STATE OF ARIZONA
STATE HIGHWAY DEPARTMENT
PLANS DIVISION
1955
"C"

ROADWAY STANDARDS
FOR USE IN
'FIELD AND OFFICE

ISSUED TO
HIGHWAY PLANS SERVICES
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Survey Monument & Cover

Min. weight of
lid ~ 31 lbs.

Min. weight of
frame ~ 18 lbs.

Note:
Set frame with
slots for lid
north & south.

8" opening for
Fry Bar.

SECTION A-A

TOP VIEW
OF LID

BOTTOM VIEW
OF LID

DETAIL OF LETTERS

TYPE A RIW MARKER

Type "A" RIW Marker
Posts to be native juniper, native cedars,
or native cypress. Minimum 5" diameter
at top. Top to be beveled 2½" and two
sides to be dressed to a minimum
4" face.

RIW Markers to be erected where shown
on the plans, or as determined by the engineer.

TYPE B RIW MARKER

RIW Line

Min. 55°
Steel Rail

P.C. 145 + 25.8

P.O. 171 + 12.1

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See Plans for details of roadway width, cut ditch, type and thickness of roadway surfacing, superelevation, and curve widening. Standard Crown Slope for PCConcrete 0.01' per foot; for Bit. Surf, Treat. and Mix. Bit. Surf. 0.015' per foot.

Standard Cut and embankment slopes as shown on this sheet may be superseded by special slopes where shown on plans.

For Cuts up to 6’ use 5’ semi-tangents(1) for slope rounding. For each additional foot of cut add 1’ to semi-tangent to 11’ maximum. Finish with approved drag so that the ground will not have a scarred appearance.

Do not daylight small negative slopes, but round as indicated.
CONCRETE CURB

MIX. BIT. CURB

MIX. BIT. GUTTER

Paved Turnouts

Notes:

W indicates width of paved surface of turnout.
L indicates length of paved surface of turnout.
Farm road turnout, 10 min. width, (W)
County road turnout, 20 min. width, (W)
Size and type of turnouts is noted on plans
as follows: W, L, Surface, and Type (12' x 30 M.B.S. (Type A))
Base material thickness under turnouts is the same
as shown on the roadway section, unless otherwise noted.
Any excavation or embankment for turnouts is
included in the roadway quantities.
Turnouts are to be placed where shown on plans,
or as directed by the Engineer.
CROWN DYKE
To be paid for by lineal measure.

CROWN DITCH
To be paid for by lineal measure.

Crown protection should be constructed in such a manner that the flow of intercepted water shall not exceed 0.5%.

Grader ditch section may be used or a ditch section similar to above may be made in any manner approved by the Engineer.

TYPICAL DIKE INSTALLATION AT STRUCTURE
Dykes at structures to be so placed that they create a water cushion.

TYPE B DIKE

TYPE A DIKE

DITCH OR CHANNEL

Dimensions of ditches and dykes as shown on plans are respectively width, depth or height, and length.
Note - All timber to be structural grade.

MIX. BIT. SURFACE FORD
Wood Walls

FLOW

5'-Depth Gauge
Finished Grade-
Slope 0.015' Per Ft.

ROADWAY WIDTH

- 3'-2"x12" boards
- 4'-4"x5'-0" Posts @ 5' cfs.

2'-2"x12"

4'-4"x5'-0" @ 5' cfs.

3'-2"x12" Boards

- 4'-4"x5'-0" Posts @ 5' cfs.

Note: Use only when called for on plans. Does not include cut-off walls.

GRAVEL SURFACE FORD

ROADWAY WIDTH

5'-Depth Gauge
Finished Grade-
Slope not more than 0.02' Per Ft.

-TIE with 2 strands 9 ga. galv. wire @ 2' cfs.

Diamond mesh woven wire fencing.
Std. Spec. Item 68
Wire basket to be filled with 8' rock.

LENGTH AS CALLED FOR ON PLANS

3'-1" Max.
5'-Depth Gauge
2'-1" Max.
5'-Depth Gauge

Wall to be built to one foot above high water level.

4'-4"x5'-0" Posts @ 5' cfs.

2'-2" Iron pipes 7'-0" lg
spaced @ 8' cfs.

ELEVATION LOOKING UPSTREAM

ROCK BASKET

Rock Basket full length of structure - Only when called for on plans.

