<table>
<thead>
<tr>
<th>100 SERIES: GENERAL INFORMATION</th>
<th>200 SERIES: MAINTENANCE ROAD INFORMATION</th>
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<tr>
<td>100 GENERAL INDEX</td>
<td>200-1 EMBANKMENT BACKFILLING</td>
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<td>101 GENERAL INFORMATION</td>
<td>200-2 MAINTENANCE ROAD (ABC)</td>
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<tr>
<td>101-1 PROJECT SHEET INDEX</td>
<td>200-3 MAINTENANCE ROAD (CONCRETE)</td>
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<td>120-1 SUBSIDENCE MONUMENT MARKERS</td>
<td>200-4 MAINTENANCE RAMP</td>
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<tr>
<td>120-2 CORE DRAIN MARKER POSTS</td>
<td>200-5 PUBLIC TRAILS FOR PEDESTRIAN AND BICYCLE USE</td>
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<tr>
<td>120-3 SEDIMENT GAGE</td>
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<td>120-4 STAFF GAGE INSTALLATION</td>
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<tr>
<td>120-5 USGS CONTINUOUS SLOPE AREA GAGE MARKERS</td>
<td>400 SERIES: UTILITY INFORMATION</td>
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<tr>
<td>131-1 SIGN INSTALLATION</td>
<td>404-1 NEW UTILITY SEPARATION AROUND EXISTING STRUCTURE(S)</td>
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<tr>
<td>131-2 ALERT STATION TUBE MANUFACTURING</td>
<td>404-2 PIPE TRENCH BACKFILL DETAIL</td>
</tr>
<tr>
<td>140-1 REMOVABLE BOLLARD</td>
<td>422-1 SEWER MANHOLE COVER FRAME</td>
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<td>140-2 REMOVABLE BOLLARD (CONT.)</td>
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<tr>
<td>141-1 STATIONING PLACARD</td>
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<td>145-1 PIPE RAIL FENCE</td>
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<tr>
<td>160-1 WIRE FENCE GATE</td>
<td>500 SERIES: STORM WATER/DRAINAGE INFORMATION</td>
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<tr>
<td>160-2 WIRE FENCE</td>
<td>552-1 RETAINING WALL CONSTRUCTION</td>
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<tr>
<td>160-3 BREAK AWAY FENCE</td>
<td>555-1 GROUTED RIPRAPH CONSTRUCTION</td>
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<tr>
<td>160-4 WROUGHT IRON GATE</td>
<td>555-2 ROCK MULCH PLACEMENT</td>
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<td>160-5 WROUGHT IRON FENCE</td>
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<td>160-6 CHAIN LINK FENCE AND GATE</td>
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<td>160-7 EQUESTRIAN GATE</td>
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<tr>
<td>160-8 MONSTER GATE</td>
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</tr>
<tr>
<td>160-9 EQUESTRIAN SWING GATE</td>
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GENERAL NOTES

1. THESE DETAILS HAVE BEEN PREPARED IN AN EFFORT TO STANDARDIZE THE CONSTRUCTION DETAILS USED BY VARIOUS CONTRACTING AGENCIES IN MARICOPA COUNTY.

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

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

4. DETAIL DRAWINGS HEREIN ARE NOT TO SCALE.
<table>
<thead>
<tr>
<th>SHEET NO.</th>
<th>DETAIL NO.</th>
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</table>
NOTES
1) MARKER SIGN PLATES WILL BE PLACED TO ALLOW VIEWING FROM BOTH DIRECTIONS.
2) IF NO ACCESS ROAD EXISTS, SIGNS WILL BE FACING DOWN STREAM
3) CONCRETE SHALL BE CLASS "B" CONCRETE
1) Marker sign plates will be placed to allow viewing from both directions.
2) Marker shall be placed 1 foot down stream and 1 foot off centerline of core drain.
3) If no access road exists, signs will be facing down stream.
4) Concrete shall be class "B" concrete.
3) CONCRETE SHALL BE CLASS "B" CONCRETE OR 8'-0" MAX. FLOODWAYS WILL NOT EXCEED BANK HEIGHT.

2) SEDIMENT GAGES PLACED IN CHANNELS AND FRS STRUCTURES UNLESS NOTED OTHERWISE.

1) SEDIMENT GAGES SHALL BE 8'-0" FOR DAM AND FRS STRUCTURES UNLESS NOTED OTHERWISE.

3'-0" CLEAR ZONE FROM VEGETATION.

WELDED LINES AND NUMBERS (1'-8')

FILL PIPE WITH GROUT ROUND OFF AT TOP.

4" SCHEDULE 80 GALVANIZED PIPE 8'-0" LONG (NOT TO BE PAINTED).

NOTES

1) SEDIMENT GAGES SHALL BE 8'-0" FOR DAM AND FRS STRUCTURES UNLESS NOTED OTHERWISE.
2) SEDIMENT GAGES PLACED IN CHANNELS AND FLOODWAYS WILL NOT EXCEED BANK HEIGHT OR 8'-0" MAX.
3) CONCRETE SHALL BE CLASS "B" CONCRETE.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

SEDIMENT GAGE

DETAIL

APPROVED BY

C. Smith Vogel

REVISION DATE

10/05/15

DETAIL NO.

FCD120-3
1. PLAIN BLACK AND WHITE BACKGROUND.
2. PAINT NUMBERS USING STENCILS.
3. SET GAGES USING A LEVEL.
   a) BOTTOM OF +1 SHALL BE LEVEL WITH THE INVERT OF OUTLET.
   b) BOTTOM OF +6 SHALL BE LEVEL WITH TOP OF +5
4. EMBED BOTH PORTIONS OF GAGE 3' INTO THE GROUND AND SET IN CONCRETE, USING 1:2:3: CONCRETE MIX. PUT SLIGHT SLOPE ON ALL FOOTINGS.
5. FILL WITH GROUT OR CAP.
6. NUMBER ARRANGEMENT WILL VARY TO FIT SITUATION.
7. FOR GAGES PAINTED ON STRUCTURES, USE THE SAME COLOR CODING SCHEME.
NOTES
1) CONTINUOUS SLOPE AREA GAGE PLATES WILL BE PLACED TO ALLOW VIEWING FROM BOTH DIRECTIONS.

