U N I F O R M S T A N D A R D
D E T A I L S
f o r
P U B L I C W O R K S
C O N S T R U C T I O N

S P O N S O R E D a n d D I S T R I B U T E D
b y t h e

MARICOPA ASSOCIATION of GOVERNMENTS

Metric 1998
ARIZONA

(Includes Revisions Through 2003)

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545 END SECTION – REINFORCED CONCRETE PIPE
550 SPILLWAY INLET AND OUTLET
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555 EROSION PROTECTION/RIPRAP

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 METRIC 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 INCULDED.

6. SOME OF THE DETAILS PRINTED HEREIN MAY BE USED BY 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.

8. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

CONCRETE PVMT. SECTION

SUBGRADE SEAL SECTION

SELECT MATERIAL SECTION

AGGREGATE BASE SECTION

BITUMINOUS PVMT. SECTION

EXISTING PAVEMENT

OBLITERATE PAVEMENT

CONCRETE PAVEMENT

BITUMINOUS PAVEMENT

SECTION LINE

ROADWAY CENTER LINE

SURVEY MONUMENT

FIRE HYDRANT

WATER METER

WATER OR GAS VALVE

GAS METER

MANHOLE

SEWER CLEANOUT

RAILROAD

IRRIGATION LINE

600

IRRIGATION STANDPIPE

"L" HEADWALL

600

600

TELEPHONE OR TEL. LINE

POWER OR JOINT LINE

DOWN GUY & ANCHOR

STREET LIGHT

STREET SIGN

TRAFFIC SIGN

TRAFFIC SIGNAL LIGHT

TS

SIDEWALK

CURB & GUTTER

VALLEY GUTTER

SINGLE GUTTER

SINGLE CURB

MAIL BOX

EXISTING WATER LINE

150 W

EXISTING TELEHONE LINE

T

EXISTING SEWER LINE

200 S

EXISTING GAS LINE

200 G

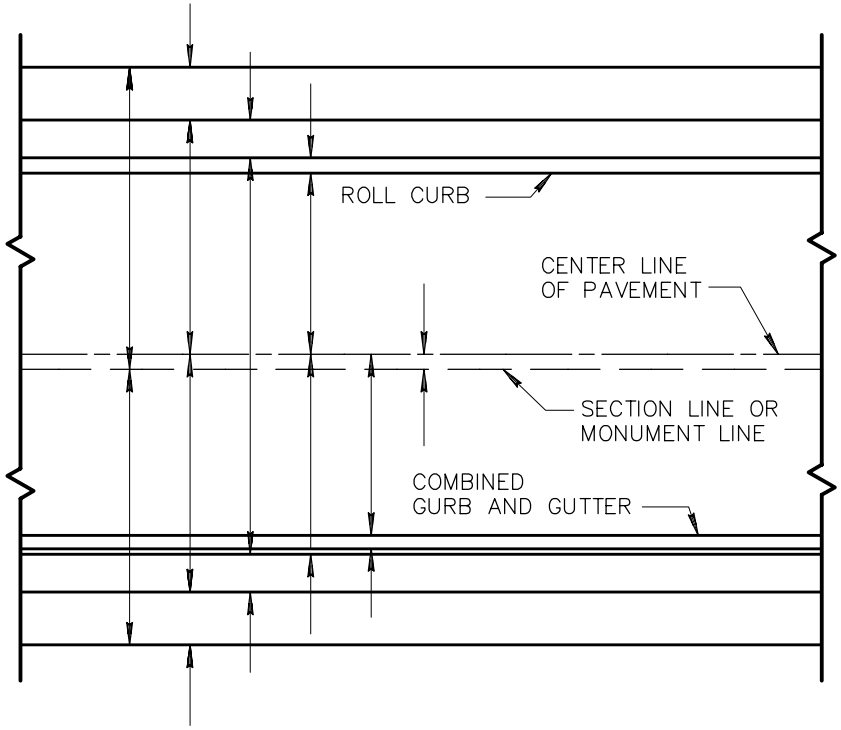
EXISTING STORM DRAIN LINE

300 SD

EXISTING IRRIGATION LINE

300 IRR

DETAIL NO.			REVISED	DETAIL NO.
110	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	**PLAN SYMBOLS**	3-02-2000	110



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.

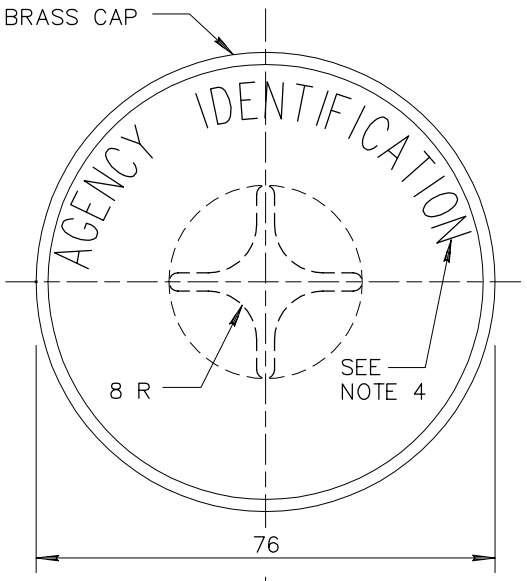
GIVE COMPLETE DIMENSIONS.

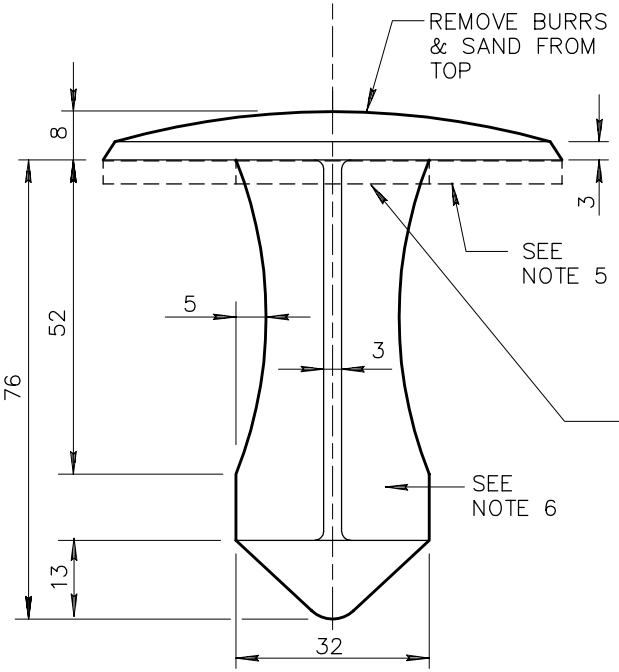
IF THE CENTERLINE OF PAVEMENT DOES NOT FALL ON THE SECTION LINE OR MONUMENT LINE OF THE STREET, DIMENSION AS ABOVE AND SHOW THE DIFFERENCE BETWEEN THE SECTION OR MONUMENT LINE AND THE CENTERLINE.

DETAIL NO.			REVISED	DETAIL NO.
112	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**DIMENSIONING FOR ROAD IMPROVEMENT PLANS**	3-03-2000	112

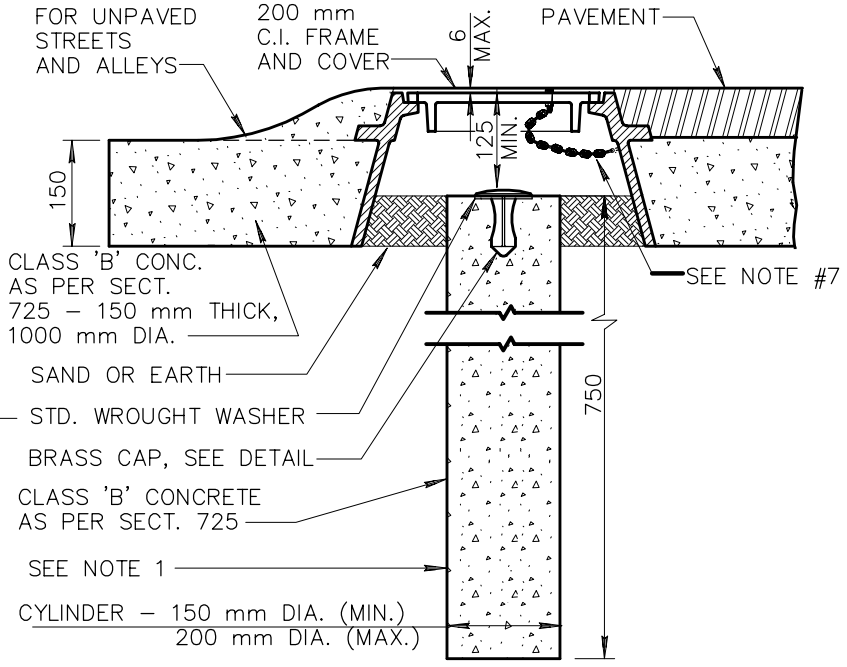
NOTES:

1. TYPE 'A' TO BE USED AT INTERSECTIONS OF MAJOR STREETS & COLLECTOR STREETS, AND AT OTHER SPECIAL PONTS IF REQUIRED BY ENGINEER, AS SHOWN ON PLANS.
2. TYPE 'B' TO BE USED AT INTERSECTION OF STREET ℄'S (EXCEPT WHERE TYPE 'A' IS SPECIFIED), CORNERS OR CHANGES IN ALIGNMENT OF SUBDIVISION BOUNDARIES (WHEN THEY FALL IN PAVEMENT), P.C.'S AND P.T.'S OF CURVES. WHEN P.I. FALLS IN PAVEMENT, THEN THE P.I. SHALL BE MONUMENTED.
3. TYPE 'C' TO BE USED AT CORNERS OF, & CHANGE IN ALIGNMENT OF SUBDIVISION BOUNDARIES WHERE CORNERS OR CHANGE POINTS FALL OUTSIDE OF PAVED AREAS OR IN ALLEYS.
4. LETTERS TO BE APPROX. 1 mm WIDE & 1 mm DEEP.
5. USE STANDARD WROUGHT IRON WASHER 76 mm x 4 mm THICK WITH 35 mm HOLE
6. CAP TO BE CONSTRUCTED OF RED BRASS OR BRONZE.
7. FRAME & COVER TO INCLUDE CHAIN PER DET. 270. (OPTIONAL PER AGENCY REQUIREMENTS.)

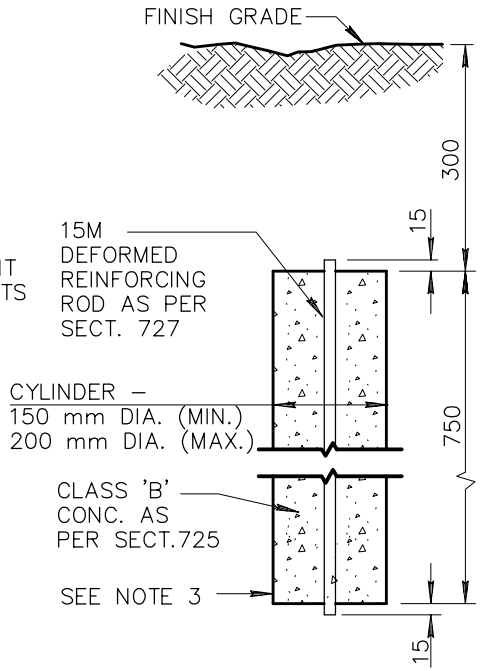




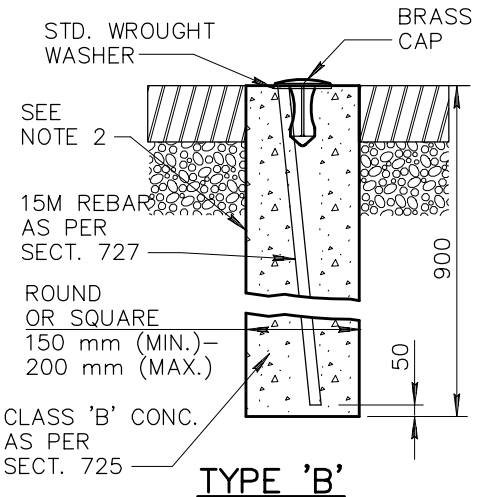
CAP DETAIL



TYPE 'A'
(WITH FRAME PER DETAIL 270)

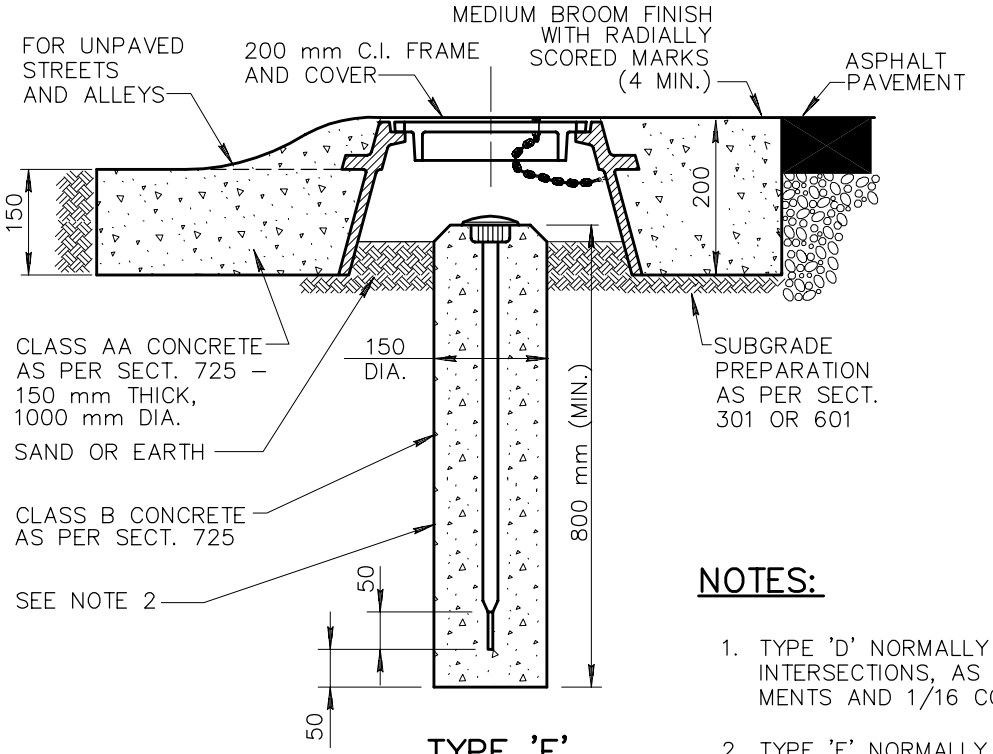


TYPE 'C'

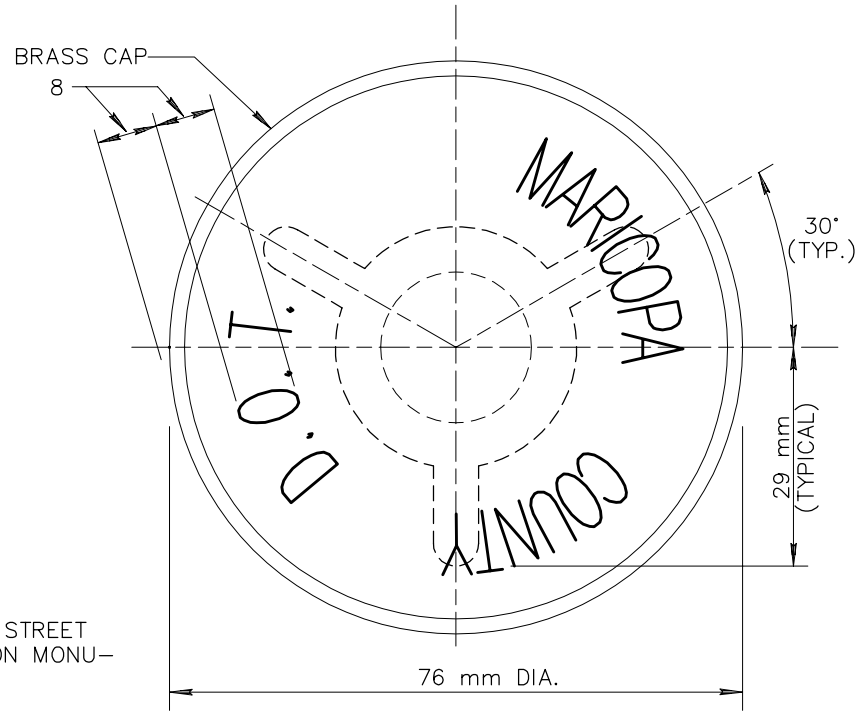


TYPE 'B'
(WITHOUT FRAME)

DETAIL NO.			REVISED	DETAIL NO.
120-1	MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL METRIC	SURVEY MARKER	3-03-2000	120-1

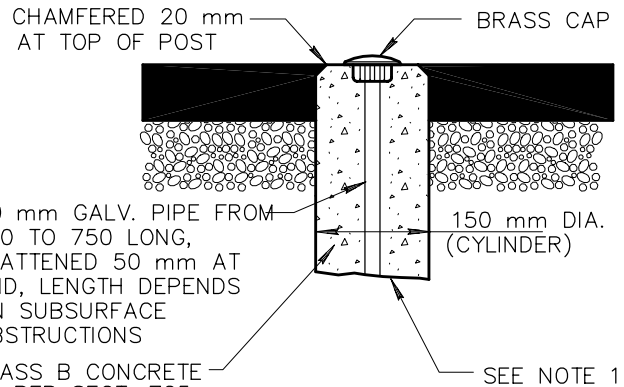


TYPE 'E'
(WITH FRAME)

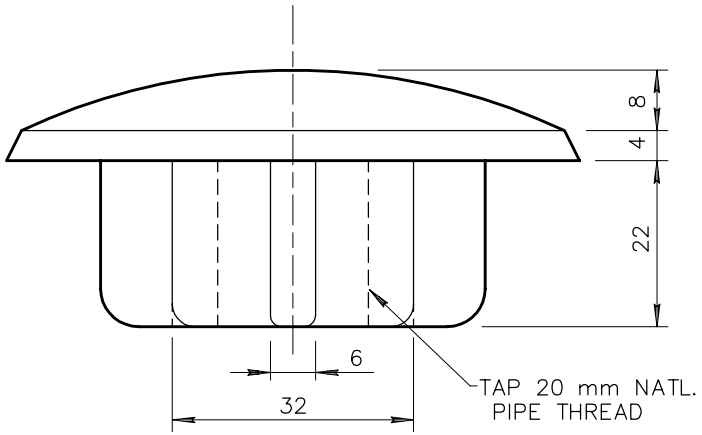


NOTES:

1. TYPE 'D' NORMALLY USED AT STREET INTERSECTIONS, AS SUBDIVISION MONUMENTS AND 1/16 CORNERS.
2. TYPE 'E' NORMALLY USED ON SECTION CORNERS, 1/4 CORNERS AND AT THE CENTER OF SECTIONS. CONCRETE POST IS CHAMFERED 20 mm AT TOP. MINIMUM LENGTH OF POST 800 mm LENGTH DEPENDS ON SUBSURFACE OBSTRUCTIONS SUCH AS OLD CONCRETE PAVING, ROCK, ETC. 20 mm GALVANIZED PIPE SET IN THIS POST SHALL BE A MINIMUM OF 750 mm LONG EXCLUSIVE OF COUPLING, SEE PLANS.
3. CAP TO BE CONSTRUCTED OF RED BRASS OR BRONZE.
4. FRAME AND COVER TO INCLUDE CHAIN PER STD. DETAIL 270.

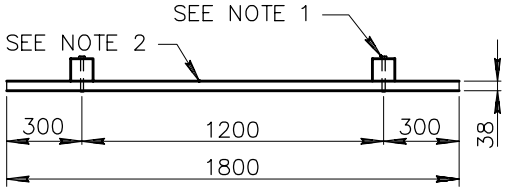


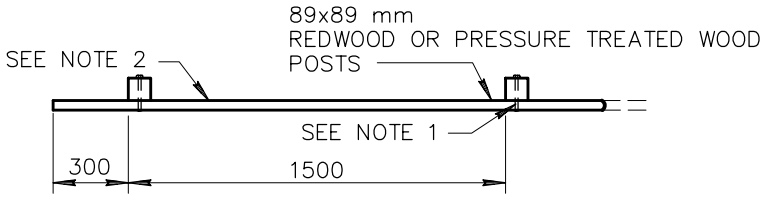
TYPE 'D'
(WITHOUT FRAME)

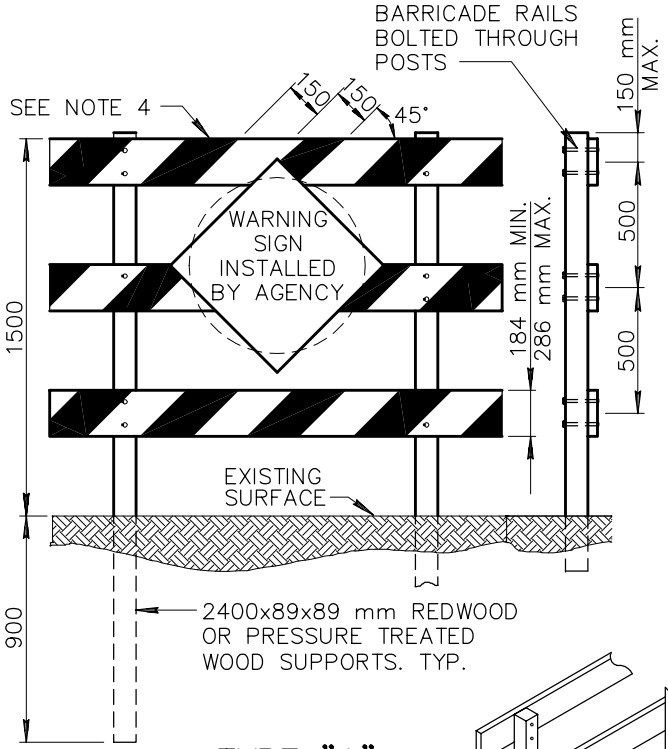


CAP DETAIL

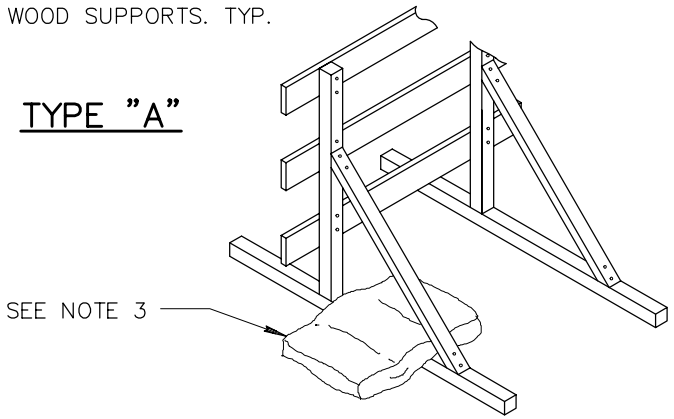
DETAIL NO.				REVISED	DETAIL NO.
120-2	MARICOPA ASSOCIATION of GOVERNMENTS	STANDARD DETAIL METRIC	SURVEY MARKER (FOR UNINCORPORATED AREAS OF COUNTY)	01-01-2003	120-2

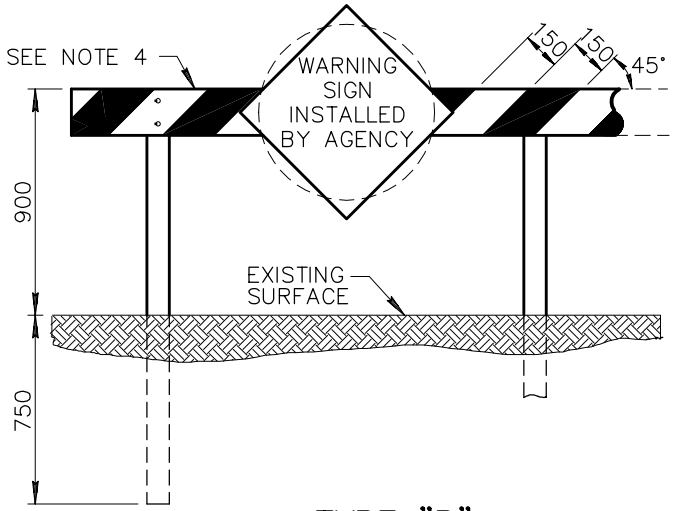






TYPE "A"



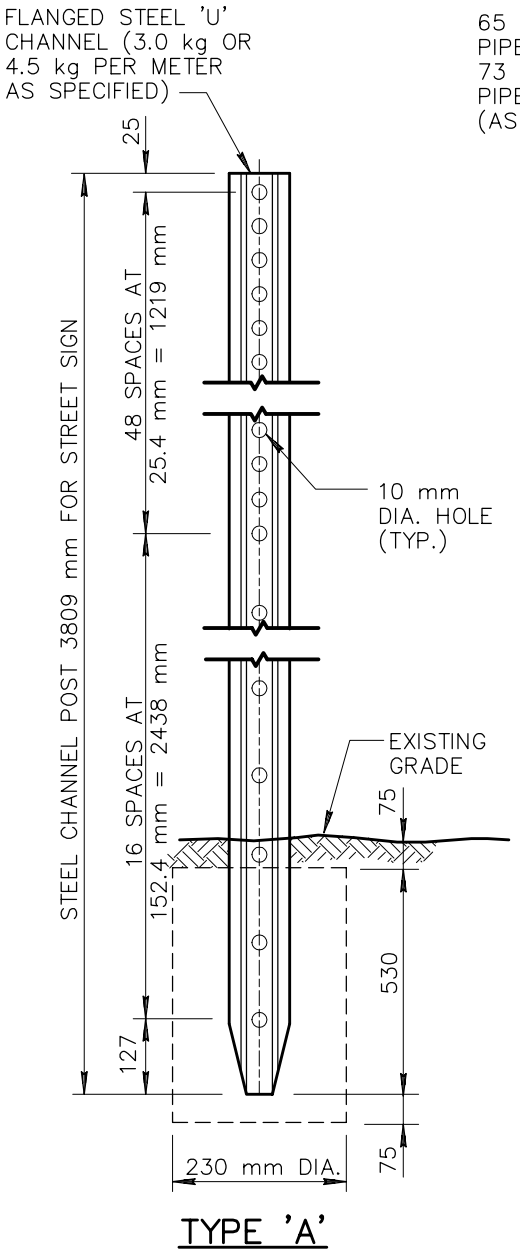


TYPE "B"

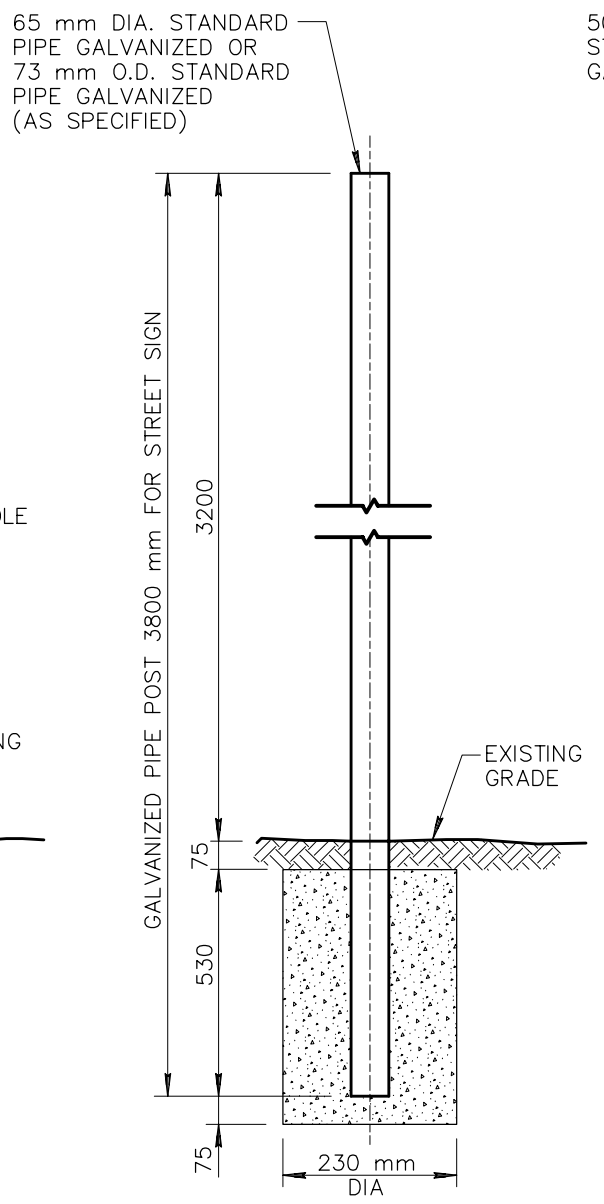
NOTES:

1. FASTEN WITH M12x125 mm LAG SCREWS WITH 2 FLAT WASHERS OR (2) M16 BOLTS, WITH 4 FLAT WASHERS.
2. 38x184 mm 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.

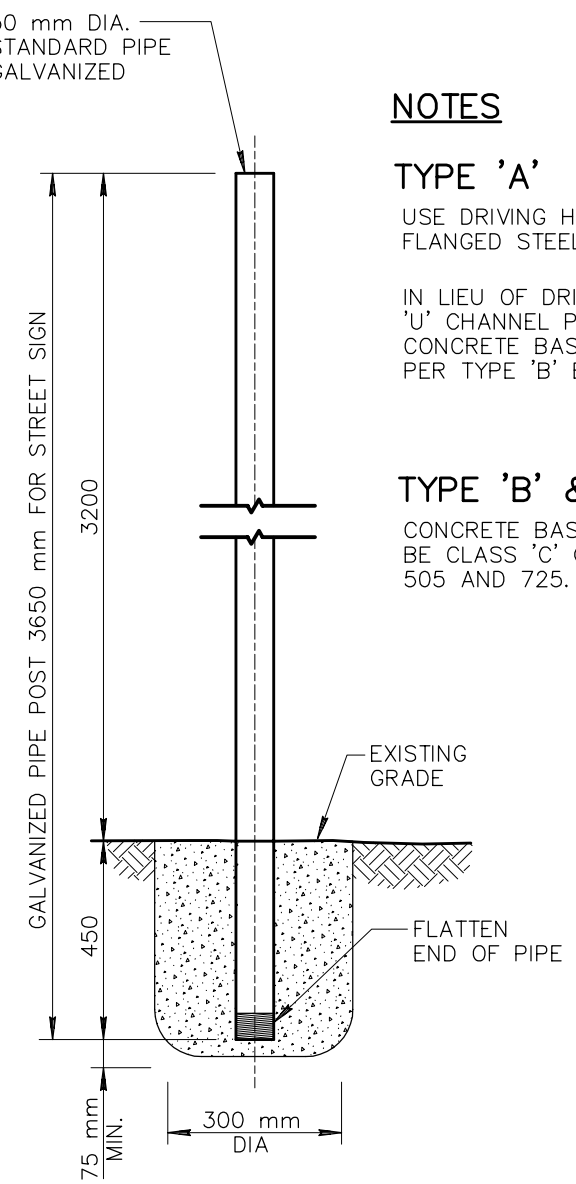
DETAIL NO.			REVISED	DETAIL NO.
130	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**BARRICADES**	01-01-2003	130



TYPE 'A'



TYPE 'B'



TYPE 'C'

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.

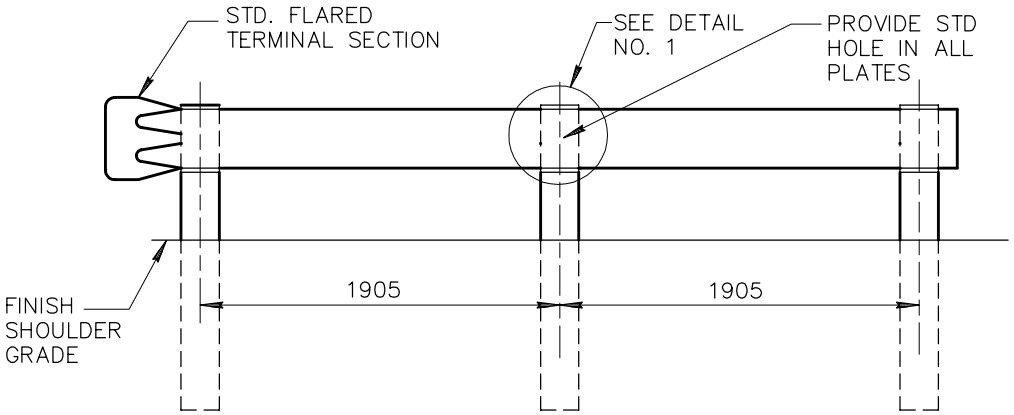
TYPE 'B' & TYPE 'C'

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

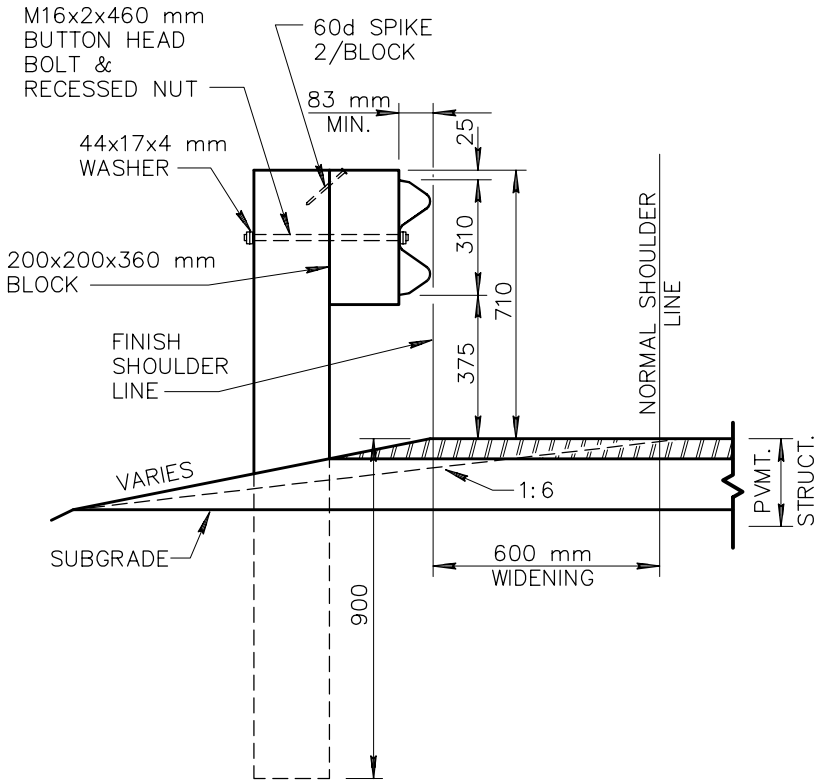
DETAIL NO.			REVISED	DETAIL NO.
131	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	STREET SIGN BASE	3-03-2000	131

NOTES

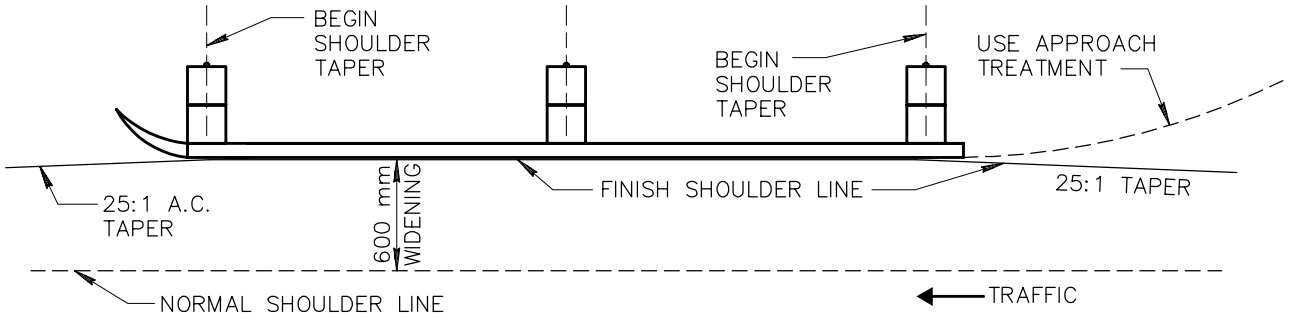
1. POSTS AND BLOCKS SHALL BE 200 mm x 200 mm ROUGH WOOD, PRESSURE TREATED AND UNPAINTED. HOLES SHALL BE BORED BEFORE TREATMENT. SEE SECT. 415
2. ALL GUARD RAIL PLATE, FITTINGS, HARDWARE, ETC. SHALL BE GALVANIZED.
3. TYPE 'A' GUARD RAIL INSTALLED ON NORMAL SHOULDER LINE.
4. TYPE 'B' GUARD RAIL INSTALLED ON WIDENED ROADWAY SHOULDER LINE.
5. TYPE 'B' INSTALLATION SHOWN. TYPE 'A' INSTALLATION SAME EXCEPT THAT INSIDE FACE OF GUARD RAIL SHALL FALL ON THE NORMAL SHOULDER LINE AS INDICATED BY PLAN DRAWING.



ELEVATION

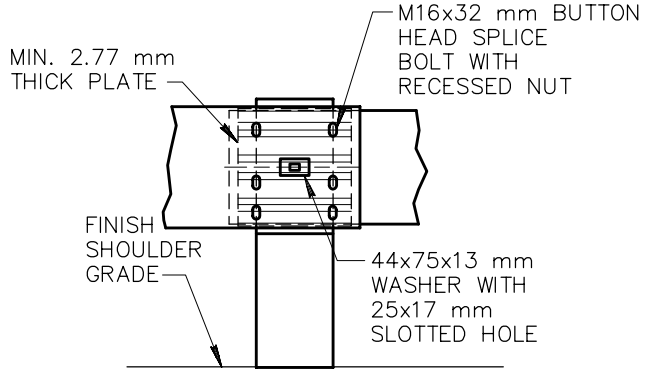


SIDE ELEVATION



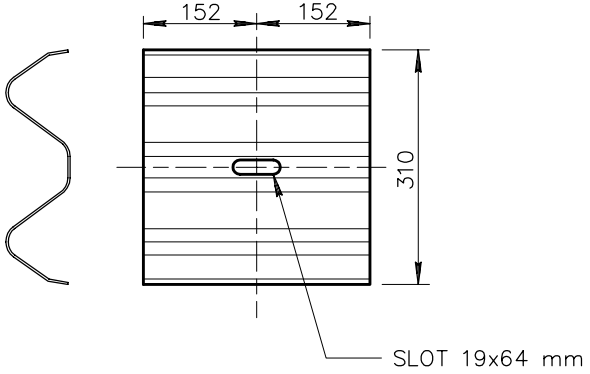
PLAN

NOTE: LAP PLATES WITH EXPOSED EDGES AWAY FROM APPROACHING TRAFFIC

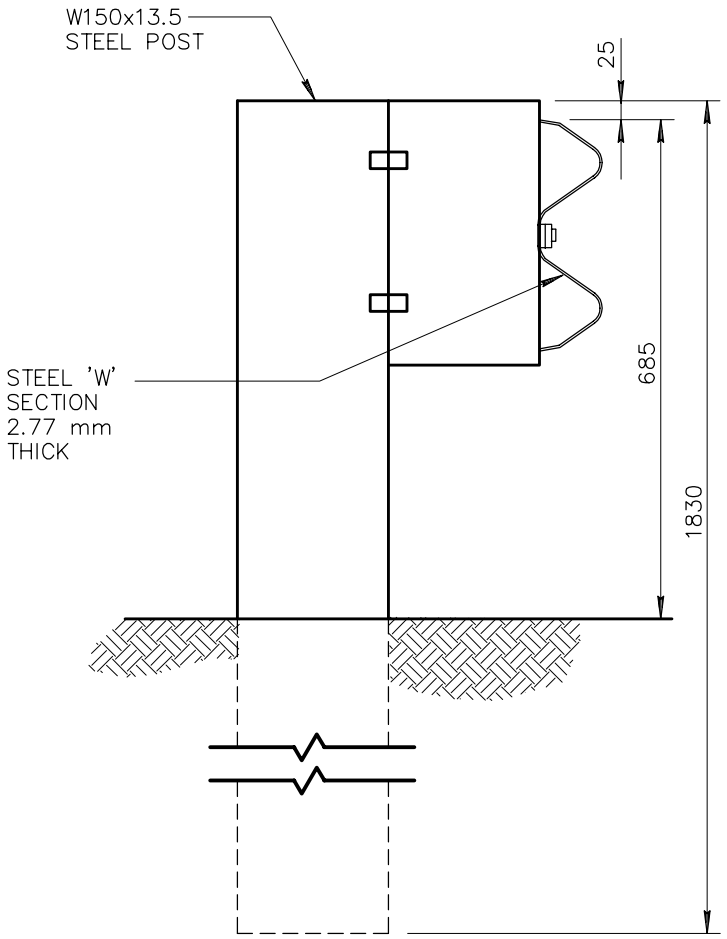


DETAIL NO. 1

DETAIL NO.			REVISED	DETAIL NO.
135-1	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	STEEL GUARD RAIL	3-03-2000	135-1

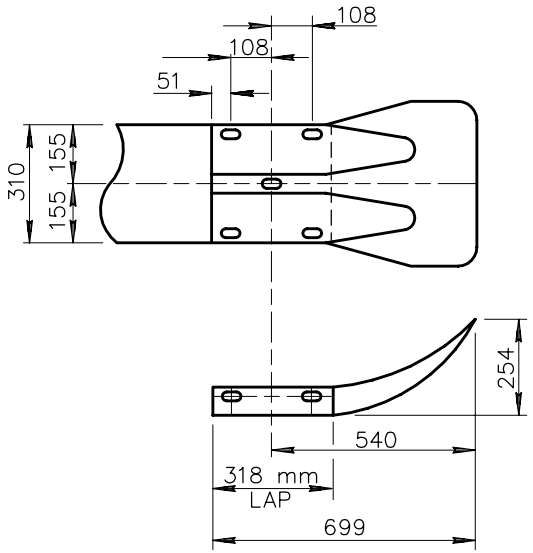


'W' SECTION BACK-UP PLATE
FOR STEEL POSTS



'W' BEAM (STEEL POST)

DETAIL NO.			REVISED	DETAIL NO.
135-2	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	STEEL GUARD RAIL	3-03-2000	135-2

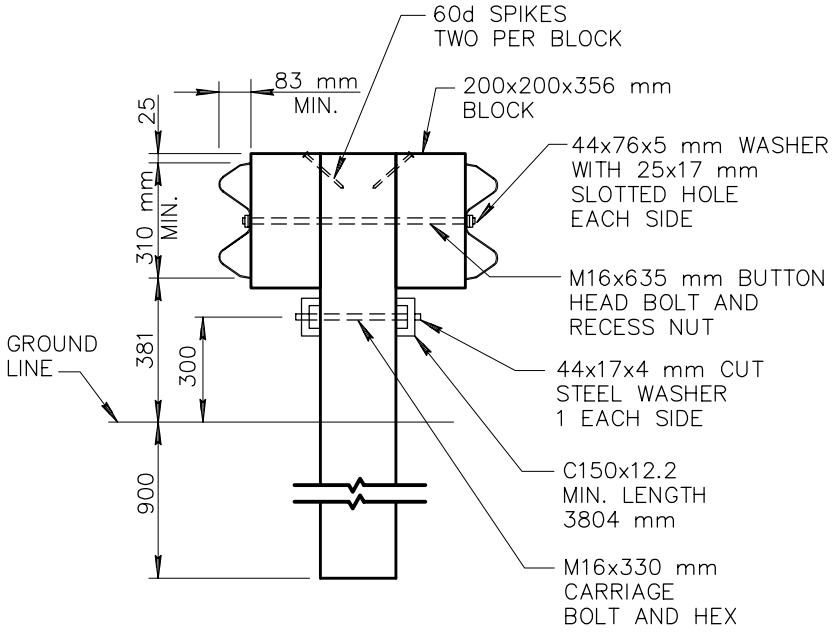


STANDARD FLARED
TERMINAL SECTION

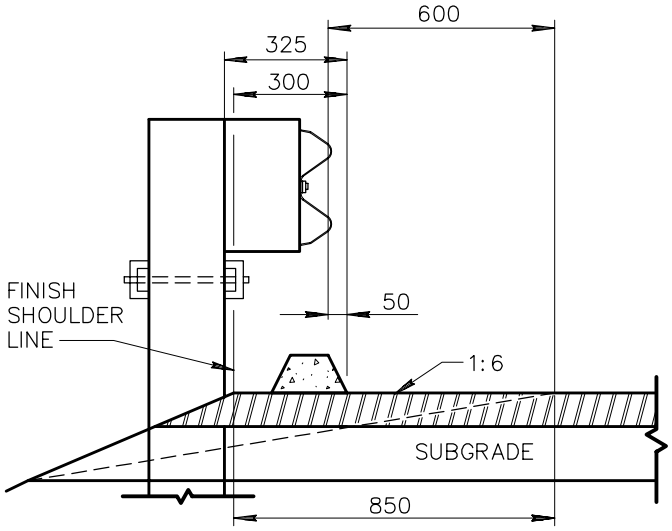
NOTES:

1. TOP AND RUB RAIL SHALL NOT PROJECT MORE THAN 25 mm. IF ADJUSTMENT SHORTENING IS REQUIRED, THREADS SHALL BE LEFT IN FUNCTIONAL CONDITION.

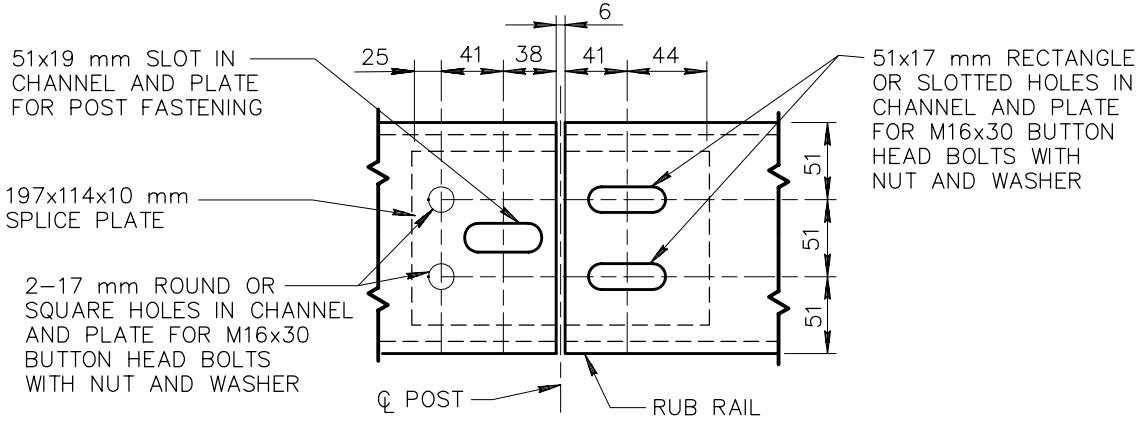
2. HORIZONTAL DISTANCE BETWEEN TOP RAIL AND MEDIAN CURB SHALL NOT EXCEED 300 mm.



DETAIL NO. 2 – MEDIAN BARRIER

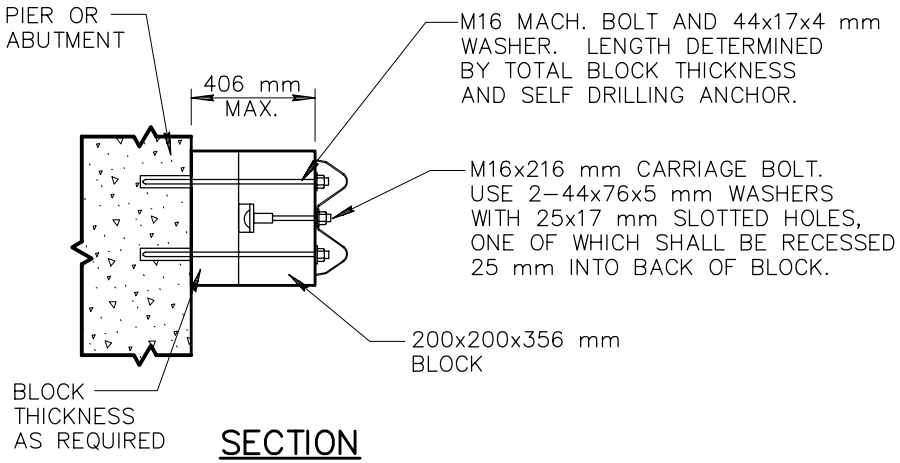


INSTALLATION OF GUARD RAIL
IN EMBANKMENT CURB SECTION



DETAIL NO. 3 – RUB RAIL SPLICE
(SPLICE AT POSTS ONLY)

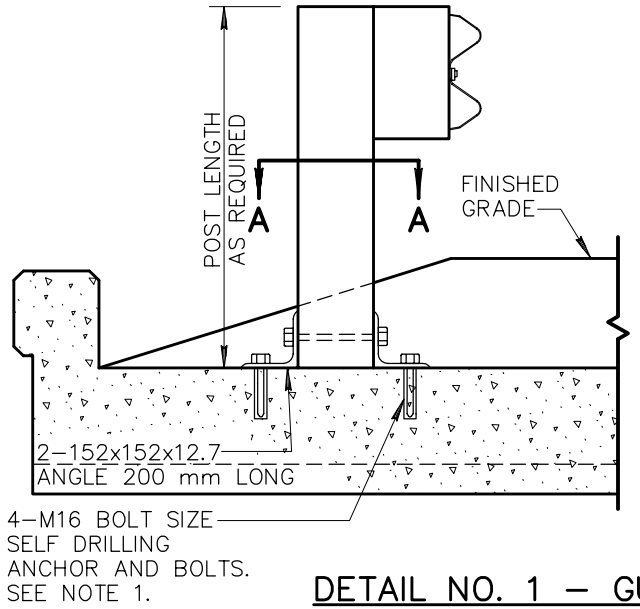
DETAIL NO.			REVISED	DETAIL NO.
135-3	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	STEEL GUARD RAIL	3-03-2000	135-3



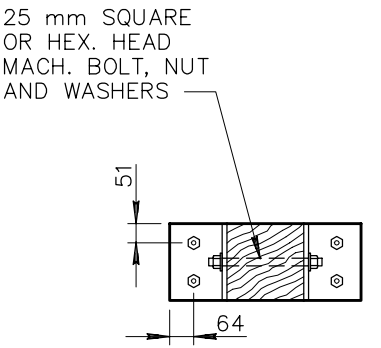
NOTE

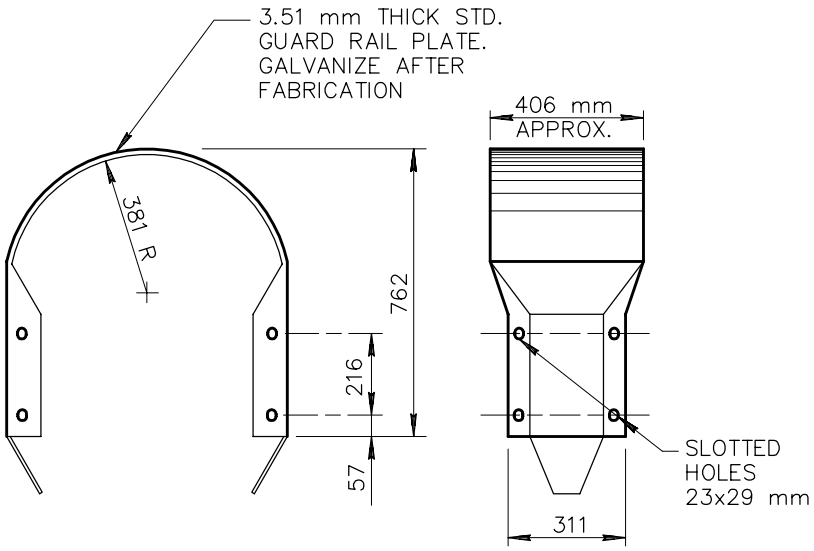
1. 16 mm BOLT SIZE SELF DRILLING ANCHOR SHALL HAVE A MINIMUM 6.7 kN PULL OUT STRENGTH IN 20 MPa CONCRETE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

DETAIL NO. 4
ATTACHMENT OF GUARD RAIL TO STRUCTURES



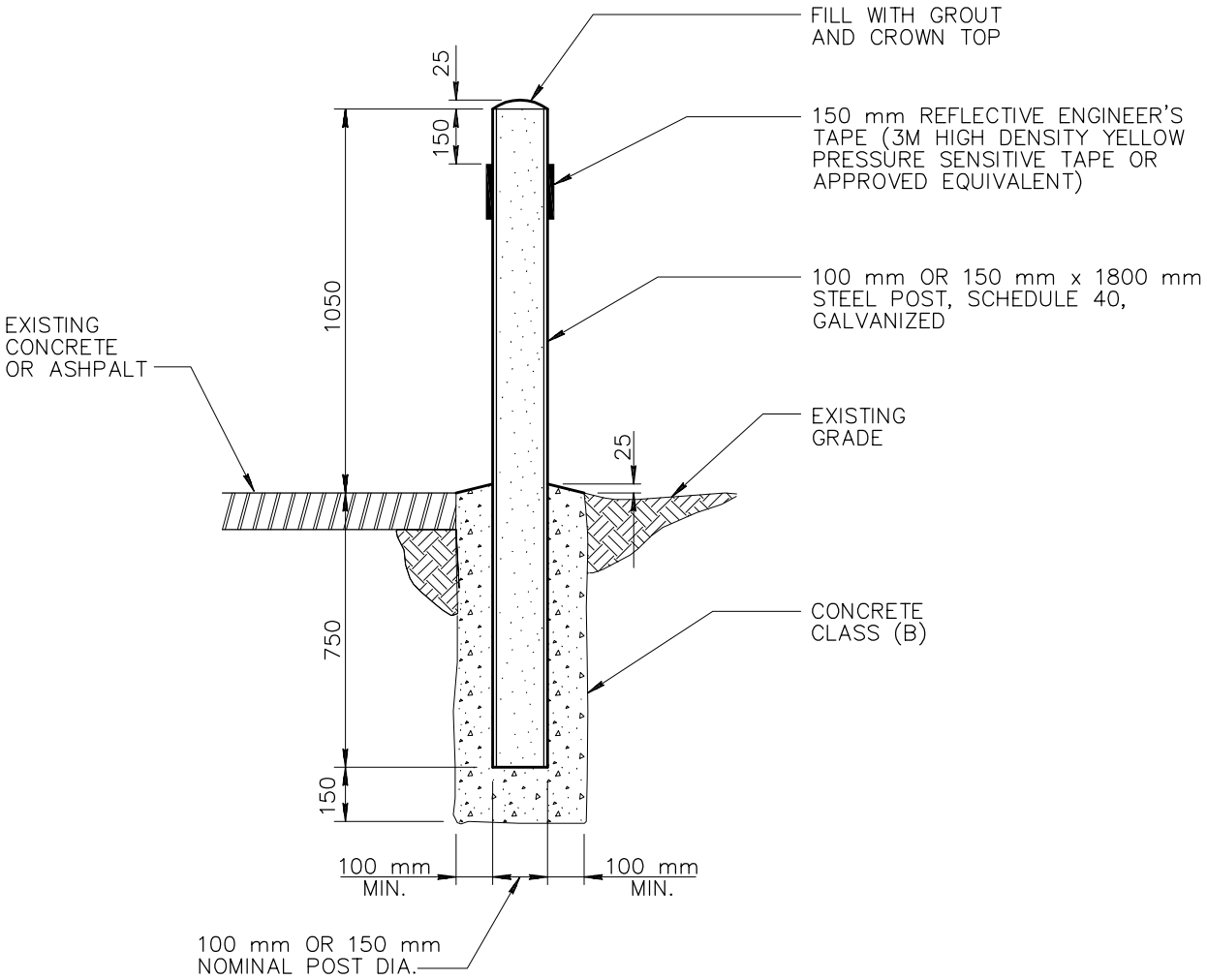
DETAIL NO. 1 – GUARD RAIL POST INSTALLATION ON STRUCTURES





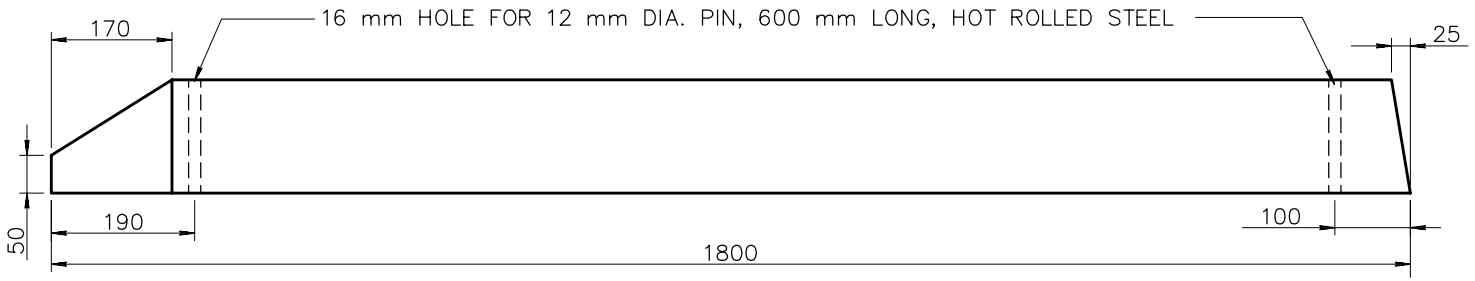
DETAIL NO. 5
BUFFER END SECTION

DETAIL NO.			REVISED	DETAIL NO.
135-4	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	STEEL GUARD RAIL	3-03-2000	135-4

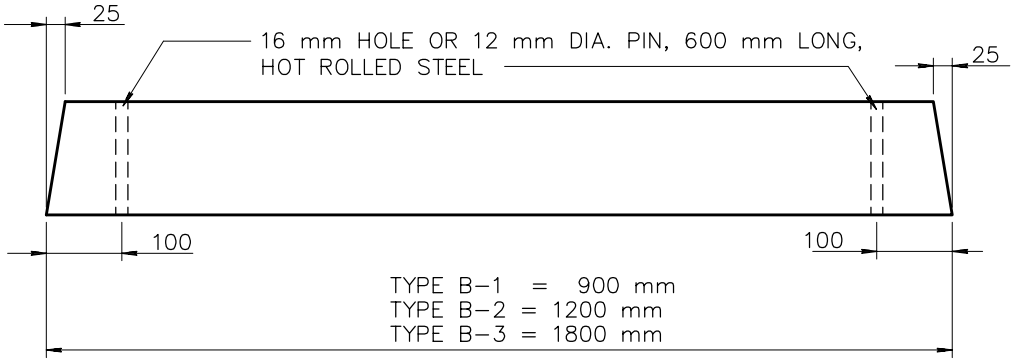


SAFETY POST SECTION

DETAIL NO.			REVISED	DETAIL NO.
140	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**SAFETY POST**	3-03-2000	140



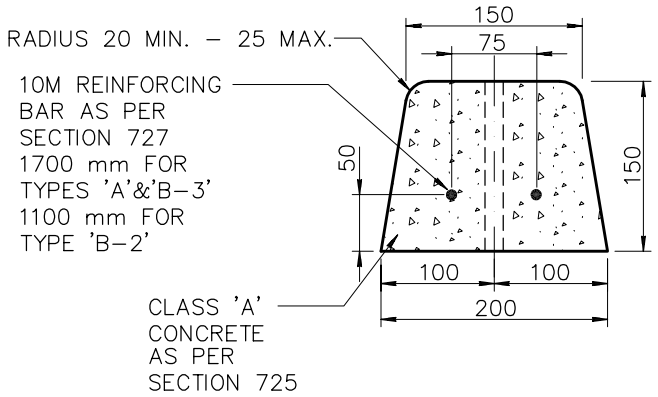
TYPE A



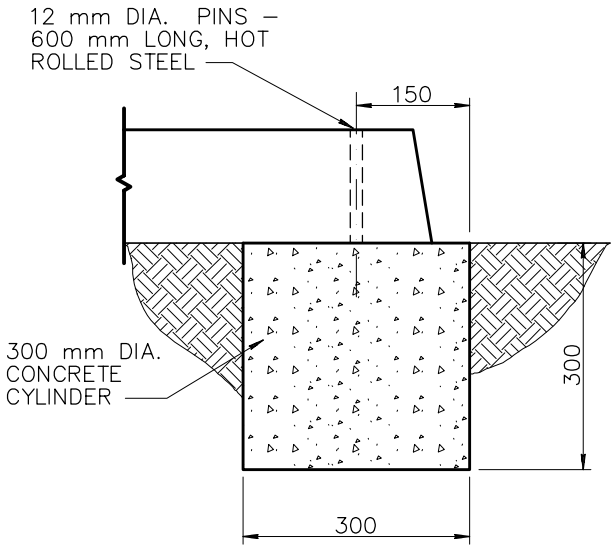
TYPE B–1, B–2, AND B–3

NOTE:

1. DIMENSIONAL AND REINFORCEMENT CHANGES WILL BE PERMITTED UPON PRIOR WRITTEN APPROVAL OF THE ENGINEER.



TYPICAL SECTION



SAFETY CURB INSTALLATION ON DIRT

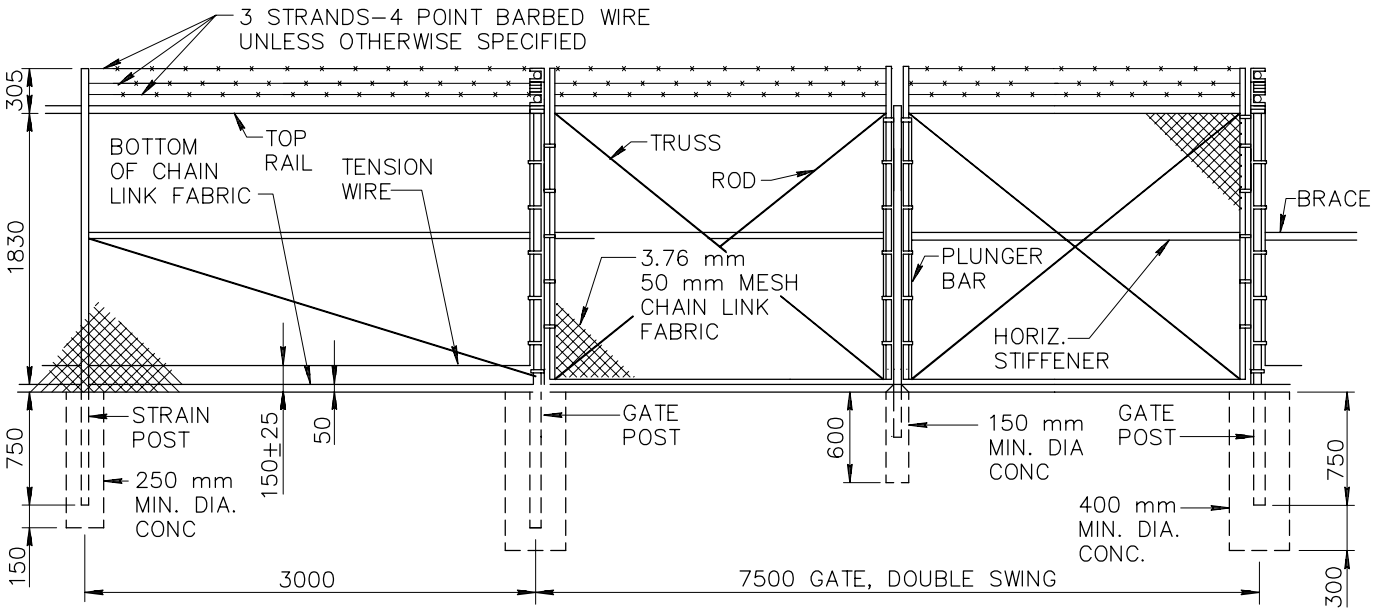
DETAIL NO.			REVISED	DETAIL NO.
150	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**PRECAST SAFETY CURB**	3-03-2000	150

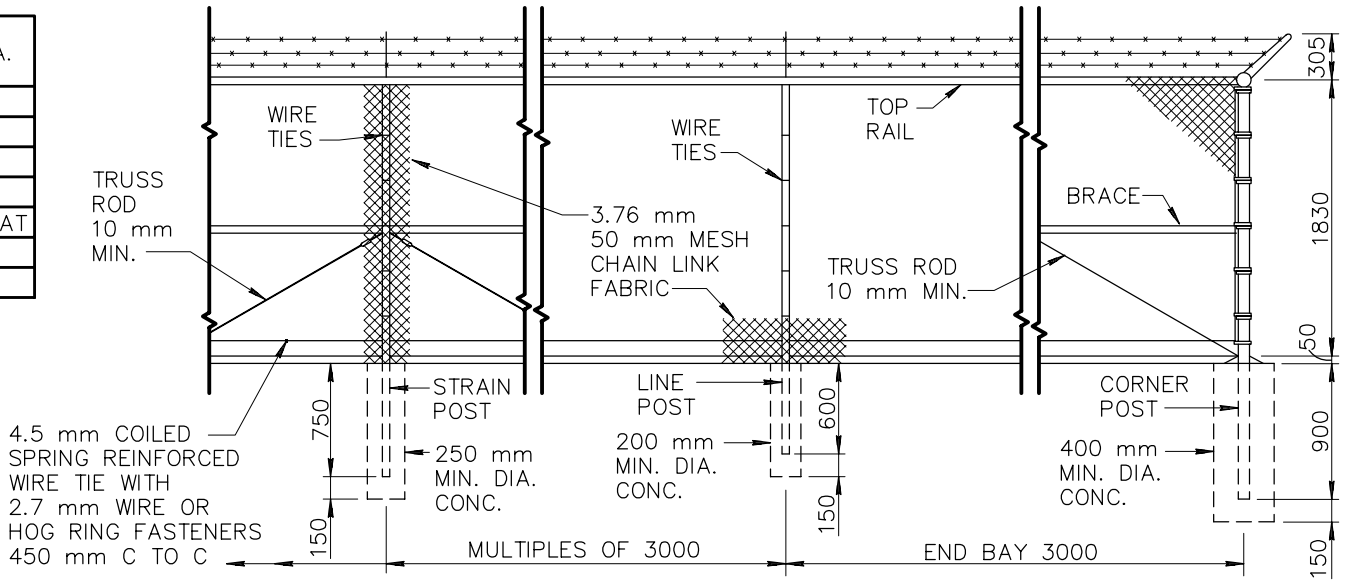
NOTES

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 150 m 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	65	73.03
LINE POST	40	48.26
STRAIN POST	40	48.26
BRACE	32	42.16
STRETCH BAR	4.76 x 19 FLAT	4.76 x 19 FLAT
GATE POST	90	101.60
TOP RAIL	32	42.16

7. CONSTRUCTION AND MATERIALS SHALL CONFORM TO SECT. 420 AND 722, RESPECTIVELY. SEE USS TABLE 722 FOR WEIGHTS OF MEMBERS.

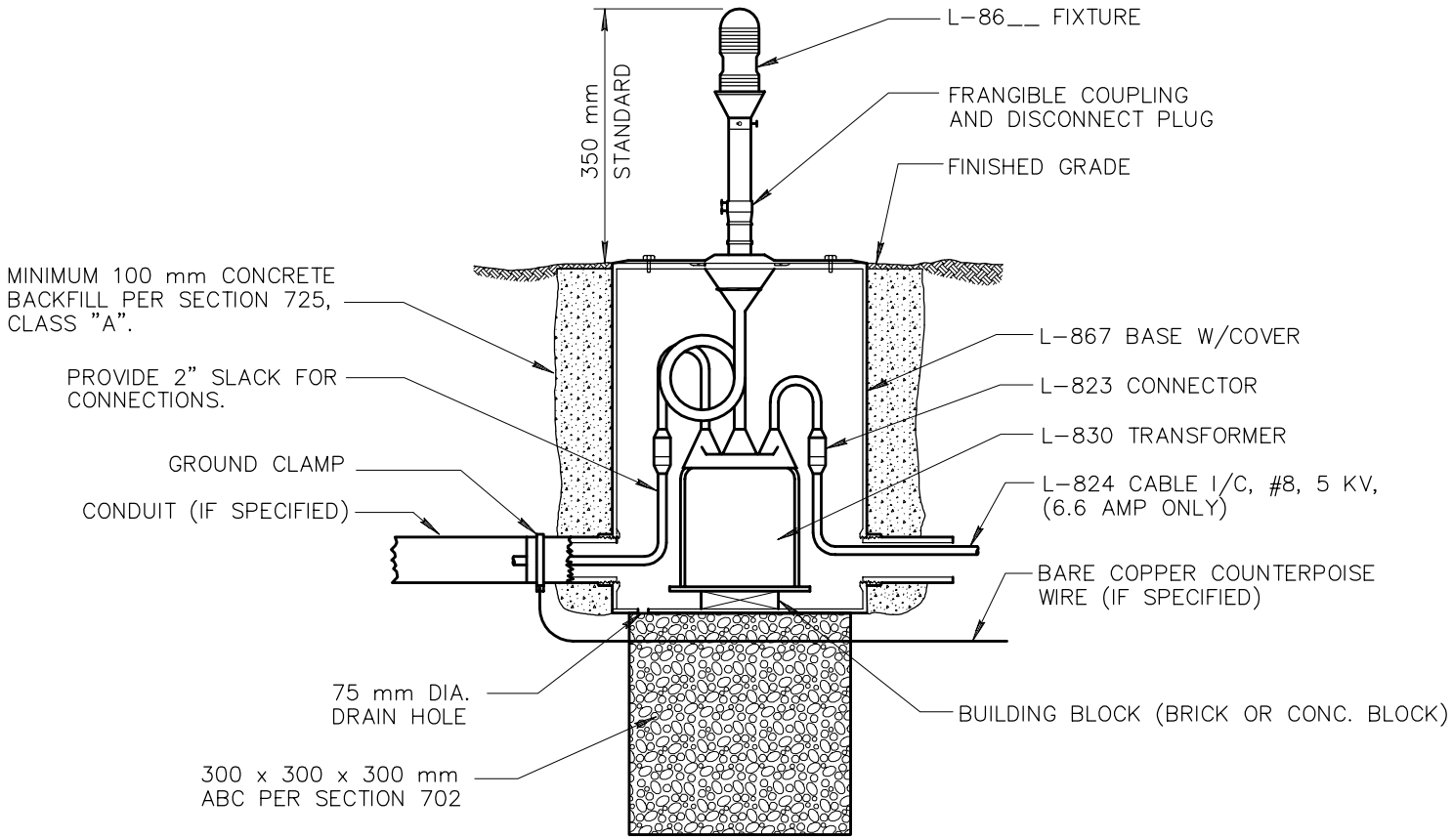




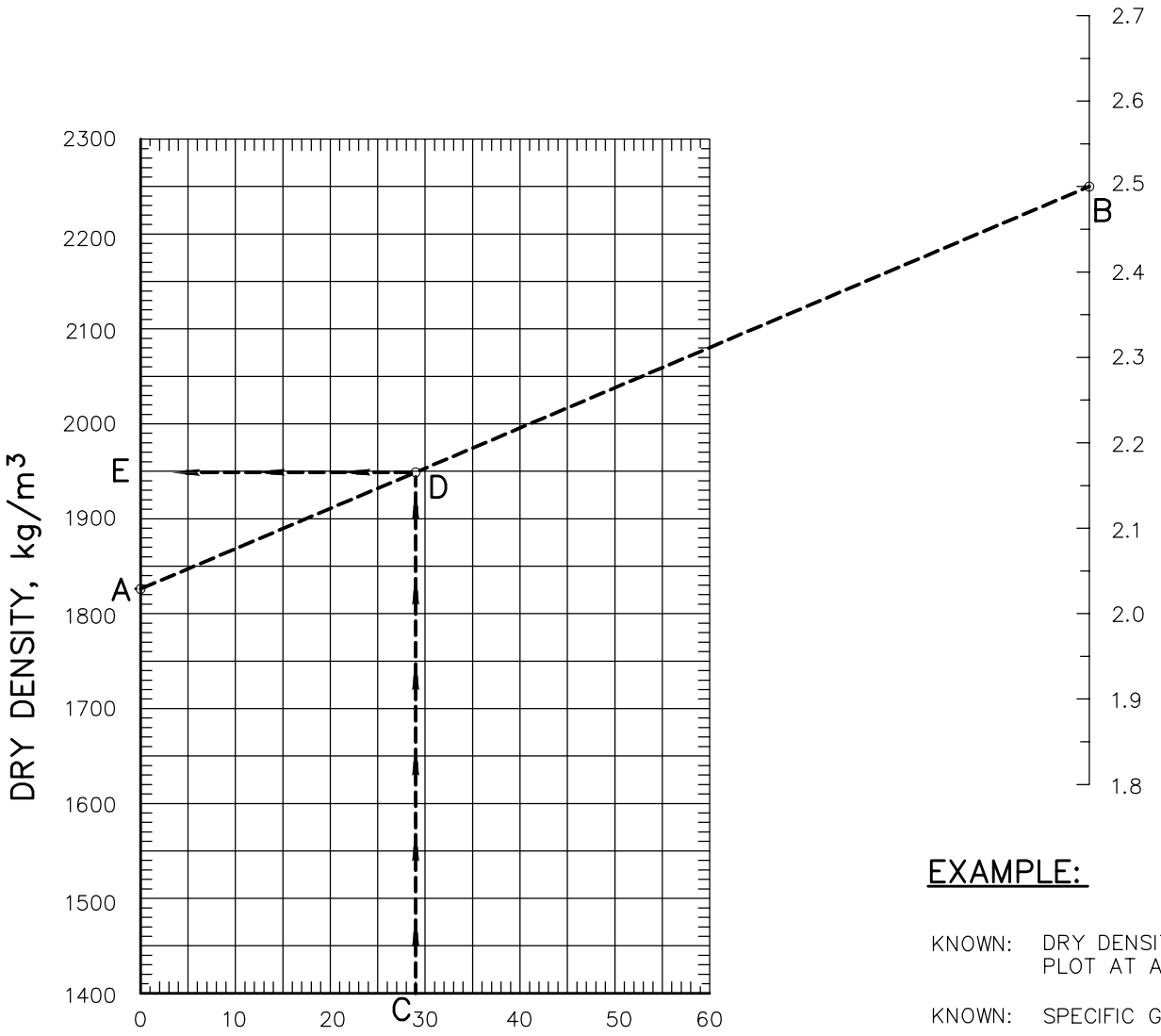
DETAIL NO.			REVISED	DETAIL NO.
160	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	1830 mm CHAIN LINK FENCE AND GATE	01–01–2003	160

NOTE:

L–xxx NUMBERS DESIGNATES FAA SPECIFICATION NO.



DETAIL NO.			REVISED	DETAIL NO.
170	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	TYPICAL RUNWAY OR TAXIWAY EDGE LIGHTING DETAIL	3-03-2000	170



$$D = \frac{(100 - R)d + 0.9\ RS \times 1000}{100}$$

WHERE:

D= DRY DENSITY OF SAMPLE CONTAINING R PERCENT ROCK, kg/m³.

R= PERCENT ROCK RETAINED ON 4.75 mm SIEVE.

d= DRY DENSITY OF PORTION PASSING 4.75 mm SIEVE, kg/m³.

S= BULK SP. GR. OF ROCK.

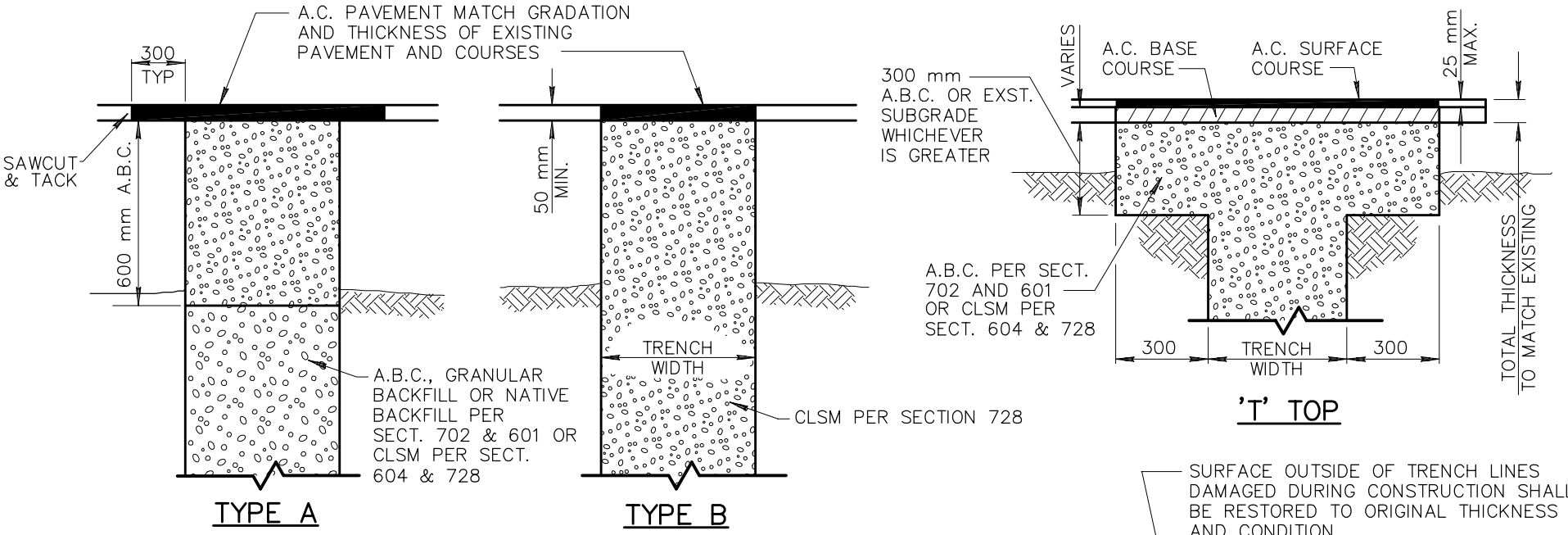
EXAMPLE:

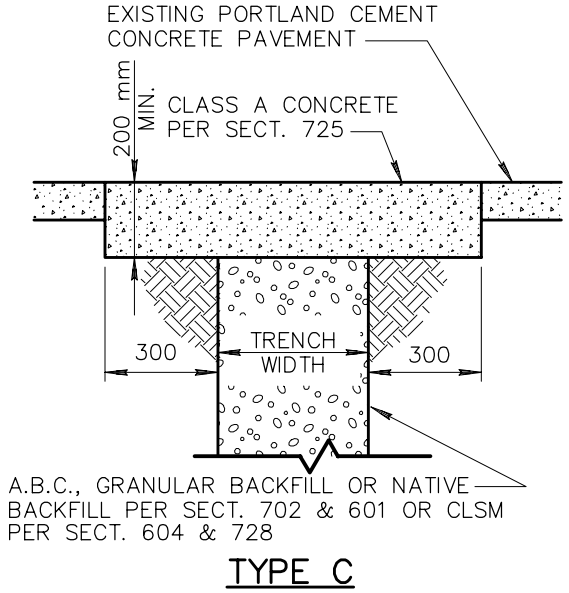
KNOWN: DRY DENSITY OF MATERIAL PASSING 4.75 mm SIEVE = 1826 kg/m³. PLOT AT A.

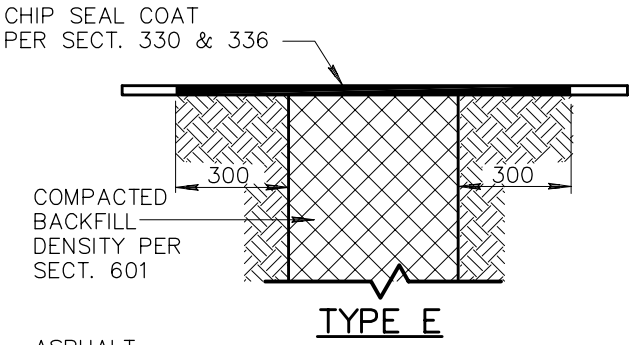
KNOWN: SPECIFIC GRAVITY OF ROCK = 2.5, PLOT AT B. DRAW LINE AB.

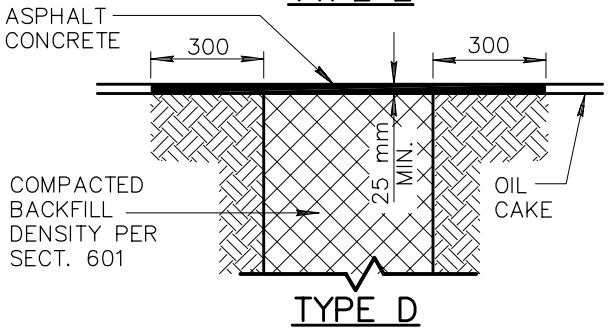
KNOWN: PERCENT OF ROCK IN TOTAL SAMPLE = 29. PLOT AT C. DRAW LINE CD AND LOCATE D AT INTERSECTION WITH AB. DRAW LINE DE LOCATING POINT E AT 1949. 1949 = DRY DENSITY IN kg/m³ OF TOTAL SAMPLE CONTAINING 29% ROCK.

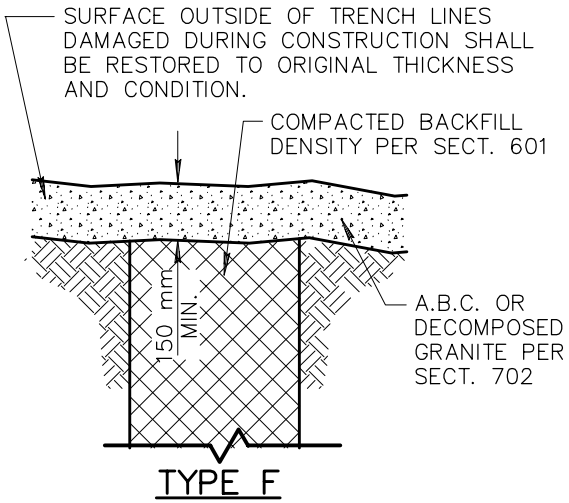
DETAIL NO.			REVISED	DETAIL NO.
190	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	ROCK CORRECTION PROCEDURE FOR MAXIMUM DENSITY DETEMINATION	3-03-2000	190







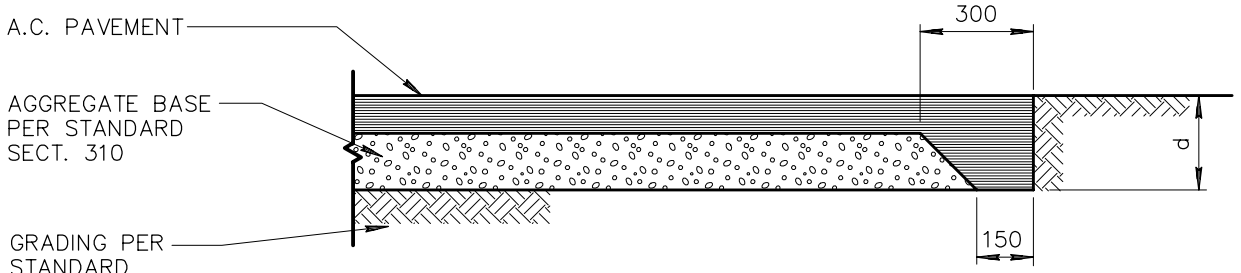




NOTES:

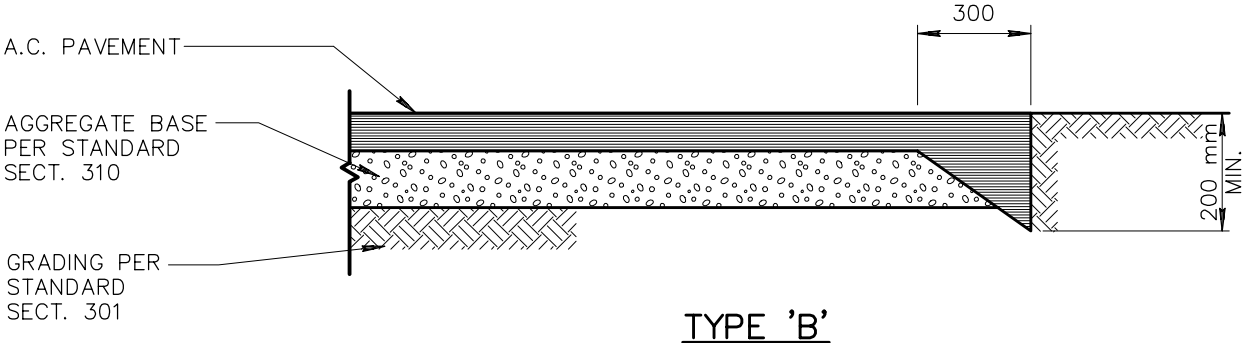
1. BEDDING PER SECTION 601.
2. ASPHALT CONCRETE SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 321.
3. TRENCHES IN ASPHALT PAVEMENTS LESS THAN 450 mm WIDE SHALL BE BACKFILLED WITH CLSM OR ABC SLURRY (NO CEMENT) AS SPECIFIED BY THE SPECIAL PROVISIONS, PLANS OR ENGINEER
4. TYPES 'D' AND 'E' REQUIRE 230 mm OF A.B.C. AT TOP OF TRENCH WHEN THERE IS AN EXISTING BASE.
5. THE TYPE OF CLSM SHALL BE 1/2 SACK OR 1 SACK AS SPECIFIED BY THE SPECIAL PROVISIONS, PLANS, OR ENGINEER

DETAIL NO.		STANDARD DETAIL	BACKFILL, PAVEMENT AND SURFACE REPLACEMENT	REVISED	DETAIL NO.
200	MARICOPA ASSOCIATION of GOVERNMENTS	METRIC		01-03-2002	200

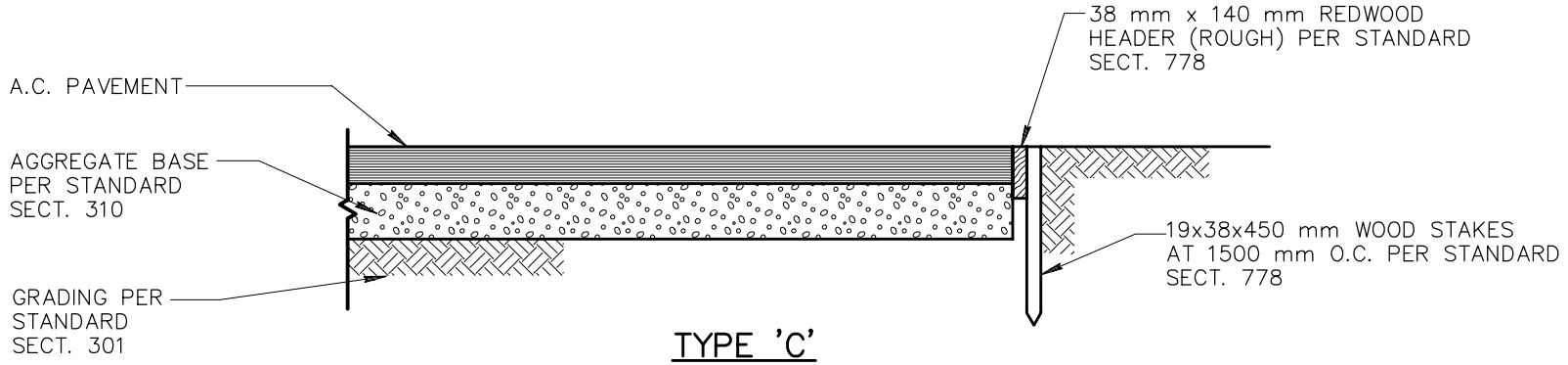


d = DESIGN THICKNESS OF A.C. PAVEMENT PLUS AGGREGATE BASE.

