0011

ACT/015/009 #7

Diamond Shamrock
Coal Company

RECEIVED

SEP 04 1985

DIVISION OF OIL
GAS & MINING

August 30, 1985

Sandy Pruitt
Divison of Oil, Gas and Mining
355 West No. Temple
3 Triad Center/Suite 350
Salt Lake City, Utah 84180

RE: NOV 85-2-14-1 Issued 8-22-85 by mail

Dear Sandy;

I am writing in regards to NOV 85-2-14-1 issued by you on 8-22-85 from your office in Salt Lake City. I would like at this time to ask you to rescind on this violation based on the following rational:

In the summer of 1983, Trail Mountain Coal Company began construction of phase two of a 66" culvert project that would culvert the north fork of the Cottonwood Creek from the coal stockpile area to a point just north of the shop/bathhouse facility at the mine site for a bid of $78,000. However, due to cost over-runs and additional culvert installation, the $80,000 budgeted by then owner Natomas Coal Co. was exhusted and Natomas Coal Company was in the process of being aquired by Diamond Shamrock Corp. With funds exhausted and a new owner who curtailed all spending and idled opertions due to economic conditions, Trail Mountain Coal Company insalled at the inlet of the 66" culvert project a concrete headwall as to to the pending MRP. At that time riprap was placed around the entrance to the culvert in lieu of a concrete wingwall and a trash rack was put in front of the head wall. This work was being done under the watchfull eye of the Divisions enforcement staff. This method of construction was to be of a temporary nature until funding from the new owner was aquired.

On June 17, 1984, I wrote a letter to Mr. Wayne Hedberg of the Division, asking for an extension date on the construction of the Vaughn Hansen approved trash rack and received an extension date.

Shortly after that the mine was idled indefinately. All hourly and all but five salary employees were given their termination notices and severance pay. The operation was up for sale with no authorizations for expenditures.

During this time, 1983-1985, the north fork of the Cottonwood creek experienced the largest amounts of peakflow in the past 20 years. During this unusal high flows, the inlet structure worked to perfection with the exception of the vertical trash rack placed in front of the headwall. The trash rack had to be cleaned out on several occasions. (In short, it was a high maintenance item).

Trail Mountain Coal Company A Subsidiary of Diamond Shamrock
P.O. Box 370, Orangeville, Utah 84537-0370 Phone: 801 748-2140

With the inlet working and the trash rack being inefficient (the trash rack is similar to the Vaughn Hansen approved design) it was our contention that a modification to the Mine Plan would be in order.

In June of this year, I petitioned Delta Geotechnical to evaluate the existing features of the inlet from a professional, unbias viewpoint. Also, in early June of this year, bids were sent out and received back in June, July and August on the construction of the inlet as per the Vaughn Hansen drawings. On August 27, of this year, we received the results of the Delta Geotechnical study supporting our contention the MRP should be modified with a new designed self-cleaning trash rack and the existing feature of the inlet are adequate and should remain.

I have met with Mr. John Whitehead and other members of the technical staff discussing this matter and also submitted drawings and data.

On August 30, 1985, I formally submitted a request for approval of a modification to the Trail Mountain MRP. This data will be reviewed by the Division and Trail Mountain will respond to their decision.

It is for these reasons that I emplore you ro rescind NOV 85-2-14-1.

Your consideration in this matter is greatly appreciated.

Sincerely;

TRAIL MOUNTAIN COAL COMPANY

Allen P. Childs
Engineer

APC/gg

137 West 2260 South, Salt Lake City, Utah 8411 Telephone (801) 487-7754

Delta
GEOTECHNICAL CONSULTANTS INC.

August 27, 1985

Mr. Allen Childs, Engineer
Diamond Shamrock Coal Unit
Trail Mountain Coal Company
Box [illegible]
Orangeville, Utah 84537-0370

Subject: Hydraulic Capacity of Rip-rapped Stream Channel, Concrete Headwall and Culvert System, Cottonwood Creek, Trail Mountain Mine
Emery County, Utah

Delta Job No. 1658

Dear Allen:

On July 11, 1985, we conducted an inspection of the above feature. The culvert, headwall and adjacent rip-rapped channel walls appeared to be operating effectively and in sound condition with no evidence of bank erosion, scour or riprap loss or rip-rap displacement noted. The existing trash rack on the concrete headwall appears to be inefficient, however, and possibly subject to plugging unless frequently maintained during high runoff periods. A seasonal high water mark of about 4 feet above the channel bottom was evident. The concrete headwall is apparently founded in sandstone bedrock.