2) IF NO ACCESS ROAD EXISTS, SIGNS WILL BE FACING DOWN STREAM
**MATERIAL LIST**

<table>
<thead>
<tr>
<th>QTY</th>
<th>ITEM</th>
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<tbody>
<tr>
<td>2</td>
<td>SIGN CHANNEL POSTS 7'-6</td>
</tr>
<tr>
<td>2</td>
<td>SIGN CHANNEL POST BACKERS 2'-0</td>
</tr>
<tr>
<td>1</td>
<td>F.C.D. RIGHT OF WAY SIGN</td>
</tr>
<tr>
<td>4</td>
<td>5/16&quot; DIA. BOLTS, 3 1/2&quot; LONG, ALL THREAD, WITH NUTS AND WASHERS.</td>
</tr>
</tbody>
</table>

**NOTES**

ALL WELDED JOINTS SHALL BE COATED WITH ZINC DUST-ZINC OXIDE COATING CONFORMING TO AASHTO M-36 PER MAG 7714 UNLESS OTHERWISE SPECIFIED. GALVANIZED SURFACES THAT ARE FIELD OR SHOP CUT, BROKEN, BURNED OR ABRATED, THUS BREAKING THE GALVANIZING, SHALL BE REPAIRED AT ALL LOCATIONS WITH ZINC DUST-ZINC OXIDE COATING CONFORMING TO AASHTO M-36 TO THE SATISFACTION OF THE PROJECT ENGINEER. ALL WIRE SHALL CONFORM TO ADOT SPEC. SECTION 903-2.04 STANDARD FENCING WIRE.
1) ALL MATERIAL SHALL BE 14Ga ALUMINUM
2) ALUMINUM CAP SHALL BE WELDED ALL AROUND - NO GAPS ALONG SEAM
<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>ITEM</th>
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<tbody>
<tr>
<td>1 PER BOLLARD</td>
<td>3-1/2&quot; (I.D.) GALVANIZED STEEL PIPE (SCHEDULE 40)</td>
</tr>
<tr>
<td>AS NEEDED</td>
<td>12&quot; REFLECTIVE TAPE (ORANGE AND WHITE)</td>
</tr>
<tr>
<td>1 PER BOLLARD</td>
<td>3/8&quot; DIAMETER STEEL ROD</td>
</tr>
<tr>
<td>1 PER BOLLARD</td>
<td>1/2&quot; DIAMETER STAINLESS STEEL ROD</td>
</tr>
<tr>
<td>AS NEEDED</td>
<td>3/8&quot; STEEL PLATE</td>
</tr>
<tr>
<td>1 PER BOLLARD</td>
<td>1/2&quot; STEEL TUBING</td>
</tr>
<tr>
<td>AS NEEDED</td>
<td>5/16&quot; STEEL WASHER</td>
</tr>
<tr>
<td>AS NEEDED</td>
<td>CONCRETE FOR FOOTING</td>
</tr>
<tr>
<td>4 PER BOLLARD</td>
<td>#4 REBAR (4&quot; LONG)</td>
</tr>
</tbody>
</table>

**NOTES:**

1) PUT SLIGHT SLOPE ON ALL FOOTINGS CLASS "B" CONCRETE MIX
2) ALL WELDS SHALL BE COATED WITH ZINC DUST-ZINC OXIDE COATING CONFORMING TO AASHTO M-36 PER MAG 771.4
3) 12" REFLECTIVE TAPE TO BE INSTALLED IN 2 ROWS EVENLY SPACED ON BOLLARD
**Steel Pipe Bollard**

- **3/8" Steel Plate Cap**
- **3/8" Steel Plate**
  - **3" Dia/3/8" Steel Plate with 1/2" Offset Hole**
  - **Flush with Top of Pipe**
- **3/8" Steel Plate Guide**
  - **1/2" Dia Hole**
- **3/8" Dia Hole (Opp. Side)**
  - **3/8" Dia Hole**
- **1/2" x 4" Slot**

**Steel Swing Pin**

- **1/2" Steel Pipe**
  - **(SCH 10)**
- **3/8" Steel Rod**
- **2 1/2"**
- **5/8" Dia Hole (Centered)**
- **1/2" Dia Hole**

**Steel Lock Bracket**

- **1/2" Dia Hole**
- **5/8" Dia Hole**
- **3/8" Steel Plate**
- **3/8" Dia Hole**
- **3/8" Dia Hole (Centered)**

**Locking Rod Guide**

- **1 1/2" Dia Hole (Centered)**
- **3/4" Dia Hole (Centered)**
- **1/2" Dia Hole**
- **3/8" Dia Hole (Centered)**
- **1/2" Round Stainless Steel Rod**
- **1/2" Round Stainless Steel**
- **1/2" Dia Hole (Centered)**
- **3" Dia Hole (Centered)**

**Lock Tab on Bollard**

- **Weld Bracket to Side of Pipe, Flush with Top of Pipe**
- **Weld Steel Rod to Steel Pipe**
- **Insert Steel Rod into Hole from Inside of Pipe, Cut Off Excess & Weld to Pipe, Grind to a Smooth Finish**
- **Guides to Be Inserted into 3/8" Holes in Pipe Bollard**

**Bollard Base Plate**

- **1/2" Dia Hole**
- **3/4" Dia Hole**
- **3/8" Steel Plate**
- **3/4" Dia Hole**
- **3 1/2" Galvanized Pipe**

**Bollard Base at Existing Bollard Install (Retrofit)**

- **Weld Top of Pipe, Flush with Top of Base Plate**
- **Weld Locking Rod Guide**
- **Weld Washer to Handle Ends After Installing Handle in Bollard**
- **Weld Washers to Handle**

**Pipe Bollard Handle**

- **5/8" Dia Hole**
- **1 1/2" Dia Hole**
- **3/8" Steel Plate**
- **3/8" Dia Hole**
- **3/8" Dia Hole (Centered)**

**Swing Pin Plate**

- **Top of Pipe to Be Flush with Top of Base Plate**
- **Bollard Base Plate**
- **Bollard Handle**
- **3/4" Dia Hole (Centered)**

**Removable Bollard**

- **Approve by**
- **C. Smith, C.S.W.**
- **Approval Date**
- **10/05/15**
- **Detail No.**
- **FCD140-2**
1) STATION MARKERS SHALL BE INSTALLED ALONG THE STRUCTURE/MAINTENANCE ROAD TO BE VISIBLE IN ASCENDING DIRECTION.

2) STATION MARKERS PLACED ON CONCRETE SHALL NOT EXCEED BANK HEIGHT OR 8'-0" MAX.

