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Coastal States Energy Company

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Midvale, Utah 84047
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NOV 05 1981

OIL, GAS & MINING

Subsidiary of
The Coastal
Corporation

JIM

NOV 06 1981

October 29, 1981

Mr. Cleon B. Feight, Director
Division of Oil, Gas and Mining
1588 West North Temple
Salt Lake City, Utah 84116

Attention: Jim Smith

Dear Mr. Feight:

Attached is a copy of the water quality data for the Skyline Project for the third quarter of 1981. These data are a complete set of replacement pages for Volume 2, and should be used in conjunction with the data and with the station map previously transmitted. Flow data will be included when gauge calibrations are completed.

Sincerely,

Keith W Welch

Keith W. Welch
Environmental Coordinator

KWW:kl

Attachment

Tom Tetting of DOGM said that the 10 year flood governed on our culvert. Snowmelt is bigger than rainfall flood in this area as indicated by area gages and calculations.
Culvert location: Assume the east side of section 1
Drainage Area: 5.70 mi^2

The 25, 50, and 100 year snowmelt flood peak was determined by the method presented in the SCS National Engineering Handbook, Section 4, Hydrology.

The 100-year peak is obtained by:

1) Determining Tc

$$T_c = \frac{L}{.6} \qquad L = \frac{\ell^{.8}(S+1)^{.7}}{1900\,Y^{0.5}}$$

where: ℓ = maximum watershed length (ft)
Y = Ave watershed slope (%)
$S = \frac{1000}{CN} - 10$

$S = \frac{1000}{CN} - 10$ and CN is 43 (from USBR Design of Small Dams with 80% cover, Oak & aspen)

$S = \frac{1000}{43} - 10 = 13.3$

$\ell = 20{,}200$ ft
$Y = 38\%$

$$L = \frac{(20200)^{.8}(13.3+1)^{.7}}{1900(38)^{.5}} = 1.53 \text{ hours}$$

$$T_c = \frac{1.53}{.6} = 2.55 \text{ hours}$$

2) From Exhibit 21-4 in SCS handbook, the 100-year, 10-day runoff is 2.7 inches

3) From Exhibit 21-5, $Q_1/Q_{10} = 0.18$

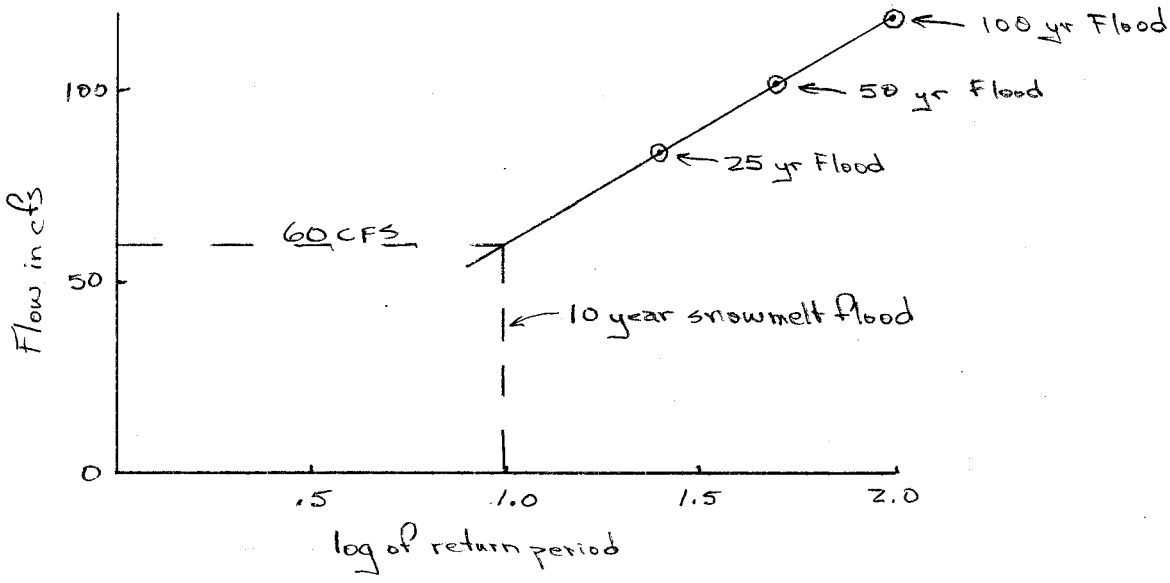
4) From Table 21.10 in SCS handbook, interpolating with $Q_1/Q_{10} = 0.18$ and $Q_{10} = 2.7$ inches, $cfs/AQ_{10} = 7.8$

