



## STANDARD BID CONDITIONS

## M-13-045P

1. **ACCEPTANCE AND REJECTION:** The Arkansas State Highway and Transportation Department (AHTD) reserves the right to reject any or all bids, to accept bids in whole or in part (unless otherwise indicated by bidder), to waive any informalities in bids received, to accept bids on materials or equipment with variations from specifications where efficiency of operation will not be impaired, and to award bids to best serve the interest of the State.
2. **PRICES:** Unless otherwise stated in the Bid Invitation, the following will apply: (1) unit prices shall be bid, (2) prices should be stated in units of quantity specified (feet, each, lbs., etc.), (3) prices must be F.O.B. destination specified in bid, (4) prices must be firm and not subject to escalation, (5) bid must be firm for acceptance for 30 days from bid opening date. In case of errors in extension, unit prices shall govern. Discounts from bid price will not be considered in making awards.
3. **BID BONDS AND PERFORMANCE BONDS:** If required, a **Bid Bond** in the form of a cashier's check, certified check, or surety bond issued by a surety company, in an amount stated in the Bid Invitation, must accompany bid. **Personal and company checks are not acceptable as Bid Bonds.** Failure to submit a Bid Bond as required will cause a bid to be rejected. The Bid Bond will be forfeited as liquidated damages if the successful bidder fails to provide a required Performance Bond within the period stipulated by AHTD or fails to honor their bid. Cashier's checks and certified checks submitted as Bid Bonds will be returned to unsuccessful bidders; surety bonds will be retained. The successful bidder will be required to furnish a **Performance Bond** in an amount stated in the Bid Invitation and in the form of a cashier's check, certified check, or surety bond issued by a surety company, unless otherwise stated in the Bid Invitation, as a guarantee of delivery of goods/services in accordance with the specifications and within the time established in the bid. **Personal and company checks are not acceptable as Performance Bonds.** In some cases, a cashier's check or certified check submitted as a Bid Bond will be held as the Performance Bond of the successful bidder. Cashier's checks or certified checks submitted as Performance Bonds will be refunded shortly after payment has been made to the successful bidder for completion of all terms of the bid; surety bonds will be retained. Surety bonds must be issued by a surety company authorized to do business in Arkansas, and must be signed by a Resident Local Agent licensed by the Arkansas State Insurance Commissioner to represent that surety company. Resident Agent's Power-of-Attorney must accompany the surety bond. Certain bids involving labor will require Performance Bonds in the form of surety bonds only (no checks of any kind allowed). In such cases, the company issuing the surety bond must comply with all stipulations herein and must be named in the U. S. Treasury listing of companies holding Certificates of Authority as acceptable sureties on Federal Bonds and as acceptable reinsuring companies. Any excess between the face amount of the bond and the underwriting limitation of the bonding company shall be protected by reinsurance provided by an acceptable reinsuring company. Annual Bid and Performance Bonds on file with E & P Division must have sufficient unencumbered funds to meet current bonding requirements, or the bid will be rejected, unless the balance is submitted as set forth above, prior to bid opening.
4. **TAXES:** The AHTD is not exempt from Arkansas State Sales and Use Taxes, or local option city/county sales taxes, when applicable, and bidders are responsible to the State Revenue Department for such taxes. These taxes should not be included in bid prices, but where required by law, will be paid by the AHTD as an addition thereto, and should be added to the billing to the AHTD. The AHTD is exempt from Federal Excise Taxes on all commodities except motor fuels; and excise taxes should not be included in bid prices except for motor fuels. Where applicable, tax exemption certificates will be furnished by the AHTD.
5. **"ALL OR NONE" BIDS:** Bidders who wish to bid "All or None" on two or more items shall so stipulate on the face of bid sheet; otherwise, bid may be awarded on an individual item basis.
6. **SPECIFICATIONS:** Complete specifications should be attached for any substitution or alternate offered, or where amplification is necessary. Bidder's name must be placed on all attachments to the bid.
7. **EXCEPTIONS TO SPECIFICATIONS:** Any exceptions to the bid specifications must be stated in the bid. Any exceptions to manufacturer's published literature must be stated in the bid, or it will be assumed that bidder is bidding exactly as stated in the literature.
8. **BRAND NAME REFERENCES:** All brand name references in bid specifications refer to that commodity or its equivalent, unless otherwise stated in Bid Invitation. Bidder should state brand or trade name of item being bid, if such name exists.
9. **FREIGHT:** All freight charges should be included in bid price. Any change in common carrier rates authorized by the Interstate Commerce Commission will be adjusted if such change occurs after the bid opening date. Receipted common carrier bills that reflect ICC authorized rate changes must be furnished.
10. **SAMPLES, LITERATURE, DEMONSTRATIONS:** Samples and technical literature must be provided free of any charge within 14 days of AHTD request, and free demonstrations within 30 days, unless AHTD extends time. Failure to provide as requested within this period may cause bid to be rejected. Samples, literature and demonstrations must be substantially the same as the item(s) being bid, unless otherwise agreed to by AHTD. Samples that are not destroyed will be returned upon request at bidders expense. Samples from successful bidders may be retained for comparison with items actually furnished.
11. **GUARANTY:** Unless otherwise indicated in Bid Invitation, it is understood and agreed that any item offered or shipped on this bid shall be newly manufactured, latest model and design, and in first class condition; and that all containers shall be new, suitable for storage or shipment and in compliance with all applicable laws relating to construction, packaging, labeling and registration.
12. **BACKORDERS OR DELAY IN DELIVERY:** Backorders or failure to deliver within the time required may constitute default. Vendor must give written notice to the AHTD, as soon as possible, of the reason for any delay and the expected delivery date. The AHTD has the right to extend delivery if reasons appear valid. If reason or delivery date is not acceptable, vendor is in default.
13. **DEFAULT:** All commodities furnished will be subject to inspection and acceptance by AHTD after delivery. Default in promised delivery or failure to meet specifications authorizes the AHTD to cancel award or any portion of same, to reasonably purchase commodities or services elsewhere and to charge full increase, if any, in cost and handling to defaulting vendor. Applicable bonds may be forfeited.
14. **ETHICS:** *"It shall be a breach of ethical standards for a person to be retained, or to retain a person, to solicit or secure a State contract upon an agreement of understanding for a commission, percentage, brokerage, or contingent fee, except for retention of bona fide employees or bona fide established commercial selling agencies maintained by the contractor for the purpose of securing business."* (Arkansas Code, Annotated, Section 19-11-708).

**ARKANSAS STATE HIGHWAY  
AND TRANSPORTATION DEPARTMENT**

**NOTICE OF NONDISCRIMINATION**

The Arkansas State Highway and Transportation (Department) complies with all civil rights provisions of federal statutes and related authorities that prohibit discrimination in programs and activities receiving federal financial assistance. Therefore the Department does not discriminate on the basis of race, sex, color, age, national origin, religion or disability, in the admission, access to and treatment in the Department's programs and activities, as well as the Department's hiring or employment practices. Complaints of alleged discrimination and inquiries regarding the Department's nondiscrimination policies may be directed to Joanna P. Nelson, Section Head - EEO/DBE (ADA/504/Title VI Coordinator), P. O. Box 2261, Little Rock, AR 72203, (501) 569-2298, (Voice/TTY 711), or the following email address: [joanna.nelson@arkansashighways.com](mailto:joanna.nelson@arkansashighways.com).

This notice is available from the ADA/504/Title VI Coordinator in large print, on audiotape and in Braille.

ARKANSAS STATE HIGHWAY & TRANSPORTATION DEPARTMENT  
 LITTLE ROCK, ARKANSAS  
 EQUIPMENT & PROCUREMENT DIVISION

Bid No. M-13-045P

BIDDER: \_\_\_\_\_

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ITEM NO.	DESCRIPTION	QTY.	UNIT	PRICE	AMOUNT
1. (206)	Flowable Select Material	114	C.Y.	\$	\$
2. (601)	Mobilization	1	LS	\$	\$
3. (SS&603)	Maintenance of Traffic	1	LS	\$	\$
4. (SS&604)	Signs	116	S.F.	\$	\$
5. (SS&604)	Traffic Drums	12	Ea.	\$	\$
6. (SP,SS&606)	48" Reinforced Concrete Pipe Culverts (Class V)	122	L.F.	\$	\$
7. (606)	48" Flared End Sections for Reinforced Concrete Pipe Culverts	2	Ea.	\$	\$
8. (SS&620)	Water	0.7	Mgal	\$	\$
9. (624)	Solid Sodding	58	S.Y.	\$	\$
		TOTAL BID		\$ _____	

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
CONSTRUCTION PLANS

**Black River Relief  
Structure Replacement  
Independence County  
Route 69 Section 4**

NOT TO SCALE

ARKANSAS HIGHWAY DIST. 6

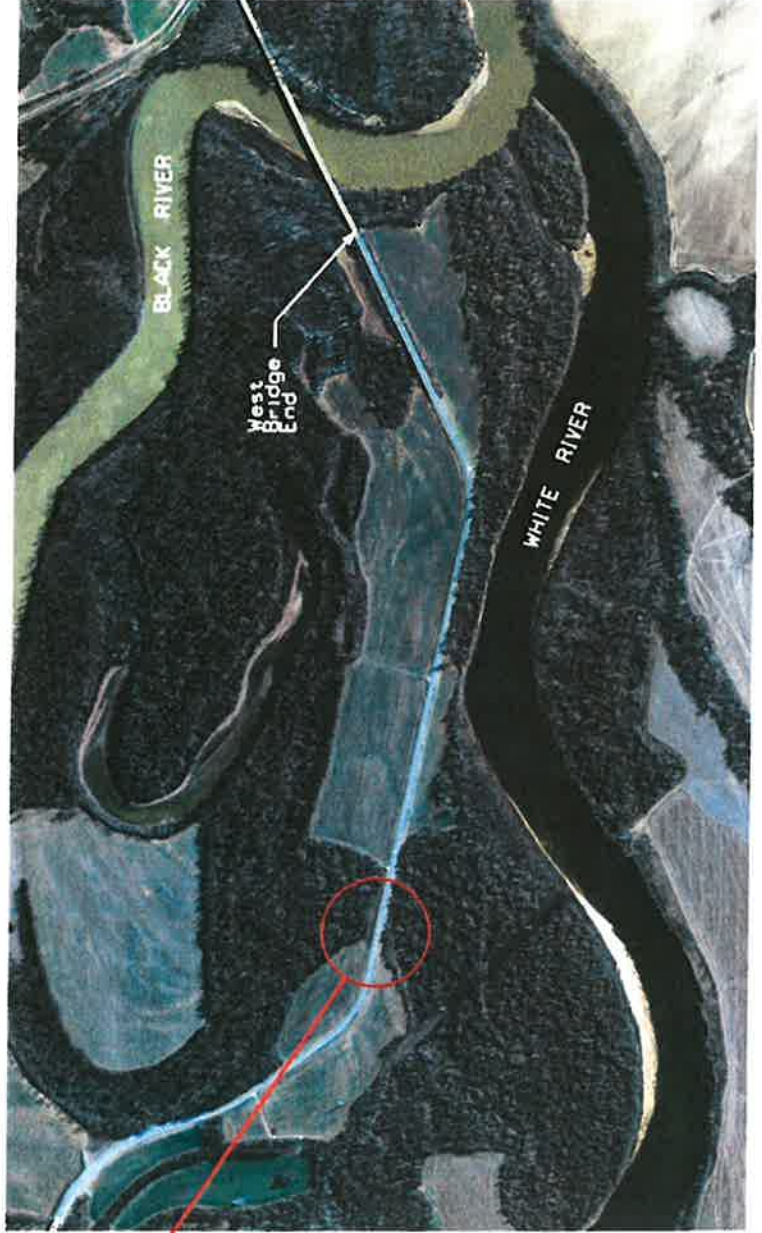


**PROJECT  
LOCATION**

INDEPENDENCE CO. JACKSON CO.



R 3 W



West  
Bridge  
End

**PROJECT  
LOCATION**  
1.9 Mile West  
of the Black River  
Bridge End

T 12 N

**RECEIVED**  
OCT 22 2002  
RD DISTRICT OFFICE  
JACKSONPORT

**INDEX OF SHEETS**

SHEET NO.	TITLE	DRAWING NO.	DATE
1	TITLE SHEET		
2	INDEX OF SHEETS AND SPECIAL PROVISIONS		
3	TYPICAL SECTION OF IMPROVEMENT AND GENERAL NOTES		
4	QUANTITY SHEET		
5	SUMMARY OF QUANTITIES AND REVISIONS		
6	FLARED END SECTION	FES-1	10/18/96
7	FLARED END SECTION	FES-2	10/18/96
8	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	TC-1	12/15/11
9	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	TC-2	3/11/10
10	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	TC-3	10/15/09

**GOVERNING SPECIFICATIONS**

ARKANSAS STATE HIGHWAY COMMISSION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, EDITION OF 2003, AND THE FOLLOWING SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS:

NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
100-1	REQUIRED CONTRACT PROVISIONS FOR STATE CONSTRUCTION JOBS
100-2	MANUAL FOR ASSESSING SAFETY HARDWARE (MASH)
102-1	BIDDING REQUIREMENTS AND CONDITIONS
105-1	CONSTRUCTION CONTROL MARKINGS
105-2	EQUIPMENT AND MATERIAL STORAGE ON BRIDGE STRUCTURES
105-3	CONTROL OF WORK
107-1	WORKER VISIBILITY
108-1	LIQUIDATED DAMAGES
600-1	WATER FOR VEGETATION
603-1	MAINTENANCE OF TRAFFIC
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
604-2	INSPECTION OF TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
606-2	PIPE CULVERTS
JOB SP	PIPE CULVERTS

C.L.  
Exist.  
Rdwy.  
El. 231.0:



F.L. 211.50

F.L. 211.00

The Existing Structure is a  
Dbl. 48" x 122' C.M. Pipe Culvert  
Fill and Abandon Using  
Flowable Select Material = 114 Cu. Yd.