NOTES:

- STANDARD PLACARD
  6" x 6"
- STANDARD SIGN CHANNEL
  5'-6" LONG
- 6'-0" VEGETATION CLEAR ZONE
- 100+00
- ** = WIDTH VARIES MATCH EXISTING, HEIGHT VARIES 8" MINIMUM OR MATCH EXISTING

PAINTED ON CONCRETE STATION MARKER

METAL STATION PLACARD

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

STATIONING PLACARD

APPROVED BY

REVISION DATE
10/05/15

DETAIL NO.
FCD141-1
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
PIPE RAIL FENCE
DETAIL SHEET 1 OF 2

NOTES

1) POSTS AND RAILS SHALL BE 1.5" SCHEDULE 40 HOT-DIPPED GALVANIZED STEEL PIPE (ASTM A-53) GRADE B (2.75#/LF - 1.9" O.D.) GALVANIZING SHALL BE IN ACCORDANCE WITH M.A.G. SPECIFICATION 7711

2) ALL WELDED JOINTS SHALL BE COATED WITH ZINC DUST-ZINC OXIDE COATING CONFORMING TO AASHTO M-36 PER M.A.G. 7714 UNLESS OTHERWISE SPECIFIED GALVANIZED SURFACES THAT ARE FIELD OR SHOP CUT, BROKEN, BURNED OR ABRADED, THUS BREAKING THE GALVANIZING SHALL BE REPLACED AT ALL LOCATIONS WITH ZINC DUST-ZINC OXIDE COATING CONFORMING TO AASHTO M-36 TO THE SATISFACTION OF THE PROJECT ENGINEER

3) PAINT RAILING PER M.A.G. SPECIFICATION SECTION 530 WHEN REQUIRED BY PLANS SHOP PRIME WITH RUST INHIBITING PRIMER (FIELD REPAIR PRIMER AS NEEDED) COLOR PER PLANS.

4) GRIND DOWN ALL SHARP EDGES.

5) EMBEDMENT FOR ANCHOR TYPES 1, 2 AND 3 SHALL BE LOCATED INSIDE OF RAIL REINFORCEMENT CAGE FOR REINFORCED CONCRETE APPLICATIONS.

6) ANCHOR CONNECTION TYPE 4 SHALL BE USED FOR GROUND APPLICATIONS INCLUDING UNREINFORCED CONCRETE OR SOIL CEMENT APPLICATIONS.

7) SAFETY RAIL SHALL NOT BE USED AS PEDESTRIAN BRIDGE RAILING

8) THE REQUIREMENTS PRESENTED HEREON ARE GENERAL REQUIREMENTS ADDITIONAL REQUIREMENTS/RESTRICTIONS MAY APPLY TO SPECIFIC STRUCTURES

DOWEL NOTES

1) FOR GROUTED RIP-RAP DRILL 7/8" DIAMETER HOLES 13" DEEP FOR #6 DOWELS EPOXY DOWEL IN HOLE WITH AN APPROVED EPOXY ADHESIVE EPOXY ANCHORAGE SHALL DEVELOP A TENSILE PULLOUT STRENGTH OF 9 KIPS FOR #6 DOWELS.

2) FOR CSA DRILL 7/8" DIAMETER HOLES 31" DEEP FOR #6 DOWELS GROUT DOWEL IN HOLE WITH AN APPROVED GROUT GROUT ANCHORAGE SHALL DEVELOP A TENSILE PULLOUT STRENGTH OF 9 KIPS FOR #6 DOWELS.

3) FOR PAVEMENT DRILL 4" DIAMETER HOLES 31" DEEP FOR #6 DOWELS GROUT DOWEL IN HOLE WITH AN APPROVED GROUT GROUT ANCHORAGE SHALL DEVELOP A TENSILE PULLOUT STRENGTH OF 9 KIPS FOR #6 DOWELS.

4) SOLID GROUT UNDER BASE PLATES IS REQUIRED.

5) AVOID DRILLING HOLE THROUGH EXPOSED RIP-RAP.
**TYPE 1**
ANCHOR BOLT CONNECTION

**TYPE 2**
PIPE SLEEVE CONNECTION

**TYPE 3**
EXPANSION BOLT CONNECTION
FOR EXISTING CONCRETE

**TYPE 4**
RIP-RAP/ NATIVE GROUND FOOTING

**TYPE 5**
PAVEMENT ANCHOR CONNECTION

**TYPE 6**
CSAAnchor Connection

**TYPE 7**
GROUTED RIP-RAP ANCHOR CONNECTION

---

RAIL POST

1/4"x5"x5" MILD STEEL PLATE

1/2"x6" ANCHOR BOLTS
(2 EACH PLATE)

TOP OF CONCRETE

WALL REINF.
(PER PLANS)

RAIL POST

PIPE TO EXTEND
1/2" ABOVE TOP
OF CONCRETE

10"x2-1/2" DIA
STANDARD PIPE

RAIL POST

TOP OF EXISTING CONCRETE

1/4"x5"x5" MILD STEEL PLATE

(4) 3/8"x5" EXPANSION
BOLTS (IN SHRINK
PROOF EPOXY)

RAIL POST

GROUT UNDER PLATE AS REQ.
(1/2" MAX)

TOP OF EXISTING CONCRETE

RAIL POST

TOP OF EXISTING CSA

#6 DOWEL AT
30" EMBEDMENT
AT EXST CSA

#6 DOWEL AT
30" EMBEDMENT
AT EXST PAVEMENT

5" DIA X 3/8" OR
3/8"x5"x5" # WELD
STEEL PLATE

4" X 31" BORED HOLE
WITH NON-SHRINK
NON-METALLIC GROUT
(9 KIPS MINIMUM)

7/8" X 31" BORED HOLE
WITH NON-SHRINK
NON-METALLIC GROUT
(9 KIPS MINIMUM)

1/4"x5"x5" MILD STEEL PLATE

MAXIMUM 1/2" GROUT
ON TOP OF EXISTING CONCRETE

MAXIMUM 1/2" GROUT
ON TOP OF EXISTING CSA

5" DIA X 3/8" OR
3/8"x5"x5" # WELD
STEEL PLATE

MAXIMUM 1/2" GROUT ON
TOP OF EXISTING CONCRETE

MAXIMUM 1/2" GROUT ON
TOP OF EXISTING CSA

4" MIN

4" MIN

4" MIN

4" MIN

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**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY**

**PIPE RAIL FENCE**

**DETAIL SHEET 2 OF 2**

**APPROVED BY**

**REVISION DATE**

**DETAIL NO.**

04/03/19

FCD145-1
MATERIAL LIST

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<td>84&quot; HORIZONTAL POSTS WITH 45° ANGLE CUTS (BOTH ENDS)</td>
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<td>2</td>
<td>4'-1&quot; VERTICAL POST OUTER FRAME WITH 45° ANGLE CUTS (BOTH ENDS)</td>
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<td>2</td>
<td>3'-9 1/4&quot; INNER VERTICAL POSTS (NOTCH EACH END TO FIT)</td>
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<tr>
<td>4</td>
<td>2&quot;X3&quot;X3/16&quot; STEEL MOUNTING TABS (FOR SIGN ATTACHMENT) HOLES TO BE DRILLED IN FIELD</td>
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<tr>
<td>5</td>
<td>12.5 GA TWISTED PAIR WIRE OR 12.5 GA BARBED WIRE</td>
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NOTES