TYPE 'A'

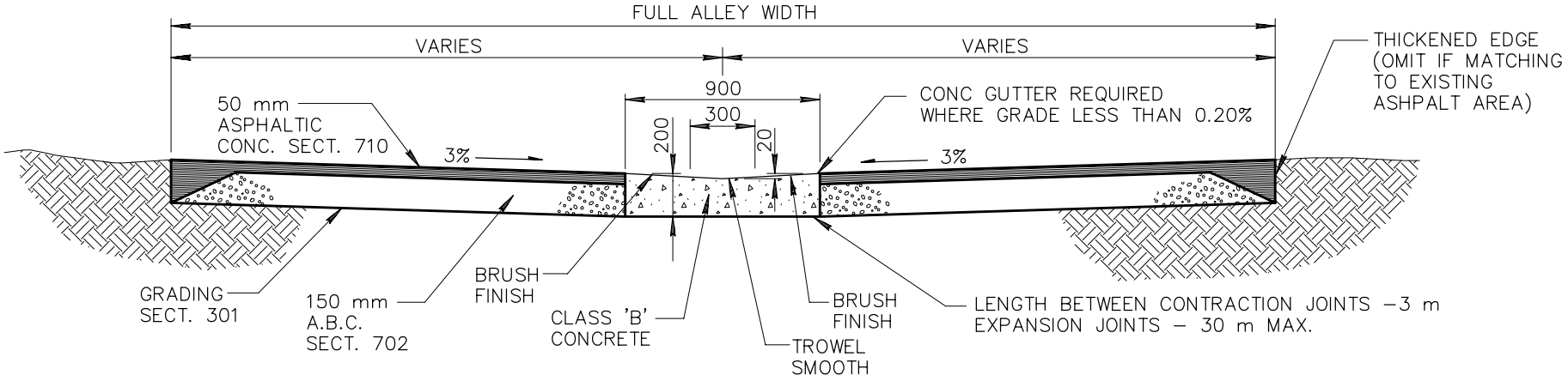


TYPE 'B'

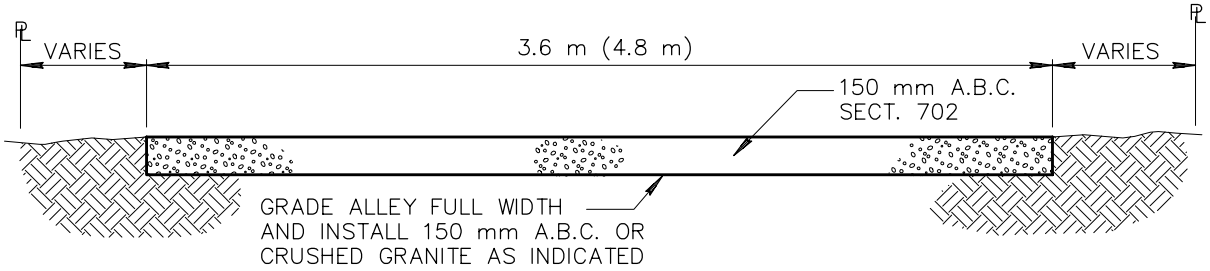


TYPE 'C'

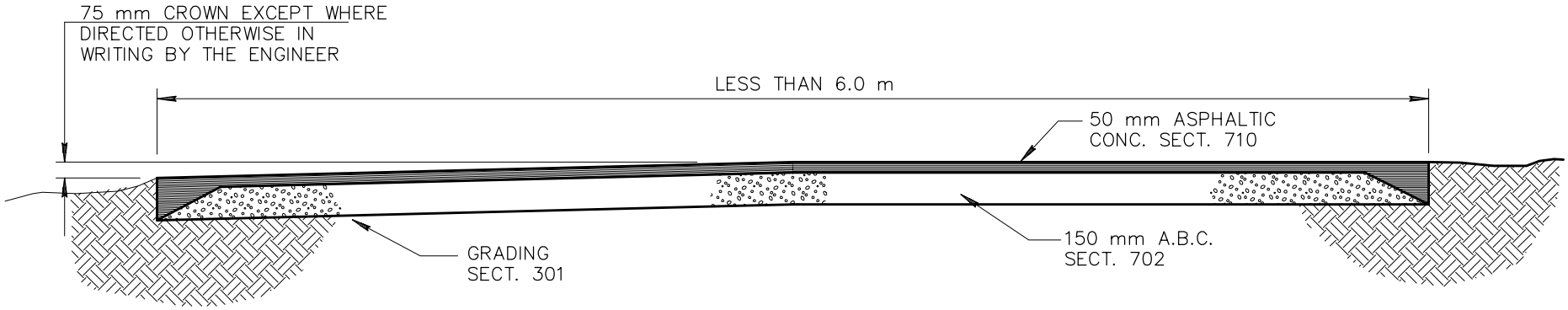
DETAIL NO.			REVISED	DETAIL NO.
201	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**PAVEMENT SECTION AT TERMINATION**	3-03-2000	201



PAVED ALLEY DETAIL

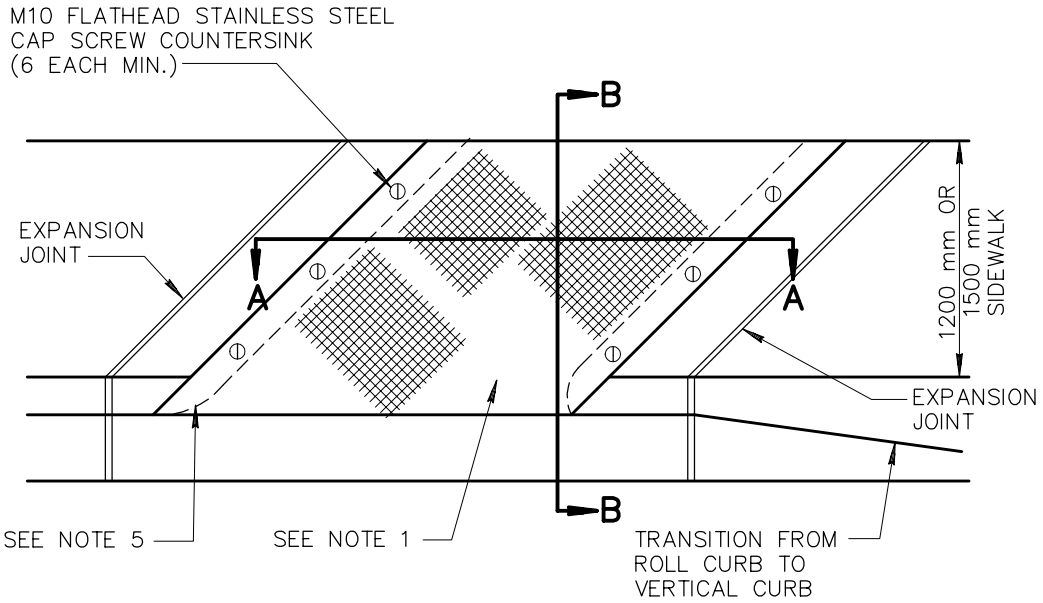


UNPAVED ALLEY DETAIL



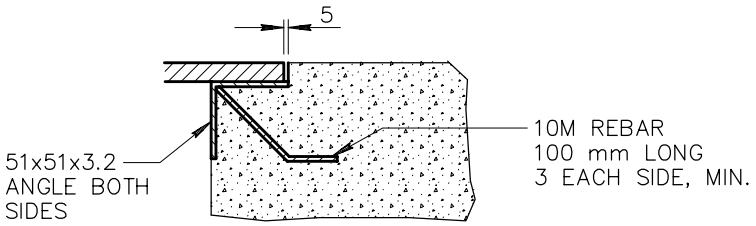
RESIDENTIAL ALLEY DETAIL

DETAIL NO.			REVISED	DETAIL NO.
202	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**ALLEY DETAILS (PAVED AND UNPAVED)**	3-03-2000	202

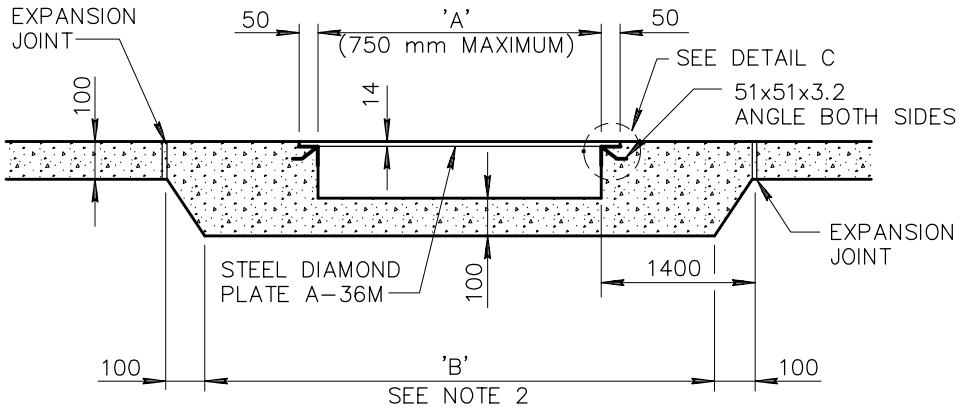


NOTES:

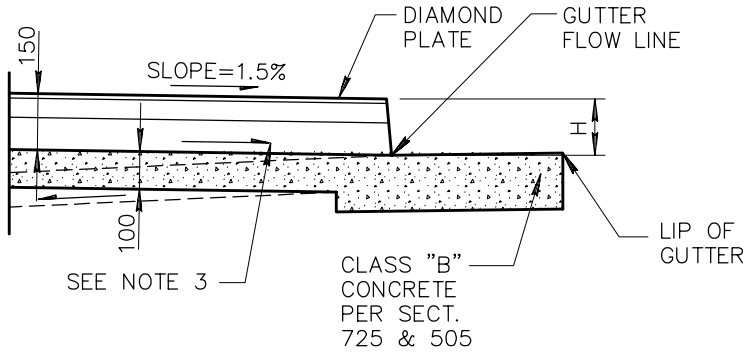
1. ANGLE EQUALS 45° UNLESS SPECIFIED ON PLAN.
2. DIMENSION 'B' EQUALS 'A' +600 mm.
3. (——►) INDICATES DIRECTION OF FLOW.
4. PAINT STEEL ACCORDING TO SECTION 790. PAINT NUMBER 1–A OR 1–B.
5. R EQUALS 25 mm UNLESS OTHERWISE DIRECTED.
6. H EQUALS CURB FACE HEIGHT.
7. FOR ROLL CURB AND GUTTER, USE 600 mm TRANSITIONS TO VERTICAL CURB.



DETAIL C

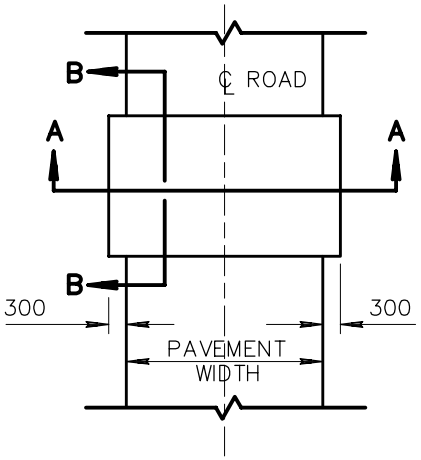


SECTION 'A–A'

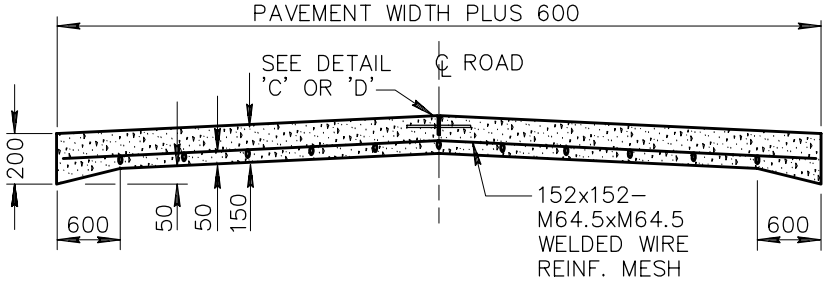


SECTION 'B–B'

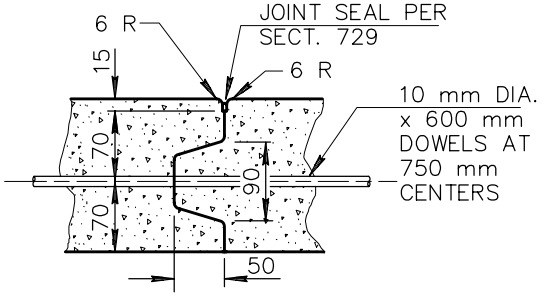
DETAIL NO.			REVISED	DETAIL NO.
203	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**SCUPPERS**	3-03-2000	203



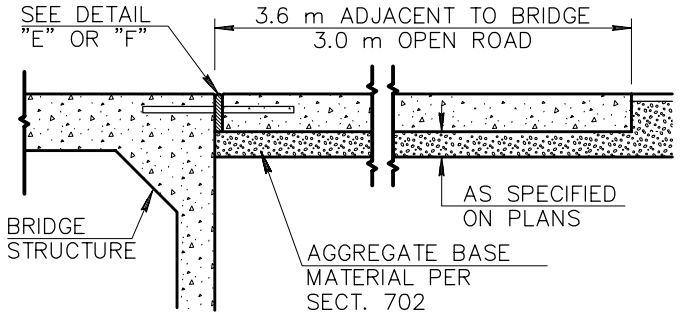
PLAN OF CONCRETE
EQUIPMENT CROSSING



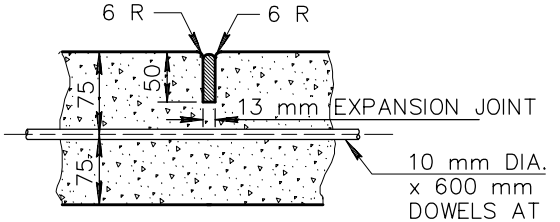
SECTION A–A



LONGITUDINAL JOINT
DETAIL 'C'



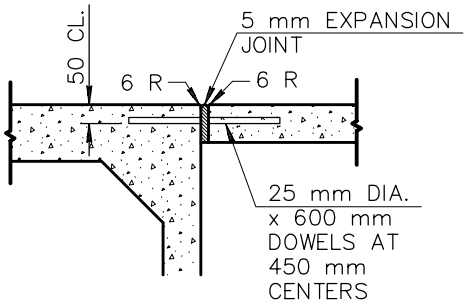
SECTION B–B



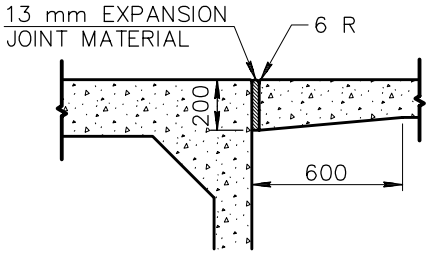
LONGITUDINAL JOINT
DETAIL 'D'

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 75 mm 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.

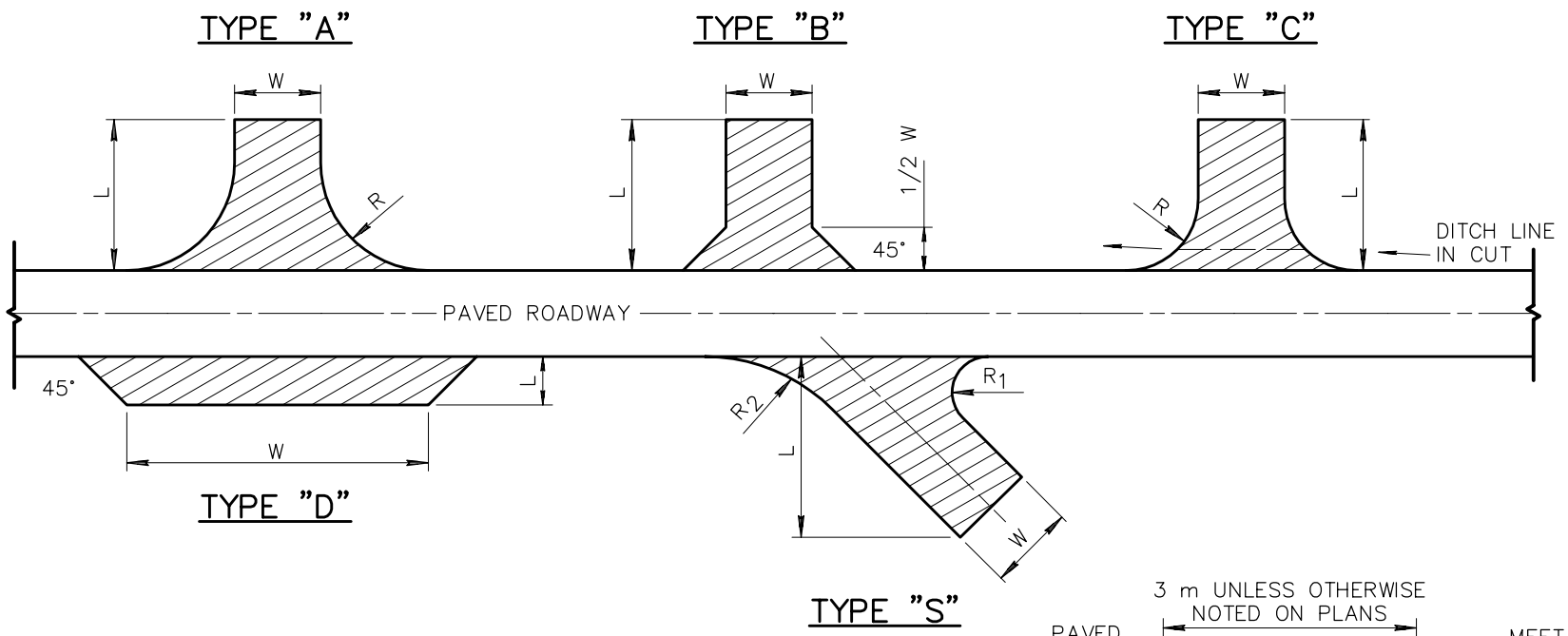


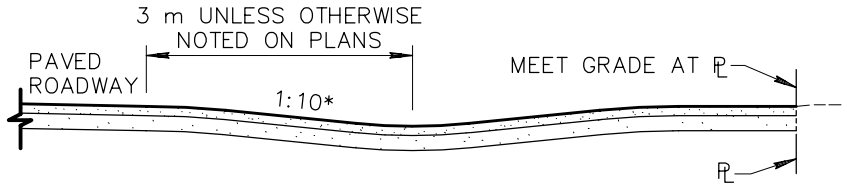
JOINT AT NEW BRIDGE
DETAIL 'F'



JOINT AT EXISTING BRIDGE
DETAIL 'E'

DETAIL NO.			REVISED	DETAIL NO.
204	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	EQUIPMENT CROSSING	3-03-2000	204





TYPICAL VALLEY GUTTER TURNOUT

TYPICAL STRAIGHT TURNOUT

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 RADUIS: WxL–SURFACE–TYPE; (4 x 9 m–A.C.–TYPE "B" TURNOUT).
   90° – WITH A RADIUS: WxLxR–SURFACE–TYPE; (4 x 9 x 4.5 m–A.C.–TYPE "C" TURNOUT). OTHER THAN 90° WITH 2 RADII–TYPE "S": $WxLxR_1xR_2$–SURFACE–TYPE; (4 x 9 x 4.5 x 15 m–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.

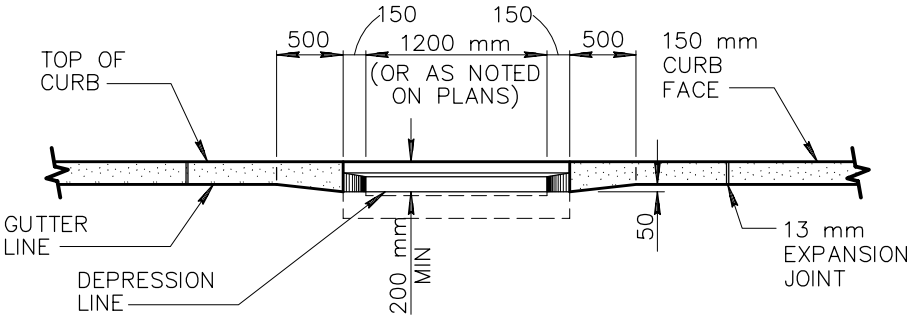
4. A.C. AND BASE MATERIAL THICKNESS FOR TURNOUTS SHALL BE THE SAME AS SHOWN ON THE ROADWAY SECTION, UNLESS OTHERWISE NOTED.

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

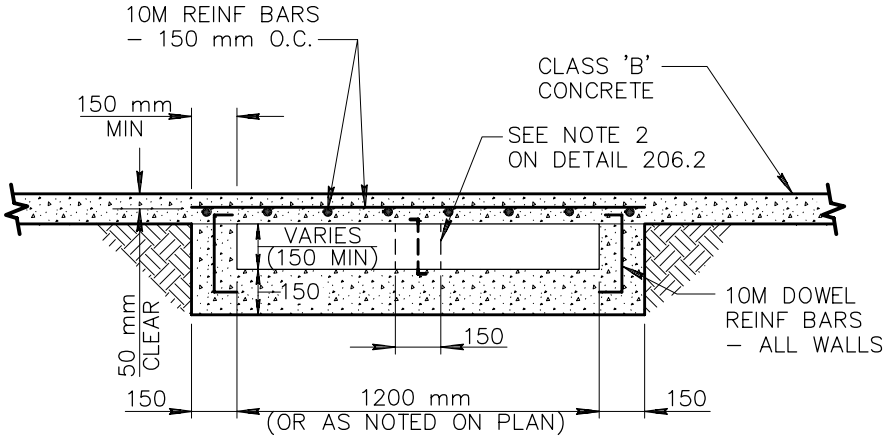
6. TURNOUTS ARE TO BE PLACED WHERE SHOWN ON PLANS, OR AS DIRECTED BY THE ENGINEER.

* UNLESS OTHERWISE NOTED ON PLANS

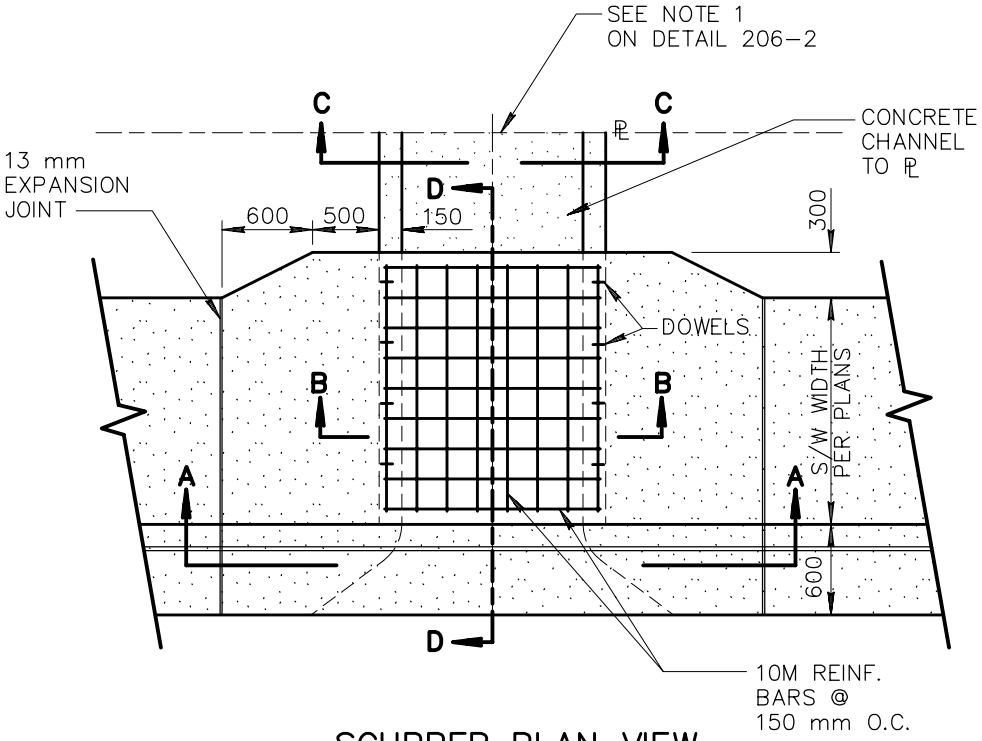
DETAIL NO.			REVISED	DETAIL NO.
205	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	PAVED TURNOUTS	3-03-2000	205



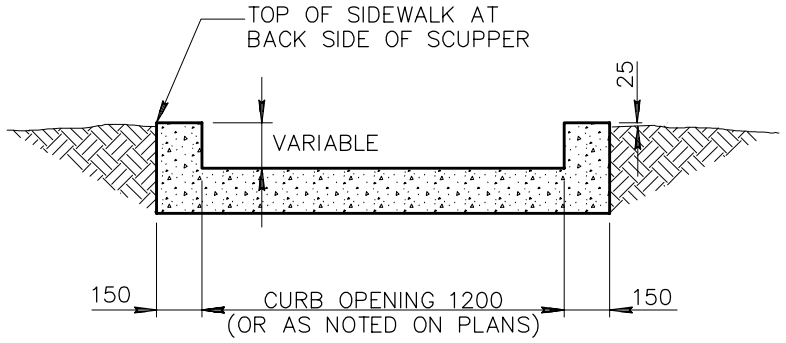
SECTION A–A



SECTION B–B

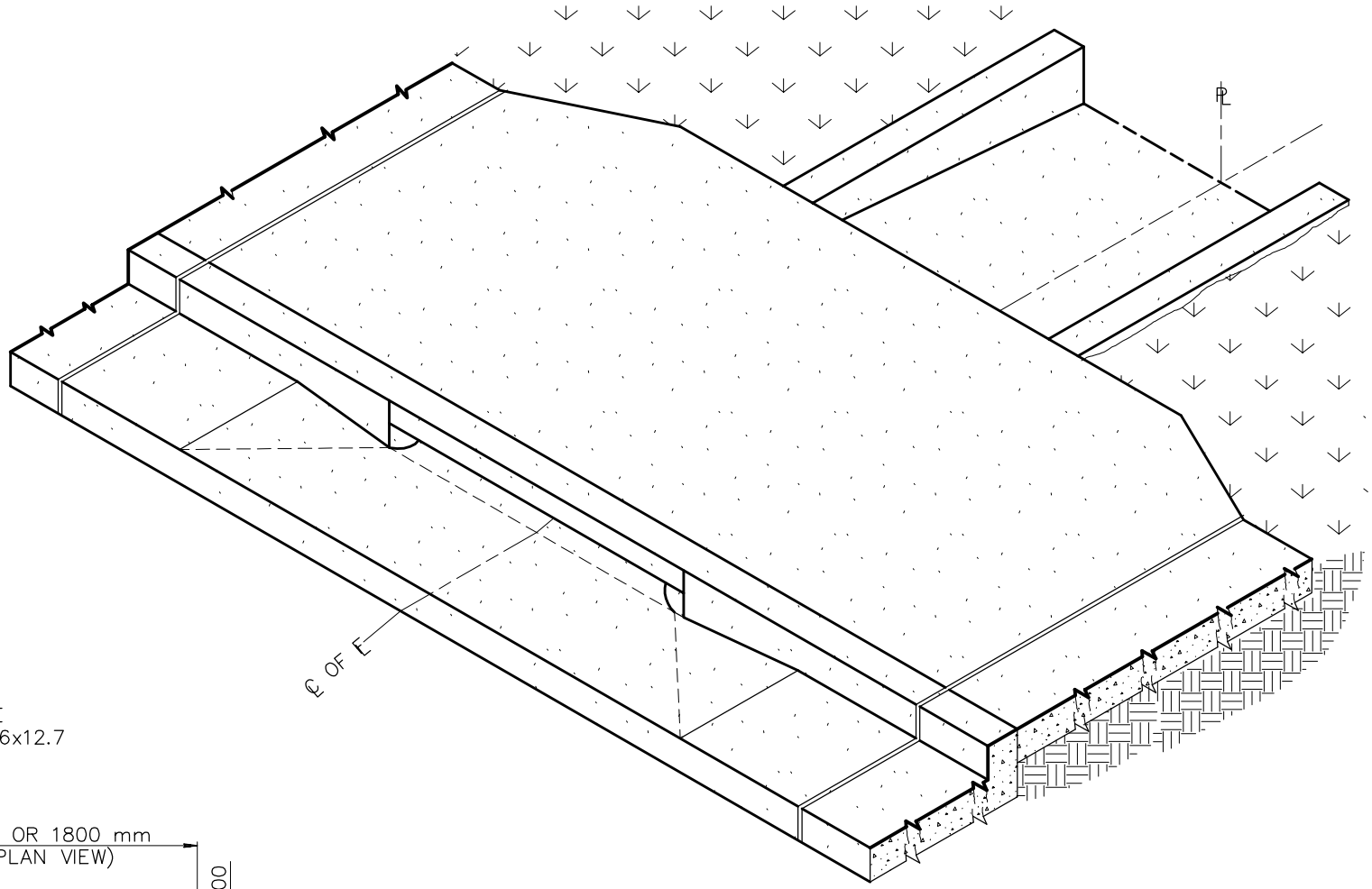


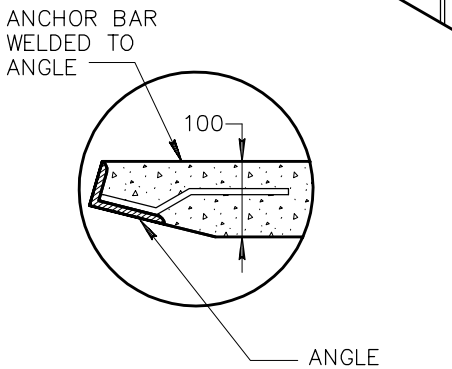
SCUPPER PLAN VIEW

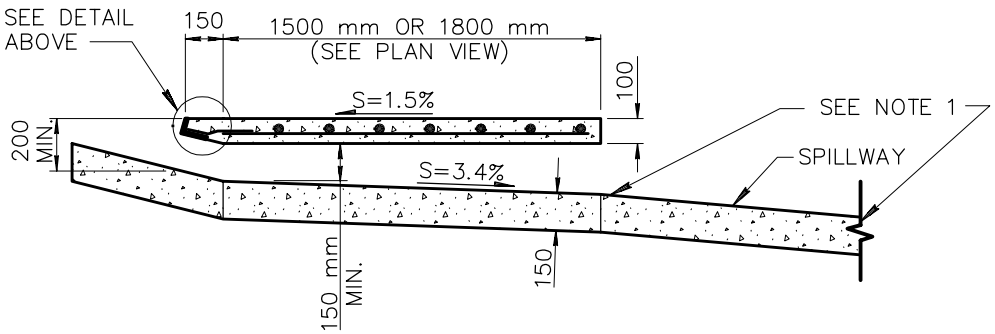


SECTION C–C
SPILLWAY

DETAIL NO.			REVISED	DETAIL NO.
206-1	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**CONCRETE SCUPPER**	3-03-2000	206-1







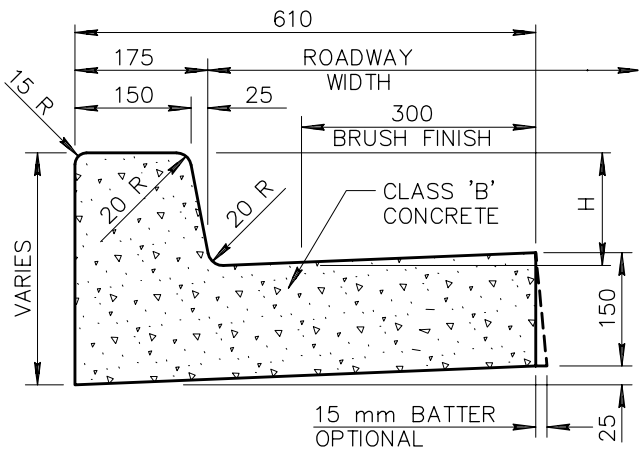
SECTION D–D

NOTES:

1. TRANSITION TO SPILLWAY/CHANNEL AS PER APPROVED PLANS.
2. A CENTER WALL SHALL BE INSTALLED IN SCUPPERS WIDER THAN 1200 mm OR IF MORE THAN 1 SCUPPER IS BUILT IN SERIES.
3. EXPANSION JOINT FILLER SHALL BE 13 mm BITUMINOUS TYPE PREFORMED EXPANSION JOINT FILLER, A.S.T.M. D–1751.

DETAIL NO.			REVISED	DETAIL NO.
206-2	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**CONCRETE SCUPPER**	3-03-2000	206-2

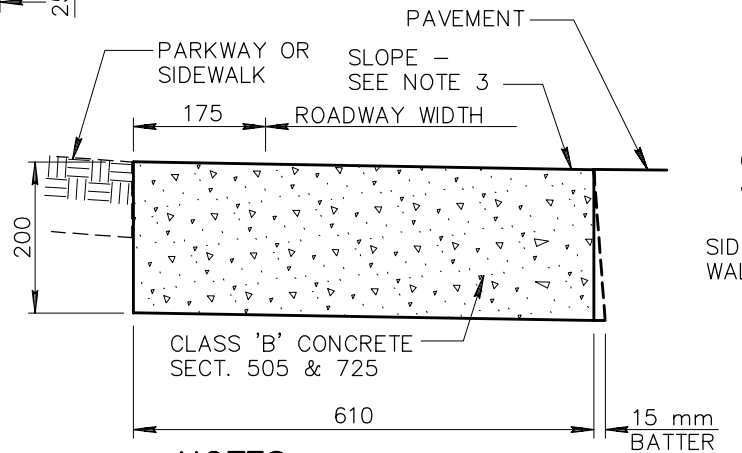
VERTICAL CURB AND GUTTER (TYPE A)



NOTES:

1. ALL EXPOSED SURFACES TO BE TROWEL FINISHED EXCEPT AS SHOWN. SEE SECT. 340.
2. H=150 OR AS SPECIFIED ON PLANS.
3. CONTRACTION JOINT SPACING 3.0 m MAXIMUM.
4. EXPANSION JOINTS AS PER SECT. 340.

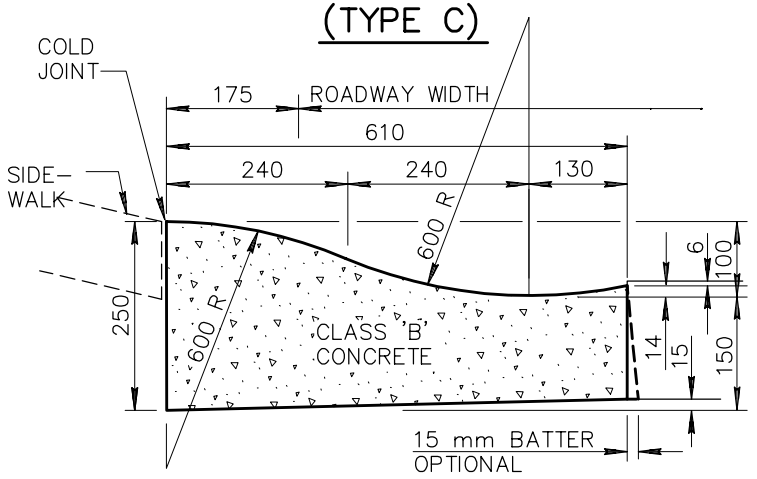
RIBBON CURB (TYPE B)



NOTES:

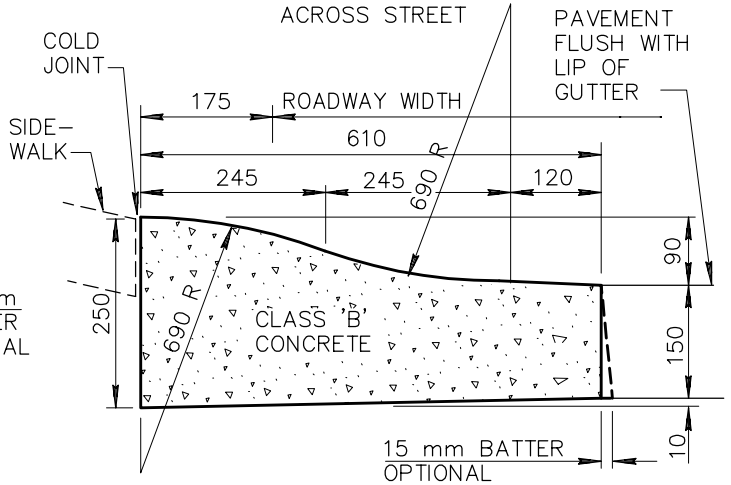
1. CONSTRUCT CURB AND INSTALL 13 mm MASTIC EXPANSION JOINTS, A.S.T.M. D–1751. SECT. 340.
2. BROOM FINISH ALL SURFACES.
3. RIBBON CURB MAY SLOPE TOWARDS PAVEMENT OR PARKWAY AS INDICATED ON PLANS.
4. CONTRACTION JOINT SPACING 3.0 m MAXIMUM.

ROLL CURB AND GUTTER (TYPE C)



(TYPE D)

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

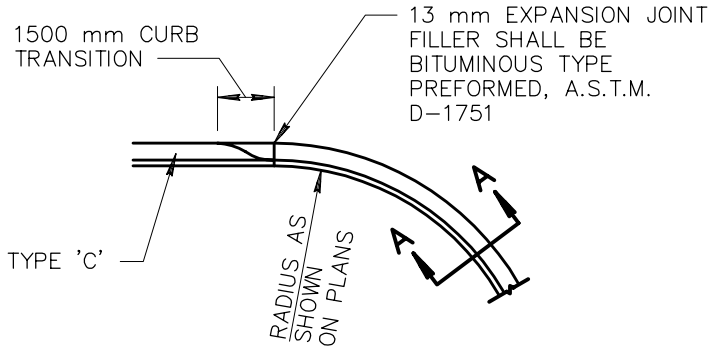


NOTES:

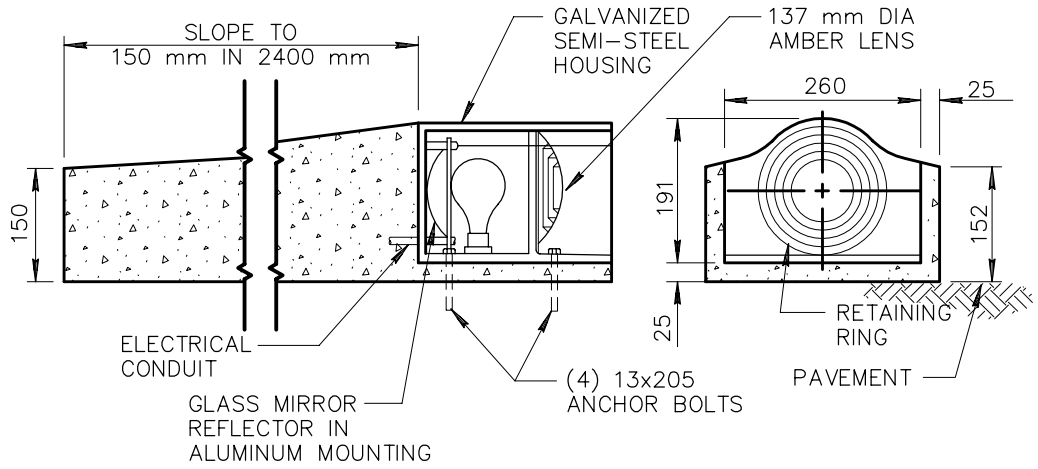
1. ALL WORK AND MATERIALS SHALL CONFORM TO SECT. 340, 505 AND 725. BROOM FINISH EXPOSED SURFACE.
2. CONTRACTION JOINT SPACING 3.0 m MAXIMUM.
3. EXPANSION JOINTS AS PER SECT. 340.

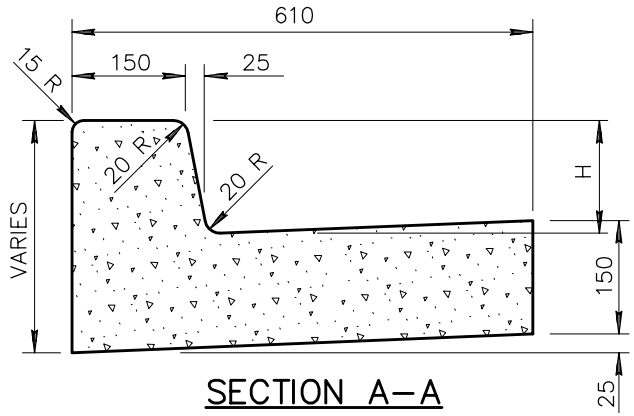
DETAIL NO.			REVISED	DETAIL NO.
220	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**CURB AND GUTTER TYPES A, B, C AND D**	3-03-2000	220

CURB AND GUTTER TRANSITION



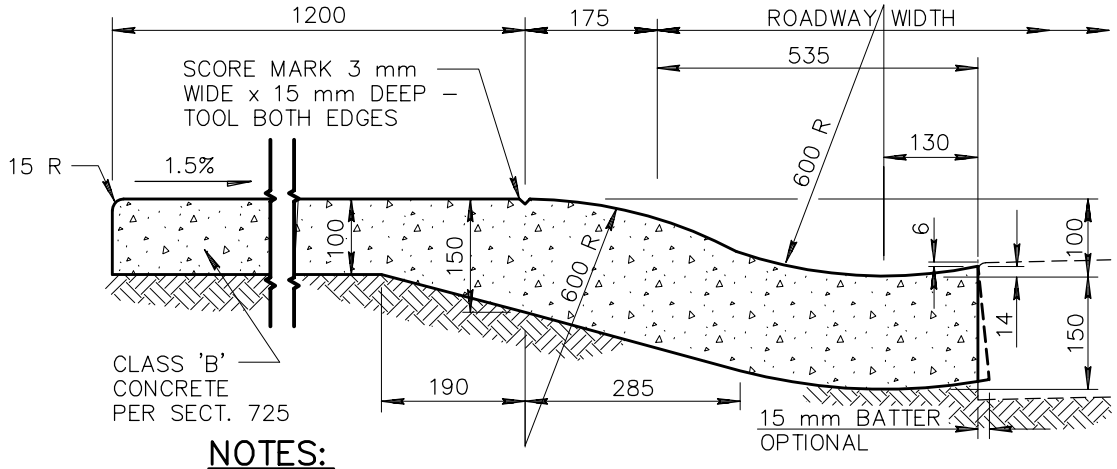
CURB WARNING BEACON





SECTION A–A

INTEGRAL ROLL CURB, GUTTER AND SIDEWALK



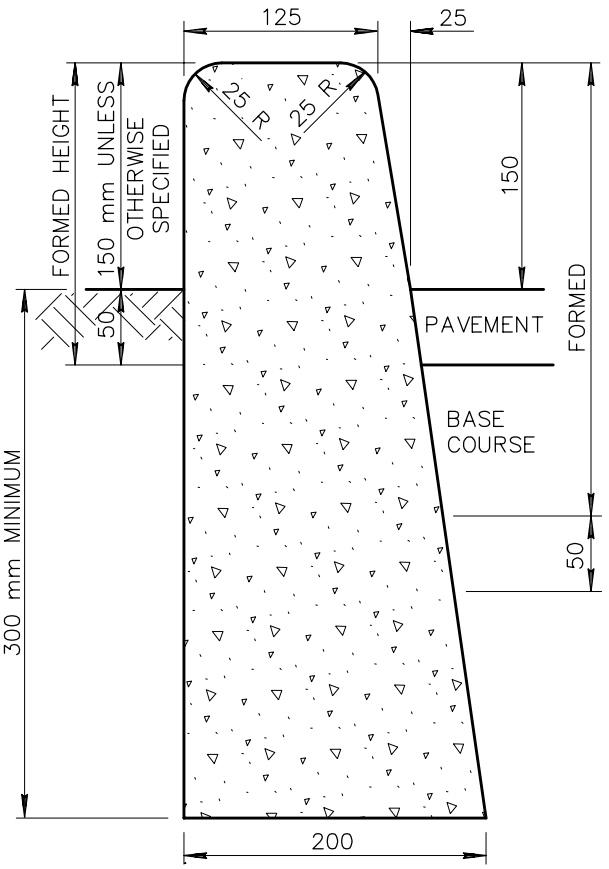
NOTES:

1. THE CURB TRANSITION WILL BE PAID FOR AS TYPE 'C'. WHEN A PROJECT CONSISTS OF TYPE 'C' CURB AND GUTTER THROUGHOUT, THE ENTIRE RETURN SHALL BE MEASURED AND PAID FOR AS TYPE 'A'.
2. WHERE PROPOSED CONSTRUCTION IS TO BE CONNECTED TO EXISTING CURB AND GUTTER, THE TRANSITION SHALL BE INDICATED ON PLANS.

NOTES:

1. CONCRETE TO BE MONOLITHIC POUR. EXPOSED SURFACE FINISH AS PER SIDEWALK AND GUTTER DETAIL.
2. CONTRACTION JOINT SPACING 5.0 m MAXIMUM.
3. EXPANSION JOINTS PER SECT. 340.

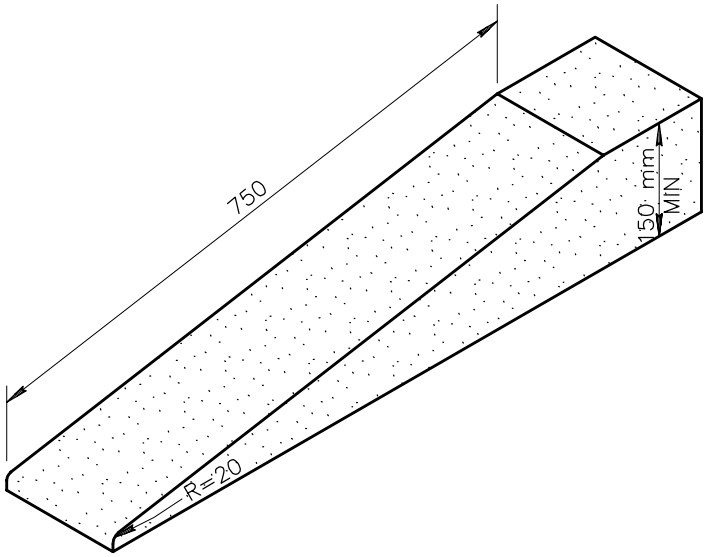
DETAIL NO.			REVISED	DETAIL NO.
221	MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL METRIC	CURB AND GUTTER (TRANSITION, INTEGRAL & WARNING BEACON)	3-03-2000	221



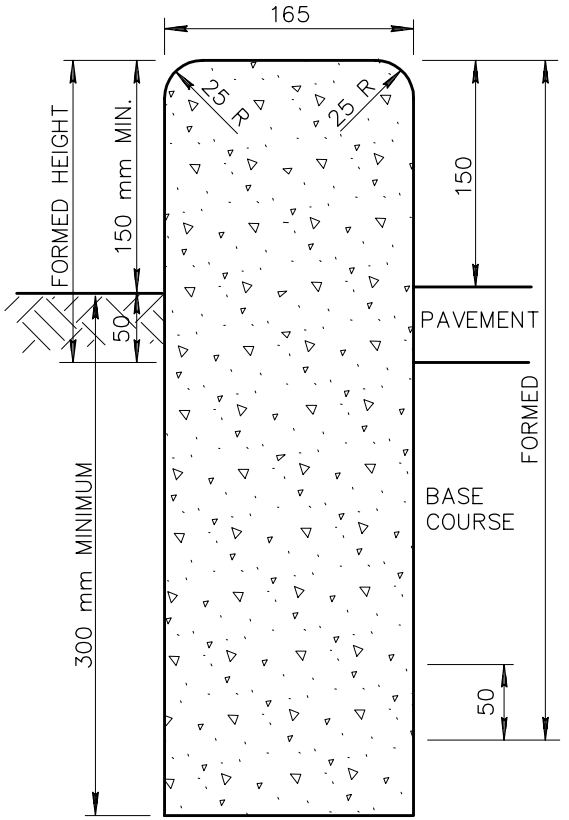
TYPE 'A'

NOTES:

1. ALL VERTICAL SURFACES TO BE FORMED.
2. VERTICAL SURFACES DOWN FROM 50 mm BELOW UNDISTURBED SOIL MAY BE PLACED AGAINST NEAT CUT IF APPROVED BY THE ENGINEER AND CONCRETE WILL NOT EXTEND MORE THAN 25 mm 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 3 m.
6. CONCRETE TO BE CLASS 'B' PER SECT. 725.

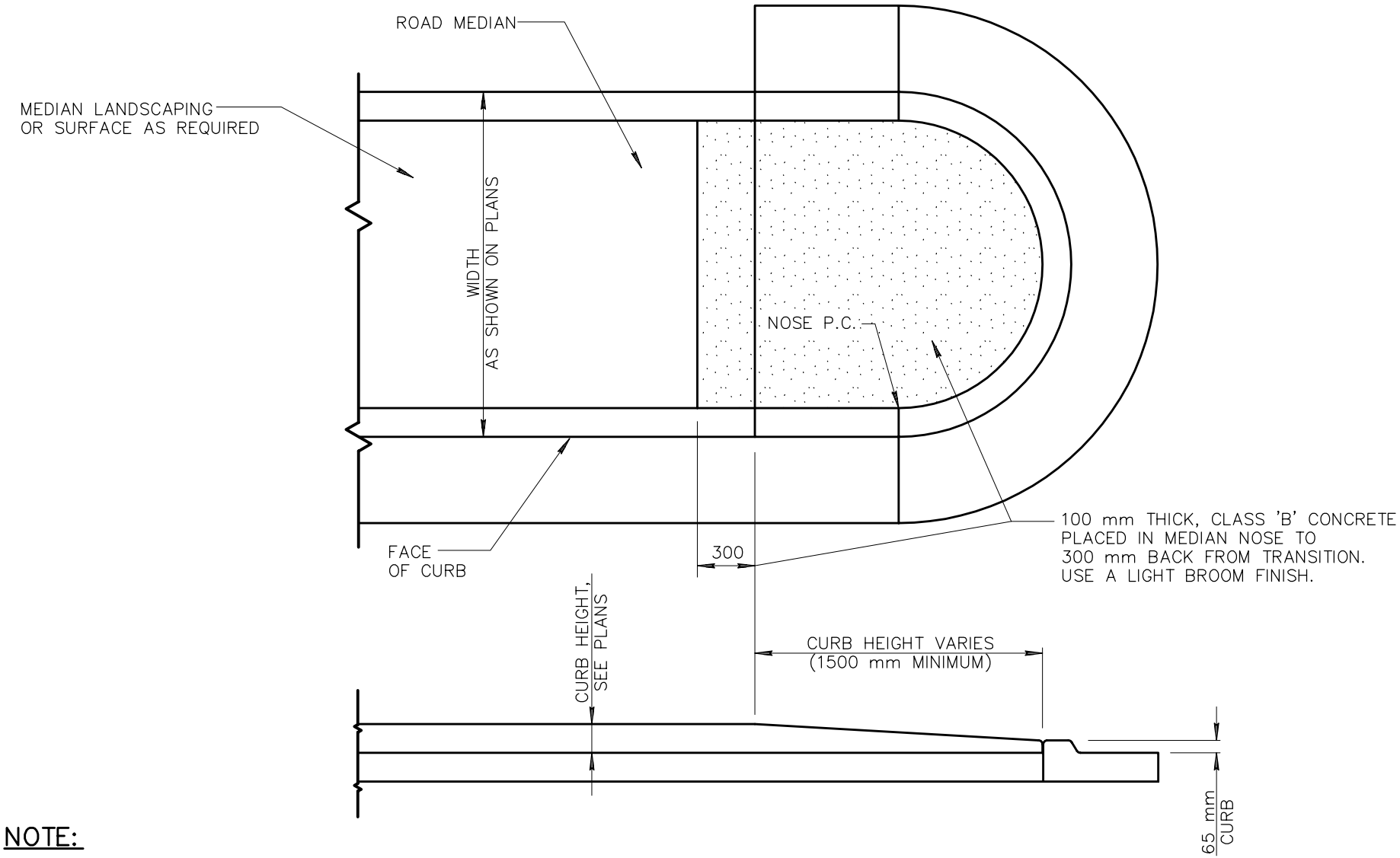


TYPICAL CURB TERMINATION



TYPE 'B'

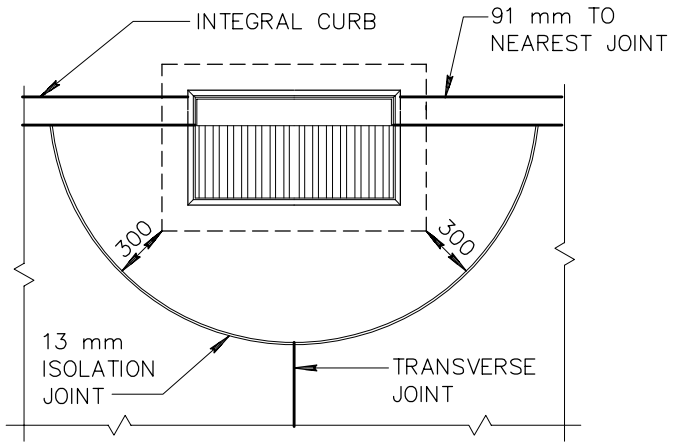
DETAIL NO.			REVISED	DETAIL NO.
222	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	SINGLE CURB - TYPES A, B AND TERMINATION	01-03-2002	222



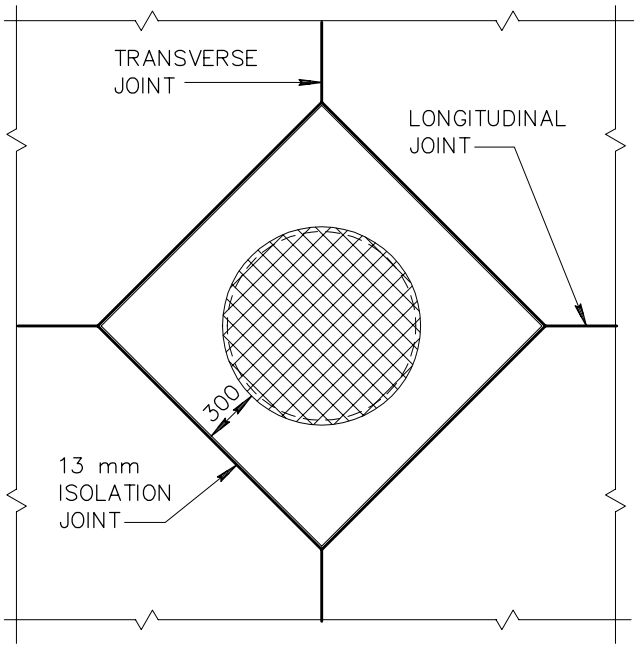
NOTE:

LENGTH OF TRANSITION SHALL BE EQUAL TO RADIUS OF MEDIAN NOSE, (1500 mm MINIMUM). FOR LOCATION SEE PLANS.

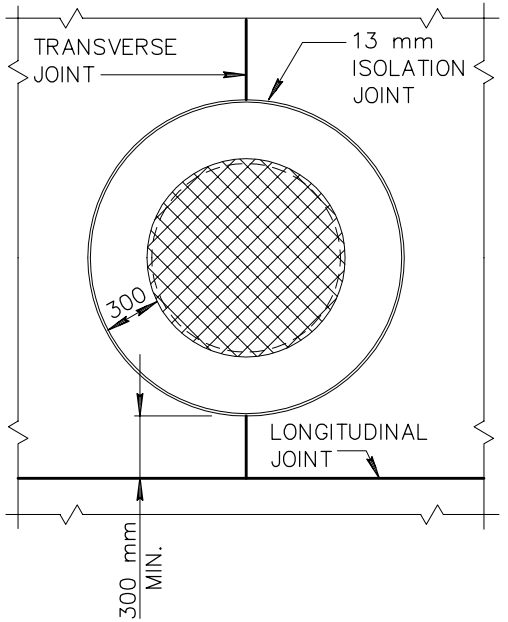
DETAIL NO.			REVISED	DETAIL NO.
223	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**MEDIAN NOSE TRANSITION**	3-03-2000	223



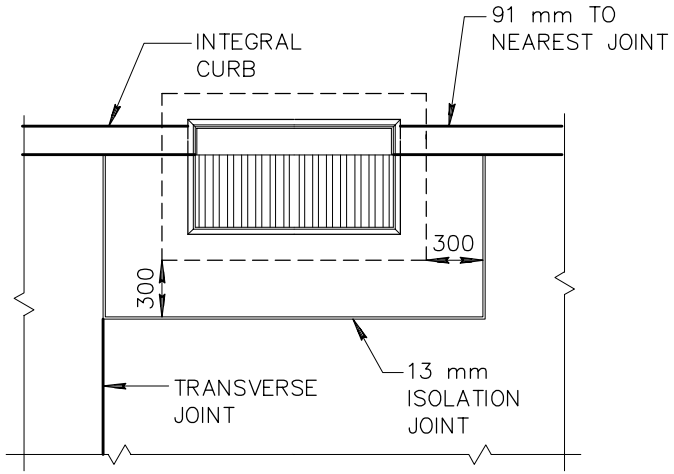
DRAINAGE INLET



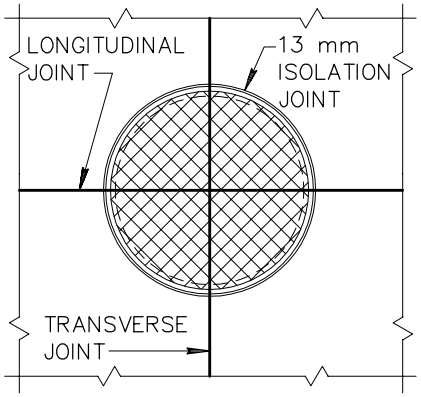
MANHOLE COVERS



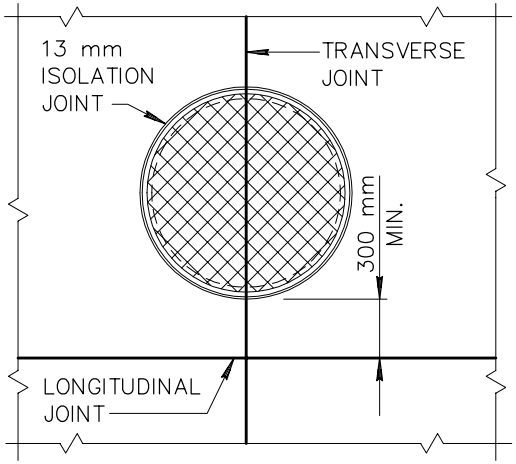
MANHOLE COVERS



DRAINAGE INLET

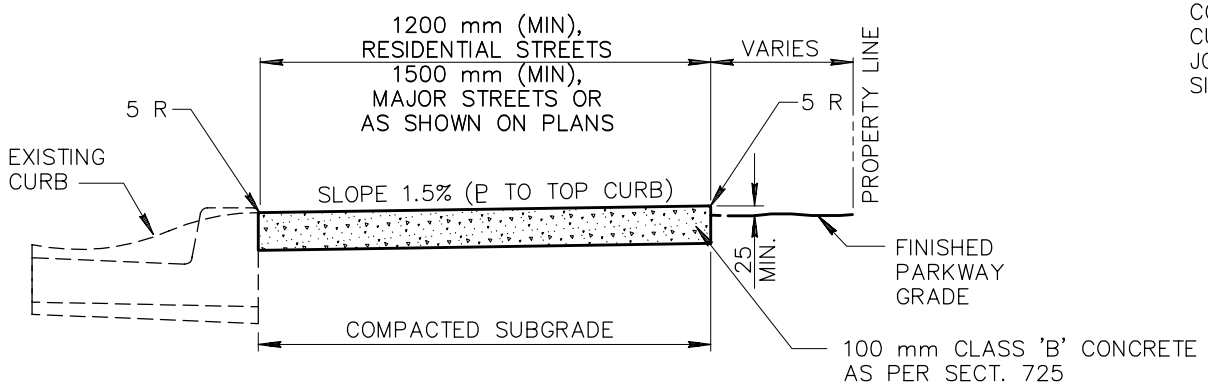


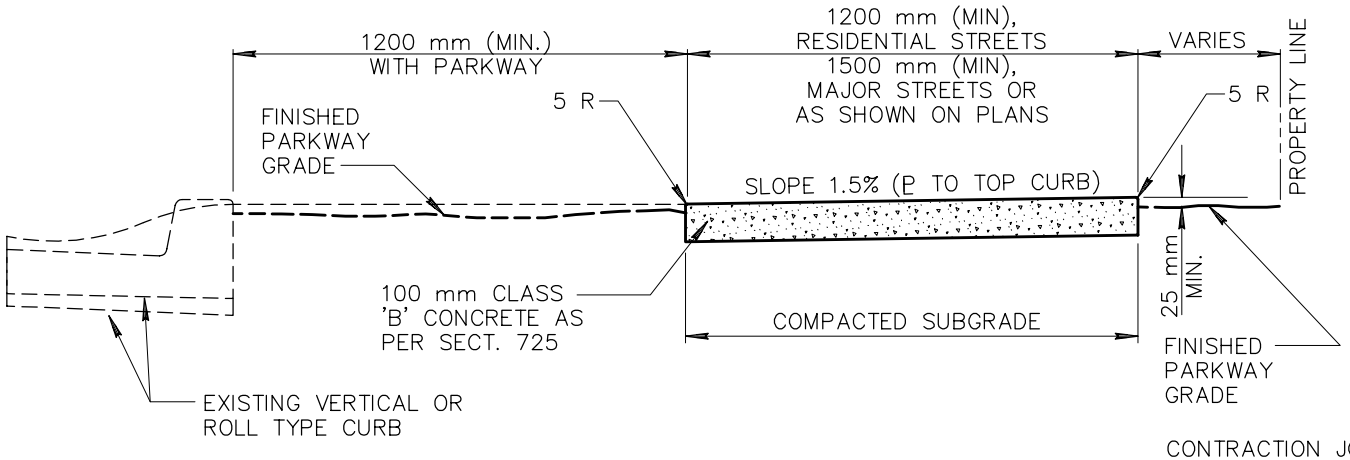
MANHOLE COVERS

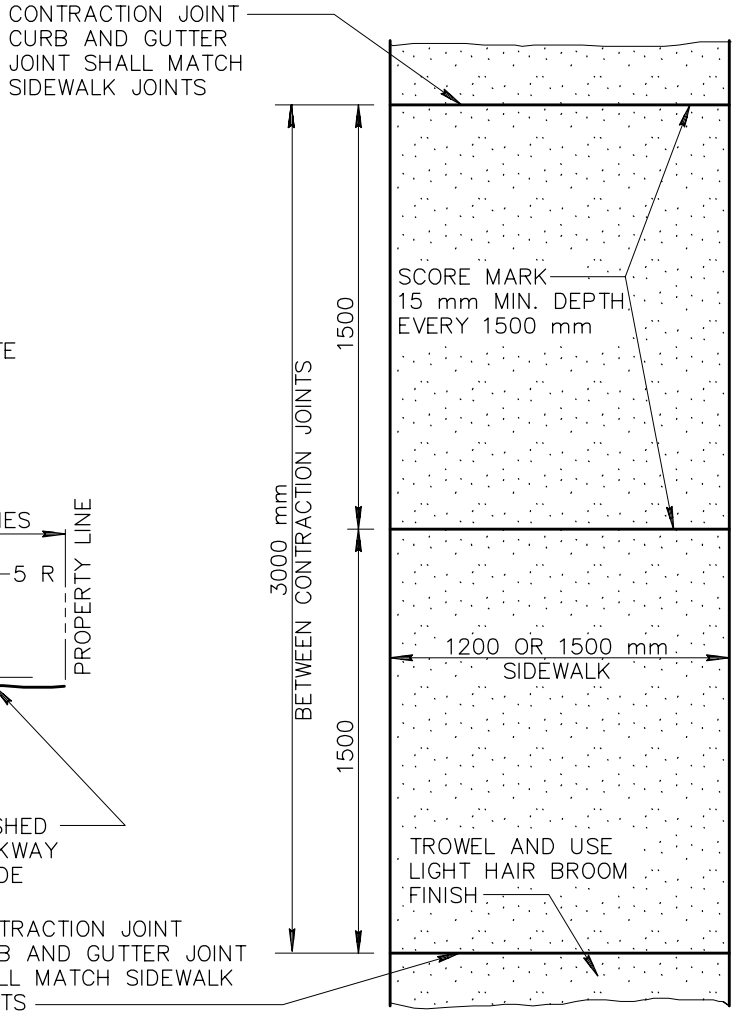


MANHOLE COVERS

DETAIL NO.			REVISED	DETAIL NO.
224	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**JOINT FOR DRAINAGE INLETS AND MANHOLE COVERS**	3-03-2000	224

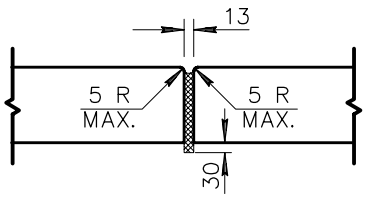




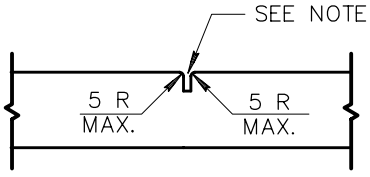


NOTES:

1. SIDEWALK CONSTRUCTION SHALL CONFORM TO SECT. 340.
2. EXPANSION JOINT FILLER SHALL BE 13 mm BITUMINOUS TYPE PREFORMED EXPANSION JOINT FILLER, A.S.T.M. D–1751.
3. LARGE AGGREGATE, IN CONTRACTION JOINT, SHALL BE SEPARATED TO A DEPTH OF 25 mm, FINISH DEPTH SHALL BE A MINIMUM OF 20 mm.
4. EXPANSION JOINT 30 m MAXIMUM SPACING PER SECT. 340.
5. CLASS 'B' CONCRETE CONSTRUCTION AS PER SECT. 725.

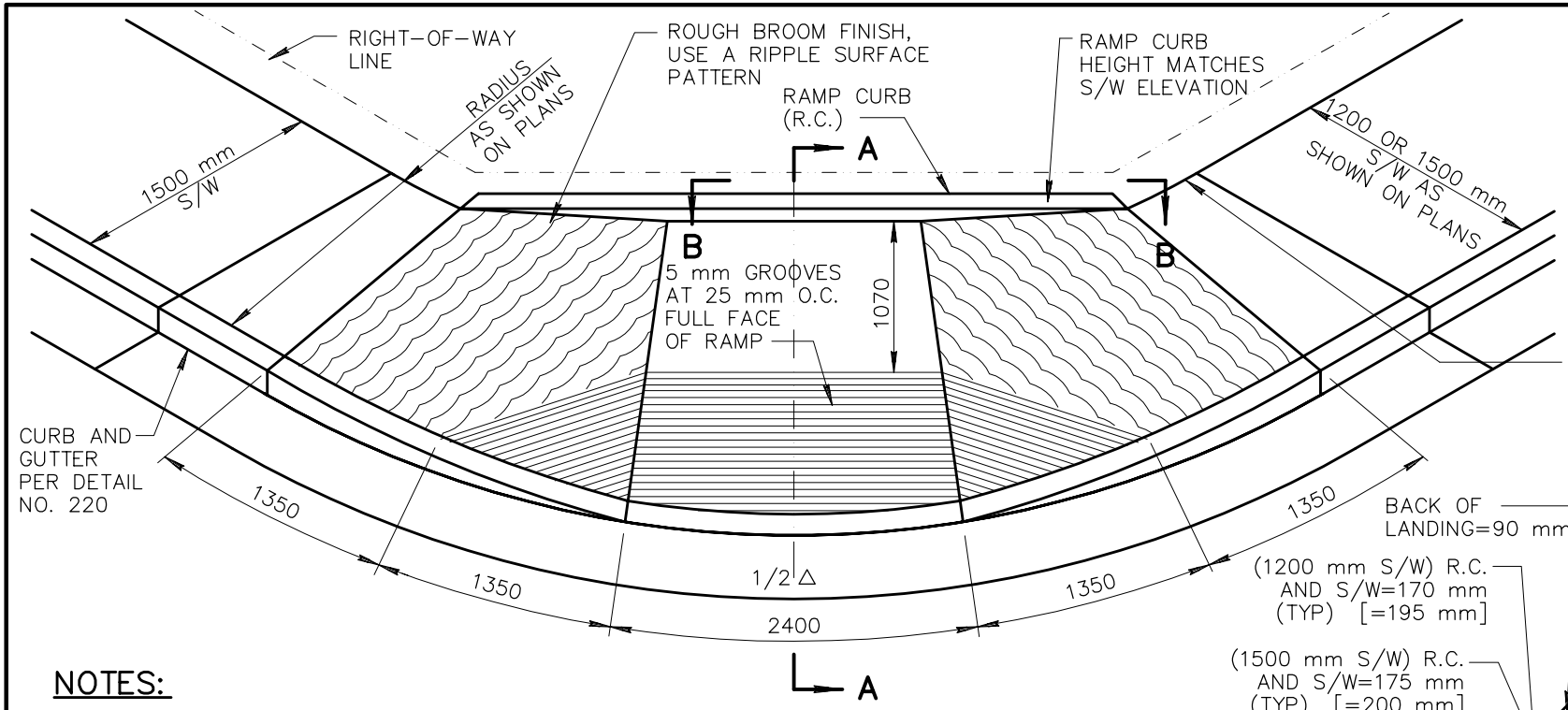


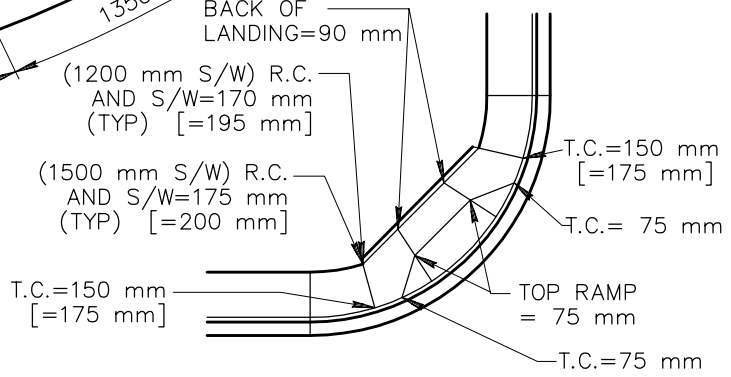
EXPANSION JOINT



CONTRACTION JOINT

DETAIL NO.			REVISED	DETAIL NO.
230	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**SIDEWALKS**	01–01–2003	230

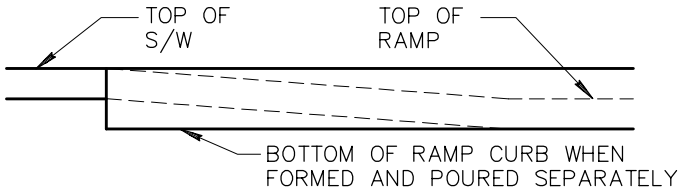




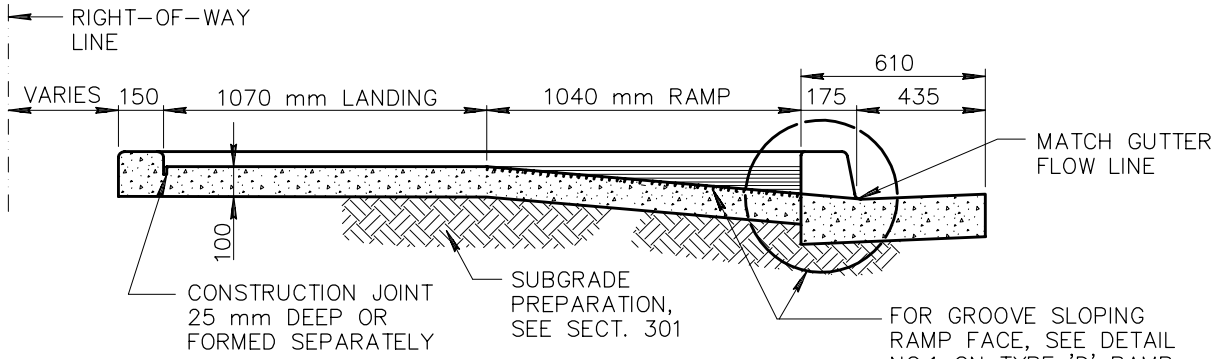
CONTROL ELEVATIONS

NOTES:

1. CONTROL ELEVATIONS SHOWN ARE IN RELATION TO THE GUTTER AND ARE LOCATED RADIALLY. GUTTER ELEVATION=0.
2. CLASS 'B' CONCRETE CONSTRUCTION AS PER SECTION 725.
3. WHEN CURB HEIGHTS OF 175 mm ARE SHOWN ON PLANS, USE DIMENSIONS SHOWN IN [ ]'S.

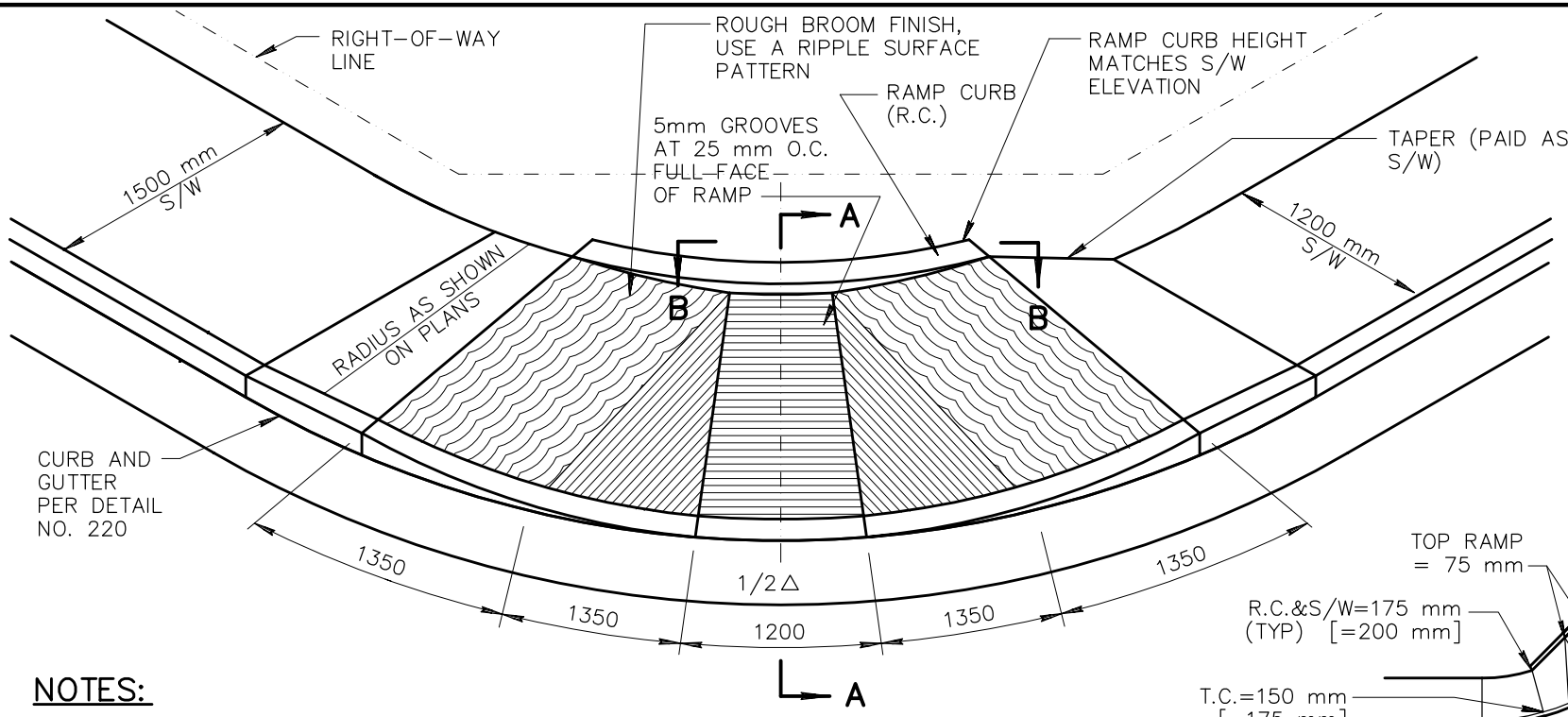


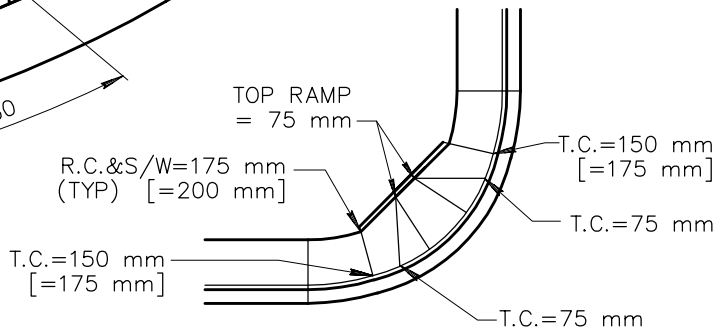
SECTION B–B



SECTION A–A

DETAIL NO.			REVISED	DETAIL NO.
231	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	SIDEWALK RAMPS - TYPE 'A'	3-03-2000	231

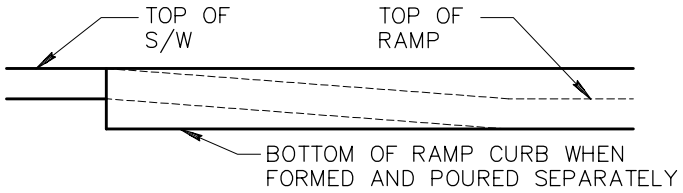




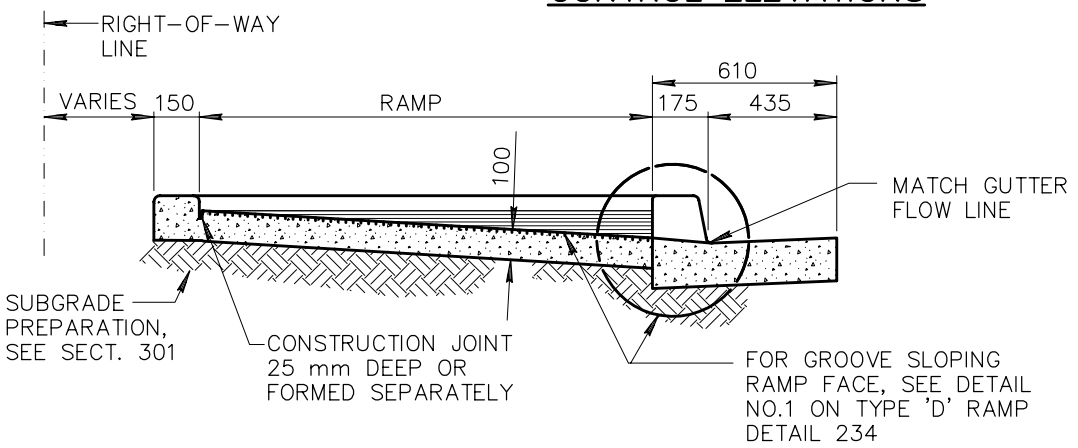
CONTROL ELEVATIONS

NOTES:

1. CONTROL ELEVATIONS SHOWN ARE IN RELATION TO THE GUTTER AND ARE LOCATED RADIALLY. GUTTER ELEVATION=0.
2. CLASS 'B' CONCRETE CONSTRUCTION AS PER SECT. 725.
3. WHEN CURB HEIGHTS OF 175 MM ARE SHOWN ON PLANS, USE DIMENSIONS SHOWN IN [ ]'S.

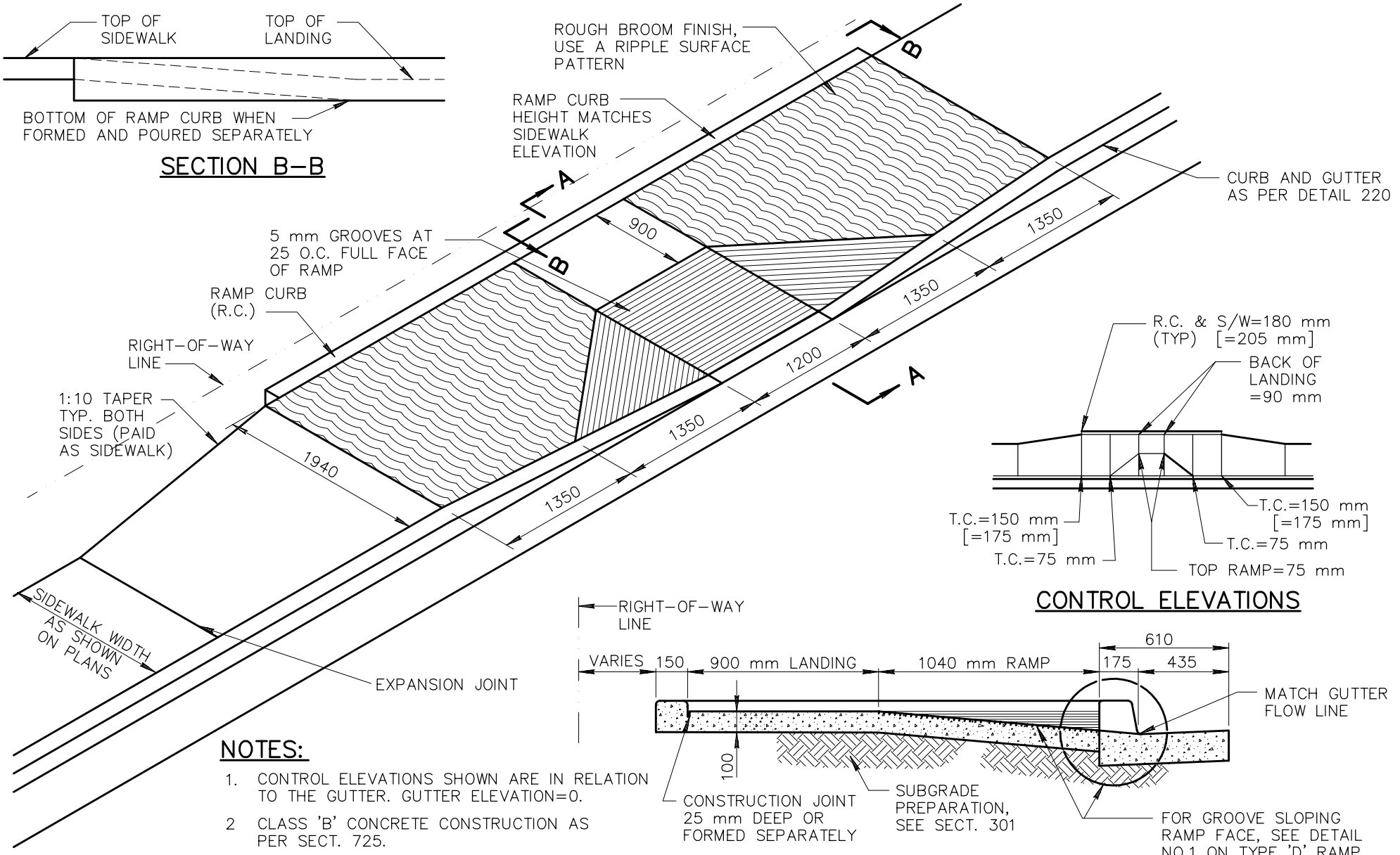


SECTION B-B



SECTION A-A

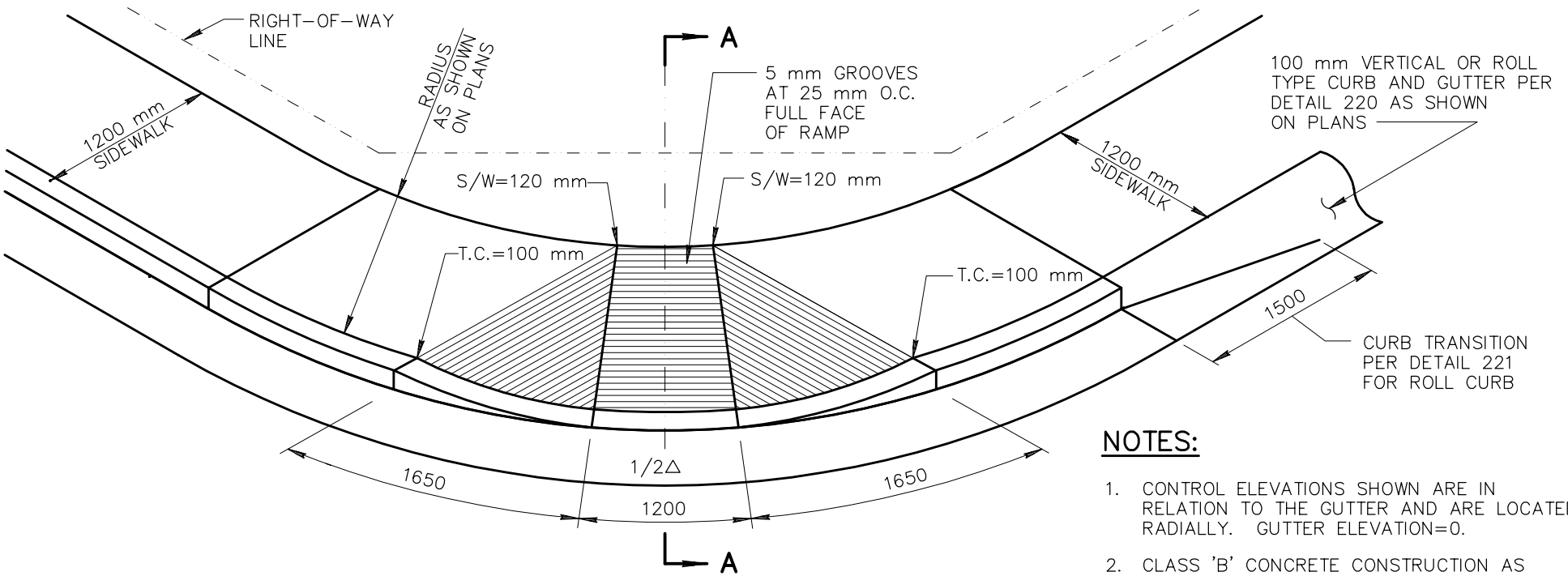
DETAIL NO.			REVISED	DETAIL NO.
232	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	SIDEWALK RAMPS - TYPE 'B'	3-06-2000	232



NOTES:

1. CONTROL ELEVATIONS SHOWN ARE IN RELATION TO THE GUTTER. GUTTER ELEVATION=0.
2. CLASS 'B' CONCRETE CONSTRUCTION AS PER SECT. 725.
3. WHEN CURB HEIGHTS OF 175 mm ARE SHOWN ON PLANS, USE DIMENSIONS SHOWN IN [ ]'S.
4. EXPANSION JOINTS SHALL CONFORM TO SECT. 340

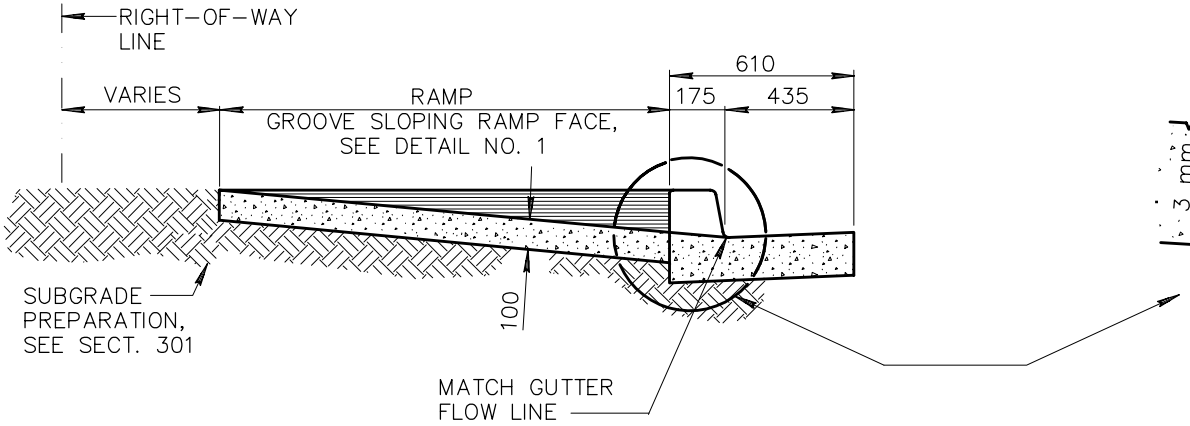
DETAIL NO.			REVISED	DETAIL NO.
233	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	SIDEWALK RAMPS - TYPE 'C'	01–01–2003	233



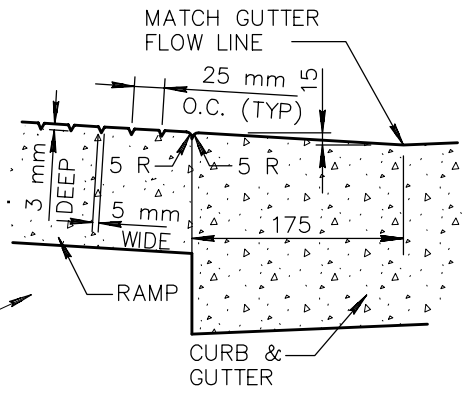
CONTROL ELEVATIONS

NOTES:

1. CONTROL ELEVATIONS SHOWN ARE IN RELATION TO THE GUTTER AND ARE LOCATED RADIALLY. GUTTER ELEVATION=0.
2. CLASS 'B' CONCRETE CONSTRUCTION AS PER SECTION 725.

