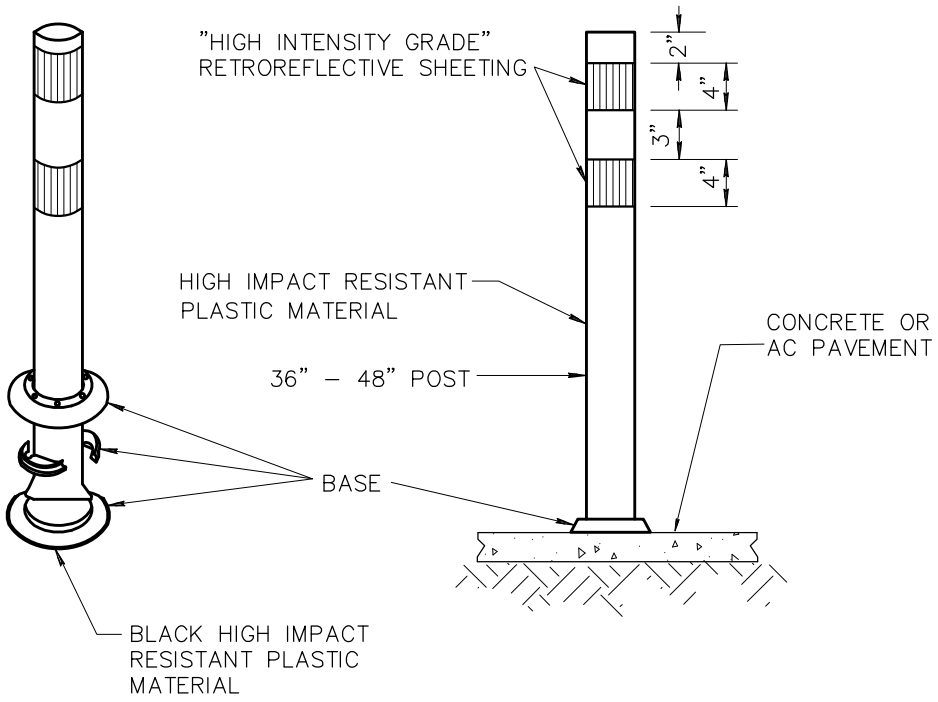



TYPE 2 REMOVABLE

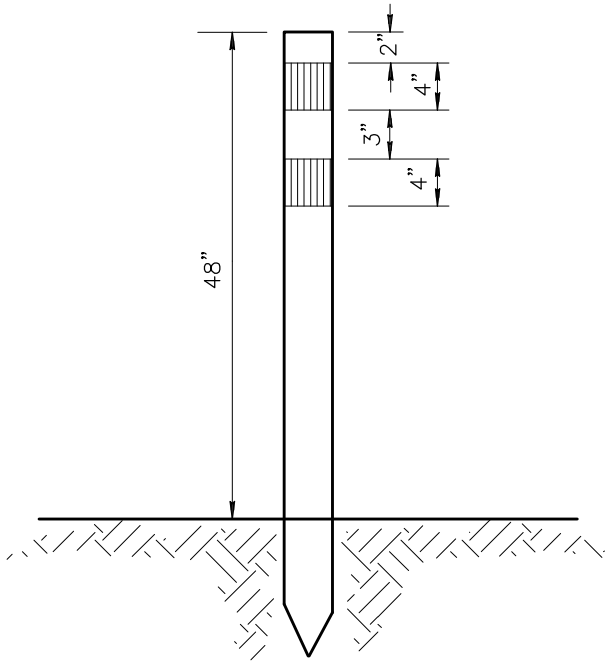
## NOTES

1. BOLLARDS SHALL HAVE A HEIGHT OF 3 FEET OR BE EQUAL TO THE HEIGHT OF THE BACK SCREEN WALL OF BIN ENCLOSURES. POSTS SHALL BE PLACED A MINIMUM OF 4" FROM THE WALL.
2. REMOVABLE POSTS SHALL HAVE 1" DIA. HOLES DRILLED THROUGH AT A DISTANCE ⅓ THE OVERALL POST LENGTH FROM TOP.
3. REMOVABLE POST – GRIND SMOOTH ALL SHARP EDGES PRIOR TO GALVANIZATION. GALVANIZE PER ASTM A54 AFTER FABRICATION.

| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 140 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | BOLLARD | | 01-01-2009 | 140 |




TYPE 1 SURFACE MOUNT

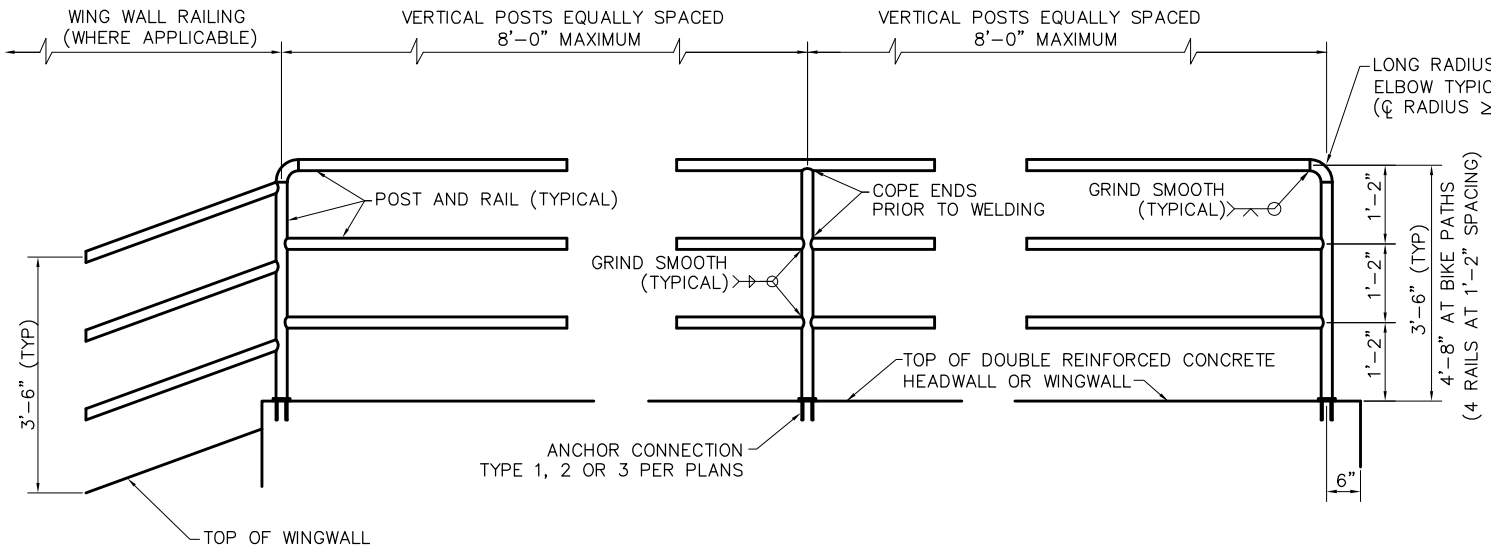



TYPE 2 GROUND MOUNT

## NOTES

1. CONTRACTOR SHALL CLEAN ROADWAY SURFACE PRIOR TO PLACEMENT OF FLEXIBLE TUBULAR MARKER.
2. FLEXIBLE TUBULAR MARKERS SHALL BE CEMENTED TO THE PAVEMENT SURFACE WITH AN EPOXY ADHESIVE IN ACCORDANCE WITH THE TUBULAR MARKER MANUFACTURER'S SPECIFICATIONS.
3. YELLOW TUBULAR MARKERS SHALL HAVE A YELLOW POST AND YELLOW "HIGH INTENSITY GRADE" RETROREFLECTIVE SHEETING. ORANGE TUBULAR MARKERS SHALL HAVE AN ORANGE POST AND WHITE HIGH INTENSITY RETROREFLECTIVE SHEETING.
4. POST SHALL BE FLEXIBLE, HIGH IMPACT RESISTANT PLASTIC MATERIAL.

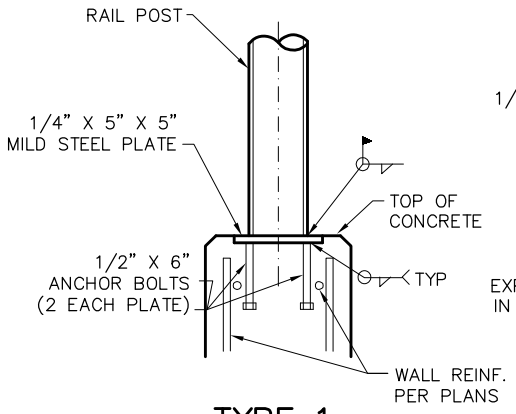
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 141 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | HAZARD MARKER | 01–01–2009 | 141 |



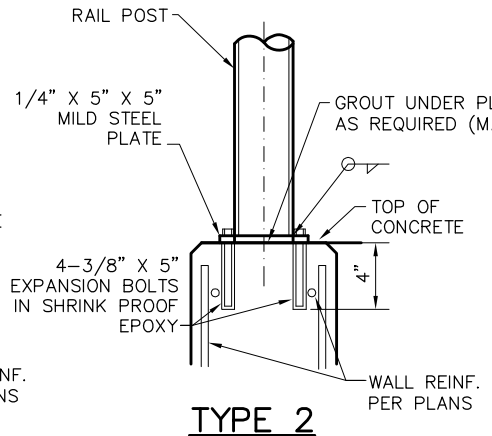

## ELEVATION

## NOTES:

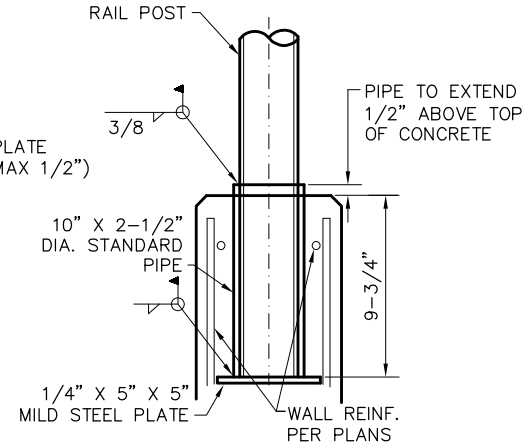
1. POSTS AND RAILS SHALL BE 1.90 INCH OUTSIDE DIAMETER HIGH STRENGTH HEAVY INDUSTRIAL STEEL PIPE CONFORMING TO ASTM F1043 MATERIAL GROUP IA-2 (2.72 LB/FT, MINIMUM YIELD STRENGTH = 50 KSI) OR MATERIAL GROUP IC GALVANIZED AFTER FORMING (2.28 LB/FT, MINIMUM YIELD STRENGTH = 50 KSI).
2. PAINT RAIL PER MAG SPECIFICATIONS SECTION 530 WHEN REQUIRED BY PLANS. SHOP PRIME WITH RUST INHIBITING PRIMER (FIELD REPAIR PRIMER AS NEEDED). COLOR PER PLANS.
3. VERTICAL POSTS TO BE EVENLY SPACED.
4. REMOVE ALL SHARP EDGES.
5. INSTALL SAFETY RAIL AS REQUIRED BY PLANS OR SPECIFICATIONS.
6. THE EMBEDMENT FOR ANCHOR TYPES 1, 2 AND 3 SHALL BE LOCATED INSIDE THE WALL REINFORCEMENT CAGE.
7. SAFETY RAIL IS NOT TO BE USED AS A PEDESTRIAN BRIDGE RAIL.



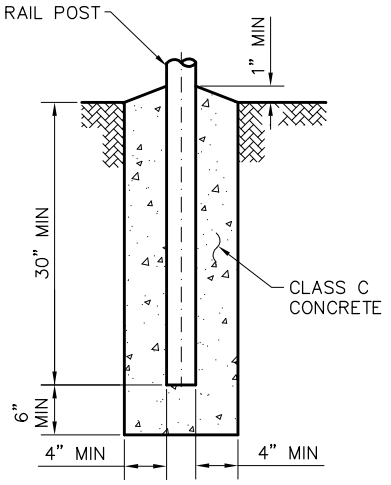

**TYPE 1**
ANCHOR PLATE DETAIL




**TYPE 2**
EXPANSION BOLT DETAIL



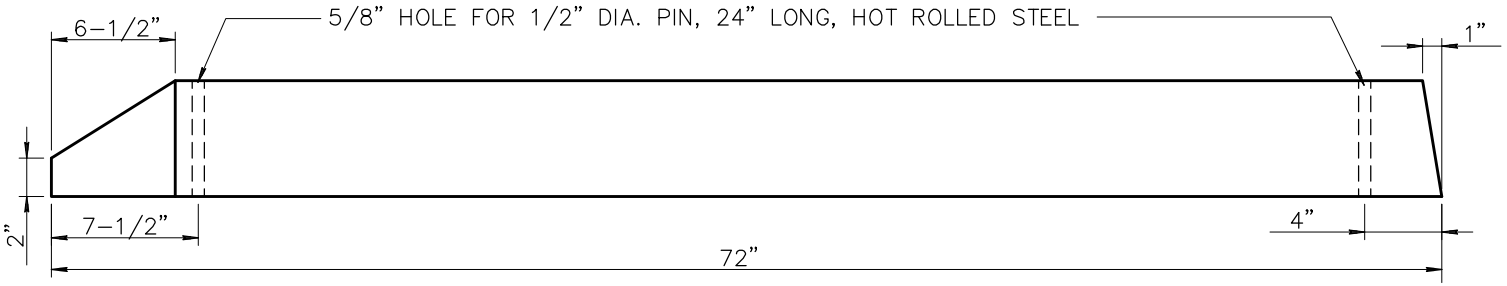

**TYPE 3**
PIPE SLEEVE DETAIL



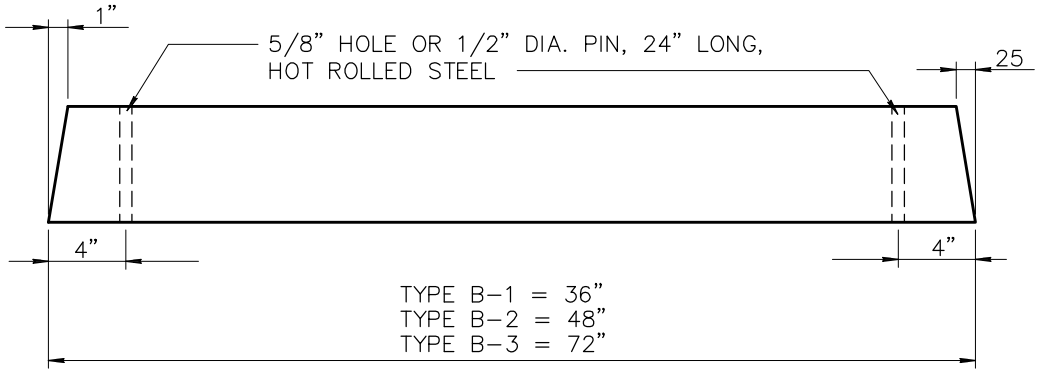

**TYPE 4**
GROUND INSTALLATION DETAIL

**NOTE:** SEE PLANS FOR ANCHORAGE DETAILS FOR ATTACHMENT TO SINGULARLY REINFORCED AND NON-REINFORCED WALLS.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 145 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | SAFETY RAIL | 01-01-2016 | 145 |



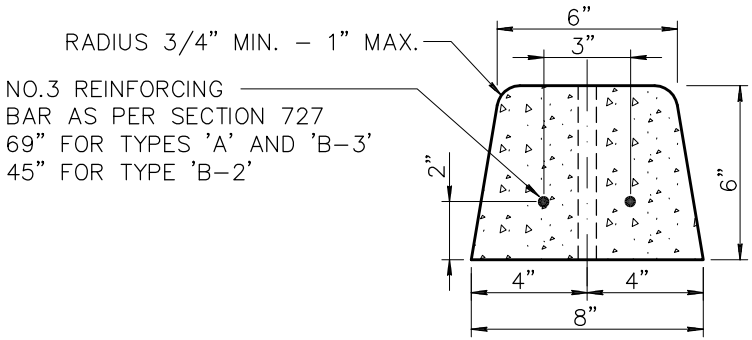

## TYPE A



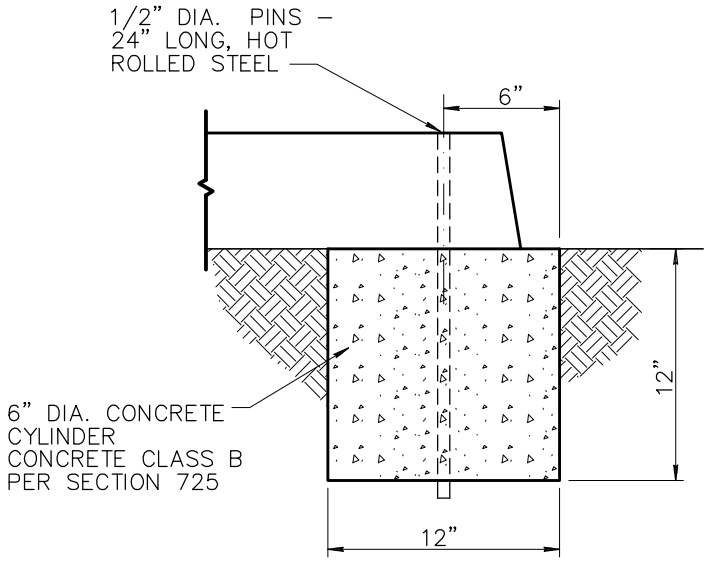

## TYPE B-1, B-2, AND B-3

## NOTES:

1. DIMENSIONAL AND REINFORCEMENT CHANGES WILL BE PERMITTED UPON PRIOR WRITTEN APPROVAL OF THE ENGINEER.
2. UNLESS OTHERWISE NOTED, CONCRETE SHALL BE CLASS 'A' PER SECTION 725.




## TYPICAL SECTION




## SAFETY CURB INSTALLATION ON DIRT

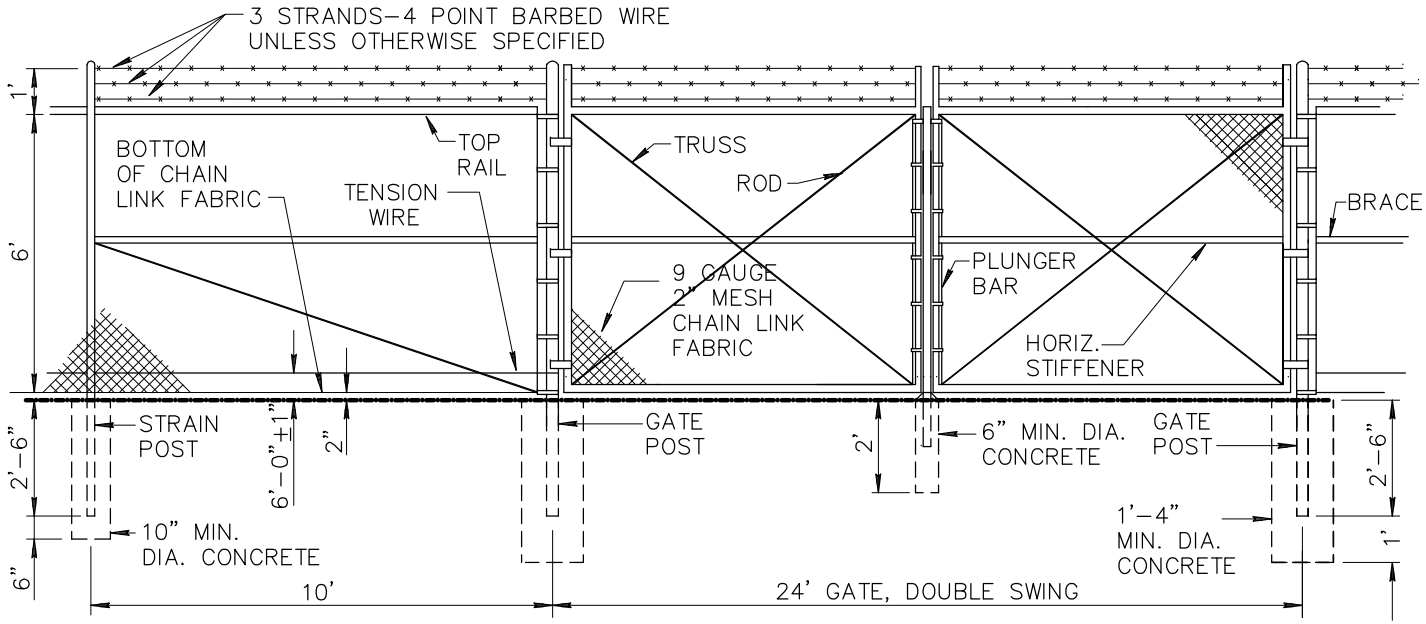
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 150 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | PRECAST SAFETY CURB | 01-01-1998 | 150 |

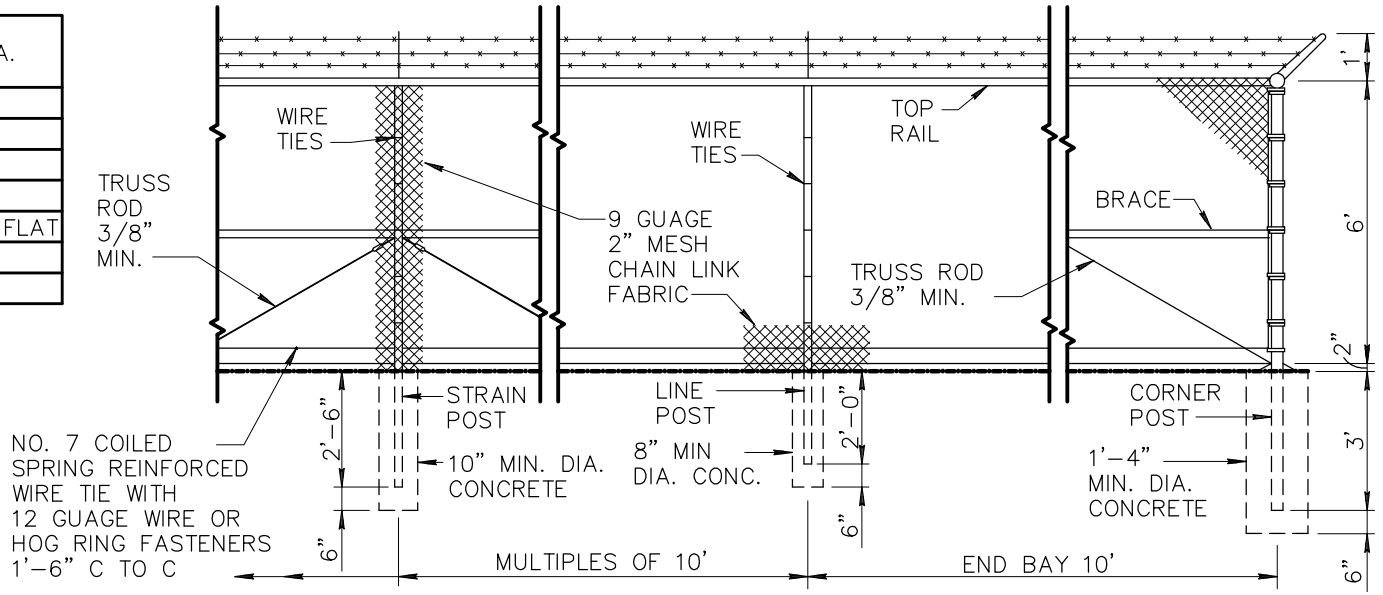
## NOTES

1. ALL CONCRETE SHALL BE CLASS 'C' PER SECT. 725.
2. FITTINGS NOT SPECIFICALLY DETAILED SHALL BE HEAVY DUTY DESIGN.
3. STRAIN POSTS SHALL BE SPACED AT 500' MAXIMUM SPACING.
4. BOTH CORNER AND STRAIN POSTS SHALL HAVE STRAIN PANELS.
5. ALL POSTS SHALL BE CAPPED.
6. MEMBER SIZES SHALL BE THE FOLLOWING:

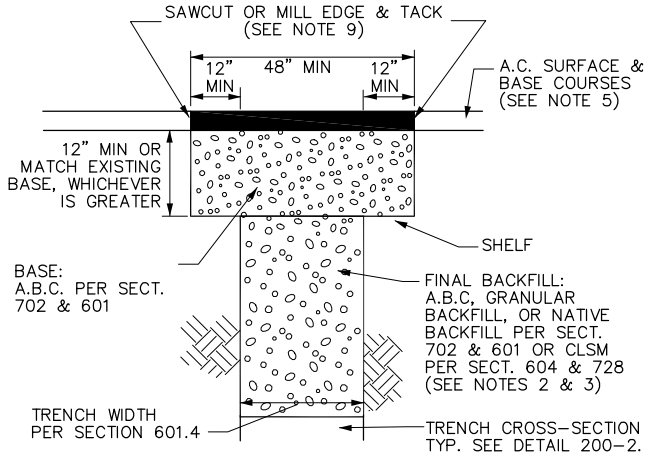
| MEMBER | AISC SIZE | OUTSIDE DIA. |
|---|---|---|
| CORNER POST | 2-1/2" | 2.875" |
| LINE POST | 1-1/2" | 1.900" |
| STRAIN POST | 1-1/2" | 1.900" |
| BRACE | 1-1/4" | 1.666" |
| STRETCH BAR | 3/16"x3/4" FLAT | 3/16"x3/4" FLAT |
| GATE POST | 3-1/2" | 4.000" |
| TOP RAIL | 1-1/4" | 1.666" |

7. CONSTRUCTION AND MATERIALS SHALL CONFORM TO SECT. 420 AND 772, RESPECTIVELY. SEE TABLE 772-1 FOR WEIGHTS OF MEMBERS.

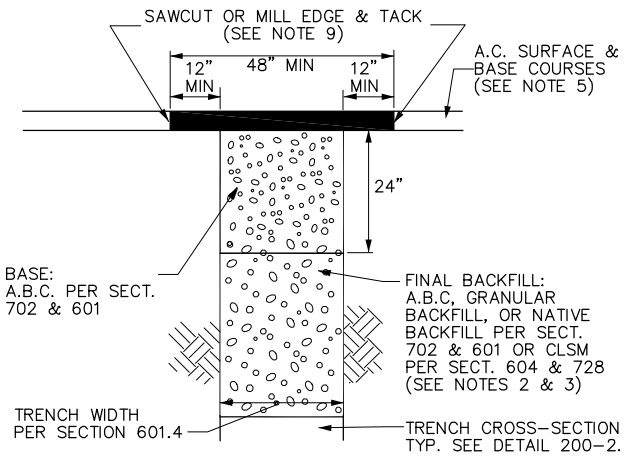


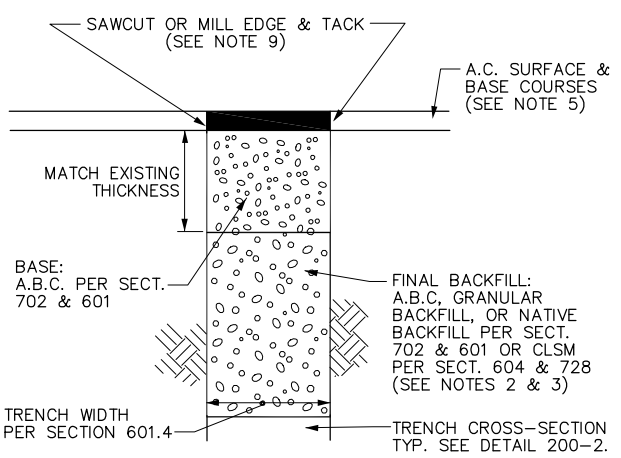

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 160 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | 6' CHAIN LINK FENCE AND GATE | 01-01-2013 | 160 |



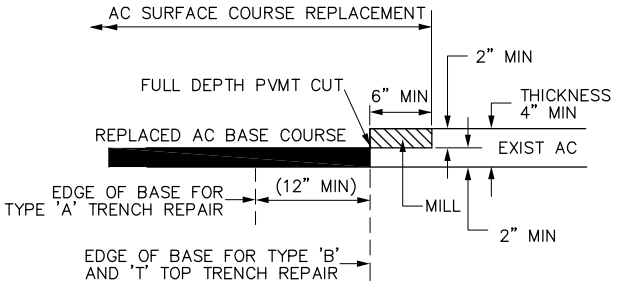

"T TOP" TRENCH REPAIR




TYPE "A" TRENCH REPAIR

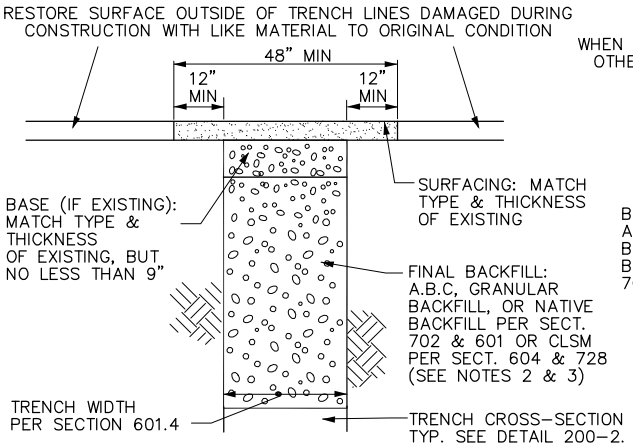



TYPE "B" TRENCH REPAIR



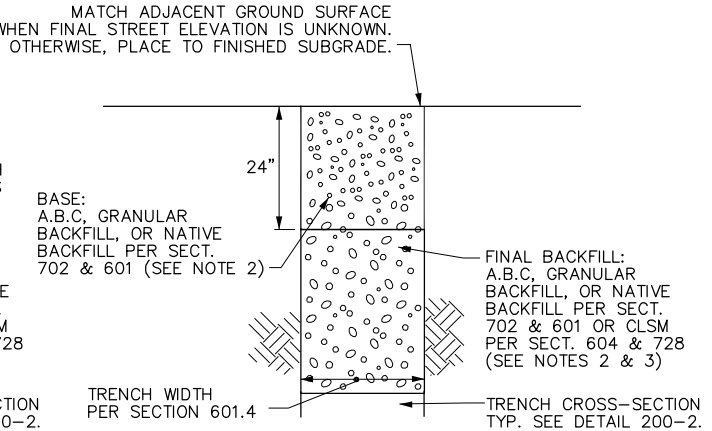

OFFSET JOINT

(FOR PAVEMENT ≥ 4" THICK)




TYPE "D" TRENCH REPAIR

(TRENCH NOT UNDER CONCRETE OR ASPHALT PAVEMENT)




TYPE "E" TRENCH REPAIR

(TRENCH IN FUTURE ROADWAY PRISM OR ALLEY)

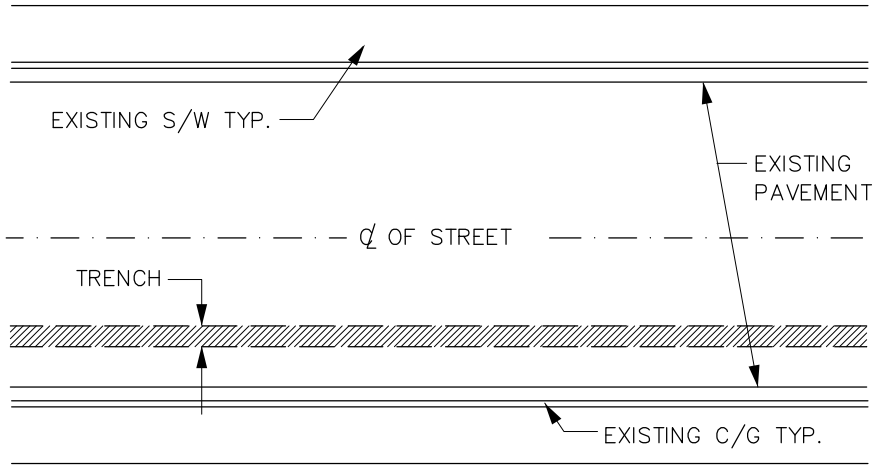
## NOTES:

1. PAVEMENT MATCHING AND SURFACE REPLACEMENT SHALL BE IN ACCORDANCE WITH SECTION 336.
2. MATERIAL FOR FINAL BACKFILL AND BASE (IF APPLICABLE) SHALL BE AS NOTED HEREIN UNLESS OTHERWISE SPECIFIED IN CONTRACT DOCUMENTS. CLSM SHALL BE 1/2-SACK OR 1-SACK PER SECTIONS 604 AND 728.
3. FINAL BACKFILL SHALL BE 1/2-SACK OR 1-SACK CLSM PER SECTIONS 604 AND 728 FOR TRENCH DEPTHS GREATER THAN 4 FEET UNLESS A SAFE (OHSA COMPLIANT) WORKING SPACE AT LEAST 30" WIDE IS PROVIDED TO CONDUCT COMPACTION TESTING.
4. BASE, FINAL BACKFILL, AND PIPE EMBEDMENT ZONE COMPACTION SHALL BE IN ACCORDANCE WITH SECTION 601.
5. ASPHALT CONCRETE SURFACE AND BASE COURSES SHALL COMPLY WITH SECTION 336.2.4.1 UNLESS OTHERWISE SPECIFIED IN CONTRACT DOCUMENTS.
6. USE TYPE "A" FOR LONGITUDINAL TRENCH REPAIR AND USE "T-TOP" FOR TRANSVERSE TRENCH REPAIR (SEE DETAIL 200-2) UNLESS OTHERWISE SPECIFIED IN CONTRACT DOCUMENTS. TYPE "B" TRENCH REPAIR MAY BE USED FOR TRANSVERSE TRENCH REPAIR IF SPECIFIED BY THE AGENCY.
7. PROVIDE MINIMUM 12" WIDE SHELF AS SHOWN IN "T-TOP" TRENCH REPAIR AT ENDS OF TYPE "A" TRENCH REPAIR EXCEPT WHERE EDGE ABUTS EXISTING CONCRETE.
8. USE "T-TOP" PAVEMENT REPLACEMENT WHERE A TRENCH IS NOT PARALLEL TO A STREET OR GOES THROUGH AN INTERSECTION.
9. THE JOINT LOCATION OR JOINT CONFIGURATION MAY VARY FROM THAT SHOWN TO ELIMINATE REMNANTS, TO ELIMINATE FULL DEPTH SAWCUT JOINTS FROM BEING LOCATED WITHIN A WHEEL PATH AS REQUIRED BY SECTION 336, OR WHEN AN OFFSET JOINT IS CONSTRUCTED.
10. SEE DETAIL 200-2 FOR REMNANT PAVEMENT REMOVAL REQUIREMENTS.
11. EXPOSED COPPER OR POLYETHYLENE WATER PIPE UP TO 2" IN DIAMETER IN TRENCHES TO BE BACKFILLED WITH CLSM SHALL BE WRAPPED WITH MINIMUM 3/4" THICK PREFORMED PIPE-COVERING FOAM INSULATION BEFORE PLACING CLSM.

| DETAIL NO. | | STANDARD DETAIL | | PROPOSED | DETAIL NO. |
|---|---|---|---|---|---|
| 200-1 | MARICOPA ASSOCIATION of GOVERNMENTS | ENGLISH | TRENCH BACKFILL AND SURFACE REPLACEMENT | 01-01-2016 | 200-1 |

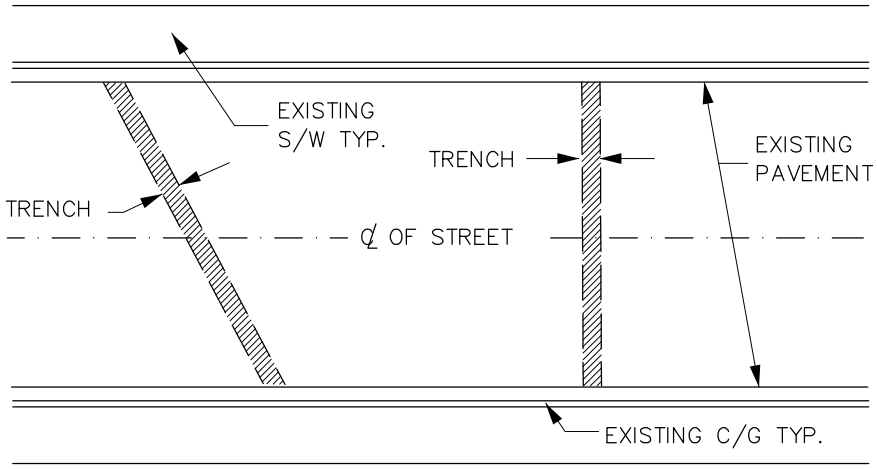
## LONGITUDINAL TRENCH

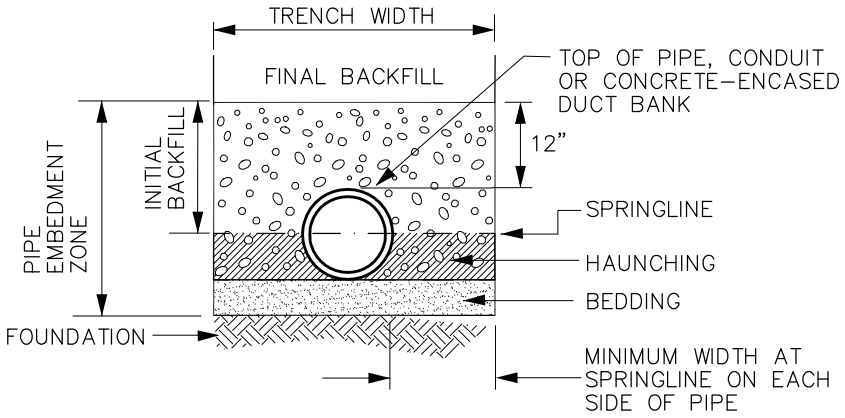
(TRENCH IN PAVEMENT PARALLEL TO TRAFFIC)



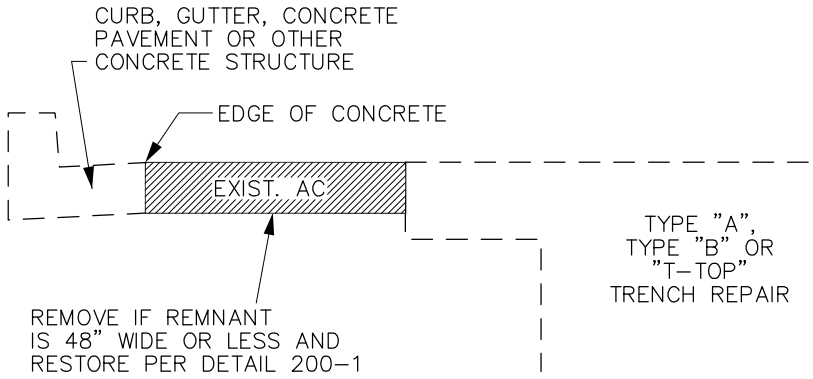

## TRANSVERSE TRENCH

(TRENCH IN PAVEMENT NOT PARALLEL TO TRAFFIC)




## TRENCH CROSS-SECTION DETAIL

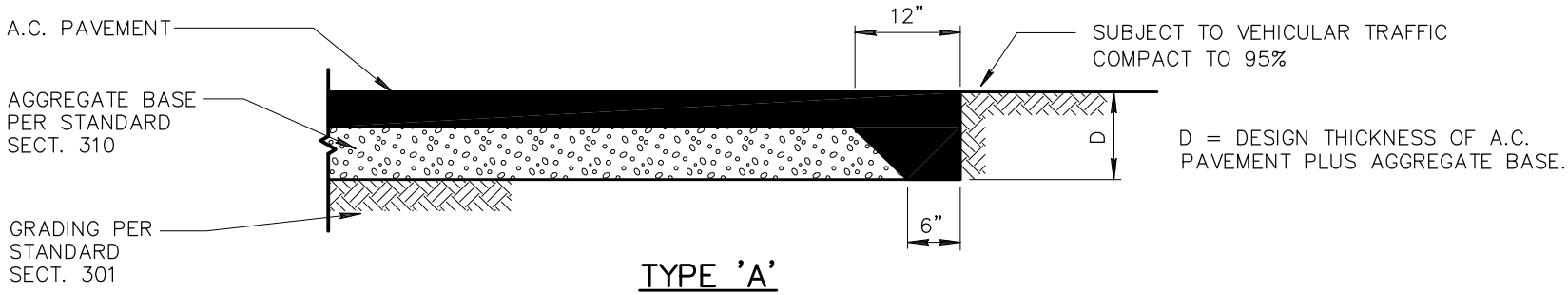



## REMNANT PAVEMENT REMOVAL

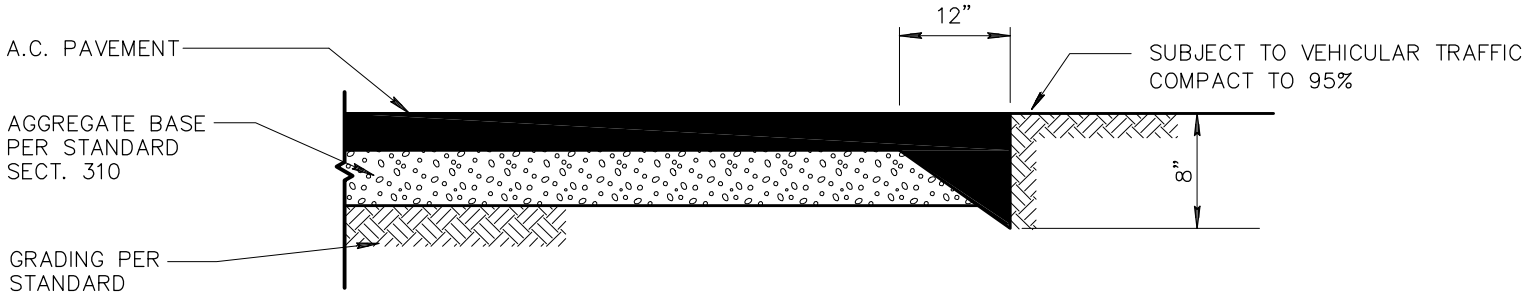
## NOTES:

1. SEE SECTION 601 FOR TRENCH EXCAVATION, BACKFILLING AND COMPACTION REQUIREMENTS.
2. SEE DETAIL 200–1 FOR DETAILED TRENCH REPAIR REQUIREMENTS FOR TRENCH TYPES NOTED HEREIN.
3. SEE DETAIL 211 FOR REQUIREMENTS REGARDING THE USE OF PLATING TRANSVERSE TRENCHES. USE OF STEEL PLATES SHALL NOT EXCEED 72 HOURS AFTER COMPLETION OF BACKFILL AND PRIOR TO FINAL PATCHING.

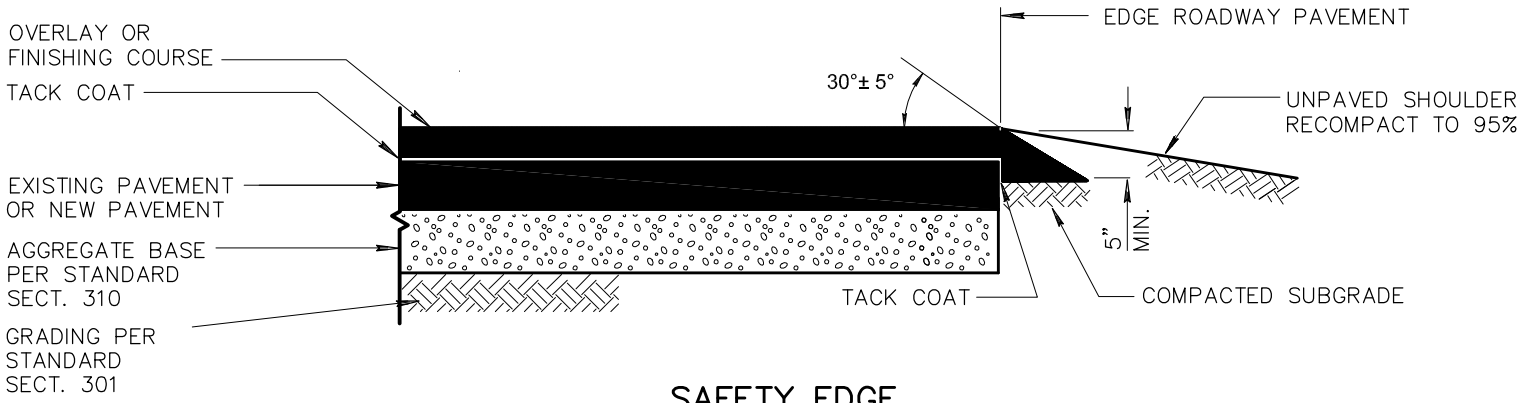
| DETAIL NO. | | | | PROPOSED | DETAIL NO. |
|---|---|---|---|---|---|
| 200-2 | MARICOPA ASSOCIATION of GOVERNMENTS | STANDARD DETAIL ENGLISH | TRENCH BACKFILL AND SURFACE REPLACEMENT | 01-01-2016 | 200-2 |




## TYPE 'A'

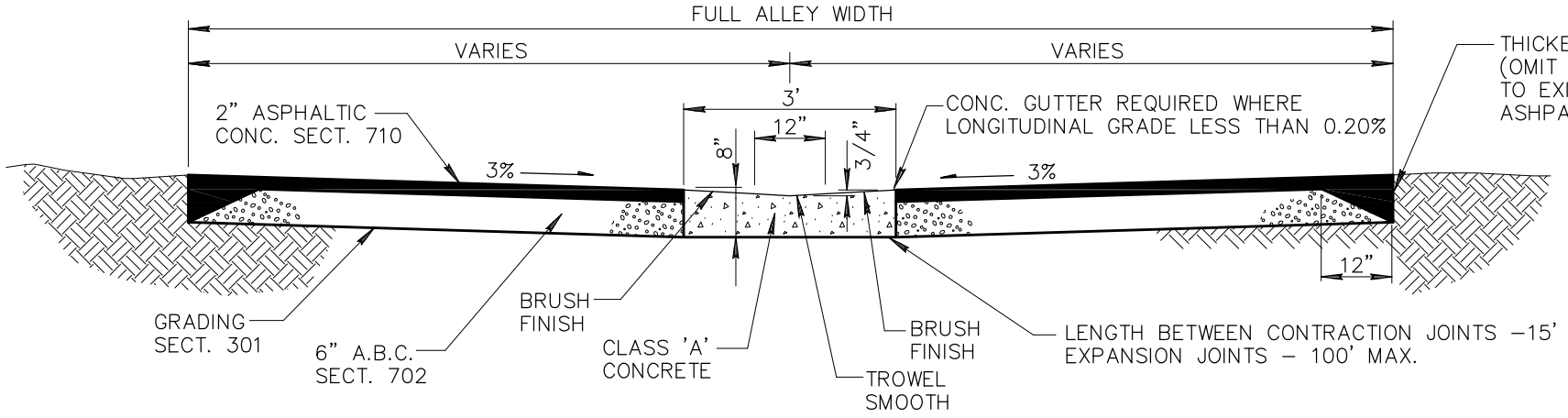



## TYPE 'B'

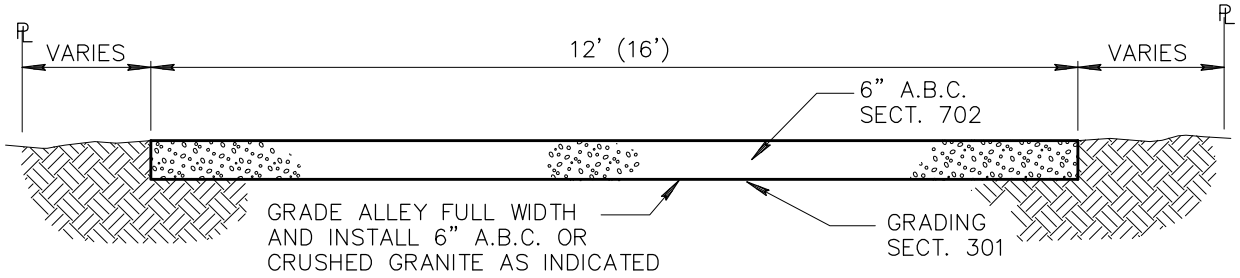



## SAFETY EDGE

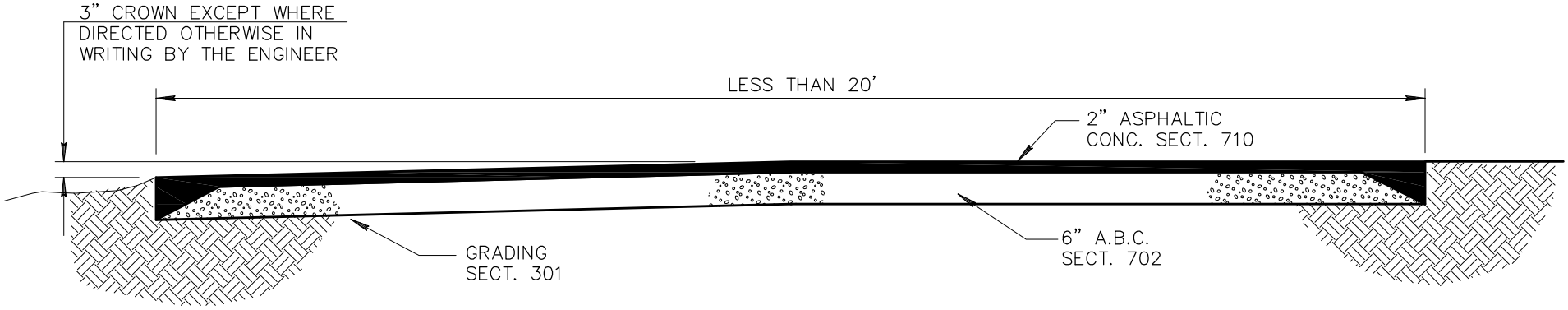
| DETAIL NO. | | | | DATE | DETAIL NO. |
|---|---|---|---|---|---|
| 201 | MARICOPA ASSOCIATION of GOVERNMENTS | STANDARD DETAIL ENGLISH | ASPHALT PAVEMENT EDGE DETAILS | 01–01–2014 | 201 |




## PAVED ALLEY DETAIL

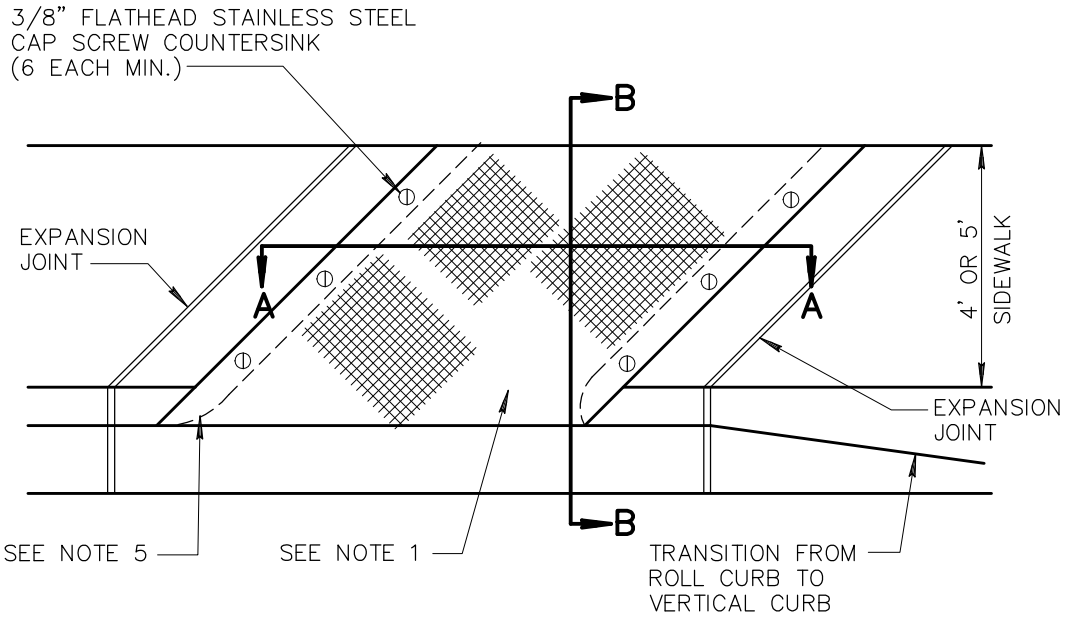



## UNPAVED ALLEY DETAIL



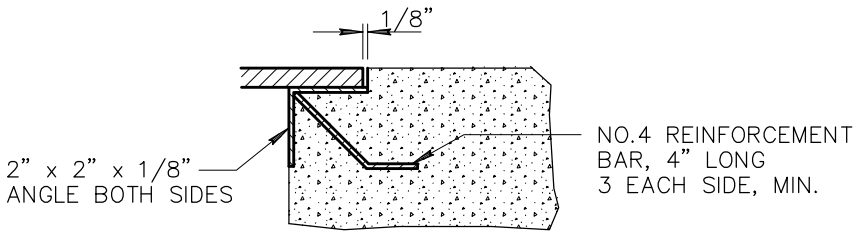

## RESIDENTIAL ALLEY DETAIL

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 202 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | ALLEY DETAILS (PAVED AND UNPAVED) | 01–01–1998 | 202 |

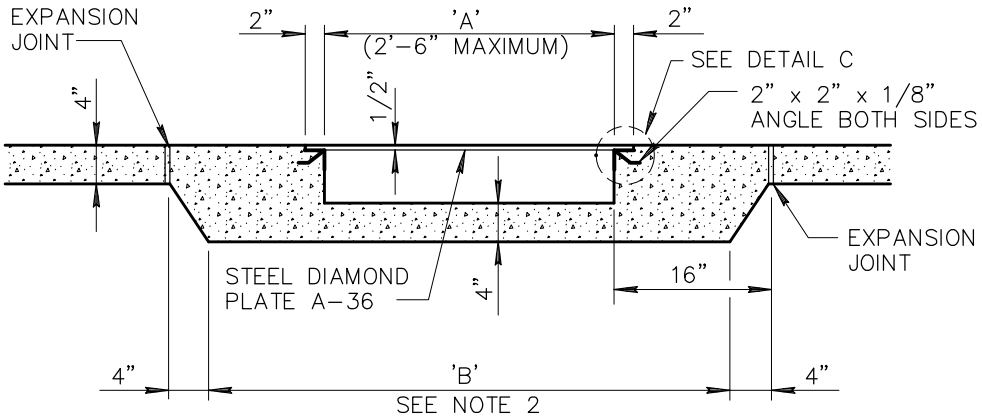



## NOTES:

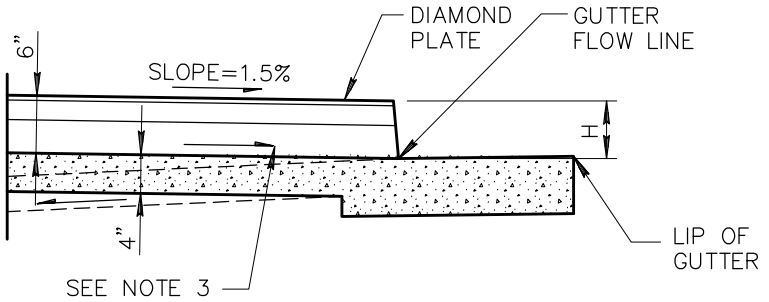
1. ANGLE EQUALS 45° UNLESS SPECIFIED ON PLAN.
2. DIMENSION 'B' EQUALS 'A' + 2'
3. ( ——► ) INDICATES DIRECTION OF FLOW.
4. PAINT STEEL ACCORDING TO SECTION 790. PAINT NUMBER 1–A OR 1–B.
5. R EQUALS 1" UNLESS OTHERWISE DIRECTED.
6. H EQUALS CURB FACE HEIGHT.
7. FOR ROLL CURB AND GUTTER, USE 2' TRANSITIONS TO VERTICAL CURB.
8. CONCRETE SHALL BE CLASS B PER SECT. 725 AND INSTALLED PER SECT. 505.




DETAIL C

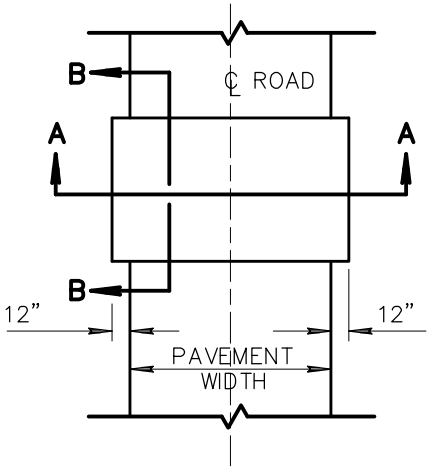



SECTION 'A–A'

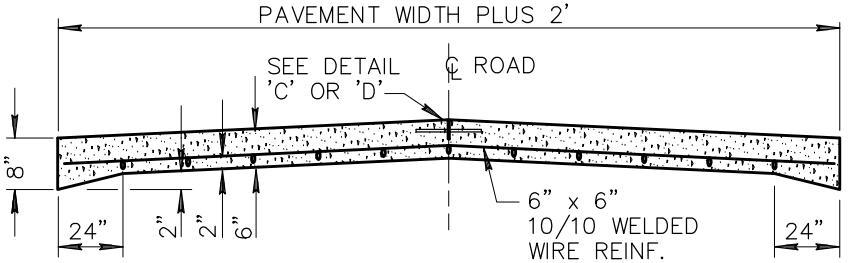



SECTION 'B–B'

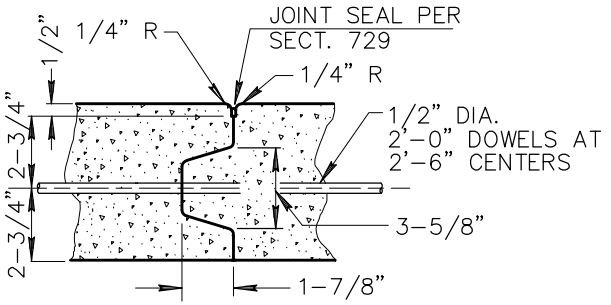
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 203 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | SCUPPERS | 01–01–1998 | 203 |



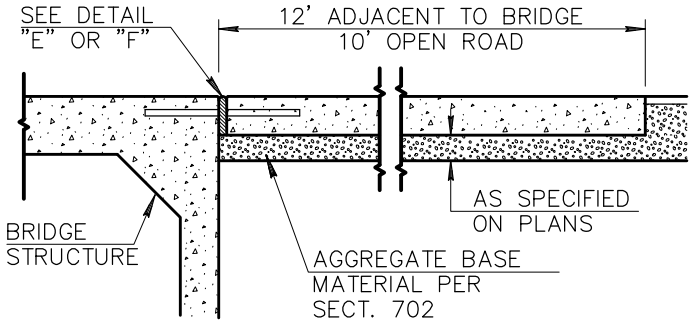

## PLAN OF CONCRETE EQUIPMENT CROSSING



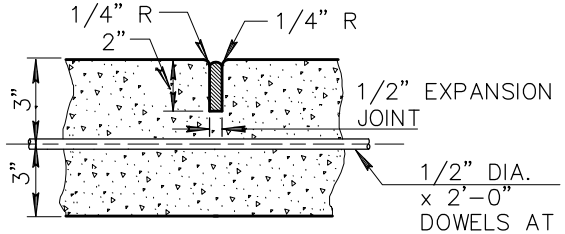

## SECTION A–A




## LONGITUDINAL JOINT DETAIL 'C'



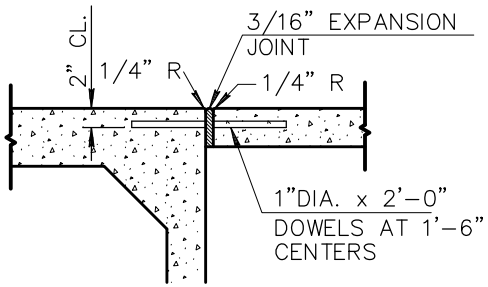

## SECTION B–B



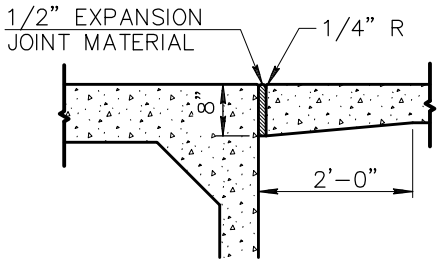

## LONGITUDINAL JOINT DETAIL 'D'

## NOTES:

1. WHEN EQUIPMENT CROSSING LIES ADJACENT TO BRIDGE OR BOX CULVERT, CONSTRUCT THE EQUIPMENT CROSSING TO WIDTH OF BRIDGE ROADWAY.
2. ALL DOWELS IN CENTER JOINTS SHALL BE DEFORMED BARS AND SHALL HAVE UNBROKEN BOND. THEY SHALL BE HELD SECURELY IN PLACE, PARALLEL TO THE SUBGRADE AND PERPENDICULAR TO THE CENTER LINE OF THE ROAD.
3. THE EDGING TOOL USED FOR ALL LONGITUDINAL JOINTS SHALL BE SO CONSTRUCTED AS TO PROVIDE A SMOOTH TROWELED SURFACE 3" WIDE ON EACH SIDE OF THE JOINT.
4. IF APPROVED BY THE ENGINEER, OTHER DEFORMATIONS MAY BE USED IN LONGITUDINAL JOINT – DETAIL 'C'.
5. DETAIL 'C' TO BE USED ONLY WHEN FULL WIDTH CAN NOT BE POURED IN ONE POUR. USE DETAIL 'D' IF FULL WIDTH IS POURED IN ONE POUR.

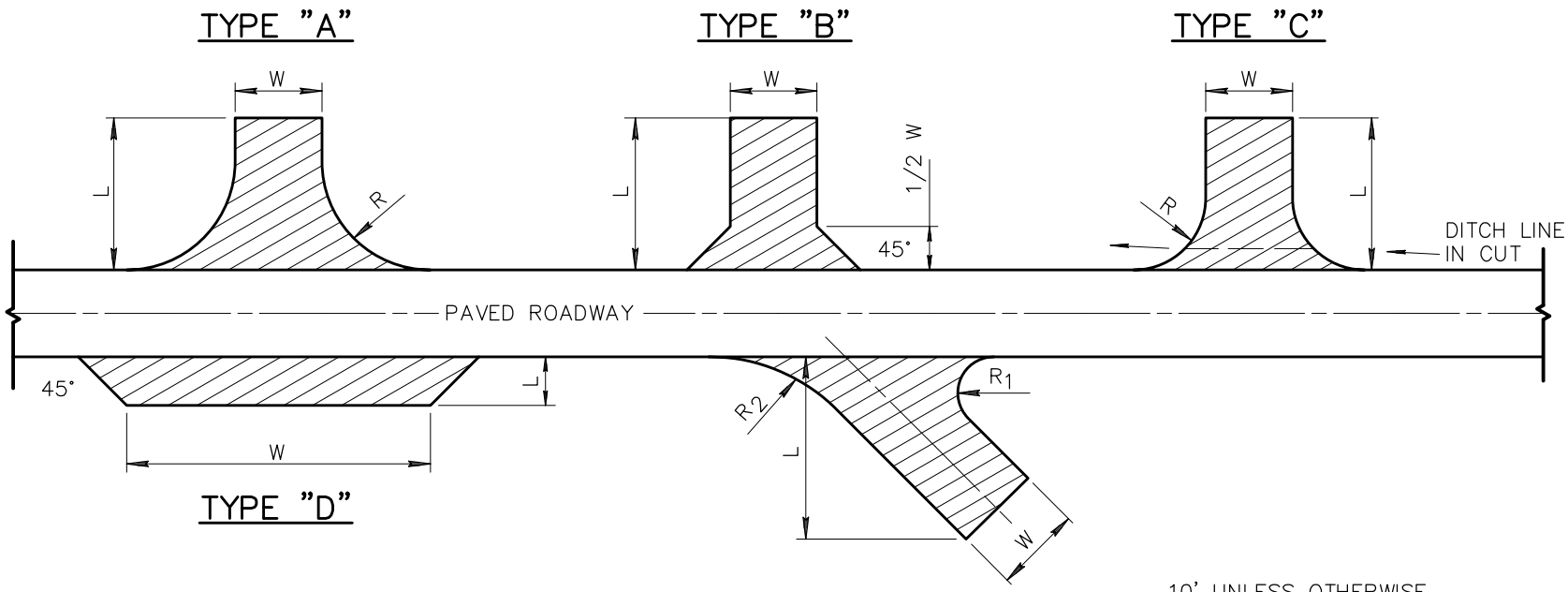



## JOINT AT NEW BRIDGE DETAIL 'F'




## JOINT AT EXISTING BRIDGE DETAIL 'E'

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 204 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | EQUIPMENT CROSSING | 01–01–1998 | 204 |




## NOTES:

1. W – INDICATES WIDTH OF PAVED SURFACE OF TURNOUT.
   L – INDICATES LENGTH OF PAVED SURFACE OF TURNOUT.
   R – RADIUS.

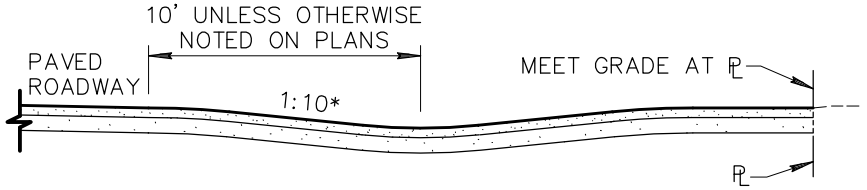
2. SIZE AND TYPE OF TURNOUT SHALL BE NOTED ON PLANS AS FOLLOWS:
   90° – NO RADIUS: WxL–SURFACE–TYPE; (12' x 30'–A.C.–TYPE "B" TURNOUT).
   90° – WITH A RADIUS: WxLxR–SURFACE–TYPE; (12' x 20' x 15'–A.C.–TYPE "C" TURNOUT). OTHER THAN 90° WITH 2 RADII–TYPE "S": WxLx$R_1$ x$R_2$–SURFACE–TYPE; (12' x 20' x 15'–A.C.–TYPE "S" TURNOUT).
   OR IT MAY BE NOTED ON PLANS IN CONVENTIONAL TERMS.

3. TURNOUTS TO BE STRAIGHT TYPE UNLESS OTHERWISE NOTED ON PLANS.

4. A.C. AND BASE MATERIAL THICKNESS FOR TURNOUTS SHALL BE THE SAME AS SHOWN ON THE ROADWAY SECTION, UNLESS OTHERWISE NOTED.

5. ANY EXCAVATION OR EMBANKMENT FOR TURNOUTS IS INCLUDED IN THE ROADWAY QUANTITIES.

6. TURNOUTS ARE TO BE PLACED WHERE SHOWN ON PLANS, OR AS DIRECTED BY THE ENGINEER.

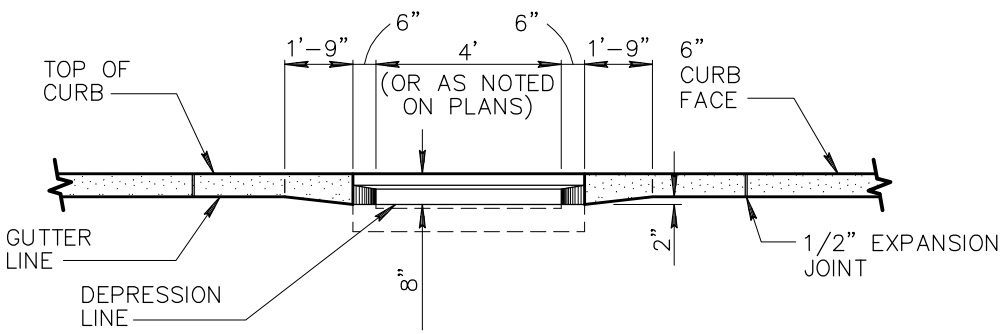



TYPICAL VALLEY GUTTER TURNOUT

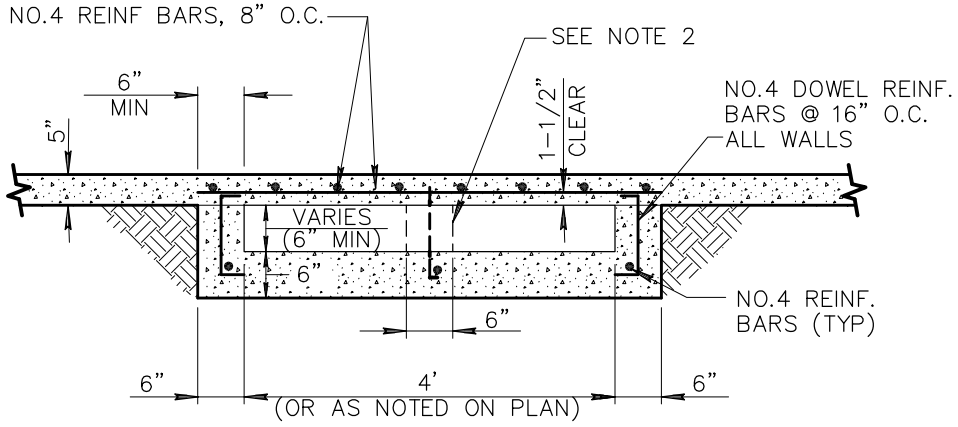
TYPICAL STRAIGHT TURNOUT

* UNLESS OTHERWISE NOTED ON PLANS

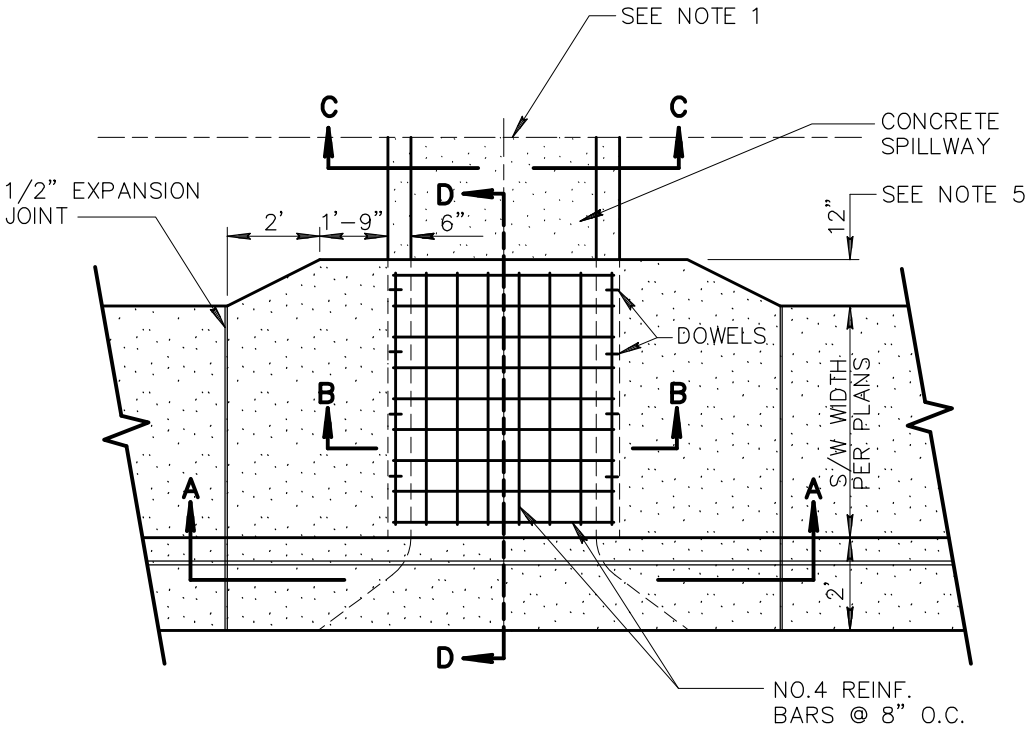
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 205 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | PAVED TURNOUTS | 01–01–2006 | 205 |



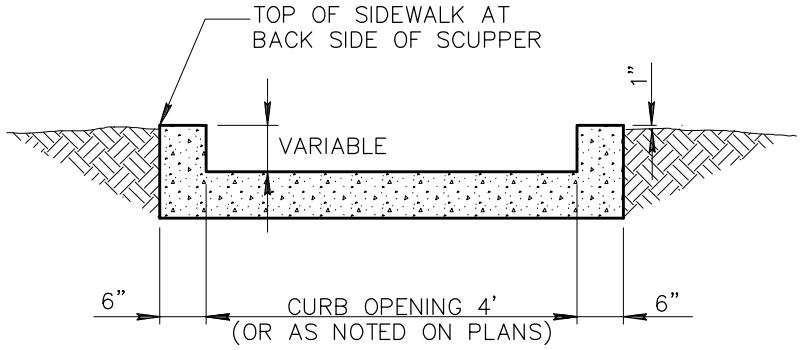

## SECTION A–A




## SECTION B–B




## SCUPPER PLAN VIEW

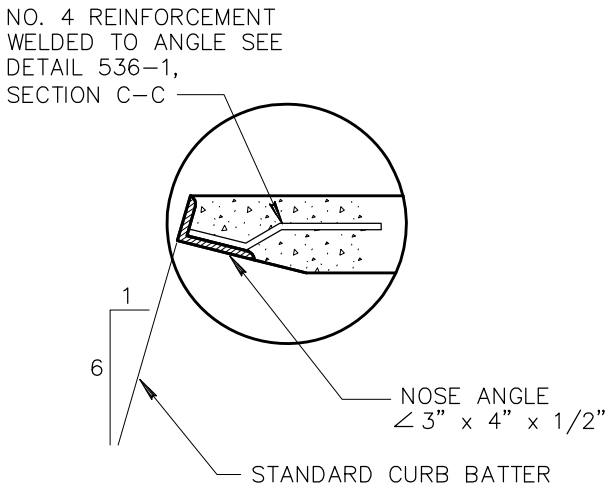


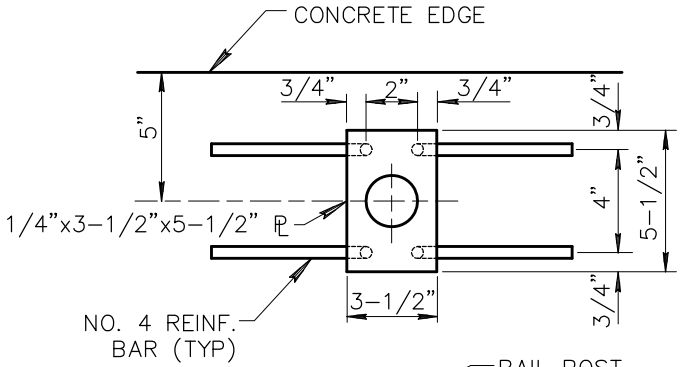

## SECTION C–C SPILLWAY

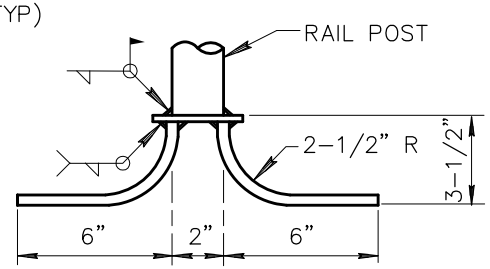
## NOTES:

1. TRANSITION TO SPILLWAY/CHANNEL AS PER APPROVED PLANS.
2. A CENTER WALL SHALL BE INSTALLED IN SCUPPERS WIDER THAN 4' OR IF MORE THAN 1 SCUPPER IS BUILT IN SERIES.
3. EXPANSION JOINT FILLER SHALL BE 1/2" BITUMINOUS TYPE PREFORMED EXPANSION JOINT FILLER, ASTM D–1751.
4. CONCRETE FOR THE SCUPPER SHALL BE CLASS 'A' PER SECTION 725. CONCRETE FOR THE SPILLWAY SHALL BE CLASS 'A' OR CLASS 'B'.
5. 12" OFFSET DISTANCE SHALL BE INCREASED TO 2'–6" FOR DESIGNATED BICYCLE PATHS.

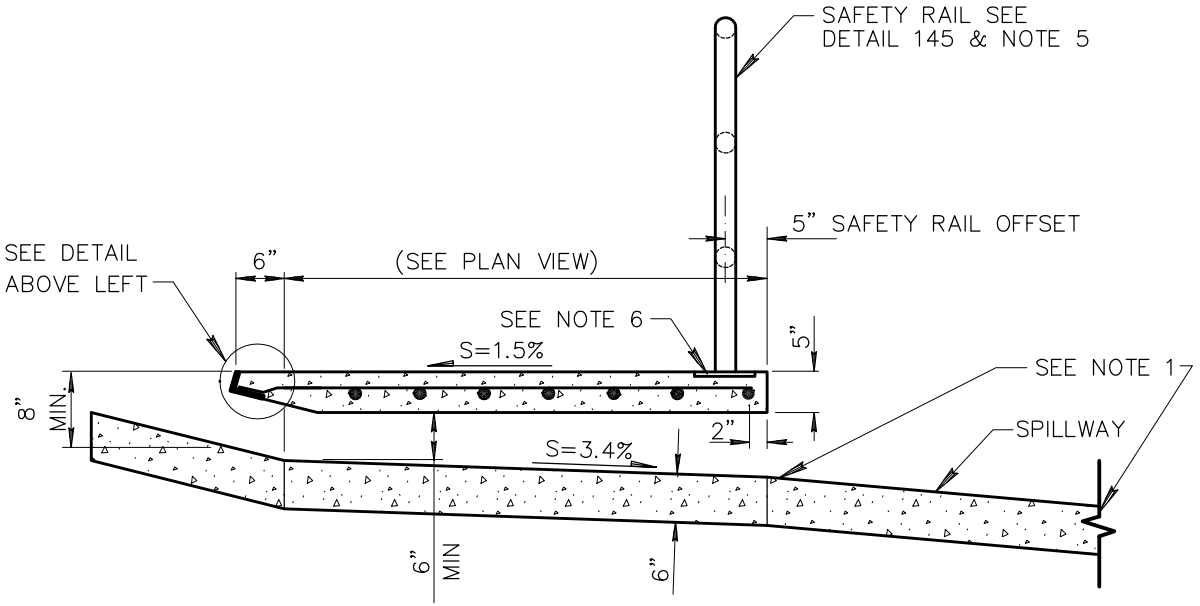
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 206–1 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | CONCRETE SCUPPER | 01–01–2007 | 206–1 |




## WELD PLATE

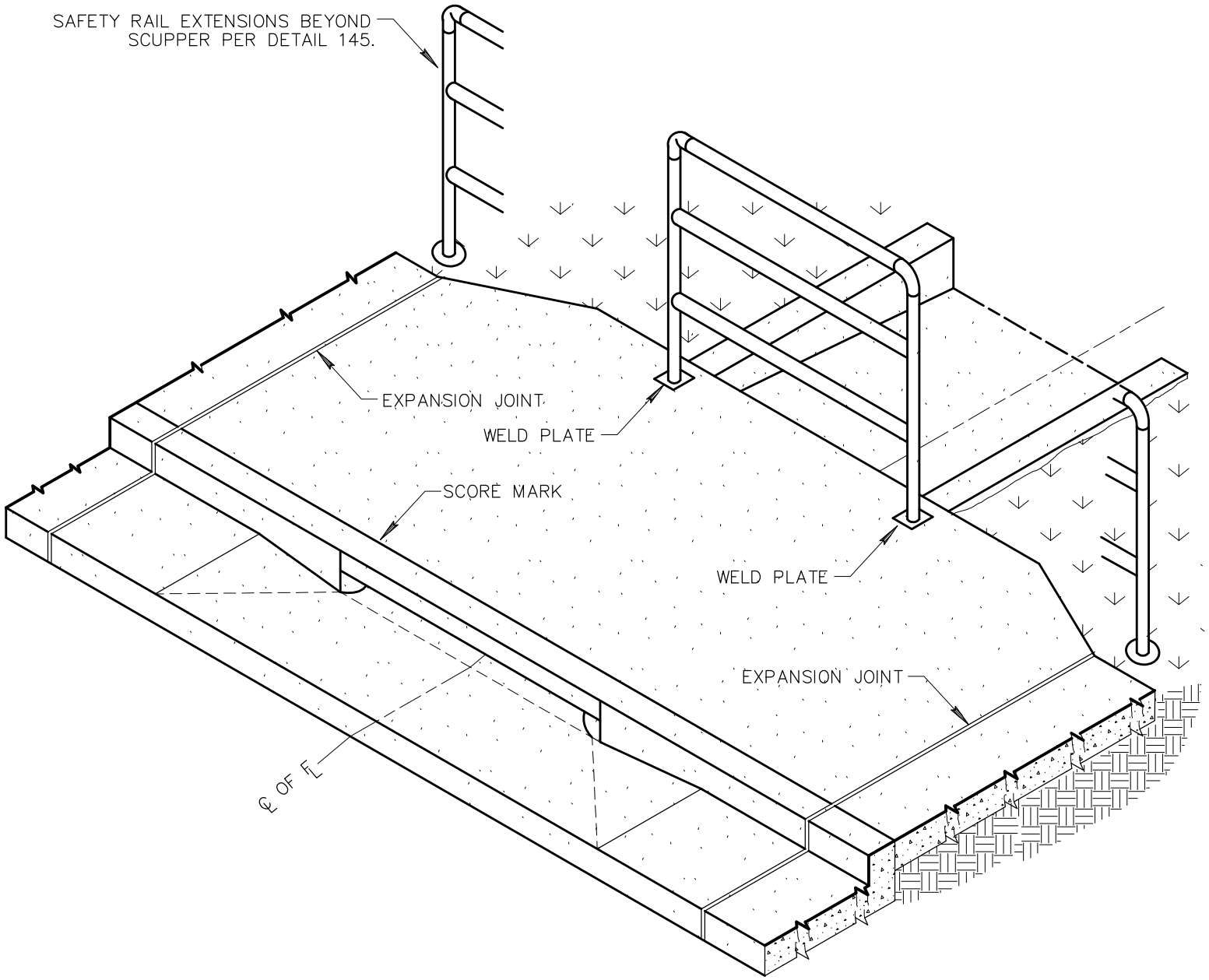



## SECTION D–D

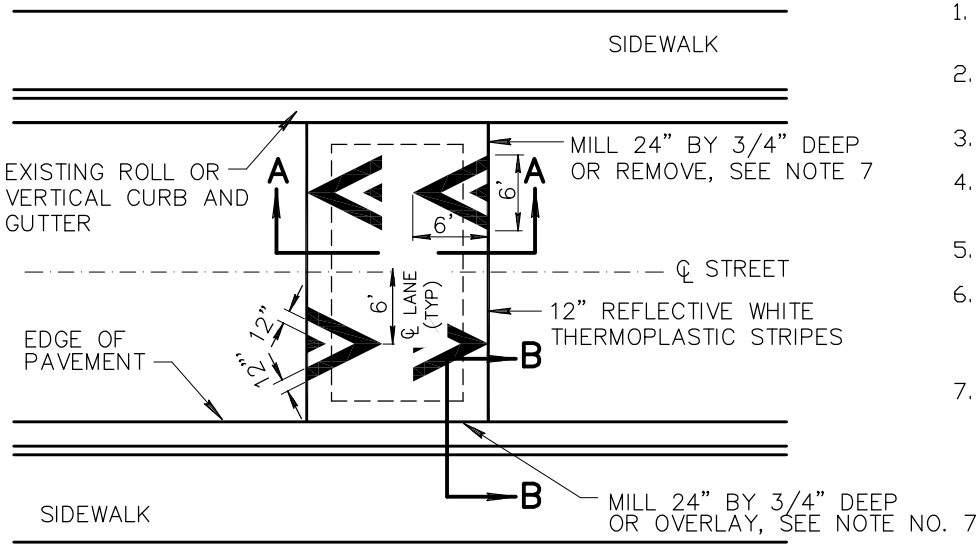
## NOTES:

1. TRANSITION TO SPILLWAY/CHANNEL AS PER APPROVED PLANS.
2. A CENTER WALL SHALL BE INSTALLED IN SCUPPERS WIDER THAN 4' OR IF MORE THAN 1 SCUPPER IS BUILT IN SERIES.
3. EXPANSION JOINT FILLER SHALL BE 1/2" BITUMINOUS TYPE PREFORMED EXPANSION JOINT FILLER, ASTM D–1751.
4. CONCRETE FOR THE SCUPPER SHALL BE CLASS 'A' PER SECTION 725. CONCRETE FOR THE SPILLWAY SHALL BE CLASS 'A' OR CLASS 'B'.
5. SAFETY RAIL SHALL BE CONTINUOUS BETWEEN THE SPILLWAY EXTERIOR WALLS.
6. USE WELD PLATES FOR SAFETY RAIL ANCHORS LOCATED IN THE 5" THICK CONCRETE.

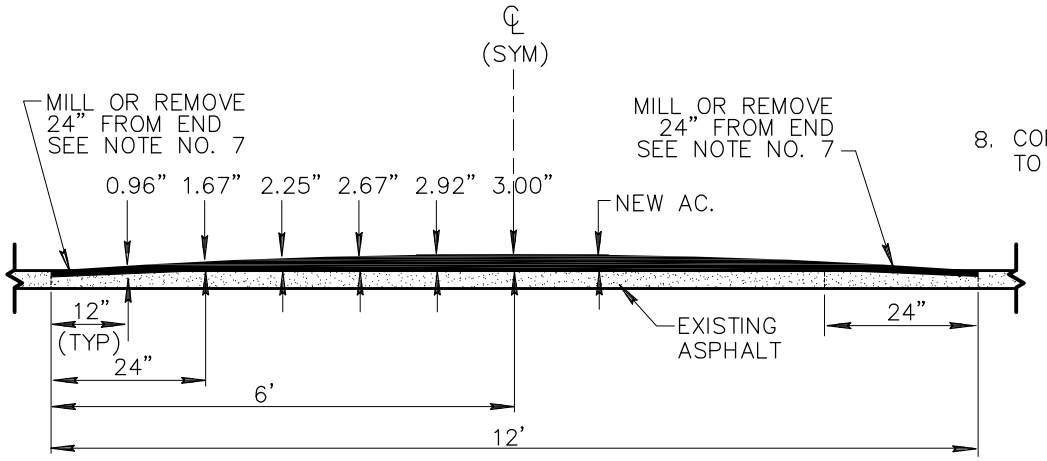
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 206–2 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | CONCRETE SCUPPER | 01–01–2007 | 206–2 |




| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 206–3 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | CONCRETE SCUPPER | | 01–01–2007 | 206–3 |



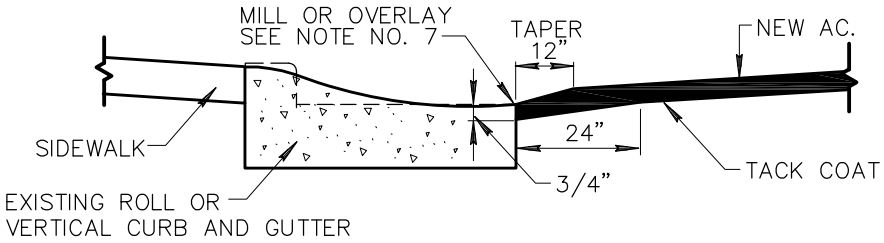

## PLAN VIEW




## SECTION A–A

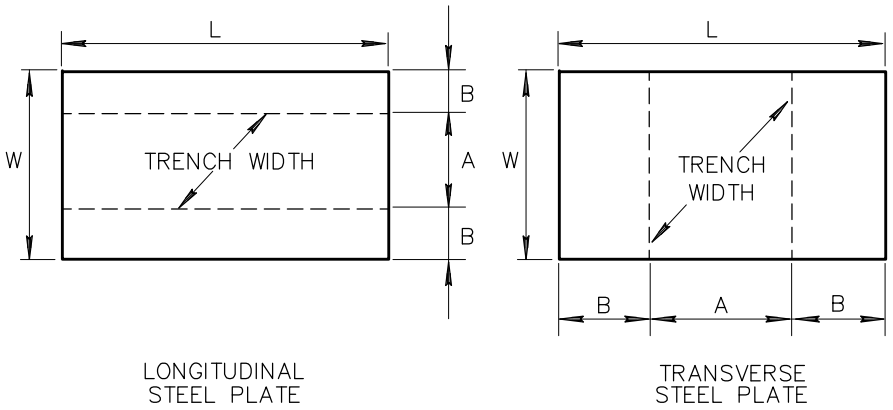
## NOTES:

1. HUMPS MUST BE THE FULL 3" FOR MAXIMUM EFFECT BUT SHALL NOT EXCEED 3.25".
2. HUMPS CONSTRUCTED OVER 3.25" OR LESS THAN 3.00" SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.
3. CROSS–SECTION ELEVATIONS SHALL HAVE A MAXIMUM TOLERANCE OF +0.25".
4. SPEED HUMPS SHALL NOT BE PLACED OVER MANHOLES, WATER VALVES, SURVEY MONUMENTS, JUNCTION CHAMBERS, ETC. OR IN CONFLICT WITH DRIVEWAYS.
5. SPEED HUMPS MUST BE PLACED AT LOCATIONS APPROVED BY THE AGENCY.
6. HUMP TO BE CONSTRUCTED WITH ASPHALT MIX APPROVED BY THE AGENCY. ASPHALT COMPACTION SHALL BE PER SECTION 321. A TACK COAT PER SECTION 713 SHALL BE APPLIED PRIOR TO APPLICATION OF PAVEMENT.
7. INSTALLATION JOINTS:
   A. STANDARD INSTALLATION:
      THE EXISTING ROADWAY SHALL BE MILLED TO A MINIMUM DEPTH OF 3/4" AROUND THE PERIMETER. CROSS SECTION DIMENSIONS DO NOT INCLUDE THE 3/4" MILLING. CONTRACTOR MUST PROVIDE VERIFICATION OF CROSS–SECTION DIMENSIONS.
   B. ALTERNATIVE INSTALLATION:
      FOR TRANSVERSE JOINTS (CROSS ROADWAY), THE EXISTING ASPHALT SHALL BE SAW CUT AND REMOVED FOR A WIDTH OF 24". THE ASPHALT SHALL BE REPLACED WITH THE SAME ASPHALT AND AT THE SAME TIME AS THE HUMP ASPHALT. FOR LONGITUDINAL JOINTS, THE EXISTING ASPHALT SHALL BE OVERLAID AND TAPERED IN 12". CROSS–SECTION DIMENSIONS REFLECT DISTANCES FROM THE SURFACE OF EXISTING ASPHALT.
8. CONTACT THE AGENCY (OR INSPECTOR) ONE WEEK PRIOR TO INSTALLATION TO COORDINATE PAVEMENT MARKINGS AND SIGNING.




## SECTION B–B

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 210 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | RESIDENTIAL SPEED HUMP | 01–01–2012 | 210 |



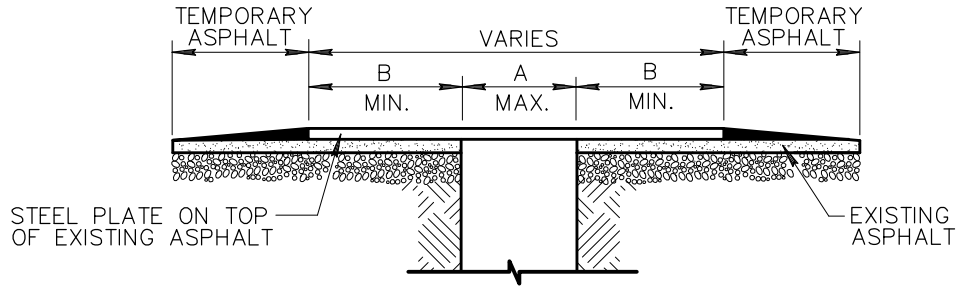

LONGITUDINAL STEEL PLATE

TRANSVERSE STEEL PLATE

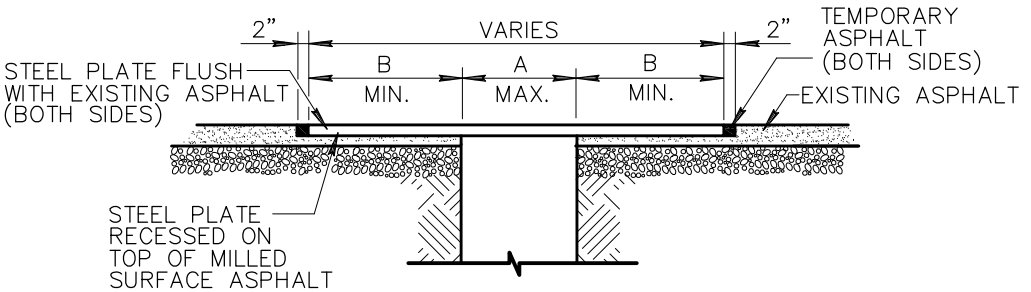
## NOTES:

1. USE TYPE 1 PLATE INSTALLATION WHERE POSTED SPEED LIMIT IS LESS THAN 30 MPH. USE TYPE 2 PLATE INSTALLATION WHERE POSTED SPEED LIMIT IS 30 MPH OR GREATER.
2. FOR TYPE 2 PLATE INSTALLATION, THE STEEL PLATE SHALL BE RECESSED BY MILLING INTO THE EXISTING ASHPALT TO SET FLUSH WITH THE SURFACE OF THE EXISTING ASPHALT. FULL DEPTH CUTTING OF PAVEMENT SECTION OUTSIDE OF TRENCH IS NOT PERMITTED. MILLING DEPTH SHALL MATCH THICKNESS OF PLATE. THE GAP BETWEEN THE EDGE OF THE PLATE AND THE ADJACENT EXISTING ASPHALT PAVEMENT MUST BE FILLED WITH TEMPORARY ASPHALT.
3. TRENCH WIDTHS ARE BASED ON AN ANALYSIS PER THE 14TH EDITION OF STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES BY AASHTO. AN ASSUMED AXLE LOADING OF 12 TONS WITH A 30% IMPACT FACTOR WAS USED. THE AXLE LENGTH IS 6 FEET: THEREFORE THE NUMBER OF WHEELS CARRIED BY A PLATE DEPENDS ON THE ROADWAY WIDTH.
4. STEEL PLATE MUST BE ABLE TO WITHSTAND H–20 TRAFFIC LOADINGS WITHOUT ANY MOVEMENT.
5. PLATES SHALL BE FABRICATED FROM ASTM A36 STEEL (MIN).
6. PLATES SHALL BE SECURED FROM LATERAL MOVEMENT AND VERTICAL VIBRATION (ASSOCIATED NOISE) WHILE IN USE BY TEMPORARY ASPHALT (COLD MIX.)

| PLATE SIZE | | | | | | |
|---|---|---|---|---|---|---|
| LONGITUDINAL | | | | | TRANSVERSE | |
| (A) | (B) | THICKNESS | (W) | (L) | (A) | (B) |
| 12” | 18” | 1” | 4’ | 8’ | 58” | 19” |
| 12” | 18” | 1” | 4’ | 10’ | 58” | 31” |
| 24” | 18” | 1” | 5’ | 10’ | 70” | 25” |
| 36” | 18” | 1” | 6’ | 10’ | 44” | 38” |
| 48” | 18” | 1” | 7’ | 10’ | 52” | 34” |
| 60” | 18” | 1” | 8’ | 10’ | 58” | 31” |
| 12” | 18” | 1–1/4” | 4’ | 15’ | 88” | 47” |
| 24” | 18” | 1–1/4” | 5’ | 12’ | 104” | 20” |
| 36” | 18” | 1–1/4” | 6’ | 12’ | 66” | 39” |
| 36” | 18” | 1–1/4” | 6’ | 16’ | 66” | 63” |
| 48” | 18” | 1–1/4” | 7’ | 12’ | 76” | 33” |
| 48” | 18” | 1–1/4” | 7’ | 16’ | 76” | 58” |
| 60” | 18” | 1–1/4” | 8’ | 12’ | 86” | 29” |
| 60” | 18” | 1–1/4” | 8’ | 15’ | 86” | 47” |
| 60” | 18” | 1–1/4” | 8’ | 16’ | 86” | 63” |
| 60” | 18” | 1–1/4” | 8’ | 20’ | 86” | 77” |
| 60” | 18” | 1–3/8” | 8’ | 20’ | 102” | 69” |

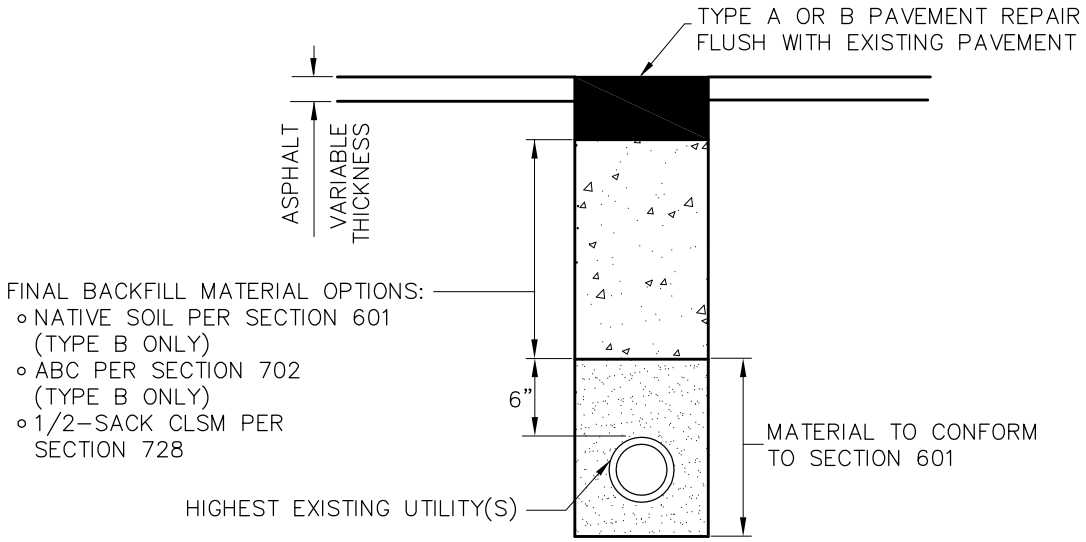



TYPE 1



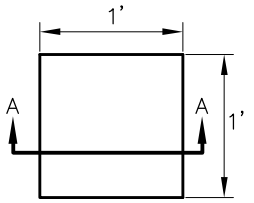

TYPE 2

| DETAIL NO. | | STANDARD DETAIL | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 211 | MARICOPA ASSOCIATION of GOVERNMENTS | ENGLISH | STANDARD TRENCH PLATING DETAIL | 01–01–1998 | 211 |



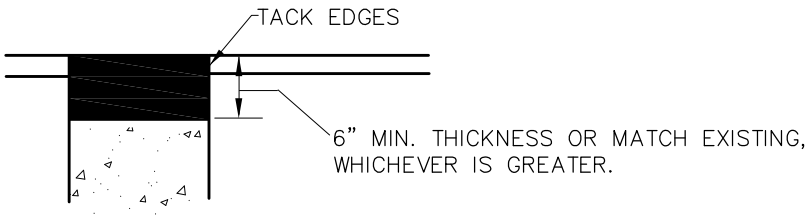

SECTION VIEW

## TYPE A PAVEMENT REPAIR



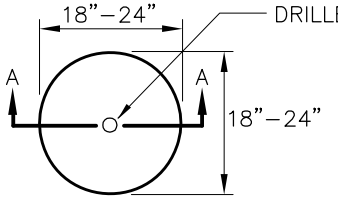

PLAN VIEW

NOTES:
1. DIMENSIONS ARE NOMINAL.
2. EDGES SHALL BE CUT TO A NEAT VERTICAL FACE.
3. PLACE CLSM BACKFILL IN ACCORDANCE WITH SECTION 604.
4. PLACE AGENCY-APPROVED ASPHALT CONCRETE IN MAXIMUM 2" LIFTS.



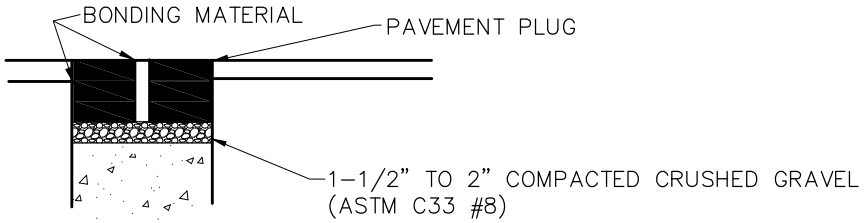

SECTION A-A

## TYPE B PAVEMENT REPAIR



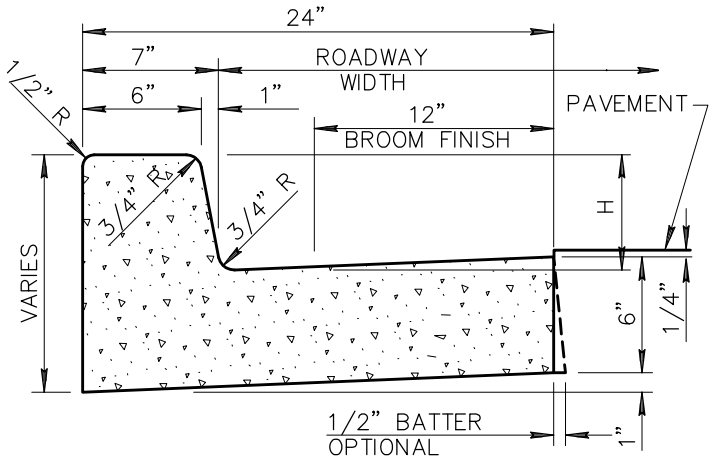

PLAN VIEW

NOTES:
1. CUT, REMOVE AND REPLACE PAVEMENT. PLUG IN ACCORDANCE WITH SECTION 355.
2. PLACE BACKFILL IN ACCORDANCE WITH SECTION 355.
3. BONDING MATERIAL SHALL BE AS SPECIFIED IN SECTION 708.