1) ALL BOLTS, BRACE BANDS AND HINGES SHALL BE WELDED TO POSTS AND OR GATE PANELS.
2) ALL WELDED JOINTS SHALL BE COATED WITH ZINC DUST-ZINC OXIDE COATING CONFORMING TO AASHTO M-36 PER MAG 771.4 UNLESS OTHERWISE SPECIFIED. GALVANIZED SURFACES THAT ARE FIELD OR SHOP CUT, BROKEN, BURNED OR ABRATED, THUS BREAKING THE GALVANIZING, SHALL BE REPAIRED AT ALL LOCATIONS WITH ZINC DUST-ZINC OXIDE COATING CONFORMING TO AASHTO M-36 TO THE SATISFACTION OF THE PROJECT ENGINEER. ALL WIRE SHALL CONFORM TO ADOT SPEC. SECTION 903-2.04 STANDARD FENCING WIRE.
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<tr>
<td>1 PER EVERY 23 FEET</td>
<td>1 3/8&quot;, 1 3/8&quot; LINE POST 6' LONG</td>
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<td>1 FOR EVERY 6.28 FEET</td>
<td>1 FOR EVERY 6.28 FEET</td>
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<tr>
<td>1 PER CORNER POST</td>
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NOTES (WIRE):

1) ALL WIRE SHALL CONFORM TO ADOT SPEC SECTION 903-2.04
2) PUT SLIGHT SLOPE ON ALL FOOTINGS, USE 1-2-3 CONCRETE MIX
3) PLACE WIRE ON THE DOWNSTREAM SIDE OF POSTS WHEN BEING INSTALLED ON BREAK AWAY FENCE
4) FASTEN WIRE TO CORNER OR INTERMEDIATE POSTS WITH WIRE CLIPS
5) FASTEN WIRE TO CORNER OR INTERMEDIATE POSTS WITH WIRE CLIPS
6) FASTEN WIRE TO CORNER OR INTERMEDIATE POSTS WITH WIRE CLIPS
7) INSTALL WIRE CLIPS AT INTERVALS NOT TO EXCEED 500 FEET
**MATERIAL LIST**

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<td>2 PER SECTION</td>
<td>&quot;17&quot; POSTS 4'-6&quot; LONG</td>
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<tr>
<td>1 FOR EVERY 6'-6&quot; FEET</td>
<td>STAY 3'-4&quot; LONG</td>
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<tr>
<td>1 PER CORNER POST</td>
<td>3&quot; DIA SCHED 40 PIPE 7'-LONG</td>
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<tr>
<td>1 PER CORNER POST</td>
<td>3&quot; DIA GALVANIZED POST CAP</td>
</tr>
<tr>
<td>2 PER CORNER POST</td>
<td>3&quot; DIA SCHED 40 PIPE 7'-LONG</td>
</tr>
<tr>
<td>2 PER CORNER POST</td>
<td>1 5/8&quot; DIA RAIL END</td>
</tr>
<tr>
<td>2 PER CORNER POST</td>
<td>3&quot; DIA BARREN BANK OR NRL BAND</td>
</tr>
<tr>
<td>4 PER LINE POST</td>
<td>WIRE CLIPS</td>
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<tr>
<td>AS NEEDED</td>
<td>BARRELLESS WIRE/BARRED WIRE PER ADOT</td>
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<tr>
<td>AS NEEDED</td>
<td>CONCRETE FOR FOOTING (CLASS B CONCRETE)</td>
</tr>
<tr>
<td>AS NEEDED</td>
<td>2&quot; REFLECTIVE TAPE (ORANGE AND WHITE)</td>
</tr>
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</table>

**NOTES**

1. ALL WELDED JOINTS SHALL BE COATED WITH ZINC DUST-ZINC OXIDE COATING CONFORMING TO AASHTO M-36 PER MAG 771.4 UNLESS OTHERWISE SPECIFIED.
2. GALVANIZED SURFACES THAT ARE FIELD OR SHOP CUT BROKEN, BURNED OR ABRADED, THUS BREAKING THE GALVANIZING SHALL BE REPAIRED AT ALL LOCATIONS WITH ZINC DUST-ZINC OXIDE COATING CONFORMING TO AASHTO M-36 TO THE SATISFACTION OF THE PROJECT ENGINEER.
3. PLACE WIRE ON THE DOWNSTREAM SIDE OF POSTS WHEN BEING INSTALLED ON BREAK AWAY FENCE.
4. FASTEN WIRE TO CORNER OR INTERMEDIATE POSTS WITH WIRE CLIPS.
5. FASTEN WIRE TO LINE POSTS WITH WIRE CLIPS.
6. FASTEN WIRE TO CORNER OR INTERMEDIATE POSTS WITH BARREN BANDS WHERE WIRE ENDS AT POST.
7. INTERMEDIATE POST ASSEMBLIES SHALL BE LOCATED AT INTERVALS NOT TO EXCEED 500 FEET.

**NOTES (WIRE)**

1. ALL WIRE SHALL CONFORM TO ADOT SPECIFICATION SECTION 903-2.04 12.5 GAUGE STANDARD FENCING WIRE.
2. PUT SLOPE ON ALL FOOTINGS, USE 1-2-3 CONCRETE MIX.
3. PLACE WIRE ON THE DOWNSTREAM SIDE OF POSTS WHEN BEING INSTALLED ON BREAK AWAY FENCE.
4. WIRE ON ALL OTHER FENCING SHALL BE ON OUTSIDE OF CURVE.
5. FASTEN WIRE TO CORNER OR INTERMEDIATE POSTS WITH WIRE CLIPS.
6. FASTEN WIRE TO CORNER OR INTERMEDIATE POSTS WITH BRACE BANDS WHERE WIRE ENDS AT POST.
7. INTERMEDIATE POST ASSEMBLIES SHALL BE LOCATED AT INTERVALS NOT TO EXCEED 500 FEET.

---

**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY**

**BREAK AWAY FENCE**

**DETAIL**

**APPROVED BY C. Scott Vogel**

**REVISION DATE 10/05/15**

**DETAIL NO. FCD160-3**
FENCE ELEVATION

STEEL RAILING

STEEL PICKLES

AT 4-3/4" O.C.

2-1/4" (EACH SIDE)

2" (EACH SIDE)

8" SQUARE CONCRETE POST

(4) 1/2" DIA ANCHOR BOLT - 3" THREADS

LEVELING NUTS

2" 

4" 

8"

CONCRETE POST

8" SQUARE

1' - 6" O.C.

