

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
EQUIPMENT AND PROCUREMENT DIVISION
BID INVITATION**

Bid Number: Contract No. H-14-200J

BID OPENING LOCATION:
AHTD Equipment &
Procurement Division
11302 West Baseline Road
Little Rock, AR 72209

MAIL TO:
AHTD Equipment and
Procurement Division
P.O. Box 2261
Little Rock, AR 72203

DELIVER TO:
AHTD Equipment &
Procurement Division
11302 West Baseline Road
Little Rock, AR 72209

Bid Opening Date: May 21, 2013 Time: 11:00 a.m.

Sealed bids for furnishing the commodities and/or services described below, subject to the conditions on page 2 of this bid invitation will be received at the above-noted mail and delivery locations until the above-noted bid opening date and time, and then publicly opened at the above-noted bid opening location. **Bids must be submitted on this form, with attachments when appropriate, or bids will be rejected. Late bids and unsigned bids will not be considered.**

In compliance with this Bid Invitation and subject to all the Conditions thereof, the undersigned offers and agrees to furnish any and all items upon which prices are quoted, at the price set opposite each item.

Company Name: _____

Name (Type or Print): _____

Address: _____

Title: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

E-mail Address: _____

Federal Tax ID or Social Security No.: _____

Signature: _____

Signature must be legible, original (not photocopied) and in ink.
Unsigned bids will be rejected.

Item No.	Description	Quantity	Unit	Unit Price	Amount
	<p>Supply Contract for furnishing to the Arkansas State Highway and Transportation Department <u>Corrugated Pipe Culvert</u> at pricing set forth on the attached Bid Form for the period beginning July 1, 2013 thru December 31, 2013.</p> <p><u>FOB</u> – Statewide</p> <p>The Bid Invitation, Bid Form and Bid Information are parts of the contract and by this reference are incorporated herein as fully and effectively as if set forth in detail herein.</p> <p>It shall be understood that by submission of bid that bidder agrees to the conditions herein specified and, if bid is found acceptable by the Department either in whole or in part, shall consider this bid a contract agreement bound under these conditions. The parties hereto agree that this contract in all things shall be governed by the Laws of the State of Arkansas.</p> <p>Bid Bond in the amount of \$500.00 required of all bidders at time of bid opening or bid will be rejected. <u>Personal and company checks are not acceptable as Bid Bonds.</u> See Condition 3 on page 2 of bid invitation.</p> <p>Performance Bond in an amount to be determined by the Department, not to exceed \$5,000.00, will be required of successful bidder prior to providing goods/services. <u>Personal and company checks are not acceptable as Performance Bonds.</u> See Condition 3 on page 2 of invitation.</p> <p>ALL OR NONE BIDS WILL NOT BE CONSIDERED.</p> <p>TWO SIGNED COPIES OF BID INVITATION AND BID FORM MUST BE SUBMITTED. PLEASE PROVIDE <u>THREE</u> ADDITIONAL COPIES TO EXPEDITE DISTRIBUTION OF INFORMATION TO PARTICIPATING BIDDERS.</p> <p>Bids and Specifications are available on-line by going to the AHTD Web Site – www.arkansashighways.com and clicking on “Commodities and Services Bids/Contracts Information”. Tabulations will also be available at this site within 72 hours after bid opening. If you have any questions, call this office at 501-569-2667.</p> <p>28-02</p>				<p align="right">TOTAL BID</p>

STANDARD BID CONDITIONS

H-14-200J

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.

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

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
SUPPLY CONTRACT FOR
CORRUGATED PIPE CULVERT**

BID FORM

CONTRACT NO. H-14-200J

BIDDER _____

All material furnished under this contract must comply with Section 606.02, AHTD Standard Specifications of 2003 and Standard Drawing PCM-1 (Rev. 3-30-00). (Specifications are accessible on our web site at www.arkansashighways.gov.)