SECTION A-A

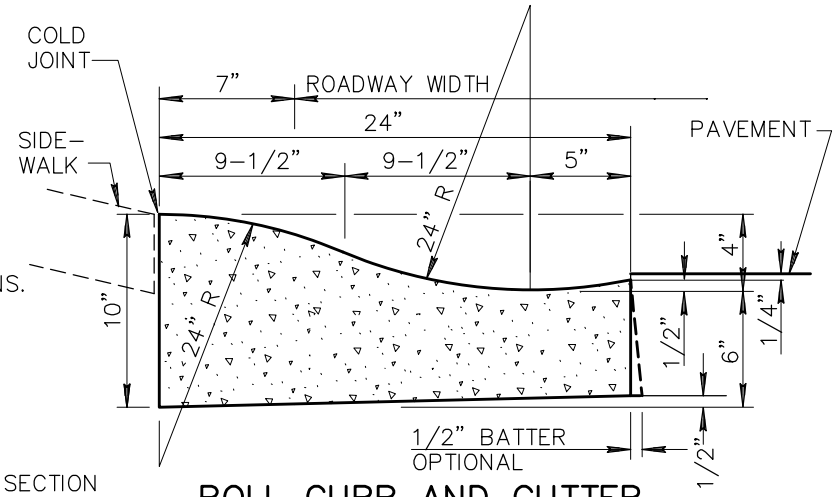
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 212 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | UTILITY POTHOLE REPAIR | 01-01-2015 | 212 |



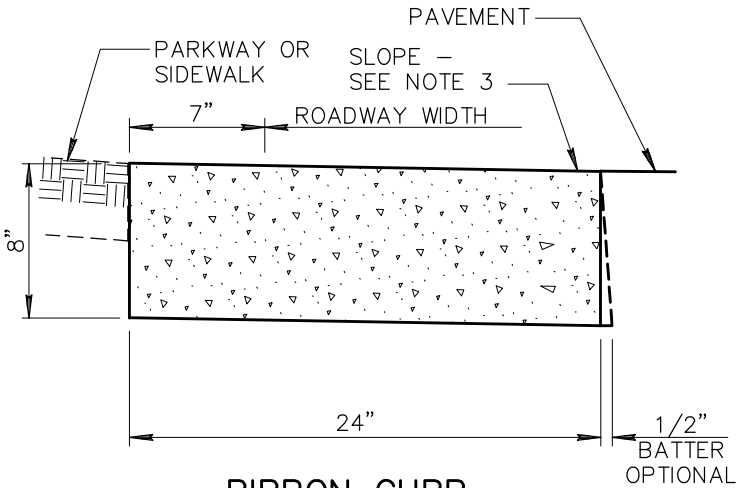

## VERTICAL CURB AND GUTTER (TYPE A)

## NOTES: (TYPE A)

1. ALL EXPOSED SURFACES TO BE TROWEL FINISHED EXCEPT AS SHOWN. SEE SECT. 340.
2. H=6" OR AS SPECIFIED ON PLANS.
3. CONTRACTION JOINT SPACING 10' MAXIMUM.
4. EXPANSION JOINTS AS PER SECT. 340.
5. CLASS 'B' CONCRETE PER 725.
6. WHEN THE ADJACENT PAVEMENT SECTION SLOPES AWAY FROM THE GUTTER, THE SLOPE OF THE GUTTER PAN SHALL MATCH PAVEMENT CROSS SLOPE.




## ROLL CURB AND GUTTER (TYPE C)

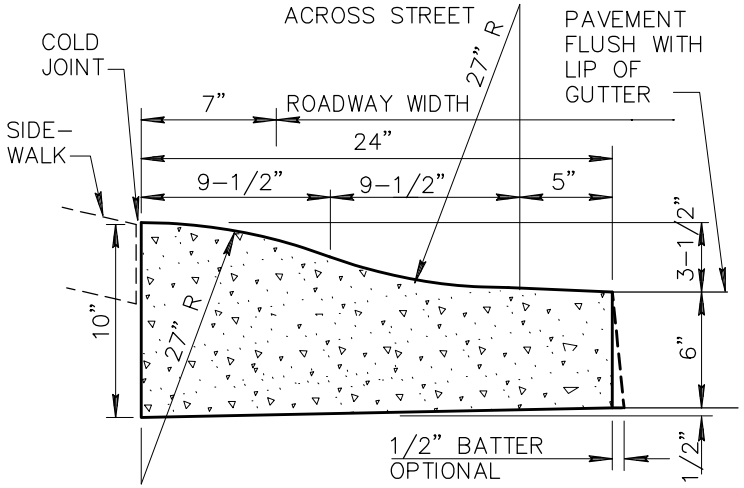



## RIBBON CURB (TYPE B)

## NOTES: (TYPE B)

1. CONSTRUCT CURB AND INSTALL 1/2" MASTIC EXPANSION JOINTS, A.S.T.M. D-1751. SECT. 340.
2. BROOM FINISH ALL SURFACES.
3. RIBBON CURB MAY SLOPE TOWARDS PAVEMENT OR PARKWAY AS INDICATED ON PLANS.
4. CONTRACTION JOINT SPACING 10' MAXIMUM.
5. CONCRETE SHALL BE CLASS 'B' PER SECT. 725 AND INSTALLED PER SECT. 505.

SPECIAL SECT. USE FOR HIGH SIDE CURB WITH SHEET DRAINAGE ACROSS STREET

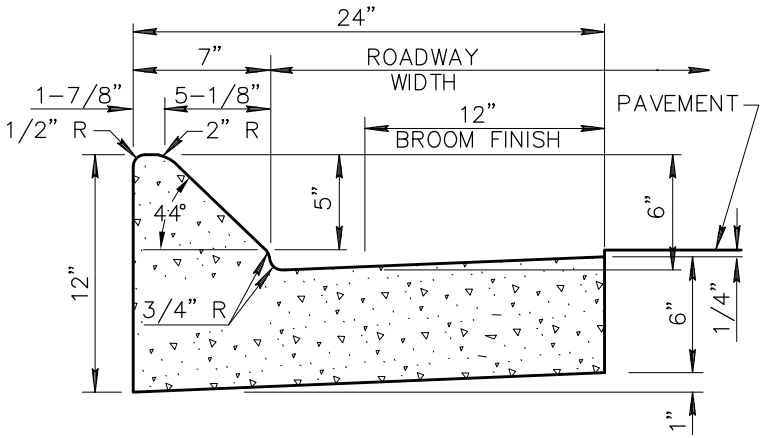



## (TYPE D)

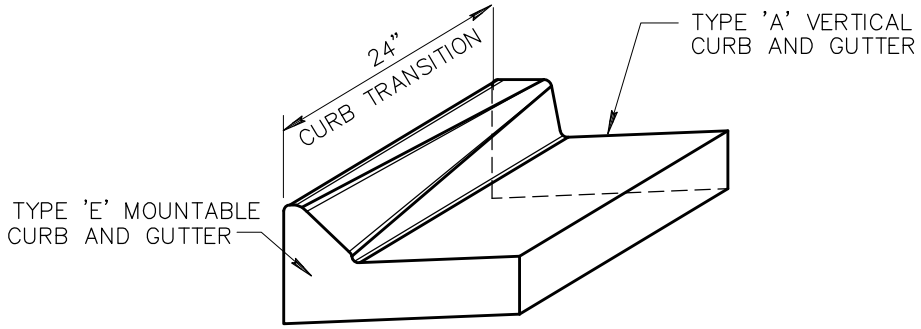
## NOTES: (C & D)

1. ALL WORK AND MATERIALS SHALL CONFORM TO SECT. 304, 505 AND 725. BROOM FINISH TO EXPOSED SURFACE.
2. CONTRACTION JOINT SPACING 10' MAXIMUM.
3. EXPANSION JOINTS AS PER SECT. 340.
4. CLASS 'B' CONCRETE PER 725.

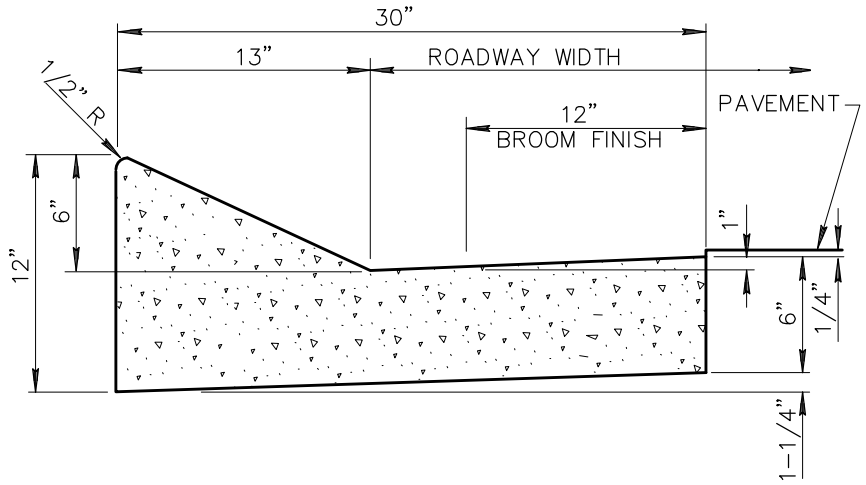
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 220-1 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | CURB AND GUTTER TYPES A, B, C AND D | 01-01-2007 | 220-1 |



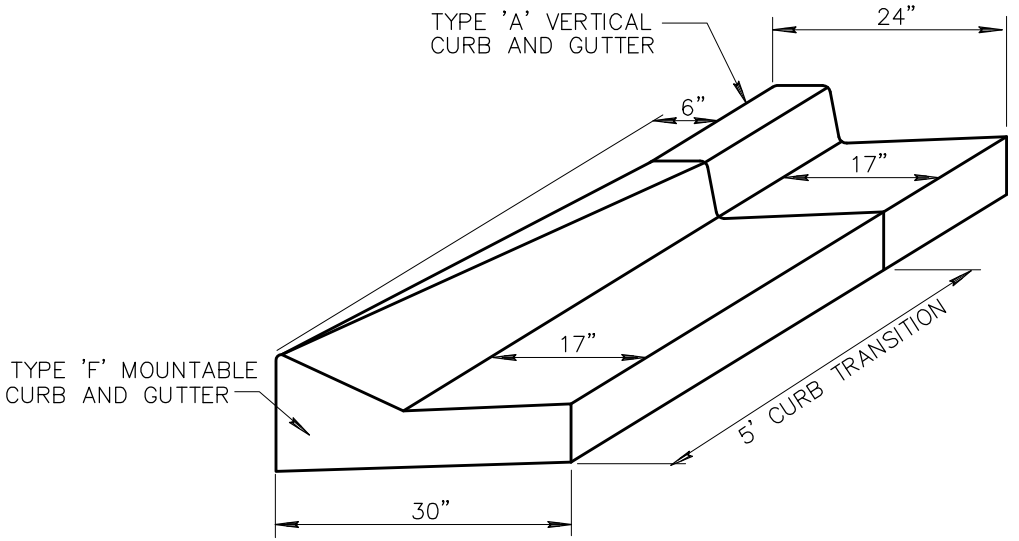

## MOUNTABLE CURB AND GUTTER (TYPE E)




## CURB TRANSITION TYPE 'E' TO TYPE 'A'




## MOUNTABLE CURB AND GUTTER (TYPE F)



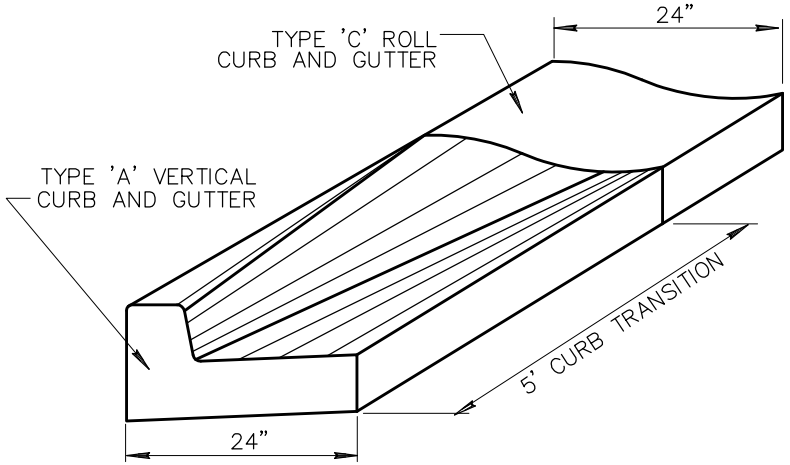

## CURB TRANSITION TYPE 'F' TO TYPE 'A'

## NOTES: (E & F)

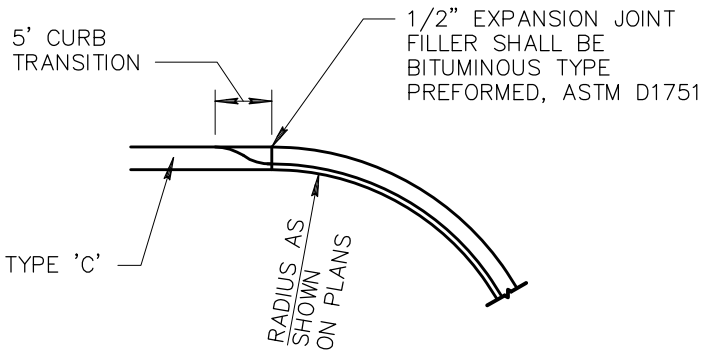
1. ALL EXPOSED SURFACES TO BE TROWEL FINISHED EXCEPT AS SHOWN. SEE SECT. 340.
2. CONTRACTION JOINT SPACING 10' MAXIMUM.
3. EXPANSION JOINTS PER SECT. 340.
4. CLASS 'B' CONCRETE PER SECT. 725.
5. WHEN THE ADJACENT PAVEMENT SECTION SLOPES AWAY FROM THE GUTTER, THE SLOPE OF THE GUTTER PAN SHALL MATCH THE PAVEMENT CROSS SLOPE.

| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 220-2 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | CURB AND GUTTER TYPES E AND F | | 01-01-2007 | 220-2 |

## CURB TRANSITION TYPE 'A' TO TYPE 'C'



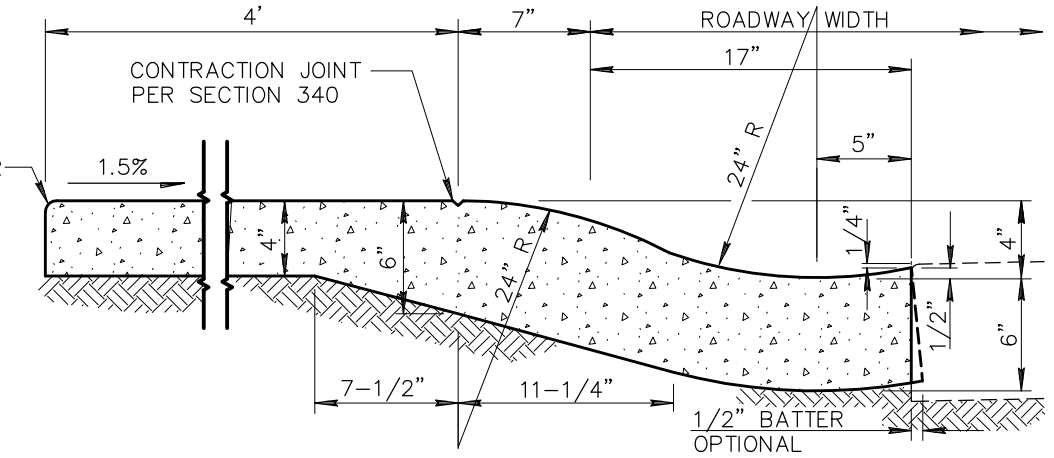

## CURB AND GUTTER TRANSITION




## NOTES: (CURB AND GUTTER TRANSITIONS)

1. TRANSITIONS WILL BE PAID FOR AS THE PREDOMINANT TYPE OF CURB AND GUTTER BEING TRANSITIONED. WHEN TYPE 'A' CURB AND GUTTER ARE USED AT CURB RETURNS AND TYPE 'C' CURB AND GUTTER IS PREDOMINANTLY USED ELSEWHERE, THE TYPE 'A' TO TYPE 'C' TRANSITIONS SHALL BE MEASURED AND PAID FOR AS TYPE 'C' CURB AND GUTTER.
2. WHERE PROPOSED CONSTRUCTION IS TO BE CONNECTED TO EXISTING CURB AND GUTTER, THE TRANSITION SHALL BE INDICATED ON PLANS.
3. CLASS 'B' CONCRETE PER SECTION 725.
4. TRANSITION BETWEEN TYPICAL SECTIONS SHALL BE ACCOMPLISHED BY THE USE OF DIRECT STRAIGHT LINE TRANSITIONS OF THE FLOW LINE AND OTHER SURFACE FEATURES.

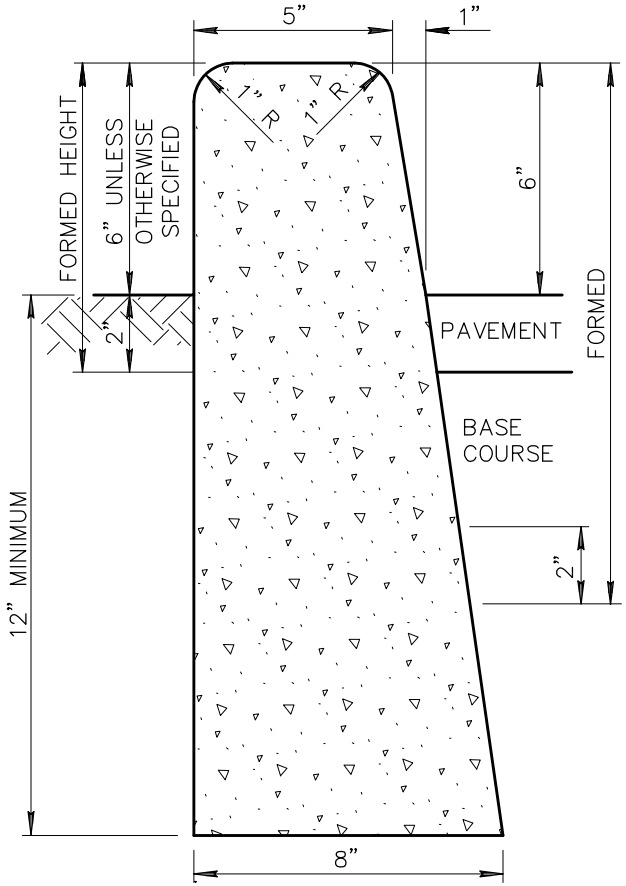
## INTEGRAL ROLL CURB, GUTTER AND SIDEWALK




## NOTES: (INTEGRAL ROLL CURB, GUTTER AND SIDEWALK)

1. CONCRETE TO BE MONOLITHIC POUR. EXPOSED SURFACE FINISH AS PER SIDEWALK AND GUTTER DETAIL.
2. CONTRACTION JOINT SPACING 5' MAXIMUM.
3. EXPANSION JOINTS PER SECTION 340.
4. CLASS 'B' CONCRETE PER SECTION 725.

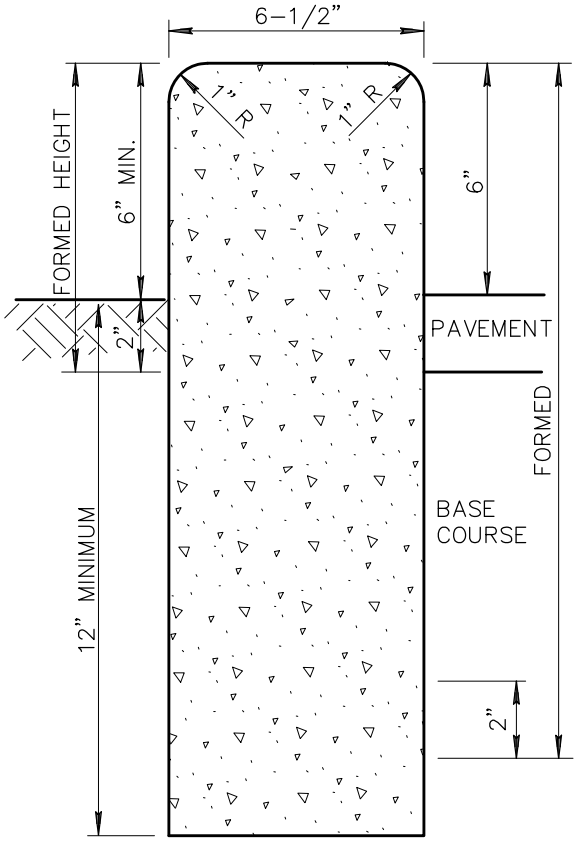
| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 221 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | **CURB AND GUTTER TRANSITION TYPE A TO TYPE C INTEGRAL ROLL CURB, GUTTER AND SIDEWALK** | | 01-01-2014 | 221 |



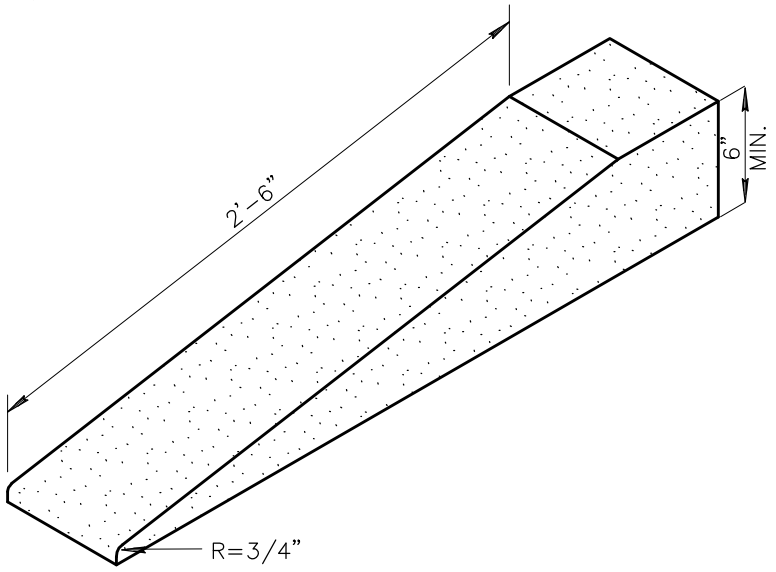

TYPE 'A'

## NOTES:

1. ALL VERTICAL SURFACES TO BE FORMED.
2. VERTICAL SURFACES DOWN FROM 2" BELOW UNDISTURBED SOIL MAY BE PLACED AGAINST NEAT CUT IF APPROVED BY THE ENGINEER AND CONCRETE WILL NOT EXTEND MORE THAN 1" BEYOND THEORETICAL FACE.
3. ALL EXPOSED SURFACES TO BE STRIPPED GREEN AND TROWEL FINISHED.
4. CONCRETE CURBS CONFORM TO SECT. 340.
5. MAXIMUM SPACING OF CONTRACTION JOINTS IS 10'
6. CONCRETE TO BE CLASS 'B' PER SECT. 725.
7. WHEN PAVEMENT AND BASE COURSE EQUALS OR EXCEEDS 10" IN DEPTH, THE ENTIRE ROADWAY SIDE OF THE CURB SHALL BE FORMED. THE TOTAL CURB HEIGHT REMAINS 18" UNLESS NOTED OTHERWISE.

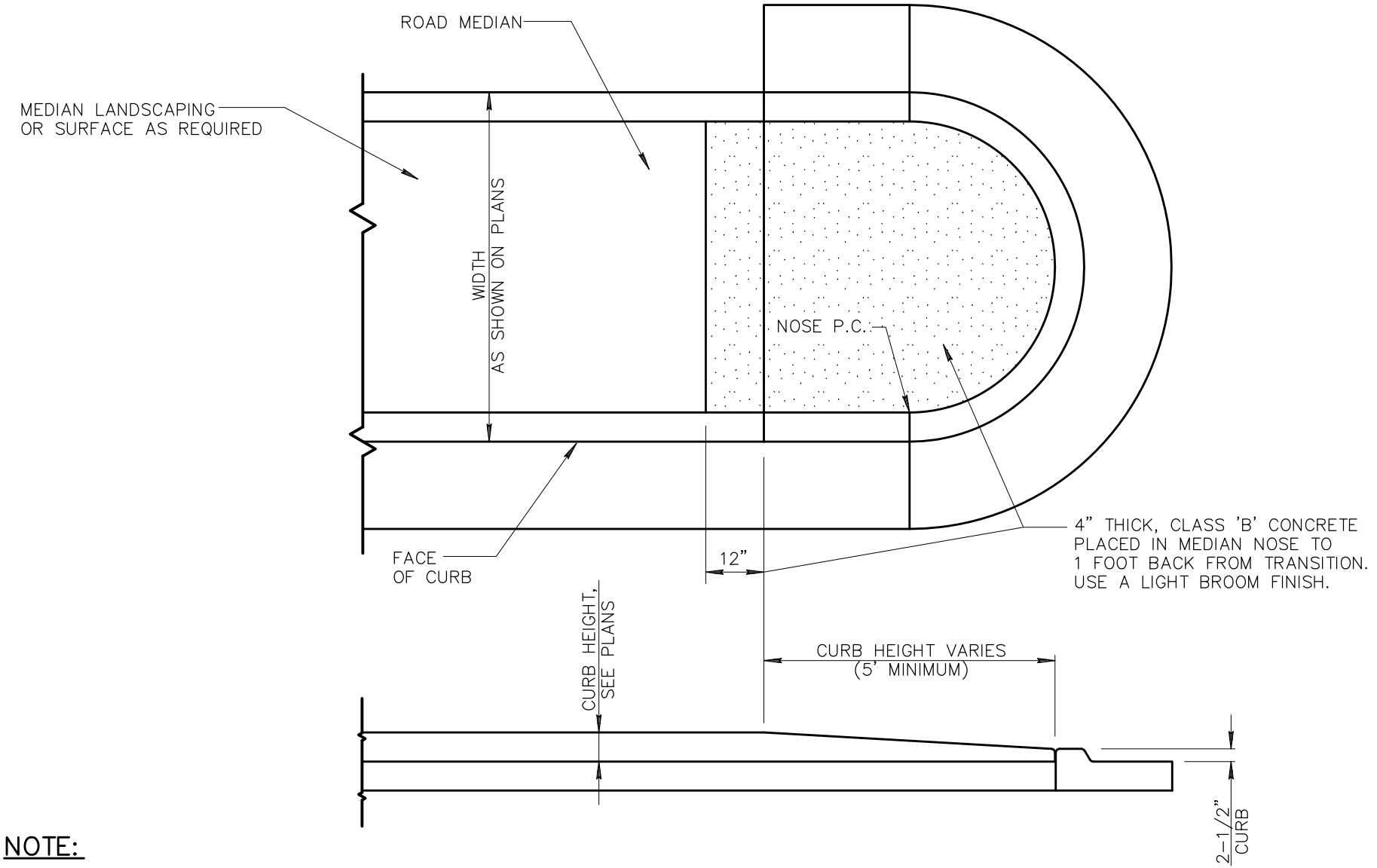



TYPE 'B'




TYPICAL CURB TERMINATION

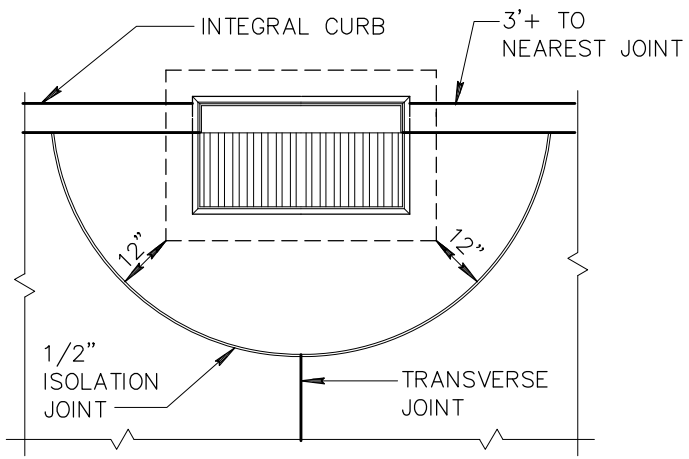
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 222 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | SINGLE CURB – TYPES A, B AND TERMINATION | 01-01-2008 | 222 |

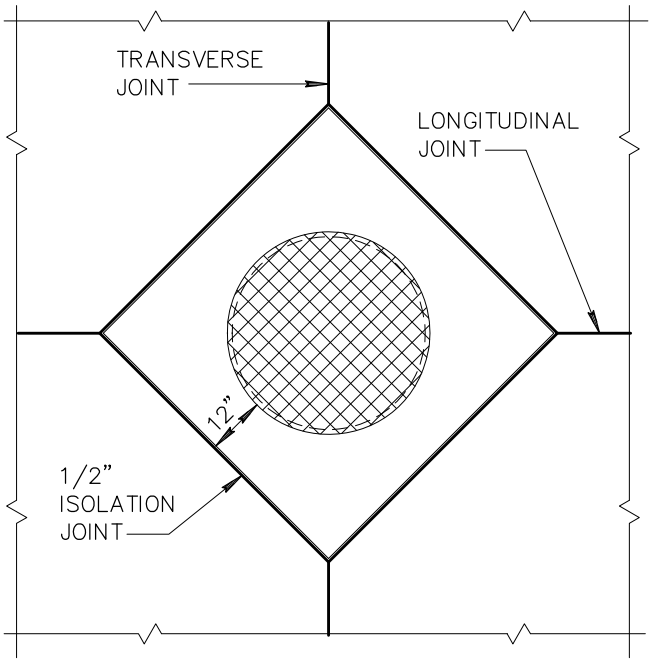


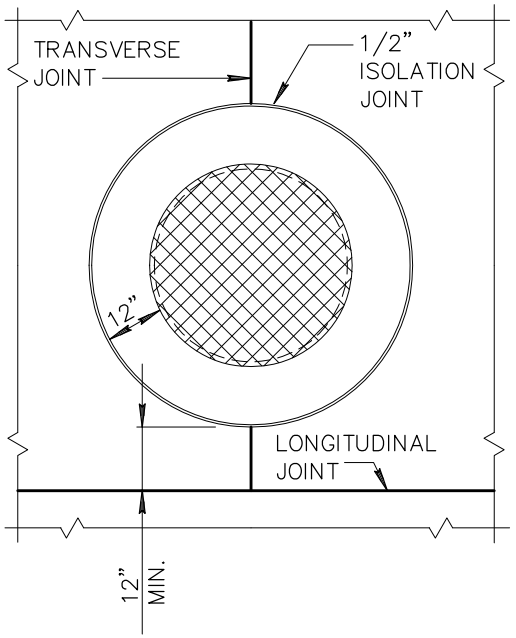

## NOTE:

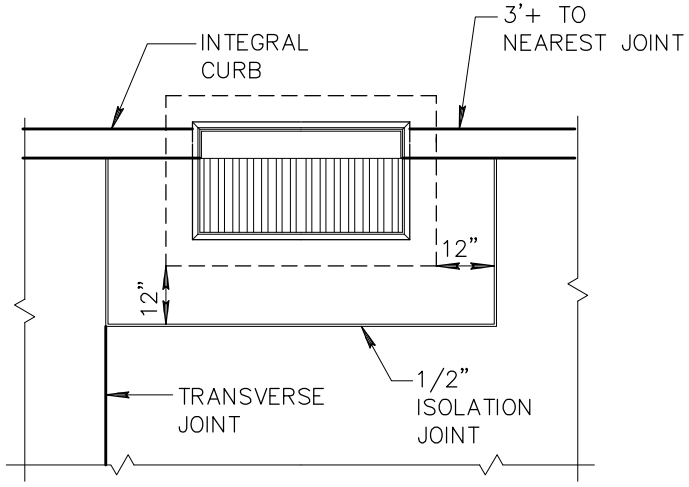
LENGTH OF TRANSITION SHALL BE EQUAL TO RADIUS OF MEDIAN NOSE, (5' MINIMUM). FOR LOCATION SEE PLANS.

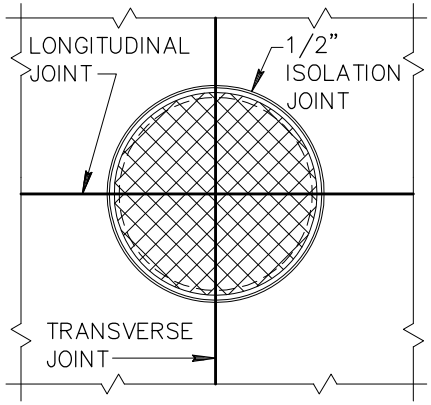
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 223 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | MEDIAN NOSE TRANSITION | 01-01-1998 | 223 |

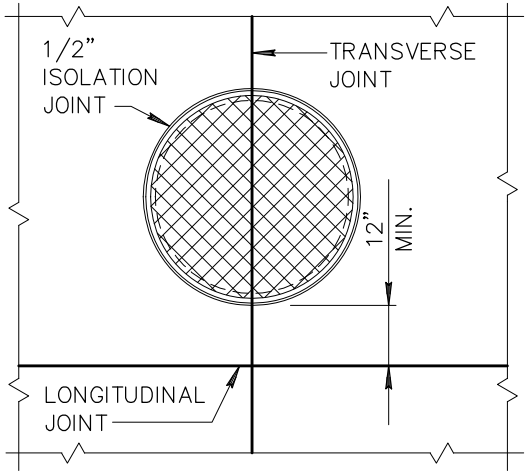


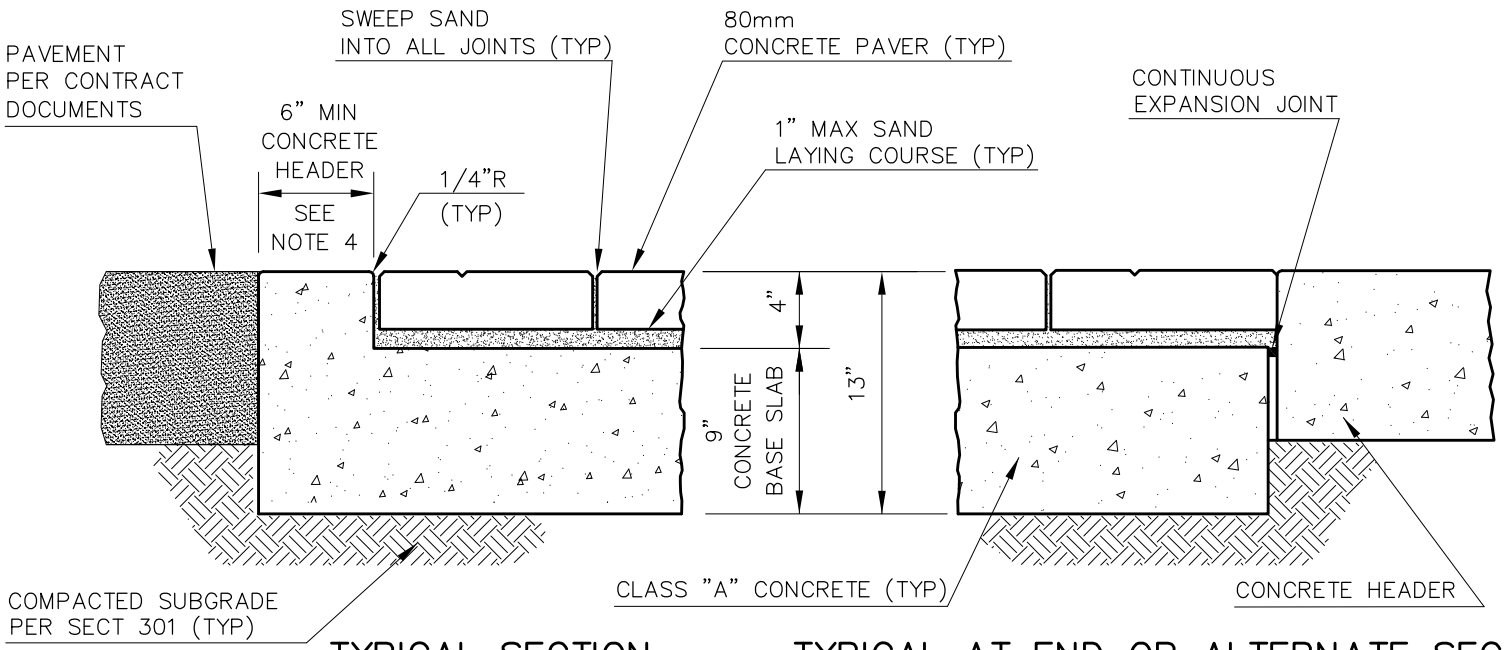




**DRAINAGE INLET**

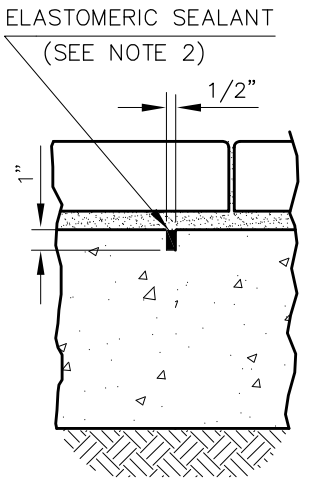
**MANHOLE COVERS**

**MANHOLE COVERS**

| DETAIL NO. 224 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | JOINT FOR DRAINAGE INLETS AND MANHOLE COVERS | REVISED 01-01-1998 | DETAIL NO. 224 |
|---|---|---|---|---|




## TYPICAL SECTION
### (AGAINST PAVEMENT)



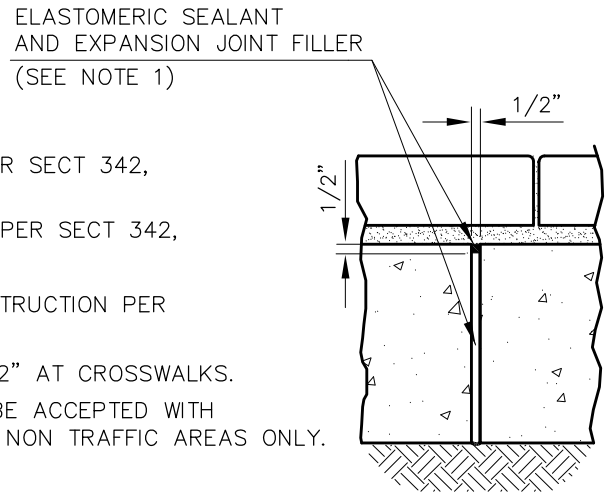

## CONTRACTION JOINT
### DETAIL

## TYPICAL AT END OR ALTERNATE SECTION
### (AGAINST CONCRETE)

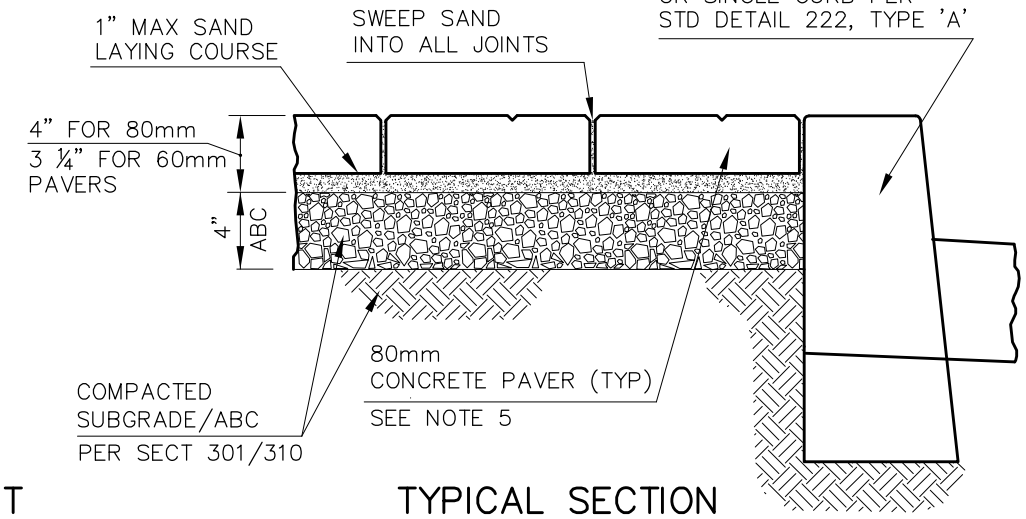
CURB PER CONTRACT DOCUMENTS – VERT CURB & GUTTER PER STD DETAIL 220–1, TYPE A OR SINGLE CURB PER STD DETAIL 222, TYPE 'A'

**NOTES:**

1. EXPANSION JOINTS PER SECT 342, EVERY 50'.
2. CONTRACTION JOINTS PER SECT 342, EVERY 10'.
3. MATERIALS AND CONSTRUCTION PER SECT 342.
4. HEADERS SHALL BE 12" AT CROSSWALKS.
5. 60mm PAVERS MAY BE ACCEPTED WITH AGENCY APPROVAL IN NON TRAFFIC AREAS ONLY.

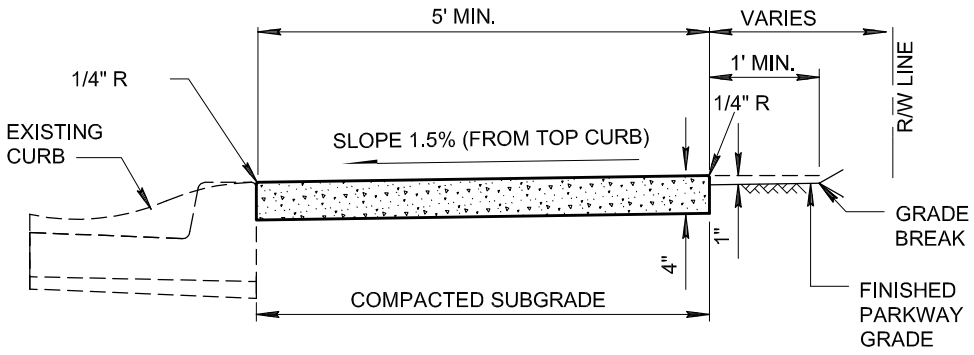


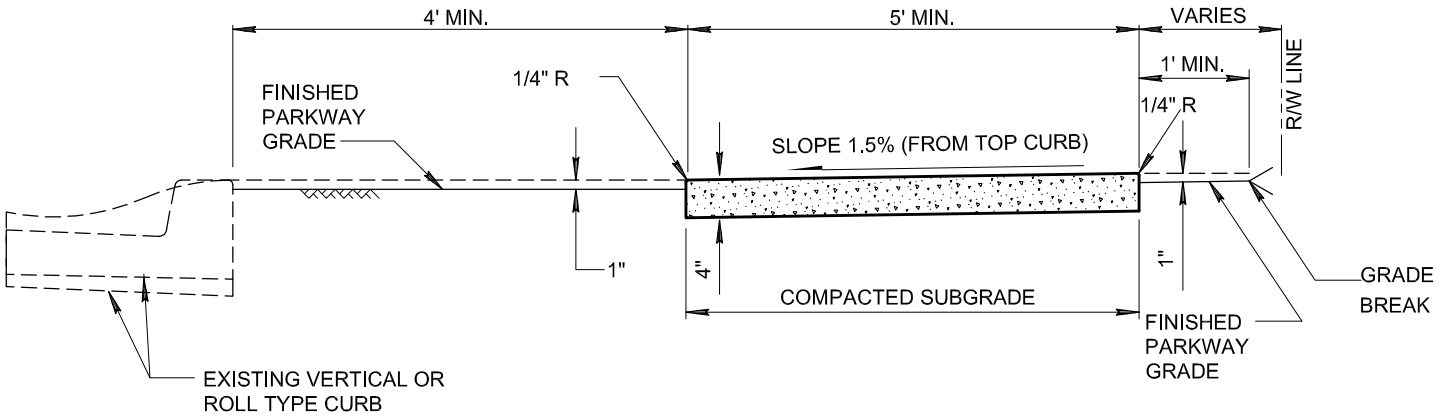

## EXPANSION JOINT
### DETAIL




## TYPICAL SECTION
### (RAISED MEDIAN)

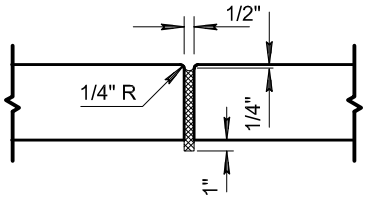
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 225 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | INTERLOCKING CONCRETE PAVERS | 01–01–2016 | 225 |



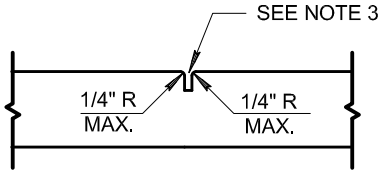




## NOTES:

1. SIDEWALK CONSTRUCTION SHALL CONFORM TO SECTION 340.
2. EXPANSION JOINTS SHALL BE 1/2" BITUMINOUS TYPE PREFORMED EXPANSION JOINT FILLER, PER SECTION 729.
3. LARGE AGGREGATE, IN CONTRACTION JOINT SHALL BE SEPARATED TO A DEPTH OF 1", FINISH DEPTH SHALL BE A MINIMUM OF 3/4".
4. EXPANSION JOINTS SHALL CONFORM TO SECTION 340, BE INSTALLED PRIOR TO CONCRETE PLACEMENT, AND AT A MAXIMUM SPACING OF 50'.
5. CONCRETE SHALL BE CLASS 'B' PER SECTION 725.
6. WHEN SIDEWALK AND ADJACENT CURB ARE CONSTRUCTED MONOLITHICALLY, ALL EXPANSION AND CONTRACTION JOINTS SHALL EXTEND ACROSS THE CURB.

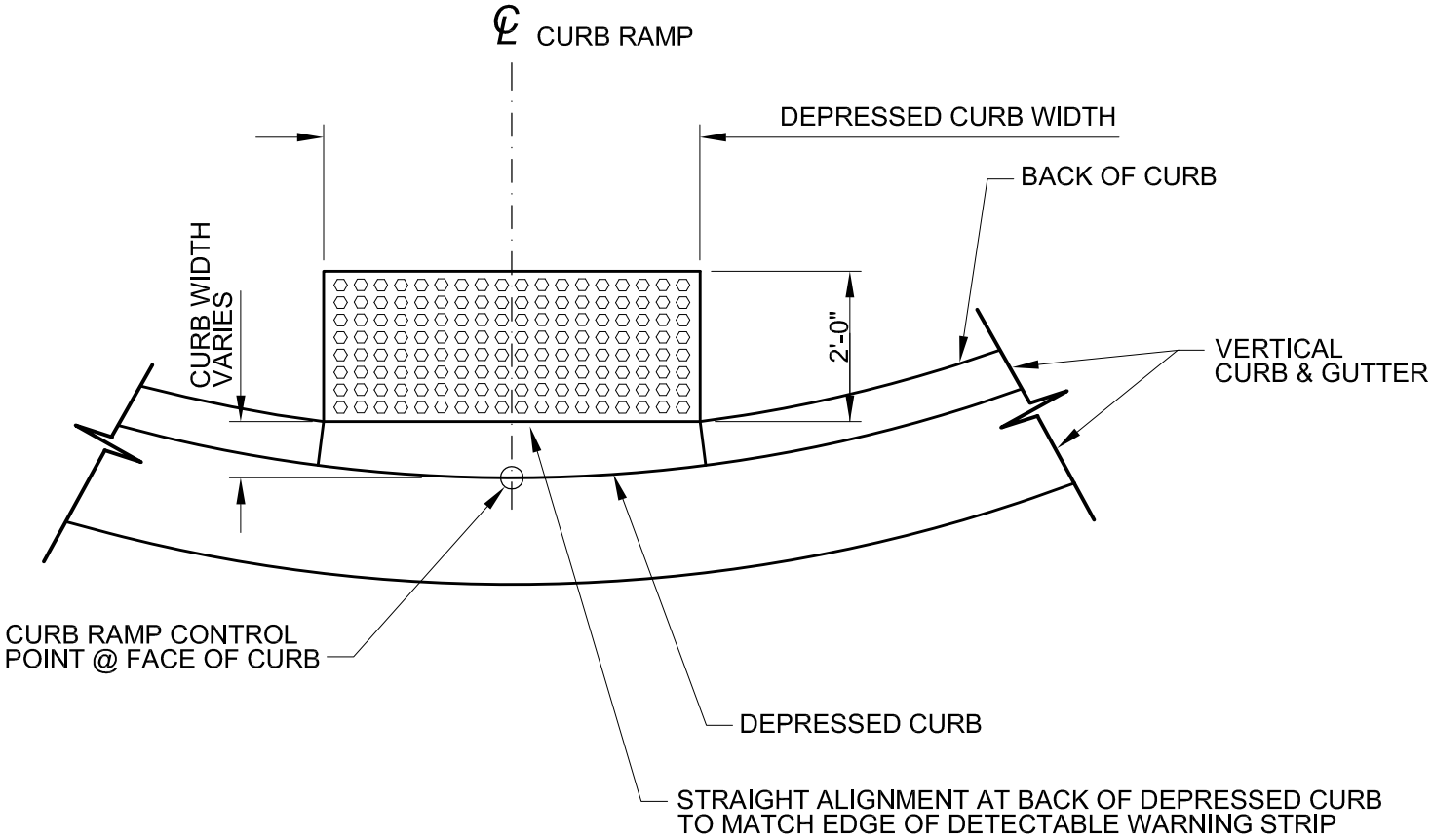



EXPANSION JOINT



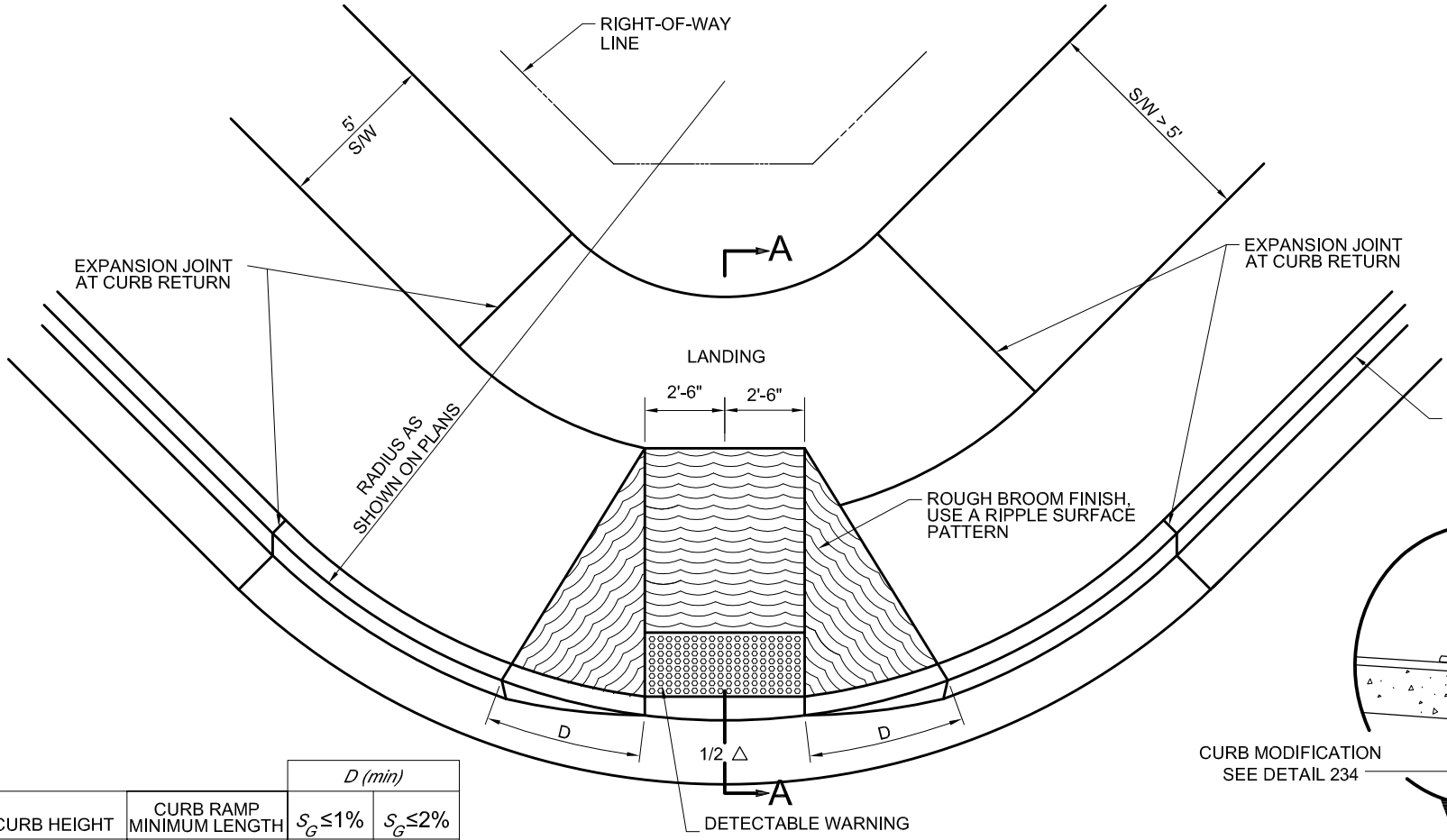

CONTRACTION JOINT

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 230 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | SIDEWALKS | 01-01-2014 | 230 |




PLAN VIEW

| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 234 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | CURB MODIFICATION AT DETECTABLE WARNING | | 01-01-2012 | 234 |

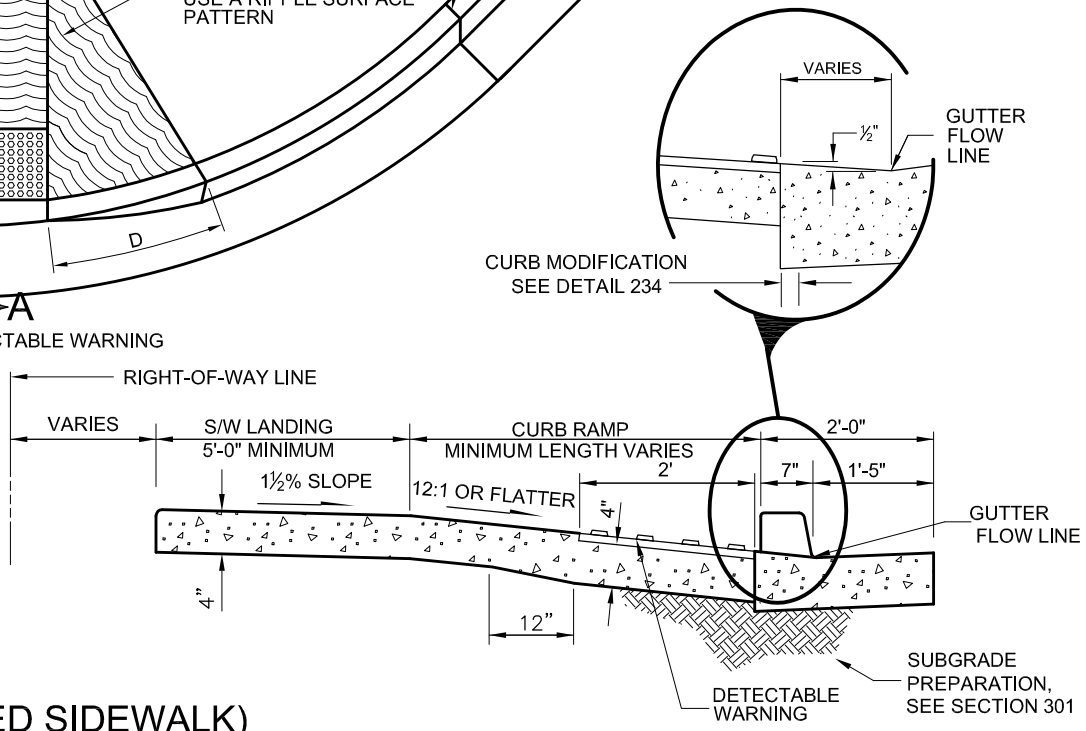



| CURB HEIGHT | CURB RAMP MINIMUM LENGTH | D (min) $S_G \leq 1\%$ | D (min) $S_G \leq 2\%$ |
|---|---|---|---|
| 4" | 5' | *4.0'* | *4.5'* |
| 6" | 7½' | *6.0'* | *6.5'* |
| 7" | 9' | *6.5'* | *7.5'* |

$S_G$ =MAXIMUM GUTTER SLOPE WITHIN RAMP LIMITS

## NOTES:

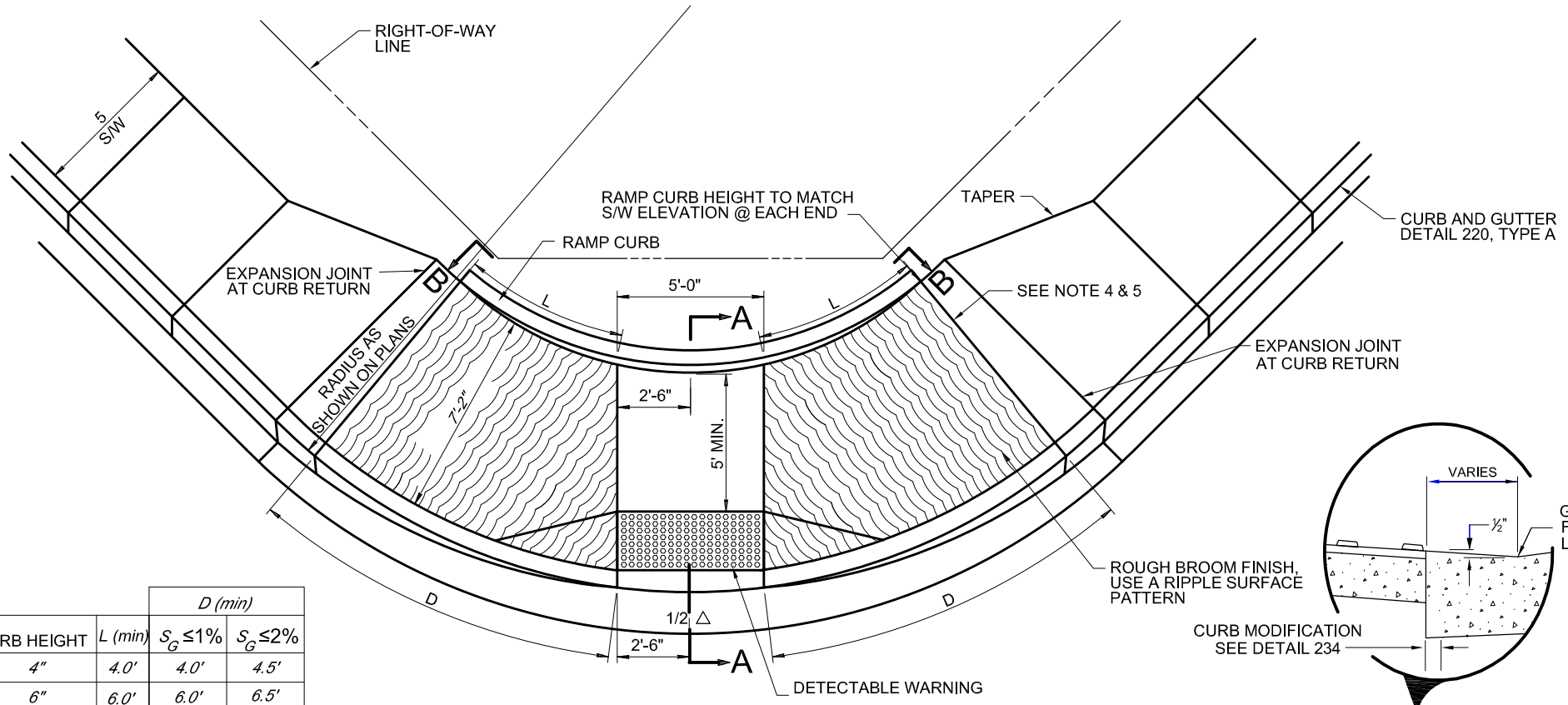
1. CLASS 'B' CONCRETE PER SECTION 725.
2. EXPANSION JOINTS SHALL CONFORM TO SECTION 340.
3. SIDEWALK SURFACE TO MATCH 1½% SLOPE FROM TOP OF CURB
4. DETECTABLE WARNING IS TO COMPLY WITH THE JURISDICTIONAL AGENCY'S REQUIREMENTS.
5. DETAIL IS ADA COMPLIANT FOR $S_G \leq 2\%$.

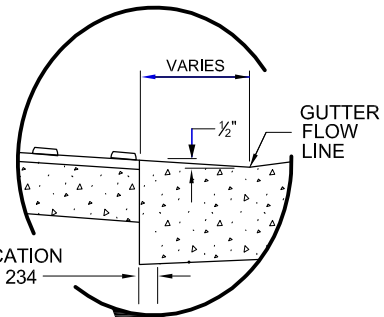



# TYPE 'A' (DETACHED SIDEWALK)

## SECTION A-A

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 235-1 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | CURB RAMPS | 01–01–2012 | 235-1 |



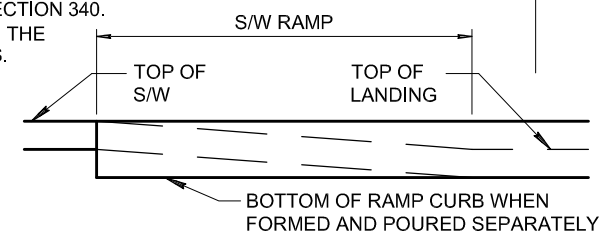




| CURB HEIGHT | L (min) | D (min) $S_G \leq 1\%$ | D (min) $S_G \leq 2\%$ |
|---|---|---|---|
| 4" | 4.0' | 4.0' | 4.5' |
| 6" | 6.0' | 6.0' | 6.5' |
| 7" | 7.0' | 6.5' | 7.5' |

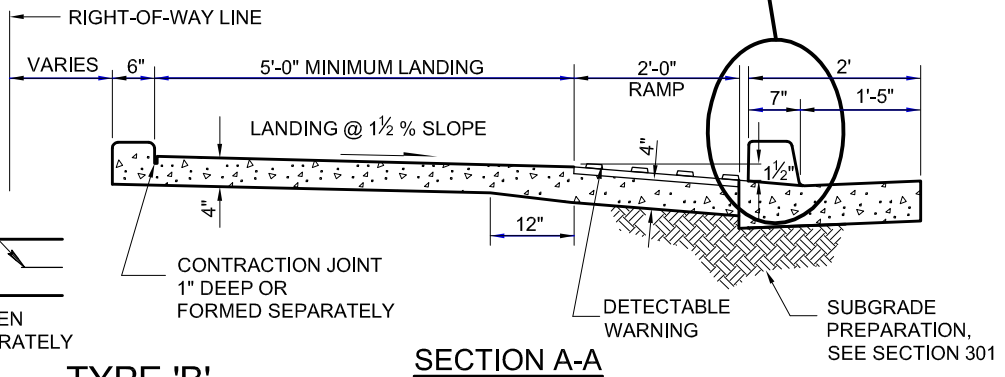
$S_G$=MAXIMUM GUTTER SLOPE WITHIN RAMP LIMITS

## NOTES:

1. CLASS 'B' CONCRETE PER SECTION 725.
2. EXPANSION JOINTS SHALL CONFORM TO SECTION 340.
3. DETECTABLE WARNING IS TO COMPLY WITH THE JURISDICTIONAL AGENCY'S REQUIREMENTS.
4. INCREASE 'L' OR 'D' AS NEEDED TO HAVE THE TOP OF RAMP FORM A RADIAL LINE.
5. WHEN TOP OF RAMP IS LESS THAN 4' FROM CURB RETURN, EXTEND RAMP TO THE CURB RETURN.
6. DETAIL IS ADA COMPLIANT FOR $S_G \leq 2\%$.




SECTION B-B



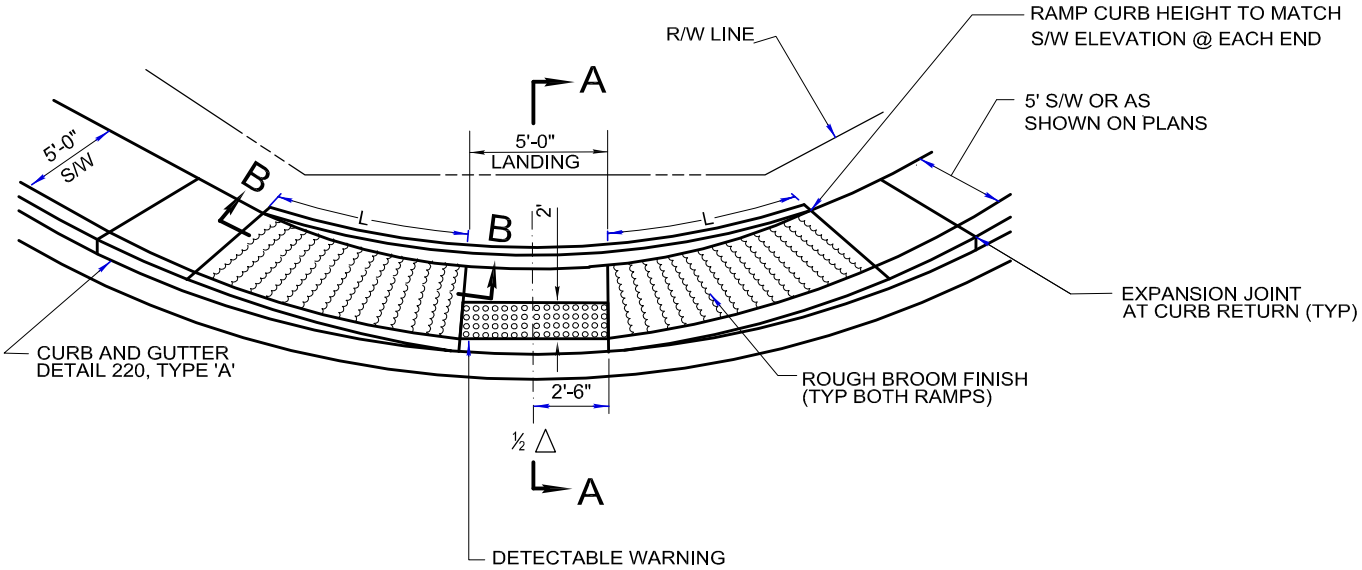

SECTION A-A

# TYPE 'B'

| DETAIL NO. | STANDARD DETAIL | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 235-2 | MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH | CURB RAMPS | 01–01–2012 | 235-2 |

## NOTES:

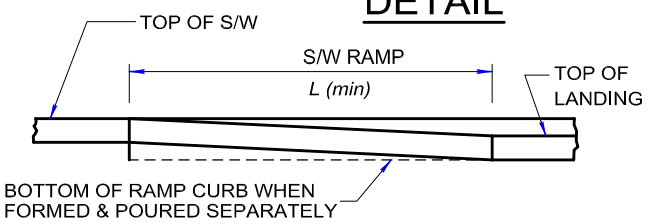
1. CLASS 'B' CONCRETE CONSTRUCTION PER SECTION 725.
2. DETECTABLE WARNING IS TO COMPLY WITH THE JURISDICTIONAL AGENCY'S REQUIREMENT.
3. RAMP LONGITUDINAL SLOPE SHALL BE 12:1 OR FLATTER.
4. RAMP CROSS SLOPE SHALL BE 1½%.
5. DETAIL IS ADA COMPLIANT FOR CURB RADII ≥ 20' AND GUTTER SLOPE ≤ 2.0%.



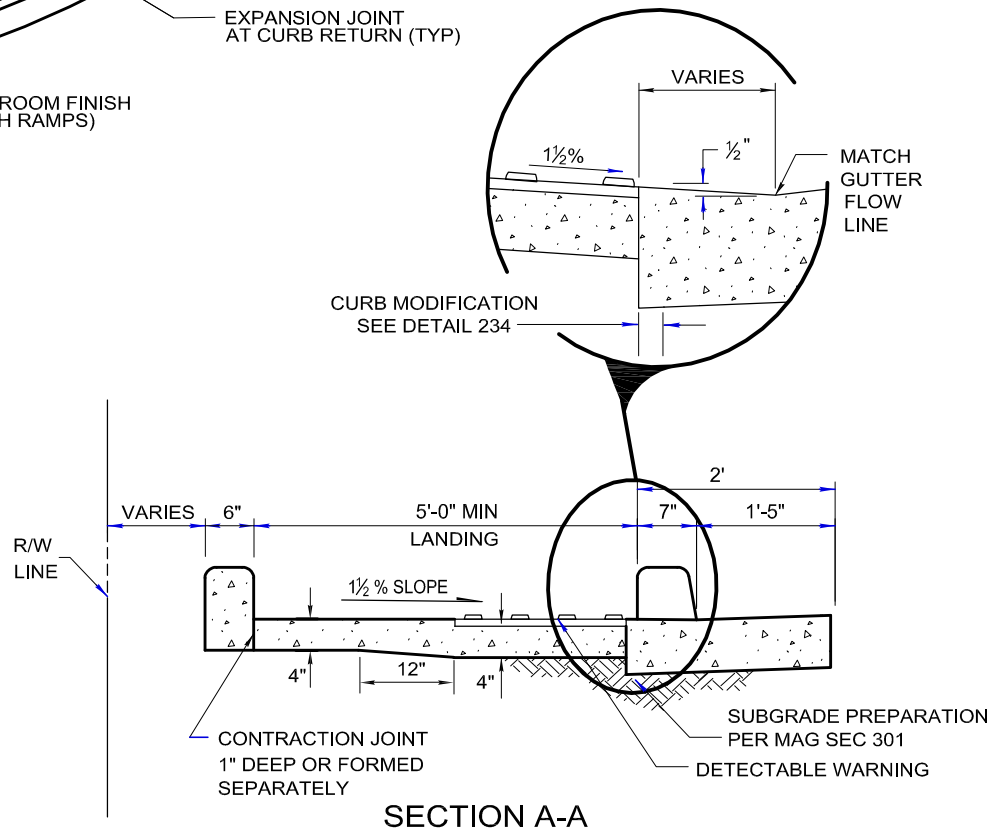

| CURB HEIGHT | L (min) $S_G \leq 1\%$ | L (min) $S_G \leq 2\%$ |
|---|---|---|
| *4″* | *5.0′* | *6.0′* |
| *6″* | *7.0′* | *8.5′* |

$S_G$ =MAXIMUM GUTTER SLOPE WITHIN RAMP LIMITS

## DETAIL



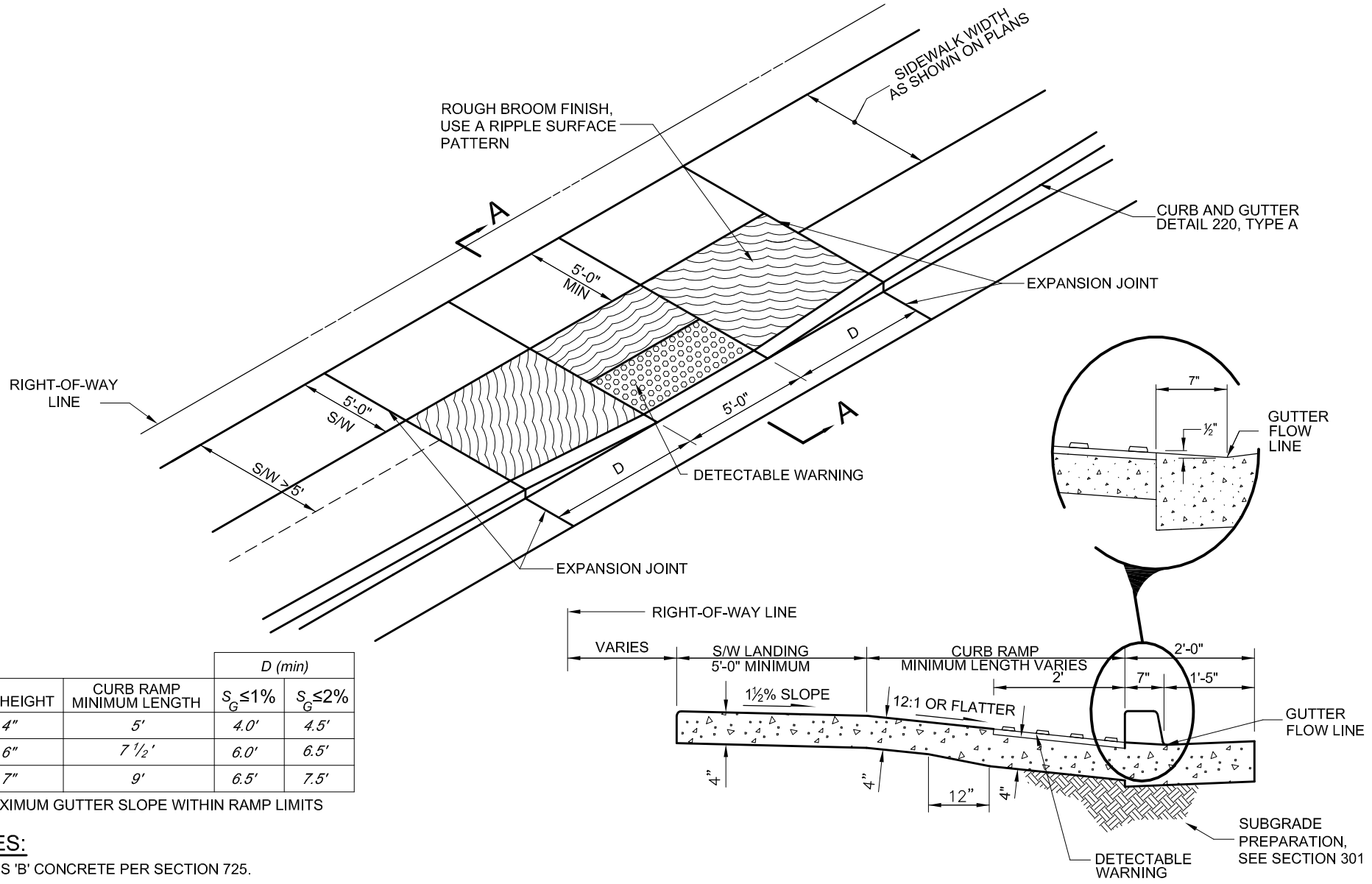

SECTION B-B




SECTION A-A

## TYPE 'C'

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 235-3 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | CURB RAMPS | 01-01-2012 | 235-3 |




SECTION A-A

| CURB HEIGHT | CURB RAMP MINIMUM LENGTH | D (min) $S_G \leq 1\%$ | D (min) $S_G \leq 2\%$ |
|---|---|---|---|
| 4" | 5' | 4.0' | 4.5' |
| 6" | 7 ½' | 6.0' | 6.5' |
| 7" | 9' | 6.5' | 7.5' |

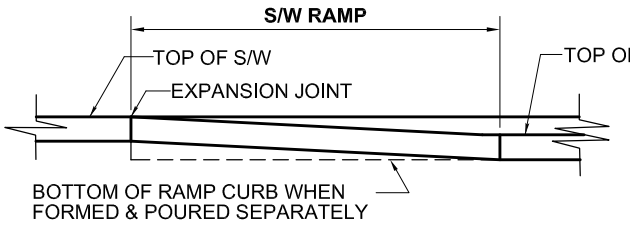
$S_G$ =MAXIMUM GUTTER SLOPE WITHIN RAMP LIMITS

## NOTES:

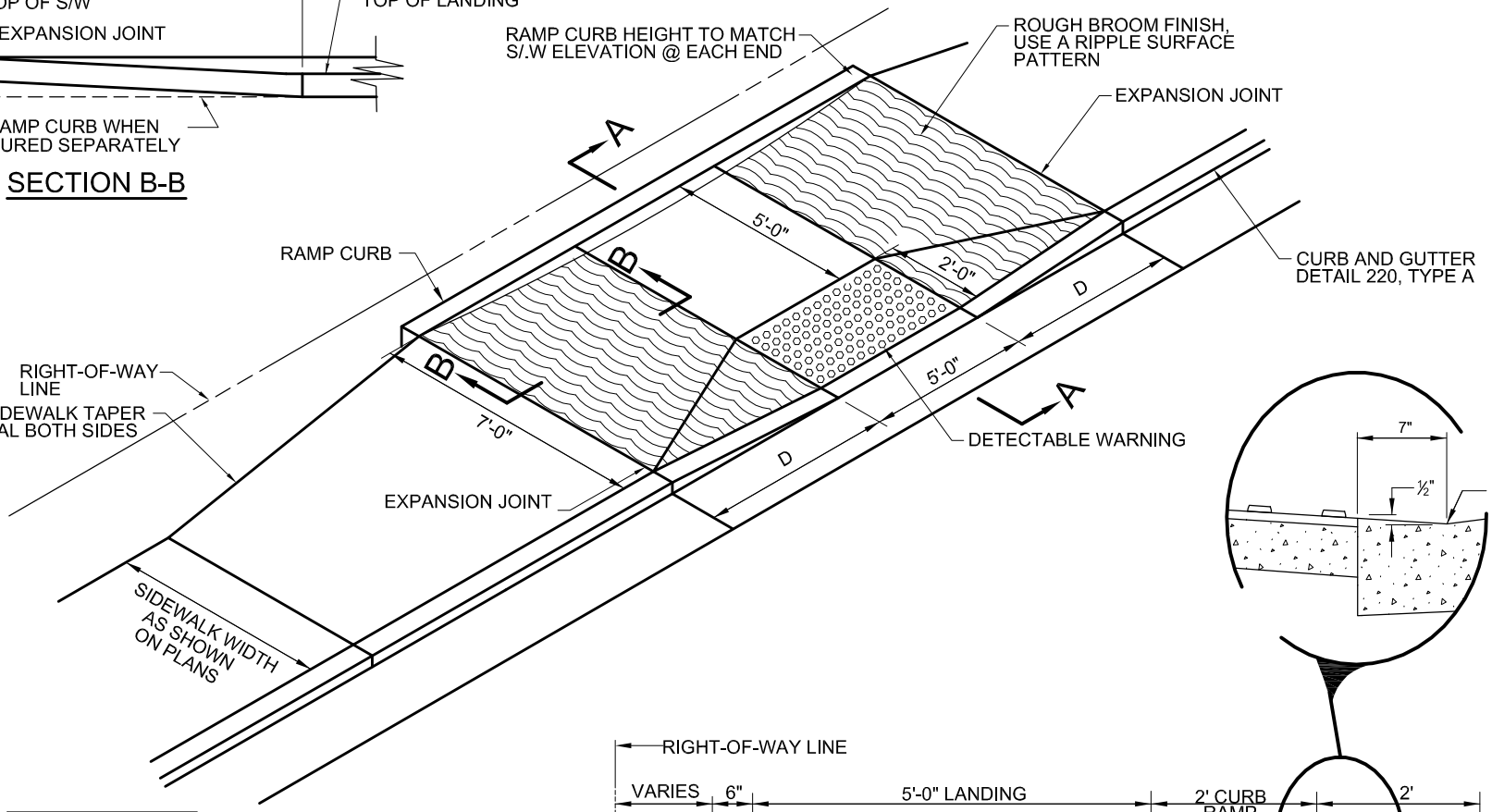
1. CLASS 'B' CONCRETE PER SECTION 725.
2. EXPANSION JOINTS SHALL CONFORM TO SECTION 340.
3. SIDEWALK SURFACE TO MATCH 1 ½ % SLOPE FROM TOP OF CURB.
4. DETECTABLE WARNING IS TO COMPLY WITH THE JURISDICTIONAL AGENCY'S REQUIREMENTS.
5. DETAIL IS ADA COMPLIANT FOR $S_G \leq 2\%$.

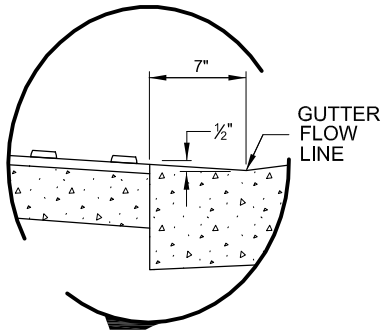
# TYPE 'D' DETACHED SIDEWALK

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 235-4 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | CURB RAMPS | 01-01-2011 | 235-4 |



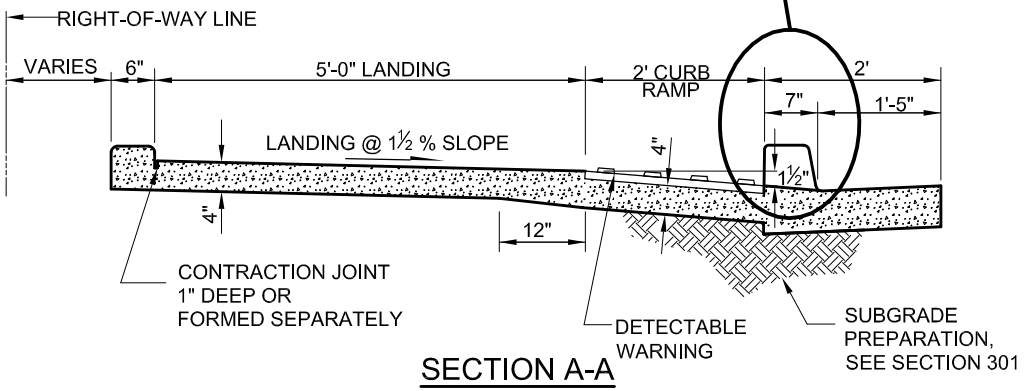

## SECTION B-B




| CURB HEIGHT | D (min) | |
|---|---|---|
| | $S_G \leq 1\%$ | $S_G \leq 2\%$ |
| *4″* | *4.0′* | *4.5′* |
| *6″* | *6.0′* | *6.5′* |
| *7″* | *6.5′* | *7.5′* |

$S_G$=MAXIMUM GUTTER SLOPE WITHIN RAMP LIMITS




## SECTION A-A

## NOTES:

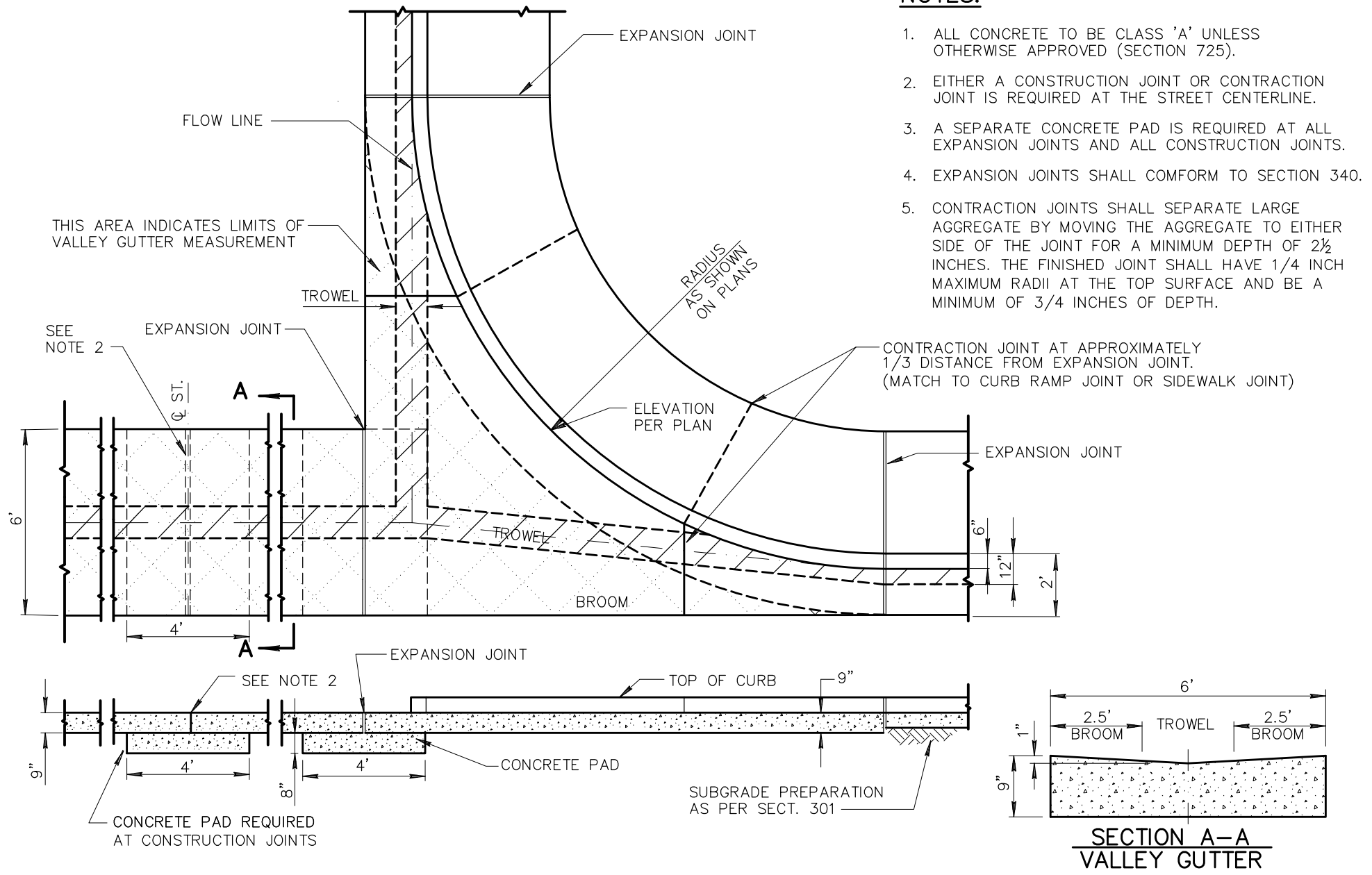
1. CLASS 'B' CONCRETE PER SECTION 725.
2. EXPANSION JOINTS SHALL CONFORM TO SECTION 340.
3. DETECTABLE WARNING IS TO COMPLY WITH THE JURISDICTIONAL AGENCY'S REQUIREMENTS.
4. DETAIL IS ADA COMPLIANT FOR $S_G \leq 2\%$.

# TYPE 'E'

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 235-5 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | CURB RAMPS | 01–01–2011 | 235-5 |

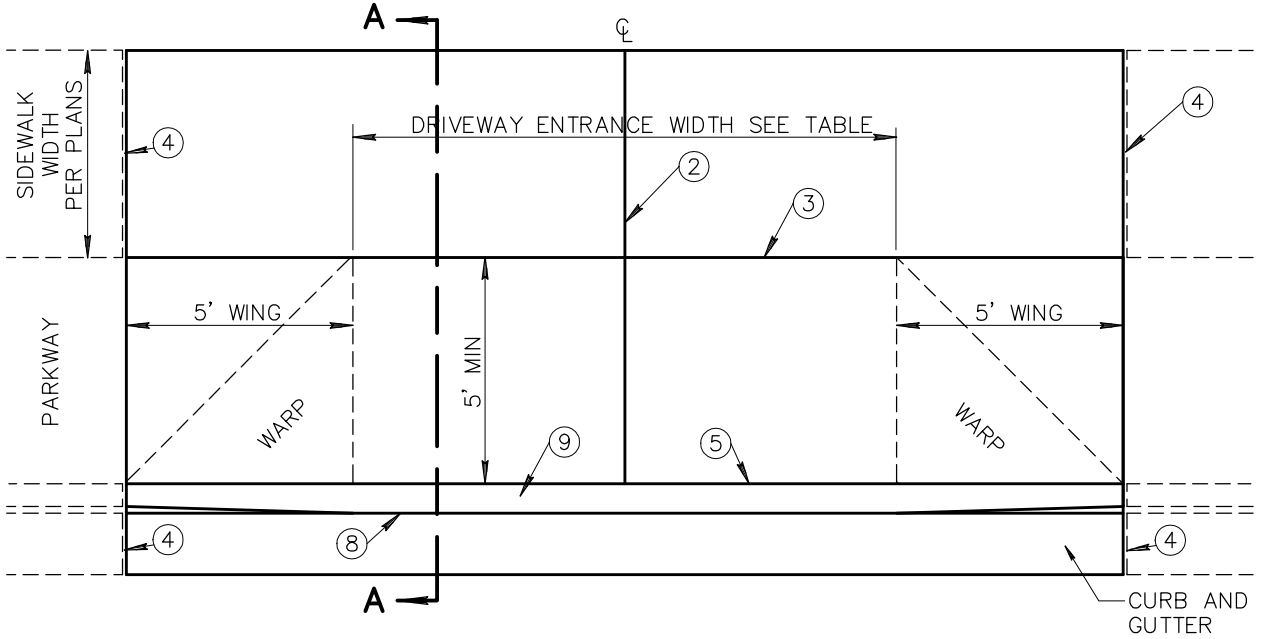
## NOTES:

1. ALL CONCRETE TO BE CLASS 'A' UNLESS OTHERWISE APPROVED (SECTION 725).
2. EITHER A CONSTRUCTION JOINT OR CONTRACTION JOINT IS REQUIRED AT THE STREET CENTERLINE.
3. A SEPARATE CONCRETE PAD IS REQUIRED AT ALL EXPANSION JOINTS AND ALL CONSTRUCTION JOINTS.
4. EXPANSION JOINTS SHALL COMFORM TO SECTION 340.
5. CONTRACTION JOINTS SHALL SEPARATE LARGE AGGREGATE BY MOVING THE AGGREGATE TO EITHER SIDE OF THE JOINT FOR A MINIMUM DEPTH OF 2½ INCHES. THE FINISHED JOINT SHALL HAVE 1/4 INCH MAXIMUM RADII AT THE TOP SURFACE AND BE A MINIMUM OF 3/4 INCHES OF DEPTH.

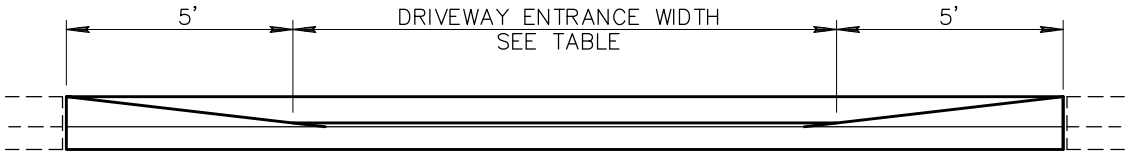


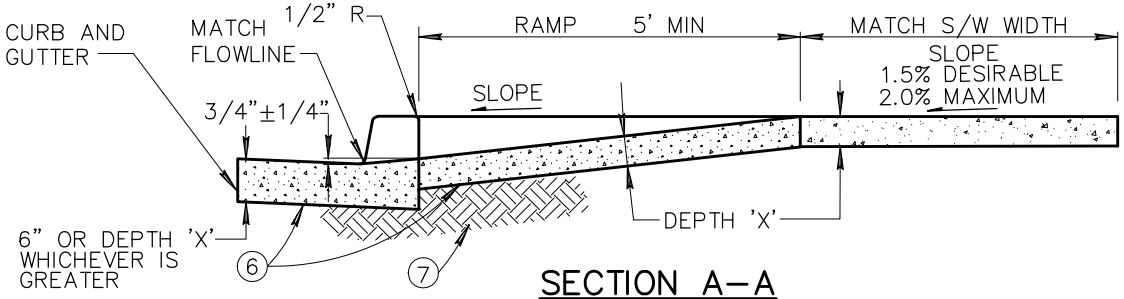

## SECTION A–A
## VALLEY GUTTER

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 240 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | VALLEY GUTTER | 01–01–2010 | 240 |




## DRIVEWAY WITH DETACHED SIDEWALK




## SECTION A–A

## NOTES:

1. DEPRESSED CURB SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE TYPE OF CURB USED AT THAT LOCATION.
2. CONTRACTION JOINT ON D/W CENTERLINE.
3. CONTRACTION JOINT.
4. 1/2–INCH EXPANSION JOINTS SHALL COMPLY WITH SECTION 340.
5. BACK OF CURB – CONSTRUCTION JOINT.
6. CONCRETE CLASS AS NOTED IN TABLE. CONCRETE PER SECTION 725.
7. SUBGRADE PREPARATION, SECT. 301.
8. FLOW LINE OF GUTTER.
9. DEPRESSED CURB.
10. SECT. A–A AND ELEVATION: D/W SHOWN WITH VERTICAL CURB AND GUTTER, ROLL TYPE CURB AND GUTTER TREATED SIMILARLY.
11. ROUGH BROOM FINISH FULL WIDTH OF RAMP AND WINGS.
12. TROWEL AND USE LIGHT HAIR BROOM FINISH FOR WALKWAY AREA.
13. 'DRIVEWAY ENTRANCE WIDTH' IS THE DRIVEWAY WIDTH PLUS ADDITIONAL WIDENING REQUIRED BY THE LOCAL JURISDICTION.
14. ELEVATION AT TOP OF DRIVEWAY RAMP SHALL BE EQUAL TO OR HIGHER THAN NORMAL CURB ELEVATION.

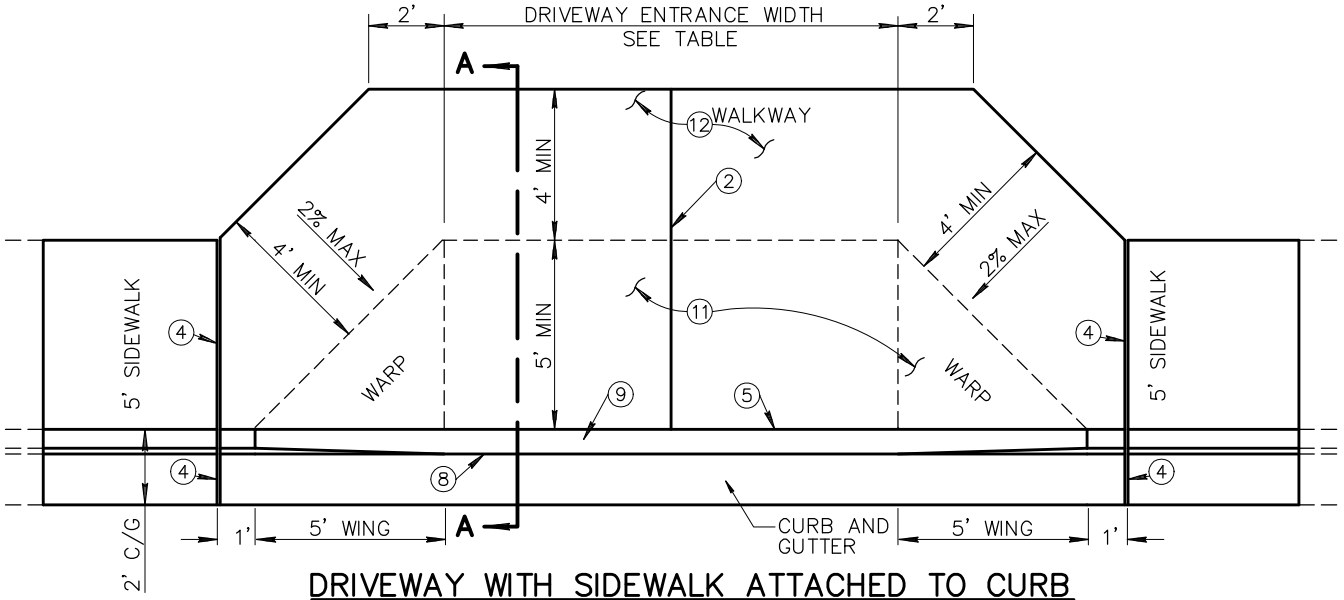
### COMMERCIAL AND INDUSTRIAL

| DRIVEWAY ENTRANCE WIDTH | MIN. | MAX. | CLASS | DEPTH 'X' |
|---|---|---|---|---|
| COMMERCIAL | ✳ 16' | 40' | A | 9" |
| INDUSTRIAL | ✳ 16' | 40' | A | 9" |
| ✳24' MIN. FOR TWO WAY TRAFFIC | | | | |

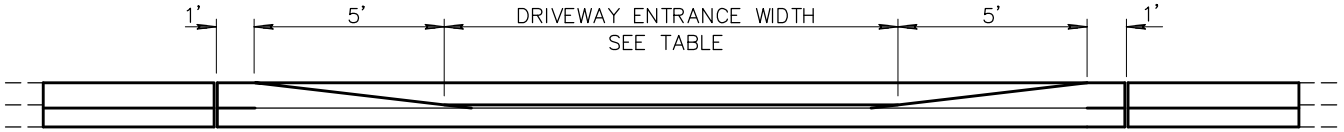
### RESIDENTIAL

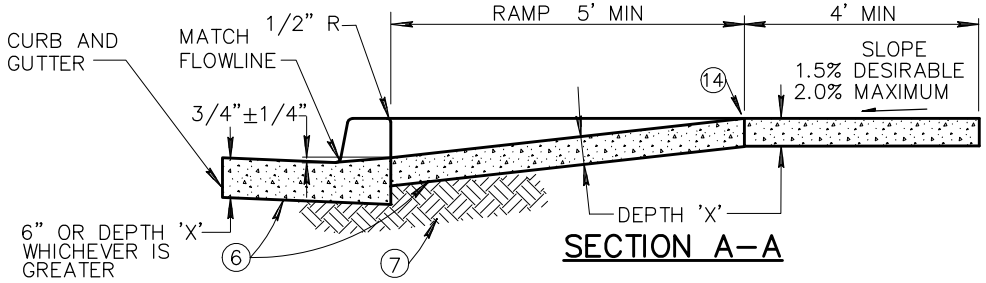
| DRIVEWAY ENTRANCE WIDTH | MIN. | MAX. | CLASS | DEPTH 'X' |
|---|---|---|---|---|
| MAJOR STREET | 16' | 30' | B | 5" |
| COLLECTOR STREET | ✳ 12' | 30' | B | 5" |
| LOCAL STREET | 12' | 30' | B | 5" |
| ✳16' DESIRABLE | | | | |

| DETAIL NO. | | STANDARD DETAIL | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 250–1 | MARICOPA ASSOCIATION of GOVERNMENTS | ENGLISH | DRIVEWAY ENTRANCES WITH DETACHED SIDEWALK | 01–01–2014 | 250–1 |




## DRIVEWAY WITH SIDEWALK ATTACHED TO CURB



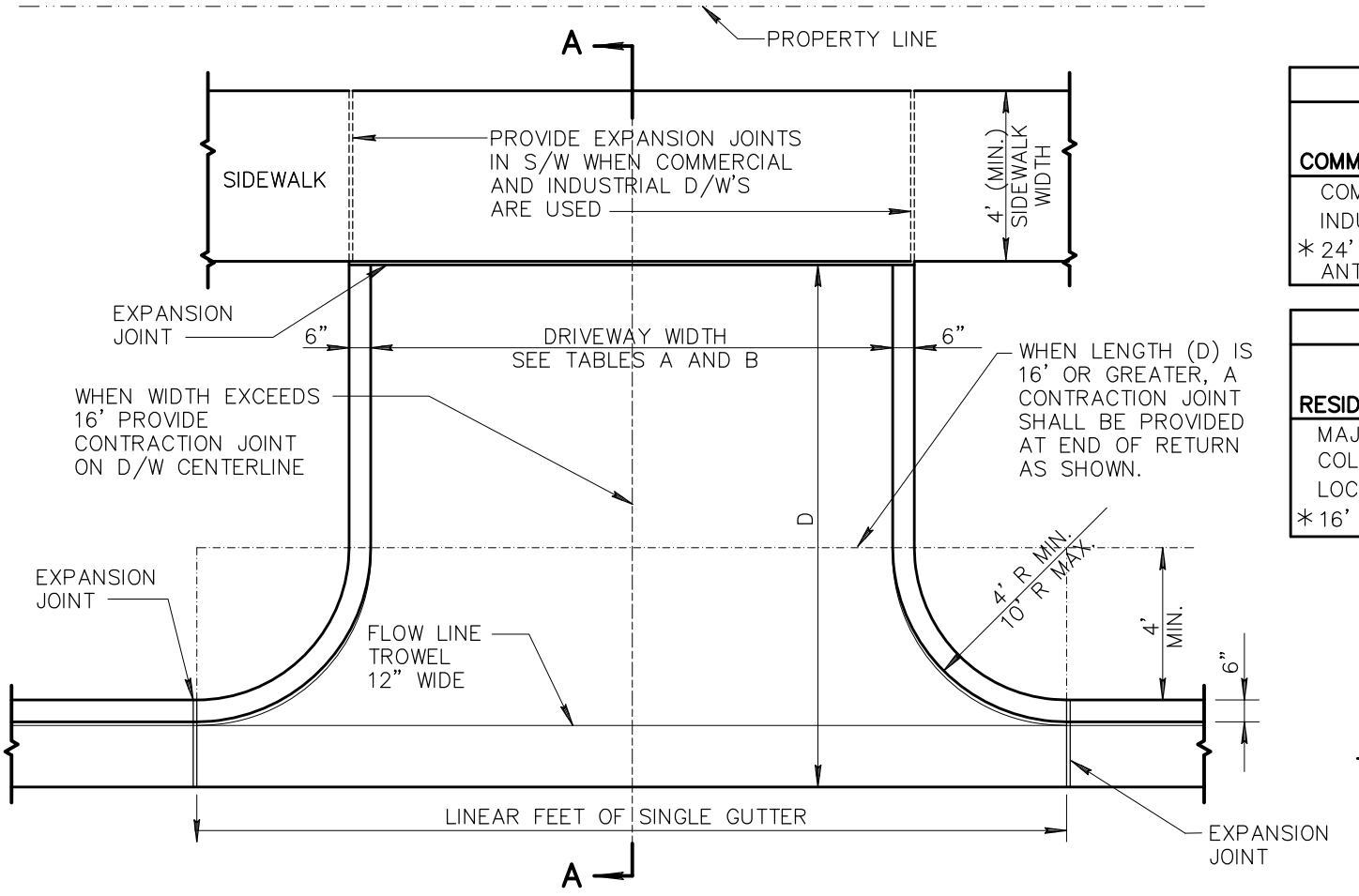

## SECTION A–A

## NOTES:

1. DEPRESSED CURB SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE TYPE OF CURB USED AT THAT LOCATION.
2. CONTRACTION JOINT(S) FOR DRIVEWAY ENTRANCE: WIDTH LESS THAN 22' NONE REQUIRED; WIDTH GREATER THAN 22' AND LESS THAN 30' LOCATE SINGLE JOINT ON D/W CENTERLINE; WIDTH OF 30' OR GREATER LOCATE TWO JOINTS TO EQUALLY DIVIDE THE DRIVEWAY ENTRANCE WIDTH.
3. DETAIL GEOMETRICS ARE BASED ON A CURB HEIGHT OF SIX INCHES (6"), AN ATTACHED SIDEWALK WIDTH OF FIVE FEET (5'), AND A DRIVEWAY RAMP LENGTH NOT EXCEEDING SIX FEET (6'). GEOMETRIC MODIFICATIONS MAY BE REQUIRED WHEN CONDITIONS ARE MODIFIED.
4. 1/2–INCH EXPANSION JOINTS SHALL COMPLY WITH SECTION 340.
5. BACK OF CURB – CONSTRUCTION JOINT.
6. CONCRETE CLASS AS NOTED IN TABLE. CONCRETE PER SECTION 725.
7. SUBGRADE PREPARATION, SECT. 301.
8. FLOW LINE OF GUTTER.
9. DEPRESSED CURB.
10. SECT. A–A AND ELEVATION: D/W SHOWN WITH VERTICAL CURB AND GUTTER, ROLL TYPE CURB AND GUTTER TREATED SIMILARLY.
11. ROUGH BROOM FINISH FULL WIDTH OF RAMP AND WINGS.
12. TROWEL AND USE LIGHT HAIR BROOM FINISH FOR WALKWAY AREA.
13. 'DRIVEWAY ENTRANCE WIDTH' IS THE DRIVEWAY WIDTH PLUS ADDITIONAL WIDENING REQUIRED BY THE LOCAL JURISDICTION.
14. ELEVATION AT TOP OF DRIVEWAY RAMP SHALL BE EQUAL TO OR HIGHER THAN NORMAL CURB ELEVATION.

| COMMERCIAL AND INDUSTRIAL | | | | | RESIDENTIAL | | | | |
|---|---|---|---|---|---|---|---|---|---|
| DRIVEWAY ENTRANCE WIDTH | MIN. | MAX. | CLASS | DEPTH 'X' | DRIVEWAY ENTRANCE WIDTH | MIN. | MAX. | CLASS | DEPTH 'X' |
| COMMERCIAL | ✳ 16' | 40' | A | 9" | MAJOR STREET | 16' | 30' | B | 5" |
| INDUSTRIAL | ✳ 16' | 40' | A | 9" | COLLECTOR STREET | ✳ 12' | 30' | B | 5" |
| ✳24' MIN. FOR TWO WAY TRAFFIC | | | | | LOCAL STREET | 12' | 30' | B | 5" |
| | | | | | ✳16' DESIRABLE | | | | |

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 250–2 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | DRIVEWAY ENTRANCES WITH SIDEWALK ATTACHED TO CURB | 01–01–2013 | 250–2 |

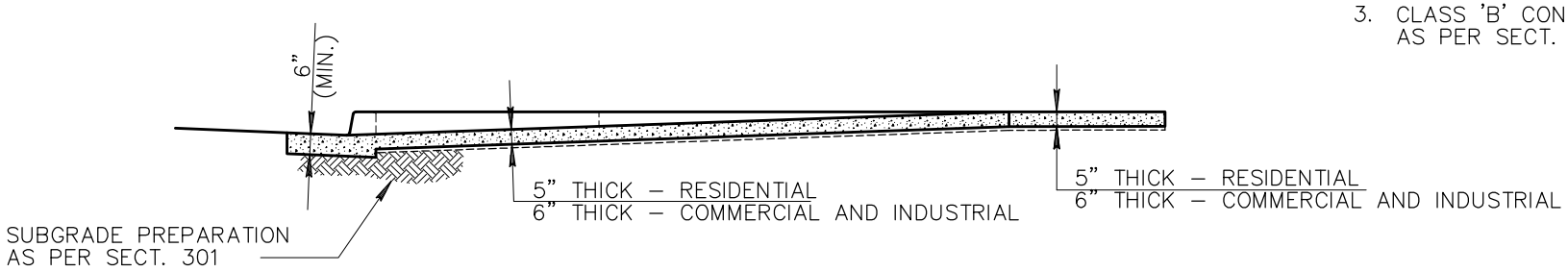



| TABLE A | | |
|---|---|---|
| **ZONING** | DRIVEWAY WIDTH | |
| **COMMERCIAL AND INDUSTRIAL** | MIN.* | MAX. |
| COMMERCIAL | 16' | 40' |
| INDUSTRIAL | 16' | 40' |
| * 24' WHERE 2-WAY TRAFFIC IS ANTICIPATED | | |

| TABLE B | | |
|---|---|---|
| **ZONING** | DRIVEWAY WIDTH | |
| **RESIDENTIAL** | MIN.* | MAX. |
| MAJOR STREET | 16' | 30' |
| COLLECTOR STREET | 12' | 30' |
| LOCAL STREET | 12' | 30' |
| * 16' WIDTH IS DESIRABLE | | |

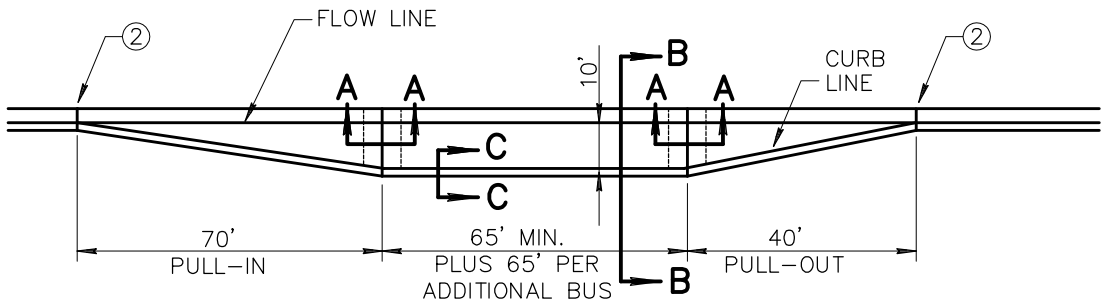
## NOTES:

1. EXPANSION JOINTS SHALL COMPLY TO SECTION 340.
2. THIS TYPE D/W TO BE USED ONLY UPON APPROVAL OF ENGINEER.
3. CLASS 'B' CONCRETE CONSTRUCTION AS PER SECT. 725

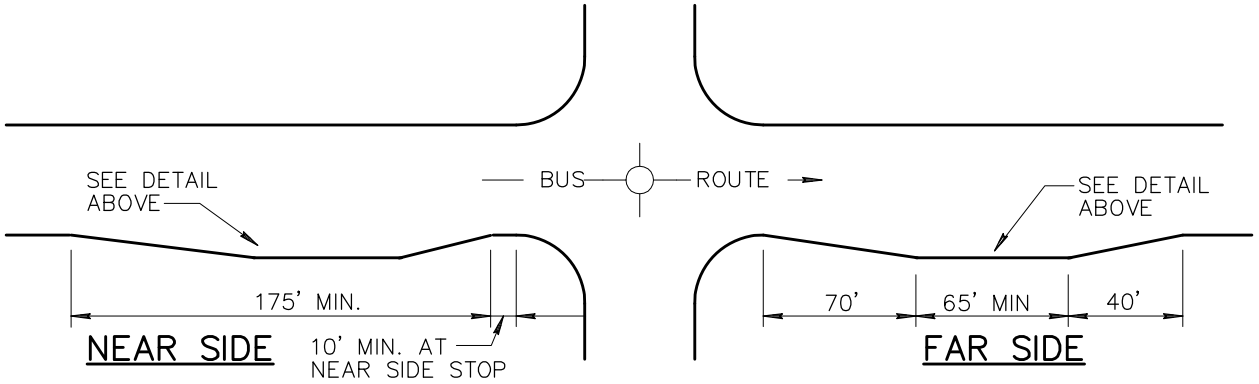



## SECTION A–A

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 251 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | RETURN TYPE DRIVEWAYS | 01-01-2003 | 251 |




DETAIL

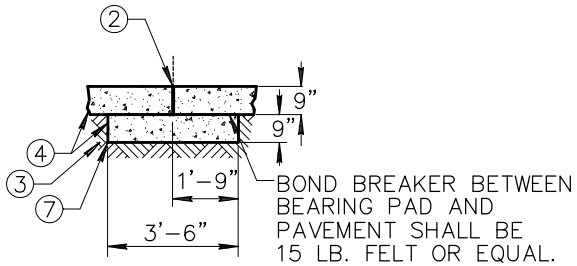



NEAR SIDE

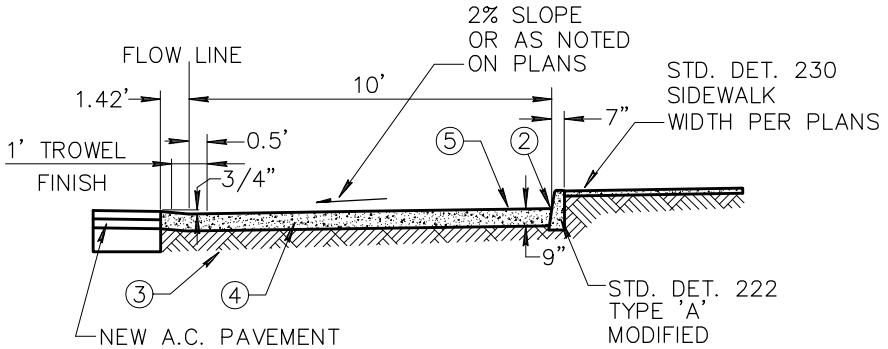
FAR SIDE

## NOTES:

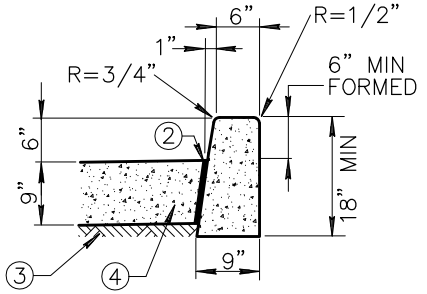
1. SUFFICIENT RIGHT-OF-WAY MUST BE AVAILABLE TO CONSTRUCT THE BUS BAY.
2. 1/2" BITUMINOUS PREFORMED EXPANSION JOINT FILLER ASTM D-1751 PER SPECIFICATION SECTION 729.
3. SUBGRADE PREPARATION PER SPECIFICATION SECTION 301 COMPACTED TO 95% MINIMUM DENSITY.
4. CONCRETE SHALL BE CLASS 'A' PER SPECIFICATION SECTION 725.
5. CONCRETE BUS BAY PAVEMENT SHALL BE BROOM FINISHED, EXCEPT WHERE OTHERWISE NOTED.
6. CONTRACTION JOINTS IN THE BUS BAY PAVEMENT SHALL MATCH THOSE IN THE CURB, 15 FT. MAXIMUM SPACING.
7. CONCRETE BEARING PAD (SECTION A-A) TO BE POURED SEPARATELY FROM CONCRETE BUS BAY PAVEMENT.