so $cfs = 7.8(5.7)(2.7) = 120$ CFS

5) From Exhibit 21-4, the 50-yr flood is .85(100 yr Flood)
$= .85(120) = 102$ cfs

the 25-yr flood is .7(100 yr. Flood)
$= .7(120) = 84$ cfs

6) Extrapolation of 100 yr, 50 yr, and 25 yr floods to get the 10 year Flood

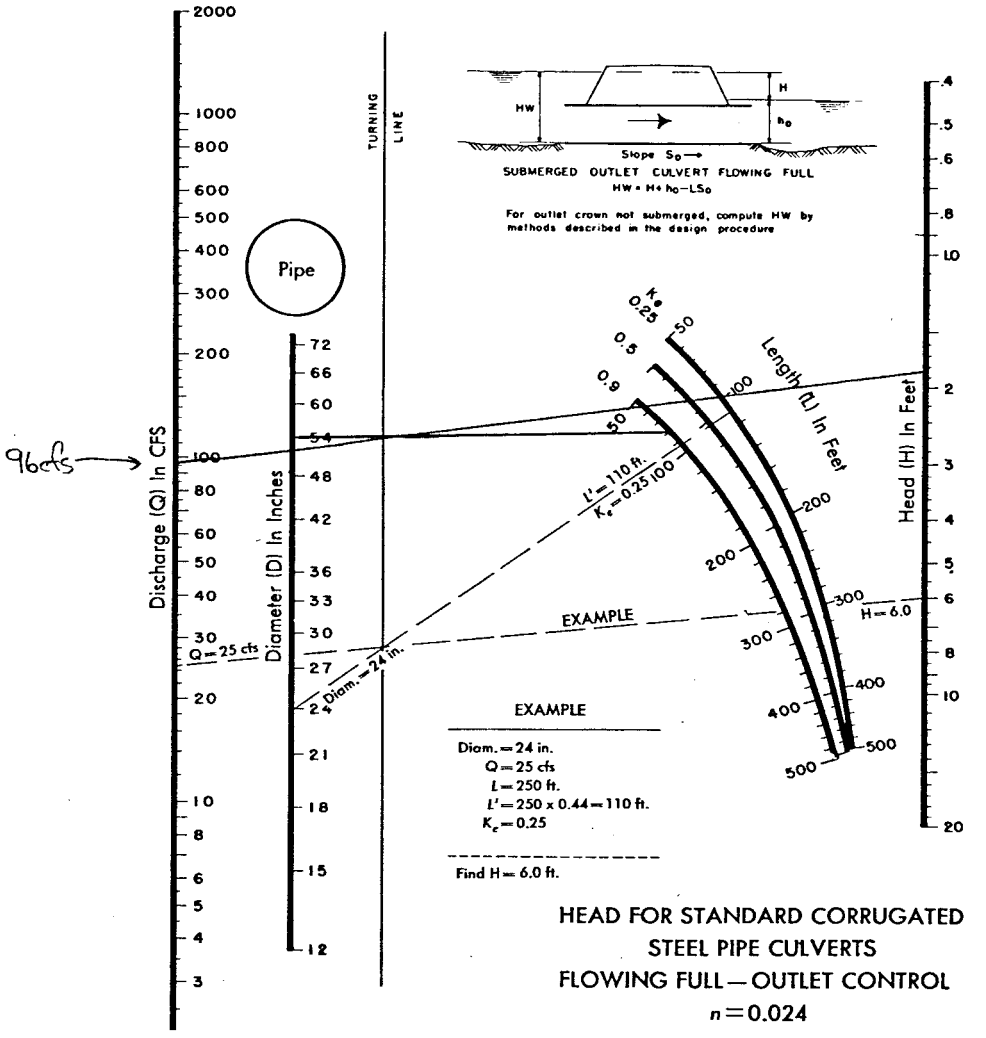


* Estimated 10-year snowmelt flood is 60 CFS.