CONCRETE POST ATTACHMENT

#3 TIE

#4 BARS

#4 BARS

(2) #4 x 4'-0" CENTERED

NOTES

1) ALL POSTS LOCATED ACROSS SPILLWAY WINGS AND INVERT SHALL BE STEEL POSTS AND EQUALLY SPACED WITH A MAXIMUM SPACING OF 10FT

2) ALL STEEL POSTS AND PICKETS SHALL HAVE STEEL CAPS WELDED TO THE TOP ENDS

3) CONCRETE POSTS DESIGNED TO BE PLACED ON REINFORCED CONCRETE WALL, OTHER FOOTING DESIGNS SHALL BE PRE-APPROVED BY DISTRICT STAFF
**NOTES**

1) ALL WELDED JOINTS SHALL BE COATED WITH ZINC DUST-ZINC OXIDE COATING CONFORMING TO AASHTO M-36 PER MAG 771.4 UNLESS OTHERWISE SPECIFIED

2) GALVANIZED SURFACES THAT ARE FIELD OR SHOP CUT, BROKEN, BURNED OR ABRUDED SHALL BE REPAIRED WITH ZINC DUST-ZINC OXIDE COATING CONFORMING TO AASHTO M-36 AND THE SATISFACTION OF THE PROJECT ENGINEER

3) CHAIN LINK FENCE FABRIC FRAMEWORK FITTINGS AND HARDWARE SHALL CONFORM TO M.A.G. SPEC 772 TYPE-C

4) ALL EXPOSED EDGES SHALL BE SMOOTHED

5) ALL BOLT HEADS SHALL BE FACING INSIDE

6) ALL CONCRETE SHALL BE CLASS 'C' PER M.A.G. SECT. 725

7) STRAIN POSTS SHALL BE SPACED AT 500' MAXIMUM SPACING

8) BOTH CORNER AND STRAIN POSTS SHALL HAVE STRAIN PANELS

9) ALL POSTS SHALL BE CAPPED.
FENCE POSTS NOMINAL
2-3/8" DIA PIPE (3.12#/FT)
(TYPICAL ALL LOCATIONS)

ACCESS GATE POSTS
SHALL HAVE
REFLECTIVE TAPE

WHERE VEHICLE ACCESS GATE
OCURS POSTS SHALL BE GROUT
FILLED AND CAPPED

10" DIA X 3' CONCRETE
FOOTING, (FENCING)

12" DIA X 2' CONCRETE
FOOTING, (GATE)

1/2" THICK (MIN)
DENSE RUBBER
COVER

NOTES

1) ALL WELDED JOINTS SHALL BE COATED WITH
ZINC DUST-ZINC OXIDE COATING CONFORMING
TO AASHTO M-36 PER MAG 771.4 UNLESS
OTHERWISE SPECIFIED
2) GALVANIZED SURFACES THAT ARE FIELD OR
SHOP CUT, BROKEN, BURNED OR ABRADED
SHALL BE REPAIRED WITH ZINC DUST-ZINC
OXIDE COATING CONFORMING TO AASHTO
M-36 AND THE SATISFACTION OF THE
PROJECT ENGINEER
3) CHAIN LINK FENCE FRAMEWORK
FITTINGS AND HARDWARE SHALL CONFORM
TO MAG SPEC 772 TYPE-C
4) ALL EXPOSED EDGES SHALL BE SMOOTHED
5) ALL BOLT HEADS SHALL BE FACING INSIDE

FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
EQUESTRIAN GATE
DETAIL

APPROVED BY

REVISION DATE
FCD160-7

NOTES
GATE IN FENCE LINE
1. Vertical gaps will have 3" space.
2. There will be a 4" ground clearance under gates.

Hinge Detail

Weld to Gate

Weld to Post

1" Cold Roll Steel
W/ 3/4" Flat Washer
Welded Top & Bottom

Monster Gate Detail

NTS

Hinge Detail

Top View

Weld to Gate

10" Dia x 10' Sch 40 Pipe as gate post
Fill with grout (each side)

6" Dia Sch 40 Pipe

Armored Plated Lock Box

Crown Top of Footing, Typical
All Locations

Notes

Flood Control District of Maricopa County

Monster Gate Detail

Approved By

Revision Date

Detail No.

10/05/15

FCD160-8
PEDESTRIAN AND EQUESTRIAN SWING GATE

NOTES

1) FOR STANDARD GATE CONSTRUCTION
   SEE FCD DET 160-1
2) FOR FENCE CONSTRUCTION SEE
   FCD DET 160-2

WELD 12" OF GRADE 30 PROOF
5/16" CHAIN TO 1 GATE PANEL.
WELDED CHAIN SHALL BE PLACED
IN MIDDLE OF PANEL TO ALLOW
6" OF FREE HANGING CHAIN
PLACING FILL AGAINST EXISTING EMBANKMENTS
1. Bench hillside into horizontal and vertical benches.
2. Fill in 6" lifts, leaving enough material on edges to grade slope surface.

PLACING FILL IN DEPRESSION
1. Clear area of topsoil and vegetation.
2. Scarify to 6" depth and add moisture.
3. Fill in 6" lifts.

PLACING FILL AROUND STRUCTURES
1. Don't fill around fresh concrete, allow it to cure at least 7 days before filling.
2. Within 1' of structure or surface, no rock pieces shall exceed 4" in diameter.

NOTES
1. Place backfill in lifts of height which can be effectively compacted, in no case larger than 6".
2. If material is rocky, mix with finer material to fill voids.
3. To achieve compaction, soil should have optimum moisture. Soil can be formed into a ball which will fall apart upon hitting the ground when dropped from a height of 3'.
4. Compact with necessary equipment.
5. Surface should be presentable and blend with existing area, grade surface to drain.
6. Compact to 95% of standard proctor with density tests on every other lift.

CUT EXISTING SOIL INTO HORIZONTAL AND VERTICAL BENCHES
LEAVE ENOUGH FILL IN EDGES TO GRADE SURFACE
GRADE SURFACE OF NEW SLOPE
FILL IN 6" LIFTS
EXISTING SOIL
LIFTS 6" IN HEIGHT
NO ROCK PIECES LARGER THAN 6" IN FILL
CLEAR TO SOIL
SCARIFY SURFACE
ADD MOISTURE
TOP OF FILL
NO ROCK PIECES LARGER THAN 4" IN DIAMETER
CONFIRM BACKFILLING CONCRETE
CASE LARGER THAN 6"
FORMED INTO A BALL WHICH WILL FALL APART UPON HITTING THE GROUND WHEN DROPPED FROM A HEIGHT OF 3'.
DRAIN.
6" IN FILL
LIFTS 6" IN HEIGHT
NO ROCK PIECES LARGER THAN 6" IN FILL
CLEAR TO SOIL
SCARIFY SURFACE
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NO ROCK PIECES LARGER THAN 4" IN DIAMETER
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FORMED INTO A BALL WHICH WILL FALL APART UPON HITTING THE GROUND WHEN DROPPED FROM A HEIGHT OF 3'.
DRAIN.
TYPICAL MAINTENANCE ROAD
PAVING CONSTRUCTION
(WITH EXCAVATION)