Immediately East of the Existing Structure  
Const. a 48" x 122' R.C. Pipe Culvert (Class V)  
W/ FES Lt. & Rt.

Match Existing Flowlines  
The Pipe Shall Be Jacked Under the Roadway

Note:

Any disturbed areas shall be  
redressed and seeded or sodded.  
Payment shall be considered included  
in the various items of the contract.

**MAINTENANCE OF TRAFFIC**

LOCATION	SIGNS		TRAFFIC DRUMS
	W20-1 (48")	RSP-1	
	SQ. FT.		
ADVANCE 1500' 1000' 500'	96		EACH
ADVANCE 100'		20	
100' Each Dir., 40' O.C.			12
<b>JOB TOTALS</b>	<b>96</b>	<b>20</b>	<b>12</b>

**STRUCTURES**

LOCATION	48" R.C. PIPE CULVERT (CLASS V) LIN. FT.	48" R.C. FLARED END SECTIONS EACH	SOLID SODDING SQ. YD.	WATER M.G.	FLOWABLE SELECT MATERIAL CU. YD.						
						ADJACENT TO EXISTING DBL. 48" CMP	122	2	58	0.7	114
						EXISTING DBL. 48" CMP					
<b>JOB TOTALS</b>	<b>122</b>	<b>2</b>	<b>58</b>	<b>0.7</b>	<b>114</b>						

BASIS OF ESTIMATE

WATER: 12.6 GAL. PER SQ. YD. SODDING



SUMMARY OF QUANTITIES

ITEM NO.	ITEM	QUANTITY	UNIT
206	FLOWABLE SELECT MATERIAL	114	CU. YD.
601	MOBILIZATION	1.00	LUMP SUM
SS&603	MAINTENANCE OF TRAFFIC	1.00	LUMP SUM
SS&604	SIGNS	116	SQ. FT.
SS&604	TRAFFIC DRUMS	12	EACH
SP,SS&606	48" REINFORCED CONCRETE PIPE CULVERTS (CLASS V)	122	LIN. FT.
606	48" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS	2	EACH
SS&620	WATER	0.7	MGAL
624	SOLID SODDING	58	SQ. YD.

REVISIONS

DATE	REVISION	SHEET NO.

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT**  
**SUPPLEMENTAL SPECIFICATION**  
**REQUIRED CONTRACT PROVISIONS FOR STATE CONSTRUCTION JOBS**

During the performance of this contract, the Contractor agrees as follows:

**EQUAL OPPORTUNITY**

**Employment Practices.** (a) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, disability, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, age, disability, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment advertising; layoffs or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

(b) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age, disability, or national origin.

(c) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract, this contract may be canceled, terminated, or suspended in whole or in part.

**Selection of Subcontractors, Procurement of Materials, and Leasing of Equipment.**

(a) The Contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, religion, sex, age, disability, or national origin in the selection and retention of subcontractors, including procurement of materials and leases for equipment.

(b) In all solicitations, either by competitive bidding or negotiation made by the Contractor for work to be performed under a subcontract, including procurement of materials or leases for equipment, each potential subcontractor or supplier shall be notified by the Contractor of the Contractor's obligations under this contract relative to nondiscrimination on the grounds of race, color, religion, sex, age, disability, or national origin.

(c) The Contractor shall provide all information and reports required by the Department and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Department to be pertinent to ascertain compliance with such directives. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the Department and shall set forth what efforts have been made by the Contractor to obtain the information.

(d) In the event of the Contractor's noncompliance with the nondiscrimination provisions of this contract, the Department shall impose such contract sanctions as it may be determine to be appropriate, including, but not limited to:

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT**  
**SUPPLEMENTAL SPECIFICATION**  
**REQUIRED CONTRACT PROVISIONS FOR STATE CONSTRUCTION JOBS**

- (1) withholding of payments to the Contractor under the contract until the Contractor complies, and/or
- (2) cancellation, termination, or suspension of the contract, in whole or in part.

(e) The Contractor shall include the provisions of this Supplemental Specification in every subcontract, including procurements of materials and leases of equipment. The Contractor shall take such action with respect to any subcontractor or procurement as the Department may direct as a means of enforcing such provisions, including sanctions for non-compliance.

**NONSEGREGATED FACILITIES**

By submission of this bid or the execution of this contract or subcontract, the bidder or subcontractor, as appropriate, certified that segregated facilities are not maintained or provided for employees at any of its establishments, and that employees are not permitted to perform services at any location, under bidder/subcontractor control, where segregated facilities are maintained. The bidder/subcontractor further certified that segregated facilities will not be maintained or provided for employees at any of its establishments, and that employees will not be permitted to perform services at any location where segregated facilities are maintained. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, age, disability, or national origin, because of habit, local custom, or otherwise. The bidder/subcontractor agrees that, except where identical certifications have been obtained from proposed subcontractors and material suppliers for specific time periods, identical certification will be obtained from subcontractors prior to the award of subcontracts.

**WAIVER OF CERTIFICATE OF PAYMENTS**

The requirements for certification of payments to DBEs/Non-DBEs, as specified in Subsection 103.08(h), are hereby waived and are not required for this contract.

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
SUPPLEMENTAL SPECIFICATION****Manual for Assessing Safety Hardware (MASH)**

**Sections 604, 617, 731, 732 and 734** of the Standard Specifications for Highway Construction, Edition of 2003, are hereby amended as follows:

The first paragraph of **Subsection 604.02(a)** is deleted and the following is substituted therefore:

All work zone traffic control devices used on the project, including sign supports, barricades, traffic drums equipped with flashing lights, crash cushions, and impact attenuators shall comply with the requirements of National Cooperative Highway Research Program (NCHRP) Report 350 or the Manual for Assessing Safety Hardware (MASH). The Contractor shall furnish a certification of such compliance from the manufacturer or supplier of all work zone traffic control devices prior to using the devices on the project. The certification shall state the device meets the requirements of NCHRP 350 or MASH and include a copy of the Federal Highway Administration's (FHWA) approval letter with all attachments for each device. Devices shall be fabricated and installed in accordance with the plans and with the crash testing documentation provided in the FHWA approval letter, which is available at [http://safety.fhwa.dot.gov/roadway\\_dept/policy\\_guide/road\\_hardware/](http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/).

The 2lb. (0.9 kg) minimum channel post or 4" x 4" (100 mm x 100 mm) wood post sign support systems, installed in accordance with the plans (direct buried), have been previously tested and accepted, and, therefore, do not require certification. No direct payment will be made for fulfilling the requirements of this Specification, but full compensation will be considered included in the contract unit prices bid for the various traffic control devices.

The third sentence of paragraph three of **Subsection 617.01** is deleted and the following sentence substituted therefore:

The guardrail terminal shall satisfy the National Cooperative Highway Research Program (NCHRP) Report 350 or the Manual for Assessing Safety Hardware (MASH) for a test level 3 (TL-3) terminal.

The first sentence of paragraph one of **Subsection 617.02(f)** is deleted and the following sentence substituted therefore:

The Contractor shall furnish a certification from the manufacturer or supplier that the guardrail terminal meets the requirements of NCHRP Report 350 or MASH for a TL-3 terminal.

The second sentence of **Subsection 731.01** is deleted and the following sentence substituted therefore:

The attenuation barrier shall satisfy the National Cooperative Highway Research Program (NCHRP) Report 350 or the Manual for Assessing Safety Hardware (MASH) requirements for a Test Level 3 (TL-3) crash cushion.

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
SUPPLEMENTAL SPECIFICATION****Manual for Assessing Safety Hardware (MASH)**

The first sentence of paragraph one of **Subsection 731.02** is deleted and the following sentence substituted therefore:

The Contractor shall furnish a certification from the manufacturer or supplier that the impact attenuation barrier meets the requirements of NCHRP Report 350 or MASH for a TL-3 crash cushion.

The second sentence of **Subsection 732.01** is deleted and the following sentence substituted therefore:

The crash cushion shall satisfy the National Cooperative Highway Research Program (NCHRP) Report 350 or the Manual for Assessing Safety Hardware (MASH) requirements for a Test Level 3 (TL-3) crash cushion.

The first sentence of **Subsection 732.02(b)** is deleted and the following sentence substituted therefore:

The Contractor shall furnish a certification from the manufacturer or supplier that the crash cushion meets the requirements of NCHRP Report 350 or MASH for a TL-3 crash cushion.

The second sentence of **Subsection 734.01** is deleted and the following sentence substituted therefore:

The bridge end terminal shall satisfy the National Cooperative Highway Research Program (NCHRP) Report 350 or the Manual for Assessing Safety Hardware (MASH) requirements for a Test Level 3 (TL-3) terminal.

The first sentence of **Subsection 734.02(b)** is deleted and the following sentence substituted therefore:

The Contractor shall furnish a certification from the manufacturer or supplier that the bridge end terminal meets the requirements of NCHRP Report 350 or MASH for a TL-3 terminal.

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
SUPPLEMENTAL SPECIFICATION  
BIDDING REQUIREMENTS AND CONDITIONS**

**SECTION 102, BIDDING REQUIREMENTS AND CONDITIONS, IS AMENDED AS FOLLOWS:**

**Subsection 102.04(j), of Issuance of Proposals,** is hereby deleted and the following substituted therefore:

- (j)** If the prospective bidder is the Contractor on a current Contract with the Commission on which Liquidated Damages are being assessed, and there are no pending time extensions warranted to remove the project from Liquidated Damages; or if the prospective bidder has an individual, as an officer/owner/partner of any firm, partnership, or corporation which has a current Contract with the Commission on which Liquidated Damages are being assessed, and there are no pending time extensions warranted to remove the project from Liquidated Damages.

**Subsection 102.04(k), of Issuance of Proposals,** is hereby deleted and the following substituted therefore:

- (k)** If the prospective bidder has a current Contract in default or has an officer/owner/partner of any firm, partnership, or corporation which has a current Contract in default.

The following is added as **Subsection 102.04(m), of Issuance of Proposals:**

- (m)** Failure to submit a Certification of Officers/Owners/Partners.

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
SUPPLEMENTAL SPECIFICATION**

**Construction Control Markings**

**Section 105** of the Standard Specifications for Highway Construction, Edition of 2003, is hereby amended as follows:

The following is added as the last paragraph of **Subsection 105.09**:

All construction control markings made for layout work, placement of traffic control devices, spotting for placement of pavement markings, or for any other purposes on structures, curb and gutters, pavements, or any surfaces that will not either be removed or covered by succeeding pavement layers or other construction shall be made with non-permanent materials (chalk, keel, non-permanent paint, etc.). Failure to comply with this requirement will result in removal of the markings by the Contractor at no expense to the Department.

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
SUPPLEMENTAL SPECIFICATION**

**Equipment and Material Storage on Bridge Structures**

**Section 105** of the Standard Specifications for Highway Construction, Edition of 2003, is hereby amended as follows:

The following is added as the fifth paragraph of **Subsection 105.14**:

No vehicles weighing in excess of the legal load (or the load posted for an existing bridge), no off road hauling equipment, cranes, or other non-legal highway vehicles or equipment will be allowed to cross or be placed on an existing or newly constructed bridge deck without the submittal of an engineering analysis for review and approval by the Engineer. No materials will be permitted to be stored or stockpiled on an existing bridge deck or on a bridge deck constructed on the project without the submittal of an engineering analysis for review and approval by the Engineer. Each submitted engineering analysis shall be prepared by a Registered Professional Engineer who shall certify the adequacy of all components for the anticipated loads. Inspection records and, when available, design drawings may be obtained from the Engineer for use in the professional engineer's analysis of existing structures.



**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT****SUPPLEMENTAL SPECIFICATION****CONTROL OF WORK**

**SECTION 105, CONTROL OF WORK**, is amended as follows:

The first sentence of the last paragraph of Subsection 105.06 Cooperation by Contractor is hereby deleted and the following substituted therefore:

The Contractor shall furnish an agent who is a competent superintendent or supervisor who is on the project while work is being performed and accessible to the Engineer during all hours of each work day. The agent shall be capable of reading and fully understanding the plans and specifications and thoroughly experienced in the type of work being performed.

5-24-07

SS-107-1  
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**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT**

**SUPPLEMENTAL SPECIFICATION**

**WORKER VISIBILITY**

**Section 107** of the Standard Specifications for Highway Construction, Edition of 2003, is hereby amended as follows:

The following is added as the third paragraph of **Subsection 107.01(b)**:

All workers within the right-of-way of a Federal-Aid highway who are exposed either to traffic (vehicles using the highway for travel purposes) or to construction equipment within the work area shall wear high-visibility safety apparel meeting the Performance Class 2 or 3 requirements of the ANSI/ISEA 107-2004 publication entitled "American National Standard for High – Visibility Safety Apparel and Headwear."