SECTION A-A



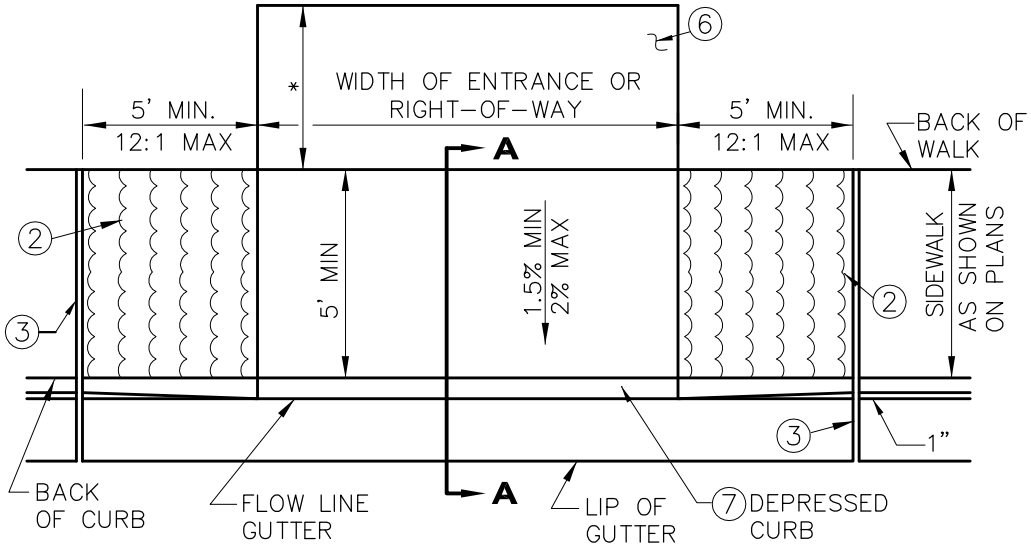

SECTION B-B




SECTION C-C

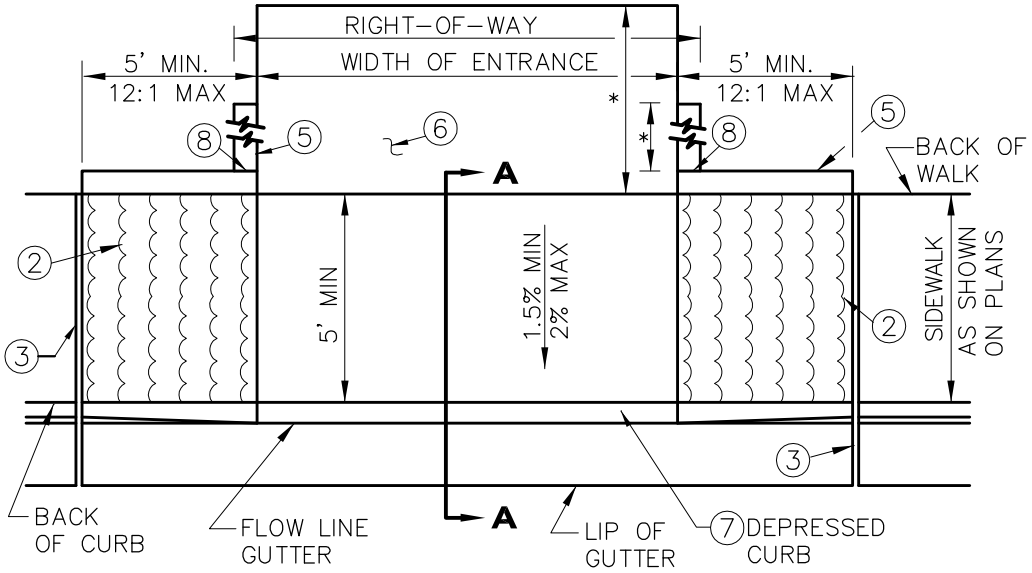
STD. DET. 222 TYPE 'A'
MODIFIED SINGLE CURB

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 252 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | BUS BAYS | 01-01-2005 | 252 |



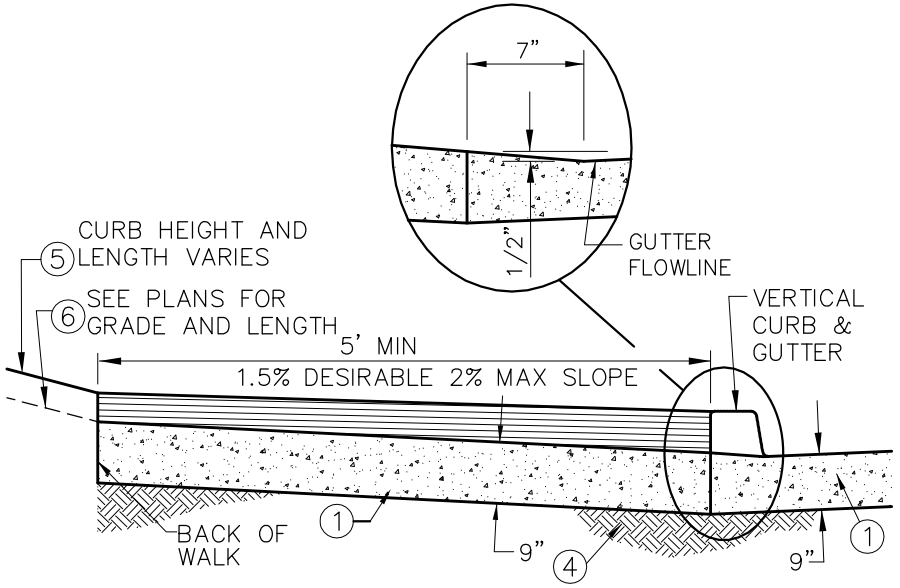

## TYPE A - WITHOUT RETAINING CURB

*SEE PLANS FOR ALLEY SURFACING REQUIREMENTS

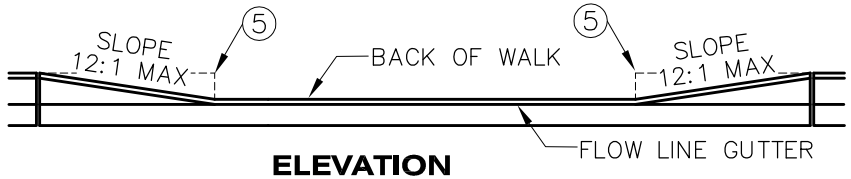



## TYPE B - WITH RETAINING CURB

* SEE PLANS FOR RETAINING CURB LENGTHS,
TOP OF CURB ELEVATIONS, AND ALLEY SURFACING REQUIREMENTS




## SECTION A-A

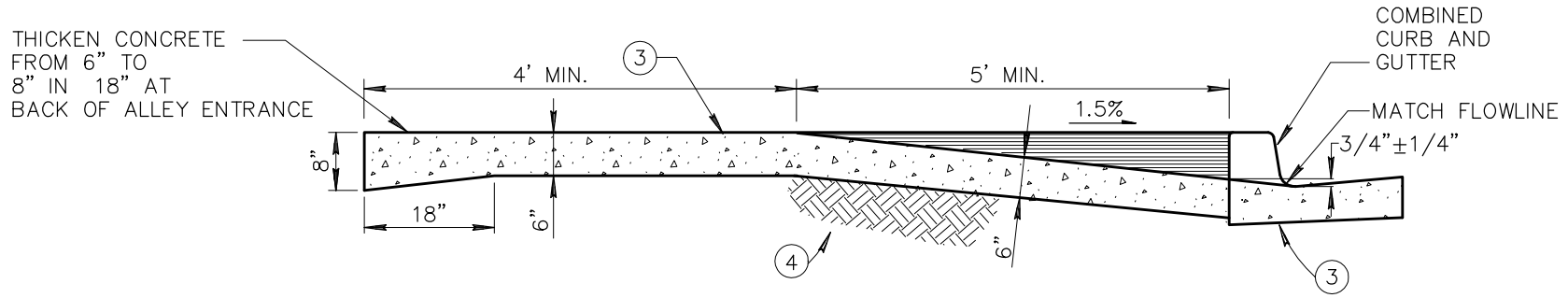



## ELEVATION

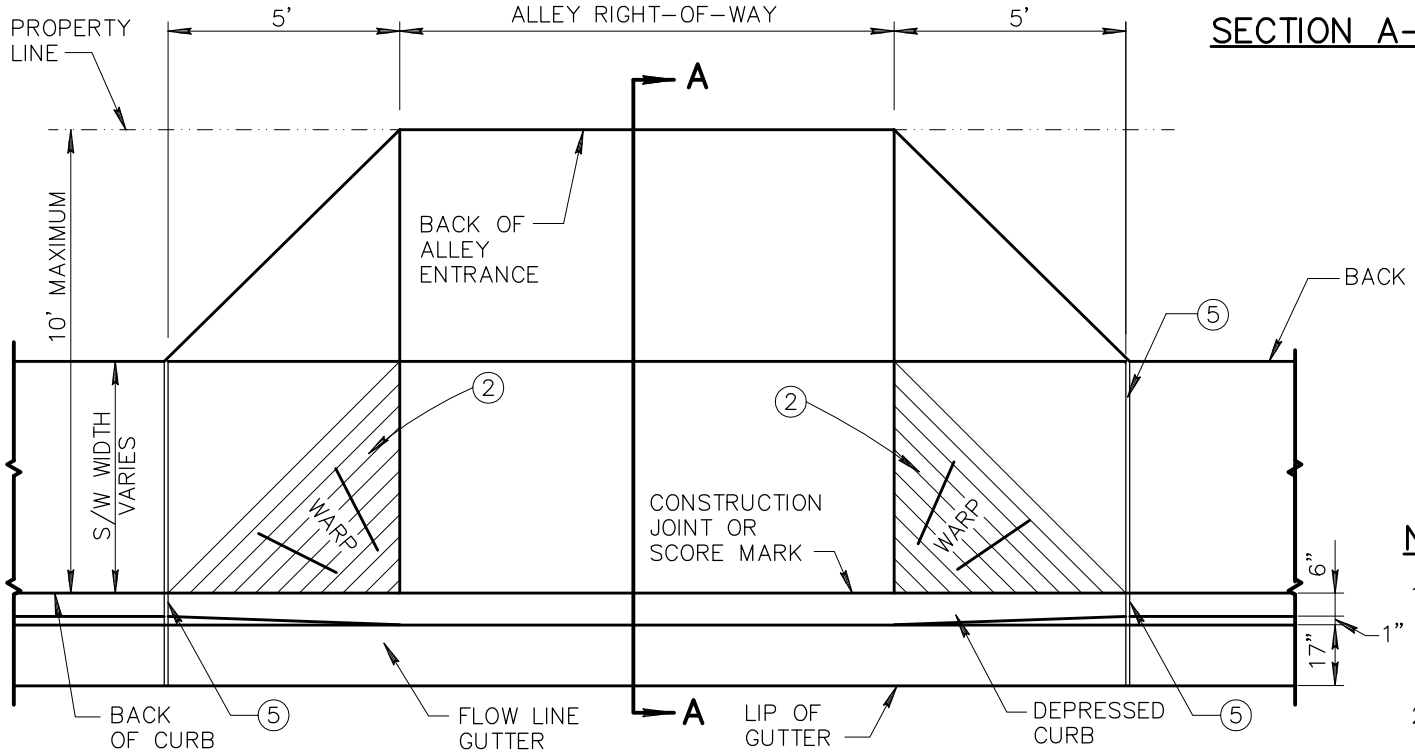
## NOTES:

1. CLASS "A" CONCRETE PER SECTION 725.
2. LIMITS OF HEAVY ROUGH BROOM FINISH.
3. EXPANSION JOINTS PER SECTION 340.
4. SUBGRADE PREPARATION PER SECTION 301.
5. SINGLE CURB PER DETAIL 222, TYPE "B".
6. ALLEY SURFACING PER PLANS.
7. DEPRESSED CURB SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE TYPE OF CURB USED AT THAT LOCATION.
8. CONTROL JOINT.

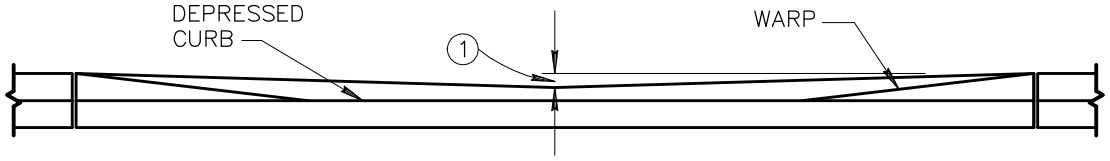
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 260 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | ALLEY ENTRANCE (WITH VERTICAL CURB AND GUTTER) | 01-01-2013 | 260 |




## SECTION A–A




## PLAN

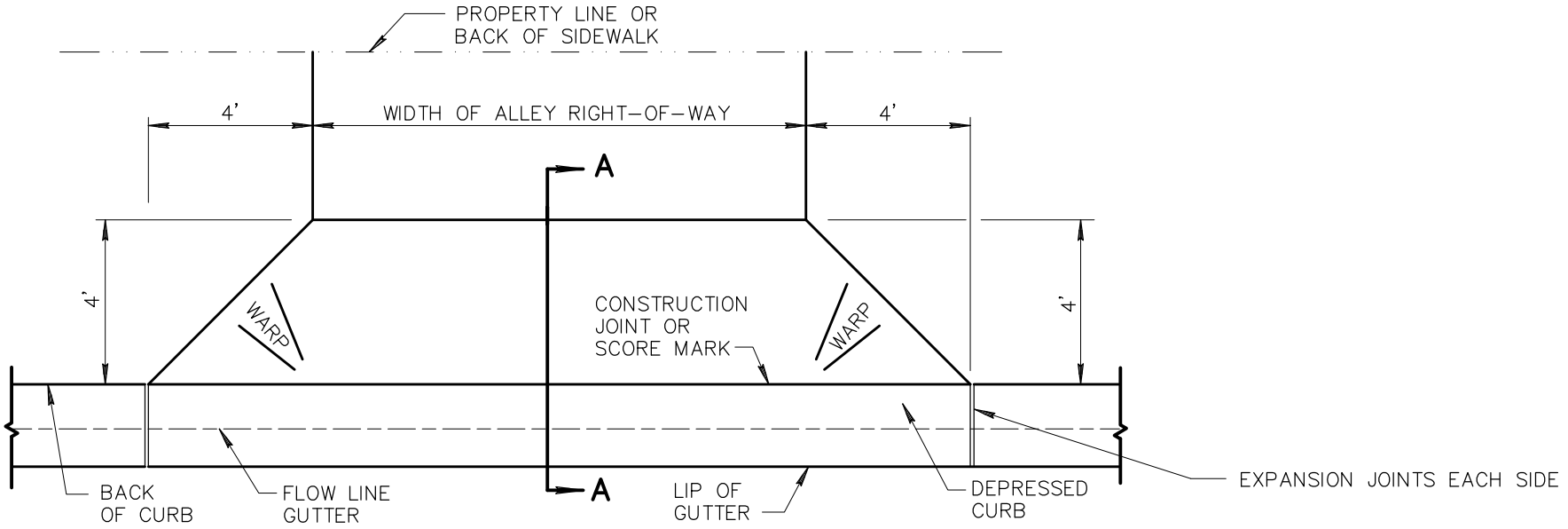


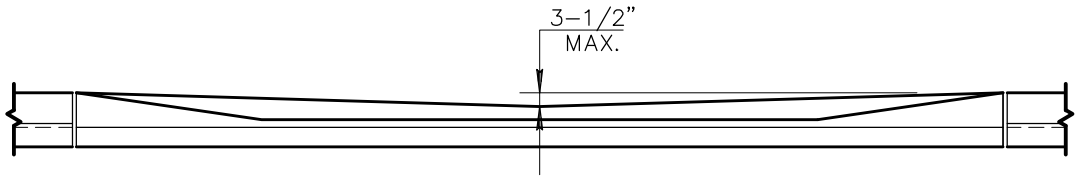

## ELEVATION

## NOTES:

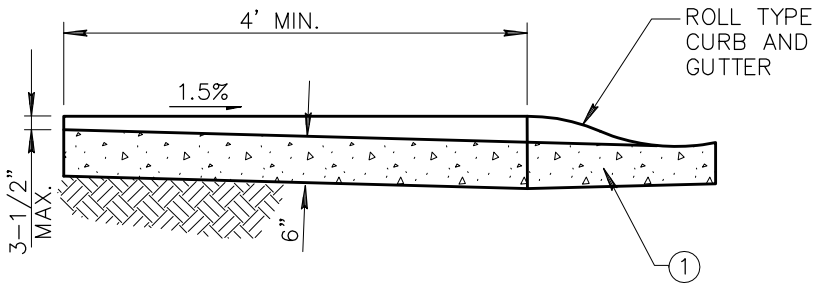
1. IF ALLEY ENTRANCE IS USED FOR DRAINAGE, THE CENTER BACK OF ALLEY ENTRANCE MAY BE DEPRESSED 2" FOR 4" CURB OR 3" FOR 6" CURB.
2. ROUGH BROOM FINISH FULL WIDTH OF 5' WARP SECTION, EACH SIDE SIDE OF ALLEY ENTRANCE.
3. CLASS 'B' CONCRETE CONSTRUCTION PER SECT. 725.
4. SUBGRADE PREPARATION, PER SECT. 301.
5. EXPANSION JOINTS SHALL CONFORM TO SECTION 340.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 262 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | **WING TYPE ALLEY ENTRANCE (WITH COMBINED CURB AND GUTTER)** | 01–01–2012 | 262 |




ELEVATION

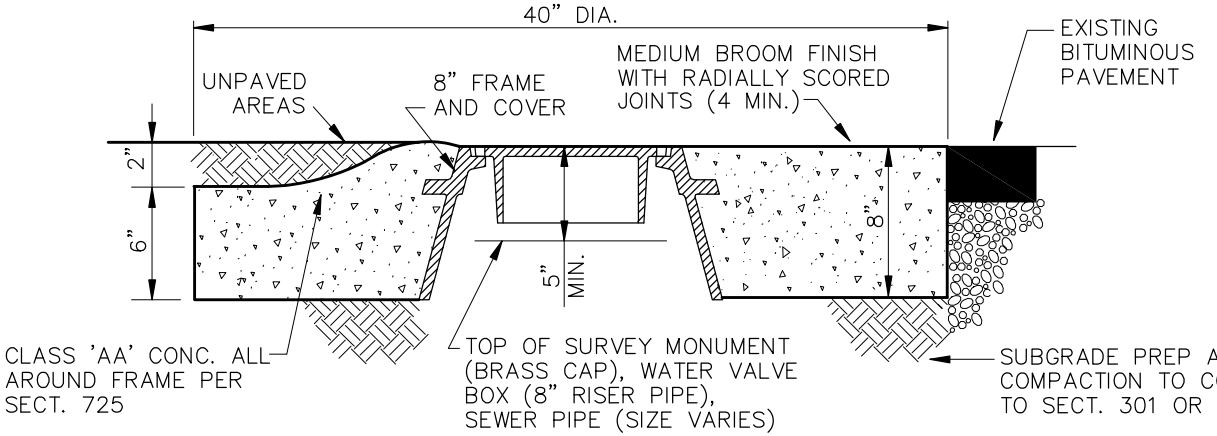



SECTION A-A

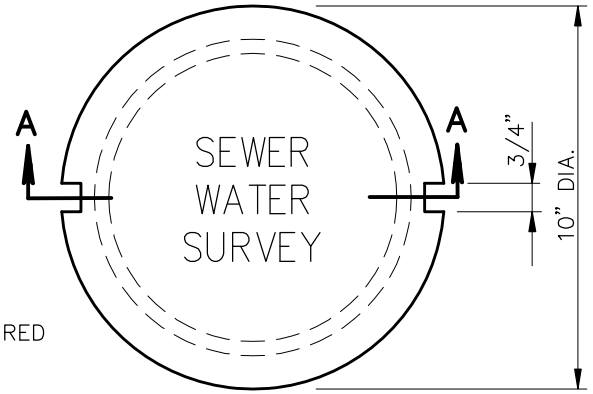
## NOTES:

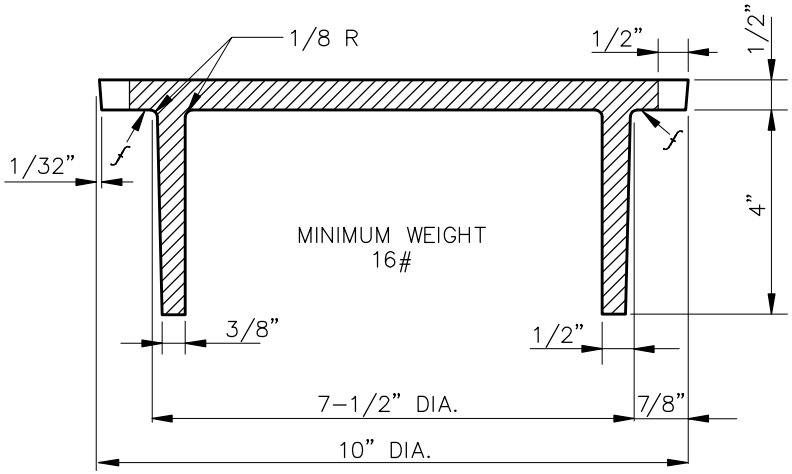
1. CLASS 'B' CONCRETE CONSTRUCTION PER SECT. 725.
2. EXPANSION JOINTS SHALL CONFORM TO SECT. 340.
3. SUBGRADE PREPARATION PER SECTION 301.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 263 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | WING TYPE ALLEY ENTRANCE (WITH ROLL TYPE CURB AND GUTTER) | 01-01-2002 | 263 |

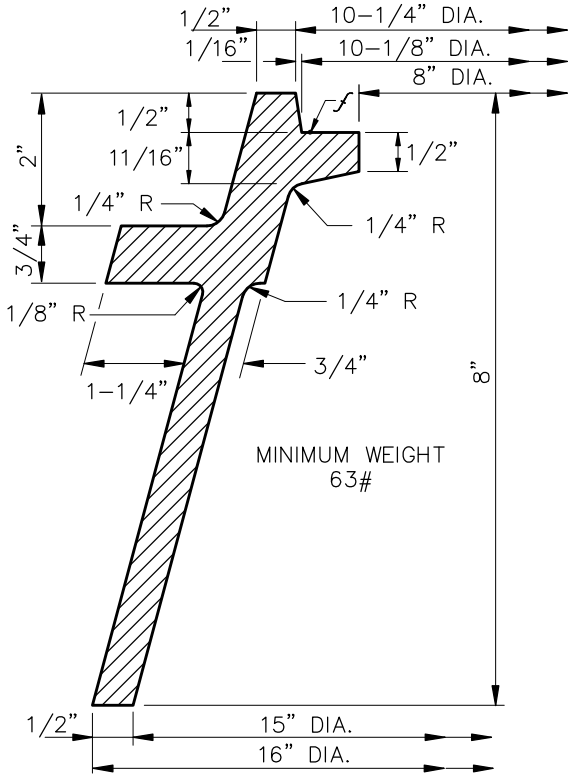



## GRADE ADJUSTMENT FOR FRAME AND COVER




## COVER SECTION A-A

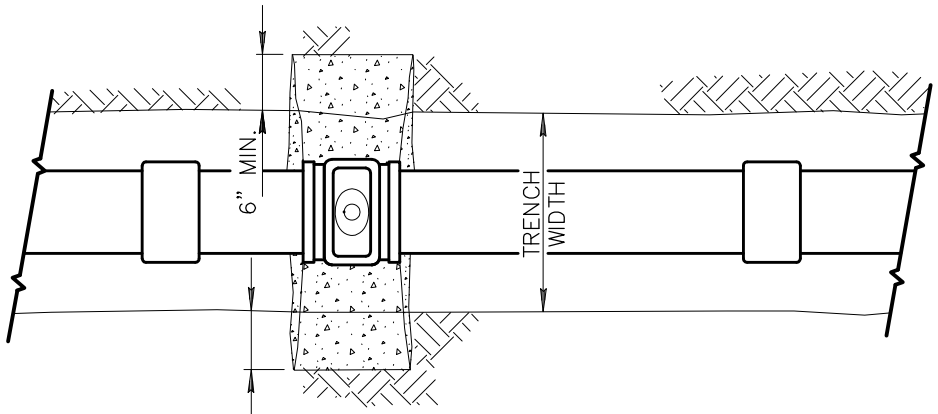


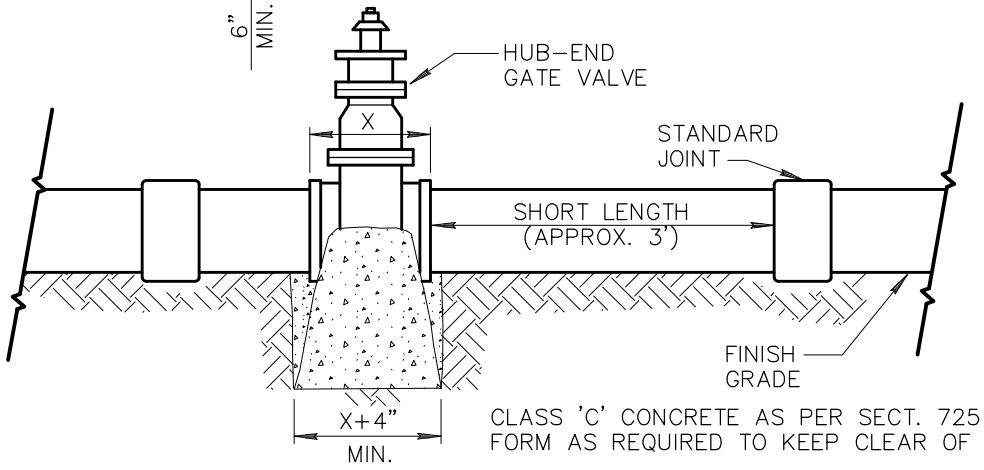

## 8" C.I. FRAME AND COVER

## NOTES:

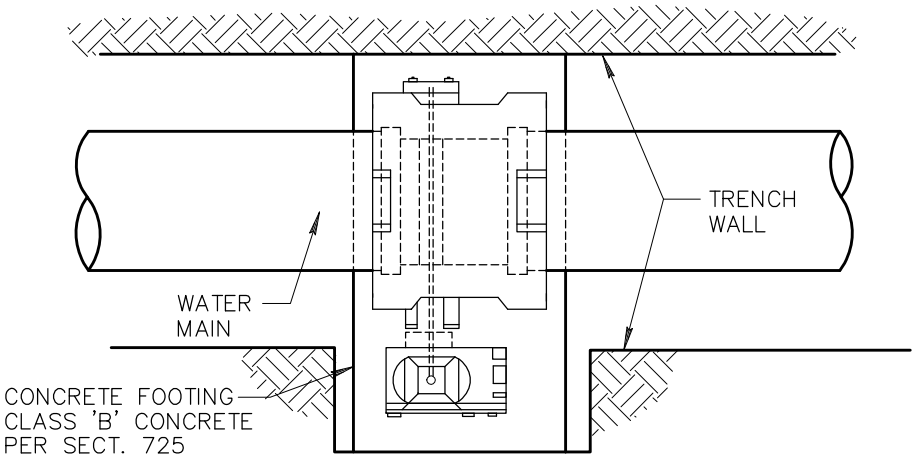
1. CASTING TO CONFORM TO SECT. 787.
2. LETTERS ON COVER TO BE AS FOLLOWS: "SEWER", "WATER", OR "SURVEY" AS DIRECTED TOTAL WIDTH OF WORD "SEWER" OR "WATER" 3-3/4". TOTAL WIDTH OF WORD "SURVEY" 4-1/2". LETTER SIZE 5/8" x 3/4", RAISED 1/16" ABOVE LEVEL OF COVER, TYPE OF LETTERS TO BE SUBMITTED FOR APPROVAL.
3. ℱ INDICATES MACHINE FINISHED SURFACE.

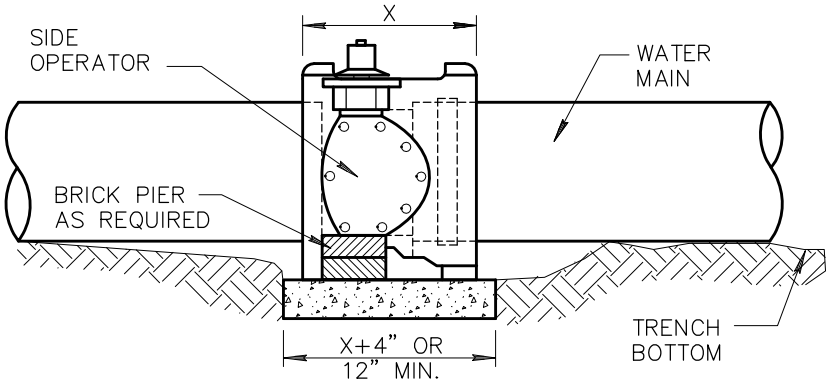
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 270 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | FRAME AND COVER AND GRADE ADJUSTMENT | 01-01-2016 | 270 |

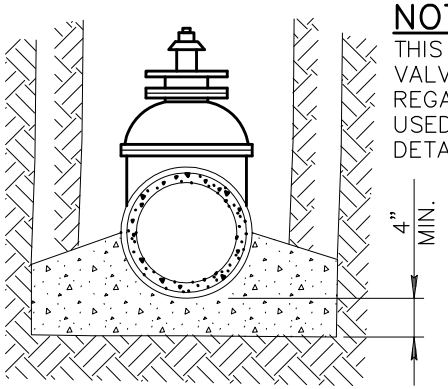



CLASS 'C' CONCRETE AS PER SECT. 725
FORM AS REQUIRED TO KEEP CLEAR OF JOINTS.



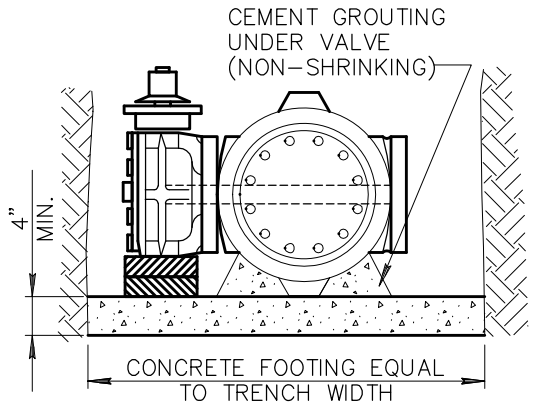




## NOTE:

THIS DETAIL COVERS WATER GATE VALVES, 4" TO 12" INCLUSIVE REGARDLESS OF TYPE OF PIPE USED. LARGER LINES TO BE DETAILED ON PLANS.

## WATER GATE VALVE

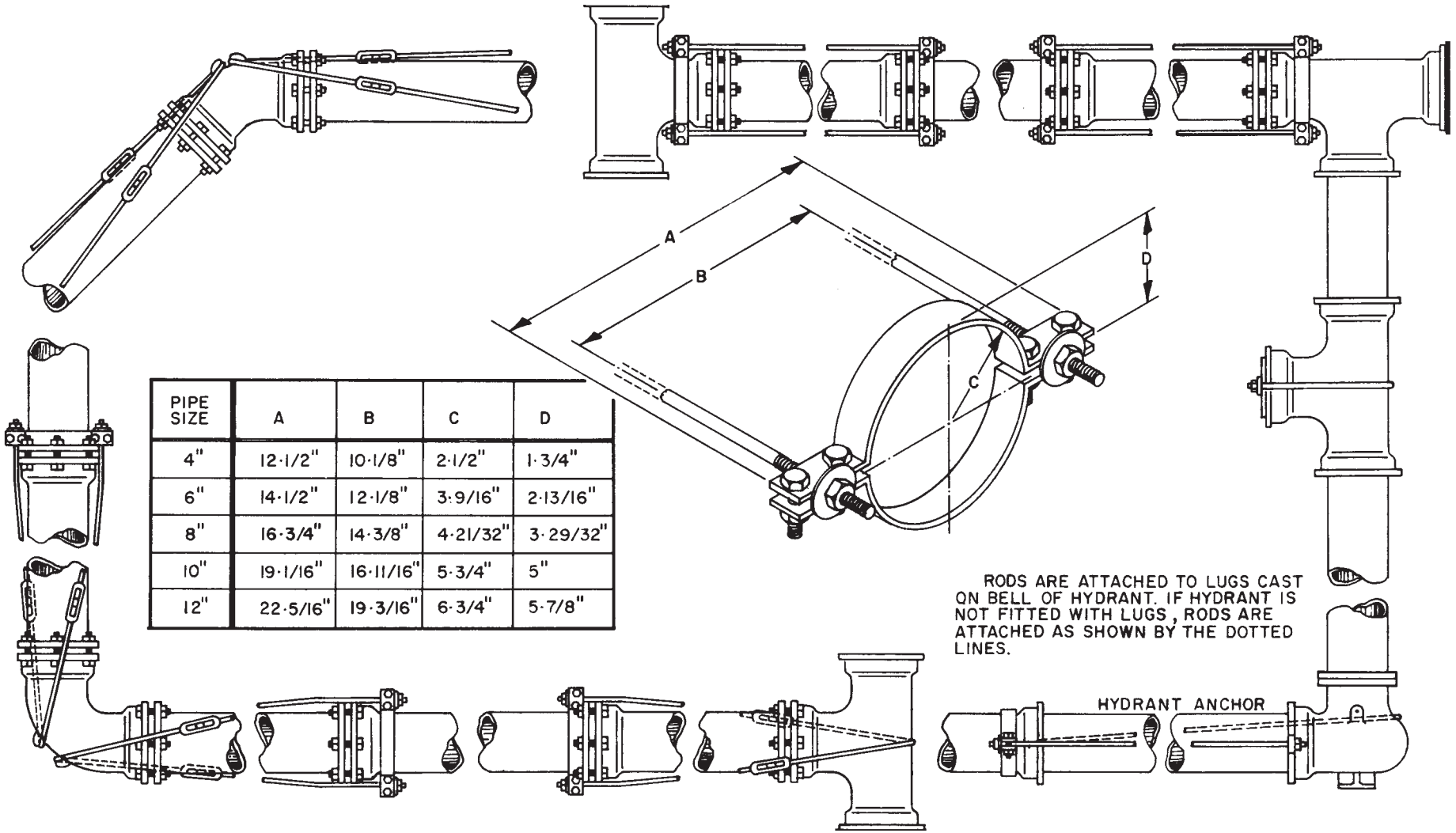



## BUTTERFLY VALVE

## NOTES:

1. THIS DETAIL COVERS BUTTERFLY VALVE INSTALLATION, 3" TO 12" INCLUSIVE, REGARDLESS OF TYPE OF PIPE OR JOINT USED. LARGER LINES TO BE DETAILED ON PLANS.
2. VALVE BOX AND COVER REQUIRED PER DETAILS 270 AND 391.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 301 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | BLOCKING FOR WATER GATE AND BUTTERFLY VALVES | 01-01-1998 | 301 |




| PIPE SIZE | A | B | C | D |
|---|---|---|---|---|
| 4" | 12-1/2" | 10-1/8" | 2-1/2" | 1-3/4" |
| 6" | 14-1/2" | 12-1/8" | 3-9/16" | 2-13/16" |
| 8" | 16-3/4" | 14-3/8" | 4-21/32" | 3-29/32" |
| 10" | 19-1/16" | 16-11/16" | 5-3/4" | 5" |
| 12" | 22-5/16" | 19-3/16" | 6-3/4" | 5-7/8" |

RODS ARE ATTACHED TO LUGS CAST ON BELL OF HYDRANT. IF HYDRANT IS NOT FITTED WITH LUGS, RODS ARE ATTACHED AS SHOWN BY THE DOTTED LINES.

HYDRANT ANCHOR



| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 302-1 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | JOINT RESTRAINT WITH TIE RODS | 01-01-1998 | 302-1 |

THIS DETAIL IS FOR USE ONLY ON UNDERGROUND INSTALLATIONS WHERE THE USE OF CONCRETE THRUST BLOCKING PER DETAIL 380 CANNOT BE USED BECAUSE OF OBSTRUCTIONS, OR REQUIREMENTS OF THE SPECIFICATIONS...

* CLAMPS SHALL BE 1/2 BY 2 INCHES FOR PIPE 4 AND 6 INCHES IN DIAMETER; 5/8 BY 2–1/2 INCHES FOR PIPE 8 AND 10 INCHES; 5/8 BY 3 INCHES FOR PIPE 12 INCHES. BOLT HOLES SHALL BE 1/16 INCH IN DIAMETER LARGER THAN BOLTS.
* RODS SHALL BE 3/4 INCHES IN DIAMETER FOR PIPES 4,6 AND 8 INCHES IN DIAMETER; 7/8 INCHES FOR PIPE 10 INCHES AND 1 INCH IN DIAMETER FOR PIPE 12 INCHES.
* BOLTS SHALL BE 5/8 INCHES IN DIAMTER FOR PIPE 4, 6 AND 8 INCHES IN DIAMETER; 3/4 INCHES FOR PIPE 10 INCHES AND 7/8 INCHES IN DIAMETER FOR PIPE 12 INCHES
* WASHERS MAY BE CAST IRON OR STEEL, ROUND OR SQUARE, DIMENSIONS FOR CAST IRON WASHERS ARE 5/8 BY 3 INCHES FOR PIPE 4, 6, 8 AND 10 INCHES IN DIAMETER AND 3/4 BY 3–1/2 INCHES FOR PIPE 12 INCHES. DIMENSIONS FOR STEEL WASHERS ARE 1/2 BY 3 INCHES FOR PIPE 4, 6, 8 AND 10 INCHES IN DIAMETER AND 1/2 BY 3–1/2 INCHES FOR PIPE 12 INCHES IN DIAMTER. HOLES SHALL BE 1/8 INCH LARGER THAN THE RODS.

FOR PIPE LARGER THAN 12 INCHES IN DIAMETER, RESTRAINT DETAILS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO INSTALLATION.

1. ALL TIE RODS, ROD COUPLINGS, TURNBUCKLES, BOLTS AND NUTS FOR THESE JOINTS SHALL BE OF CARBON STEEL EQUIVALENT TO A.S.T.M. A–307, GRADE B, WITH CADMIUM PLATING IN ACCORDANCE WITH A.S.T.M. A–165. EXCEPT THAT THE MIN. THICKNESS OF THE PLATING SHALL BE .0002 OF AN INCH. CADMIUM PLATED BOLTS SHALL HAVE CLASS 2A THREADS AND THE NUTS, ROD COUPLINGS AND TURNBUCKLES SHALL HAVE 2B THREADS.

2. HIGH STRENGTH, HEAT TREATED CAST IRON TEE–HEAD BOLTS WITH HEXAGON NUTS, ALL IN ACCORDANCE WITH THE STRENGTH REQUIREMENTS OF A.W.W.A. C–111, MAY BE USED IN LIEU OF THE CADMIUM PLATED BOLTS AND NUTS.

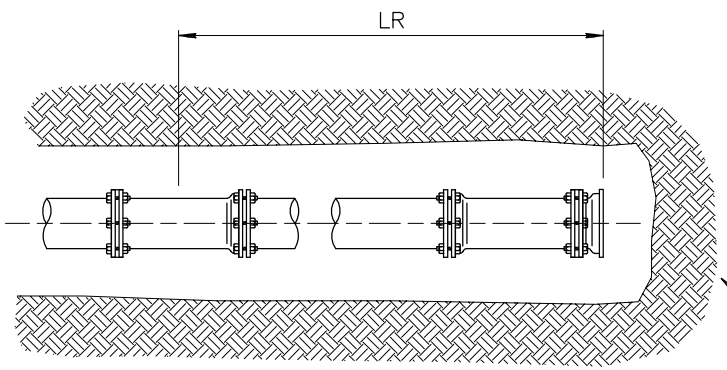
3. THE SKETCHES IN THIS SERIES OF FIGURES SHOW ACCEPTABLE METHODS OF PROVIDING ANCHORAGE. THERE IS NO PARTICULAR SIGNIFICANCE TO BE ATTACHED TO WHETHER THE SKETCH SHOWS A BELL AND SPIGOT JOINT OR A STANDARD MECHANICAL JOINT. THE ANCHORING PROCEDURE ILLUSTRATED APPLIES IN MOST CASES TO EITHER TYPE OF JOINT. IN SOME CASES, DIMENSIONS OF THE PARTICULAR PIPE OR HUB AND SPACE AVAILABLE FOR WORKING AROUND THE PARTICULAR JOINT WILL INFLUENCE THE CHOICE OF METHODS USED.

4. IN CERTAIN ASSEMBLIES OF RODS AND CLAMPS SHOWN, RODS RUN FROM A LUG ON THE FITTING (OR A CLAMP BEHIND THE HUB OF A BELL) TO A CLAMP AGAINST A FACE OF A BELL. NOTE THAT THIS ARRANGEMENT ANCHORS ONLY ONE JOINT. THE STABILITY OF THE JOINT WHERE THE CLAMP IS AGAINST THE FACE OF THE BELL DEPENDS ON HAVING SOIL ABOVE A RELATIVELY LONG PIECE OF PIPE ON BOTH SIDES OF THE JOINT. CONSEQUENTLY, IF THE DISTANCE BETWEEN THE FIRST AND SECOND JOINTS IS LESS THAN 12 FEET, THE SECOND JOINT SHOWN SHALL BE ANCHORED BY A CLAMP BEHIND THE HUB OF THE BELL AND RODS TO A CLAMP AT THE FACE OF THE NEXT BELL.

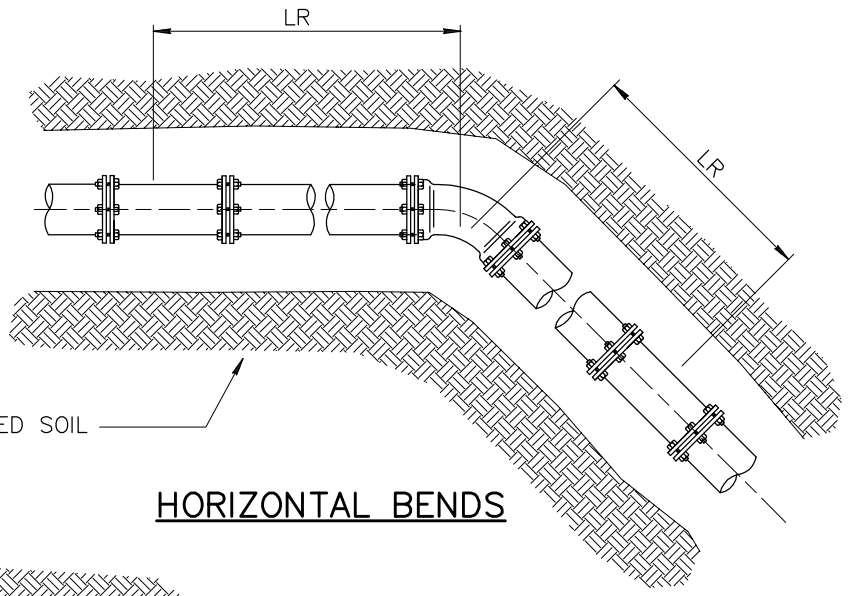
5. COATING TYPE: A.H.D. ASPHALTIC PRIMER 719(A). – ALL EXPOSED METAL.



| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 302-2 | MARICOPA ASSOCIATION of GOVERNMENTS | STANDARD DETAIL ENGLISH | JOINT RESTRAINT WITH TIE RODS | 01–01–1998 | 302-2 |



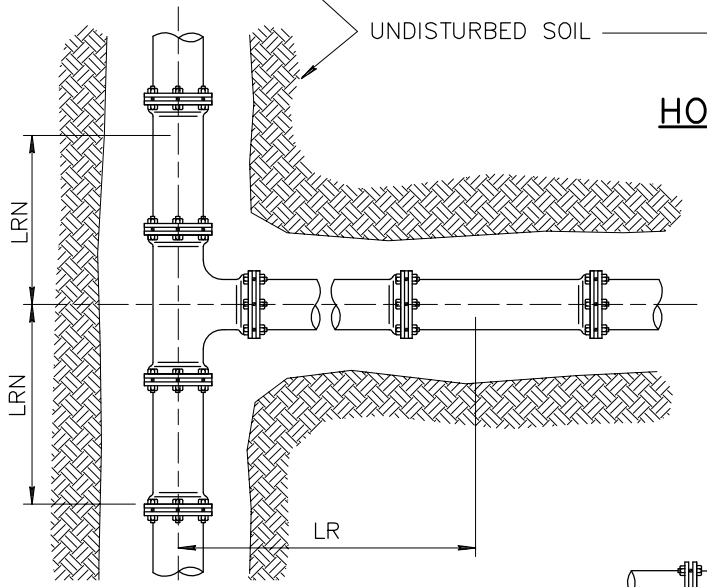

DEAD ENDS



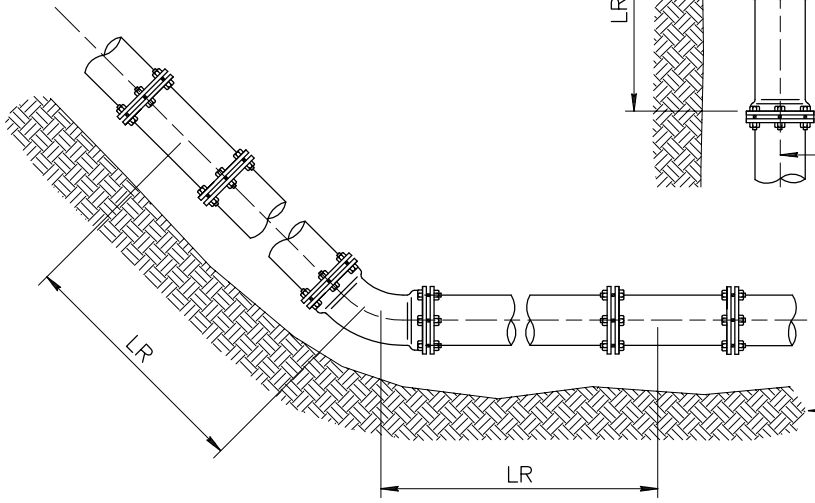

HORIZONTAL BENDS

UNDISTURBED SOIL

LRN = SHORTEST LENGTH OF PIPE RESTRAINED TO THE RUN OF THE TEE FITTING (BOTH SIDES OF TEE).

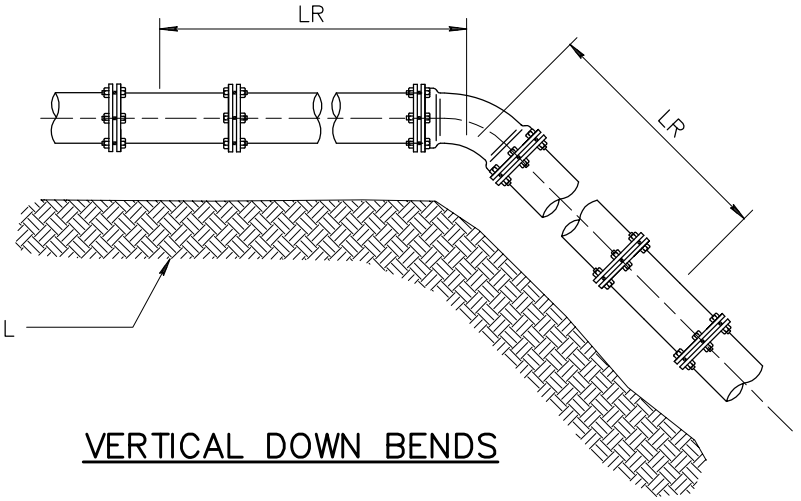



TEES




VERTICAL UP BEND

UNDISTURBED SOIL




VERTICAL DOWN BENDS

| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 303–1 | MARICOPA ASSOCIATION of GOVERNMENTS | STANDARD DETAIL ENGLISH | JOINT RESTRAINT FOR DUCTILE IRON AND POLYETHYLENE WRAPPED DUCTILE IRON WATER PIPES | 01–01–1998 | 303–1 |

## RESTRAINED LENGTHS, LR, FOR DUCTILE IRON PIPE

| NOMINAL PIPE SIZE INCHES | HORIZONTAL BENDS | | | TEES | | VERTICAL OFFSETS | | | | | | DEAD ENDS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 90° BEND FITTINGS | | 45° BEND FITTINGS | | 22-1/2° BEND FITTINGS | | |
| | 90° | 45° | 22-1/2° | LRN=0' | LRN=10' | DOWN BEND | UP BEND | DOWN BEND | UP BEND | DOWN BEND | UP BEND | |
| 4 | 18 | 7 | 4 | 30 | 8 | 31 | 18 | 13 | 7 | 6 | 3 | 31 |
| 6 | 25 | 10 | 5 | 43 | 20 | 44 | 25 | 18 | 10 | 9 | 5 | 44 |
| 8 | 32 | 13 | 6 | 56 | 34 | 58 | 32 | 24 | 13 | 11 | 6 | 58 |
| 10 | 38 | 16 | 8 | 68 | 45 | 69 | 38 | 29 | 16 | 14 | 8 | 69 |
| 12 | 45 | 19 | 9 | 80 | 57 | 81 | 45 | 34 | 19 | 16 | 9 | 81 |
| 14 | 51 | 21 | 10 | 91 | 68 | 92 | 51 | 38 | 21 | 18 | 10 | 92 |
| 16 | 57 | 24 | 11 | 103 | 79 | 104 | 57 | 43 | 24 | 21 | 11 | 104 |
| 18 | 62 | 26 | 12 | 113 | 90 | 115 | 62 | 48 | 26 | 23 | 12 | 115 |
| 20 | 68 | 28 | 14 | 125 | 100 | 126 | 68 | 52 | 28 | 25 | 14 | 126 |
| 24 | 79 | 33 | 16 | 145 | 121 | 147 | 79 | 61 | 33 | 29 | 16 | 147 |

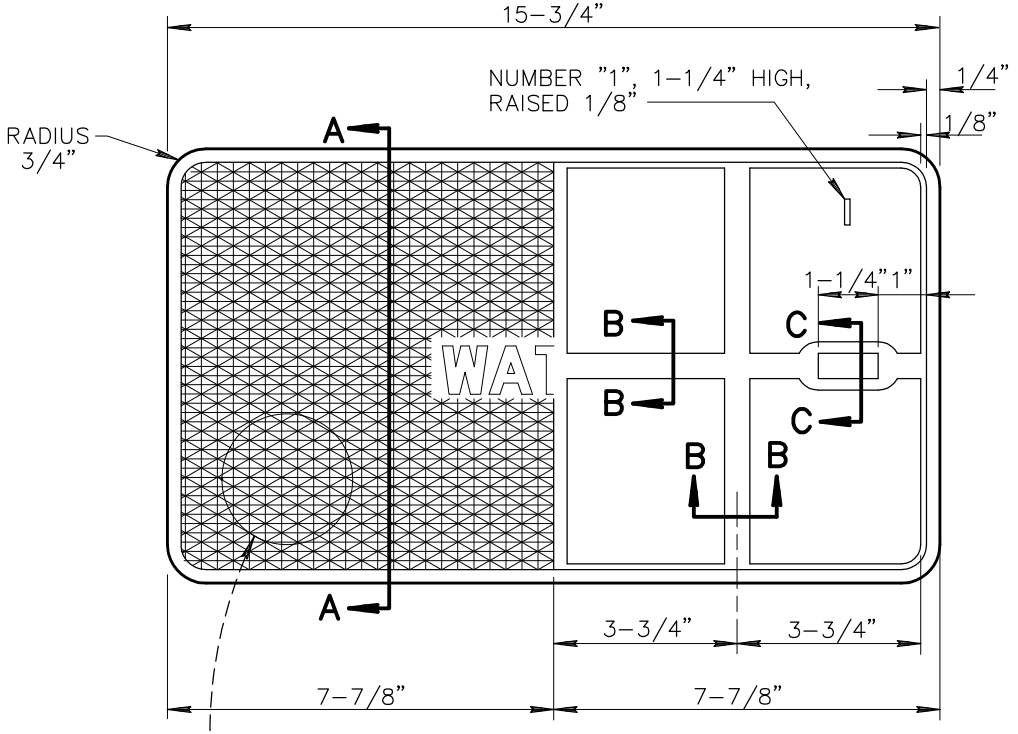
## RESTRAINED LENGTHS, LR, FOR DUCTILE IRON PIPE WITH POLYETHYLENE WRAP

| NOMINAL PIPE SIZE INCHES | HORIZONTAL BENDS | | | TEES | | VERTICAL OFFSETS | | | | | | DEAD ENDS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 90° BEND FITTINGS | | 45° BEND FITTINGS | | 22-1/2° BEND FITTINGS | | |
| | 90° | 45° | 22-1/2° | LRN=0' | LRN=10' | DOWN BEND | UP BEND | DOWN BEND | UP BEND | DOWN BEND | UP BEND | |
| 4 | 26 | 11 | 5 | 69 | 18 | 72 | 26 | 30 | 11 | 14 | 5 | 72 |
| 6 | 36 | 15 | 7 | 99 | 47 | 102 | 36 | 42 | 15 | 20 | 7 | 102 |
| 8 | 47 | 19 | 9 | 130 | 78 | 133 | 47 | 55 | 19 | 26 | 9 | 133 |
| 10 | 56 | 23 | 11 | 157 | 103 | 159 | 56 | 66 | 23 | 32 | 11 | 159 |
| 12 | 65 | 27 | 13 | 185 | 131 | 187 | 65 | 77 | 27 | 37 | 13 | 187 |
| 14 | 74 | 31 | 15 | 211 | 156 | 214 | 74 | 89 | 31 | 42 | 15 | 214 |
| 16 | 82 | 34 | 16 | 238 | 183 | 241 | 82 | 100 | 34 | 48 | 16 | 241 |
| 18 | 90 | 37 | 18 | 263 | 207 | 266 | 90 | 110 | 38 | 53 | 18 | 266 |
| 20 | 98 | 41 | 20 | 289 | 233 | 292 | 98 | 121 | 41 | 58 | 20 | 292 |
| 24 | 113 | 47 | 22 | 337 | 280 | 340 | 113 | 141 | 47 | 68 | 22 | 340 |

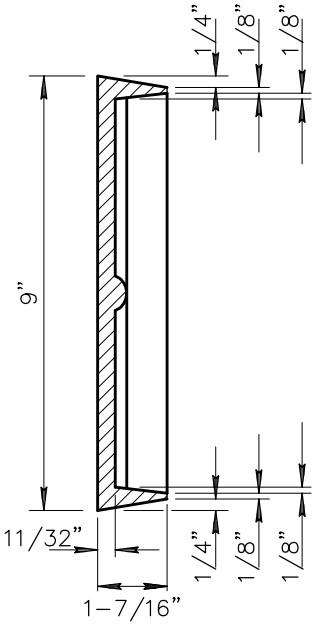
## NOTES:

1. ALL JOINTS WITHIN THE SPECIFIED LENGTH LR MUST BE RESTRAINED. ALL LENGTHS ARE GIVEN IN FEET.
2. THE MAXIMUM TEST PRESSURE SHALL NOT EXCEED 200 PSI
3. THE MINIMUM DEPTH OF BURY SHALL BE 3' TO TOP OF PIPE.
4. RESTRAINED LENGTHS MAY BE REDUCED WHEN SUPPORTED BY ENGINEERING CALCULATIONS.

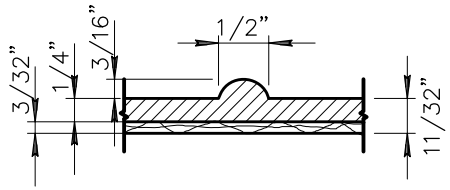
| DETAIL NO. | | STANDARD DETAIL | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 303-2 | MARICOPA ASSOCIATION of GOVERNMENTS | ENGLISH | JOINT RESTRAINT FOR DUCTILE IRON AND POLYETHYLENE WRAPPED DUCTILE IRON WATER PIPES | 01-01-1998 | 303-2 |



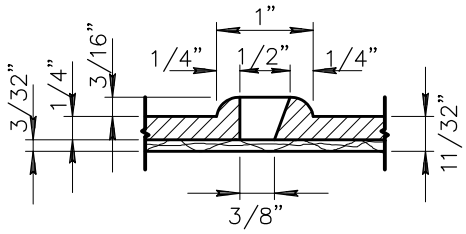

PLAN



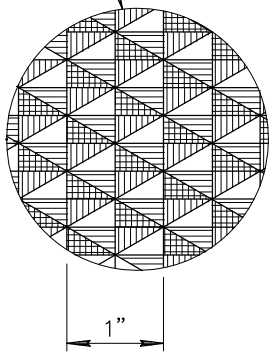

SECTION A–A



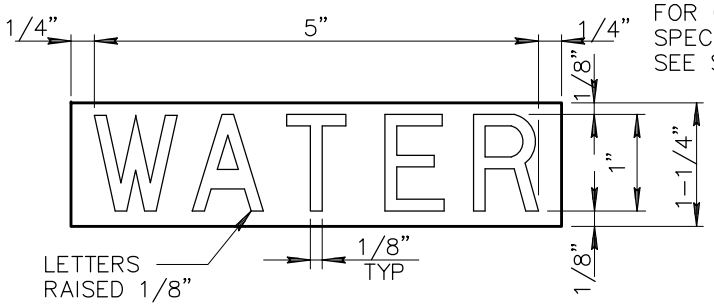

SECTION B–B




SECTION C–C

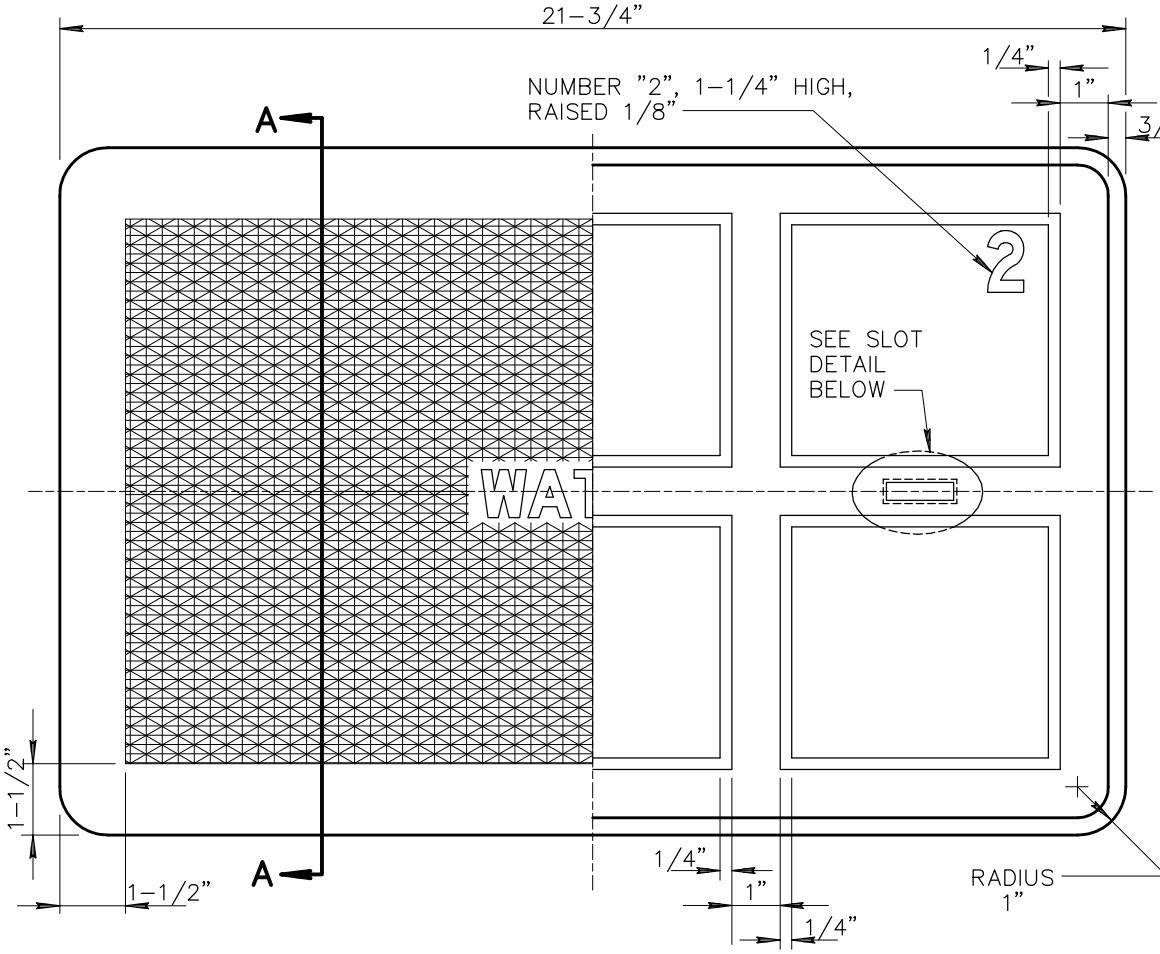


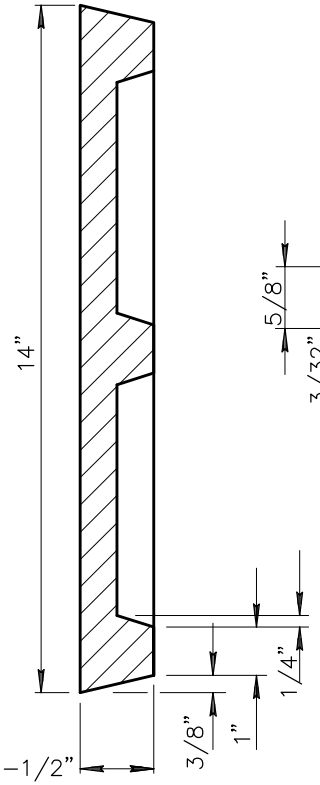

TOP OF COVER



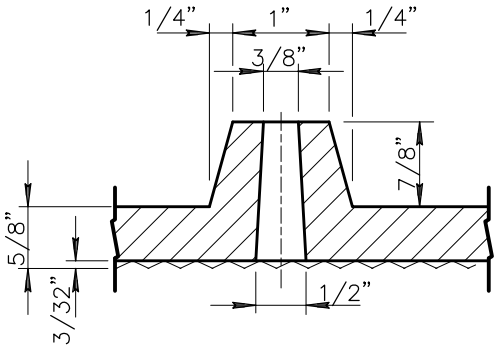

FOR CASTING SPECIFICATIONS SEE SECT. 787

| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 310 | MARICOPA ASSOCIATION of GOVERNMENTS | STANDARD DETAIL ENGLISH | CAST IRON WATER METER BOX COVER NO. 1 | 01–01–1998 | 310 |



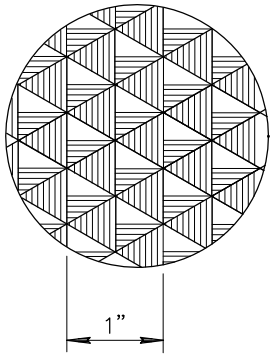

SECTION A–A



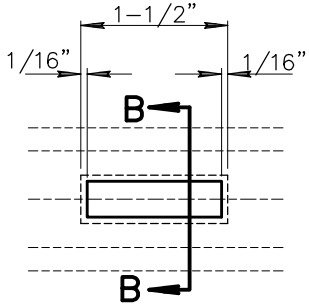

SECTION B–B

**NOTE:**

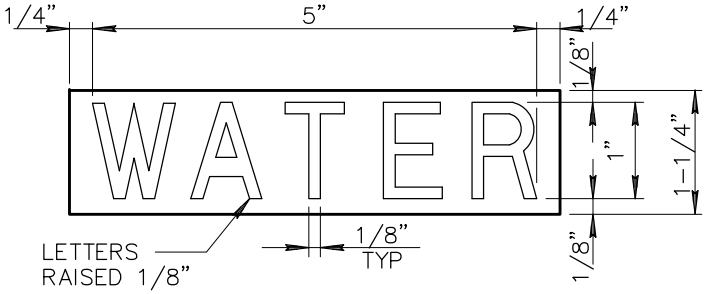
FOR CASTING SPECIFICATIONS
SEE SECT. 787.



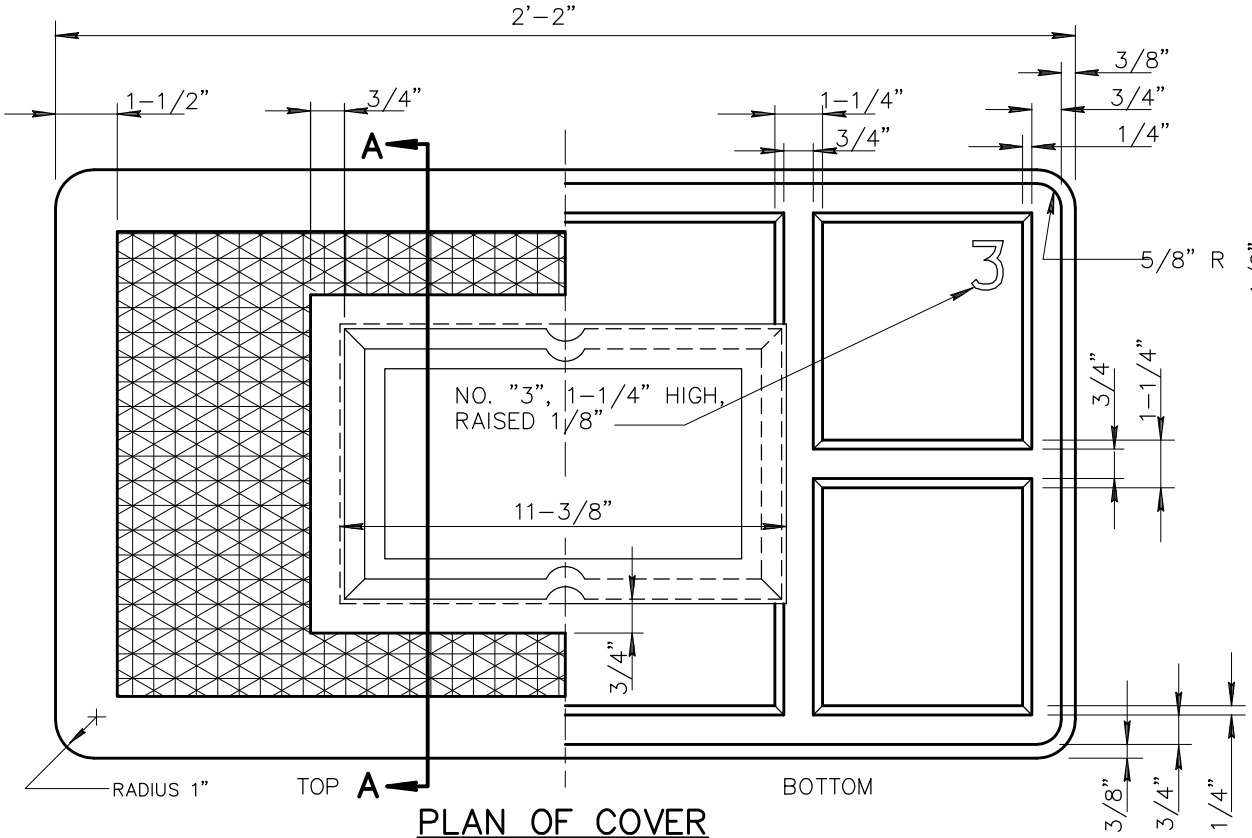

TOP OF COVER



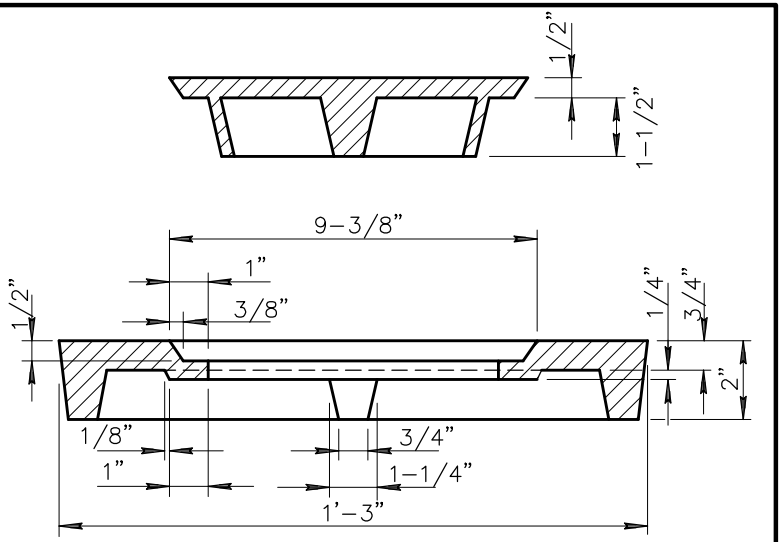

SLOT DETAIL




| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 311 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | CAST IRON WATER METER BOX COVER NO. 2 | 01–01–1998 | 311 |



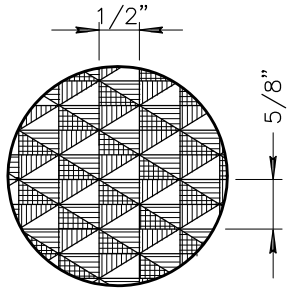

PLAN OF COVER



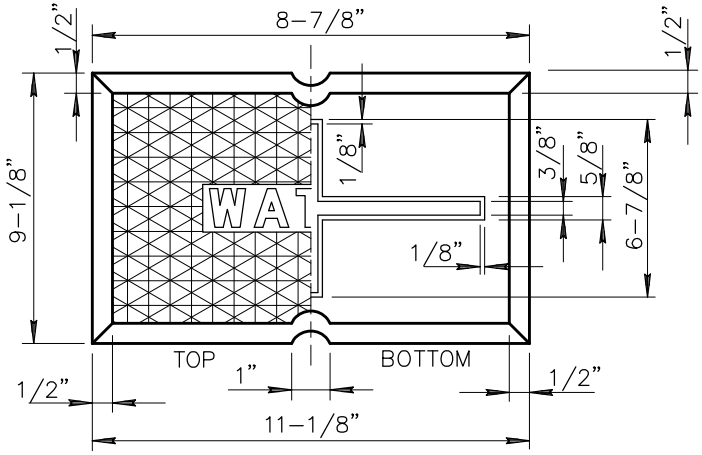

SECTION A-A

## NOTES:

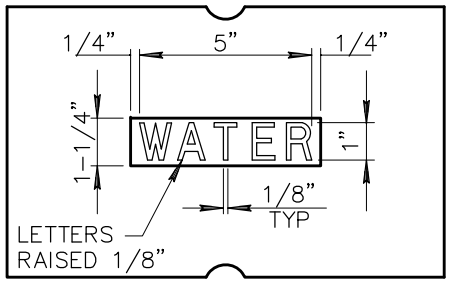
1. INSPECTION PLATE IS SAME AS USED WITH METER BOX COVER NO. 4.
2. FOR CASTING SPECIFICATIONS, SEE SECTION 787.
3. THE BEARING EDGES OF THESE CASTINGS SHALL BE MACHINED TO INSURE A FULL BEARING ON A FLAT SURFACE.




DETAIL
TOP OF COVER & PLATE

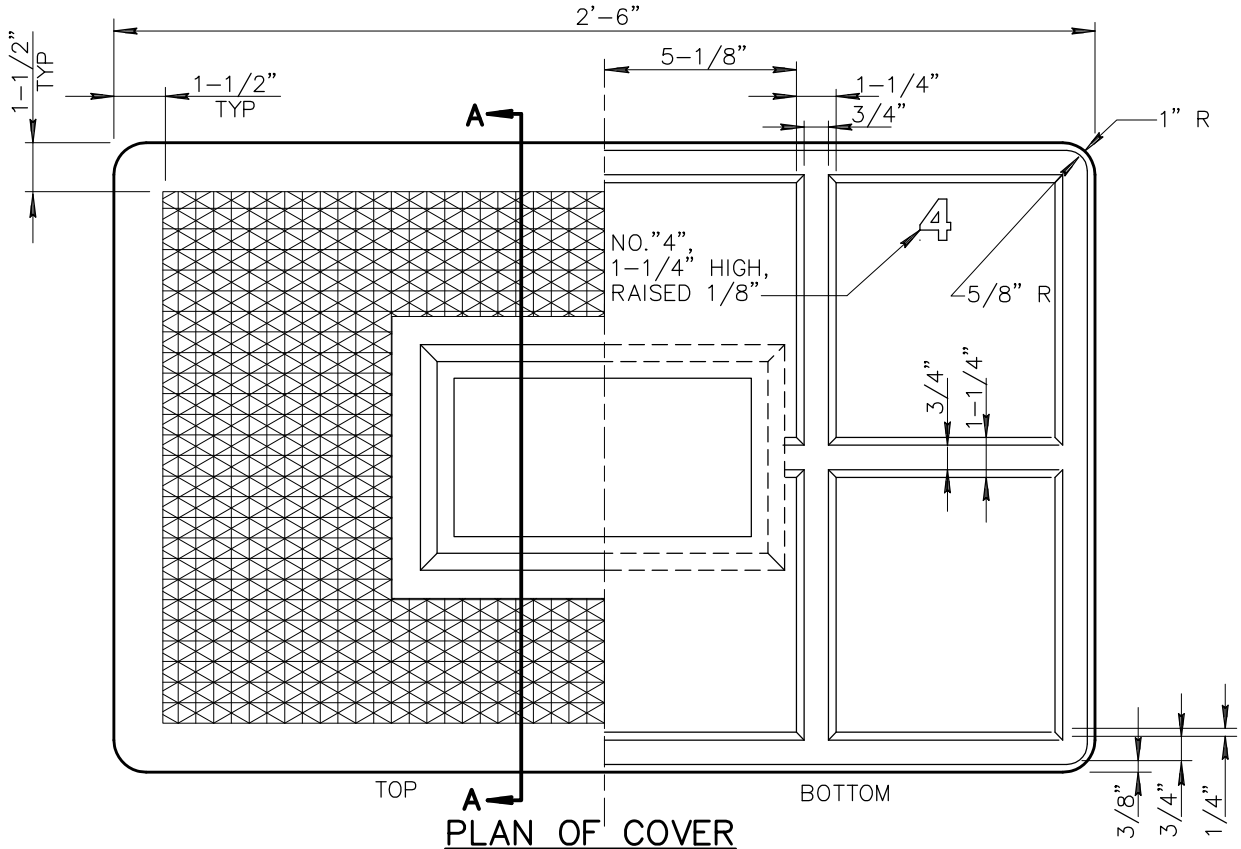



INSPECTION PLATE

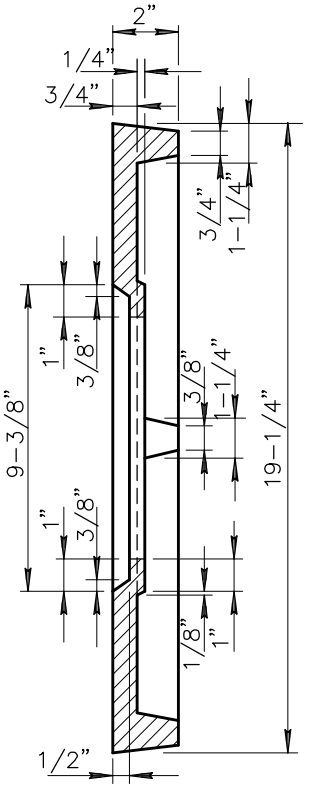



LETTERING DETAIL

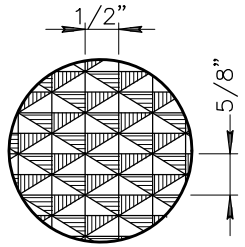
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 312 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | CAST IRON WATER METER BOX COVER NO. 3 | 01-01-1998 | 312 |




PLAN OF COVER



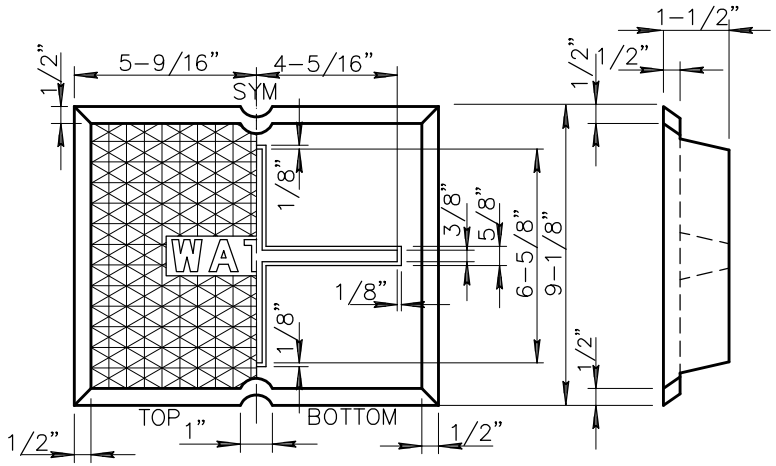

SECTION A–A



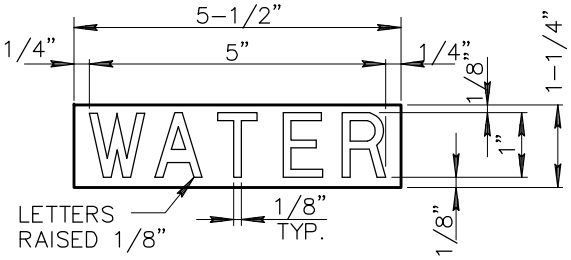

TOP OF COVER

## NOTES:

1. FOR CASTING SPECIFICATIONS, SEE SECT. 787. THE BEARING
2. THE BEARING EDGES OF THESE CASTINGS SHALL BE MACHINED TO INSURE A FULL BEARING ON A FLAT SURFACE.

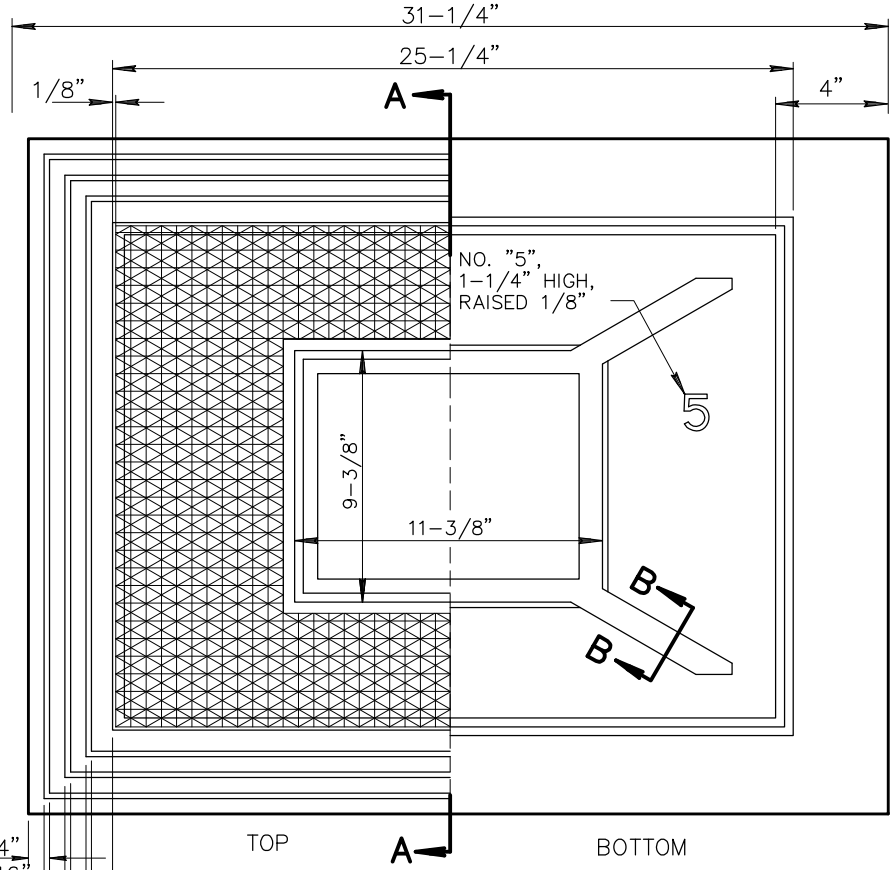



INSPECTION PLATE

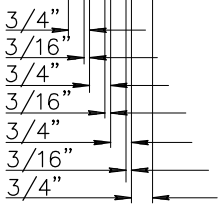


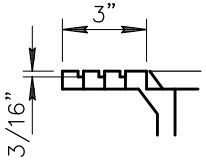

LETTERING DETAIL

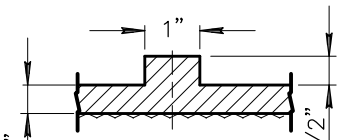
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 313 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | CAST IRON WATER METER BOX COVER NO. 4 | 01-01-1998 | 313 |



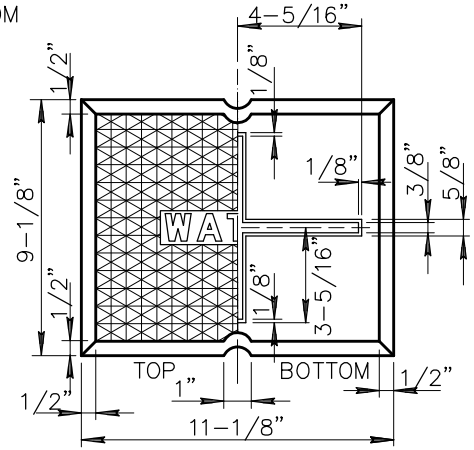

PLAN OF COVER



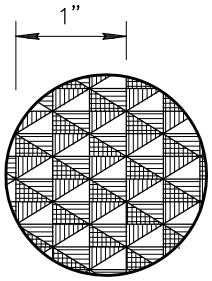



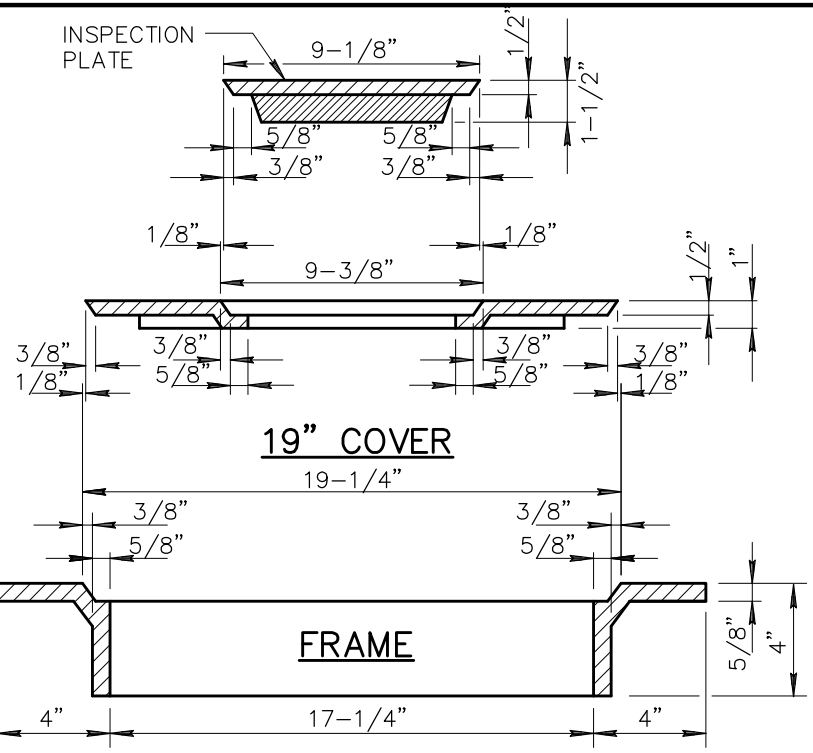

SECTION B-B



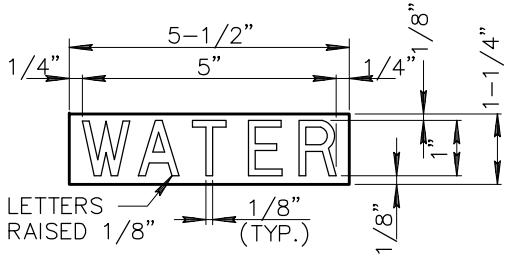

INSPECTION PLATE




DETAIL
TOP OF COVER




SECTION A-A

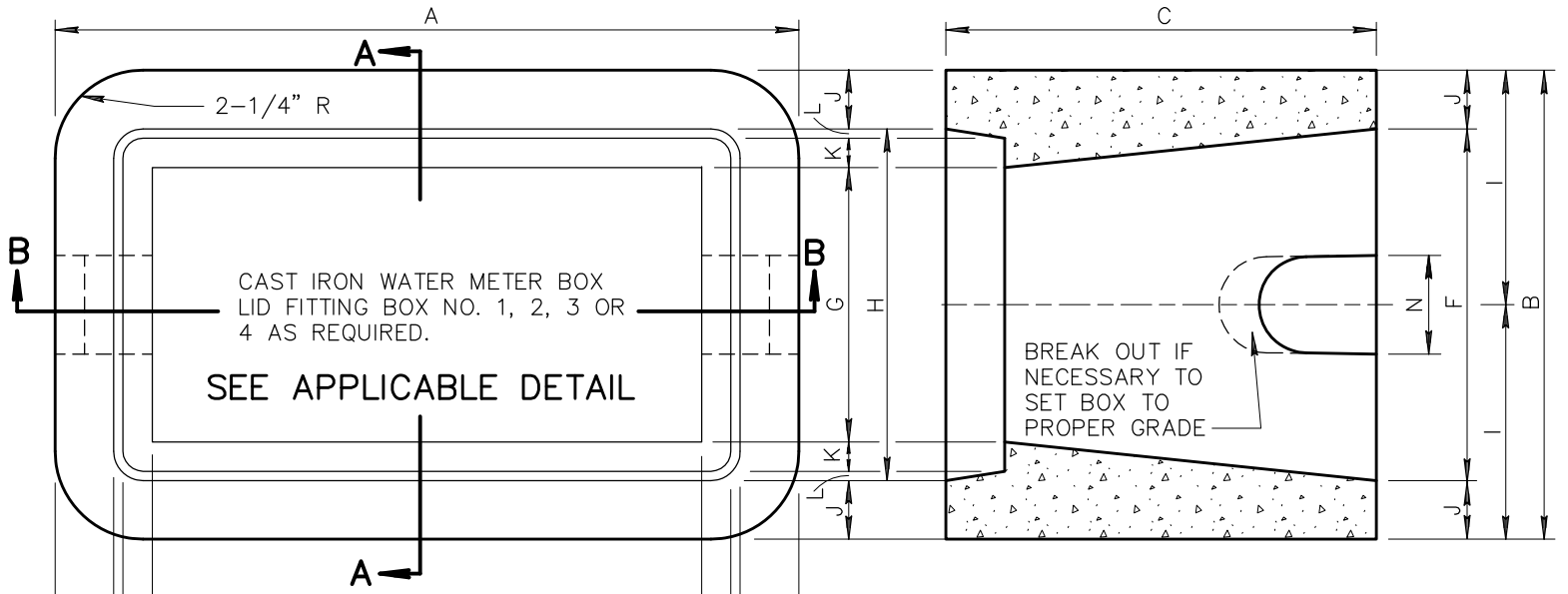



LETTERING DETAIL

## NOTES:

1. FOR CASTING SPECIFICATIONS, SEE SECT. 787.
2. THE BEARING EDGES OF THESE CASTINGS SHALL BE MACHINED TO INSURE A FULL BEARING ON A FLAT SURFACE.

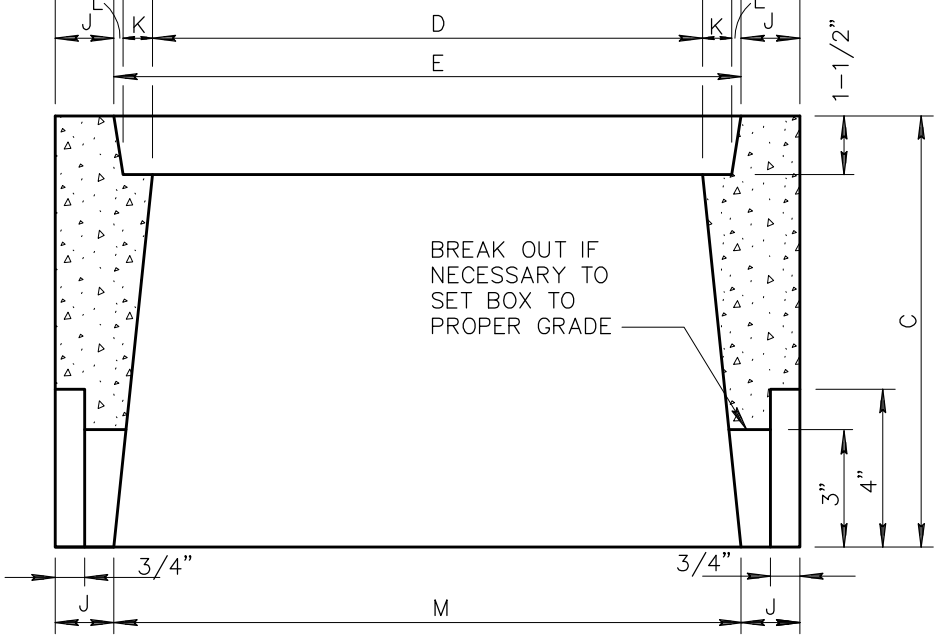
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 314 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | CAST IRON WATER METER BOX COVER NO. 5 | 01-01-1998 | 314 |




SECTION A–A

## NOTES:

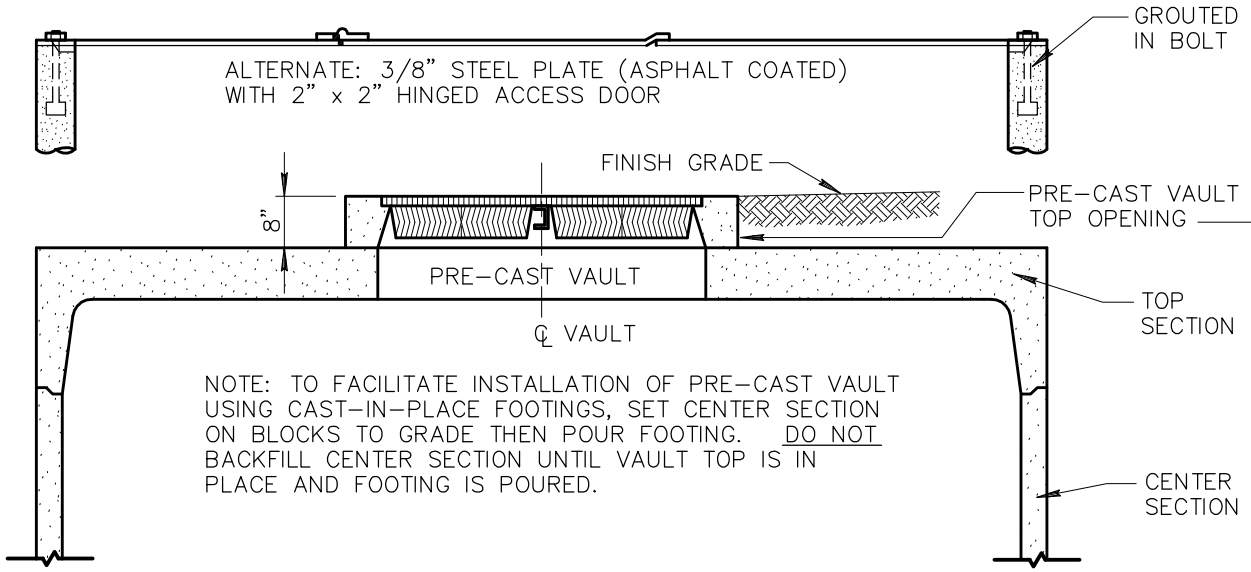
1. THE METER BOXES SHALL CONFORM TO THE DIMENSIONS AS SHOWN AND SHALL BE MADE OF PORTLAND CEMENT CONCRETE POURED AND TAMPED (OR VIBRATED) IN TRUE FORMS.
2. USE CLASS 'AA' CONCRETE PER SECT. 725.