We understand that the rip-rapped channel walls next to the concrete headwall, which have been in place for about two years, were originally intended as a temporary replacement for the design wing walls.

We have conducted an analysis of the hydraulic capacity of the existing feature, based on the same supportive data as was used in the original design, with wing walls, conducted by Vaughn Hansen and Associates.

The results of our analysis of the hydraulic characteristics of the existing feature, with rip-rapped channel walls in place of the wing walls, are essentially the same as the original wing wall design. That is, the culvert capacity is limited only by losses in the pipe in both designs.

Copies of the original calculations by Vaughn Hansen and Associates (P. George Chadwick, October 8, 1981) and backup data and copies of our calculations are attached.

Design drawings of a replacement trash rack for the concrete headwall are also attached.

Please contact us if there are any questions on the above.

Very truly yours,

DELTA GEOTECHNICAL CONSULTANTS, INC.

LaMONTE G. SORENSON
Principal Engineering Geologist

LGS/amh
Enclosures
cc: Terry Pearce
Pearce Engineering

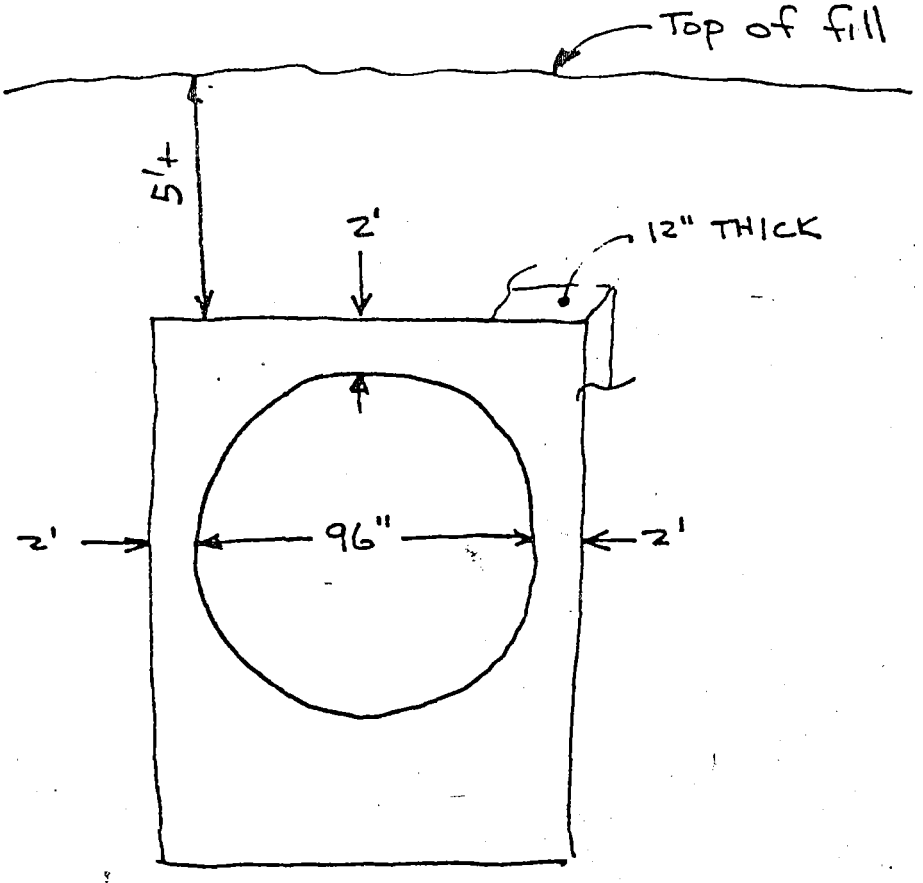
Pearce Engineering
44 Exchange Place
Salt Lake City, UT 84111

TVP 7-30-85

REGISTERED PROFESSIONAL ENGINEER
1-31-85
No. 4631
TERRY V. PEARCE
STATE OF UTAH

DETERMINATION OF AS-CONSTRUCTED CAPACITY OF COTTONWOOD CREEK CULVERT

1. As-constructed headwall dimensions:



FRONT ELEVATION - TRASH RACK NOT SHOWN

2. Assumptions - See attached calculations by D. George Chadwick, P.E., dated 10-8-81.

   a. Design flow = 510 cfs

   b. Head loss within culvert is unchanged from Chadwick's calculations.

   c. Approach channel losses are the same as Chadwick's.