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT**

**SPECIAL PROVISION**

**LIQUIDATED DAMAGES**

As specified in the Contract, liquidated damages for this project will be as shown in the following table:

**WORKING DAY PROJECTS**

<b><u>ORIGINAL CONTRACT AMOUNT</u></b>		
<b>FROM MORE THAN</b>	<b>TO AND INCLUDING</b>	<b>RATE</b>
\$ 0	\$ 50,000	\$ 400
50,000	100,000	700
100,000	500,000	800
500,000	1,000,000	1100
1,000,000	2,000,000	1300
2,000,000	5,000,000	1500
5,000,000	10,000,000	1900
10,000,000	15,000,000	2000
15,000,000	20,000,000	2100
20,000,000	-----	2500

**FIXED DATE PROJECTS**

<b><u>ORIGINAL CONTRACT AMOUNT</u></b>		
<b>FROM MORE THAN</b>	<b>TO AND INCLUDING</b>	<b>RATE</b>
\$ 0	\$ 50,000	\$ 90
50,000	100,000	100
100,000	500,000	200
500,000	1,000,000	250
1,000,000	2,000,000	320
2,000,000	5,000,000	400
5,000,000	10,000,000	600
10,000,000	-----	750

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
SUPPLEMENTAL SPECIFICATION  
WATER FOR VEGETATION**

**Division 600** of the Standard Specifications for Highway Construction, Edition of 2003, is hereby amended as follows:

**SECTION 620, SEEDING, IS AMENDED AS FOLLOWS:**

Paragraphs (1) and (2) of **Subsection 620.03(f), Water**, are hereby deleted and the following substituted therefore:

**(f) Water. (1) Initial Application.** From April 1 through December 31, either the day before the seeding is placed or on the day of the seeding operation (either before the seed is placed or after the application of the mulch cover), a minimum of 20.4 M Gallons per acre (188 cu m or 188 kL per ha) of water will be applied to thoroughly moisten the soil to the depth of pulverization and then as necessary to germinate the seed. This quantity may be reduced by the Engineer dependent on the soil moisture conditions immediately prior to the application of the seeding. Failure to apply the initial application of the quantity of water directed by the Engineer will result in a deduction in payment as shown below. Water used for hydro-seeding or tackifier application will not be measured or paid for, and will not be included in the quantity of water required for the initial water application. The initial application of water and deductions for failure to water will not be required from January 1 through March 31.

**(2) Weekly Application.** From April 1 – December 31, unless otherwise directed by the Engineer, the Contractor shall apply water in an amount such that, in conjunction with any rainfall, the seeded and mulched areas will receive an amount equivalent to a minimum of  $\frac{3}{4}$ " (19 mm) of water each week beginning the week after seeding and continuing for a minimum of four (4) weeks ( $\frac{3}{4}$ " [19 mm] of water is equivalent to 20.4 M Gallons per acre [188 cu m or 188 kL per ha]). The Engineer will adjust the amount of water required each week to deduct any rainfall received during the 7 calendar day period prior to the weekly watering. The weekly applications of water and deductions for failure to water will not be required from January 1 through March 31.

**SECTION 621, TEMPORARY EROSION CONTROL ITEMS AND DEVICES, IS AMENDED AS FOLLOWS:**

The fourth and fifth paragraphs of **Subsection 621.03(b), Temporary Seeding**, are hereby deleted and the following substituted therefore:

From April 1 through December 31, either the day before the temporary seeding is placed or on the day of the temporary seeding operation (either before the seed is placed or after the application of the mulch cover) an application of water will be applied, in accordance with Subsection 620.03(f)(1). No subsequent weekly waterings will be required for Temporary Seeding.

Failure to meet this application of water requirement will result in a permanent deduction in payment and /or permanent recovery of payments equal to the minimum bid price established in Subsection 620.05(d) for each M.G. (kL) not applied as directed in accordance with these specifications. Equipment and methods used to place the water shall be in accordance with Subsection 620.03(f)(4).

**SECTION 624, SOLID SODDING, IS AMENDED AS FOLLOWS:**

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
SUPPLEMENTAL SPECIFICATION  
WATER FOR VEGETATION**

The second paragraph of **Subsection 624.03(c), Placement of Sod**, is hereby deleted and the following substituted therefore:

When sodding is completed, the sodded areas shall be cleared of loose sod, excess soil, or other foreign material; a thin application of topsoil shall be scattered over the sod as a top dressing; and the areas thoroughly moistened. Water shall be applied at a minimum rate of 20.4 M Gallons per acre (188 cu m or 188 kL per ha) or as directed by the Engineer for a period of at least 3 weeks. The Engineer will adjust the amount of water required each week to deduct any rainfall received during the 7 calendar day period prior to the weekly watering. The weekly applications of water and deductions for failure to water will not be required from January 1 through March 31. The time required for application of water will not be included in the computation of contract time for completion of the project provided all other work under the Contract has been completed.

Failure to meet this water application requirement will result in a permanent deduction in payment and /or permanent recovery of payments equal to the minimum bid price established in Subsection 620.05(d) for each M.G. (kL) not applied as directed in accordance with these specifications. Equipment and methods used to place the water shall be in accordance with Subsection 620.03(f)(4).

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
SUPPLEMENTAL SPECIFICATION  
MAINTENANCE OF TRAFFIC**

**Division 600** of the Standard Specifications for Highway Construction, Edition of 2003, is hereby amended as follows:

**SECTION 603, MAINTENANCE OF TRAFFIC AND TEMPORARY STRUCTURES, IS AMENDED AS FOLLOWS:**

Paragraph 3 of **Subsection 603.02(d), Projects on Existing Roadways**, is hereby deleted and the following substituted therefore:

The Contractor shall provide the Engineer with a minimum of three full business days advance, written notification of any non-emergency lane closure or lane width restriction. The first full business day shall commence at midnight on the first business day following written notification to the Engineer. This advanced notification is required to allow adequate notice for the issuance of over width load permits by the Department.

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
SUPPLEMENTAL SPECIFICATION**

**Retroreflective Sheeting for Traffic Control Devices in Construction Zones**

**Section 604** of the Standard Specifications for Highway Construction, Edition of 2003, is hereby amended as follows:

The first two paragraphs of **Subsection 604.02(b)** are hereby deleted and the following substituted therefore:

**(b) Signs, Vertical Panels, Barricades, Drums and Traffic Cones.** Materials for signs required under this subsection shall comply with materials requirement of the plans, specifications and the MUTCD for the construction of signs using ASTM D 4956 Type VII, VIII, or IX sheeting for non-orange signs and Fluorescent Orange retroreflective sheeting furnished according to the QPL for orange signs. Materials for vertical panels and barricades shall comply with ASTM D 4956 Type VII, VIII, or IX sheeting.

Retroreflective sheeting used on traffic drums shall meet the requirements of ASTM D4956 for Type III or Type IV with the additional requirements for Reboundable Sheeting. Retroreflective sheeting for delineators shall meet the requirements of ASTM D 4956 for Type IX sheeting.

Table 604-1 Fluorescent Orange Sheeting and Table 604-2 Fluorescent Orange Color Specification Limits (Daytime) in **Subsection 604.02(b)** are hereby deleted and the following substituted therefore:

**TABLE 604-1  
Fluorescent Orange Sheeting**

Observation Angle	Minimum Coefficient Of Retroreflection Candelas Per Foot Candle Per Square Foot	
	Entrance Angle	Fluorescent Orange
0.2	-4.0	200
0.2	30.0	92
0.5	-4.0	80
0.5	30.0	30

**TABLE 604-2  
Fluorescent Orange Color Specification Limits (Daytime)**

Corner Point:	1		2		3		4	
	x	y	x	y	x	y	x	y
	0.583	0.418	0.516	0.397	0.560	0.341	0.655	0.345

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
SUPPLEMENTAL SPECIFICATION**

**Inspection of Traffic Control Devices in Construction Zones**

**Section 604** of the Standard Specifications for Highway Construction, Edition of 2003, is hereby amended as follows:

The last sentence of paragraph one of **Subsection 604.03(a)** is hereby deleted and the following substituted therefore:

The certification for inspection of traffic control devices shall be documented on the attached "Traffic Control Device Inspection Checklist", which is to be completed in its entirety, as applicable, on a daily basis.

The Traffic Control Device Inspection Checklist form is available on the Department's website at:

[http://www.arkansashighways.com/construction\\_division/TrafficControlDeviceInspectionForm.pdf](http://www.arkansashighways.com/construction_division/TrafficControlDeviceInspectionForm.pdf)



**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT**  
**SUPPLEMENTAL SPECIFICATION**  
**PIPE CULVERTS**

**Section 606** of the Standard Specification for Highway Construction, Edition of 2003, is hereby amended as follows:

The fifth paragraph of **Subsection 606.02 Materials (b) Reinforced Concrete Pipe** is hereby deleted and the following substituted therefor:

(4) Joints shall be sealed with either preformed rubber gaskets or bitumen/ butyl rubber plastic gaskets complying with AASHTO M 198 or with tubular cross-section closed cellular rubber gaskets complying with the physical requirements of ASTM D 1056 (Type 2, Class C, Grade 1) and meeting the chemical requirements of AASHTO M 198.

The sixth paragraph of **Subsection 606.03 Construction (d) Joining Pipe** is hereby deleted and the following substituted therefore:

(3) When tubular cross-section closed cellular rubber gaskets are selected by the Contractor, the gaskets shall be a single, continuous part conforming to the joint shape. The outer surface of the gasket shall be completely covered with a natural skin. The cross-sectional diameters and installation practices shall be in accordance with the manufactures' recommendations for the size of pipe or culvert being placed.

To ensure an even and well-filled joint, the final joining of the pipe shall be accomplished by either pushing or pulling, by approved mechanical means, each joint of the pipe as it is laid. In cold weather, when directed, the joint material shall be warmed in a hot water bath, or by other approved methods, to the extent required to keep the material pliable for placement without breaking or cracking.

1-10-95

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
SPECIAL PROVISION  
PIPE CULVERTS**

**DESCRIPTION:** Section 606, Pipe Culverts, of the Standard Specifications shall be expanded to include jacking concrete pipe. The work shall consist of jacking concrete pipe through the existing roadway embankment at the locations shown on the plans or as directed by the Engineer.

**CONSTRUCTION METHODS:** The culvert pipe shall be pushed through the roadway embankment in conformity with the lines and grades as shown on the plans or as established by the Engineer. Approved mechanical boring devices shall be used, no hand digging will be allowed. Tolerance on grade variance will be no more than 0.1' for an entire bore.

Borings should be augered progressively ahead of the leading edge of the advancing pipe as spoil is augered or mucked back through the pipe. Annular void and overbreaks should be minimized by having cutterhead sized closely to pipe diameter and the pipe advanced with cutterhead in close proximity. Overbore should not exceed 5 percent of the pipe diameter. Water used to lubricate or cool bits must be done using a pressure gauge. Water pressure at the bore or auger head shall not exceed 10 psig in the operation.

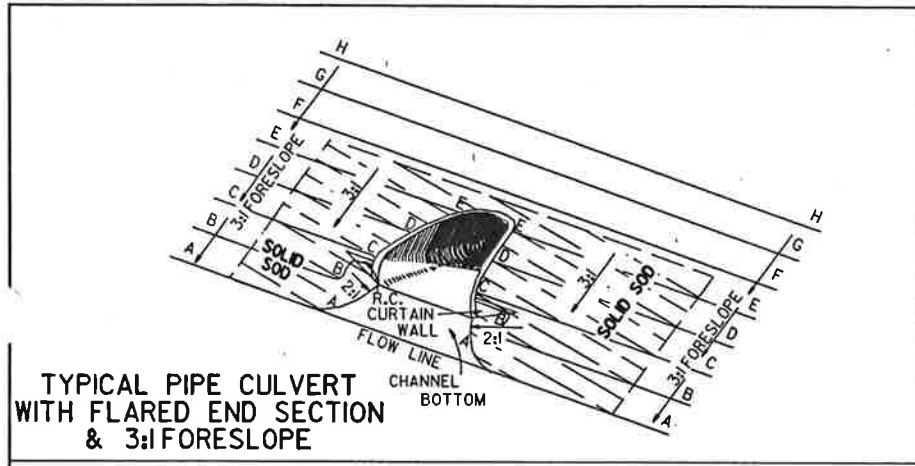
The Contractor's operations shall be arranged so as to cause no interference with roadway traffic.

Any damage done to the existing roadway due to the jacking operations shall be repaired by the Contractor at no expense to the State.

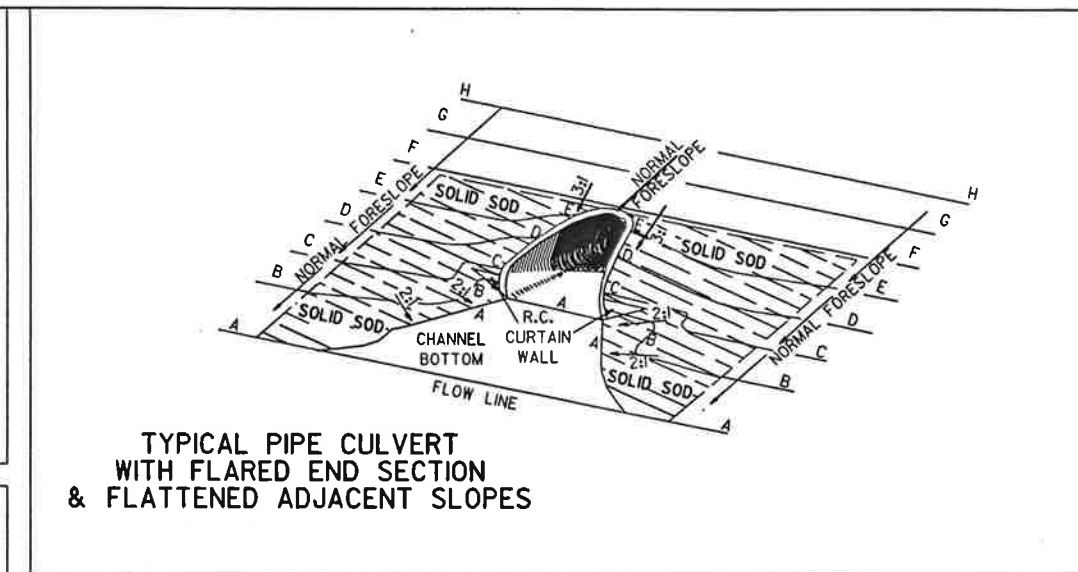
The Contractor will use all precaution to prevent damage to the culvert pipe during the jacking operation and shall replace any damaged sections at his own expense.