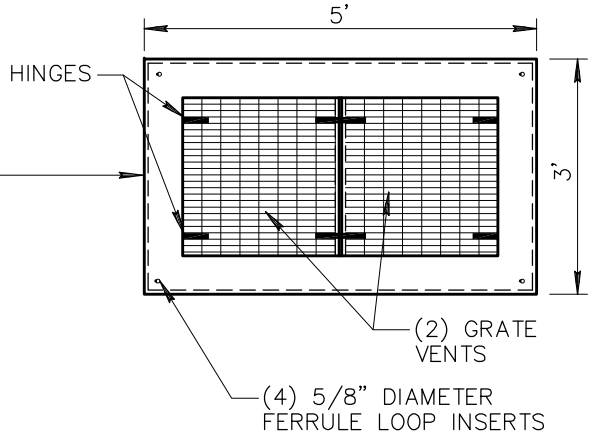



SECTION B–B

| METER BOX DIMENSIONS | | | | |
|---|---|---|---|---|
| DIMS | BOX NUMBER | | | |
| | 1 | 2 | 3 | 4 |
| A | 19" | 24-1/2" | 29-1/2" | 33-1/2" |
| B | 12" | 16-3/4" | 18-1/2" | 22-3/4" |
| C | 11" | 12" | 13" | 12" |
| D | 14" | 19" | 23-3/4" | 27-3/4" |
| E | 16" | 22" | 26-1/2" | 30-1/2" |
| F | 9" | 13-1/4" | 15" | 19-3/4" |
| G | 7" | 11-1/4" | 12-3/4" | 17" |
| H | 9" | 14-1/4" | 15-1/2" | 19-3/4" |
| I | 6" | 8-3/8" | 9-1/4" | 11-3/8" |
| J | 1-1/2" | 1-3/4" | 1-3/4" | 1-1/2" |
| K | 3/4" | 1-1/8" | 1" | 1" |
| L | 1/4" | 3/8" | 3/8" | 3/8" |
| M | 16" | 21" | 25-1/2" | 30-1/2" |
| N | 2-1/2" | 3-1/2" | 4" | 4" |
| | 5/8" OR 3/4" METER | 1" METER | 1-1/2" METER | 2" METER |

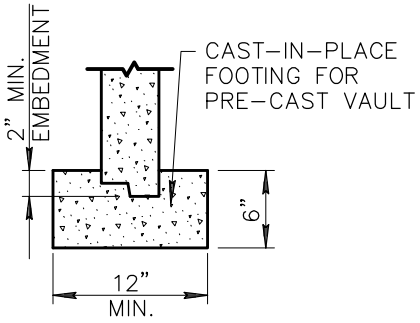
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 320 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | CONCRETE WATER METER BOXES | 01-01-1998 | 320 |

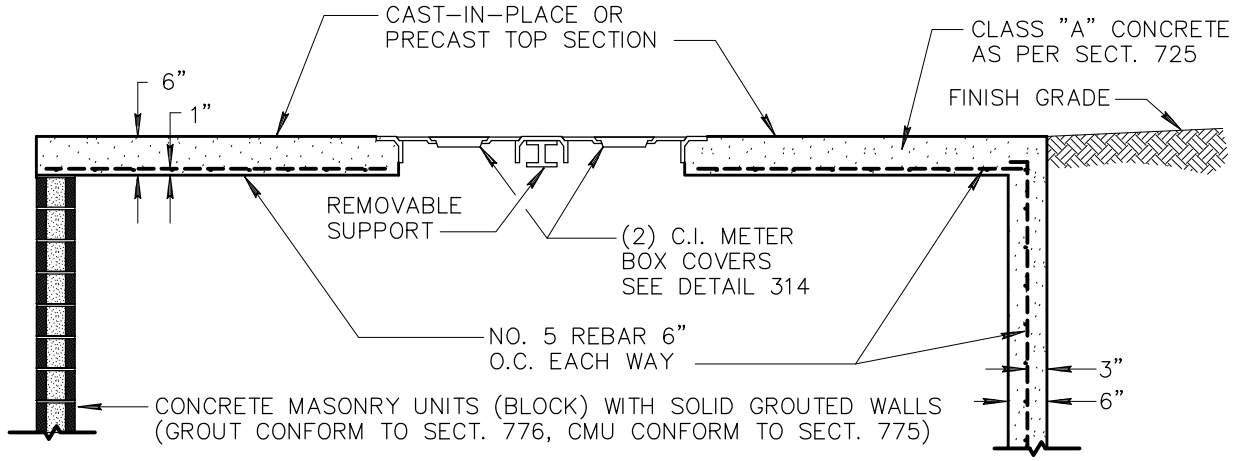


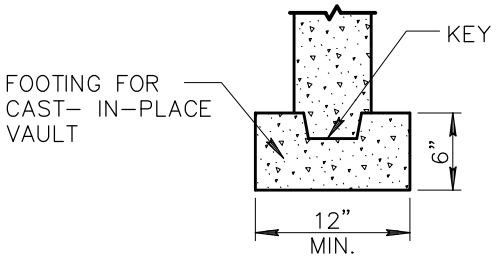




## PRE-CAST VAULT SECTION

NOTE: PRECAST REINFORCED VAULT SECTIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND DETAILS AS APPROVED BY ENGINEER.



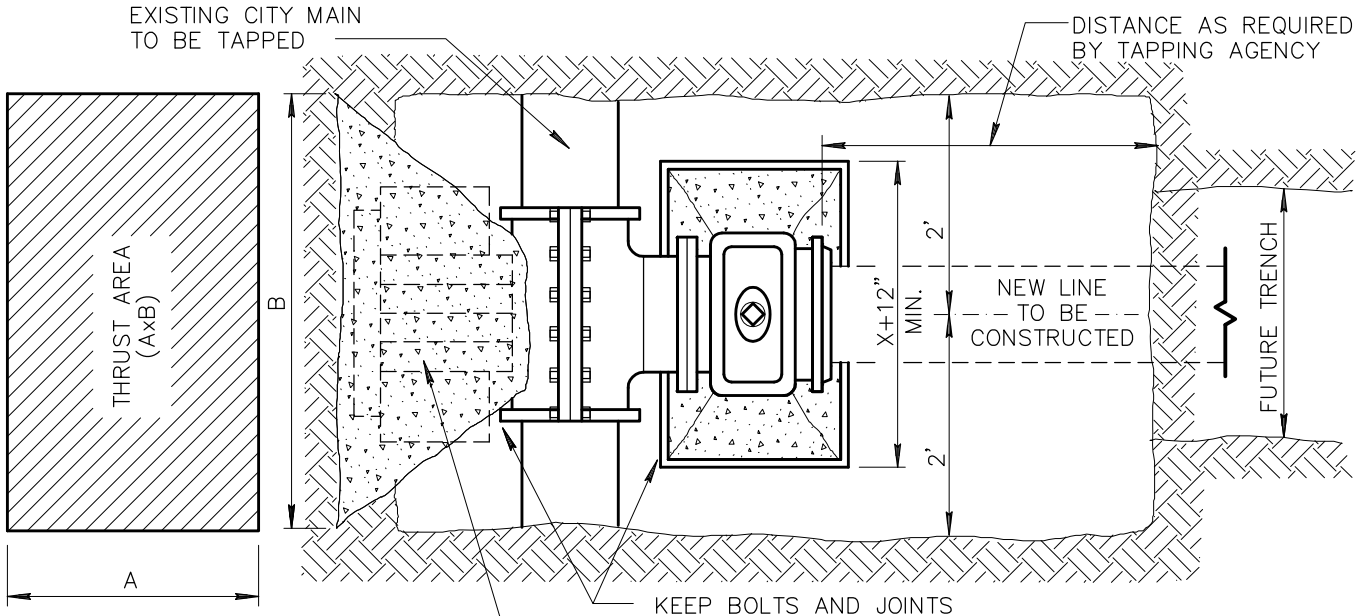



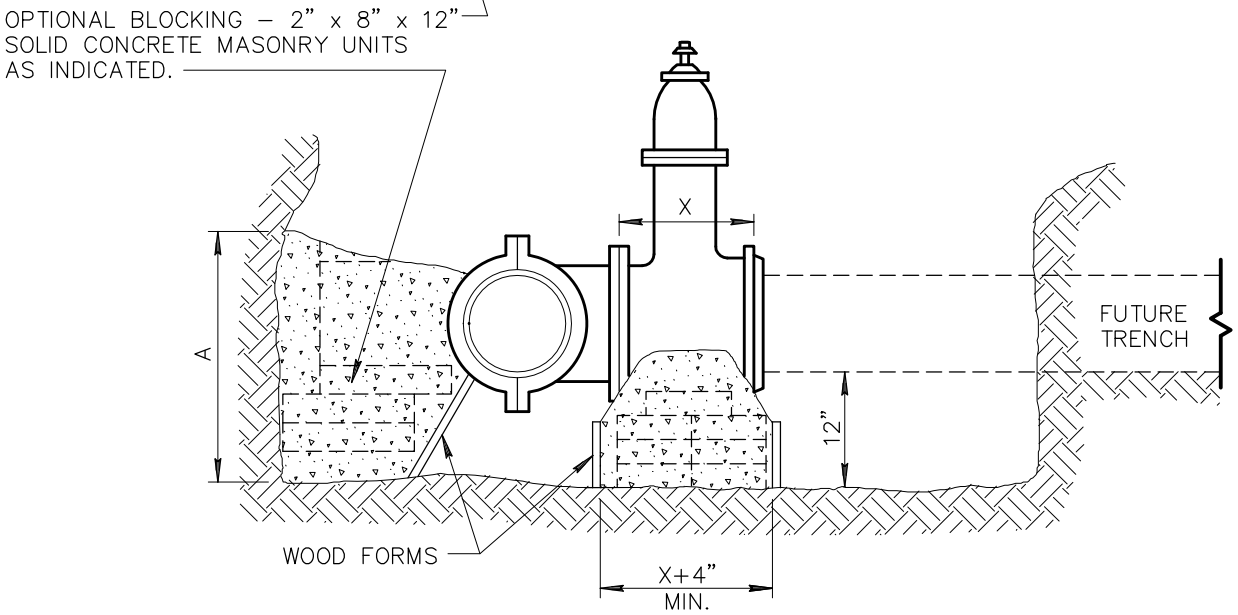

BLOCK MASONRY MAY BE USED IN LIEU OF CAST-IN-PLACE VAULT WALLS, NO. 4 REBAR IN EVERY OTHER CORE.

## CAST-IN-PLACE VAULT SECTION

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 321 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | STANDARD WATER METER VAULT | 01-01-1998 | 321 |




PLAN



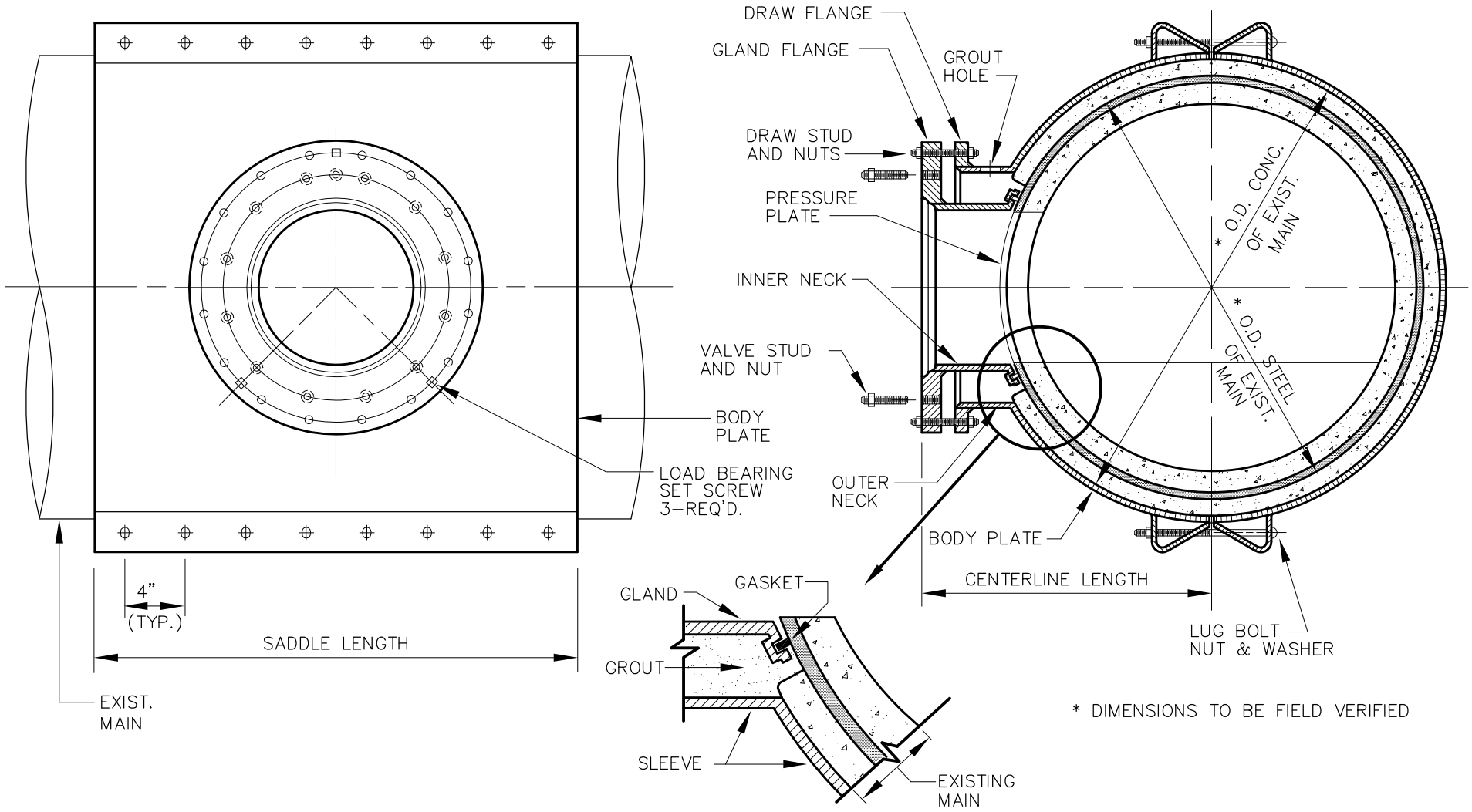

ELEVATION

## NOTES:

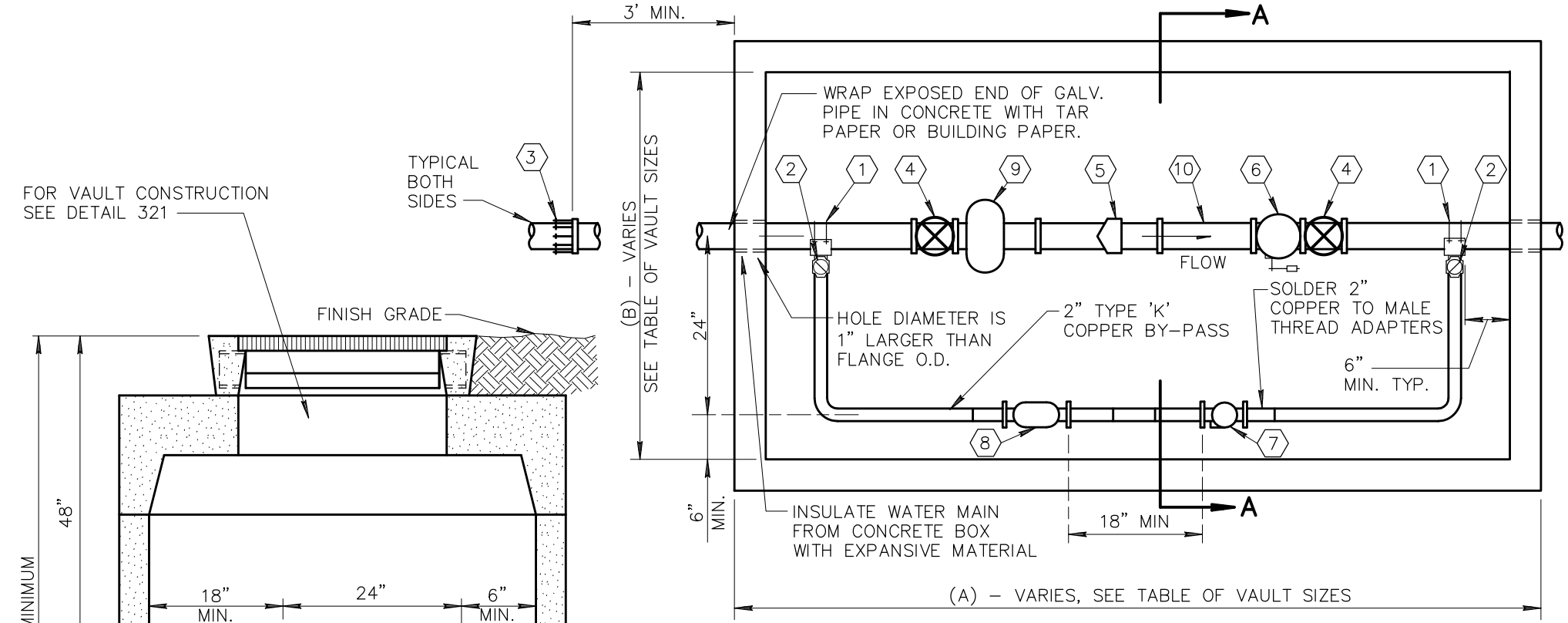
1. TAPPING SLEEVE TO BE PLACED A MINIMUM OF 18" FROM ANY BELL COUPLING, VALVE, FITTING OR OTHER OBSTRUCTION
2. CONTRACTOR SHALL EXCAVATE AS SHOWN AND SHALL SET TAPPING SLEEVE AND VALVE AND TIGHTEN ALL BOLTS PRIOR TO THE PRESSURE TEST.
3. ALL TAPPING SLEEVES AND VALVES MUST BE PRESSURE TESTED PRIOR TO BLOCKING OR TAPPING. THE TEST MUST BE WITNESSED AND APPROVED BY THE INSPECTOR.
4. BLOCKS ARE TO EXTEND TO UNDISTURBED GROUND AND BE INSTALLED BEFORE THE TAP IS MADE. ALL FLANGE BOLTS SHALL BE FREE AND CLEAR OF CONCRETE.
5. CONCRETE THRUST BLOCKS SHALL BE CLASS 'B' PER SECT. 725. NORMALLY, CURE TIME FOR CONCRETE IS 24 HOURS BEFORE BACKFILLING.
6. TAPS SHALL BE MADE BY CITY CREWS AT PREVAILING RATES OR BY APPROVED CONTRACTORS WHEN ALLOWED BY AGENCY.
7. THIS DETAIL COVERS TAPPING SLEEVES 4" THROUGH 16" IN SIZE ON DUCTILE IRON, CAST IRON AND ASBESTOS CEMENT PIPE. ANY OTHER SIZE OR TYPE OF PIPE WILL REQUIRE A SEPARATE SUBMITTAL AND APPROVAL BY THE ENGINEER.

| SIZE OF PIPE BEING CONNECTED | MINIMUM THRUST AREA REQUIRED EQUALS (AxB) (SQUARE FEET) |
|---|---|
| 4" AND LESS | 3 |
| 6" | 4 |
| 8" | 6 |
| 10" | 9 |
| 12" | 13 |
| 16" | 23 |

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 340 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | INSTALLING TAPPING SLEEVES AND VALVES | 01-03-2002 | 340 |




| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 342 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | CONCRETE PRESSURE PIPE TAPPING SLEEVE | 01-01-1998 | 342 |



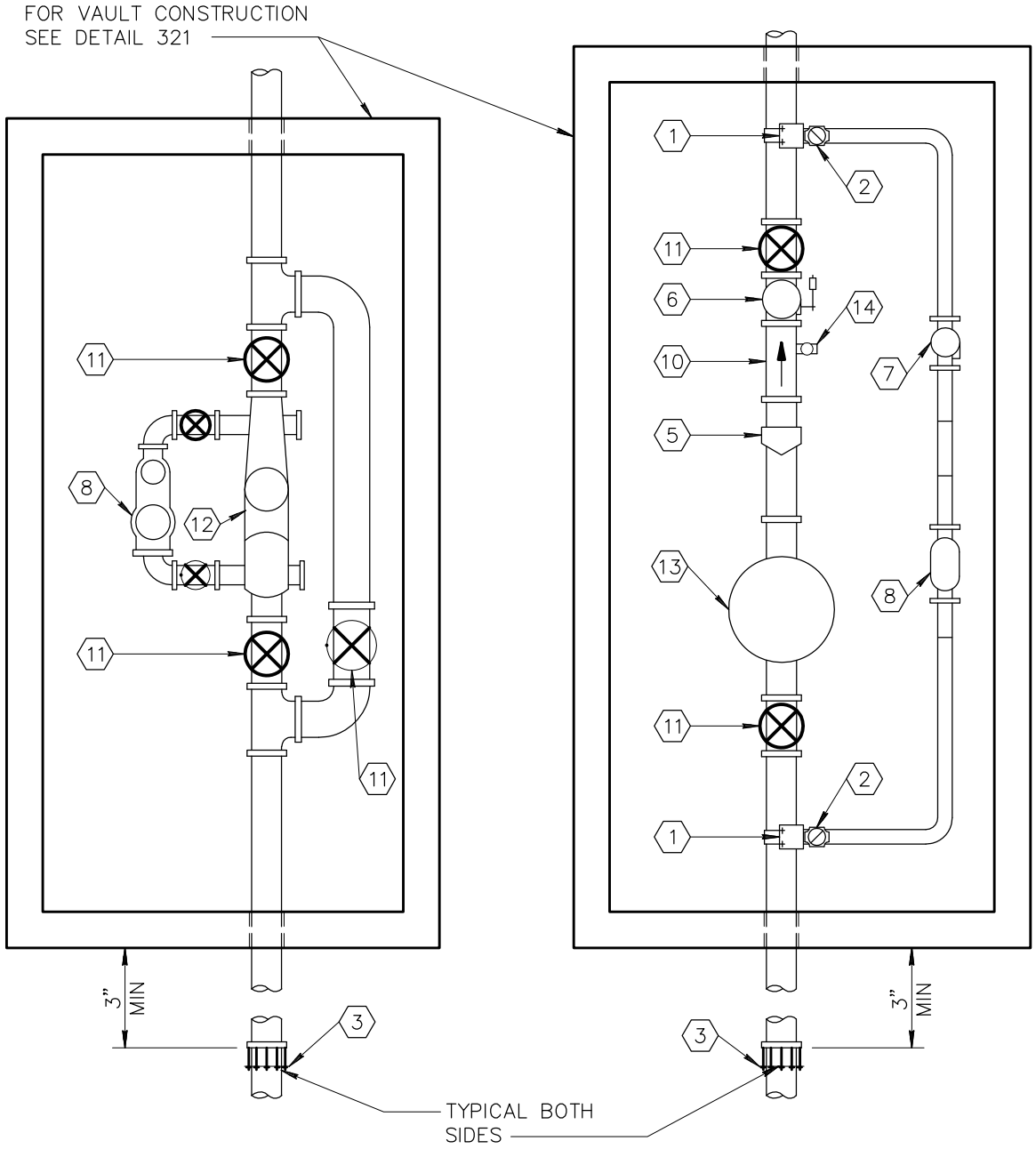

SECTION A–A

## VAULT DIMENSION DETAILS

| A.C.P. SIZE | 3" | 4" | 6" |
|---|---|---|---|
| (A) | 8'–4" | 10'–6" | 12'–0" |
| (B) | 4'–4" | 5'–0" | 5'–0" |

NOTE: METER VAULTS MAY BE EITHER CONCRETE MASONRY UNITS OR CAST–IN–PLACE OR PRE–CAST CONCRETE, SEE DETAIL 321 FOR VAULT CONSTRUCTION.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 345–1 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | 3", 4", 6" WATER METER | 01–01–1998 | 345–1 |



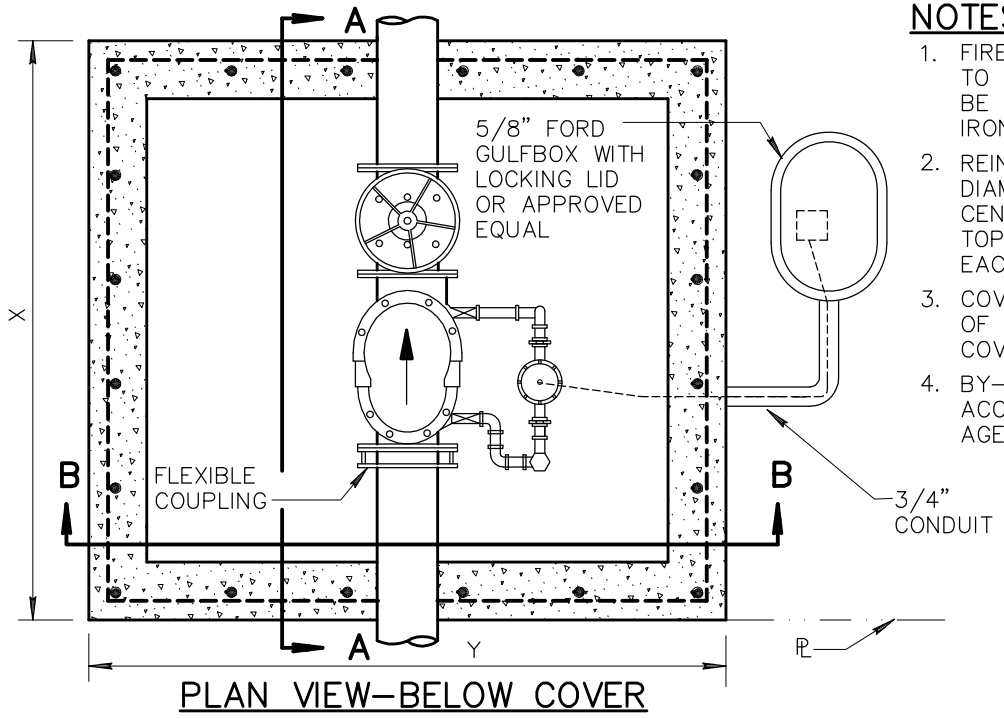

## LEGEND

1. DOUBLE STRAP ALL BRONZE SERVICE SADDLES.
2. CORP. STOP, 2" (BALL TYPE).
3. ADAPTER, FLANGED, TO MECH. JOINT FOR A.C.P.
4. GATE VALVE, FLANGED, WITH HAND WHEEL, OPEN LEFT.
5. TURBOMETER: ROCKWELL SERIES 'W' OR HERSEY SERIES 'M.H.R.' OR NEPTUNE TRIDENT TURBINE.
6. FLANGED SWING CHECK VALVE WITH EXTERNAL LEVER AND WEIGHT.
7. 2" BRONZE CHECK VALVE.
8. 2" TURBOMETER: ROCKWELL 'W-160' OR HERSEY 'M.H.R.' OR NEPTUNE TRIDENT TURBINE.
9. STRAINER (3", 4", 6") AVAILABLE FROM METER MANUFACTURER, INSTALL ONLY WHEN 'TURBO' IS USED.
10. FLANGED SPOOL (3 PIPE DIAMETERS IN LENGTH).
11. O.S.&Y. GATE VALVE, FLANGED WITH HAND WHEEL OPEN LEFT, AND RISING STEM.
12. TURBOMETER U.L. APPROVED: ROCKWELL W-5000 DR. OR W-2000 DR. OR HERSEY F.M.-C.T. OR NEPTUNE TURBINE-F.S.-U.L.
13. 6" OR 10" STRAINER, U.L. APPROVED.
14. 2" THREADED OUTLET AND GATE VALVE.

## NOTES

1. FOR LARGER METERS, SPECIAL VAULT DESIGN IS REQUIRED.
2. USE OF REMOTE READING DEVICE AT OPTION OF UTILTIY.
3. CERTAIN AGENCIES AND/OR UTILITIES PREFER TO CONSTRUCT VAULT, CONTACT AGENCY INVOLVED PRIOR TO VAULT CONSTRUCTION.

| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 345-2 | MARICOPA ASSOCIATION of GOVERNMENTS | STANDARD DETAIL ENGLISH | **4", 6" WATER METER WITH ON-SITE FIRE HYDRANTS** | 01-01-1998 | 345-2 |

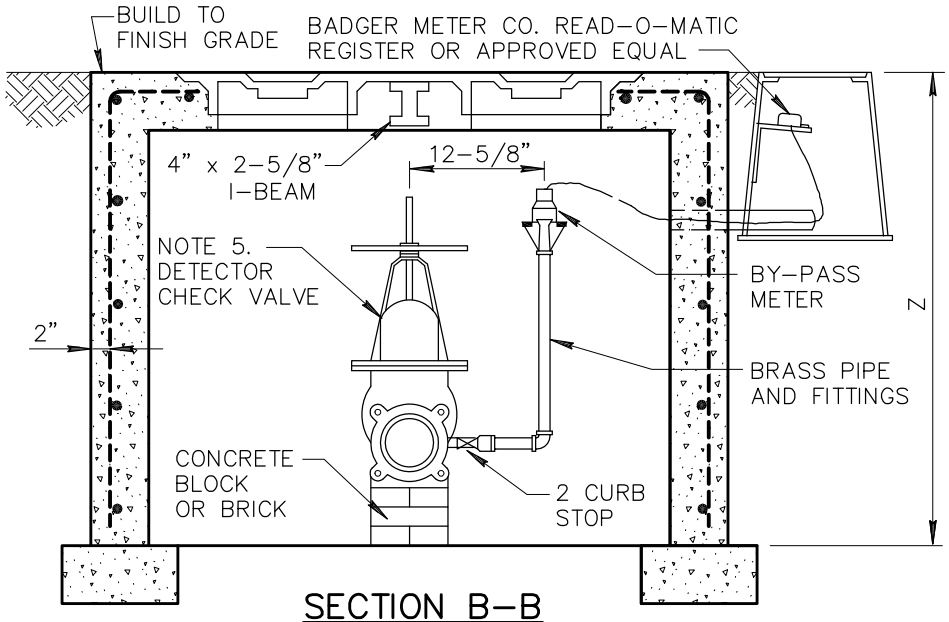



PLAN VIEW–BELOW COVER

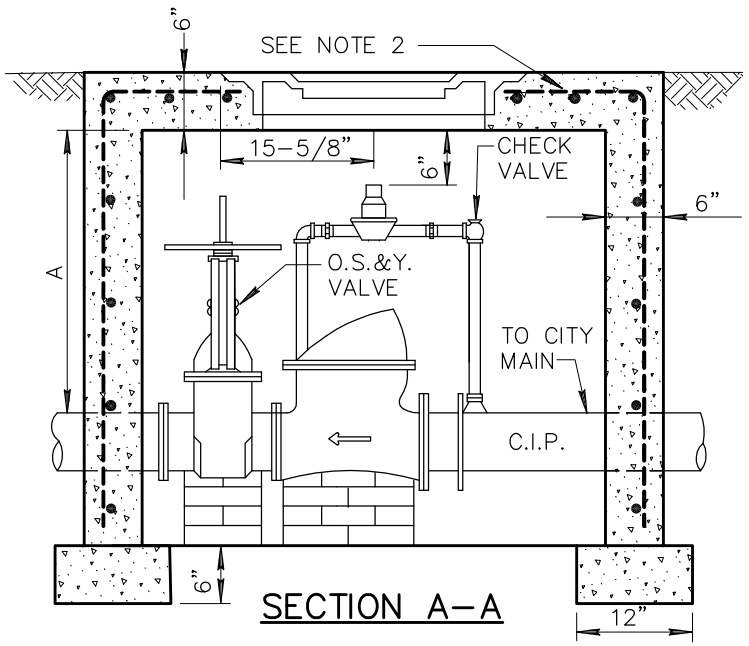
## NOTES:

1. FIRELINE FROM CITY MAIN TO PROPERTY LINE SHALL BE CONSTRUCTED OF CAST IRON PIPE.
2. REINFORCING TO BE 1/2" DIAMETER REBAR ON 6" CENTERS EACH WAY ON TOP AND 12" CENTERS EACH WAY ON THE SIDES.
3. COVERS TO CONSIST OF TWO METER BOX COVERS DET. 314.
4. BY–PASS METER TO BE ACCORDING TO GOVERNING AGENCY.
5. CHECK VALVE TO BE GLOBE MODEL "A" GRINNEL, HERSEY MODEL D.C., VIKING MODEL "A" OR APPROVED EQUAL.
6. VAULT SHALL BE CONSTRUCTED IN OWNERS PROPERTY AGAINST THE FRONT PROPERTY LINE OR ANOTHER APPROVED LOCATION. WALLS AND FENCES SHALL NOT OBSTRUCT ACCESS.
7. CITY CONTROL VALVE TO BE REQUIRED AT MAIN.
8. PARTS OF PIPE TO BE EMBEDDED IN CONC. SHALL BE WRAPPED WITH 30 LB ASPHALT ROOFING FELT.
9. REMOTE READING DEVICE SHALL BE OF SELF GENERATING ELECTRICAL TYPE. HYDRAULIC OR MECHANICAL DRIVE REGISTERS WILL NOT BE ACCEPTABLE.
10. CONCRETE TO BE CLASS 'B' PER SECT. 725.

| DIA. OF PIPE | X | Y | Z | BY–PASS METER SIZE | A |
|---|---|---|---|---|---|
| 4" | 60" | 66" | 49" | 5/8" x 3/4" | 30" |
| 6" | 66" | 72" | 49" | 5/8" x 3/4" | 30" |
| 8" | 72" | 72" | 58" | 1" | 36" |
| 10" | 78" | 72" | 69" | 1–1/2" | 36" |

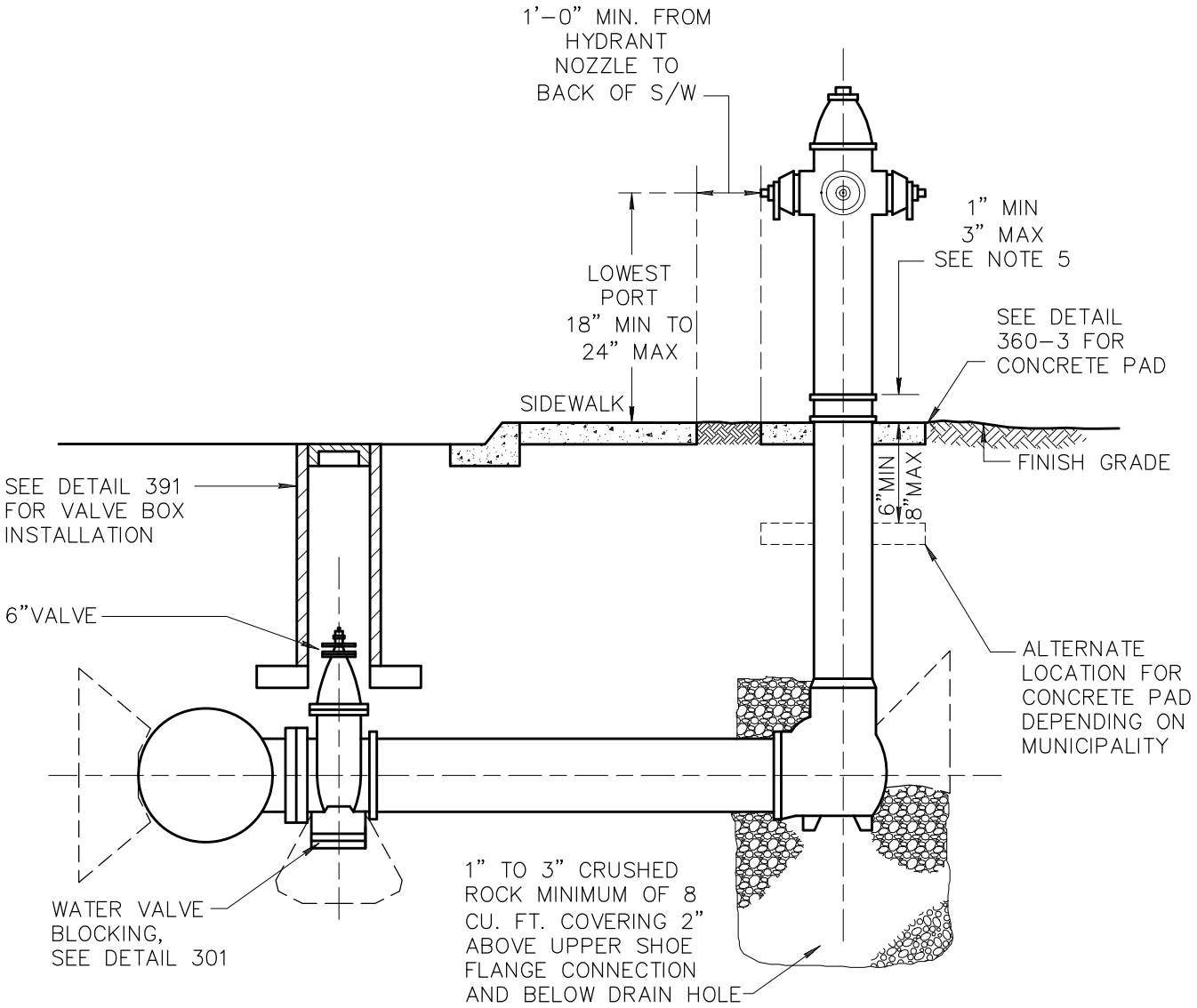



SECTION B–B




SECTION A–A

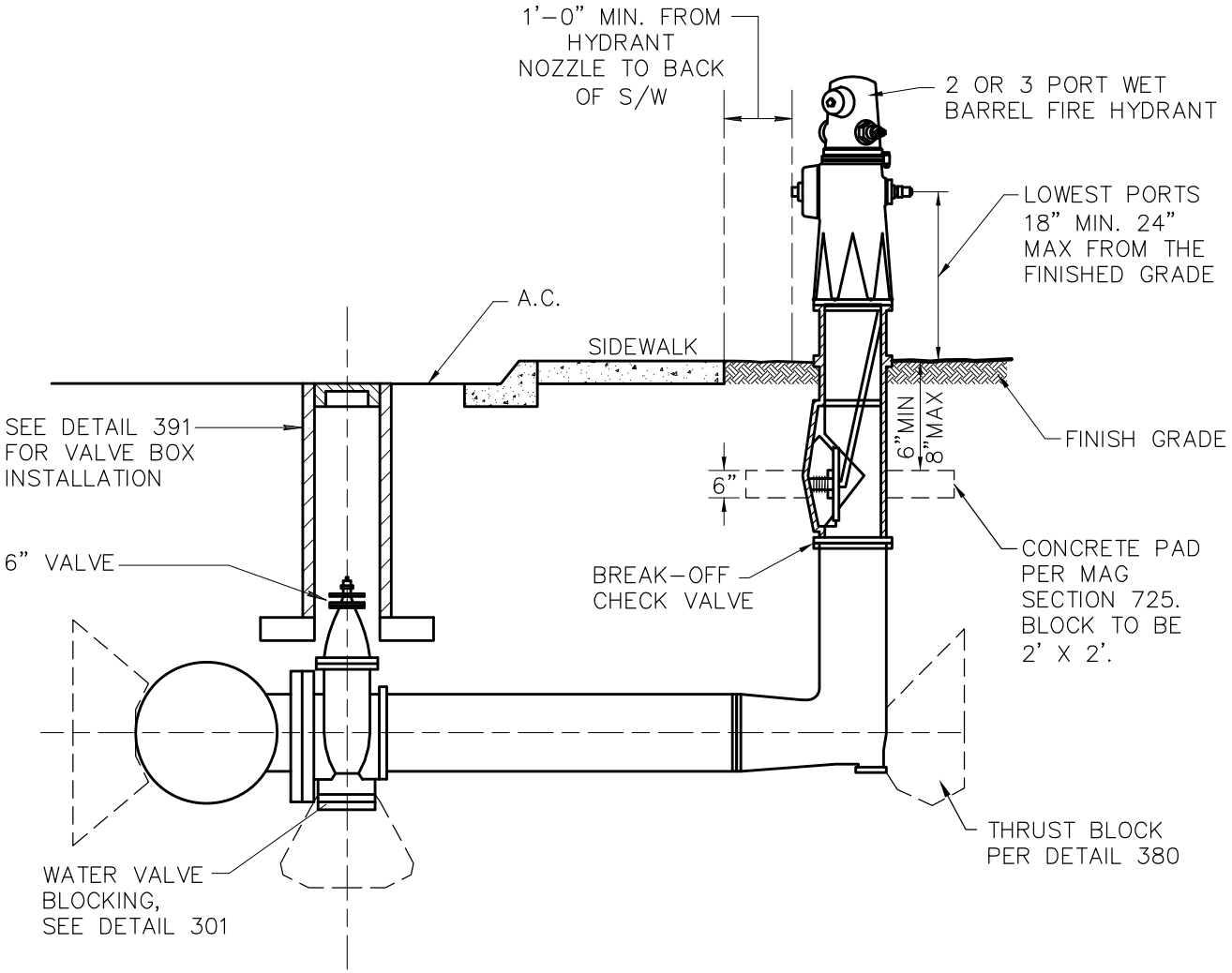
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 346 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | FIRE LINE DETECTOR CHECK VAULT | 01–01–1998 | 346 |




## NOTES:

1. JOINTS BETWEEN THE VALVE AND THE MAIN SHALL BE FLANGED TYPE. JOINTS BETWEEN THE VALVE AND HYDRANT SHALL BE RESTRAINT OR MECHANICAL TYPE.
2. RESTRAINTS SHALL BE MECHANICAL RESTRAINT OR THRUST BLOCK PER DETAIL 380.
3. A FLANGE JOINT BY MECHANICAL JOINT VALVE SHALL BE USED AS THE TRANSITION BETWEEN THE JOINT TYPES.
4. PIPING BETWEEN WATER VALVE AND HYDRANT SHALL BE DUCTILE IRON.
5. SEE DETAIL 362 FOR LOCATION OF HYDRANT.
6. PUMPER CONNECTION SHALL FACE THE STREET.
7. NO VALVES ARE TO BE LOCATED IN CURB.
8. NATIONAL STANDARD THREADS REQUIRED ON ALL CONNECTIONS UNLESS OTHERWISE DIRECTED.
9. SEE DETAIL 360–3 FOR CONCRETE PAD.
10. FIRE HYDRANT SHALL BE FRESHLY PAINTED PRIOR TO FINAL ACCEPTANCE.
11. SEE SECTION 756 FOR HYDRANT MATERIAL.

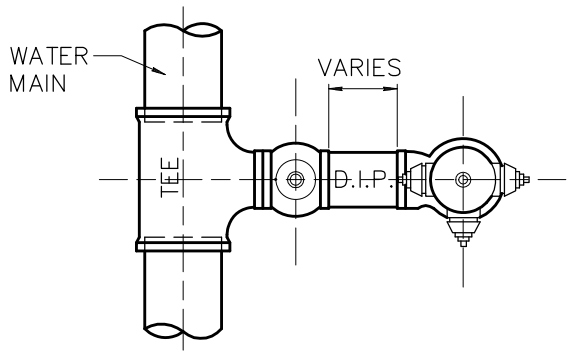
| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 360-1 | MARICOPA ASSOCIATION of GOVERNMENTS | STANDARD DETAIL ENGLISH | DRY BARREL FIRE HYDRANT INSTALLATION | 01–01–2013 | 360-1 |



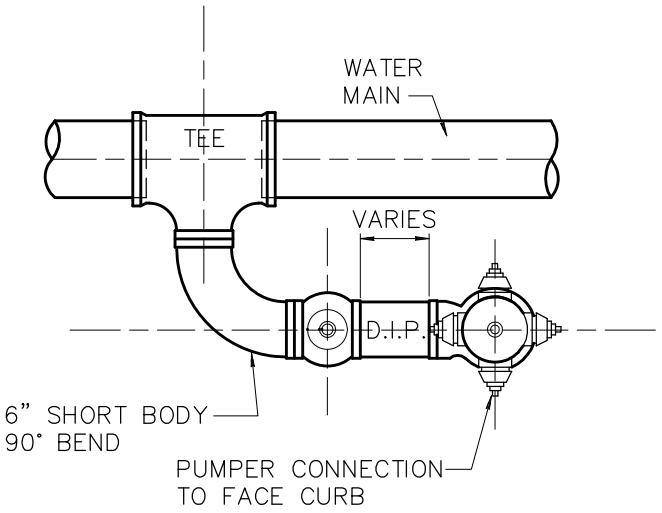

## NOTES:

1. JOINTS BETWEEN THE VALVE AND THE MAIN SHALL BE FLANGED TYPE. JOINTS BETWEEN THE VALVE AND HYDRANT SHALL BE MECHANICAL RESTRAINT MECHANICAL TYPE.
2. RESTRAINTS SHALL BE MECHANICAL RESTRAINT OR THRUST BLOCK PER DETAIL 380.
3. A FLANGE JOINT BY MECHANICAL JOINT VALVE SHALL BE USED AS THE TRANSITION BETWEEN THE JOINT TYPES.
4. PIPING BETWEEN WATER VALVE AND HYDRANT SHALL BE DUCTILE IRON.
5. SEE DETAIL 362 FOR LOCATION OF HYDRANT.
6. PUMPER CONNECTION SHALL FACE THE STREET.
7. NO VALVES ARE TO BE LOCATED IN CURB.
8. NATIONAL STANDARD THREADS REQUIRED ON ALL CONNECTIONS UNLESS OTHERWISE DIRECTED.
9. SEE DETAIL 360–3 FOR CONCRETE PAD.
10. FIRE HYDRANT SHALL BE FRESHLY PAINTED PRIOR TO FINAL ACCEPTANCE.
11. THE HYDRANT SHALL HAVE 2– 2½" PORT AND 1– 4½" PORT (INDUSTRIAL OR COMMERCIAL).
12. THE HYDRANT SHALL HAVE 1– 2½" PORT AND 1– 4½" PORT (RESIDENTIAL).

| DETAIL NO. | | STANDARD DETAIL | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 360-2 | MARICOPA ASSOCIATION of GOVERNMENTS | ENGLISH | WET BARREL FIRE HYDRANT INSTALLATION | 01–01–2013 | 360-2 |

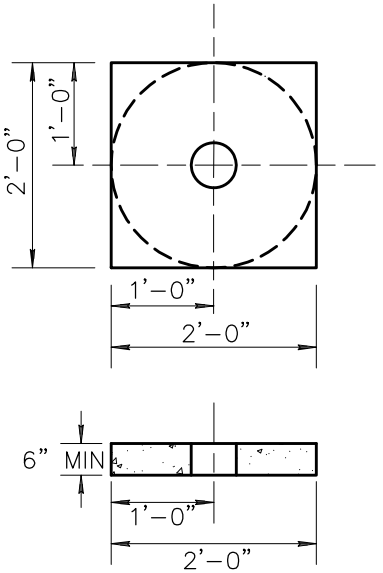



TYP MAIN CONNECTION
(PREFERRED)

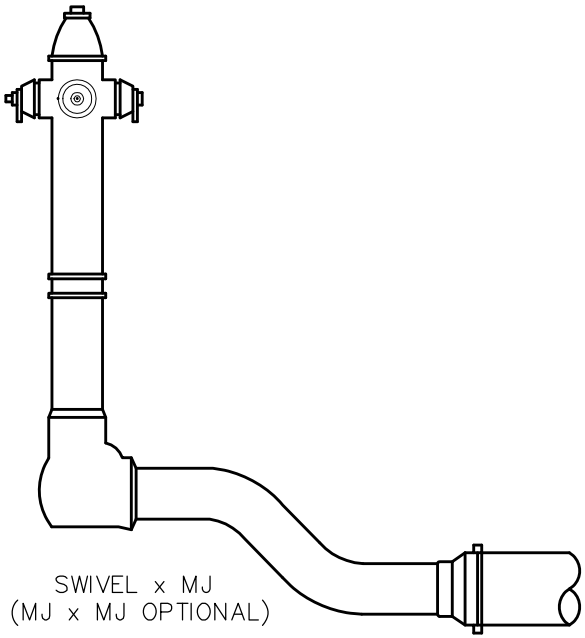



ALT MAIN
CONNECTION

SQUARE OR ROUND IS ACCEPTABLE
IF ROUND: 24" DIAMETER MIN. REQUIRED




CONCRETE PAD
LOCATION DETAIL




OFFSET FITTINGS

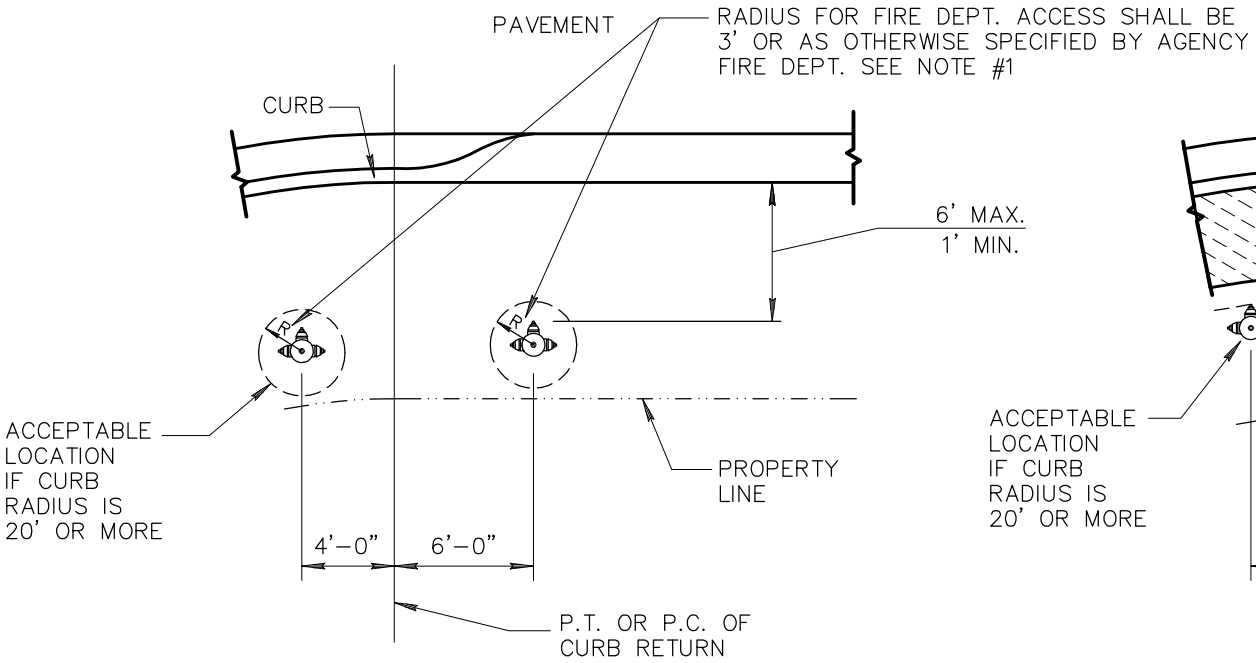
## NOTES:

1. CONCRETE FOR PAD SHALL BE CLASS "A".
2. SCORE LINE SHALL BISECT CONCRETE PAD AT MID POINT OF ALL SIDES.
3. CONCRETE COLOR SHALL MATCH ADJACENT CONCRETE. THE FINISHED CONCRETE SURFACE SHALL HAVE A ROUGH BROOM FINISH (SURFACE ONLY).
4. MULTIPLE OFFSET FITTINGS SHALL NOT BE ALLOWED.
5. MINIMUM 36" CLEARANCE PER NFPA-24 AROUND FIRE HYDRANT.
6. 1/2" BITUMINOUS EXPANSION SHALL BE PLACED AROUND THE BARREL OF THE FIRE HYDRANT AT THE CONCRETE PAD.

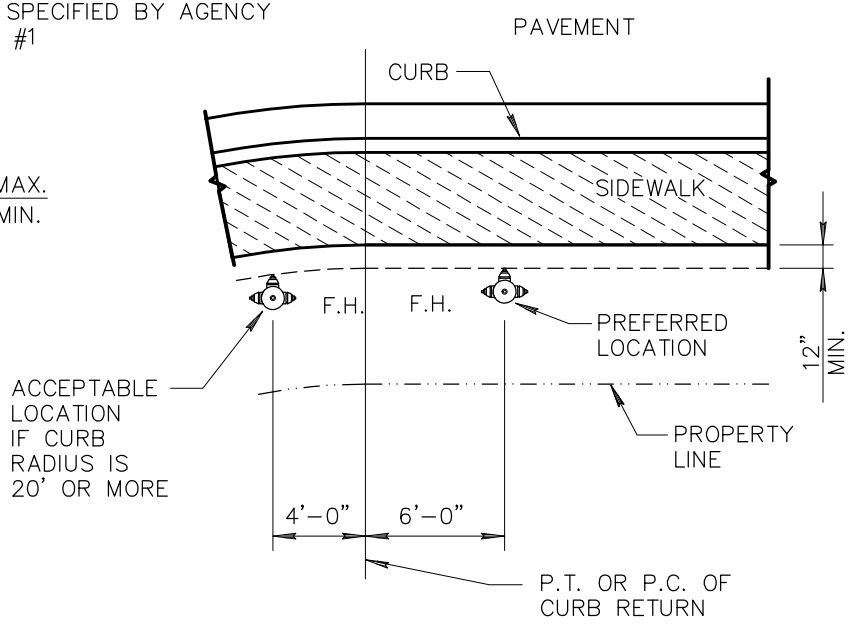
| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 360-3 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | FIRE HYDRANT INSTALLATION DETAILS | | 01-01-2013 | 360-3 |

## NOTES:

1. OBSTRUCTIONS SUCH AS UTILITY POLES, STREET SIGNS, IRRIGATION BOXES, FENCES, ETC., MUST NOT BE PLACED BETWEEN CURB AND HYDRANT AND WITHIN THE RADIUS FOR FIRE DEPT. ACCESS.
2. DIMENSIONS SHOWN ON CONSTRUCTION DRAWINGS SUPERSEDE LOCATIONS SHOWN HERE.
3. ON LOCATIONS IN MIDBLOCK, THE FIRE HYDRANT WILL BE ALIGNED WITH A PROPERTY LINE.

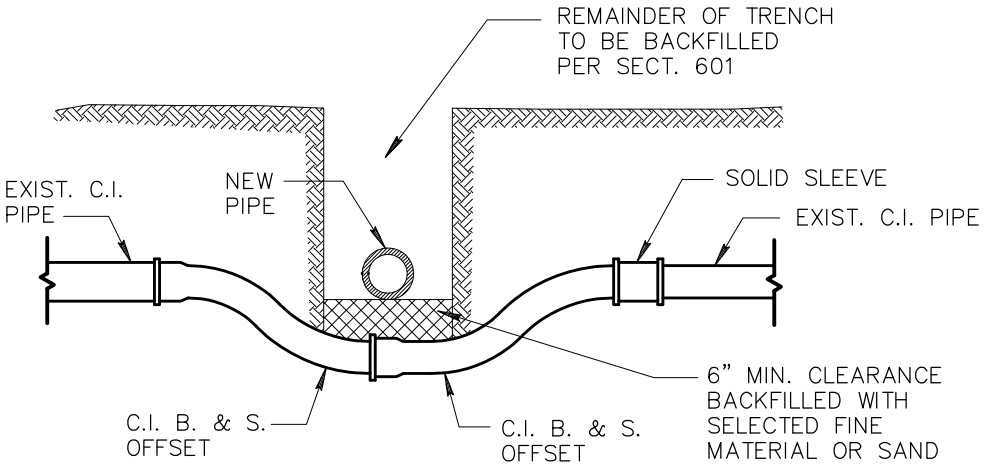



PARKWAY AREA OR NO SIDEWALK

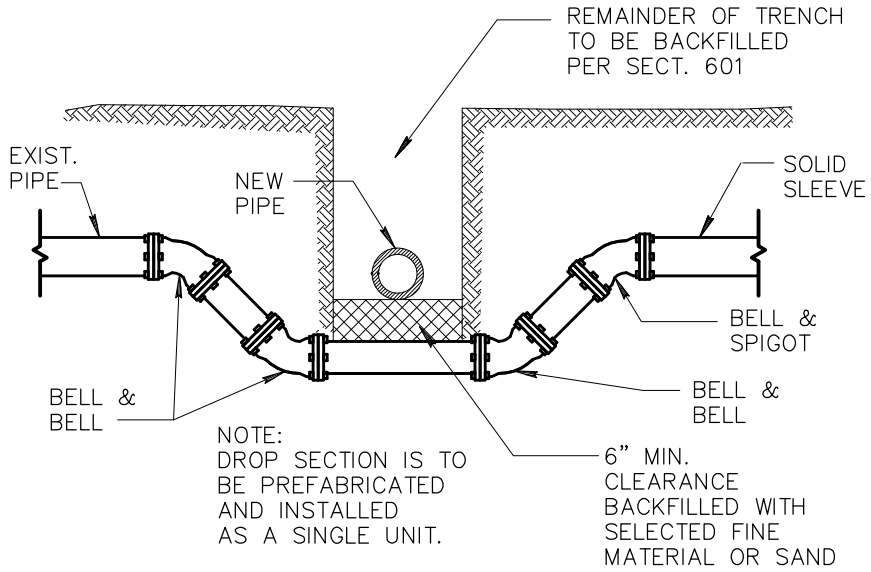



AREA WITH SIDEWALK

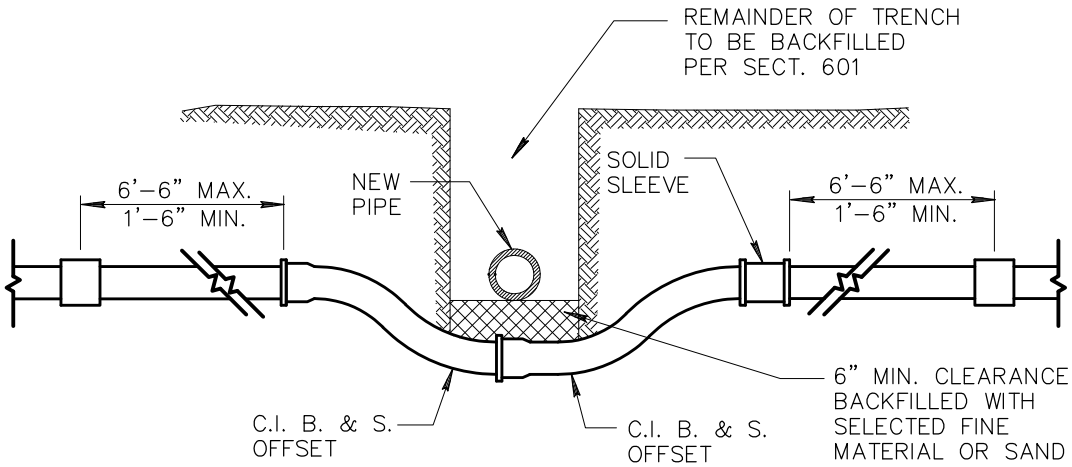
| DETAIL NO. | | STANDARD DETAIL | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 362 | MARICOPA ASSOCIATION of GOVERNMENTS | ENGLISH | LOCATIONS FOR NEW FIRE HYDRANTS | 01-01-1999 | 362 |




## CAST IRON




## CAST IRON MECHANICAL JOINT



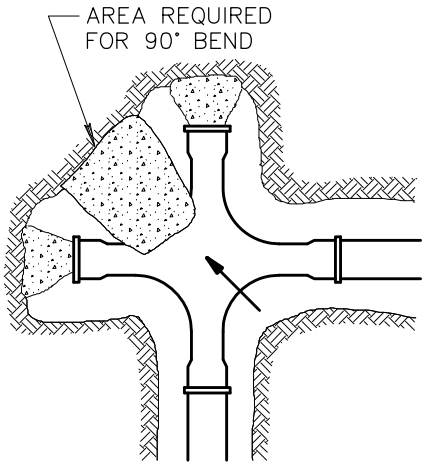

## ASBESTOS CEMENT

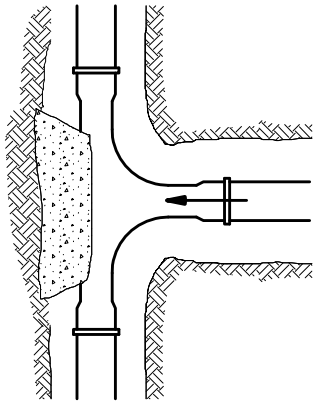
## NOTES:

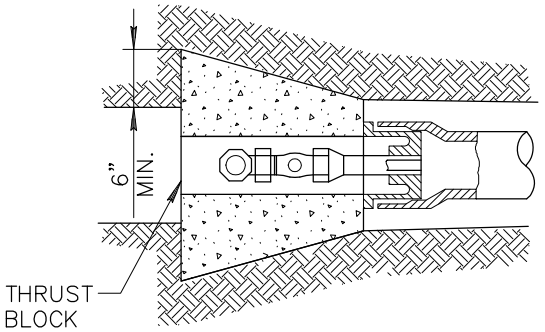
1. THIS DETAIL COVERS MOVING OF WATER MAINS 2" TO 12" ONLY.
2. THRUST BLOCKING AS PER DET. 380 & 381.
3. IF OFFSET IS TO GO OVER OBSTRUCTION, JOINT RESTRAINTS MUST BE USED.
4. PIPE IS TO BE CAST IRON OR DUCTILE IRON.

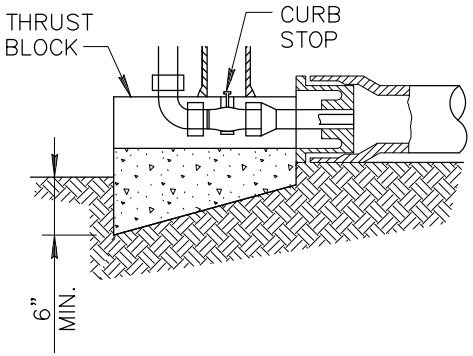
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 370 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | VERTICAL REALIGNMENT OF WATER MAINS | 01-01-1998 | 370 |

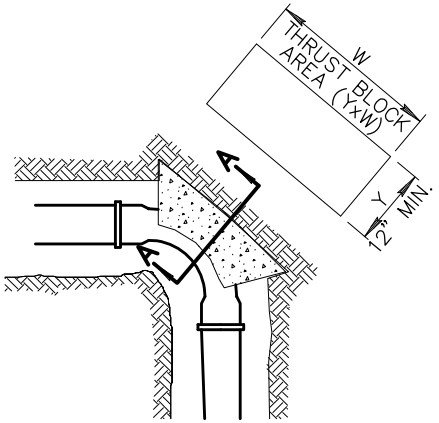
# TYPICAL LOCATIONS OF THRUST BLOCKS

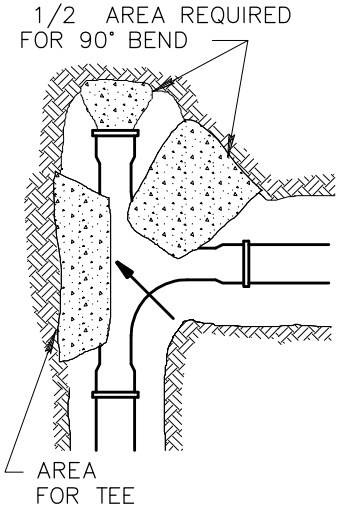


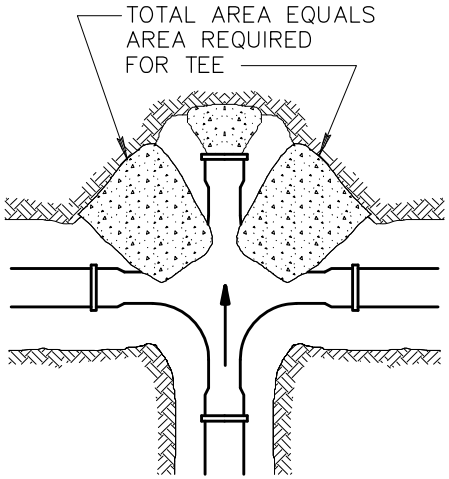



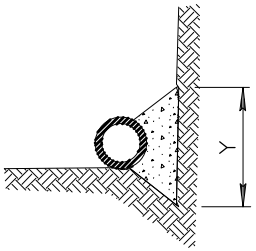



SECTION A–A

## NOTES:

1. TABLE IS BASED ON 200 P.S.I. TEST PRESSURE AND 3,000 LBS/SQ FT. SOIL. IF CONDITIONS ARE FOUND TO INDICATE SOIL BEARING IS LESS, THE AREAS SHALL BE INCREASED ACCORDINGLY.
2. AREAS FOR PIPES LARGER THAN 16" SHALL BE CALCULATED FOR EACH PROJECT.
3. FORM ALL NON–BEARING VERTICAL SURFACES.
4. THRUST BLOCKS ARE TO EXTEND TO UNDISTURBED GROUND. CONCRETE TO BE CLASS 'C', SECT. 725.

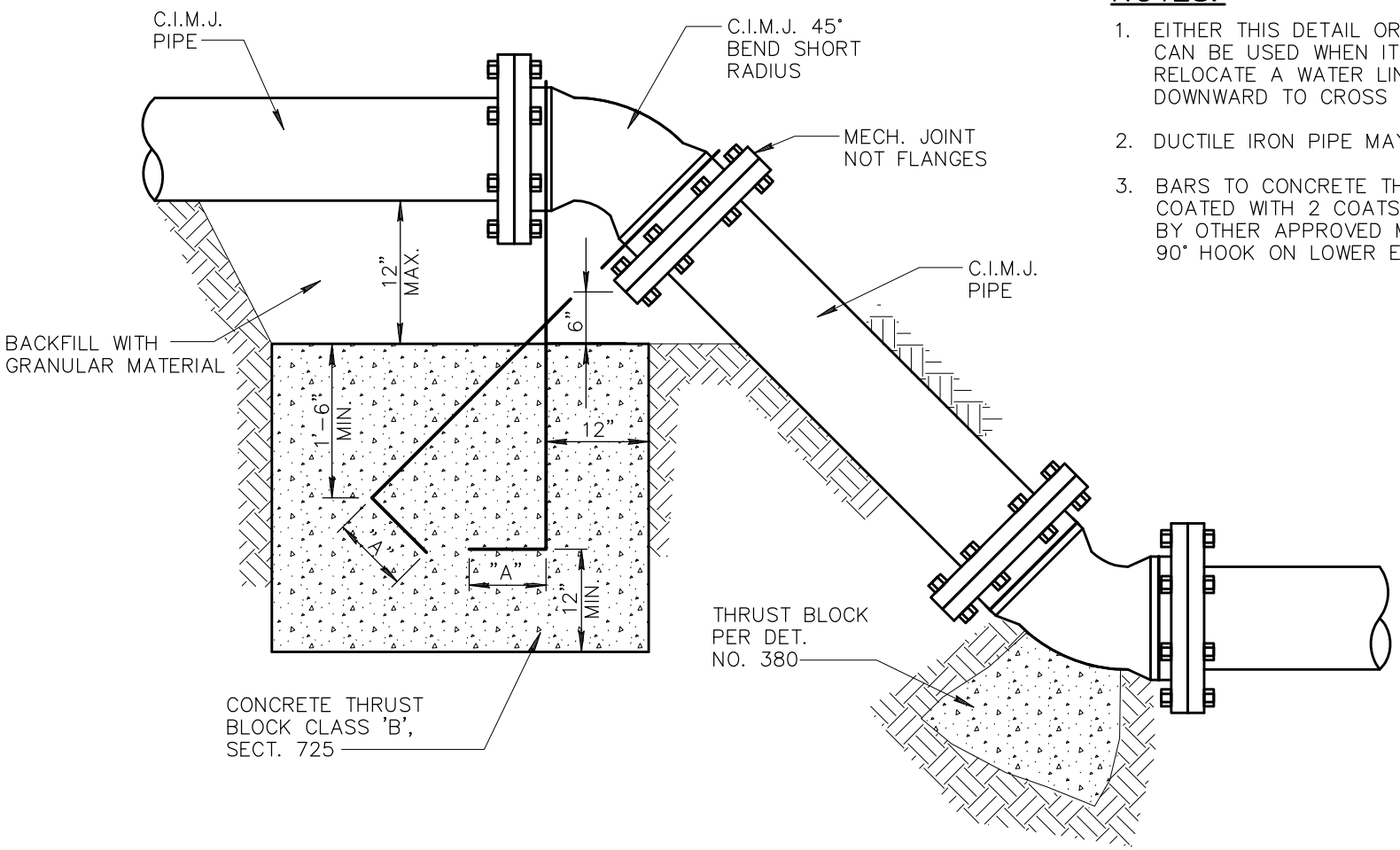
**MINIMUM THRUST BLOCK AREA REQUIRED (YxW) (SQ. FT.)**

| PIPE SIZE | WATER PIPE | |
|---|---|---|
| | TEE, DEAD END, 90° BEND | 45° & 22 1/2° BENDS |
| 4" OR LESS | 3 | 3 |
| 6" | 4 | 3 |
| 8" | 6 | 3 |
| 10" | 10 | 5 |
| 12" | 14 | 7 |
| 16" | 24 | 12 |

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 380 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | THRUST BLOCKS FOR WATER LINES | 01–01–1998 | 380 |

| PIPE SIZE | MIN BAR SIZE | "A"–DIMENSION HOOK | MIN. * BLOCK DIM. |
|---|---|---|---|
| 6" | #6 | 6" | 3' x 3' x 3' |
| 8" | #6 | 9" | 4' x 4' x 2.5' |
| 12" | #8 | 9" | 4' x 4' x 5' |

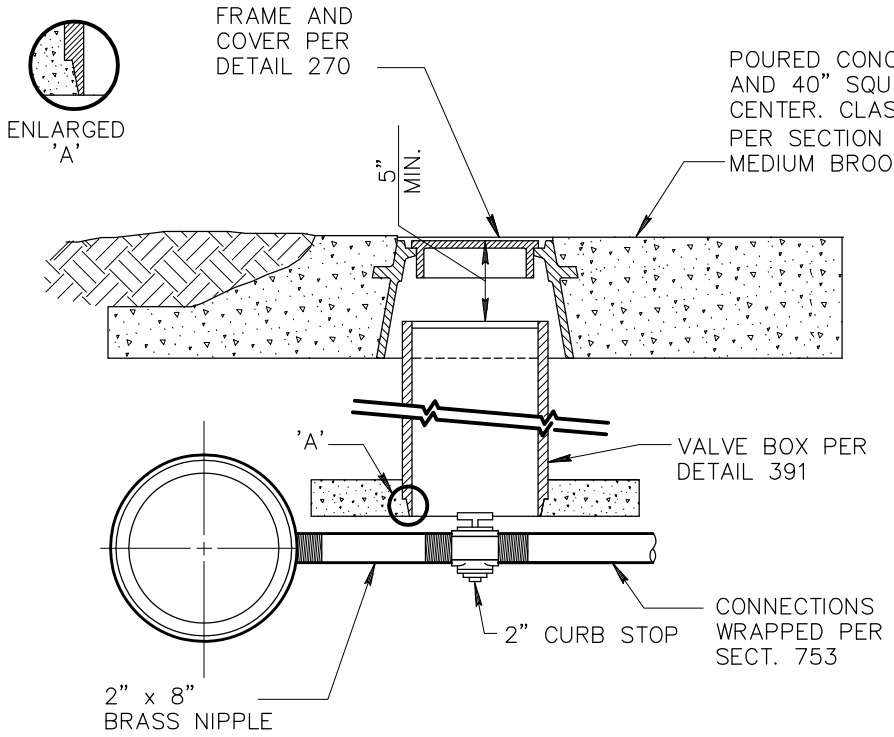
* FOR 125 P.S.I. WORKING PRESSURE.



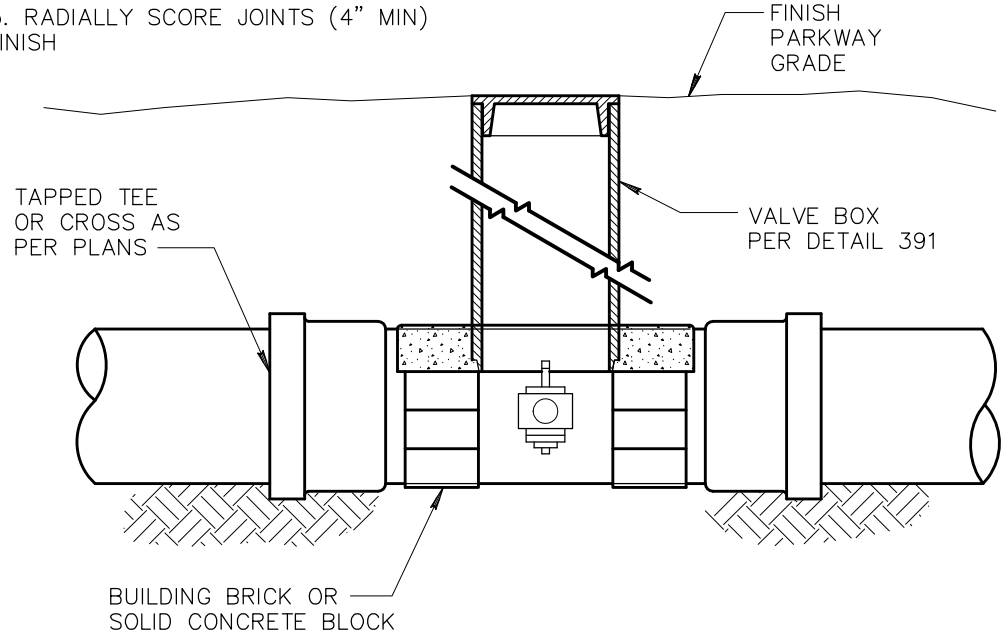

## NOTES:

1. EITHER THIS DETAIL OR RESTRAINT RODS CAN BE USED WHEN IT IS ALLOWED TO RELOCATE A WATER LINE UPWARD OR DOWNWARD TO CROSS A CONFLICT.
2. DUCTILE IRON PIPE MAY BE USED.
3. BARS TO CONCRETE THRUST BLOCK TO BE COATED WITH 2 COATS COAL TAR, EPOXY OR BY OTHER APPROVED METHOD. BARS TO HAVE 90° HOOK ON LOWER END, AS PER TABLE.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 381 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | ANCHOR BLOCKS FOR VERTICAL BENDS | 01–01–1998 | 381 |




TYPE 'A'




TYPE 'B'

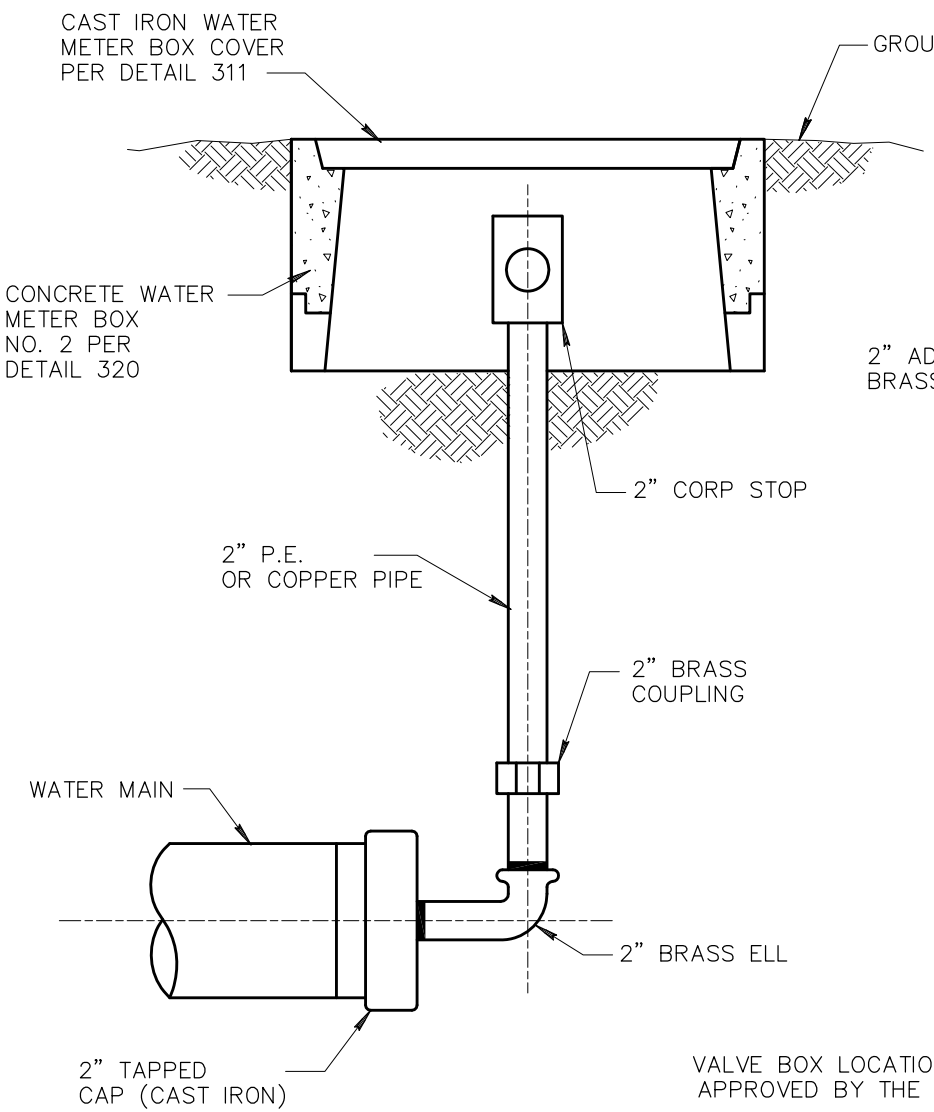
## NOTES:

1. CURB STOP TO BE MUELLER ORISEAL (H–10283), FORD BALL VALVE B11–777, HAYES BULLETIN 400, J. JONES (J–1900) OR APPROVED EQUAL.
2. REDUCER MAY BE USED WHEN CONNECTING TO SMALLER GALVANIZED PIPE.
3. THIS DETAIL IS TO BE USED WHEN CONNECTING EXISTING GALVANIZED PIPE TO ASBESTOS CEMENT PIPE OR CAST IRON PIPE.

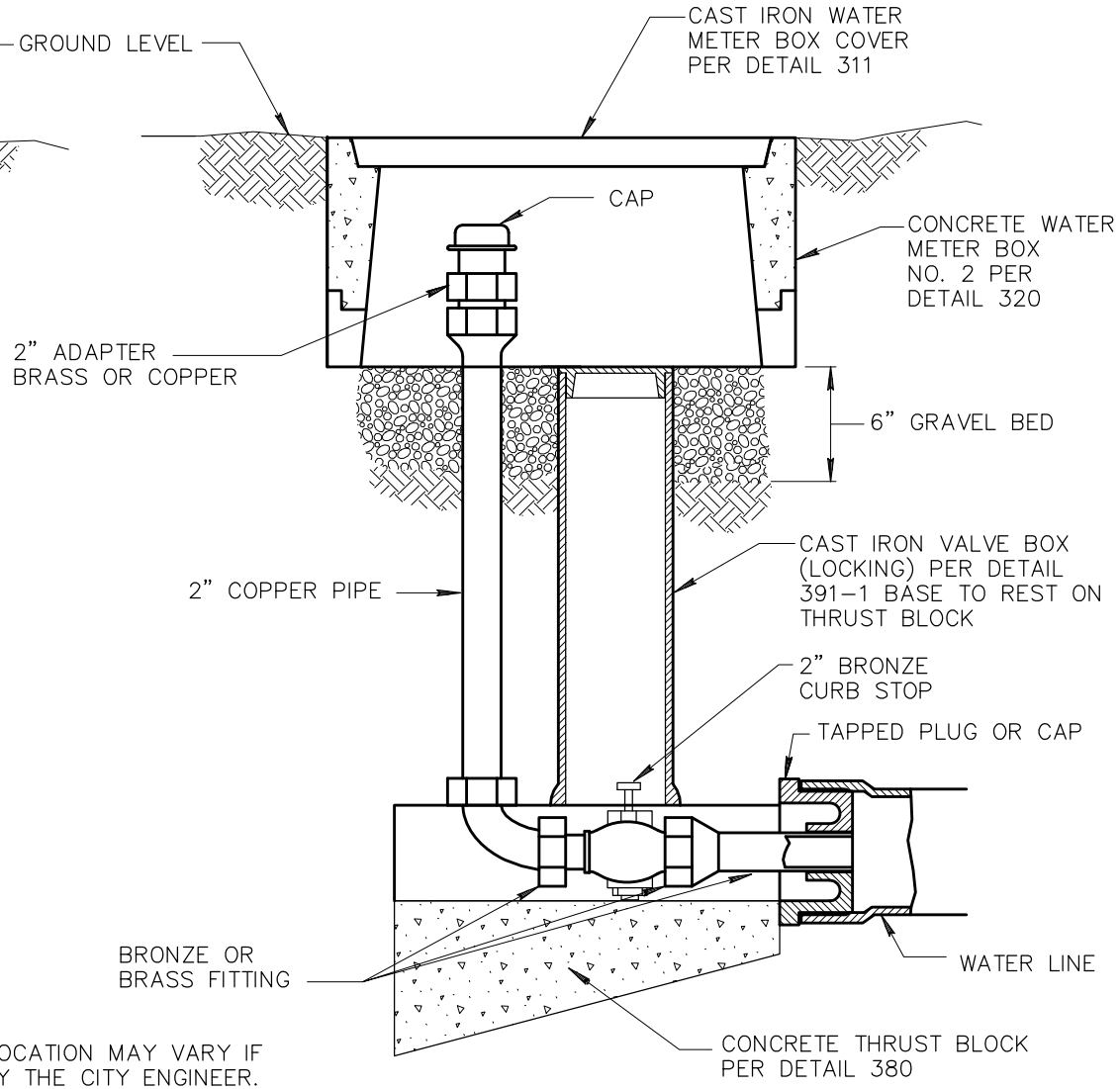
## NOTE:

1. VALVE BOX TO BE SUPPORTED ON BRICKS TO PREVENT VERTICAL LOADS FROM BEING TRANSMITTED TO THE SMALL PIPE.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 389 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | CURB STOP WITH VALVE BOX AND COVER | 01–01–2001 | 389 |



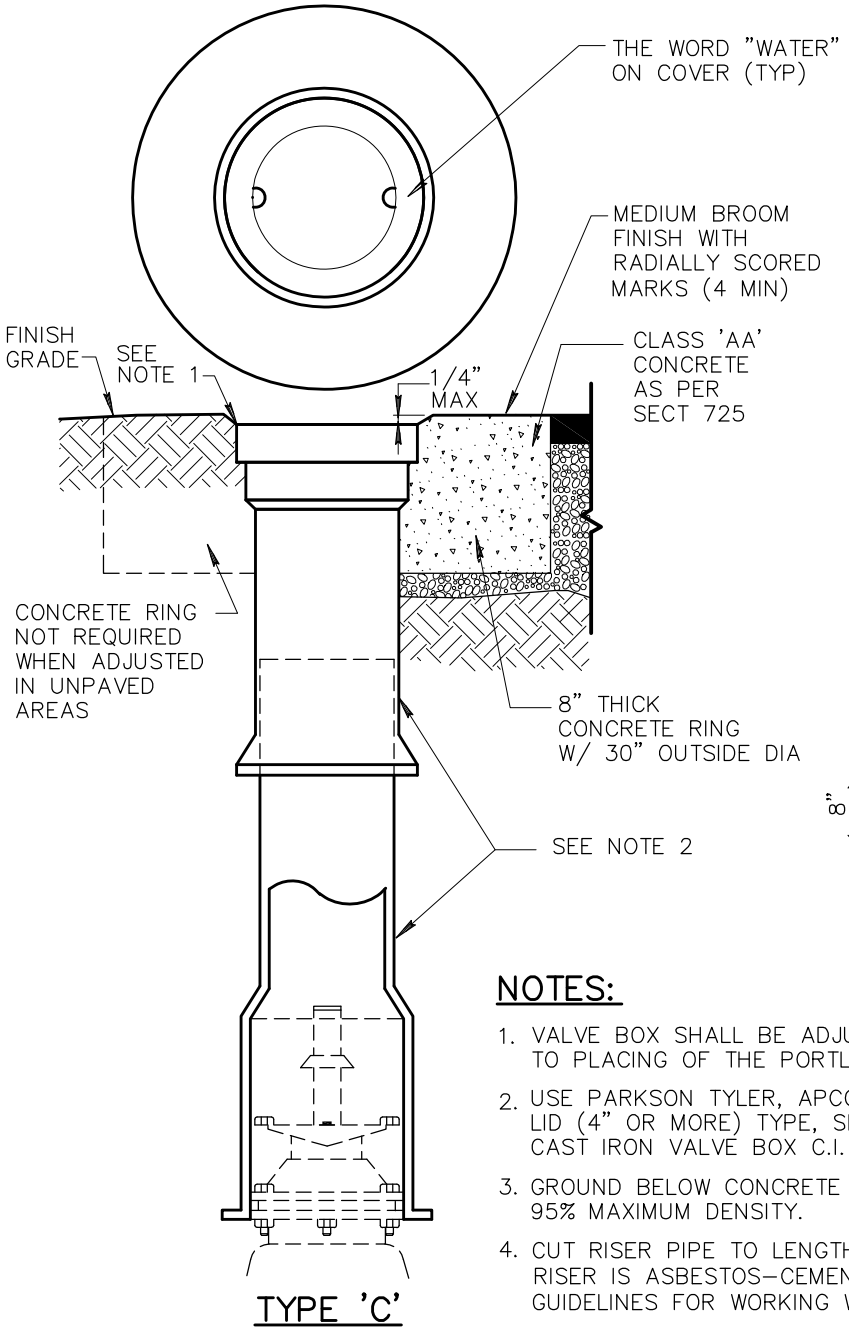

TYPE 'A'



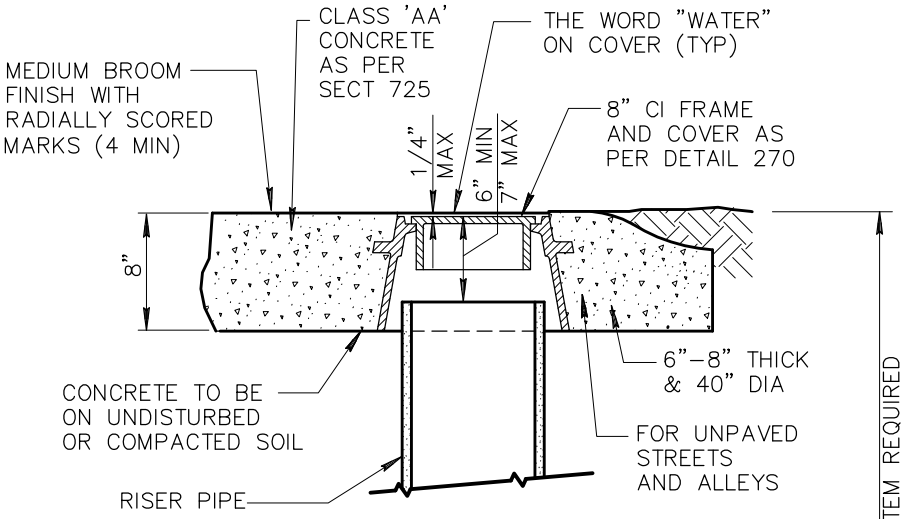

TYPE 'B'

VALVE BOX LOCATION MAY VARY IF APPROVED BY THE CITY ENGINEER.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 390 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | CURB STOP WITH FLUSHING PIPE | 01-01-1998 | 390 |

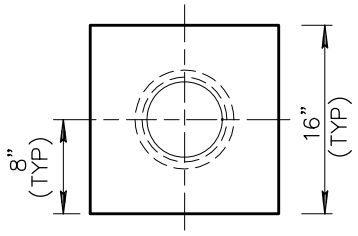



TYPE 'C'

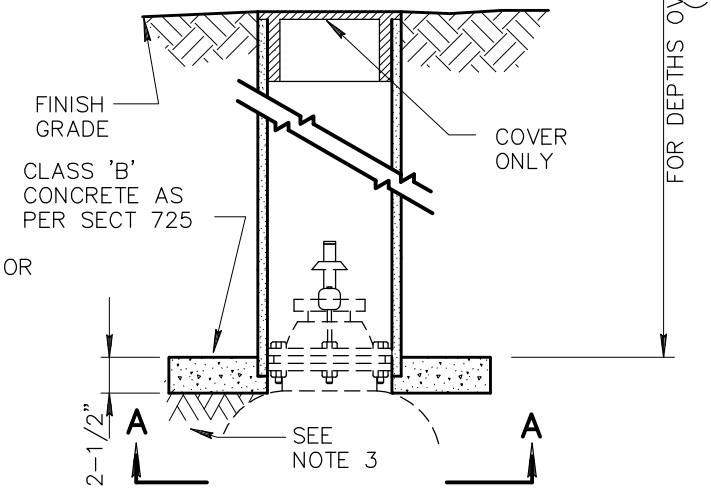



TYPE 'A'

(TO BE USED IN AREAS SUBJECT TO VEHICULAR TRAFFIC)




VIEW A–A



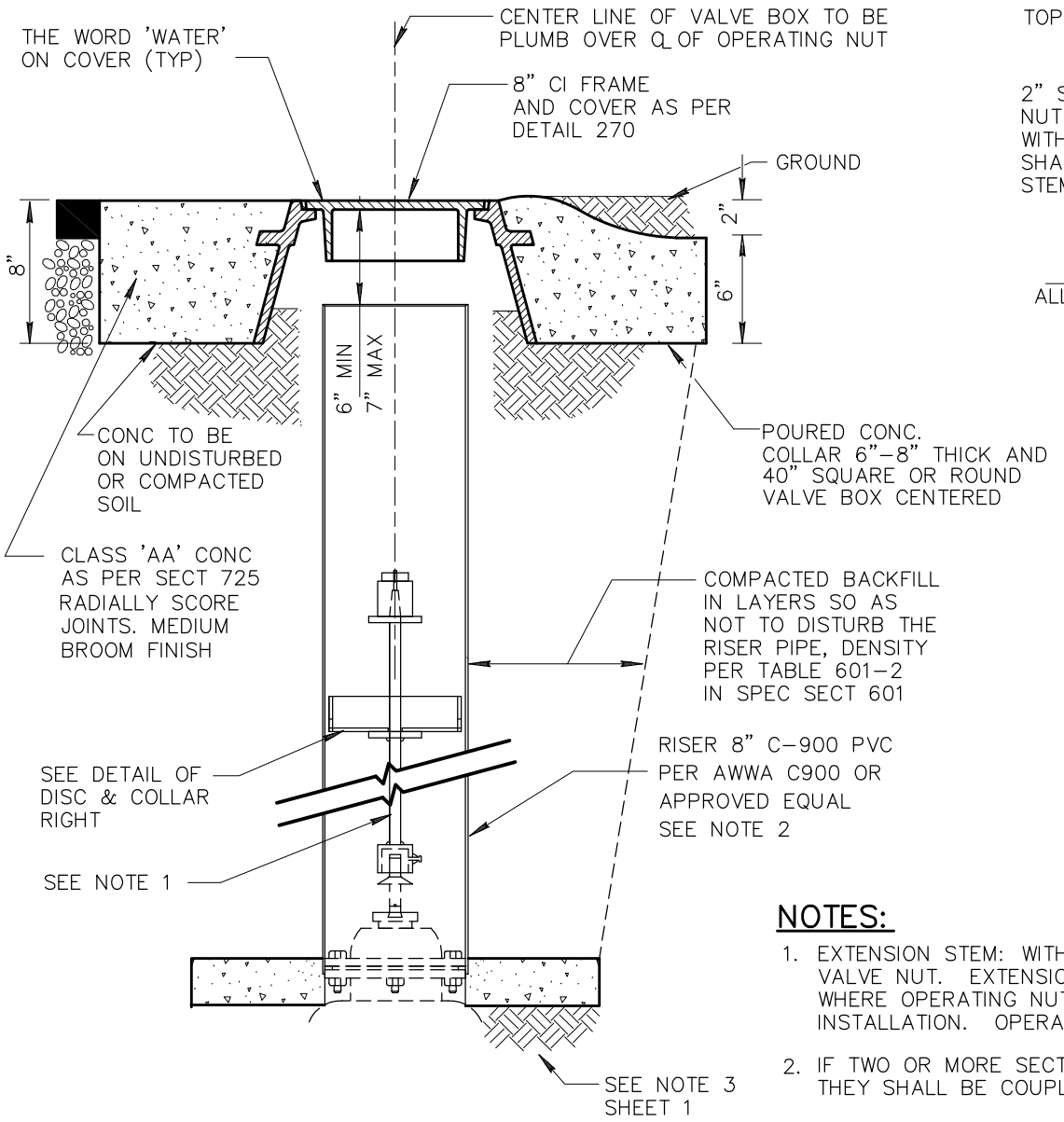

TYPE 'B'

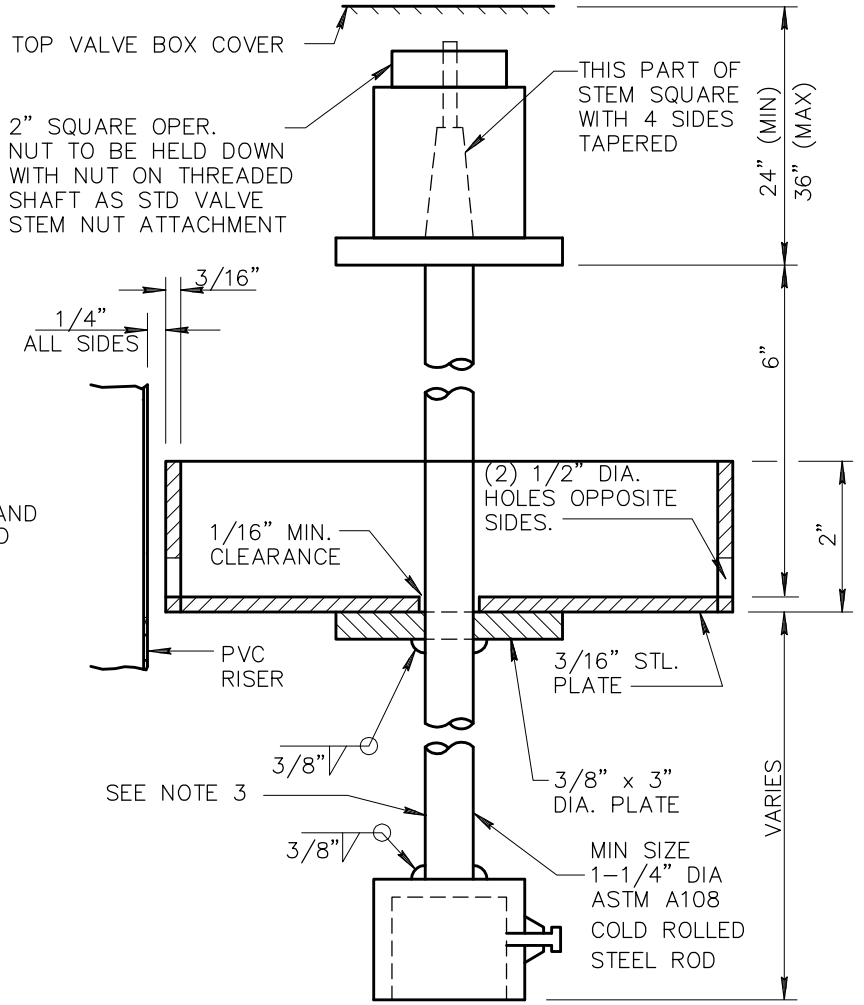
(NOT SUBJECT TO VEHICULAR TRAFFIC)

## NOTES:

1. VALVE BOX SHALL BE ADJUSTED TO THE FINISHED GRADE PRIOR TO PLACING OF THE PORTLAND CEMENT CONCRETE SURFACE.
2. USE PARKSON TYLER, APCO OR EQUAL DEEP SKIRTED LID (4" OR MORE) TYPE, SLIDING ADJUSTABLE CAST IRON VALVE BOX C.I. MIN. T.S. 30,000 P.S.I.
3. GROUND BELOW CONCRETE PAD TO BE COMPACTED 95% MAXIMUM DENSITY.
4. CUT RISER PIPE TO LENGTH IN FIELD. **CAUTION:** IF EXISTING RISER IS ASBESTOS–CEMENT PIPE (ACP) FOLLOW OSHA GUIDELINES FOR WORKING WITH ACP.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 391–1 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | VALVE BOX INSTALLATION AND GRADE ADJUSTMENT | 01–01–2015 | 391–1 |

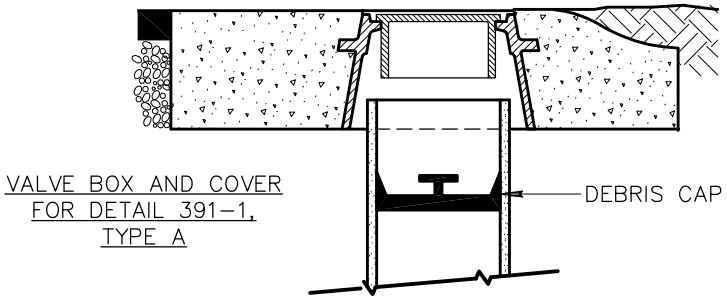


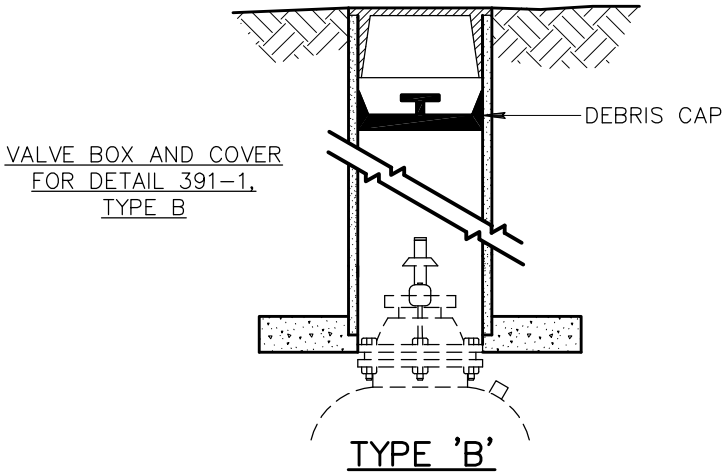

## NOTES:

1. EXTENSION STEM: WITH SQUARE SOCKET ON BOTTOM TO FIT 2" SQUARE VALVE NUT. EXTENSION TO VALVE STEMS REQUIRED ON ALL VALVES INSTALLED WHERE OPERATING NUT IS OVER 5' BELOW SURFACE. LENGTH TO FIT EACH INSTALLATION. OPERATING NUT TO BE HELD ON TOP OF EXTENSION WITH STOP NUT.
2. IF TWO OR MORE SECTIONS OF PIPE ARE USED TO MAKE THE VALVE BOX RISER, THEY SHALL BE COUPLED OR BONDED TO FORM DEBRIS–TIGHT JOINTS.
3. STEM PAINTING: ALL STEEL TO HAVE PRIME COAT OF PAINT NO. 1–D AND ONE HEAVY APPLICATION (FINISH COAT) OF PAINT NO. 9 AS PER SECT. 790.

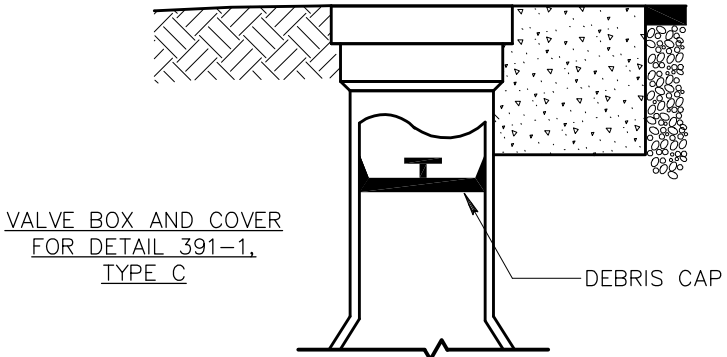
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 391–2 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | VALVE BOX INSTALLATION AND GRADE ADJUSTMENT | 01–01–2015 | 391–2 |




TYPE 'A'




TYPE 'B'

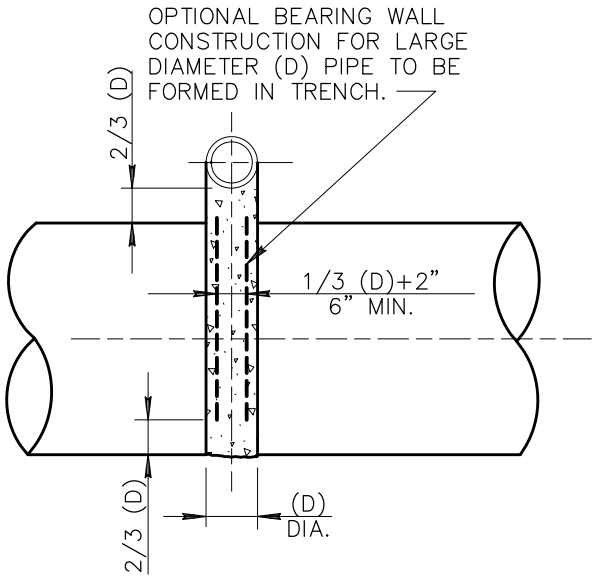



TYPE 'C'

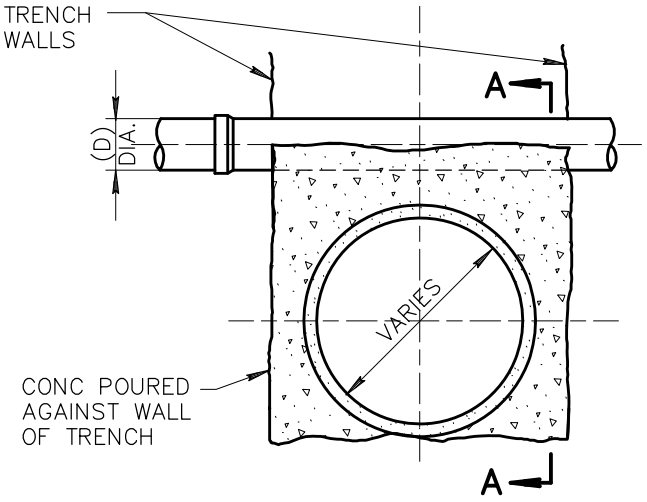
## NOTES:

1. THE DEBRIS CAP SHALL BE DESIGNED AND INSTALLED TO PREVENT DEBRIS SUCH AS DIRT, DUST SAND, ETC., FROM PASSING AROUND THE CAP AND DOWN INTO THE VALVE HOUSING. THE CAP SHALL BE HELD IN PLACE BY A MECHANISM WHICH WILL NOT DAMAGE THE VALVE HOUSING.
2. THE CAP SHALL BE MANUFACTURED OF CORROSIVE RESISTANT MATERIALS.
3. DEBRIS CAP SHALL BE INSTALLED AS CLOSE UNDER THE CAST IRON COVER WITHOUT INTERFERING WITH COVER OPERATION.
4. THE CAP SHALL BE CAPABLE OF SECURELY HOLDING A STANDARD LOCATING COIL, "SCOTCH MARK" 4 DISK MARKER BY 3M OR EQUAL.
5. THE CAP SHALL BE CONSTRUCTED TO ALLOW THE DEVICE TO BE SECURED BY A LOCK. THE LOCK (PAD, BARREL, ETC.) SHALL BE SUPPLIED BY THE AGENCY.
6. THE CAP SHALL BE INSTALLED IN ALL VALVE HOUSINGS AS REQUIRED BY THE CONTRACT DOCUMENTS OR BY THE AGENCY'S POLICIES.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 392 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | DEBRIS CAP INSTALLATION | 01-01-2015 | 392 |

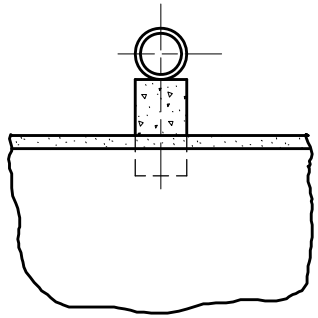



SECTION A–A

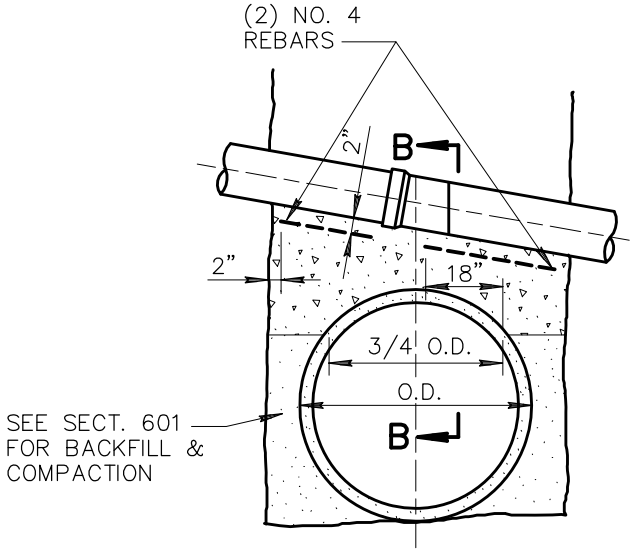



PIPE CONDUIT

TYPE 'A'



SECTION B–B




PIPE CONDUIT

TYPE 'B'

## NOTES:

1. TYPE 'A' PIPE SUPPORT MAY BE USED FOR ANY TYPE CROSSING CONDITION.
2. TYPE 'C' PIPE SUPPORT MAY BE USED FOR CROSSING PIPES WITH A BELL DIAMETER OF 18" OR LESS IF SUFFICIENT CLEARANCE OVER STORM SEWER IS AVAILABLE AND TOTAL SPAN IS LESS THAN 34'
3. INTERMEDIATE PIPE SUPPORT SHALL BE USED IN CONJUNCTION WITH TYPE 'C' PIPE SUPPORT IF TOTAL SPAN EXCEEDS MAX. 'W' IN TABLE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL SUPPORTS BOTH PERMANENT AND TEMPORARY. TEMPORARY SUPPORTS SHALL NOT BE A SEPARATE PAY ITEM.
5. PERMANENT PIPE SUPPORTS MAY BE DECREASED FROM PLAN QUANTITIES OR EXTENDED TO INCLUDE SOME LISTED BELOW AS TEMPORARY SUPPORTS IF CONDITIONS WARRANT THESE CHANGES AT THE TIME OF CONSTRUCTION. DECISION SHALL BE MADE BY THE ENGINEER.
6. WHEN TYPE 'A' PIPE SUPPORT IS USED AND WHENEVER SO DIRECTED BY THE ENGINEER, THE CONTRACTOR SHALL PIERCE THE WALL WITH SUITABLE OPENINGS TO PREVENT UNEQUAL PRESSURE RESULTING FROM FLOODING OF THE BACKFILL. THE VOLUME OF THE PIERCED OPENING SHALL NOT EXCEED 1/2 THE VOLUME OF THE SUPPORTING WALL.
7. USE TYPE 'B' PIPE SUPPORT INSTEAD OF TYPE 'C' WHEN CLEARANCE IS LESS THAN 'Y' IN TABLE, BETWEEN PIPES.
8. CLASS 'A' CONCRETE AS PER SECT. 725 UNLESS OTHERWISE NOTED.