The size and thickness for corrugated steel shown are for 2-2/3 x 1/2 inch corrugations. Substitution will be allowed in accordance with Standard Drawing PCM-1.

Prices quoted shall be FOB any point in Arkansas accessible by rail, motor transport or improved roads, without regard to quantities included in any shipment.

Prices are subject to discount of _____% for payment of invoices within _____ days.

CORRUGATED STEEL ROUND PIPE CULVERT

	<u>Zinc Coated (Galvanized)</u>		<u>Asphalt Coated</u>	
		Price per		Price per
	<u>Item #</u>	<u>Linear Foot</u>	<u>Item #</u>	<u>Linear Foot</u>
18" Diameter - 16 GA.	1.	_____	7.	_____
24" Diameter - 16 GA.	2.	_____	8.	_____
30" Diameter - 16 GA.	3.	_____	9.	_____
36" Diameter - 14 GA.	4.	_____	10.	_____
42" Diameter - 14 GA.	5.	_____	11.	_____
48" Diameter - 14 GA.	6.	_____	12.	_____

	<u>Polymer Precoated Metallic Coated</u>	
		Price per
	<u>Item #</u>	<u>Linear Foot</u>
18" Diameter - 16 GA.	13.	_____
24" Diameter - 16 GA.	14.	_____
30" Diameter - 16 GA.	15.	_____
36" Diameter - 14 GA.	16.	_____
42" Diameter - 14 GA.	17.	_____
48" Diameter - 14 GA.	18.	_____

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
SUPPLY CONTRACT FOR
CORRUGATED PIPE CULVERT**

BID FORM

CONTRACT NO. H-14-200J

BIDDER _____

CORRUGATED STEEL ARCH PIPE CULVERT

	<u>Zinc Coated (Galvanized)</u>		<u>Asphalt Coated</u>	
		Price per		Price per
	<u>Item #</u>	<u>Linear Foot</u>	<u>Item #</u>	<u>Linear Foot</u>
21" x 15" (18") - 16 GA.	19.	_____	25.	_____
28" x 20" (24") - 16 GA.	20.	_____	26.	_____
35" x 24" (30") - 14 GA.	21.	_____	27.	_____
42" x 29" (36") - 14 GA.	22.	_____	28.	_____
49" x 33" (42") - 14 GA.	23.	_____	29.	_____
57" x 38" (48") - 12 GA.	24.	_____	30.	_____

Polymer Precoated Metallic Coated

		Price per
	<u>Item #</u>	<u>Linear Foot</u>
21" x 15" (18") - 16 GA.	31.	_____
28" x 20" (24") - 16 GA.	32.	_____
35" x 24" (30") - 14 GA.	33.	_____
42" x 29" (36") - 14 GA.	34.	_____
49" x 33" (42") - 14 GA.	35.	_____
57" x 38" (48") - 12 GA.	36.	_____

ALUMINUM COATED ROUND CORRUGATED STEEL PIPE CULVERT

		Price per
	<u>Item #</u>	<u>Linear Foot</u>
18" Diameter - 16 GA.	37.	_____
24" Diameter - 16 GA.	38.	_____
30" Diameter - 16 GA.	39.	_____
36" Diameter - 14 GA.	40.	_____
42" Diameter - 14 GA.	41.	_____
48" Diameter - 14 GA.	42.	_____

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
SUPPLY CONTRACT FOR
CORRUGATED PIPE CULVERT**

BID FORM

CONTRACT NO. H-14-200J

BIDDER _____

ALUMINUM COATED ARCH CORRUGATED STEEL PIPE CULVERT

	<u>Item #</u>	<u>Price per Linear Foot</u>
21" x 15" (18") Diameter - 16 GA.	43.	_____
28" x 20" (24") Diameter - 16 GA.	44.	_____
35" x 24" (30") Diameter - 14 GA.	45.	_____
42" x 29" (36") Diameter - 14 GA.	46.	_____
49" x 33" (42") Diameter - 14 GA.	47.	_____
57" x 38" (48") Diameter - 12 GA.	48.	_____

Coupling Bands for the above shall be furnished as required and will be paid as follows:

- 18" - 36" Price of 1.0 Linear Feet of pipe of the specified diameter.
- 42" - 48" Price of 1.5 Linear Feet of pipe of the specified diameter.