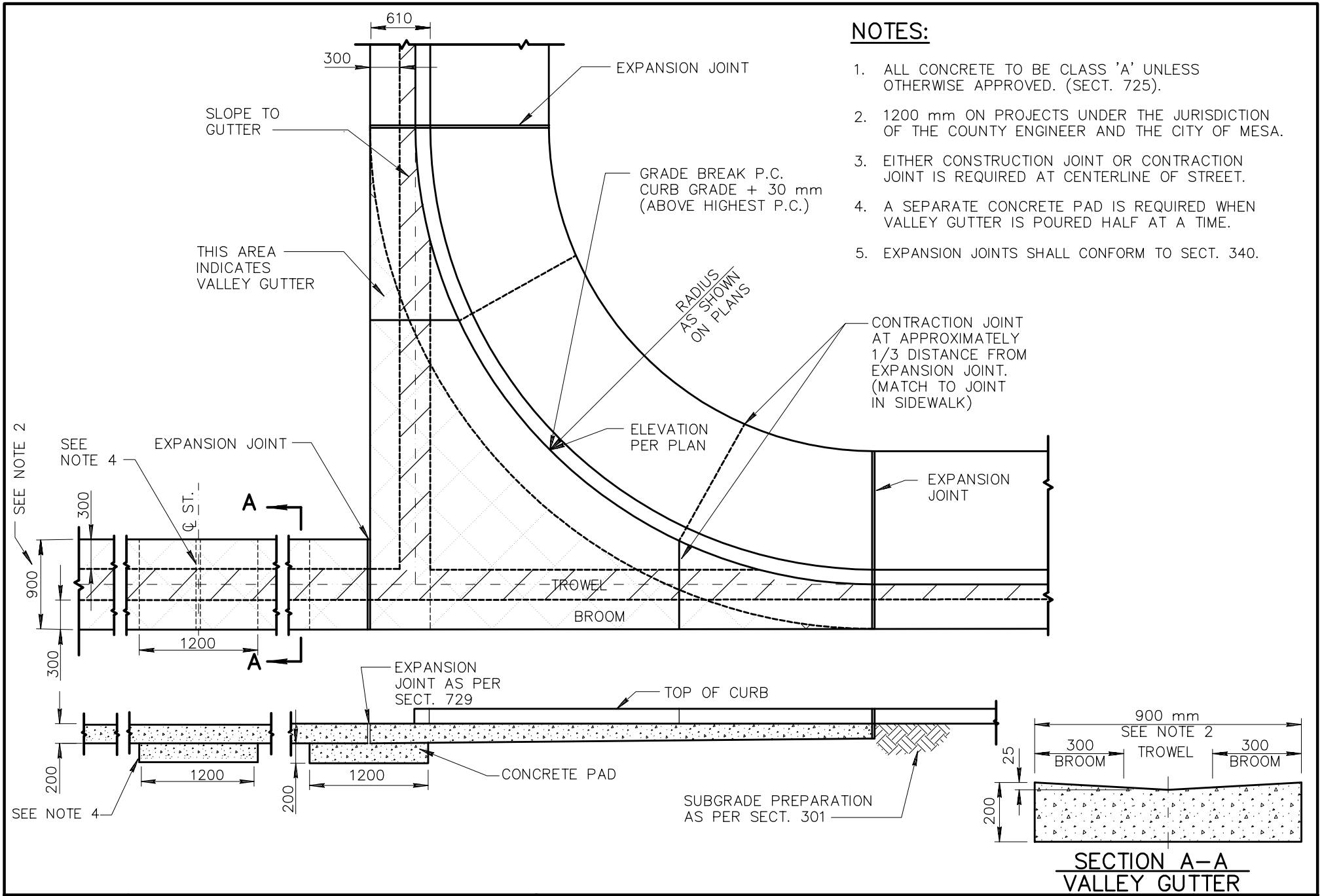


SECTION A–A



DETAIL 1

DETAIL NO.			REVISED	DETAIL NO.
234	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	SIDEWALK RAMPS - TYPE 'D'	01–03–2002	234

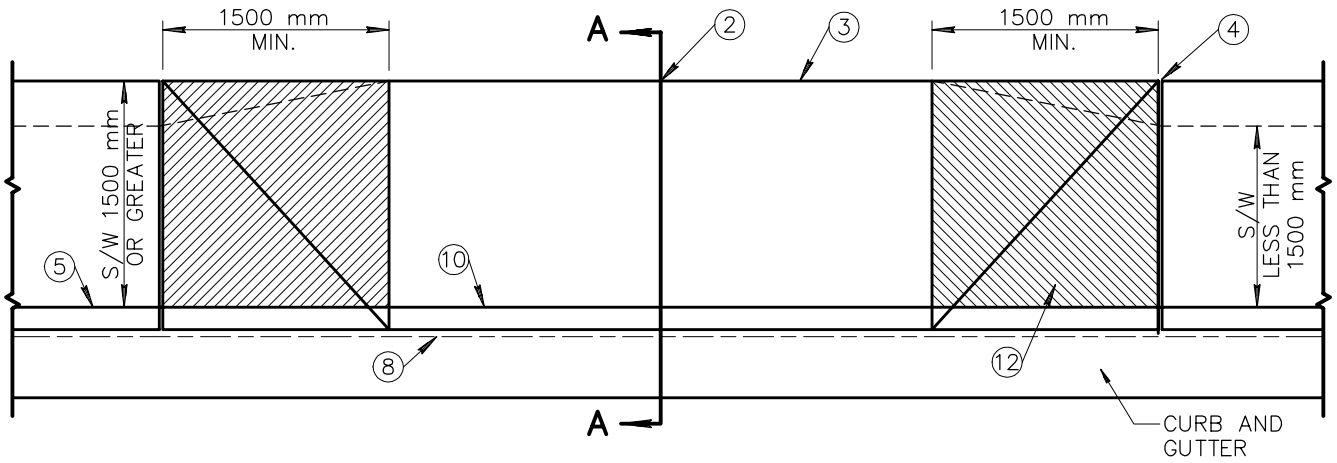


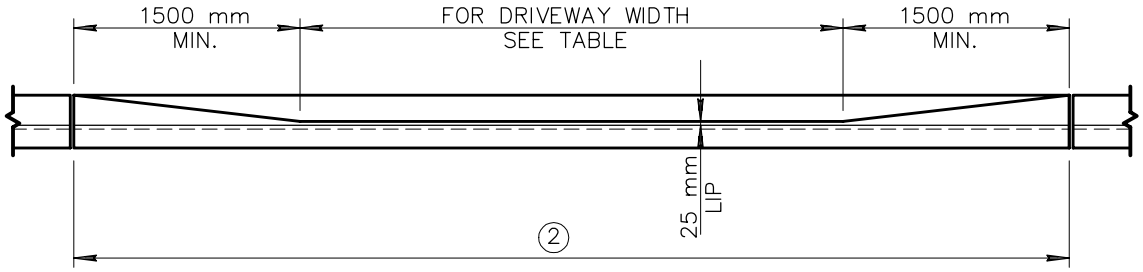
NOTES:

1. ALL CONCRETE TO BE CLASS 'A' UNLESS OTHERWISE APPROVED. (SECT. 725).
2. 1200 mm ON PROJECTS UNDER THE JURISDICTION OF THE COUNTY ENGINEER AND THE CITY OF MESA.
3. EITHER CONSTRUCTION JOINT OR CONTRACTION JOINT IS REQUIRED AT CENTERLINE OF STREET.
4. A SEPARATE CONCRETE PAD IS REQUIRED WHEN VALLEY GUTTER IS POURED HALF AT A TIME.
5. EXPANSION JOINTS SHALL CONFORM TO SECT. 340.

SECTION A–A
VALLEY GUTTER

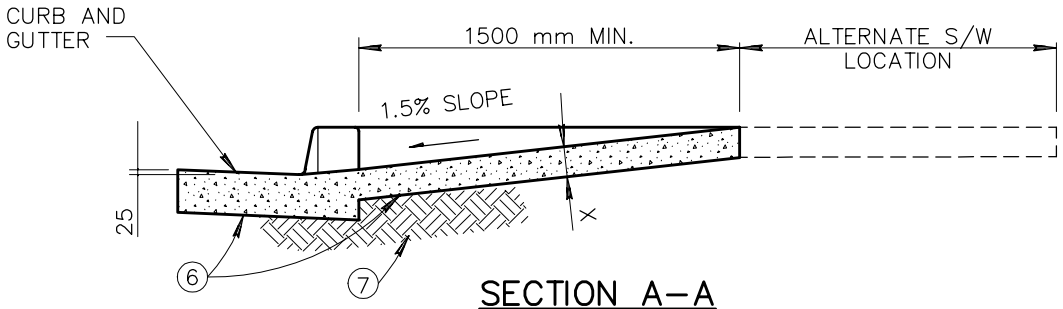
DETAIL NO.			REVISED	DETAIL NO.
240	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	VALLEY GUTTER	01–01–2003	240





NOTES:

1. DEPRESSED CURB SHALL BE PAID FOR AT THE UNIT PRICE BID FOR THE TYPE OF CURB USED AT THAT LOCATION.
2. WHEN WIDTH EXCEEDS 6.7 m PROVIDE A CONTRACTION JOINT ON D/W CENTERLINE.
3. BACK OF D/W OR FACE OF FUTURE S/W.
4. EXPANSION JOINTS SHALL COMPLY WITH SECTION 340.
5. BACK OF CURB – CONSTRUCTION JOINT OR SCORE MARK.
6. CLASS 'B' CONCRETE, SECT. 725.
7. SUBGRADE PREPARATION, SECT. 301.
8. FLOW LINE OF GUTTER.
9. DEPRESSED CURB.
10. SECT. A–A AND ELEVATION, D/W VERTICAL CURB AND GUTTER OR ROLL TYPE CURB AND GUTTER.
11. ROLL TYPE CURB AND GUTTER NOT PERMITTED IN THE CITY OF MESA
12. 5 mm GROOVES AT 25 mm O.C. FULL WIDTH OF 1500 mm WARP SECTION, EACH SIDE OF DRIVEWAY. SEE DETAIL NO. 1 ON TYPE 'D' RAMP DETAIL NO. 234.



SECTION A–A

COMMERCIAL AND INDUSTRIAL				
DRIVEWAY WIDTH	MIN.	MAX.	CLASS	DEPTH [x]
COMMERCIAL	✳5.0 m	12.0 m	B	150 mm
INDUSTRIAL ✳7.5 m MIN. FOR TWO WAY TRAFFIC	✳5.0 m	12.0 m	B	150 mm

RESIDENTIAL				
DRIVEWAY WIDTH	MIN.	MAX.	CLASS	DEPTH [x]
MAJOR STREET	5.0 m	9.0 m	B	125 mm
COLLECTOR STREET	✳4.0 m	9.0 m	B	125 mm
LOCAL STREET ✳5.0 m DESIRABLE	4.0 m	9.0 m	B	125 mm

DETAIL NO.			REVISED	DETAIL NO.
250	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	DRIVEWAY ENTRANCES	01–01–2003	250

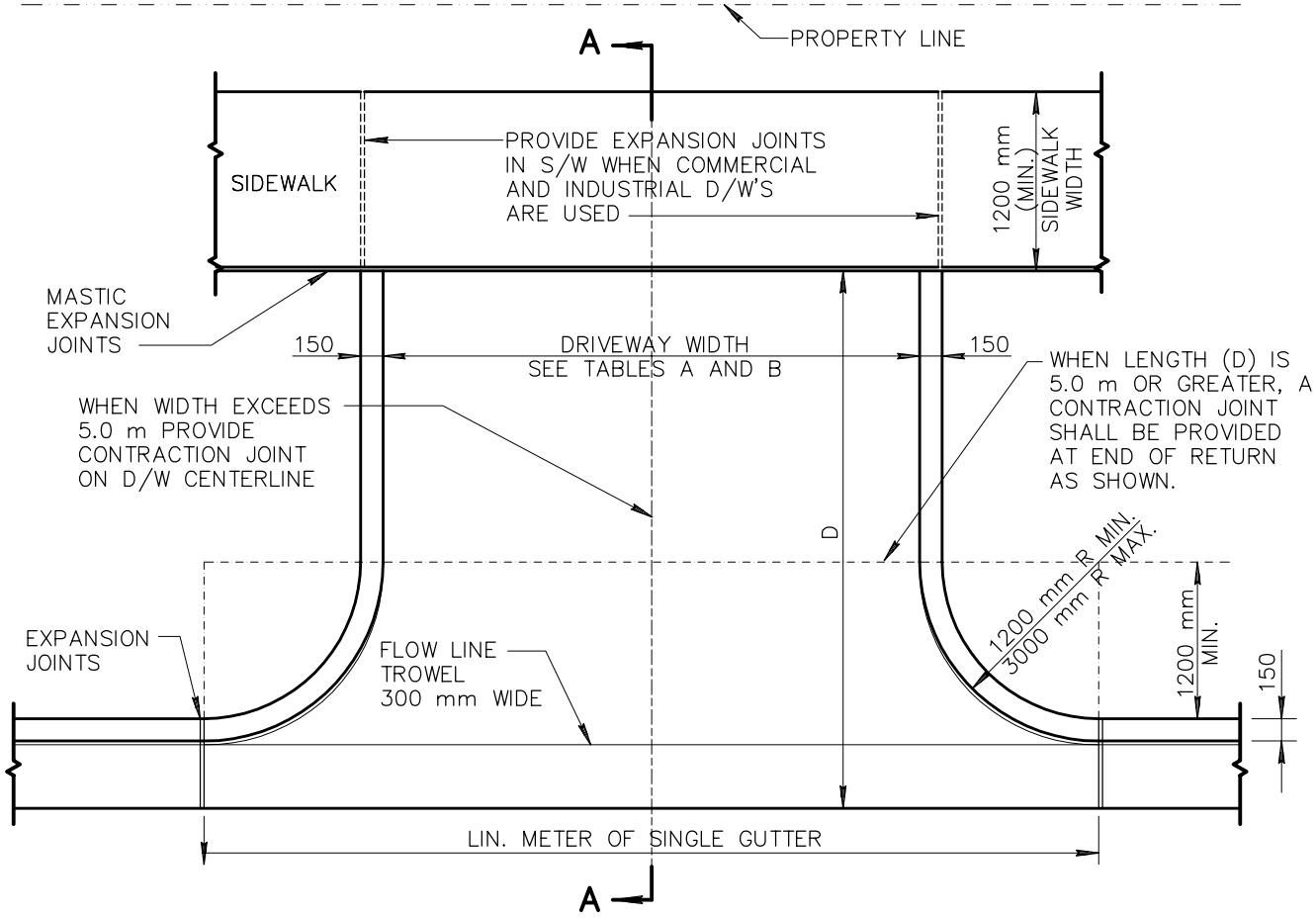
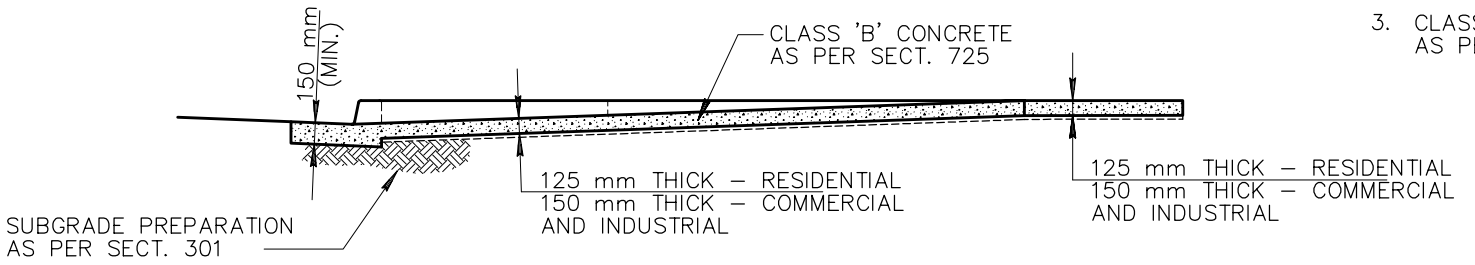


TABLE A		
ZONING	DRIVEWAY WIDTH	
	MIN.*	MAX.
COMMERCIAL	5.0 m	12.0 m
INDUSTRIAL	5.0 m	12.0 m
* 7.5 m WHERE 2-WAY TRAFFIC IS ANTICIPATED		

TABLE B		
ZONING	DRIVEWAY WIDTH	
RESIDENTIAL	MIN.*	MAX.
MAJOR STREET	5.0 m	9.0 m
COLLECTOR STREET	4.0 m	9.0 m
LOCAL STREET	4.0 m	9.0 m
* 5.0 m WIDTH IS DESIRABLE		

NOTES:

1. EXPANSION JOINT FILLER SHALL BE 13 mm BITUMINOUS TYPE PREFORMED EXPANSION JOINT FILLER, A.S.T.M. D-1751.
2. THIS TYPE D/W TO BE USED ONLY UPON APPROVAL OF ENGINEER.
3. CLASS 'B' CONCRETE CONSTRUCTION AS PER SECT. 725

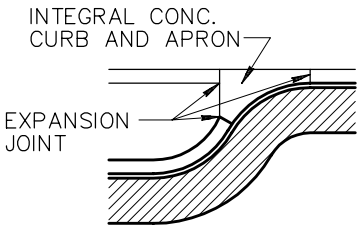


SECTION A-A

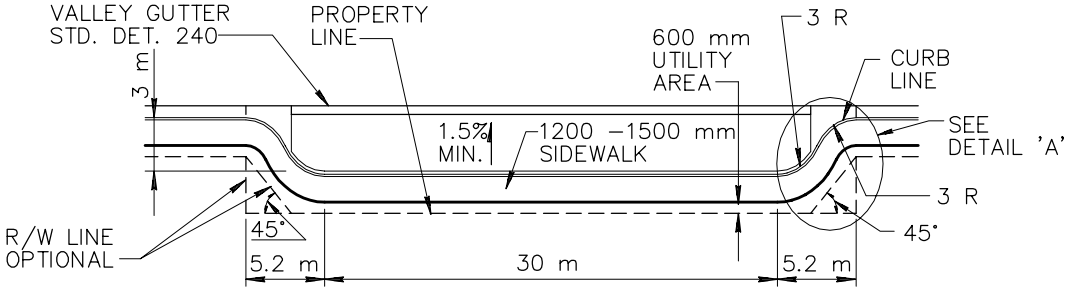
DETAIL NO.			REVISED	DETAIL NO.
251	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	RETURN TYPE DRIVEWAYS	01-01-2003	251

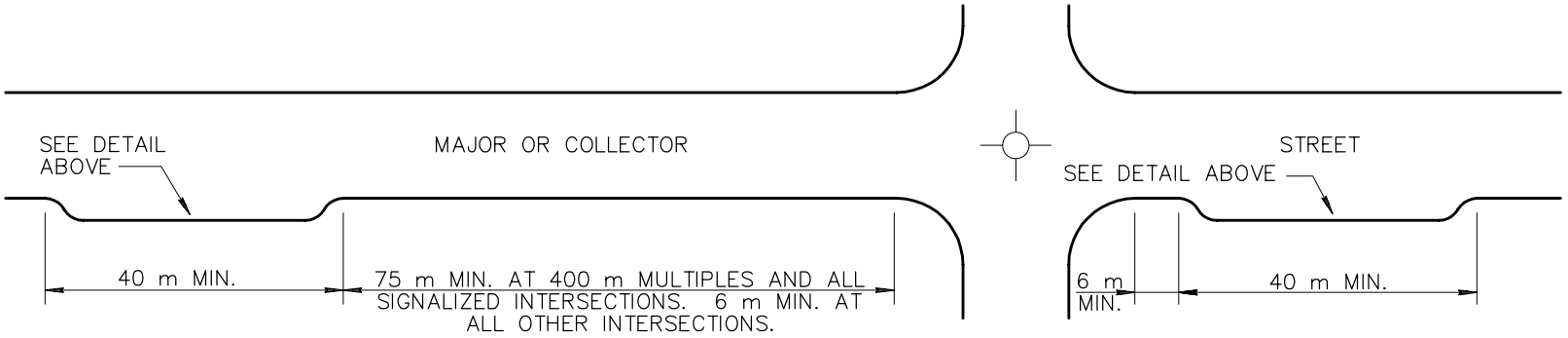
NOTES: (PARKING BAY)

1. SUFFICIENT RIGHT-OF-WAY MUST BE AVAILABLE TO CONSTRUCT PARKING BAY.
2. PARKING BAYS WILL NOT BE ALLOWED WHERE THEY CONFLICT WITH BUS STOPS.

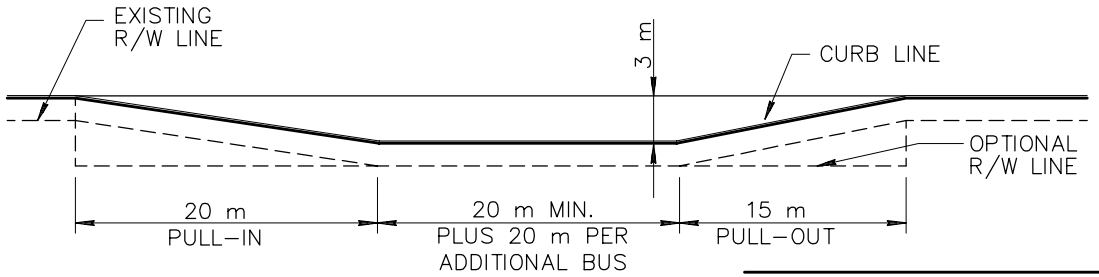


DETAIL 'A'





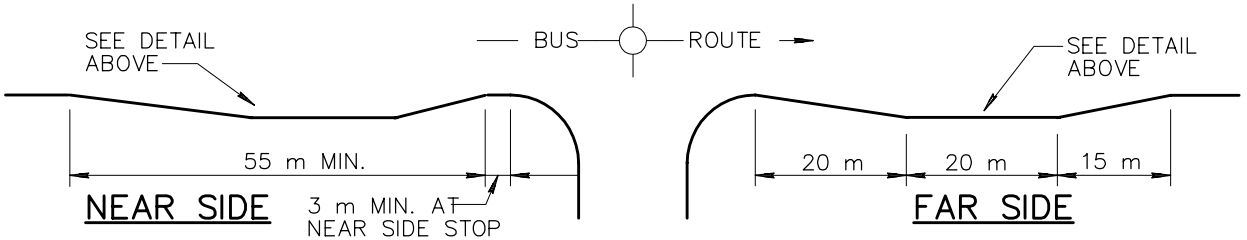
PARKING BAY



DETAIL

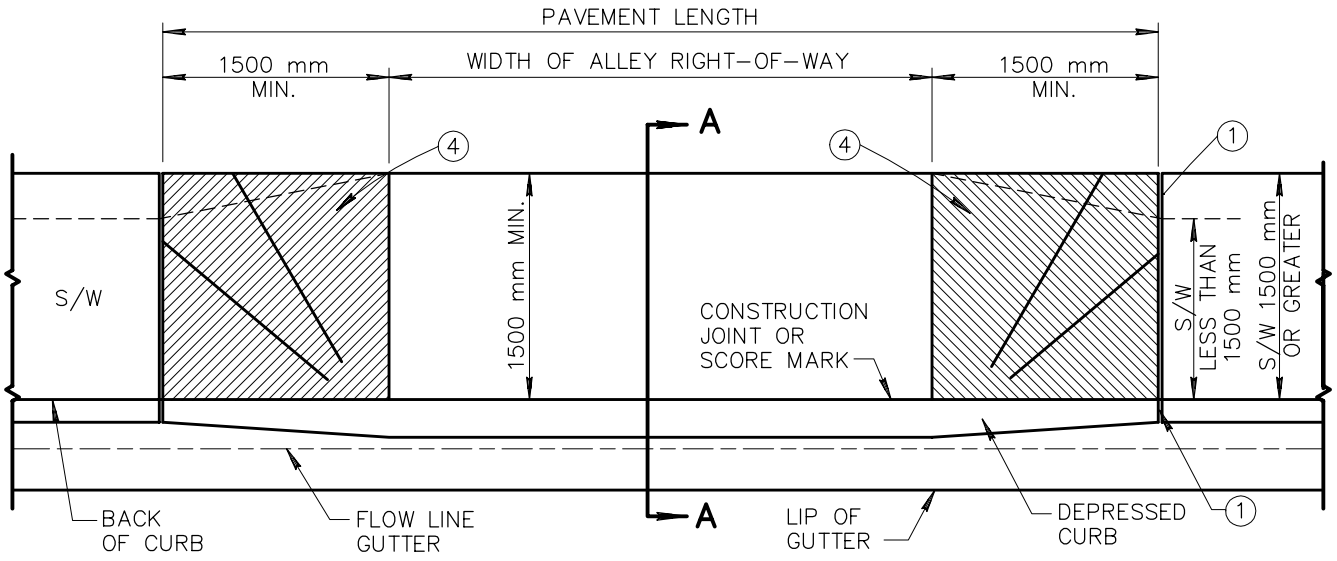
NOTES: (BUS BAY)

1. SUFFICIENT RIGHT-OF-WAY MUST BE AVAILABLE TO CONSTRUCT BUS BAY.
2. RADII, SIDEWALK, CURB AND GUTTER, PAVING SLOPE AND CONCRETE APRON SHALL BE CONSTRUCTED AS FOR PARKING BAYS.



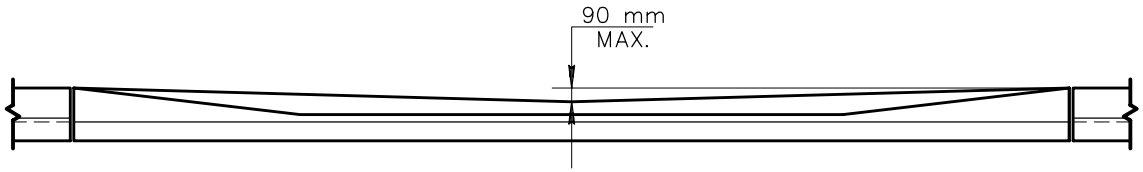
BUS BAY

DETAIL NO.			REVISED	DETAIL NO.
252	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**BUS AND PARKING BAYS**	3-06-2000	252

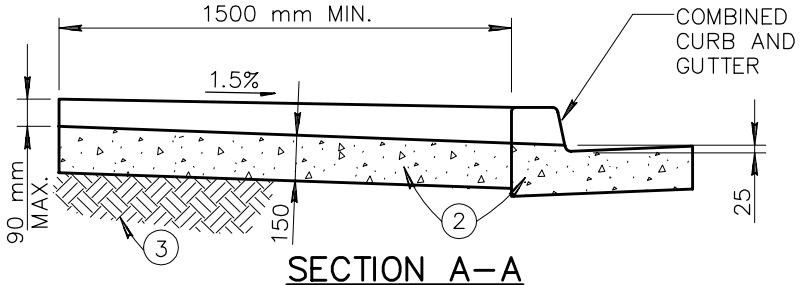


NOTES:

1. EXPANSION JOINTS SHALL CONFORM TO SECTION 340.
2. CLASS 'B' CONCRETE, PER SECT. 725.
3. SUBGRADE PREPARATION, PER SECT. 301.
4. 5mm GROOVES AT 25 mm O.C. FULL WIDTH OF 1500 mm WARP SECTION, EACH SIDE OF ALLEY ENTRANCE. SEE DETAIL NO. 1 ON TYPE 'D' RAMP DETAIL NO. 234.

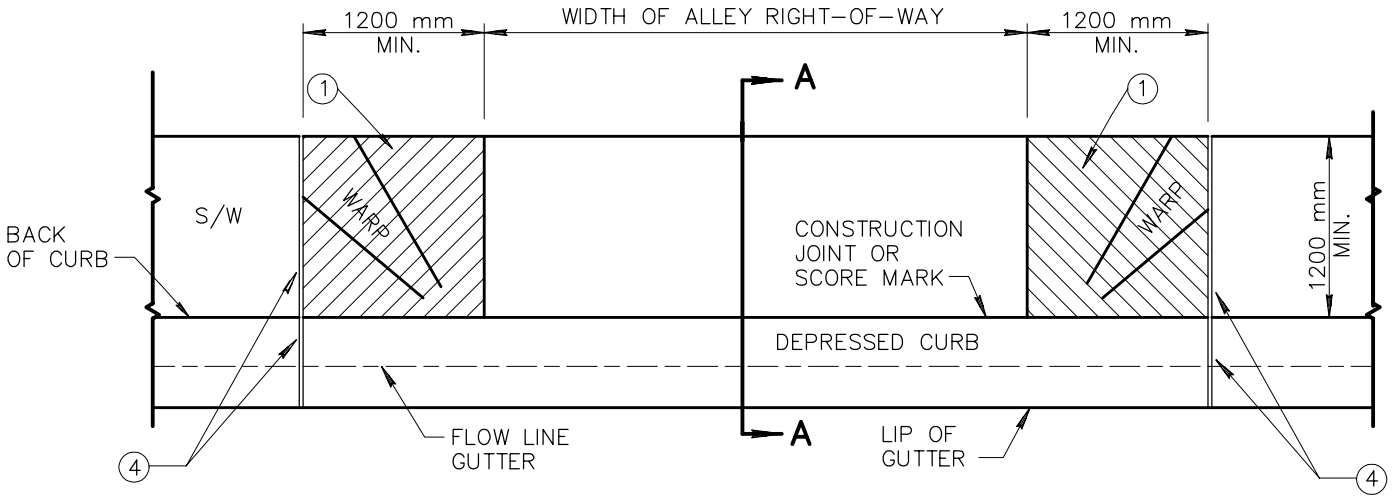


ELEVATION

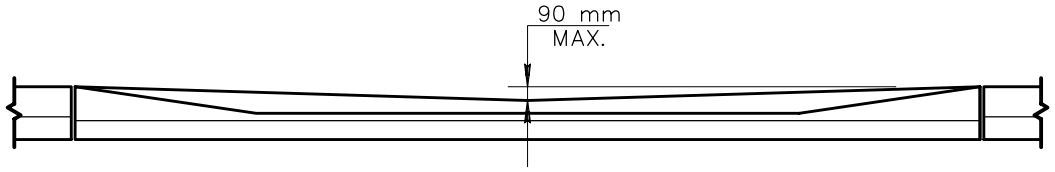


SECTION A–A

DETAIL NO.		REVISED	DETAIL NO.
260	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC** — **ALLEY ENTRANCE (WITH COMBINED CURB AND GUTTER)**	01–01–2003	260



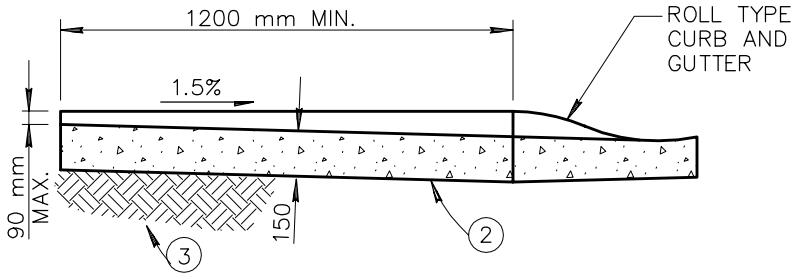
NOTE:



ELEVATION

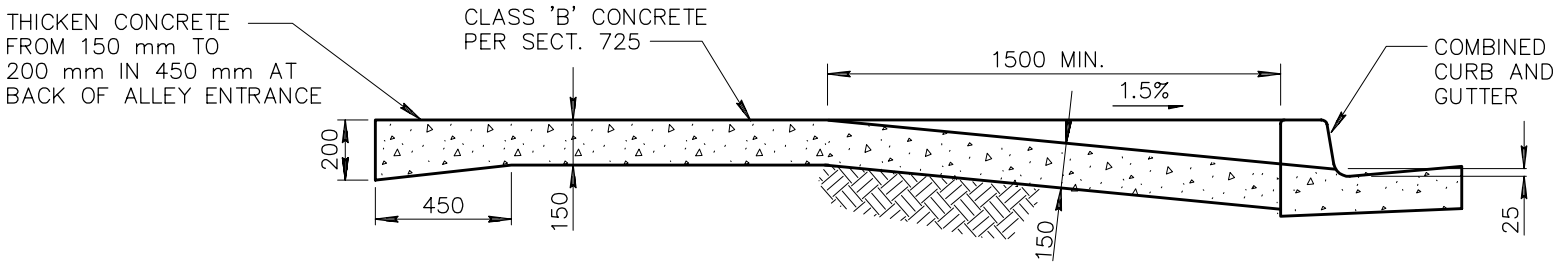
NOTES:

1. 5 mm GROOVES AT 25 mm O.C. FULL WIDTH OF 1200 mm WARP SECTION, EACH SIDE OF ALLEY ENTRANCE. SEE DETAIL NO. 1 ON TYPE 'D' RAMP DETAIL 234.
2. CLASS 'B' CONCRETE CONSTRUCTION PER SECT. 725.
3. SUBGRADE PREPARATION, PER SECT. 301.
4. EXPANSION JOINTS SHALL CONFORM TO SECT. 340.

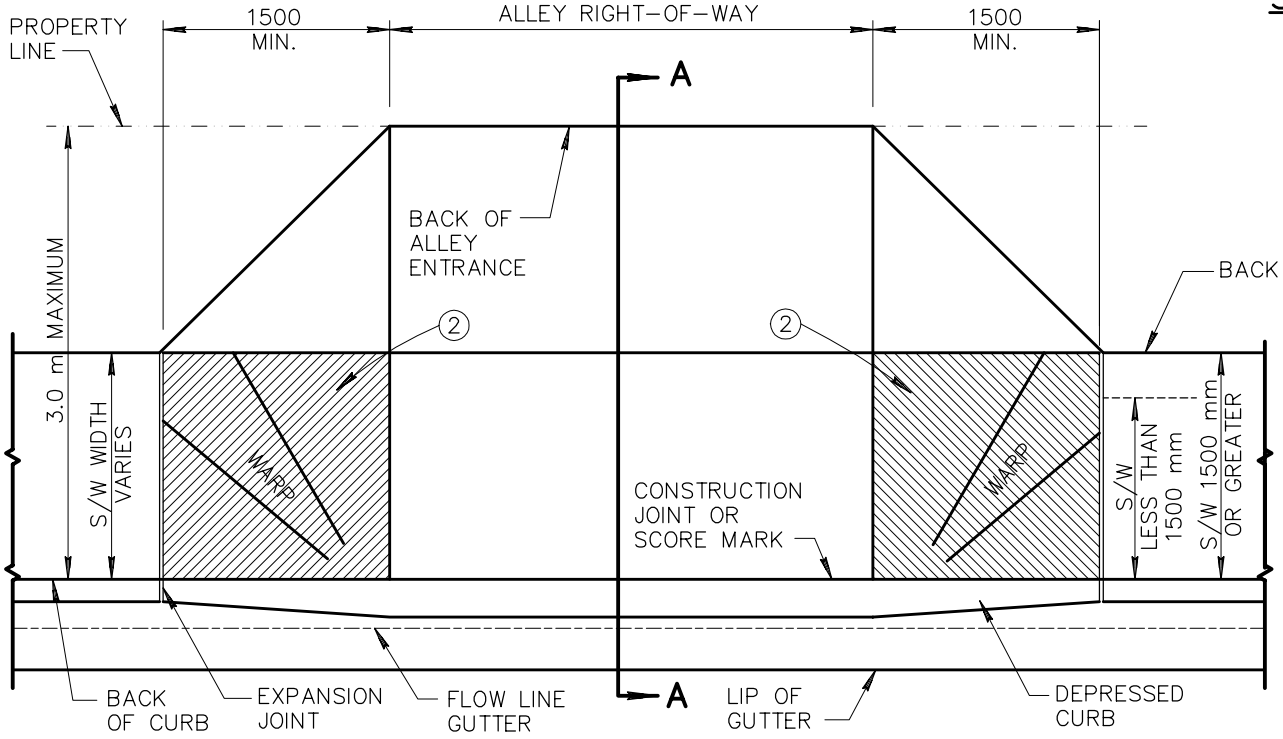


SECTION A–A

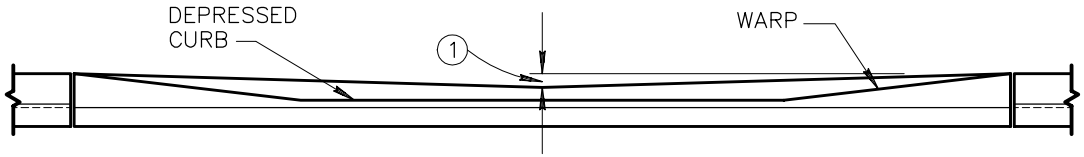
DETAIL NO.			REVISED	DETAIL NO.
261	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**ALLEY ENTRANCE (WITH ROLL TYPE CURB AND GUTTER)**	01–01–2003	261



SECTION A–A



PLAN



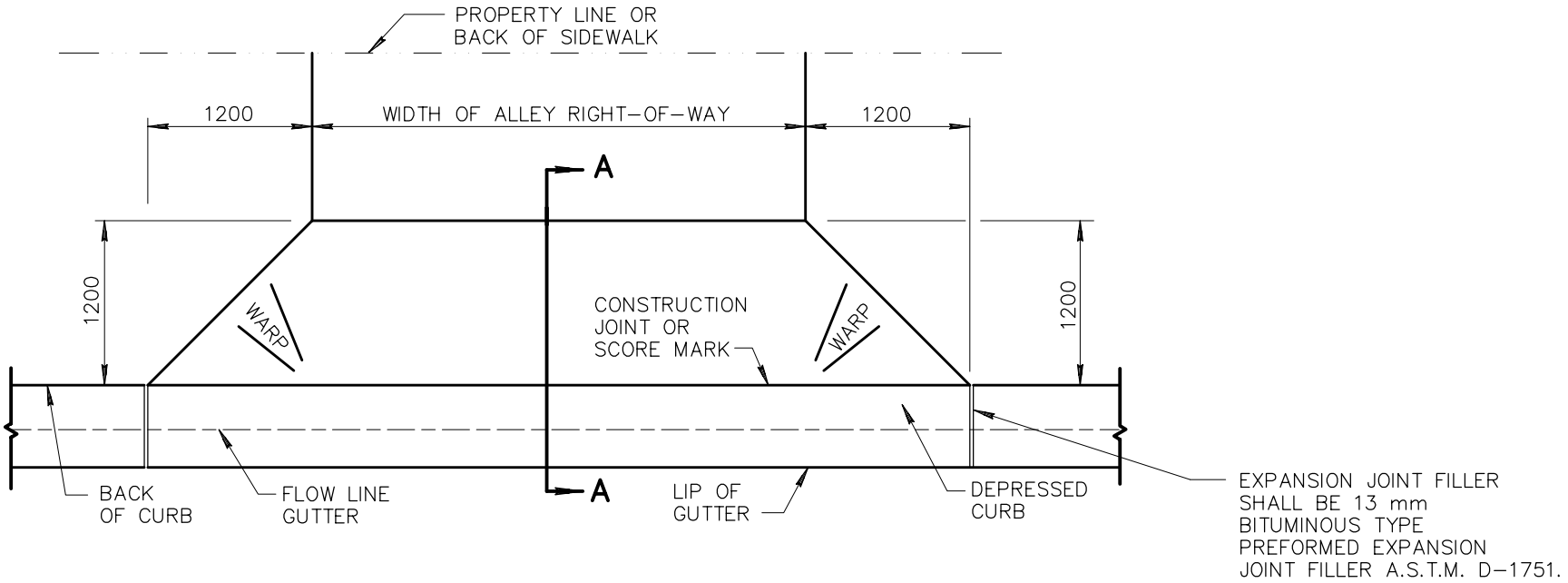
ELEVATION

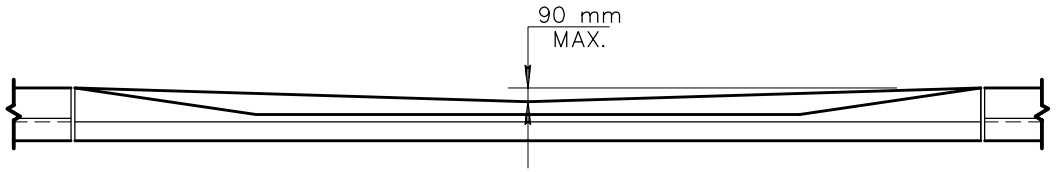
NOTES:

1. IF ALLEY ENTRANCE IS USED FOR DRAINAGE, THE CENTER BACK OF ALLEY ENTRANCE MAY BE DEPRESSED 50 mm FOR 100 mm CURB OR 75 mm FOR 150 mm CURB.

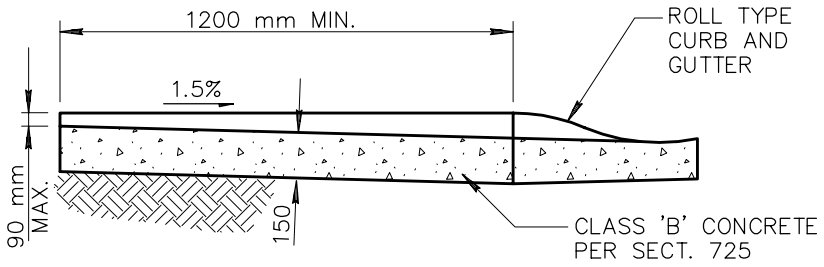
2. 5 mm GROOVES AT 25 mm O.C. FULL WIDTH OF 1500 mm WARP SECTION, EACH SIDE OF ALLEY ENTRANCE. SEE DETAIL NO. 1 ON TYPE 'D' RAMP DETAIL NO. 234.

DETAIL NO.			REVISED	DETAIL NO.
262	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**WING TYPE ALLEY ENTRANCE (WITH COMBINED CURB AND GUTTER)**	3-06-2000	262



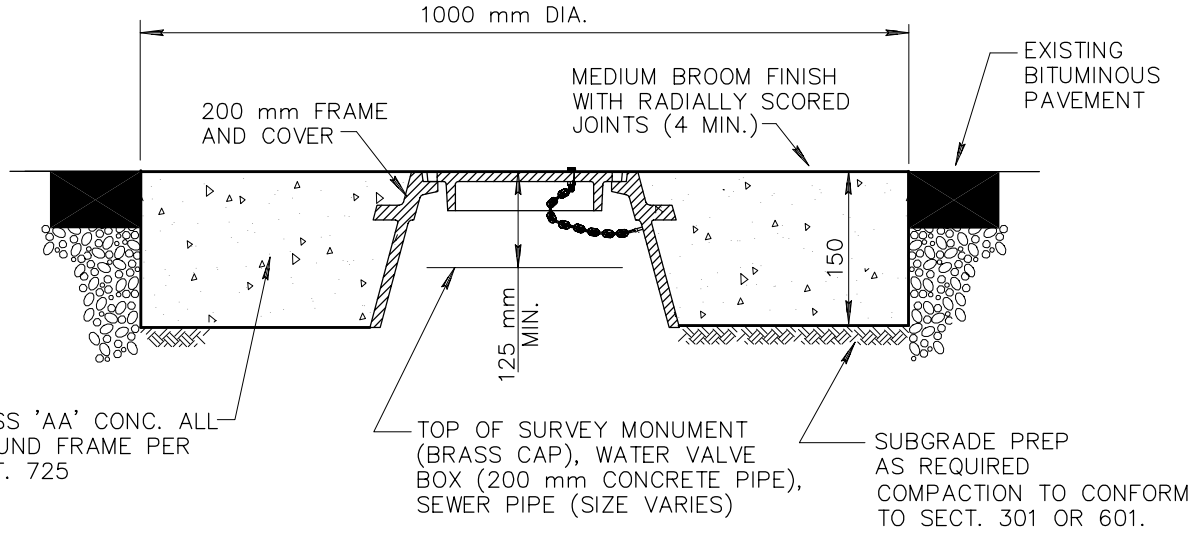


ELEVATION

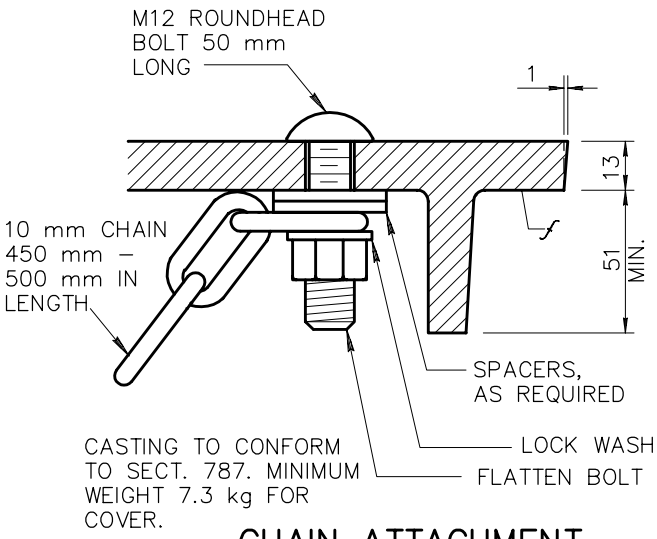


SECTION A–A

DETAIL NO.			REVISED	DETAIL NO.
263	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**WING TYPE ALLEY ENTRANCE (WITH ROLL TYPE CURB AND GUTTER)**	3-06-2000	263

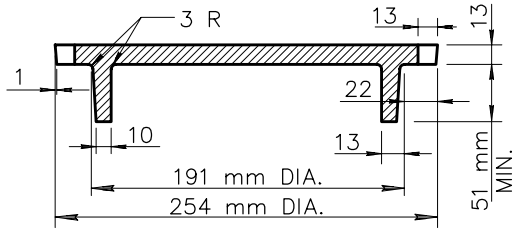


WATER VALVE, SURVEY MONUMENT, OR SEWER CLEAN OUT FRAME AND GRADE ADJUSTMENT



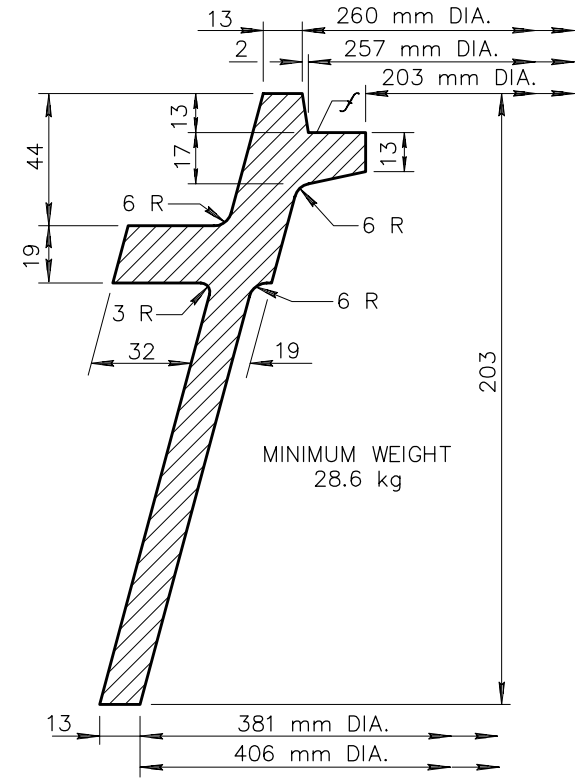
CHAIN ATTACHMENT
(AS REQUIRED)

LETTERS ON COVER TO BE AS FOLLOWS: "SEWER", "WATER", OR "SURVEY" AS DIRECTED TOTAL WIDTH OF WORD "SEWER" OR "WATER" 95 mm. TOTAL WIDTH OF WORD "SURVEY" 114 mm. LETTER SIZE 16x19 mm, RAISED 2 mm ABOVE LEVEL OF COVER, TYPE OF LETTERS TO BE SUBMITTED FOR APPROVAL.

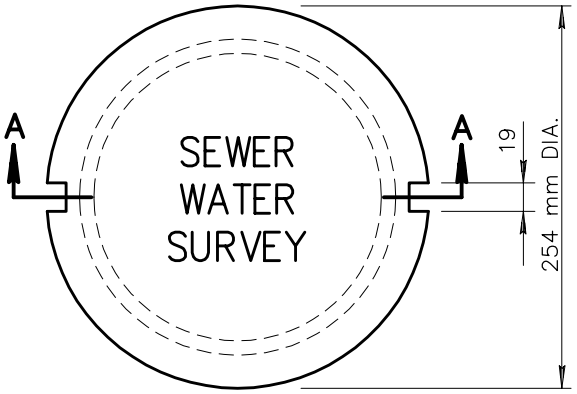


COVER SECTION A–A

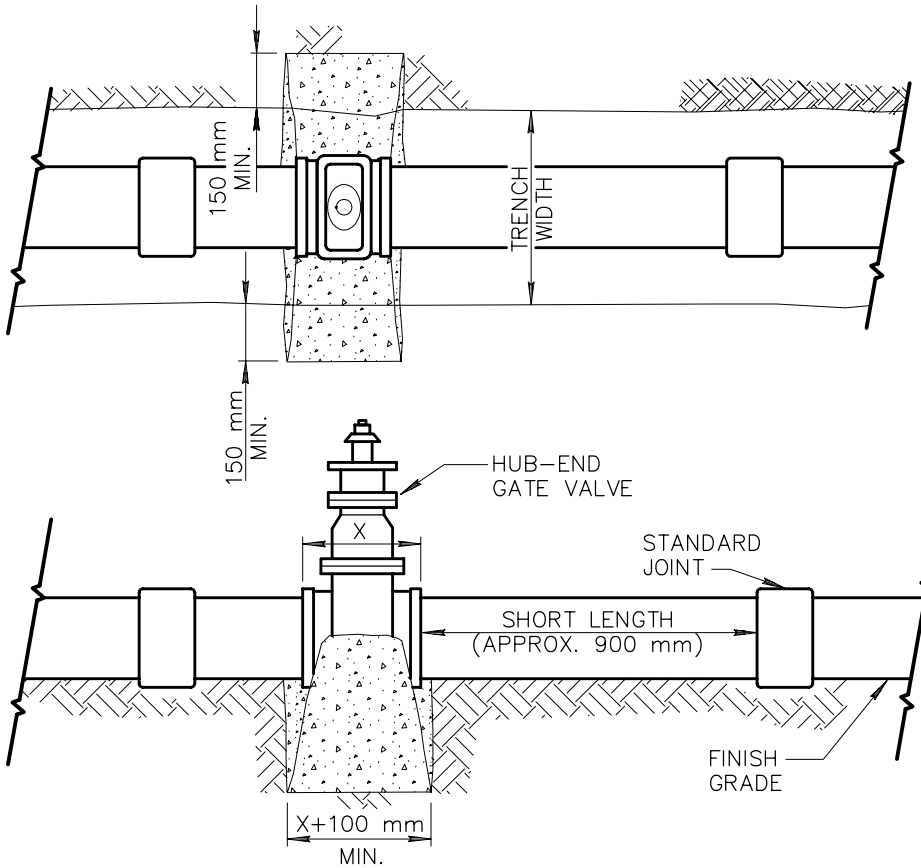
DETAIL TYPICAL FOR BOTH FRAME AND COVER



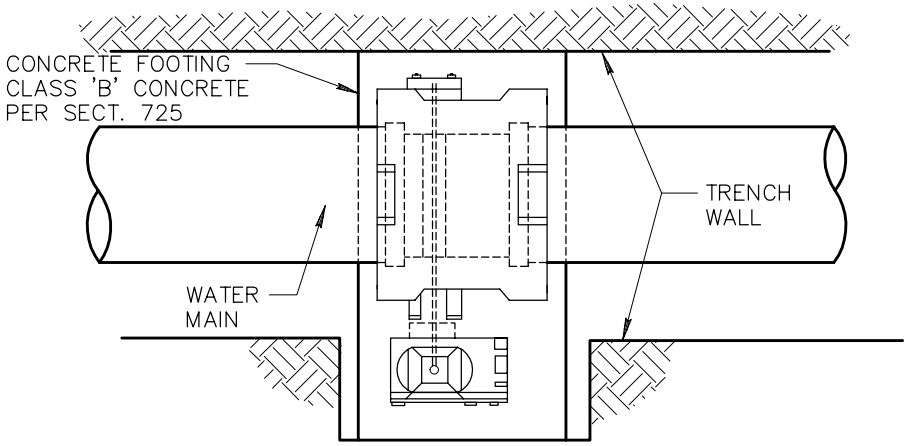
200 C.I. FRAME AND COVER

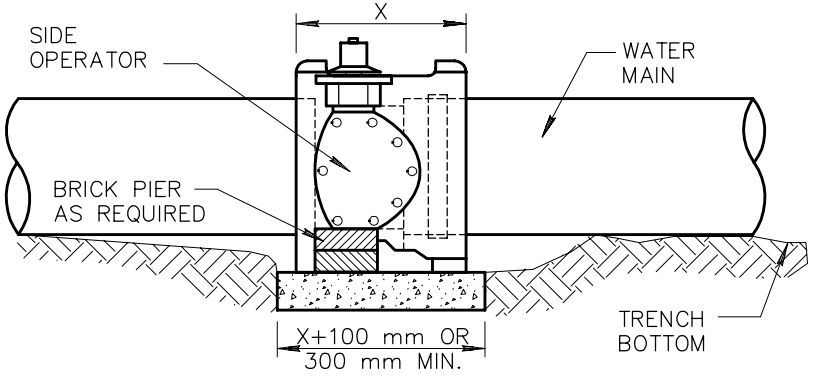


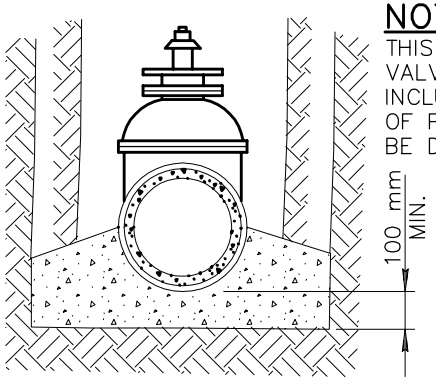
DETAIL NO.		STANDARD DETAIL	FRAME AND COVER INSTALLATION AND GRADE ADJUSTMENT	REVISED	DETAIL NO.
270	MARICOPA ASSOCIATION of GOVERNMENTS	METRIC		01-03-2002	270



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



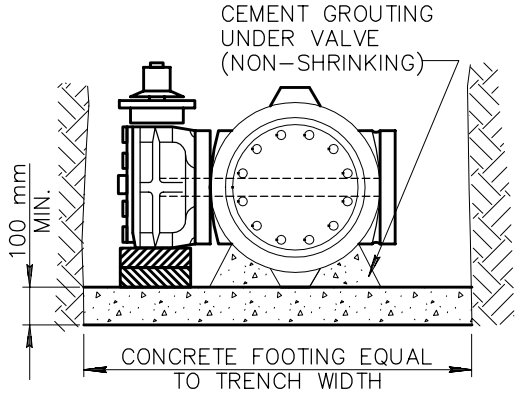




NOTE:

THIS DETAIL COVERS WATER GATE VALVES, 100 mm TO 300 mm INCLUSIVE, REGARDLESS OF TYPE OF PIPE USED. LARGER LINES TO BE DETAILED ON PLANS.

WATER GATE VALVE

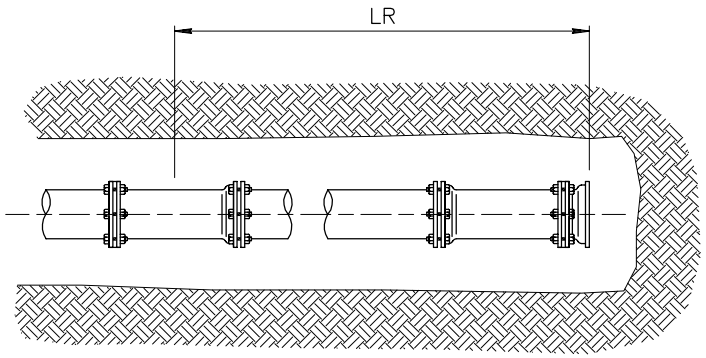


BUTTERFLY VALVE

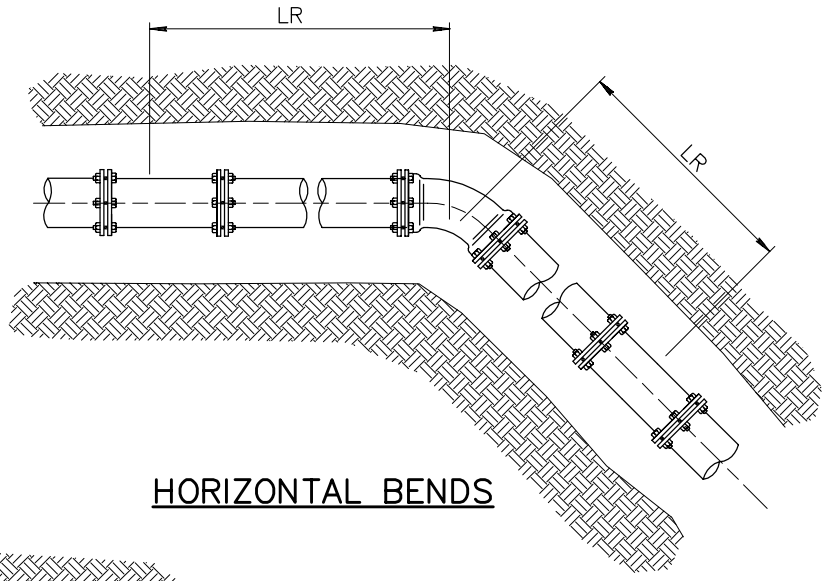
NOTES:

1. THIS DETAIL COVERS BUTTERFLY VALVE INSTALLATION, 75 mm TO 300 mm 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 METRIC	BLOCKING FOR WATER GATE AND BUTTERFLY VALVES	3-06-2000	301

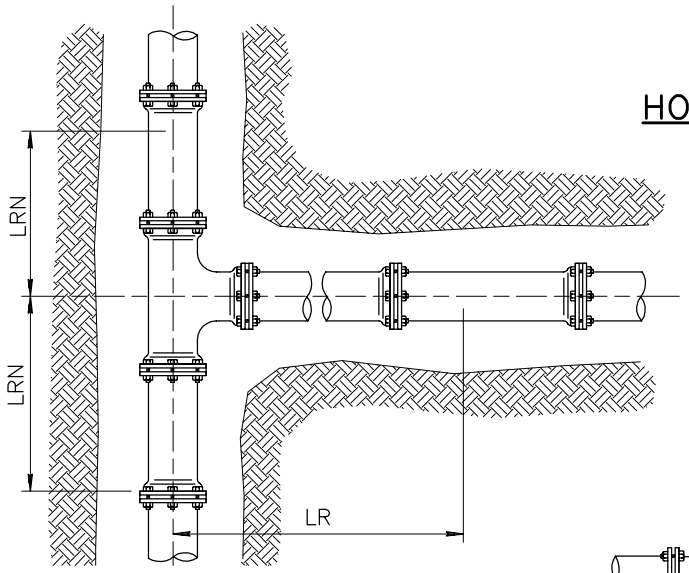


DEAD ENDS

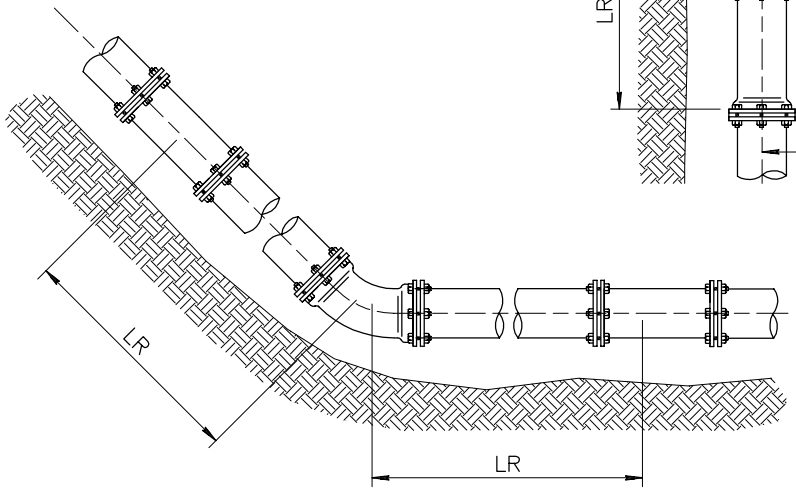


HORIZONTAL BENDS

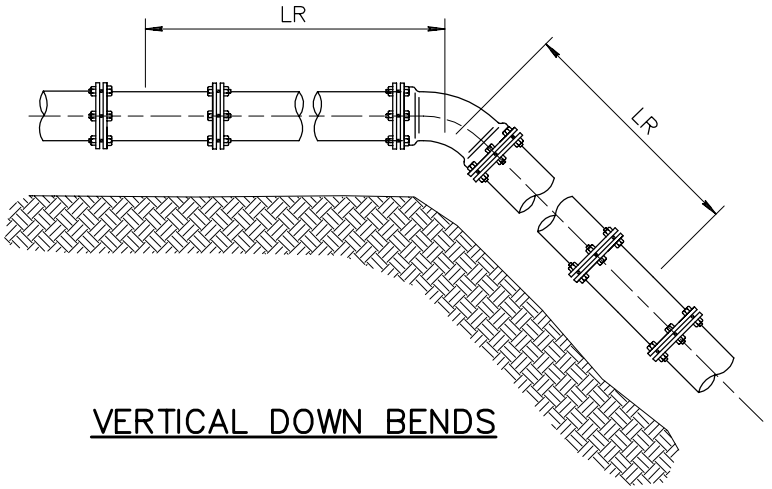
LRN = SHORTEST LENGTH OF PIPE RESTRAINED TO THE RUN OF THE TEE FITTING (BOTH SIDES OF TEE).



TEES



VERTICAL UP BEND



VERTICAL DOWN BENDS

DETAIL NO.			REVISED	DETAIL NO.
303-1	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**JOINT RESTRAINT FOR DUCTILE IRON AND POLYETHYLENE WRAPPED DUCTILE IRON WATER PIPES**	01-01-2003	303-1

RESTRAINED LENGTHS, LR, FOR DUCTILE IRON PIPE

NOMINAL PIPE SIZE (mm)	HORIZONTAL BENDS			TEES		VERTICAL OFFSETS						DEAD ENDS
						90° BEND FITTINGS		45° BEND FITTINGS		22 1/2° BEND FITTINGS		
	90°	45°	22°	LRN=0 m	LRN=3 m	DOWN BEND	UP BEND	DOWN BEND	UP BEND	DOWN BEND	UP BEND	
100	5.5	2.1	1.2	9.1	2.4	9.4	5.5	4.0	2.1	1.8	0.9	9.4
150	7.6	3.0	1.5	13.1	6.1	13.4	7.6	5.5	3.0	2.7	1.5	13.4
200	9.8	4.0	1.8	17.1	10.4	17.7	9.8	7.3	4.0	3.4	1.8	17.7
250	11.6	4.9	2.4	20.7	13.7	21.0	11.6	8.8	4.9	4.3	2.4	21.0
300	13.7	5.8	2.7	24.4	17.4	24.7	13.7	10.4	5.8	4.9	2.7	24.7
350	15.5	6.4	3.0	27.7	20.7	28.0	15.5	11.6	6.4	5.5	3.0	28.0
400	17.4	7.3	3.4	31.4	24.1	31.7	17.4	13.1	7.3	6.4	3.4	31.7
450	18.9	7.9	3.7	34.4	27.4	35.1	18.9	14.6	7.9	7.0	3.7	35.1
500	20.7	8.5	4.3	38.1	30.5	38.4	20.7	15.8	8.5	7.6	4.3	38.4
600	24.1	10.0	4.9	44.2	36.9	44.8	24.1	18.6	10.1	8.8	4.9	44.8

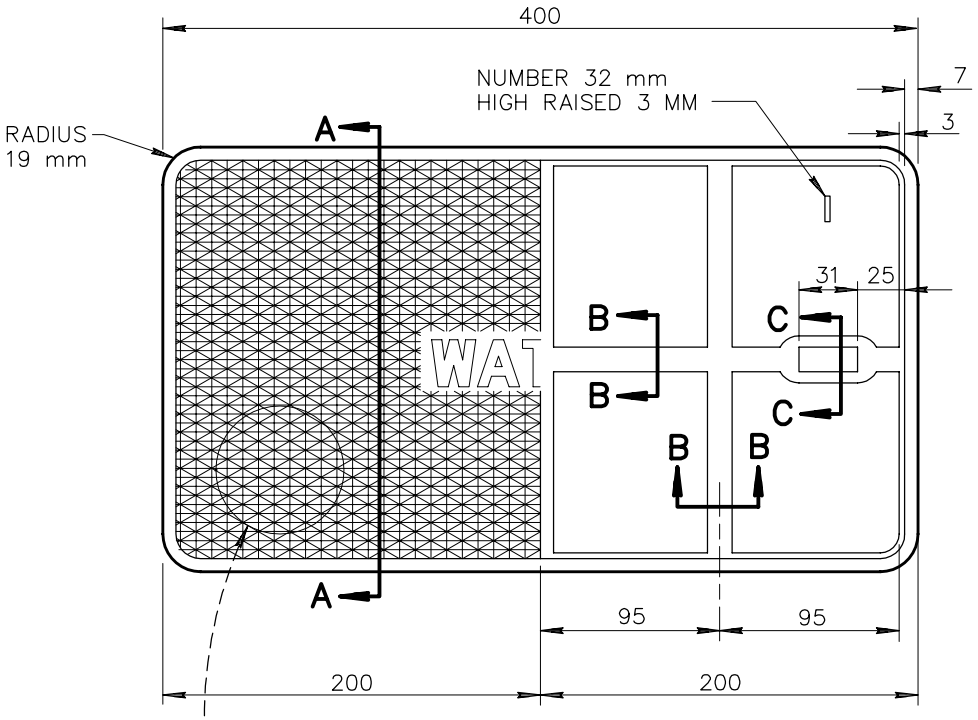
RESTRAINED LENGTHS, LR, FOR DUCTILE IRON PIPE WITH POLYETHYLENE WRAP

NOMINAL PIPE SIZE (mm)	HORIZONTAL BENDS			TEES		VERTICAL OFFSETS						DEAD ENDS
						90° BEND FITTINGS		45° BEND FITTINGS		22 1/2° BEND FITTINGS		
	90°	45°	22°	LRN=0 m	LRN=3 m	DOWN BEND	UP BEND	DOWN BEND	UP BEND	DOWN BEND	UP BEND	
100	7.9	3.4	1.5	21.0	5.5	21.9	7.9	9.1	3.4	4.3	1.5	21.9
150	11.0	4.6	2.1	30.2	14.3	31.1	11.0	12.8	4.6	6.1	2.1	31.1
200	14.3	5.8	2.7	39.6	23.8	40.5	14.3	16.7	5.8	7.9	2.7	40.5
250	17.1	7.0	3.4	47.9	31.4	48.5	17.1	20.1	7.0	9.8	3.4	48.5
300	19.8	8.2	4.0	56.4	39.9	57.0	19.8	23.5	8.2	11.3	4.0	57.0
350	22.6	9.4	4.6	64.3	47.5	65.2	22.6	27.1	9.4	12.8	4.6	65.2
400	25.0	10.4	4.9	72.5	55.8	73.5	25.0	30.5	10.4	14.6	4.9	73.5
450	27.4	11.3	5.5	80.2	63.1	81.1	27.4	33.5	11.6	16.2	5.5	81.1
500	29.9	12.5	6.1	88.1	71.0	89.0	29.9	36.9	12.5	17.7	6.1	89.0
600	34.4	14.3	6.7	102.7	85.3	103.6	34.4	43.0	14.3	20.7	6.7	103.6

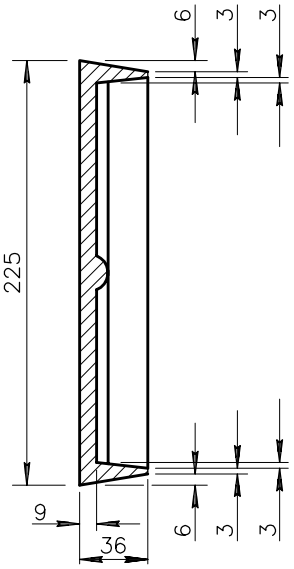
NOTES:

1. ALL JOINTS WITHIN THE SPECIFIED LENGTH LR MUST BE RESTRAINED. ALL LENGTHS ARE GIVEN IN METERS.
2. THE MAXIMUM TEST PRESSURE SHALL NOT EXCEED 1.38 MPa
3. THE MINIMUM DEPTH OF BURY SHALL BE 900 mm TO TOP OF PIPE.
4. RESTRAINED LENGTHS MAY BE REDUCED WHEN SUPPORTED BY ENGINEERING CALCULATIONS.

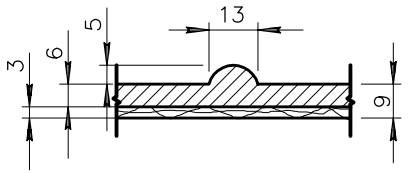
DETAIL NO.		STANDARD DETAIL		REVISED	DETAIL NO.
303-2	MARICOPA ASSOCIATION of GOVERNMENTS	METRIC	JOINT RESTRAINT FOR DUCTILE IRON AND POLYETHYLENE WRAPPED DUCTILE IRON WATER PIPES	01-01-2003	303-2



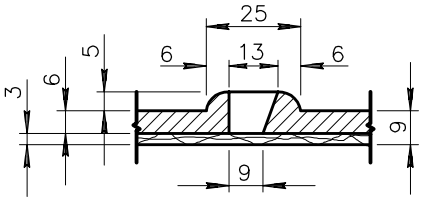
PLAN



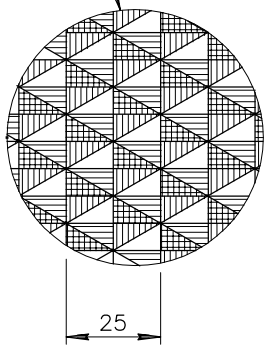
SECTION A–A



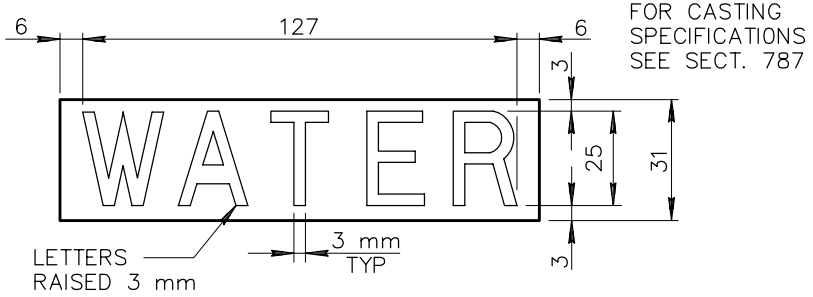
SECTION B–B



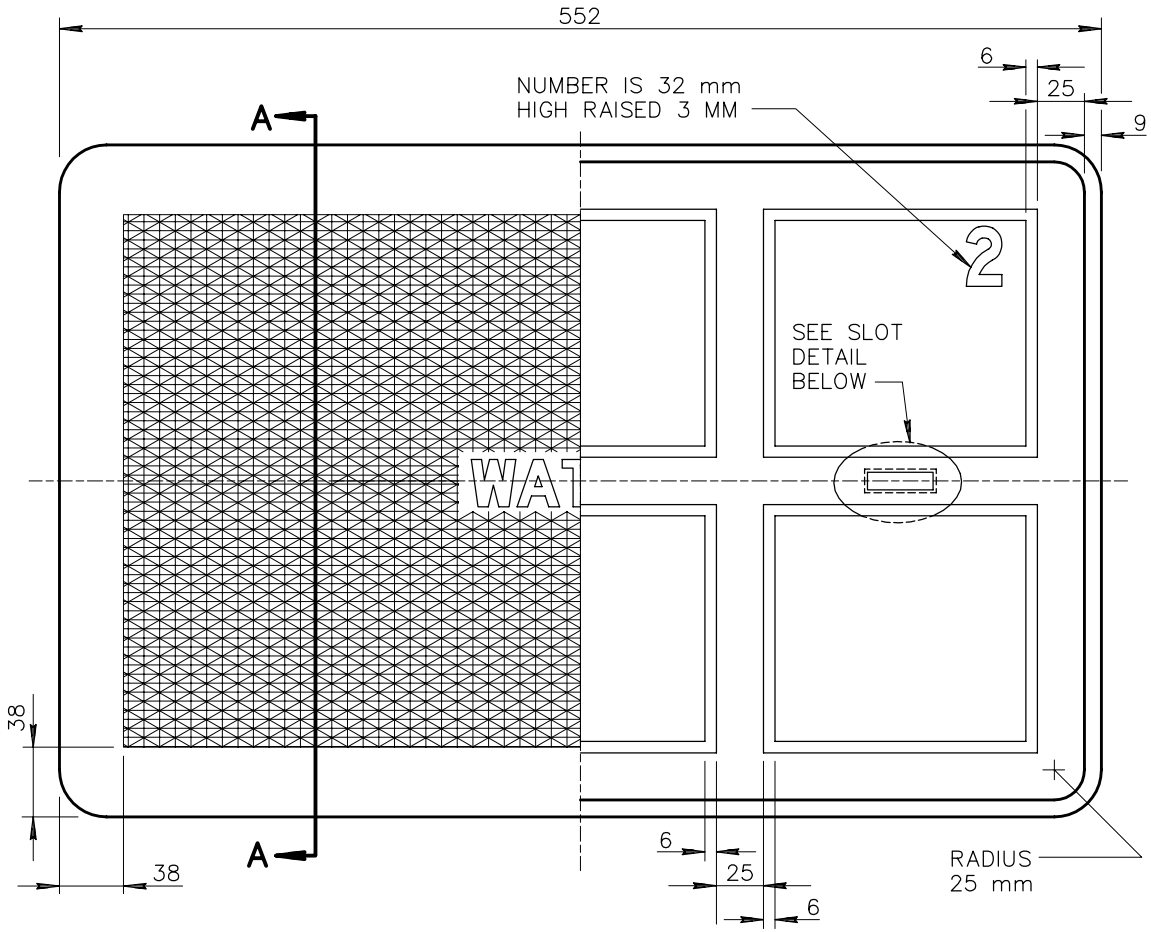
SECTION C–C

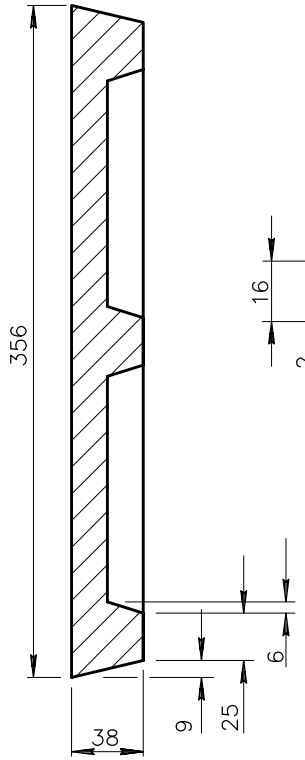


TOP OF COVER

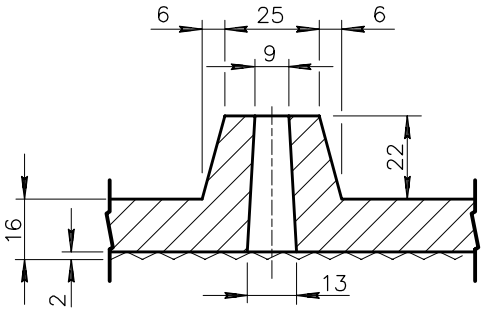


DETAIL NO.			REVISED	DETAIL NO.
310	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	CAST IRON WATER METER BOX COVER NO. 1	3-06-2000	310





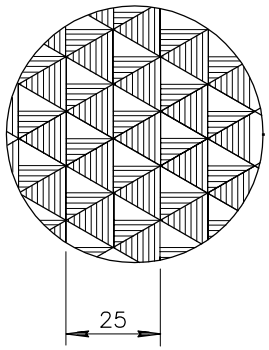
SECTION A–A



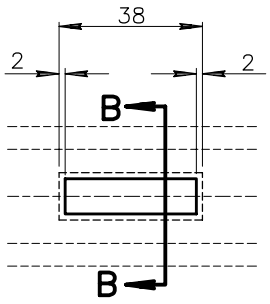
SECTION B–B

NOTE:

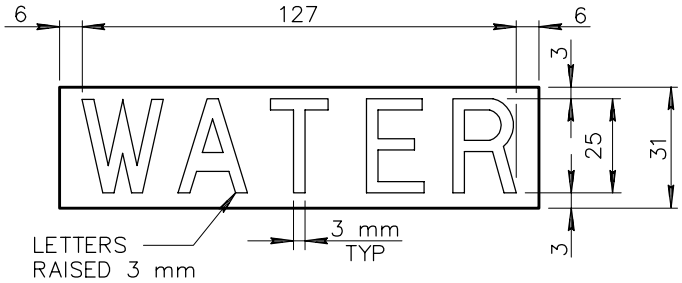
FOR CASTING SPECIFICATIONS
SEE SECT. 787.



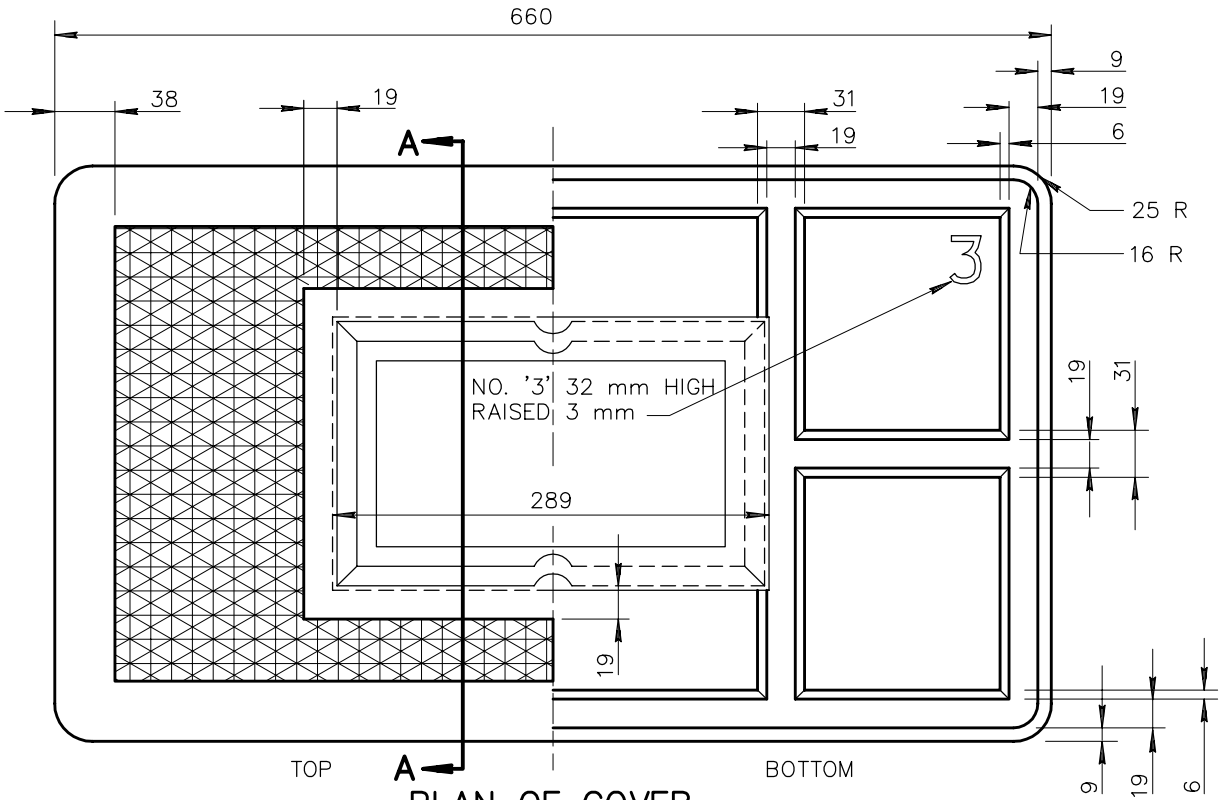
TOP OF COVER



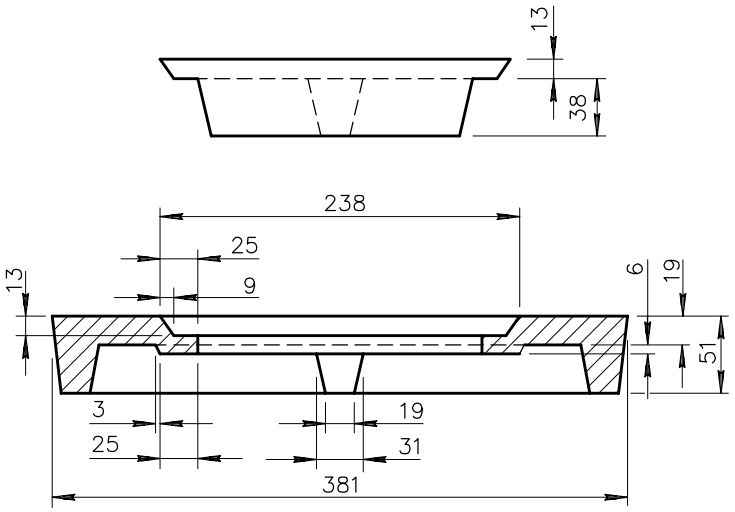
SLOT DETAIL



DETAIL NO.			REVISED	DETAIL NO.
311	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**CAST IRON WATER METER BOX COVER NO. 2**	3-06-2000	311



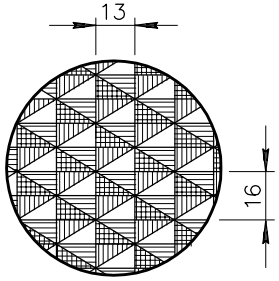
PLAN OF COVER



SECTION A–A

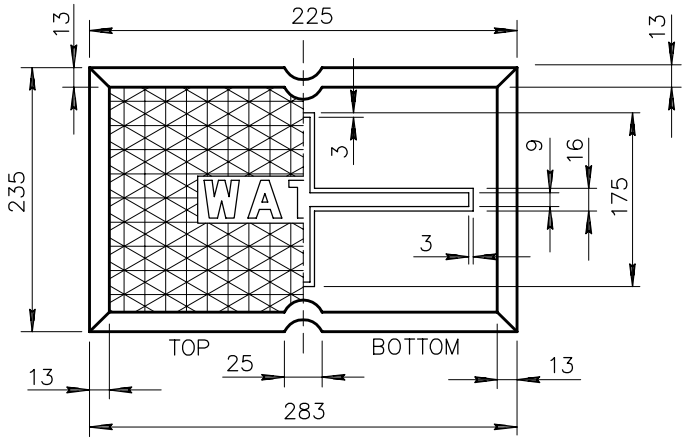
NOTES:

1. INSPECTION PLATE IS SAME AS USED WITH METER BOX COVER NO. 4.
2. FOR CASTING SPECIFICATIONS, SEE SECTION 787.

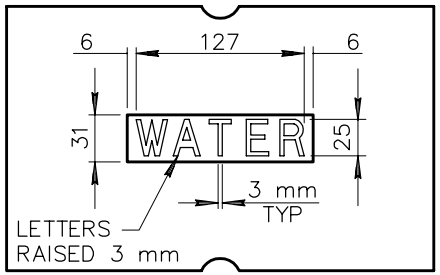


DETAIL

TOP OF COVER & PLATE

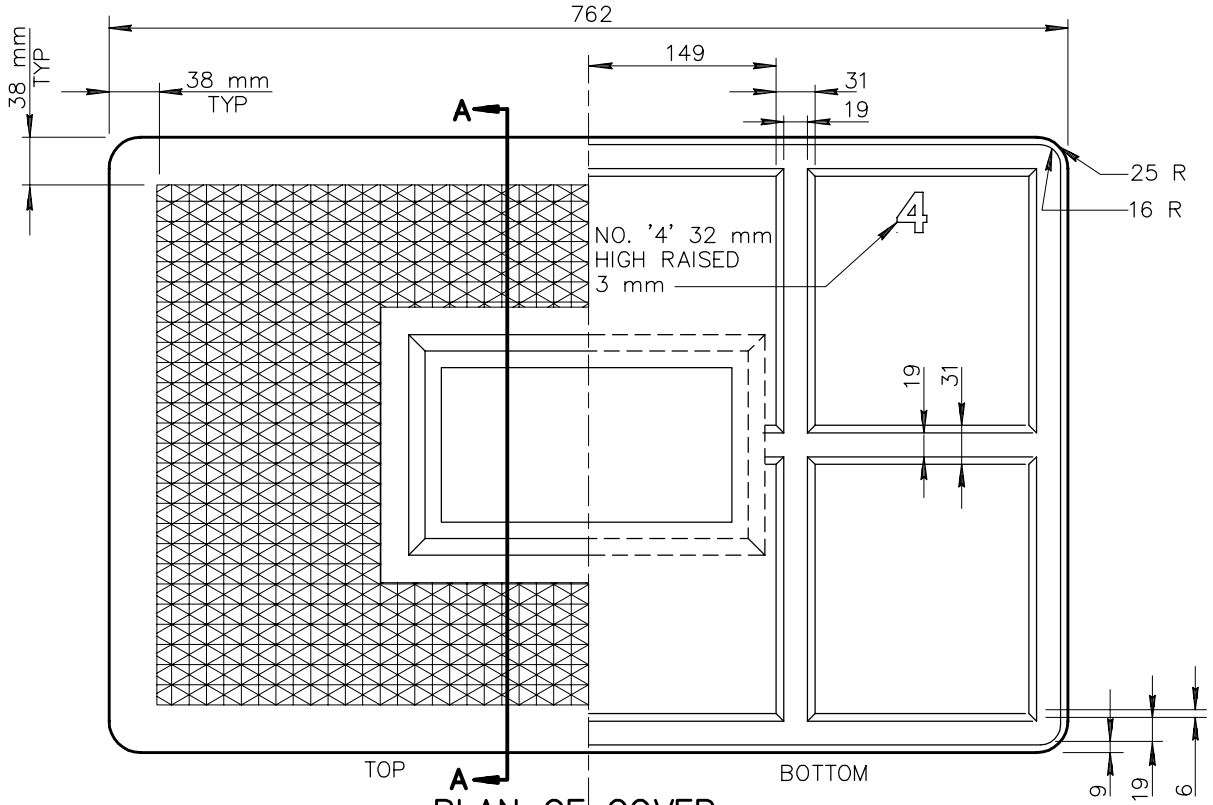


INSPECTION PLATE

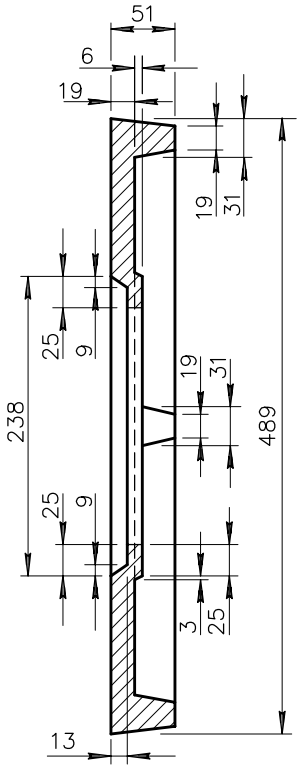


LETTERING DETAIL

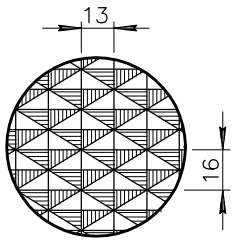
DETAIL NO.			REVISED	DETAIL NO.
312	MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL METRIC	CAST IRON WATER METER BOX COVER NO. 3	3-06-2000	312



PLAN OF COVER



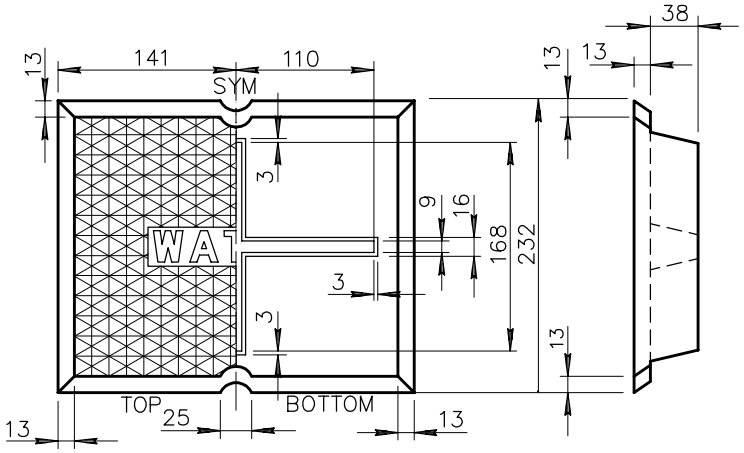
SECTION A–A



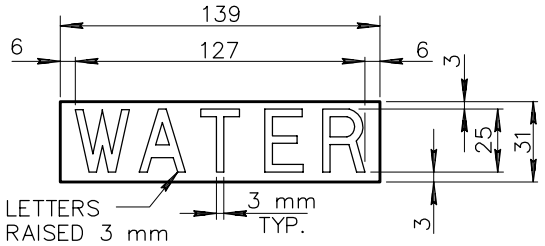
TOP OF COVER

NOTE:

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

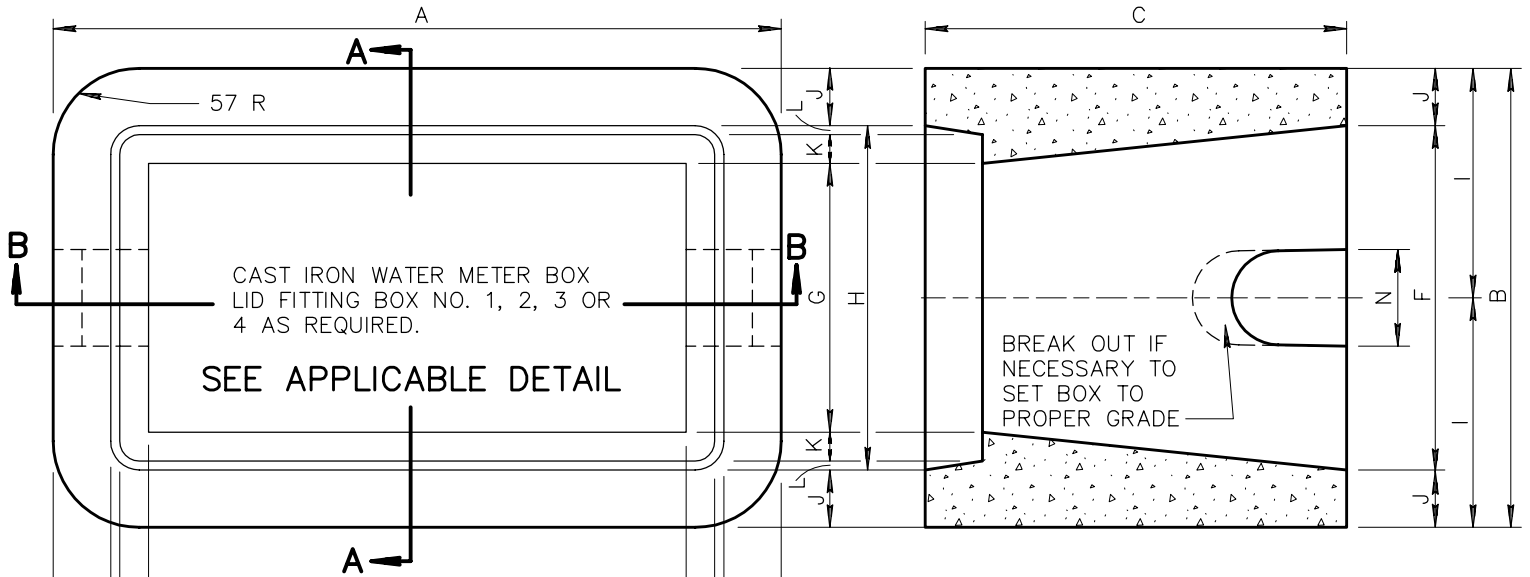


INSPECTION PLATE



LETTERING DETAIL

DETAIL NO.			REVISED	DETAIL NO.
313	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	CAST IRON WATER METER BOX COVER NO. 4	3-06-2000	313

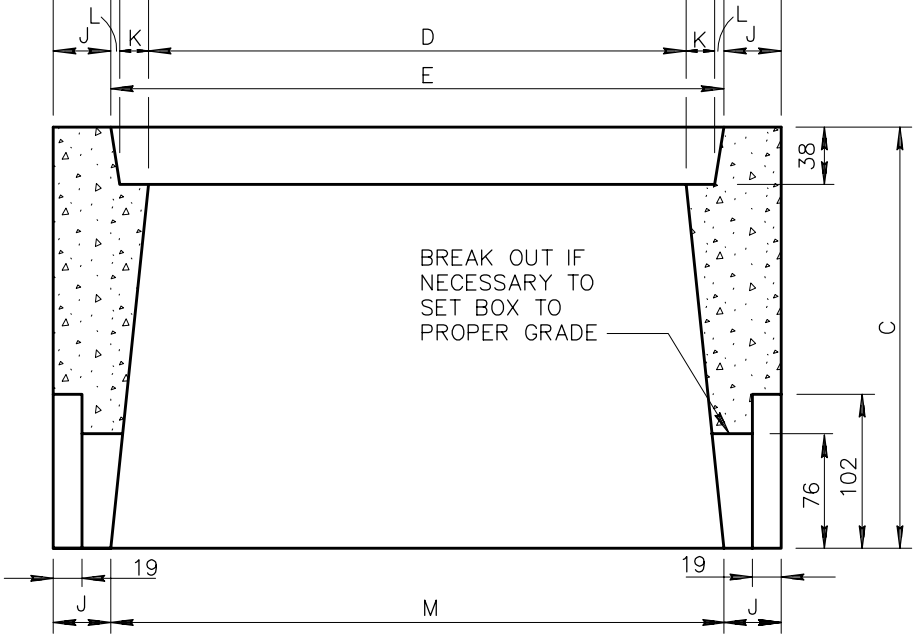


PLAN VIEW

SECTION A–A

NOTES:

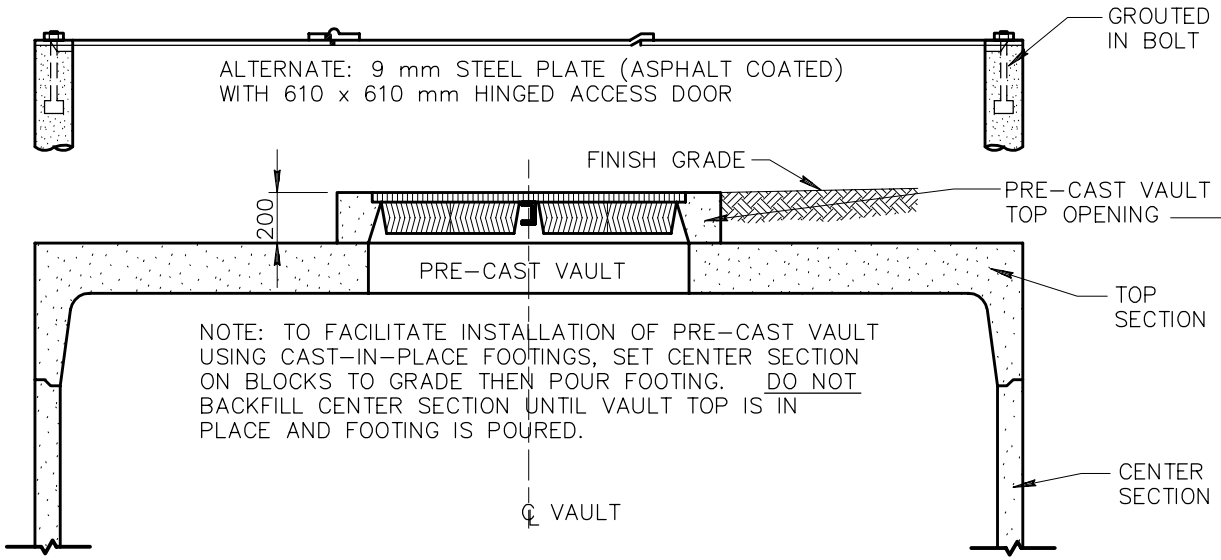
1. THE METER BOXES SHALL CONFORM TO THE DIMENSIONS AS SHOWN AND SHALL BE MADE OF PORTLAND CEMENT CONCRETE POURED AND TAMPED (OR VIBRATED) IN TRUE FORMS.
2. USE CLASS 'AA' CONCRETE PER SECT. 725.