Excavated material may be placed in the roadway embankment if approved by the engineer or otherwise disposed of by the Contractor, but will in no case be left in piles or in such locations that will obstruct drainage or present an unsightly appearance.

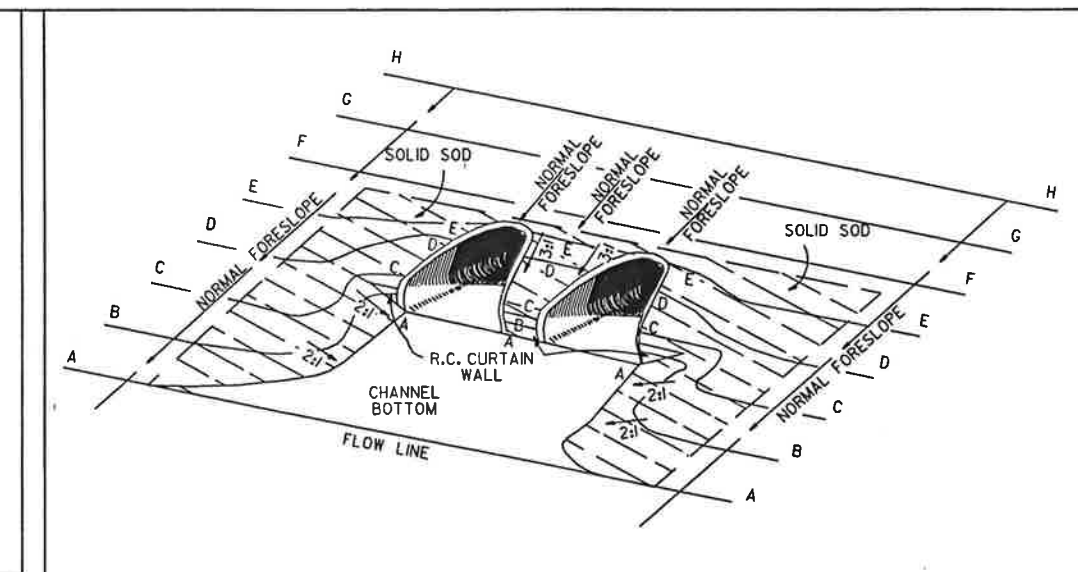
**BASIS OF PAYMENT:** Payment for fulfilling the requirements of this Specification shall be considered to be included in the price bid for the size and type of pipe culvert designated.



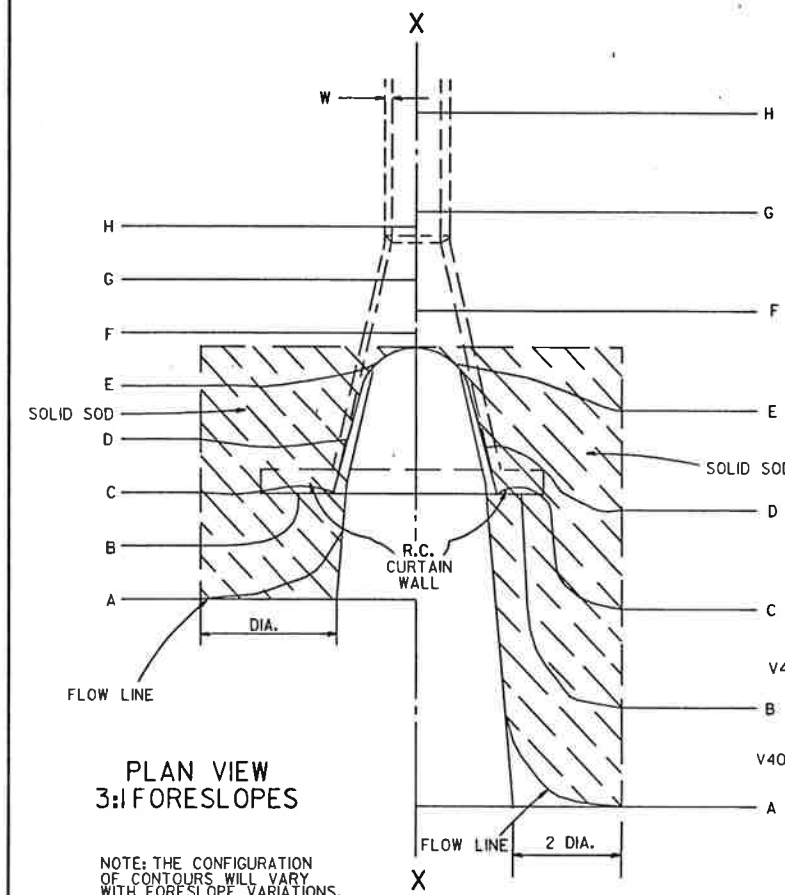
TYPICAL PIPE CULVERT WITH FLARED END SECTION & 3:1 FORESLOPE



TYPICAL PIPE CULVERT WITH FLARED END SECTION & FLATTENED ADJACENT SLOPES



TYPICAL MULTIPLE PIPE CULVERT WITH FLARED END SECTIONS & FLATTENED ADJACENT SLOPES



PLAN VIEW 3:1 FORESLOPES

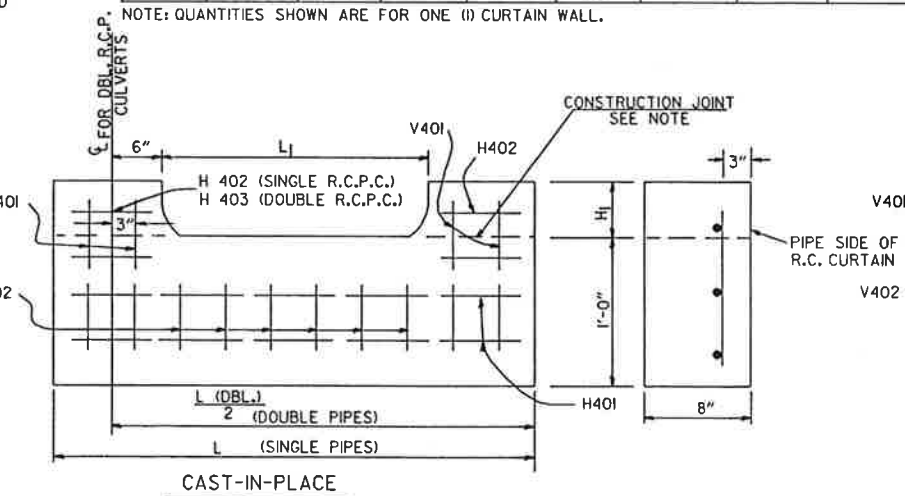
NOTE: THE CONFIGURATION OF CONTOURS WILL VARY WITH FORESLOPE VARIATIONS.

PLAN VIEW FLATTENED FORESLOPES

R.C. CURTAIN WALL DIMENSIONS & QUANTITIES

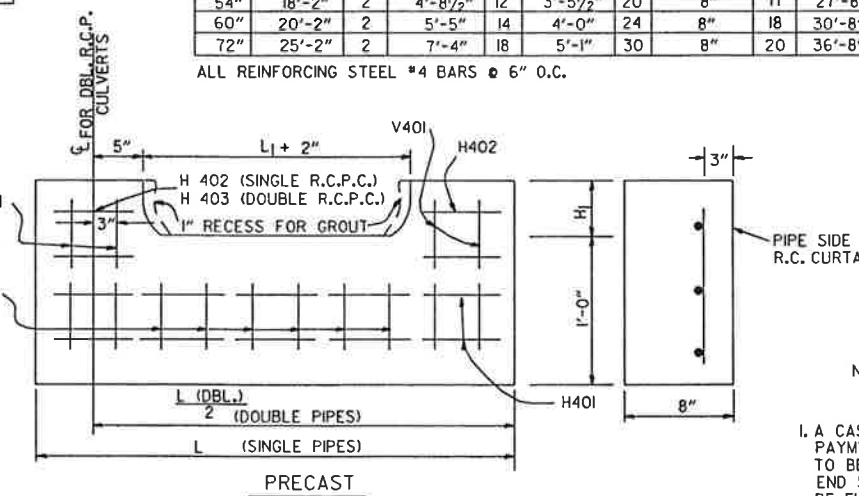
PIPE DIA.	H <sub>1</sub>	L <sub>1</sub>	L	L (DBL.) / 2	SINGLE R.C.P.C.		DOUBLE R.C.P.C.	
					CONC.	REINF. STEEL	CONC.	REINF. STEEL
					CU. YDS.	LBS.	CU. YDS.	LBS.
18"	11 1/2"	3'-5"	8'-0"	6'-3"	0.31	27.7	0.45	39.5
24"	1'-0 1/2"	4'-6"	9'-6"	7'-6"	0.37	33.4	0.53	48.0
30"	1'-3 1/2"	5'-7"	11'-0"	9'-0"	0.45	39.0	0.67	59.0
36"	1'-7"	6'-8"	13'-0"	10'-6"	0.58	52.6	0.83	73.9
42"	2'-1 1/2"	7'-3"	15'-6"	12'-0"	0.82	77.1	1.10	100.7
48"	2'-5"	7'-10"	17'-0"	13'-0"	0.98	94.9	1.27	120.4
54"	2'-9 1/2"	8'-5"	18'-6"	14'-0"	1.16	115.8	1.47	143.7
60"	3'-4"	9'-0"	20'-6"	15'-6"	1.47	149.7	1.84	180.3
72"	4'-5"	10'-2"	25'-6"	18'-6"	2.31	232.6	2.73	271.0

NOTE: QUANTITIES SHOWN ARE FOR ONE (1) CURTAIN WALL.



R.C. CURTAIN WALL DETAILS

NOTE: THE PORTION OF THE R.C. CURTAIN WALL BENEATH THE FLARED END SECTION (LOWER 1'-0") SHALL BE PLACED MONOLITHICALLY. THE FLARED END SECTION SHALL THEN BE SET IN PLACE & THE REMAINING PORTIONS OF THE R.C. CURTAIN WALL PLACED.



NOTE: THE PRECAST CURTAIN WALL WILL BE SET AND BACKFILLED WITH COMPACTED MATERIAL. THE FLARED END SECTION SHALL THEN BE SET IN PLACE AND THE 1" RECESS FILLED WITH GROUT. WHERE "L" EXCEEDS 11' THE CURTAIN WALL MAY BE CAST IN TWO (2) OR MORE SECTIONS. THE METHOD OF JOINING THE SECTIONS FOR INSTALLATION SHALL BE APPROVED BY THE ENGINEER.

REINFORCING STEEL SCHEDULE

PIPE DIA.	SINGLE R.C. PIPE CULVERT								DOUBLE R.C. PIPE CULVERT									
	H401		H402		V401		V402		H401		H402		H403		V401		V402	
	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.
18"	7'-8"	2	1'-11 1/2"	4	1'-7 1/2"	8	8"	8	12'-2"	2	1'-11 1/2"	4	8"	2	1'-7 1/2"	10	8"	14
24"	9'-2"	2	2'-2"	4	1'-8 1/2"	10	8"	9	14'-8"	2	2'-2"	4	8"	2	1'-8 1/2"	12	8"	18
30"	10'-8"	2	2'-4 1/2"	4	1'-11 1/2"	10	8"	12	17'-8"	2	2'-4 1/2"	4	8"	2	1'-11 1/2"	14	8"	22
36"	12'-8"	2	2'-10"	6	2'-3"	12	8"	14	20'-8"	2	2'-10"	6	8"	3	2'-3"	14	8"	28
42"	15'-2"	2	3'-9 1/2"	8	2'-9 1/2"	16	8"	15	23'-8"	2	3'-9 1/2"	8	8"	4	2'-9 1/2"	18	8"	30
48"	16'-8"	2	4'-3"	10	3'-1"	18	8"	16	25'-8"	2	4'-3"	10	8"	5	3'-1"	20	8"	32
54"	18'-2"	2	4'-8 1/2"	12	3'-5 1/2"	20	8"	17	27'-8"	2	4'-8 1/2"	12	8"	6	3'-5 1/2"	22	8"	34
60"	20'-2"	2	5'-5"	14	4'-0"	24	8"	18	30'-8"	2	5'-5"	14	8"	7	4'-0"	26	8"	36
72"	25'-2"	2	7'-4"	18	5'-1"	30	8"	20	36'-8"	2	7'-4"	18	8"	9	5'-1"	33	8"	40

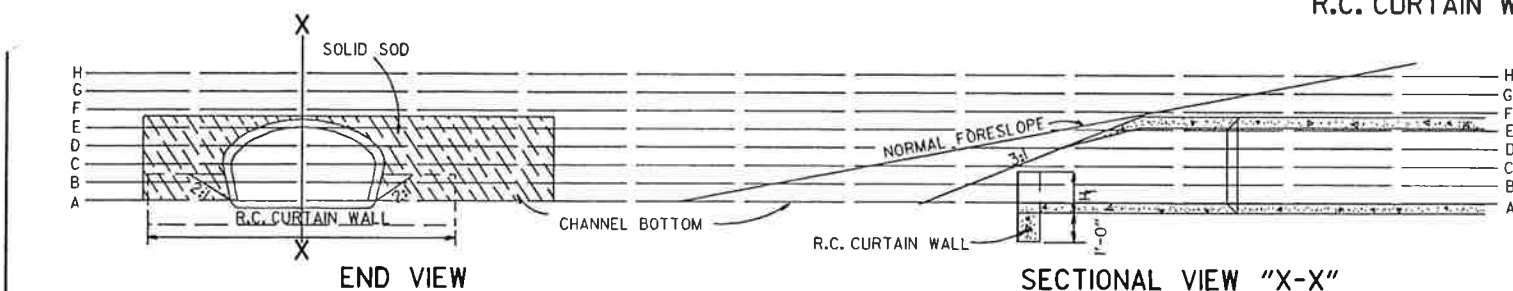
ALL REINFORCING STEEL #4 BARS @ 6" O.C.