3. Check to see if inlet control exists.

Note: This headwall still has a coefficient of 0.5 because it meets the definition - "Headwall; sq. edge, or end section conforming to fill slope". (See attached nomograph.)

$H = 8 + 2 + 5 = 13$

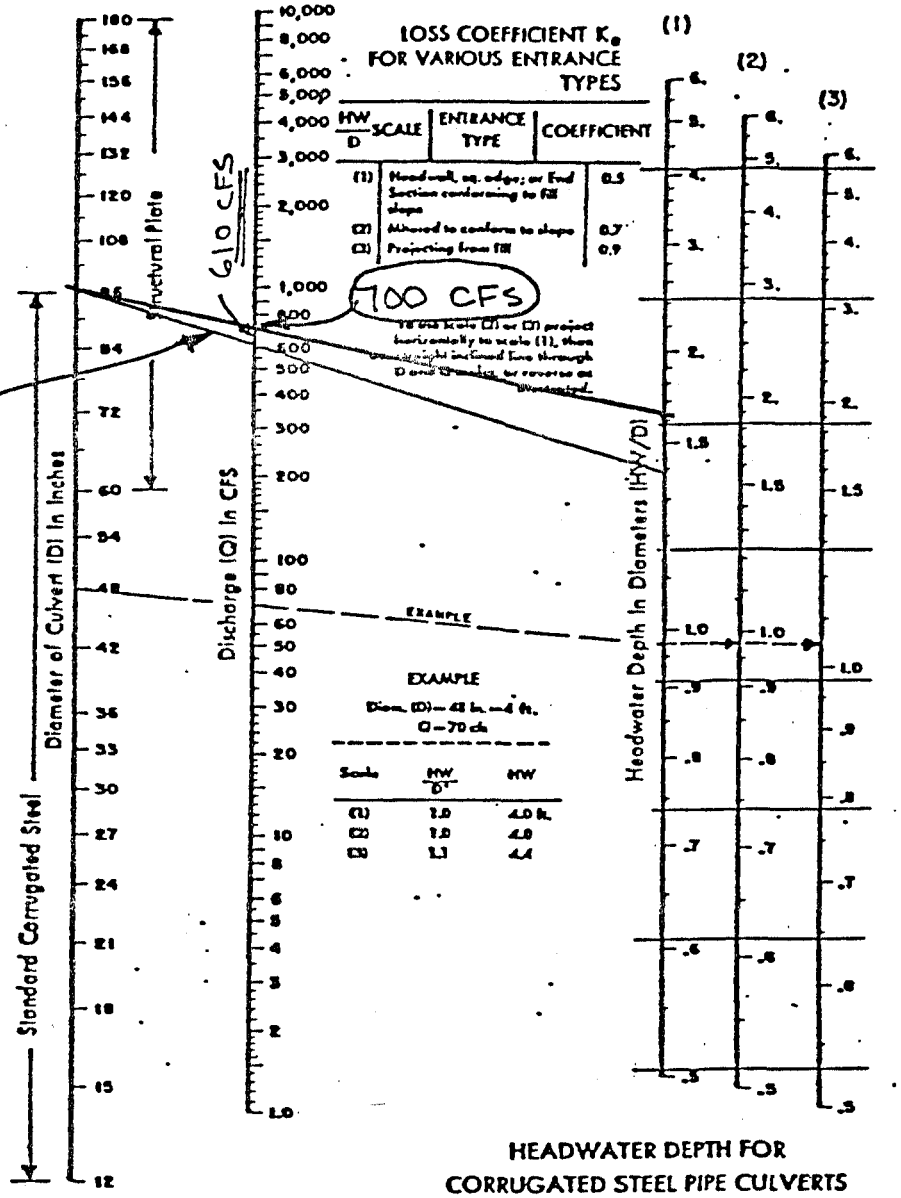
$\frac{Hw}{D} = \frac{13}{8} = 1.63$

from Nomograph: Inlet capacity is 700 CFS

SO THIS HEADWALL DOES NOT RESTRICT FLOW.