ARIZONA HIGHWAY DEPARTMENT
PLANS DIVISION

TYPE "B" FORD
ROCK BASKET

DRAWN C.B.B. July 1945
TRACED G.W. Nov. 1945
CHECKED H.H. W.
APPROVED ENGINEER

DRAWING NO. C-6
GENERAL NOTES

In order to secure proper alignment, all bolt holes shall be bored and taps of all posts trimmed after posts are set. Treated structural timber posts shall be minimum 6 x 6" (Epith) and need not be painted. Steel posts, if galvanizing is waived, shall be painted 2 coats of #5 (black) over 1 coat of #1 (primer) tell length. All posts for road guard shall be able to withstand a minimum theoretical bending moment of 50,000 inch pounds. Unless otherwise called for, either type A or B road guard may be used.

Place 2 x 6" Silver Scotch lite tab on end posts and every third intermediate post facing traffic.

TYPE "A" ROAD GUARD

After submission and approval of plate, manufacturer's plans & specifications shall be used in conjunction with Std. erection details on this drawing.

Intermediate Panel Length 10' (Max)

Finish Shoulder Line

Lap plates with exposed edge away from approaching traffic.

Provide Deflector panel and 1/2" Min. DIA. round timber anchorage (End post only)

Type Front of Plate
2 Coats #8 Paint after erection

3/8" Round Head Bolts
(Min) 10 Gauge Steel

Race line Fin. Grade

End Panel Length 10' (Max)

Traffic

Treated 5/8" or 3/4" Min. DIA. half round timber anchor (End post only)

TYPE "B" ROAD GUARD

Intermediate Panel Length 10' (Max)

Finish Shoulder Line

Lap plates with exposed edge away from approaching traffic.

Provide Deflector panel and 1/2" Min. DIA. round timber anchorage (End post only)

Type Front of Plate
2 Coats #8 Paint after erection

3-3/4" Machine Bolts
Finish Shoulder Line

1" Mach. Bolt and Washer
(Min) 12 Gauge Steel

Traffic

Treated 3/4" or 1" Min. DIA. half round timber anchor (End post only)

ARIZONA HIGHWAY DEPARTMENT
PLANS DIVISION
ROAD GUARD

REV.
2/9/47
1/9/47
10/10/46
2/24/46
2/22/46
4/6/46

DRAWING NO
C-7
Note—Use driving head for driving all posts.

TYPE "A"

Steel post and mounting details same as Type "B".

Paint face plates with one coat Industrial Synthetic Alkyd Black Primer & one coat Industrial Synthetic Alkyd Black enamel or equal before Scotchlite is applied.

Round posts shall be 6" min. and 9" max. diameter at a point 6" below top of post and 7½ min. and 10½ max. diameter at the butt. They shall be graded for size so that in any one continuous row of guide posts the top diameters shall not vary more than 1". Measurement for size shall be made after shrinkage.

Where rectangular posts are used, they shall be 3"x8", S4S.

All guide posts shall conform to Std. Specifications.

Guide post locations shown on plans are approximate and changes may be necessary to meet field conditions.

When placed in rows, guide posts shall be spaced at 200 ft. c.t.s. unless otherwise called for on plans.

After erection and painting, install a No.1 Crystal reflector button or Silver Scotchlite tab in each post, facing traffic.

ARIZONA HIGHWAY DEPARTMENT
PLANS DIVISION

GUIDE POSTS

TYPICAL GUIDE POST INSTALLATION

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DRAWN: C.B.B. July 1945
TRACED: V.H. Nov. 1946
CHECKED: H.H.H.
APPROVED: J.R.H.
DRAWING NO.: C-8
# Single Pipe Headwall

**Dimensions:**

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<th>B</th>
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<th>F</th>
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<th>K</th>
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**Steel - $\frac{3}{4}$" bars:**

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**Reinforcement:**

- $\frac{3}{4}$" a bars, bent
- $\frac{3}{4}$" b bars, str.

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# Double Pipe Headwall

**Dimensions:**

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**Steel - $\frac{3}{4}$" bars:**

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<thead>
<tr>
<th>Dom</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>F</th>
<th>G</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>T</th>
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</table>

**Reinforcement:**

- $\frac{3}{4}$" a bars, bent
- $\frac{3}{4}$" b bars, str.