SOLID SODDING

PIPE DIA.	SINGLE R.C.P.C.			DOUBLE R.C.P.C.		
	3:1	4:1	6:1	3:1	4:1	6:1
	SQ. YDS.					
18"	5	7	12	6	8	13
24"	8	12	19	9	13	20
30"	13	18	29	14	19	30
36"	17	26	41	18	28	43
42"	23	35	55	25	37	57
48"	29	46	68	31	48	70
54"	35	57	85	37	59	87
60"	45	62	104	48	65	107
72"	64	92	156	67	95	159

NOTE: QUANTITIES SHOWN ABOVE ARE FOR ONE (1) END OF F.E.S.

- GENERAL NOTES
1. A CAST-IN-PLACE OR PRECAST CURTAIN WALL MAY BE USED. PAYMENT FOR THE CURTAIN WALL SHALL BE CONSIDERED TO BE INCLUDED IN THE UNIT PRICE BID EACH FOR FLARED END SECTIONS OF THE SEVERAL SIZES, WHICH PRICE SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIALS INCLUDING REINFORCING STEEL AND CONCRETE; FOR FORMS, MIXING AND PLACING; FOR EXCAVATION AND BACKFILL, AND FOR ALL LABOR, TOOLS, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.
  2. ALL EXPOSED EDGES SHALL BE CHAMFERED 3/4".
  3. CONCRETE FOR CURTAIN WALL SHALL MEET THE REQUIREMENTS FOR CLASS A OR S CONCRETE AS PROVIDED IN SECTION 802 OF THE STANDARD SPECIFICATIONS OR FOR PAVING CONCRETE AS PROVIDED IN SECTION 501 OF THE STANDARD SPECIFICATIONS.
  4. WELDED WIRE MESH 3 x 3 W/10 x W10 MAY BE USED IN LIEU OF REINFORCING BARS.

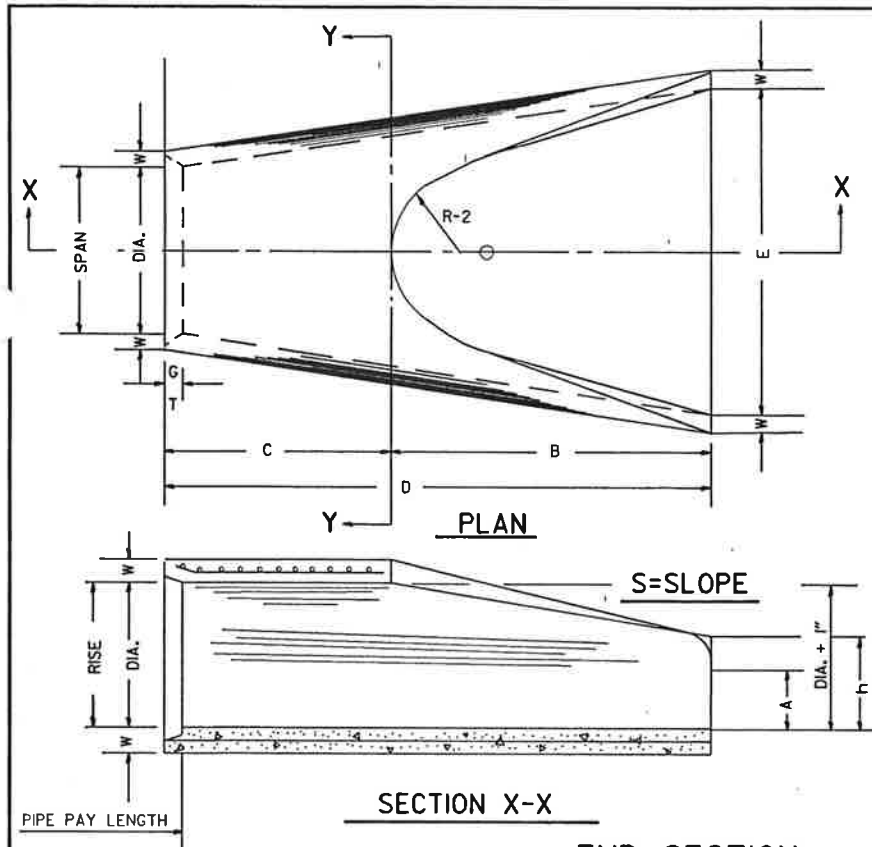


END VIEW

SECTIONAL VIEW "X-X"

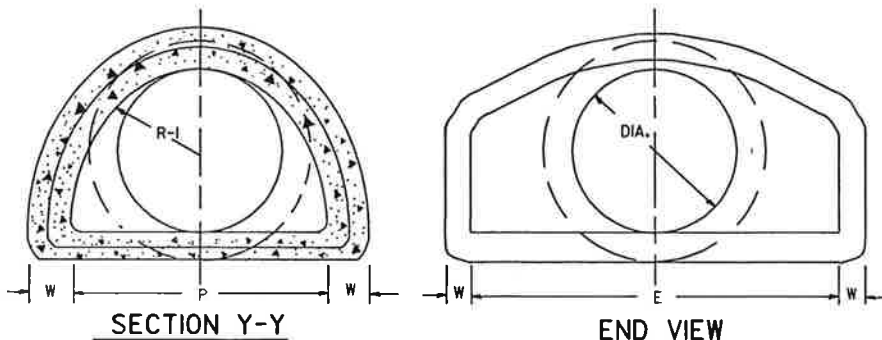
10-18-96	ADDED NOTE TO SOLID SODDING		ARKANSAS STATE HIGHWAY COMMISSION
10-12-95	CORRECTED SPELLING		
11-3-94	ADDED GENERAL NOTE NO. 4		
8-15-91	REV. CURTAIN WALL QUANT. STEEL SCH. & SOLID SOD QUANT.		
3-2-81	ALLOW PRECAST IN 2 OR MORE PIECES CHAMFER EDGES		
5-15-80	ADDED PRECAST WALL & GENERAL NOTES		
10-2-72	REVISED AND REDRAWN		
DATE	REVISION	FILMED	STANDARD DRAWING FES-1

FLARED END SECTION



### TABLE OF DIMENSIONS

DIA.	WALL	A	B	C	D	E	S	DIA. + 1"	P	R-1	R-2	G-T	WT.	h
18"	2 1/2"	9"	2'-3"	3'-10"	6'-1"	3'-0"	3:1	19"	29"	15 1/2"	12"	2"	1000	1'-0 1/2"
24"	3"	9 1/2"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	3:1	25"	33 3/8"	16 3/8"	14"	2 1/2"	1600	1'-1 1/2"
30"	3 1/2"	1'-0"	4'-6"	1'-7 3/4"	6'-1 3/4"	5'-0"	3:1	31"	37"	18 1/2"	15"	3 1/4"	1940	1'-4 5/8"
36"	4"	1'-3"	5'-3"	2'-10 3/4"	8'-1 3/4"	6'-0"	3:1	37"	47 1/8"	24 3/8"	20"	3 1/2"	4100	1'-8"
42"	4 1/2"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	3:1	43"	53 3/8"	27 1/2"	22"	3 1/2"	5380	2'-2 1/2"
48"	5"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	3:1	49"	56 1/2"	28 1/2"	22"	3 1/2"	6550	2'-6"
54"	5 1/2"	2'-4"	6'-6"	1'-10"	8'-4"	7'-6"	3:1	55"	65 1/2"	33 1/8"	24"	4"	8750	2'-10 1/2"
60"	6"	2'-10"	6'-6"	1'-10"	8'-4"	8'-0"	3:1	61"	72 1/2"	36 1/8"	24"	4"	9270	3'-5"
72"	7"	3'-10"	6'-6"	1'-10"	8'-4"	9'-0"	3:1	73"	77 1/2"	38 1/8"	24"	5"	13250	4'-6"



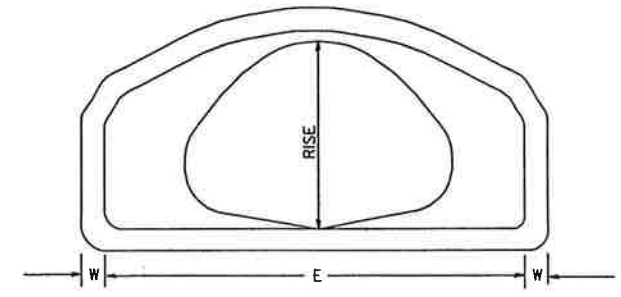
**END SECTION FOR REINFORCED CONCRETE PIPE CULVERTS**

NOTE: TONGUE END ON UPSTREAM SECTION  
GROOVE END ON DOWNSTREAM SECTION

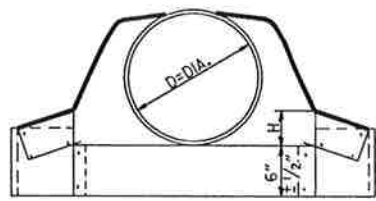
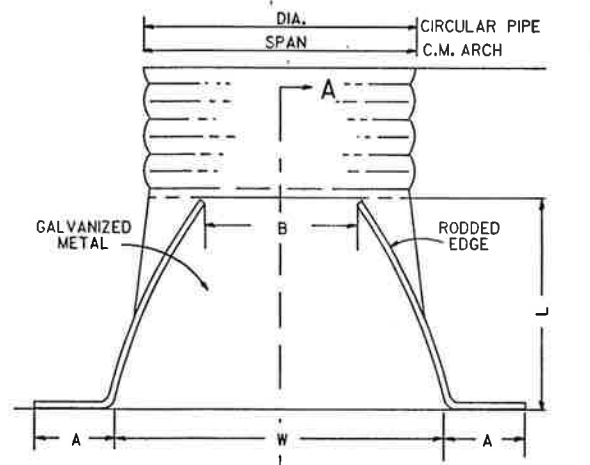
### ARCH PIPE

EQUIV. DIA.	• SPAN		• RISE		W	A	B	C	D	E	P	R2	G-T	S
	AASHTO M 206	AHD NOMINAL	AASHTO M 206	AHD NOMINAL										
INCHES														
15	18	18	11	11	2"	4"	2'-0"	4'-0"	6'-0"	3'-0"	29"	12"	1 1/2"	2 1/2:1
18	22	22	13 1/2	14	2 1/2"	5"	2'-0"	4'-1"	6'-1"	3'-6"	32 1/8"	13"	2 1/2"	2 1/2:1
21	26	26	15 1/2	16	2 3/4"	7"	2'-3"	3'-10"	6'-1"	4'-0"	34 1/8"	14"	2 1/2"	2 1/2:1
24	28 1/2	29	18	18	3"	9"	2'-3"	3'-10"	6'-1"	5'-0"	36 1/8"	15"	2 1/2"	2 1/2:1
30	36 1/4	36	22 1/2	23	3 1/2"	10"	3'-1"	3'-0 1/2"	6'-1 1/2"	6'-0"	47 3/8"	20"	3"	2 1/2:1
36	43 3/4	44	26 3/8	27	4"	10 1/2"	4'-0"	2'-1 1/2"	6'-1 1/2"	6'-6"	54 3/8"	22"	3 1/2"	2 1/2:1
42	51 1/8	51	31 1/8	31	4 1/2"	11 1/2"	4'-7"	1'-10 1/4"	6'-5 1/4"	7'-2"	59 1/8"	23"	3 3/4"	2 1/2:1
48	58 1/2	59	36	36	5"	1'-3"	5'-3"	2'-10 3/4"	8'-1 3/4"	7'-10"	70 3/8"	24"	4 1/4"	2 1/2:1
54	65	65	40	40	5 1/2"	1'-7"	5'-3"	2'-11"	8'-2"	8'-6"	72 1/8"	24"	4 1/4"	2 1/2:1
60	73	73	45	45	6"	1'-10"	5'-6"	2'-8"	8'-2"	9'-0"	77 3/8"	24"	5"	2 1/2:1

• THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PER CENT FROM THE VALUES SPECIFIED BY AASHTO M 206.