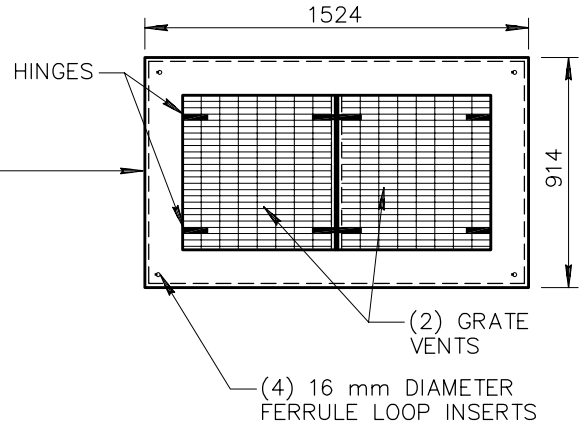
SECTION B–B

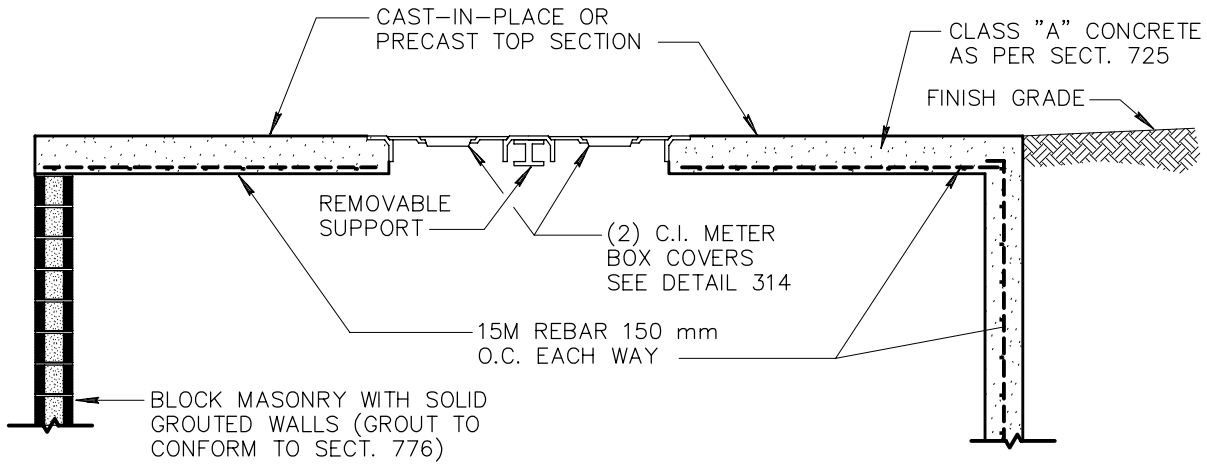
METER BOX DIMENSIONS				
DIMS	BOX NUMBER			
	1	2	3	4
A	482	622	749	851
B	305	426	470	578
C	279	305	330	305
D	356	482	603	705
E	406	560	673	775
F	228	337	381	502
G	178	286	324	432
H	228	362	394	502
I	152	213	235	289
J	38	44	44	38
K	19	28	25	25
L	6	9	9	9
M	406	534	648	775
N	64	89	102	102
	16 mm OR 19 mm METER	25 mm METER	38 mm METER	50 mm METER

DETAIL NO.			REVISED	DETAIL NO.
320	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	CONCRETE WATER METER BOXES	3-06-2000	320



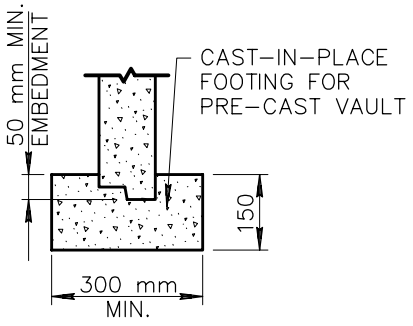
PRE-CAST VAULT SECTION

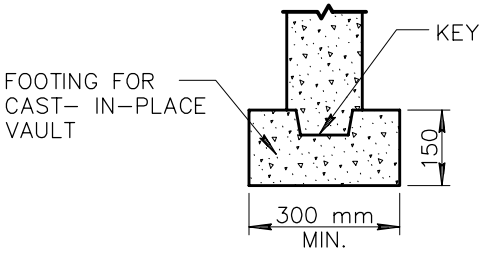




BLOCK MASONRY MAY BE USED IN LIEU OF CAST-IN-PLACE VAULT WALLS, 15M REBAR IN EVERY OTHER CORE.

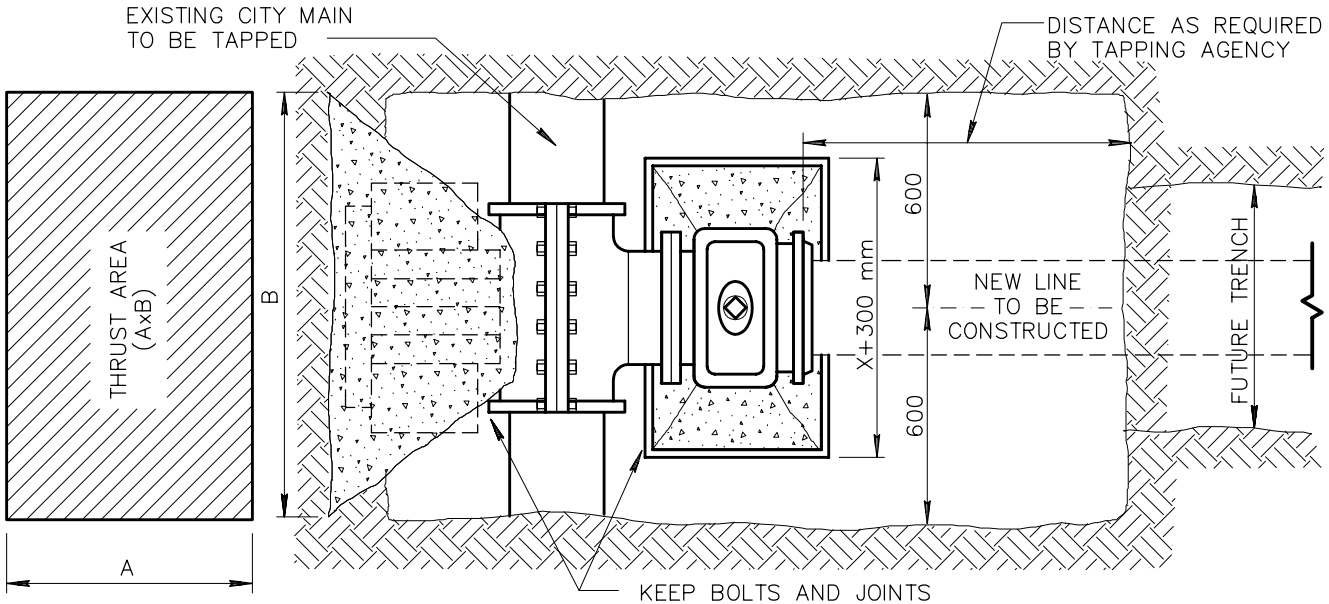
CAST-IN-PLACE VAULT SECTION





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

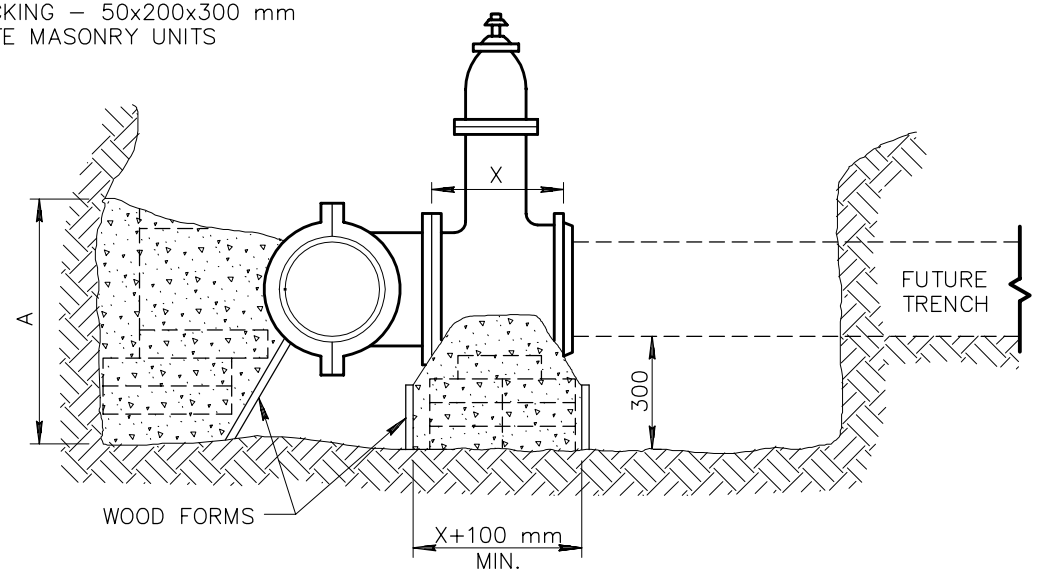
DETAIL NO.			REVISED	DETAIL NO.
321	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	STANDARD WATER METER VAULT	3-06-2000	321



PLAN

CONCRETE: CLASS 'B' PER SECT. 725 NORMALLY, CURE 24 HOURS BEFORE BACKFILLING.

OPTIONAL BLOCKING – 50x200x300 mm SOLID CONCRETE MASONRY UNITS AS INDICATED.



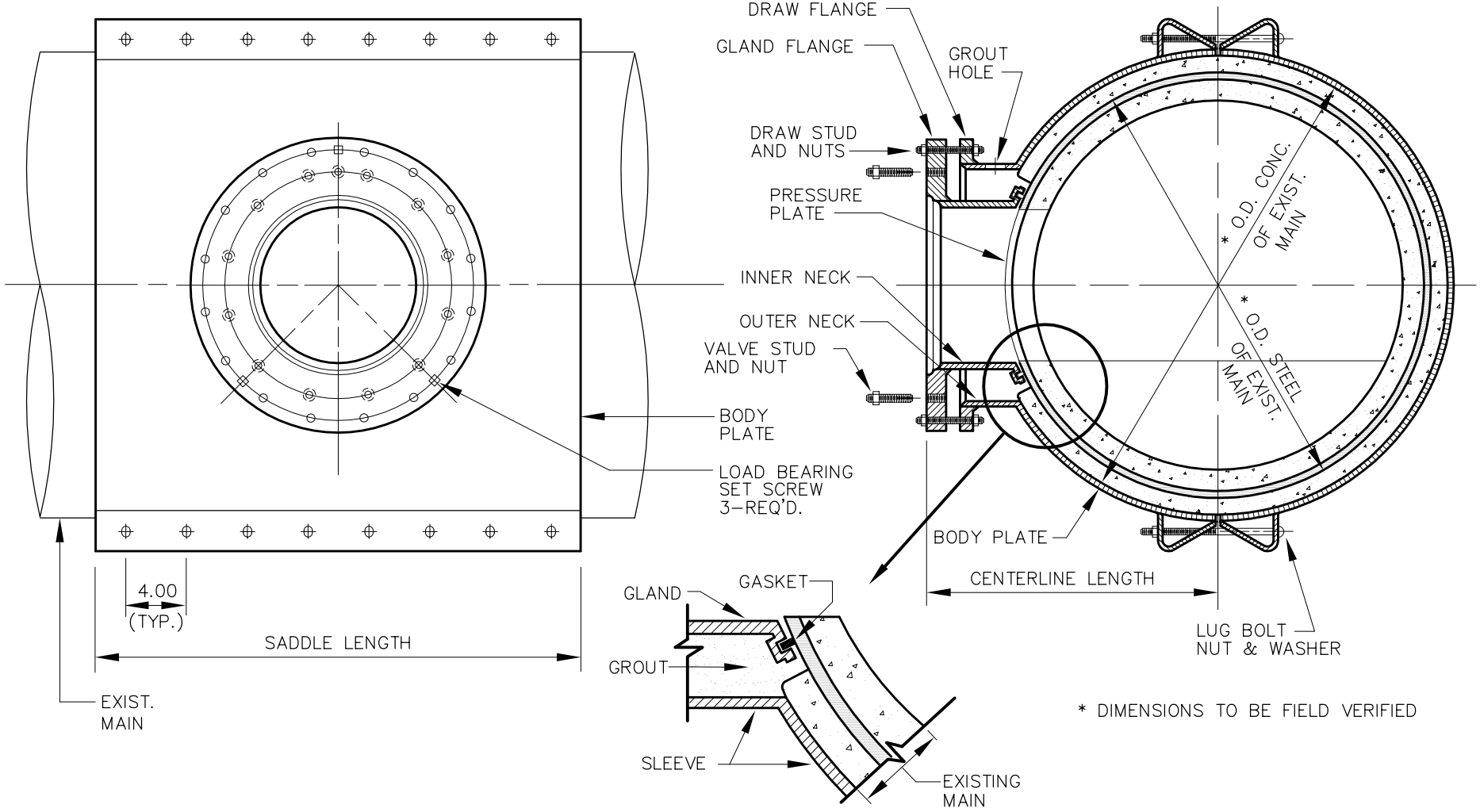
ELEVATION

NOTES:

1. TAPPING SLEEVE TO BE PLACED A MINIMUM OF 450 mm 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. TAPS SHALL BE MADE BY CITY CREWS AT PREVAILING RATES OR BY APPROVED CONTRACTORS WHEN ALLOWED BY CITY.
6. THIS DETAIL COVERS TAPPING SLEEVES 100 mm THROUGH 400 mm 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.

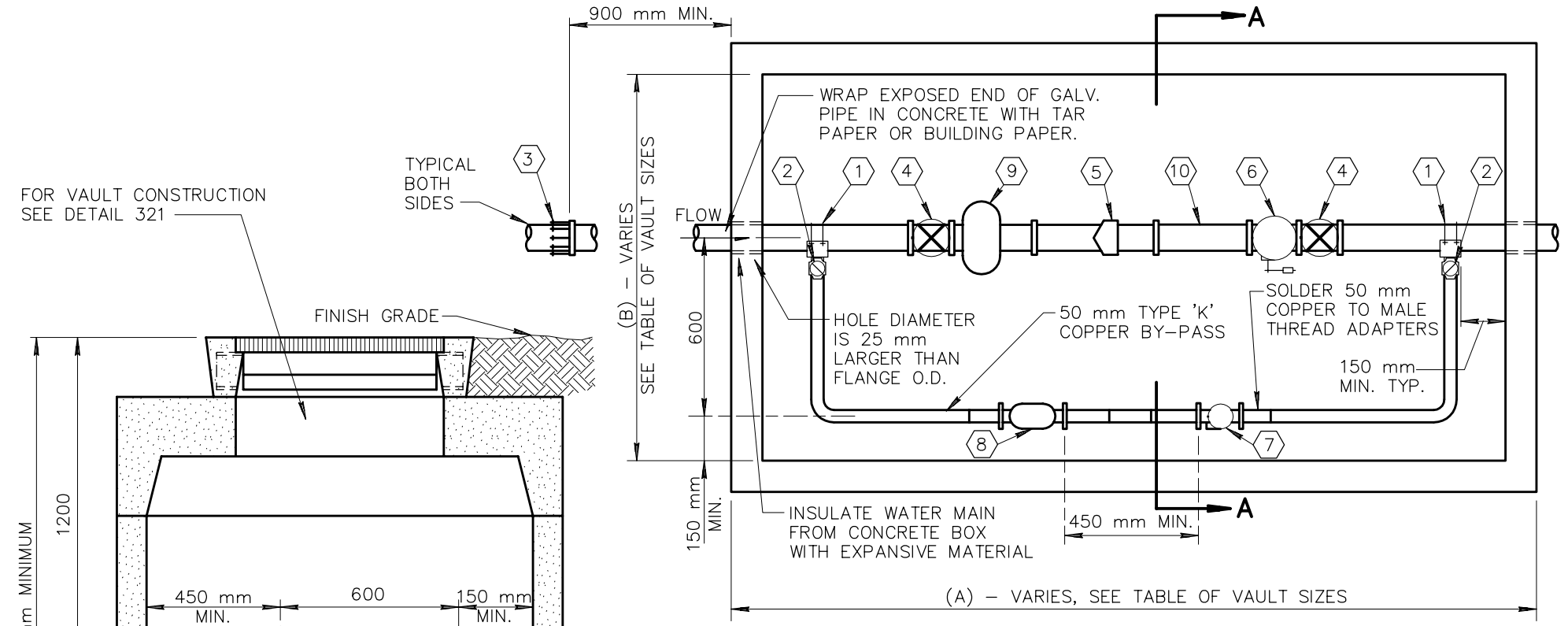
SIZE OF PIPE BEING CONNECTED (mm)	MINIMUM THRUST AREA REQUIRED EQUALS (AxB) (m^2)
100 AND LESS	0.28
150	0.37
200	0.56
250	0.84
300	1.21
400	2.14

DETAIL NO.			REVISED	DETAIL NO.
340	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	INSTALLING TAPPING SLEEVES AND VALVES	3-06-2000	340



* DIMENSIONS TO BE FIELD VERIFIED

DETAIL NO.			REVISED	DETAIL NO.
342	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	CONCRETE PRESSURE PIPE TAPPING SLEEVE	3–06–2000	342

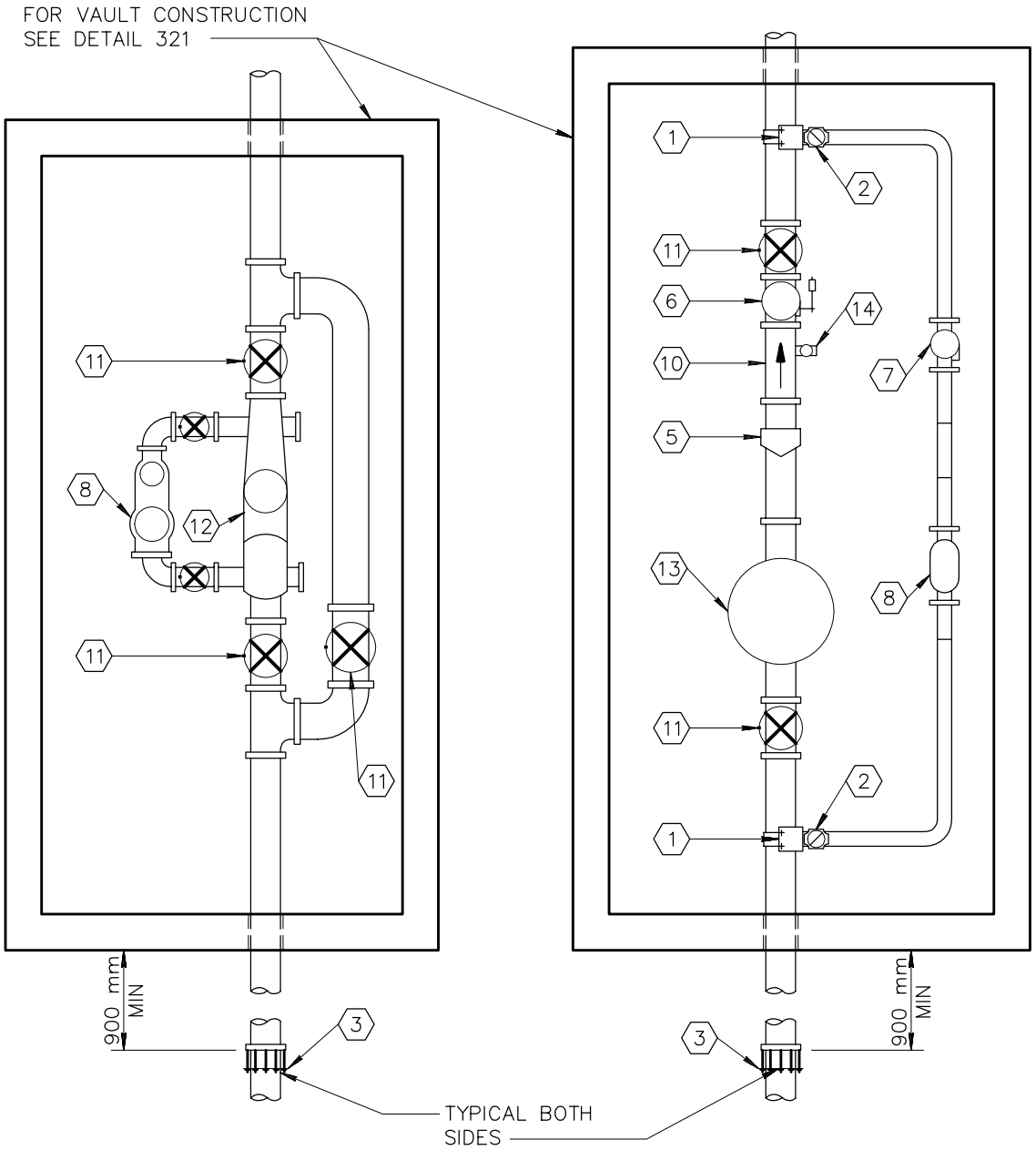


SECTION A–A

VAULT DIMENSION DETAILS (mm)			
A.C.P. SIZE	75	100	150
(A)	2550	3200	3650
(B)	1350	1550	1550

NOTE: METER VAULTS MAY BE EITHER BLOCK MASONRY 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 METRIC	75 mm, 100 mm, 150 mm WATER METER	3-06-2000	345-1



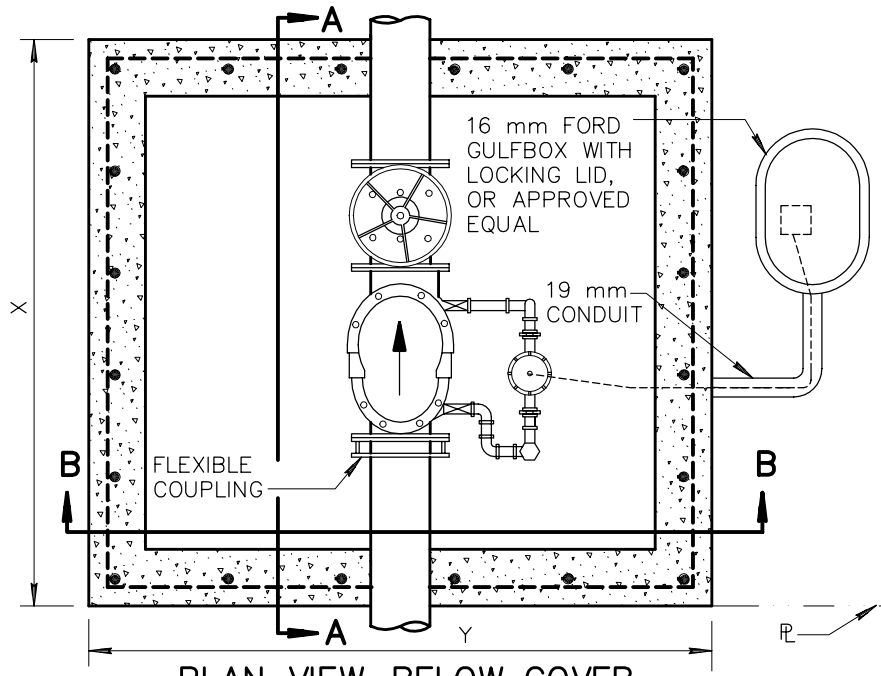
LEGEND

1. DOUBLE STRAP ALL BRONZE SERVICE SADDLES.
2. CORP. STOP, 50 mm (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. 50 mm BRONZE CHECK VALVE.
8. 50 mm TURBOMETER: ROCKWELL 'W–160' OR HERSEY 'M.H.R.' OR NEPTUNE TRIDENT TURBINE.
9. STRAINER (75 mm, 100 mm, 150 mm) 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 FM.–CT. OR NEPTUNE TURBINE–FS–UL.
13. 150 mm OR 250 mm STRAINER, U.L. APPROVED.
14. 50 mm 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 METRIC**	**100 mm, 150 mm WATER METER WITH ON-SITE FIRE HYDRANTS**	3-06-2000	345-2

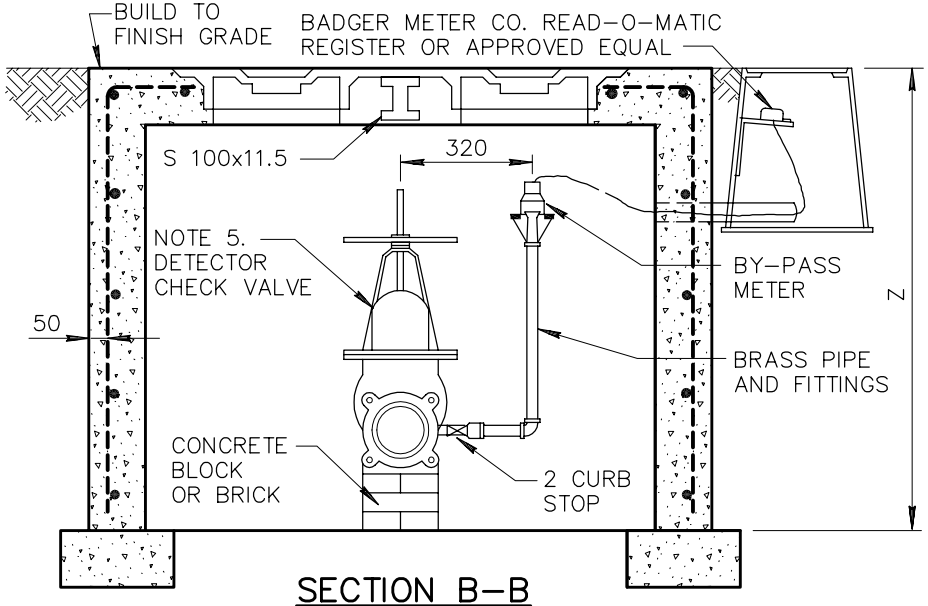


PLAN VIEW–BELOW COVER

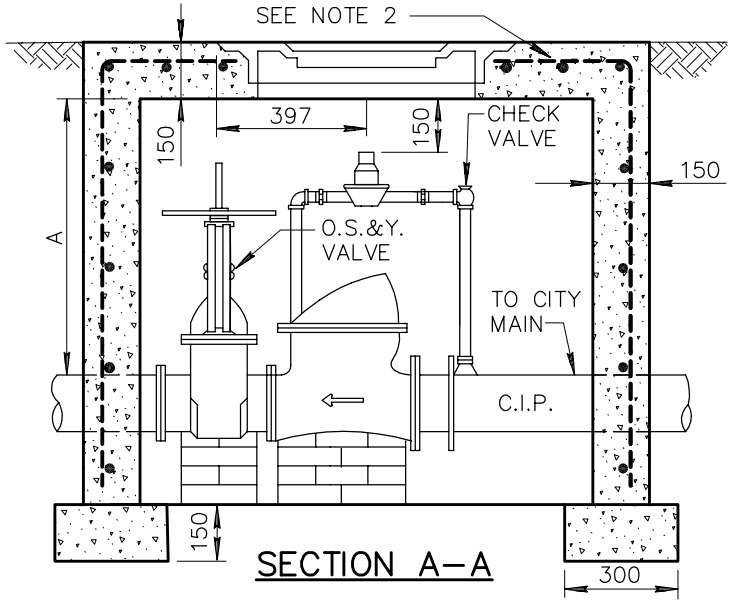
NOTES:

1. FIRELINE FROM CITY MAIN TO PROPERTY LINE SHALL BE CONSTRUCTED OF CAST IRON PIPE.
2. REINFORCING TO BE 15M REBAR ON 230 mm CENTERS EACH WAY ON TOP AND 460 mm 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 1470 g/m^2 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 (mm)	X (mm)	Y (mm)	Z (mm)	BY–PASS METER SIZE (mm)	A (mm)
100	1550	1700	1250	16x19	750
150	1700	1850	1250	16x19	750
200	1850	1850	1500	25	900
250	2000	1850	1750	38	900



SECTION B–B

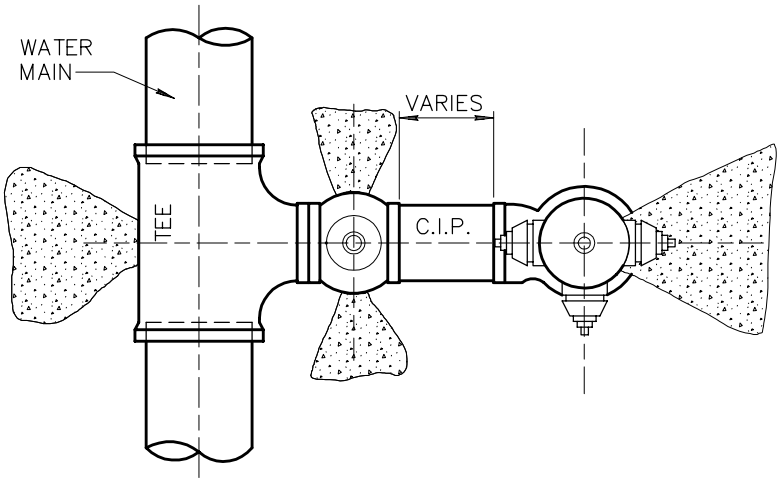


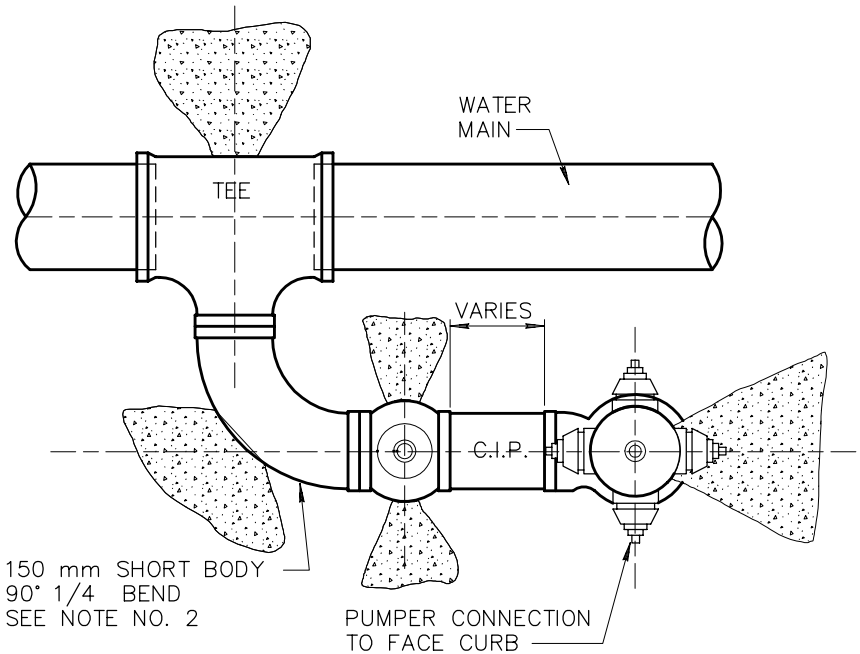
SECTION A–A

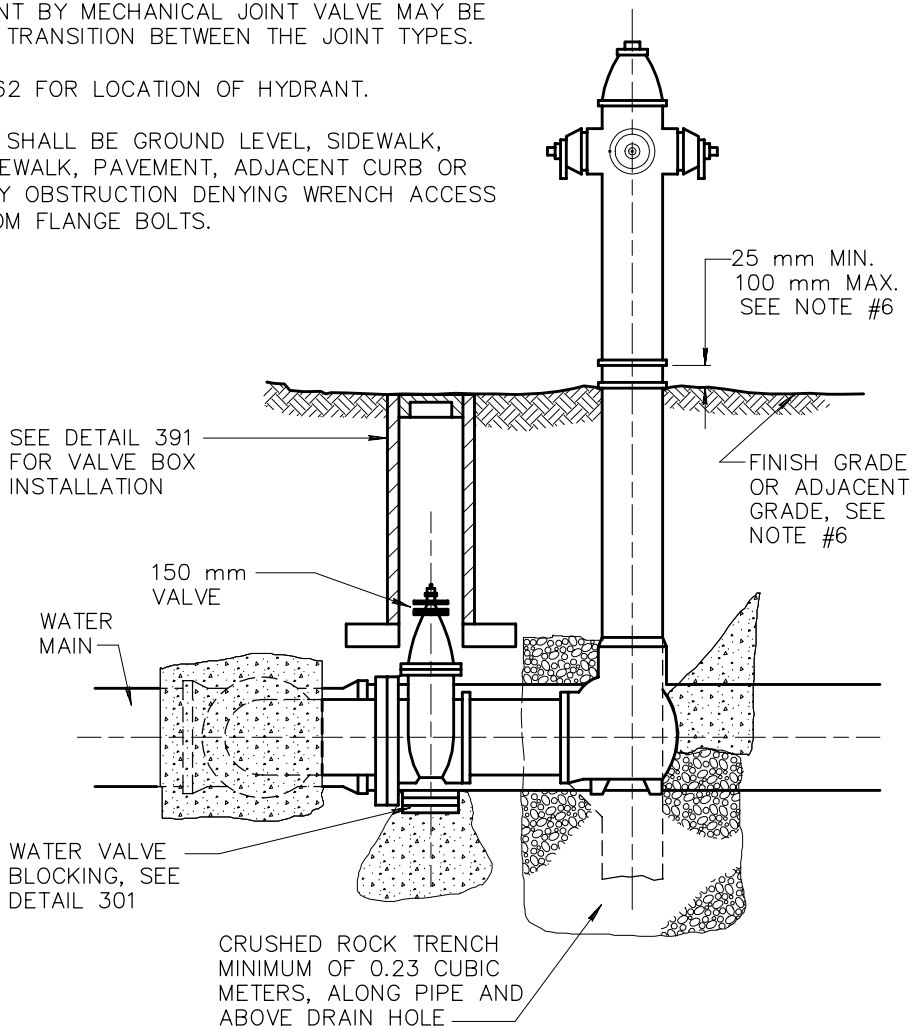
DETAIL NO.		REVISED	DETAIL NO.
346	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC — FIRE LINE DETECTOR CHECK VAULT	3-06-2000	346

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. 90° BEND NOT REQUIRED IF SUFFICIENT ROOM FOR PERPENDICULAR INSTALLATION.
3. FOR CONCRETE THRUST BLOCKS, SEE DETAIL 380.
4. A FLANGE JOINT BY MECHANICAL JOINT VALVE MAY BE USED AS THE TRANSITION BETWEEN THE JOINT TYPES.
5. SEE DETAIL 362 FOR LOCATION OF HYDRANT.
6. FINISH GRADE SHALL BE GROUND LEVEL, SIDEWALK, ADJACENT SIDEWALK, PAVEMENT, ADJACENT CURB OR OTHER NEARBY OBSTRUCTION DENYING WRENCH ACCESS TO THE BOTTOM FLANGE BOLTS.



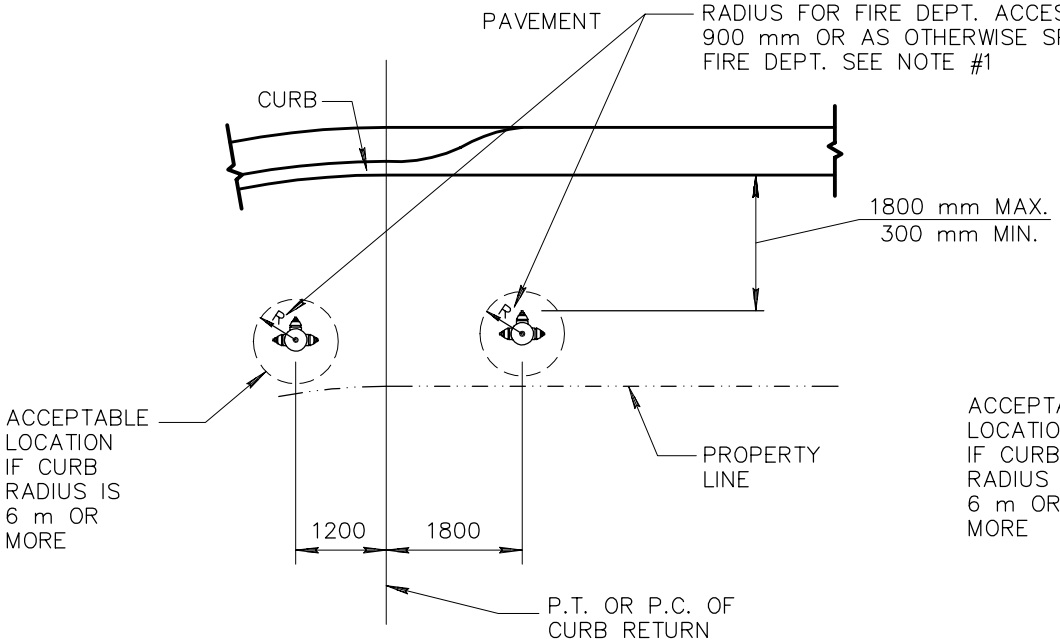




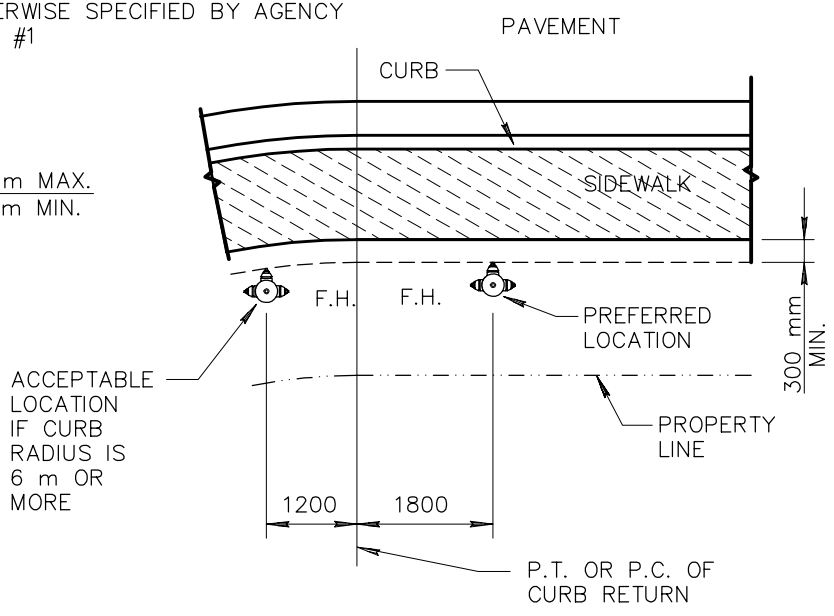
DETAIL NO.			REVISED	DETAIL NO.
360	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	FIRE HYDRANT INSTALLATION	3-06-2000	360

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.

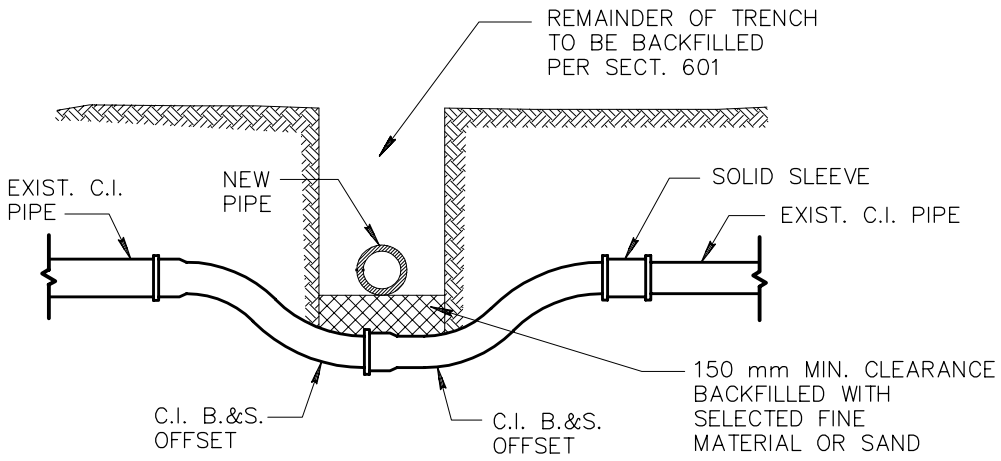


PARKWAY AREA OR NO SIDEWALK

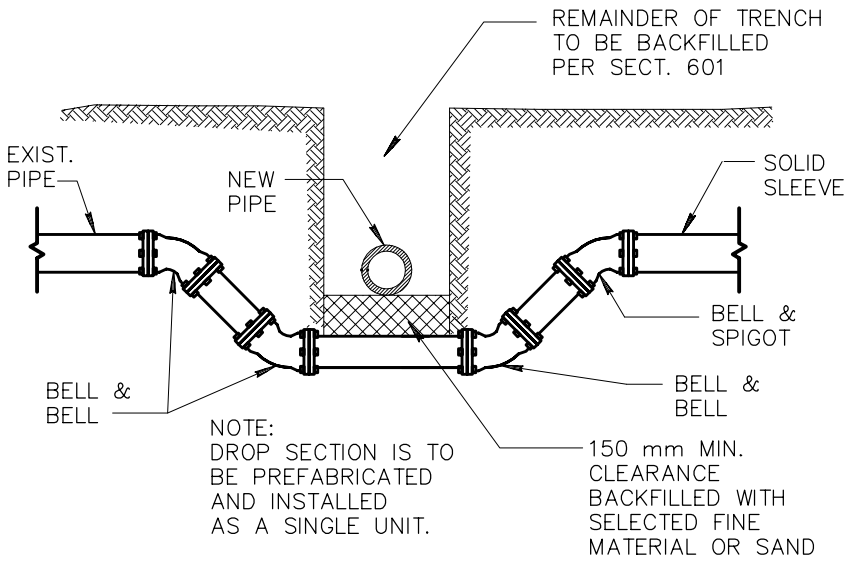


AREA WITH SIDEWALK

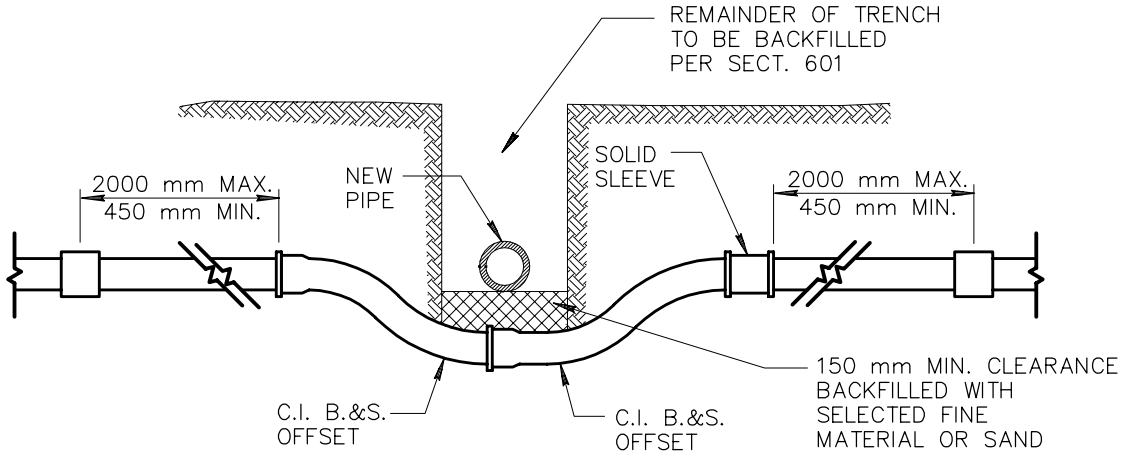
DETAIL NO.			REVISED	DETAIL NO.
362	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	LOCATIONS FOR NEW FIRE HYDRANTS	3-06-2000	362



CAST IRON



CAST IRON MECHANICAL JOINT



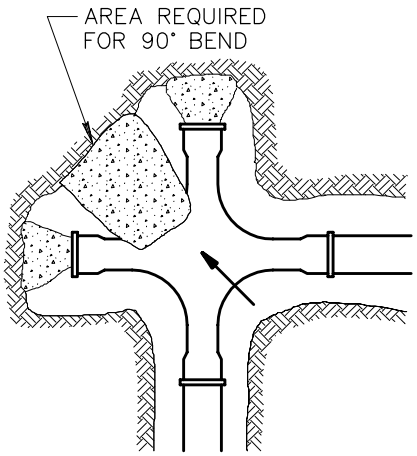
ASBESTOS CEMENT

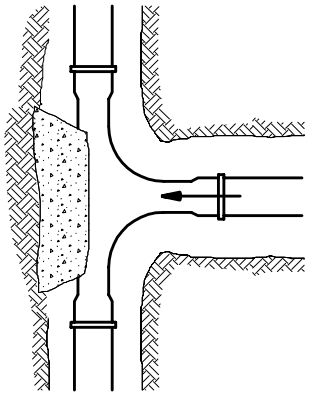
NOTES:

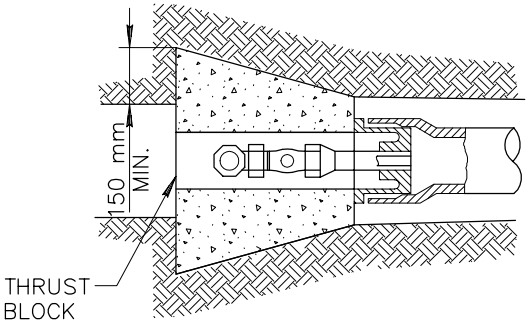
1. THIS DETAIL COVERS MOVING OF WATER MAINS 50 mm TO 300 mm ONLY.
2. THRUST BLOCKING AS PER DET. 380 & 381.
3. IF OFFSET IS TO GO OVER OBSTRUCTION, JOINT RESTRAINTS MUST BE USED.
4. PIPE IS TO BE CAST IRON OR DUCTILE IRON.

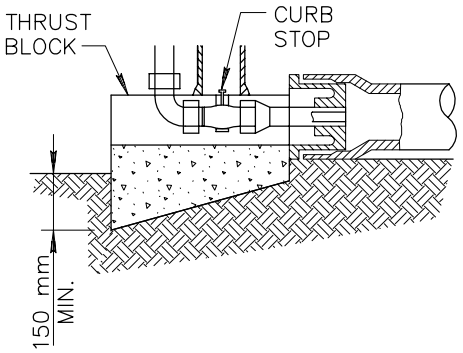
DETAIL NO.			REVISED	DETAIL NO.
370	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**VERTICAL REALIGNMENT OF WATER MAINS**	3-06-2000	370

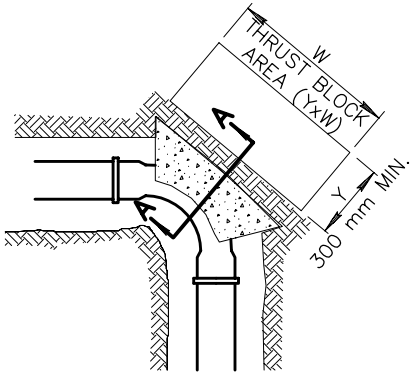
TYPICAL LOCATIONS OF THRUST BLOCKS

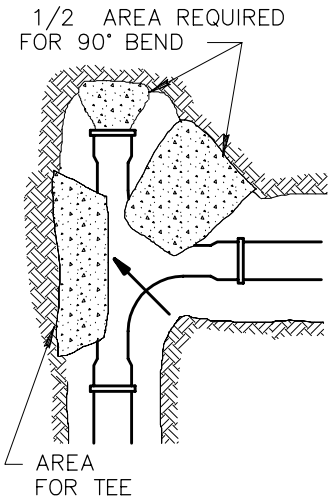


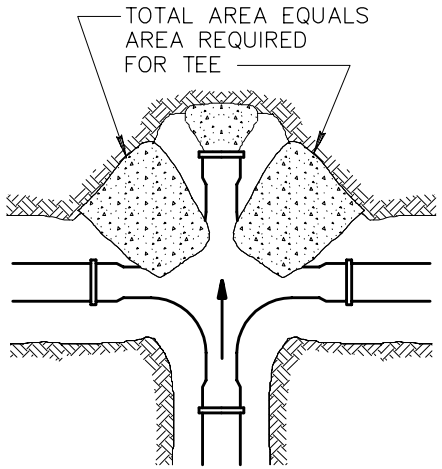


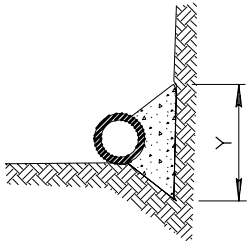












SECTION A–A

NOTES:

1. TABLE IS BASED ON 1370 kPa TEST PRESSURE AND 145 kPa SOIL. IF CONDITIONS ARE FOUND TO INDICATE SOIL BEARING IS LESS, THE AREAS SHALL BE INCREASED ACCORDINGLY.
2. AREAS FOR PIPES LARGER THAN 400 mm 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) (m^2)

PIPE SIZE (mm)	WATER PIPE	
	TEE, DEAD END, 90° BEND	45° & 22 1/2° BENDS
100 OR LESS	0.28	0.28
150	0.37	0.28
200	0.56	0.28
250	0.93	0.46
300	1.30	0.65
400	2.23	1.11

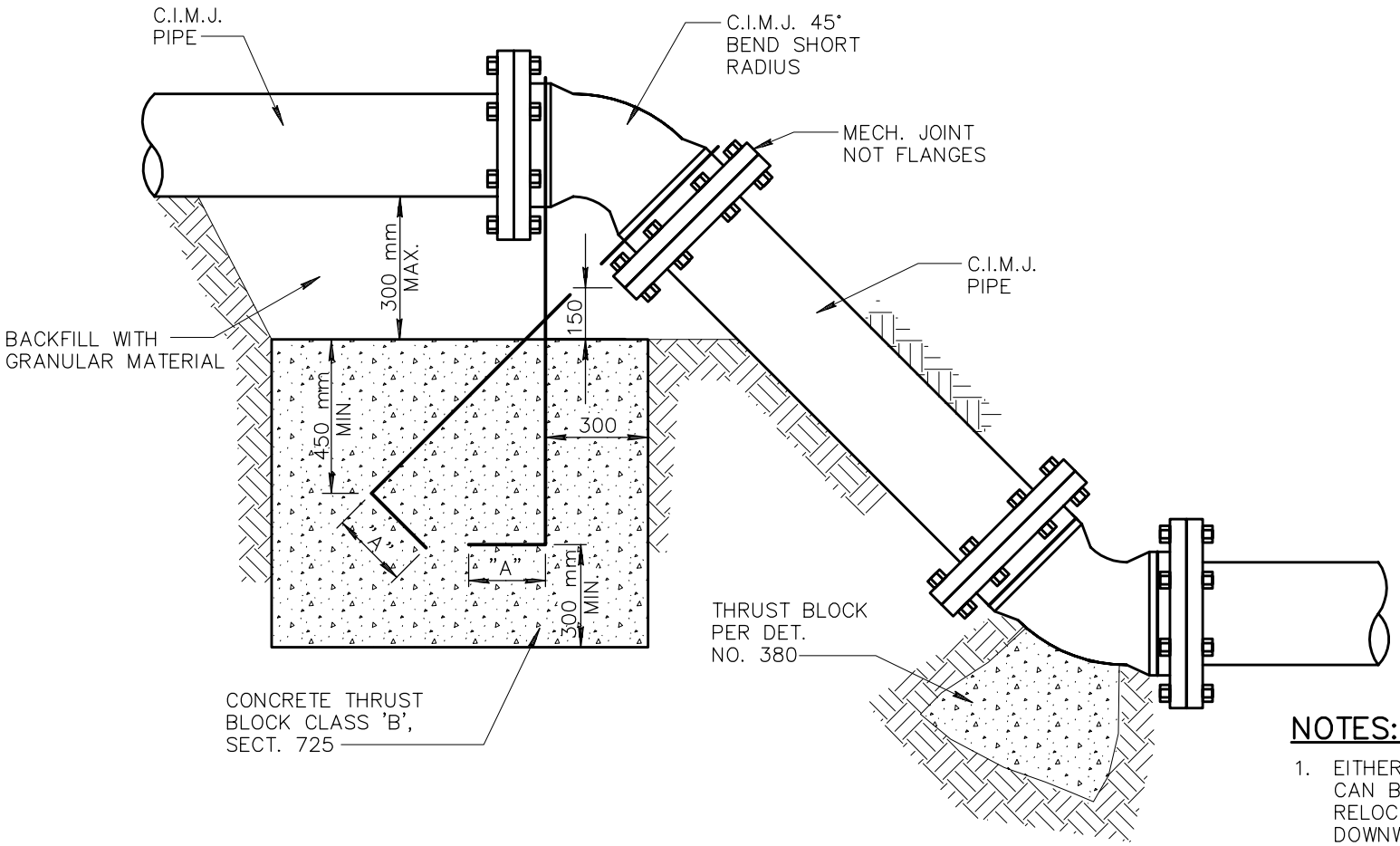
DETAIL NO.		STANDARD DETAIL		REVISED	DETAIL NO.
380	MARICOPA ASSOCIATION of GOVERNMENTS	METRIC	THRUST BLOCKS FOR WATER LINES	3-06-2000	380

NOTE

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.

PIPE SIZE (mm)	MIN BAR SIZE	"A"–DIMENSION HOOK (mm)	MIN. * BLOCK DIM. (mm)
150	20M	150	900x900x900
200	20M	230	1200x1200x750
300	25M	230	1200x1500x1500

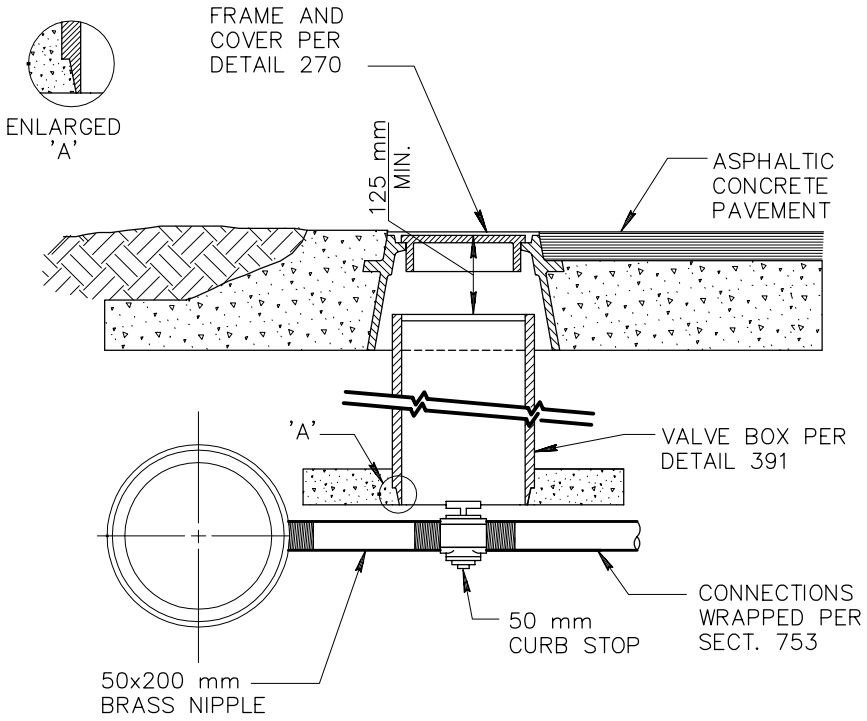
* FOR 862 kPa WORKING PRESSURE.



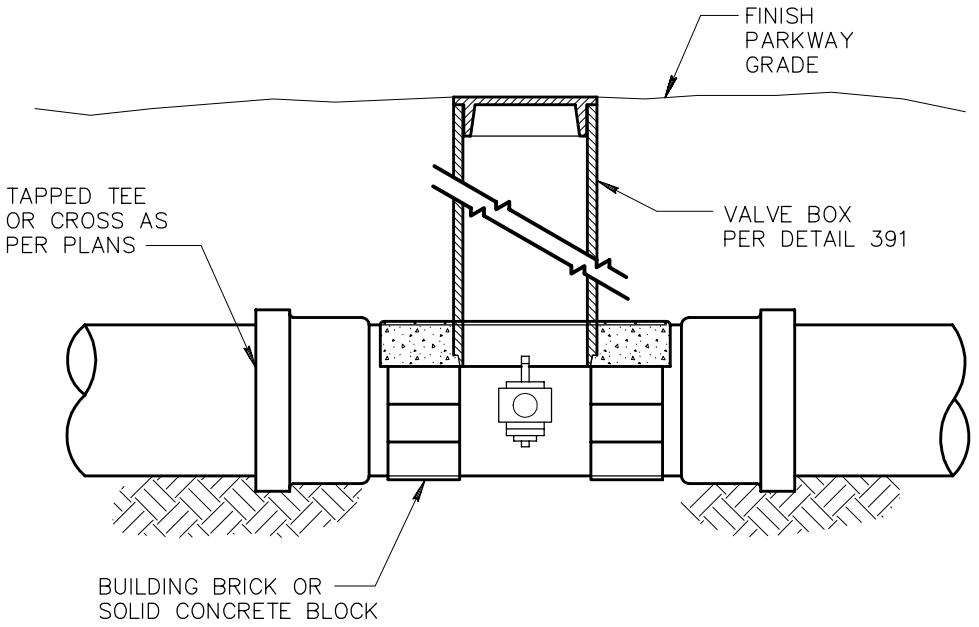
NOTES:

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.

DETAIL NO.			REVISED	DETAIL NO.
381	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	ANCHOR BLOCKS FOR VERTICAL ENDS	3-07-2000	381



TYPE 'A'



TYPE 'B'

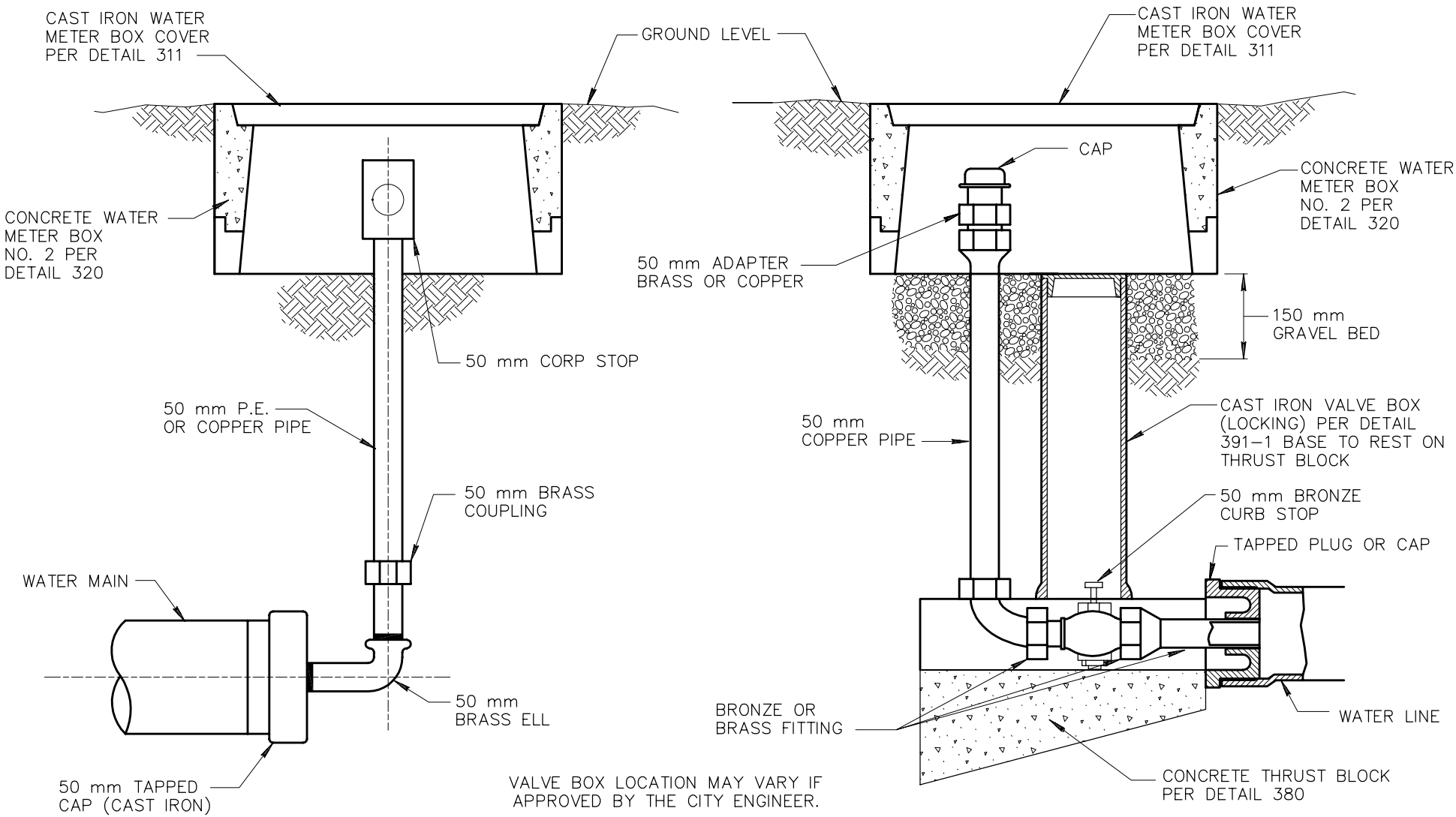
NOTES:

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.

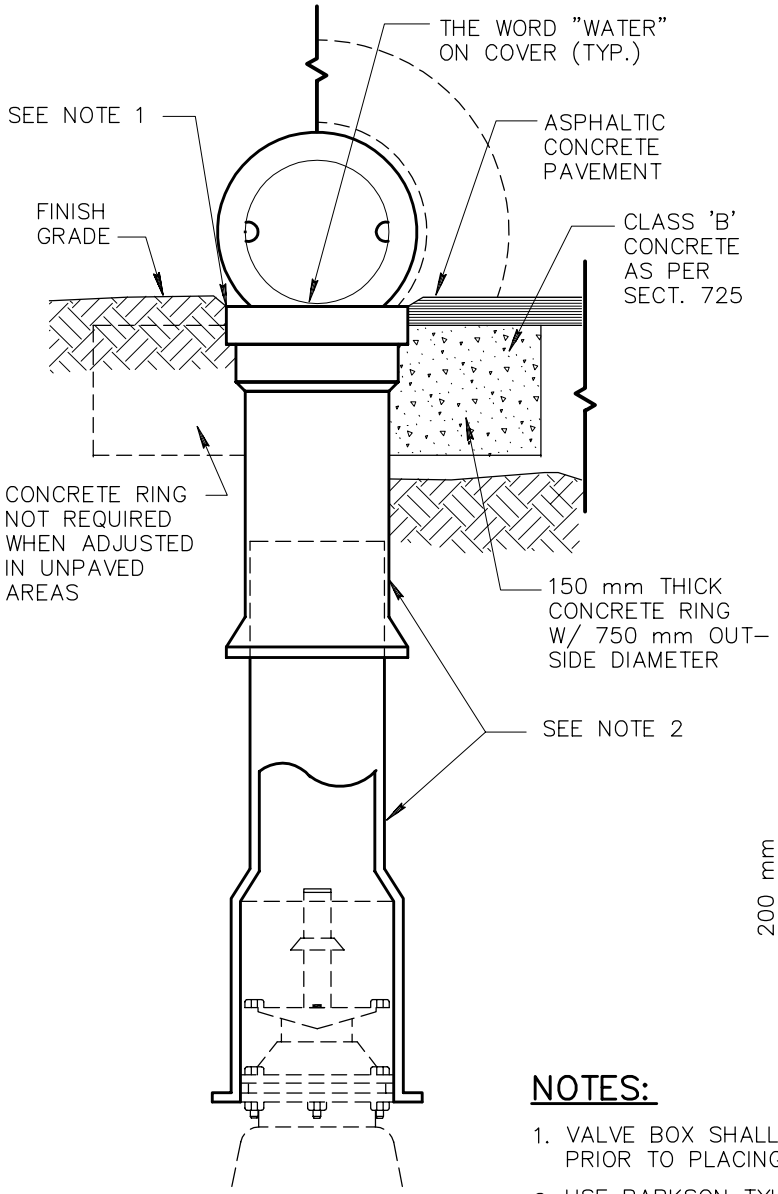
DETAIL NO.			REVISED	DETAIL NO.
389	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	CURB STOP WITH VALVE BOX AND COVER	3-07-2000	389



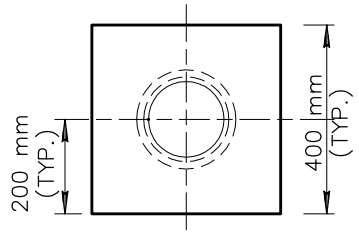
TYPE 'A'

TYPE 'B'

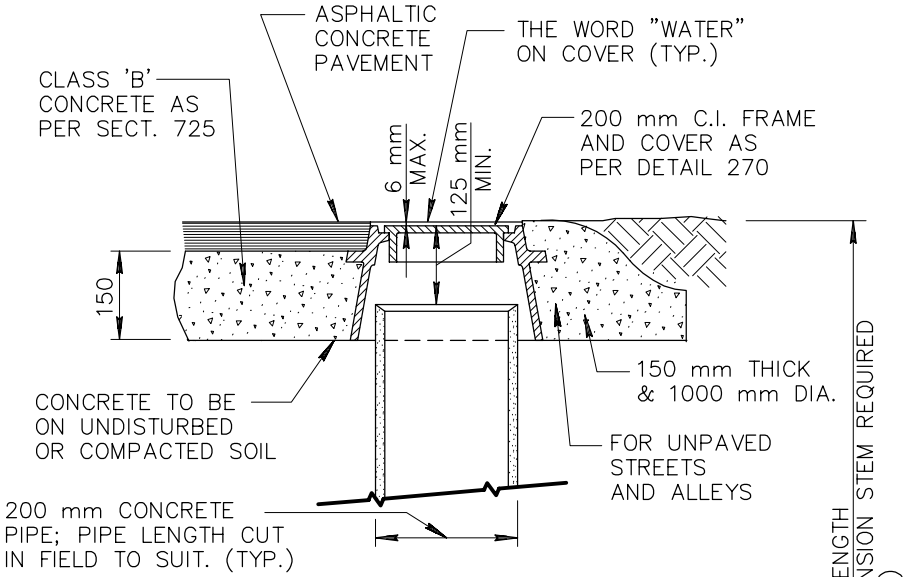
DETAIL NO.			REVISED	DETAIL NO.
390	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**CURB STOP WITH FLUSHING PIPE**	3-07-2000	390



TYPE 'C'

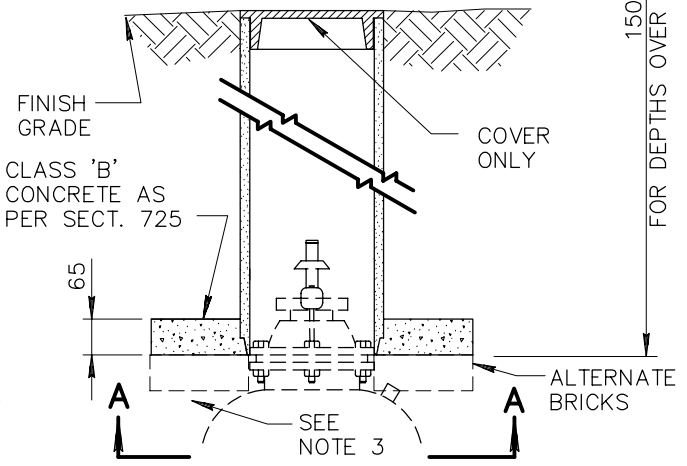


VIEW A–A



TYPE 'A'

(TO BE USED IN AREAS SUBJECT TO VEHICULAR TRAFFIC.)



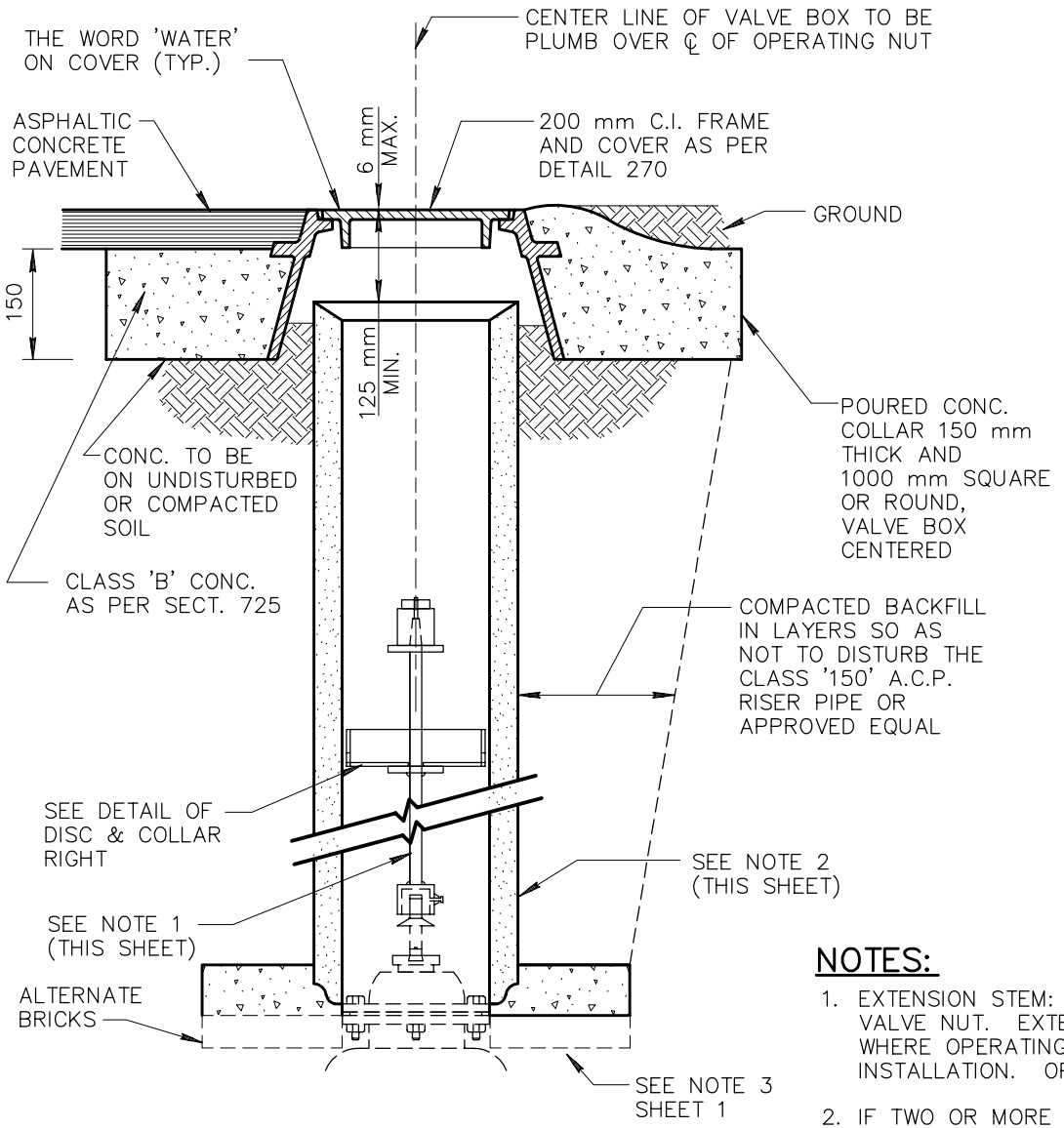
TYPE 'B'

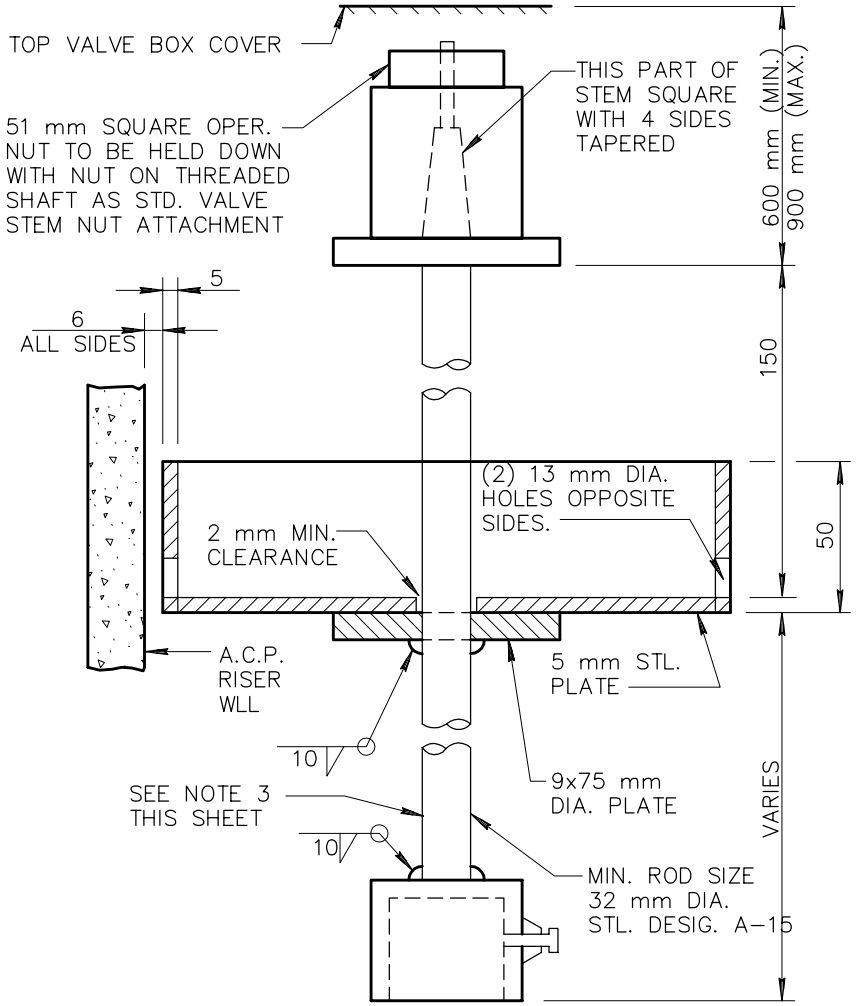
(NOT SUBJECT TO VEHICULAR TRAFFIC)

NOTES:

1. VALVE BOX SHALL BE ADJUSTED TO THE FINISHED GRADE PRIOR TO PLACING OF THE ASPHALTIC CONCRETE SURFACE.
2. USE PARKSON TYLER, APCO OR EQUAL DEEP SKIRTED LID (100 mm OR MORE) TYPE, SLIDING ADJUSTABLE CAST IRON VALVE BOX C.I. MIN. T.S. 207 MPa.
3. GROUND BELOW CONCRETE PAD OR 3 BRICKS TO BE COMPACTED 95% OF MAX. DENSITY.

DETAIL NO.			REVISED	DETAIL NO.
391-1	MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL METRIC	VALVE BOX INSTALLATION AND GRADE ADJUSTMENT	3-07-2000	391-1

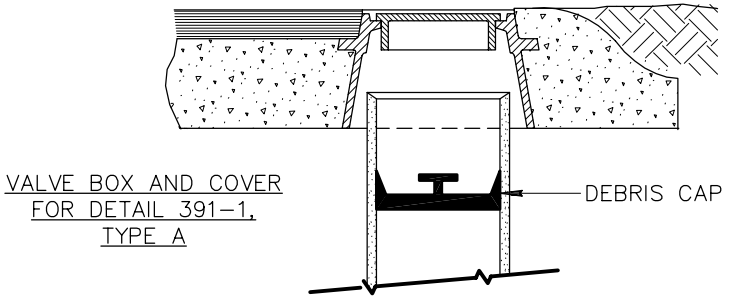




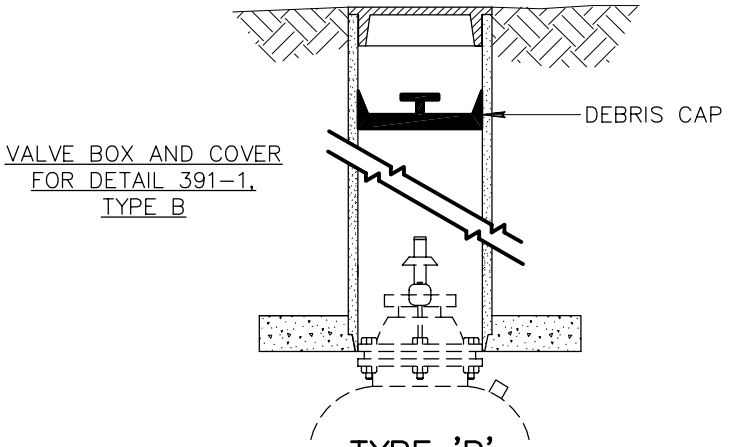
NOTES:

1. EXTENSION STEM: WITH SQUARE SOCKET ON BOTTOM TO FIT 51 mm SQUARE VALVE NUT. EXTENSION TO VALVE STEMS REQUIRED ON ALL VALVES INSTALLED WHERE OPERATING NUT IS OVER 1500 mm BELOW SURFACE. LENGTH TO FIT EACH INSTALLATION. OPERATING NUT TO BE HELD ON TOP OF EXTENSION WITH STOP NUT.
2. IF TWO OR MORE JOINTS OF A.C.P. ARE USED TO MAKE RISER, USE STANDARD A.C. PIPE RUBBER GASKET COUPLING TO JOIN PIPE. WHERE RISER LENGTH EXCEEDS 3000 mm USE 300 mm A.C. PIPE.
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.

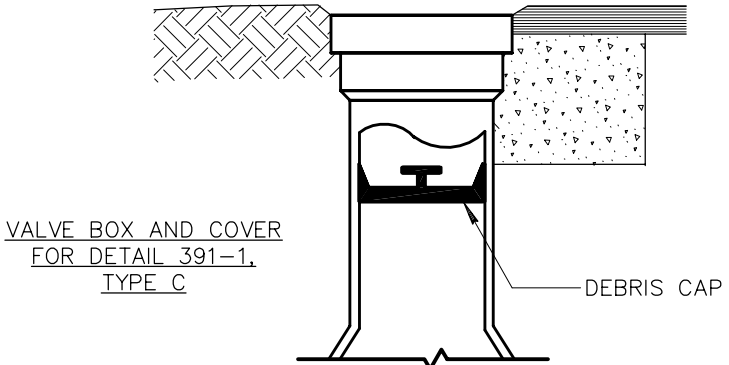
DETAIL NO.			REVISED	DETAIL NO.
391-2	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	VALVE BOX INSTALLATION	3-07-2000	391-2



TYPE 'A'



TYPE 'B'

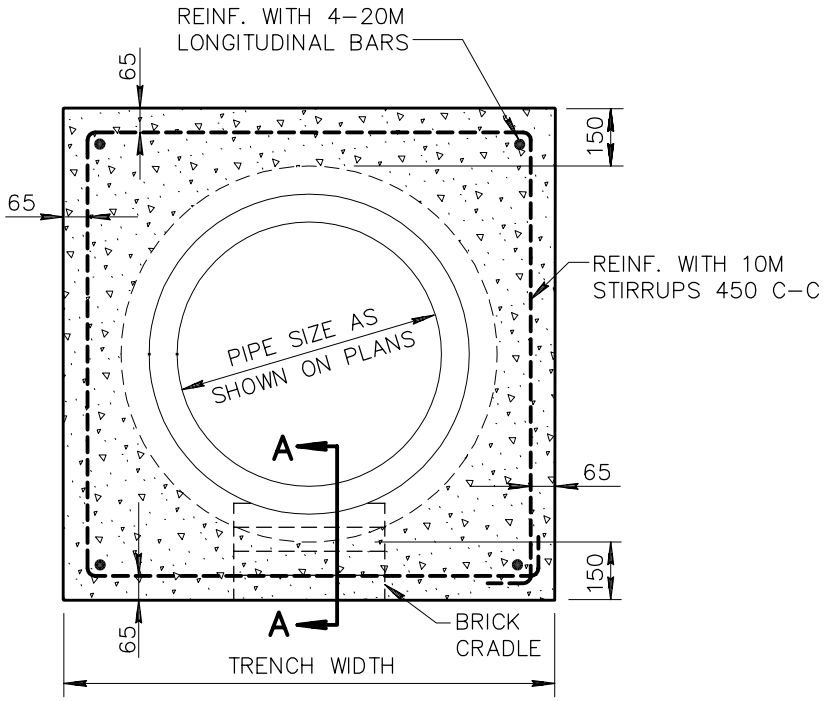


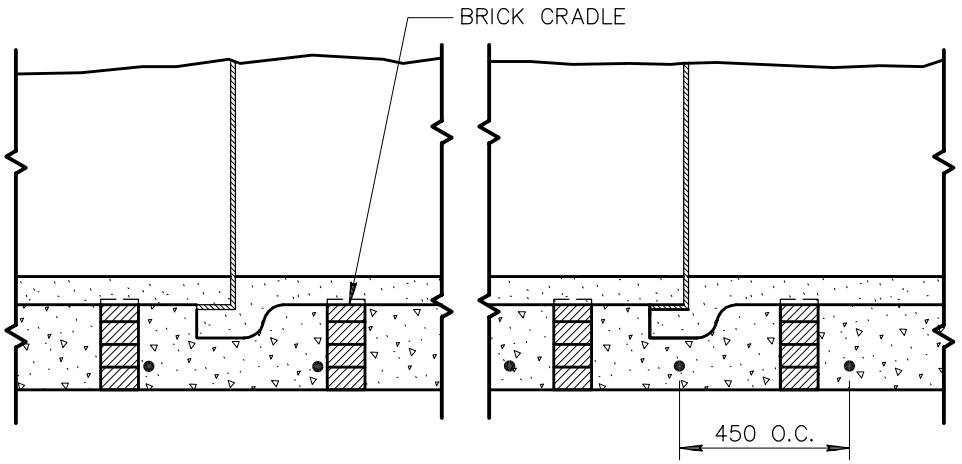
TYPE 'C'

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. ONCE INSTALLED THE CAP MUST WITHSTAND, WITHOUT SLIPAGE, A MINIMUM VERTICAL FORCE OF 225 NEWTONS, AT A LOADING RATE OF 25 mm/MINUTE.
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 HANDLE AND/OR BODY OF THE CAP SHALL BE INTEGRALLY COLORED IF REQUIRED BY THE AGENCY. IF REQUIRED, THE COLOR SHALL CONFORM TO THE ONE CALL LOCATING SERVICE (BLUE STAKE) COLORS (ARS 40–360.21).
7. THE CAP SHALL BE INSTALLED IN ALL VALVE HOUSINGS AS REQUIRED BY THE CONTRACT DOCUMENTS OR BY THE AGENCY'S POLICIES.
8. THE DEBRIS CAP SHALL BE MANUFACTURED BY SW SERVICES, INC. PHOENIX, ARIZONA OR EQUAL.