---

*Note: The Std. "L" Headwall is made up of $\frac{1}{2}$" U and $\frac{3}{4}$" Str. Headwall.*
METHOD OF PLACING STRUTS

Compressing caps to be of soft wood to allow compression. Top and bottom sill caps shall be same size as struts.

<table>
<thead>
<tr>
<th>STRUTS FOR FULL CIRCLE C.M.P. VERT DIAM + 3%</th>
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<tbody>
<tr>
<td>Diam. of Sett</td>
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<tr>
<td>----------------</td>
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<tr>
<td>48 x 4 x 4</td>
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<tr>
<td>60 x 4 x 4</td>
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<tr>
<td>84 x 4 x 4</td>
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<tr>
<td>96 x 4 x 4</td>
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No struts will be required for 48 C.M.P. for fill of less than 15 feet unless so noted on plans.

ELEVATION

WING TYPE HEADWALL DETAILS

Drawn for 60" C.M.P.
Scale 1/2" = 1'-0"

WING TYPE HEADWALL

ONE HEADWALL STEEL LIST - 84" to 66"

<table>
<thead>
<tr>
<th>Material</th>
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<th>Bar No.</th>
<th>Length</th>
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<tr>
<td>Concrete</td>
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ONE HEADWALL STEEL LIST - 60" to 42"

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Note: Dimensions W to be increased to take care of increased with due to plane Quantities are for Headwall only.

ARIZONA HIGHWAY DEPARTMENT
PLANS DIVISION
HEADWALLS AND STRUTS FOR C.M.P.'S 42" TO 84" DIA.
SECTION ZZ

PLAN

Note — All reinforcing to be deformed bars approx. 1/2 in.

SECTION YY

FRONT

FRONT

SECTION ZZ

Dimensions

Pipe D Single Double Single Double W A B C E F G H J K O

16" 5-0" 7-3" 2-4" 4-7" 2-6" 3-5 5-12 1-4" 1-4" 6-3" 2-9" 3-9" 10" 6-7 2-9 6-5" 110"

24" 6-9" 9-9" 3-4" 6-4" 3-1" 6-8 1-8 1-8" 1-11" 6-4" 4-0" 3-1" 11" 1-6 1-07 1-46 1-30" 1-30"

30" 8-0" 11-9" 3-10 7-7" 3-8" 6-8 1-11 2-1" 2-6" 6-4" 3-5" 1-11 2-0 1-41 2-09 1-18" 1-65"

36" 9-4" 13-10 4-4" 8-10 4-3" 6-8 2-2 2-6" 3-1" 6-5 9-3" 1-4 2-6" 1-86 2-70 1-35" 1-95"

42" 10-9" 16-0" 5-0" 10-3" 4-11" 6-8 2-6 2-0" 3-8" 7-5 4-0" 1-6 2-9 2-64 3-78 1-96" 2-68"

Quantities

Class A Concrete  Reinforced Steel
Single Double Single Double

ARIZONA HIGHWAY DEPARTMENT
PLANS DIVISION

DRAWN: K.S. Oct 1939
TRADED: K.S. Oct 1939
CHECKED: PHIL POTTER
TRANSMITTED: J.W. WESSEL

DROP INLET HEADWALLS

DRAWING NO.
C-11
Length of culvert "L", shall be computed in even 2' lengths for C.M.P. and Conc. Pipes as a basis for estimates. Each side where height of embankment "H" is more than 10', add 3/6 H to measured "L" to obtain total length required. Inside face of headwall should be at least 1' outside of finished shoulder line.

Pipe should be laid on a straight gradient (1% min.) and on solid base at all points.

Minimum cover "C" shall be 24 for standard strength tile or conc. pipes and 30 for double strength conc., tile, or corrugated metal pipes.

Culvert basins, in connection with angle headwalls, shall be excavated as shown in Fig. A and classified as channel excavation.

Warp embankment slopes of pipe culvert to 2:1 where Std. C-2 calls for flatter slopes.
FABRICATED WIRE FENCE & GATE.

Any standard make of fence may be used which is similar to detail shown above. Entire assembly to be hot galvanized.
Expansion Joints @ 600' centers or as shown on plans

Contraction Joints @ 15' centers

10' Thickened ends at Expansion Jts.

CONTRACTION JOINT

CONSTRUCTION JOINT (IF NOT AT EXPANSION JT.)