Culvert capacity is limited by losses in pipe as originally designed.

TVF 7-30-85



Note: Design Condition from Chadwick's calcs

HEADWATER DEPTH FOR CORRUGATED STEEL PIPE CULVERTS WITH INLET CONTROL

REFERENCE CALCULATIONS

BY

D. GEORGE CHADWICK

dated

10-3-81

October 9, 1981

Mr. Wayne Hedberg
Divisi[illegible] of Oil, Gas, & Mining
1588 W[illegible] North Temple
Salt L[illegible]e City, Utah 84110

RE: [illegible]ification of culvert size used to pass 510 cfs flood on C[illegible]onwood Creek

Dear Mr. Hedberg:

Andy King has asked that we submit our calculations showing that the culvert we designed for Cottonwood Creek has the capacity to pass the 50-year flood event. The U.S. Forest Service estimated the design flood to be 450 cfs. We have estimated it to be about 510 cfs and have designed the culvert with a capacity of about 535 cfs.

We have used the Darcy-Weisbach equation for estimating headloss in the culvert. This is considered as the most accurate headloss equati[illegible] As you may be aware, headloss through a culvert and entrance capaci[illegible] of a culvert both need to be checked to determine actual capacity. When culverts are installed on fairly steep slopes (such as in the Natomas Trail Mountain case) the inlet capacity is much less than the capacity of the rest of the culvert. Consequently, in large, expensive installations on relatively steep slopes it is cost-effective to use a larger inlet than the main portion of the culvert. That is why we recommend using a 96-inch inlet which goes into a transition down to the 66-inch main culvert.

If you have any questions please feel free to call me.