DETAIL NO.			REVISED	DETAIL NO.
392	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	DEBRIS CAP INSTALLATION	3-07-2000	392



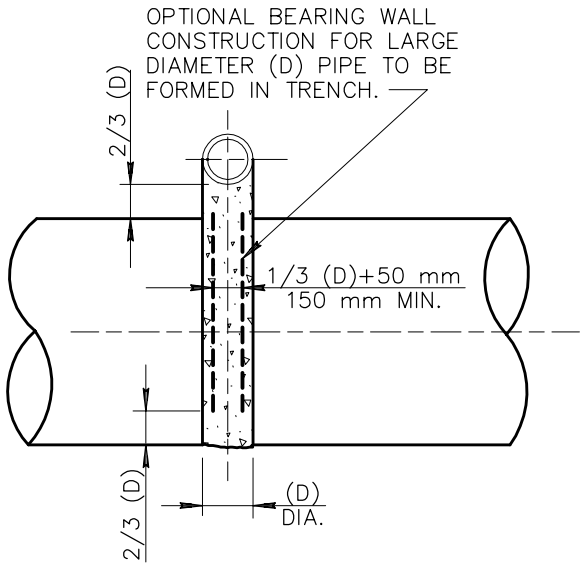


SECTION A–A

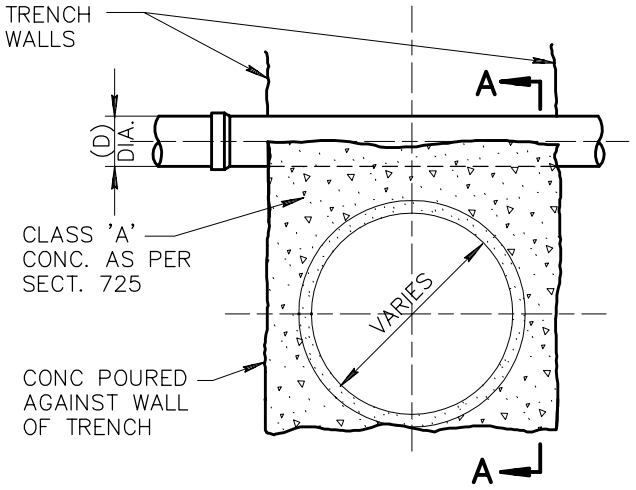
NOTES:

1. LAY PIPE TO LINE AND GRADE ON BRICK CRADLE.
2. PLACE CLASS 'C' CONCRETE PER SECT. 725 & 505, IN SUCH A MANNER AS NOT TO FLOAT THE PIPE.

DETAIL NO.			REVISED	DETAIL NO.
402	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	ENCASED PIPE FOR CANAL CROSSINGS	3-07-2000	402

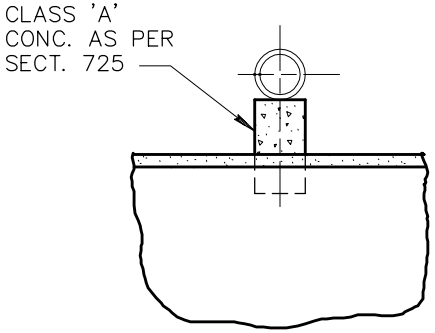


SECTION A–A

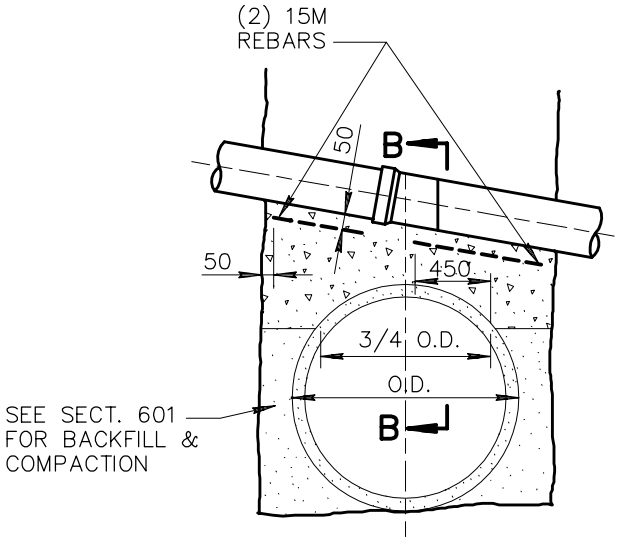


PIPE CONDUIT

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 450 mm OR LESS IF SUFFICIENT CLEARANCE OVER STORM SEWER IS AVAILABLE AND TOTAL SPAN IS LESS THAN 10.5 m.
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.

SCHEDULE OF REQUIRED SUPPORTS

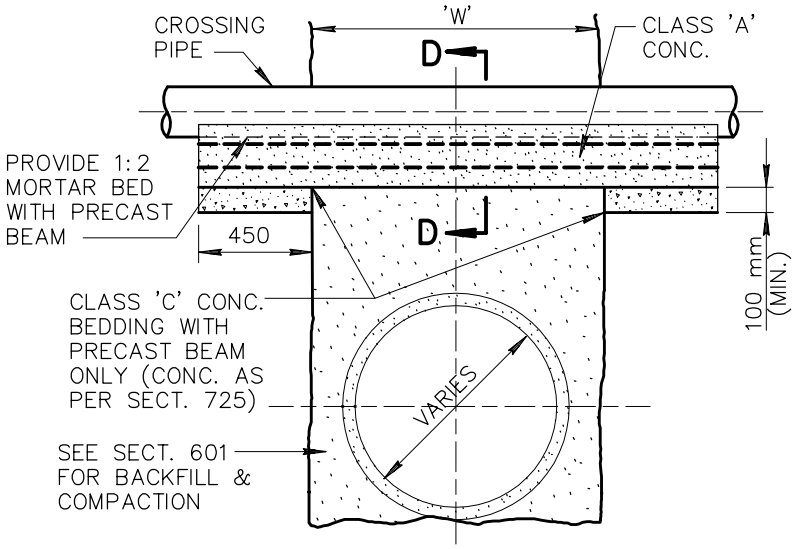
PERMANENT	TEMPORARY	
SEWER LINES	CAST IRON PIPE	CONC. BOX CULVERT
	CONC. IRRIG. PIPE	TRAFFIC CONTROL CONDUIT
	BURIED TELCO.	WATER & SEWER LINES
	GAS PIPES	
	CONC. STORM DRAIN	

NOTE

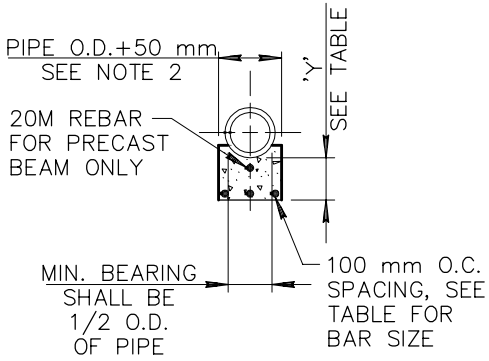
OTHER UTILITIES AS NOTED ON THE PLANS OR AS REQUIRED BY THE ENGINEER AT TIME OF CONSTRUCTION.

DETAIL NO.			REVISED	DETAIL NO.
403-1	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	PIPE SUPPORT ACROSS TRENCHES	3-07-2000	403-1

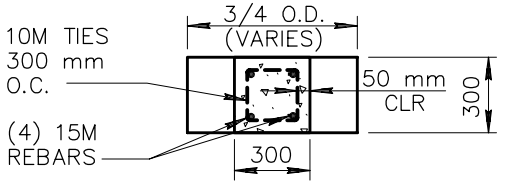
TABLE				
'W'	DEPTH OF COVER ON SUPPORTS (mm)			
	0 mm TO 2500 mm		2500 mm TO 5000 mm	
	BAR NO.	Y(mm)	BAR NO.	Y(mm)
TO 1800	15M	200	20M	275
2100	15M	225	20M	300
2400	15M	250	20M	325
2700	20M	275	20M	350
3000	20M	300	25M	375
3300	20M	325	25M	400
3700	20M	350	25M	425
4000	25M	375	25M	475
4300	25M	400	25M	500
4600	25M	425	25M	525
4900	25M	450		
5200	25M	475		



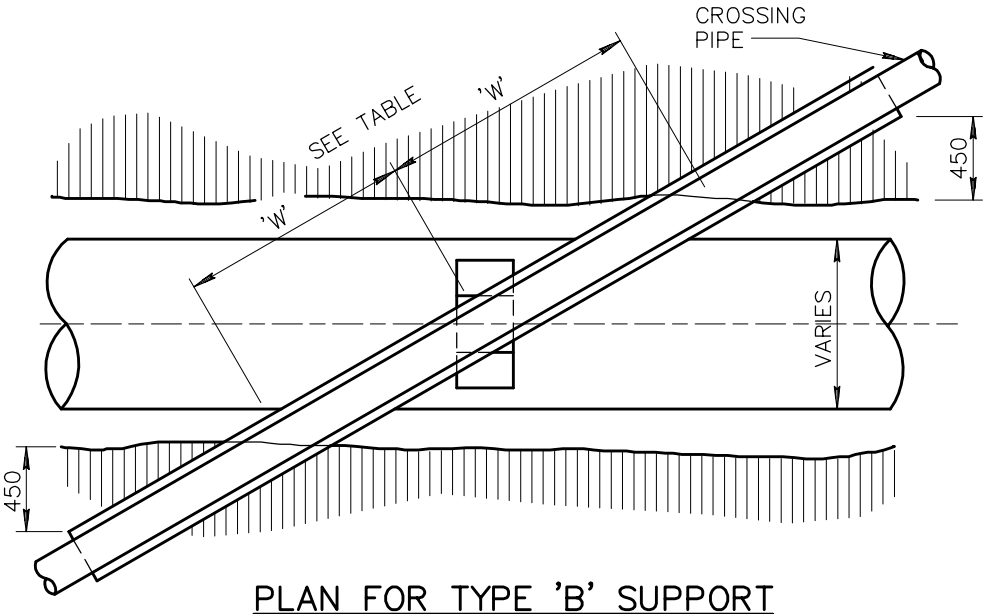
TYPE 'C'



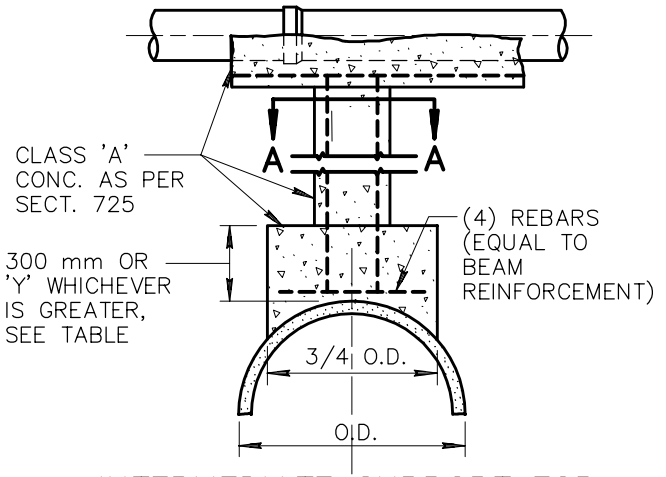
SECTION D–D



SECTION A–A

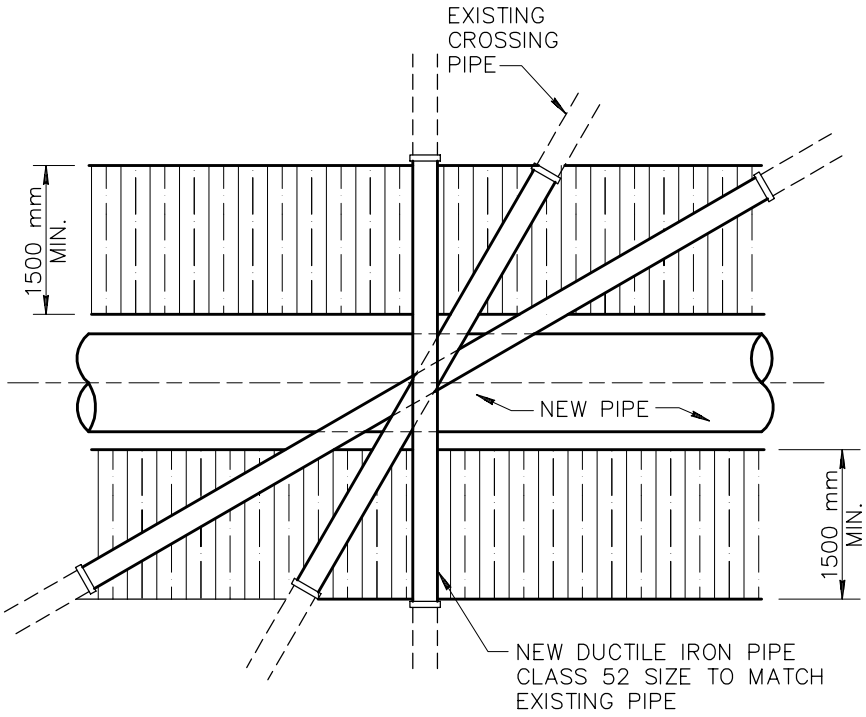


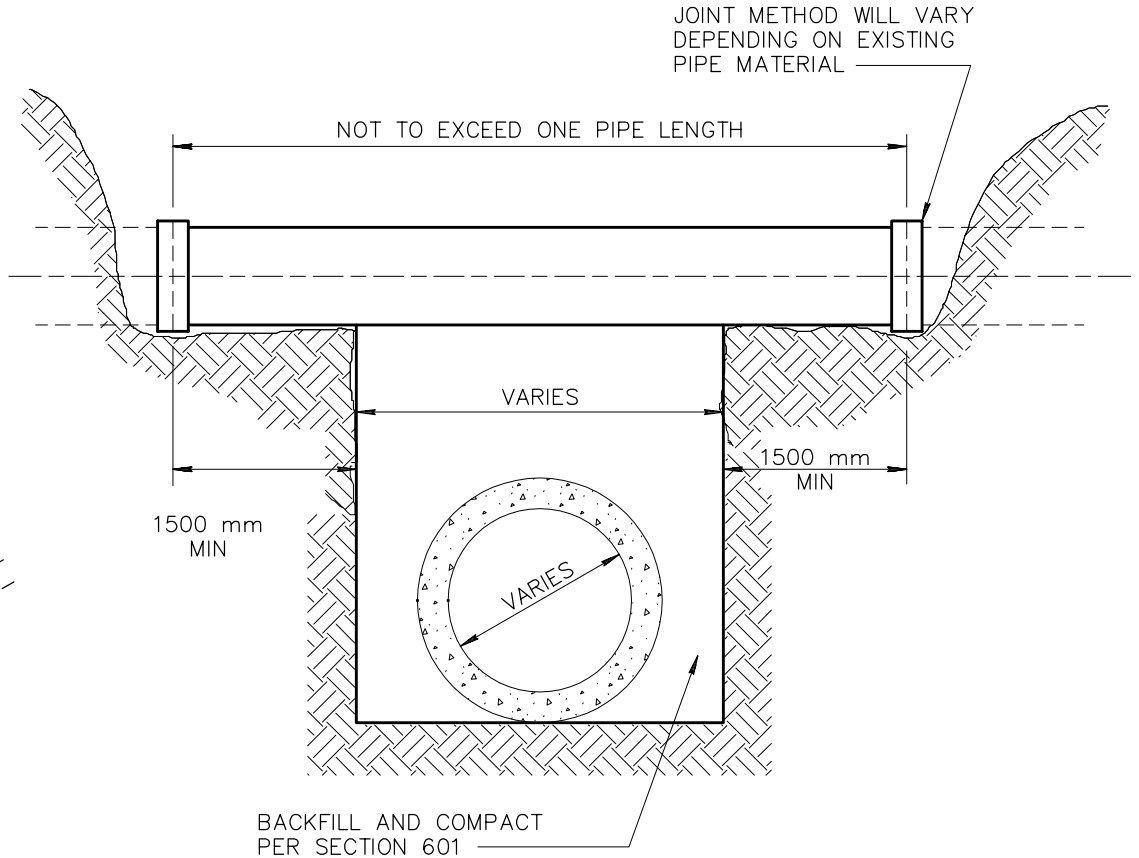
PLAN FOR TYPE 'B' SUPPORT



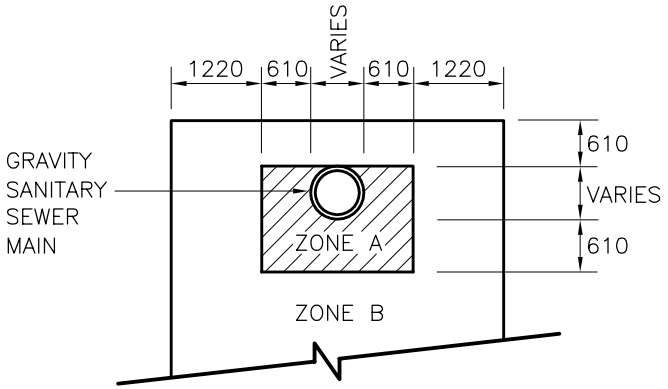
INTERMEDIATE SUPPORT FOR TYPE 'B' CROSSINGS

DETAIL NO.			REVISED	DETAIL NO.
403-2	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	PIPE SUPPORT ACROSS TRENCHES	3-07-2000	403-2

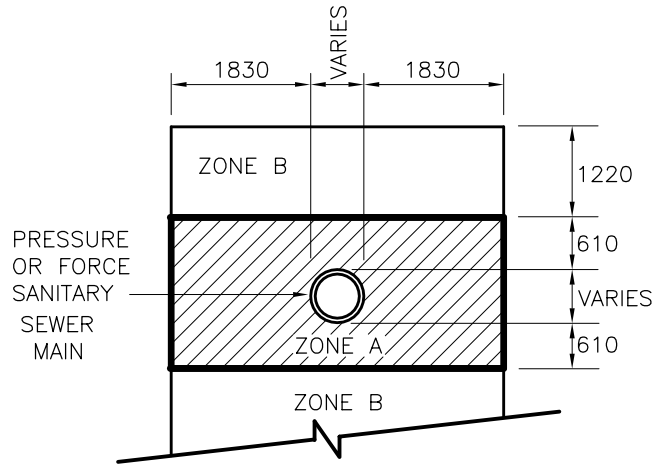




DETAIL NO.			REVISED	DETAIL NO.
403-3	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**ALTERNATE TO PIPE SUPPORT**	3-07-2000	403-3



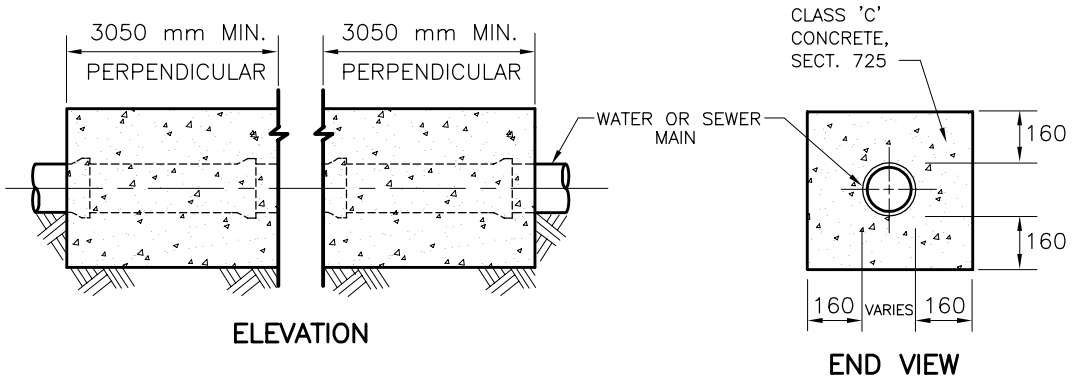
CROSS SECTION DETAIL FOR
GRAVITY SANITARY SEWER



CROSS SECTION DETAIL FOR
PRESSURE OR FORCE SANITARY SEWER

NOTES:

1. SEPARATION DISTANCES AND/OR OTHER EXTRA PROTECTION SHALL BE REQUIRED TO PROTECT WATER MAINS FROM CONTAMINATION BY SANITARY SEWER MAINS.
2. THIS CRITERIA APPLIES TO PARALLEL MAINS AS WELL AS CROSSINGS.
3. SEE CROSS SECTION DETAIL FOR LIMITS OF SEPARATION/EXTRA PROTECTION. ALL DISTANCES ARE MEASURED PERPENDICULARLY FROM THE OUTSIDE OF THE PIPES.
   A. NO WATER MAINS SHALL FALL WITHIN ZONE A.
   B. EXTRA PROTECTION WILL BE REQUIRED WHEN THE WATER MAIN FALLS WITHIN ZONE B. EXTRA PROTECTION SHALL CONSIST OF CONSTRUCTING THE SANITARY SEWER MAIN WITH MECHANICAL JOINT OR RESTRAINED JOINT DUCTILE IRON PIPE FOR A DISTANCE OF TEN FEET ON EITHER SIDE OF THE WATER MAIN. THE DUCTILE IRON PIPE SHALL COMPLY WITH THE AGENCY'S REQUIREMENTS FOR SEWER INSTALLATION. IN THE CASE OF A CROSSING, THE NUMBER OF JOINTS SHALL BE HELD TO A MINIMUM WITH ONE FULL JOINT OF PIPE CENTERED OVER/UNDER THE OTHER. AN ALTERNATE PROTECTION MAY CONSIST OF ENCASING BOTH PIPES IN CONCRETE AS SHOWN HEREIN.
   C. NO ADDITIONAL PROTECTION WILL BE REQUIRED OUTSIDE OF THE ZONE A AND B.
4. SEPARATION REQUIREMENTS FOR 4" OR 6" INDIVIDUAL HOUSE SERVICE CONNECTIONS SHALL COMPLY WITH THE AGENCY'S PLUMBING CODES.
5. RECLAIMED WATER SHALL BE CONSIDERED AS POTABLE WATER WHEN PLACED NEXT TO A SANITARY SEWER AND CONSIDERED A PRESSURE OR FORCE SANITARY SEWER MAIN WHEN PLACED NEXT TO A POTABLE WATER MAIN.

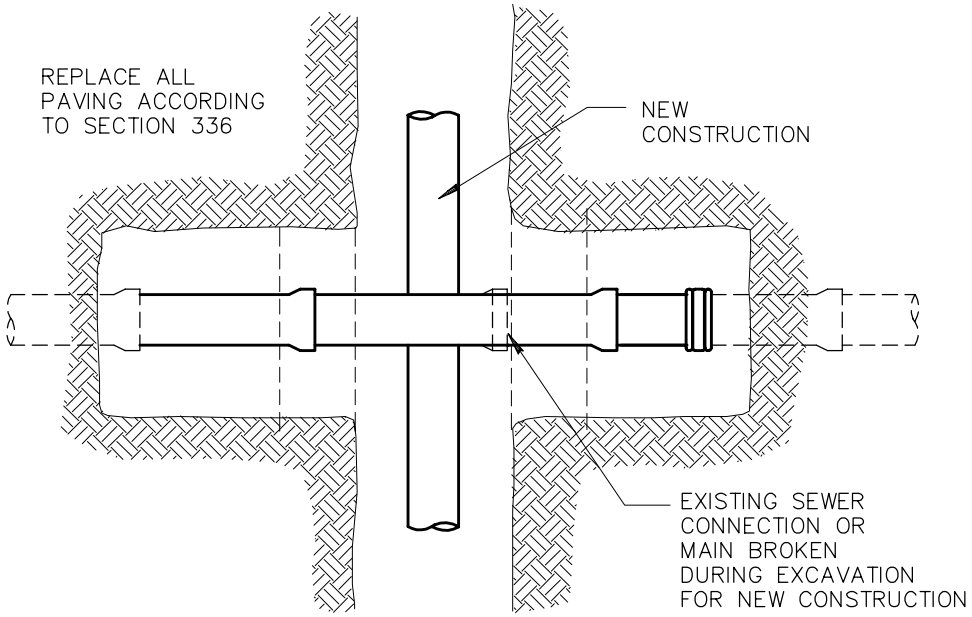


ELEVATION

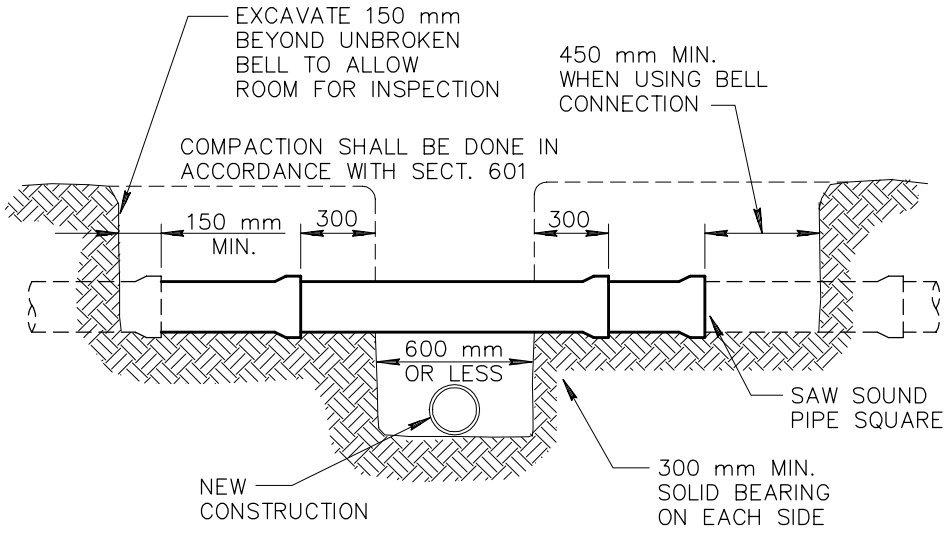
END VIEW

ENCASEMENT FOR PARALLEL PIPES

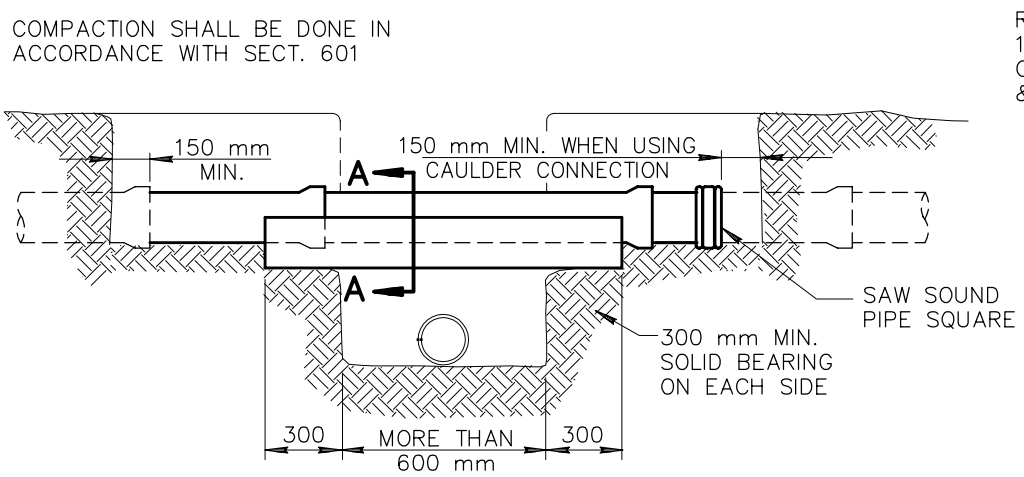
DETAIL NO.			REVISED	DETAIL NO.
404–1	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	WATER AND SANITARY SEWER SEPARATION/PROTECTION	01–03–2002	404–1



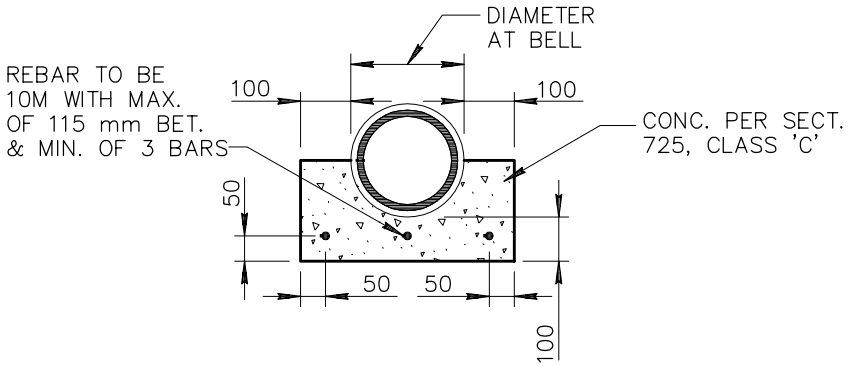
PLAN VIEW OF REPLACEMENT



REPLACEMENT WHEN NEW TRENCH 600 mm WIDE OR LESS



REPLACEMENT WHEN NEW TRENCH MORE THAN 600 mm WIDE



SECTION 'A–A'

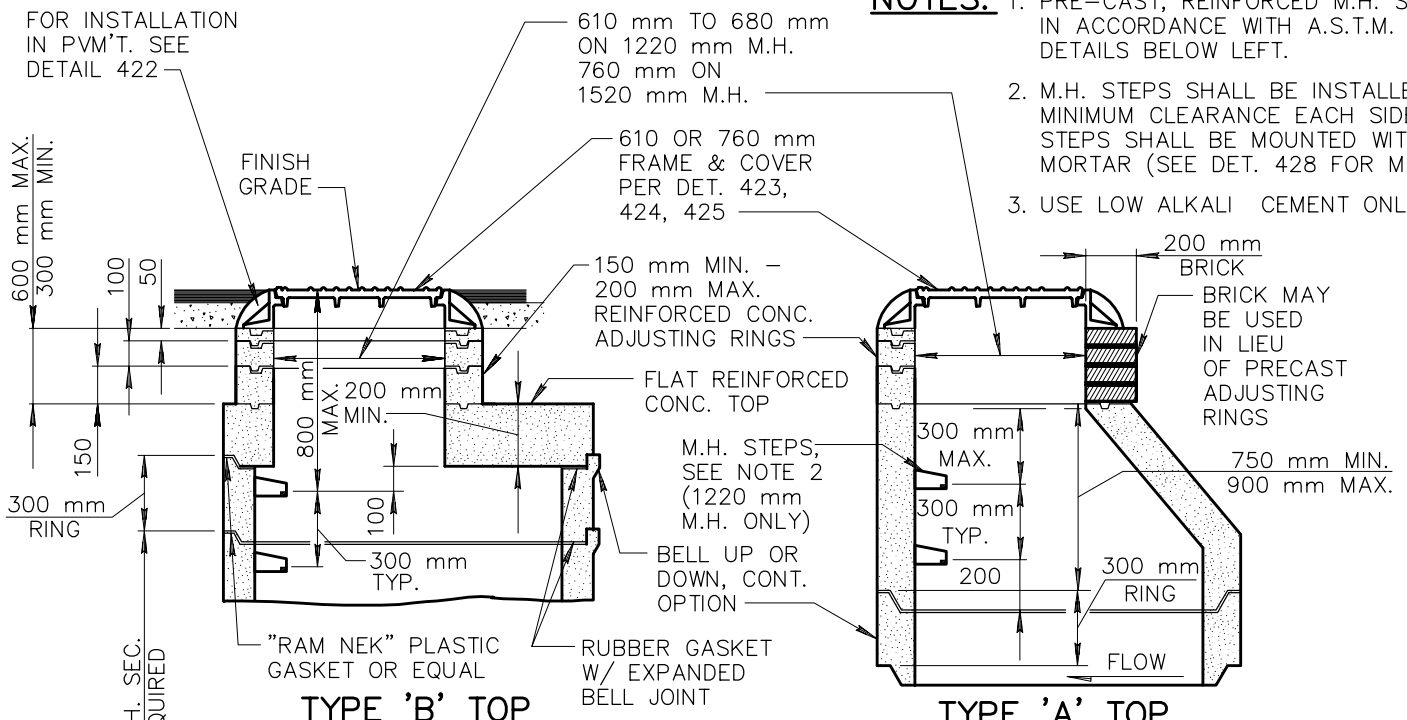
NOTES:

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 METRIC	BROKEN SEWER LINE REPLACEMENT	3-09-2000	405

NOTES:

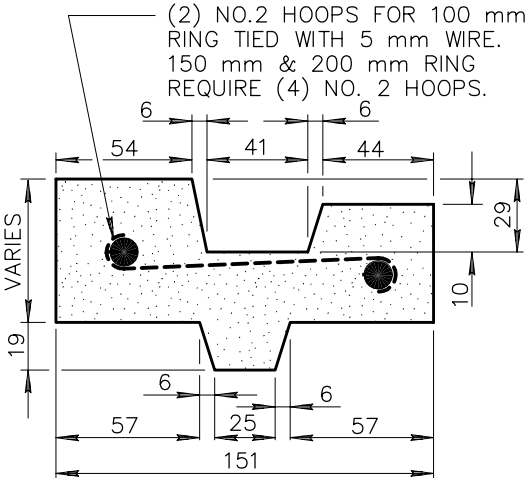
1. PRE-CAST, REINFORCED M.H. SECTIONS SHALL BE MANUFACTURED IN ACCORDANCE WITH A.S.T.M. C-478M EXCEPT AS MODIFIED BY DETAILS BELOW LEFT.
2. M.H. STEPS SHALL BE INSTALLED AT SITE OF M.H. SECTION MANUFACTURE MINIMUM CLEARANCE EACH SIDE OF M.H. LEG SHALL BE 25 mm. STEPS SHALL BE MOUNTED WITH 2 TO 1 SAND/CEMENT DRY PACK MORTAR (SEE DET. 428 FOR M.H. STEP.)
3. USE LOW ALKALI CEMENT ONLY.



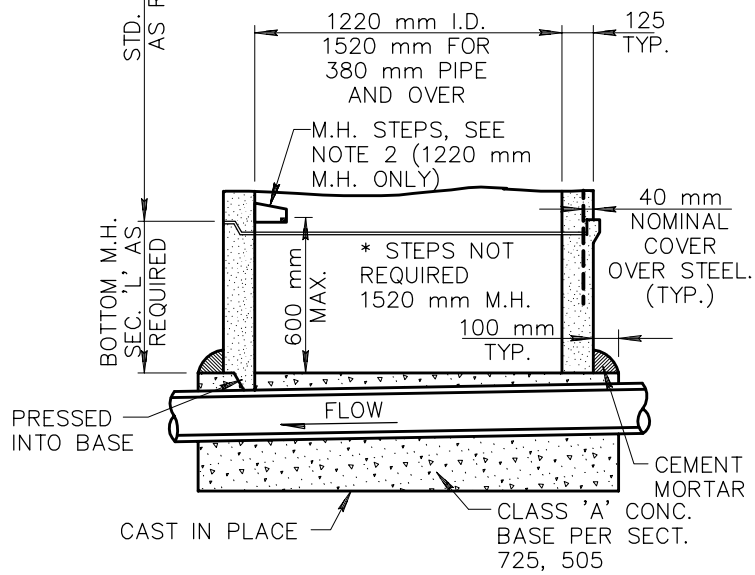
TYPE 'B' TOP

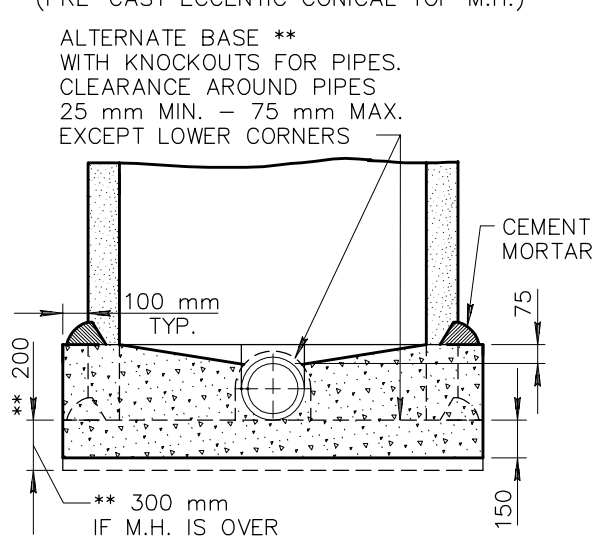
TYPE 'A' TOP

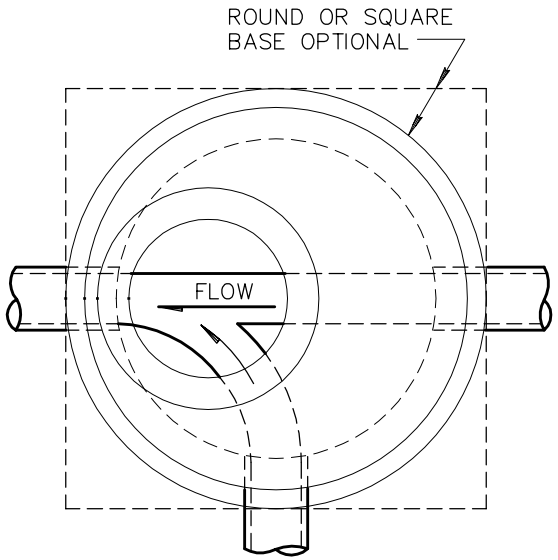
(PRE-CAST ECCENTIC CONICAL TOP M.H.)



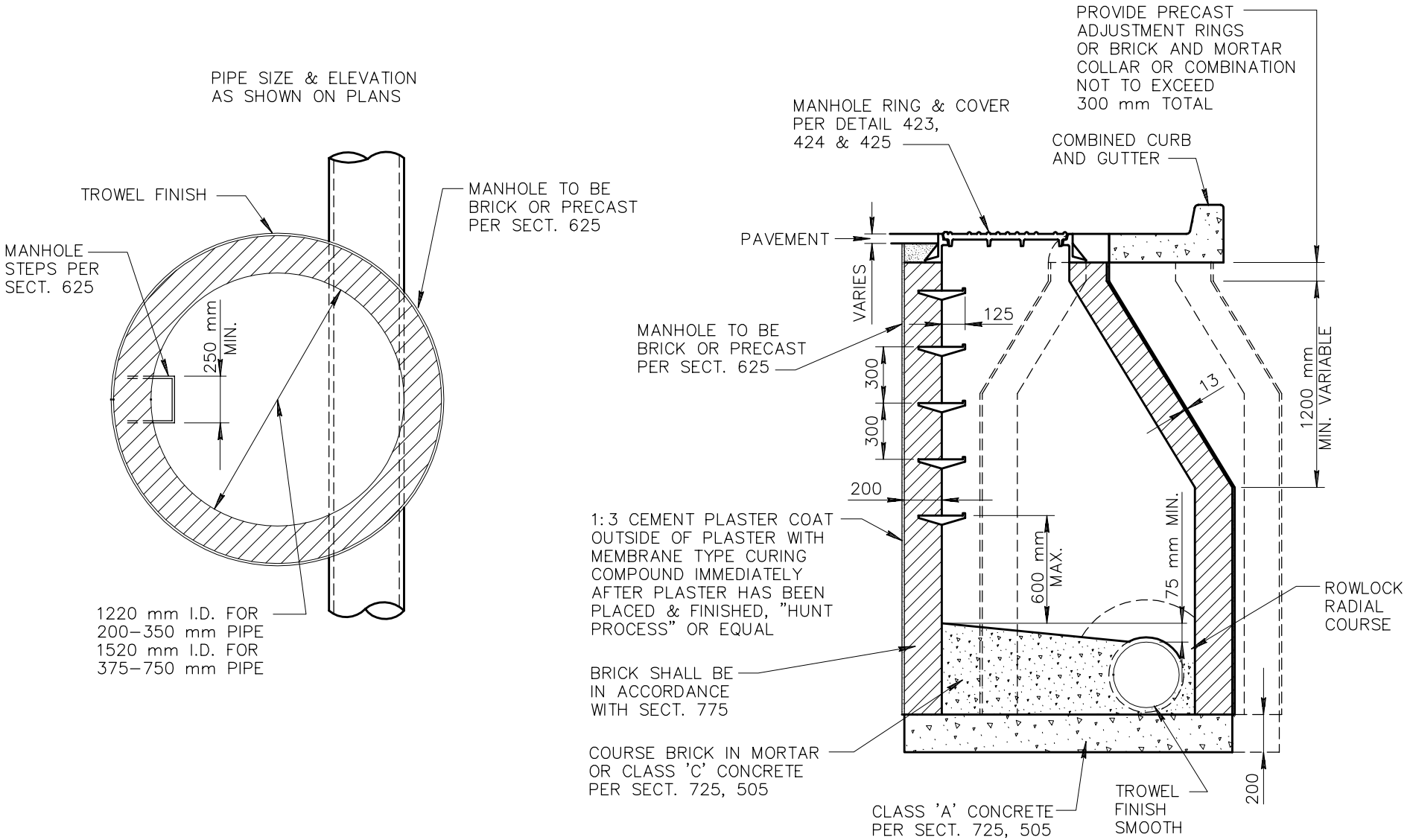
ADJUSTING RING DETAIL



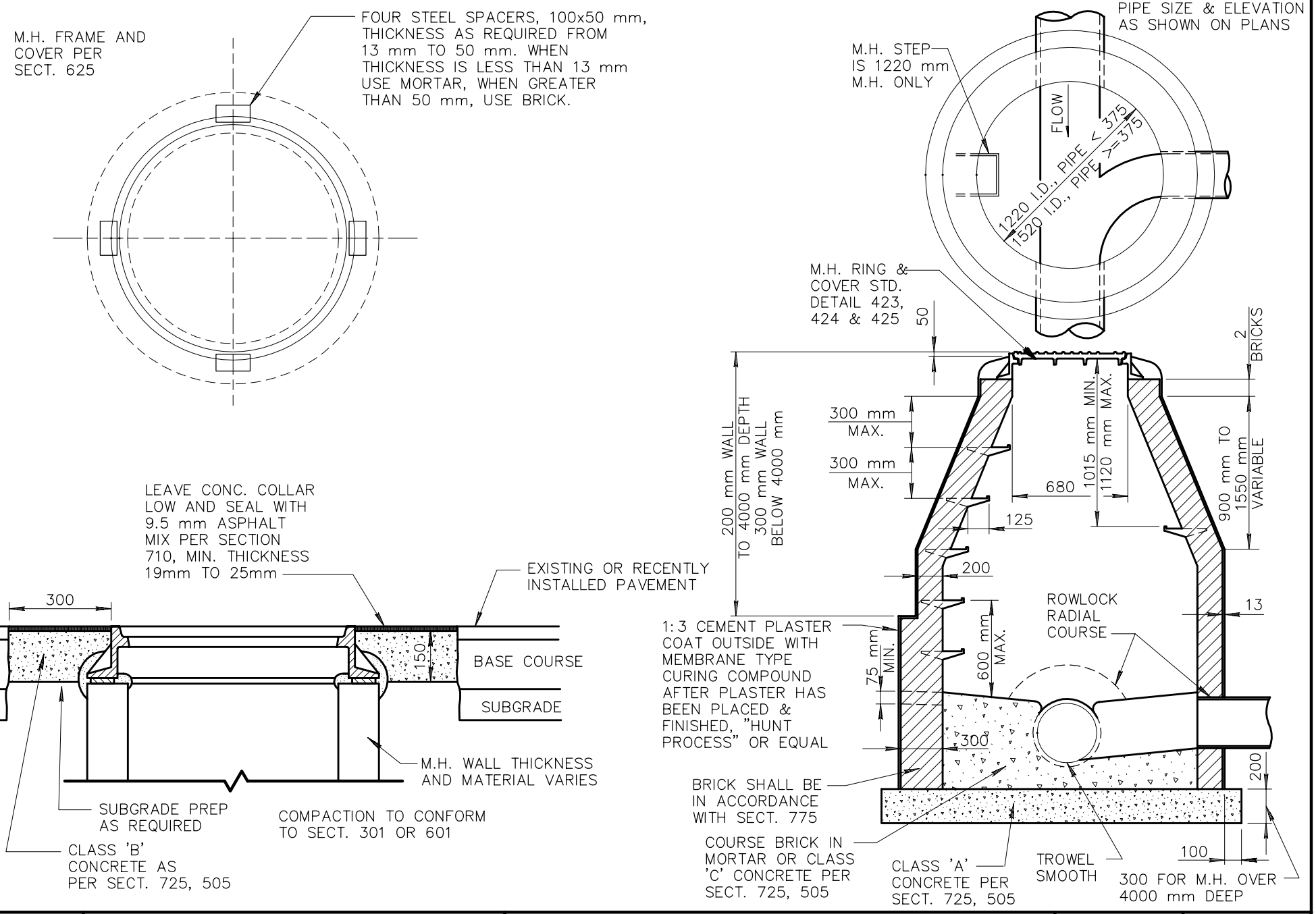




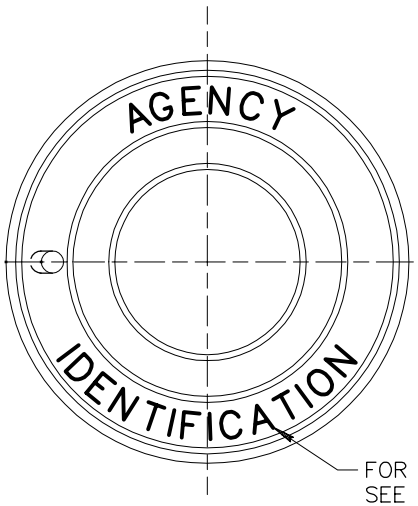
DETAIL NO.		STANDARD DETAIL		REVISED	DETAIL NO.
420	MARICOPA ASSOCIATION of GOVERNMENTS	METRIC	PRE-CAST CONCRETE SEWER MANHOLE	3-09-2000	420



DETAIL NO.			REVISED	DETAIL NO.
421	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**OFFSET MANHOLE FOR 200 mm - 750 mm PIPE**	3-09-2000	421

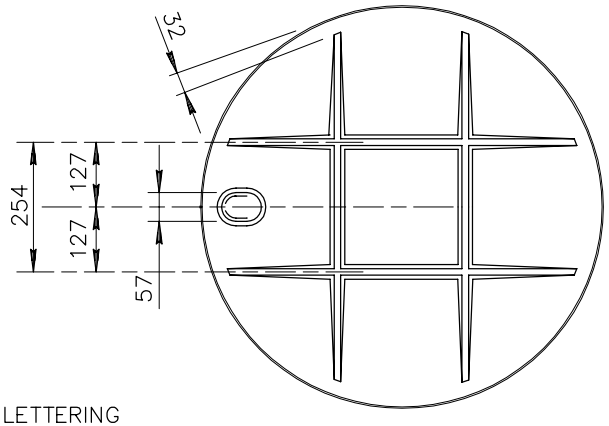


DETAIL NO.			REVISED	DETAIL NO.
422	MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL METRIC	BRICK SEWER MANHOLE AND COVER FRAME ADJUSTMENT	3-09-2000	422

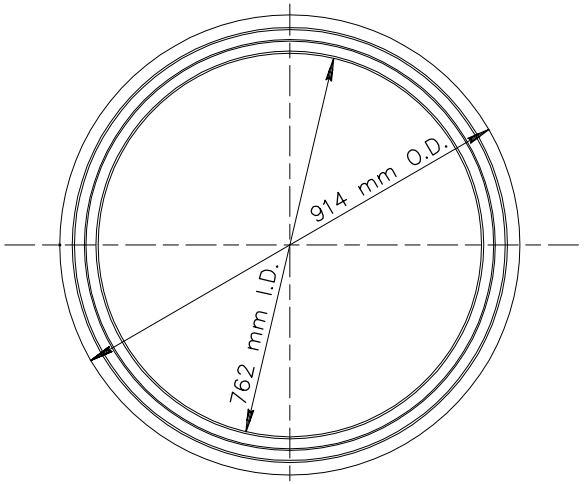


FOR COVER LETTERING
SEE NOTE ON DETAIL 424

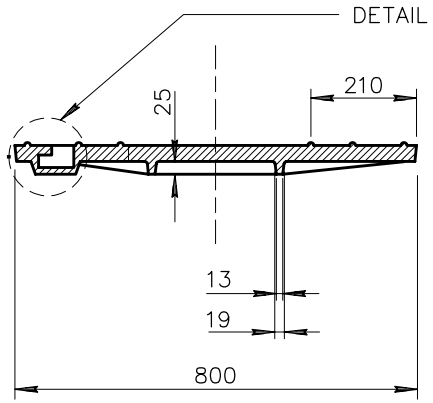
FACE OF COVER
CAST IRON



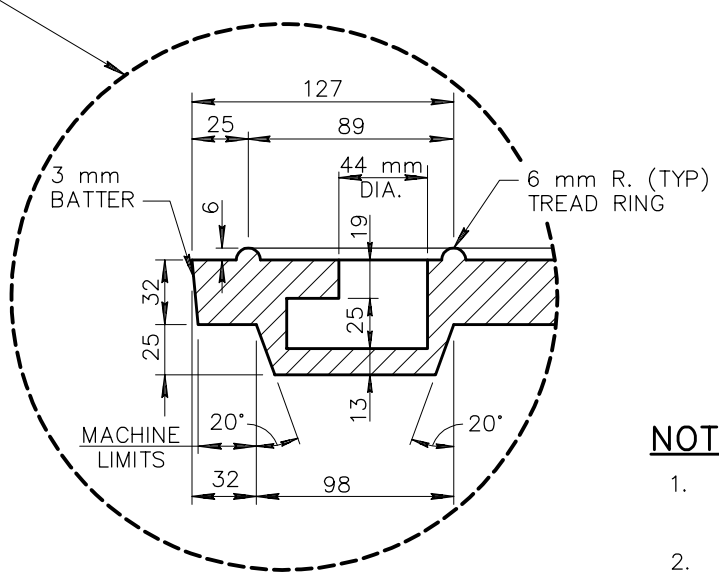
BACK OF COVER

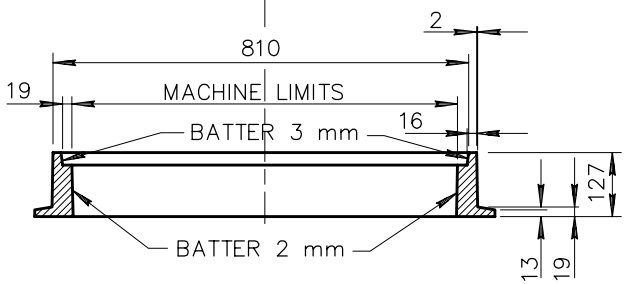


CAST IRON
MANHOLE RING



SECTION OF COVER
APPROX. WEIGHT 125 kg



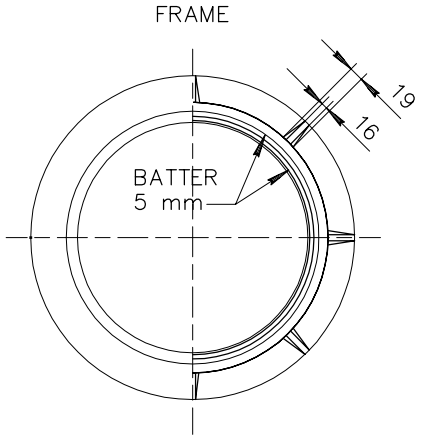


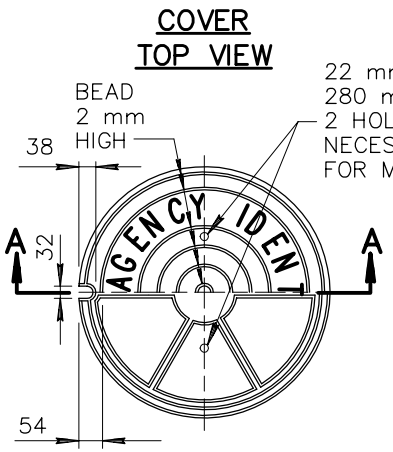
SECTION OF RING
APPROX. WEIGHT 95 kg

NOTES:

1. WEIGHT OF CASTING SHALL BE NO MORE THAN 2% LESS THAN THE APPROXIMATE WEIGHT SPECIFIED.
2. CASTINGS SHALL CONFORM TO SECT. 787.

DETAIL NO.			REVISED	DETAIL NO.
423	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**WATER TIGHT 760 mm MANHOLE FRAME AND COVER**	3-09-2000	423





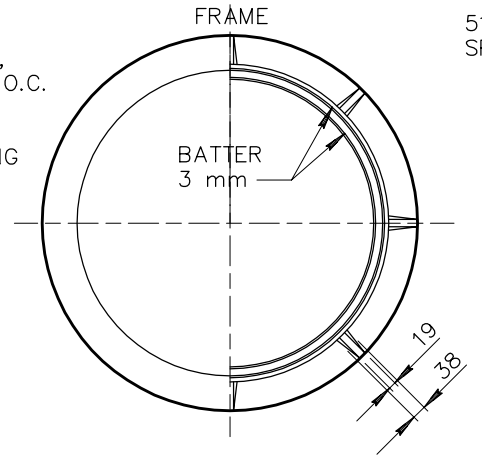
BOTTOM VIEW – TOP VIEW

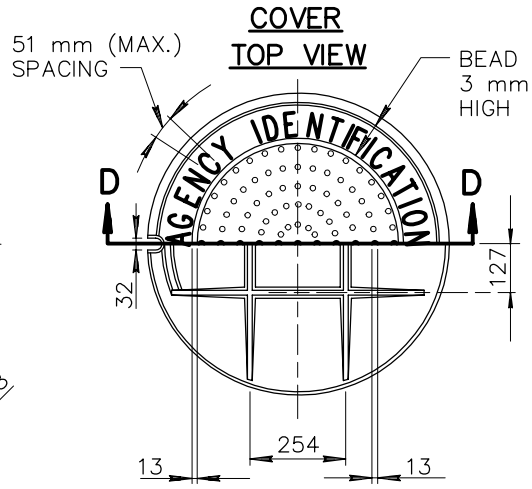
WT. (CL. 30) – 93 kg
WT. (CL. 35) – 77 kg

BOTTOM VIEW

WT. (CL. 30) – 91 kg
WT. (CL. 35) – 82 kg

610 mm MANHOLE FRAME AND COVER





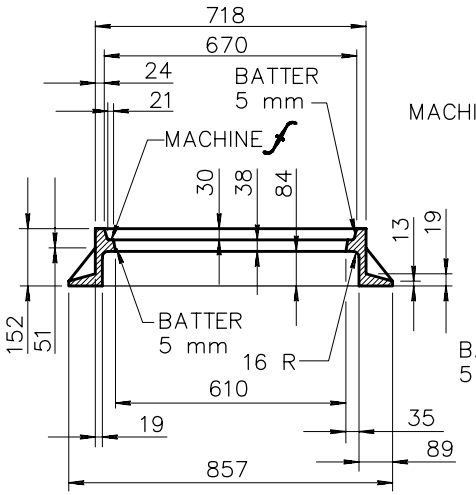
BOTTOM VIEW – TOP VIEW

WT. (CL. 30) – 102 kg
WT. (CL. 35) – 99 kg

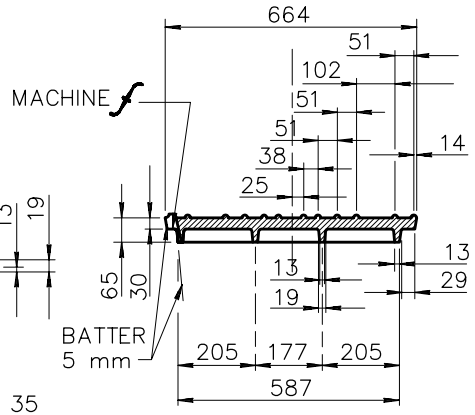
BOTTOM VIEW

WT. (CL. 30) – 147 kg
WT. (CL. 35) – 94 kg

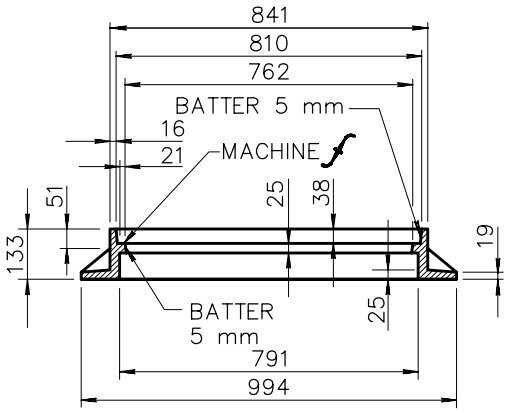
760 mm MANHOLE FRAME AND COVER



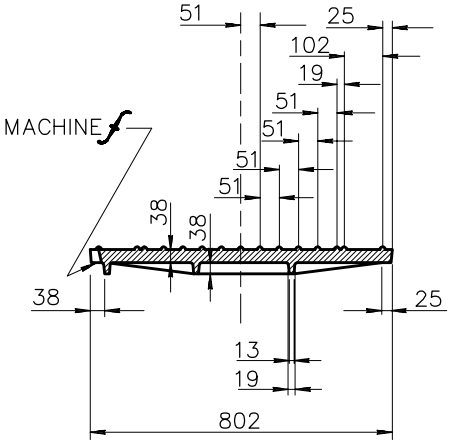
SECTION OF FRAME



SECTION 'A–A' OF COVER



SECTION OF FRAME

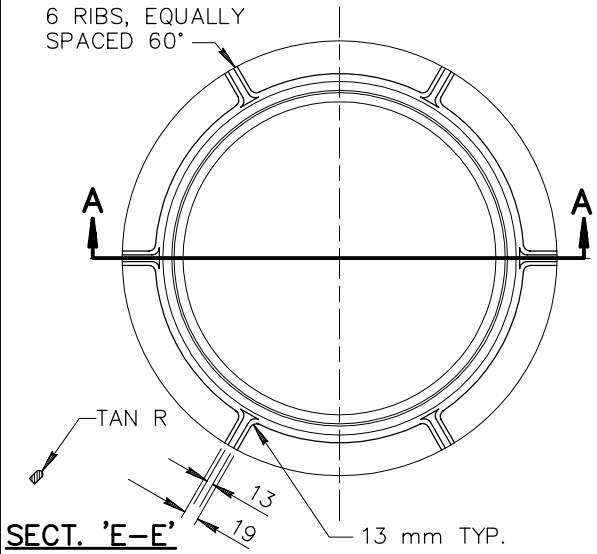


SECTION 'D–D' OF COVER

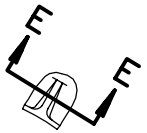
NOTE:

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 51 mm IN HEIGHT AND RAISED 3 mm ABOVE LEVEL OF COVER. TYPE OF LETTERS TO BE SUBMITTED FOR APPROVAL. WEIGHT OF CASTINGS SHALL BE NO MORE THAN 2% LESS THAN THE APPROXIMATE WEIGHT SPECIFIED. CASTINGS SHALL CONFORM TO SECTION 787.

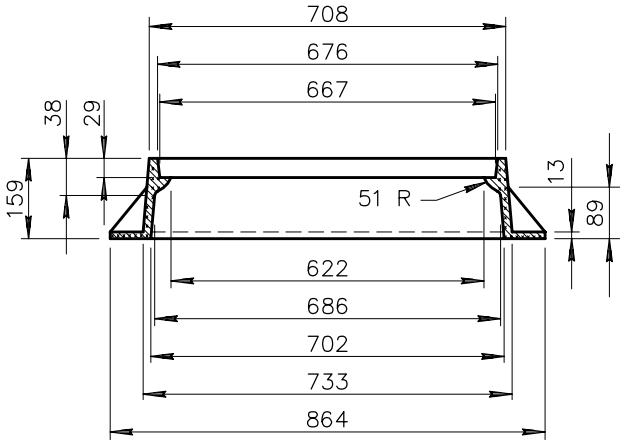
DETAIL NO.			REVISED	DETAIL NO.
424	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**610 mm AND 760 mm MANHOLE FRAME AND COVER**	3-09-2000	424



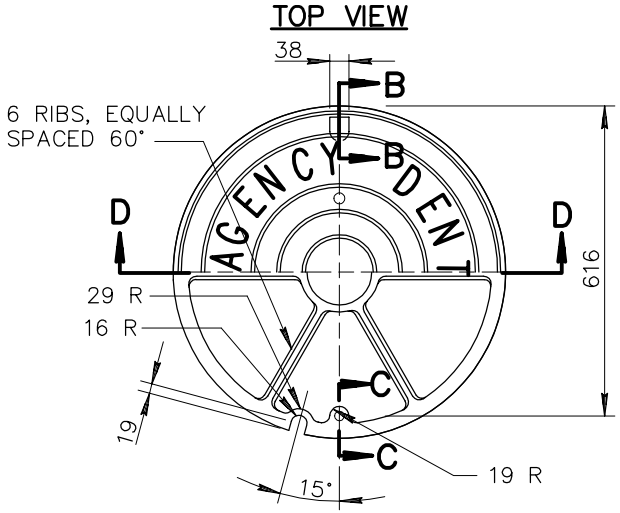
SECT. 'E–E'



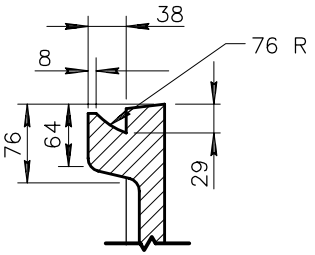
RIB DETAIL



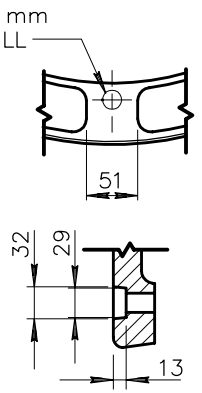
SECTION 'A–A'



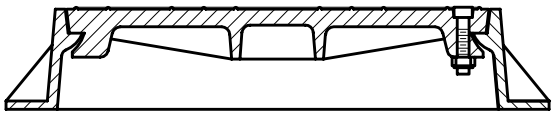
BOTTOM VIEW



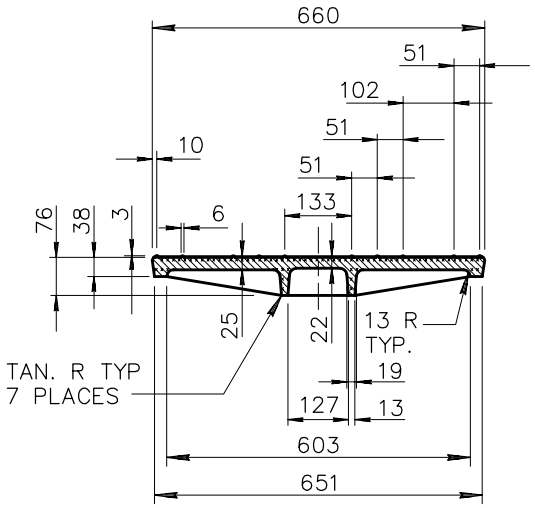
SECTION 'B–B'



SECTION 'C–C'



SECTION VIEW OF FRAME AND COVER WITH CAM LOCKING DEVICE



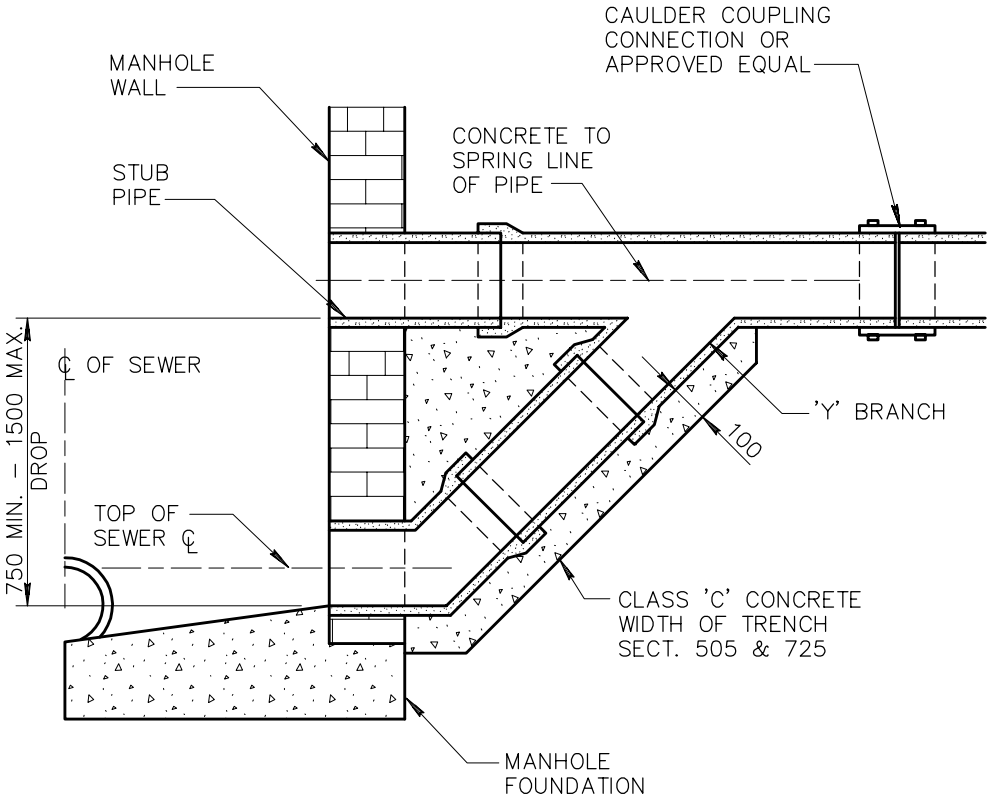
SECTION 'D–D'

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)

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 51 mm RAISED 3 mm ABOVE LEVEL OF COVER. TYPE OF LETTERS TO BE SUBMITTED FOR APPROVAL. WEIGHT OF CASTINGS SHALL BE NO MORE THAN 2% LESS THAN THE APPROXIMATE WEIGHT SPECIFIED. CASTINGS SHALL CONFORM TO SECT. 787.

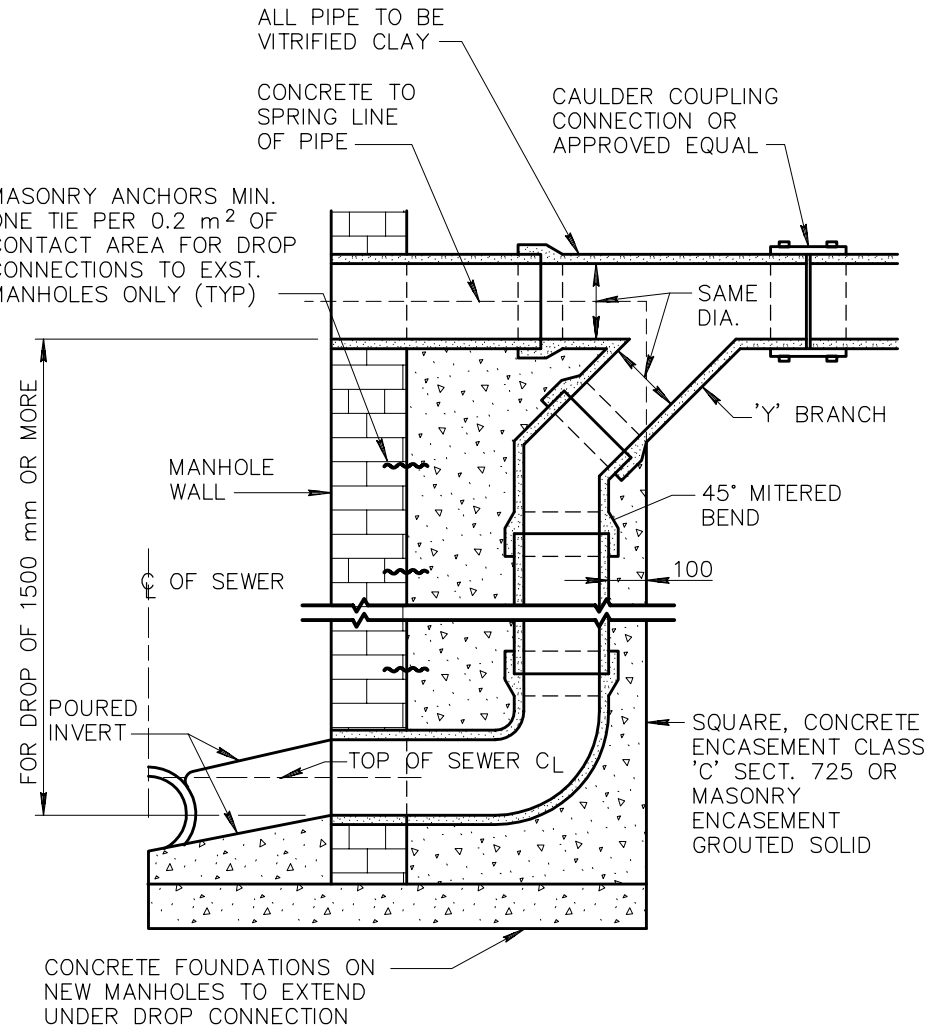
SHALL CONFORM TO SECT. 625.3.1 – (FRAME AND COVER).

DETAIL NO.			REVISED	DETAIL NO.
425	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**610 mm ALUMINUM MANHOLE FRAME AND COVER**	3-09-2000	425



TYPE A

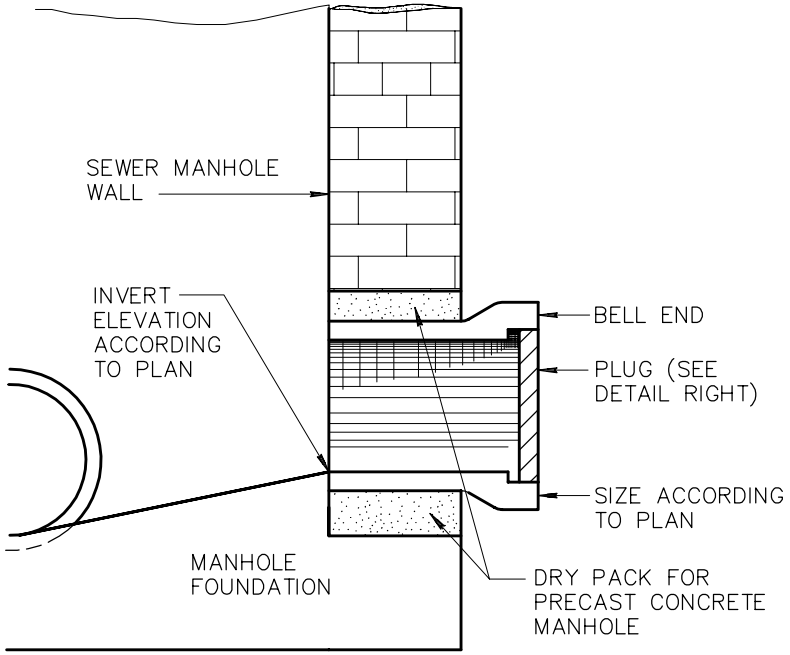
750 mm TO 1500 mm DROP



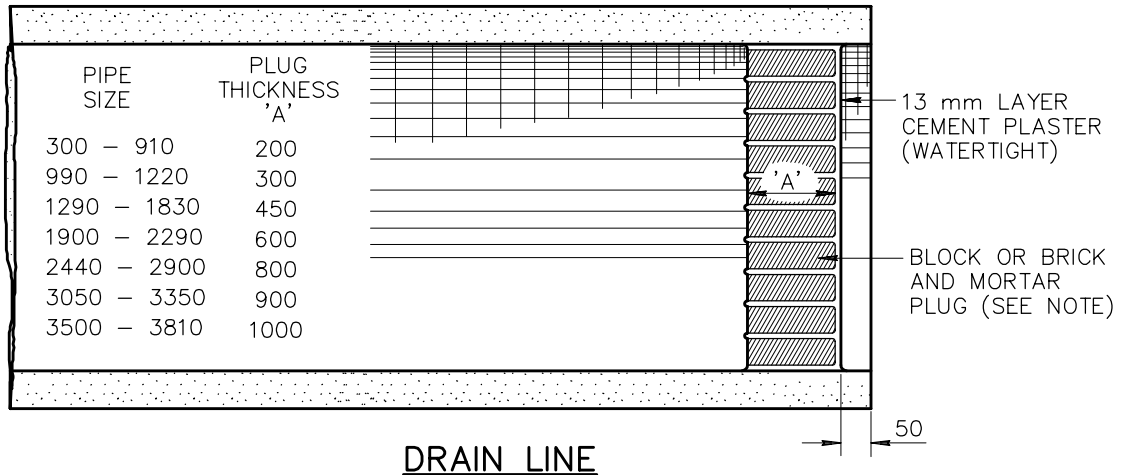
TYPE B

1500 mm OR MORE

DETAIL NO.			REVISED	DETAIL NO.
426	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**DROP SEWER CONNECTIONS**	3-09-2000	426



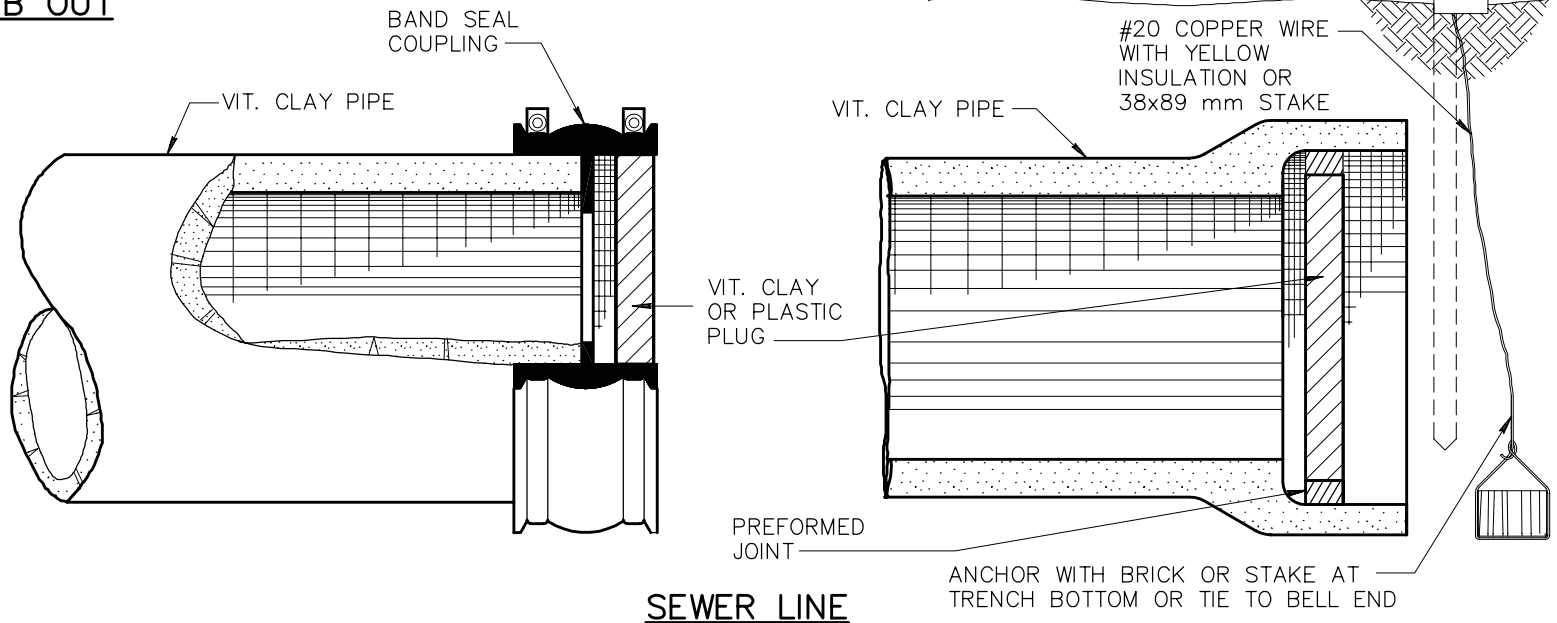
TYPICAL STUB OUT



DRAIN LINE

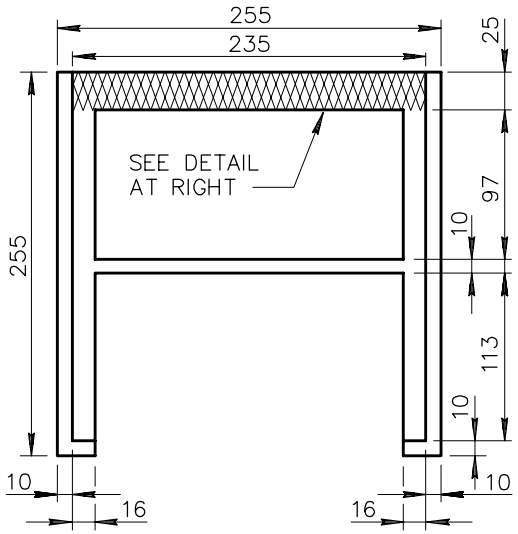
NOTES:

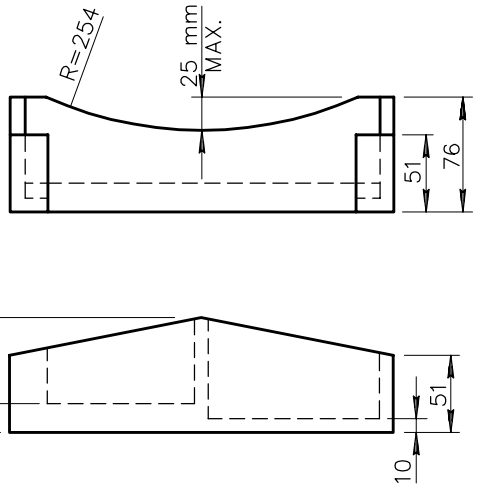
1. NOTE: COMPACT SOIL AT END OF PIPE TO 95% OF MAXIMUM DENSITY.
2. IF DEPTH OF COVER IS LESS THAN 1500 mm OR GREATER THAN 3000 mm, INCREASE PLUG THICKNESS A MIN. OF 100 mm.

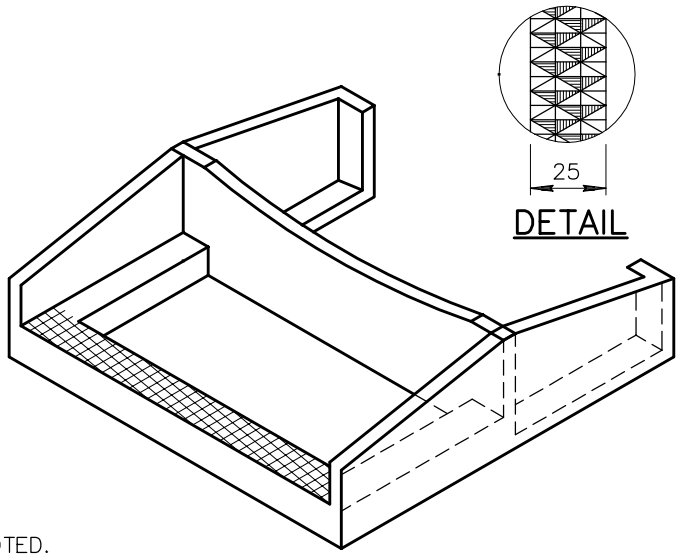


SEWER LINE

DETAIL NO.		STANDARD DETAIL METRIC		REVISED	DETAIL NO.
427	MARICOPA ASSOCIATION of GOVERNMENTS		STUB OUT AND PLUGS	3-09-2000	427



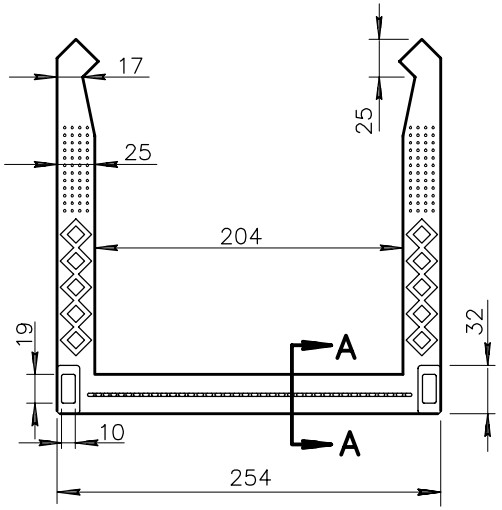


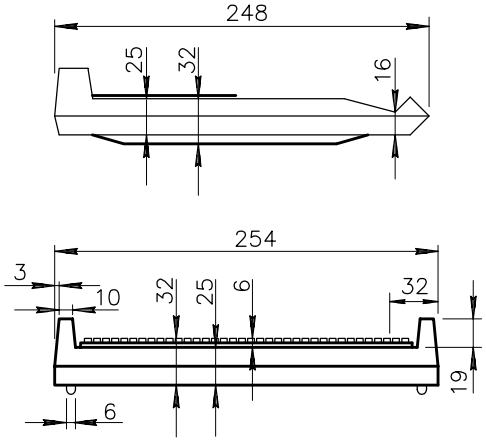


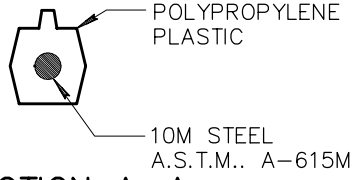
NOTES

1. ALL DIMENSIONS ARE MINIMUM EXCEPT WHERE NOTED.
2. CASTING AS PER SECT. 787.

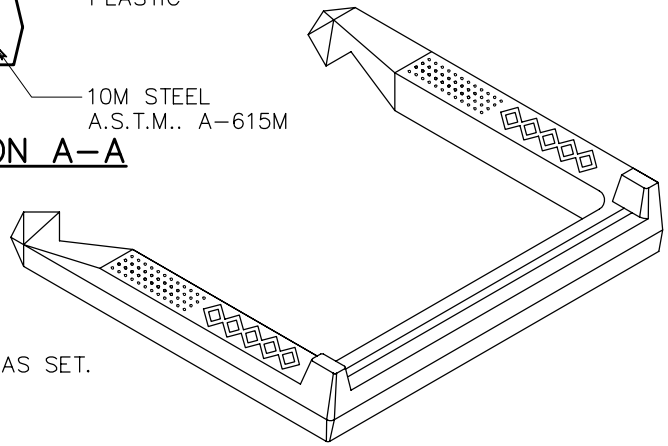
CAST IRON MANHOLE STEP







SECTION A–A

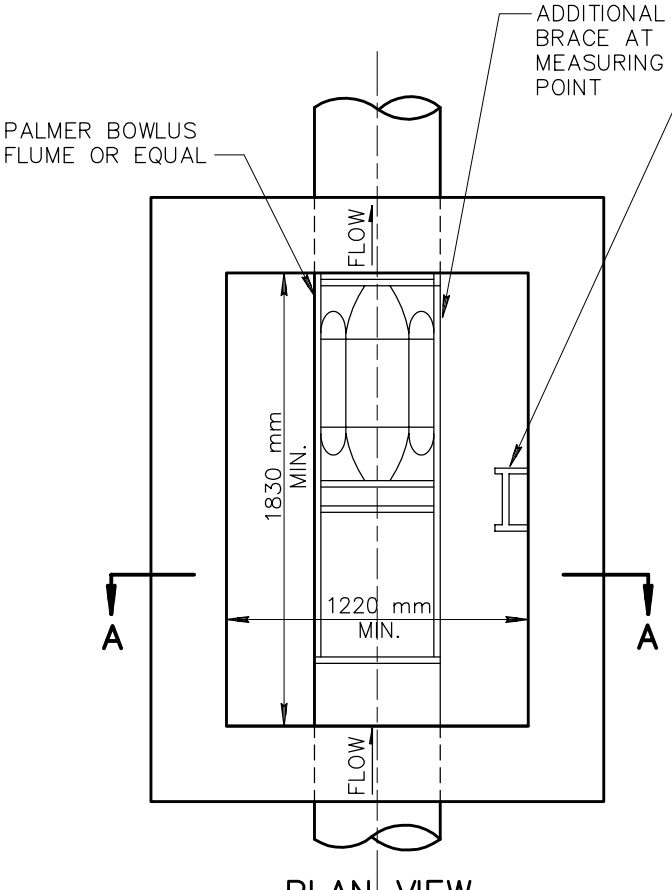


NOTES

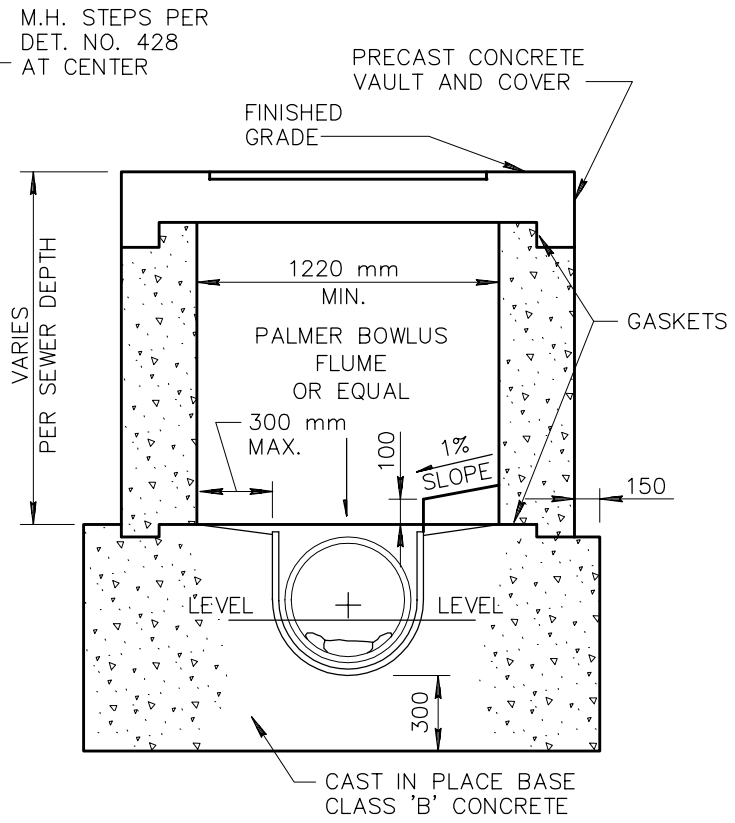
1. STEPS SHALL BE PLACED INTO WET CONCRETE WALL DURING MANUFACTURE OR MORTARED INTO HOLES AFTER CONCRETE HAS SET.
2. POLYPROPYLENE MUST MEET REQUIREMENTS OF A.S.T.M. 2146, TYPE II, GRADE 16906.