FOG SEAL WITH STONE CHIPS AND PRIME COAT APPLICATION

EXCAVATE, GRADE, LEVEL AND PLACE ABC BY CONTRACTOR

FOG SEAL 0.14-0.16 GAL/SY
Sweep chips prior to fog seal

STONE CHIPS HIGH VOLUME (MODIFIED)
NON COATED - 23-27LB/SY

BITUMINOUS PRIME COAT
MC800TR 0.55-0.65 GAL/SY

4" MINIMUM ABC
COMPACT BASE COURSE
ADD MOISTURE PRIOR TO PRIMER MC800TR

TYPICAL MAINTENANCE ROAD
PAVING CONSTRUCTION
(WITHOUT EXCAVATION)

FOG SEAL WITH STONE CHIPS AND PRIME COAT APPLICATION

PREPARE SUBGRADE, LEVEL AND PLACE ABC BY CONTRACTOR

NOTES
1) MAXIMUM CROSS SLOPE SHALL BE 2%
2) CROSS SLOPE SHALL DRAIN TOWARD UPSTREAM SIDE ON ALL DAMS AND FLOOD RETARDING STRUCTURES (FRS)
1) MAXIMUM CROSS SLOPE SHALL BE 2\%  
2) CROSS SLOPE SHALL DRAIN TOWARD UPSTREAM SIDE ON ALL DAMS AND FLOOD RETARDING STRUCTURES (FRS)  
3) SUBGRADE GRADING PER M.A.G. SPECIFICATION 301  
4) 6" ABC PER M.A.G. SPECIFICATION 702
NOTES

1) MAXIMUM CROSS SLOPE SHALL BE 2\%.
2) CROSS SLOPE SHALL DRAIN TOWARD UPSTREAM SIDE ON ALL DAMS AND FLOOD RETARDING STRUCTURES (FRS).
3) CONCRETE SHALL BE CLASS "A" 3000PSI BROOK FINISH.
4) CONSTRUCTION JOINTS SHALL BE 10'-0" MAX WITH EXPANSIONJOINTS AT 50'-0" MAX.
**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY**

**MAINTENANCE RAMP DETAIL**

**NOTES**

1) MAXIMUM CROSS SLOPE SHALL BE 2%
2) CROSS SLOPE SHALL DRAIN TOWARD UPSTREAM SIDE ON ALL DAMS AND FLOOD RETARDING STRUCTURES (FRS)
3) CONCRETE SHALL BE CLASS "A" 3000PSI BROOM FINISH
4) CONSTRUCTION JOINTS SHALL BE 10'-0" MAX WITH EXPANSION JOINTS AT 50'-0" MAX

**PLAN VIEW**

**MAINTENANCE ROAD ACCESS RAMP**

- **FOG SEAL** 0.14-0.16 GAL/SY SWEEP CHIPS PRIOR TO FOG SEAL
- **STONE CHIPS** HIGH VOLUME (MODIFIED) NON COATED 23-27LB/SY
- **BITUMINOUS PRIME COAT** MC800TR 0.55-0.65 GAL/SY
- **4" MINIMUM ABC** COMPACT BASE COURSE ADD MOISTURE PRIOR TO PRIMER MC800TR

**CONSTRUCTION SECTION**

- **MAINTENANCE ROAD**
- **CHANNEL FLOW**
- **ACCESS RAMP**
- **CROSS SECTION**

- **CONCRETE RAMP**
- **FILTER FABRIC**
- **CUTOFF WALL**
- **CONSTRUCTION JOINT**
- **REINFORCING**

**DETAIL**

- **NOTES**
- **REVISION DATE** 10/05/15
- **APPROVED BY**

**DETAIL NO.** FCD201-4
NOTES
(1) MAXIMUM CROSS SLOPE SHALL BE 2%
(2) THERE SHALL BE A MINIMUM OF 16 FEET
   DRIVEABLE WIDTH ALONG TRAIL IF TRAIL
   MEanders THEN 16'-0" (MIN) DRIVEABLE
   WIDTH (INCLUDING SHOULDER) SHALL BE
   MAINTAINED FROM TOP OF BANK
(3) PAVED TRAIL SHALL HANDLE TRUCK LOADS
   AS WELL AS BIKE AND PEDESTRIAN TRAFFIC
(4) DRIVEABLE SHOULDER SHALL BE COMPActED
   MATERIAL (AB/DS) OR PAVEMENT. SUB-BASE
   SOILS SHALL BE COMPActED TO 95% (MIN)
   STANDARD PROCTOR
(5) IF SHOULDER IS 5 FEET OR LESS INSTALL
    SAFETY RAIL TO PROTECT BICYCLE TRAFFIC
    PER FCD STANDARD DETAIL 145-1 (4'-8" HEIGHT)
(6) SAFETY RAIL SHALL MEET FCD STANDARD
    DETAIL 145-1 (MINIMUM) WITH TYPE 4 FOOTINGS.
    ALTERNATE RAIL TYPE(S) SHALL BE
    PRE-APPROVED BY FLOOD CONTROL
    DISTRICT STAFF
(7) A CLEARANCE HEIGHT OF 13 FEET 6 INCHES
    SHALL BE MAINTAINED ABOVE DRIVEABLE AREA
    (INCLUDING LIGHT POLES AND TREES)
    FOR EQUIPMENT PASSAGE.
(8) TREE TRunks SHALL HAVE A MINIMUM OF
    5 FEET CLEARANCE FROM DRIVEABLE AREA.
    LARGE TREES MAY NEED TO BE PLACed MORE
    THEN 5'-0" FROM DRIVEABLE AREA TO PREVENT
    ENCROACHMENT INTO 13'-6" CLEARANCE AREA
    ADDITIONAL RESTRICTIONS ON TREES OR
    VEGETATION MAY APPLY FOR SOME
    STRUCTURES (IE: DAMS/LEVEES) REFER TO
    FLOOD CONTROL DISTRICT STAFF FOR
    ADDITIONAL RESTRICTIONS
(9) THE REQUIREMENTS PRESENTED HEREON ARE
    GENERAL REQUIREMENTS, ADDITIONAL
    REQUIREMENTS/RESTRICTIONS MAY APPLY
    TO SPECIFIC STRUCTURES