LONGITUINAL SECTION THRU PAVEMENT

TRANSVERSE EXPANSION JOINT

TRANSVERSE CONTRACTION JOINT

All general requirements may be superseded by special notations on the plans. At intersections of side roads or streets, joints shall be so placed as to give the intersection a symmetrical appearance and to conform to the cross section of the intersecting road or street.
PLAN OF LONGITUDINAL JOINT DETAIL "E" OR "F"

LONGITUDINAL JOINT DETAIL "E"

If approved by the District Engineer, other deformations may be used.

LONGITUDINAL JOINT DETAIL "F"

GENERAL NOTES

Width (t) of longitudinal expansion joints shall be 2 unless otherwise noted on the plans.

All tie bars in center joints shall be deformed bars and shall have unbroken bond. They shall be held securely in place, parallel to the subgrade & perpendicular to the center line of the road, by the use of metal chairs or approved design and made for that purpose.

The edging tool used for all longitudinal joints shall be so constructed as to provide a smooth troweled surface 3' wide on each Side of the joint.

All general requirements may be superseded by special notations on the plans.
GENERAL NOTES

All curbs & gutters to be single course Class A" concrete.
All curbs shall be trowel finished.
All flow lines of gutters shall be troweled to an accurate grade to a width of 3'"
Corners or curb & gutter shall have 4 1/2" joints extending all the way through the concrete,
every 15 feet. Joints shall match those in adjacent pavement. The joint may be open or made with wood filler which may be left in place.

In integral curb all expansion & contraction joints shall extend through the curb.
Expansion joints to be placed at all radius points and structures.

DEPRESSED CURB FOR DRIVEWAY ENTRANCE

EXPANSION JOINT BETWEEN CURB & SIDEWALK

CONCRETE CURBS,
GUTTERS & SIDEWALKS

ARIZONA HIGHWAY DEPARTMENT
PLANS DIVISION

DRAWN O.K. MAR. 1935 DRAWING NO. C-20
TRACED H.A. JULY 1935
CHECKED J.A. JULY 1935
CONTRACTOR'S PRINTS

NOTE: - Drawings shown in sample cubs are typical.
Where curbs & gutters are both to be constructed they shall be cast monolithic.

**Typical Construction of Valley Gutter at Street Intersection or Alley**

- **Combined curb & gutter to end at end of return.**
- **Curb around return to be measured as per type adjacent.**
- **Shaded area to be constructed and measured as 75\% valley gutter or pavement.**
- **W = width as shown on plans.**

**Measurement of Curb, Gutter or Combined Curb & Gutter on Curves**

- **Expanded Joint**
- **Radius as shown on plans.**
- **Combined curb & gutter shall be measured along a line midway between the back of the curb & the outer edge of the gutter along line ‘a.’**

**Formula for Quarter Points**

- \(D = \text{drop from center of intersection to center of return.}\)
- \(P = \text{drop from center of intersection to quarter point.}\)

---

**Arizona Highway Department**

**Plans Division**

**Curb & Gutter Measurement and Street Intersection Grades**

- **Drawn by:**
- **Traced by:**
- **Checked by:**

**C-21**
SECTION

TYPE A

RUBBLE GAP DETAIL

3" Weep holes @ 12 cfts. 12" x 12" x 12" Gravel backfill.

PER LIN FT

<table>
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<tr>
<td>30</td>
<td>8.630</td>
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</tbody>
</table>

Note: For parapet on top of retaining wall add per linear ft .145 Cu Yds. of masonry.

Material to be used in construction of wall to be approved by laboratory.

SECTION

TYPE B

3" Weep holes @ 12 cfts. 12" x 12" x 12" Gravel backfill.

When in suitable material footing may be stepped.

DRAIN RUBBLE
RETIAYING WALL

To find quantities of rock required

\[
\frac{H}{4} \times \frac{B+H}{2} = \text{Cu Yds. per linear ft of wall}
\]

Example:

To find Cu Yds. of rock per ft of 10' high wall

\[
\frac{10}{4} \times \frac{12+10}{2} = 45 \text{ Cu. Ft.} \Rightarrow \frac{45}{1.66} = 27 \text{ Cu Yds. per lin. ft.}
\]

Note:

Due to disintegrating character of some types of rock, height of wall should be limited to 10 ft. unless otherwise approved by laboratory.