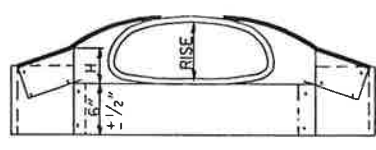
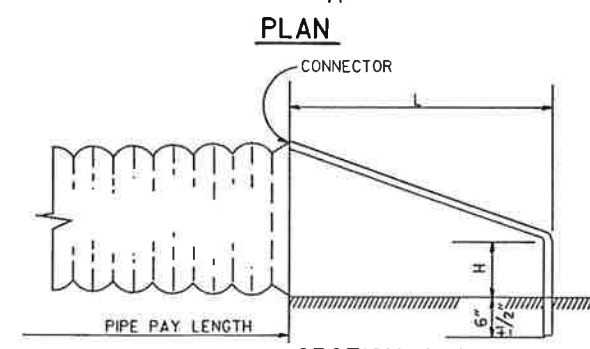
**END VIEW CONCRETE ARCH PIPE**



**CIRCULAR PIPE**

### CIRCULAR PIPE

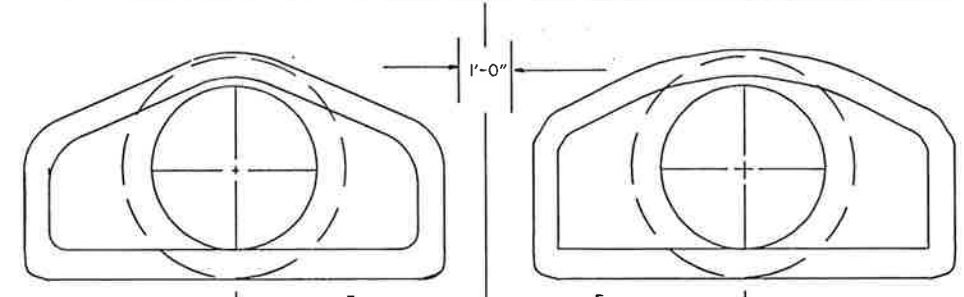
D. DIA.	GAUGE	A 1" ±	B. MAX.	H 1" ±	L 1/2" ±	W ±	S
12	16	6	6	6	21	24	2 1/2:1
15	16	7	8	6	26	30	2 1/2:1
18	16	8	10	6	31	36	2 1/2:1
21	16	9	12	6	36	42	2 1/2:1
24	16	10	13	6	41	48	2 1/2:1
30	14	12	16	8	51	60	2 1/2:1
36	14	14	19	9	60	72	2 1/2:1
42	12	16	22	11	69	84	2 1/2:1
48	12	18	27	12	78	90	2 1/2:1
54	12	18	30	12	84	102	2:1
60	12	18	33	12	87	114	1 1/2:1
66	12	18	36	12	87	120	1 1/2:1
72	12	18	39	12	87	126	1 1/2:1



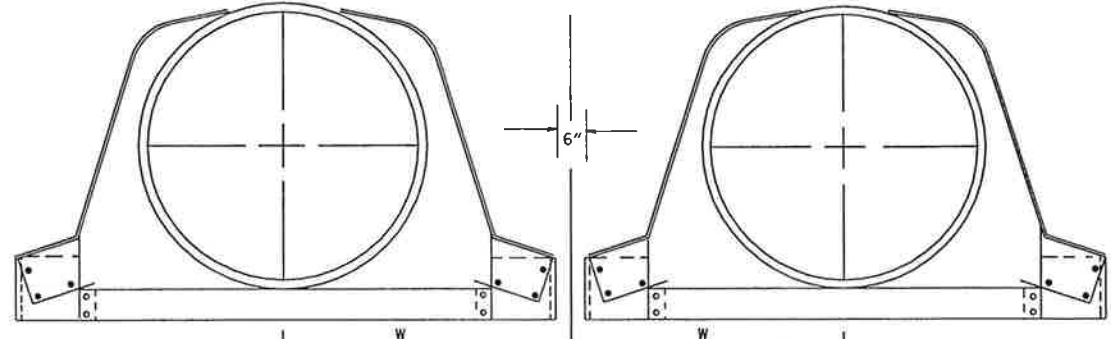
**C.M. ARCH PIPE**

### C.M. ARCH PIPE

EQUIV. DIA.	SPAN	RISE	A 1" ±	B. MAX.	H 1" ±	L 1/2" ±	W ±	S	GAUGE
15"	17	13	7	9	6	19	30	2 1/2:1	16
18"	21	15	7	10	6	23	36	2 1/2:1	16
21"	24	18	8	12	6	28	42	2 1/2:1	16
24"	28	20	9	14	6	32	48	2 1/2:1	16
30"	35	24	10	16	6	39	60	2 1/2:1	14
36"	42	29	12	18	8	46	75	2 1/2:1	14
42"	49	33	13	21	9	53	85	2 1/2:1	12
48"	57	38	18	26	12	63	90	2 1/2:1	12
54"	64	43	18	30	12	70	102	2 1/2:1	12
60"	71	47	18	33	12	77	114	2 1/2:1	12



**MULTIPLE R.C. PIPE CULVERTS**












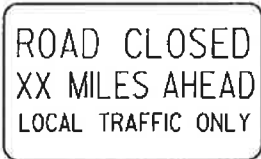

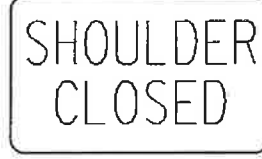








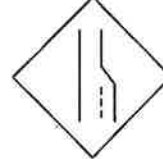



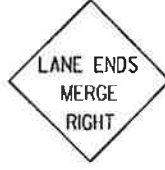














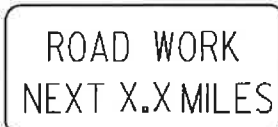
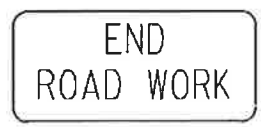
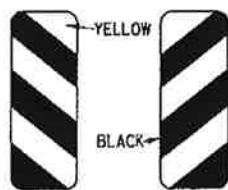


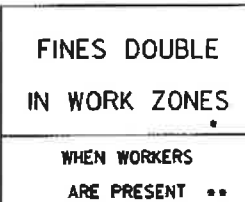
**MULTIPLE C.M. PIPE CULVERTS**

NOTE: ALTERNATE CONNECTIONS TO THE PIPE CULVERTS, IN ACCORDANCE WITH MANUFACTURER'S STANDARD PRACTICES, MAY BE MADE SUBJECT TO THE APPROVAL OF THE ENGINEER.

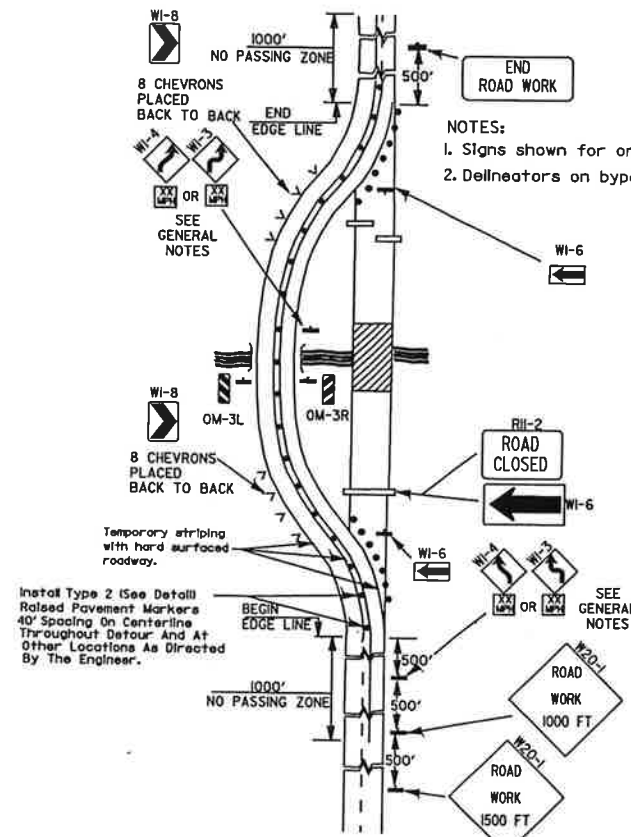
**END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS**

10-18-96	REVISED ASTM REF. TO AASHTO	664-5-15-80	ARKANSAS STATE HIGHWAY COMMISSION
5-15-80	REVISED DISTANCE BETWEEN MULTIPLE R.C.P. F.E.S.	752-7-14-78	
7-14-78	C.M. ARCH SIZES TO CONFORM WITH AASHTO SIZES	517-8-22-75	
8-22-75	ADDED MULTIPLE PIPE CULVERTS	500-12-5-74	
12-5-74	REMOVED NOTE RE REINF. FOR R.C.F.E.S.	627-5-24-73	
5-24-73	CMP END SECTION, SHOW PIPE PAY LENGTH	760-10-2-72	
10-2-72	REVISED AND REDRAWN		
DATE	REVISION	FILED	

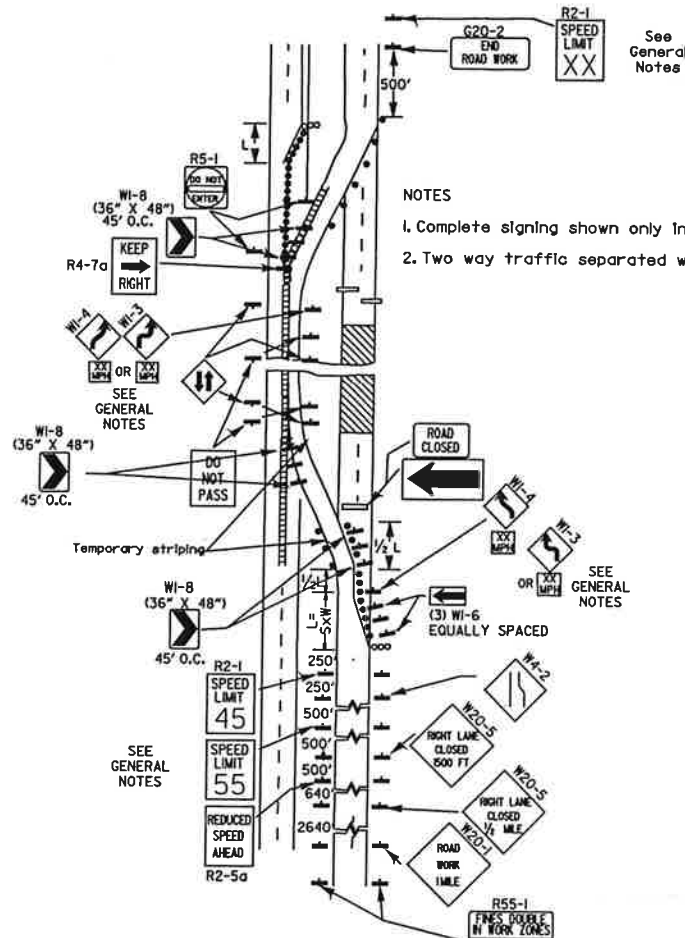
**FLARED END SECTION  
STANDARD DRAWING FES-2**

							ADVANCE DISTANCES (XXXX)
<p>RI-1</p>  <p>STANDARD 30"x30" EXPRESSWAY 36"x36" SPECIAL 48"x48"</p>	<p>RI-2</p>  <p>STD. 36"x36"x36" EXPWY. 48"x48"x48" FWY. 60"x60"x60"</p>	<p>R2-1</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>R2-5A</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>R2-5C</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>R4-1</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>R4-2</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>500 FT 1000 FT 1500 FT</p> <p>1/2 MILE 3/4 MILE 1 MILE AHEAD</p>
<p>GENERAL NOTES:</p> <ol style="list-style-type: none"> <li>ALL TRAFFIC CONTROL DEVICES USED ON ROAD CONSTRUCTION SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, AND TO THE STANDARD HIGHWAY SIGNS, LATEST EDITION, OR AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION.</li> <li>TRAFFIC CONTROL DEVICES SHALL BE SET UP JUST BEFORE THE START OF CONSTRUCTION OPERATIONS AND SHALL BE PROPERLY MAINTAINED DURING THE TIME SUCH CONDITIONS EXIST. THEY SHALL REMAIN IN PLACE ONLY AS LONG AS NEEDED AND REMOVED THEREAFTER.</li> <li>EXISTING SIGNS AND CONSTRUCTION SIGNS SHALL BE KEPT IN PROPER POSITION, AND BE CLEAN AND LEGIBLE AT ALL TIMES. SIGNS THAT DO NOT APPLY TO EXISTING CONDITIONS SHALL BE REMOVED. SIGNS THAT ARE DAMAGED, DEFACED, OR THAT ACCUMULATE DIRT DURING CONSTRUCTION SHALL BE CLEANED, REPAIRED, OR REPLACED.</li> <li>SIGNS ARE USUALLY MOUNTED ON A SINGLE POST, ALTHOUGH THOSE WIDER THAN 36" OR LARGER THAN 10 SQ. FT. SHALL BE MOUNTED ON TWO POSTS OR ABOVE A TYPE II BARRICADE.</li> <li>SIGN POSTS DIRECT BURIED IN SOIL SHALL BE 2 LB. MINIMUM CHANNEL POST OR 4"x4" WOOD POSTS. CHANNEL POSTS SHALL BE PAINTED GREEN. WOOD POSTS SHALL BE PAINTED WHITE. ALL POSTS SHALL BE NEATLY CONSTRUCTED, AND SHALL BE REPLUMBED, CLEANED, OR REPAIRED AS NEEDED FOR THE DURATION OF THE JOB. THERE SHALL NOT BE MORE THAN 2 POSTS IN A 7' PATH FOR WOOD OR CHANNEL POSTS. ANY CHANNEL POST SPLICE SHALL BE IN ACCORDANCE WITH STANDARD DRAWING TC-3.</li> <li>POST MOUNTED SIGNS IN RURAL AREAS SHALL BE CONSTRUCTED WITH THE NEAR EDGE OF THE SIGN FROM 6 TO 12 FEET FROM THE PAVEMENT EDGE. SIGNS IN URBAN AREAS AND BARRICADE MOUNTED SIGNS SHALL BE MOUNTED A MINIMUM OF 2 FEET FROM THE PAVEMENT EDGE.</li> <li>ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN URBAN AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN RURAL AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE. EXCEPT A MINIMUM OF 6' SHALL BE USED WHEN MOUNTING AN ADVISORY SIGN BELOW A WARNING SIGN. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR INTERMEDIATE TERM STATIONARY WORK CONDITIONS. THE SIGNS MINIMUM MOUNTING HEIGHT SHALL BE 5'. RETROREFLECTIVE DEVICES SHALL BE USED. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR SHORT-TERM, SHORT DURATION, AND MOBILE CONDITIONS. THEY SHALL BE NO LESS THAN ONE FOOT ABOVE THE TRAVELED WAY. LONG-TERM STATIONARY SIGNS SHALL BE DIRECT BURIED IN SOIL, UNLESS CONDITIONS NECESSITATE THE USE OF PORTABLE SIGNS, OR AS APPROVED BY THE ENGINEER. CONCRETE PADS, CONCRETE OR ROCK BALLAST, OR OTHER SOLID MATERIALS SHALL NOT BE UTILIZED WITH PORTABLE SIGN SUPPORTS.</li> <li>FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.</li> <li>MOST OF THE SIGNS SHOWN ARE ORIENTED TO THE RIGHT. HOWEVER, THIS DOES NOT PRECLUDE THE USE OF MIRROR IMAGES OF THESE SIGNS WHERE THE REVERSE ORIENTATION MIGHT BETTER CONVEY TO MOTORISTS THE PROPER DIRECTION OF MOVEMENT.</li> <li>R55-1 SIGNS SHALL BE PLACED AT LEAST 1500' BUT NOT MORE THAN 1 MILE IN ADVANCE OF THE WORK ZONE. IF A SPEED LIMIT REDUCTION IS IN EFFECT, THE SIGN SHALL BE PLACED A MINIMUM OF 500' IN ADVANCE OF THE "REDUCED SPEED AHEAD" SIGN.</li> </ol>							
<p>R5-1</p>  <p>STD. 30"x30" EXPWY. 36"x36" SPECIAL 48"x48"</p>	<p>R11-2</p>  <p>48"x30"</p>	<p>R11-3A</p>  <p>60"x30"</p>	<p>R11-4</p>  <p>60"x30"</p>	<p>RSP-1</p>  <p>48"x30"</p>	<p>W1-1</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W1-2</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	
<p>W1-3</p>  <p>STD. 48"x48"</p>	<p>W1-4</p>  <p>STD. 48"x48"</p>	<p>W1-6</p>  <p>STD. 48"x24" SPECIAL 60"x30"</p>	<p>W1-8</p>  <p>STD. 18"x24" SPECIAL 24"x30" EXPWY. 30"x36" FWY. 36"x48"</p>	<p>W3-1</p>  <p>STD. 36"x36" SPECIAL 48"x48"</p>	<p>W3-2</p>  <p>STD. 36"x36" SPECIAL 48"x48"</p>	<p>W4-2</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	
<p>W5-1</p>  <p>STD. 36"x36" SPECIAL 48"x48"</p>	<p>W6-3</p>  <p>EXPWY. 36"x36" SPECIAL 48"x48"</p>	<p>W8-7</p>  <p>EXPWY. 36"x36" FWY. 48"x48"</p>	<p>W9-2</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W13-1</p>  <p>STD. 24"x24"</p>	<p>W20-1</p>  <p>STD. 48"x48"</p>	<p>W20-2</p>  <p>STD. 48"x48"</p>	<p>W20-3</p>  <p>STD. 48"x48"</p>
<p>W20-4</p>  <p>STD. 48"x48"</p>	<p>W20-5</p>  <p>STD. 48"x48"</p>	<p>W20-7a</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W21-2</p>  <p>STD. 30"x30" SPECIAL 36"x36"</p>	<p>W21-5</p>  <p>STD. 30"x30" SPECIAL 36"x36"</p>	<p>W24-1</p>  <p>STD. 36"x36"</p>	<p>W1-4b</p>  <p>STD. 48"x48"</p>	<p>R56-1</p>  <p>STD. 18"x18"</p>
<p>W8-11</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W8-9</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>G20-1</p>  <p>60"x24"</p>	<p>G20-2</p>  <p>48"x24"</p>	<p>OM-3L OM-3R</p>  <p>12"x36"</p>	<p>M4-9</p>  <p>STD. 30"x24" SPECIAL 48"x36" SPECIAL 60"x48"</p>	<p>M4-10</p>  <p>48"x18"</p>	<p>R55-1</p>  <p>36"x60"</p> <p>• USE 6" C LETTERS •• USE 4" D LETTERS</p>