RAIL REQUIREMENT TABLE

<table>
<thead>
<tr>
<th>SIDE SLOPE</th>
<th>RAIL REQUIREMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERTICAL RAIL TO 2:1 SLOPE</td>
<td>PIPE RAIL WITH ATTACHED CHAIN LINK FABRIC OR OTHER RESTRICTION TO PROTECT AGAINST FALL HAZARDS</td>
</tr>
<tr>
<td>2:1 - 6:1 SLOPE</td>
<td>PIPE RAIL ONLY UNLESS SIDE SLOPE PRESENTS OTHER HAZARDS</td>
</tr>
<tr>
<td>6:1 - FLAT SLOPE</td>
<td>NO PIPE RAIL REQUIRED UNLESS NOTED OTHERWISE BY DISTRICT STAFF</td>
</tr>
</tbody>
</table>
EXISTING FLOOD CONTROL DISTRICT STRUCTURE

5'-0" MIN

4'-6" MIN

5'-0" MIN

4'-6" MIN

NOTES
1) THE REQUIREMENTS HEREIN ARE GENERAL REQUIREMENTS. REFER TO PROJECT SPECIFICATIONS AND/OR PROJECT ENGINEER FOR ANY ADDITIONAL REQUIREMENTS.
**CONSTRUCTION NOTES**

1. Base or bedding compacted to 95% of standard proctor.

2. For pipes under 12-inches in diameter, place backfill in 6-inch lifts and compact to 95% of standard proctor with compaction tests on every other lift and for each 300 feet of trench.

3. For pipes over 12-inches in diameter, backfill trench from the bottom of the pipe to the spring line of the pipe with 1-sack CLSM.

4. For conduit bundles or duct banks, place 1-sack CLSM from the bottom of the bundle/duct bank to the top of the bundle/duct bank.

5. Place backfill above pipes, bundles or duct banks in 6-inch lifts and compact to 95% of standard proctor with compaction tests on every other lift and for each 300 feet of trench.

6. **With permission from the district, in areas that are not part of a structure or water way (i.e. basins, channels, washes, etc.) half-sack CLSM may be used instead of 1-sack CLSM.**

**GENERAL NOTES**

1. 1-sack CLSM can be used instead of compacted backfill.

2. These backfill requirements are the minimum required for trench backfill within the district's right-of-way or real property.

3. Backfill can be native material that meets the requirements of MAG standard specification 601.4.8 or other acceptable backfill material per specification 601.

4. 1-sack CLSM shall meet the requirements of MAG standard specification 728.

5. For flexible pipes, backfill trench from the bottom of the pipe to 12" above the top of pipe (minimum) with 1-sack CLSM.

6. District inspectors must inspect the pipe installation prior to backfilling around the pipe.

7. pea gravel is not an acceptable backfill or bedding material and may not be used.

8. water jetting is not allowed.

9. backfill compaction tests and CLSM delivery tickets must be provided with as-built drawings for all pipe installations.

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**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY**

**PIPE TRENCH BACKFILL DETAIL**

**APPROVED BY** C. Sanchez

**REVISION DATE** 04/03/19

**DETAIL NO.** FCD 404-2
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

SEWER MANHOLE COVER FRAME DETAIL

APPROVED BY C. Scott Vogl

10/05/15

FCD422-1

MEDIUM BROOM FINISH WITH RADIAILY SCORED MARKS (4 MIN.)

CROWN SHALL BE APPLIED IN UNPAVED CONDITIONS - U.N.O.

SUBGRADE PREPARATION TO CONFORM TO M.A.G. SECT. 301 OR 601

CLASS 'AA' CONCRETE PER M.A.G. SECT. 725, 505

GROUNDBAORD

FOUR STEEL SPACERS, 4" x 2" THICKNESS AS REQUIRED FROM 1/2" to 2" WHEN THICKNESS IS LESS THAN 1/2" USE MORTAR, WHEN GREATER THAN 1/2", USE BRICK.

PAINT MANHOLE STATION ON CONCRETE PER FCD DET 141-1

USE BRICK.

WHEN GREATER THAN 1/2" USE MORTAR, WHEN THICKNESS IS LESS THAN 1/2" USE MORTAR, WHEN GREATER THAN 1/2", USE BRICK.

FCD DET 141-1

ON CONCRETE PER MANHOLE STATION

100+00

1'-0"

GROUND
**NOTES**

1) DIMENSIONS OF THE CONCRETE, PLACEMENT OF REINFORCING AND VERTICAL CONCRETE FORMS WILL BE SPECIFIED FOR EACH INDIVIDUAL PROJECT.

2) EXCAVATE TO THE DEPTH AND WIDTH REQUIRED, BEING CAREFUL NOT TO OVEREXCAVATE FOOTER SHALL BE POURED AGAINST THE GROUND, BEING SURE ALL LOOSE MATERIAL IS REMOVED.

3) USE 3000 P.S.I. CONCRETE MIX (5.5 BAGS CEMENT PER CUBIC YARD CONCRETE).

4) FORM AND POUR VERTICAL WALL AS DIRECTED. CONSOLIDATE CONCRETE BY VIBRATION OR PUDDLING.

5) BACKFILL AFTER CONCRETE HAS CURED AT LEAST 7 DAYS. THERE SHALL BE NO ROCK PIECES LARGER THAN 4" WITHIN 1 FOOT FROM THE STRUCTURE.

6) FILL IN LIFT 6" OR LESS, COMPACT TO 95% IF NATURAL SOIL IS GRANULAR, FILL CAN BE OMITTED.

7) GRADE SURFACE TO BLEND WITH EXISTING GROUND.
**NOTES:**

1) ALL INLETS ARE TO ENTER THE FLOODWAY AT RIGHT ANGLES.

2) RIPRAP BED SHALL HAVE A THICKNESS OF AT LEAST THE SIZE OF THE LARGEST RIPRAP (TYPICALLY RIPRAP HAS A D50=9" AND THE LARGEST ROCK=18")

3) RIPRAP SHALL BE OBTAINED FROM ANY SOURCE APPROVED BY THE FLOOD CONTROL DISTRICT OR PROJECT ENGINEER, AND SHALL BE ROUND & REASONABLY WELL GRADED.

4) CUT OFF WALLS ARE TO BE CLASS B CONCRETE AND BE CONSTRUCTED THE ENTIRE PERIMETER OF THE RIPRAP.

5) RIPRAP GRADATION SHALL BE DETERMINED BY PROJECT-ENGINEER SPECIFICATIONS.

6) GROUT SHALL BE A MINIMUM OF 2,500 PSI. GROUT SLUMP SHALL BE A MINIMUM OF 7" - 9" OR TO PROJECT/ENGINEER SPECIFICATIONS.

7) GROUT SHALL FULLY PENETRATE TO BASE OF RIPRAP. A PENCIL VIBRATOR SHALL BE USED TO ENSURE GROUT PENETRATION.

8) POUR GROUT FROM BASE OF SLOPE IN AN UPHILL DIRECTION.