PLASTIC PIPE CULVERT

Polyethylene			PVC	
	<u>Item #</u>	<u>Price per Linear Foot</u>		<u>Price per Linear Foot</u>
18" Diameter	49.	_____	18" Diameter	57. _____
24" Diameter	50.	_____		
30" Diameter	51.	_____		
36" Diameter	52.	_____		
42" Diameter	53.	_____		
48" Diameter	54.	_____		
54" Diameter	55.	_____		
60" Diameter	56.	_____		

Coupling Bands for the above shall be furnished as required and will be paid as follows:

- 18" - 24" NO CHARGE
- 30" - 36" Price of 1.0 Linear Feet of pipe of the specified diameter.
- 42" - 60" Price of 1.5 Linear Feet of pipe of the specified diameter.

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
SUPPLY CONTRACT FOR
CORRUGATED PIPE CULVERT
BID INFORMATION

CONTRACT NO. H-14-200J

1. The Arkansas State Highway and Transportation Department, hereinafter referred to as “the Department,” will enter into a term contract with the successful bidder(s) to furnish Corrugated Pipe Culvert for the period set forth in the Bid Invitation.
2. A bid may be withdrawn, modified, or corrected by the bidder after it has been submitted provided written request to do so is filed with the Equipment and Procurement Division prior to the time set for opening bids. Telegrams, faxes or letters received before time set for opening bids will be accepted and attached to the unopened bid, and the bid will be considered withdrawn, modified, or otherwise changed accordingly. No proposal may be withdrawn, modified, corrected, or otherwise changed after the time set for opening bids.
3. Under terms of this contract, the Department is not obligated to purchase any specific quantity or to make purchases at any specific time during the contract period.
4. Where awards are made to corporations organized in states other than Arkansas, bidders shall at their own expense furnish a certified copy of certificate of authority and license to do business in Arkansas, which will remain on file with the Department. No contract will be executed in favor of such corporation until certificate shall have been furnished.
5. If a contract supplier is unable to load and start shipment of materials within seventy-two (72) hours after receipt of an individual order, he shall immediately notify the ordering District and the Department’s Equipment and Procurement Division in Little Rock. In such event, the Department shall have the right to cancel the order and purchase the material on the open market. Any increase in cost occasioned by purchasing the material from other than the contract supplier may be billed to the contract supplier or deducted from payments due. This provision is not intended to allow any supplier 72 hours to make shipments of material ordered where immediate shipment is designated and required to avoid loss to the State.
6. Invoices for material furnished should be submitted in quintuplicate to the headquarters of the District ordering the material. Invoices submitted to the Little Rock Central Office will cause delay in payments.
7. The Department reserves the right to cancel this contract, or any part thereof, upon giving the vendor fifteen days notice of its intent to terminate. The contract shall automatically terminate as of the date given in said notice. Otherwise, prices bid shall remain in effect for the contract term.
8. Cooperative Purchasing: Procedures are being developed to permit other tax-supported entities* in Arkansas (cities, counties, state agencies, school districts, etc.) to purchase from this Contract on an individual basis under the same specifications and conditions, and at the pricing set forth by each vendor, all at the discretion of each vendor in each case. Prices could be reduced by a vendor for minor alterations in conditions (changing minimum order quantities, etc.) as agreed by both parties, but could not be raised above the contract bid price under any circumstances. Vendors would not be required to sell to any such entity under this Contract, and those entities would not be obligated to purchase from the Contract.