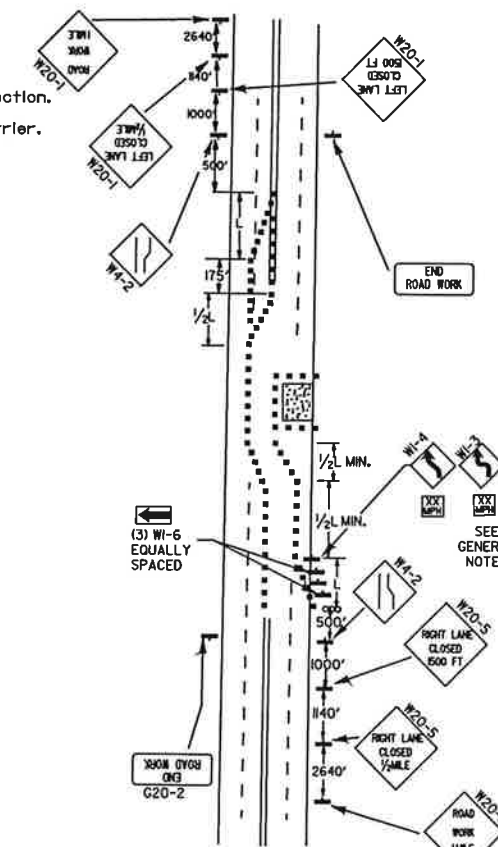
DATE	REVISION	FILMED
12-15-1	REVISED W24-1	
1-17-10	DELETED W8-9a & ADDED W8-9	
10-15-09	ADDED REFERENCE TO MASH & ADDED SIGN W24-1	
4-17-08	REVISED SIGN DESIGNATIONS	
11-18-04	REVISED NOTES	
10-13-03	REVISED NOTE 1	
11-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
11-18-98	ADDED NOTE	
6-26-97	REVISED NOTE 5	
4-03-97	REVISED NOTE 5	
10-18-96	ADDED CONTROLLED ACCESS HWY. SIGN & TO NOTE 7	
10-12-95	ADDED R55-1	
6-8-95	REVISED TO CORRECT SIGN ILLUSTRATIONS	6-8-95
2-2-95	REVISED PER PART VI, MUTCD SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	



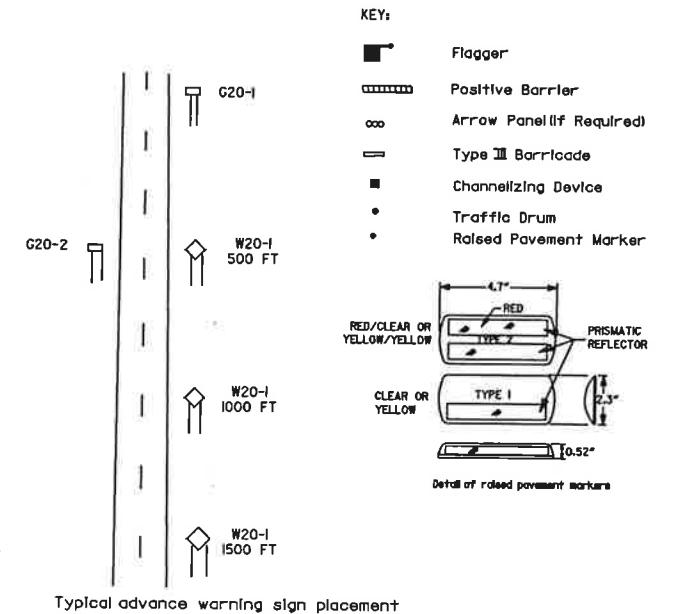
(A) Typical application of traffic control devices on a 2-lane highway where the entire roadway is closed and a bypass detour is provided.



(B) Typical application - 4-lane divided roadway where one roadway is closed.

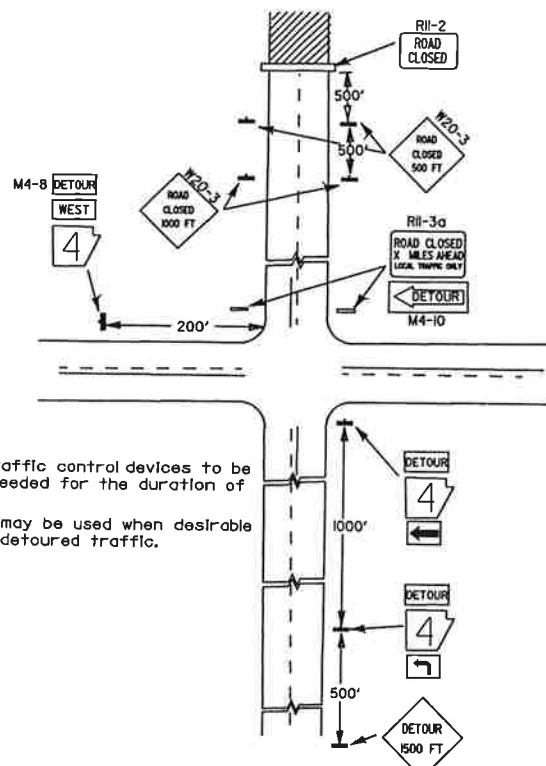


(C) Typical application - 4-lane undivided roadway where half of the roadway is closed.

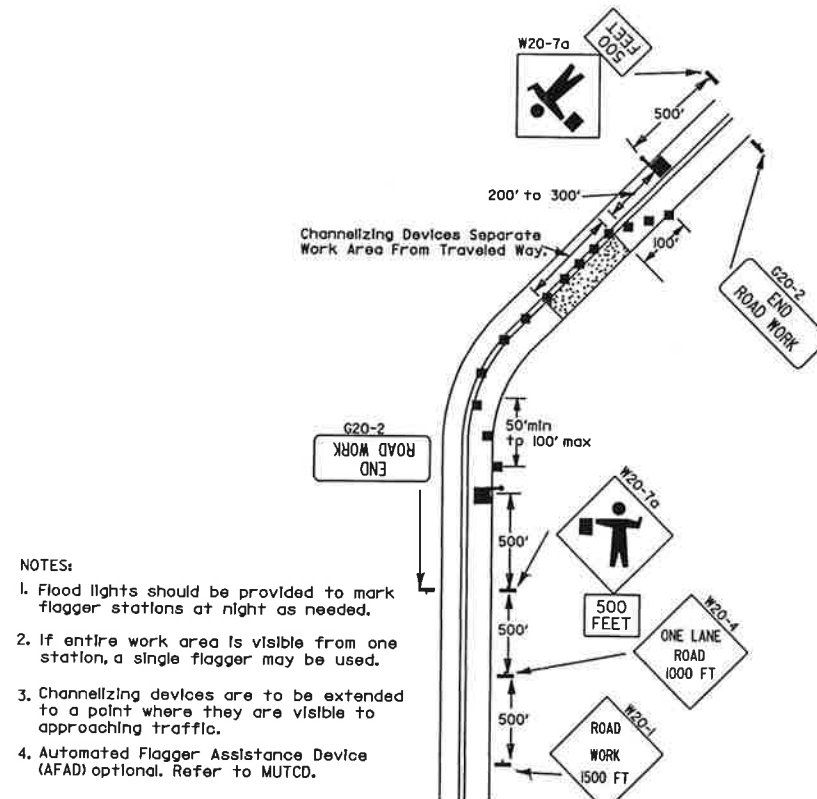


Taper formulae:  
 $L = S \times W$  for speeds of 45mph or more.  
 $L = \frac{WS^2}{60}$  for speeds of 40mph or less.  
 Where:  
 L = Minimum length of taper.  
 S = Numerical value of posted speed limit prior to work or 85th percentile speed.  
 W = Width of offset.

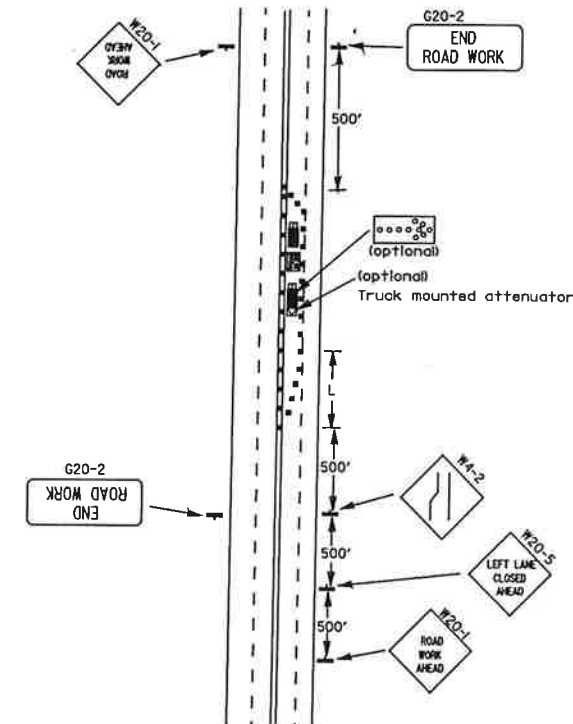
- GENERAL NOTES:
- Advisory speed posted on W1-3 or W1-4 curve warning signs to be determined at site. Use W1-4 when speed is greater than 30mph and W1-3 when 30mph or less.
  - When the existing speed limit is 45mph and the plans require a speed limit of 45mph, the R2-1(45) shall be omitted and the R2-5A shall be installed at that location. Additional R2-145mph speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1(45) shall be installed to match original speed limit.
  - When the existing speed limit is 65mph and the plans require a speed limit of 55mph, the R2-1(45) shall be omitted. Additional R2-155mph speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1(45) shall be installed to match original speed limit.
  - The maximum spacing between channelizing devices in a taper should be approximately equal in feet to the speed limit. Beyond the taper, maximum spacing shall be two times the speed limit, or as directed by the Engineer.
  - Warning lights and/or flags may be mounted to signs or channelizing devices at night as needed.
  - Pavement markings no longer applicable which might create confusion in the minds of vehicle operators shall be removed or obliterated as soon as practicable.
  - Trailer mounted devices such as arrow panels and portable changeable message signs shall be delineated by affixing conspicuity material in a continuous line on the face of the trailer. When placed on or adjacent to the shoulder and not behind a positive barrier, these devices shall be delineated by placing five (5) traffic drums, equally spaced along the traffic side of the device.