ARIZONA HIGHWAY DEPARTMENT
PLANS DIVISION
CEMENT RUBBLE AND DRY RUBBLE RETAINING WALLS

DRAWN BY: REED, JAN. 1938
TRACED BY: S.C. JULY 1938
CHECKED BY: NEW, JULY 1938
APPROVED

REV. C-22
Note:
Include elbow as part of total length. Call for hinged band coupling for pipe joints. Use 12" band width for pipes over 12' long. T band width for pipes 12' long or less. Catch basin to have bituminous coating. C.M.P. shall be plain unless otherwise specified. Catch basin shall be shifted to fit the ground so as to lessen the angle in the C.M.P. as much as possible.

16 ga. Corrugated Metal

Two foot length of 8" pipe included as part of catch basin. Additional length of pipe shown on plans.

16 ga. Corrugated Metal Plate.

16" Unless otherwise shown.

SIDE ELEVATION TYPE B' CATCH BASINS

FRONT ELEVATION

SIDE ELEVATION TYPE A' CATCH BASINS

PERFORATED C.M.P. INSTALLATION
GENERAL NOTES

Warped face of standard curb and gutter (or curb) into catch basin in lengths of 2 feet on each side.

The curb and gutter section of the catch basin shall conform in surface finish to the adjoining curb and gutter.

All concrete shall be class A.

All exposed edges shall be finished with a suitable edge.

All structural iron, including bar grate, shall have a shop coat of hot paint and a second coat of No. 3 paint.

When catch basins are located in curb returns, the catch basin curb face shall conform to the radius of the return.

LONGITUDINAL SFC

CROSS SECTION

DETAIL OF NO. 1 CATCH BASIN

Scale = 1/8" = 1'
The finish of the top slab shall conform in color, marking and finish to the adjacent pavement work. Where no sidewalk exists the surface shall be trowel finished, without mortar coat.

The concrete cover shall be composed of one part Portland cement and three parts clean well graded aggregate passing a 3/4" sieve. All other concrete shall be Class A.

When catch basins are located in a curb return the angle iron above the mud shall conform to the curvature of the curb.

All exposed edges shall be finished with a suitable edger.
LONGITUDINAL SECTION
DETAILS OF NO. 3 CATCH BASIN
Scale ~ 1" = 1'-0"

GUTTER & GRADE
HALF PLAN
FRAME & ANCHORS

SECTION XX
DETAILS OF STEEL FRAME
Scale ~ 3'-0"

SECTION YY

SECTION ZZ

ADJUSTABLE CURB

ADJUSTABLE CURB

ARIZONA HIGHWAY DEPARTMENT
PLANS DIVISION
CATCH BASIN
NO. 3

DRAWN
R.H.W.
TRACED
R.J.
CHECKED
R.H.W.
APPROVED

C-27
**MANHOLE FRAME & COVER NO. 1**

**TYPE "A" COVER**
Approx. weight 190 lbs.

**TYPE "A-1" COVER** shall be the same as Type "A" except that the cover shall be vented with at least six one inch holes, equally spaced in a circle 6" from the center of the cover.

Type "A" cover shall be used unless otherwise specified.

Notations as shown on the plans shall be as follows: Std M.H. Frame & Cover No. 1-2, the letter denoting the type of cover.

The bearing faces shall be machined so that the cover will have a uniform bearing in any position in the frame.

**SECTION OF FRAME**
Approx. weight 205 lbs.

**SCALE** 1/8" = 1'-0"
The bearing faces shall be machined so that the cover will have a uniform bearing in any position in the frame.
Manhole frame & cover No.1 is shown. Other types may be substituted if noted on the plans.

All concrete shall be Class "A".

Every 5th course of brick shall be laid as stretchers.
Plan

Part Section

Standard Irrigation Valve Detail "C"

Concrete "T" or "L" to be included with valve.

Variable 6" to 20"

Snow alfalfa valve or its equivalent. Number of valve shall correspond to the size of the pipe in inches No. 6 to No. 20.

Elevation

Standard Irrigation Headgate Detail "H"

16 Ga. Galv. Iron Gate

Pipe size as called for on plans.
Note: Prior to placing pipe, the roadway embankment shall be placed and compacted to an elevation of at least 9" above the proposed grade for the top of double strength pipe and 24" above the top of std. strength pipe. Then the trench shall be excavated and the pipe installed, backfilled and tamped as per specifications. See specifications for strength requirements.