Sincerely,

D. George Chadwick, Jr., P.E.

DGC/das

Enclosure

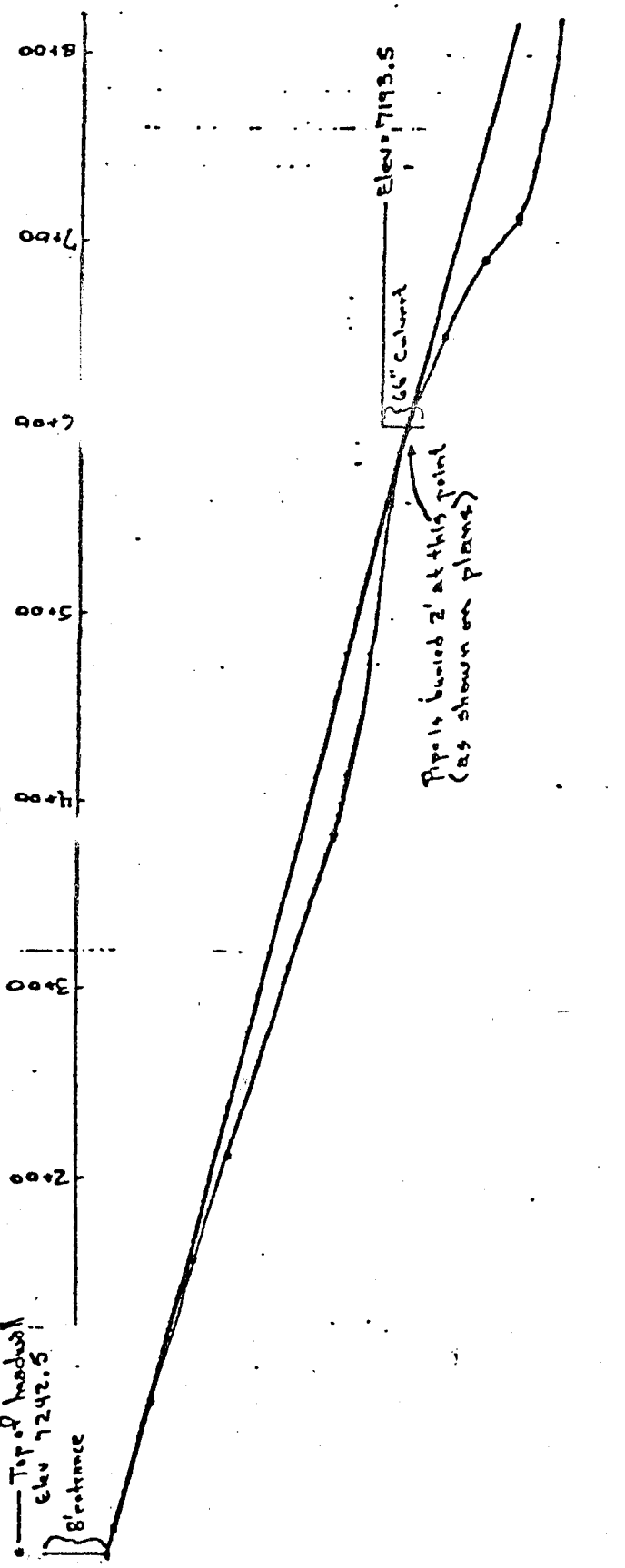
cc: Andy King

VAUGHN HANSEN ASSOCIATES
CONSULTANTS / ENGINEERS

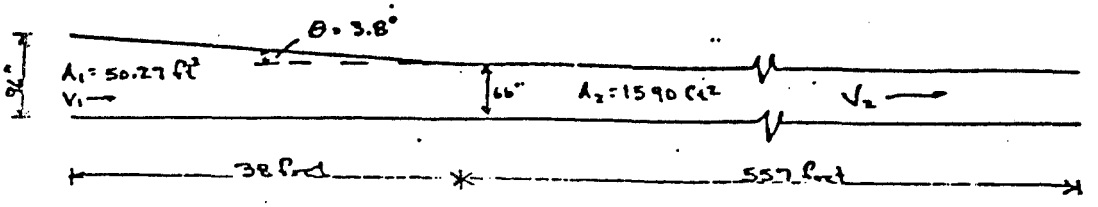
CHECKED _____ PROJECT _____

DATE 10-8-81 FEATURE Culvert Size

Determination of Culvert Size needed to pass 510 cfs Flood on Cottonwood Creek



Governing section of pipe is from Sta 0+00 to 5+95
The allowable headloss through this section is 7242.5 − 7193.5 = 49 Feet