POLYPROPYLENE MANHOLE STEP

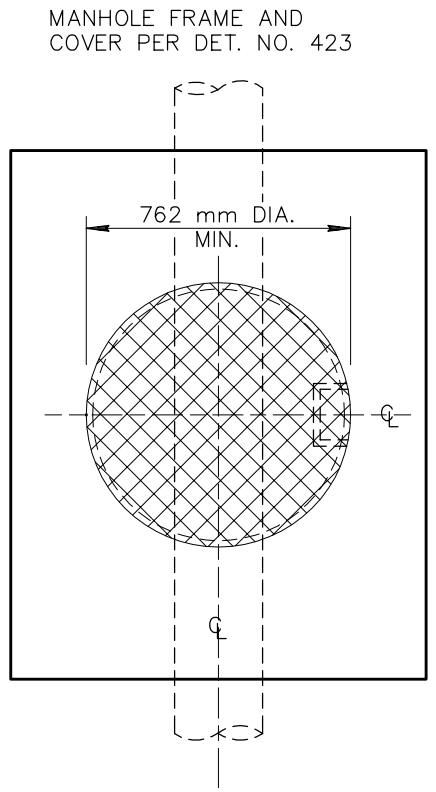
DETAIL NO.			REVISED	DETAIL NO.
428	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**MANHOLE STEPS**	3-09-2000	428



PLAN VIEW



SECTION A–A

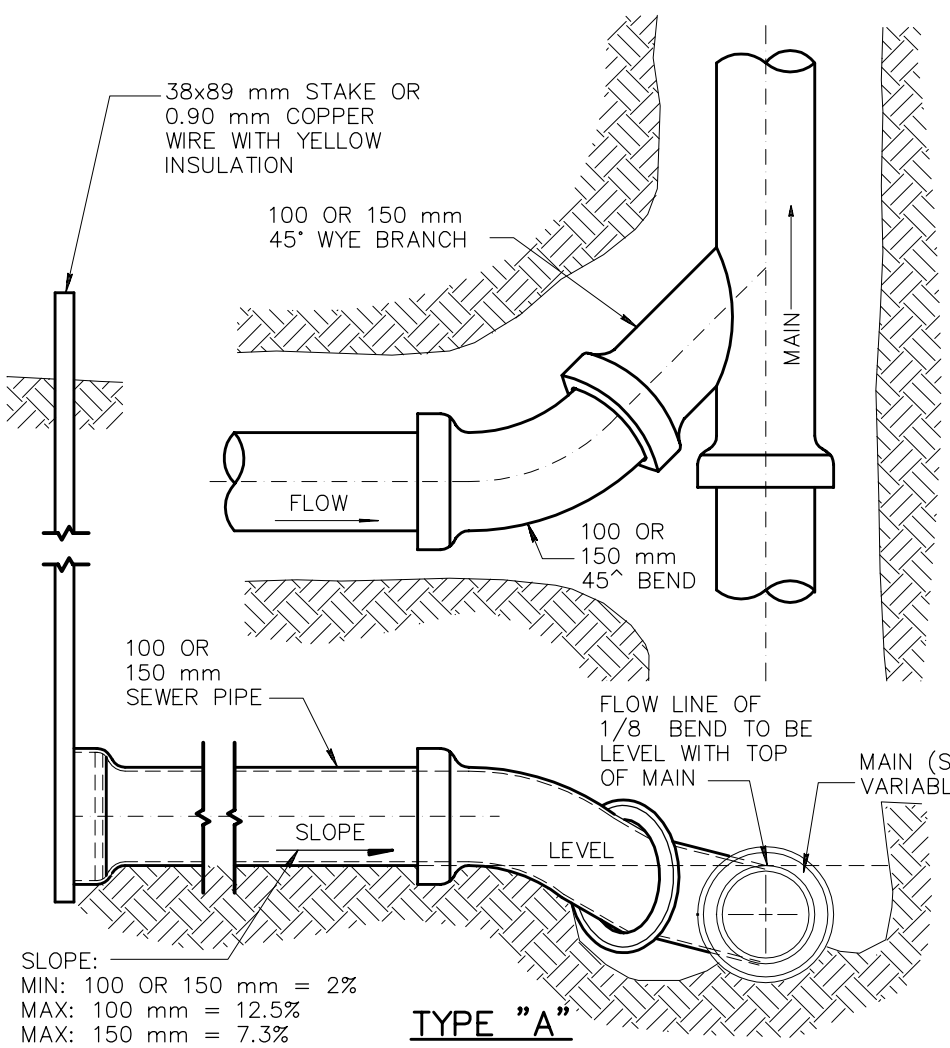


MANHOLE & COVER SLAB

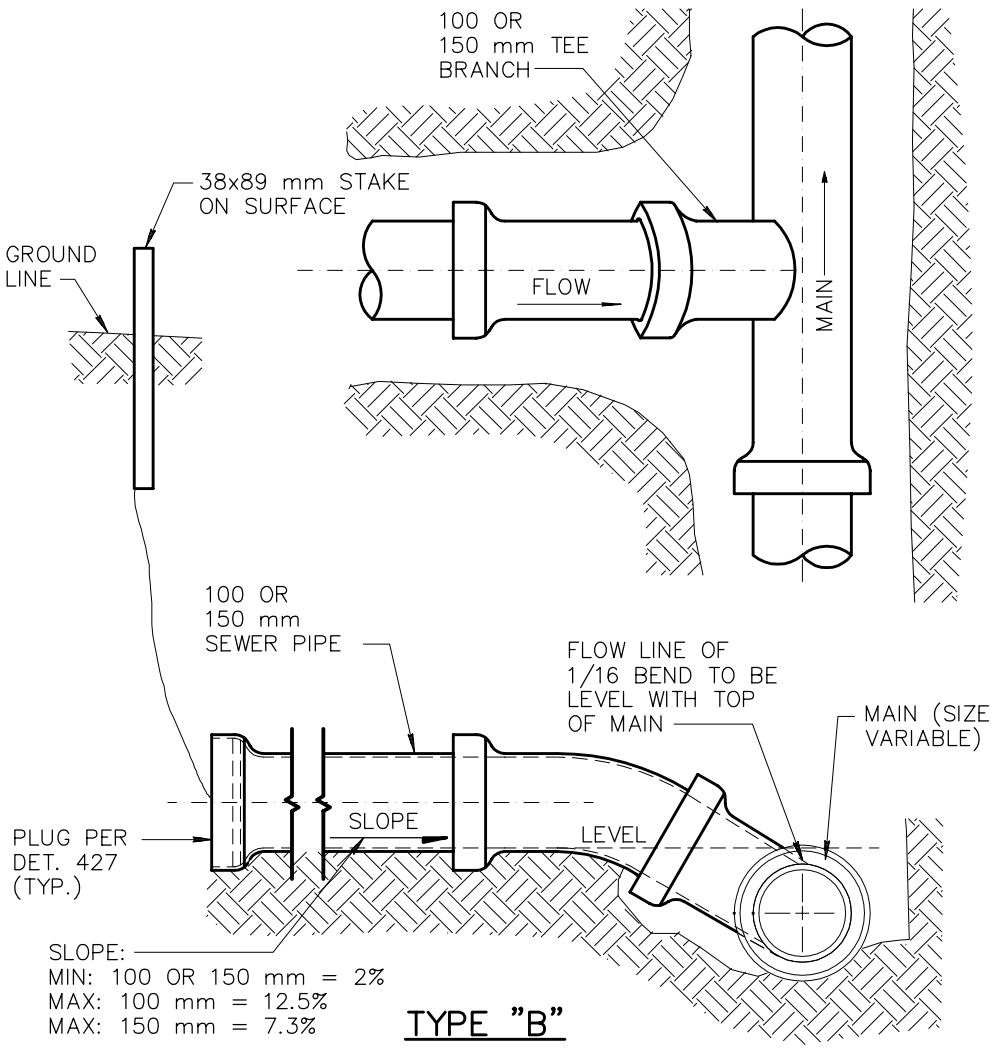
NOTES:

1. THIS CONTROL VAULT WITH MANHOLE AND COVER SHALL BE USED ON 150 mm AND 200 mm DIAMETER SEWER WITH FLOWS IN THE RANGE OF 2.5 L/s TO 21.5 L/s.
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 1220 mm WIDE AND 1830 mm 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 METRIC	INDUSTRIAL WASTE CONTROL VAULT WITH MANHOLE	3-09-2000	429



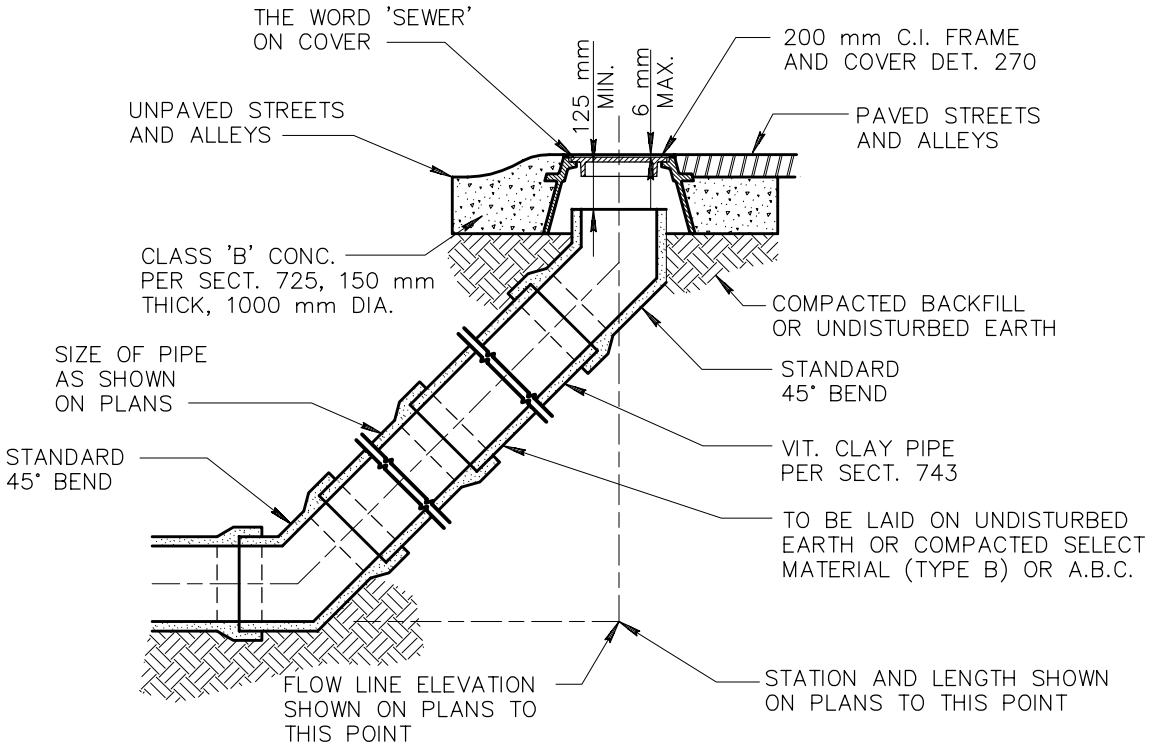
TYPE "A"



TYPE "B"

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. DETAILS SHOWN MUST BE MET FOR MINIMUM CONDITION OF LESS THAN 1500 mm.
4. CONSTRUCT TAP AT MINIMUM SLOPE IF COVER WILL BE LESS THAN 1500 mm AT PROPERTY LINE.
5. IF DEPTH REQUIRES, MINIMUM SLOPE CAN BE REDUCED TO 1% PROVIDED STUB IS STAKED TO GRADE.
6. FOR DEEPER LATERAL OR TRUNK SEWER CONDITION, THE WYE AND 1/8 BEND OR THE TEE AND 1/16 BEND WILL BE ROTATED TOWARD THE VERTICAL POSITION AS REQUIRED TO OBTAIN 1500 mm COVER OVER TAP AT PROPERTY LINE OR EASEMENT LINE.
7. END OF TAP TO BE SEALED AND MARKED AS NOTED.

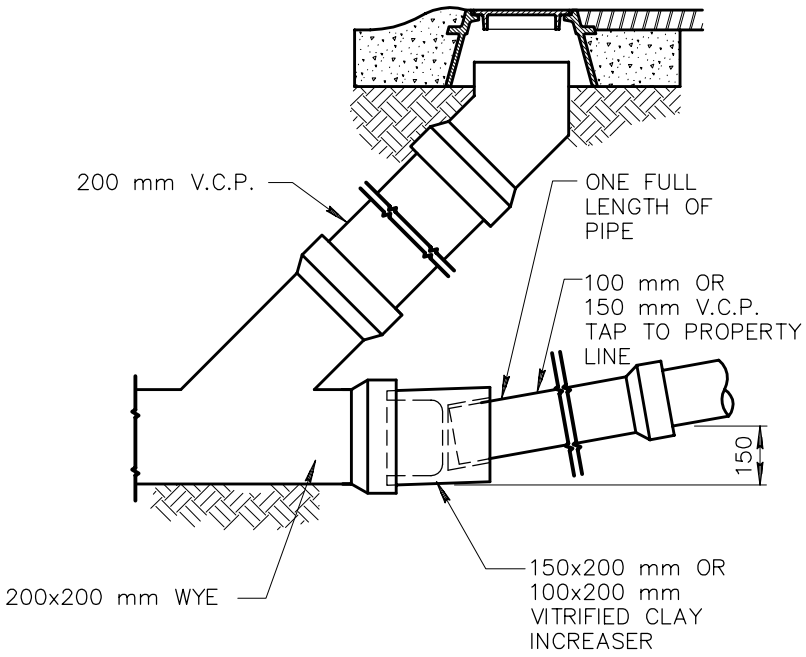
DETAIL NO.			REVISED	DETAIL NO.
440	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	SEWER BUILDING CONNECTIONS	3-09-2000	440



CLEANOUT INSTALLATION

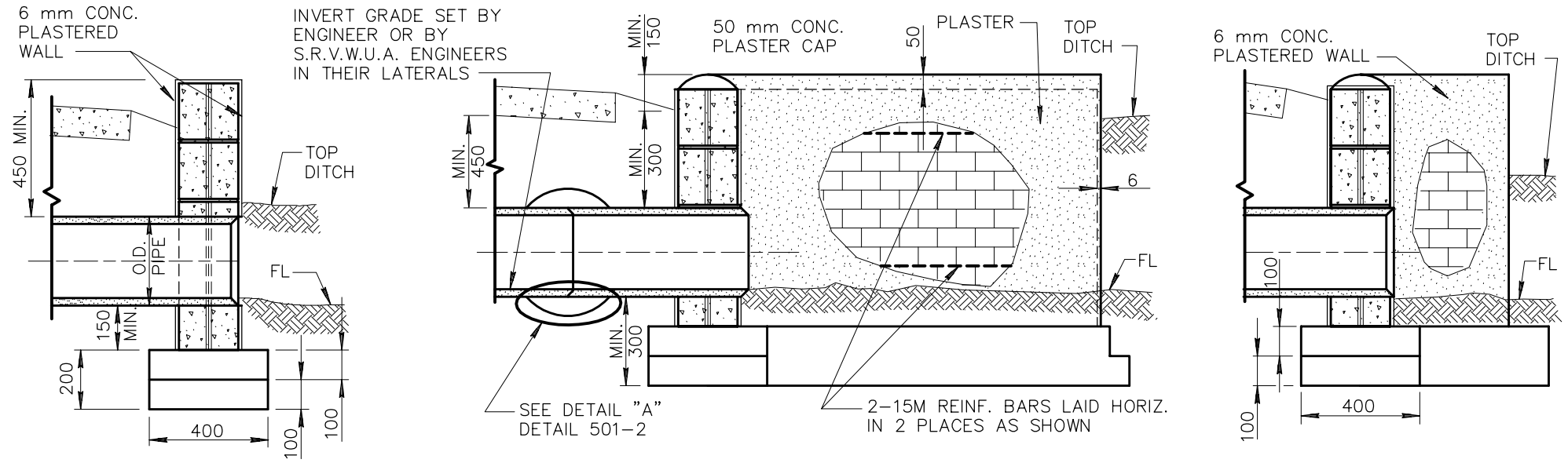
NOTE:

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

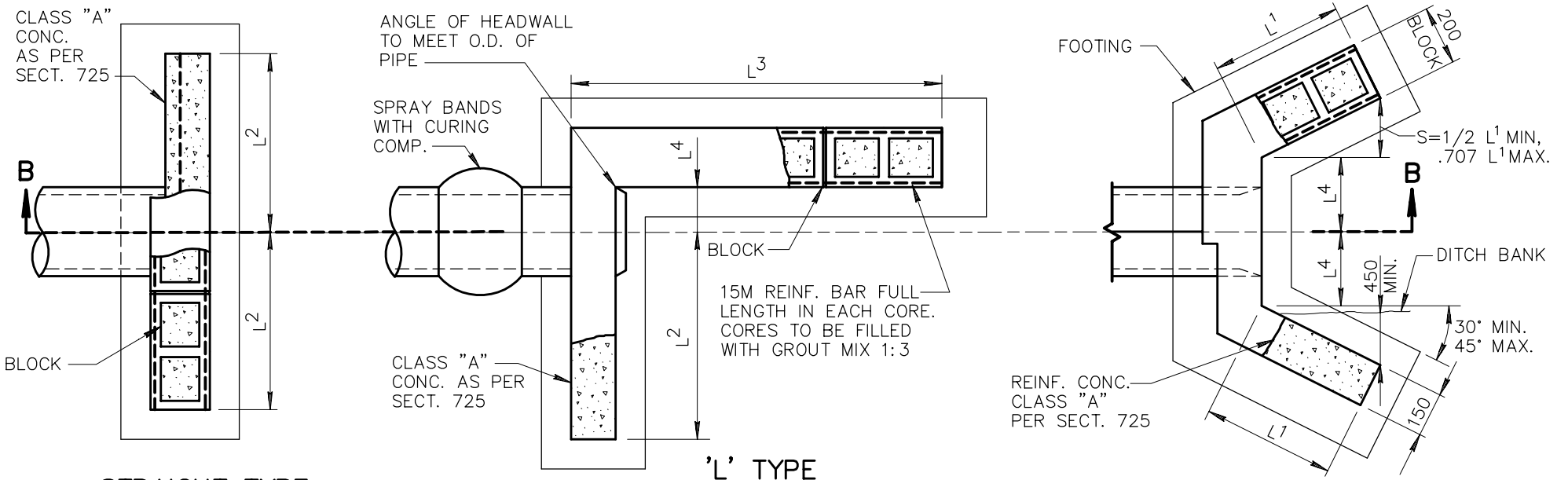


SEWER TAP AT CLEANOUT

DETAIL NO.			REVISED	DETAIL NO.
441	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	SEWER CLEANOUT	3-09-2000	441



SECTION B-B



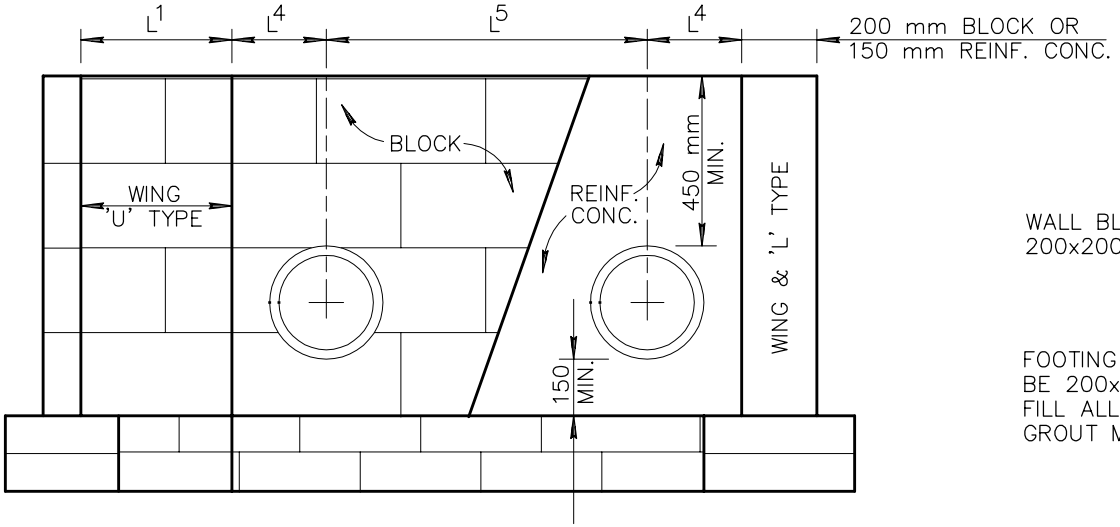
STRAIGHT TYPE

'L' TYPE

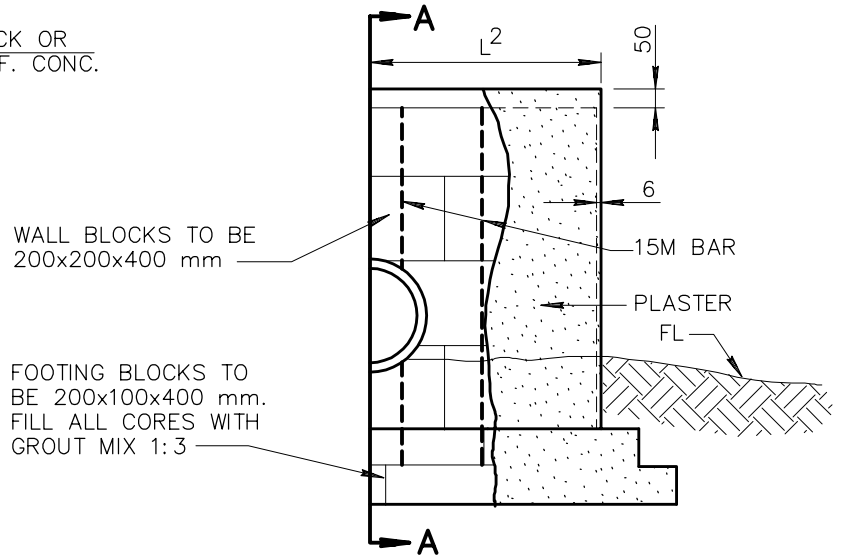
PLAN

'U' TYPE

DETAIL NO.			REVISED	DETAIL NO.
501-1	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	HEADWALL	3-10-2000	501-1



DOUBLE PIPE HEADWALL



ELEVATION

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

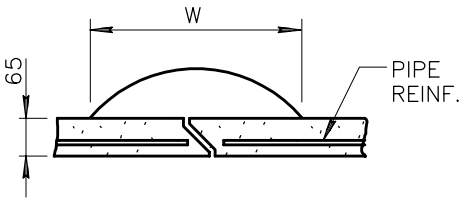
NOTES:

1. ALL CONCRETE SHALL BE CLASS 'A' PER SECT. 505 & 725.
2. CONCRETE BLOCK PER SECT. 510, 775 & 776.
3. CONCRETE REINF. SHALL BE 15M BAR, 300 mm BOTH WAYS.

HEADWALL DIMENSIONS

*NOMINAL PIPE SIZE	L^1	L^2	L^3	L^4	L^5
300	410	610	1120	250	860
375	610	810	1220	300	910
450	610	1020	1420	360	1020
525	810	1220	1630	380	1120
600	810	1220	1630	460	1190
750	810	1630	2030	560	1400
900	1020	2030	2440	560	1570
1050	1220	2440	2840	660	1750

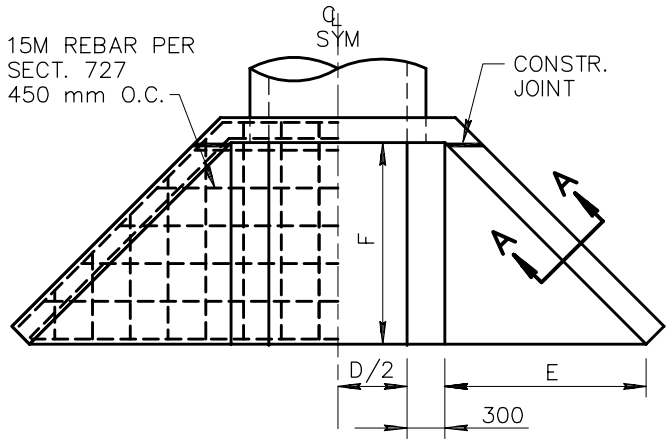
* NOMINAL PIPE SIZE GIVEN FOR REINFORCED CONC. PIPE.



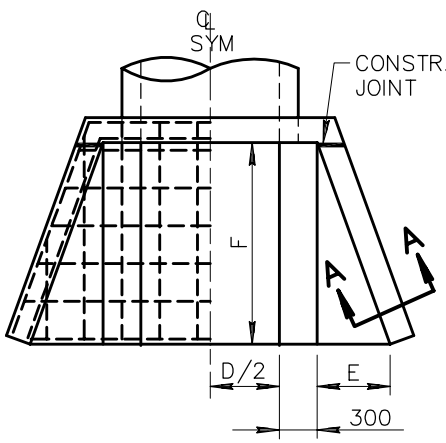
PIPE SIZE	W
300–550 mm INCL.	280 mm
600–1100 mm INCL.	330 mm

DETAIL "A"

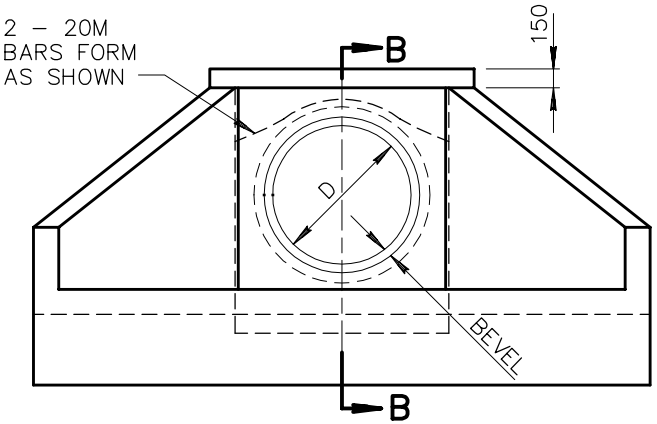
DETAIL NO.			REVISED	DETAIL NO.
501-2	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	HEADWALL	3-10-2000	501-2



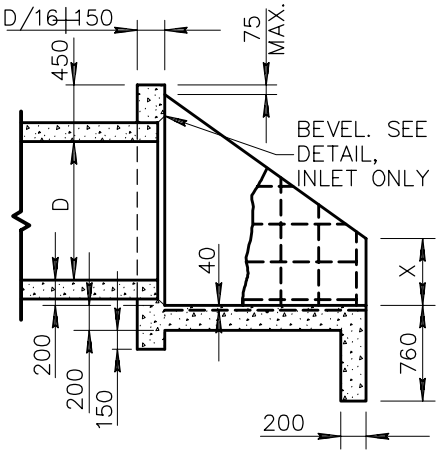
INLET HEADWALL



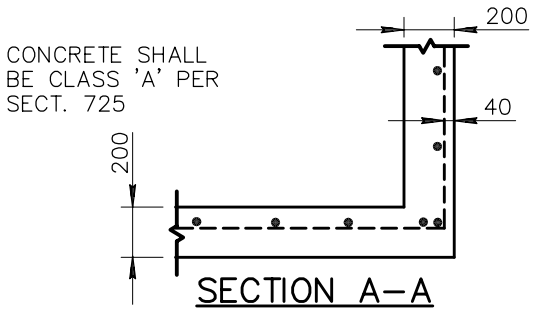
OUTLET HEADWALL



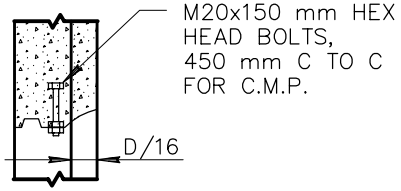
INLET HEADWALL FACE ELEVATION
OUTLET SIMILAR



SECTION B–B



SECTION A–A



BEVEL DETAIL

1:1 1/2 EMBANKMENT SLOPE

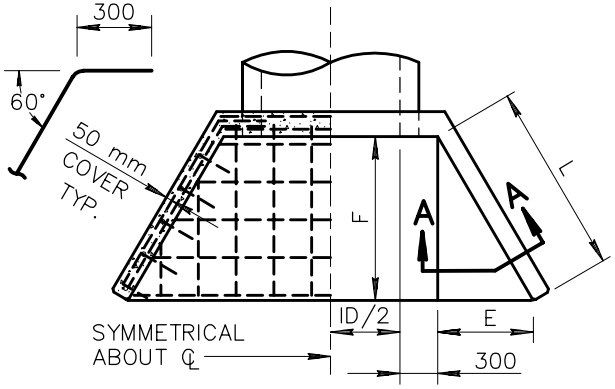
NOMINAL PIPE SIZE		D	TYPE	DIMENSIONS			CONC. (m^3)		REINF. STEEL (kg)
R.C.P.	C.M.P.			F	E	X	C.M.P.	R.C.P.	
1050	1000	1070	1 (IN)	1570	1570	530	3.42	3.34	129
			2 (OUT)	1570	580	530	2.65	2.59	100
1200	1200	1220	3 (IN)	1730	1730	580	4.01	3.92	151
			4 (OUT)	1730	640	580	3.11	3.04	117
1350	1400	1370	5 (IN)	1830	1830	640	4.51	4.44	174
			6 (OUT)	1830	690	640	3.52	3.45	135
1500		1520	7 (IN)	2030	2030	690	——	5.17	199
			8 (OUT)	2030	740	690	——	3.99	154
1650		1680	9 (IN)	2180	2180	740	——	5.88	226
			10 (OUT)	2180	790	740	——	4.54	175
1800	1800	1830	11 (IN)	2340	2340	790	6.78	6.64	255
			12 (OUT)	2340	840	790	5.24	5.12	197
1950	2000	1980	13 (IN)	2490	2490	840	7.59	7.42	286
			14 (OUT)	2490	910	840	5.86	5.73	217
2100	2200	2130	15 (IN)	2640	2640	890	8.42	8.24	318
			16 (OUT)	2640	970	890	6.52	6.37	246

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

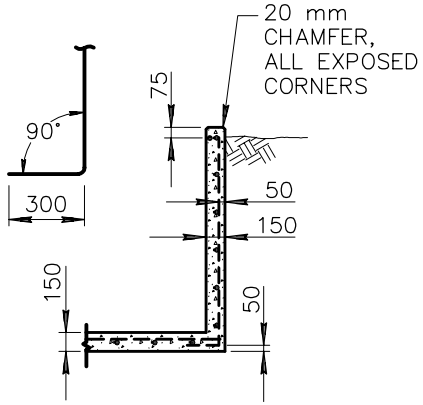
1:4 EMBANKMENT SLOPE

NOMINAL PIPE SIZE		D	TYPE	DIMENSIONS			CONC. (m^3)		REINF. STEEL (kg)
R.C.P.	C.M.P.			F	E	X	C.M.P.	R.C.P.	
1050	1000	1070	17 (IN)	2640	2640	910	5.93	5.79	223
			18 (OUT)	2640	970	910	4.21	4.11	159
1200	1200	1220	19 (IN)	2640	2640	1070	6.38	6.23	240
			20 (OUT)	2640	970	1070	4.60	4.50	173
1350	1400	1370	21 (IN)	2640	2640	1220	6.82	6.67	258
			22 (OUT)	2640	970	1220	4.99	4.88	188
1500		1520	23 (IN)	2840	2840	1320	——	7.63	295
			24 (OUT)	2840	1040	1320	——	5.55	215
1650		1680	25 (IN)	2950	2950	1450	——	8.48	324
			26 (OUT)	2950	1070	1450	——	6.19	238
1800	1800	1830	27 (IN)	2950	2950	1600	9.13	8.93	344
			28 (OUT)	2950	1070	1600	6.78	6.64	255
1950	2000	1980	29 (IN)	3050	3050	1730	9.96	9.74	375
			30 (OUT)	3050	1120	1730	7.45	7.28	280
2100	2200	2130	31 (IN)	3250	3250	1830	11.14	10.89	420
			32 (OUT)	3250	1190	1830	8.27	8.09	312

DETAIL NO.			REVISED	DETAIL NO.
501-3	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**HEADWALL 1100 mm TO 2100 mm PIPE**	3-10-2000	501-3

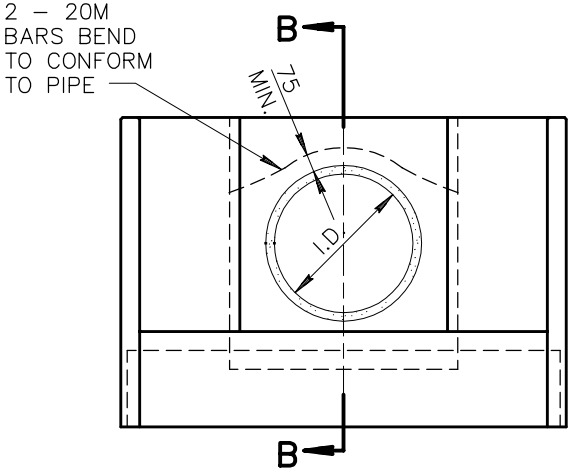


PLAN

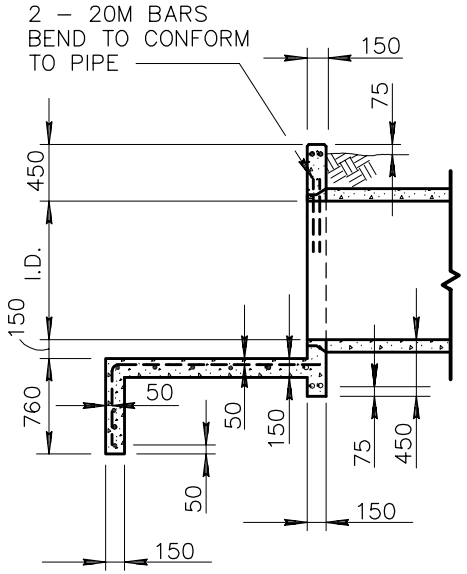


SECTION A–A

NOMINAL PIPE SIZE		PIPE	DIMENSIONS			CONC. (m^3)		REINF. STEEL (kg)
R.C.P.	C.M.P.	I.D.	L	F (APPROX)	F	R.C.P.	C.M.P.	
450	450	460	610	300	530	0.71	0.72	31
600	600	610	610	300	530	0.79	0.82	37
750	800	760	910	460	790	1.08	1.13	51
900	900	910	1220	610	1060	1.51	1.56	71
1050	1000	1070	1520	760	1320	1.98	2.04	96
1200	1200	1220	1830	910	1590	2.48	2.55	127
1350	1400	1370	2130	1070	1840	3.02	3.11	158
1500		1520	2440	1220	2110	3.61		193



ELEVATION

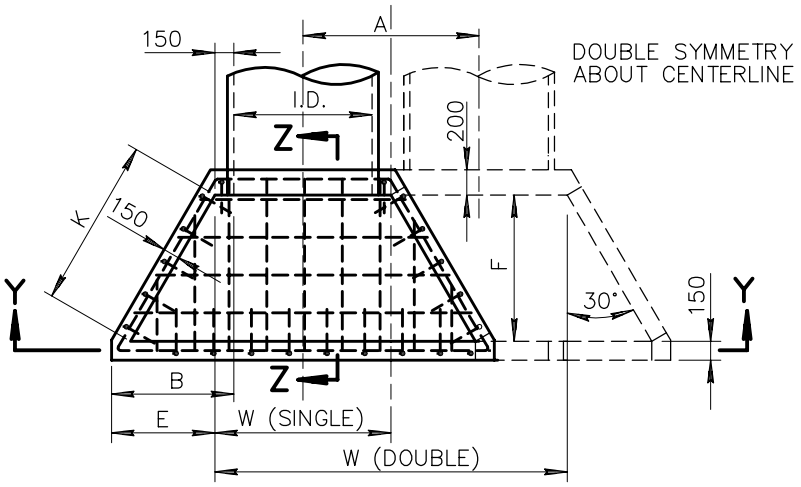


SECTION B–B

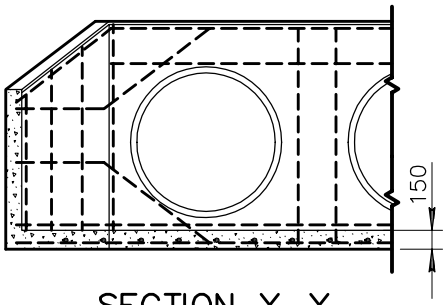
NOTES:

1. ALL CONCRETE SHALL BE CLASS 'A' PER SECT. 725.
2. ALL REINFORCING BARS SHALL BE 15M EXCEPT 20M BARS OVER PIPE. BAR SPACING APPROXIMATELY 300 mm 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 METRIC**	**HEADWALL IRRIGATION 450 mm TO 1500 mm PIPE**	3-10-2000	501-4



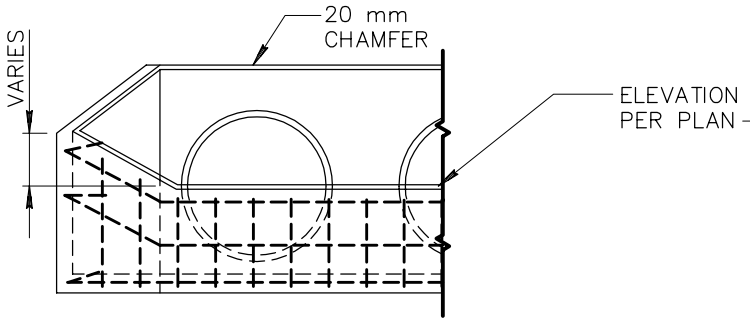
PLAN



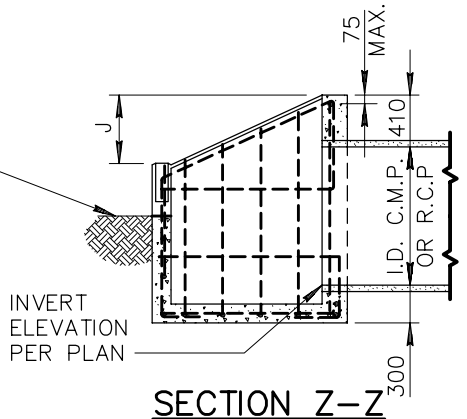
SECTION Y–Y

NOTES:

1. HIGH POINT OF HEADWALL SHALL NOT PROJECT MORE THAN 75 mm ABOVE SLOPE.
2. ALL CONCRETE SHALL BE CLASS 'A' PER SECT. 725.
3. ALL REINFORCING BARS SHALL BE 15M, 300 mm C TO C AND 75 mm CLEAR TO INSIDE OF FLOOR AND WALLS.



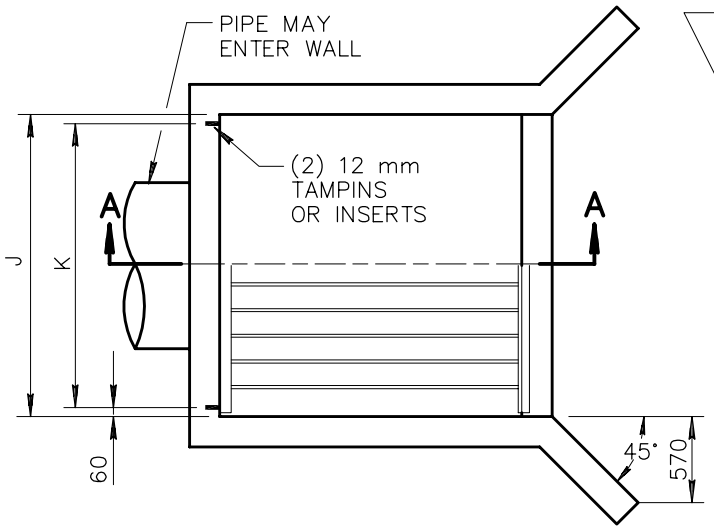
ELEVATION

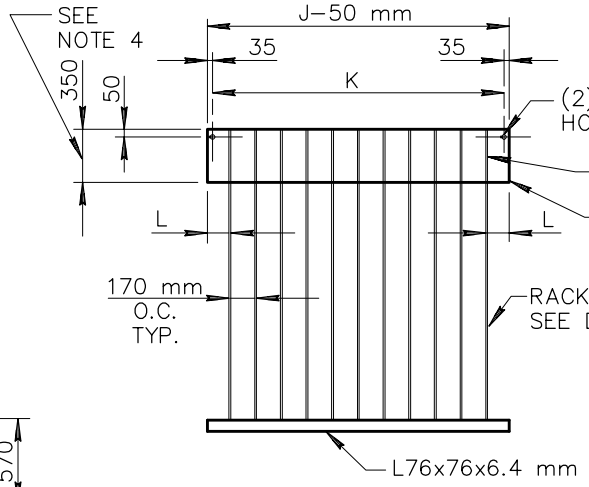


SECTION Z–Z

PIPE			DIMENSIONS							
NOMINAL PIPE SIZE		I.D.	W		A	B	E	F	J	K
R.C.P.	C.M.P.		SINGLE	DOUBLE						
450	450	460	760	1580	810	380	230	398	230	460
600	600	610	910	1980	1070	495	345	598	280	690
750	800	760	1070	2390	1320	610	460	785	330	910
900	900	910	1220	2800	1580	720	570	987	410	1140
1050	1000	1070	1370	3200	1830	835	685	1185	460	1370

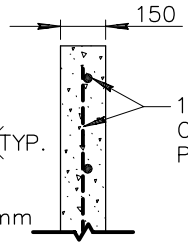
DETAIL NO.			REVISED	DETAIL NO.
501-5	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	HEADWALL DROP INLET	3-10-2000	501-5



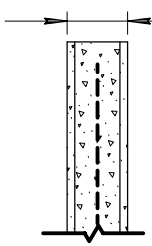


TRASH RACK

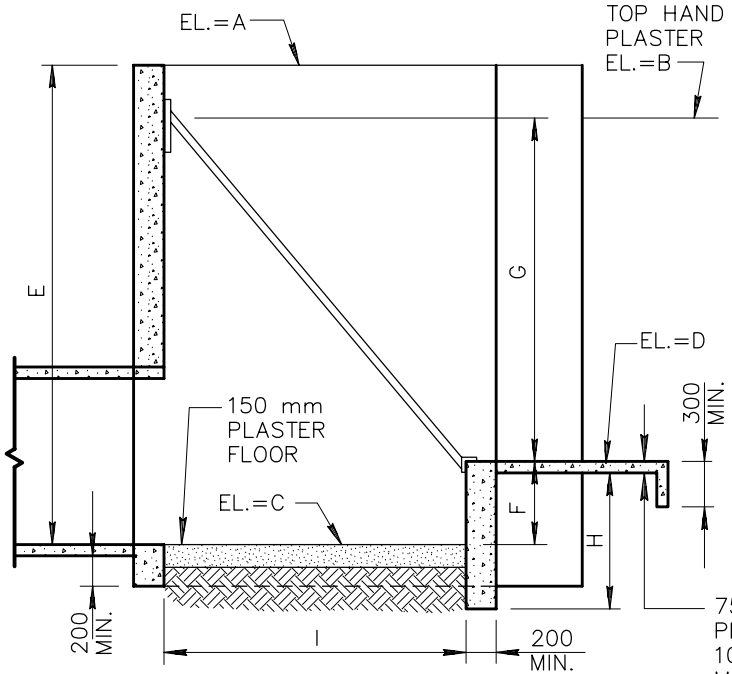
POURED WALLS



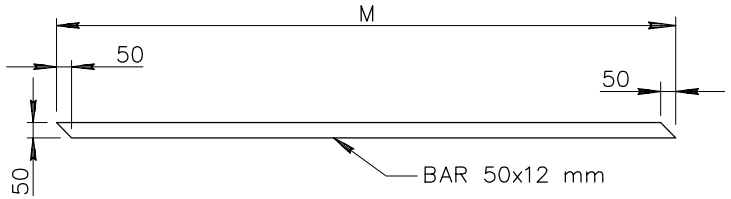
BLOCK WALLS



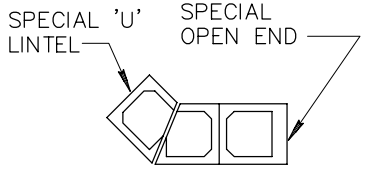
BLOCK HEADWALL TO HAVE ONE 15M REINF. BAR CENTERED IN EACH CORE FOR FULL HEIGHT AND CORES FILLED WITH CONCRETE OR CEMENT GROUT (3:1 RATIO). ALL BLOCKS TO BE JOINTED WITH MORTAR. PLASTERED ON EXPOSED SURFACES THEN SPRAY WITH WHITE PIGMENTED CURING COMPOUND. SECT. 510, 727 & 776.



SECTION A–A



RACK BARS

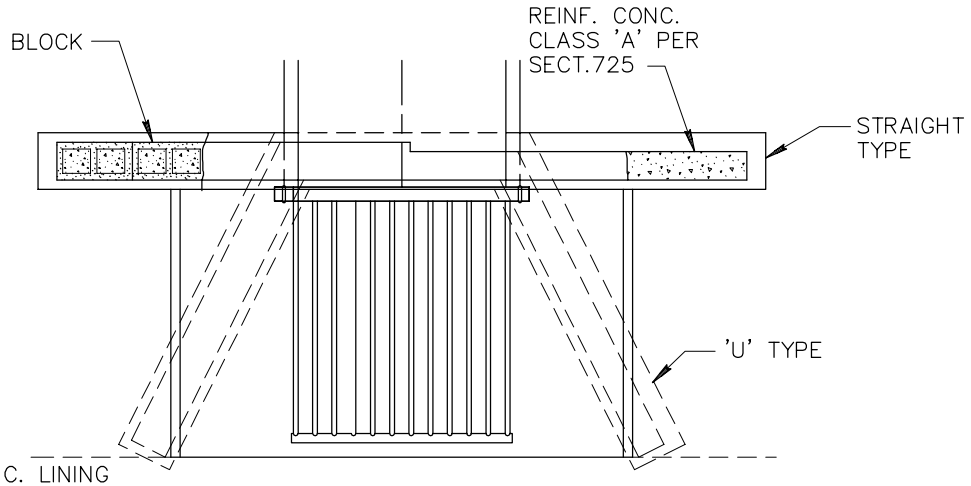


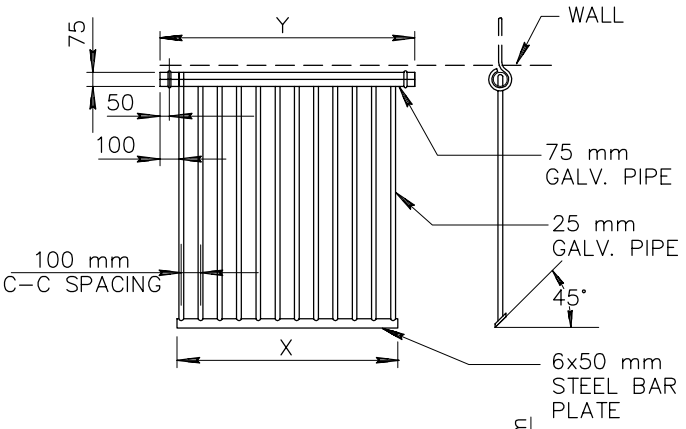
45° BLOCK CORNER

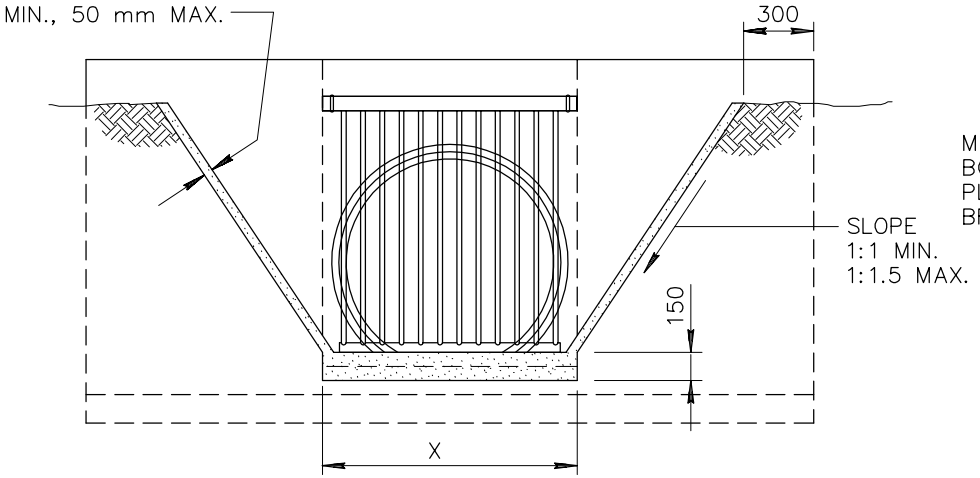
NOTES:

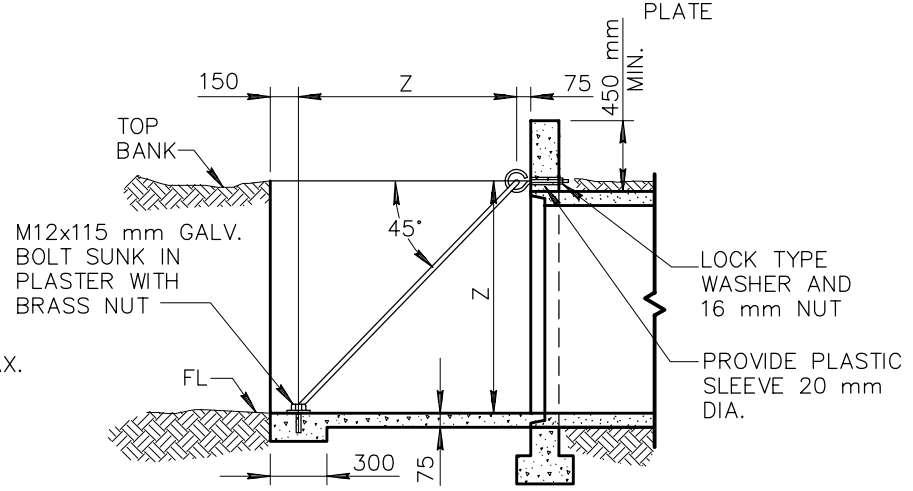
1. REMOVE ALL SCALE FROM RACK BARS. METAL SPRAY OR PAINT WITH ONE COAT ZINC CHROMATE OR RED LEAD PRIMER (INDUSTRIAL QUALITY). OVERCOAT WITH GREY INDUSTRIAL ENAMEL SECT. 790.
2. SHAPE, COMPACT AND PLASTER NEW DITCH FROM HEADWALL TO UNDISTURBED EXISTING DITCH. PLASTER TO EXTEND TO MINIMUM ELEVATION NOTED 1000 mm 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. 350 mm PLATE SHALL NOT EXTEND BELOW TOP OF PIPE.

DETAIL NO.			REVISED	DETAIL NO.
502-1	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	TRASH RACK	3-10-2000	502-1



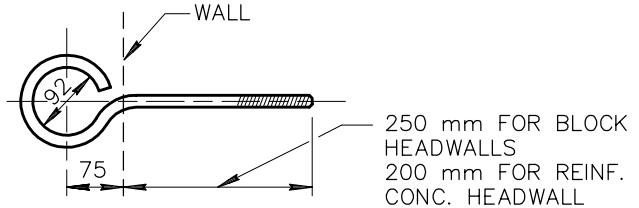






SECTION A–A

TYPE BASED ON PIPE SIZE								
TYPE	NOMINAL PIPE SIZE		PIPE I.D.	NO. OF BARS	LENGTH OF BARS	DIMENSIONS		
	R.C.P.	C.M.P.				X	Y	Z
A	450	450	460	6	1095	530	740	740
	600	600	610	8	1095	740	940	740
B	750	800	760	10	1325	940	1140	900
C	900	900	910	10	1565	940	1140	1070
D	1050	1000	1070	12	1790	1140	1350	1230
E	1200	1200	1220	14	2030	1350	1550	1400

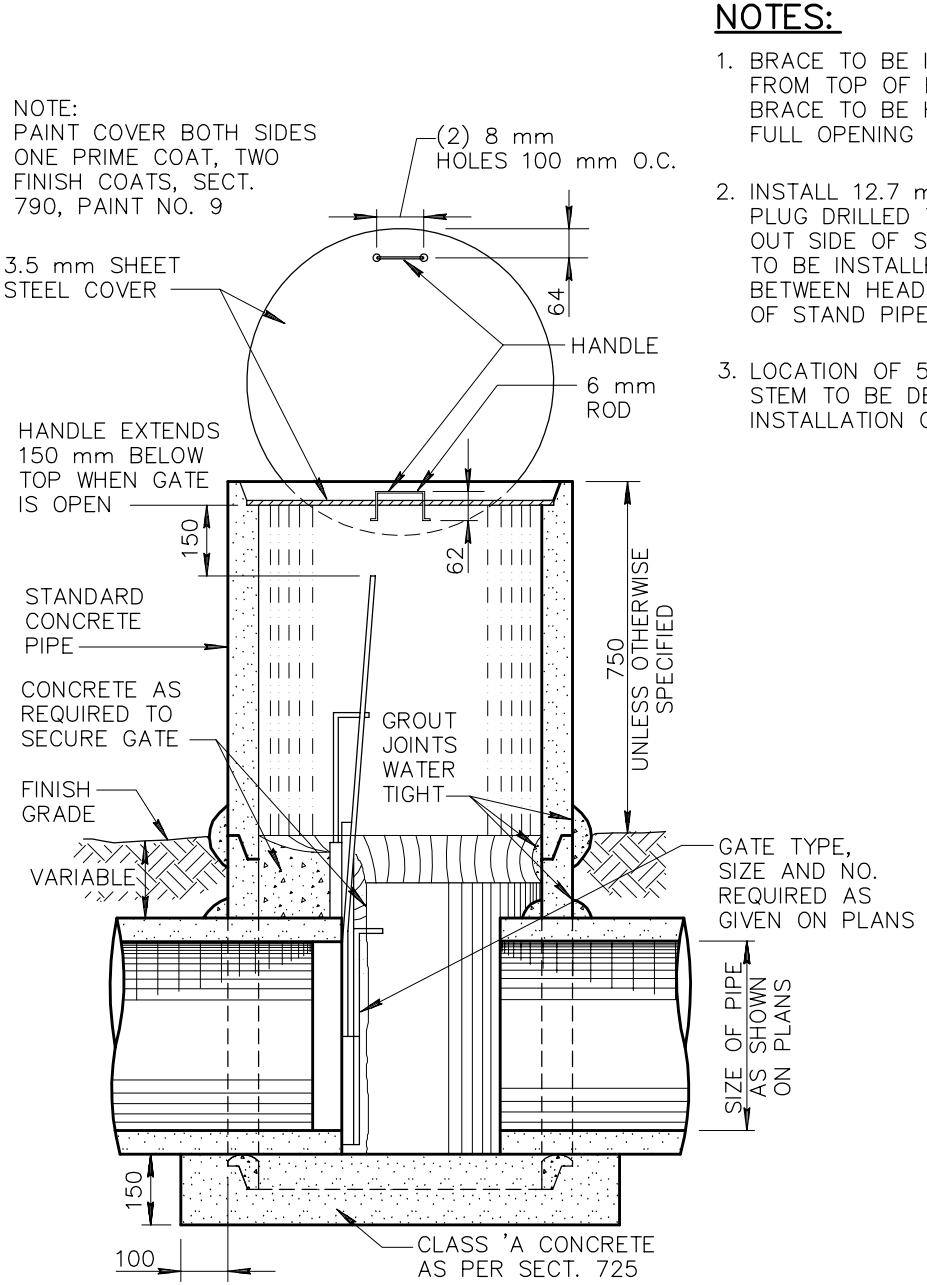


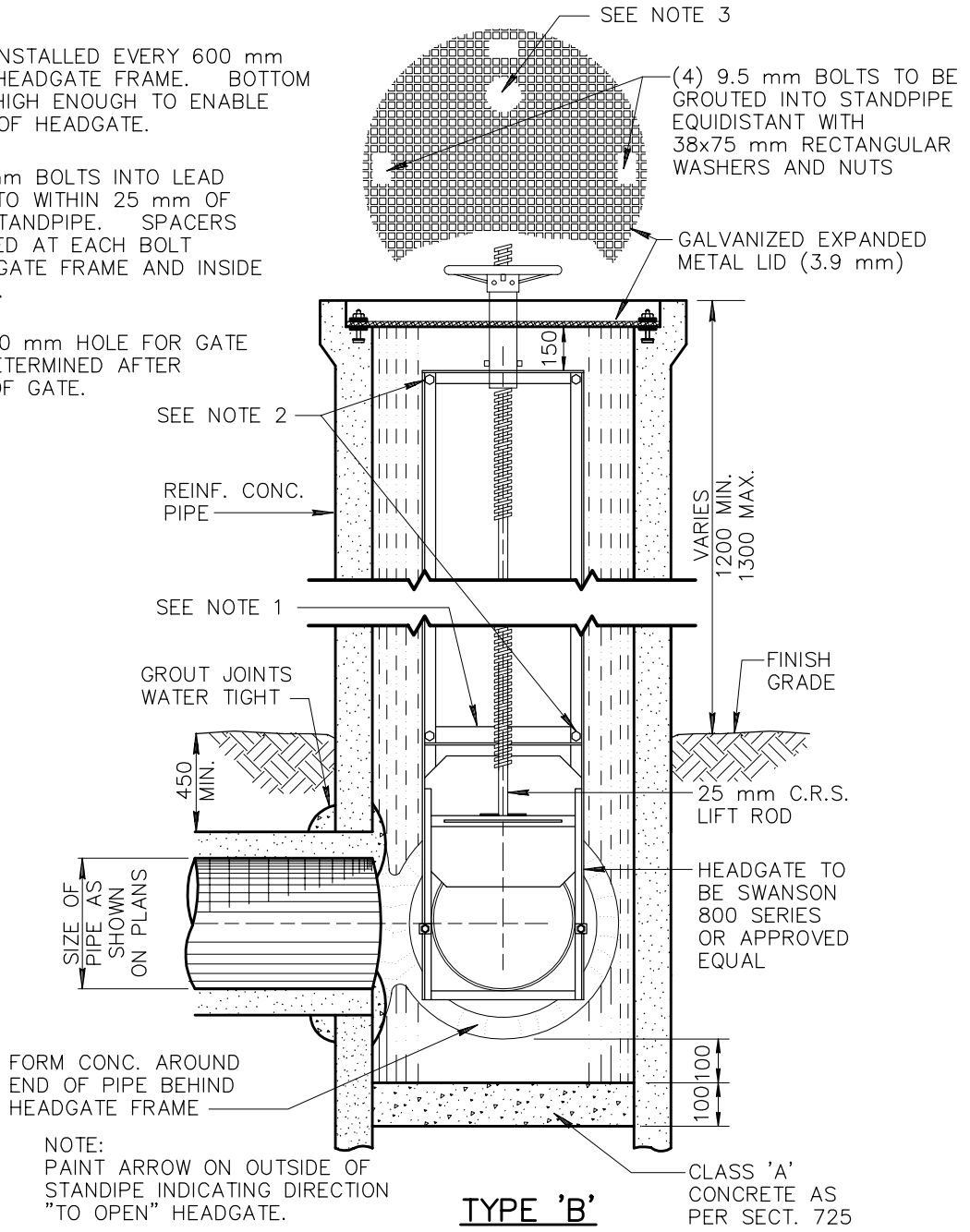
EYE BOLT

DETAIL NO.			REVISED	DETAIL NO.
502-2	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	TRASH RACK	3-10-2000	502-2

NOTES:

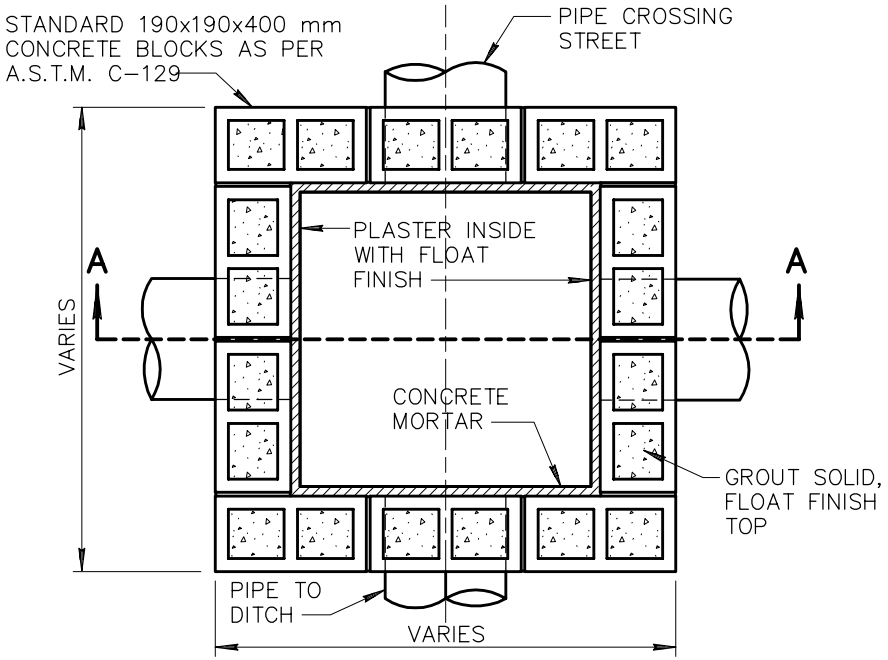
1. BRACE TO BE INSTALLED EVERY 600 mm FROM TOP OF HEADGATE FRAME. BOTTOM BRACE TO BE HIGH ENOUGH TO ENABLE FULL OPENING OF HEADGATE.
2. INSTALL 12.7 mm BOLTS INTO LEAD PLUG DRILLED TO WITHIN 25 mm OF OUT SIDE OF STANDPIPE. SPACERS TO BE INSTALLED AT EACH BOLT BETWEEN HEADGATE FRAME AND INSIDE OF STAND PIPE.
3. LOCATION OF 50 mm HOLE FOR GATE STEM TO BE DETERMINED AFTER INSTALLATION OF GATE.

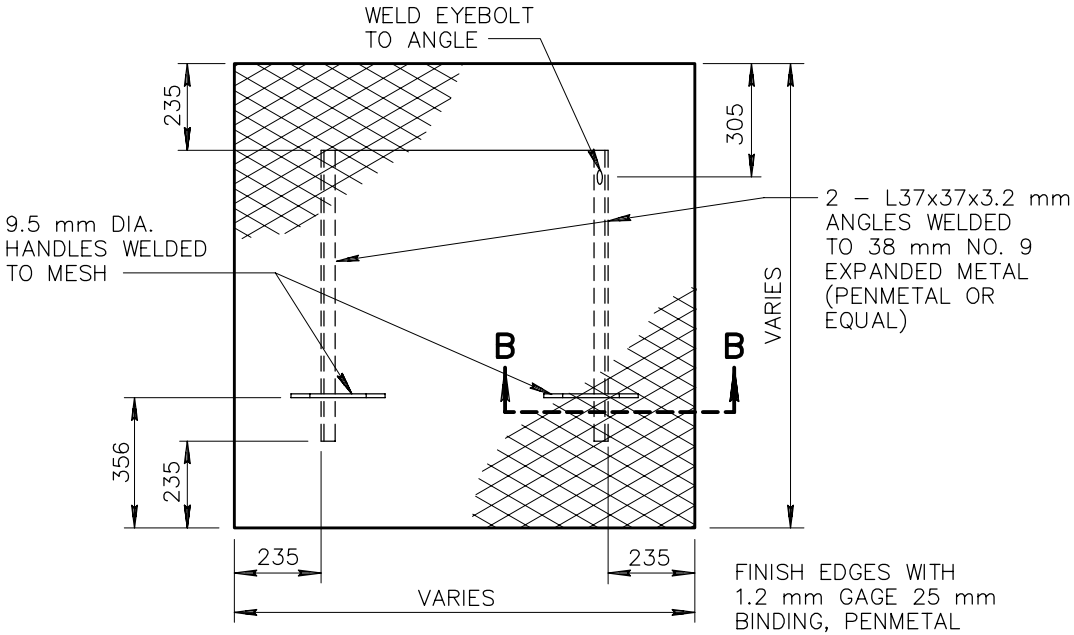




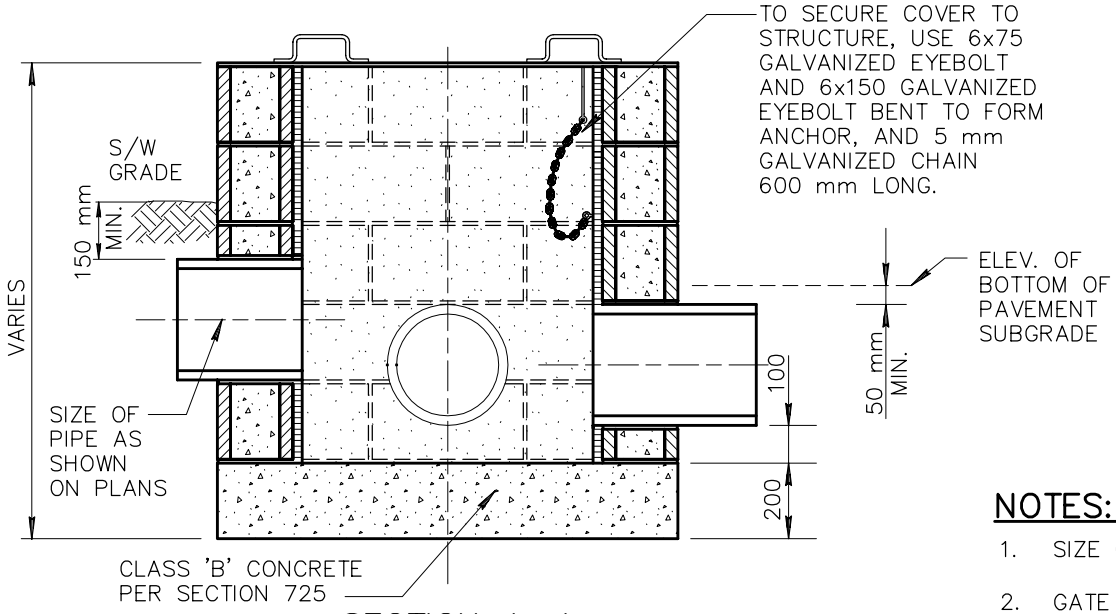
TYPE 'B'

DETAIL NO.			REVISED	DETAIL NO.
503	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**IRRIGATION STANDPIPE**	3-10-2000	503

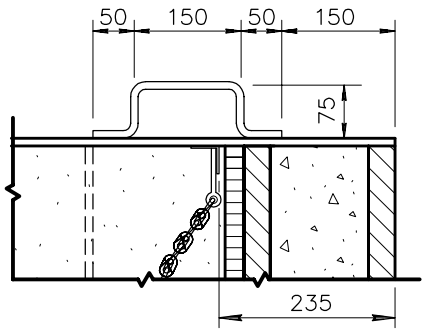




PLAN OF COVER



SECTION A–A

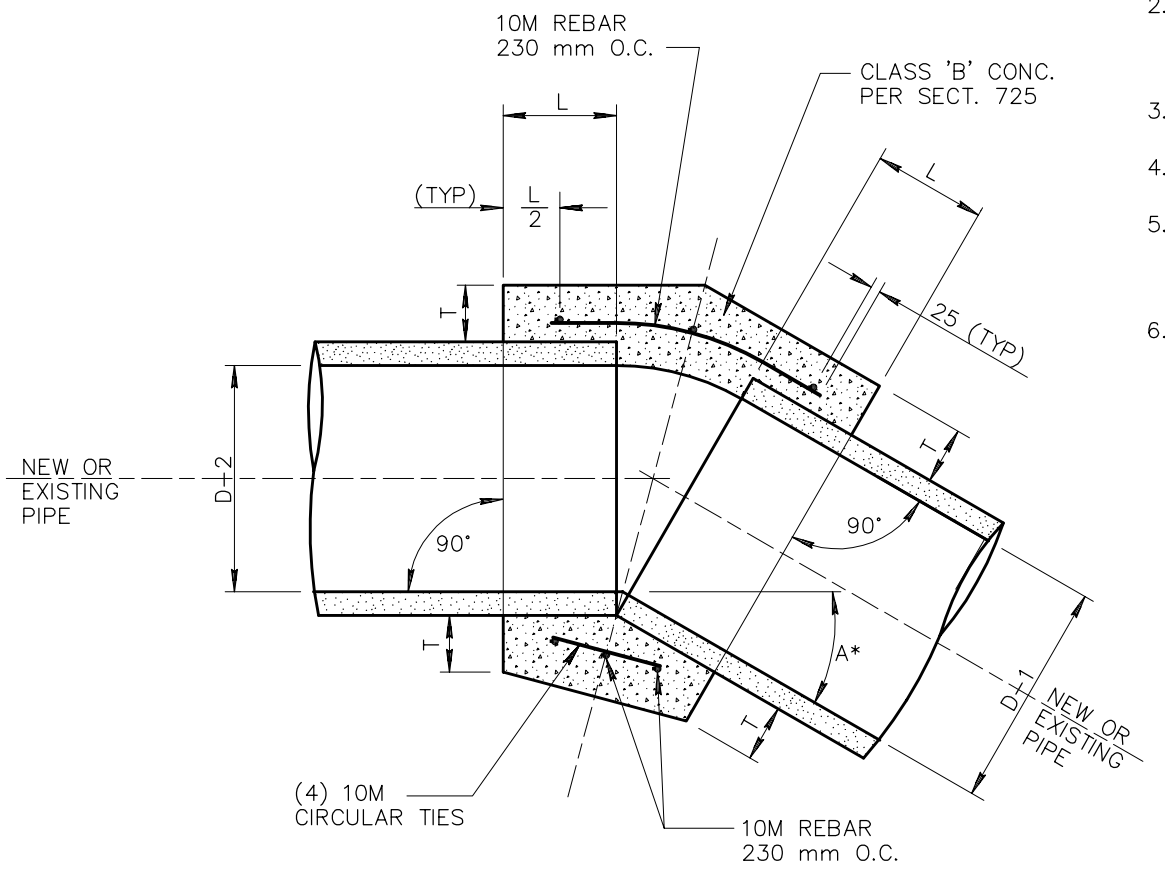


SECTION B–B

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.

DETAIL NO.			REVISED	DETAIL NO.
504	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	CONCRETE BLOCK JUNCTION BOX	3-10-2000	504



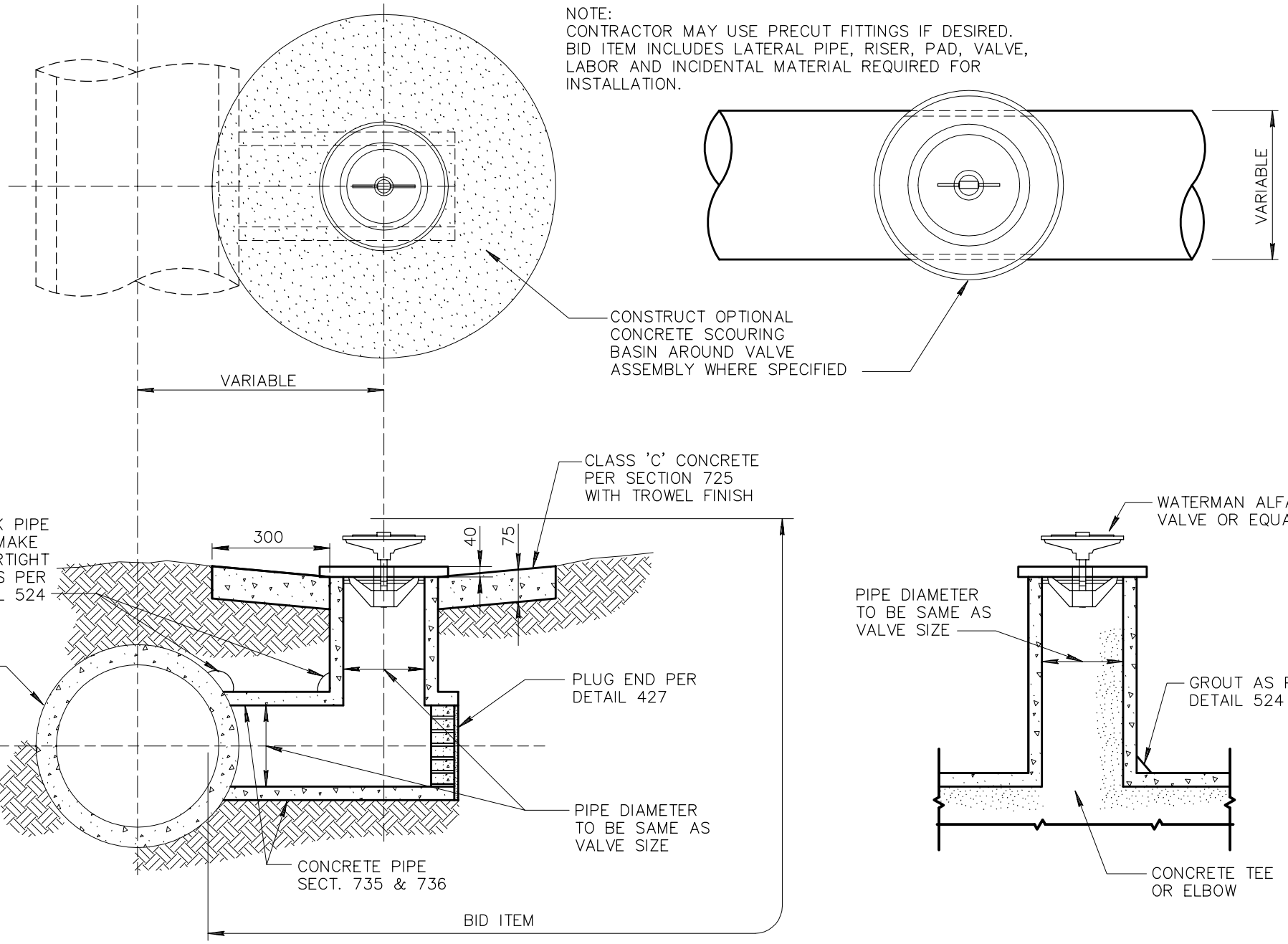
NOTES:

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 USE NEXT SIZE LARGER.
4. OMIT REINFORCING ON PIPE 600 mm 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.

A*=ANGLE OF DEFLECTION

TABLE		
D	L	T
300	300	100
450	300	125
600	300	150
900	450	200
1200	450	250
1425	450	250
1500	475	275
1650	475	275

DETAIL NO.			REVISED	DETAIL NO.
505	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**CONCRETE PIPE COLLAR**	3-10-2000	505



DETAIL NO.			REVISED	DETAIL NO.
506	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**IRRIGATION VALVE INSTALLATION**	3-10-2000	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.

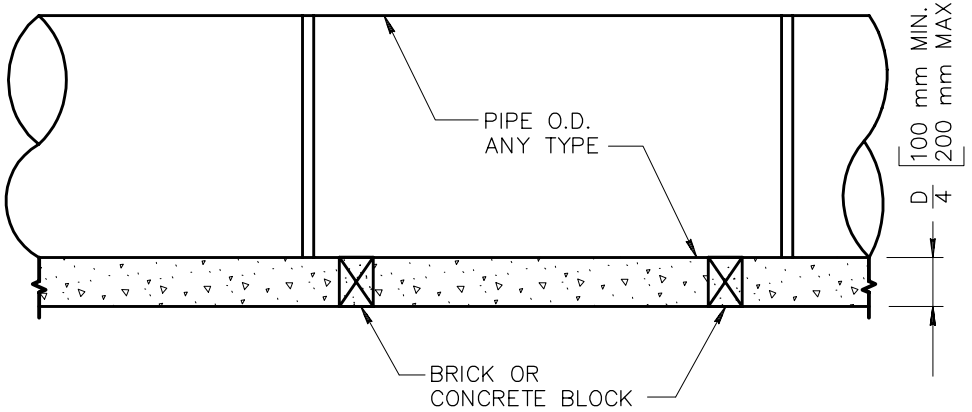
2. FOR PIPE OVER 450 mm I.D. WOOD, METAL OR GYPSUM BOARD FORMS MUST BE USED TO FORM THE SIDES OF THE ENCASEMENT. GYPSUM BOARD FORMS MAY BE LEFT IN THE GROUND BELOW THE TOP OF THE ENCASEMENT. THIS SHALL BE OPTIONAL WITH POURING AGAINST TRENCH WALLS FOR ENCASEMENT OF 450 mm AND SMALLER PIPE.

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.

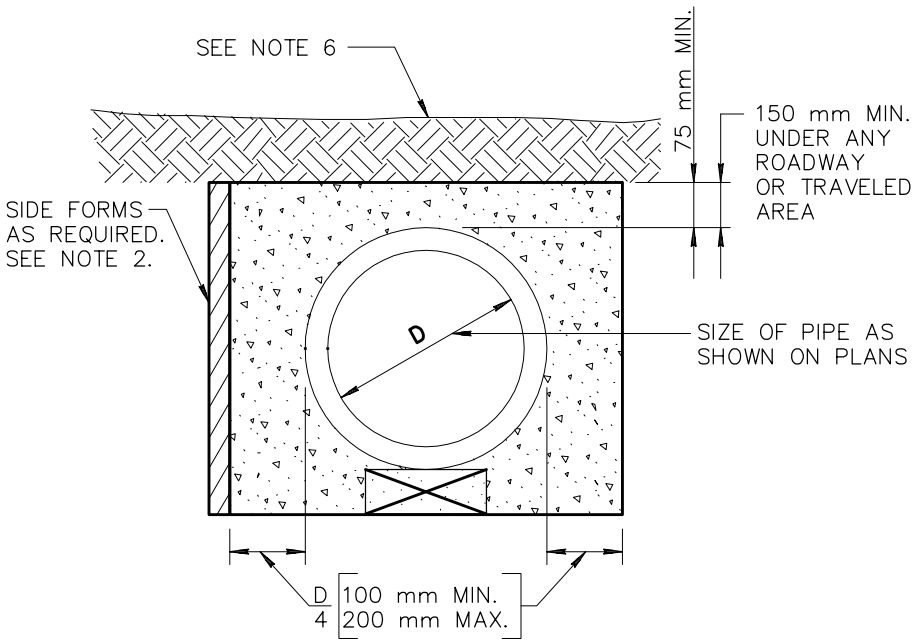
4. CONCRETE WHICH SPILLS BEYOND 300 mm FROM THE SIDES OF THE PIPE FOR ANY REASON SHALL BE REMOVED BACK TO THE PROPER LINE PRIOR TO BACKFILLING.

5. SEE SECT. 601 FOR TRENCH PREPARATION. CONCRETE TO BE CLASS 'A' PER SECT. 725.

6. COVER TO BE APPROVED BY ENGINEER.

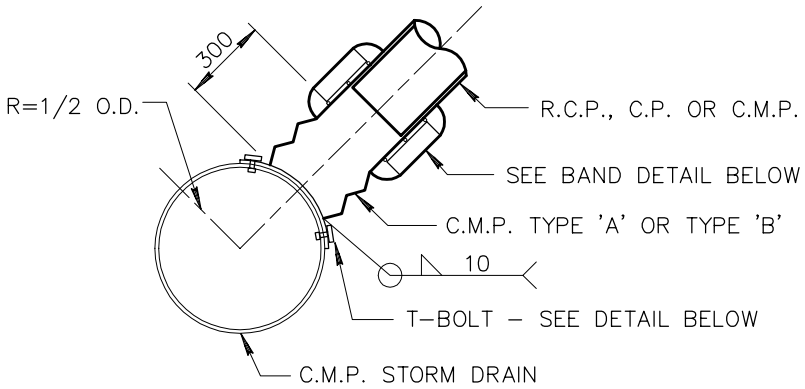


LONGITUDINAL SECTION

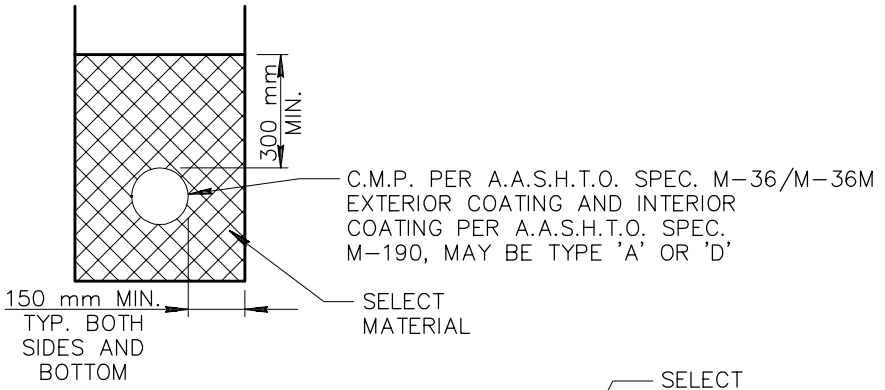


END SECTION

DETAIL NO.			REVISED	DETAIL NO.
507	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**ENCASED CONCRETE PIPE (FOR SHALLOW INSTALLATION)**	3-10-2000	507

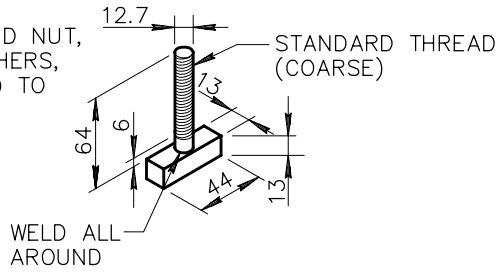


CONNECTOR CROSS SECTION

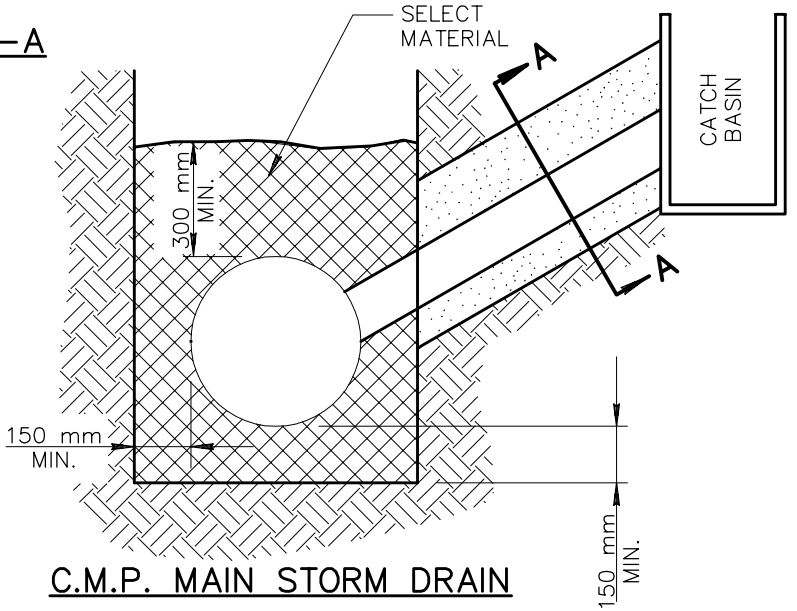


SECTION A-A

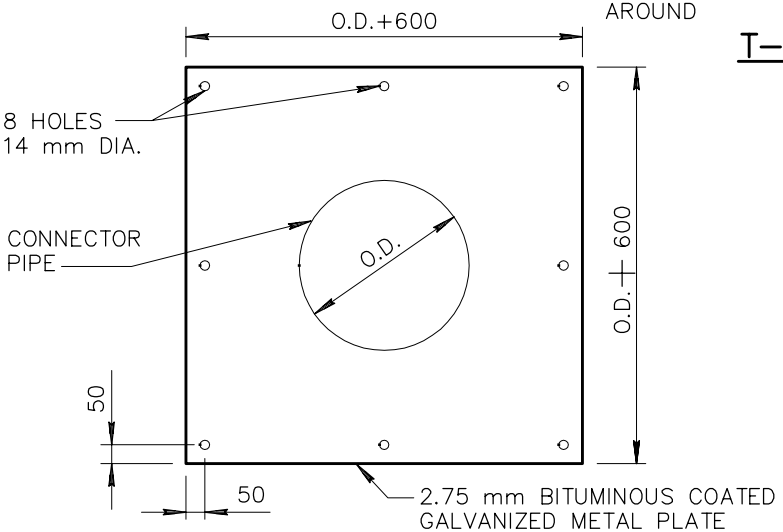
NOTE:
USE 16 mm WASHER AND NUT, ALL PIECES (NUTS, WASHERS, AND FABRICATED BOLTS) TO BE GALVANIZED AS PER A.S.T.M. A-123 LATEST REVISION.



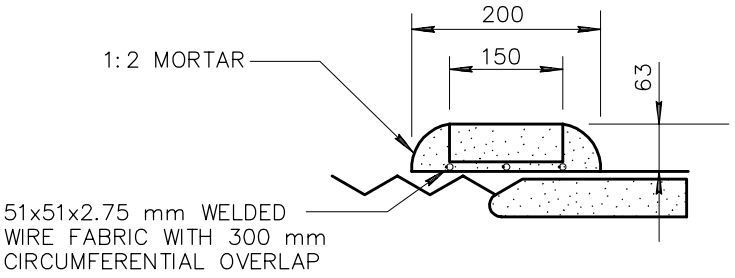
T-BOLT



C.M.P. MAIN STORM DRAIN

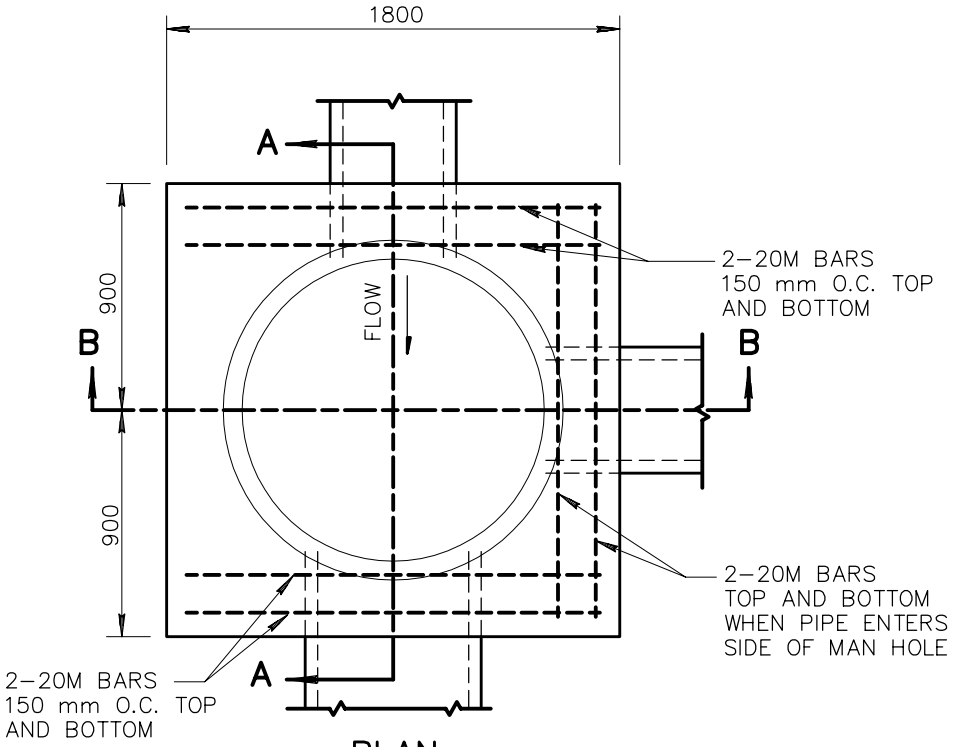


C.M.P. CONNECTION TO MAIN STORM DRAIN 600 mm PIPE AND SMALLER



BAND DETAIL

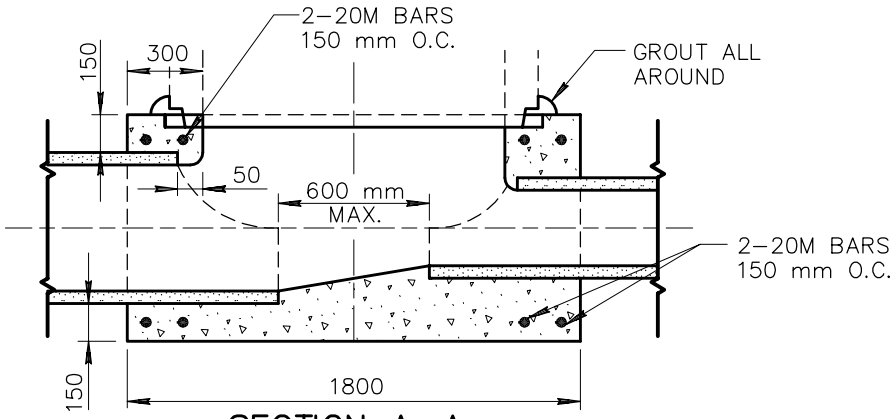
DETAIL NO.			REVISED	DETAIL NO.
510	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**CORRUGATED METAL PIPE AND INSTALLATION**	3-10-2000	510



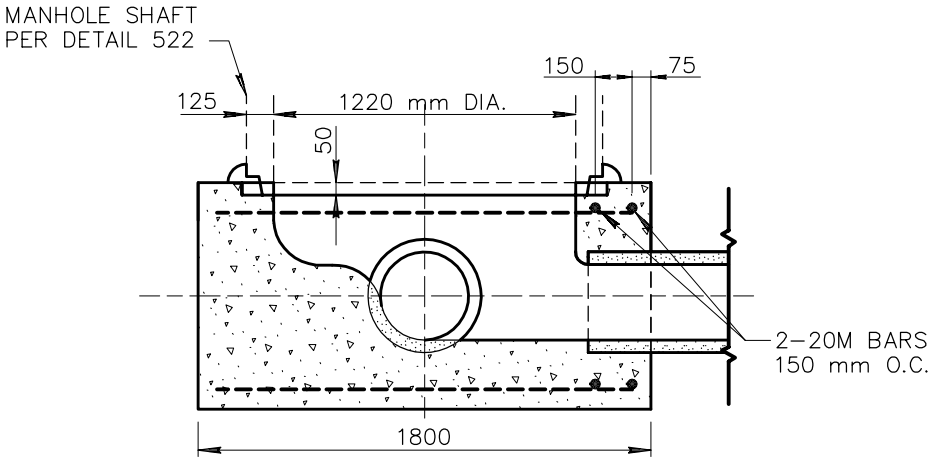
PLAN

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 1220 mm DIA. CYLINDRICAL FORM FROM 150 mm ABOVE MAIN LINE PIPE TO SPRING LINE. CUT PIPE 50 mm LARGER THAN FORM TO ALLOW 50 mm 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 300 mm MINIMUM, 600 mm MAXIMUM.