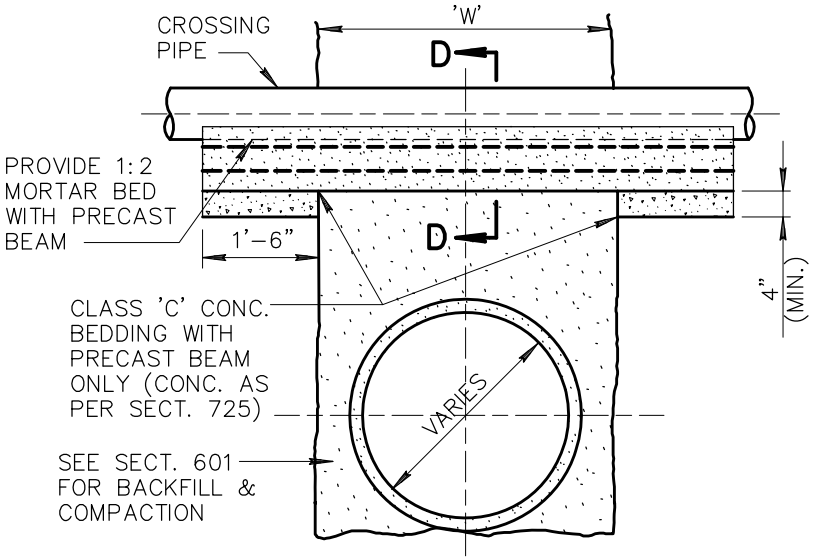
## SCHEDULE OF REQUIRED SUPPORTS

| PERMANENT | TEMPORARY |
|---|---|
| SEWER LINES | CAST IRON PIPE<br>CONC. IRRIG. PIPE |
| OTHER UTILITIES AS NOTED ON THE PLANS OR AS REQUIRED BY THE ENGINEER AT TIME OF CONSTRUCTION. | BURIED TELCO.<br>GAS PIPES<br>CONC. STORM DRAIN<br>CONC. BOX CULVERT<br>TRAFFIC CONTROL CONDUIT<br>WATER & SEWER LINES |

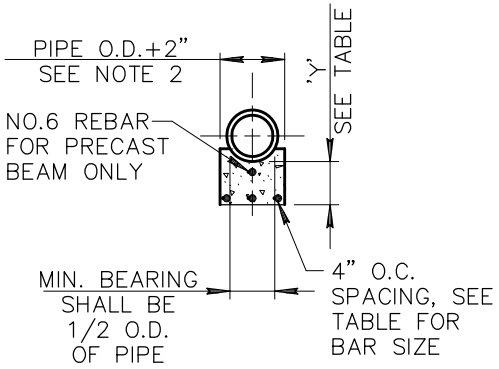
| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 403–1 | MARICOPA ASSOCIATION of GOVERNMENTS | STANDARD DETAIL ENGLISH | PIPE SUPPORT ACROSS TRENCHES | 01–01–1998 | 403–1 |

## TABLE

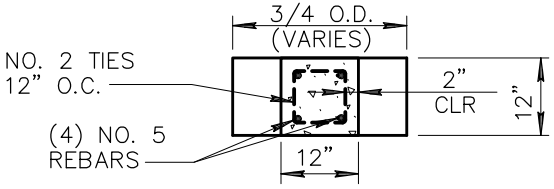
| 'W' | DEPTH OF COVER ON SUPPORTS | | | |
|---|---|---|---|---|
| | 0' TO 8' | | 8' TO 16' | |
| | BAR NO. | Y | BAR NO. | Y |
| TO 6' | 5 | 8" | 6 | 11" |
| 7' | 5 | 9" | 6 | 12" |
| 8' | 5 | 10" | 6 | 13" |
| 9' | 6 | 11" | 6 | 14" |
| 10' | 6 | 12" | 7 | 15" |
| 11' | 6 | 13" | 7 | 16" |
| 12' | 6 | 14" | 7 | 17" |
| 13' | 7 | 15" | 7 | 19" |
| 14' | 7 | 16" | 8 | 20" |
| 15' | 7 | 17" | 8 | 21" |
| 16' | 7 | 18" | | |
| 17' | 8 | 19" | | |



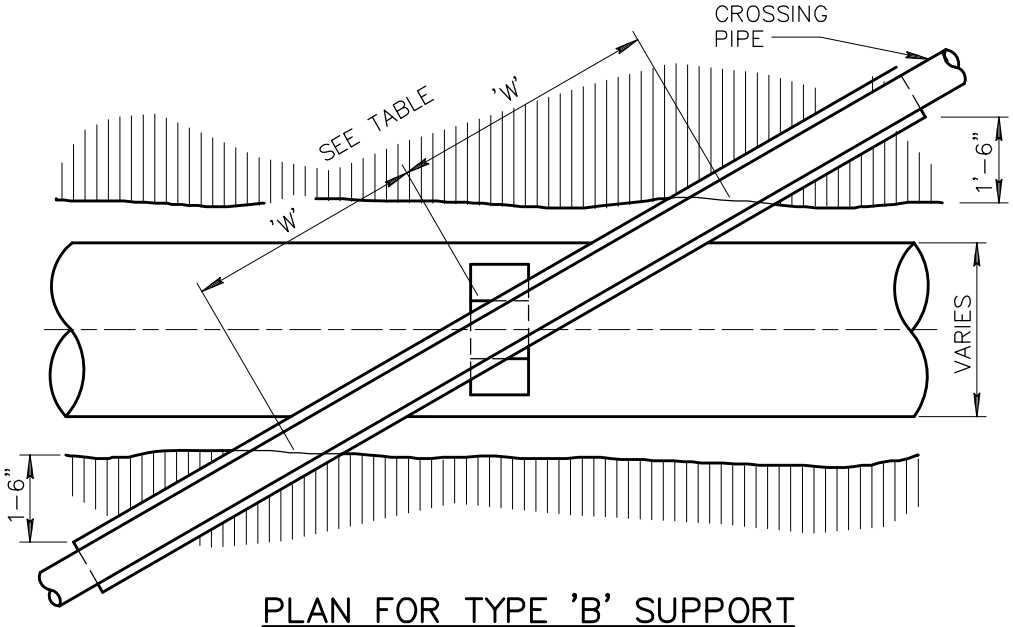

TYPE 'C'



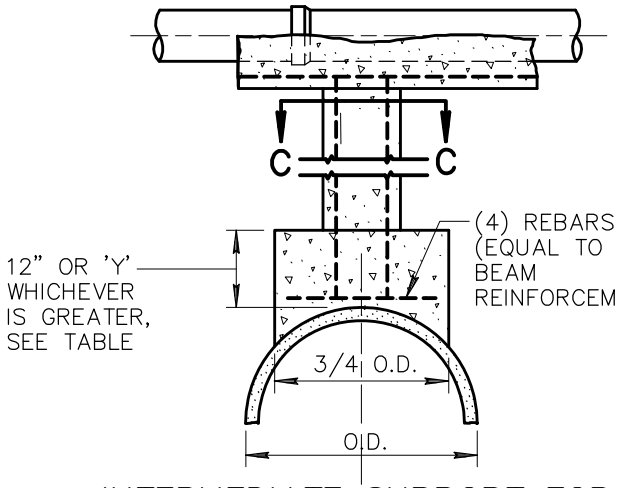

SECTION D-D




SECTION C-C

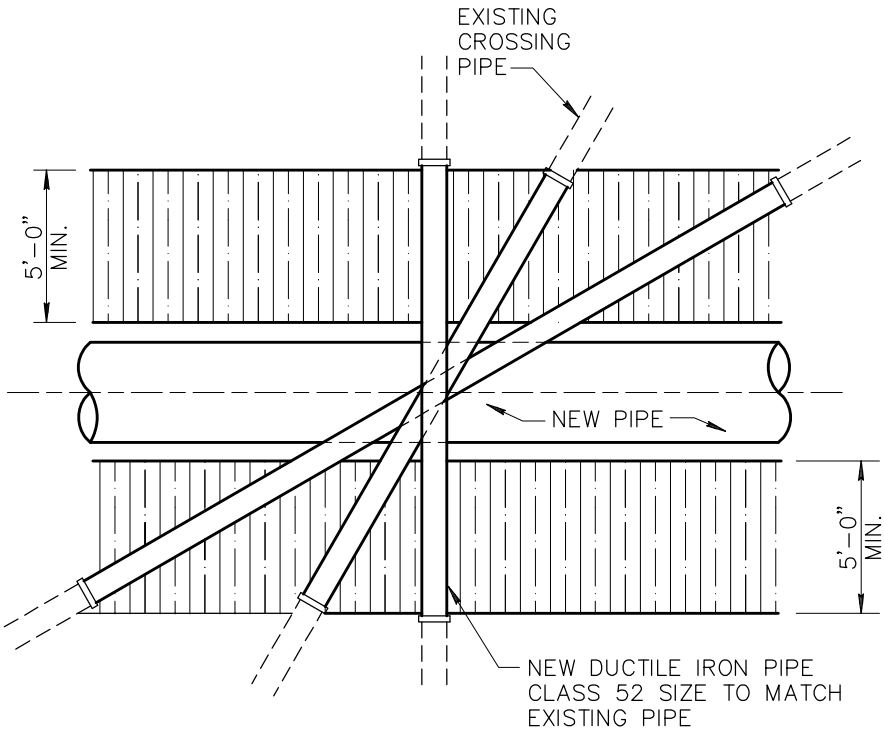


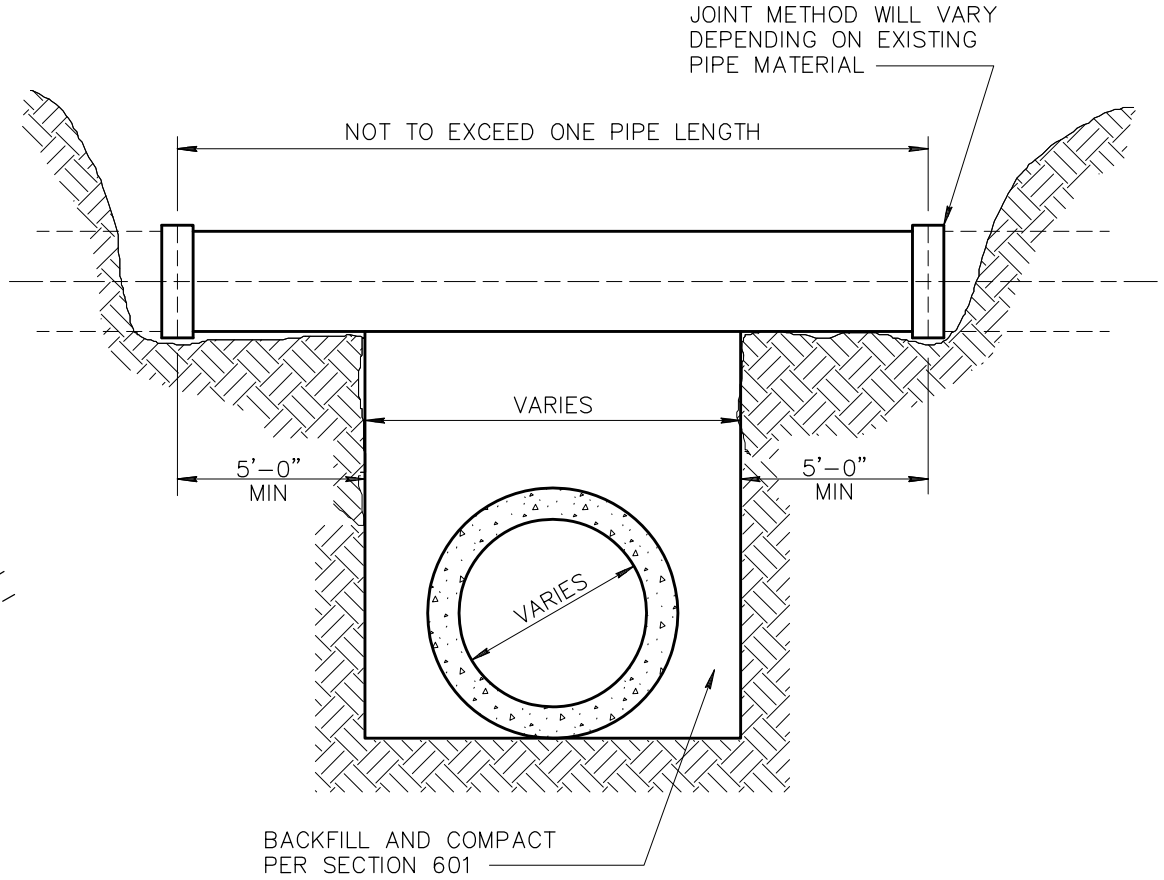

PLAN FOR TYPE 'B' SUPPORT




INTERMEDIATE SUPPORT FOR TYPE 'B' CROSSINGS

| DETAIL NO. | | STANDARD DETAIL | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 403-2 | MARICOPA ASSOCIATION of GOVERNMENTS | ENGLISH | PIPE SUPPORTS ACROSS TRENCHES | 01-01-1998 | 403-2 |

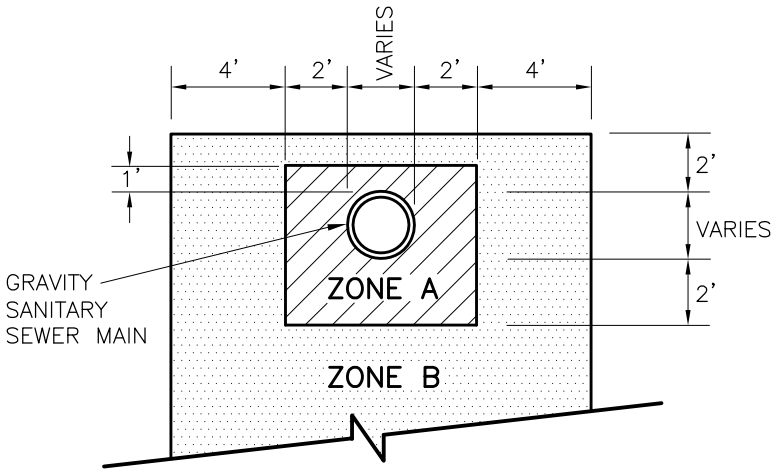


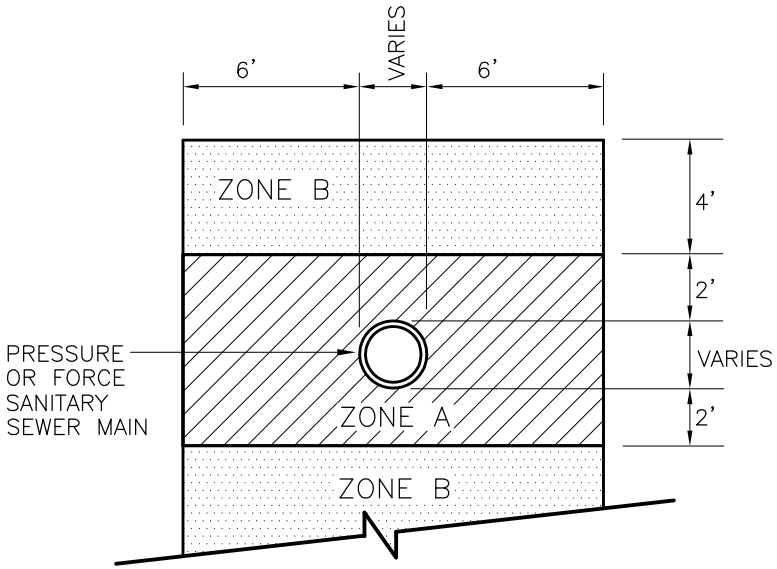

| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 403-3 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | ALTERNATE TO PIPE SUPPORT | | 01-01-1998 | 403-3 |

# WATER LINE EXCLUSION AND EXTRA PROTECTION ZONES*

## GRAVITY SANITARY SEWER




## PRESSURIZED SANITARY SEWER




## NOTES:

ZONE A: NO WATER LINES ALLOWED/MINIMUM SEPARATION.

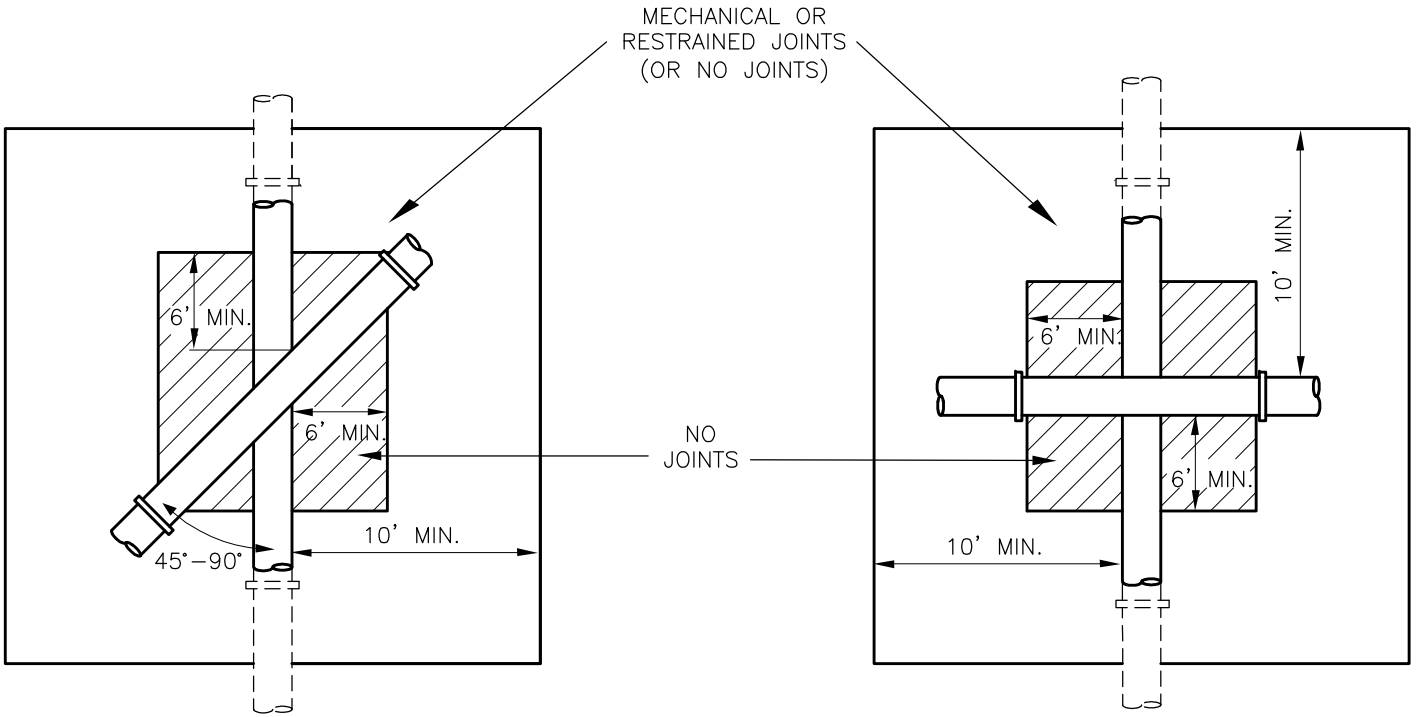
ZONE B: EXTRA PROTECTION REQUIRED FOR WATER LINES.

* REFER TO STANDARD 610, WATER LINE CONSTRUCTION.

| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 404–1 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | WATER AND SANITARY SEWER SEPARATION/PROTECTION | | 01–01–2006 | 404–1 |

# WATER LINE EXTRA PROTECTION

## DUCTILE IRON PIPE WITH RESTRAINED OR MECHANICAL JOINTS*



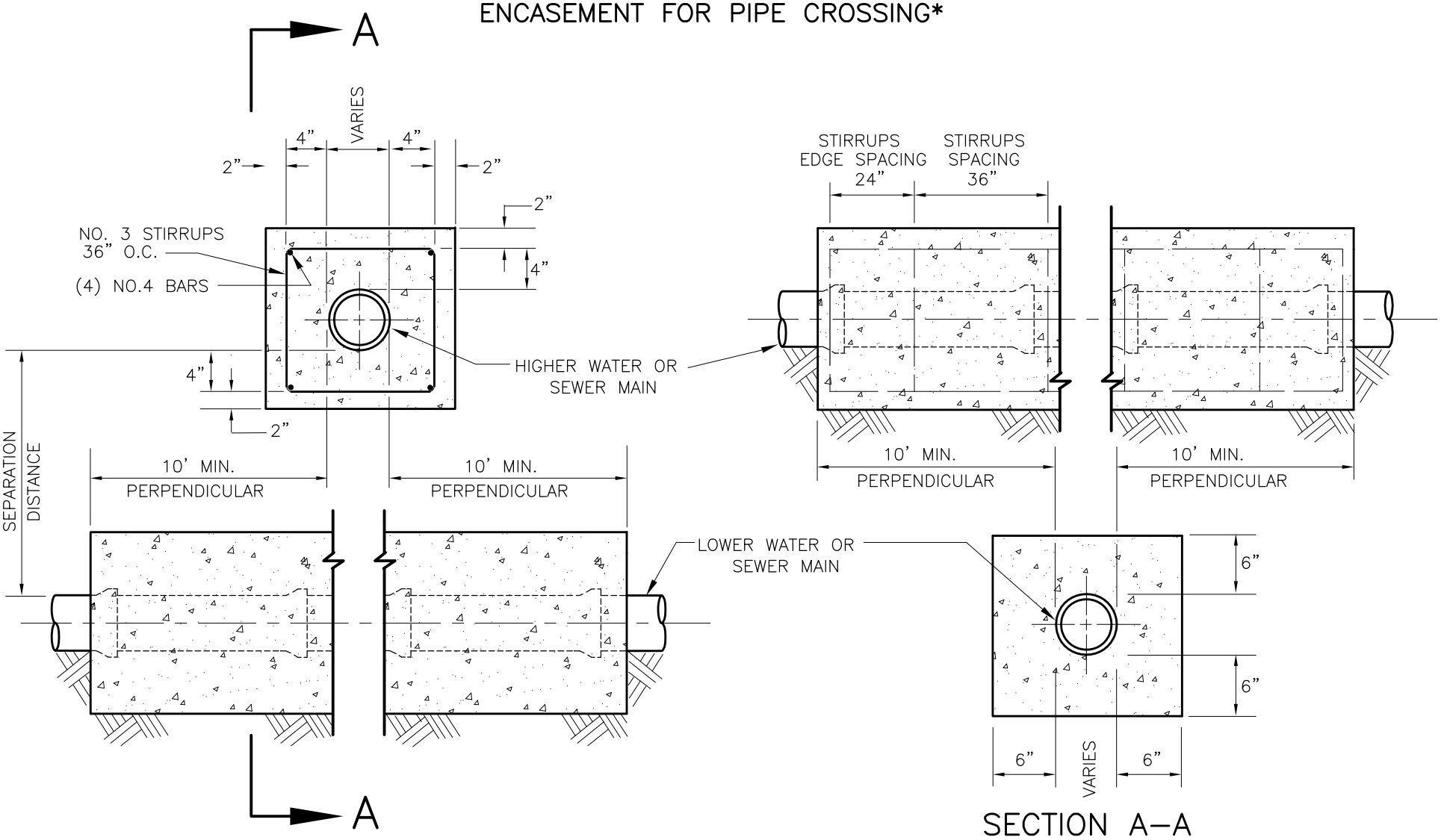

EXTRA PROTECTION DUCTILE IRON PIPE
(GRAVITY OR PRESSURIZED) SEWER LINE

NOTES:

* REFER TO MAG STANDARD SPECIFICATION SECTION 610.

| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 404-2 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | WATER AND SANITARY SEWER SEPARATION/PROTECTION | | 01-01-2006 | 404-2 |

# ENCASEMENT FOR PIPE CROSSING*

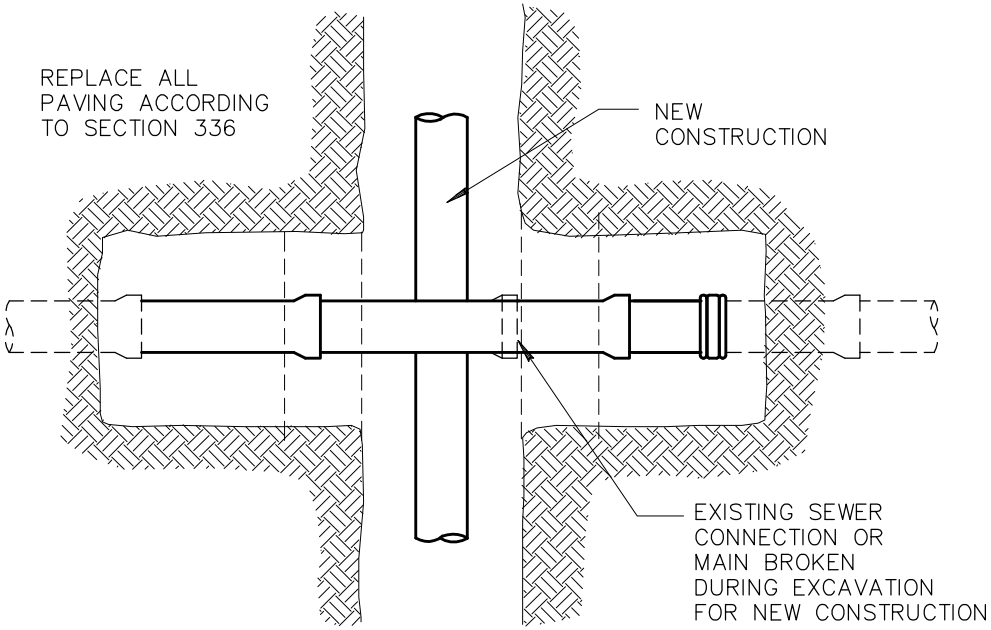



SECTION A–A

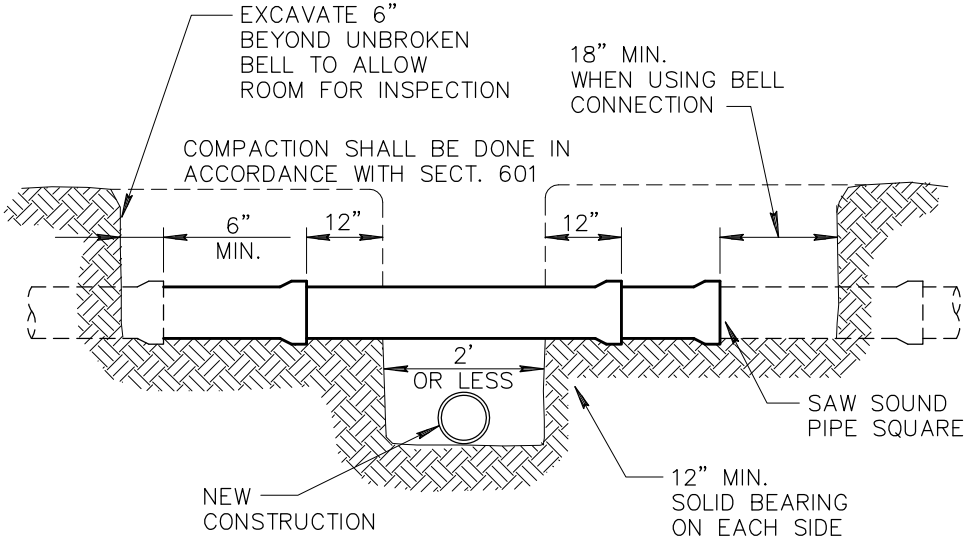
**NOTES:**

1. CLASS 'C' CONCRETE AS PER SECTION 725.
*REFER TO MAG STANDARD SPECIFICATION SECTION 610.

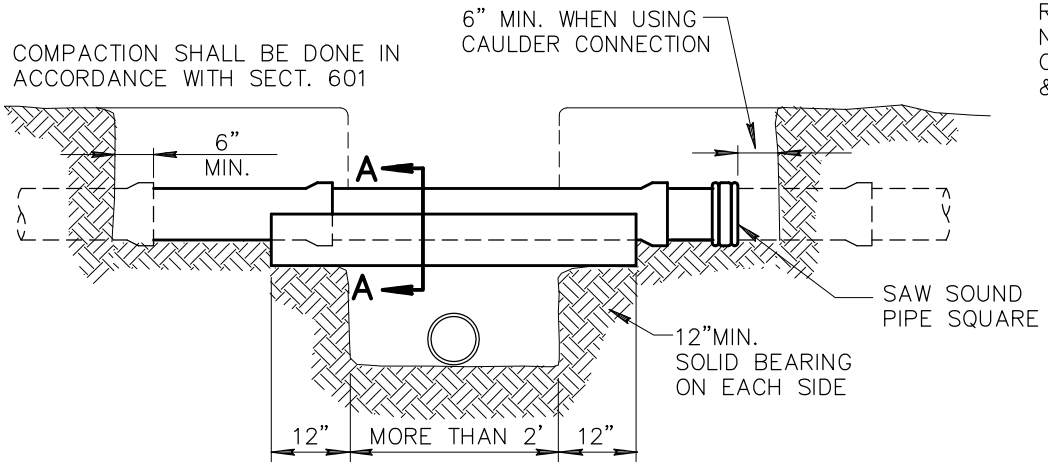
| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 404–3 | MARICOPA ASSOCIATION of GOVERNMENTS | STANDARD DETAIL ENGLISH | WATER AND SANITARY SEWER SEPARATION/PROTECTION | 01–01–2006 | 404–3 |



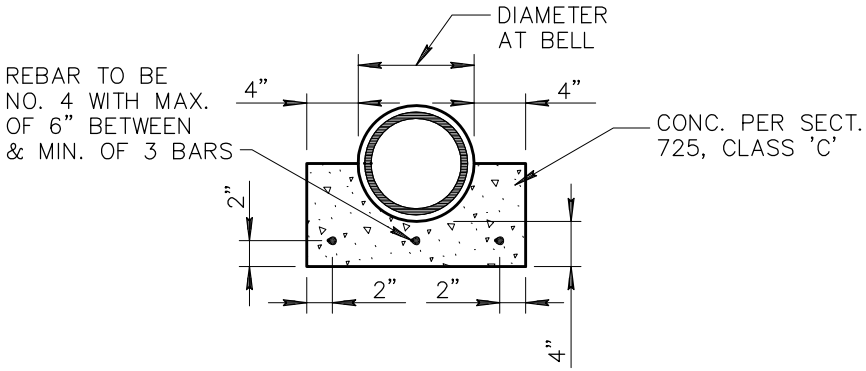

## PLAN VIEW OF REPLACEMENT




## REPLACEMENT WHEN NEW TRENCH 2' WIDE OR LESS




## REPLACEMENT WHEN NEW TRENCH MORE THAN 2' WIDE




## SECTION 'A–A'

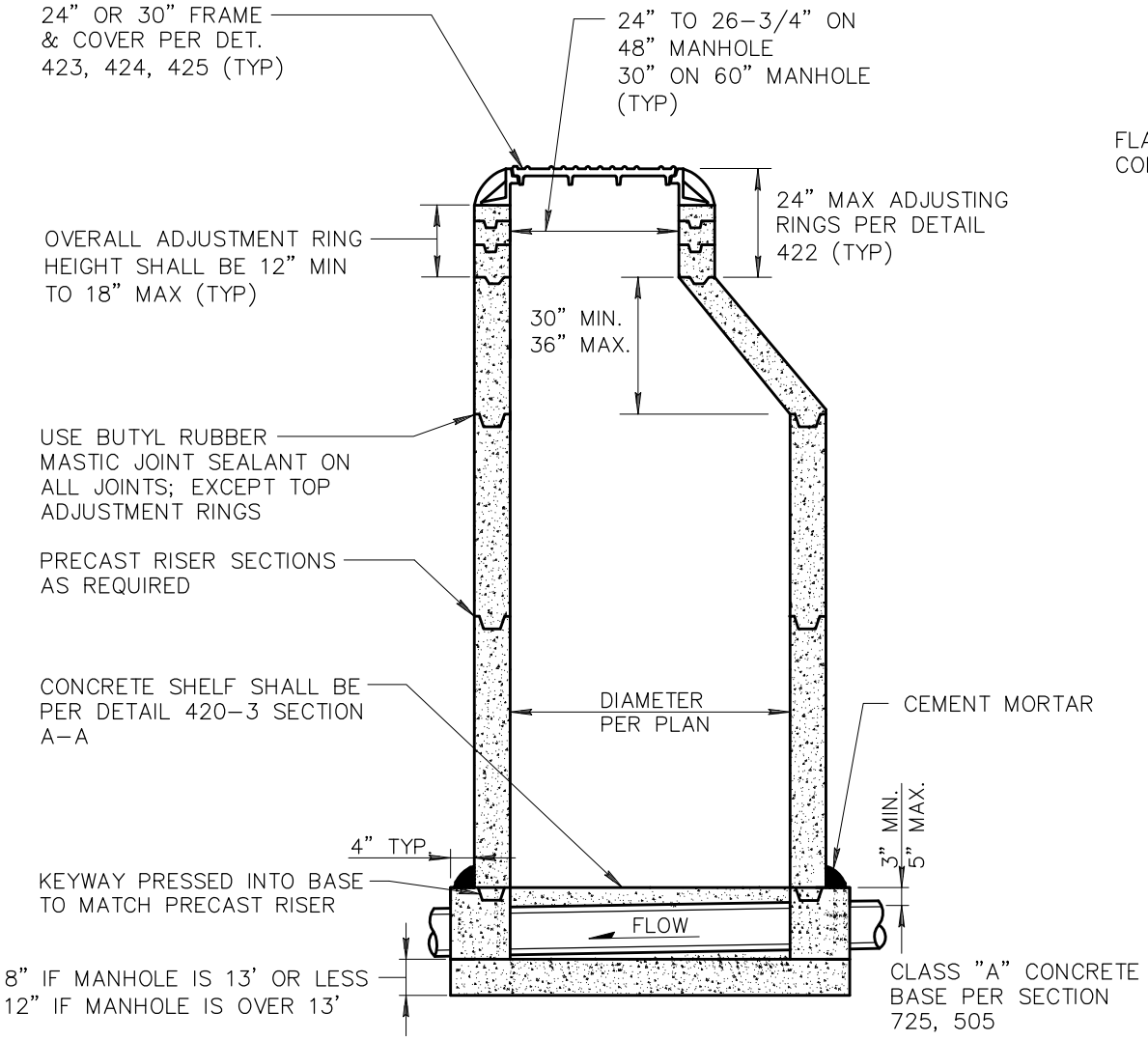
## NOTES:

1. BROKEN PIPE SHALL BE REPLACED WITH A MINIMUM OF ONE FULL JOINT AND TWO SHORT LENGTHS WITH UNBROKEN BELLS. CONSTRUCTION AND JOINTS TO BE MADE AS PER SECTION 615.

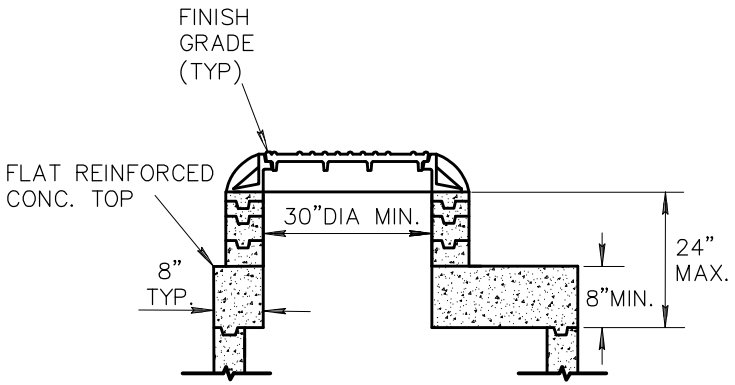
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 405 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | BROKEN SEWER LINE REPLACEMENT | 01–01–1998 | 405 |

## TYPE 'A' TOP

(PRECAST ECCENTRIC CONICAL TOP MANHOLE)



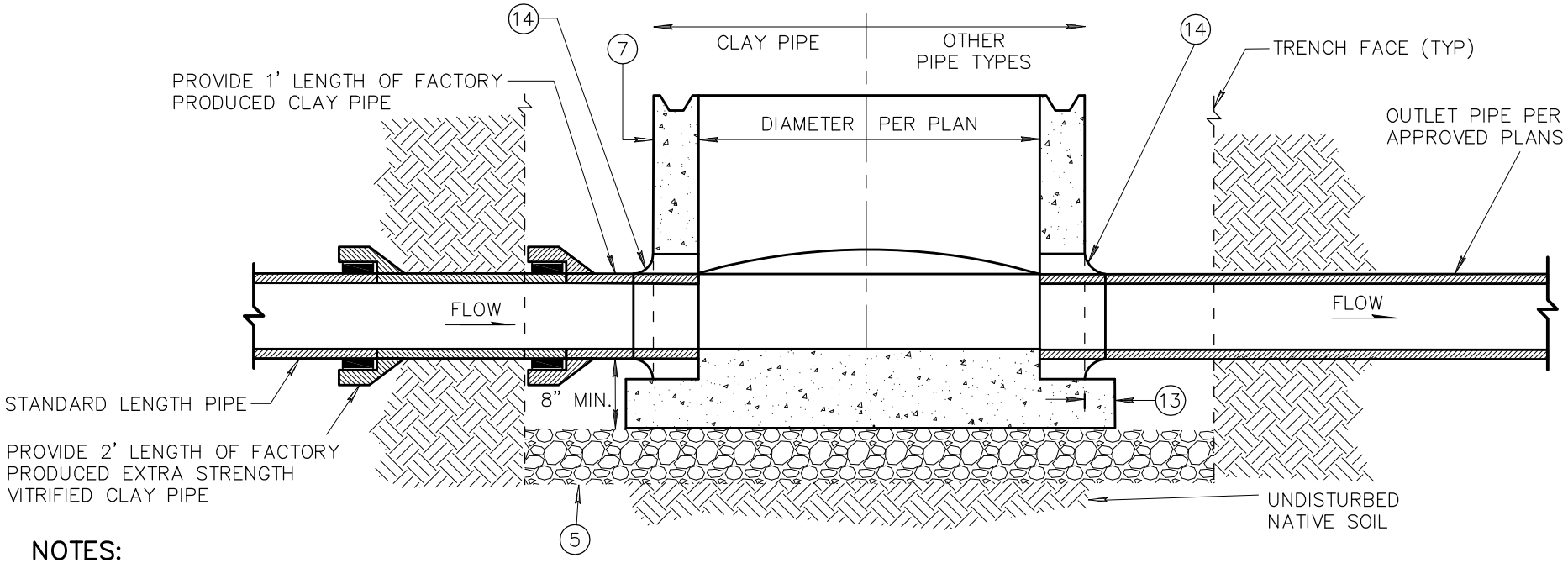

## (PRECAST FLAT TOP M.H.)




## NOTES:

1. PRECAST STEEL REINFORCED MANHOLE SECTIONS SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C 478 EXCEPT AS MODIFIED HEREIN.
2. CAST-IN-PLACE MANHOLE BASE TO BE CONSTRUCTED IN ONE PLACEMENT.
3. CAST-IN-PLACE MANHOLE BASE SHELF AND CHANNEL TO RECEIVE SMOOTH TROWEL FINISH.
4. MANHOLE COATINGS PER AGENCY.
5. SEE MAG DETAIL 422 FOR FINAL ADJUSTMENT TO GRADE.
6. ANY MANHOLE OVER 20' SHALL REQUIRE ENGINEER (STRUCTURAL) CALCS.
7. THE MANHOLE ACCESS POINT SHALL BE ORIENTED IN SUCH A WAY THAT THE OPENING IS DIRECTLY ABOVE THE LOWEST INVERT, OR AS OTHERWISE DIRECTED BY THE PLANS OR ENG.
8. FOR PRECAST BASE SEE DETAIL 420-2.
9. FLAT TOPS SHALL ONLY BE USED WITH APPROVAL FROM THE ENGINEER.

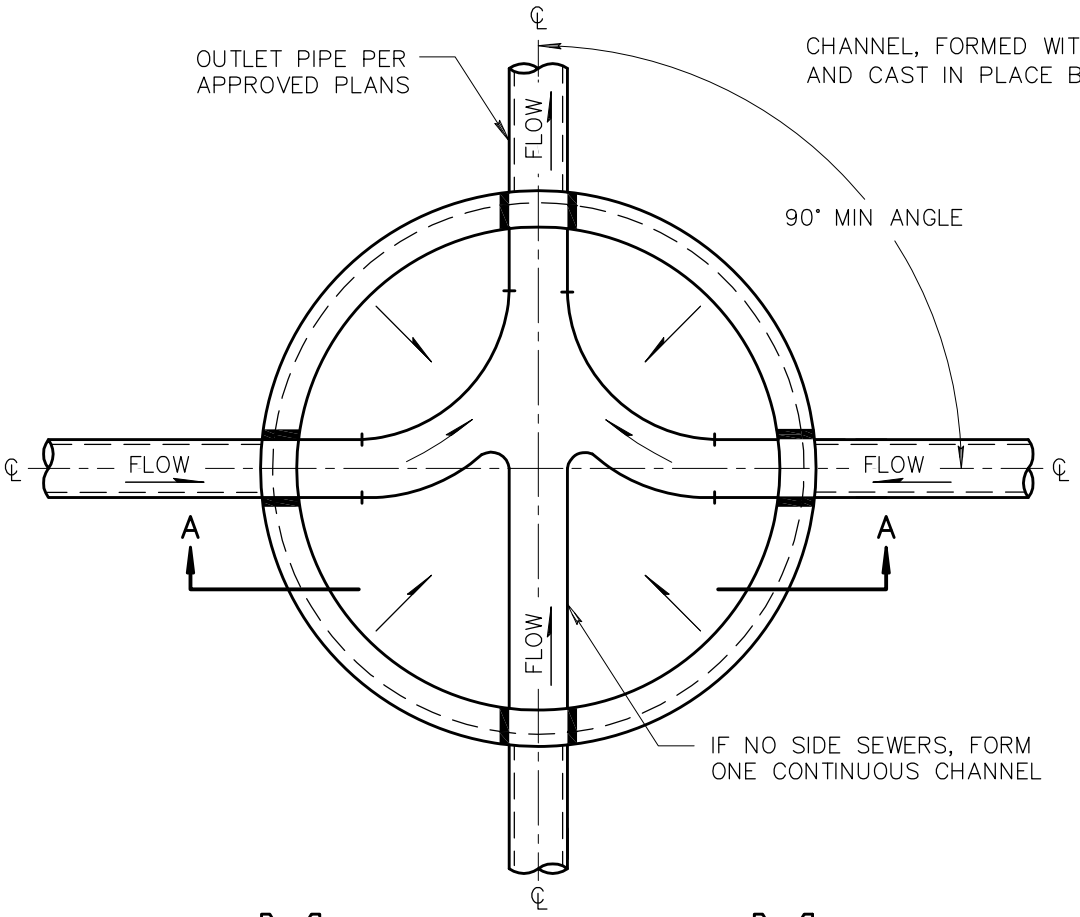
| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 420-1 | MARICOPA ASSOCIATION of GOVERNMENTS | STANDARD DETAIL ENGLISH | CONCRETE SANITARY SEWER MANHOLE | 01-01-2015 | 420-1 |

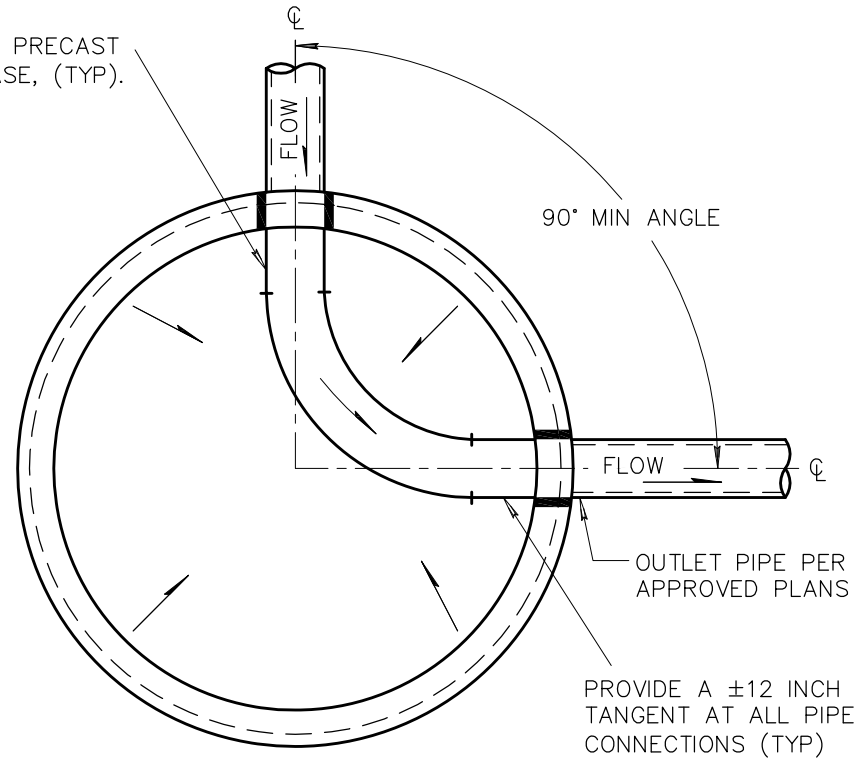


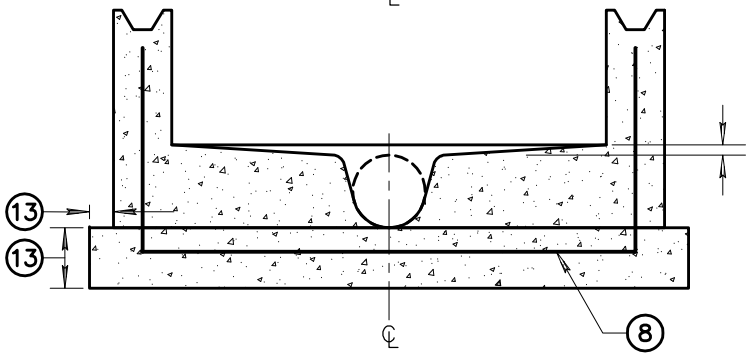

## NOTES:

1. PRECAST, MANUFACTURER SHALL BE AN NATIONAL PRECAST CONCRETE ASSOCIATION (NPCA) CERTIFIED PLANT. ENTIRE PRECAST BASE SHALL BE MANUFACTURED AT THE PLANT PER ASTM C478.
2. MAG "AA" 4000 PSI CONCRETE SHALL BE USED FOR PRECAST MANHOLE BASES.
3. SPRING LINE OF CAST-IN-PLACE BELL SHALL STOP AT INSIDE FACE OF MANHOLE.
4. JOINTS FOR BARREL SECTION SHALL BE TONGUE AND GROOVE TYPE. ALL LIFTING HOLES SHALL BE SEALED WITH GROUT.
5. ALL PRECAST MANHOLE BASES SHALL BE PLACED ON 8" MINIMUM OF ABC PER SECTION 702 COMPACTED TO 100% MAXIMUM DENSITY.
6. ALL MODIFICATIONS SHALL BE APPROVED BY THE ENGINEER.
7. MINIMUM WALL THICKNESS SHALL BE PER ASTM C478 (MIN 5").
8. REINFORCEMENT SHALL BE DESIGNED BY AN ARIZONA REGISTERED PROFESSIONAL ENGINEER.
9. CHANNEL TRANSITION SHALL BE CONSTANT FROM INLET TO OUTLET OF MANHOLE TO FACILITATE SMOOTH TRANSITIONS AND ACCOMMODATE CORRESPONDING MANDREL.
10. THERE SHALL BE NO HARD CONNECTIONS (GROUTED) INTO THE MANHOLE BASE UNLESS APPROVED BY THE ENGINEER.
11. ALL SEWER SERVICE CONNECTIONS SHALL HAVE THE SAME CONNECTION TYPES IN THE PRECAST MANHOLE BASE.
12. ALL CORE HOLES INTO THIS STRUCTURAL PRECAST BASE SHALL BE COATED WITH AN APPROVED COATING MATERIAL.
13. THE MANHOLE BOTTOM SHALL EXTEND OUTSIDE THE MANHOLE WALL A MINIMUM 6" WIDE ON 48" BASES, 7" WIDE ON 60" BASES, AND 8" WIDE ON 72" BASES. EXTENDED BOTTOM SHALL BE A MINIMUM OF 5" THICK.
14. ALL PIPE CONNECTIONS SHALL BE IN COMPLIANCE WITH ASTM F477 OR ASTM C425. AN EXTRA STRENGTH VCP BELL WITH A POLYURETHANE JOINT THAT MEETS ASTM C425 MAY BE USED WITH VCP.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 420-2 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | PRECAST CONCRETE MANHOLE BASE | 01-01-2015 | 420-2 |

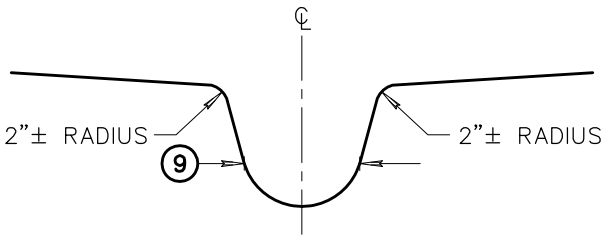



SECTION A–A

TOP OF SHELF TO TOP OF PIPE (MIN 2% SLOPE) NOT TO EXCEED 3"

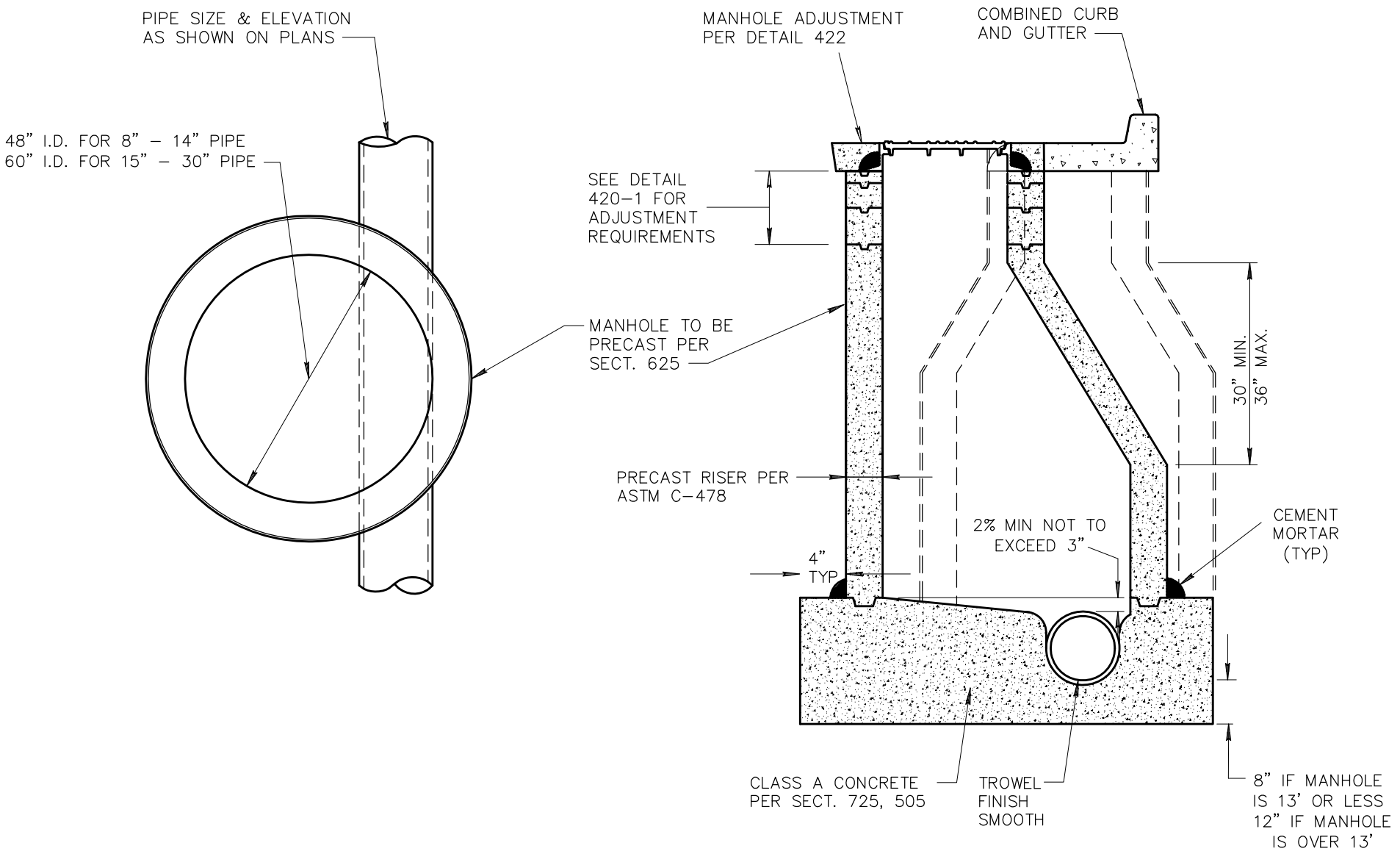



CHANNEL TRANSITION SHALL BE CONSISTENT FROM INLET TO OUTLET OF MANHOLE TO FACILITATE SMOOTH TRANSITIONS AND ACCOMMODATE CORRESPONDING MANDREL.

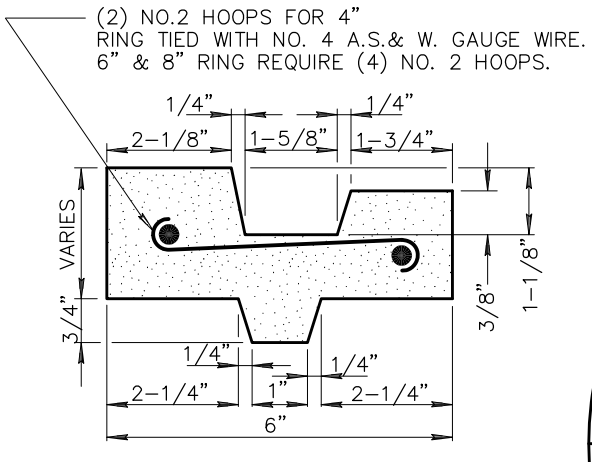
TYPICAL CHANNEL

SEE DETAIL 420–2 FOR NOTES

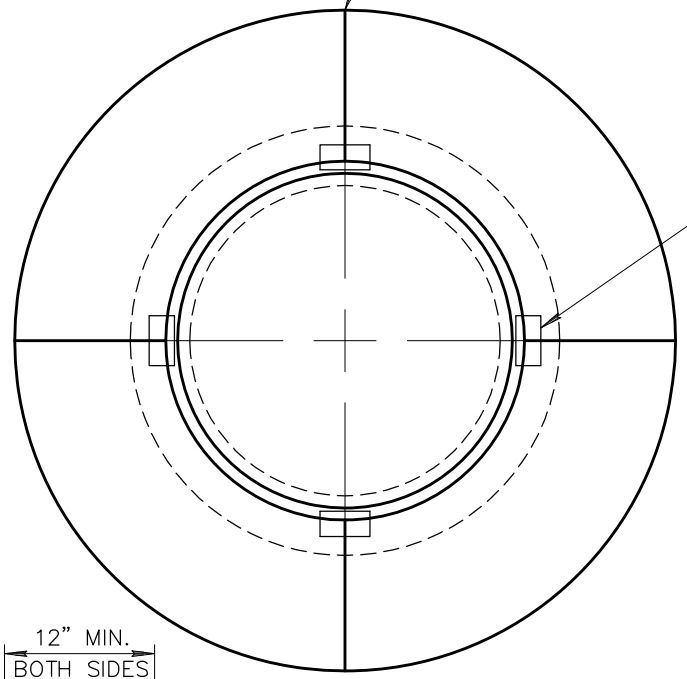
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 420-3 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | CONCRETE MANHOLE BASE | 01-01-2015 | 420-3 |




| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 421 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | OFFSET MANHOLE 8" TO 30" PIPE | | 01–01–2015 | 421 |



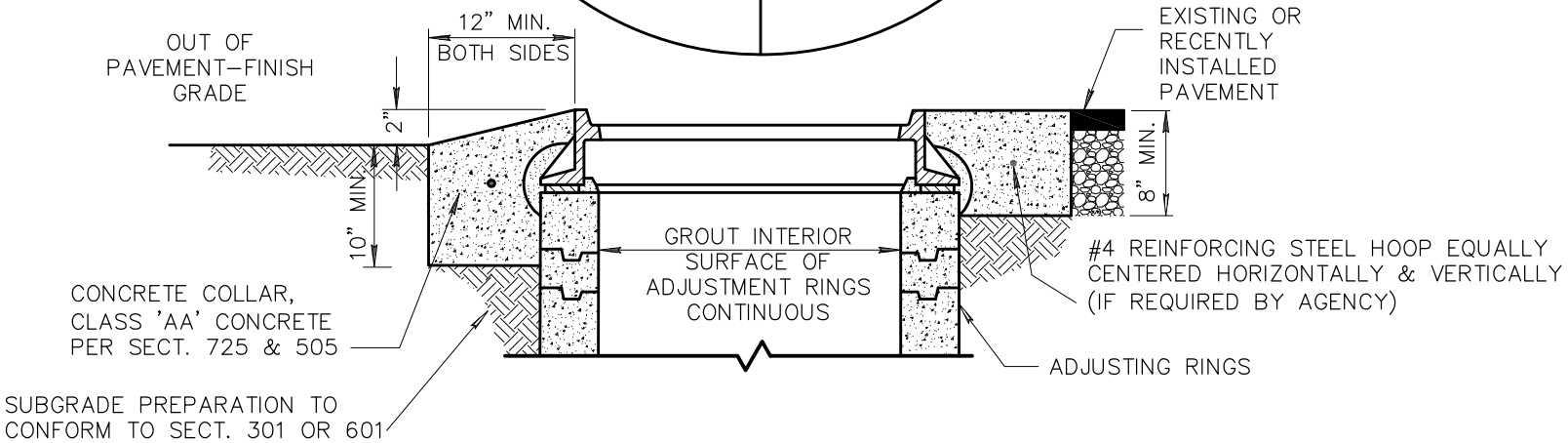

ADJUSTING RING DETAIL




## NOTES:

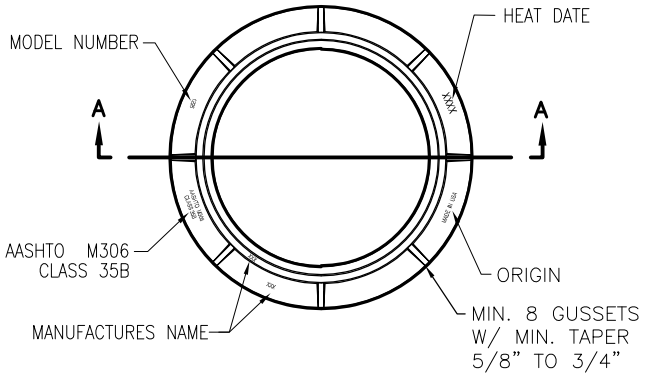
1. CONTRACTORS SHALL ADJUST ALL MANHOLE RINGS AND COVERS, INCLUDING MANHOLES OUTSIDE OF THE PAVEMENT.
2. ADJUSTMENT SHALL BE CONSTRUCTED PER MAG SECTION 345.
3. MANHOLE COATINGS PER AGENCY
4. GROUT SHALL BE USED BETWEEN FRAME AND ADJUSTING RING TO ACHIEVE WATER TIGHTNESS.

| SPACER TYPE | REQUIRED THICKNESS |
|---|---|
| BRICK | GREATER THAN 2" |
| 4"X2" STEEL SPACER | ½" TO 2" |
| GROUT | LESS THAN ½" |



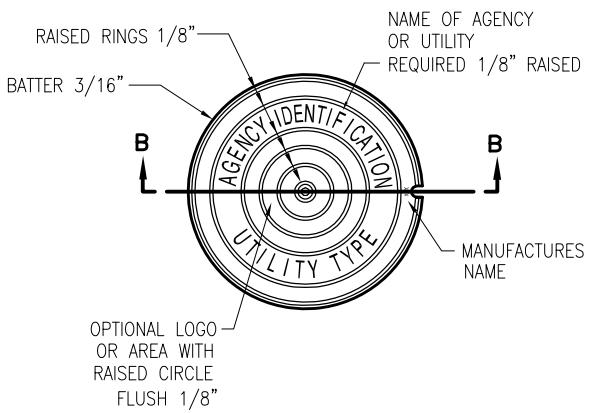

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 422 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | MANHOLE FRAME AND COVER ADJUSTMENT | 01-01-2015 | 422 |

## FRAME TOP VIEW

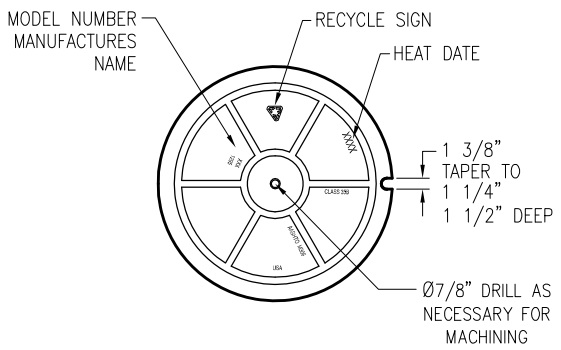



FRAME WT. (CL. 35) – 180 LBS

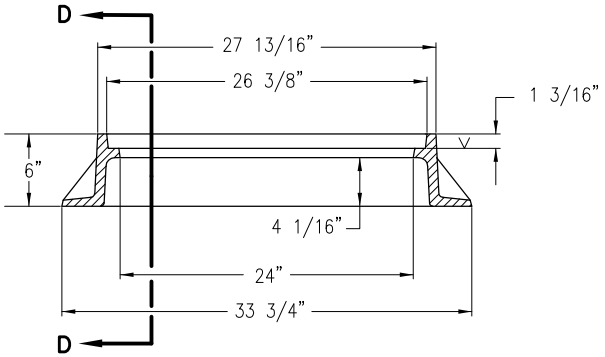
## COVER TOP VIEW



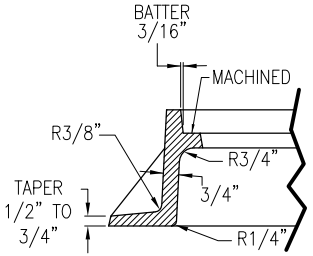

## COVER BOTTOM VIEW



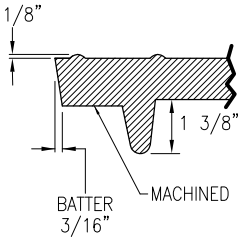

COVER WT. (CL. 35) – 188 LBS



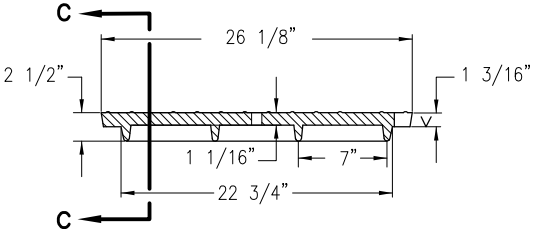

SECTION A




SECTION D




SECTION C



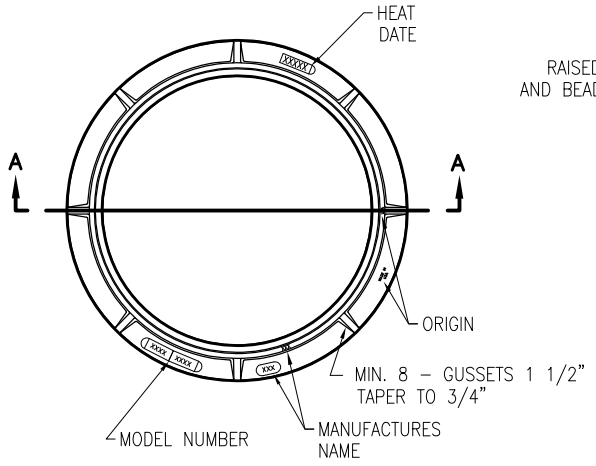

SECTION B

## NOTE:

LETTERING ON MANHOLE COVER TO CONTAIN NAME OF AGENCY AND UTILITY FOR WHICH MANHOLE IS NEEDED, (I.E. "PHOENIX SANITARY SEWER"), OR AS DIRECTED. THE TOTAL WIDTH OF INDIVIDUAL LETTERS TO BE SUCH THAT LETTERS AND WORDS ARE EQUALLY SPACED AND BALANCED TO FORM A COMPLETE CIRCLE WITH SPACERS BEFORE AND AFTER THE WORD IDENTIFYING THE AGENCY INVOLVED. LETTERS TO BE 2" IN HEIGHT AND RAISED FLUSH W/ TOP OF RINGS. TYPE OF LETTERS TO BE SUBMITTED FOR APPROVAL. WEIGHT OF CASTINGS SHALL BE NO MORE THAN 2% MORE OR LESS THAN THE APPROXIMATE WEIGHT SPECIFIED. CASTINGS SHALL CONFORM TO ASTM A–48, CLASS 35 AND AASHTO M306. THE BEARING SURFACES OF THE FRAMES AND COVERS SHALL BE MACHINED AND THE COVERS SHALL SEAT FIRMLY WITHOUT ROCKING. ALL DIMENSIONS SHALL HAVE A 1/16" TOLERANCE.

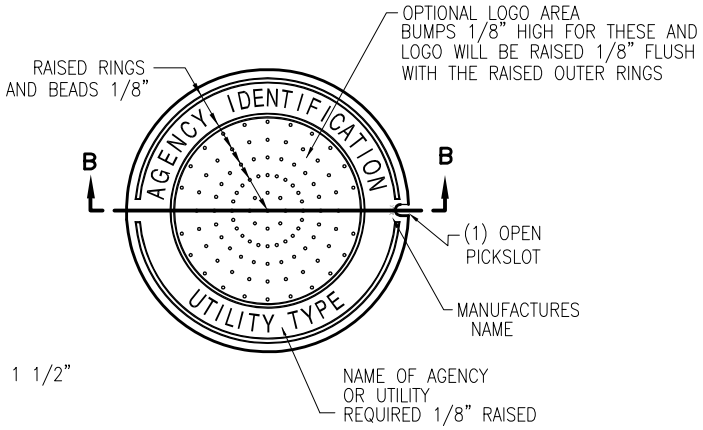
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 423–1 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | 24" CAST IRON MANHOLE FRAME AND COVER | 01–01–2012 | 423–1 |

## FRAME TOP VIEW

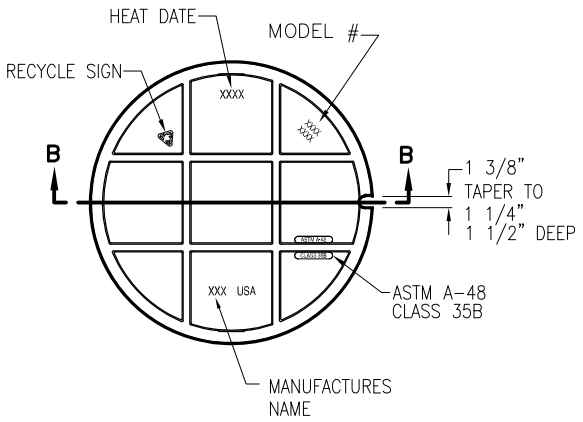



FRAME WT. (CL. 35) – 227 LBS

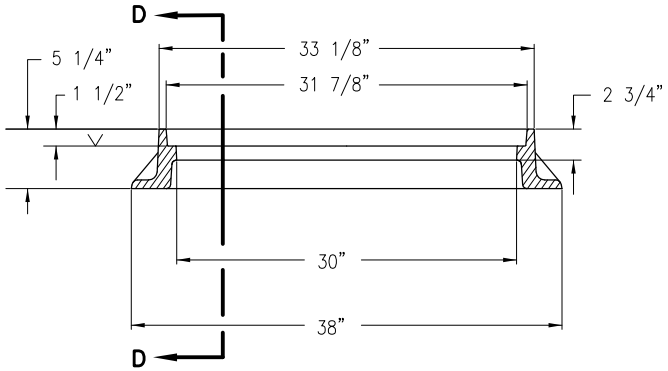
## COVER TOP VIEW



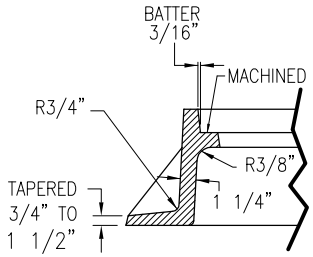

## COVER BOTTOM VIEW



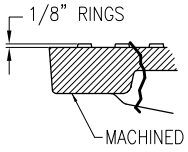

COVER WT. (CL. 35) – 210 LBS



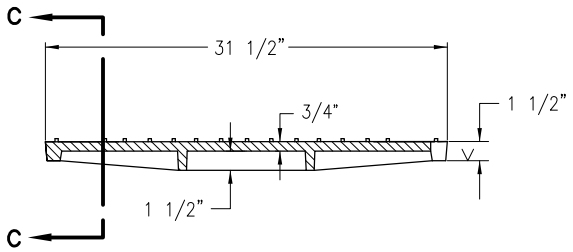

SECTION A




SECTION D




SECTION C



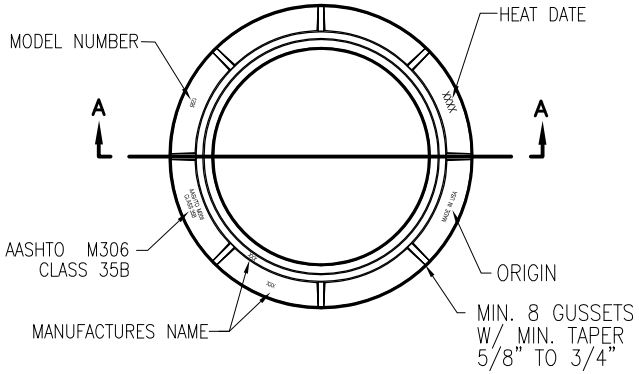

SECTION B

## NOTE:

LETTERING ON MANHOLE COVER TO CONTAIN NAME OF AGENCY AND UTILITY FOR WHICH MANHOLE IS NEEDED, (I.E. "PHOENIX SANITARY SEWER"), OR AS DIRECTED. THE TOTAL WIDTH OF INDIVIDUAL LETTERS TO BE SUCH THAT LETTERS AND WORDS ARE EQUALLY SPACED AND BALANCED TO FORM A COMPLETE CIRCLE WITH SPACERS BEFORE AND AFTER THE WORD IDENTIFYING THE AGENCY INVOLVED. LETTERS TO BE 2" IN HEIGHT AND RAISED FLUSH W/ TOP OF COVER. TYPE OF LETTERS TO BE SUBMITTED FOR APPROVAL. WEIGHT OF CASTINGS SHALL BE NO MORE THAN 2% MORE OR LESS THAN THE APPROXIMATE WEIGHT SPECIFIED. CASTINGS SHALL CONFORM TO ASTM A-48, CLASS 35 AND AASHTO M306. THE BEARING SURFACES OF THE FRAMES AND COVERS SHALL BE MACHINED AND THE COVERS SHALL SEAT FIRMLY WITHOUT ROCKING. ALL DIMENSIONS SHALL HAVE A 1/16" TOLERANCE.

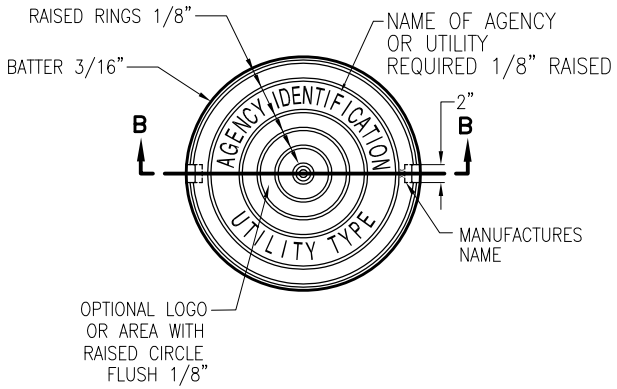
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 423-2 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | 30" CAST IRON MANHOLE FRAME AND COVER | 01-01-2012 | 423-2 |

## FRAME TOP VIEW

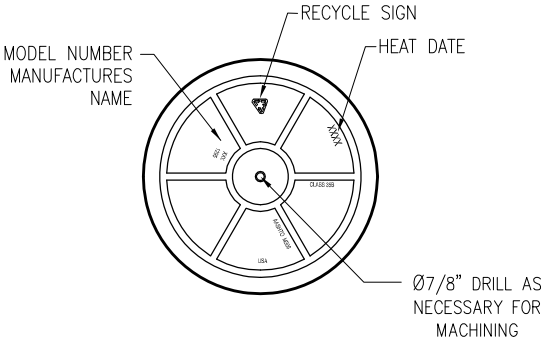



FRAME WT. (CL. 35) – 180 LBS

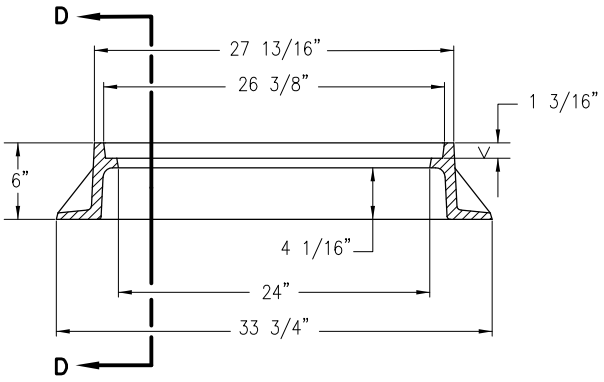
## COVER TOP VIEW



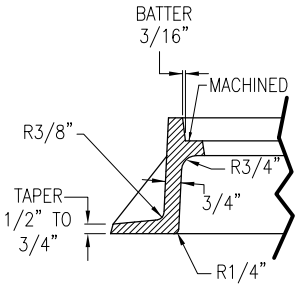

## COVER BOTTOM VIEW



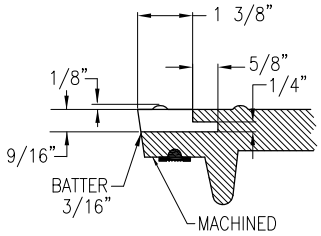

COVER WT. (CL. 35) – 188 LBS




SECTION A

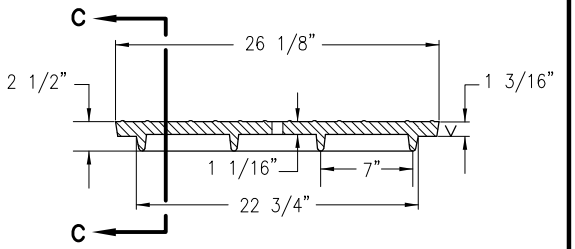



SECTION D




CONCEALED PICK DETAIL
WITH GASKET

SECTION C



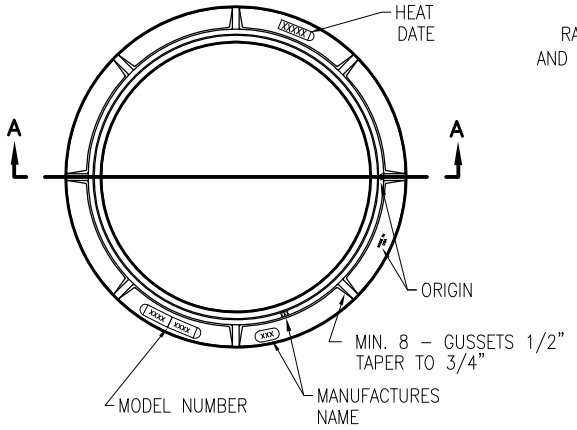

SECTION B

## NOTE:

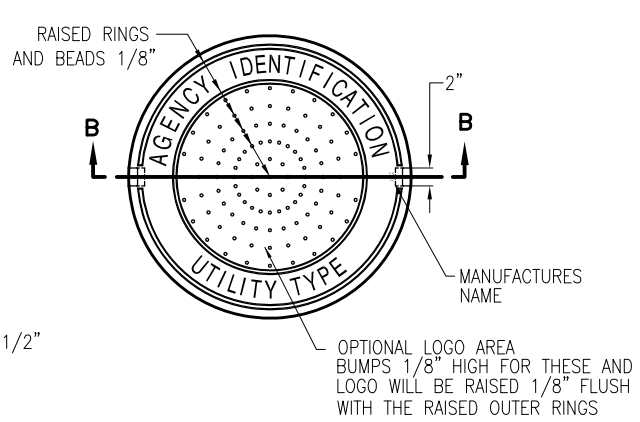
LETTERING ON MANHOLE COVER TO CONTAIN NAME OF AGENCY AND UTILITY FOR WHICH MANHOLE IS NEEDED, (I.E. "PHOENIX SANITARY SEWER"), OR AS DIRECTED. THE TOTAL WIDTH OF INDIVIDUAL LETTERS TO BE SUCH THAT LETTERS AND WORDS ARE EQUALLY SPACED AND BALANCED TO FORM A COMPLETE CIRCLE WITH SPACERS BEFORE AND AFTER THE WORD IDENTIFYING THE AGENCY INVOLVED. LETTERS TO BE 2" IN HEIGHT AND RAISED FLUSH W/ TOP OF COVER. TYPE OF LETTERS TO BE SUBMITTED FOR APPROVAL. WEIGHT OF CASTINGS SHALL BE NO MORE THAN 2% MORE OR LESS THAN THE APPROXIMATE WEIGHT SPECIFIED. CASTINGS SHALL CONFORM TO ASTM A-48, CLASS 35 AND AASHTO M306. THE BEARING SURFACES OF THE FRAMES AND COVERS SHALL BE MACHINED AND THE COVERS SHALL SEAT FIRMLY WITHOUT ROCKING. ALL DIMENSIONS SHALL HAVE A 1/16" TOLERANCE.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 424–1 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | 24" CAST IRON WATERTIGHT MANHOLE FRAME AND COVER | 01–01–2012 | 424–1 |

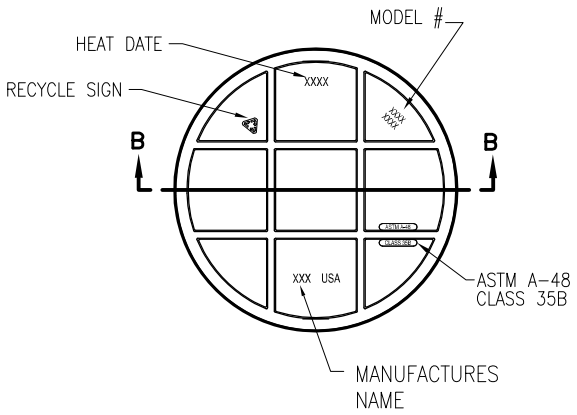
## FRAME TOP VIEW




## COVER TOP VIEW

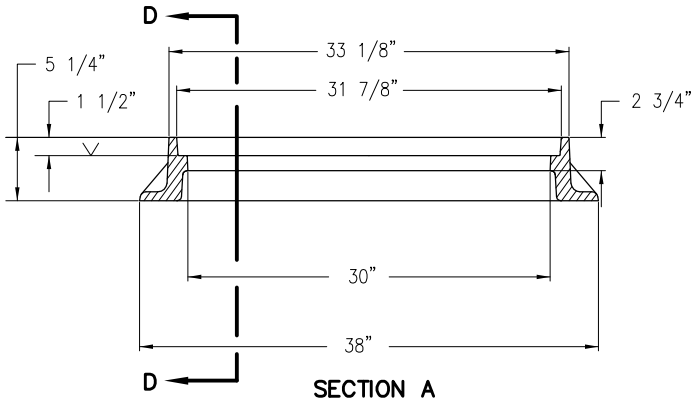



## COVER BOTTOM VIEW

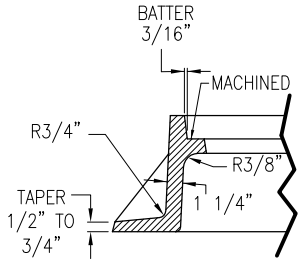



FRAME WT. (CL. 35) – 227 LBS

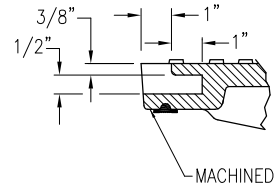
COVER WT. (CL. 35) – 210 LBS




SECTION A

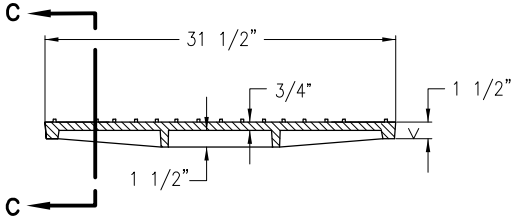



SECTION D




CONCEALED PICKHOLE DETAIL
WITH GASKET

SECTION C

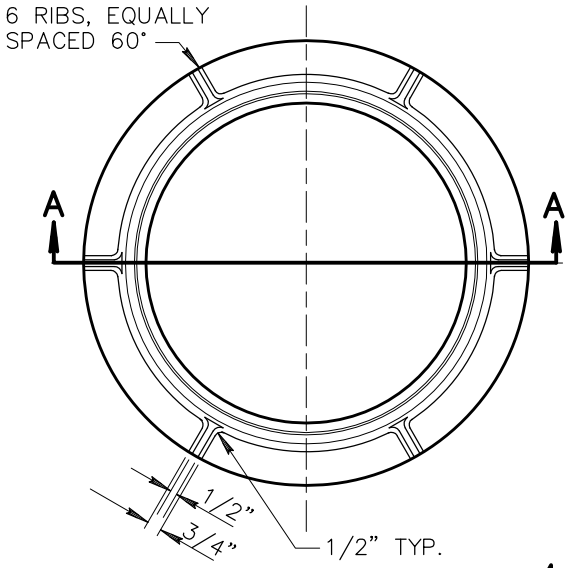



SECTION B

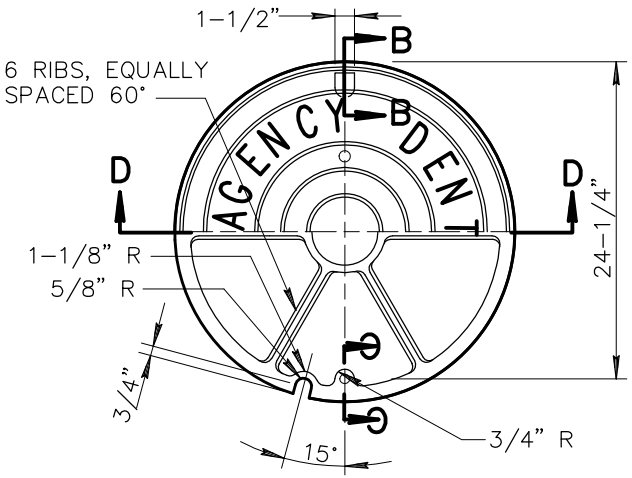
## NOTE:

LETTERING ON MANHOLE COVER TO CONTAIN NAME OF AGENCY AND UTILITY FOR WHICH MANHOLE IS NEEDED, (I.E. "PHOENIX SANITARY SEWER"), OR AS DIRECTED. THE TOTAL WIDTH OF INDIVIDUAL LETTERS TO BE SUCH THAT LETTERS AND WORDS ARE EQUALLY SPACED AND BALANCED TO FORM A COMPLETE CIRCLE WITH SPACERS BEFORE AND AFTER THE WORD IDENTIFYING THE AGENCY INVOLVED. LETTERS TO BE 2" IN HEIGHT AND RAISED FLUSH W/ TOP OF COVER. TYPE OF LETTERS TO BE SUBMITTED FOR APPROVAL. WEIGHT OF CASTINGS SHALL BE NO MORE THAN 2% MORE OR LESS THAN THE APPROXIMATE WEIGHT SPECIFIED. CASTINGS SHALL CONFORM TO ASTM A–48, CLASS 35 AND AASHTO M306. THE BEARING SURFACES OF THE FRAMES AND COVERS SHALL BE MACHINED AND THE COVERS SHALL SEAT FIRMLY WITHOUT ROCKING. ALL DIMENSIONS SHALL HAVE A 1/16" TOLERANCE.

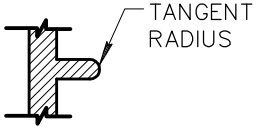
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 424–2 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | 30" CAST IRON WATERTIGHT MANHOLE FRAME AND COVER | 01–01–2012 | 424–2 |



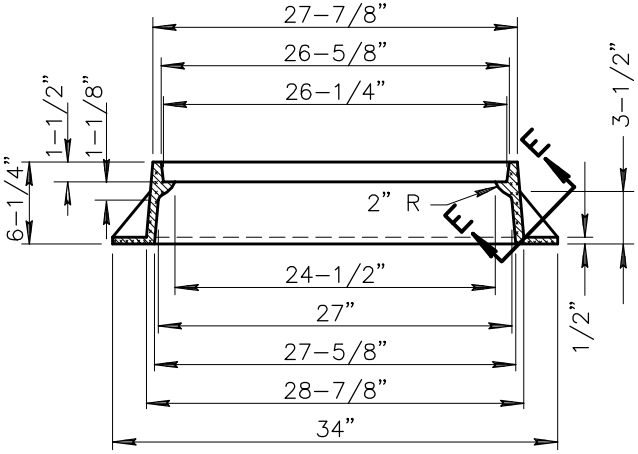

TOP VIEW



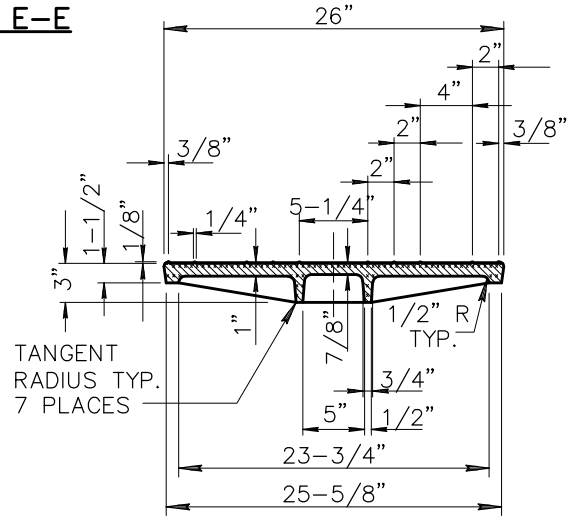

BOTTOM VIEW



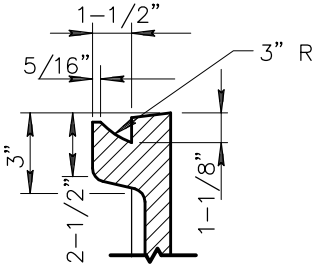

SECTION E-E



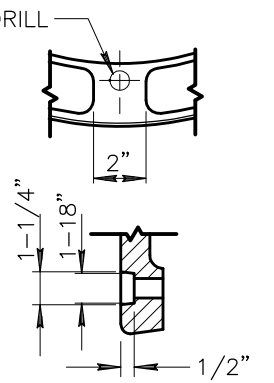

SECTION 'A-A'



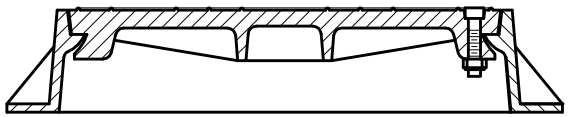

SECTION 'D-D'




SECTION 'B-B'




SECTION 'C-C'

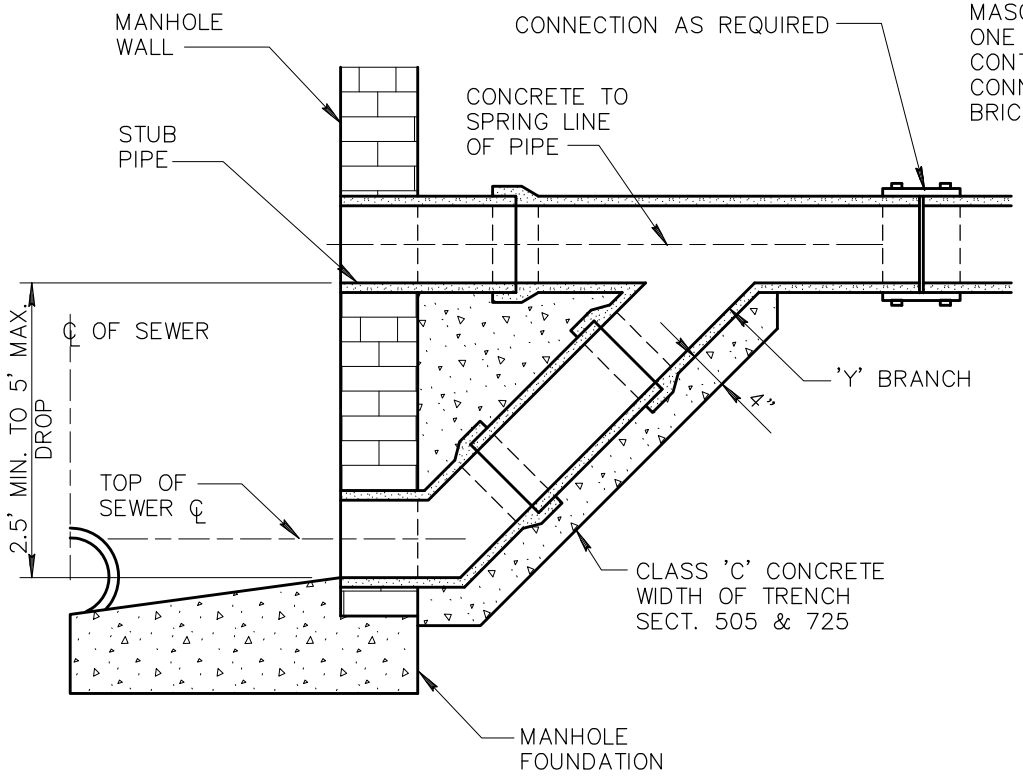


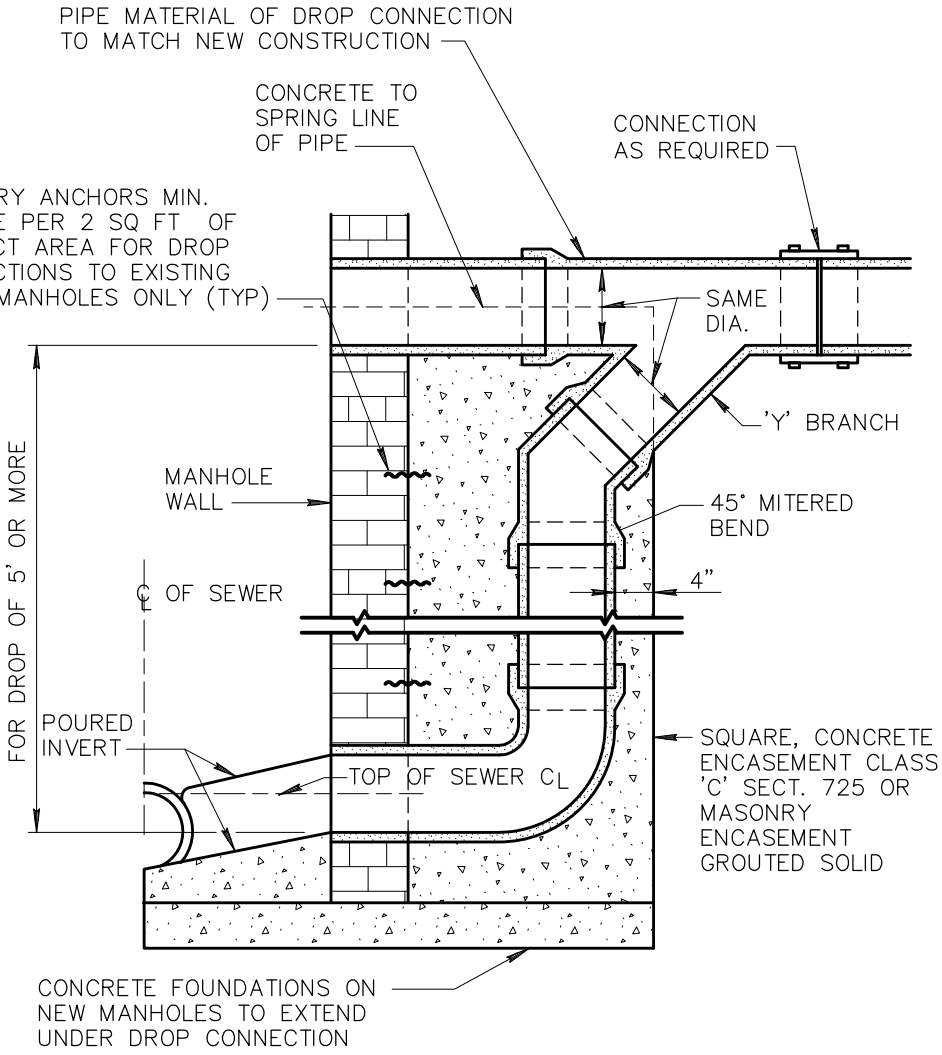
SECTION VIEW OF FRAME AND COVER WITH CAM LOCKING DEVICE

## NOTES:

1. MATERIAL SHALL CONFORM TO A.S.T.M. STANDARDS
   B 179-65 ALLOY SN122A
   B 179-65 ALLOY CN42A
   B 108-65 ALLOY SC103A
   (ALL 3 ACCEPTABLE)
2. LETTERING ON MANHOLE COVER TO CONTAIN NAME OF AGENCY AND UTILITY FOR WHICH MANHOLE IS NEEDED. (I.E. "PHOENIX SANITARY SEWER"), OR AS DIRECTED. THE TOTAL WIDTH OF INDIVIDUAL LETTERS TO BE SUCH THAT LETTERS AND WORDS ARE EQUALLY SPACED AND BALANCED TO FORM A COMPLETE CIRCLE WITH SPACERS BEFORE AND AFTER THE WORD IDENTIFYING THE AGENCY INVOLVED. LETTERS TO BE 2" RAISED 1/8" ABOVE LEVEL OF COVER. TYPE OF LETTERS TO BE SUBMITTED FOR APPROVAL.
3. WEIGHT OF CASTINGS SHALL BE NO MORE THAN 2% LESS THAN THE APPROXIMATE WEIGHT SPECIFIED.
4. CASTINGS SHALL CONFORM TO SECT. 787.
5. SHALL CONFORM TO SECT. 625.3.1 – (FRAME AND COVER).

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 425 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | **24" ALUMINUM MANHOLE FRAME AND COVER** | 01-01-1998 | 425 |

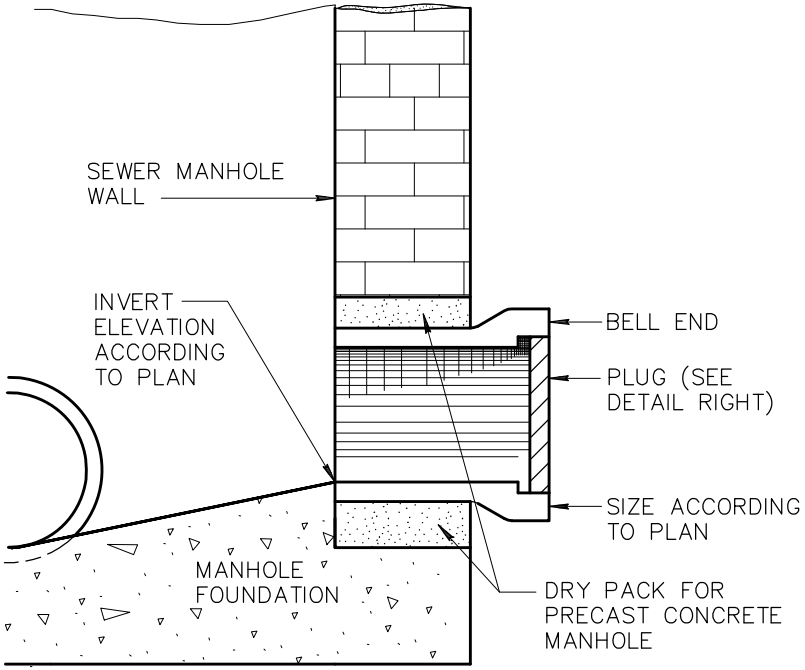


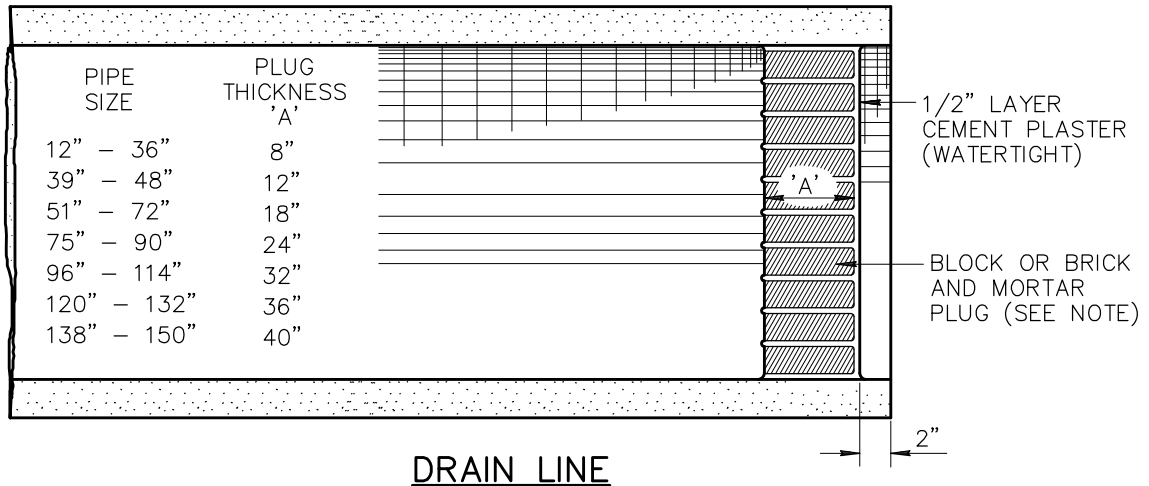

## TYPE A
2.5' TO 5' DROP

## TYPE B
5' OR MORE

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 426 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | DROP SEWER CONNECTIONS | 01-01-2007 | 426 |



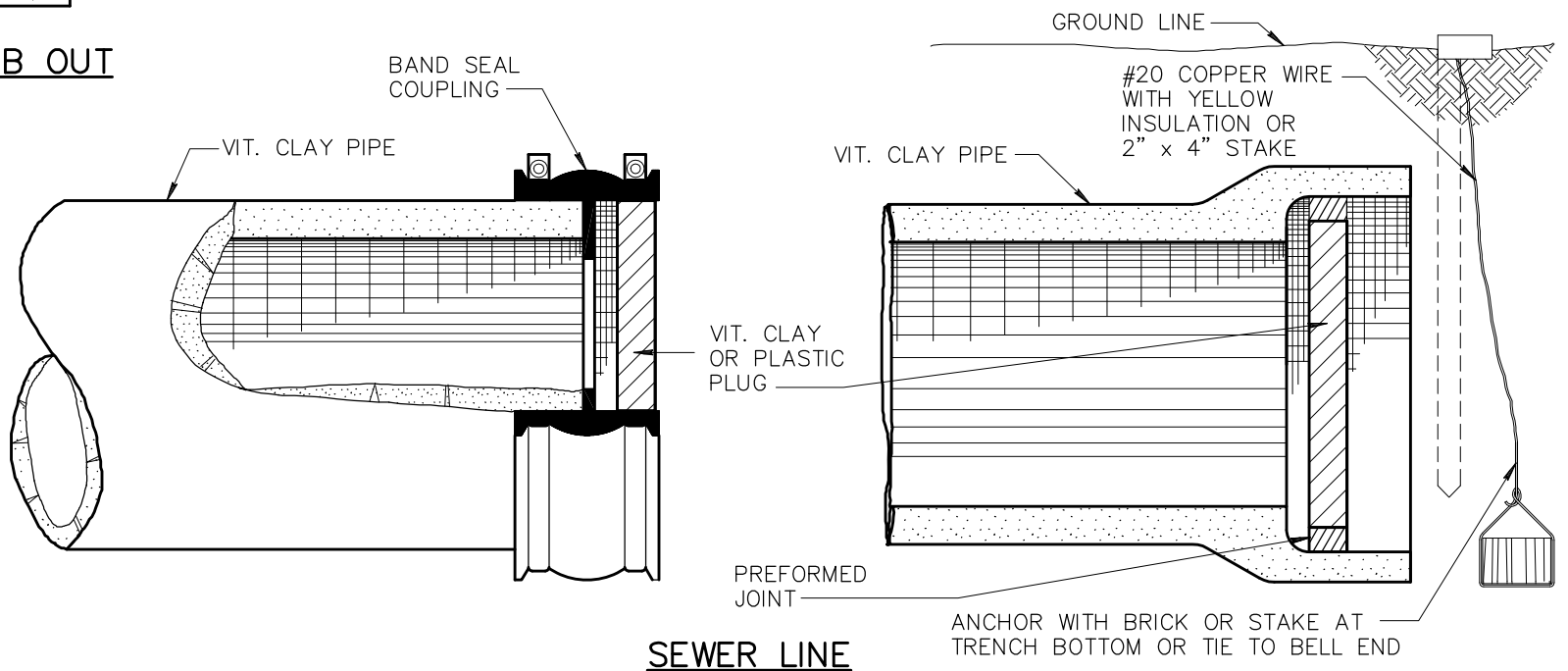

## TYPICAL STUB OUT




## DRAIN LINE

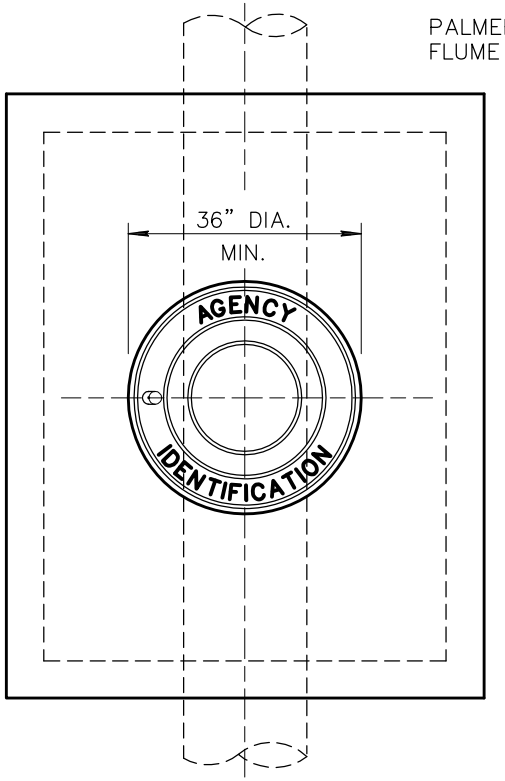
## NOTES:

1. NOTE: COMPACT SOIL AT END OF PIPE TO 95% OF MAXIMUM DENSITY.
2. IF DEPTH OF COVER IS LESS THAN 5' OR GREATER THAN 10' INCREASE PLUG THICKNESS A MIN. OF 4".