Using Darcy-Weisbach Equation

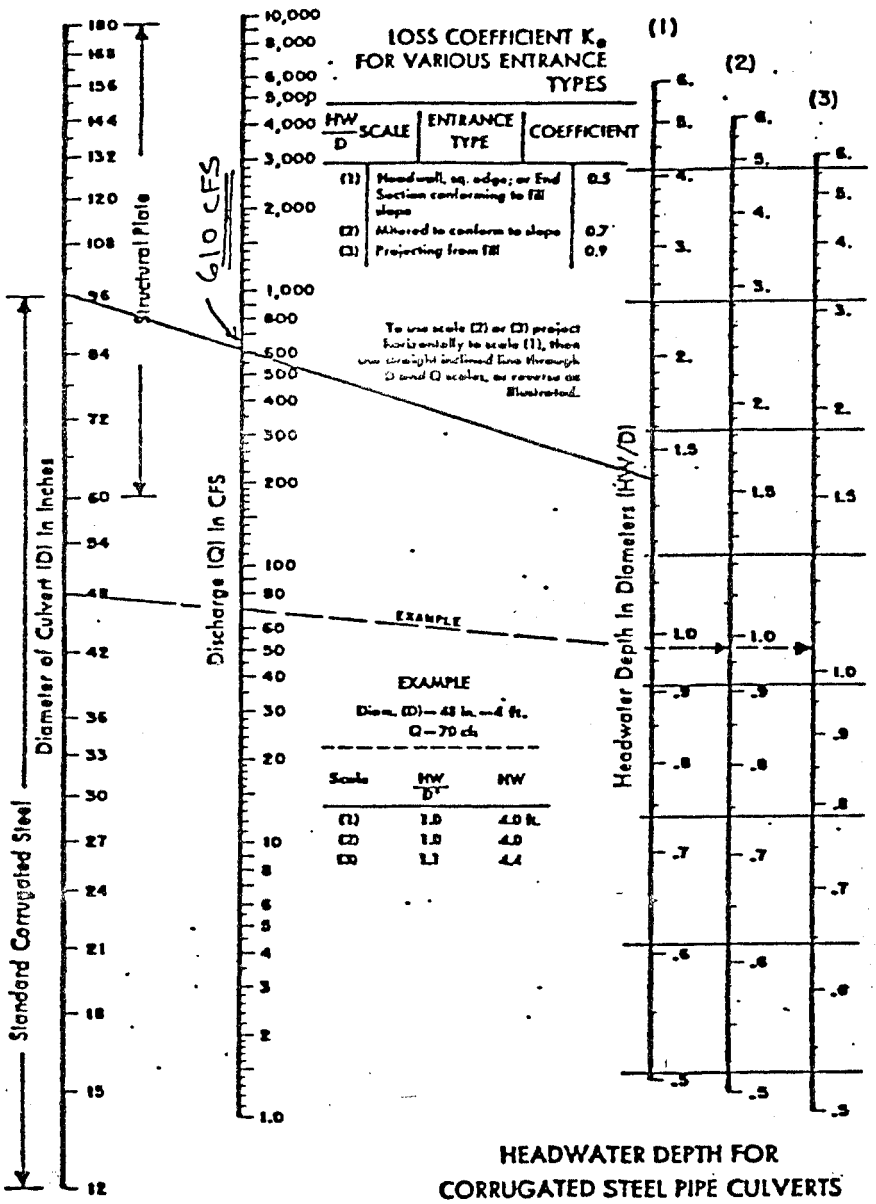
Minor Losses

	K	Headloss (H_L)
Entrance loss	0.25	$H_L = 0.25 \frac{V_1^2}{2g}$
Contraction	0.11	
Bends (2 @ 0.08ea.)	0.16	
Exit	1.0	
	$\Sigma = 1.27$	$H_L = 1.27 \frac{V_2^2}{2g}$

Friction Loss

Headloss in a pipe is $\frac{fL}{D} \frac{V^2}{2g}$

The headloss in the 38 ft transition is approximated by the above formula when $D = 6.5$ ft



HEADWATER DEPTH FOR CORRUGATED STEEL PIPE CULVERTS WITH INLET CONTROL

Trial #1 Q = 450 cfs

$V_1 = \frac{450}{50.27} = 8.95$ fps

$V_2 = \frac{450}{23.76} = 18.94$ fps

V in 6.5' average transitional section is $\frac{450}{33.18} = 13.56$ fps

Minor losses = $.25\frac{(8.95)^2}{64.4} + 1.27\frac{(18.94)^2}{64.4} =$ 7.1 ft.

Major losses

— 557 ft of 5.5' pipe

e = .1 $e/D = .1/5.5 = .018$ so $f = .047$

$H_L = (.047)\frac{(557)}{5.5}\frac{(18.94)^2}{64.4} =$ 26.5 feet

— 38 ft of 6.5' ave. dia. transition

$H_L = (.044)\frac{(38)}{6.5}\frac{(13.56)^2}{64.4} =$ .7 ft

Total Loss = 7.1 + 26.5 + .7 = 34.3 feet

Trial #2 Q = 535 CFS

$V_1 = \frac{535}{50.27} = 10.64$ fps V in 6.5' ave. trans. section is $\frac{535}{33.18} = 16.12$ fps

$V_2 = \frac{535}{23.76} = 22.52$ fps

Minor losses = $.25\frac{(10.64)^2}{64.4} + 1.27\frac{(22.52)^2}{64.4} =$ 10.4 ft

Major losses

- 557 ft of pipe $H_L = (.047)\frac{(557)}{5.5}\frac{(22.52)^2}{64.4} =$ 37.5 ft

- 38 ft of ave. diam. 6.5' transition

$H_L = .044\frac{(38)}{6.5}\frac{(16.12)^2}{64.4} =$ 1.0 ft

Total losses = 10.4 + 37.5 + 1.0 = 48.9 ft OK (because it is ≈ 49ft available)

therefore **Capacity is 535 CFS**

Check inlet control of 96" Culvert. $\frac{Hw}{D} = 11/8 < 1.38$

From Nomograph. Capacity is 610 CFS so 535 cfs governs.