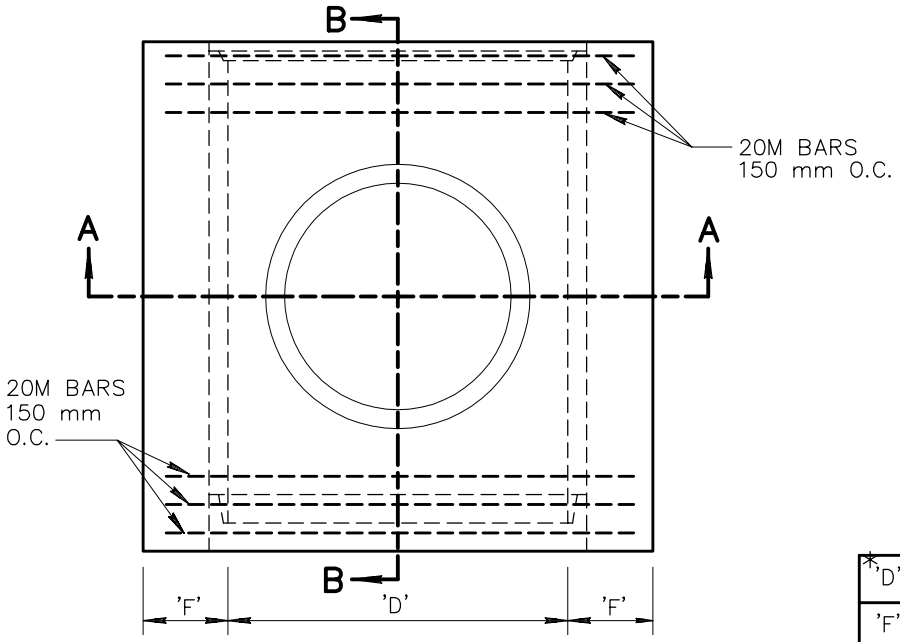


SECTION A–A



SECTION B–B

DETAIL NO.			REVISED	DETAIL NO.
520	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	STORM DRAIN MANHOLE BASE (1220 mm AND SMALLER)	3-10-2000	520



PLAN

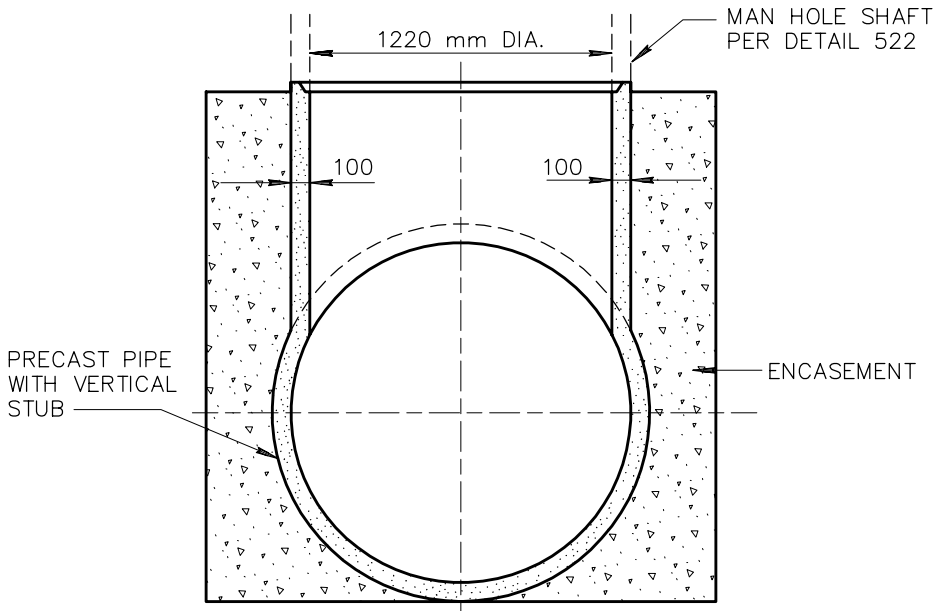
NOTES:

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 40 mm UNLESS SHOWN OTHERWISE.
5. CONCRETE ENCASEMENT SHALL BE CLASS 'A' PER SECT. 725, 505.

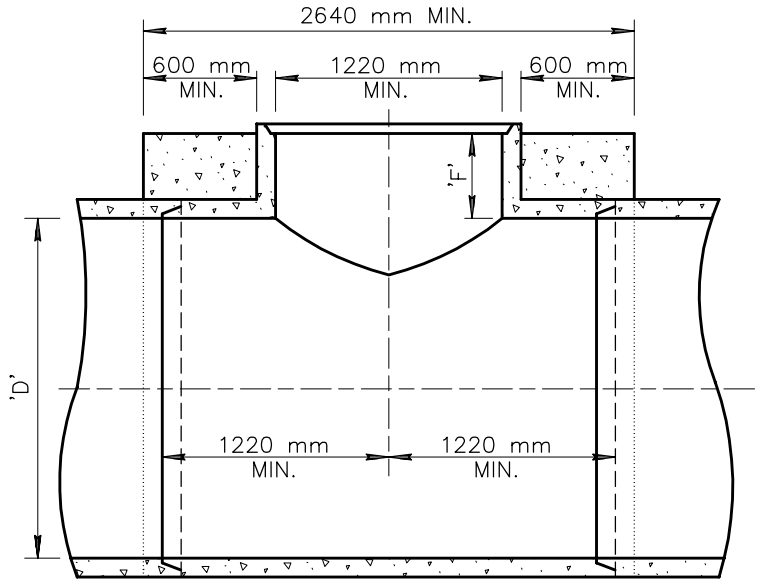
TABLE OF VALUES FOR 'F' & 'D'

*'D'(mm)	1295	1372	1448	1524	1600	1676	1753	1829	1981	2134	2286	2438
'F'(mm)	350	370	380	395	415	425	445	455	490	520	550	580

*TRUE INNER DIAMETER DIMENSIONS. (NOT NOMINAL SIZE.)

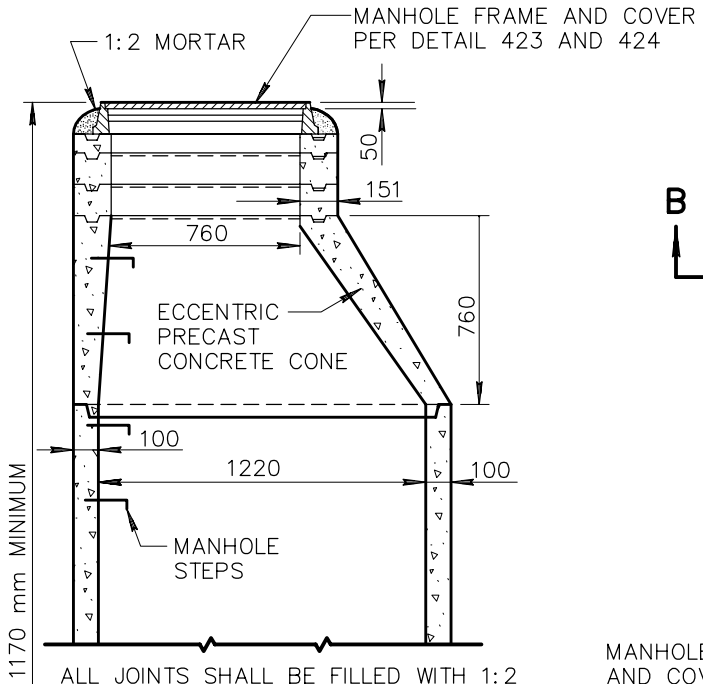


SECTION A–A

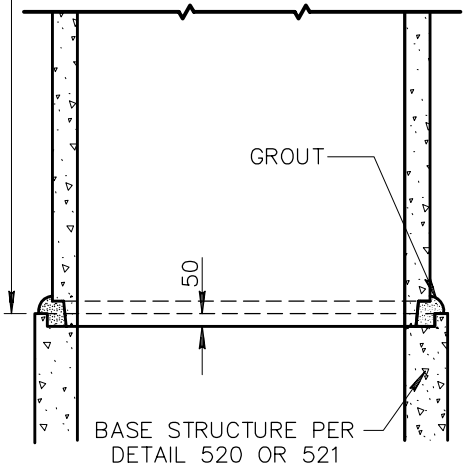


SECTION B–B

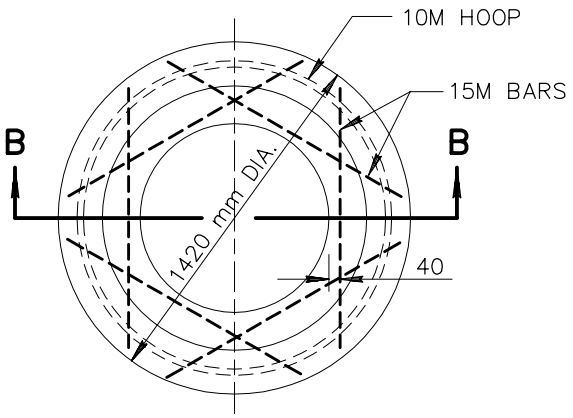
DETAIL NO.			REVISED	DETAIL NO.
521	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	STORM DRAIN MANHOLE BASE (1295 mm OR LARGER)	3-10-2000	521



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

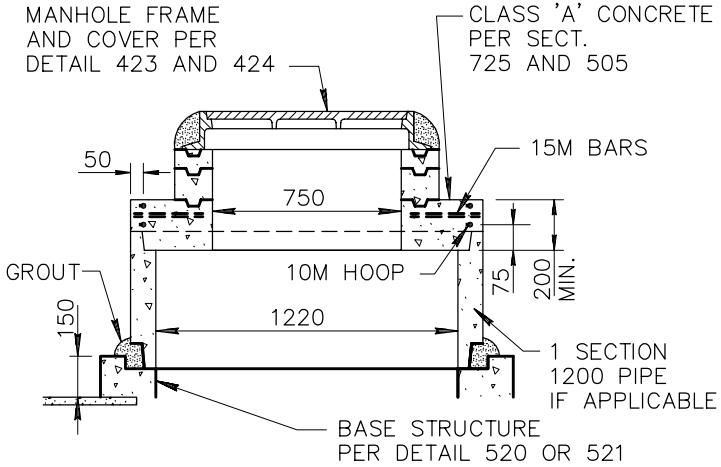


VERTICAL SECTION OF ECCENTRIC MANHOLE SHAFT



PLAN

USE WHERE THERE IS 1170 OR LESS COVER OVER PIPE

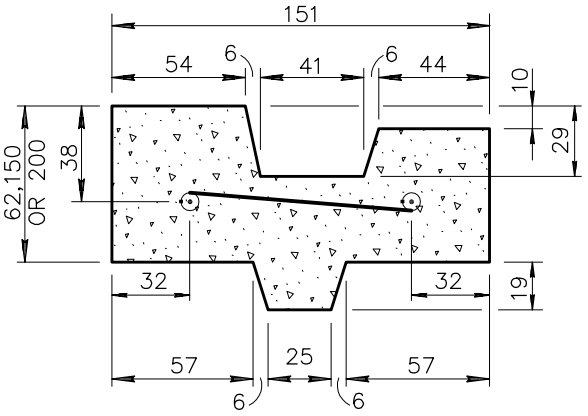


SECTION B–B

SHALLOW MANHOLE

NOTES:

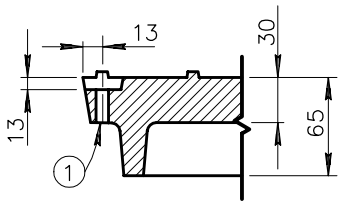
1. PRECAST CONCRETE CONES AND SECTIONS TO BE A.S.T.M. C–478M.
2. BRICK MAY BE USED IN LIEU OF, OR IN COMBINATION WITH CONCRETE ADJUSTING RINGS.
3. PRECAST CONCRETE SECTIONS 1200 mm DIA. PIPE MAY BE FURNISHED IN STANDARD LENGTHS.
4. UNLESS OTHERWISE SHOWN ON PLANS, USE 2–65 mm PRECAST CONCRETE ADJUSTING RINGS ON IMPROVED STREETS AND 4–65 mm RINGS ON UNIMPROVED STREETS.
5. MANHOLE STEPS SHALL BEGIN 600 mm BELOW FINISHED GRADE AND CONTINUE AT 300 mm INTERVALS TO APPROXIMATELY 600 mm ABOVE MANHOLE SHELF. (AS REQUIRED BY AGENCY.)



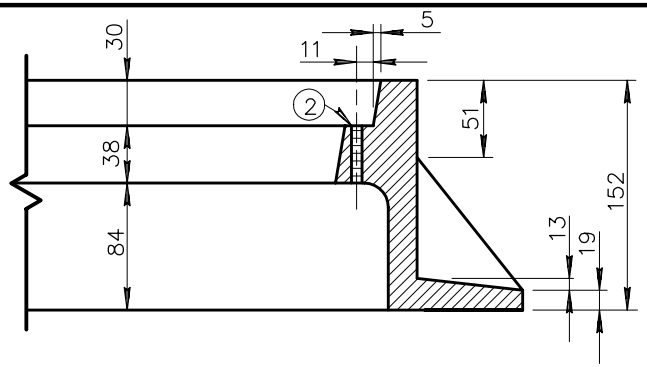
65 mm RINGS SHALL BE REINFORCED WITH TWO 6.3 mm ROUND STEEL HOOPS; 150 AND 200 mm RINGS SHALL BE REINFORCED WITH FOUR 6.3 mm HOOPS, TIED WITH 2 mm WIRE 200 mm O.C.

REINFORCED CONCRETE ADJUSTING RING

DETAIL NO.			REVISED	DETAIL NO.
522	MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL METRIC	STORM DRAIN MANHOLE SHAFT	3-10-2000	522



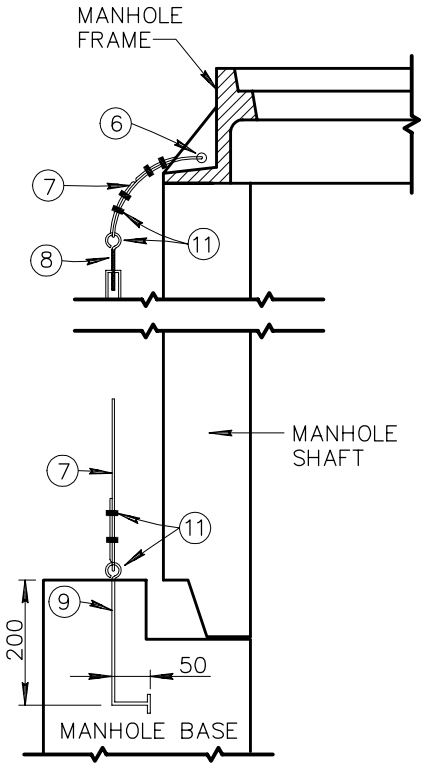
COVER SECTION

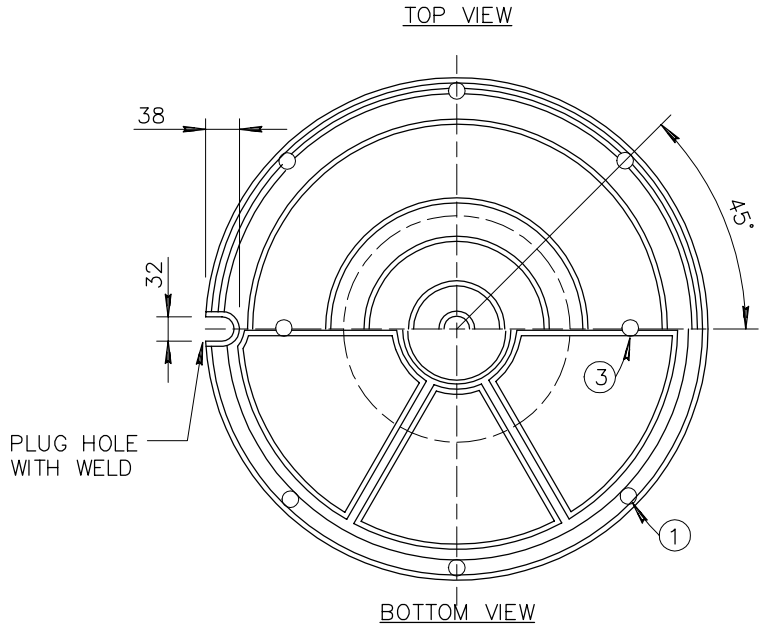


FRAME SECTION

FOR A 760 mm M.H. OPENING, USE THE STD. WATER TIGHT 760 mm M.H. FRAME & COVER, AND ANCHOR THE FRAME AS OUTLINED IN THE INSTRUCTIONS NOTED ON THIS SHEET.

FOR A 610 mm M.H. OPENING, MODIFY THE STD. 610 mm M.H. FRAME & COVER, FOLLOWING THE NOTED PROCEDURES, ONE THRU FIVE.





STANDARD 610 mm M.H. FRAME AND COVER

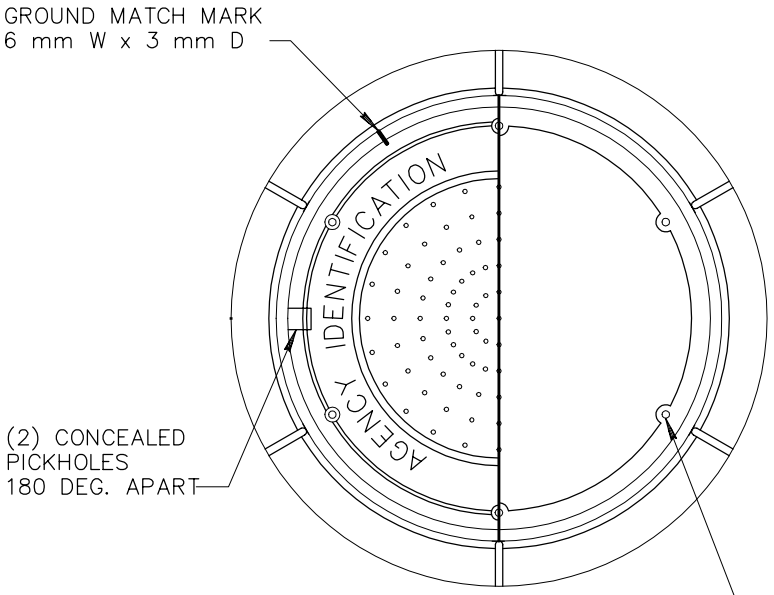
NOTES:

1. DRILL (8) HOLES 13.5 mm IN COVER FOR 12.7 mm CAPSCREWS, COUNTERBORE 13 mm DEEP BY 29 mm DIA. TO ACCOMODATE CAPSCREW AND SOCKET WRENCH. SPACE EQUALLY.
2. DRILL (8) HOLES AND TAP FOR 12.7 mm – 13 THREAD NATIONAL COARSE BOLT.
3. DRILL, TAP AND COUNTERBORE (2) HOLES FOR 12.7 mm 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, 610 mm MANHOLE FRAME AND COVER.

BOTH 610 & 760 mm FRAMES TO BE ANCHORED AS FOLLOWS:

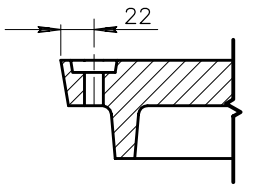
6. DRILL 13 mm HOLE IN FILLET. DO NOT USE ADJACENT FILLETS.
7. 6 mm STAINLESS STEEL CABLE. SECURED WITH CABLE CLAMPS.
8. 13x225 mm HOOK AND EYE TURNBUCKLE.
9. 13 mm EYE BOLT WITH 25 mm DIA. EYE.
10. INSTALL THREE CABLES PER 610 mm (FOUR CABLES FOR 760 mm COVERS). EYEBOLTS TO BE SET DIRECTLY BELOW FILLETS USED.
11. TRIPLE WRAP TURNBUCKLES AND CABLE CLAMPS WITH 25 mm 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 METRIC	PRESSURE MANHOLE	3-10-2000	523-1

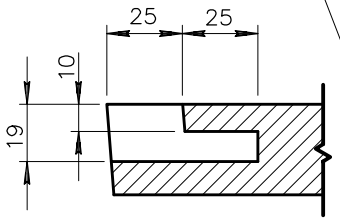


NOTES:

1. DRILL (6) HOLES IN 760 mm COVER (4 HOLES IN 610 mm COVER) 13 mm CORED RECESS FOR 13 mm CAPSCREWS. SPACE EQUALLY (304 S.S.)
2. DRILL (6) HOLES IN 760 mm FRAME (4 HOLES IN 610 mm FRAME) AND TAP FOR 13 mm – 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.

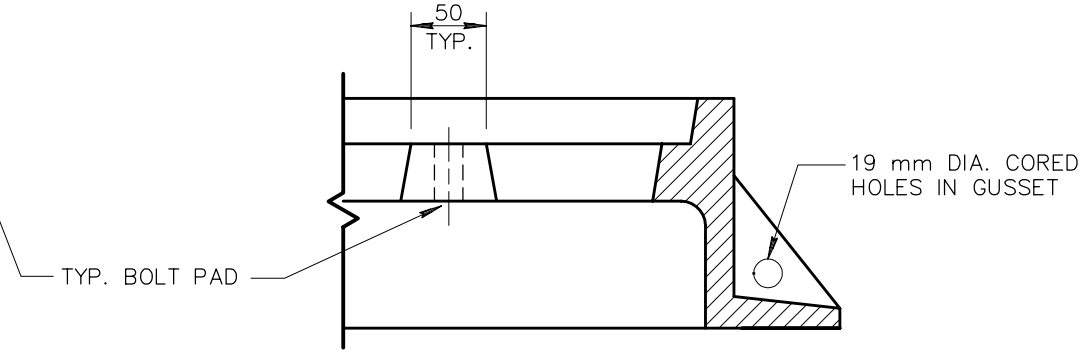


BOLT HOLE DETAIL



PICKHOLE DETAIL

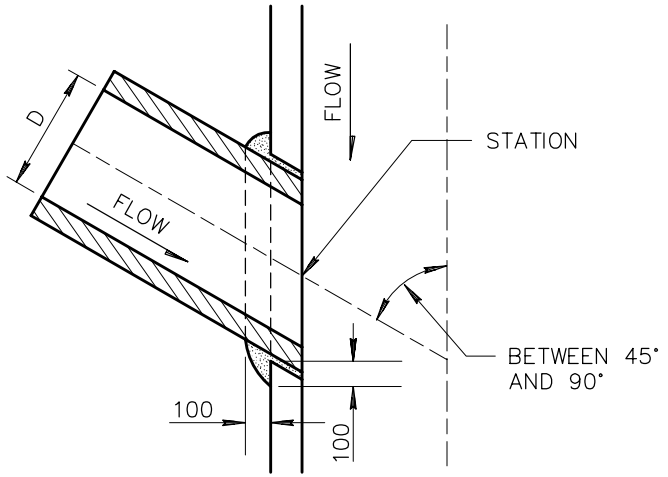
COVER SECTION



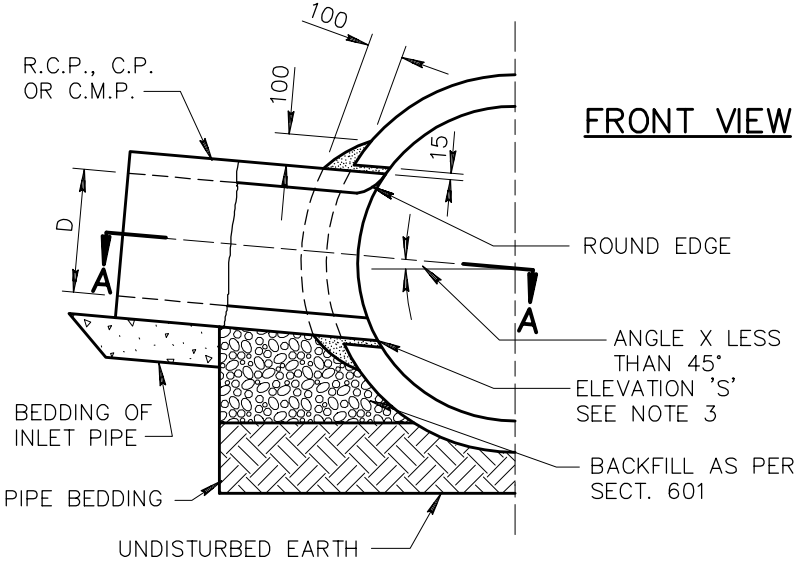
FRAME SECTION

DETAIL NO.			REVISED	DETAIL NO.
523-2	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	PRESSURE MANHOLE	3-10-2000	523-2

TOP VIEW



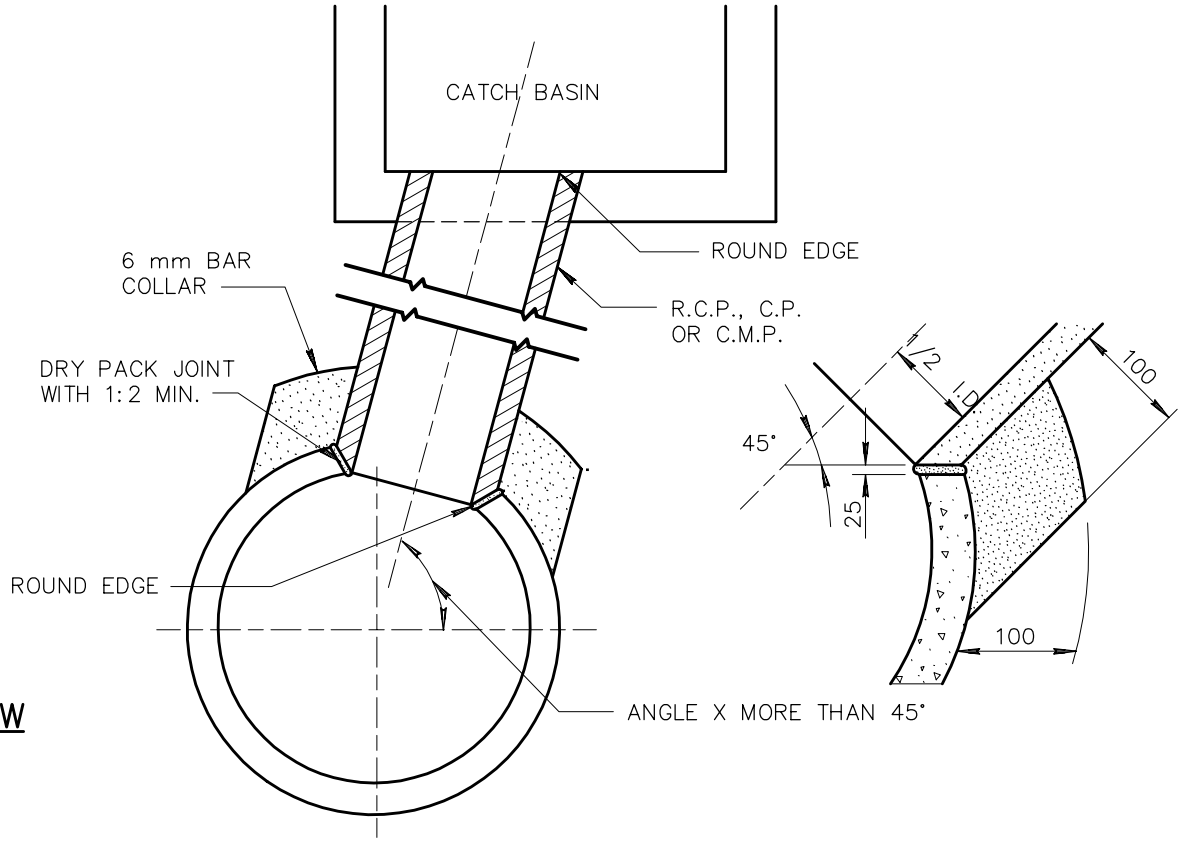
SECTION A–A



FRONT VIEW

SIDE INLET TYPE "1"

FRONT VIEW

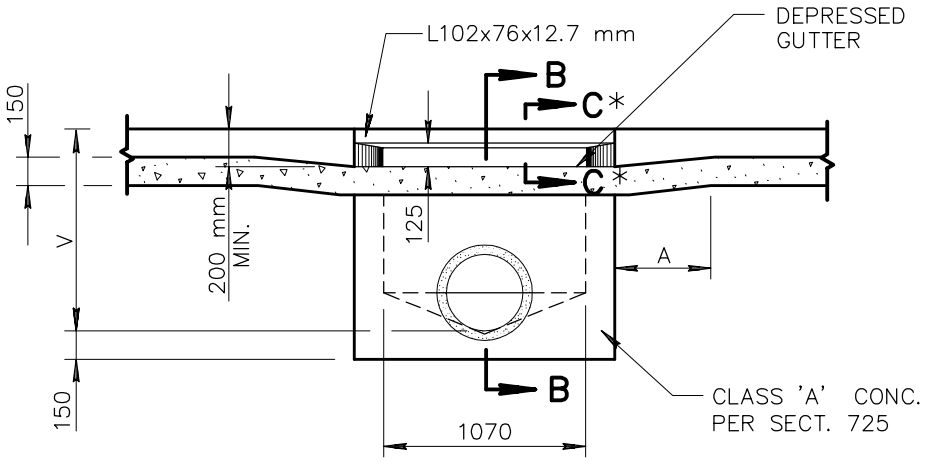


CATCH BASIN ABOVE STORM DRAIN TYPE "2"

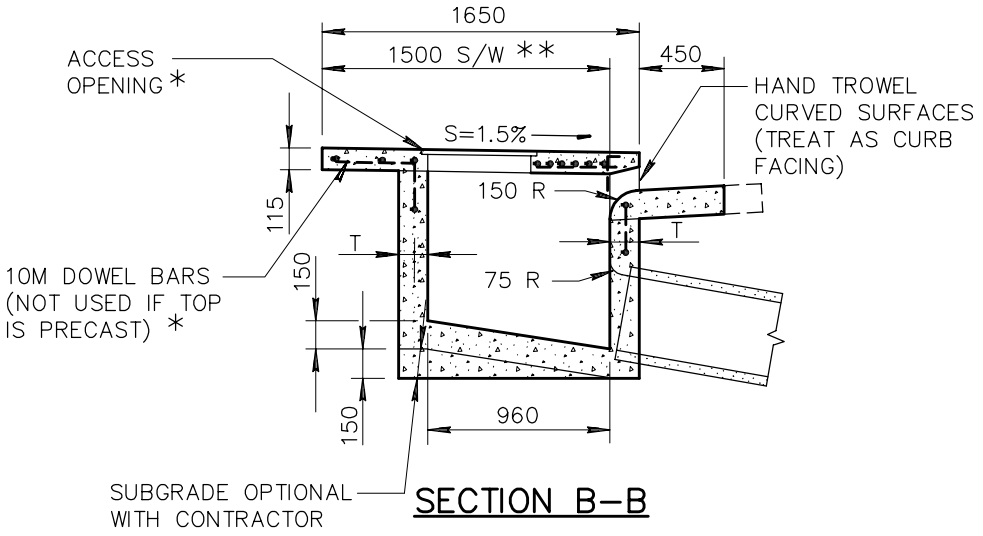
NOTES:

1. 'D' SHALL BE 610 mm 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 25 mm.
5. IF ANGLE X IS 45° OR LESS USE TYPE 1.

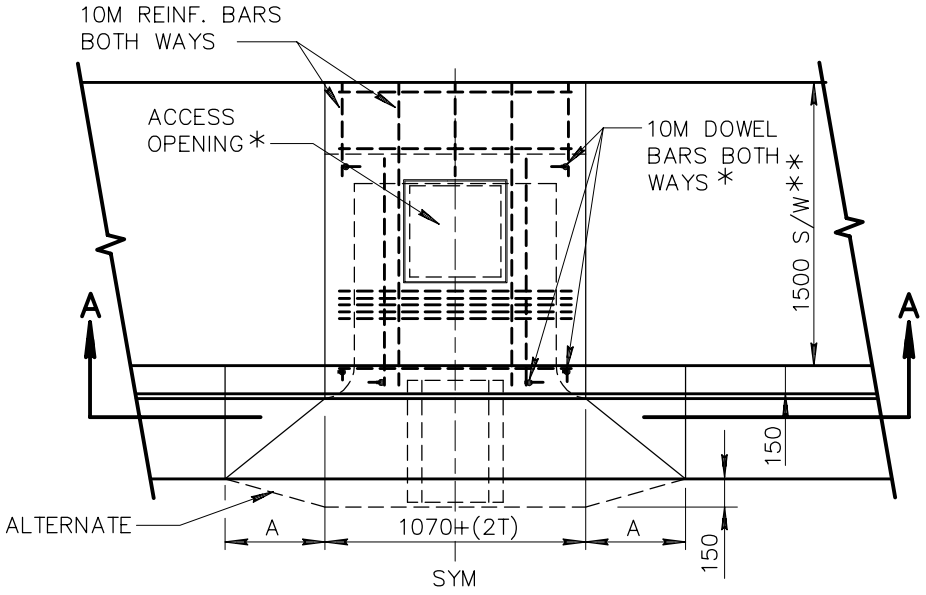
DETAIL NO.			REVISED	DETAIL NO.
524	MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL METRIC	STORM DRAIN LATERAL PIPE CONNECTIONS	3-10-2000	524



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.

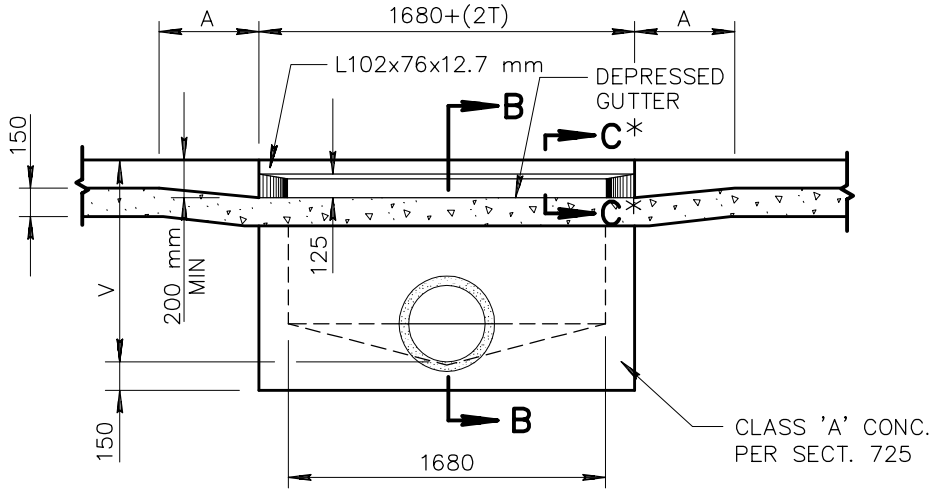
CURB	A
100	990
150	535
175	305

DIMENSIONS

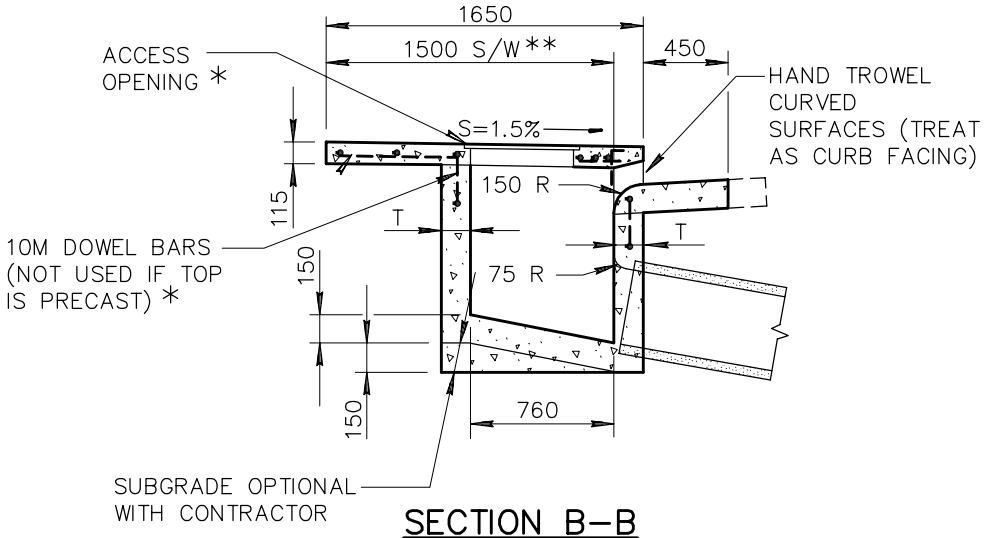
T=150 mm IF V=1220 mm OR LESS
T=200 mm IF V IS BETWEEN 1220 AND 2440 mm.
T=250 mm IF V IS 2440 OR MORE (IF V EXCEEDS 3000 mm SPECIAL DESIGN IS REQUIRED)
V=1070 mm UNLESS OTHERWISE SPECIFIED.

* SEE DETAILS 536–1 AND 536–2 FOR DETAILS AND SECTIONS COMMON TO ALL CURB OPENING CATCH BASINS.
** 1200 mm LOCATIONS WHERE 1200 mm S/W IS REQUIRED.

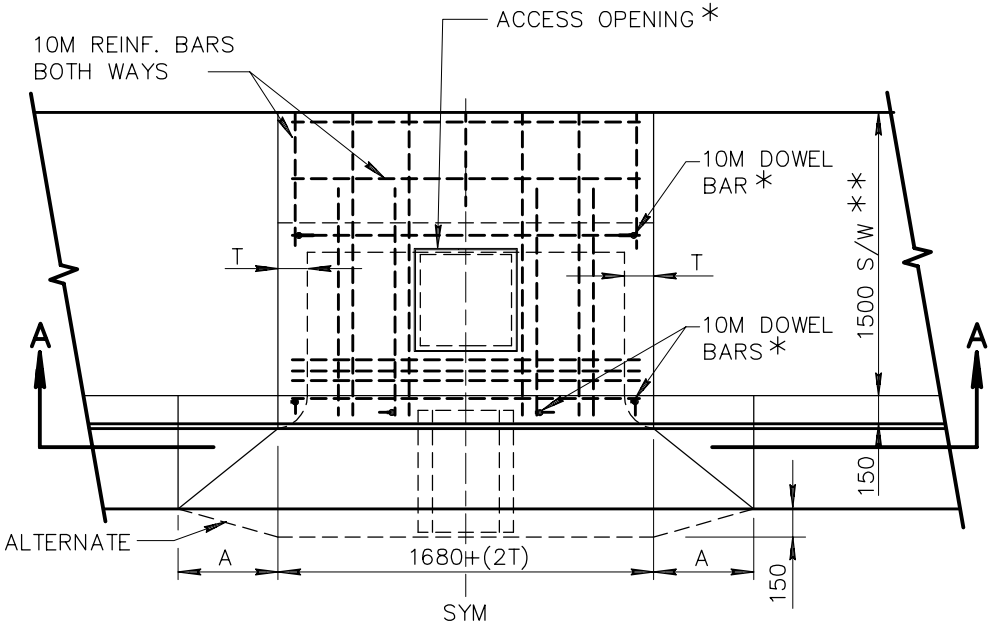
DETAIL NO.			REVISED	DETAIL NO.
530	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	1070 mm CURB OPENING CATCH BASIN - TYPE 'A'	3-10-2000	530



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.

CURB	A
100	990
150	535
175	305

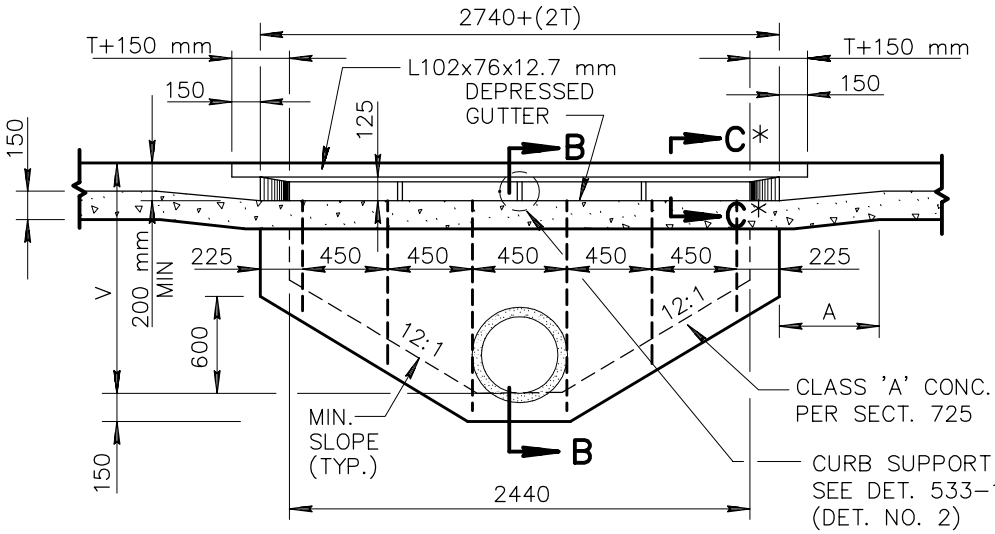
DIMENSIONS

T=150 mm IF V=1220 mm OR LESS
T=200 mm IF V IS BETWEEN 1220 AND 2440 mm.
T=250 mm IF V IS 2440 mm OR MORE
(IF V EXCEEDS 3000 mm
SPECIAL DESIGN IS REQUIRED)
V=1070 mm UNLESS OTHERWISE SPECIFIED.

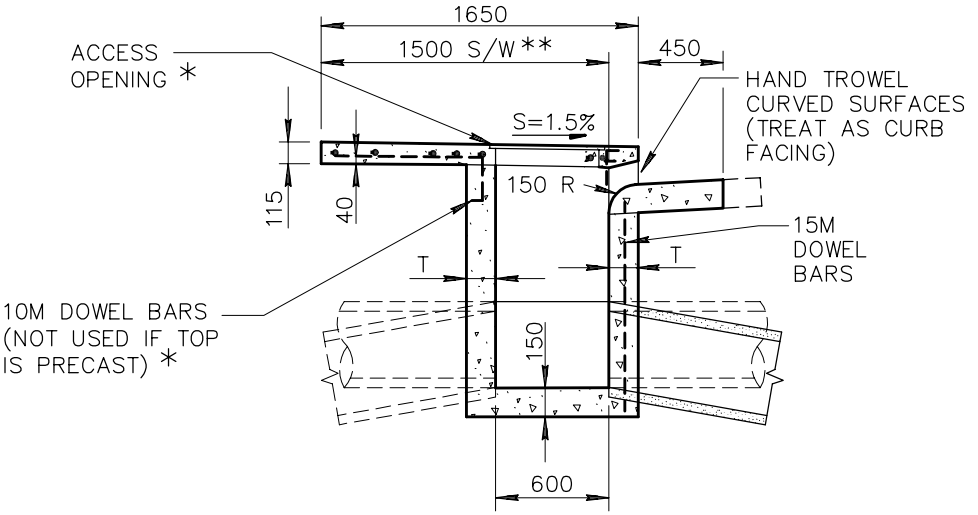
* SEE DETAILS 536–1 AND 566–2 FOR DETAILS AND SECTIONS COMMON TO ALL CURB OPENING CATCH BASINS.

** 1200 mm LOCATIONS WHERE 1200 mm S/W IS REQUIRED.

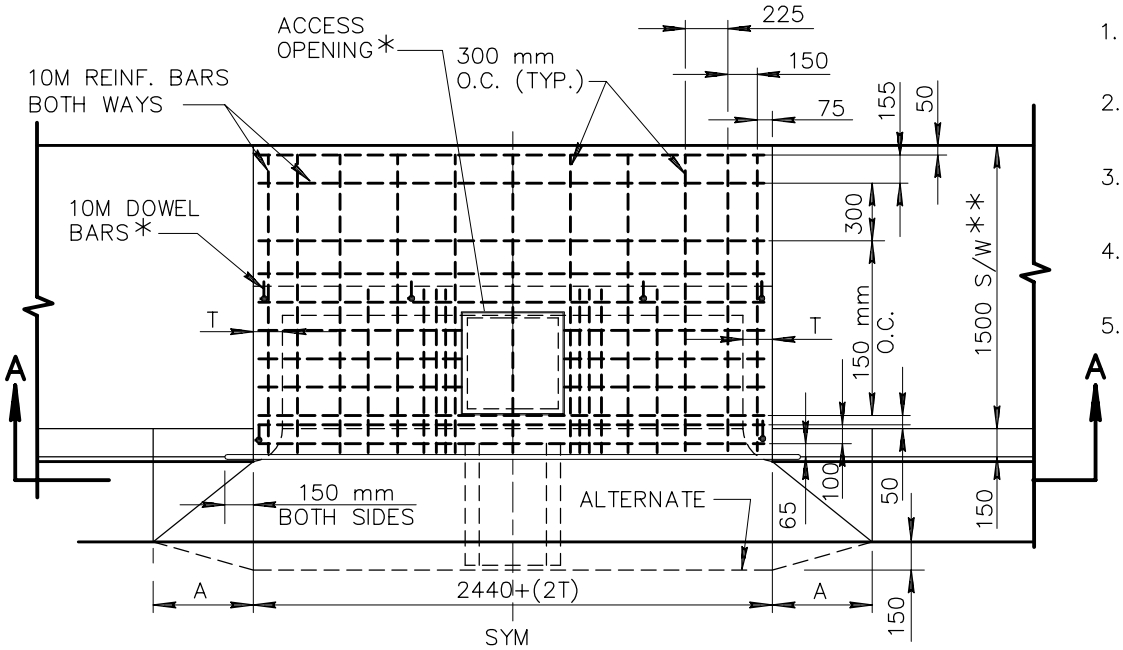
DETAIL NO.			REVISED	DETAIL NO.
531	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	1680 mm CURB OPENING CATCH BASIN - TYPE 'B'	3-10-2000	531



SECTION A–A



SECTION B–B



PLAN VIEW

*SEE DETAILS 536–1 AND 536–2 FOR DETAILS AND SECTIONS COMMON TO ALL CURB OPENING CATCH BASINS.

**1200 mm LOCATIONS WHERE 1200 mm S/W IS REQUIRED.

NOTES:

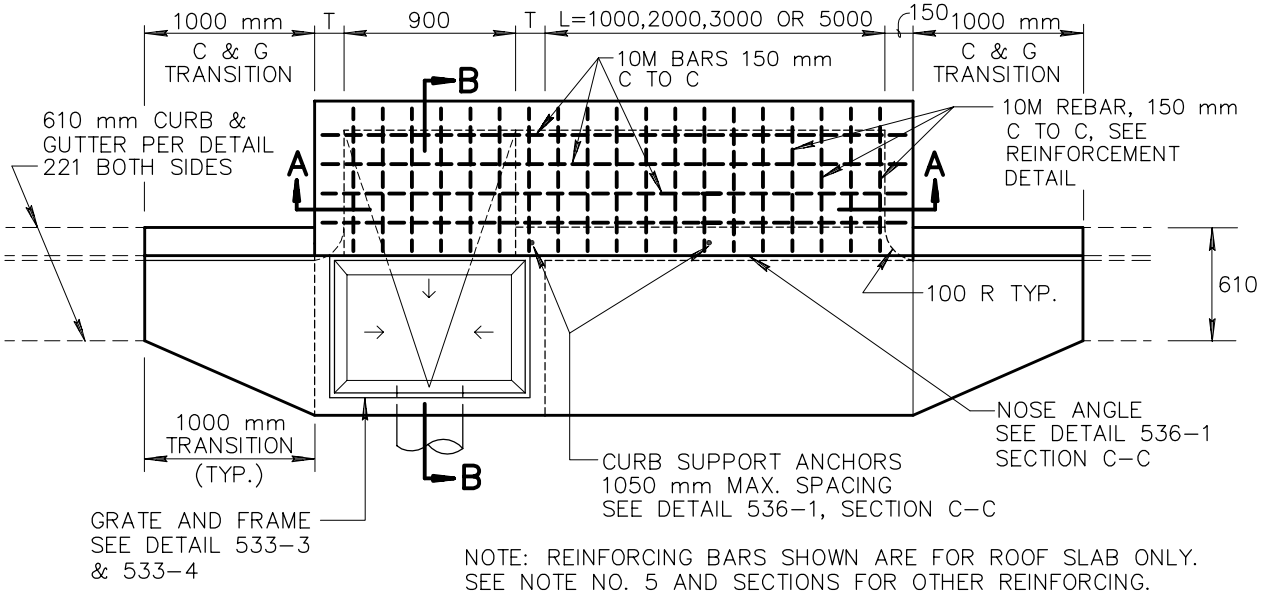
1. THE ENTIRE CATCH BASIN COVER MAY BE POURED IN PLACE OR PRECAST.
2. CONNECTION PIPES MAY BE PLACED IN ANY POSITION AROUND THE WALLS PROVIDED THE POSITION IS CONSISTENT WITH THE PLAN.
3. OUTLET PIPE SHALL BE TRIMMED TO FINAL SHAPE AND LENGTH BEFORE CONCRETE IS POURED.
4. FLOOR OF BASIN SHALL BE TROWELLED 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.

CURB	A
100	990
150	535
175	305

DIMENSIONS

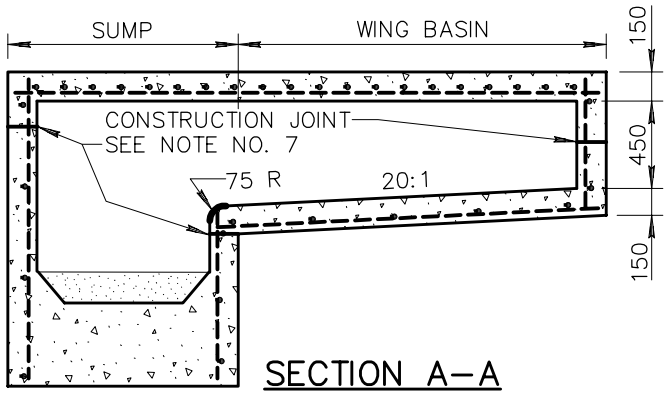
T=150 mm IF V=1220 mm OR LESS
T=200 mm IF V IS BETWEEN 1220 AND 2440 mm.
T=250 mm IF V IS 2440 mm OR MORE
(IF V EXCEEDS 3000 mm
SPECIAL DESIGN IS REQUIRED)
V=1070 mm UNLESS OTHERWISE SPECIFIED.

DETAIL NO.			REVISED	DETAIL NO.
532	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	2440 mm CURB OPENING CATCH BASIN - TYPE 'C'	3-10-2000	532



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

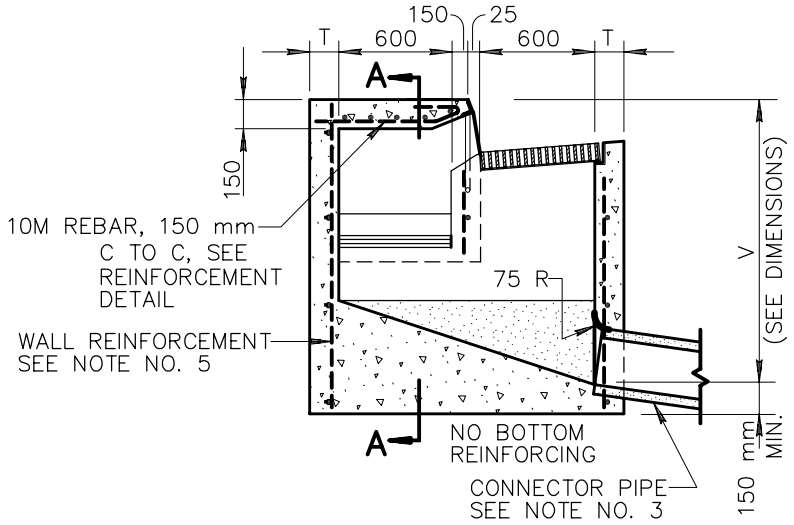
PLAN VIEW



SECTION A-A

NOTES:

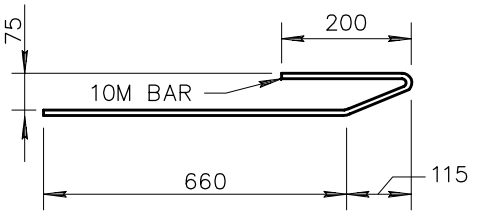
1. SINGLE C.B. (ILLUSTRATED), SUMP WITH WING BASIN UPSTREAM.
2. DOUBLE C.B. SUMP WITH SYMMETRICAL WING BASINS EACH SIDE.
3. PIPES CAN BE PLACED IN ANY WALL EXCEPT WALL ADJACENT TO A WING BASIN. PIPE SHALL BE TRIMMED TO FINAL SHAPE AND LENGTH BEFORE CONCRETE IS PLACED.
4. SUMP FLOOR SHALL HAVE A WOOD TROWEL FINISH AND A MIN. SLOPE OF 4:1 IN ALL DIRECTIONS TOWARD OUTLET PIPE.
5. ALL REFORCING BARS SHALL BE 15M 450 mm C TO C BOTH WAYS AND 40 mm 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.



SECTION B-B

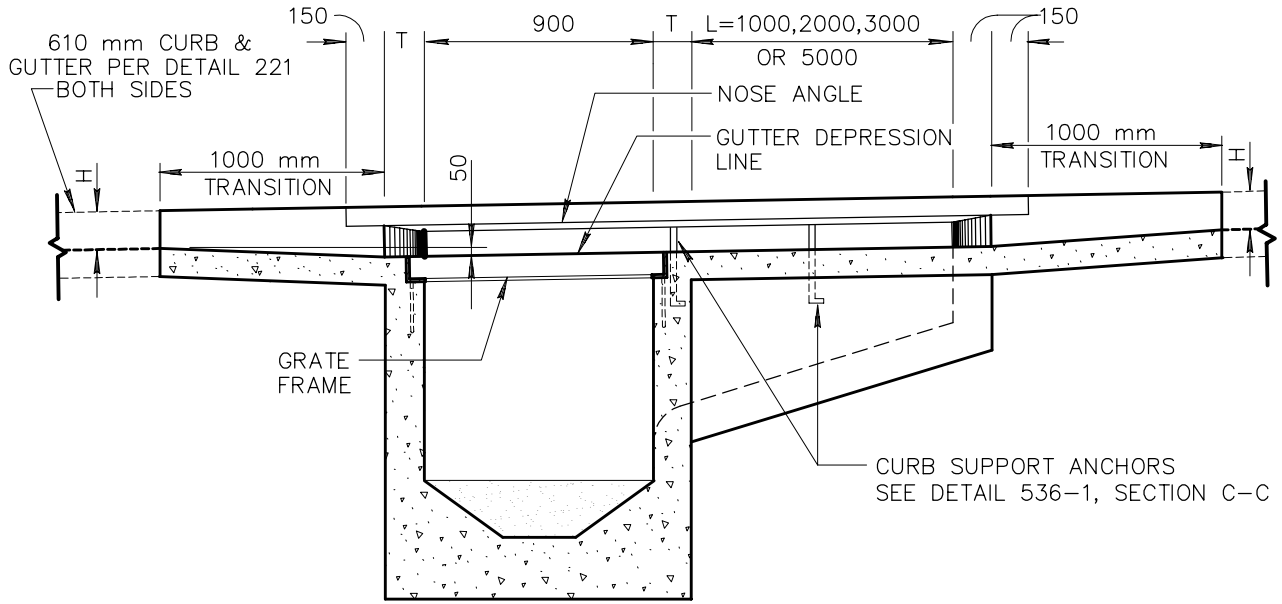
DIMENSIONS

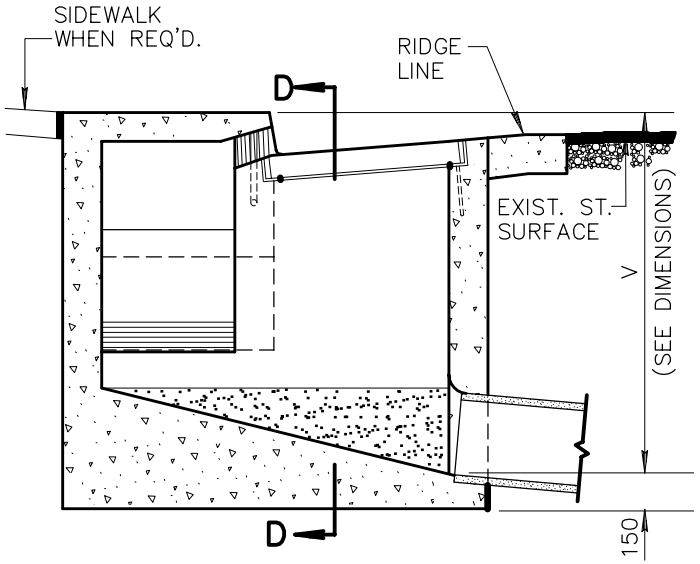
V = 1000 mm MIN. WHEN L = 1000 mm
V = 1050 mm MIN. WHEN L = 2000 mm
V = 1100 mm MIN. WHEN L = 3000 mm
V = 1200 mm MIN. WHEN L = 5000 mm
T = 150 mm WHEN V IS LESS THAN 2400 mm
T = 200 mm WHEN V IS EQUAL TO OR GREATER THAN 2400 mm
H = CURB HEIGHT PRIOR TO THE TRANSITION



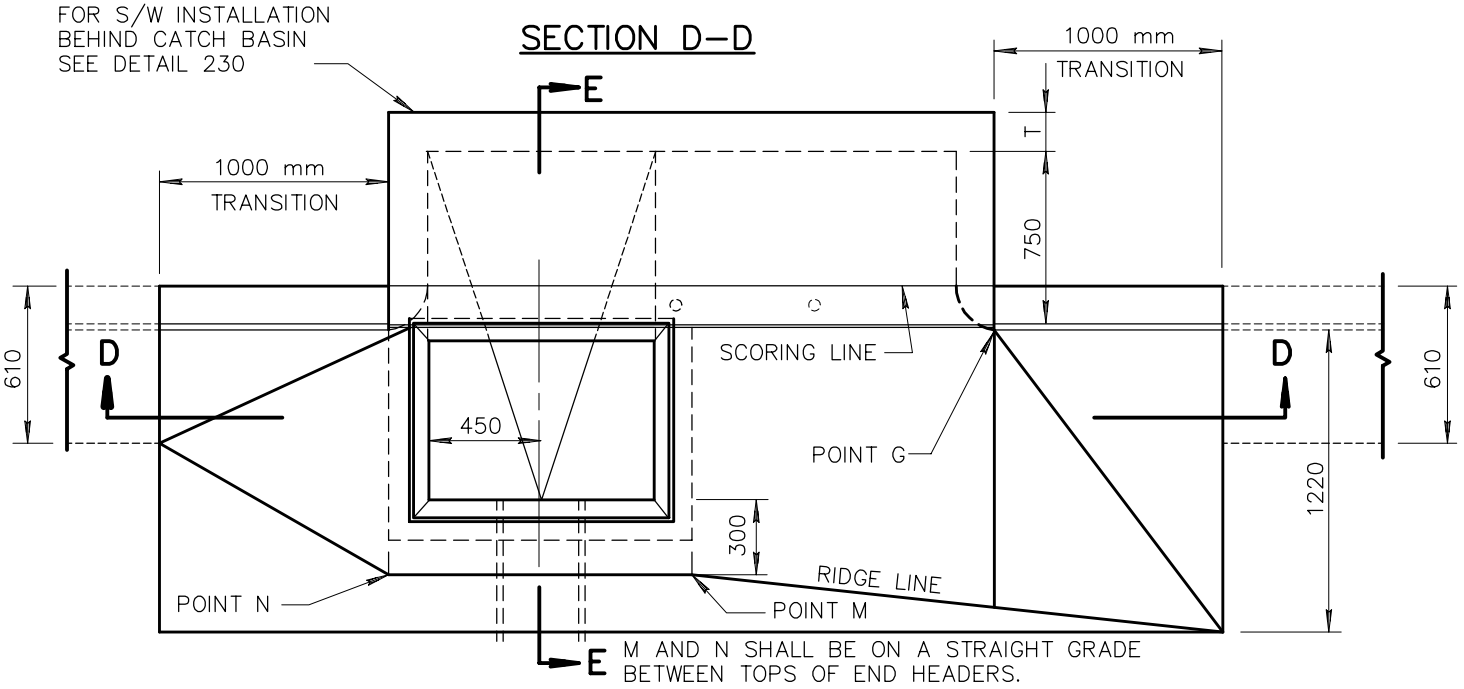
REINFORCEMENT DETAIL

DETAIL NO.			REVISED	DETAIL NO.
533-1	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	CATCH BASIN TYPE 'D	3-10-2000	533-1





SECTION E-E

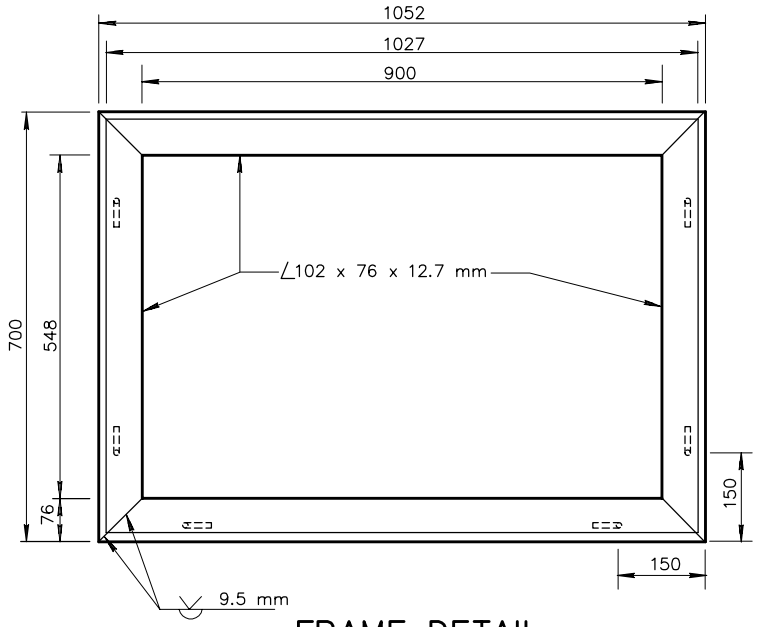


PLAN VIEW

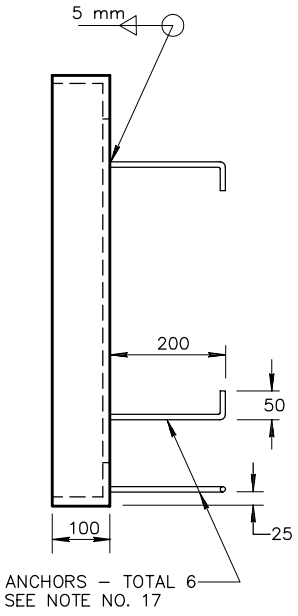
APRON NOTES:

9. APRON IS CONSTRUCTED ONLY WHEN SPECIFIED ON PLANS.
10. CONCRETE IN APRON SHALL BE NOT LESS THAN 200 mm THICK.
11. CURB FACES AT CATCH BASIN OPENING AND POINT G SHALL BE THAT OF THE EXISTING CURB FACE PLUS 50 mm 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 METRIC	APRON FOR TYPE 'D' CATCH BASIN	3-10-2000	533-2

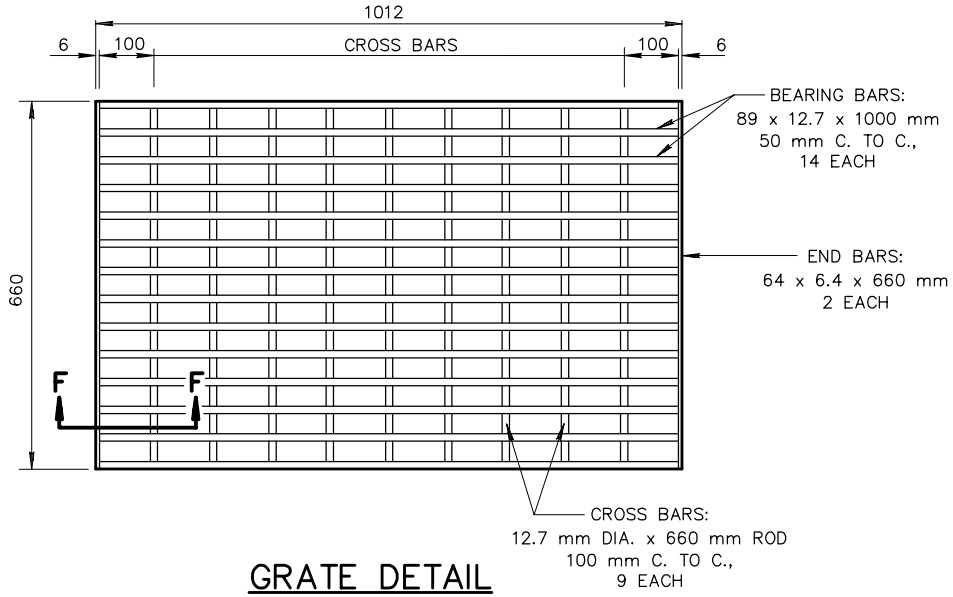


FRAME DETAIL

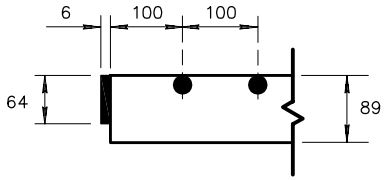


FRAME AND GRATE NOTES

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 9.5 mm DIA. STEEL ROD, 10M REBAR, 9.5 mm DIA. x 200 mm BOLTS OR 200mm 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.

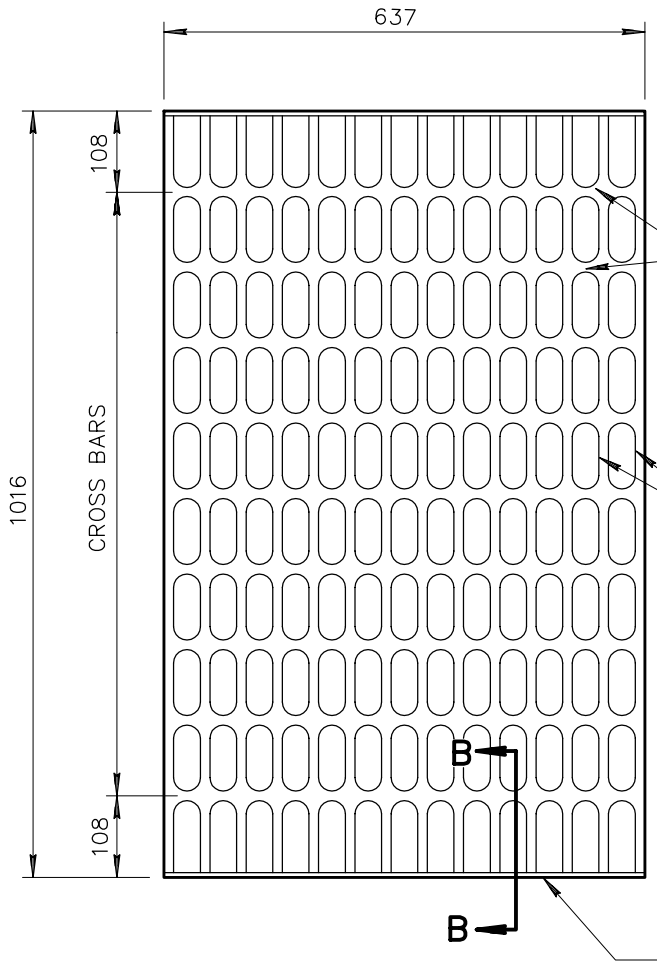


GRATE DETAIL



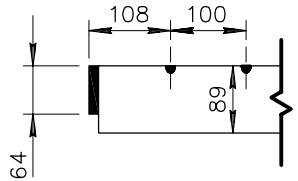
SECTION F–F

DETAIL NO.				DETAIL NO.	DETAIL NO.
533-3	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	FRAME AND GRATE FOR TYPE 'D' CATCH BASIN		3-10-2000	533-3



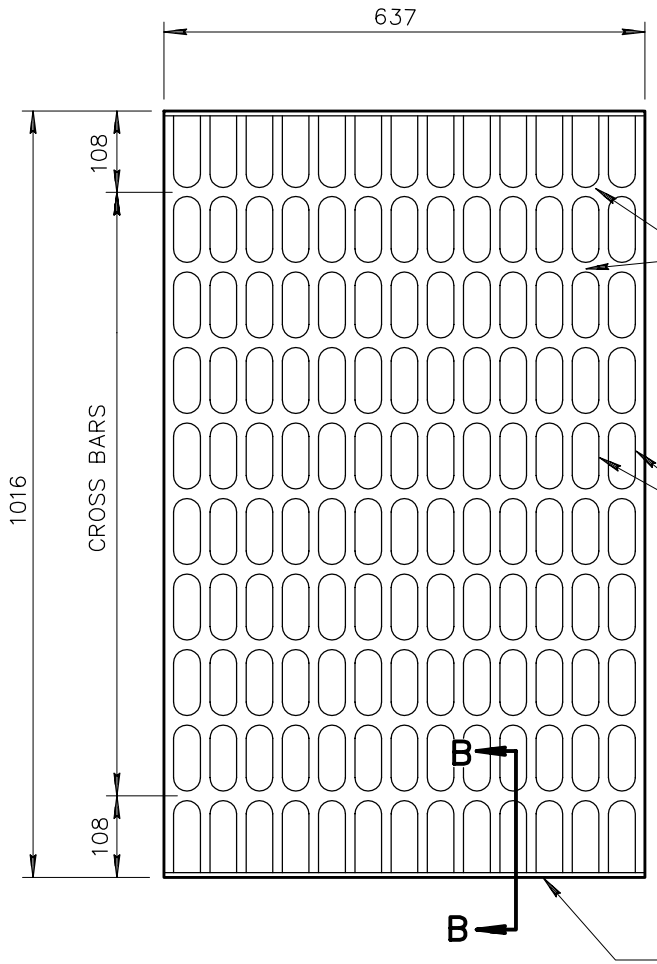
GRATE DETAIL

GRATE OPENING: 0.404 m^2



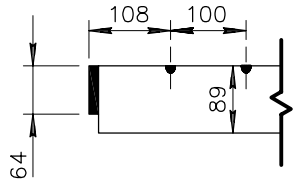
SECTION B–B

DETAIL NO.			REVISED	DETAIL NO.
533-4	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	2130 mm CURB OPENING CATCH BASIN TYPE 'D' - GRATE DETAILS	3-10-2000	533-4



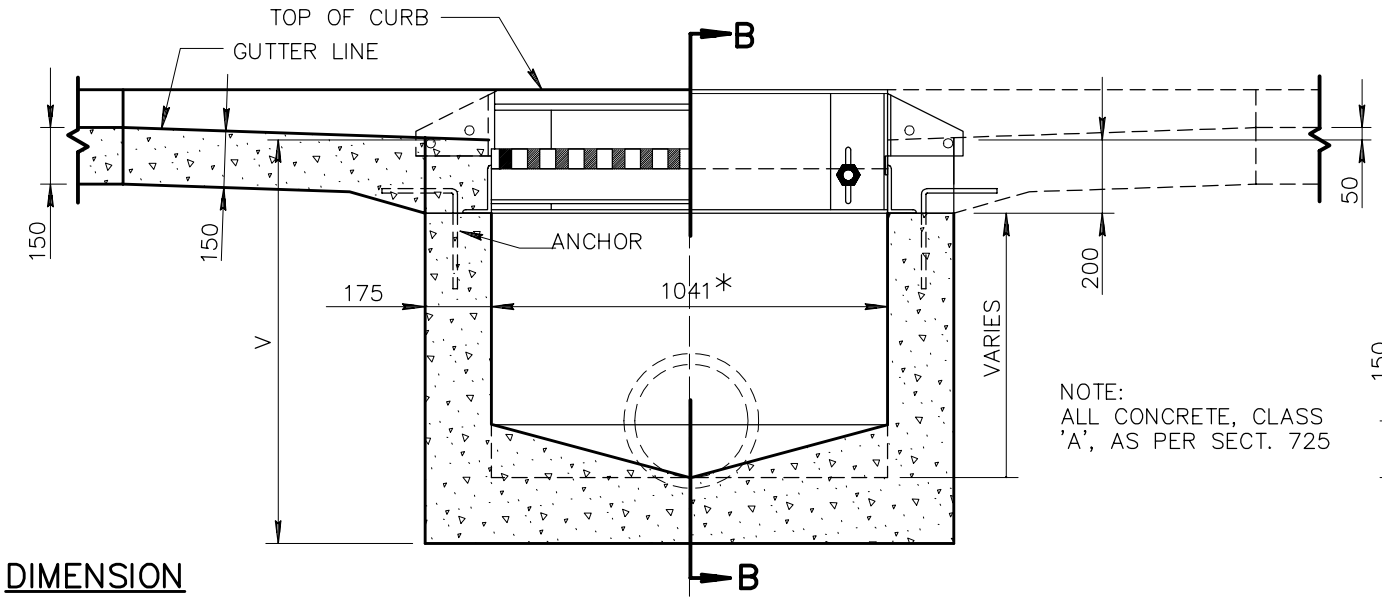
GRATE DETAIL

GRATE OPENING: 0.404 m^2



SECTION B–B

DETAIL NO.			REVISED	DETAIL NO.
533-4	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	2130 mm CURB OPENING CATCH BASIN TYPE 'D' - GRATE DETAILS	3-10-2000	533-4

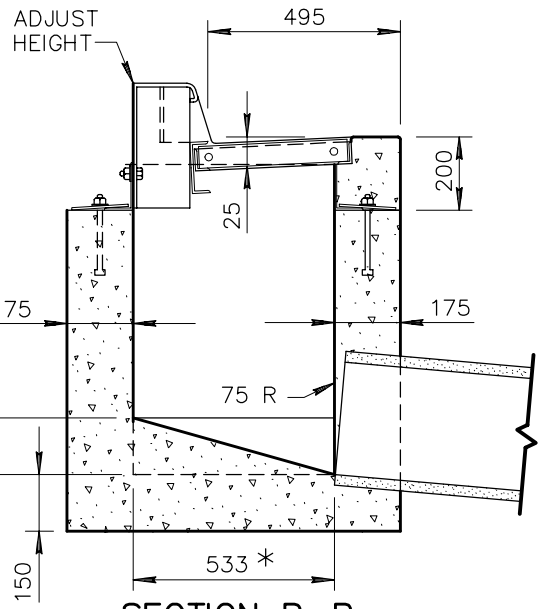


NOTE:
ALL CONCRETE, CLASS 'A', AS PER SECT. 725

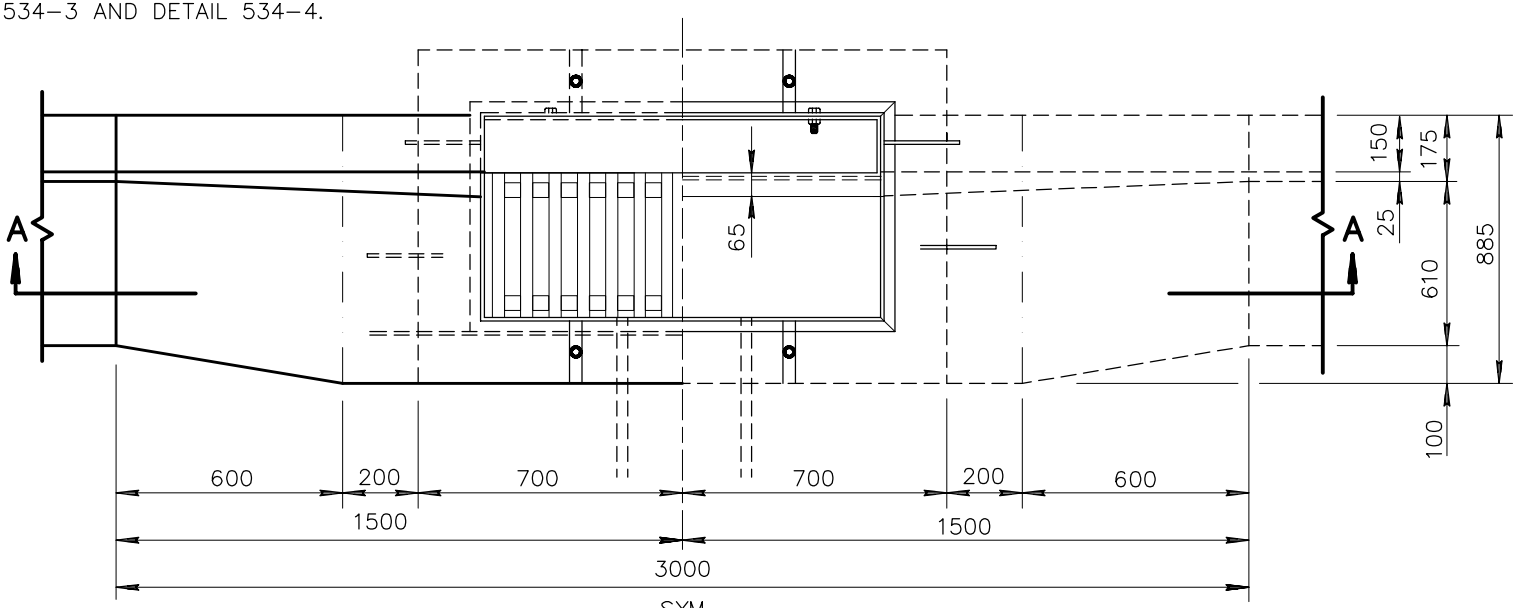
DIMENSION

V=900 mm UNLESS OTHERWISE SPECIFIED.
* DIMENSIONAL CHANGE WITH DETAIL 534-3 AND DETAIL 534-4.

SECTION A–A



SECTION B–B



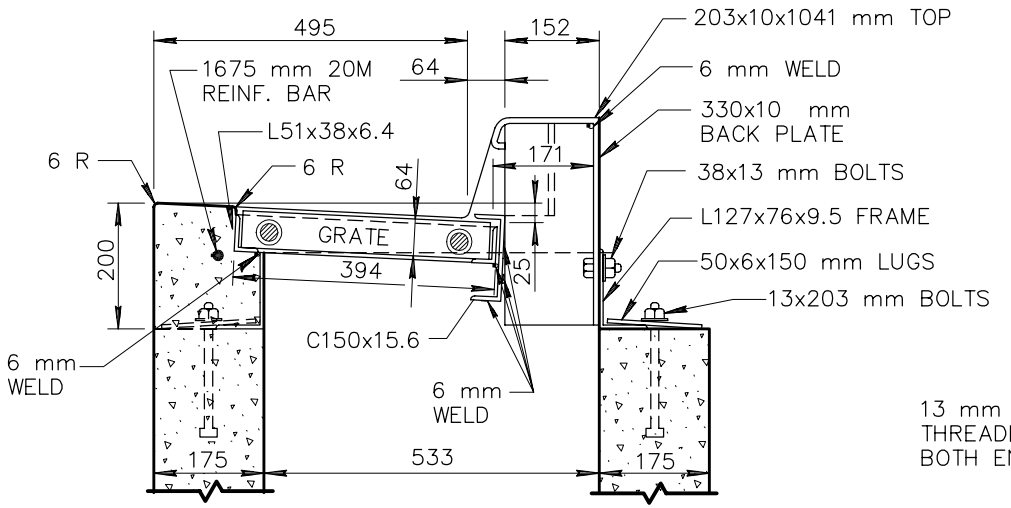
HALF PLAN GUTTER & GRATE

HALF PLAN FRAME & ANCHORS

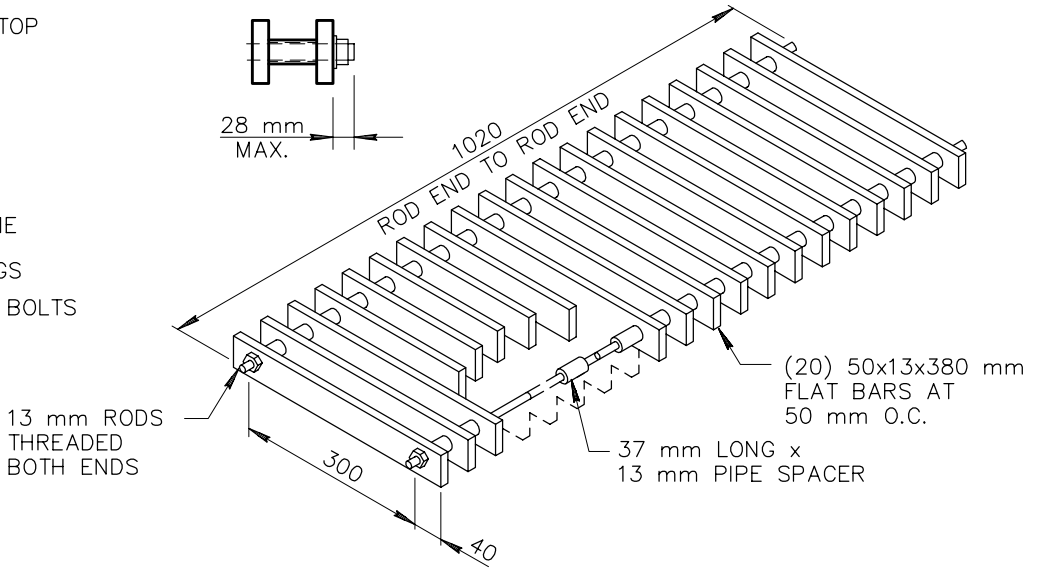
NOTES:

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.