Try 54" diameter CMP culvert

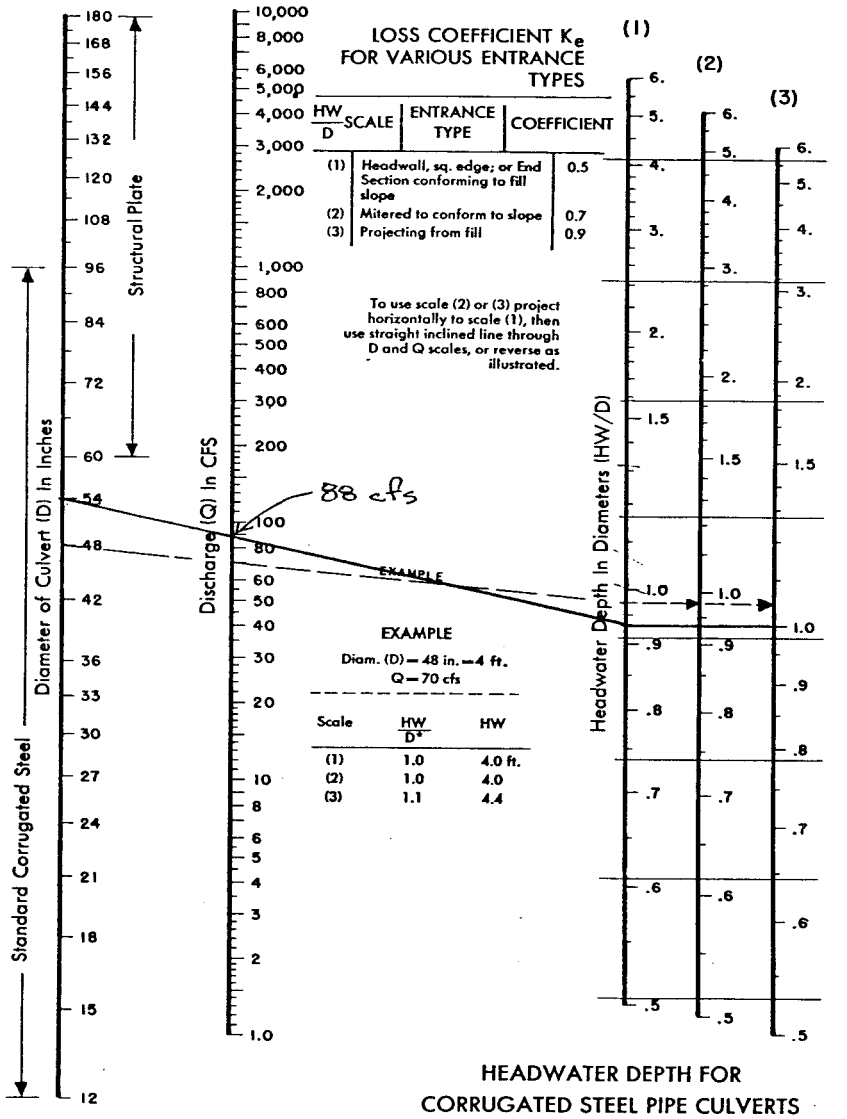
Exact location is unknown. The minimum slope on a 1" = 100' map with 10' contours on this section of the stream is 10/430 = .023. An 80 ft culvert would have 1.84 ft of fall. From culvert nomographs (Hydraulic Charts for the Selection of Highway Culverts) outlet control for this culvert would limit flow to about 96 cfs and inlet control limits flow to about 88 cfs (assuming projecting entrance with no headwall and no water backing above the top of the culvert).

CONCLUSION: A 54-inch culvert is more than adequate to pass the 10-year flood of 60 cfs on Winter Quarters Creek



HEAD FOR STANDARD CORRUGATED STEEL PIPE CULVERTS FLOWING FULL—OUTLET CONTROL

$n = 0.024$



LOSS COEFFICIENT K_e FOR VARIOUS ENTRANCE TYPES

$\frac{HW}{D}$ SCALE	ENTRANCE TYPE	COEFFICIENT
(1)	Headwall, sq. edge; or End Section conforming to fill slope	0.5
(2)	Mitered to conform to slope	0.7
(3)	Projecting from fill	0.9

To use scale (2) or (3) project horizontally to scale (1), then use straight inclined line through D and Q scales, or reverse as illustrated.

EXAMPLE

Diam. (D) = 48 in. = 4 ft.
Q = 70 cfs

Scale	$\frac{HW}{D^*}$	HW
(1)	1.0	4.0 ft.
(2)	1.0	4.0
(3)	1.1	4.4

HEADWATER DEPTH FOR CORRUGATED STEEL PIPE CULVERTS WITH INLET CONTROL