(D) Typical application - roadway closed beyond detour point.



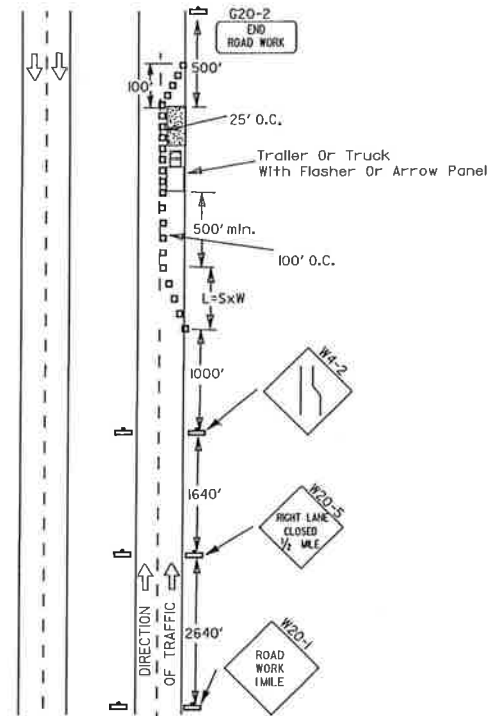
(E) Typical application of traffic control devices on 2-lane highway where one lane is closed and flagging is provided.



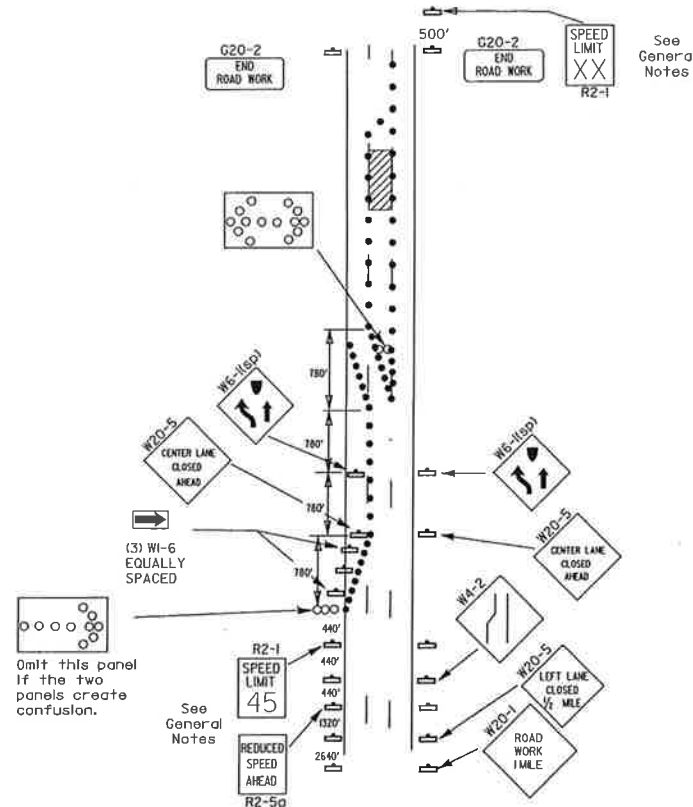
(F) Typical application - 4-lane undivided roadway with inside lane closed.

DATE	REVISION	FILMED
3-11-10	ADDED (AFAD)	
8-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON W1-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

Channelizing devices



(A) Typical application - daytime maintenance operations of short duration on a 4-lane divided roadway where half of the roadway is closed.

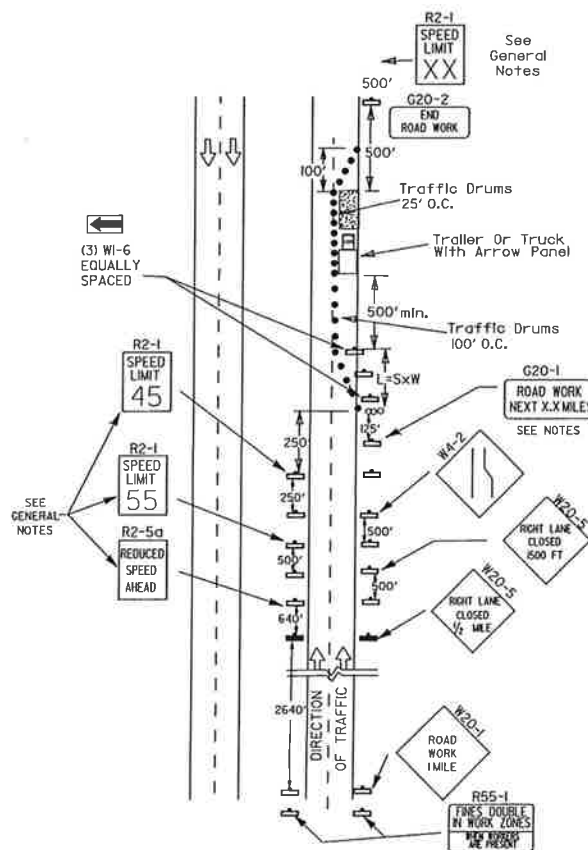


(B) Typical application - 3-lane oneway roadway where center lane is closed.

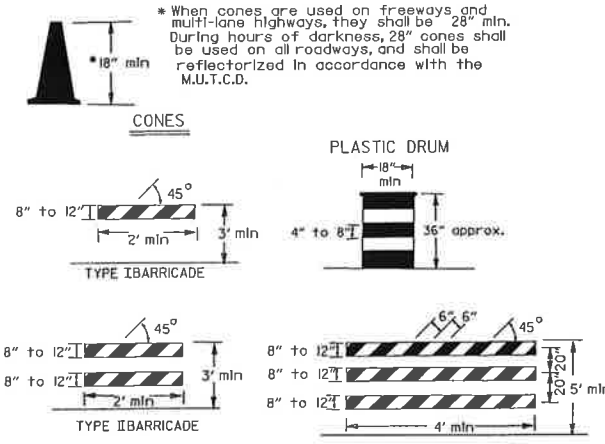
- KEY:
- ◻ Arrow Panel (if Required)
  - Channelizing Device
  - Traffic drum

GENERAL NOTES:

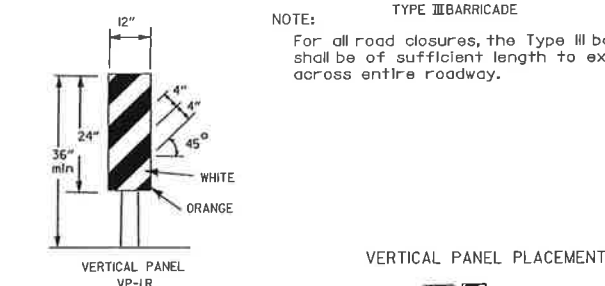
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the R2-5A shall be installed at that location. Additional R2-145mph speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
3. When the existing speed limit is 65mph and the plans require a speed limit of 55mph, the R2-1(65) shall be omitted. Additional R2-155mph speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
4. The maximum spacing between channelizing devices in a taper should be approximately equal in feet to the speed limit. Beyond the taper, maximum spacing shall be two times the speed limit or as directed by the Engineer.
5. Warning lights and/or flags may be mounted to signs or channelizing devices at night as needed.
6. Pavement markings no longer applicable which might create confusion in the minds of vehicle operators shall be removed or obliterated as soon as practicable.
7. The G20-1 sign will be required on jobs of over two miles in length. When the lane closure is not at the beginning of the project, the G20-1 sign shall be erected 125' in advance of the job limit. Additional W20-1(1 MILE) signs are not required in advance of lane closures that begin inside the project limits.
8. Flaggers shall use STOP/SLOW paddles for controlling traffic through work zones. Flags may be used only for emergency situations.
9. All plastic drums and cones shall meet the requirements of NCHRP-350 or Manual for Assessing Safety Hardware (MASH).
10. Trailer mounted devices such as arrow panels and portable changeable message signs shall be delineated by affixing conspicuity material in a continuous line on the face of the trailer. When placed on or adjacent to the shoulder and not behind a positive barrier, these devices shall be delineated by placing five (5) traffic drums, equally spaced along the traffic side of the device.



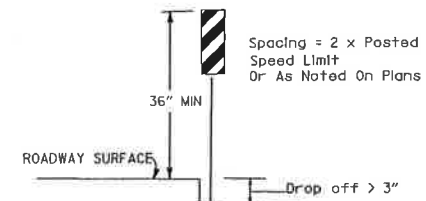
(C) Typical application - construction operations of intermediate to long term duration on a 4-lane divided roadway where half of the roadway is closed.



NOTE: For all road closures, the Type III barricades shall be of sufficient length to extend across entire roadway.



VERTICAL PANEL PLACEMENT

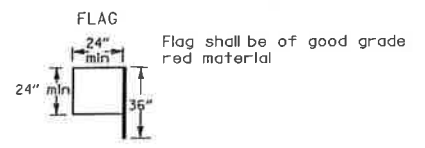


TRAFFIC CONTROL DEVICES FOR VERTICAL PAVEMENT DIFFERENTIALS

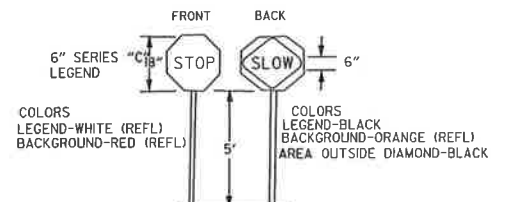
VERTICAL DIFFERENTIAL	LOCATIONS	TRAFFIC CONTROL
1" to 3"	Centerline, lane lines	W8-11
1" to 3"	Edge of shoulder	W8-9
Greater than 3"	Lane lines	Standard lane closure required
Greater than 3"	Edge of traveled lane	*RSP-1 and vertical panels, drums or concrete barrier
Greater than 3"	Edge of shoulder	*Vertical panels, drums or concrete barrier

\* When shown on the plans concrete barrier will be used.

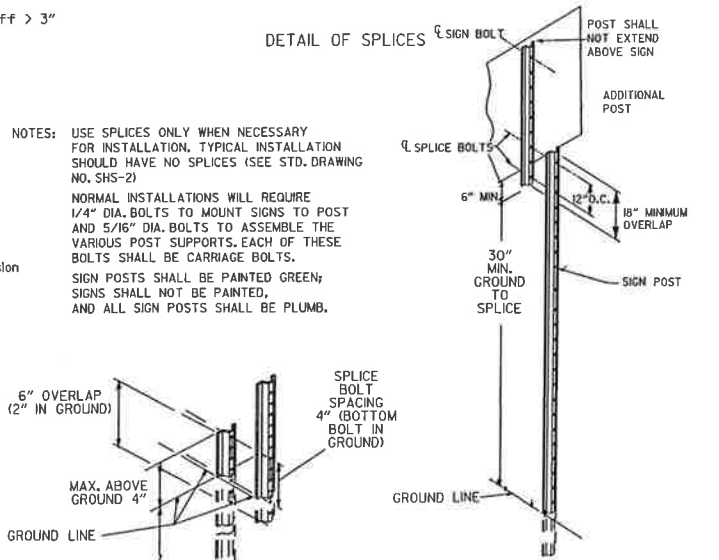
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.



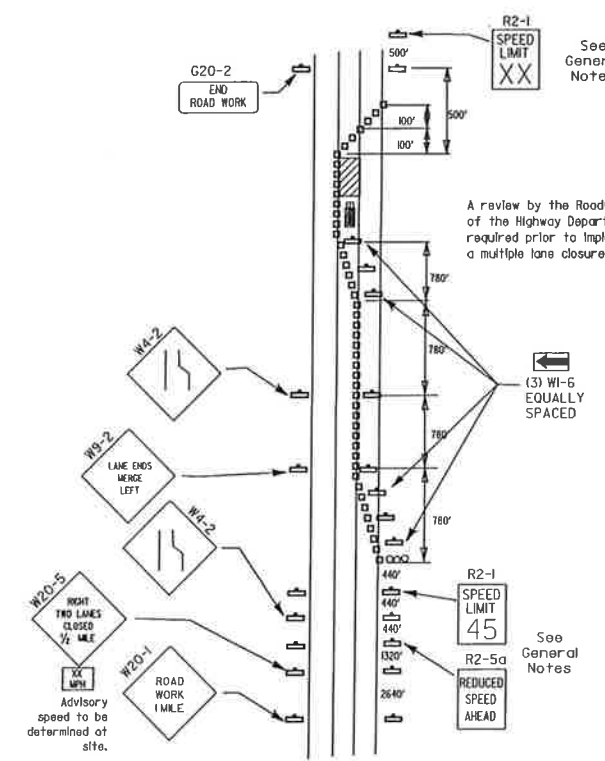
STOP SLOW PADDLE



DETAIL OF SPLICES



- NOTES:
- USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-2)
  - NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. BOLTS TO MOUNT SIGNS TO POST AND 5/16" DIA. BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS. EACH OF THESE BOLTS SHALL BE CARRIAGE BOLTS.
  - SIGN POSTS SHALL BE PAINTED GREEN; SIGNS SHALL NOT BE PAINTED, AND ALL SIGN POSTS SHALL BE PLUMB.



(D) Typical application - closing multiple lanes of a multilane highway.

DATE	REVISION	FILED
10-15-09	ADDED REFERENCE TO MASH	
4-20-08	REVISED SIGN DESIGNATIONS	
8-18-04	ADDED NOTE	
10-1-98	ADDED NOTE	
4-03-97	ADDED (SP) TO W6-1 & REVISED TRAFFIC CONTROL DEVICES NOTE	
10-18-96	ADDED R55-1	
10-12-95	MOVED UPPER SPLICE	
6-8-95	REVISED SPLICE DETAIL, TEXT	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	