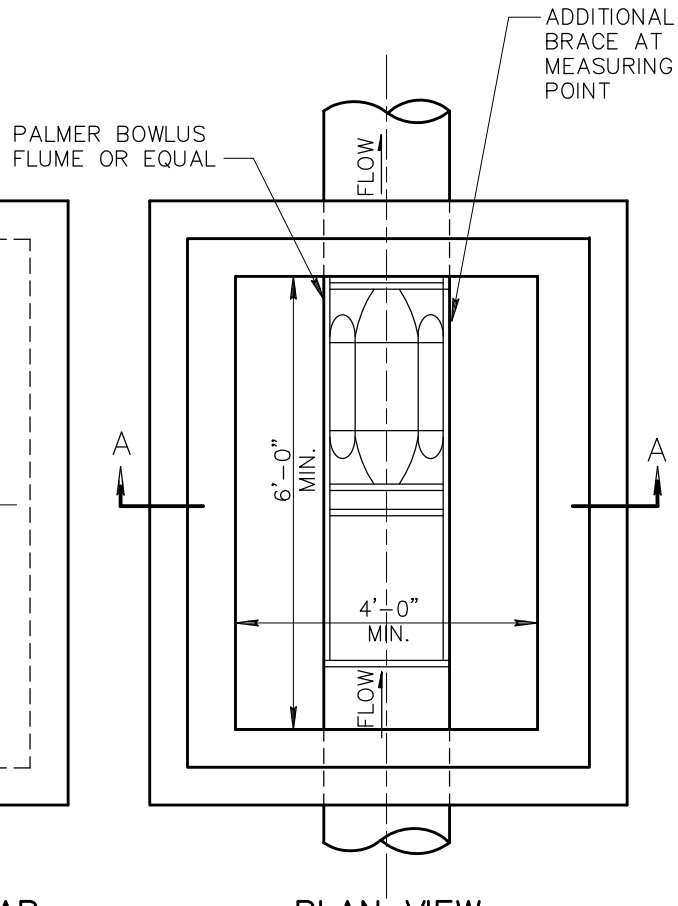



## SEWER LINE

| DETAIL NO. | | STANDARD DETAIL | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 427 | MARICOPA ASSOCIATION of GOVERNMENTS | ENGLISH | STUB OUT AND PLUGS | 01-01-1998 | 427 |

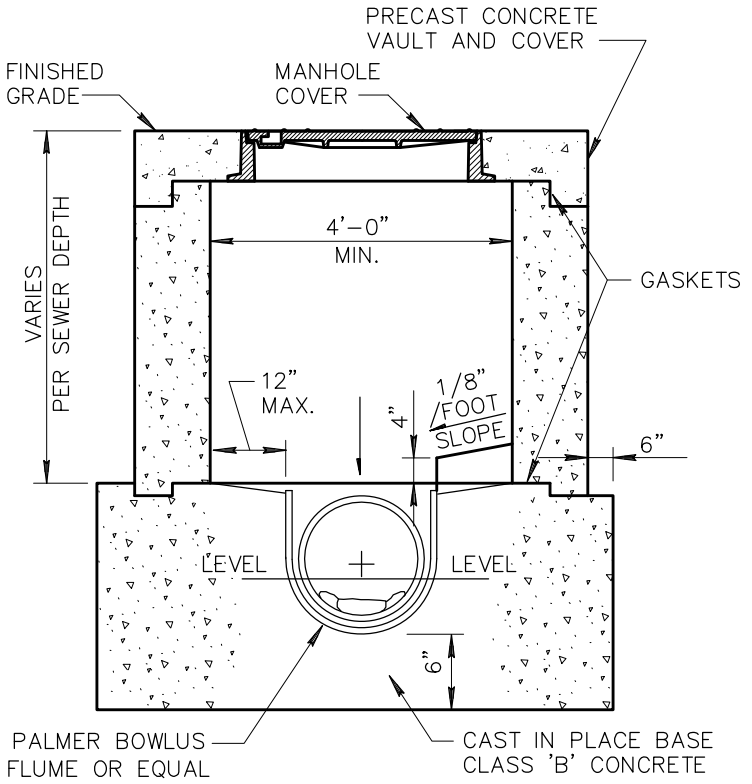



MANHOLE & COVER SLAB




PLAN VIEW

NOTE: WITH COVER REMOVED.



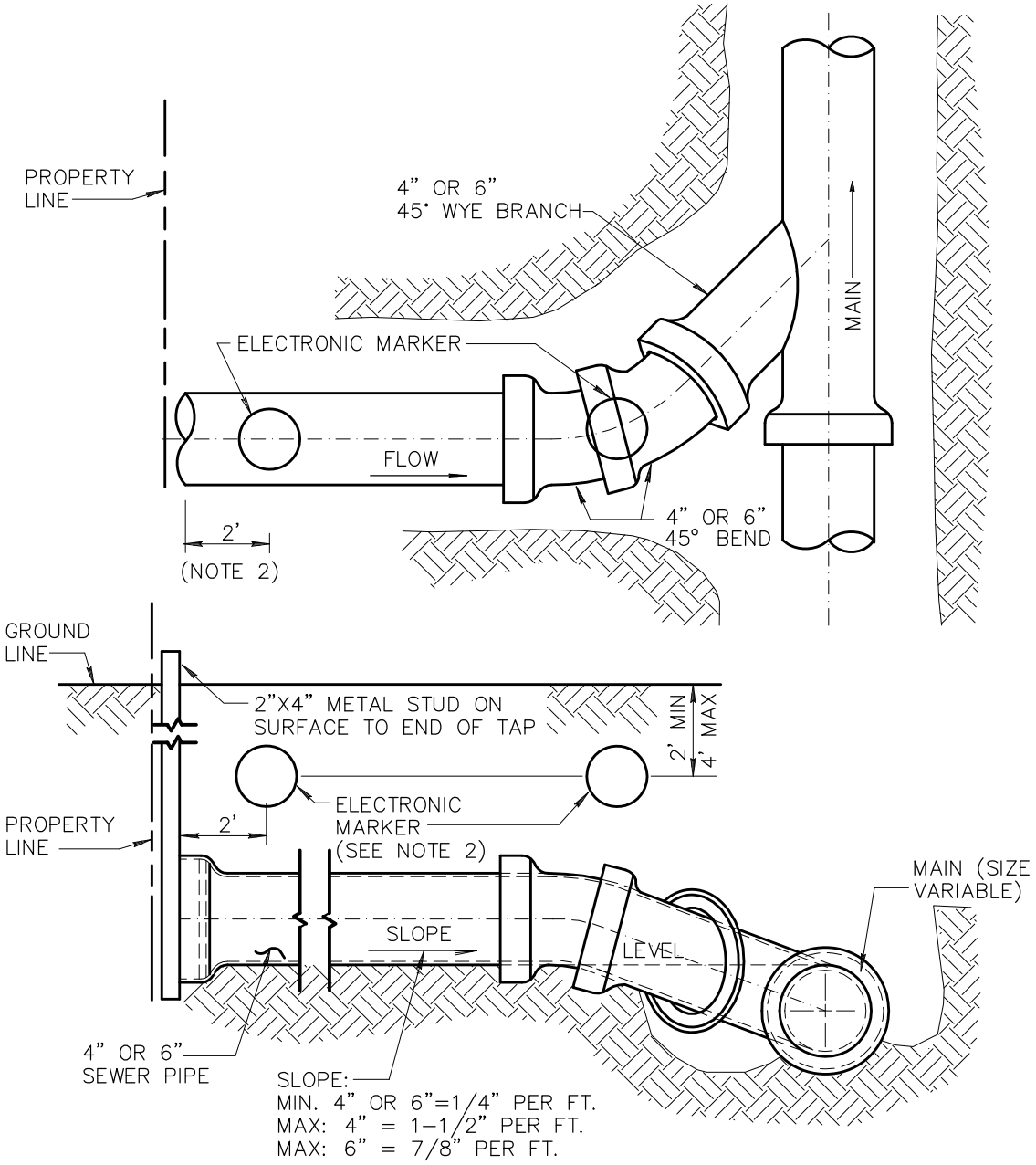

SECTION A-A

NOTE: LADDER NOT SHOWN IN SECTION VIEW.
SECTION SHOWN WITH COVER IN PLACE.

## NOTES:

1. THIS CONTROL VAULT WITH MANHOLE AND COVER SHALL BE USED ON 6" AND 8" DIAMETER SEWER WITH FLOWS IN THE RANGE OF 40 TO 340 GPM.
2. VAULT TO BE CONSTRUCTED ON STRAIGHT RUN OF BUILDING SEWER. ACCESSIBLE AND SAFELY LOCATED ON THE OWNERS PROPERTY ADJACENT TO A PUBLIC RIGHT-OF-WAY.
3. THE PALMER BOWLUS FLUME SHALL BE INSTALLED PER THE MANUFACTURERS RECOMMENDATIONS.
4. THE PRE-CAST CONCRETE VAULT SHALL BE RECTANGULAR WITH MINIMUM INSIDE DIMENSIONS OF 4' WIDE AND 6' LONG AND AT A DEPTH OF THE DESIGN OF THE BUILDING SEWER.
5. A SHOP DRAWING SHALL BE SUBMITTED TO THE CONTRACTING AGENCY FOR APPROVAL BEFORE INSTALLATION OF THE VAULT AND THE PALMER BOWLUS FLUME WILL BE ALLOWED.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 429 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | INDUSTRIAL WASTE CONTROL VAULT WITH MANHOLE | 01-01-2015 | 429 |

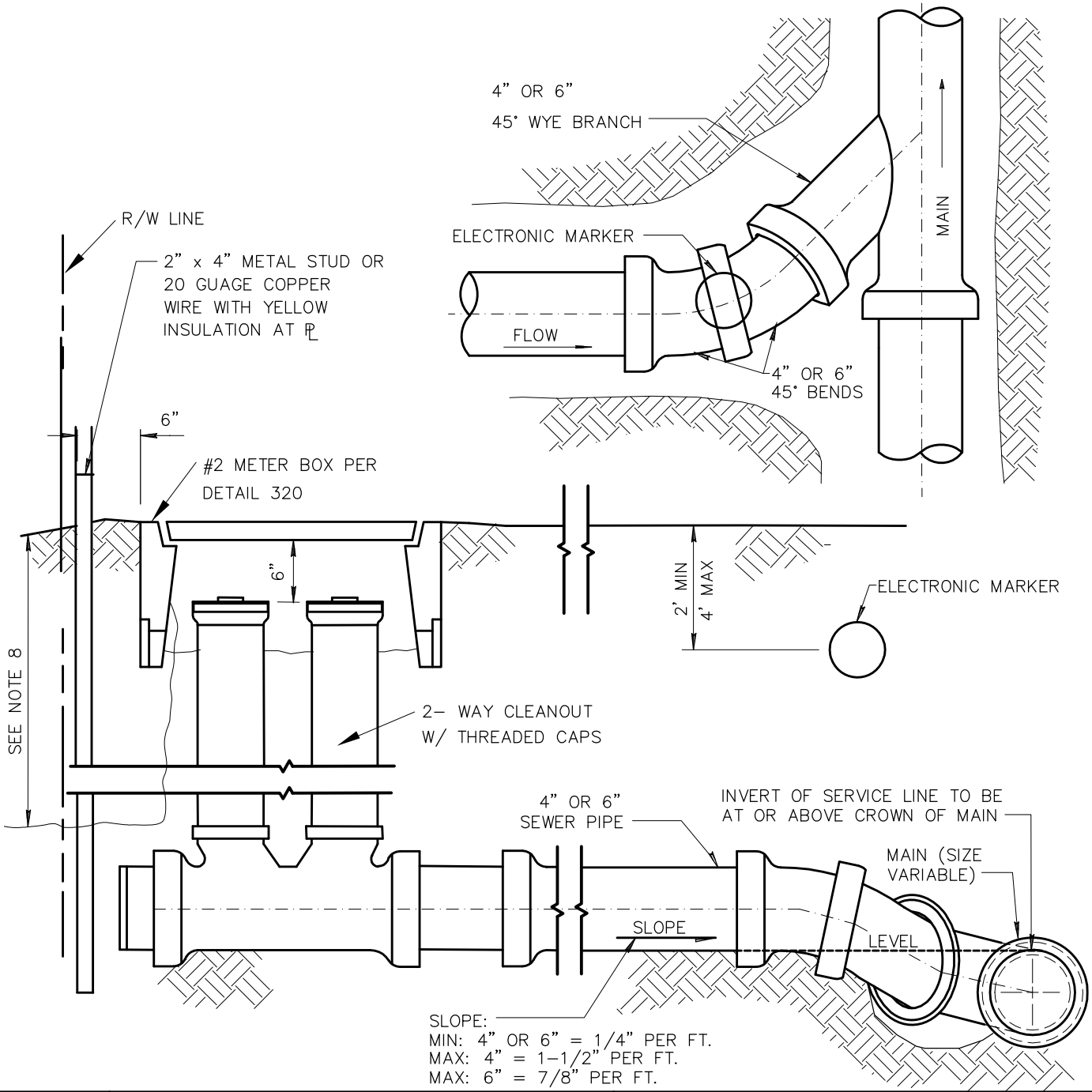



ELECTRONIC MARKER PLACEMENT

## NOTES:

1. ELECTRONIC MARKER SHALL BE A 3M MODEL 1424-XR/iD [4" DIAMETER SELF LEVELING MARKER BALL GREEN IN COLOR] OR APPROVED EQUAL OR AS REQUIRED BY THE LOCAL AGENCY.
2. MARKER SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS, 2' BACK FROM THE END OF THE SEWER SERVICE STUB AND CINCH TIED TO PIPE OR ABOVE PIPE AS REQUIRED BY LOCAL AGENCY. AN ADDITIONAL MARKER SHALL BE INSTALLED AT EACH SERVICE STUB BEND.
3. ELECTRONIC MARKER SHALL BE RESTORED BY CONTRACTOR IF DISTURBED WHEN PRIVATE SERVICE LINE CONNECTION IS INSTALLED.
4. MARKER SHALL BE USED IN ADDITION TO A 2"x4" METAL STUD.
5. CONSTRUCTION DETAIL APPLIES WHERE CONTRACTOR BUILDS HOUSE CONNECTION. TAP EXTENDS TO PROPERTY LINE IN ALLEYS OR STREETS OR TO EASEMENT LINE.
6. SIZE OF TAP SHALL BE DESIGNATED ON PLANS.
7. CONSTRUCT TAP AT MINIMUM SLOPE IF COVER WILL BE LESS THAN 5' AT PROPERTY LINE.
8. ALL FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D-2321. THE CONTRACTOR MAY VARY FROM THE DRAWING TO USE THE APPROPRIATE WYES, TEE-WYES AND BENDS TO ENSURE NO MISALIGNMENT OF THE PIPE AND FITTINGS. BLOCK OR BRACE FITTINGS JOINTS TO ENSURE ZERO DEGREES ANGULAR JOINT DEFLECTION.
9. END OF TAP TO BE SEALED AND MARKED AS NOTED.

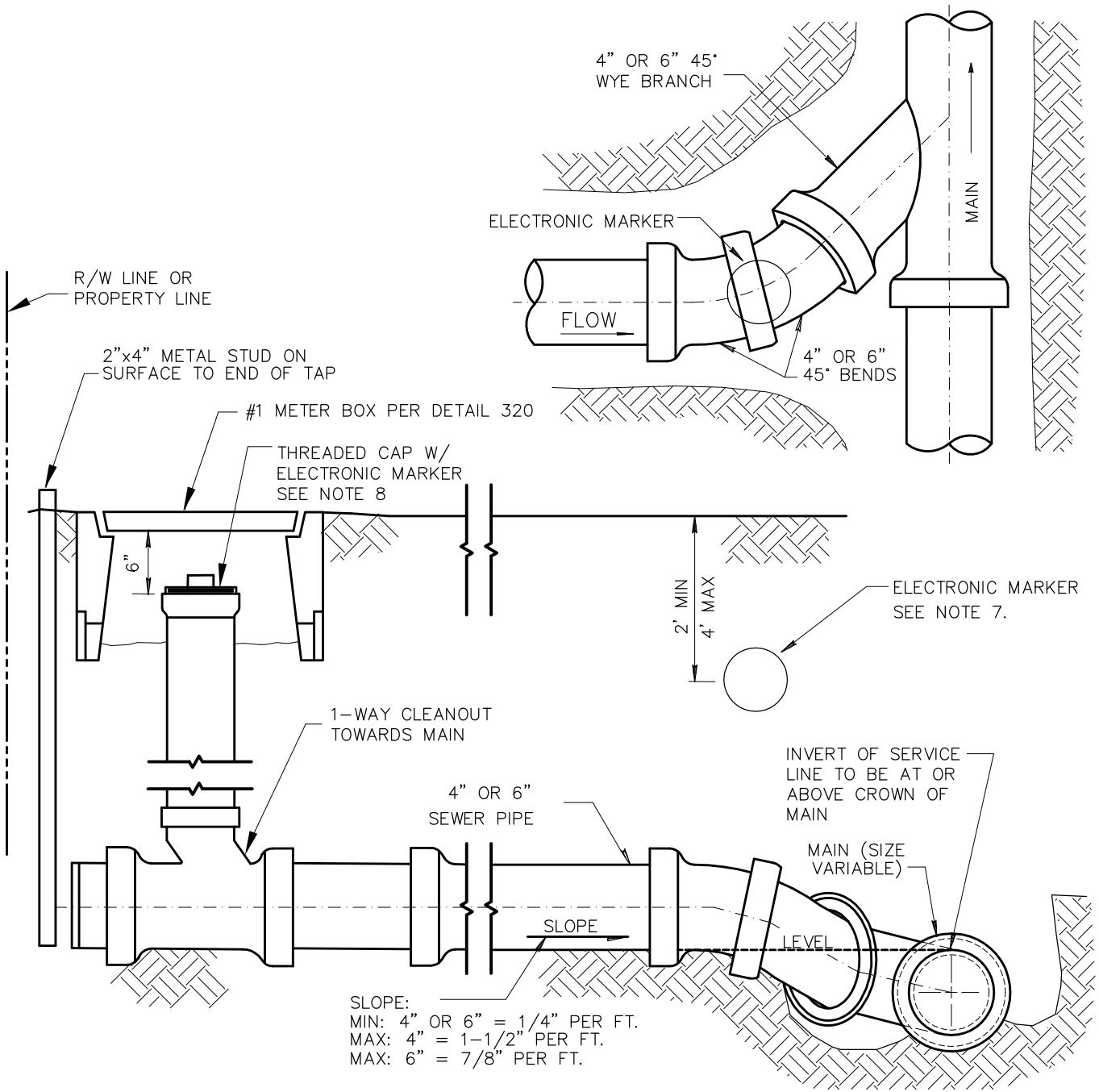
| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 440-1 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | TYPE 'A' – SEWER BUILDING CONNECTION ELECTRONIC BALL MARKERS (STANDARD) | | 01-01-2007 | 440-1 |




## NOTES:

1. CONSTRUCTION DETAIL APPLIES WHERE CONTRACTOR BUILDS HOUSE CONNECTION. TAP EXTENDS TO PROPERTY LINE IN ALLEYS OR STREETS OR TO EASEMENT LINE.
2. SIZE OF TAP SHALL BE DESIGNATED ON PLANS.
3. CONSTRUCT TAP AT MINIMUM SLOPE IF COVER WILL BE LESS THAN 5' AT PROPERTY LINE.
4. IF DEPTH REQUIRES, MINIMUM SLOPE CAN BE REDUCED TO 1/8" PER FOOT PROVIDED STUB IS STAKED TO GRADE.
5. ALL FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D-2321. THE CONTRACTOR MAY VARY FROM THE DRAWING TO USE THE APPROPRIATE WYES, TEE-WYES AND BENDS TO ENSURE NO MISALIGNMENT OF THE PIPE AND FITTINGS. BLOCK OR BRACE FITTING JOINTS TO ENSURE ZERO DEGREES ANGULAR JOINT DEFLECTION.
6. END OF TAP TO BE SEALED AND MARKED AS NOTED.
7. ELECTRONIC MARKER SHALL BE A 3M MODEL 1424-XR/iD [4" DIAMETER SELF LEVELING MARKER BALL GREEN IN COLOR] OR APPROVED EQUAL OR AS REQUIRED BY THE LOCAL AGENCY.
8. # 14 BARE COPPER LOCATOR WIRE ACCESSIBLE AT R/W AND AT PROPERTY OWNER CLEANOUT BOX NO GREATER THAN 4' DEEP.
9. STAMP OR WELD THE LETTER "S" ON LID OF METER BOX.

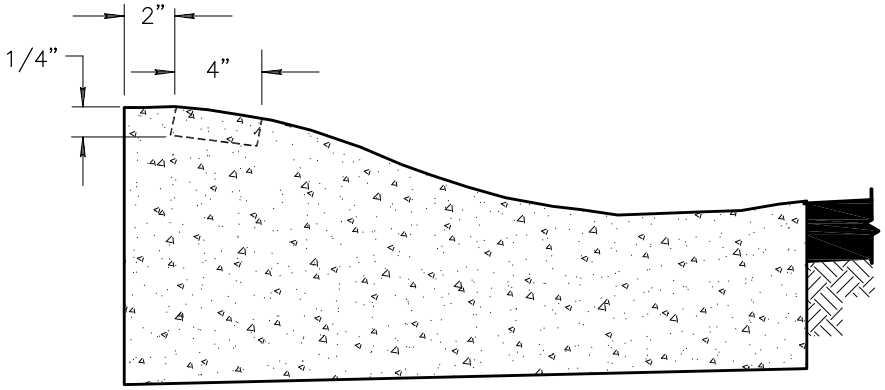
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 440-2 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | **TYPE 'B' – SEWER BUILDING CONNECTION**<br>**TWO-WAY CLEANOUT AND METER BOX AT R/W**<br>(WHEN SPECIFIED BY LOCAL AGENCY) | 01-01-2007 | 440-2 |



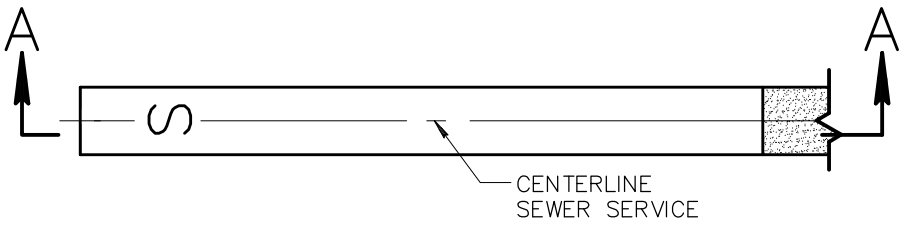

## NOTES:

1. CONSTRUCTION DETAIL APPLIES WHERE CONTRACTOR BUILDS HOUSE CONNECTION. TAP EXTENDS TO PROPERTY LINE IN ALLEYS OR STREETS OR TO EASEMENT LINE.
2. SIZE OF TAP SHALL BE DESIGNATED ON PLANS.
3. CONSTRUCT TAP AT MIN. SLOPE IF COVER WILL BE LESS THAN 5' AT PROPERTY LINE.
4. IF DEPTH REQUIRES, MINIMUM SLOPE CAN BE REDUCED TO 1/8" PER FOOT PROVIDED STUB IS STAKED TO GRADE.
5. ALL FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D-2321. THE CONTRACTOR MAY VARY FROM THE DRAWING TO USE THE APPROPRIATE WYES, TEE-WYES AND BENDS TO ENSURE NO MISALIGNMENT OF THE PIPE AND FITTINGS. BLOCK OR BRACE FITTING JOINTS TO ENSURE ZERO DEGREES ANGULAR JOINT DEFLECTION.
6. END OF TAP TO BE SEALED AND MARKED.
7. ELECTRONIC MARKER SHALL BE A 3M MODEL 1424-XR/iD [4" DIAMETER SELF LEVELING MARKER BALL GREEN IN COLOR] OR APPROVED EQUAL OR AS REQUIRED BY THE LOCAL AGENCY.
8. INSTALL RAISED 4" THREADED PLUG IN CLEANOUT INCORPORATING 3M MODEL 1414 ELECTRONIC DISC MARKER. GREEN IN COLOR. LOCATOR PLUG TO BE GPK PRODUCTS MODEL #228-0004 DM OR APPROVED EQUAL.
9. STAMP OR WELD THE LETTER "S" ON LID OF METER BOX.

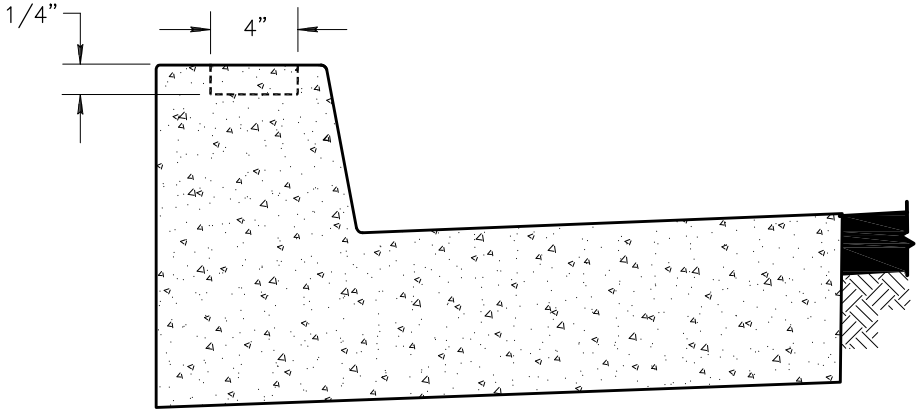
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 440-3 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | **TYPE 'C' – SEWER BUILDING CONNECTION**<br>**ONE-WAY CLEANOUT AND METER BOX**<br>(WHEN SPECIFIED BY LOCAL AGENCY) | 01-01-2007 | 440-3 |



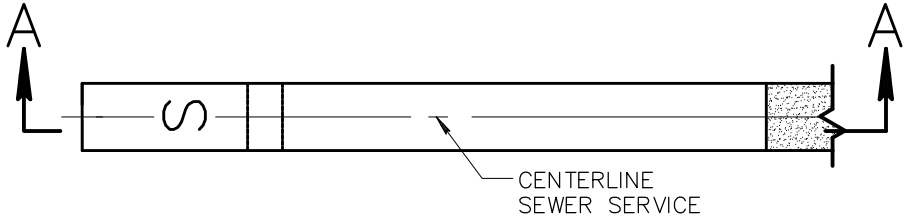

SECTION A–A




CURB STAMP ROLLED CURB




SECTION A–A

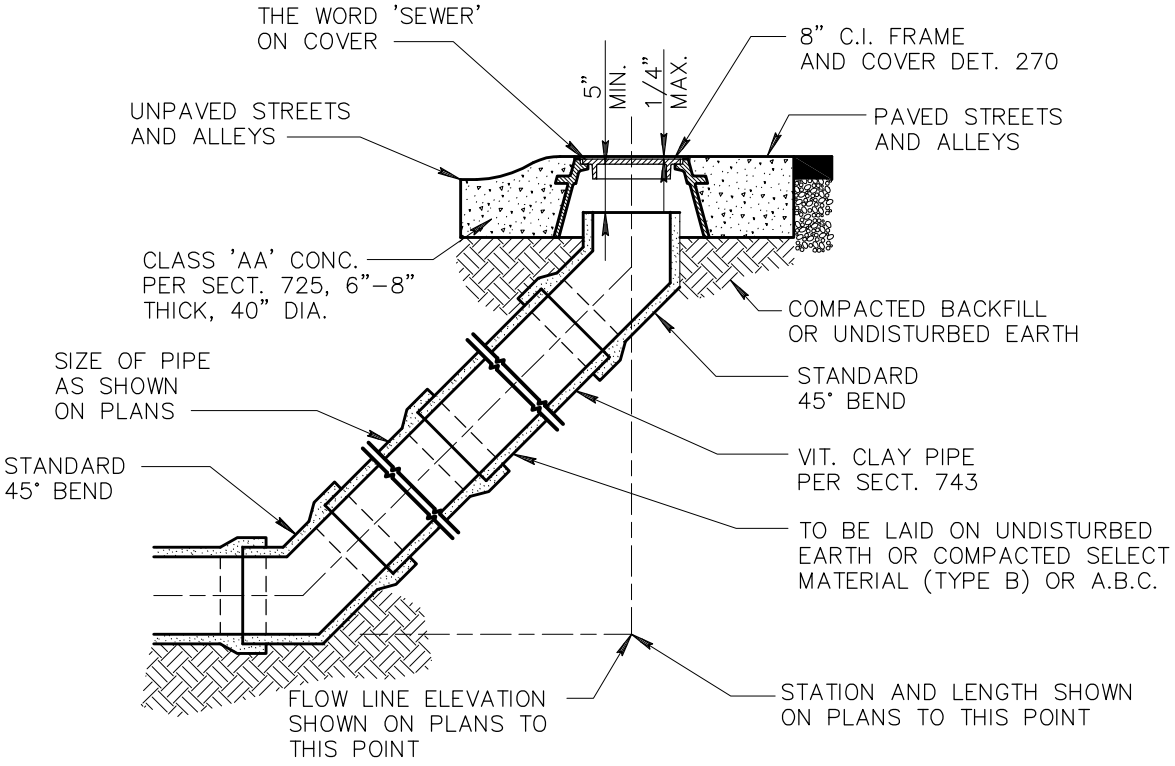



CURB STAMP VERTICAL CURB

## NOTES:

1. STAMP TOP OF CURB WITH 4" TALL BY 1/4" DEEP "S" TO DESIGNATE SEWER SERVICE LINE CROSSING.

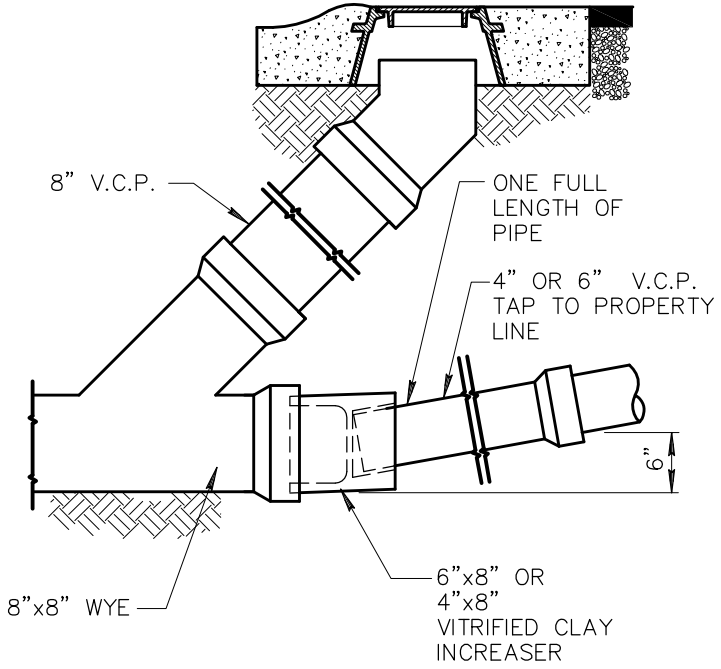
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 440–4 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | **SEWER SERVICE CURB CROSSING STAMP DETAIL** | 01–01–2006 | 440–4 |




## CLEANOUT INSTALLATION

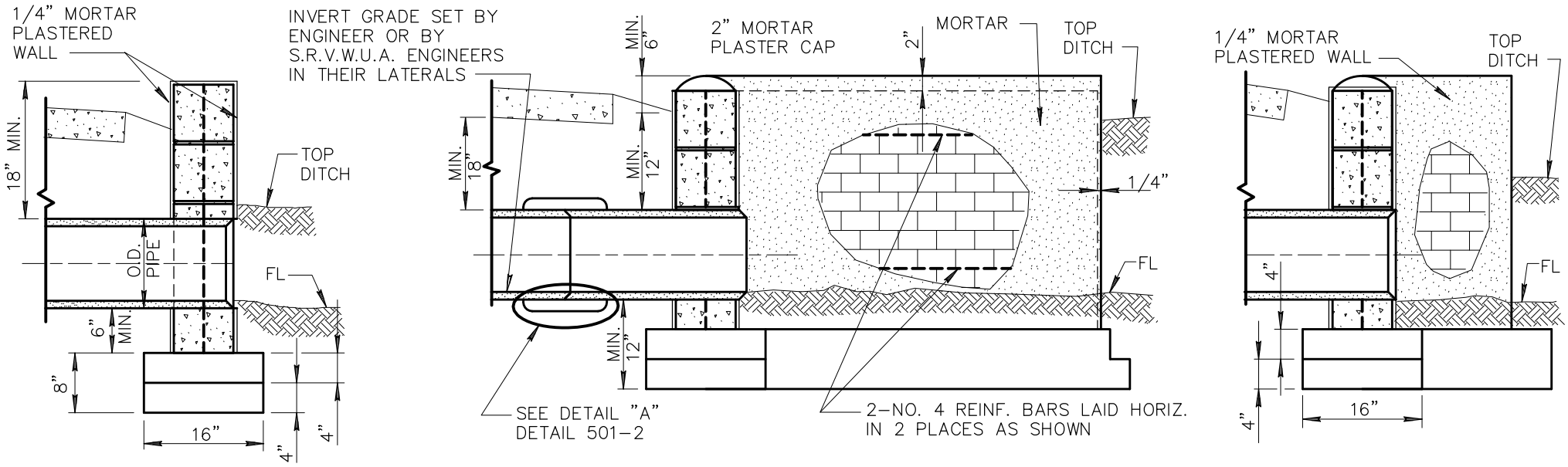
**NOTE:**

END OF SEWER TAP TO BE SEALED AND MARKED IN ACCORDANCE WITH DET. 440

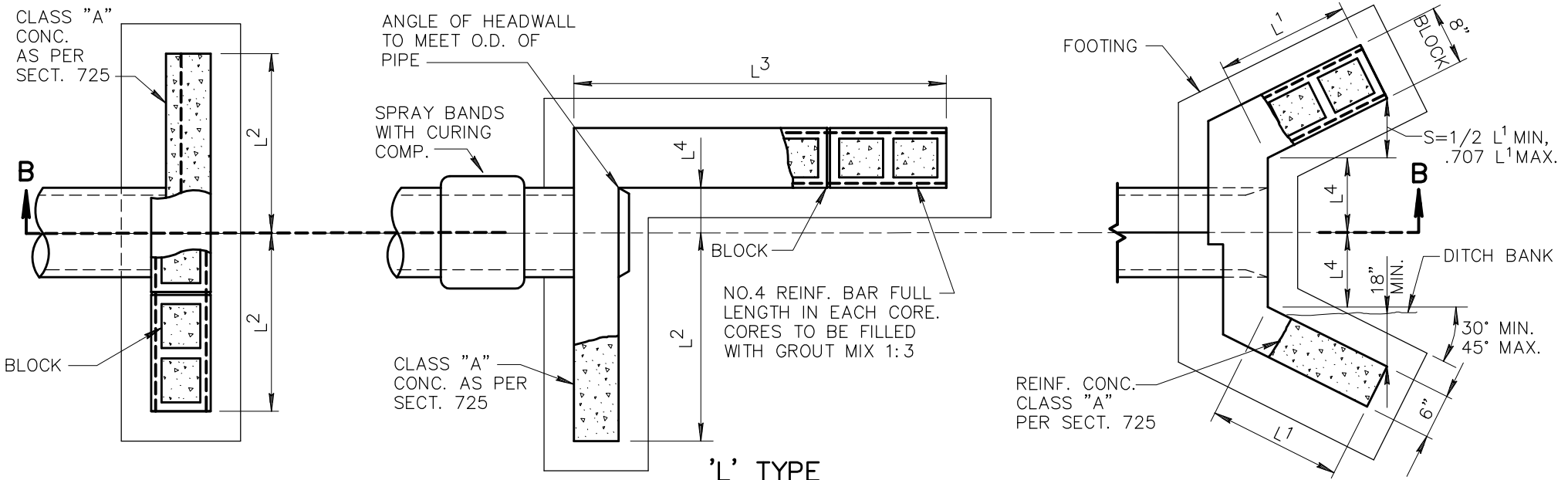



## SEWER TAP AT CLEANOUT

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 441 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | SEWER CLEANOUT | 01–01–2001 | 441 |




## SECTION B-B



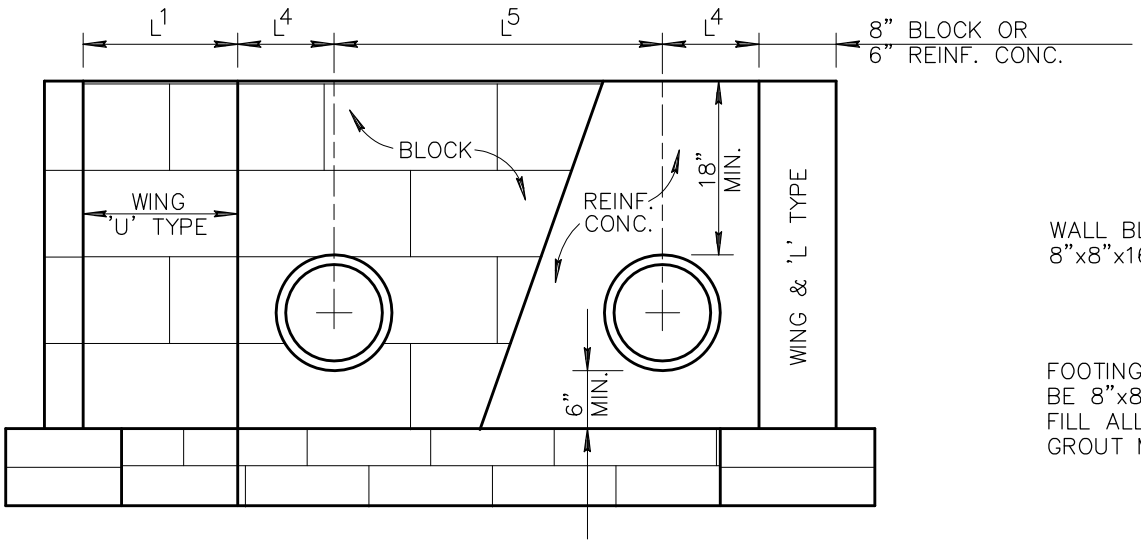

## STRAIGHT TYPE

## 'L' TYPE

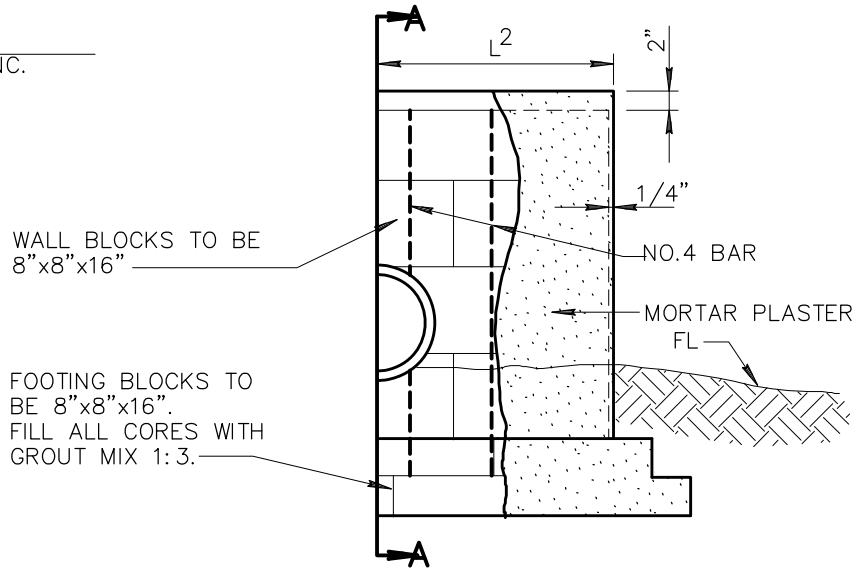
## PLAN

## 'U' TYPE

| DETAIL NO. | | STANDARD DETAIL | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 501-1 | MARICOPA ASSOCIATION of GOVERNMENTS | ENGLISH | HEADWALL | 01-01-2012 | 501-1 |




## DOUBLE PIPE HEADWALL




## ELEVATION

CONCRETE MASONRY UNITS (BLOCK) HEADWALLS JOINED WITH CEMENT MORTAR PLASTERED BOTH SIDES OF WALL FULL HEIGHT AND SHALL BE CURED PER SECT. 726.

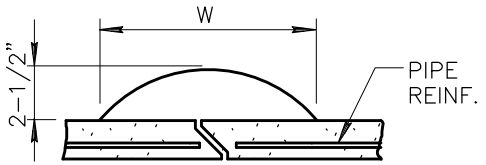
## NOTES:

1. ALL CONCRETE SHALL BE CLASS 'A' PER SECT. 505 & 725.
2. CONCRETE MASONRY UNITS (BLOCK) PER SECT. 510, 775 & 776.
3. CONCRETE REINF. SHALL BE NO.4 BAR 12" O.C. BOTH WAYS.

### HEADWALL DIMENSIONS

| *NOMINAL PIPE SIZE | $L^1$ | $L^2$ | $L^3$ | $L^4$ | $L^5$ |
|---|---|---|---|---|---|
| 12" | 1'-4" | 2'-0" | 3'-8" | 0'-10" | 2'-10" |
| 15" | 2'-0" | 2'-8" | 4'-0" | 1'-0" | 3'-0" |
| 18" | 2'-0" | 3'-8" | 4'-8" | 1'-2" | 3'-4" |
| 21" | 2'-8" | 4'-0" | 5'-4" | 1'-3" | 3'-8" |
| 24" | 2'-8" | 4'-0" | 5'-4" | 1'-6" | 3'-11" |
| 30" | 2'-8" | 5'-4" | 6'-8" | 1'-10" | 4'-7" |
| 36" | 3'-4" | 6'-8" | 8'-0" | 1'-10" | 5'-2" |
| 42" | 4'-0" | 8'-0" | 9-4" | 2'-2" | 5'-9" |

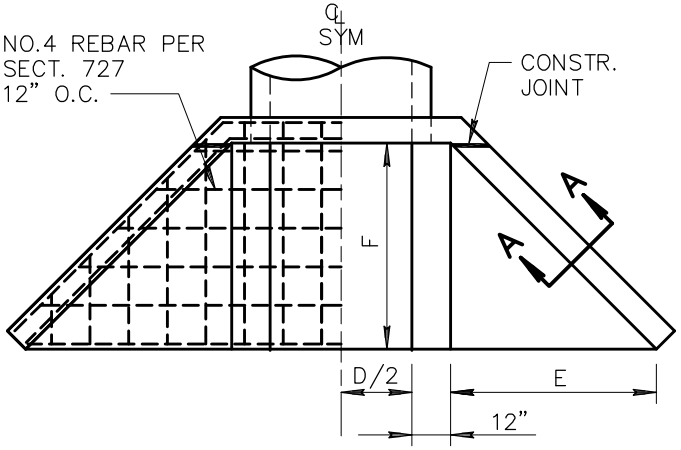
* NOMINAL PIPE SIZE GIVEN FOR REINFORCED CONC. PIPE.



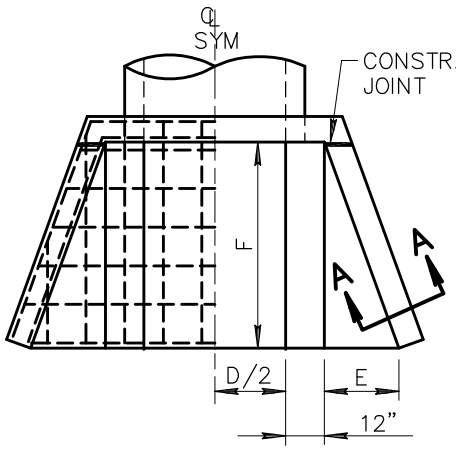

| PIPE SIZE | W |
|---|---|
| 12" – 21" INCL. | 11" |
| 24" – 42" INCL. | 13" |

## DETAIL "A"

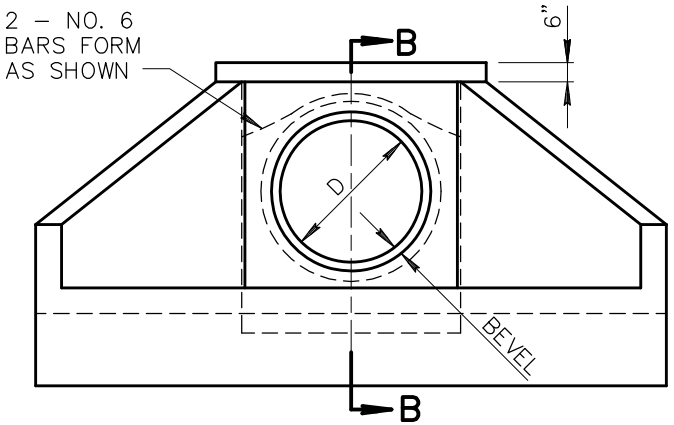
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 501-2 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | HEADWALL | 01-01-2012 | 501-2 |



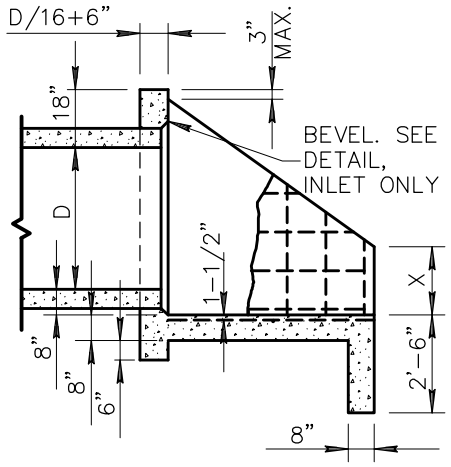

INLET HEADWALL



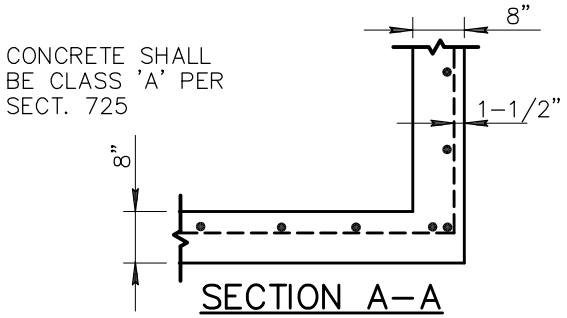

OUTLET HEADWALL



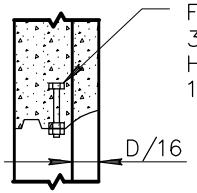

INLET HEADWALL FACE ELEVATION
OUTLET SIMILAR




SECTION B–B




SECTION A–A



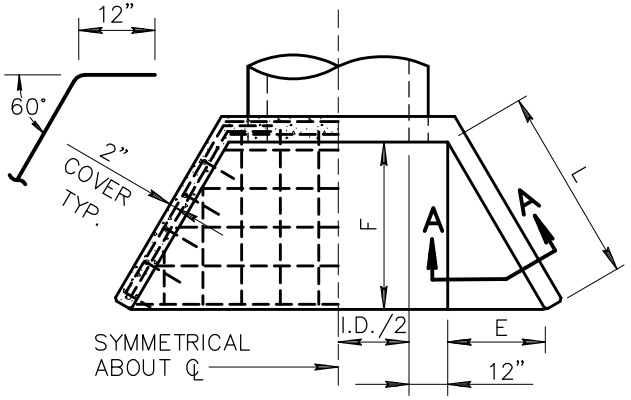

CMP BEVEL DETAIL

| 1:1 1/2 EMBANKMENT SLOPE | | | | |
|---|---|---|---|---|
| D | TYPE * | DIMENSIONS | | |
| | | F | E | X |
| 42" | 1 (IN) | 5'–2" | 5'–2" | 1'–9" |
| | 2 (OUT) | 5'–2" | 1'–11" | 1'–9" |
| 48" | 3 (IN) | 5'–8" | 5'–8" | 1'–11" |
| | 4 (OUT) | 5'–8" | 2'–1" | 1'–11" |
| 54" | 5 (IN) | 6'–2" | 6'–2" | 2'–1" |
| | 6 (OUT) | 6'–2" | 2'–3" | 2'–1" |
| 60" | 7 (IN) | 6'–8" | 6'–8" | 2'–3" |
| | 8 (OUT) | 6'–8" | 2'–5" | 2'–3" |
| 66" | 9 (IN) | 7'–2" | 7'–2" | 2'–5" |
| | 10 (OUT) | 7'–2" | 2'–7" | 2'–5" |
| 72" | 11 (IN) | 7'–8" | 7'–8" | 2'–7" |
| | 12 (OUT) | 7'–8" | 2'–9" | 2'–7" |
| 78" | 13 (IN) | 8'–2" | 8'–2" | 2'–9" |
| | 14 (OUT) | 8'–2" | 3'–0" | 2'–9" |
| 84" | 15 (IN) | 8'–8" | 8'–8" | 2'–11" |
| | 16 (OUT) | 8'–8" | 3'–2" | 2'–11" |

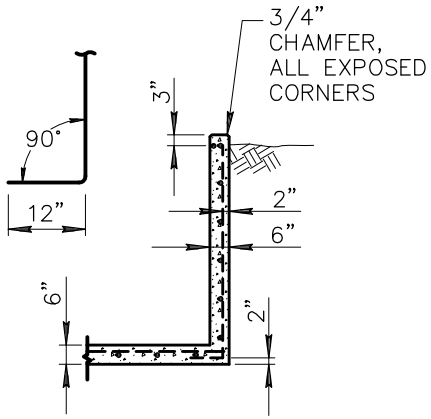
| 1:4 EMBANKMENT SLOPE | | | | |
|---|---|---|---|---|
| D | TYPE * | DIMENSIONS | | |
| | | F | E | X |
| 42" | 17 (IN) | 8'–8" | 8'–8" | 3'–0" |
| | 18 (OUT) | 8'–8" | 3'–2" | 3'–0" |
| 48" | 19 (IN) | 8'–8" | 8'–8" | 3'–6" |
| | 20 (OUT) | 8'–8" | 3'–2" | 3'–6" |
| 54" | 21 (IN) | 8'–8" | 8'–8" | 4'–0" |
| | 22 (OUT) | 8'–8" | 3'–2" | 4'–0" |
| 60" | 23 (IN) | 9'–4" | 9'–4" | 4'–4" |
| | 24 (OUT) | 9'–4" | 3'–5" | 4'–4" |
| 66" | 25 (IN) | 9'–8" | 9'–8" | 4'–9" |
| | 26 (OUT) | 9'–8" | 3'–6" | 4'–9" |
| 72" | 27 (IN) | 9'–8" | 9'–8" | 5'–3" |
| | 28 (OUT) | 9'–8" | 3'–6" | 5'–3" |
| 78" | 29 (IN) | 10'–0" | 10'–0" | 5'–8" |
| | 30 (OUT) | 10'–0" | 3'–8" | 5'–8" |
| 84" | 31 (IN) | 10'–8" | 10'–8" | 6'–0" |
| | 32 (OUT) | 10'–8" | 3'–11" | 6'–0" |

* (IN) REFERS TO INLET
(OUT) REFERS TO OUTLET

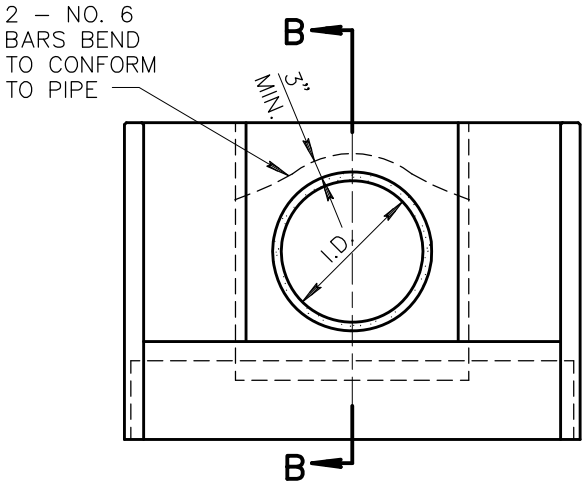
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 501–3 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | HEADWALL 42" TO 84" PIPE | 01–01–1998 | 501–3 |



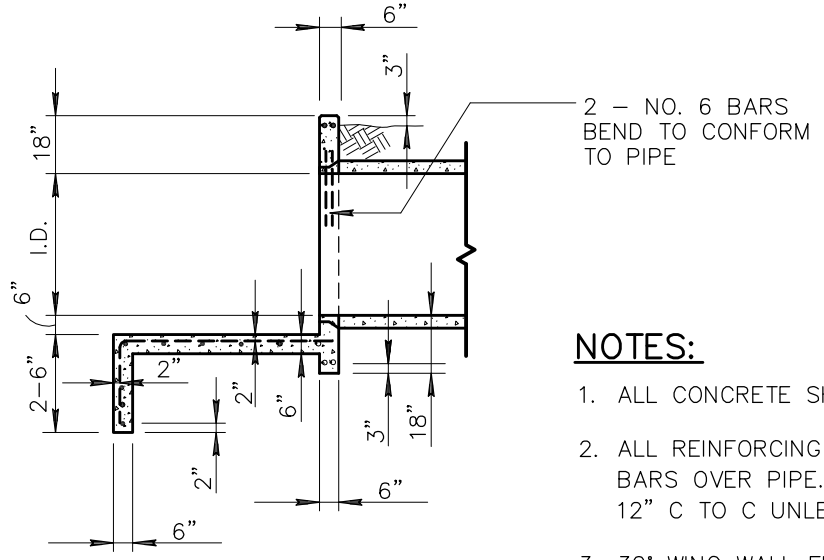

PLAN




SECTION A–A




ELEVATION



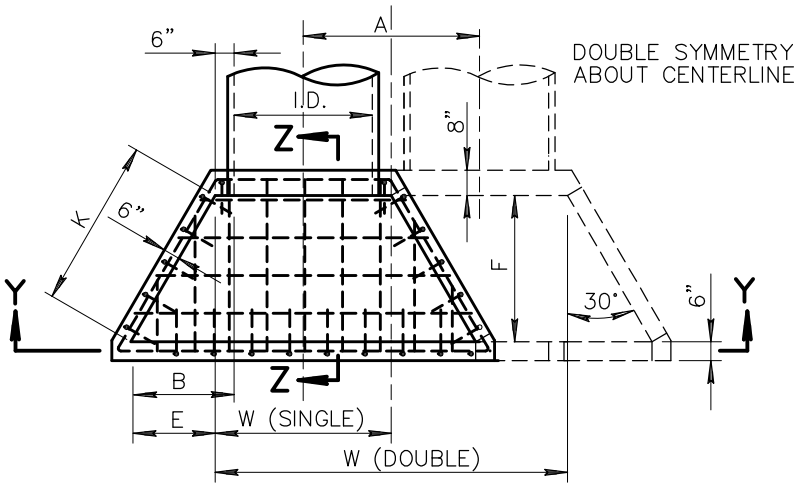

SECTION B–B

| PIPE I.D. | DIMENSIONS | | |
|---|---|---|---|
| | L | E | F (APPROX) |
| 18" | 2'–0" | 1'–0" | 1'–9" |
| 24" | 2'–0" | 1'–0" | 1'–9" |
| 30" | 3'–0" | 1'–6" | 2'–7" |
| 36" | 4'–0" | 2'–0" | 3'–6" |
| 42" | 5'–0" | 2'–6" | 4'–4" |
| 48" | 6'–0" | 3'–0" | 5'–2" |
| 54" | 7'–0" | 3'–6" | 6'–1" |
| 60" | 8'–0" | 4'–0" | 6'–11" |

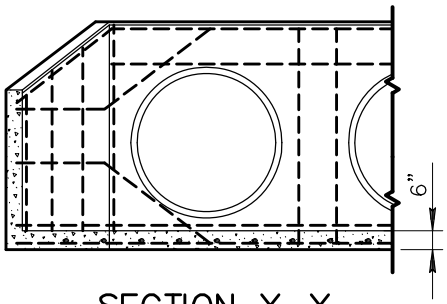
## NOTES:

1. ALL CONCRETE SHALL BE CLASS 'A' PER SECT. 725.
2. ALL REINFORCING BARS SHALL BE NO. 4 EXCEPT NO. 6 BARS OVER PIPE. BAR SPACING APPROXIMATELY 12" C TO C UNLESS OTHERWISE NOTED.
3. 30° WING WALL FLARE SHOWN; 45° NORMALLY DESIRABLE.

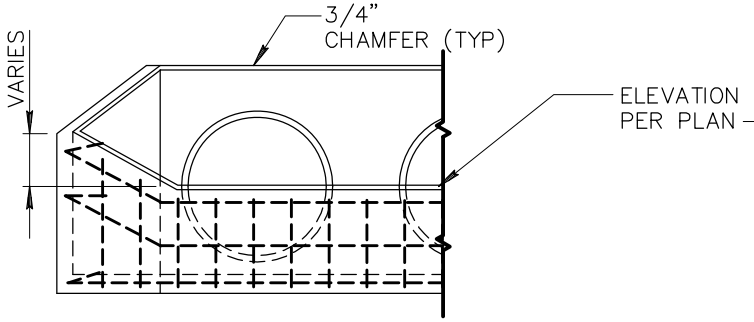
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 501–4 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | HEADWALL IRRIGATION 18" TO 60" PIPE | 01–01–1998 | 501–4 |



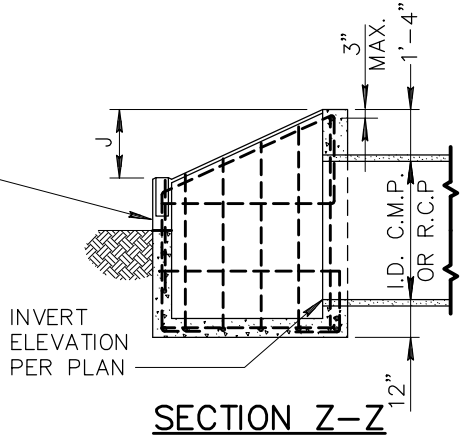

PLAN




SECTION Y–Y




ELEVATION



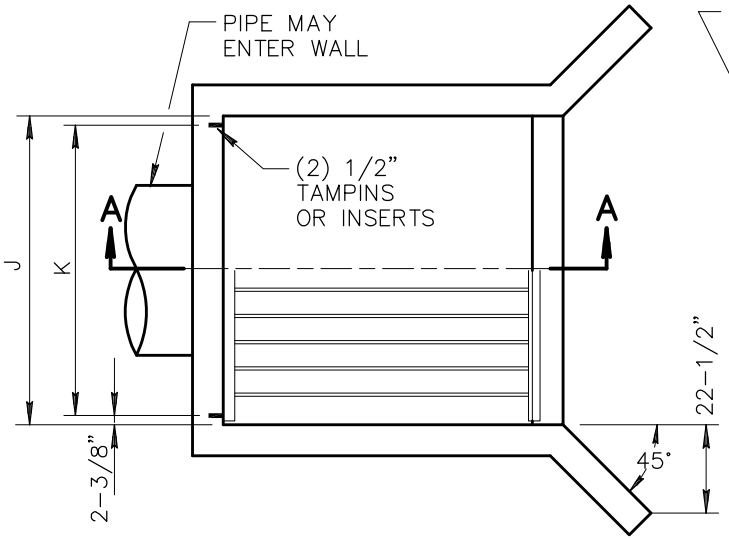

SECTION Z–Z

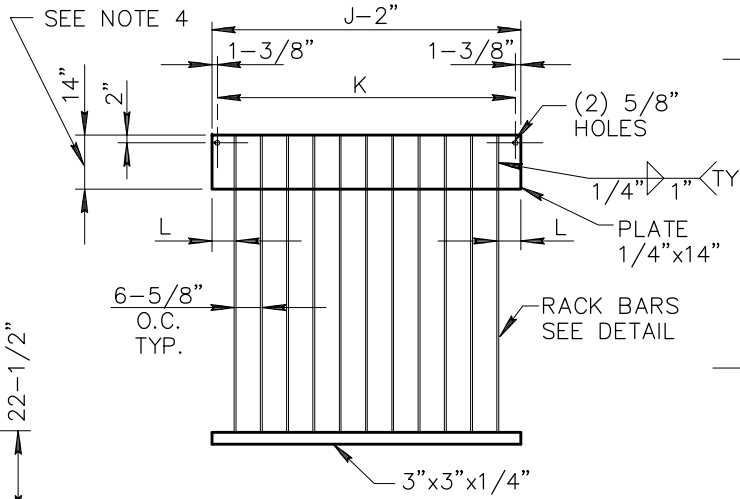
| PIPE | DIMENSIONS | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| I.D. | W | | A | B | E | F | J | K |
| | SINGLE | DOUBLE | | | | | | |
| 18" | 2'–6" | 5'–2" | 2'–8" | 1'–3" | 0'–9" | 1'–3·5/8" | 9" | 1'–6" |
| 24" | 3'–0" | 6'–6" | 3'–6" | 1'–7·1/2" | 1'–1·1/2" | 1'–11· 3/8" | 11" | 2'–3" |
| 30" | 3'–6" | 7'–10" | 4'–4" | 2'–0" | 1'–6" | 2'–7·1/4" | 1'–1" | 3'–0" |
| 36" | 4'–0" | 9'–2" | 5'–2" | 2'–4·1/2" | 1'–10·1/2" | 3'–3" | 1'–4" | 3'–9" |
| 42" | 4'–6" | 10–6" | 6'–0" | 2'–9" | 2'–3" | 3'–10 ·3/4" | 1'–6" | 4'–6" |

## NOTES:

1. HIGH POINT OF HEADWALL SHALL NOT PROJECT MORE THAN 3" ABOVE SLOPE.
2. ALL CONCRETE SHALL BE CLASS 'A' PER SECT. 725.
3. ALL REINFORCING BARS SHALL BE NO. 4, 12" C TO C AND 3" CLEAR TO INSIDE OF FLOOR AND WALLS.

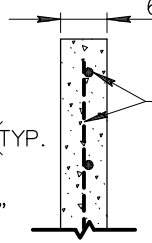
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 501–5 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | HEADWALL DROP INLET | 01–01–2014 | 501–5 |



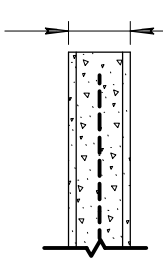

## TRASH RACK

## POURED WALLS

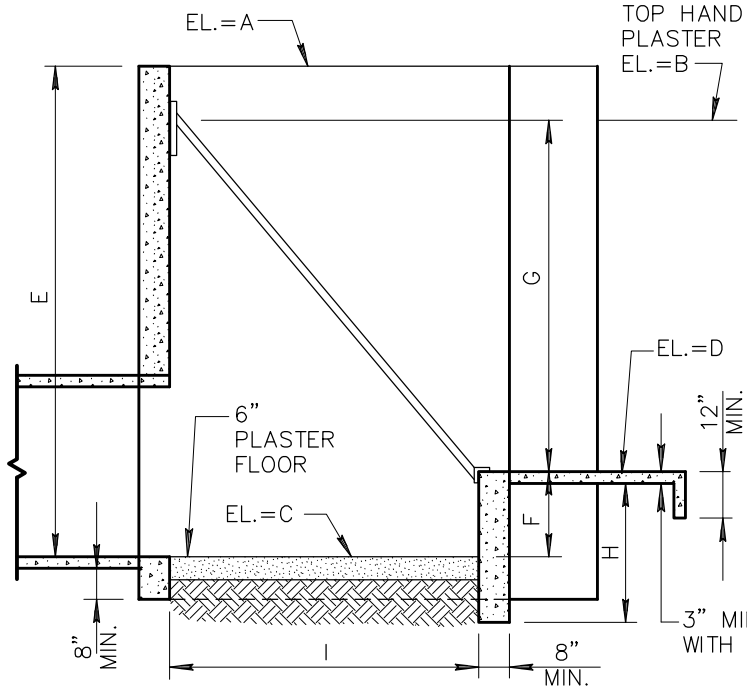



NO. 4 REINFORCED BARS 12" O.C. BOTH WAYS, CLASS 'A' CONC PER SECT. 505, 725 & 727.

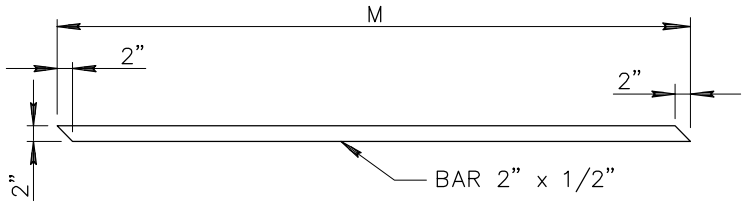
## BLOCK WALLS



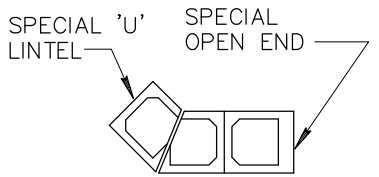

BLOCK HEADWALL TO HAVE ONE NO.4 REINF. BAR CENTERED IN EACH CORE FOR FULL HEIGHT AND CORES FILLED WITH CONCRETE OR CEMENT GROUT (3:1 RATIO). ALL BLOCKS TO BE JOINTED WITH MORTAR. PLASTERED ON EXPOSED SURFACES THEN SPRAY WITH WHITE PIGMENTED CURING COMPOUND. SECT. 510, 727 & 776.




## SECTION A-A




## RACK BARS




## 45° BLOCK CORNER

## NOTES:

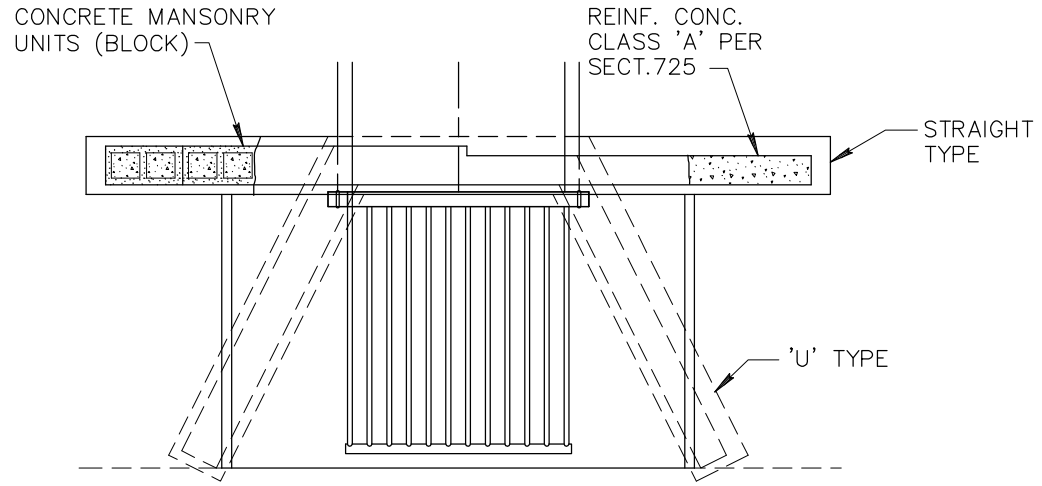
1. REMOVE ALL SCALE FROM RACK BARS. METAL SPRAY OR PAINT WITH ONE COAT ZINC CHROMATE OR RED LEAD PRIMER (INDUSTRIAL QUALITY). OVERCOAT WITH GREY INDUSTRIAL ENAMEL SECT. 790.

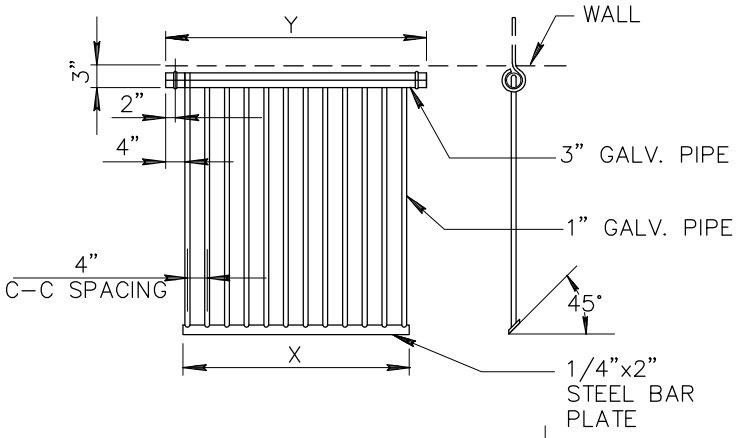
2. SHAPE, COMPACT AND PLASTER NEW DITCH FROM HEADWALL TO UNDISTURBED EXISTING DITCH. PLASTER TO EXTEND TO MINIMUM ELEVATION NOTED 3 FEET BEYOND CONNECTION TO UNDISTURBED EXISTING DITCH.

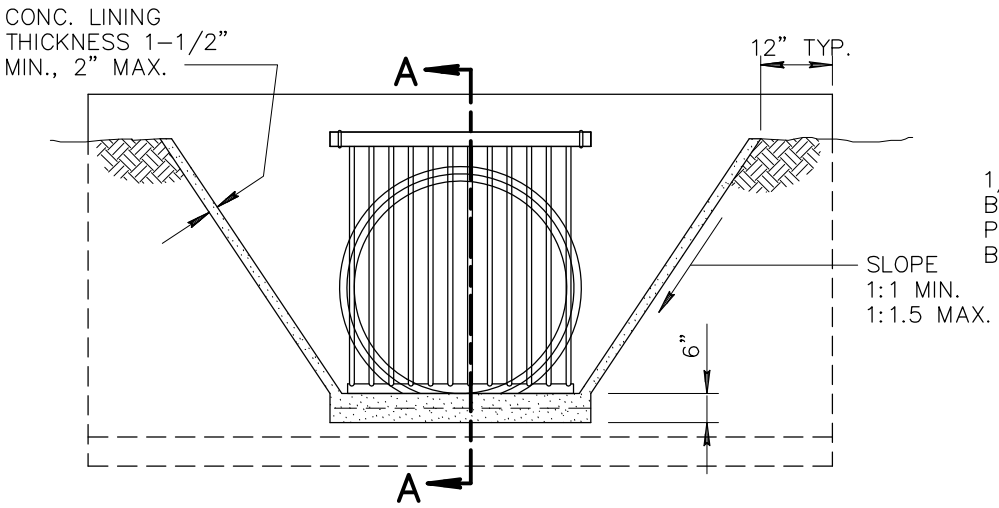
3. ELEVATIONS A, B, C & D AND DIMENSIONS E, F, G, H, I, J, K, L & M WILL BE SHOWN ON PLANS. DIMENSIONS SHOULD PROVIDE STANDARD SIZE BLOCK.

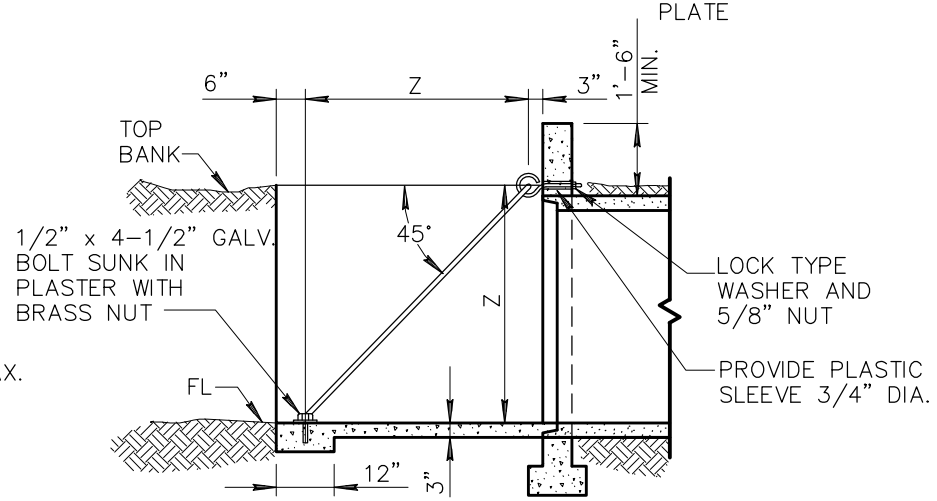
4. 14" PLATE SHALL NOT EXTEND BELOW TOP OF PIPE.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 502-1 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | TRASH RACK | 01-01-1998 | 502-1 |



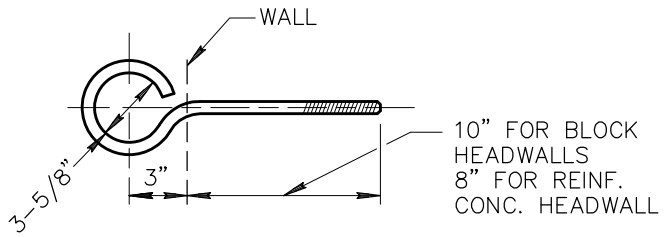




SECTION A-A

| TYPE BASED ON PIPE SIZE | | | | | | |
|---|---|---|---|---|---|---|
| TYPE | PIPE SIZE | NO. OF BARS | LENGTH OF BARS | DIMENSIONS | | |
| | | | | X | Y | Z |
| A | 18" | 6 | 3'-7" | 1'-9" | 2'-5" | 2'-5" |
| | 24" | 8 | 3'-7" | 2'-5" | 3'-1" | 2'-5" |
| B | 30" | 10 | 4'-4 1/4" | 3'-1" | 3'-9" | 2'-11 1/2" |
| C | 36" | 10 | 5'-1 1/2" | 3'-1" | 3'-9" | 3'-6" |
| D | 42" | 12 | 5'-10 5/8" | 3'-9" | 4'-5" | 4'-0 1/2" |
| E | 48" | 14 | 6'-7 3/4" | 4'-5" | 5'-1" | 4'-7" |




EYE BOLT

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 502-2 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | TRASH RACK | 01-01-2004 | 502-2 |

NOTE:
PAINT COVER BOTH SIDES ONE PRIME COAT, TWO FINISH COATS, SECT. 790, PAINT NO. 9

(2) 5/16" HOLES 4" O.C.

2-1/2"

10 GUAGE SHEET STEEL COVER

1/4" ROD HANDLE

HANDLE EXTENDS 6" BELOW TOP WHEN GATE IS OPEN

2-1/2"

6"

STANDARD CONCRETE PIPE

30" UNLESS OTHERWISE SPECIFIED

CONCRETE AS REQUIRED TO SECURE GATE

GROUT JOINTS WATER TIGHT

FINISH GRADE

VARIABLE

GATE TYPE, SIZE AND NO. REQUIRED AS GIVEN ON PLANS

SIZE OF PIPE AS SHOWN ON PLANS

6"

4"

TYPE 'A'

## NOTES:

1. BRACE TO BE INSTALLED EVERY 2' FROM TOP OF HEADGATE FRAME. BOTTOM BRACE TO BE HIGH ENOUGH TO ENABLE FULL OPENING OF HEADGATE.
2. INSTALL 1/2" BOLTS INTO LEAD PLUG DRILLED TO WITHIN 1" OF OUT SIDE OF STANDPIPE. SPACERS TO BE INSTALLED AT EACH BOLT BETWEEN HEADGATE FRAME AND INSIDE OF STAND PIPE.
3. LOCATION OF 2" HOLE FOR GATE STEM TO BE DETERMINED AFTER INSTALLATION OF GATE.
4. CONCRETE SHALL BE CLASS A PER SECT. 725.

SEE NOTE 3

(4) 3/8" BOLTS TO BE GROUTED INTO STANDPIPE EQUI-DISTANT WITH 1-1/2"x3" RECTANGULAR WASHERS AND NUTS

GALVANIZED EXPANDED METAL LID (9 GUAGE)

6"

SEE NOTE 2

REINF. CONC. PIPE

PAINT ARROW ON OUTSIDE OF STANDIPE INDICATING DIRECTION "TO OPEN" HEADGATE.

VARIES 48" MIN. 52" MAX.

SEE NOTE 1

GROUT JOINTS WATER TIGHT

FINISH GRADE

18" MIN.

1" C.R.S. LIFT ROD

SIZE OF PIPE AS SHOWN ON PLANS

HEADGATE TO BE SWANSON 800 SERIES OR APPROVED EQUAL

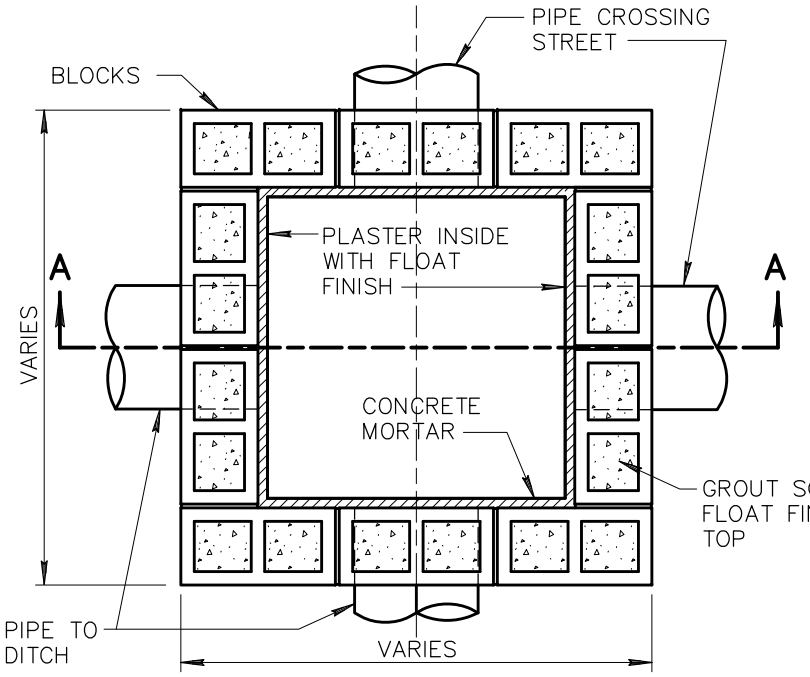
FORM CONC. AROUND END OF PIPE BEHIND HEADGATE FRAME

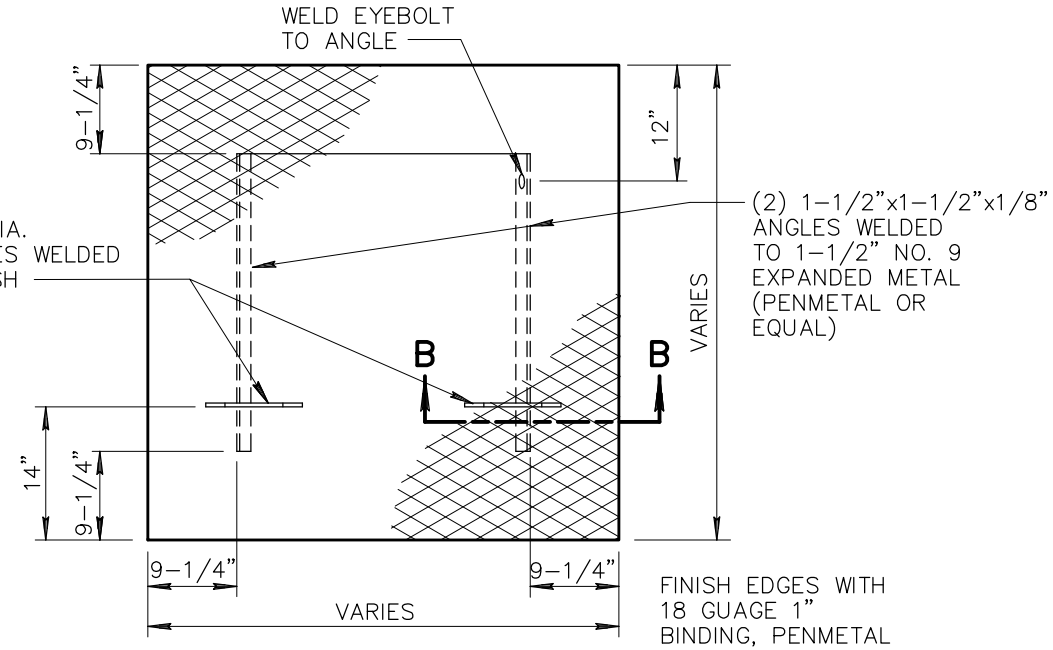
4"

4"

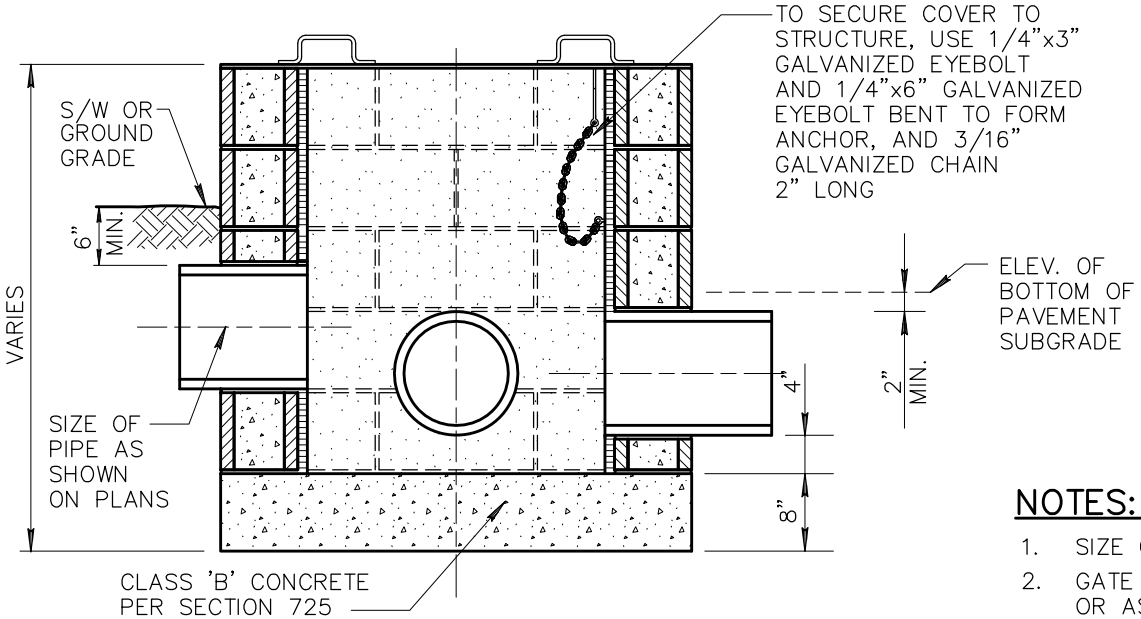
TYPE 'B'

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 503 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | IRRIGATION STANDPIPE | 01-01-1998 | 503 |

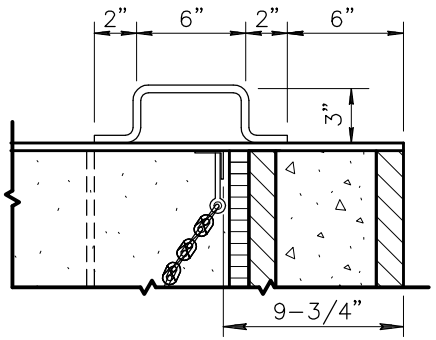



PLAN OF COVER




SECTION A–A

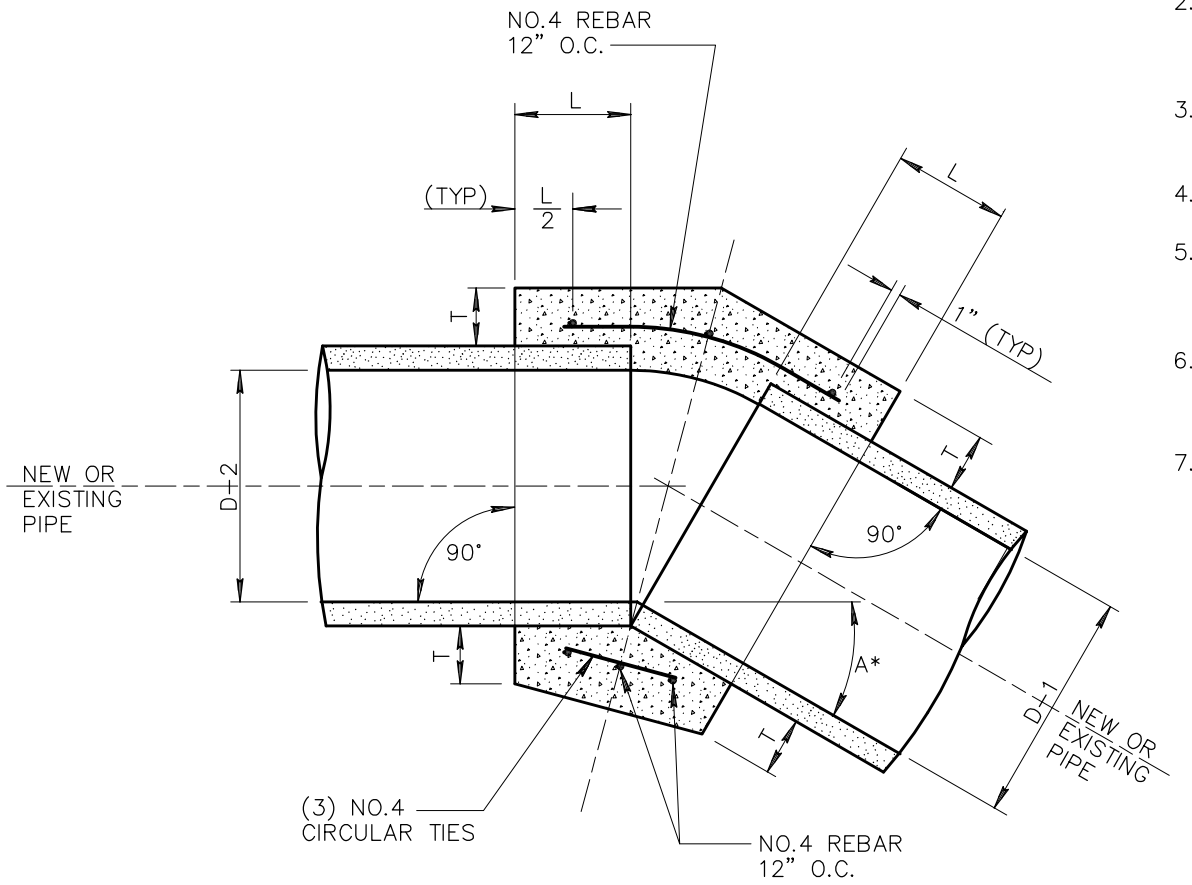



SECTION B–B

## NOTES:

1. SIZE OF JUNCTION BOX TO BE DETERMINED BY THE ENGINEER.
2. GATE TYPE, SIZE AND NUMBER REQUIRED AS SHOWN ON PLANS OR AS SPECIFIED.
3. CONCRETE MASONRY UNITS (BLOCK) PER SECT. 510, 775 & 776

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 504 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | CONCRETE BLOCK JUNCTION BOX | 01–01–1998 | 504 |



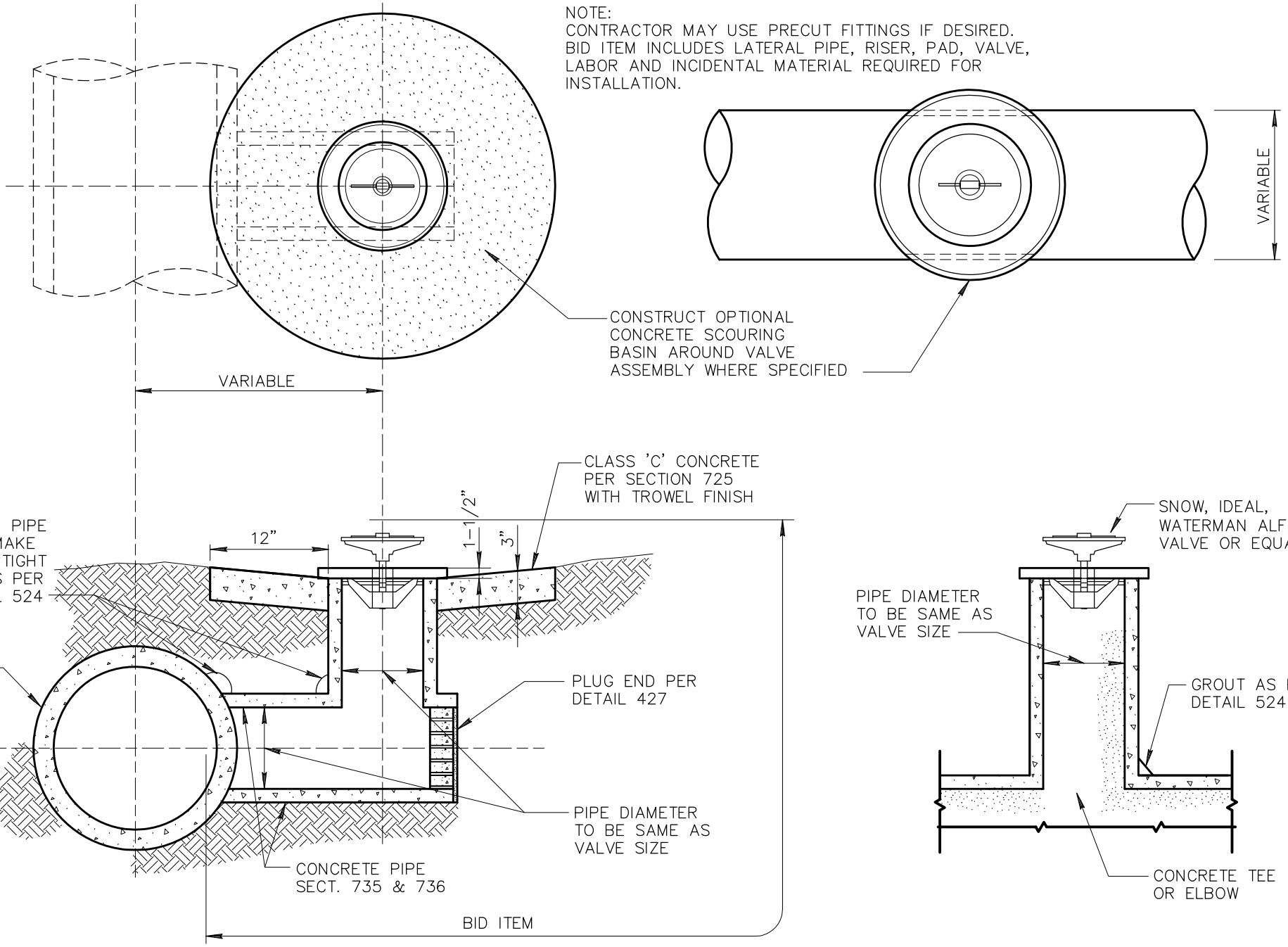

## NOTES:

1. A CONCRETE COLLAR IS REQUIRED WHERE PIPES OF DIFFERENT DIAMETERS OR MATERIALS ARE JOINED, OR WHERE THE CHANGE IN ALIGNMENT OR GRADE EXCEEDS THAT ALLOWED FOR ON ORDINARY JOINTS.
2. WHERE PIPES OF DIFFERENT DIAMETERS ARE JOINED WITH A CONCRETE COLLAR, L AND T SHOULD BE THOSE OF THE LARGER PIPE. D=D−1, OR D−2 WHICHEVER IS GREATER.
3. FOR PIPE SIZES NOT LISTED AND LESS THAN 66" USE NEXT SIZE LARGER.
4. OMIT REINFORCING ON PIPE 24" OR LESS IN DIAMETER.
5. WHERE REINFORCING IS REQUIRED, THE DIAMETER OF THE CIRCULAR TIES SHALL BE....
   OUTSIDE DIAMETER OF PIPE+T.
6. FIELD CLOSURES OF PIPE OF THE SAME DIAMETER AND WITHOUT CHANGE IN GRADE OR ALIGNMENT SHALL BE MADE WITH A CONCRETE COLLAR.
7. CONCRETE SHALL BE CLASS B PER SECT. 725.

A*=ANGLE OF DEFLECTION

| TABLE | | |
|---|---|---|
| D | L | T |
| 12" | 1.0' | 4" |
| 18" | 1.0' | 5" |
| 24" | 1.0' | 6" |
| 36" | 1.5' | 8" |
| 48" | 1.5' | 10" |
| 57" | 1.5' | 10" |
| 60" | 1.75' | 11" |
| 66" | 1.75' | 11" |

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 505 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | CONCRETE PIPE COLLAR | 01−01−1998 | 505 |




| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 506 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | IRRIGATION VALVE INSTALLATION | 01-01-1998 | 506 |

## NOTES:

1. THIS DETAIL SHALL BE REQUIRED WHEN NEW OR EXISTING PIPE INSTALLATIONS WILL BE SUBJECT TO DAMAGE ANYTIME IN THE FUTURE DUE TO LACK OF PROPER COVER, AS DETERMINED BY THE ENGINEER.

2. FOR PIPE OVER 18" I.D. WOOD, METAL OR GYPSUM BOARD FORMS MUST BE USED TO FORM THE SIDES OF THE ENCASEMENT. GYPSUM BOARD FORMS MAY BE LEFT IN THE GROUND BELOW THE TOP OF THE ENCASEMENT. THIS SHALL BE OPTIONAL WITH POURING AGAINST TRENCH WALLS FOR ENCASEMENT OF 18" AND SMALLER PIPE.

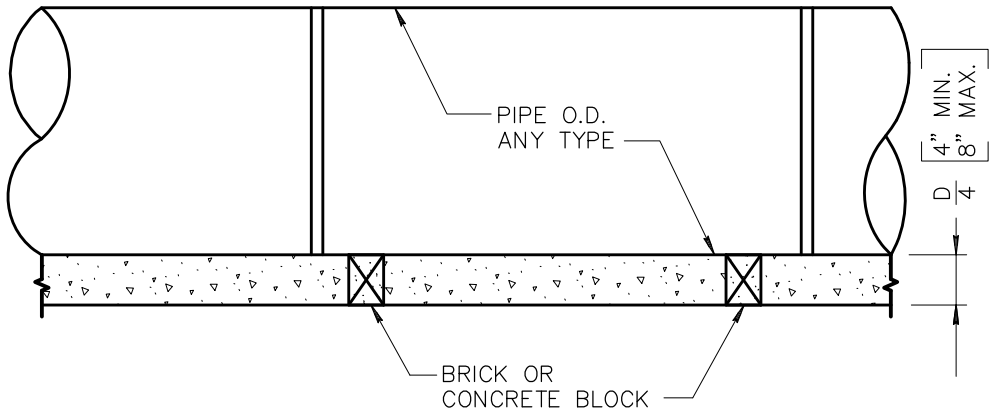
3. FOR ALL SITUATIONS WHERE SIDE FORMS ARE USED, TRENCH WALLS SHALL BE OVER-EXCAVATED TO ALLOW SUFFICIENT ROOM TO OPERATE PROPER MECHANICAL COMPACTION EQUIPMENT.

4. CONCRETE WHICH SPILLS BEYOND 12" FROM THE SIDES OF THE PIPE FOR ANY REASON SHALL BE REMOVED BACK TO THE PROPER LINE PRIOR TO BACKFILLING.

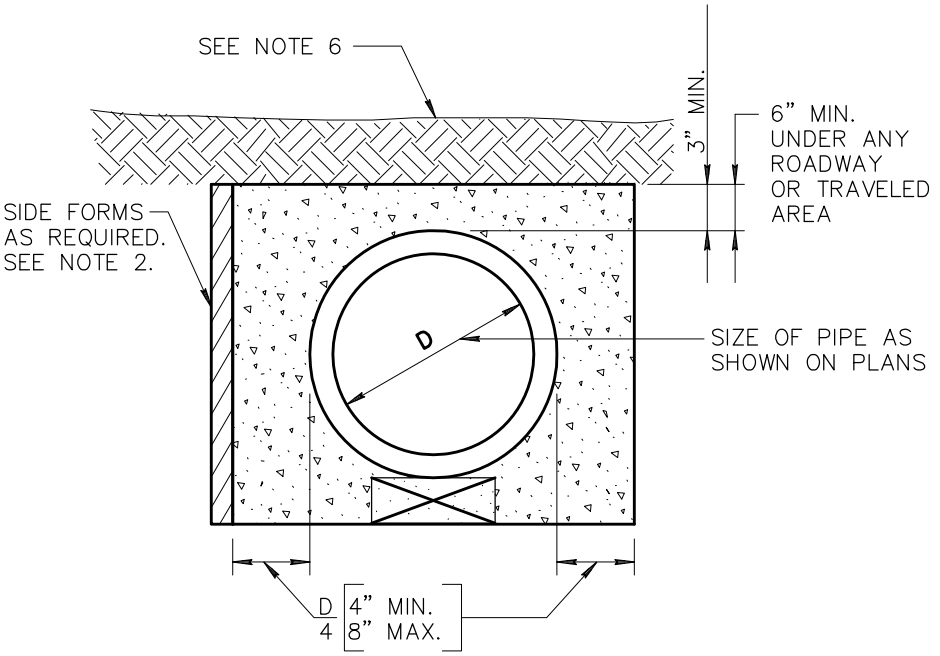
5. SEE SECTION 601 FOR TRENCH PREPARATION.

6. CONCRETE TO BE CLASS 'A' PER SECT. 725.

7. COVER TO BE APPROVED BY ENGINEER.

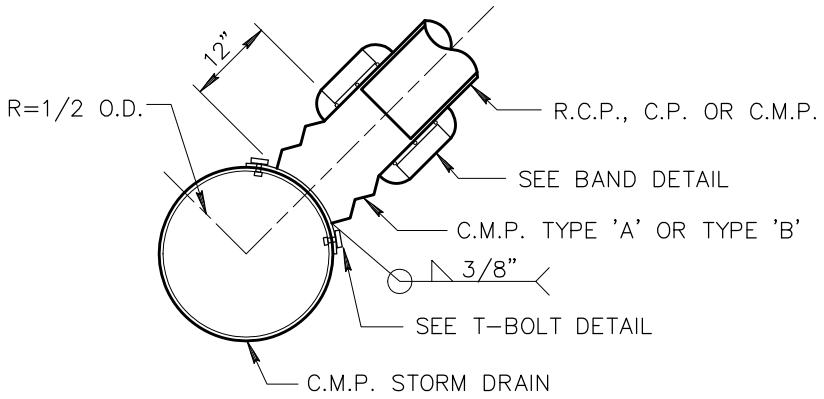



LONGITUDINAL SECTION



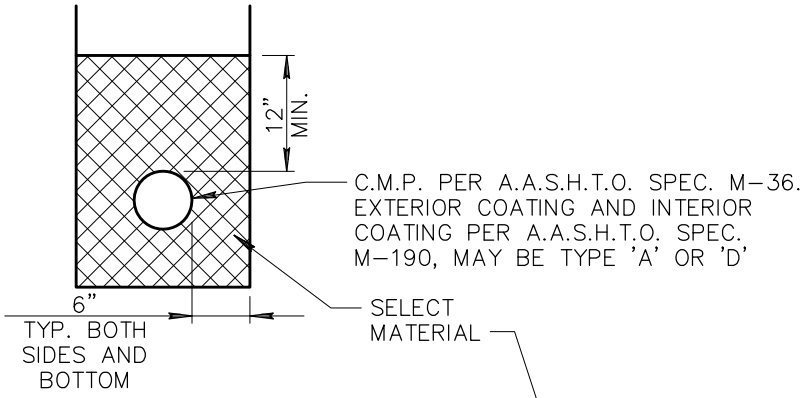

END SECTION

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 507 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | ENCASED CONCRETE PIPE (FOR SHALLOW INSTALLATION) | 01-01-1998 | 507 |

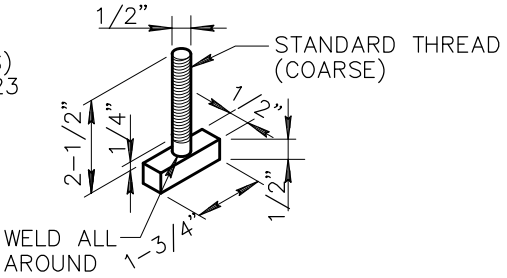



## CONNECTOR CROSS SECTION

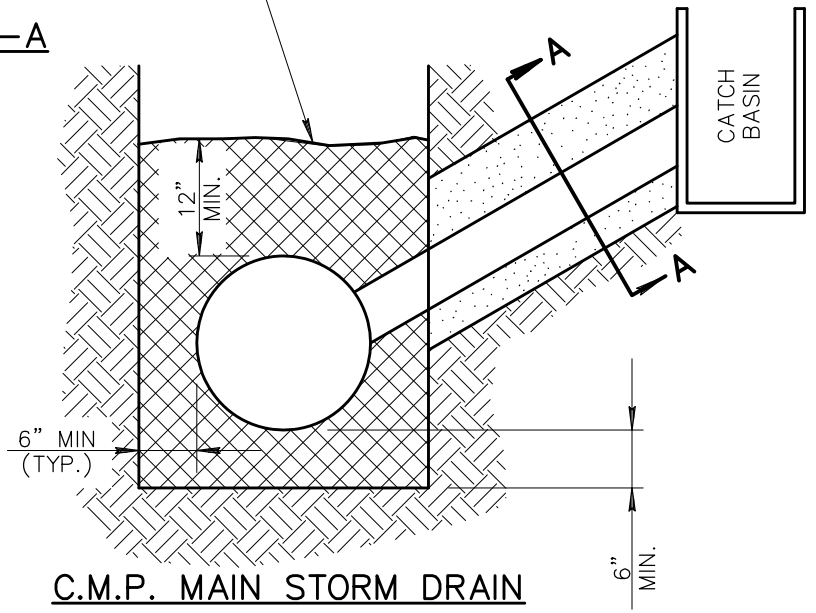
NOTE:
USE 5/8" WASHER AND NUT, ALL PIECES (NUTS, WASHERS, AND FABRICATED BOLTS) TO BE GALVANIZED AS PER A.S.T.M. A-123 LATEST REVISION.