TYPICAL INSTALLATION OF CONCRETE OR TILE PIPE

DETAIL "X" CONCRETE ENCASEMENT

ARIZONA HIGHWAY DEPARTMENT
PLANS DIVISION

CONCRETE AND VITRIFIED CLAY PIPE

DRAWN

TRACED

CHECKED

APPROVED

DRAWING NO.

C-33
**Notes**

Standard R.R. Crossing consists of two flange rails and necessary number of brace plates and brace nuts. Welded nut and brace plate to be placed every third tie. Construction and assembly details as shown. Length of R.R. Crossing is noted on plans in linear feet.

Finished roadway surface of crossing (between rails) shall be same as adjacent roadway, unless noted otherwise on plans.
Bench Mark to be established and installed by the Project Engineer on culvert headwalls, bridge abutments, abutment walls, F.A. project markers or other permanent structures. Location and data shall be noted on "As Built" plans.

**PROJECT MARKER**

Project Marker to be furnished by the State and installed and marked by the Project Engineer at each end of all Federal Aid Projects. Project Markers are to be placed on R/W line, but not more than 100' from E of road if R/W is greater than 100.

**ELEVATION**

**STD. BENCH MARK**

**SECTION A-A**

**CONCRETE CONSTRUCTION MARKER**

Scale: Full Size

Marker to be made of brass or bronze, and is to be furnished and placed at beginning and end of each day's work, after marking, by Proj. Engr.

**MILE POST, BENCH MARKER**

Mile posts are furnished by State and shall be installed by the Project Engineer.
PLANT CONSERVATION.

No clearing of right of way shall be done until thorough inspection has been made for possible preservation of existing growth. The trees and shrubs to be retained will be carefully and clearly marked. Unnecessary destruction of existing ground cover is prohibited.

ROCK WORK:

Straight rock cuts should not be rounded where rock has an earth overburden, treat the overburden the same as a straight cut. In cuts which are composed of rock and earth abutting each other let the excavation follow a smooth rounding course.

ARIZONA HIGHWAY DEPARTMENT
PLANS DIVISION

PLANT CONSERVATION & ROCK AND EARTH CUTS

PLAN ~ ROCK & EARTH CUT

SECTION A-A.

The final grade should conform as nearly as possible to the original surface where trees are involved.

If specimens to be retained should be in greater than 6" fill, a dry rubble wall shall be constructed around same.

Trees and shrubs on top of cuts of crowns of VCs should be preserved wherever possible.

Small pockets of earth should be left between rocks to permit small growth to re-seed.
TYPICAL INSTALLATION PLAN OF ROAD GUARD AT BRIDGE APPROACHES

Widen shoulder for Pedestrian Walkway if required.
Control Line.
Top of Curb line projected at 20' of Roadway.

Minimum Length of Shoulder Flare - 80'
End of Structure

End of Road Guard Flare (Depends on W)

Dimension varies depending on make of Road Guard.

Bracket if required

Basic Formula for Road Guard Flare:

\[ Y = \frac{W \times X^2}{F} \]

W = Offset from top of Curb line (Control line) to Shoulder line.
F = Length of Road Guard Flare.
X = Distance from beginning post away from structure.
Y = Offset to face of Road Guard at each post.

GENERAL NOTES:

When value of "W" is different than shown in Table, then use Basic Formula to find values for Y.

When Road Guard is to be continued beyond end of Road Guard Flare required for W, offset, the face of Road guard shall then be continued at the shoulder line, nearest lost offset to avoid kink.

When W = 0, no flare is required. Shoulder line is then the control line.

Offset from Roadway \( Y = \frac{X}{2} \). All figures are expressed in feet.

Place Road Guard both sides of roadway.

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<th>X</th>
<th>W = 3</th>
<th>W = 4</th>
<th>W = 5</th>
<th>W = 6</th>
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ARIZONA HIGHWAY DEPARTMENT
PLANS DIVISION

INSTALLATION OF ROAD GUARD AT STRUCTURE APPROACHES

DRAWN: [Signature]
CHECKED: [Signature]
APPROVED: [Signature]

REVISION: 1/2/90
DRAWING NO.: C-42