9) SURFACE OF RIPRAP STONE PROJECTING ABOVE GROUT SHALL BE CLEAN TO MATCH ANY EXISTING RIPRAP. SURFACE SHALL BE CLEANED BY AIR-WATER BLASTING OR OTHER APPROVED METHOD. CLEANING SHALL REMOVE ALL GROUT, CEMENT PASTE, AND DISCOLORATION CAUSED BY GROUT, WITHOUT DAMAGING THE GROUT TO REMAIN IN PLACE.

**SECTION B-B**

- GRouted RIPRAP
- CONC CUT OFF WALL TYP
- 1'-0" TYP
- INLET WIDTH 4x PIPE OR WASH DIAMETER
- 3'-0" TYP

**SECTION A-A**

- GRouted RIPRAP
- CONC CUT OFF WALL TYP
- A = SWALE DEPTH 1/2 PIPE DIAMETER OR WASH DEPTH AT UPSTREAM SLOPE END. SWALE FLARES TO NOTHING AT DOWNSTREAM END
- BOTTOM CHANNEL

**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY**

**GRouted RIPRAP CONSTRUCTION DETAIL**

审批日期：10/05/15

详情编号：FCD555-1
1. ROCK MULCH SHALL BE FREE OF CALCAREOUS COATING, CALICHE, ORGANIC MATTER OR OTHER FOREIGN SUBSTANCES.

2. THE SURFACES UPON WHICH THE ROCK MULCH IS TO BE PLACED SHALL INCLUDE PROOF ROLLING WITH RUBBER TIRED OR TRACKED EQUIPMENT. SURFACE TO BE PROBED FOR ACCEPTABLE DENSITY AS DETERMINED BY THE ENGINEER.

3. THE ROCK SHALL BE PLACED IN AN EVEN APPLICATION, TIGHTLY PACKED, TO PROVIDE COMPLETE COVERAGE OF THE AREA SHOWN ON THE PROJECT PLANS SO THAT SOIL WILL NOT BE VISIBLE BETWEEN ROCKS.

4. AFTER PLACING AND GRADING THE ROCK MULCH, THE CONTRACTOR SHALL WATER THE MULCH WITH A LIGHT SPRAY TO REMOVE FINE MATERIAL FROM THE SURFACE AS APPROVED BY THE ENGINEER.

5. ROCK MULCH SHALL MEET THE REQUIREMENTS OF THE MAG UNIFORM STANDARD SPECIFICATIONS 701, 702, AND 703. THIS WORK INCLUDES FURNISHING, HAULING, SUBGRADE PREPARATIONS AND PLACEMENT OF MULTICH (AKA GRAVEL MULCH) AS SHOWN ON THESE STANDARD PLANS.

6. ROCK MULCH SHALL BE A GRADED MATERIAL AND SHALL BE ANGULAR, FREE OF CALCAREOUS COATING, CALICHE, ORGANIC MATTER OR OTHER FOREIGN SUBSTANCES AND SHALL NOT EXCEED 3:1 RATIO FOR FLAT AND/OR ELONGATED PIECES WHEN DETERMINED BY ASTM D4791. ROUNDED aggregate will not be allowed. Fractured river-run rock material will not be accepted as a substitute.

7. THE DESIGN INTENT FOR THE USE OF ROCK MULCH IS TO PROVIDE A SURFACE TREATMENT THAT IS SIMILAR IN COLOR, TONE AND OVERALL CAST TO THE EXISTING SOIL/ROCK PLACEMENT AT THE PROJECT SITE. THE ROCK MULCH IS INTENDED TO BLEND, NOT CONTRAST, THE PROJECT INTO THE SURROUNDING LANDSCAPE.

8. THE LOSS BY ABRASION IN THE LOS ANGELES ABRASION MACHINE, DETERMINED AS PRESCRIBED IN ASTM C538, SHALL NOT EXCEED 40 PERCENT (BY WEIGHT) AFTER 500 REVOLUTIONS. THE AGGREGATES SHALL BE WELL GRADED WHEN TESTED IN ACCORDANCE WITH ASTM C136 AND ASTM C117.

9. HOLES AND EROSION RILLS THAT WILL INTERFERE WITH ROCK MULCH PLACEMENT SHALL BE FILLED AS DIRECTED BY THE ENGINEER. TRASH, WEEDE, AND OTHER DEBRIS THAT WILL INTERFERE WITH ROCK MULCH PLACEMENT SHALL BE REMOVED AND DISPOSED OF AS DETERMINED BY THE ENGINEER.

10. THE ROCK MULCH SHALL BE CONSTRUCTED TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF THE UNDERLYING MATERIALS.

11. THE ROCK MULCH SHALL BE DELIVERED AND PLACED IN A MANNER TO ENSURE THAT THE IN-PLACE MULCH LAYER SHALL BE REASONABLY HOMOGENEOUS AND THE FRACTIONS UNIFORMLY DISTRIBUTED. HAND PLACING OF ROCK MULCH SHALL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS. ROCK MULCH SHALL BE PLACED IN AN EVEN APPLICATION, TIGHTLY PACKED TO PROVIDE COMPLETE COVERAGE OF THE AREA SHOWN ON THE PROJECT PLANS SO THAT SOIL IS NOT BE VISIBLE BETWEEN ROCKS.

12. PERCENTAGE OF FRACTURED COARSE AGGREGATE PARTICLES SHALL BE DETERMINED BY TEST METHOD ARIZ 212T. THE PERCENTAGE COMPOSITION BY WEIGHT SHALL BE WITHIN THE FOLLOWING LIMITS:

<table>
<thead>
<tr>
<th>SIEVE</th>
<th>PERCENT PASSING</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-INCH</td>
<td>100%</td>
</tr>
<tr>
<td>2-INCH</td>
<td>40% - 60%</td>
</tr>
<tr>
<td>1-INCH 10%</td>
<td>15%</td>
</tr>
</tbody>
</table>

SECTION B-B

SECTION A-A
ANGLED HEADWALL
PLAN VIEW (NTS)

FLARED END
PLAN VIEW (NTS)

WINGWALL
SECTION A-A (NTS)

FLARED END
VIEW B-B (NTS)

CULVERT

EXISTING RIPRAP

2'-0" (MIN) WIDE
DEPTH OF 6" to 12"
ROCK MULCH
PROTECTION

WINGWALL

EXISTING RIPRAP

2'-0" (MIN) WIDE
DEPTH OF 6" to 12"
ROCK MULCH
PROTECTION

FLOW

2'-0"

ROCK MULCH Varies
IN DEPTH OF 6" TO 12"

2'-0" Minimum

WINGWALL

EXISTING RIPRAP

FLOW

FLOW

FLOW

FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY

ROCK MULCH PLACEMENT
DETAIL SHEET 2 of 2

APPROVED BY

REVISION DATE
04/03/19

DETAIL NO.
FCD555-2