Should these procedures be approved during the term of this contract, each entity wishing to purchase from the Contract would make contact directly with the appropriate vendor(s). The Highway Department would remain “out of the loop” for such transactions: all contact, orders, invoices, payments, etc. regarding such transactions must take place exclusively between the tax-supported entity and the vendor. The Department would be held harmless of any and all liability arising from such transactions.

*Tax-supported entities are defined as those receiving more than half of total funding from appropriated tax funds.

CORRUGATED STEEL PIPE (ROUND) H-20 LOADING

PIPE DIAMETER (INCHES)	MINIMUM COVER TOP OF PIPE TO TOP OF SUBGRADE (INCHES)	MAX. FILL HEIGHT ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS IN INCHES				
		0.060	0.075	0.105	0.135	0.164
12	12	45	45	52	41	34
18	12	38	38	45	34	28
24	12	32	32	39	29	24
30	12	27	27	33	24	20
36	12	22	22	28	20	17
42	12	18	18	23	17	14
48	12	14	14	18	13	11
54	12	11	11	14	10	8
60	12	8	8	11	8	6
66	12	6	6	8	6	5
72	12	5	5	6	5	4
78	12	4	4	5	4	3
84	12	3	3	4	3	2
90	12	2	2	3	2	2
96	12	2	2	3	2	2
102	12	2	2	3	2	2
108	12	2	2	3	2	2
114	12	2	2	3	2	2
120	12	2	2	3	2	2

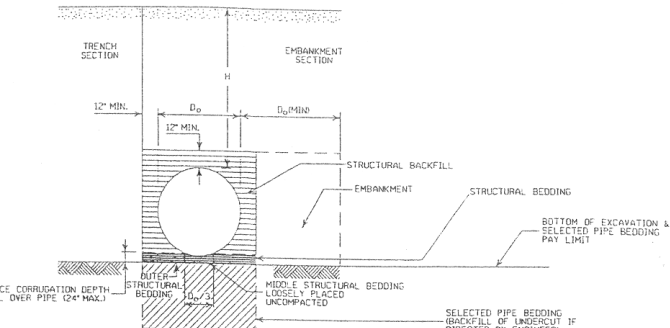
* MAX. FILL CAN BE INCREASED IN THESE DIAMETER PIPES BY USING THE NEXT LARGER CORRUGATION. REFER TO "CORRUGATED METAL PIPE, REVISED 1976, PUBLISHED BY U.S. DEPARTMENT OF TRANSPORTATION, F.H.W.A., B.P.R.
 ** WHERE THE STANDARD 2 1/2" X 1/2" CORRUGATION AND GAUGE IS SPECIFIED FOR A GIVEN DIAMETER, A 3" X 1/2" OR 5" X 1/2" CORRUGATION PIPE OF THE SAME DIAMETER MAY BE SUBSTITUTED, PROVIDED IT IS GAUGED FOR A FILL HEIGHT CONDITION EQUAL TO OR GREATER THAN THE MAXIMUM FILL HEIGHT CONDITION FOR THE SPECIFIED GAUGE AND CORRUGATION.

CORRUGATED ALUMINUM PIPE (ROUND) H-20 LOADING

PIPE DIAMETER (INCHES)	MINIMUM COVER TOP OF PIPE TO TOP OF SUBGRADE (INCHES)	MAX. FILL HEIGHT ABOVE TOP OF PIPE (FEET)			
		METAL THICKNESS IN INCHES			
		0.060	0.075	0.105	0.164
12	12	45	45	52	41
18	12	38	38	45	34
24	12	32	32	39	29
30	12	27	27	33	24
36	12	22	22	28	20
42	12	18	18	23	17
48	12	14	14	18	13
54	12	11	11	14	10
60	12	8	8	11	8
66	12	6	6	8	6
72	12	5	5	6	5