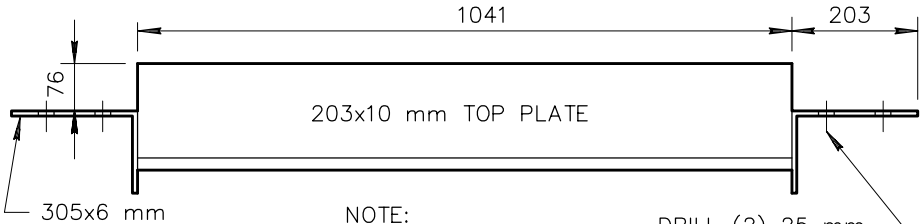
DETAIL NO.			REVISED	DETAIL NO.
534-1	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	**CATCH BASIN TYPE 'E'**	3-13-2000	534-1

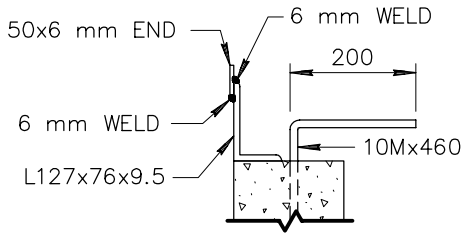


CROSS SECTION

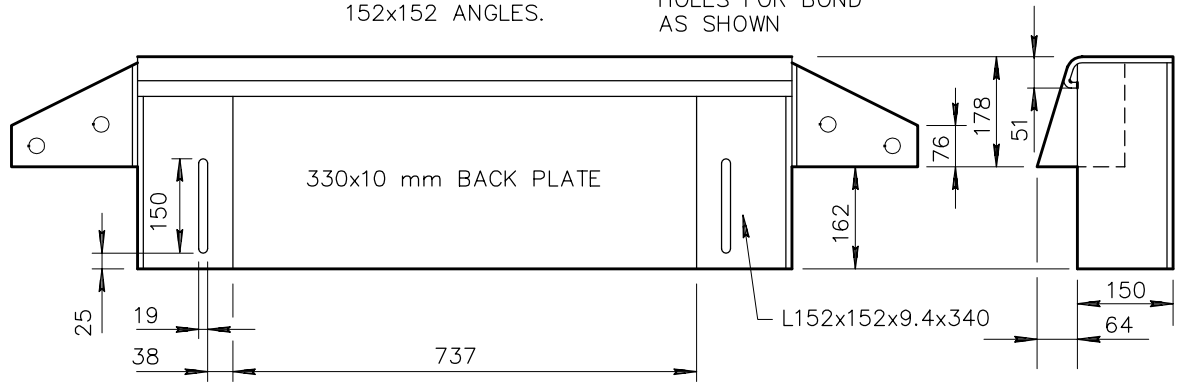


GRATE

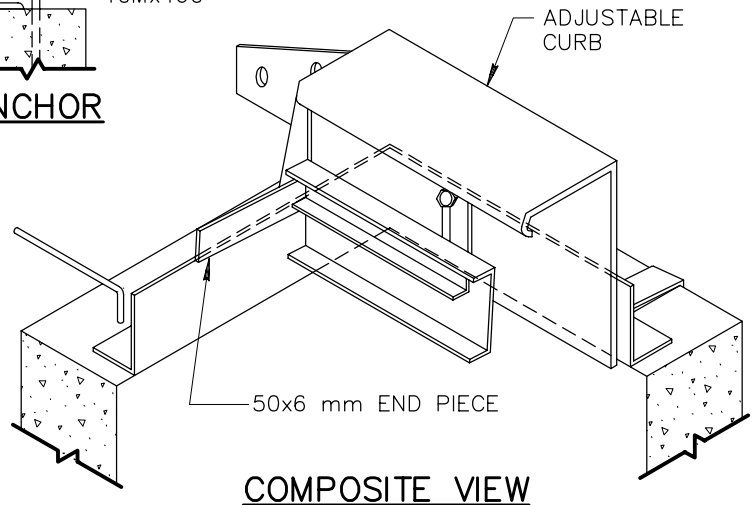




ANCHOR

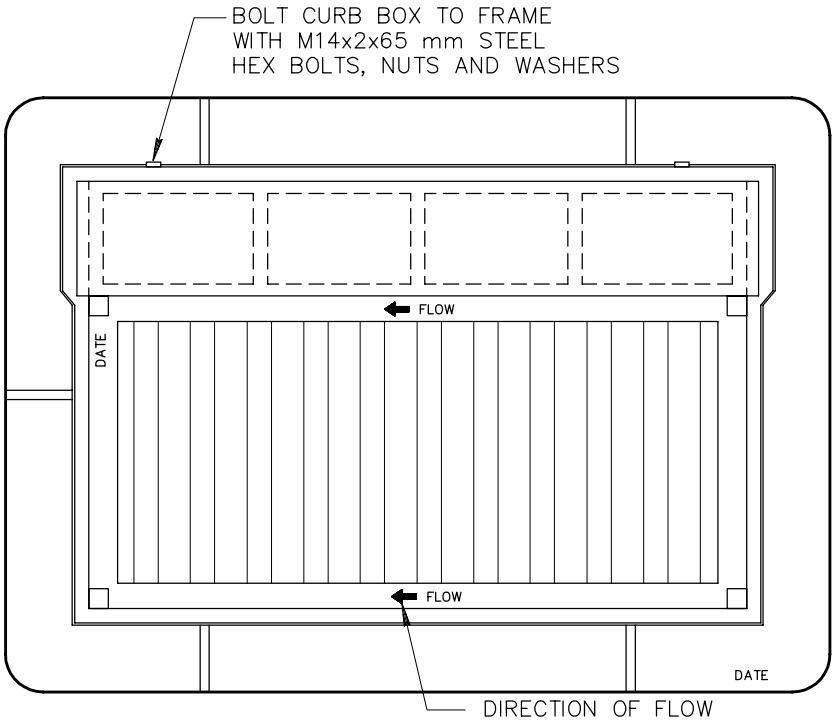


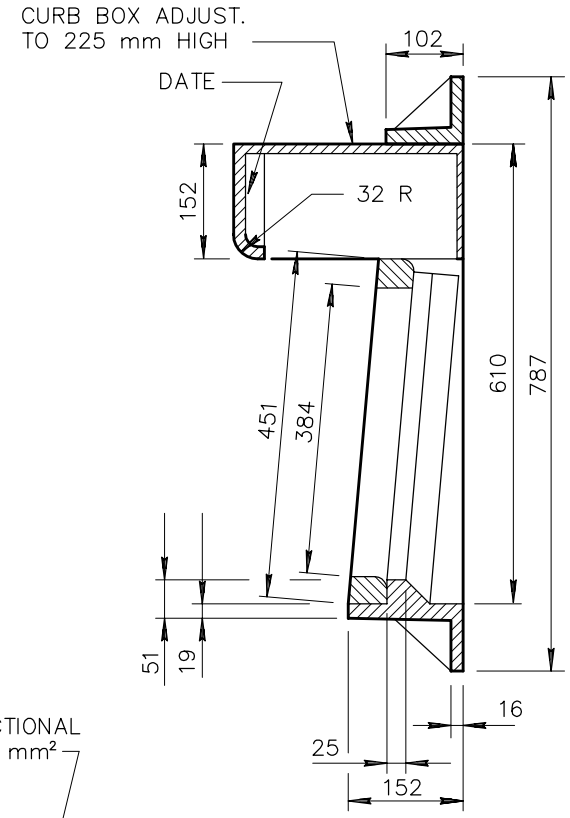
ADJUSTABLE CURB



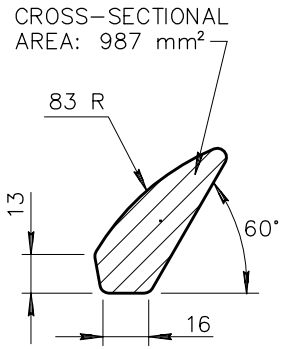
COMPOSITE VIEW

DETAIL NO.			REVISED	DETAIL NO.
534-2	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	CATCH BASIN TYPE 'E' (DETAILS)	3-13-2000	534-2

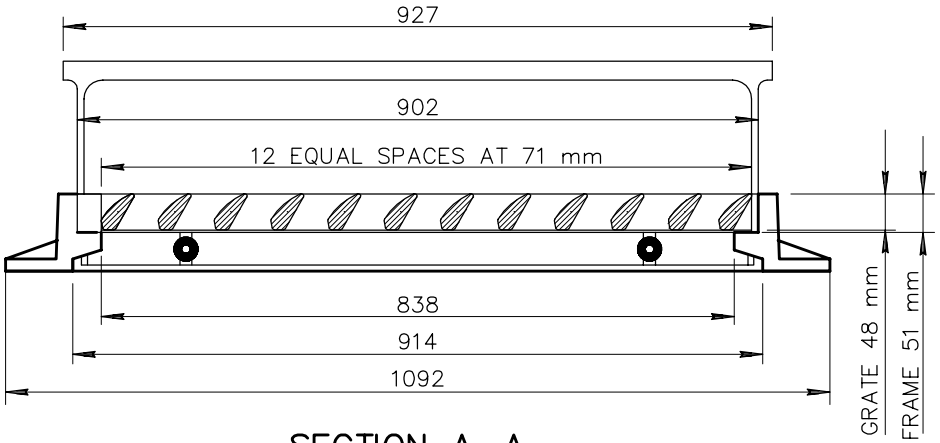




SECTION B–B



VANE DETAIL



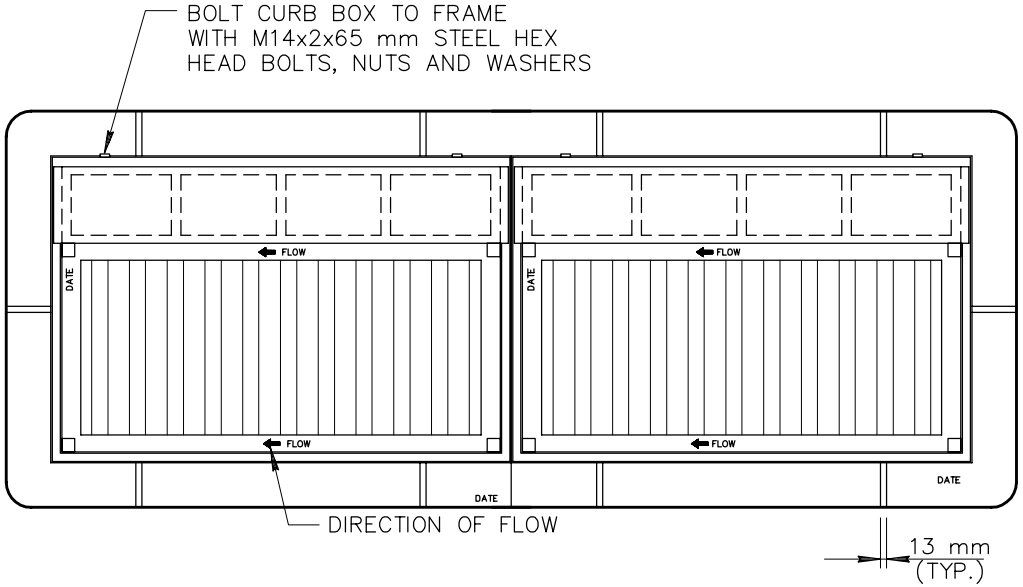
SECTION A–A

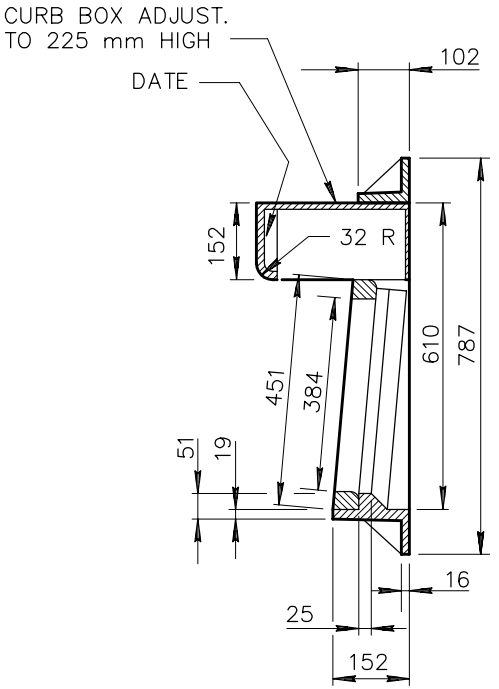
CAST IRON FRAME – GRATE – CURB BOX

NOTE:

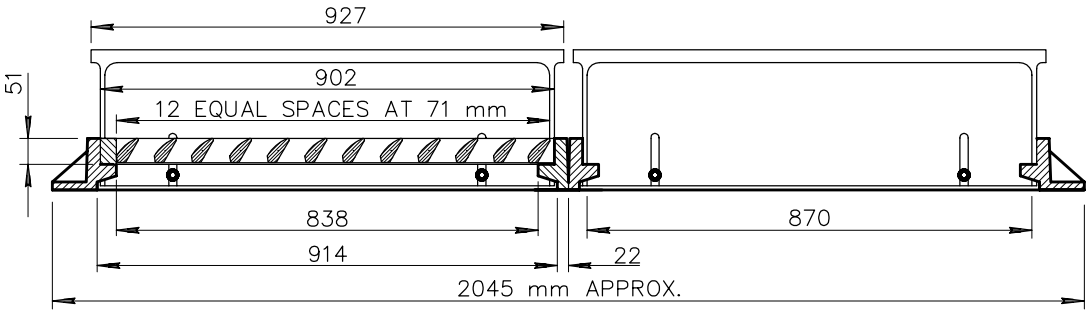
DIMENSIONAL CHANGE REQUIRED FROM 1041 mm WIDTH TO 915 mm, AND 533 mm DEPTH TO 610 mm.
MATERIAL CAST GRAY IRON ASTM A–48 CLASS 35B.
FRAME WEIGHT 95 kg; GRATE 64 kg; CURB BOX 42 kg.

DETAIL NO.			REVISED	DETAIL NO.
534-3	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	CATCH BASIN TYPE 'E' (DETAILS)	3-13-2000	534-3

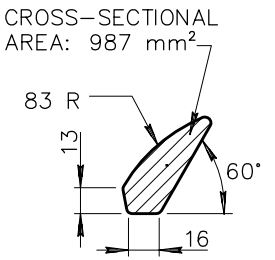




SECTION B–B



SECTION A–A



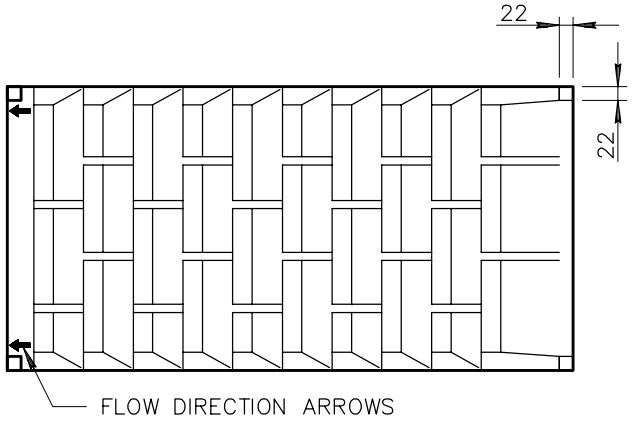
VANE DETAIL

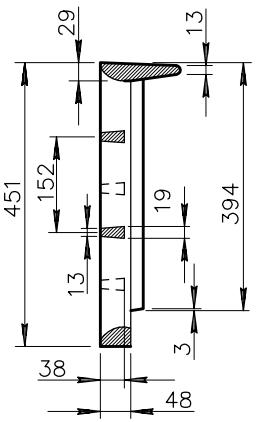
DOUBLE UNIT CAST IRON FRAME – GRATE – CURB BOX

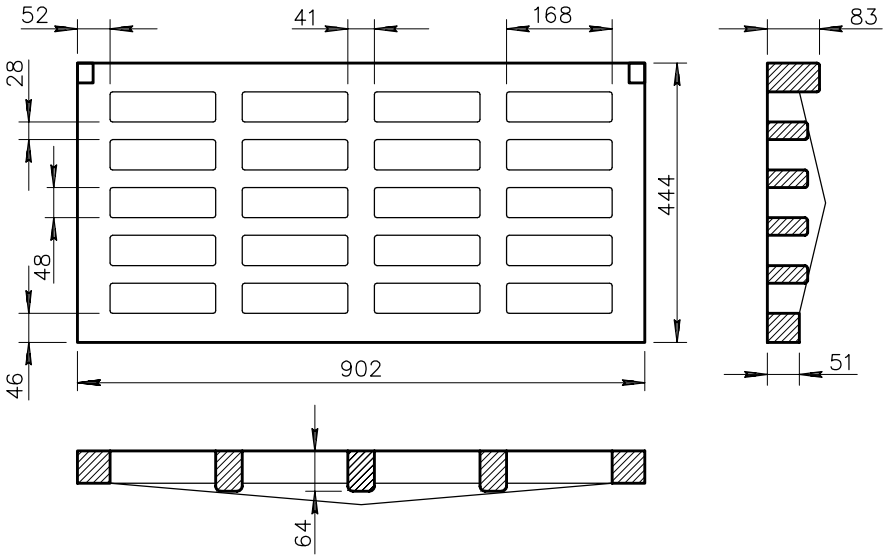
NOTE:

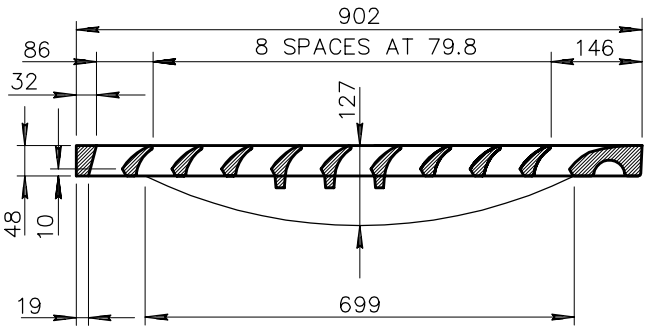
DIMENSIONAL CHANGE REQUIRED FROM 1041 mm WIDTH TO 1880 mm, AND 533 mm DEPTH TO 610 mm.
REQUIRES ONE CENTER STEEL I–BEAM S100x11.
MATERIAL CAST GRAY IRON ASTM A–48 CLASS 35B.
FRAME MASS 89 kg; GRATE 64 kg; CURB BOX 42 kg.

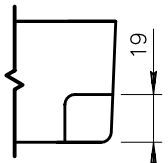
DETAIL NO.			REVISED	DETAIL NO.
534-4	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	CATCH BASIN TYPE 'E' (DETAILS)	3-13-2000	534-4



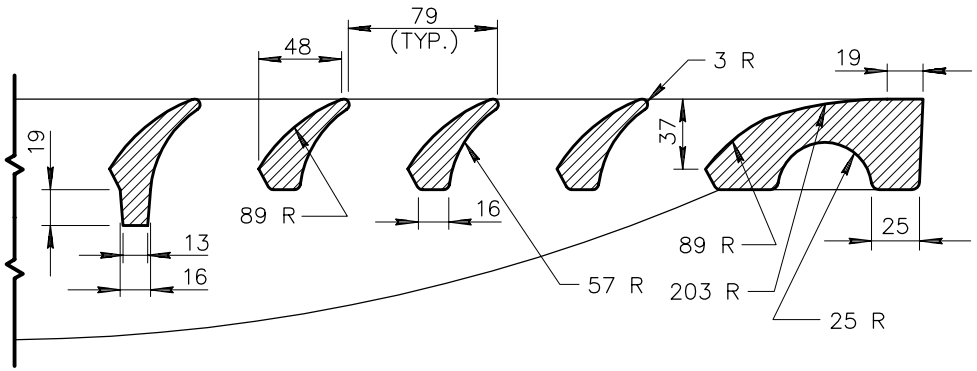




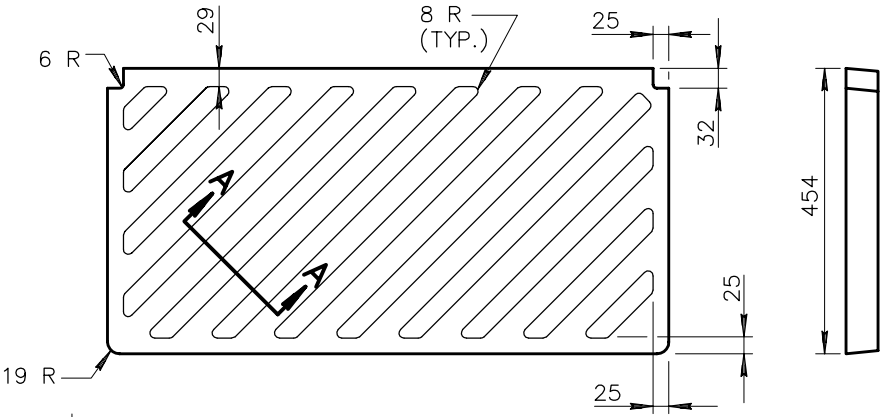


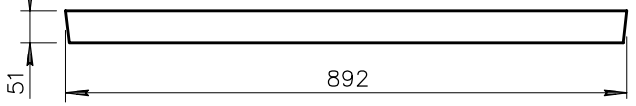


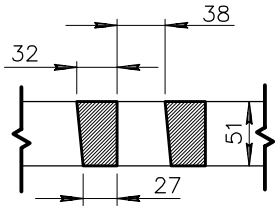
NOTCH DETAIL



VANE DETAIL

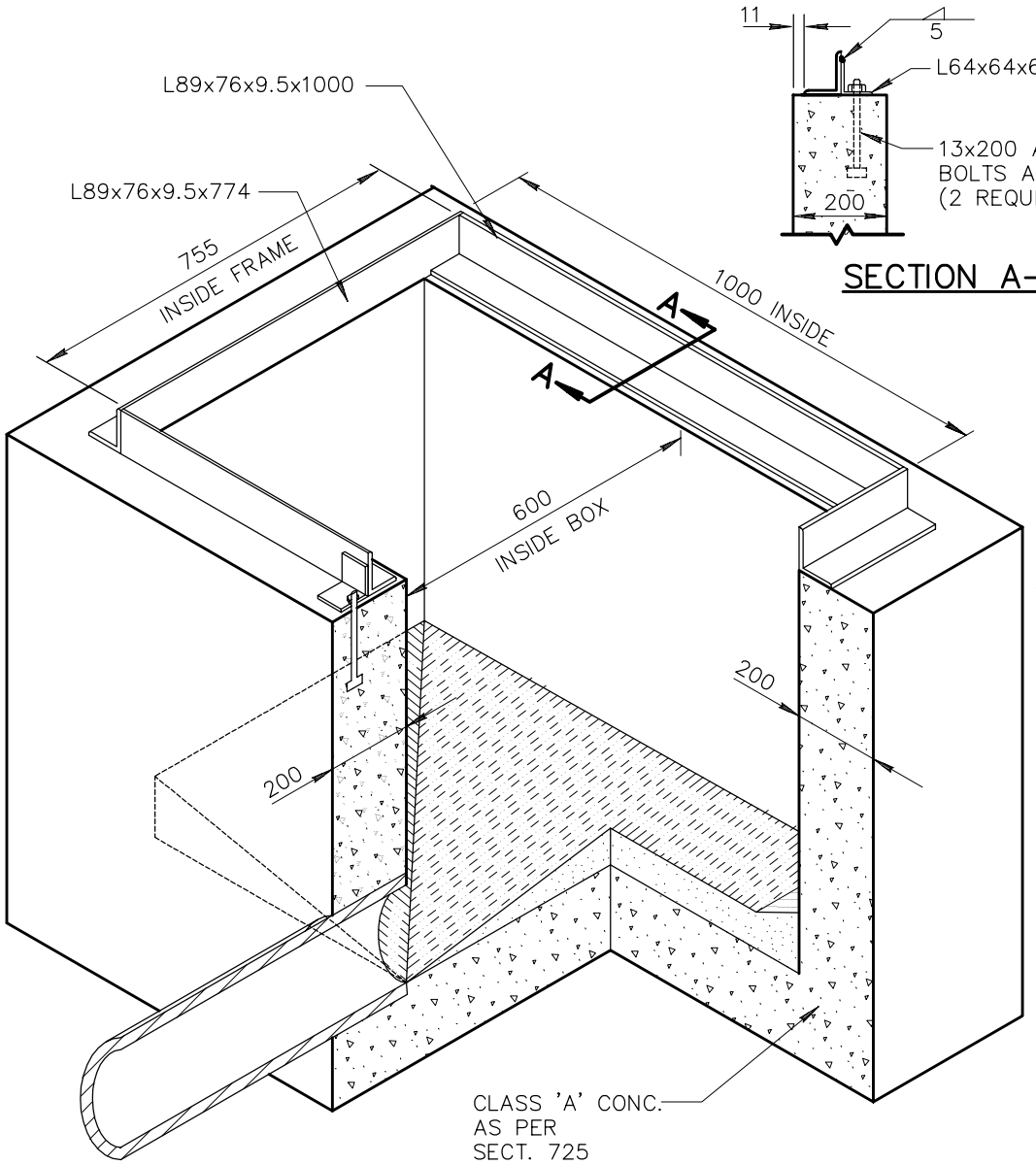




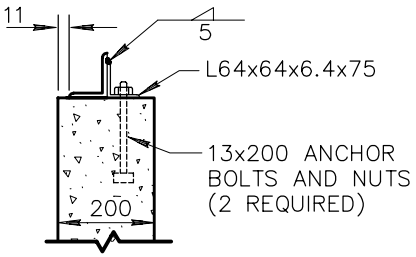


SECTION A–A

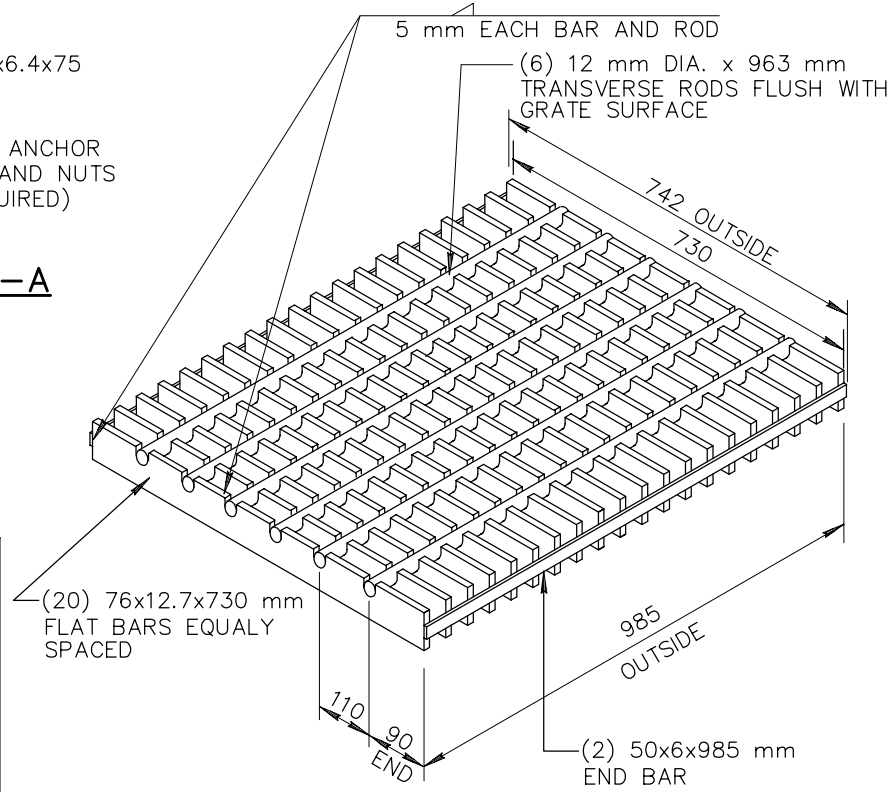
DETAIL NO.			REVISED	DETAIL NO.
534-5	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	ALTERNATE GRATE STYLES SUMP LOCATION	3-13-2000	534-5



NOTE:
CONSTRUCT BOX AS PER CATCH BASIN TYPE 'E'
(LOWER PORTION ONLY).



SECTION A–A

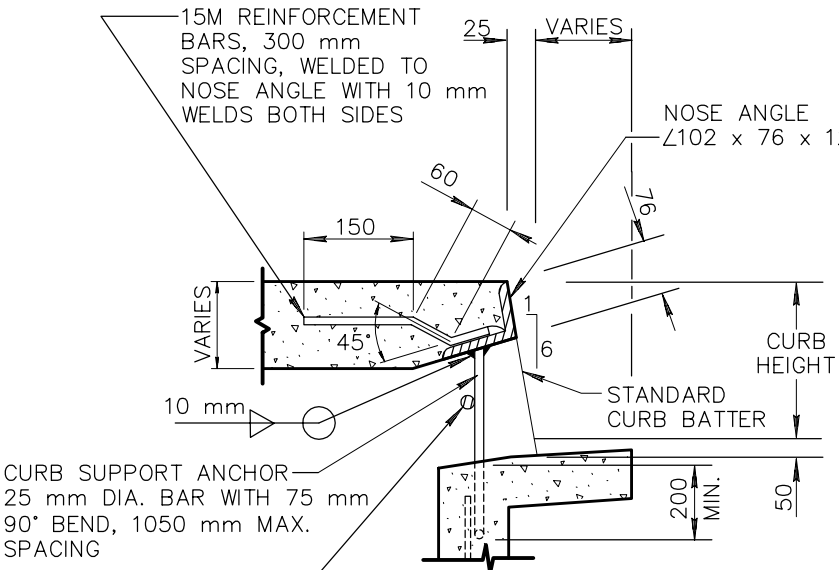


GRATE

NOTES:

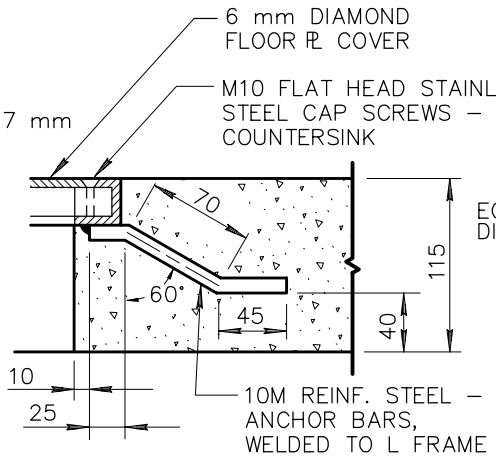
1. PIPES MAY ENTER OR LEAVE ANY WALL. BOTTOM OF BOX TO BE SLOPED TO OUTLET PIPE FROM ALL DIRECTIONS AND TROWELLED TO A HARD SMOOTH SURFACE.
2. CONNECTION PIPES MAY BE PLACED IN ANY POSITION AROUND THE WALLS PROVIDED THE POSITION IS CONSISTENT WITH THE PLAN.
3. OUTLET PIPE SHALL BE TRIMMED TO FINAL SHAPE 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.

DETAIL NO.			REVISED	DETAIL NO.
535	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	CATCH BASIN TYPE 'F' (FOR USE WITHOUT CURB)	3–13–2000	535

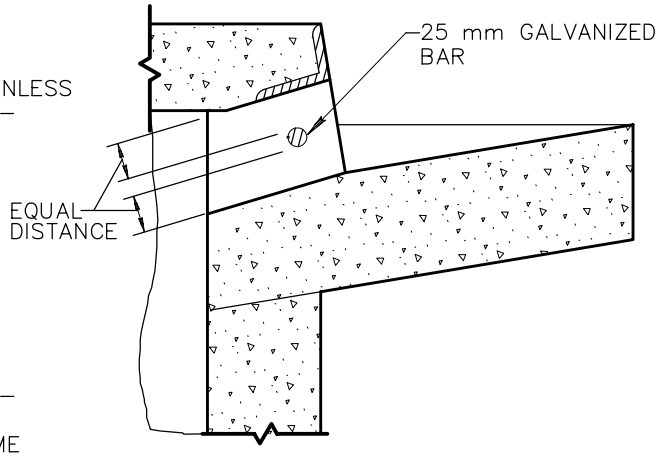


SECTION C–C

FOR DETAILS 531, 532 AND 533



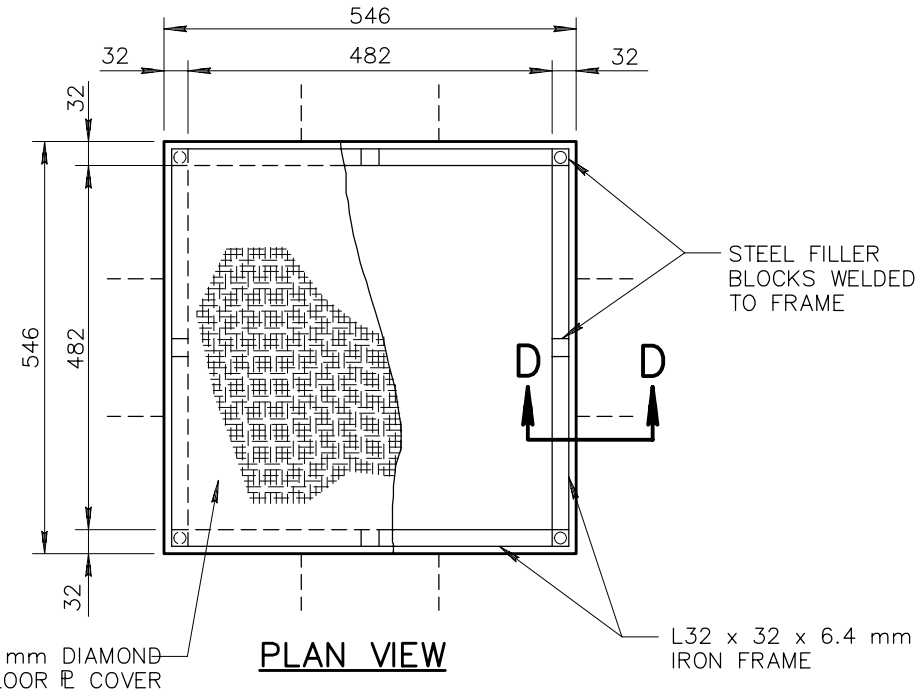
SECTION D–D



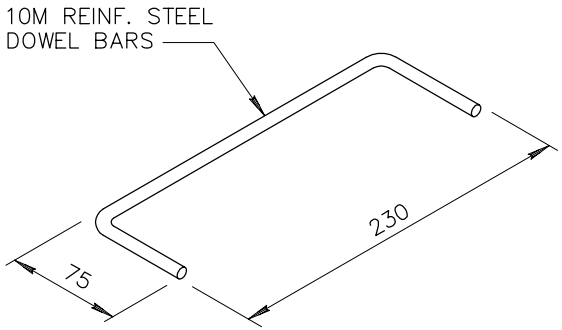
PROTECTION BAR

NOTES:

1) HORIZONTAL PLAIN ROUND GALVANIZED STEEL PROTECTION BAR SHALL BE USED WHEN CURB FACE IS 230 mm OR MORE.
2) THE BAR SHALL BE EMBEDDED 125 mm AT EACH END.

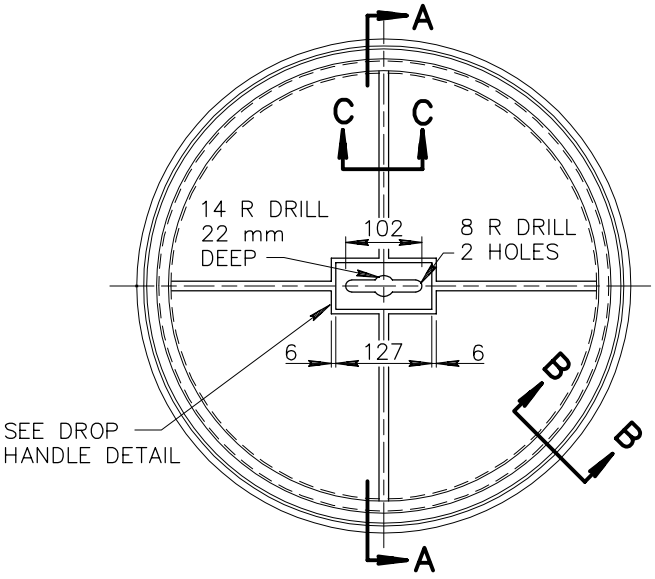


PLAN VIEW

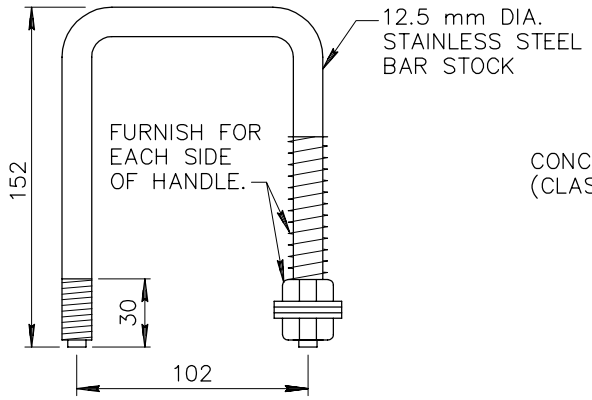


DOWEL BAR

DETAIL NO.				REVISED	DETAIL NO.
536-1	MARICOPA ASSOCIATION of GOVERNMENTS	STANDARD DETAIL METRIC	COMMON DETAILS AND SECTIONS FOR CURB OPENING CATCH BASINS	3-13-2000	536-1

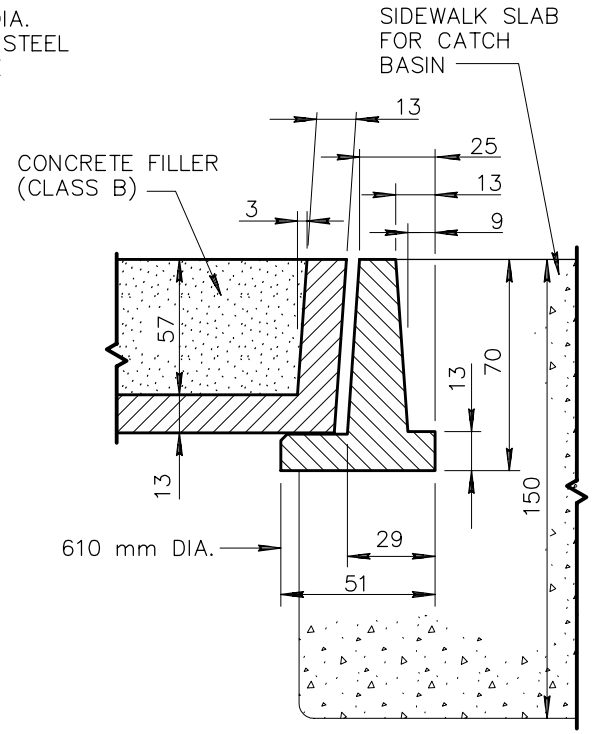


PLAN VIEW

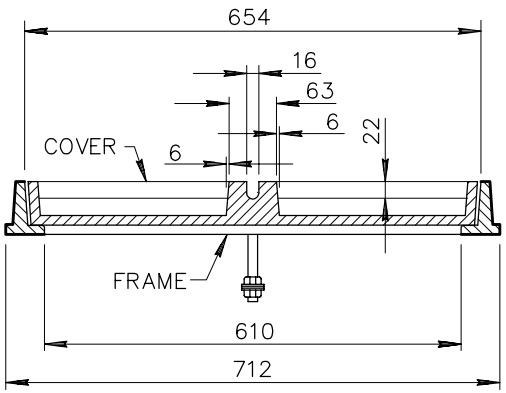


1 EACH 304–S.STL. SPRING
63x13.5 I.D.x2.4
2 EACH 13 mm HEX NUT
3 EACH 13 mm FLAT WASHER
1 EACH 13 mm LOCK WASHER

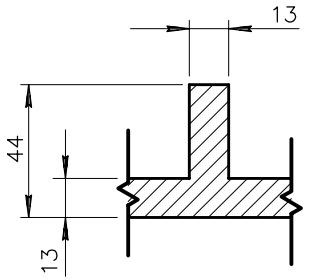
DROP HANDLE



SECTION B–B



SECTION A–A

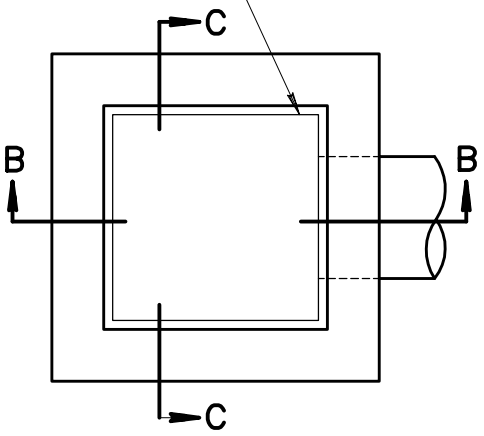


SECTION C–C

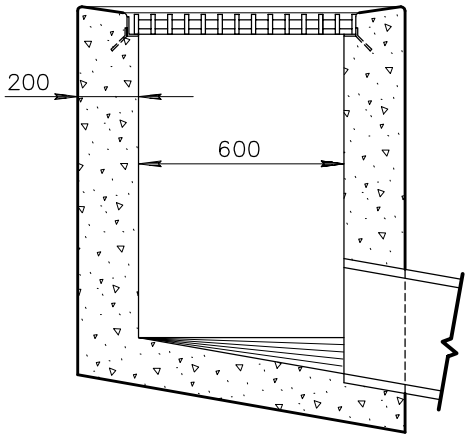
NOTES:

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 0.79 mm.
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 METRIC	ALTERNATE COVER FOR CURB OPENING CATCH BASINS	3-13-2000	536-2

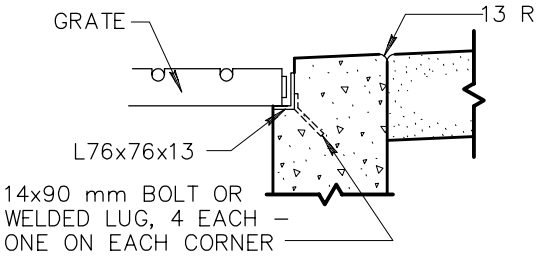


PLAN



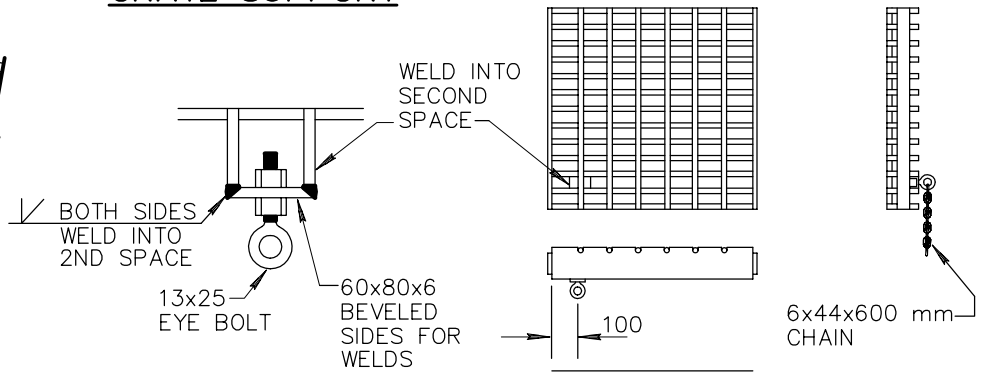
SECTION B–B

SINGLE GRATE

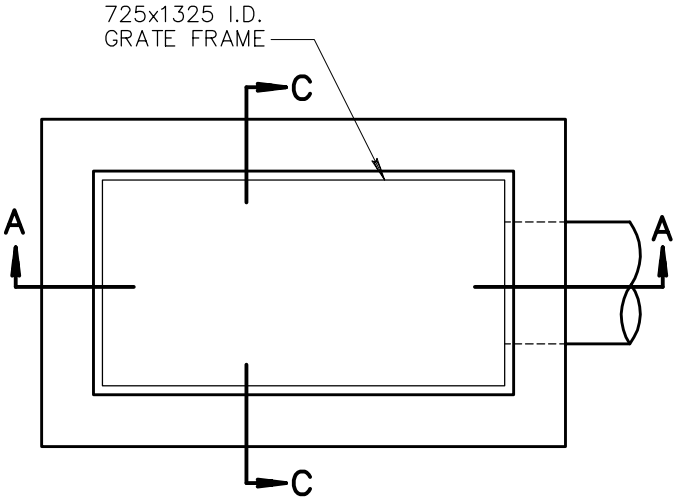


DETAIL OF ANGLE FRAME
GRATE SUPPORT

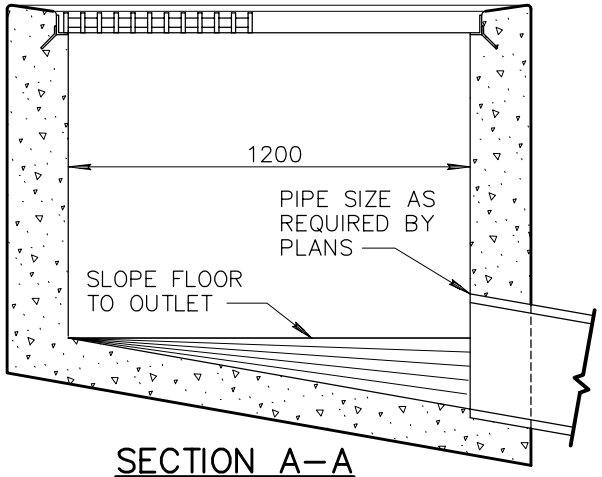
ALL CONCRETE SHALL BE CLASS 'A' PER SECT. 725. EXPOSED EDGES SHALL BE FINISHED WITH A 13 mm RADIUS.



BAR GRATE
SEE DETAIL 539

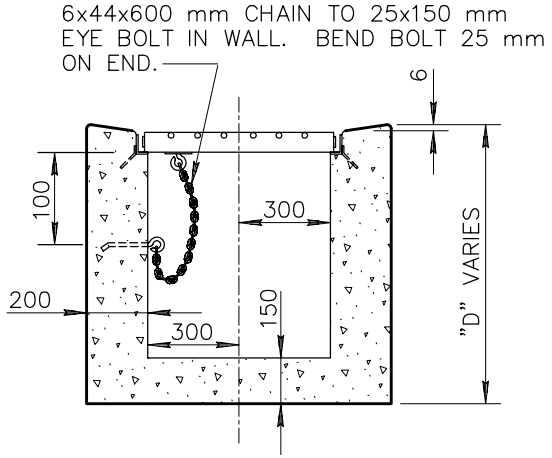


PLAN



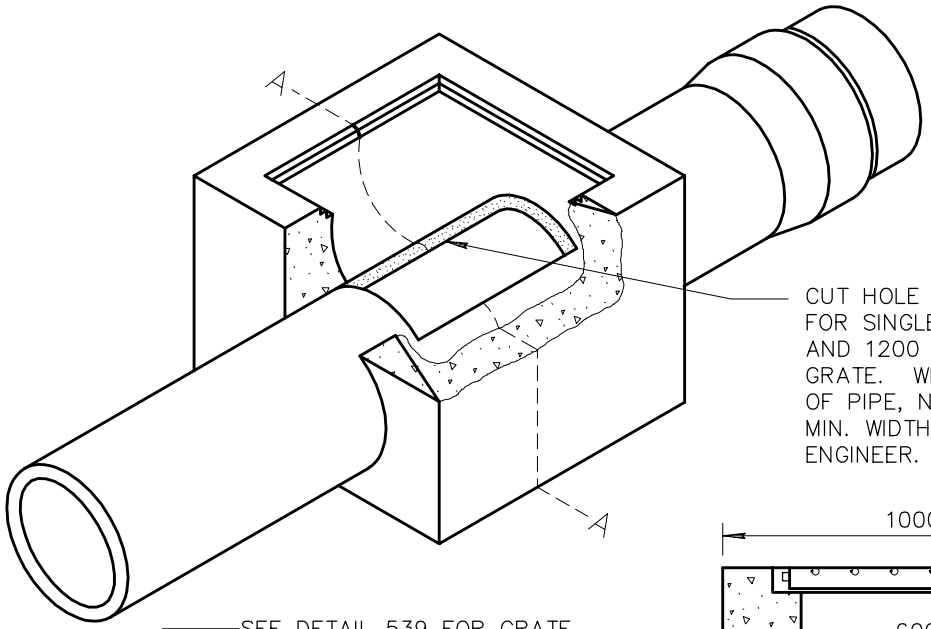
SECTION A–A

DOUBLE GRATE



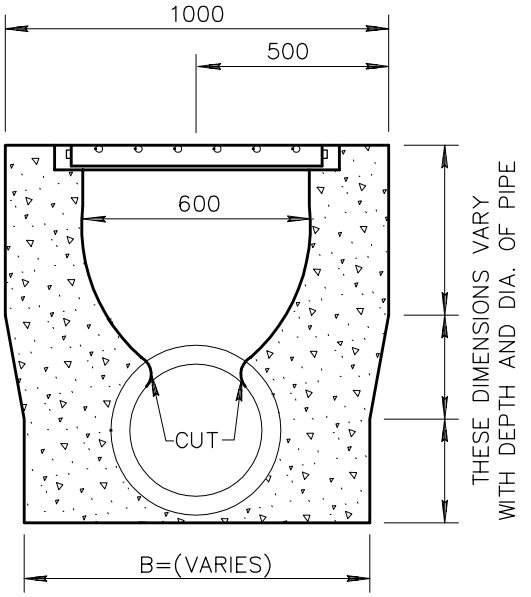
SECTION C–C

DETAIL NO.			REVISED	DETAIL NO.
537	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	CATCH BASIN – TYPE 'G'	7–05–2000	537

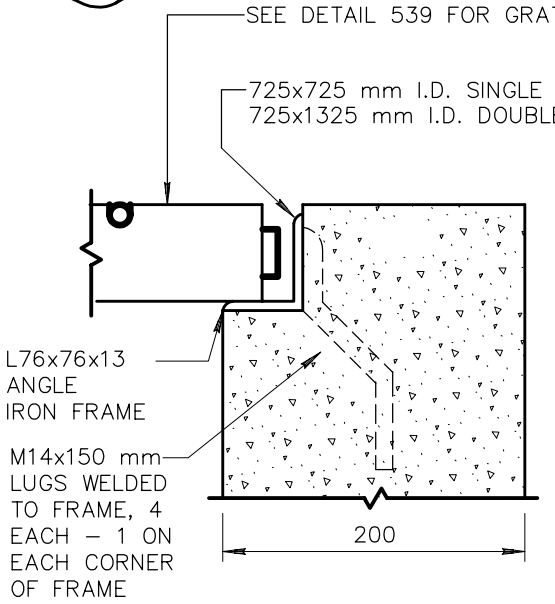


WHEN DOUBLE GRATE IS USED INCREASE THE LENGTH OF THE STRUCTURE ACCORDINGLY.

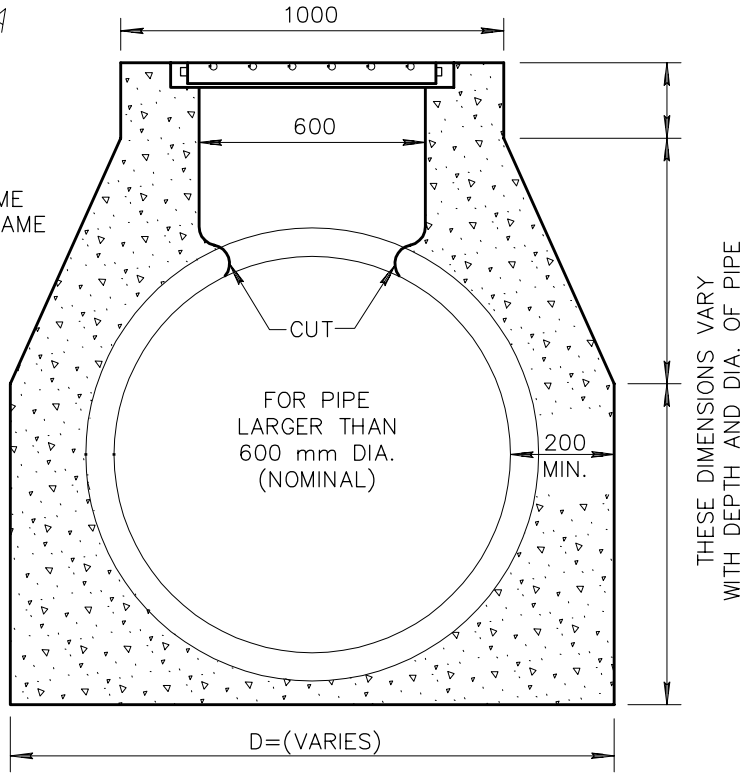
CUT HOLE IN PIPE 600 mm LONG FOR SINGLE GRATE STRUCTURES AND 1200 mm LONG FOR DOUBLE GRATE. WIDTH DEPENDS ON DIA. OF PIPE, NOT TO EXCEED 560 mm MIN. WIDTH TO BE SET BY PROJECT ENGINEER.



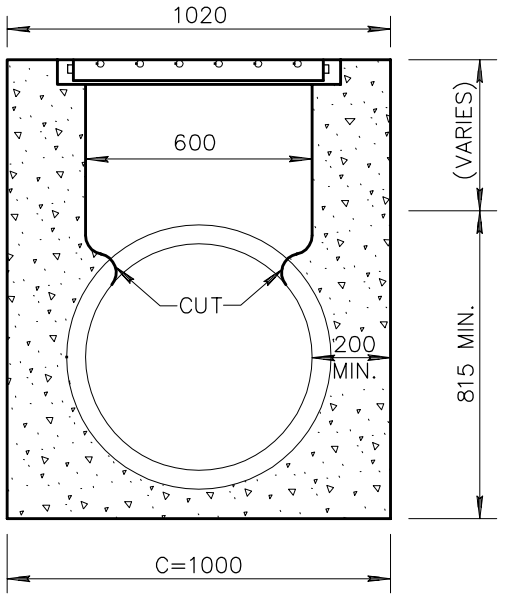
SECTION A–A



DETAIL OF ANGLE FRAME GRATE SUPPORT

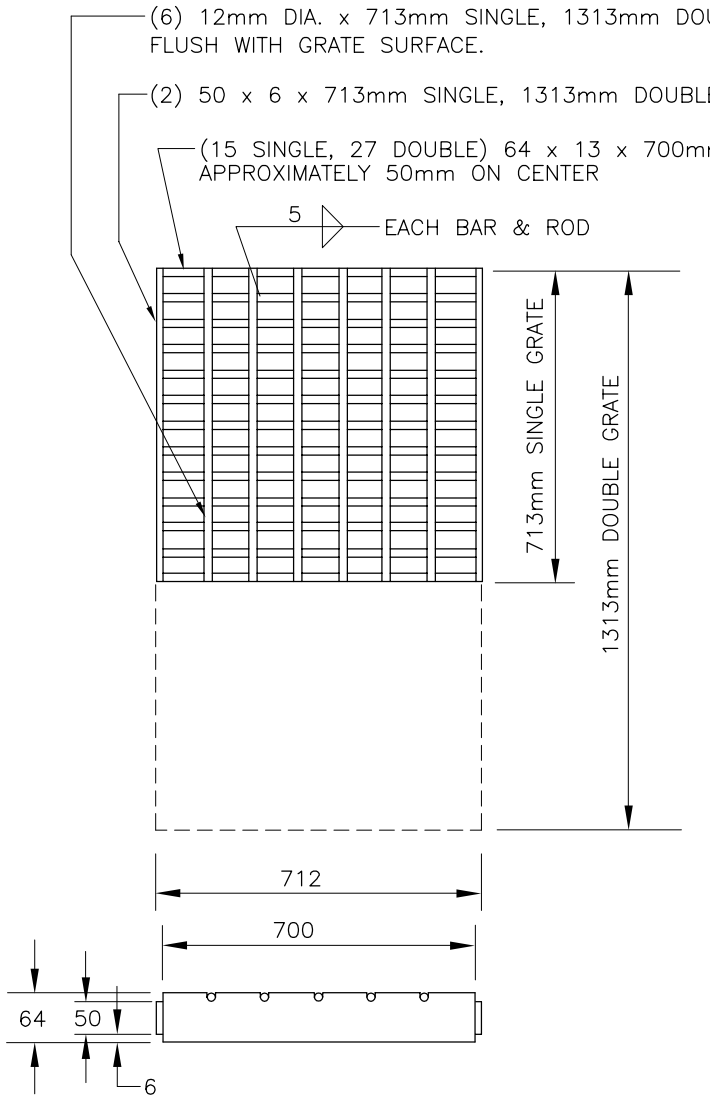


SECTION A–A



SECTION A–A
600 mm PIPE (NOMINAL)

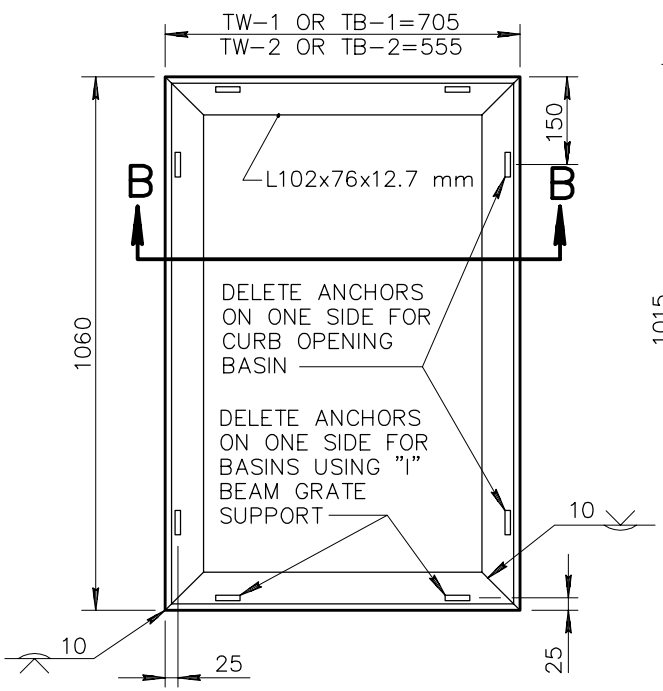
DETAIL NO.			REVISIONS	DETAIL NO.
538	MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL METRIC	CATCH BASIN – TYPE 'H'	3–13–2000	538



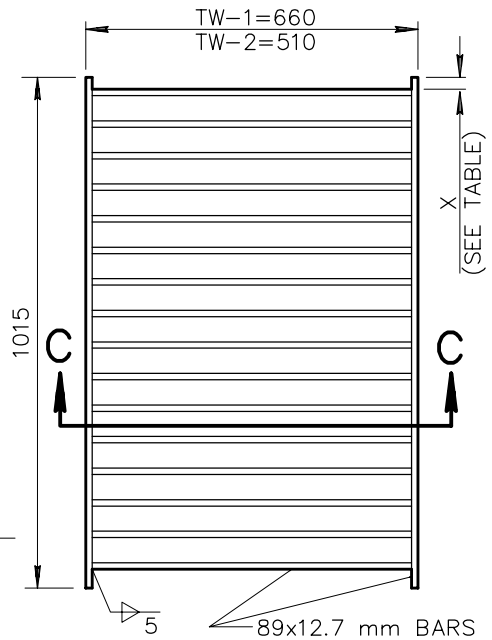
NOTES:

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 3 mm SPECIFIED DIMENSIONS.

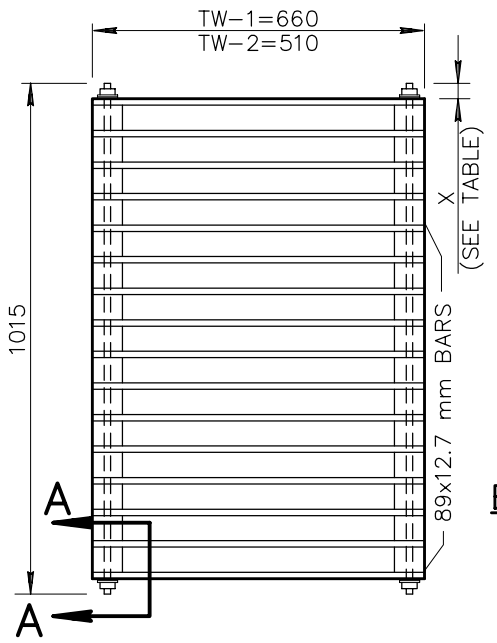
DETAIL NO.			REVISED	DETAIL NO.
539	MARICOPA ASSOCIATION of GOVERNMENTS **STANDARD DETAIL METRIC**	GRATES FOR CATCH BASINS, TYPE G AND H	3–13–2000	539



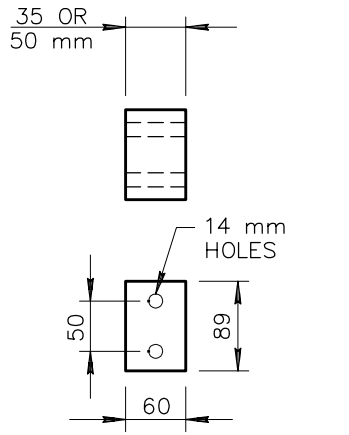
PLAN I



PLAN IA

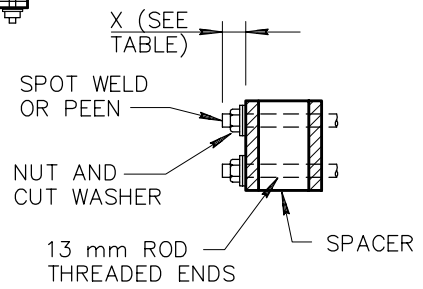


PLAN IB



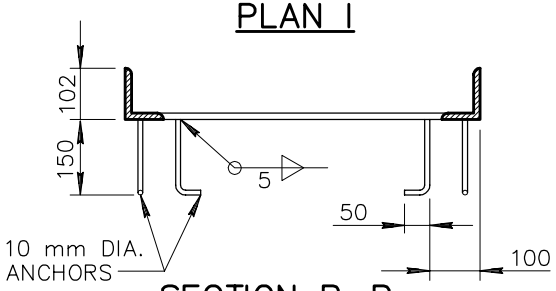
CAST IRON, CAST STEEL OR STEEL BAR STOCK

BAR SPACER DETAIL

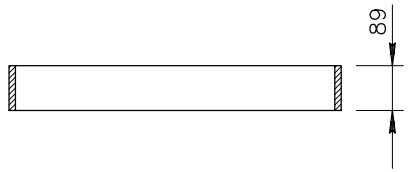


SECTION A–A

GRATE TYPES TB–1 AND TB–2



SECTION B–B



SECTION C–C

GRATE TYPES TW–1 AND TW–2

NOTES:

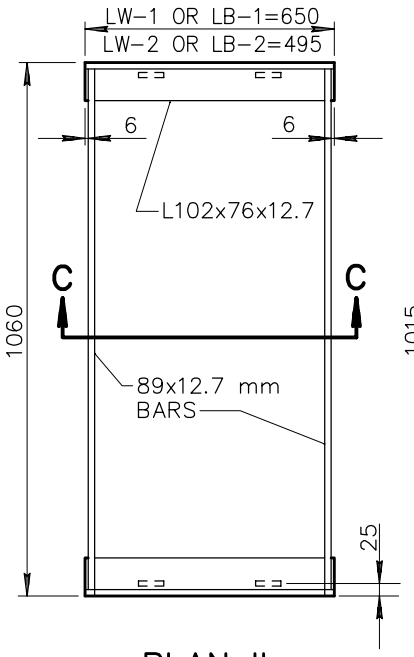
1. GRATING UNITS AND FRAMES SHALL BE FABRICATED FROM STRUCTURAL STEEL EXCEPT AS NOTED.
2. WELDING SHALL BE IN ACCORDANCE WITH STD. WELDING SPECS.
3. THE COMPLETED ASSEMBLY SHALL BE GIVEN TWO SHOP COATS OF NO. 1 PAINT AS PER SECT. 790.
4. FRAME AND GRATE SHALL FIT TO A MAX. ROCK OF 2.4 mm AT ANY POINT.
5. RESTRICT USE TO GRADES OF 3% OR LESS.

BAR TABLE

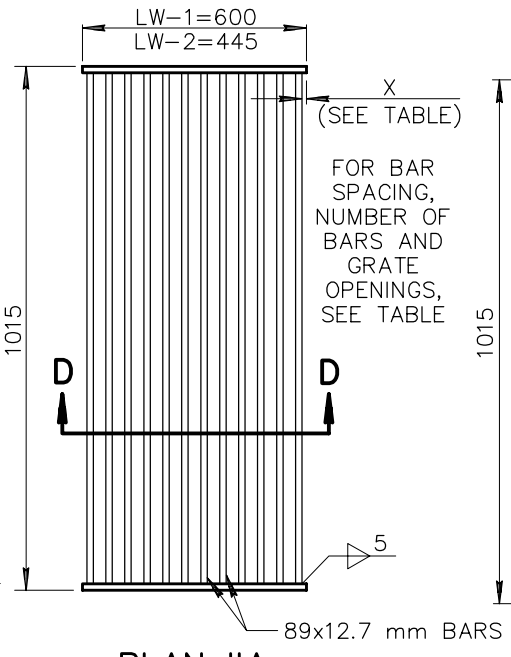
TYPE	CLEAR SPACING	NO. BARS	X	GRATE OPENING m^2
TW OR TB–1.0	25	26	30	0.298
TW OR TB–1.1	35	21	24	0.308
TW OR TB–1.2	50	16	31	0.433
TW OR TB–2.0	25	26	30	0.216
TW OR TB–2.1	35	21	24	0.224
TW OR TB–2.2	50	16	31	0.246

TW INDICATES TRANSVERSE WELDED
TB INDICATES TRANSVERSE BOLTED

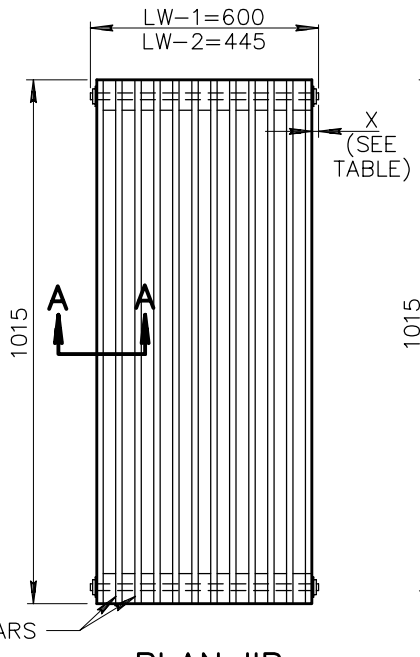
DETAIL NO.			REVISED	DETAIL NO.
540-1	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	CATCH BASIN GRATES	3-13-2000	540-1



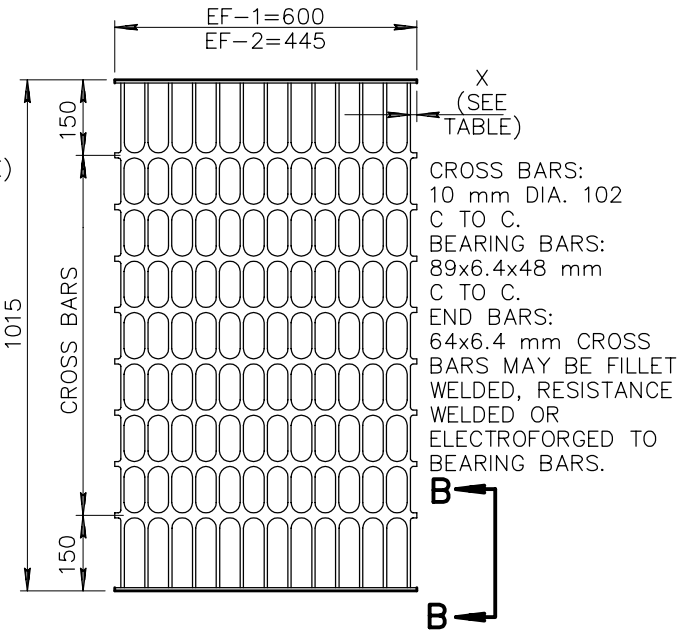
PLAN II



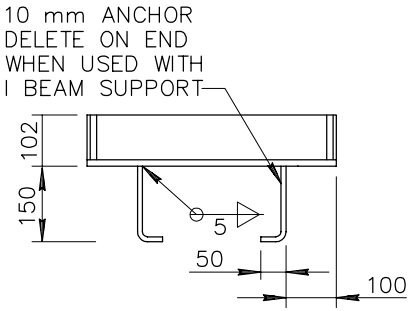
PLAN IIA



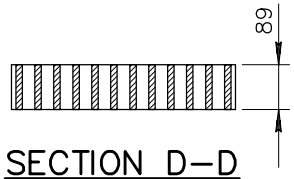
PLAN IIB



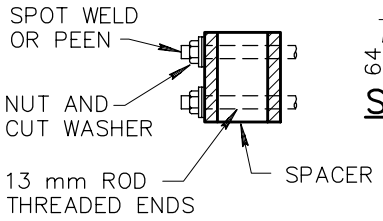
PLAN II



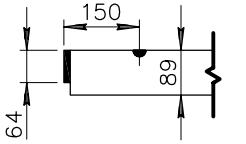
SECTION C–C



SECTION D–D

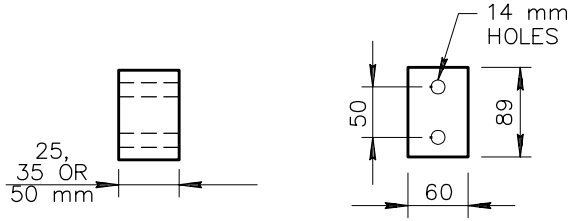


SECTION A–A



SECTION B–B

GRATE TYPE	CLEAR BAR SPACING	NO. BARS	X	GRATE OPENING m^2
LW OR LB–1.0	25	16	11	0.369
LW OR LB–1.1	35	13	7	0.403
LW OR LB–1.2	50	9	43	0.450
EF–1	41	13	12	0.433
LW OR LB–2.0	25	12	9	0.277
LW OR LB–2.1	35	9	25	0.311
LW OR LB–2.2	50	7	28	0.335
EF–2	41	10	6	0.323



BAR SPACER DETAIL

CAST IRON, CAST STEEL
OR STEEL BAR STOCK

NOTES:

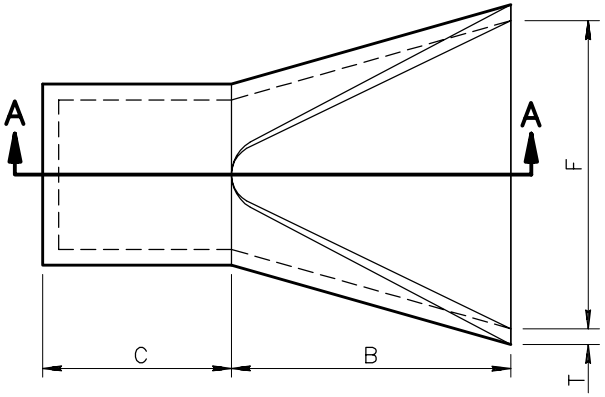
1. LW INDICATES LONGITUDINAL WELDED.
2. LB INDICATES LONGITUDINAL BOLTED.
3. EF INDICATES ELECTROFORGED.
4. GRATING UNITS AND FRAMES SHALL BE FABRICATED FROM STRUCTURAL STEEL 'A–36/A36M' EXCEPT AS NOTED.
5. ALL WELDING SHALL BE IN ACCORDANCE WITH STANDARD WELDING SPECIFICATIONS.
6. THE COMPLETED ASSEMBLY SHALL BE GIVEN ONE SHOP COAT OF NO. 1 PAINT.
7. FRAMES AND GRATES SHALL FIT TO A MAXIMUM ROCK OF 2.4 mm 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 METRIC	CATCH BASIN GRATES	3-13-2000	540-2

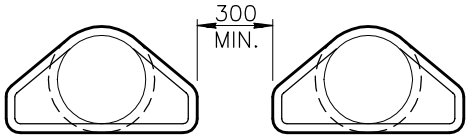
NOMINAL PIPE SIZE	PIPE DIA. (mm)	APPROX. MASS (kg)	DIMENSIONS – MILLIMETERS						APPROX. SLOPE
			T	A	B	C	E	F	
600	610	690	75	841	1105	762	1867	1219	3
675	690	875	83	267	1257	610	1867	1372	3
750	760	990	89	305	1372	502	1873	1524	3
900	910	1860	102	381	1600	883	2483	1829	3
1050	1070	2440	114	533	1600	889	2489	1981	3
1200	1220	2970	127	610	1829	660	2489	2134	3
1350	1370	3740	140	686	1651	845	2496	2286	2 1/2

NOTES

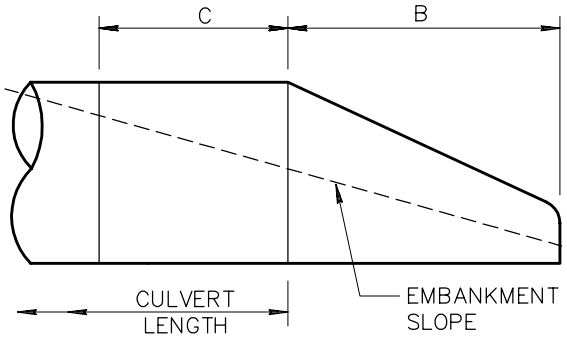
1. DESIGN OF END SECTION SHALL CONFORM TO STANDARD FOR REINFORCED CONCRETE PIPE.
2. END SECTION JOINT CONFORMATION SHALL MATCH THE PIPE JOINTS.
3. EMBANKMENT SLOPE SHALL BE WARPED TO MATCH SLOPE OF END SECTION.
4. CULVERT LENGTH IS AS SHOWN ON PLANS.



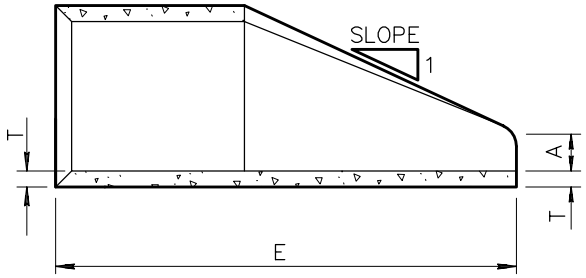
PLAN



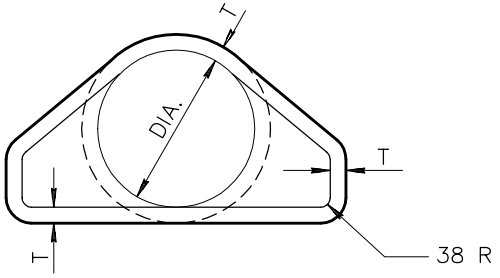
SPACING FOR MULTIPLE INSTALLATION



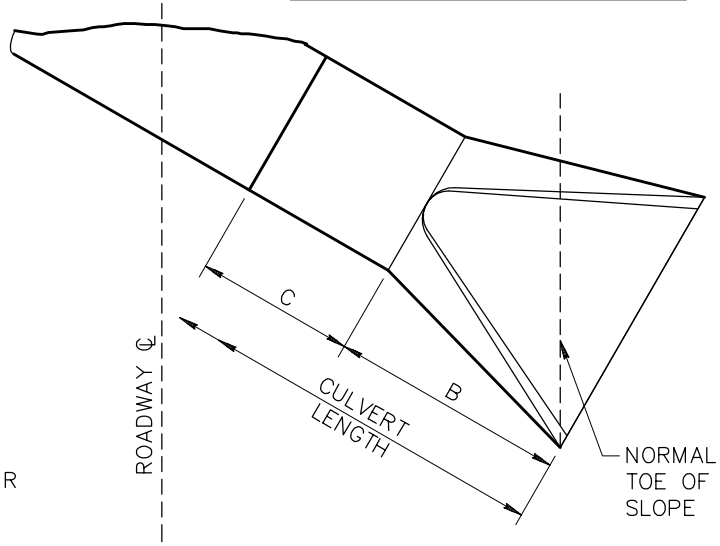
RIGHT ANGLE CULVERT



SECTION A–A

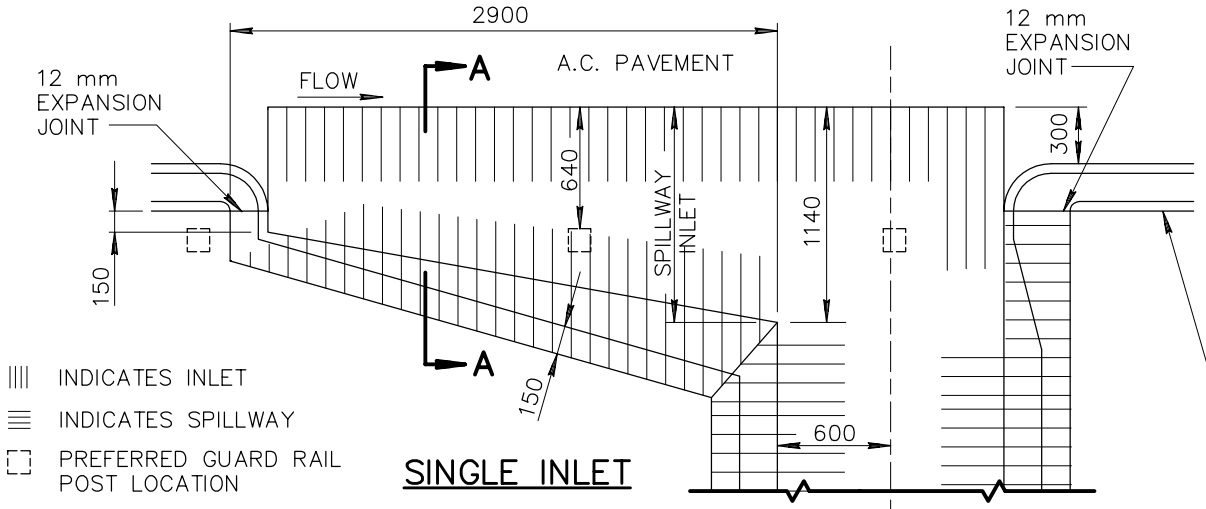


FRONT ELEVATION

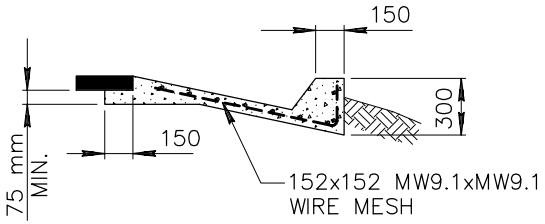


SKEWED CULVERT

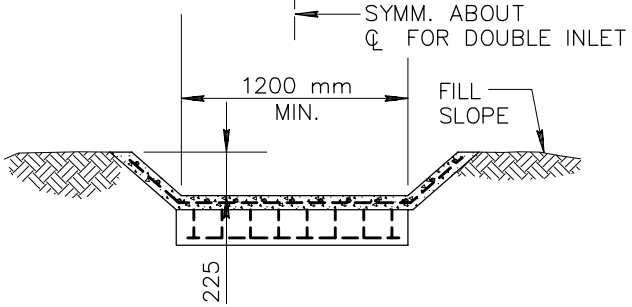
DETAIL NO.			REVISED	DETAIL NO.
545	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	END SECTION-REINFORCED CONCRETE PIPE	3-13-2000	545



SINGLE INLET



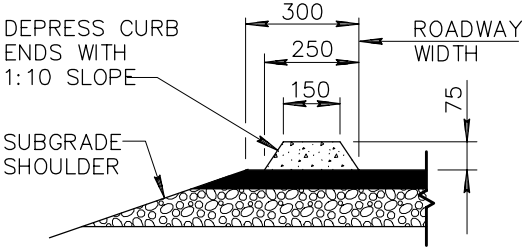
SECTION A–A



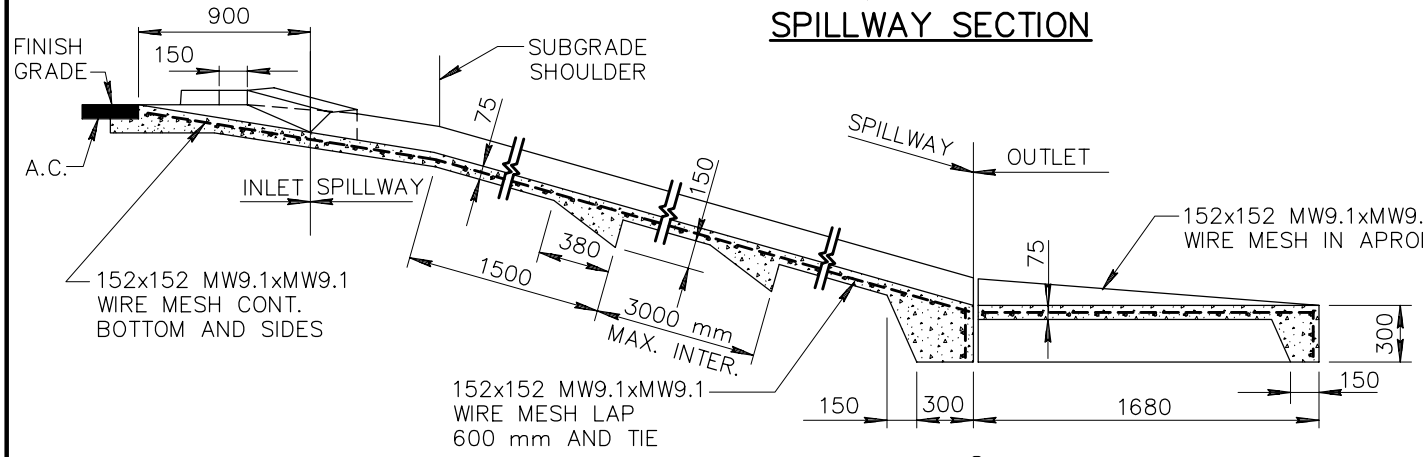
SPILLWAY SECTION

NOTES:

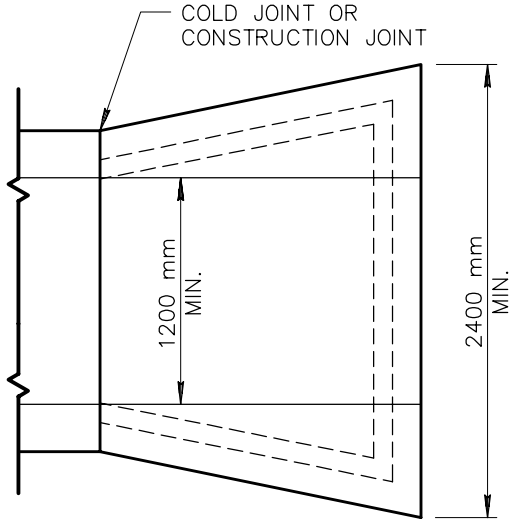
1. WHERE ROCK IS ENCOUNTERED THE OUTLET MAY BE OMITTED.
2. ALL PORTIONS OF SPILLWAY TO BE TROWEL FINISHED.
3. CONCRETE FOR THE SPILLWAY INLET, SPILLWAY AND OUTLET SHALL BE CLASS 'B' PER SECT. 725.
4. WHEN THE OUTLET IS USED, THE WIRE MESH SHALL EXTEND THROUGH THE JOINT INTO THE OUTLET IN LIEU OF BENDING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



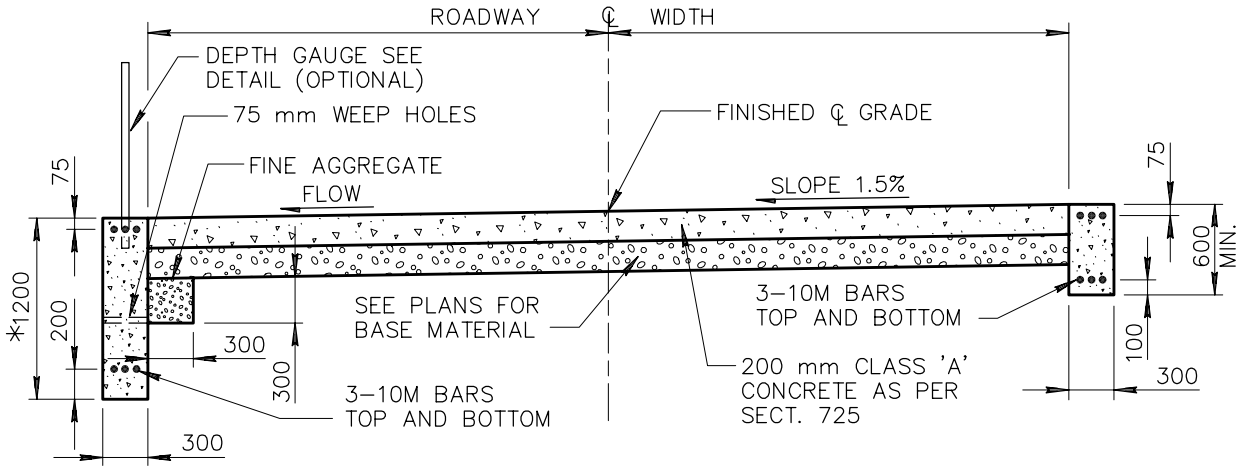
EMBANKMENT CURB/EXTRUDED (OPTIONAL)



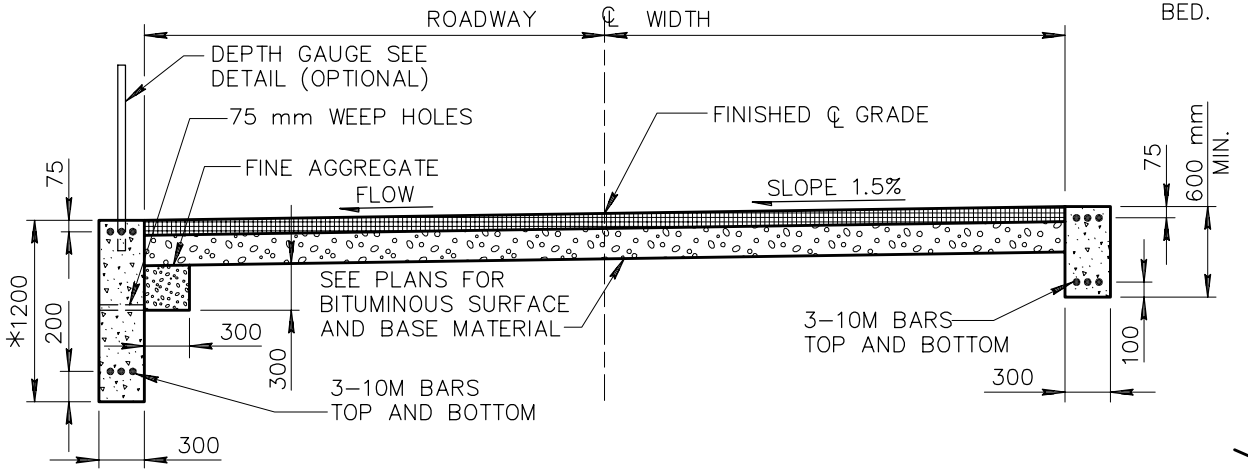
SECTION ON SPILLWAY ℄ DOUBLE INLET



DETAIL NO.			REVISED	DETAIL NO.
550	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	SPILLWAY INLET AND OUTLET	3-13-2000	550

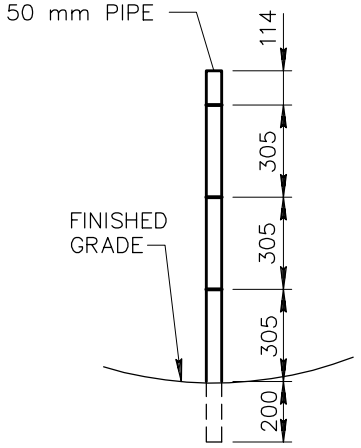


CONCRETE SURFACE FORD CONCRETE WALLS



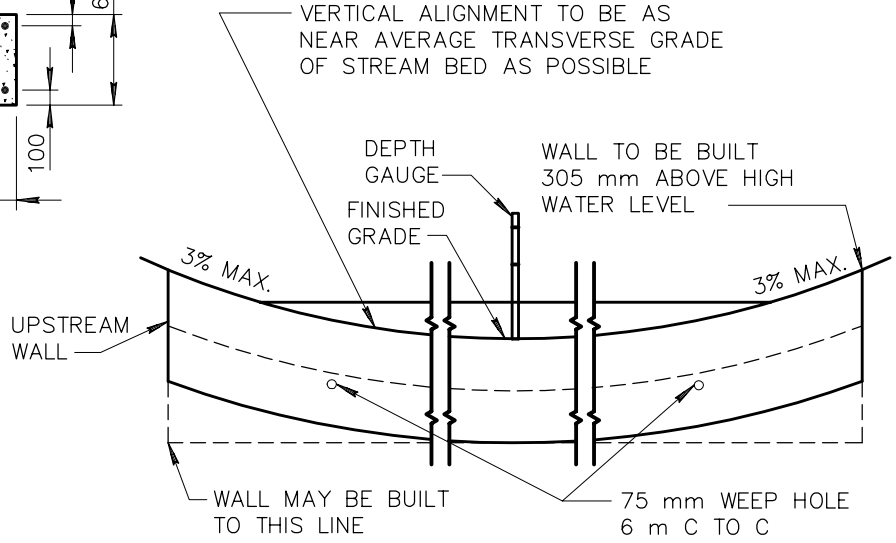
BITUMINOUS SURFACE FORD CONCRETE WALLS

*MIN. DISTANCE BELOW STREAM BED.



DEPTH GAUGE DETAIL

(OPTION OF THE CONTRACTING AGENCY)

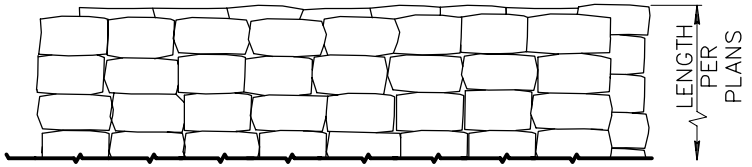


ELEVATION LOOKING UPSTREAM

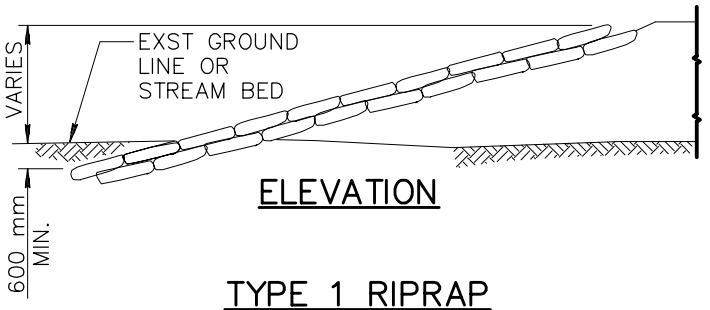
NOTES:

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 50 mm HIGH.
4. HEIGHT OF DEPTH GAUGE OPTIONAL.
5. TWO DEPTH GAUGES MAY BE USED. ONE ON EACH END OF UPSTREAM WALL.

DETAIL NO.			REVISED	DETAIL NO.
552	MARICOPA ASSOCIATION of GOVERNMENTS — STANDARD DETAIL METRIC	CONCRETE CUT-OFF WALLS	3-13-2000	552

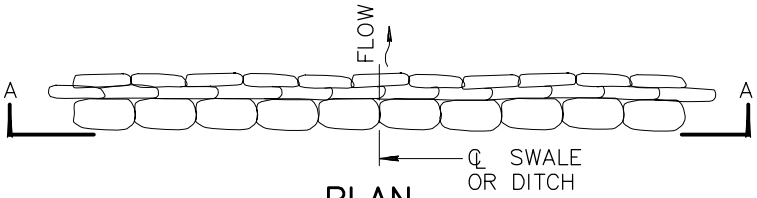


PLAN

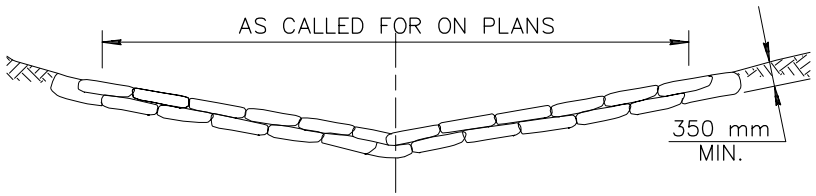


ELEVATION

TYPE 1 RIPRAP



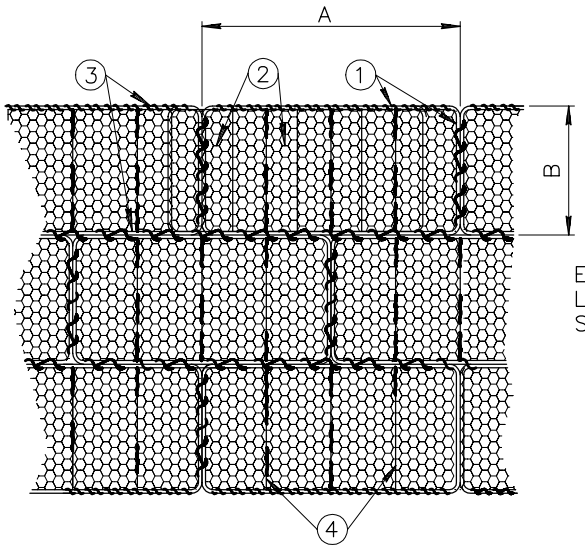
PLAN



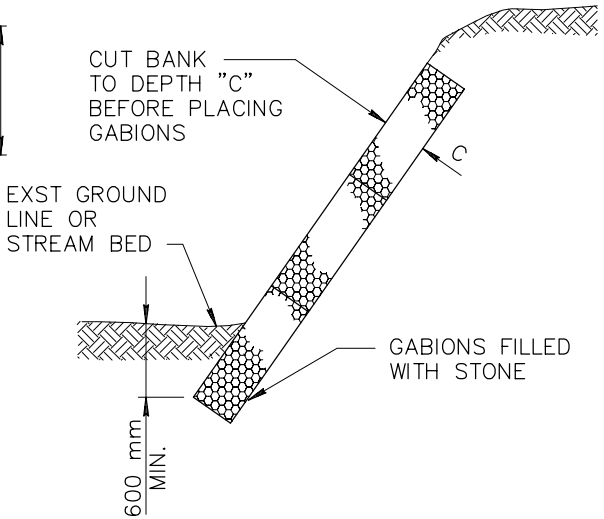
ELEVATION

TYPE 2 RIPRAP

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 900 mm LENGTH. INSTALLED AT FACTORY.

NOMINAL SIZE COMBINATIONS		
LENGTH	WIDTH	DEPTH
A	B	C
1830	900	300, 450, 900
2700	900	300, 450, 900
3660	900	300, 450, 900

OTHER SIZES AVAILABLE FROM MANUFACTURER.

NOTES:

1. PLAIN ROCK OR GROUTED ROCK MAY BE SUBSTITUTED FOR SACKED CONCRETE.
2. GROUT FOR RIPRAP MAY BE PNEUMATICALLY PLACED MORTAR.

DETAIL NO.			REVISED	DETAIL NO.
555	MARICOPA ASSOCIATION of GOVERNMENTS STANDARD DETAIL METRIC	EROSION PROTECTION / RIPRAP	3-13-2000	555