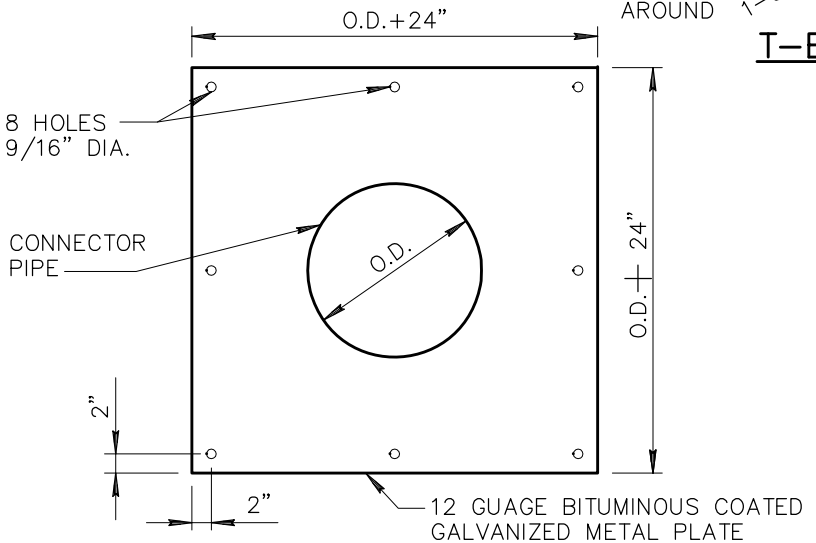

## SECTION A-A



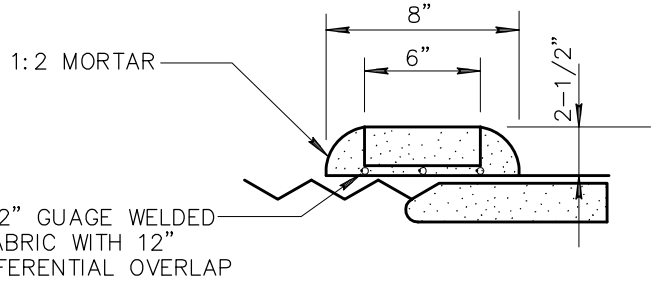

## T-BOLT




## C.M.P. MAIN STORM DRAIN

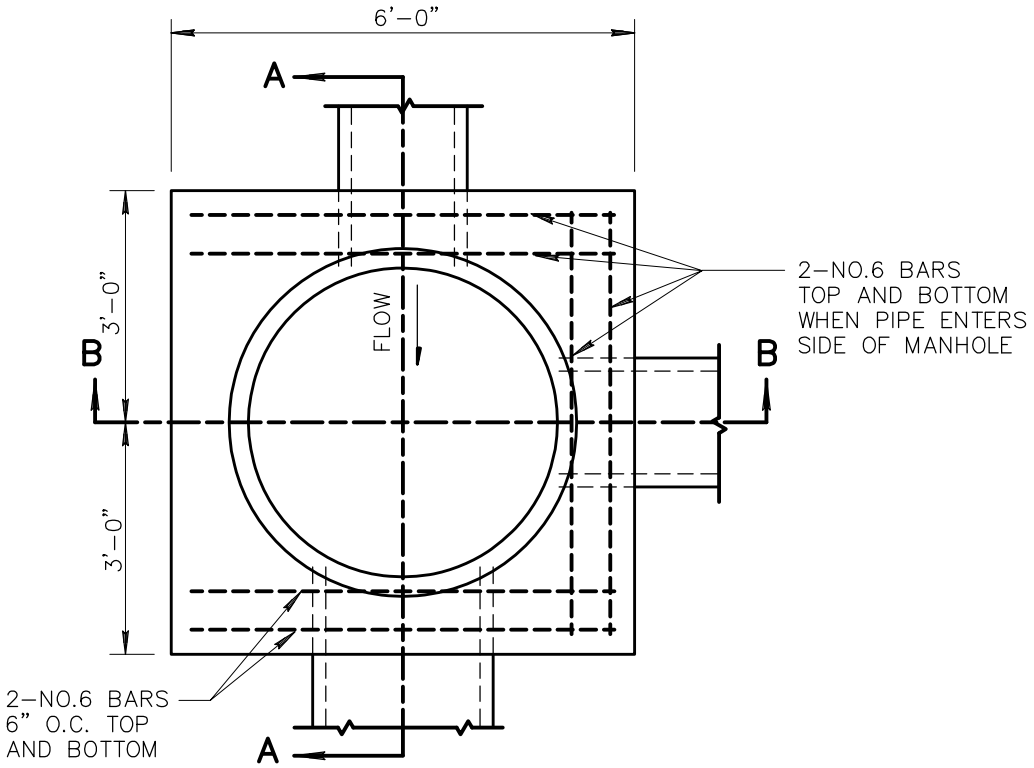



## C.M.P. CONNECTION TO MAIN STORM DRAIN 24" PIPE AND SMALLER




## BAND DETAIL

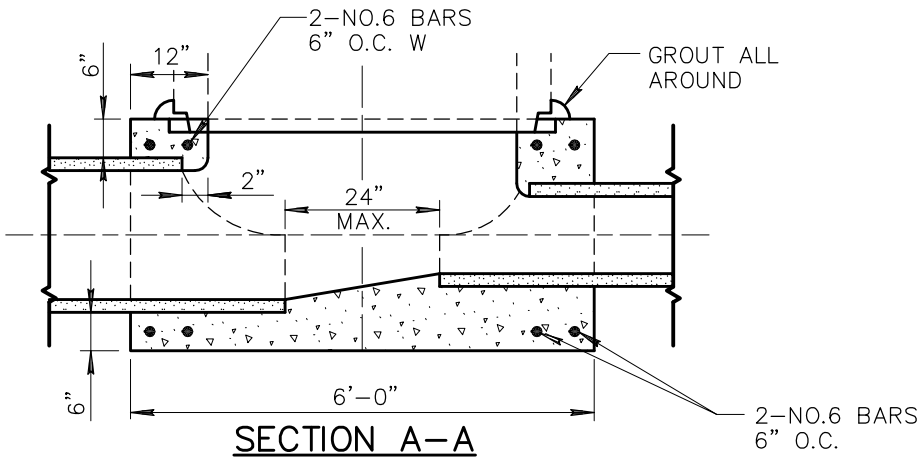
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 510 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | CORRUGATED METAL PIPE AND INSTALLATION | 01-01-1998 | 510 |



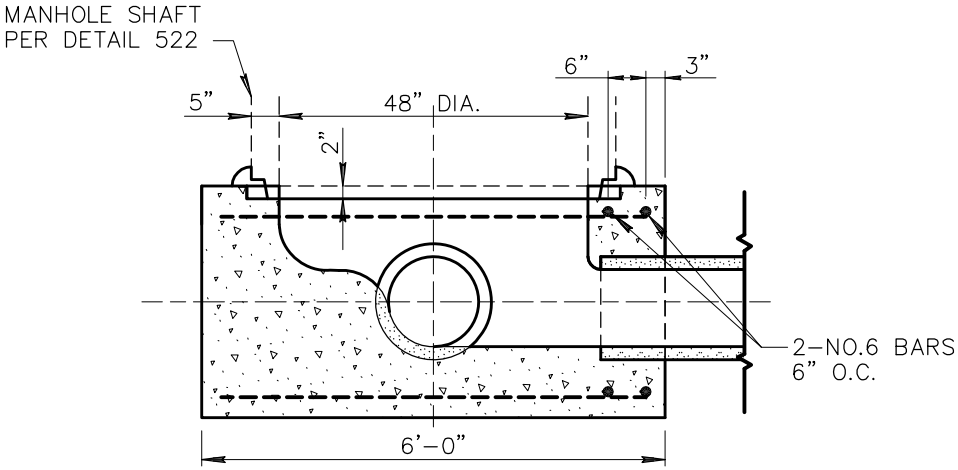

PLAN

## NOTES

1. ALL CONCRETE TO BE CLASS 'A' PER SECT. 725, 505.
2. MATCH SPRING LINES OF PIPE ENTERING MANHOLE UNLESS OTHERWISE NOTED.
3. CUT PIPES TO ALLOW SETTING OF 4' DIA. CYLINDRICAL FORM FROM 6" ABOVE MAIN LINE PIPE TO SPRING LINE. CUT PIPE 2" LARGER THAN FORM TO ALLOW 2" CONCRETE OVER ENDS OF ALL CUT PIPE.
4. INVERT AND BASE OF MANHOLE TO BE POURED AND INVERT TO BE SHAPED BY HAND TO MAKE SMOOTH TRANSITION. FINISH WITH RUBBER FLOAT.
5. CENTER MANHOLE ON PIPE JOINT WHERE PIPE CHANGES SIZES, LEAVING A GAP OF 12" MINIMUM, 24" MAXIMUM.

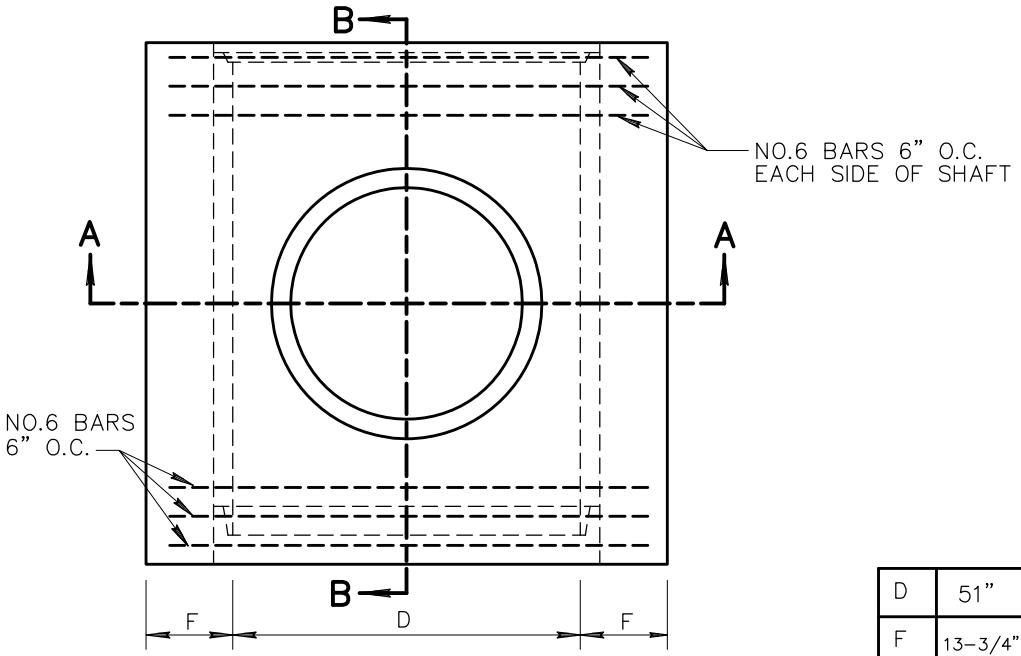



SECTION A–A




SECTION B–B

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 520 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | STORM DRAIN MANHOLE BASE (48" AND SMALLER) | 01–01–1998 | 520 |



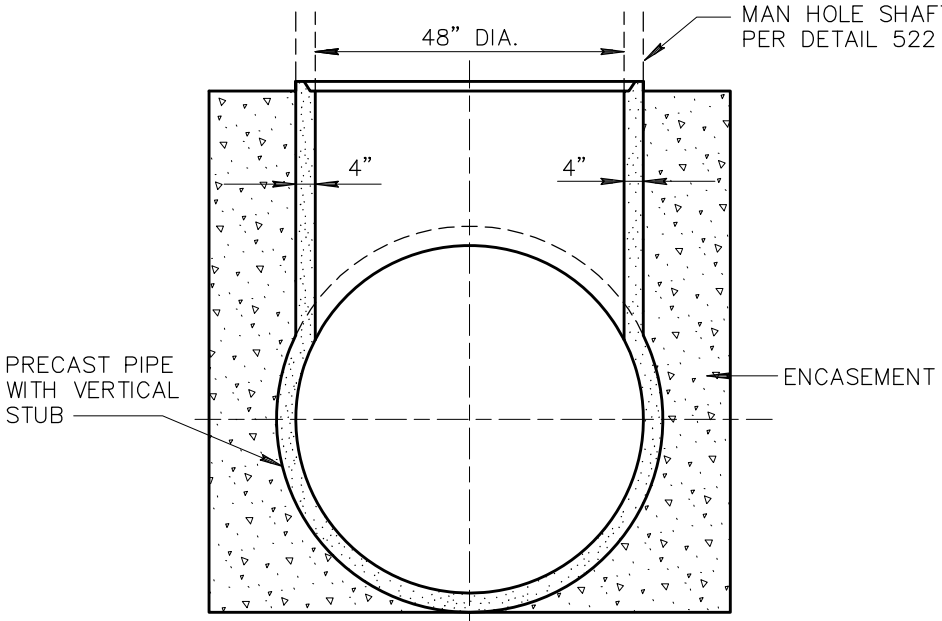

PLAN

## NOTES:

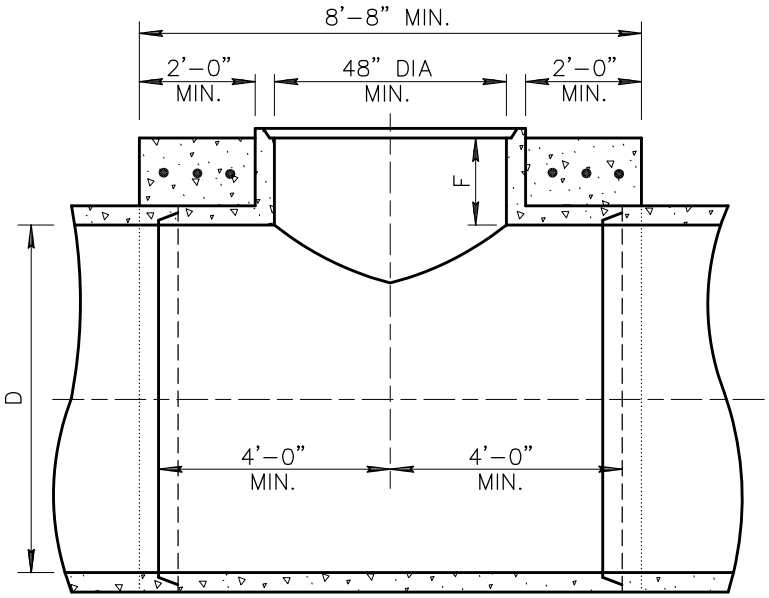
1. LINE PIPE AND STUB MAY BE CAST MONOLITHICALLY OR STUB MAY BE CAST ON TO LINE PIPE SECTION PRIOR TO COMPLETE CURING.
2. ALL LINE PIPE REINFORCEMENT SHALL BE TURNED UP INTO STUB.
3. THE VERTICAL STUB TO BE A.S.T.M. C-76 CLASS II WALL 'A' AND THE HORIZONTAL PIPE TO BE EQUAL TO STRENGTH OF PIPE ENTERING MANHOLE.
4. ALL REINFORCING STEEL SHALL CLEAR FACE OF CONCRETE BY 1-1/2" UNLESS SHOWN OTHERWISE.
5. CONCRETE ENCASEMENT SHALL BE CLASS 'A' PER SECT. 725 AND 505.

## TABLE OF VALUES FOR 'F' & 'D'

| D | 51" | 54" | 57" | 60" | 63" | 66" | 69" | 72" | 78" | 84" | 90" | 96" |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F | 13-3/4" | 14-1/2" | 15" | 15-1/2" | 16-1/4" | 16-3/4" | 17-1/2" | 18" | 19-1/4" | 20-1/2" | 21-3/4" | 23" |

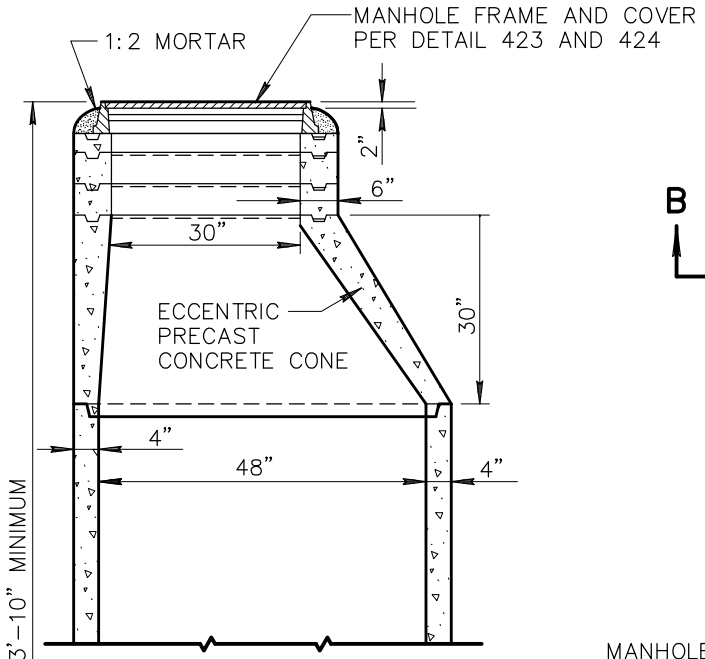



SECTION A-A

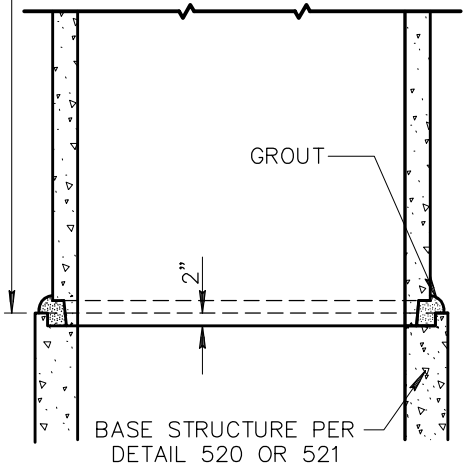



SECTION B-B

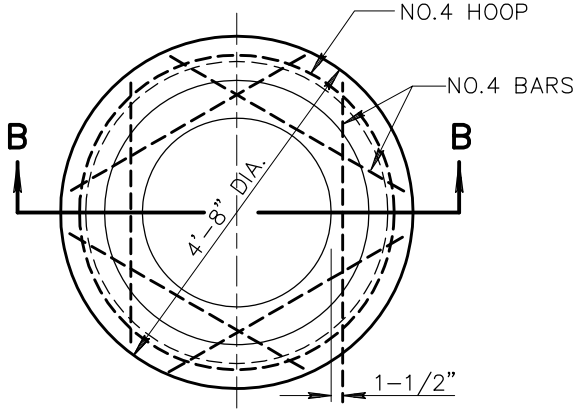
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 521 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | STORM DRAIN MANHOLE BASE (51" OR LARGER) | 01-01-1998 | 521 |




ALL JOINTS SHALL BE FILLED WITH 1:2 MORTAR AND NEATLY POINTED OR WIPED ON INSIDE OF SHAFT.

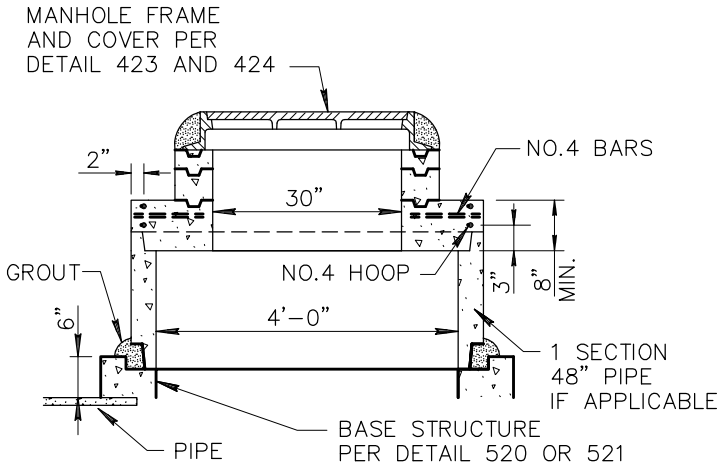



## VERTICAL SECTION OF ECCENTRIC MANHOLE SHAFT




## PLAN

USE WHERE THERE IS 3'-10" OR LESS COVER OVER PIPE

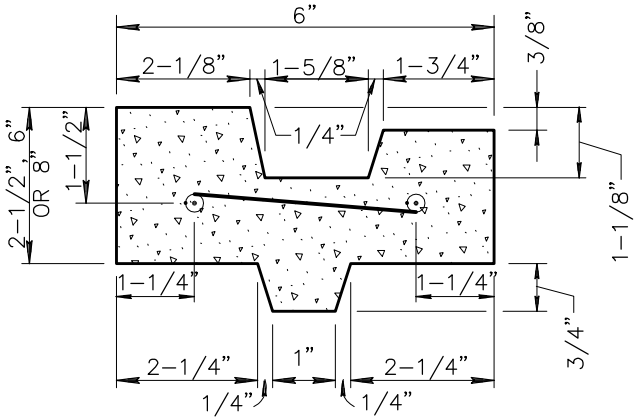



## SECTION B-B

## SHALLOW MANHOLE

## NOTES:

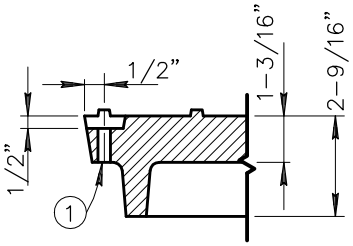
1. PRECAST CONCRETE CONES AND SECTIONS TO BE A.S.T.M. C-478.
2. BRICK MAY BE USED IN LIEU OF OR IN COMBINATION WITH CONCRETE ADJUSTING RINGS.
3. PRECAST CONCRETE SECTIONS 48" DIA PIPE MAY BE FURNISHED IN STANDARD LENGTHS.
4. UNLESS OTHERWISE SHOWN ON PLANS, USE (2) 2-1/2" PRECAST CONCRETE ADJUSTING RINGS ON IMPROVED STREETS AND (4) 2-1/2" RINGS ON UNIMPROVED STREETS.
5. CONCRETE SHALL BE CLASS A PER SECTION 725 AND 505.



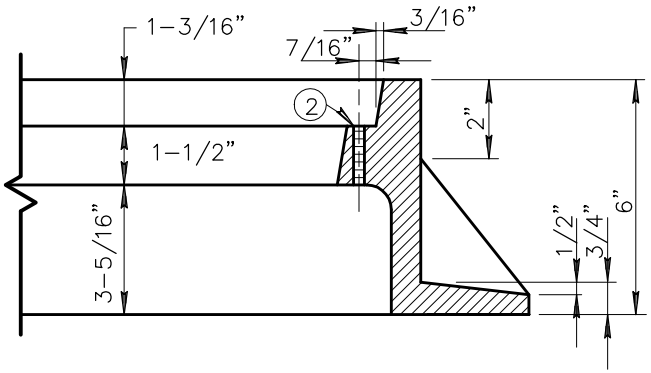

2-1/2" RINGS SHALL BE REINFORCED WITH TWO 1/4" ROUND STEEL HOOPS; 6" AND 8" RINGS SHALL BE REINFORCED WITH FOUR 1/4" HOOPS, TIED WITH NO. 14 A.S.& W. GAUGE WIRE 8" O.C.

## REINFORCED CONCRETE ADJUSTING RING

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 522 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | STORM DRAIN MANHOLE SHAFT | 01-01-2015 | 522 |



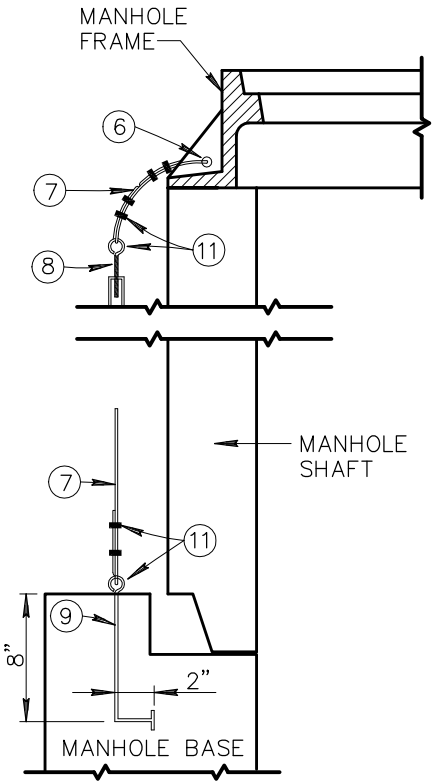

COVER SECTION

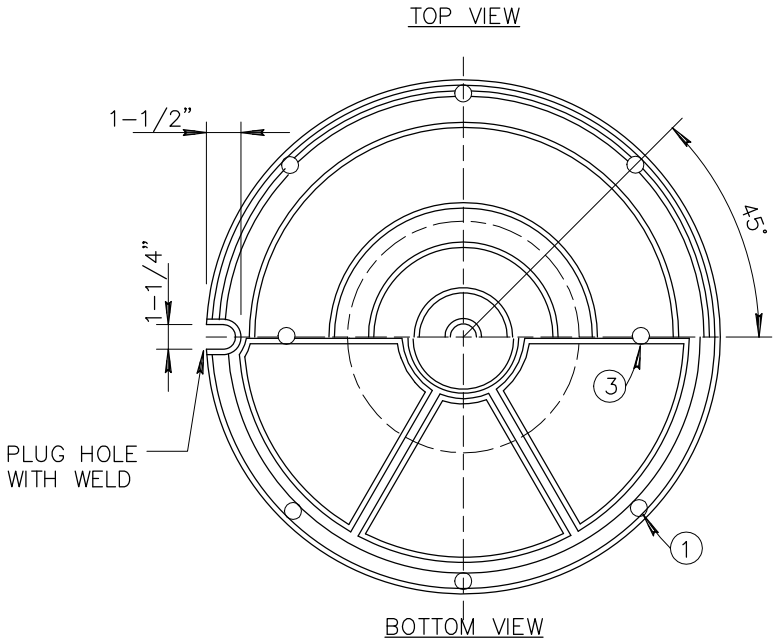



FRAME SECTION

FOR A 30" M.H. OPENING, USE THE STD. WATER TIGHT 30" M.H. FRAME & COVER, AND ANCHOR THE FRAME AS OUTLINED IN THE INSTRUCTIONS NOTED ON THIS SHEET.

FOR A 24" M.H. OPENING, MODIFY THE STD. 24" M.H. FRAME & COVER, FOLLOWING THE NOTED PROCEDURES, ONE THRU FIVE.




STANDARD 24" M.H. FRAME AND COVER

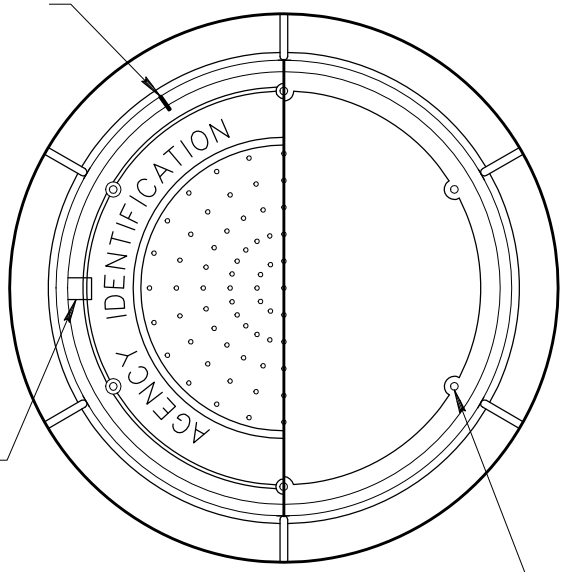
## NOTES:

1. DRILL (8) HOLES 17/32" IN COVER FOR 1/2" CAPSCREWS, COUNTERBORE 1/2" DEEP BY 1-1/8" DIA. TO ACCOMODATE CAPSCREW AND SOCKET WRENCH. SPACE EQUALLY.
2. DRILL (8) HOLES AND TAP FOR 1/2" – 13 THREAD NATIONAL COARSE BOLT.
3. DRILL, TAP AND COUNTERBORE (2) HOLES FOR 1/2" CAPSCREWS TO BE USED FOR LIFTING COVER. PLUG WITH CAPSCREWS.
4. COVER AND FRAME MUST BE MATCHED, DRILLED AND TAPPED IN SETS.
5. CASTING DIMENSIONS GIVEN ABOVE ARE FROM DET. 424, 24" MANHOLE FRAME AND COVER.

BOTH 24" AND 30" FRAMES TO BE ANCHORED AS FOLLOWS:

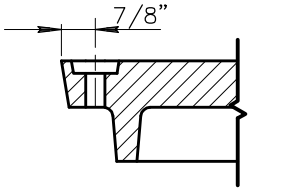
6. DRILL 1/2" HOLE IN FILLET. DO NOT USE ADJACENT FILLETS.
7. 1/4" STAINLESS STEEL CABLE. SECURED WITH CABLE CLAMPS.
8. 1/2"x9" HOOK AND EYE TURNBUCKLE.
9. 1/2" EYE BOLT WITH 1" DIA. EYE.
10. INSTALL THREE CABLES PER 24" COVER (FOUR CABLES FOR 30" COVERS). EYEBOLTS TO BE SET DIRECTLY BELOW FILLETS USED.
11. TRIPLE WRAP TURNBUCKLES AND CABLE CLAMPS WITH 1" WIDE TAPE, SAFE-T-CLAD, F.O.S. 655, OR APPROVED EQUAL.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 523-1 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | PRESSURE MANHOLE | 01-01-1998 | 523-1 |

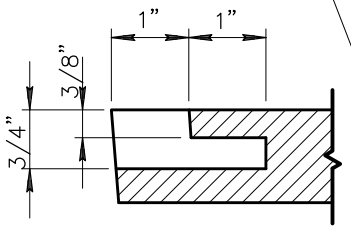



## NOTES:

1. DRILL (6) HOLES IN 30" COVER (4 HOLES IN 24" COVER) 17/32" CORED RECESS FOR 1/2" CAPSCREWS. SPACE EQUALLY (304 S.S.)
2. DRILL (6) HOLES IN 30" FRAME (4 HOLES IN 24" FRAME) AND TAP FOR 1/2" – NATIONAL COARSE BOLT (HEX HEAD).
3. COVER AND FRAME MUST BE MATCH MARKED, DRILLED AND TAPPED IN SETS.
4. DIMENSIONS, LETTERING, WEIGHTS AND MATERIALS SHALL CONFORM TO DET. 424.
5. REFER TO DETAIL 523–1 FOR INSTALLATION PROCEDURES.

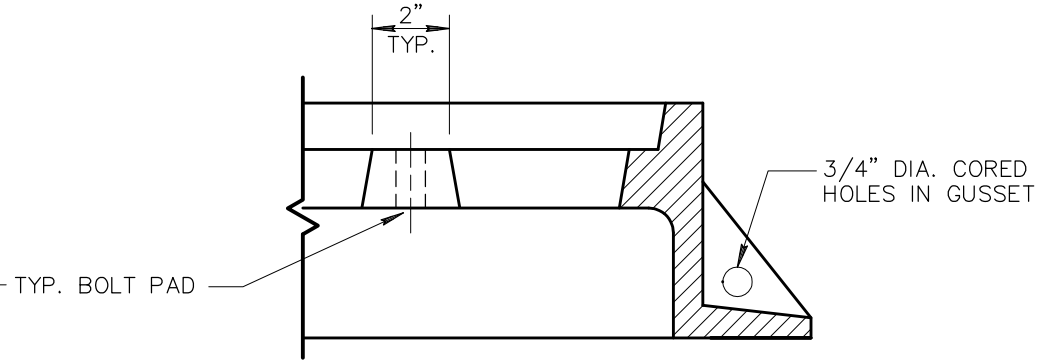



BOLT HOLE DETAIL




PICKHOLE DETAIL

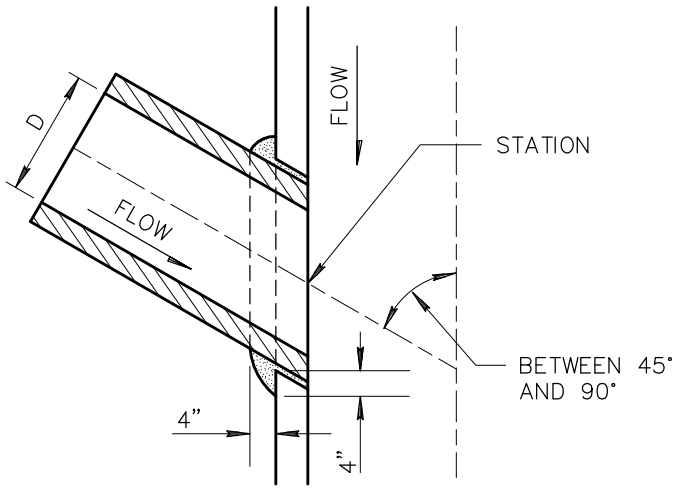
## COVER SECTION



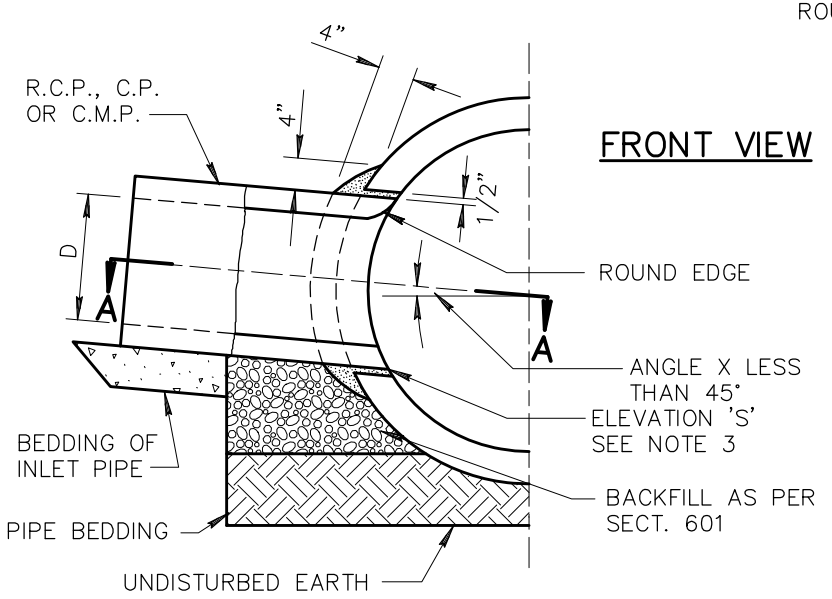

## FRAME SECTION

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 523–2 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | PRESSURE MANHOLE | 01–01–1998 | 523–2 |

## TOP VIEW



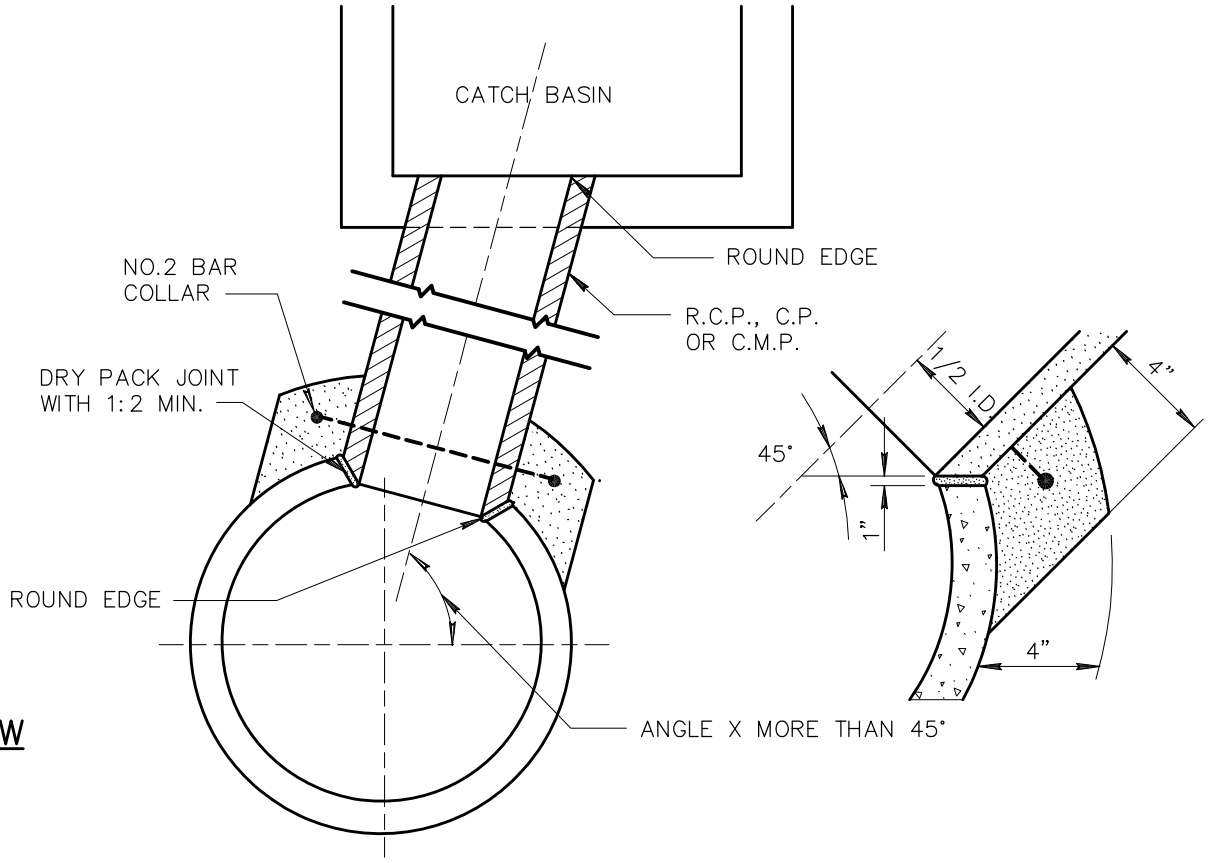

## SECTION A–A




## FRONT VIEW

## SIDE INLET TYPE 1

## FRONT VIEW

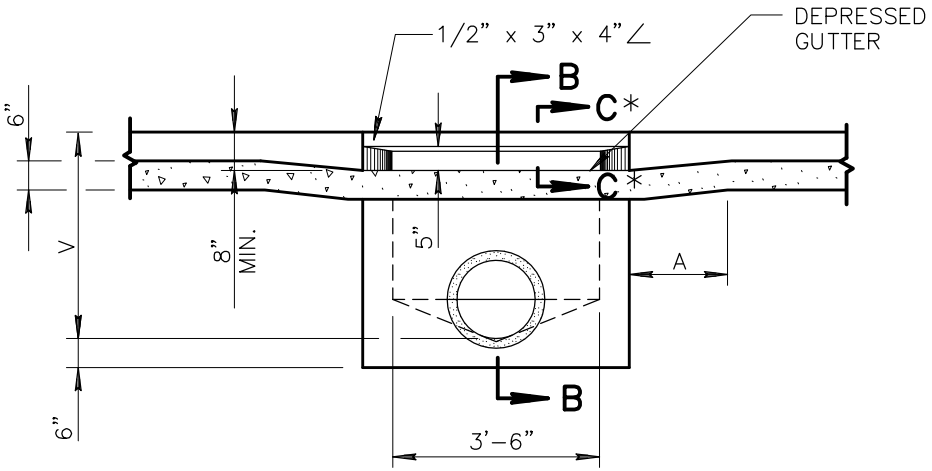



## CATCH BASIN ABOVE STORM DRAIN TYPE 2

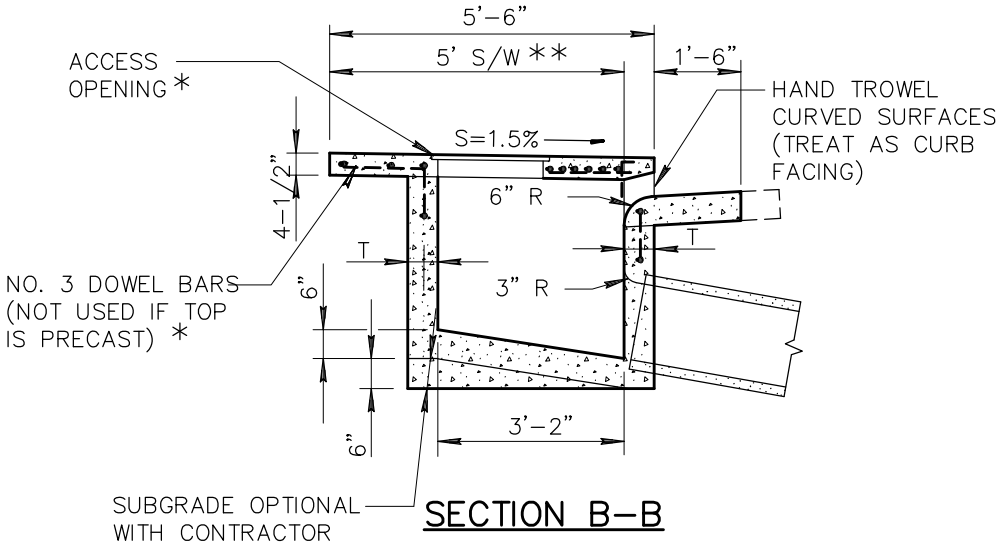
## NOTES:

1. D SHALL BE 24" OR LESS. FOR LARGER VALUE OF D USE MANHOLE OR JUNCTION STRUCTURE.
2. IN NO CASE SHALL THE OUTSIDE DIAMETER OF THE INLET EXCEED ONE HALF THE INSIDE DIAMETER OF THE MAIN STORM DRAIN.
3. CENTERLINE OF INLET SHALL BE ON RADIUS OF MAIN STORM DRAIN EXCEPT WHEN ELEVATION S IS SHOWN ON PLANS.
4. THE MINIMUM OPENING INTO THE STORM DRAIN SHALL BE THE OUTSIDE DIAMETER OF THE CONNECTING PIPE PLUS 1".
5. IF ANGLE X FROM HORIZONTAL IS 45° OR LESS USE TYPE 1. IF ANGLE X IS 45° OR OVER USE TYPE 2.

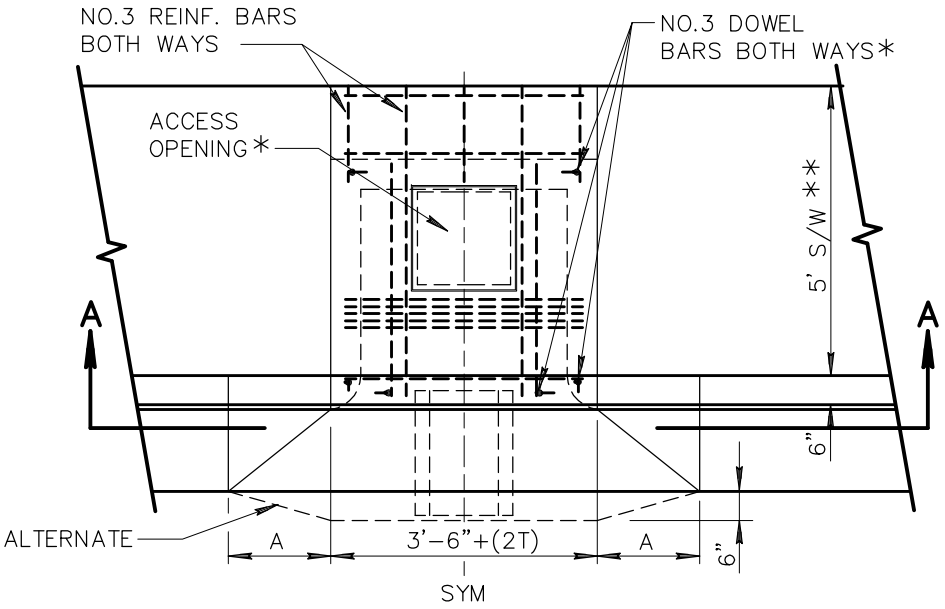
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 524 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | STORM DRAIN LATERAL PIPE CONNECTIONS | 01–01–1998 | 524 |




SECTION A-A




SECTION B-B




PLAN VIEW

## NOTES:

1. THE ENTIRE CATCH BASIN COVER MAY BE POURED IN PLACE OR PRECAST.
2. CONNECTION PIPES MAY BE PLACED IN ANY POSITION AROUND THE WALLS PROVIDED THE POSITION IS CONSISTENT WITH THE PLAN.
3. OUTLET PIPE SHALL BE TRIMMED TO FINAL SHAPE AND LENGTH BEFORE CONCRETE IS POURED.
4. FLOOR OF BASIN SHALL BE TROWELLED TO A HARD SMOOTH SURFACE AND SHALL SLOPE FROM ALL DIRECTIONS TO OUTLET.
5. ALL STRUCTURAL STEEL TO BE PAINTED ONE SHOP COAT OF NO. 1 D PAINT AND TWO FIELD COATS OF NO. 10 PAINT AS PER SECT. 790.
6. CONCRETE SHALL BE CLASS A PER SECTION 725.

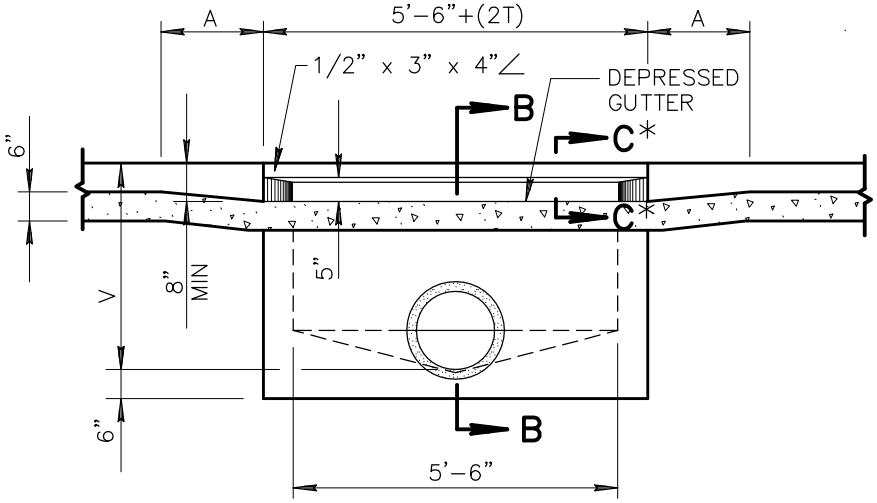
| CURB | A |
|---|---|
| 4" | 3'-3" |
| 6" | 1'-9" |
| 7" | 1'-0" |

## DIMENSIONS

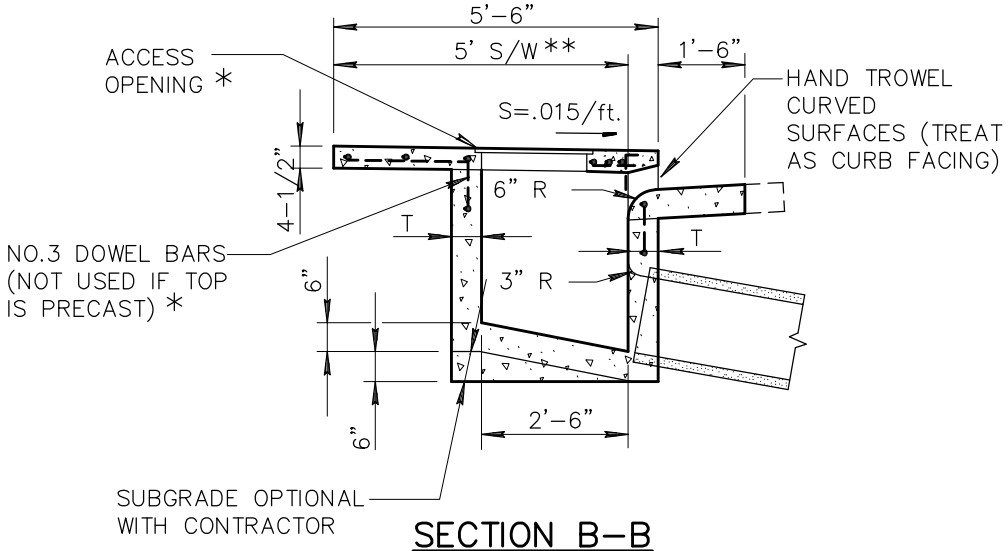
T=6" IF V=4' OR LESS
T=8" IF V IS BETWEEN 4' AND 8'
T=10" IF V IS 8' OR MORE (IF V EXCEEDS 10' SPECIAL DESIGN IS REQUIRED)
V=3'-6" UNLESS OTHERWISE SPECIFIED.

* SEE DETAILS 536-1 AND 536-2 FOR DETAILS AND SECTIONS COMMON TO ALL CURB OPENING CATCH BASINS.
** 4' LOCATIONS WHERE 4' S/W IS REQUIRED.

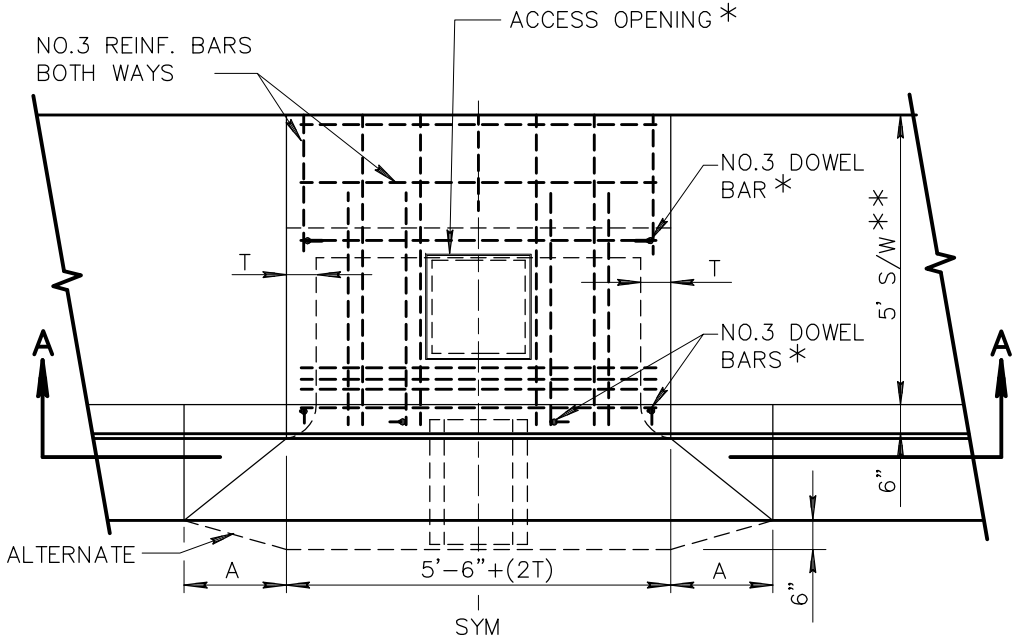
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 530 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | 3'-6" CURB OPENING CATCH BASIN - TYPE 'A' | 01-01-1998 | 530 |




SECTION A-A




SECTION B-B




PLAN VIEW

## NOTES:

1. THE ENTIRE CATCH BASIN COVER MAY BE POURED IN PLACE OR PRECAST.
2. CONNECTION PIPES MAY BE PLACED IN ANY POSITION AROUND THE WALLS PROVIDED THE POSITION IS CONSISTENT WITH THE PLAN.
3. OUTLET PIPE SHALL BE TRIMMED TO FINAL SHAPE AND LENGTH BEFORE CONCRETE IS POURED.
4. FLOOR OF BASIN SHALL BE TROWELLED TO A HARD SMOOTH SURFACE AND SHALL SLOPE FROM ALL DIRECTIONS TO OUTLET.
5. ALL STRUCTURAL STEEL TO BE PAINTED ONE SHOP COAT OF NO. 1 D PAINT AND TWO FIELD COATS OF NO. 10 PAINT AS PER SECT. 790.
6. CONCRETE SHALL BE CLASS A PER SECTION 725.

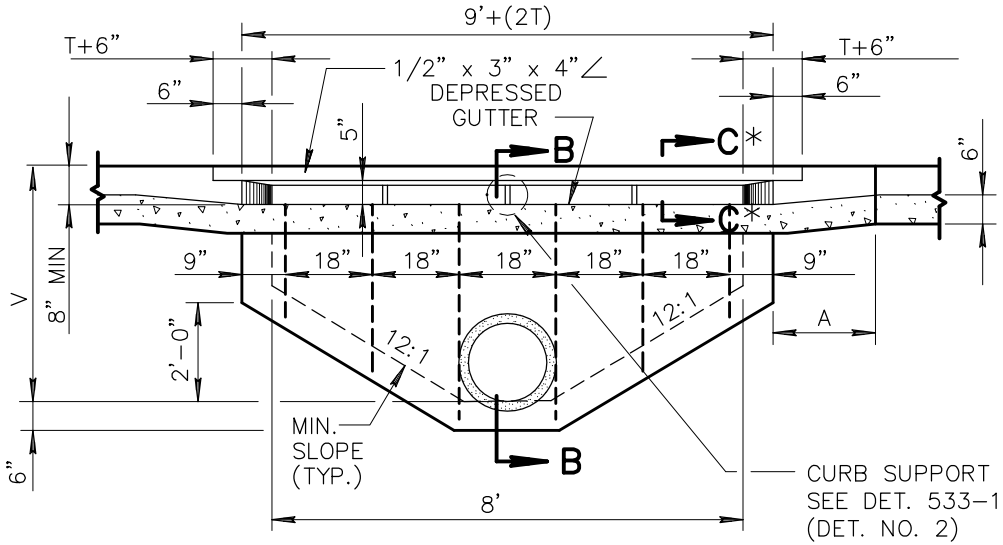
| CURB | A |
|---|---|
| 4" | 3'-3" |
| 6" | 1'-9" |
| 7" | 1'-0" |

## DIMENSIONS

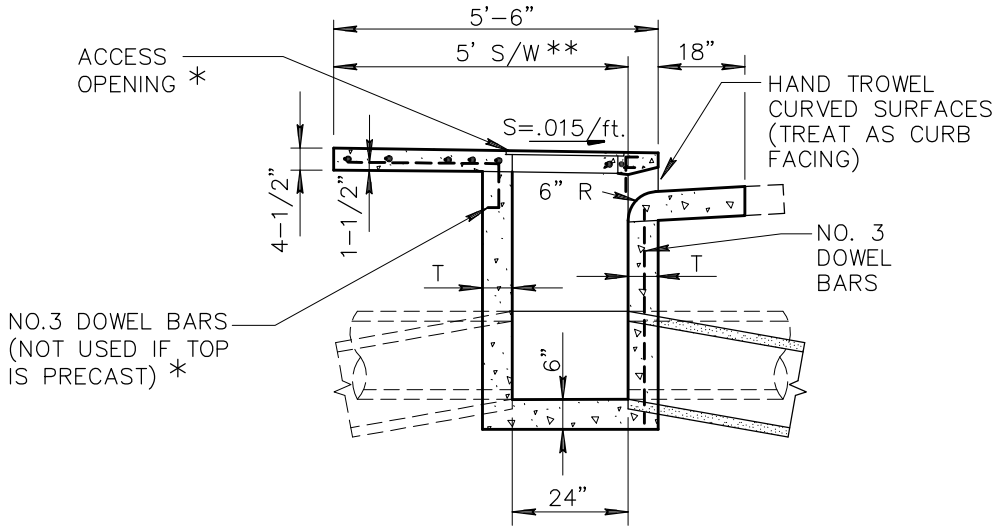
T=6" IF V=4' OR LESS
T=8" IF V IS BETWEEN 4' AND 8'
T=10" IF V IS 8' OR MORE (IF V EXCEEDS 10' SPECIAL DESIGN IS REQUIRED)
V=3'-6" UNLESS OTHERWISE SPECIFIED.

* SEE DETAILS 536-1 AND 536-2 FOR DETAILS AND SECTIONS COMMON TO ALL CURB OPENING CATCH BASINS.
** 4' LOCATIONS WHERE 4' S/W IS REQUIRED.

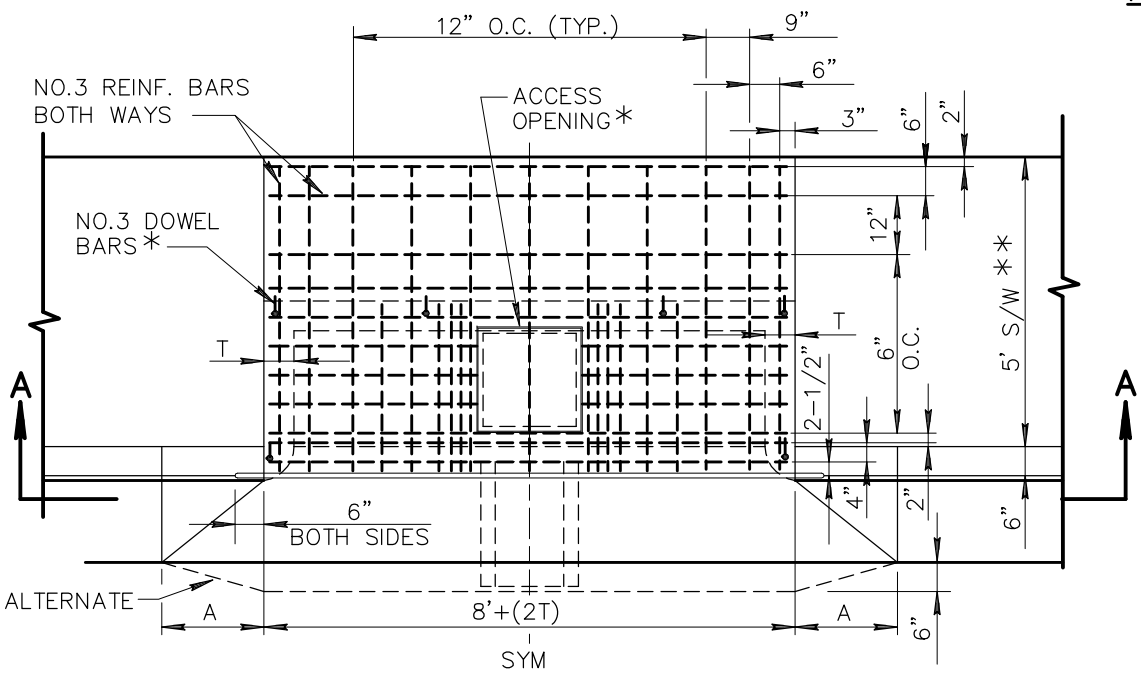
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 531 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | 5'-6" CURB OPENING CATCH BASIN - TYPE 'B' | 01-01-1998 | 531 |




## SECTION A–A




## SECTION B–B




## PLAN VIEW

## NOTES:

1. THE ENTIRE CATCH BASIN COVER MAY BE POURED IN PLACE OR PRECAST.
2. CONNECTION PIPES MAY BE PLACED IN ANY POSITION AROUND THE WALLS PROVIDED THE POSITION IS CONSISTENT WITH THE PLAN.
3. OUTLET PIPE SHALL BE TRIMMED TO FINAL SHAPE AND LENGTH BEFORE CONCRETE IS POURED.
4. FLOOR OF BASIN SHALL BE TROWELLED TO A HARD SMOOTH SURFACE AND SHALL SLOPE FROM ALL DIRECTIONS TO OUTLET.
5. ALL STRUCTURAL STEEL TO BE PAINTED ONE SHOP COAT OF NO.1 D PAINT AND TWO FIELD COATS OF NO. 10 PAINT AS PER SECT. 790.
6. CONCRETE SHALL BE CLASS A PER SECTION 725.

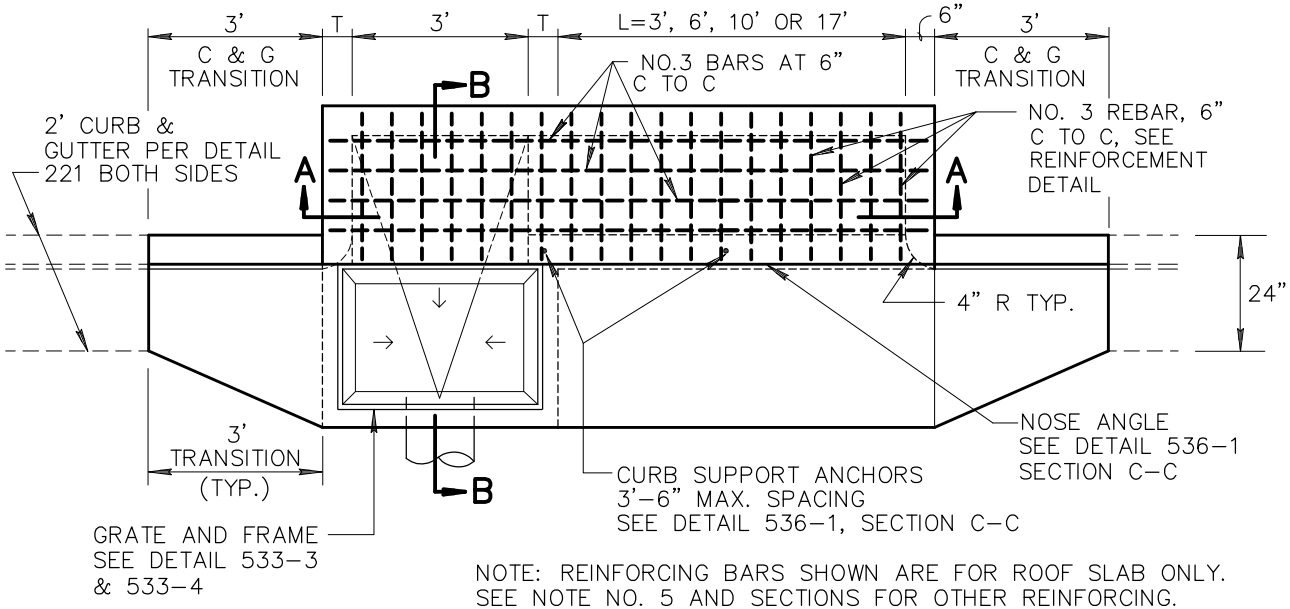
| CURB | A |
|---|---|
| 4" | 3'-3" |
| 6" | 1'-9" |
| 7" | 1'-0" |

## DIMENSIONS

T=6" IF V=4' OR LESS
T=8" IF V IS BETWEEN 4' AND 8'
T=10" IF V IS 8' OR MORE (IF V EXCEEDS 10' SPECIAL DESIGN IS REQUIRED)
V=4' UNLESS OTHERWISE SPECIFIED.

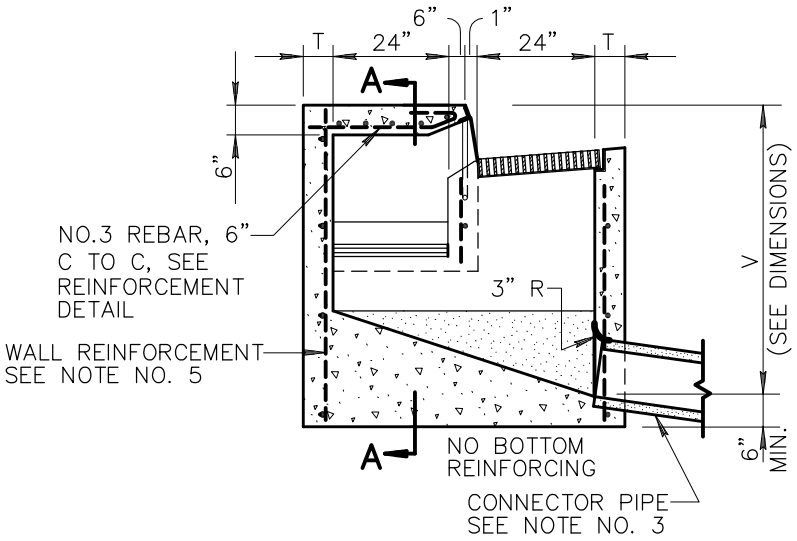
* SEE DETAILS 536-1 AND 536-2 FOR DETAILS AND SECTIONS COMMON TO ALL CURB OPENING CATCH BASINS.
** 4' LOCATIONS WHERE 4' S/W IS REQUIRED.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 532 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | 8'-0" CURB OPENING CATCH BASIN – TYPE 'C' | 01-01-1998 | 532 |

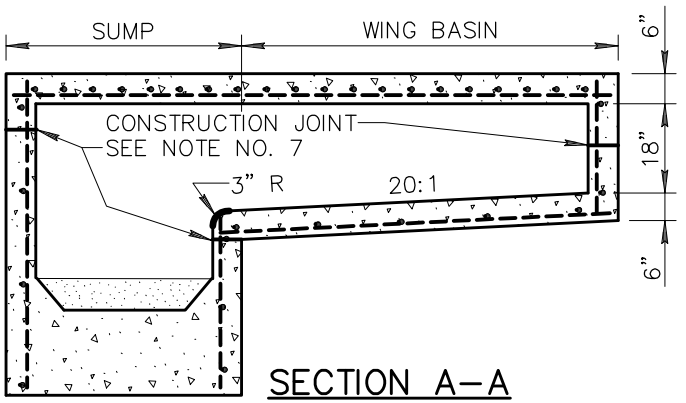



NOTE: REINFORCING BARS SHOWN ARE FOR ROOF SLAB ONLY. SEE NOTE NO. 5 AND SECTIONS FOR OTHER REINFORCING.

PLAN VIEW




SECTION B-B



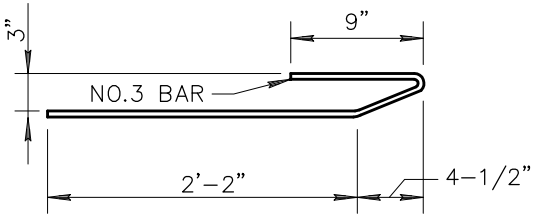

SECTION A-A

## NOTES:

1. SINGLE C.B. (ILLUSTRATED), SUMP WITH WING BASIN UPSTREAM.
2. DOUBLE C.B. SUMP WITH SYMMETRICAL WING BASINS EACH SIDE.
3. PIPES CAN BE PLACED IN ANY WALL EXCEPT WALL ADJACENT TO A WING BASIN. PIPE SHALL BE TRIMMED TO FINAL SHAPE AND LENGTH BEFORE CONCRETE IS PLACED.
4. SUMP FLOOR SHALL HAVE A WOOD TROWEL FINISH AND A MIN. SLOPE OF 4:1 IN ALL DIRECTIONS TOWARD OUTLET PIPE.
5. ALL REFORCING BARS SHALL BE NO.4 18" C TO C BOTH WAYS AND 1-1/2" CLEAR TO INSIDE OF WALLS AND OUTSIDE WING BASIN FLOOR EXCEPT AS SHOWN. SEE SECT. 727.
6. ALL CONCRETE SHALL BE CLASS 'A', PER SECT. 725.
7. CONSTRUCTION JOINTS SHALL BE PLACED TO MEET FIELD CONDITIONS.
8. ALL EXPOSED STEEL SHALL BE GALVANIZED OR PAINTED WITH ONE SHOP COAT OF #1 PAINT AND TWO FIELD COATS OF #10 PAINT.

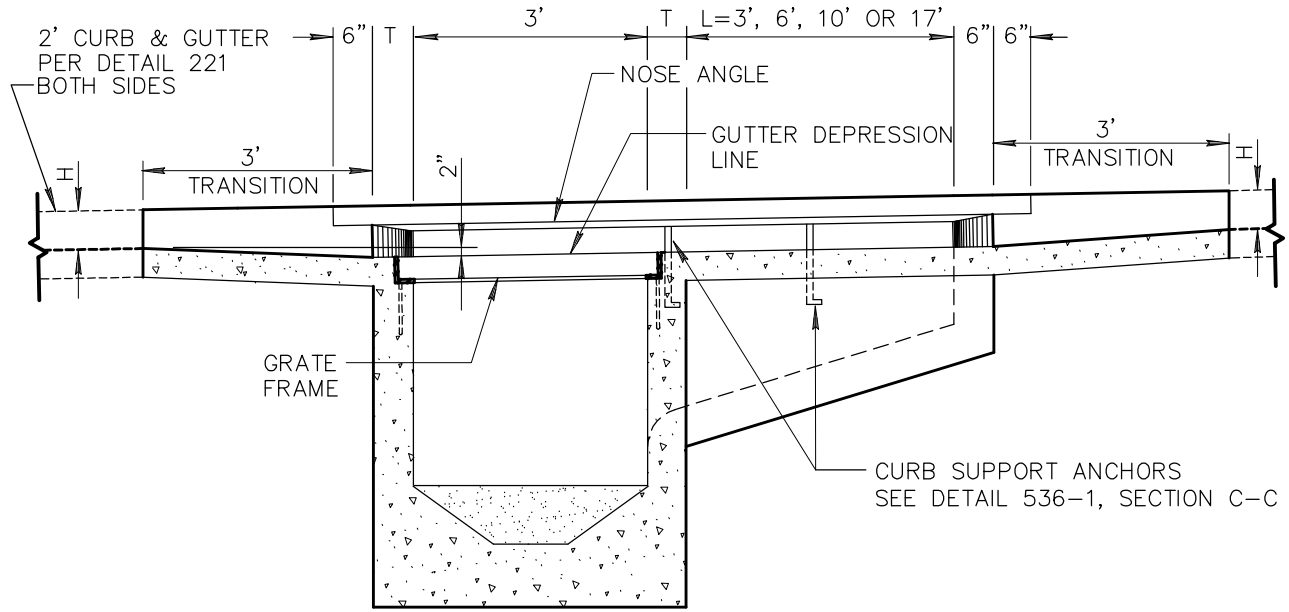
## DIMENSIONS

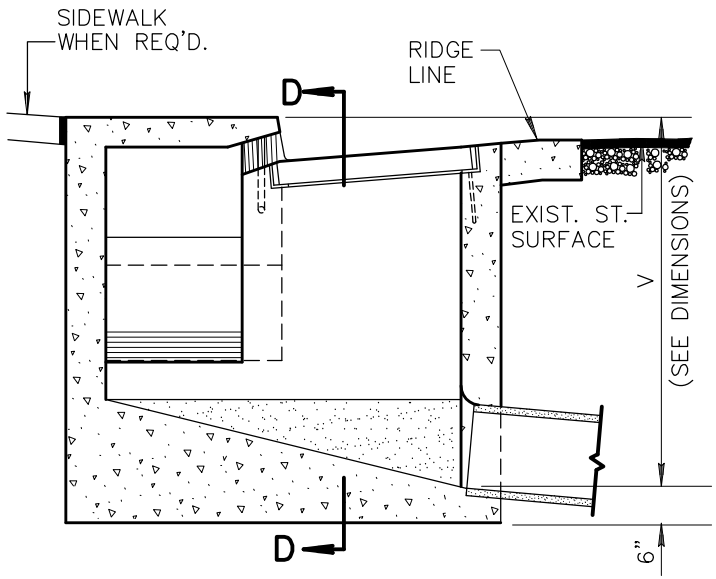
V = 3'-3" MIN. WHEN L = 3'
V = 3'-5" MIN. WHEN L = 6'
V = 3'-7" MIN. WHEN L = 10'
V = 4'-0" MIN. WHEN L = 17'
T = 6" WHEN V IS LESS THAN 8'
T = 8" WHEN V IS EQUAL TO OR GREATER THAN 8'
H = CURB HEIGHT PRIOR TO THE TRANSITION




REINFORCEMENT DETAIL

| DETAIL NO. | | STANDARD DETAIL | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 533-1 | MARICOPA ASSOCIATION of GOVERNMENTS | ENGLISH | CATCH BASIN TYPE 'D | 01-01-1998 | 533-1 |

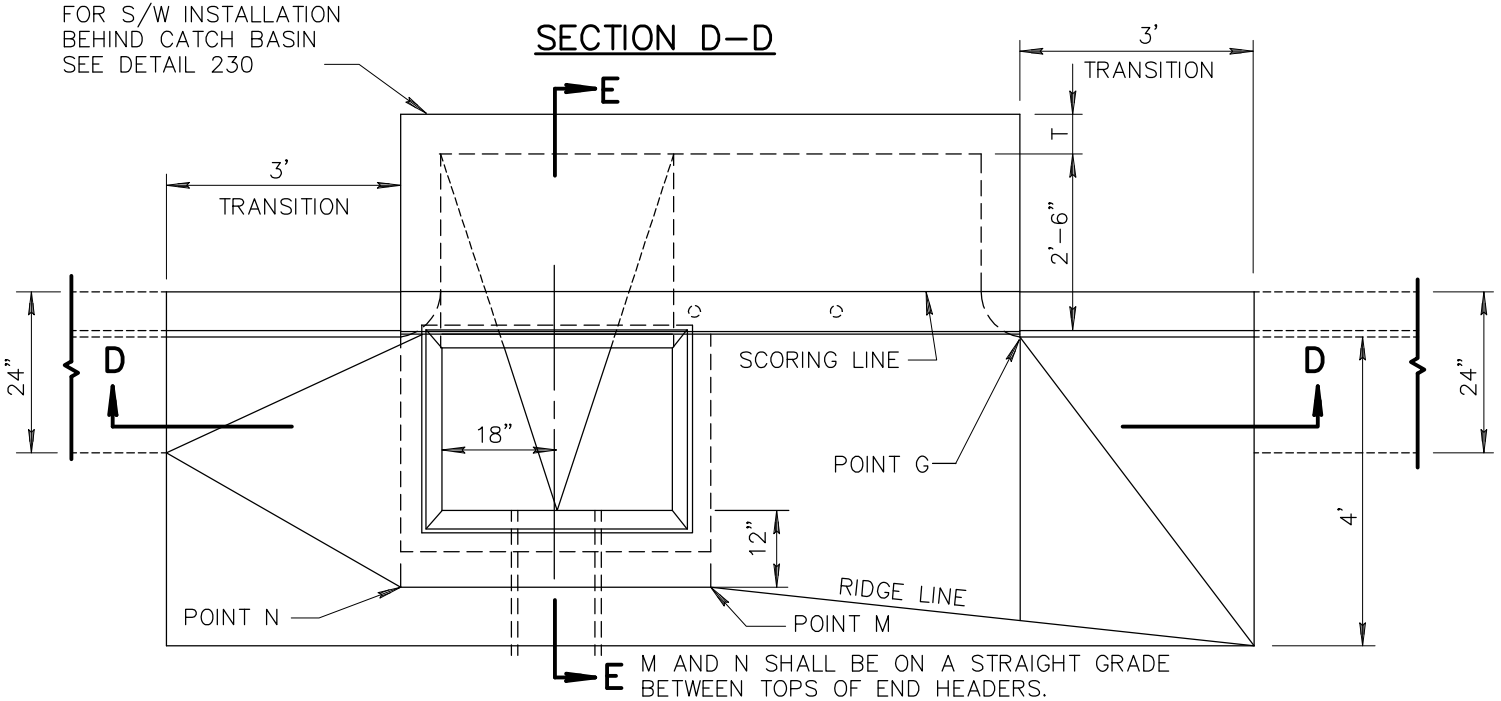



SECTION E-E

FOR S/W INSTALLATION
BEHIND CATCH BASIN
SEE DETAIL 230

SECTION D-D



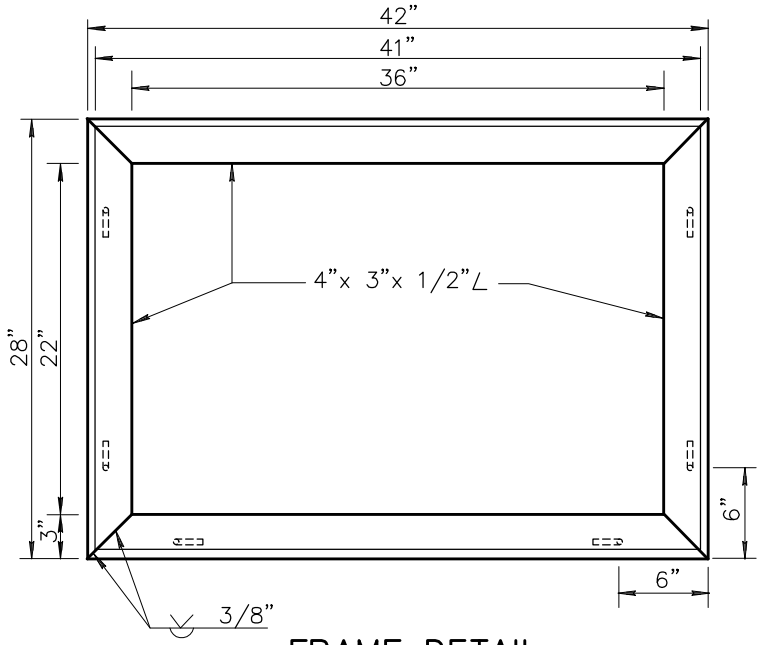

M AND N SHALL BE ON A STRAIGHT GRADE BETWEEN TOPS OF END HEADERS.

PLAN VIEW

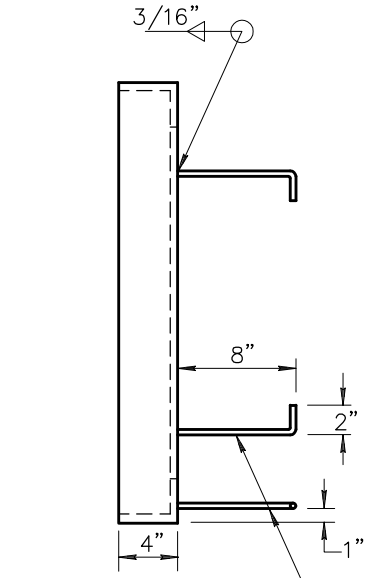
## APRON NOTES:

9. APRON IS CONSTRUCTED ONLY WHEN SPECIFIED ON PLANS.
10. CONCRETE IN APRON SHALL BE NOT LESS THAN 8" THICK.
11. CURB FACES AT CATCH BASIN OPENING AND POINT G SHALL BE THAT OF THE EXISTING CURB FACE PLUS 2' OR AS OTHERWISE SHOWN.
12. ELEVATION AT THE OUTER CORNERS OF THE LOCAL DEPRESSION SHOWN ON THE PLANS ARE FOR THE FINISHED SURFACE.
13. SEE DETAIL 533-1 FOR ADDITIONAL DIMENSIONS, REBAR PLACEMENT AND OTHER INFORMATION TO CONSTRUCT CATCH BASIN.

| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 533-2 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | APRON FOR TYPE 'D' CATCH BASIN | | 01-01-1999 | 533-2 |

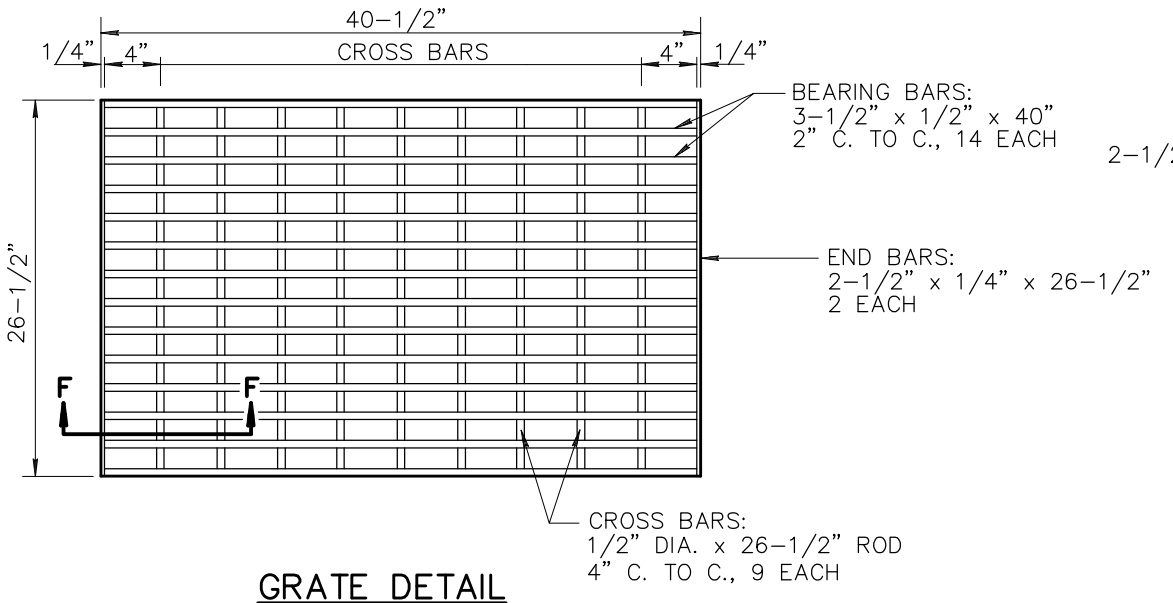



FRAME DETAIL

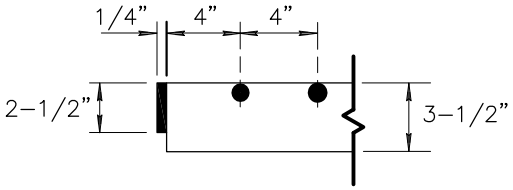



## FRAME AND GRATE NOTES

14. FRAME AND GRATING SHALL BE TESTED FOR ACCURACY OF FIT AND SHALL BE MARKED IN SETS BEFORE DELIVERY.
15. ALL WELDING SHALL BE IN ACCORDANCE WITH STANDARD WELDING SPECIFICATIONS.
16. CROSS BARS AND END BARS MAY BE FILLET WELDED, RESISTANCE WELDED OR ELECTOR FORGED TO BEARING BARS.
17. ANCHORS SHALL BE 3/8" DIA. STEEL ROD, NO. 3 REBAR, 3/8" DIA. x 8" BOLTS OR 8" NELSON STUDS.
18. ALL PARTS SHALL BE OF STRUCTURAL GRADE STEEL.
19. ALL EXPOSED STEEL SHALL BE GALVANIZED OR PAINTED WITH ONE COAT #1 PAINT AND TWO FIELD COATS OF #10 PAINT.

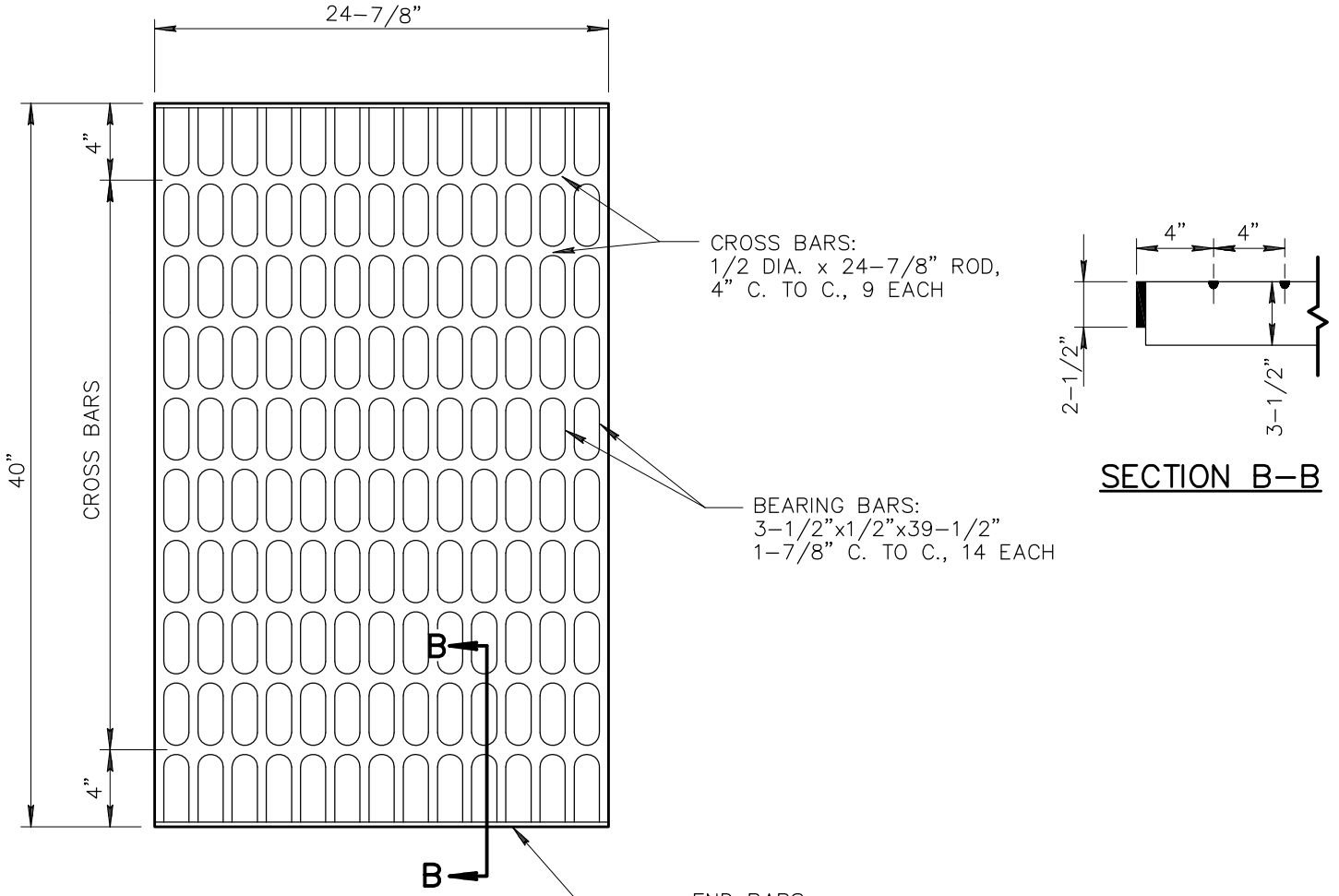



GRATE DETAIL




SECTION F–F

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 533–3 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | FRAME AND GRATE FOR TYPE 'D' CATCH BASIN | 01–01–2007 | 533–3 |

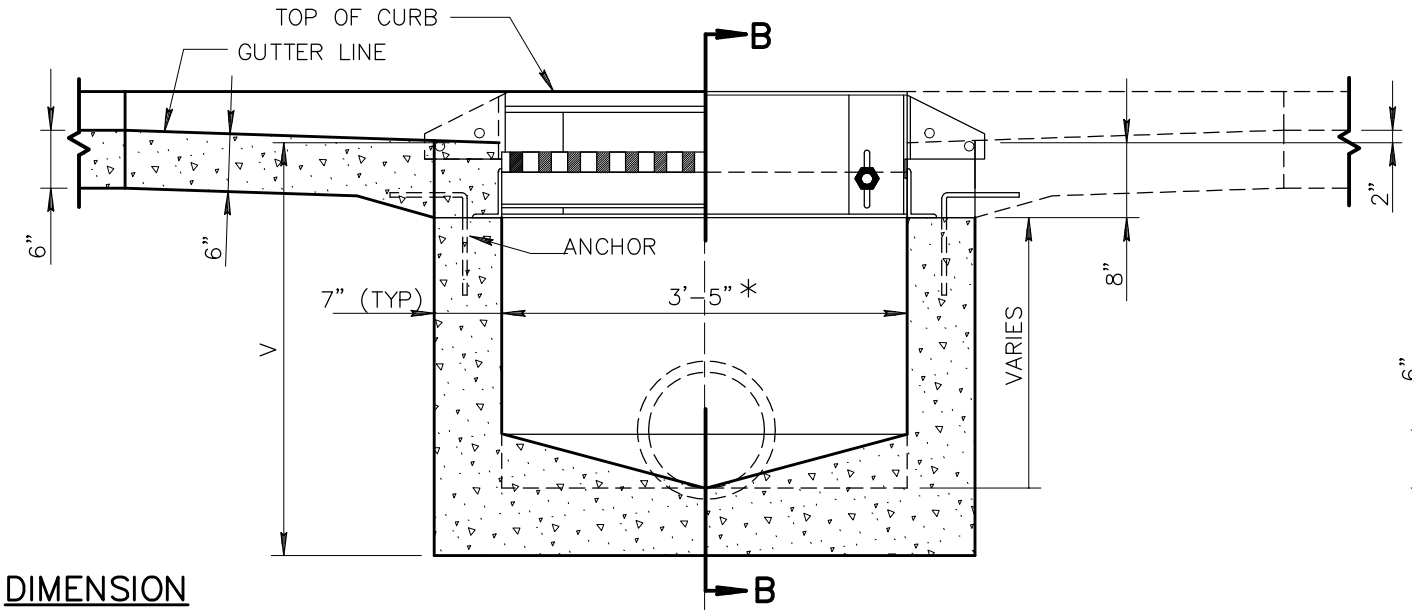



## GRATE DETAIL

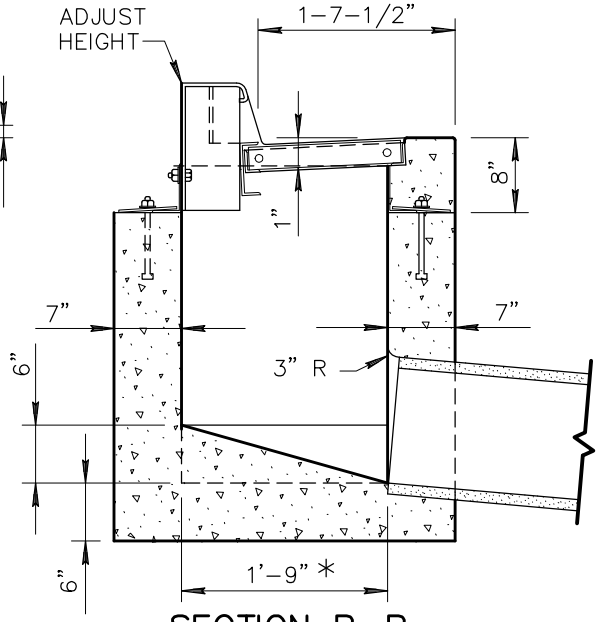
GRATE OPENING: 4.344 SQ. FT.

## SECTION B-B

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 533-4 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | 7'-0" CURB OPENING CATCH BASIN TYPE 'D' - GRATE DETAILS | 01-01-2007 | 533-4 |



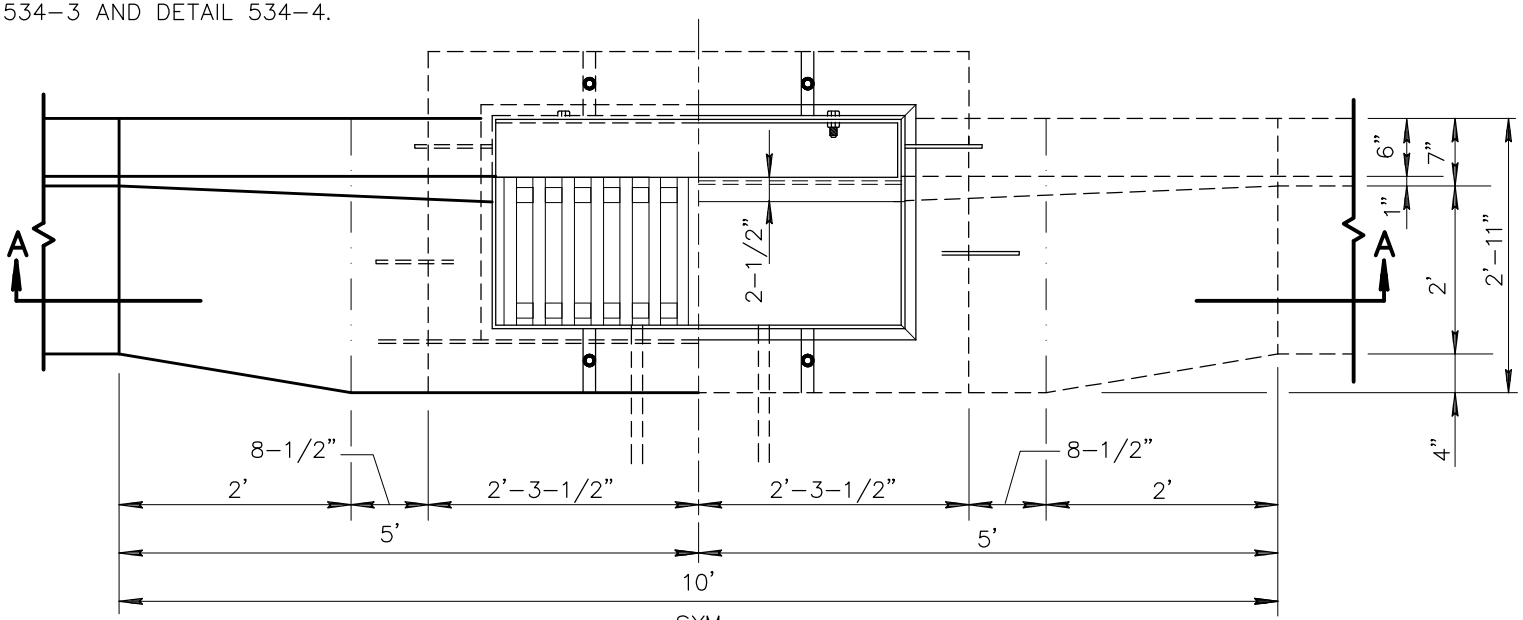

SECTION A–A




SECTION B–B

## DIMENSION

V=3'–0" UNLESS OTHERWISE SPECIFIED.
* DIMENSIONAL CHANGE WITH DETAIL 534–3 AND DETAIL 534–4.



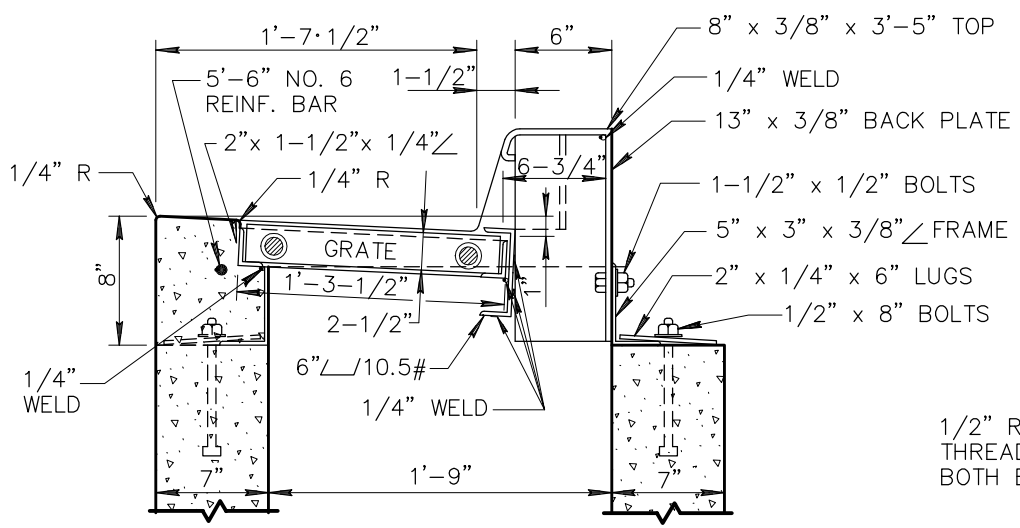

HALF PLAN GUTTER & GRATE

HALF PLAN FRAME & ANCHORS

## NOTES:

1. ADJUSTABLE CURB, FRAME AND GRATING UNITS SHALL BE STRUCTURAL STEEL OR CAST IRON
2. PIPES MAY ENTER OR LEAVE ANY WALL. BOTTOM OF BOX TO BE SLOPED TO OUTLET PIPE FROM ALL DIRECTIONS AND TROWELLED TO A HARD SMOOTH SURFACE.
3. CONNECTION PIPES MAY BE PLACED IN ANY POSITION AROUND THE WALLS PROVIDED THE POSITION IS CONSISTENT WITH THE PLAN.
4. OUTLET PIPE SHALL BE TRIMMED TO FINAL SHAPE AND LENGTH BEFORE CONCRETE IS POURED.
5. ALL STRUCTURAL STEEL TO BE PAINTED ONE SHOP COAT OF NO. 1 PAINT AND TWO FIELD COATS OF NO. 10 PAINT AS PER SECT. 790.
6. ALL CONCRETE, CLASS 'A' AS PER SECTION 725.