EQUIVALENT METAL THICKNESSES AND GAUGES

METAL THICKNESS IN INCHES			GAUGE NUMBER
STEEL			
ZINC COATED	UNCOATED	ALUMINUM	
0.064	0.058	0.060	15
0.079	0.074	0.075	14
0.109	0.104	0.105	12
0.138	0.134	0.135	10
0.168	0.164	0.164	8
0.218	0.213		6
0.245	0.241		5
0.280	0.275		3



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. COMPLETE STRUCTURAL BACKFILL OPERATION BY WORKING FROM SIDE TO SIDE OF THE PIPE. THE SIDE TO SIDE STRUCTURAL BACKFILL DIFFERENTIAL SHALL NOT EXCEED 24 INCHES OR 1/3 THE SIZE OF THE PIPE, WHICHEVER IS LESS.

INSTALLATION TYPE	MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 2	SELECTED MATERIALS (CLASS SM-1, SM-2 OR SM-3)

* AGGREGATE (BASE COURSE CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

NOTE: STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF METAL PIPE.

GENERAL NOTES

1. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
2. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
4. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE.
5. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
6. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
7. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH BELOW THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED WILL BE MEASURED AND PAID FOR AS SELECTED PIPE BEDDING.
8. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL, BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL".

LEGEND

- D₀ = OUTSIDE DIAMETER OF PIPE
- MAX. = MAXIMUM
- MIN. = MINIMUM
- ===== STRUCTURAL BACKFILL MATERIAL
- UNDISTURBED SOIL
- ELONG. = ELONGATED
- EQUIV. DIA. = EQUIVALENT DIAMETER
- H = FILL COVER HEIGHT OVER PIPE (FEET)

CORRUGATED METAL PIPE ARCHES (H - 20 LOADING)

EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINIMUM COVER CORNER (INCHES)	MIN. COVER TOP OF PIPE TO TOP OF SUBGRADE (INCHES)	STEEL			ALUMINUM		
				MINIMUM THICKNESS REQUIRED			MINIMUM THICKNESS REQUIRED		
				2 TONS	1 1/2 TONS	1 TON	2 TONS	1 1/2 TONS	1 TON
15	17x12	3	12	0.064	13	15	0.060	15	15
18	21x15	3	12	0.064	12	15	0.060	14	15
21	24x18	3	12	0.064	10	15	0.060	12	15
24	28x20	3	12	0.064	10	15	0.060	10	15
30	35x24	3	12	0.079	9	14	0.075	9	14
36	42x29	3 1/2	12	0.079	9	13	0.075	9	13
42	49x33	4	12	0.075	8	12	0.105	8	12
48	57x38	5	12	0.109	8	12	0.135	8	12
54	64x43	6	12	0.099	8	12	0.135	8	12
60	71x47	7	12	0.138	8	12	0.164	8	12
66	77x52	8	12	0.168	8	12	0.164	8	12
72	83x57	9	12	0.168	9	12	0.164	8	12

WHERE BEARING PRESSURE EXCEEDING 2 TONS PER SQUARE FOOT IS REQUIRED FOR GIVEN FILL HEIGHTS, THE FOUNDATION MATERIAL SHALL BE INVESTIGATED TO DETERMINE THE BEARING CAPACITY.
 ** WHERE THE STANDARD 2 1/2" X 1/2" CORRUGATION AND GAUGE IS SPECIFIED FOR A GIVEN DIAMETER, A 3" X 1/2" OR 5" X 1/2" CORRUGATION PIPE OF THE SAME DIAMETER MAY BE SUBSTITUTED, PROVIDED IT IS GAUGED FOR A FILL HEIGHT CONDITION EQUAL TO OR GREATER THAN THE MAXIMUM FILL HEIGHT CONDITION FOR THE SPECIFIED GAUGE.

3-30-88	REVISED INSTALLATIONS
11-06-97	15047

ARKANSAS STATE HIGHWAY COMMISSION
**METAL PIPE CULVERT
 FILL HEIGHTS & BEDDING**
 STANDARD DRAWING PCM-1