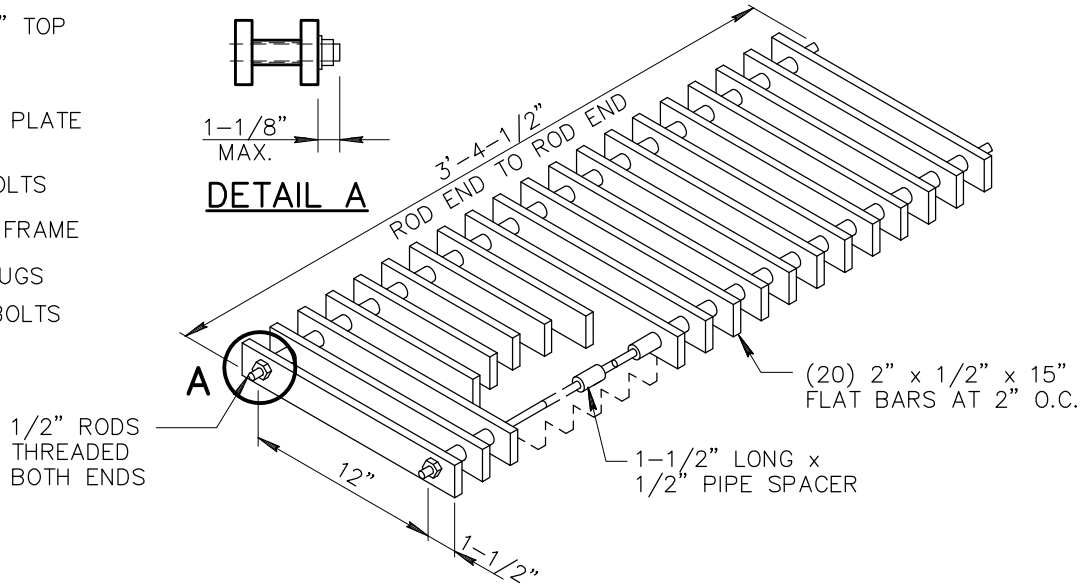
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 534–1 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | CATCH BASIN TYPE 'E' | 01–01–1998 | 534–1 |



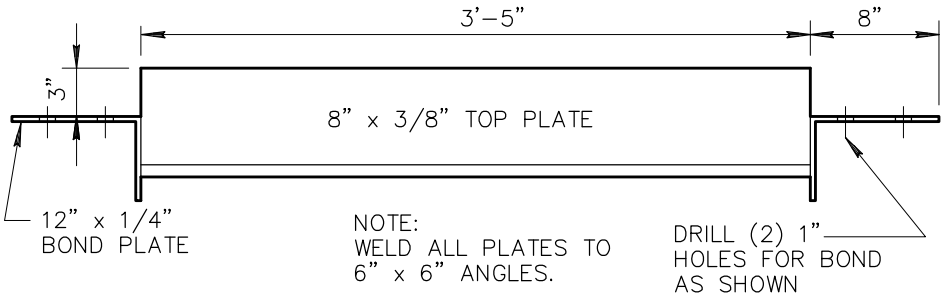

CROSS SECTION

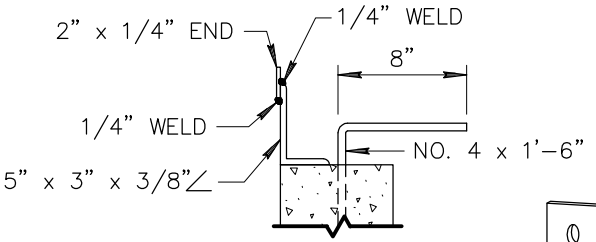



DETAIL A

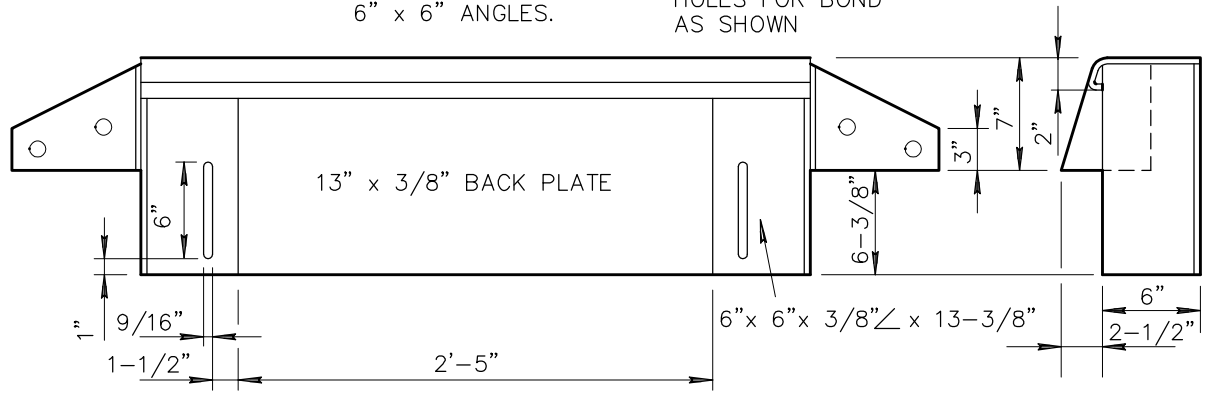



GRATE

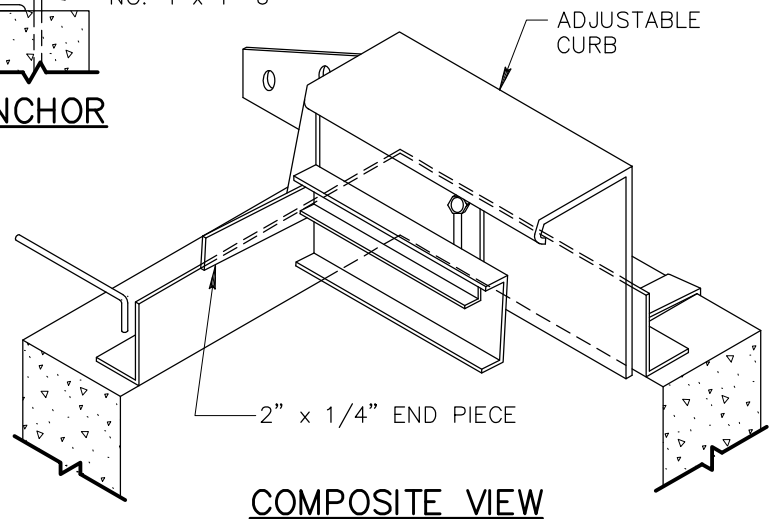



ANCHOR

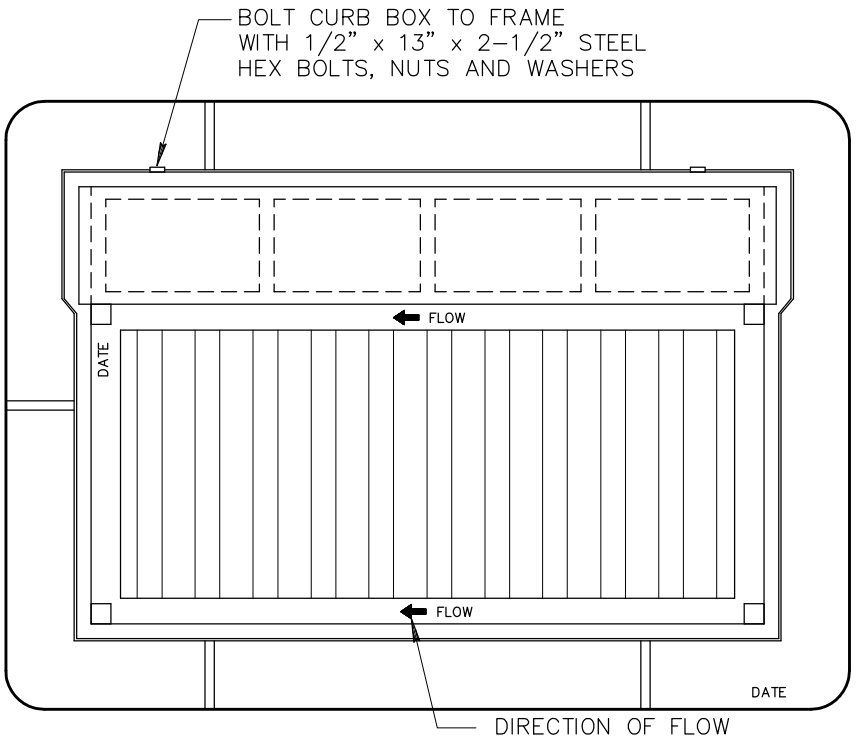


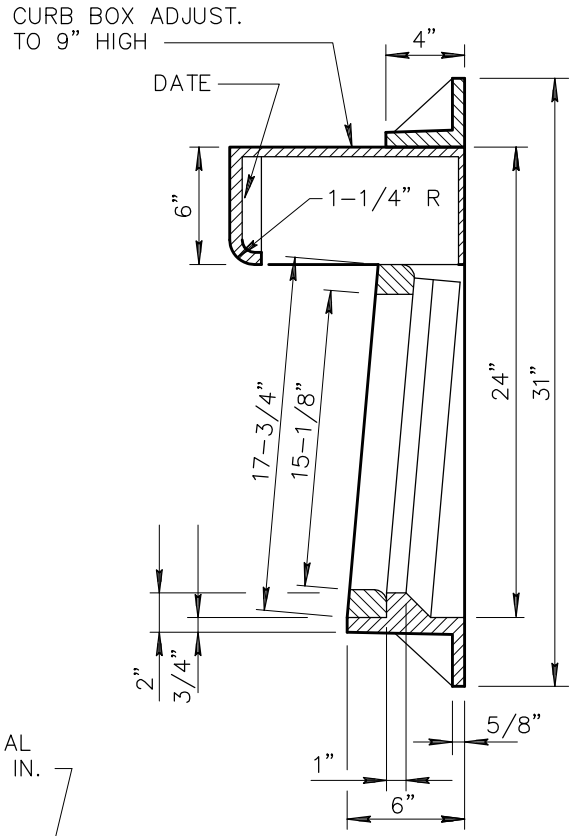

ADJUSTABLE CURB



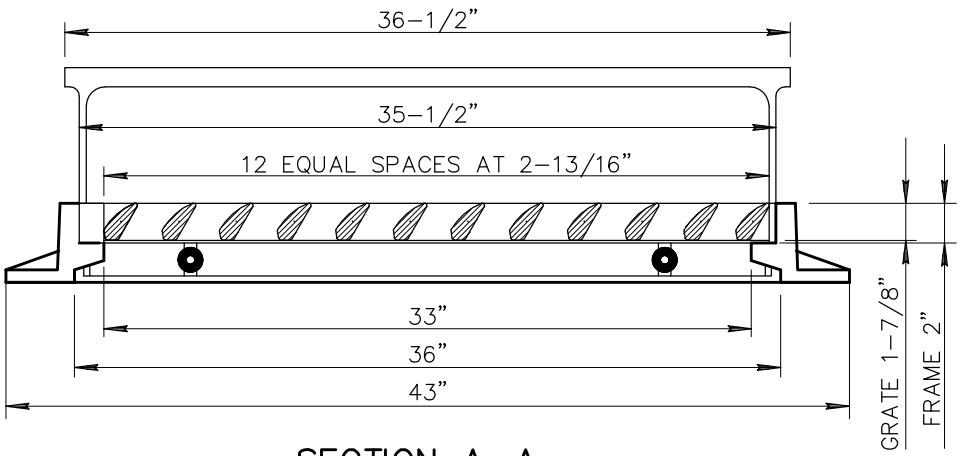

COMPOSITE VIEW

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 534-2 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | CATCH BASIN TYPE 'E' (DETAILS) | 01-01-1998 | 534-2 |



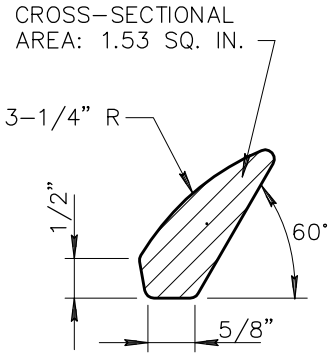




SECTION B–B




SECTION A–A

CAST IRON FRAME – GRATE – CURB BOX

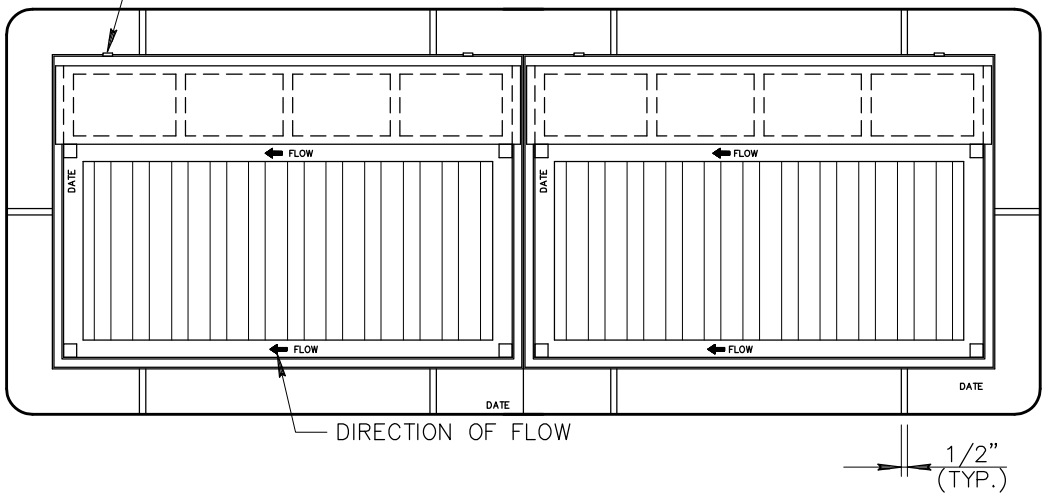


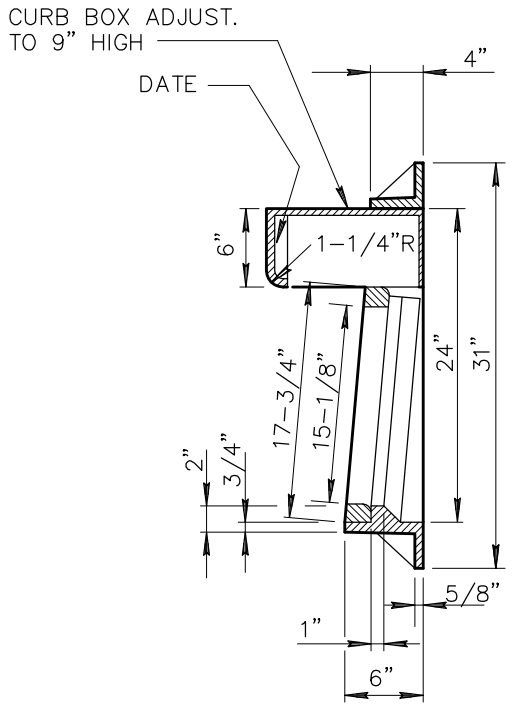

VANE DETAIL

## NOTE:

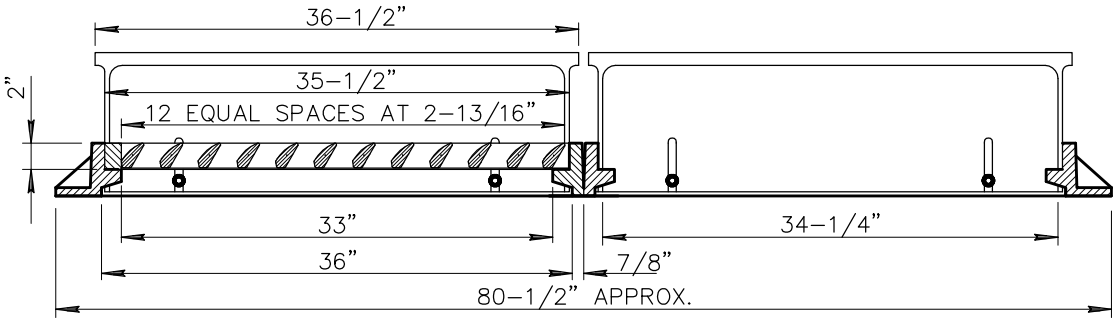
DIMENSIONAL CHANGE REQUIRED FROM 3'–5"
WIDTH TO 3'–0" AND 1'–9" DEPTH TO 2'–0"
MATERIAL CAST GRAY IRON ASTM A–48–83 CLASS 35B.
FRAME WEIGHT 209 LBS; GRATE 140 LBS; CURB BOX 92 LBS.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 534–3 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | CATCH BASIN TYPE 'E' (DETAILS) | 01–01–1998 | 534–3 |

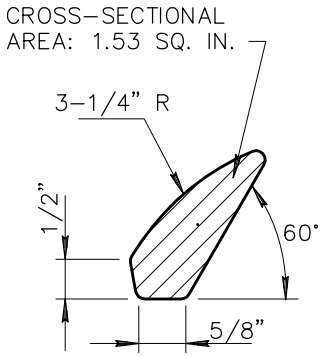



SECTION B-B




SECTION A-A



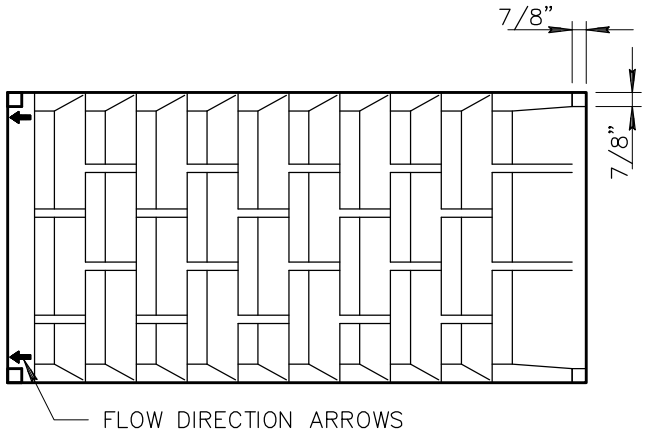

VANE DETAIL

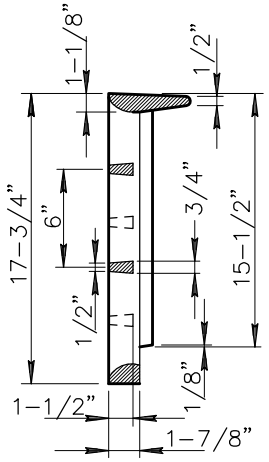
## DOUBLE UNIT CAST IRON FRAME - GRATE - CURB BOX

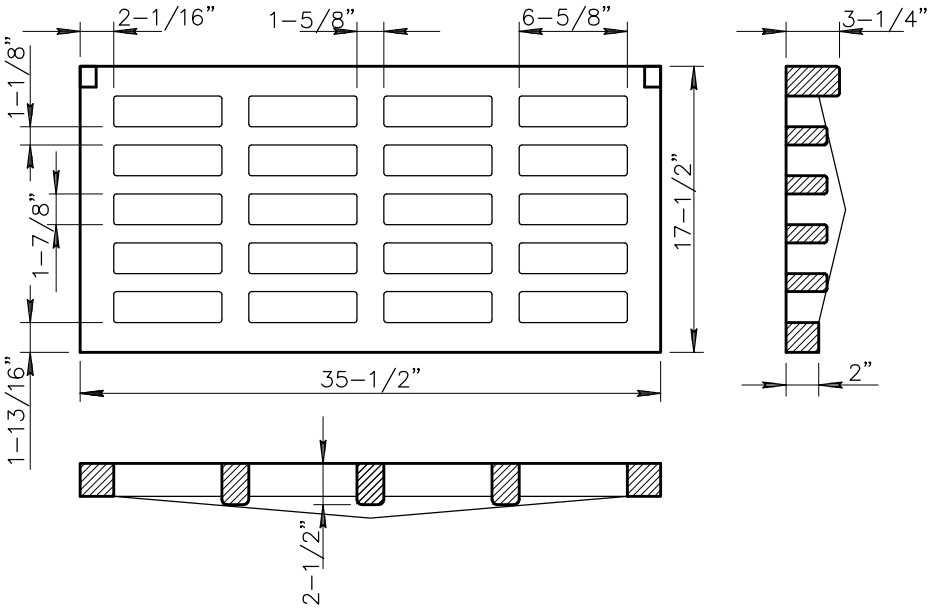
**NOTE:**

DIMENSIONAL CHANGE REQUIRED FROM 3'-5" WIDTH TO 6'-2", AND 1'-9" DEPTH TO 2'-0"
REQUIRES ONE CENTER STEEL I-BEAM 4" x 7.7 LBS.
MATERIAL CAST GRAY IRON ASTM A-48-83 CLASS 35B.
FRAME WEIGHT 197 LBS.; GRATE 140 LBS.; CURB BOX 92 LBS.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 534-4 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | CATCH BASIN TYPE 'E' (DETAILS) | 01-01-1998 | 534-4 |

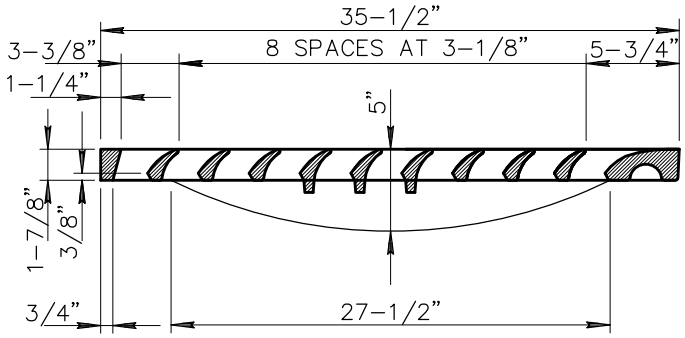


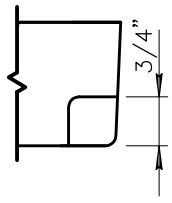



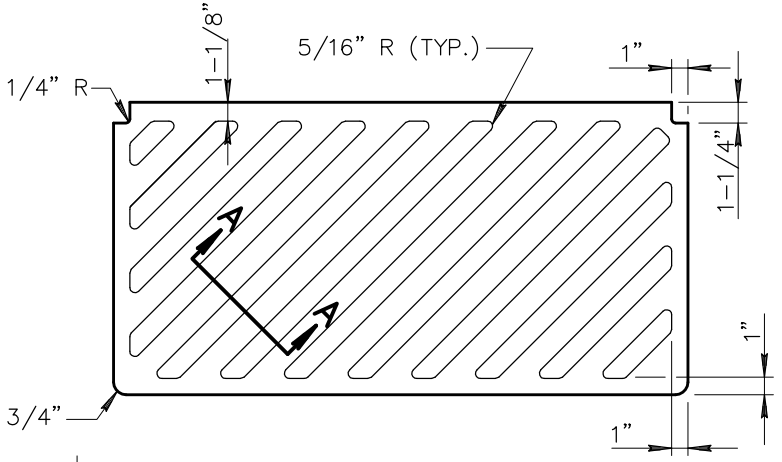


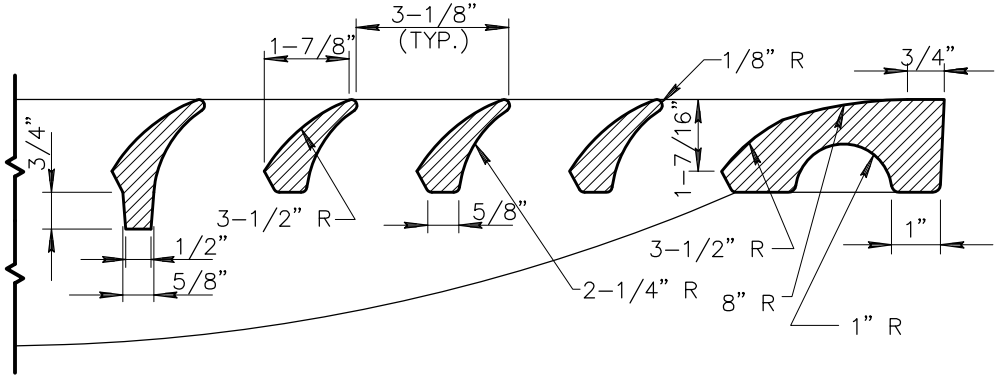




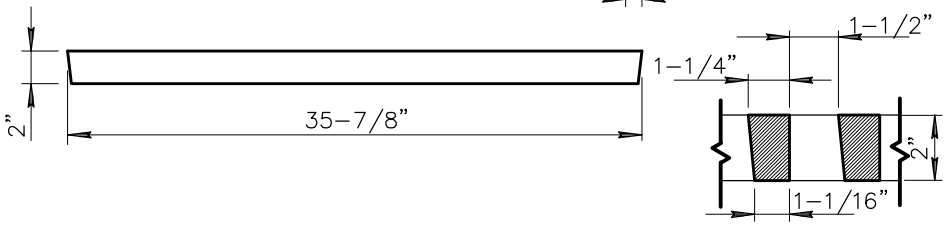




NOTCH DETAIL



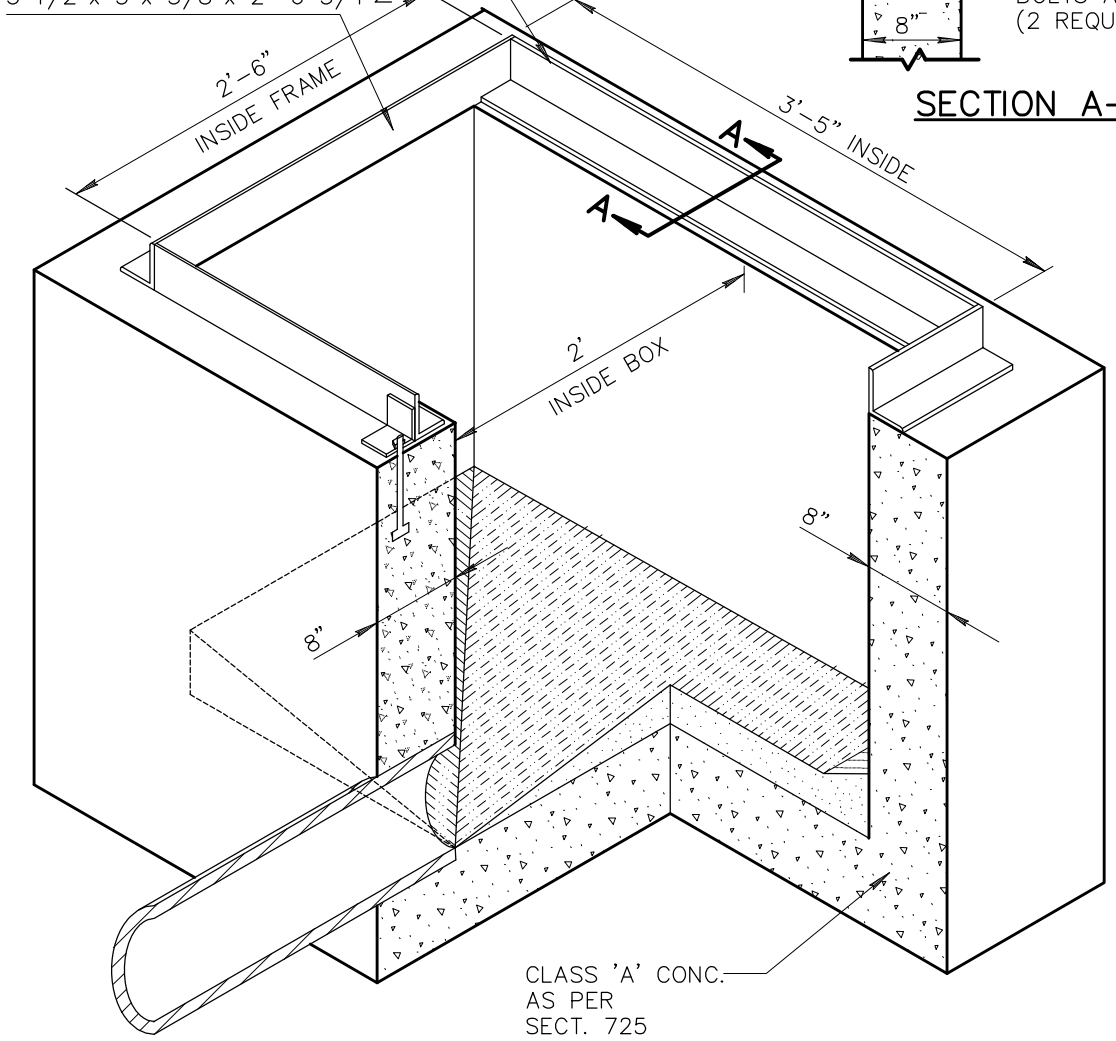



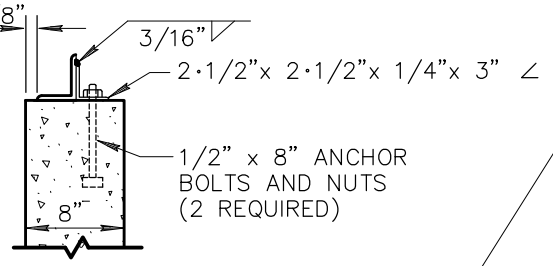

VANE DETAIL



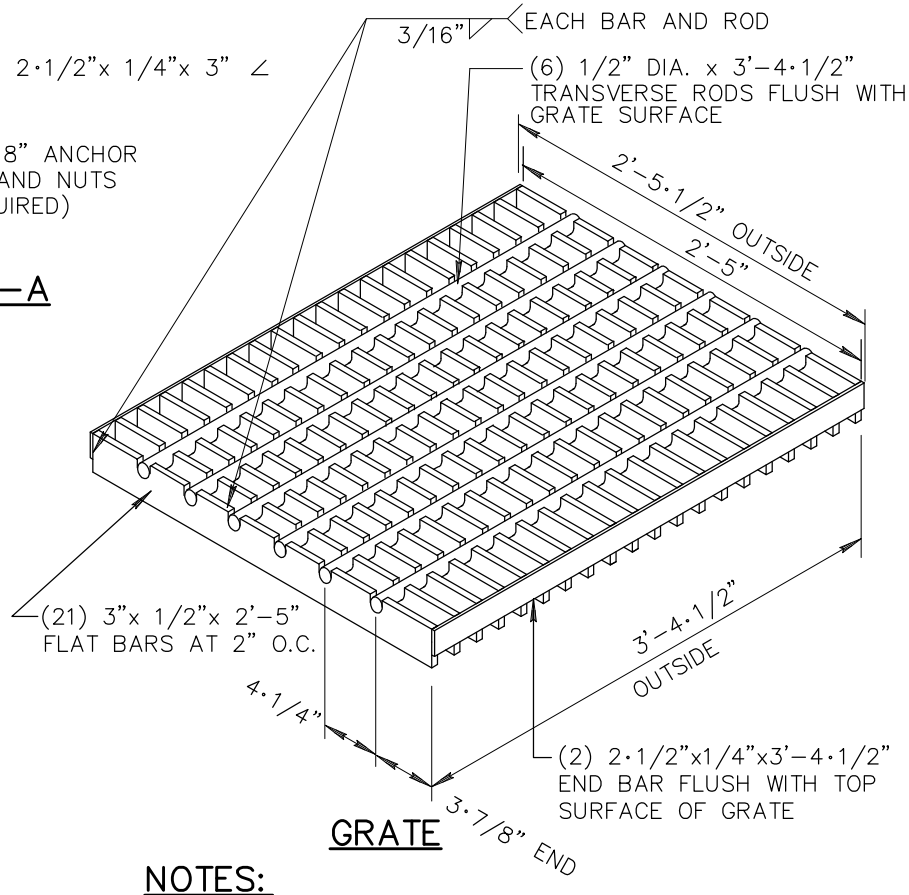

SECTION A-A

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 534-5 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | ALTERNATE GRATE STYLES SUMP LOCATION | 01-01-1998 | 534-5 |




SECTION A–A



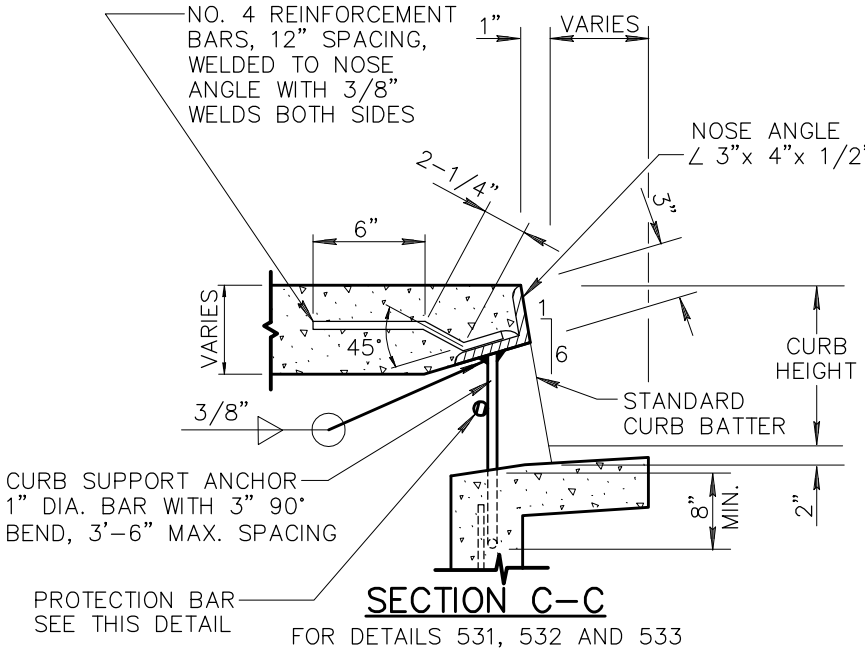

GRATE

NOTE:
SEE DETAIL 534–1 FOR THICKNESS AND SLOPE DIMENSIONS OF BOTTOM.

## NOTES:

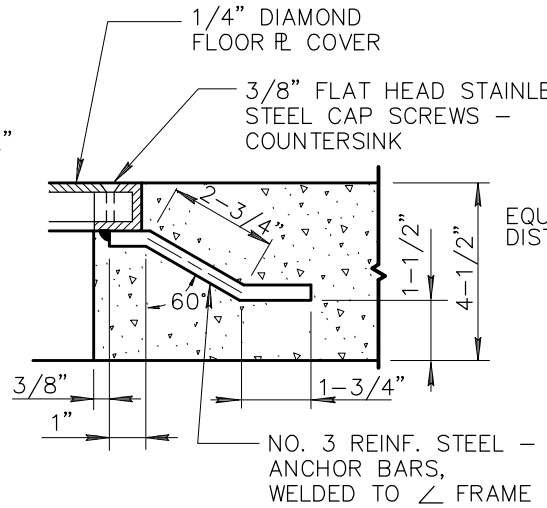
1. PIPES MAY ENTER OR LEAVE ANY WALL. BOTTOM OF BOX TO BE SLOPED TO OUTLET PIPE FROM ALL DIRECTIONS AND TROWELLED TO A HARD SMOOTH SURFACE.
2. CONNECTION PIPES MAY BE PLACED IN ANY POSITION AROUND THE WALLS PROVIDED THE POSITION IS CONSISTENT WITH THE PLAN.
3. OUTLET PIPE SHALL BE TRIMMED TO FINAL SHAPE AND LENGTH BEFORE CONCRETE IS POURED.
4. ALL STRUCTURAL STEEL TO BE PAINTED ONE SHOP COAT OF NO. 1 PAINT AND TWO FIELD COATS OF NO. 10 PAINT AS PER SECT. 790.
5. ALL WELDS ON FRAME AND SIDE BARS ON GRATE SHALL BE FULL LENGTH OF JOINT.
6. TOTAL COMBINED CLEARANCE BETWEEN FRAME AND GRATE IS 1/2".

| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 535 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | CATCH BASIN TYPE 'F' (FOR USE WITHOUT CURB) | | 01–01–2009 | 535 |

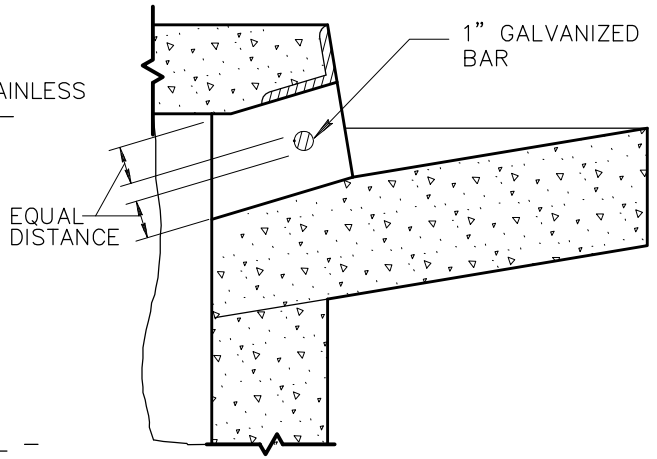



## SECTION C–C

FOR DETAILS 531, 532 AND 533



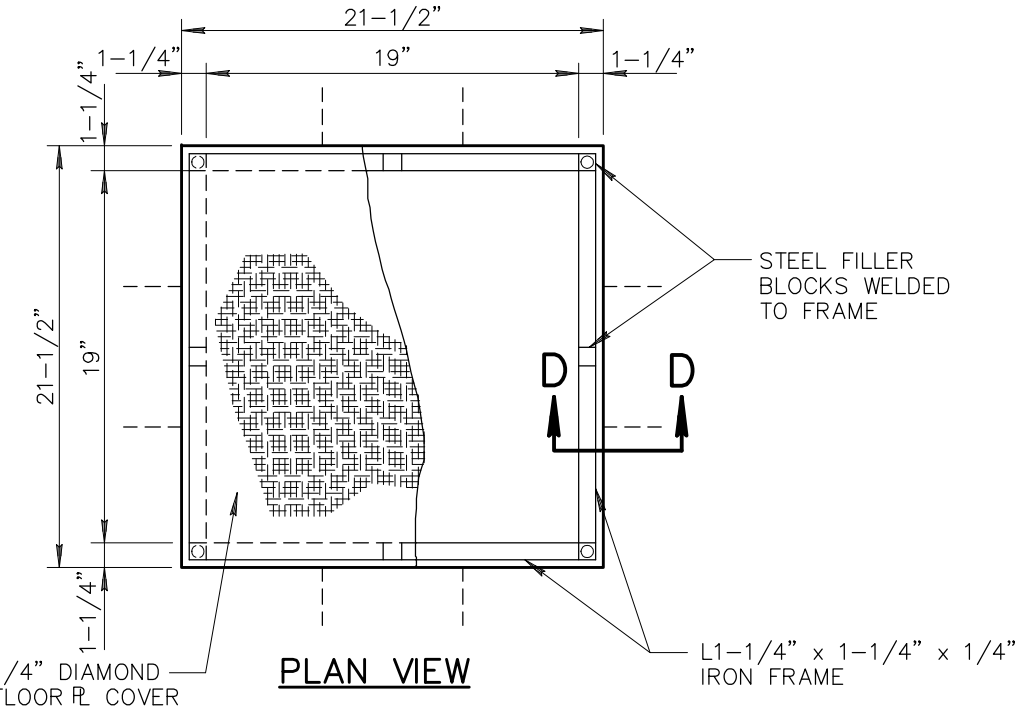

## SECTION D–D



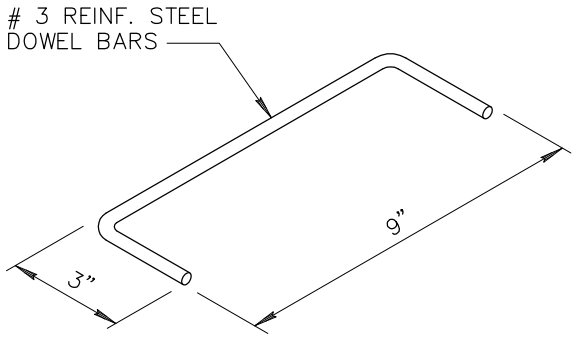

## PROTECTION BAR

## NOTES:

1) HORIZONTAL PLAIN ROUND GALVANIZED STEEL PROTECTION BAR SHALL BE USED WHEN CURB FACE IS 9" OR MORE.
2) THE BAR SHALL BE EMBEDDED 5" AT EACH END.

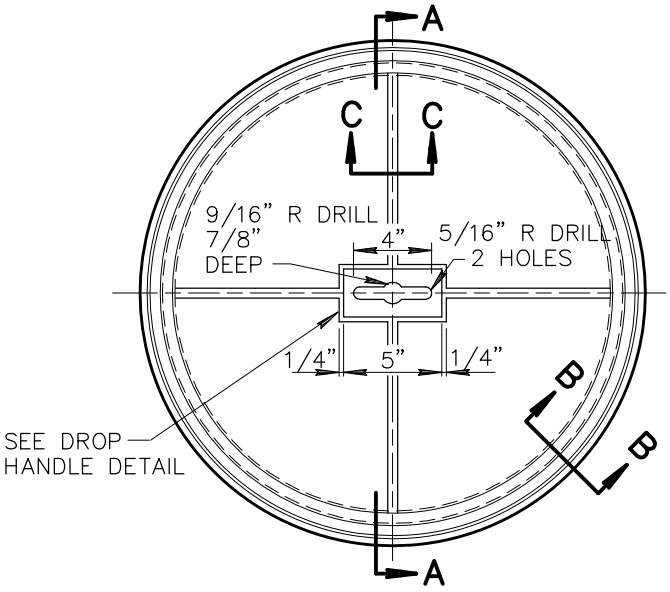



## PLAN VIEW

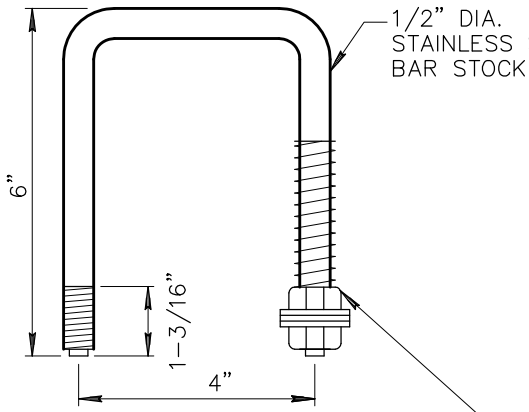



## DOWEL BAR

| DETAIL NO. | | STANDARD DETAIL | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 536–1 | MARICOPA ASSOCIATION of GOVERNMENTS | ENGLISH | COMMON DETAILS AND SECTIONS FOR CURB OPENING CATCH BASINS | 01–01–1999 | 536–1 |

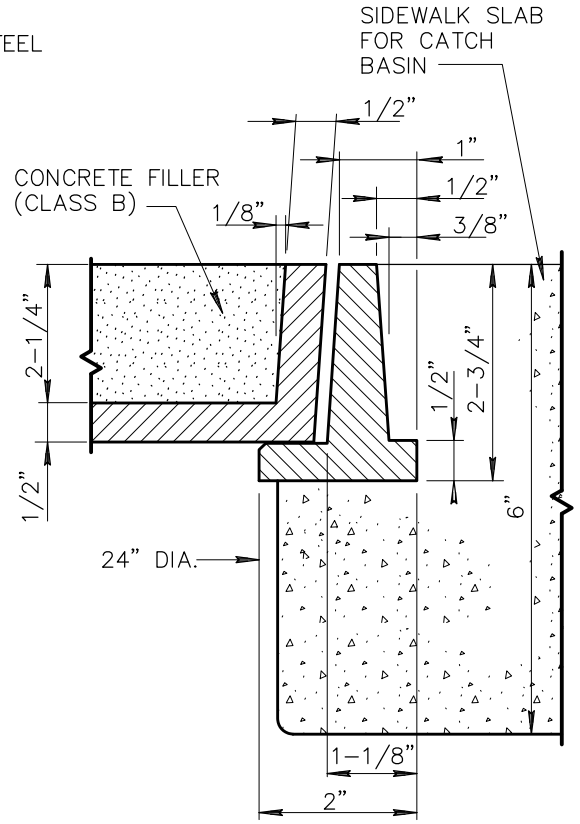



PLAN VIEW

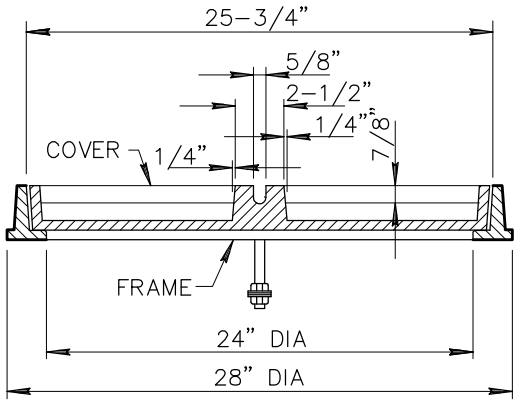



FURNISH FOR EACH SIDE OF HANDLE
1 EACH 304-S.STL. SPRING
2-1/2" x 17/32" I.C. x 3/32"
2 EACH 1/2" HEX NUT
3 EACH 1/2" FLAT WASHER
1 EACH 1/2" LOCK WASHER

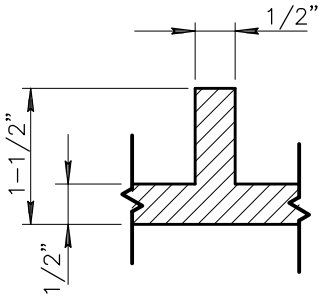
DROP HANDLE




SECTION B-B




SECTION A-A

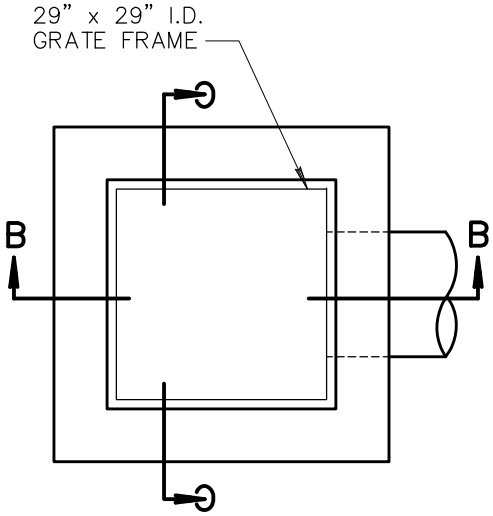



SECTION C-C

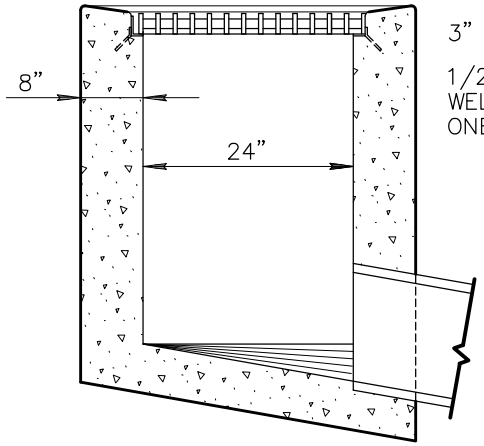
## NOTES:

1. FRAME SHALL BE NON-LOCKING.
2. FRAME AND COVER SHALL BE CAST IRON OR ASTM A-36 STRL. HORIZONTIAL SURFACE OF COVER IN CONTACT WITH FRAME SHALL BE MACHINED. ASA B-46 ROUGHNESS SHALL NOT EXCEED 1/32".
3. COVER SHALL BE FILLED WITH CONCRETE AND BROOM FINISHED.
4. SMALL VARIATIONS IN DIMENSIONS OF FEATURES OF A MINOR NATURE THAT ARE PART OF THE FOUNDRY'S CASTING ARE PERMISSIBLE.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 536-2 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | ALTERNATE COVER FOR CURB OPENING CATCH BASINS | 01-01-1998 | 536-2 |

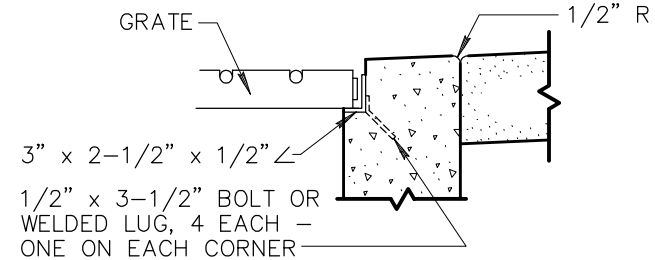



PLAN



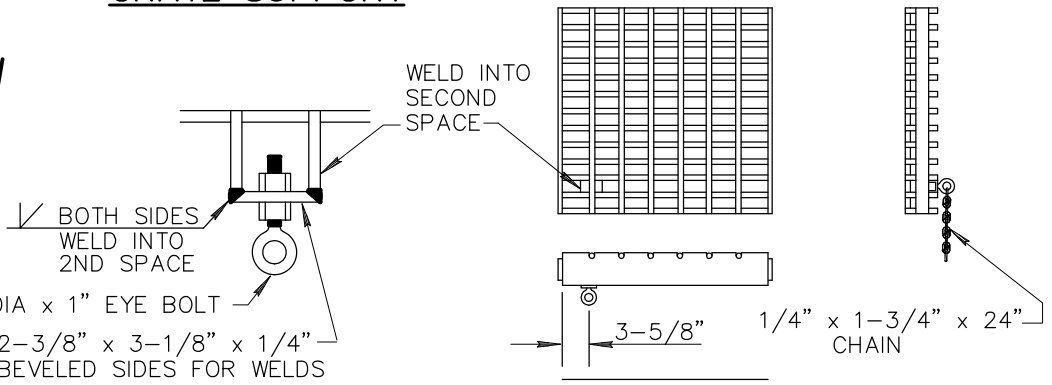

SECTION B–B

SINGLE GRATE



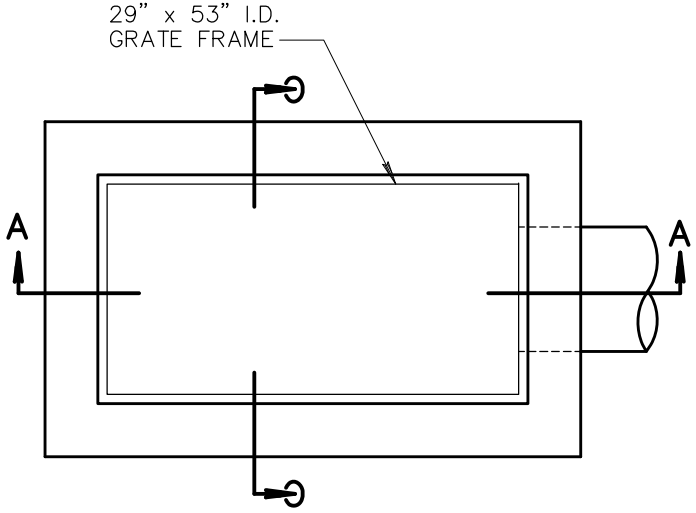

DETAIL OF ANGLE FRAME GRATE SUPPORT

ALL CONCRETE SHALL BE CLASS 'A' PER SECT. 725. EXPOSED EDGES SHALL BE FINISHED WITH A 1/2" RADIUS.

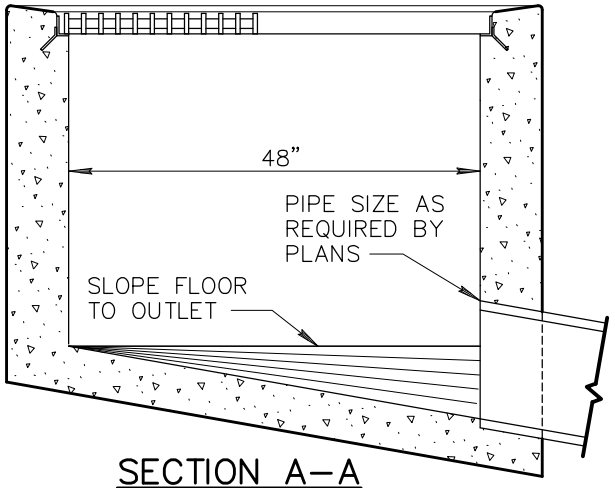



BAR GRATE

SEE DETAIL 539

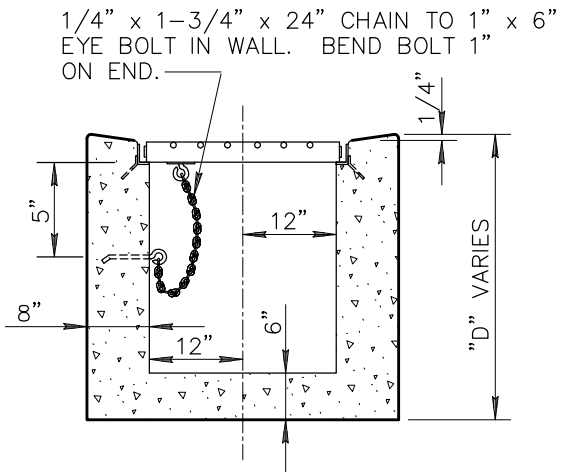



PLAN



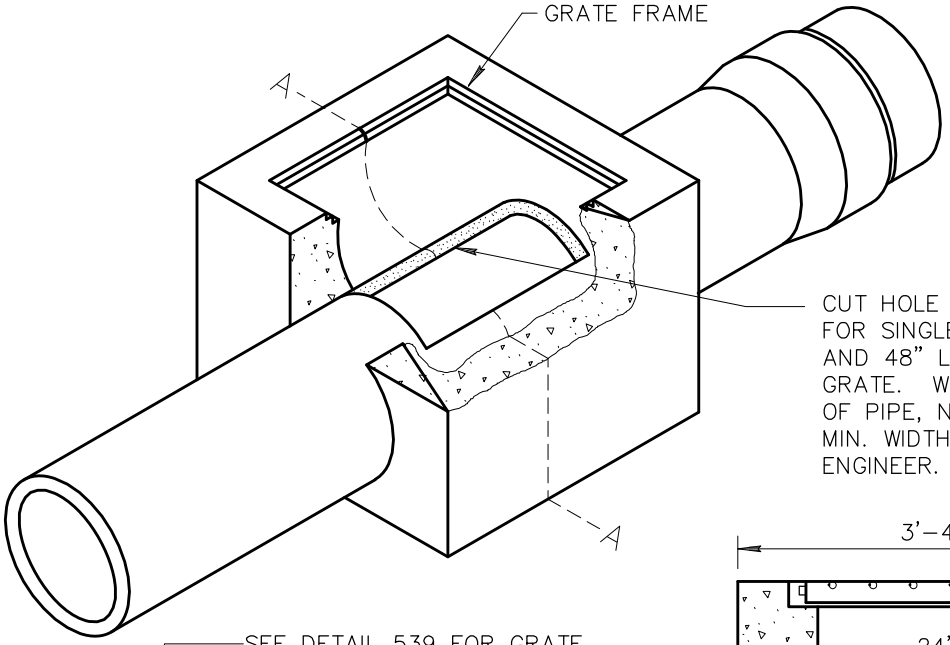

SECTION A–A

DOUBLE GRATE



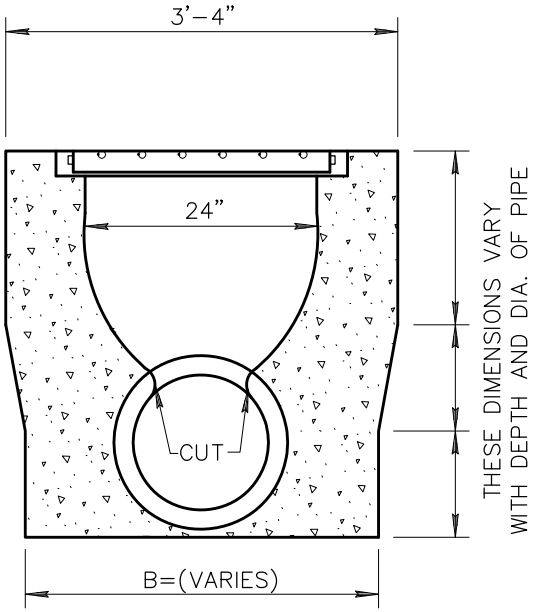

SECTION C–C

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 537 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | CATCH BASIN – TYPE 'G' | 01–03–2002 | 537 |

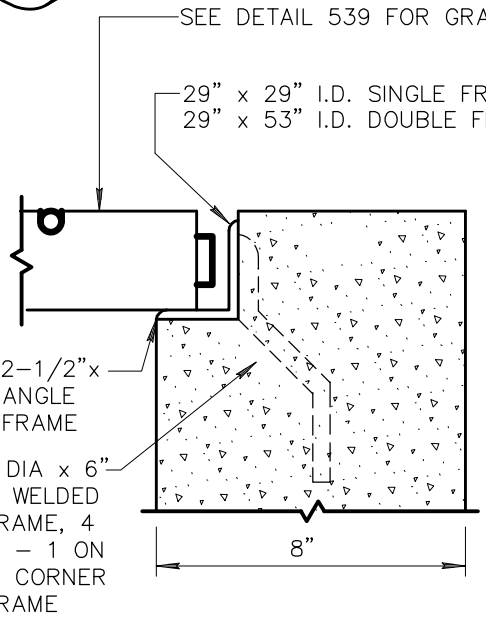



WHEN DOUBLE GRATE IS USED INCREASE THE LENGTH OF THE STRUCTURE ACCORDINGLY.

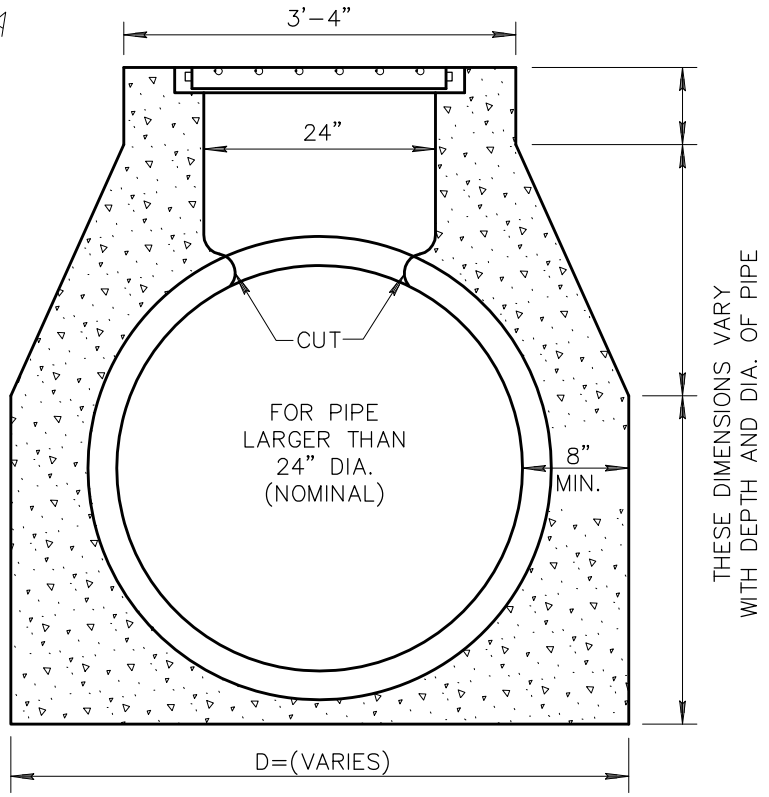
CUT HOLE IN PIPE 24" LONG FOR SINGLE GRATE STRUCTURES AND 48" LONG FOR DOUBLE GRATE. WIDTH DEPENDS ON DIA. OF PIPE, NOT TO EXCEED 22" MIN. WIDTH TO BE SET BY PROJECT ENGINEER.



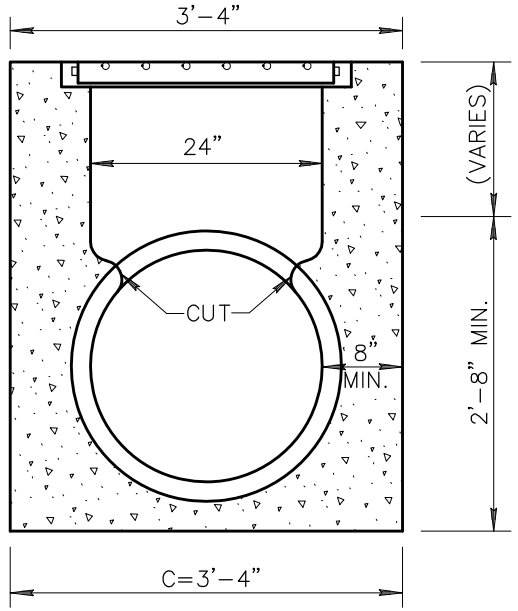

SECTION A-A




DETAIL OF ANGLE FRAME GRATE SUPPORT

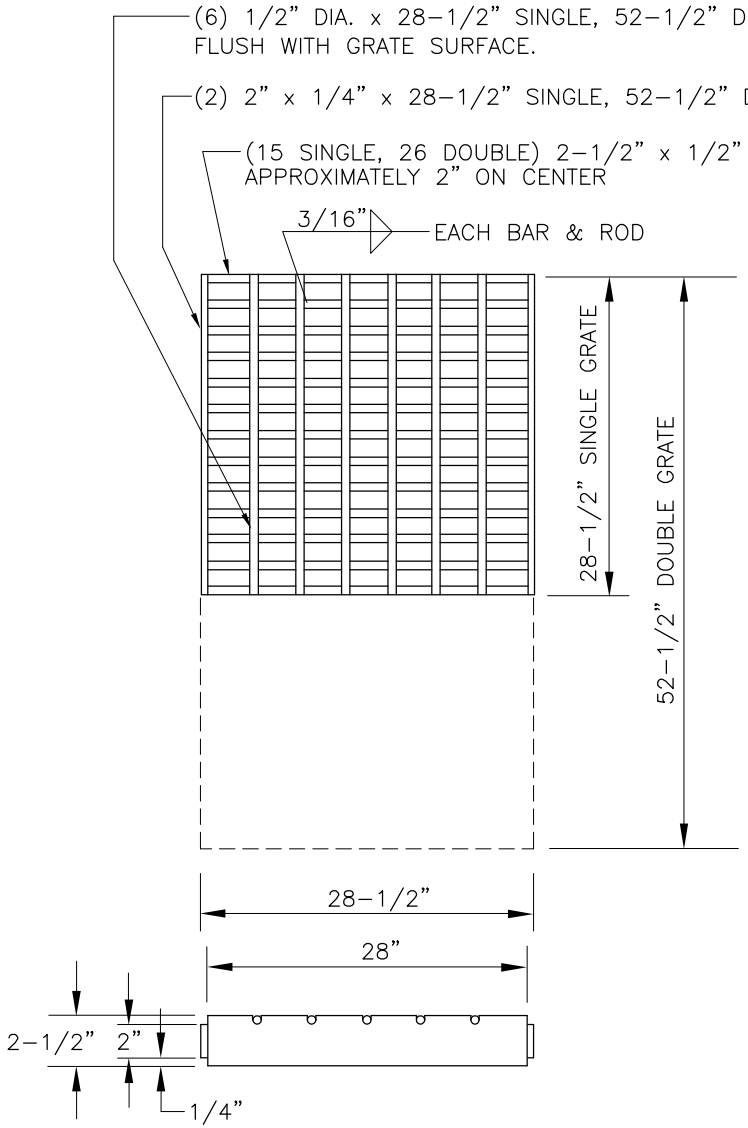



SECTION A-A




SECTION A-A
24" PIPE (NOMINAL)

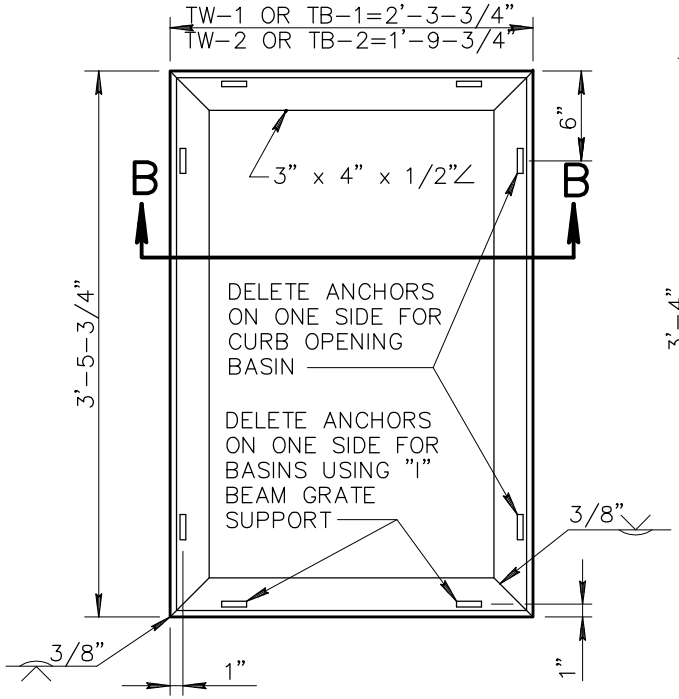
| DETAIL NO. | | STANDARD DETAIL | | REVISIONS | DETAIL NO. |
|---|---|---|---|---|---|
| 538 | MARICOPA ASSOCIATION of GOVERNMENTS | ENGLISH | CATCH BASIN - TYPE 'H' | 01-01-1998 | 538 |



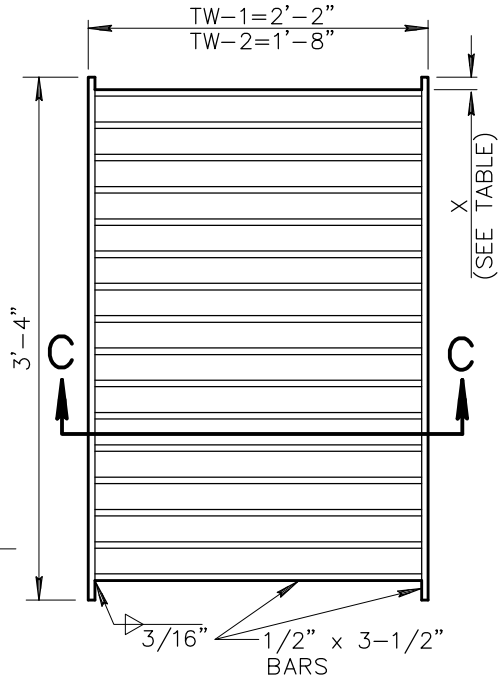

## NOTES:

1. ALL STEEL SHALL BE IN ACCORDANCE WITH A.S.T.M. A-36.
2. WELDING SHALL BE IN ACCORDANCE WITH A.W.S. SPECIFICATIONS.
3. FRAME AND GRATE SHALL BE TESTED FOR ACCURACY OF FIT AND SHALL BE MARKED IN SETS BEFORE DELIVERY.
4. THE COMPLETED ASSEMBLY SHALL BE GIVEN ONE SHOP COAT OF NO. 1 PAINT AND TWO FIELD COATS OF NO. 10 PAINT AS PER SECTION 790.
5. THE GRATE SHALL BE FABRICATED TO WITHIN 1/8" SPECIFIED DIMENSIONS.

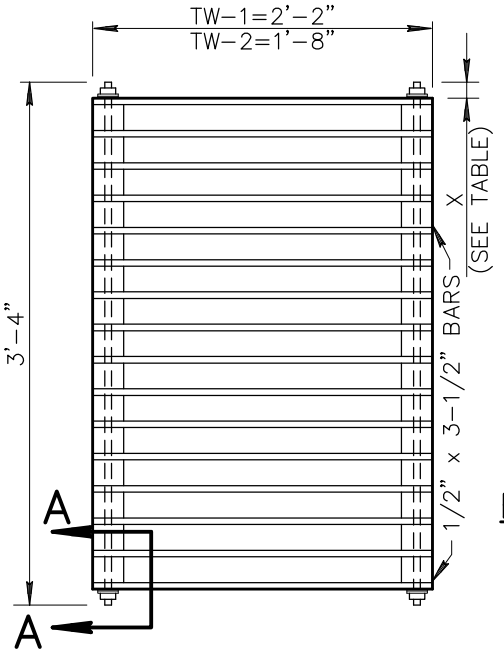
| DETAIL NO. | | | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 539 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | GRATES FOR CATCH BASINS, TYPE G AND H | | 01-01-1998 | 539 |



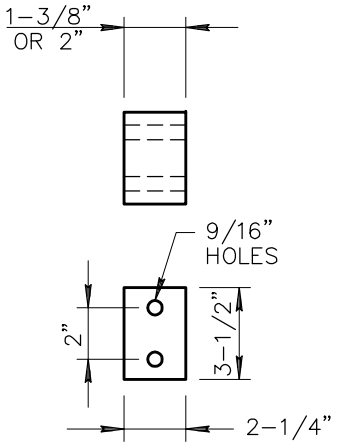

PLAN I




PLAN IA

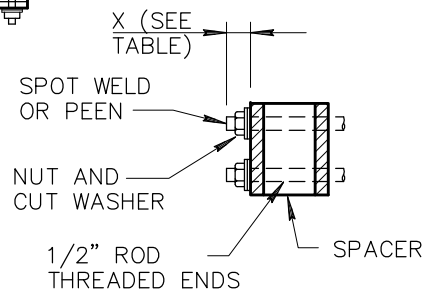



PLAN IB



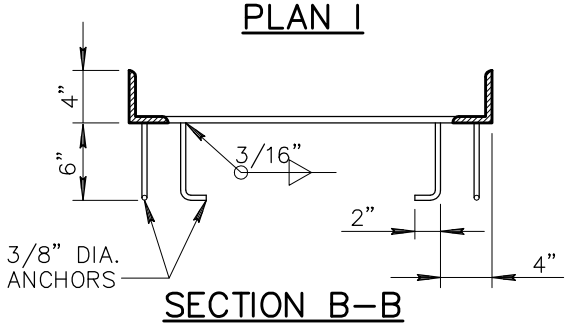

CAST IRON, CAST STEEL OR STEEL BAR STOCK

BAR SPACER DETAIL

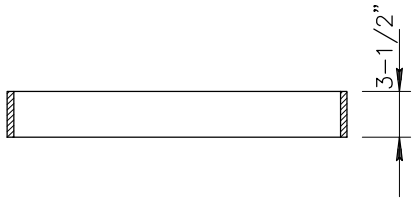



SECTION A-A

GRATE TYPES TB-1 AND TB-2




SECTION B-B




SECTION C-C

GRATE TYPES TW-1 AND TW-2

## NOTES:

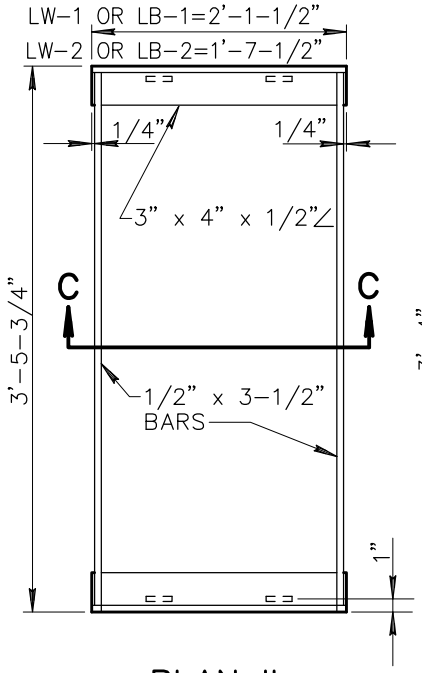
1. GRATING UNITS AND FRAMES SHALL BE FABRICATED FROM STRUCTURAL STEEL EXCEPT AS NOTED.
2. WELDING SHALL BE IN ACCORDANCE WITH STD. WELDING SPECS.
3. THE COMPLETED ASSEMBLY SHALL BE GIVEN TWO SHOP COATS OF NO. 1 PAINT AS PER SECT. 790.
4. FRAME AND GRATE SHALL FIT TO A MAX. ROCK OF 0.093" AT ANY POINT.
5. RESTRICT USE TO GRADES OF 3% OR LESS.

BAR TABLE

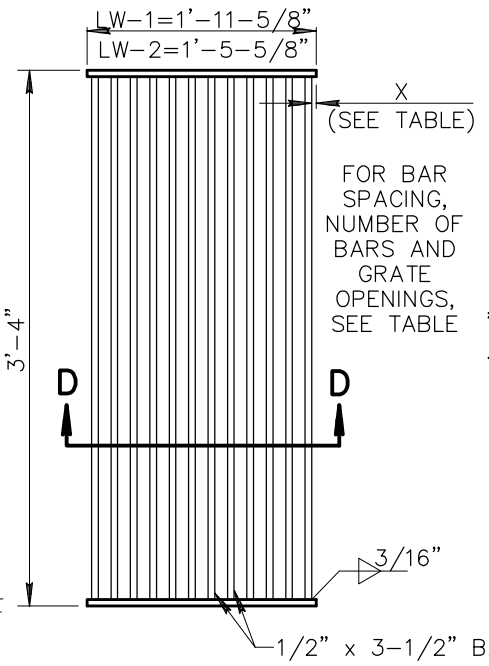
| TYPE | CLEAR SPACING | NO. BARS | X | GRATE OPENING $ft^2$ |
|---|---|---|---|---|
| TW OR TB-1.0 | 1" | 26 | 1" | 3.21 |
| TW OR TB-1.1 | 1-3/8" | 21 | 1" | 3.32 |
| TW OR TB-1.2 | 2" | 16 | 1" | 4.66 |
| TW OR TB-2.0 | 1" | 26 | 1" | 2.32 |
| TW OR TB-2.1 | 1-3/8" | 21 | 1" | 2.41 |
| TW OR TB-2.2 | 2" | 16 | 1" | 2.65 |

TW INDICATES TRANSVERSE WELDED
TB INDICATES TRANSVERSE BOLTED

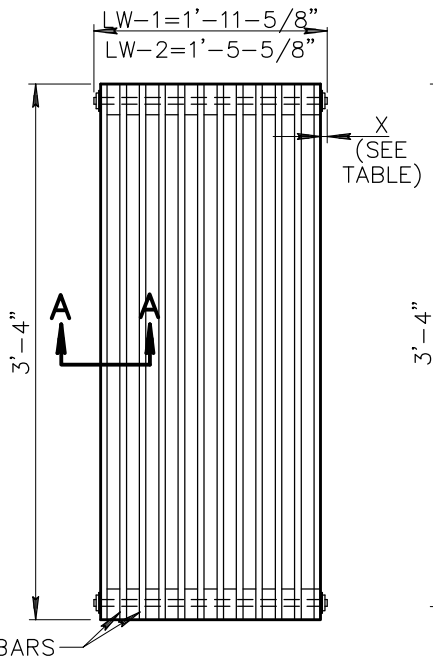
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 540-1 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | CATCH BASIN GRATES | 01-01-1998 | 540-1 |



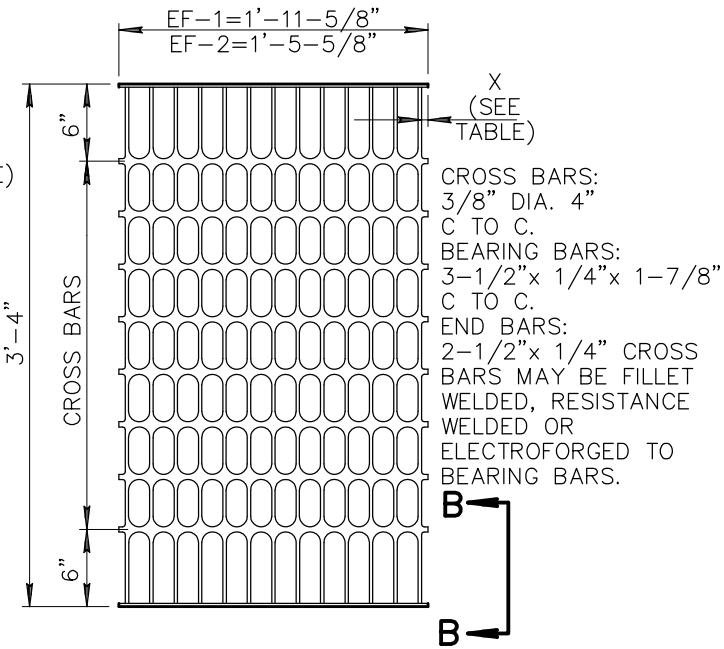

PLAN II



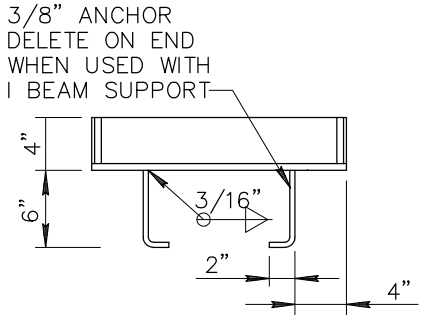

PLAN IIA



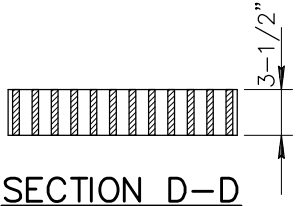

PLAN IIB



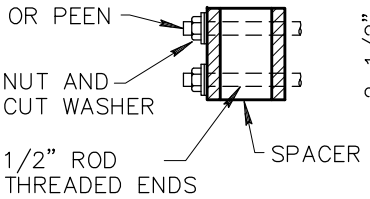

PLAN II



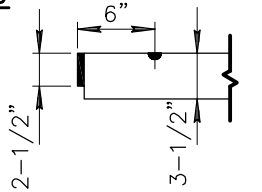

SECTION C-C




SECTION D-D

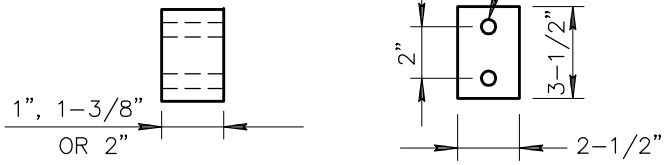



SECTION A-A




SECTION B-B

| GRATE TYPE | CLEAR BAR SPACING | NO. BARS | X | GRATE OPENING $ft^2$ |
|---|---|---|---|---|
| LW OR LB-1.0 | 1" | 16 | 5/16" | 3.97 |
| LW OR LB-1.1 | 1-3/8" | 13 | 5/16" | 4.34 |
| LW OR LB-1.2 | 2" | 9 | 1-9/16" | 4.84 |
| EF-1 | 1-5/8" | 13 | 7/16" | 4.66 |
| LW OR LB-2.0 | 1" | 12 | 5/16" | 2.98 |
| LW OR LB-2.1 | 1-3/8" | 9 | 1-1/16" | 3.35 |
| LW OR LB-2.2 | 2" | 7 | 1-1/16" | 3.60 |
| EF-2 | 1-5/16" | 10 | 1/4" | 3.48 |




BAR SPACER DETAIL

CAST IRON, CAST STEEL OR STEEL BAR STOCK

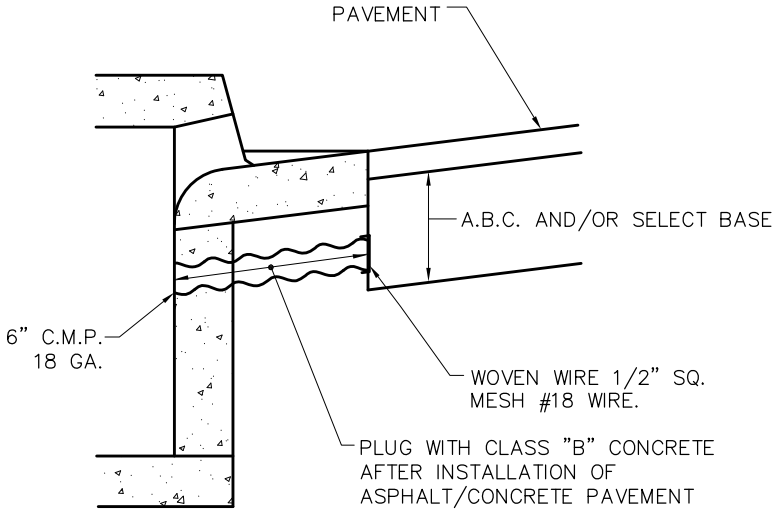
## NOTES:

1. LW INDICATES LONGITUDINAL WELDED.
2. LB INDICATES LONGITUDINAL BOLTED.
3. EF INDICATES ELECTROFORGED.
4. GRATING UNITS AND FRAMES SHALL BE FABRICATED FROM STRUCTURAL STEEL 'A-36 EXCEPT AS NOTED.
5. ALL WELDING SHALL BE IN ACCORDANCE WITH STANDARD WELDING SPECIFICATIONS.
6. THE COMPLETED ASSEMBLY SHALL BE GIVEN ONE SHOP COAT OF NO. 1 PAINT.
7. FRAMES AND GRATES SHALL FIT TO A MAXIMUM ROCK OF 0.093" AT ANY POINT.
8. GRATE TYPE LW AND EF RESTRICTED TO SLOPES OF 3% OR LESS
9. GRATES TYPE LB USE LONGITUDINAL GRADES IN EXCESS OF 3% OR AS AN ALTERNATE TO TYPES LW OR EF ON GRADES OF 3% OR LESS.

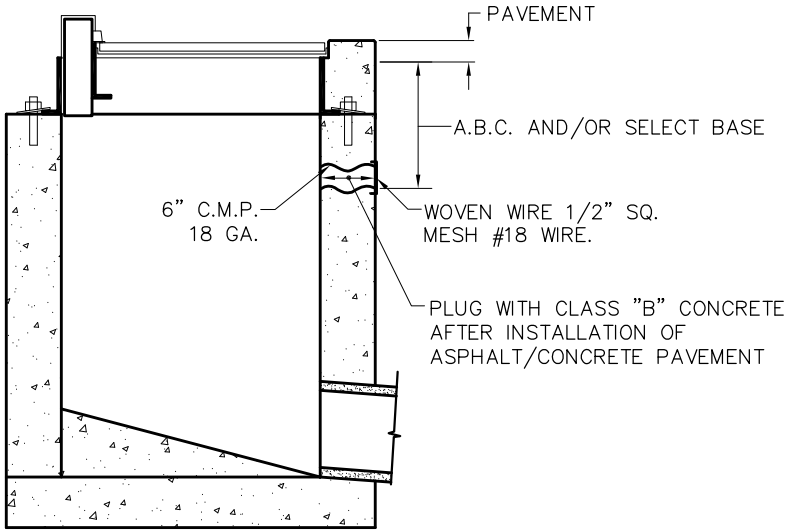
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 540-2 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | CATCH BASIN GRATES | 01-01-1998 | 540-2 |

## NOTES:

1. INSTALL WHEN REQUIRED BY PLANS, SPECIFICATIONS, OR APPROVED BY THE ENGINEER.
2. SEE PROJECT PLANS FOR CATCH BASIN DETAILS AND PAVEMENT STRUCTURAL SECTION.




CURB OPENING INLET



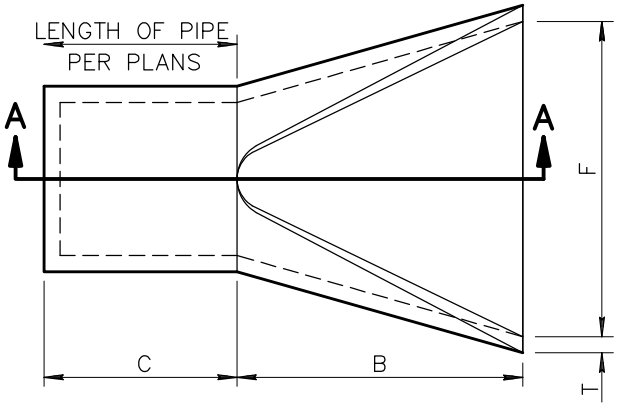

GRATE OPENING INLET

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 541 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | CATCH BASIN SUBGRADE DRAIN | 01-01-2005 | 541 |

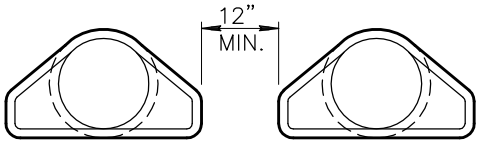
| PIPE DIA. | APPROX. WEIGHT (LBS.) | DIMENSIONS – INCHES | | | | | | APPROX. SLOPE |
|---|---|---|---|---|---|---|---|---|
| | | T | A | B | C | E | F | |
| 24" | 1520 | 3 | 9–1/2 | 43–1/2 | 30 | 73–1/2 | 48 | 3 |
| 27" | 1930 | 3–1/4 | 10–1/2 | 49–1/2 | 24 | 73–1/2 | 54 | 3 |
| 30" | 2190 | 3–1/2 | 12 | 54 | 19–3/4 | 73–3/4 | 60 | 3 |
| 36" | 4100 | 4 | 15 | 63 | 34–3/4 | 97–3/4 | 72 | 3 |
| 42" | 5380 | 4–1/2 | 21 | 63 | 35 | 98 | 78 | 3 |
| 48" | 6550 | 5 | 24 | 72 | 26 | 98 | 84 | 3 |
| 54" | 8240 | 5–1/2 | 27 | 65 | 33–1/4 | 98–1/4" | 90 | 2 1/2 |

## NOTES

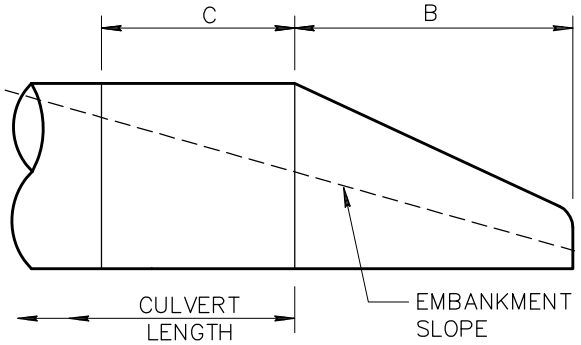
1. DESIGN OF END SECTION SHALL CONFORM TO STANDARD FOR REINFORCED CONCRETE PIPE.
2. END SECTION JOINT CONFORMATION SHALL MATCH THE PIPE JOINTS.
3. EMBANKMENT SLOPE SHALL BE WARPED TO MATCH SLOPE OF END SECTION.
4. CULVERT LENGTH IS AS SHOWN ON PLANS.



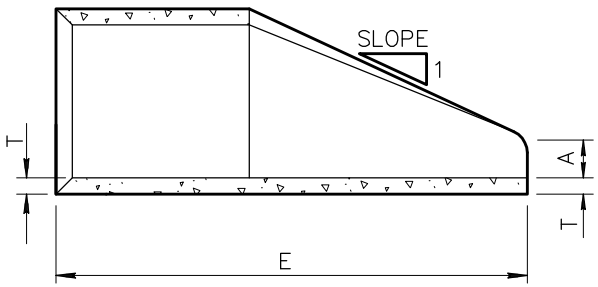

PLAN



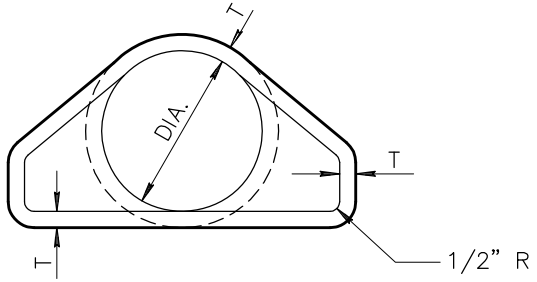

SPACING FOR MULTIPLE INSTALLATION



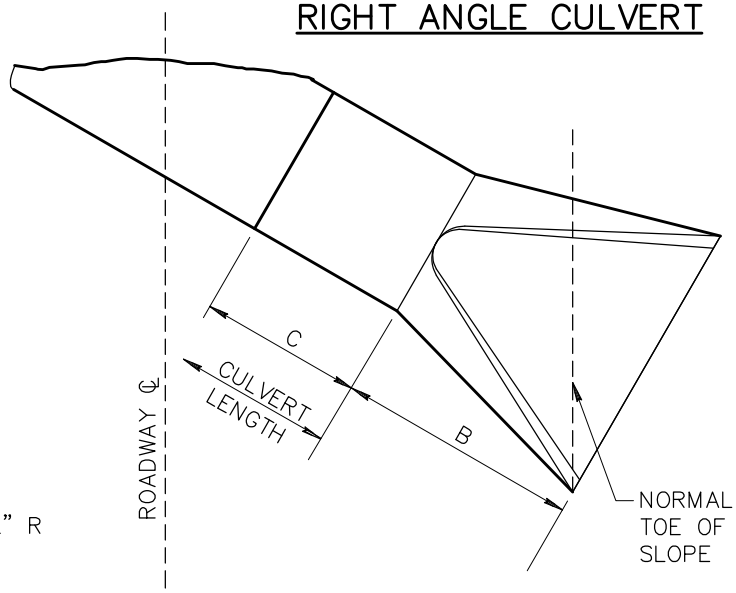

RIGHT ANGLE CULVERT




SECTION A–A

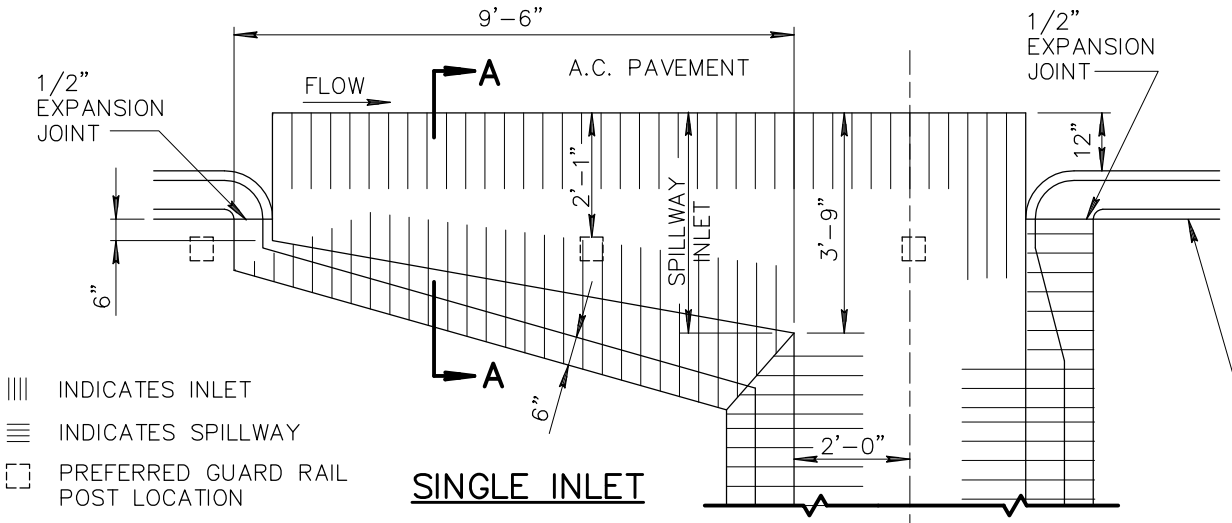



FRONT ELEVATION

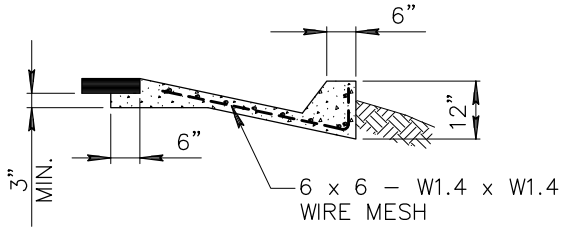



SKEWED CULVERT

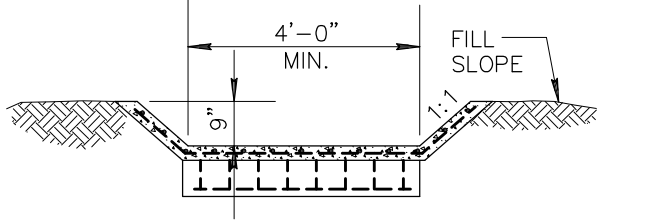
| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 545 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | END SECTION–REINFORCED CONCRETE PIPE | 01–01–1998 | 545 |




## SINGLE INLET



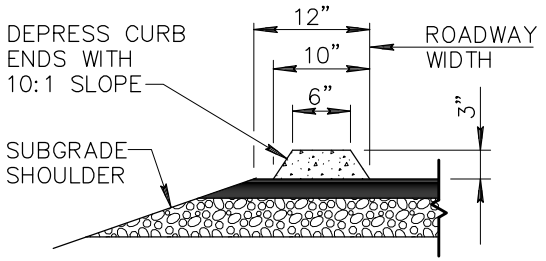

## SECTION A–A



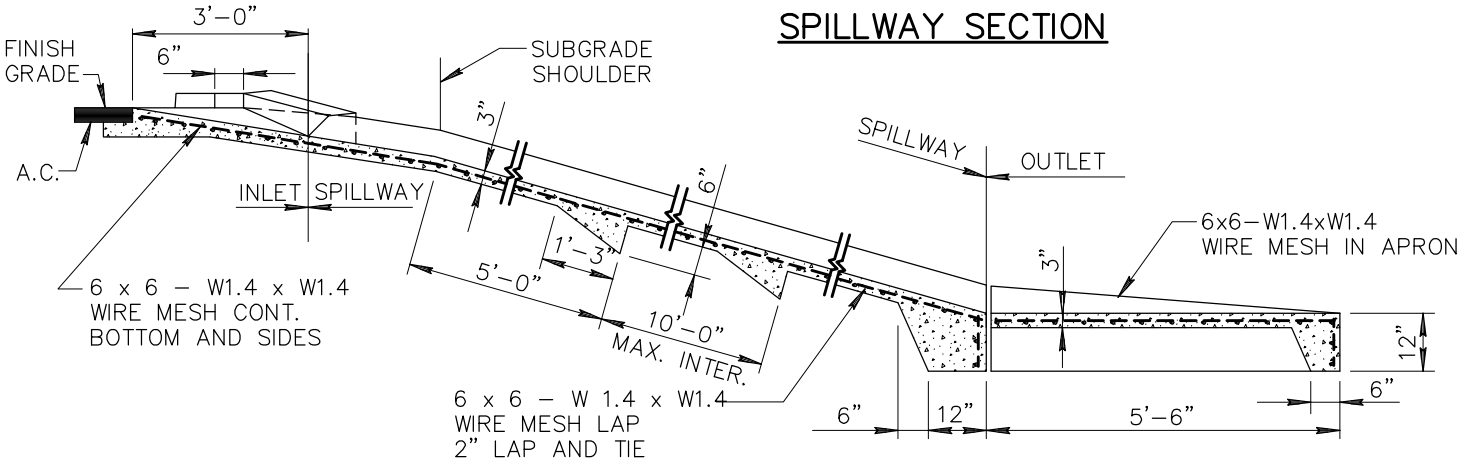

## SPILLWAY SECTION

## NOTES:

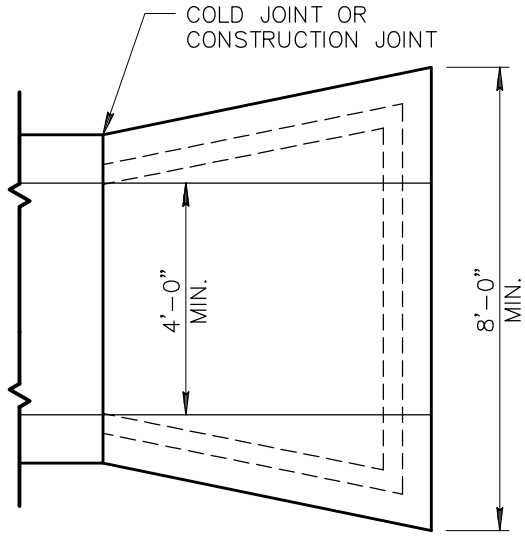
1. WHERE ROCK IS ENCOUNTERED THE OUTLET MAY BE OMITTED.
2. ALL PORTIONS OF SPILLWAY TO BE TROWEL FINISHED.
3. CONCRETE FOR THE SPILLWAY INLET, SPILLWAY AND OUTLET SHALL BE CLASS 'B' PER SECT. 725.
4. WHEN THE OUTLET IS USED, THE WIRE MESH SHALL EXTEND THROUGH THE JOINT INTO THE OUTLET IN LIEU OF BENDING INTO THE KEY.



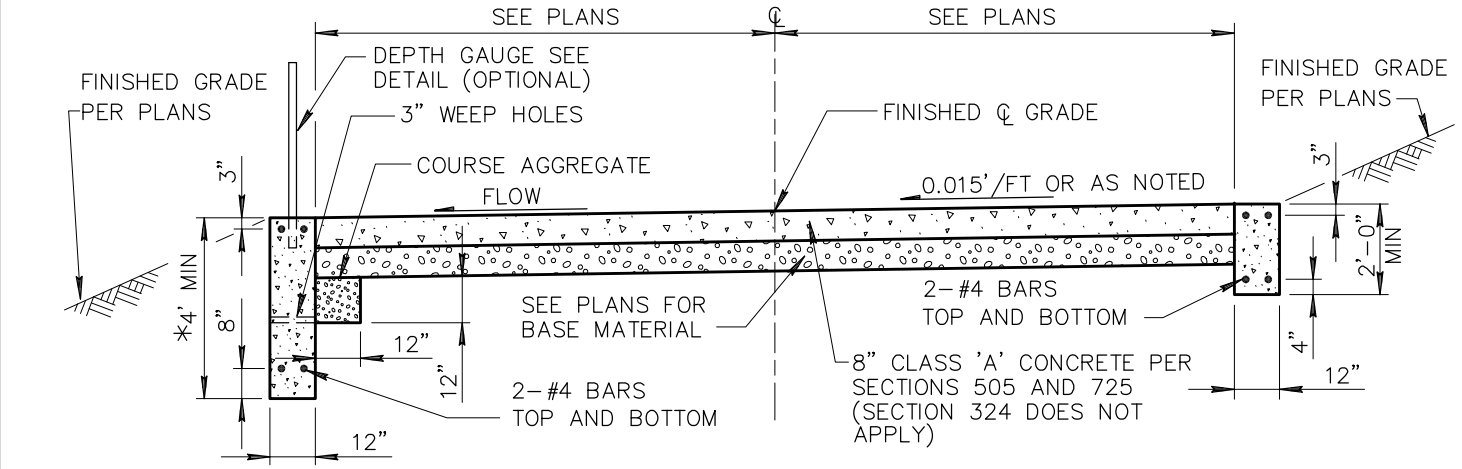

## EMBANKMENT CURB/EXTRUDED (OPTIONAL)




## SECTION ON SPILLWAY ℄ DOUBLE INLET

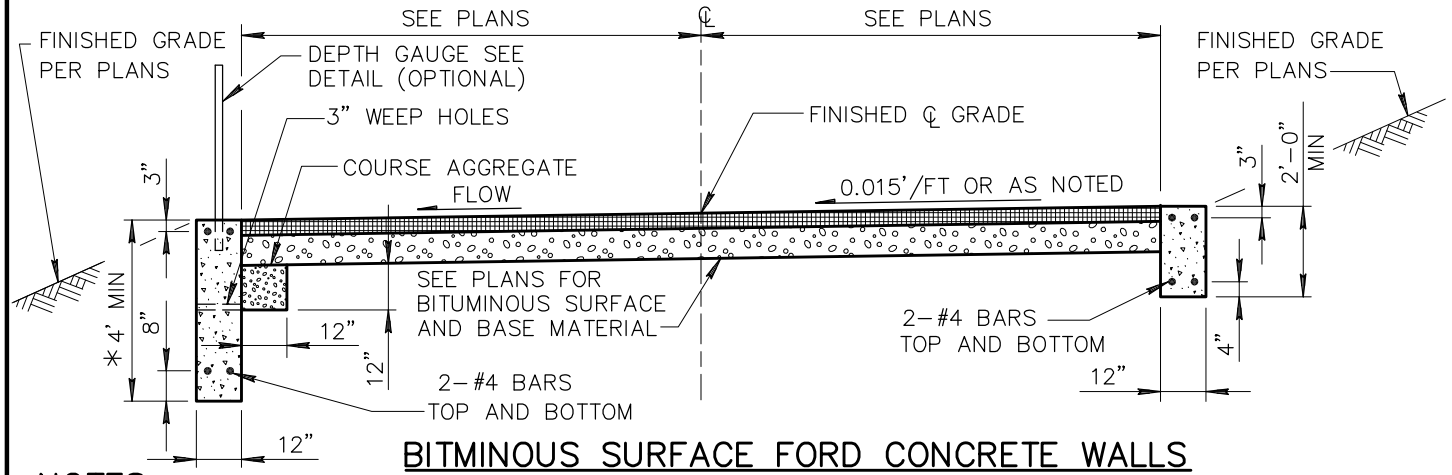



| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 550 | MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL ENGLISH | SPILLWAY INLET AND OUTLET | 01–01–1998 | 550 |

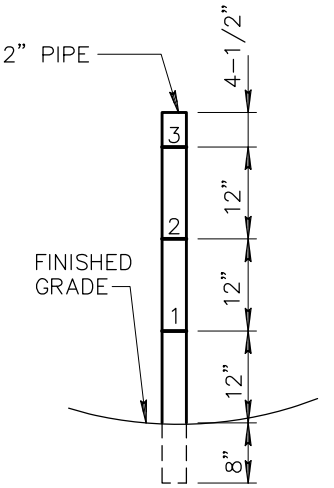



## CONCRETE SURFACE FORD CONCRETE WALLS

*MIN. DISTANCE BELOW STREAM BED




## BITMINOUS SURFACE FORD CONCRETE WALLS

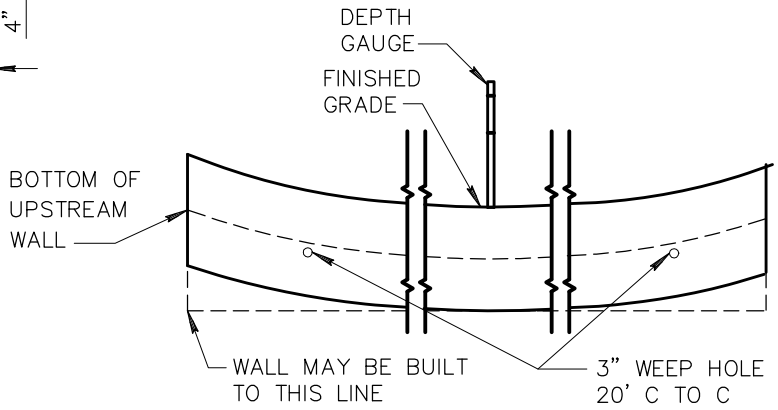



## DEPTH GUAGE DETAIL

(OPTION OF THE CONTRACTING AGENCY)

## NOTES:

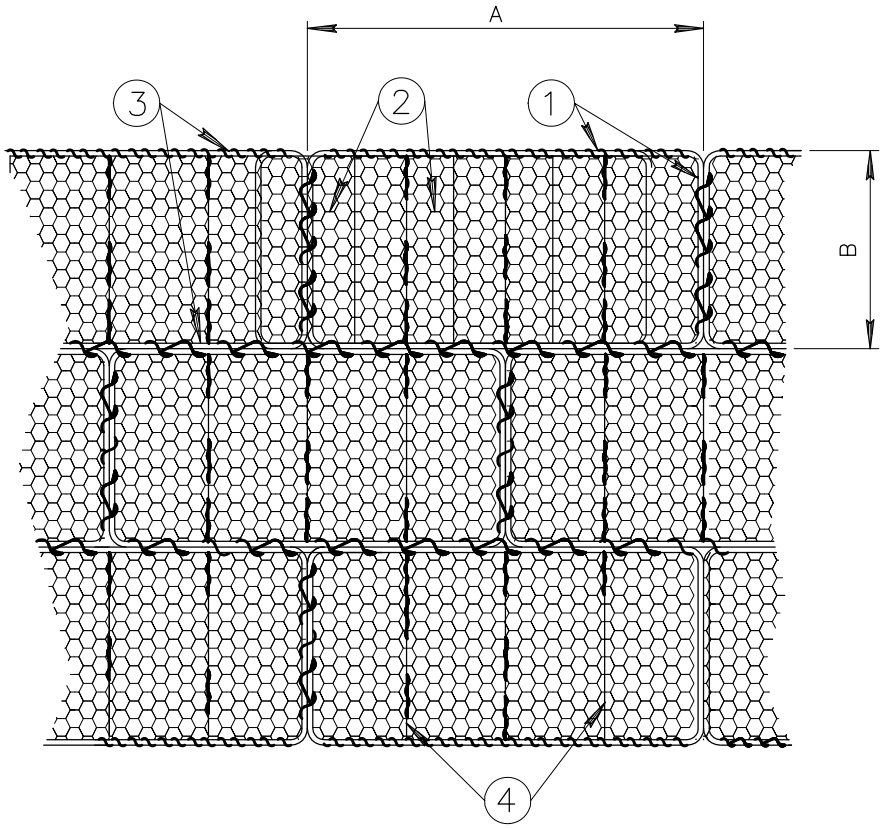
1. FORD WALLS SHALL BE CLASS 'A' CONCRETE PER SECT. 725.
2. DEPTH GAUGE SHALL BE PAINTED 2 COATS WHITE ENAMEL. NUMERALS AND MARKERS SHALL BE 1 COAT BLACK ENAMEL.
3. NUMBERS ON DEPTH GAUGE TO BE 2" HIGH.
4. HEIGHT OF DEPTH GAUGE PER PLANS.
5. REINFORCING BARS SHALL BE SET 3" CLEAR FROM SIDES OF CUT-OFF WALLS.
6. COURSE AGGREGATE AT WEEP HOLES SHALL BE ASTM C33 SIZE 57, ENCLOSED IN FILTER FABRIC (SECTION 796, CLASS B), AND EXTENDED LATERALLY A MINIMUM OF SIX-INCHES (6") ON EACH SIDE OF THE WEEP HOLE.



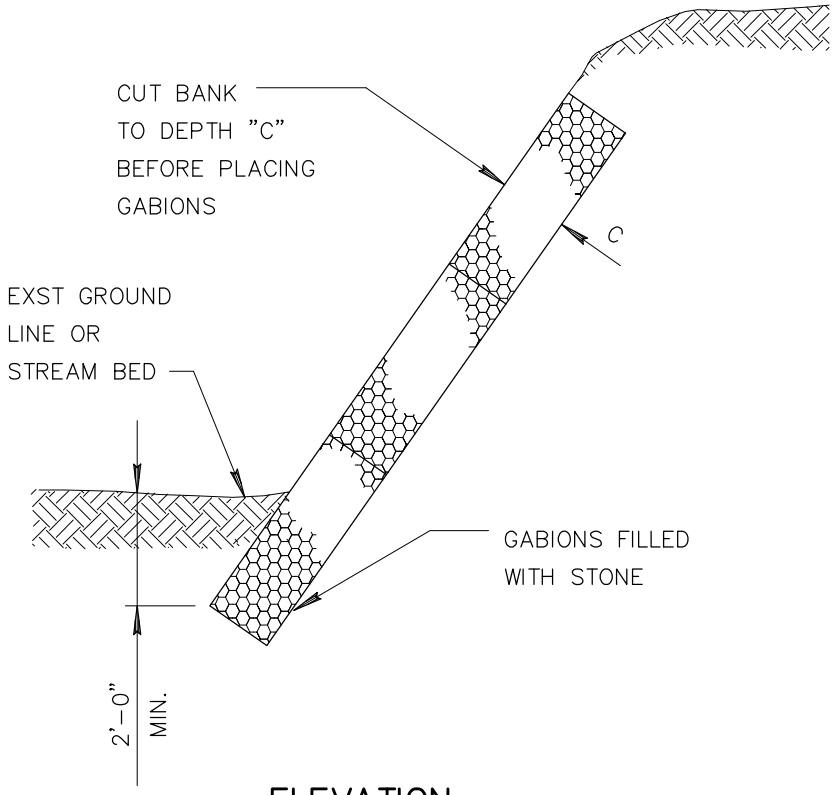

## ELEVATION LOOKING UPSTREAM

| DETAIL NO. | | STANDARD DETAIL | | REVISED | DETAIL NO. |
|---|---|---|---|---|---|
| 552 | MARICOPA ASSOCIATION of GOVERNMENTS | ENGLISH | FORD CROSSING AND CUT-OFF WALLS | 01-01-2015 | 552 |

# TYPICAL GABIONS




PLAN




ELEVATION

1. HEAVY GAUGE FRAME WIRE.
2. HEAVY GAUGE TRIPLE-TWIST HEXAGONAL MESH (OR EQUAL) FASTENED TO FRAME WIRE.
3. CONTINUOUS HEAVY GAUGE WRAPPED AROUND FRAMES TO FASTEN GABIONS TO EACH OTHER.
4. PARTITIONS TO PREVENT SHIFTING, NORMALLY ONE PER 3' LENGTH. INSTALLED AT FACTORY.

| NOMINAL SIZE COMBINATIONS | | |
|---|---|---|
| LENGTH | WIDTH | DEPTH |
| A | B | C |
| 6' | 3' | 1' 1.5' 3' |
| 9' | 3' | 1' 1.5' 3' |
| 12' | 3' | 1' 1.5' 3' |

## NOTE:

OTHER SIZES AVAILABLE FROM MANUFACTURER.

| DETAIL NO. | | | REVISED | DETAIL NO. |
|---|---|---|---|---|
| 555 | MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL ENGLISH | EROSION PROTECTION / GABIONS | 01-01-2010 | 555 |