Measuring Structure
Pervious Empire Letter Reservoir Outlet

Mr. R. L. Parshall,
Senior Agricultural Engineer,
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Fort Collins, Colo.

Jan. 1933
\[ Q = \frac{10}{3} \left( \frac{L}{H} - 0.214 \right) H^{3/2} \]

\[ L = 49.8 - 1 = 48.8 \quad H = 20.6 \]

with 6" angles all around

\[ Q = 3.33 \left( 48.8 - 2(20.6) \right) 20.6^{3/2} \]

\[ = 3.33 \left( 48.388 \right) 20.6^{3/2} = 478 \text{ cfs} \]

with 6" walls angles on bottom only 412

\[ Q = 3.33 \left( 49.388 \right) 20.6^{3/2} = 487 \]

\[ Q = \frac{10}{3} \left( Q - 0.214 H \right) H^{3/2} \]

\[ L = \left( \frac{46}{3} - 2(20.6) \right) 20.6^{3/2} \]

412

450 cfs

3.33 \times 45.588 \times 20.6^{3/2}
<table>
<thead>
<tr>
<th>Length (L)</th>
<th>Value (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>60.0</td>
</tr>
<tr>
<td>1.0</td>
<td>169.0</td>
</tr>
<tr>
<td>1.5</td>
<td>314.0</td>
</tr>
<tr>
<td>2.0</td>
<td>491.0</td>
</tr>
<tr>
<td>2.5</td>
<td>700.0</td>
</tr>
</tbody>
</table>
\[ L = \text{39.8} = P = \text{2.0} \]

\[
\begin{align*}
0.5 & = 49 \rightleftharpoons 44 \\
1.0 & = 141 \rightleftharpoons 137 \\
1.5 & = 267 \rightleftharpoons 137 \\
2.0 & = 421 \rightleftharpoons 0 \\
2.5 & = 604 \rightleftharpoons \\
2.8 & = 730 \\
\end{align*}
\]

\[
\begin{align*}
0.5 & = 48 \rightleftharpoons 43 \\
1.0 & = 138 \rightleftharpoons 134 \\
1.5 & = 258 \\
2.0 & = 407 \\
2.5 & = 582 \\
2.8 & = 697 \\
\end{align*}
\]

\[ P = \text{3.0} \]
Form 4b

SUBVOUCHER FOR MEALS AND LODGING

City or Town, ____________________________

Name of Hotel, __________________________

Date, ____________________________

To be completely filled in before signature by payee,
and there must not be any erasure or
other alteration whatever

RECEIVED IN CASH OF

U. S. DEPARTMENT OF AGRICULTURE

for MEALS and LODGING from ____________________________

Time covered, ____________________________ day _____, at $_____________ per day.

If charge for fractional part of day is greater in
proportion, it must be explained HEREBUNDER.

I certify the foregoing to be correct.

(Signature)

USE ONE SIDE ONLY

(DO NOT SIGN IN DUPLICATE)

(Title)
U. S. Department of Agriculture

To: _______________________________ , Dr.

Address: _______________________________

For $49.8

28' 12" 49.8

5 panels

16' 5'

Total: $______

TO BE COMPLETELY FILLED IN BEFORE SIGNATURE BY PAYEE, AND THERE MUST NOT BE ANY ERASURE OR OTHER ALTERATION WHATSOEVER.

RECEIVED IN CASH this __________ day of __________, 19___, from ____________.

__________________________
(Dollar, in full
100)

of the above account, which I CERTIFY TO BE CORRECT.

Do not sign in duplicate.

(Signature)

(Title)

Witness to signature by mark.

__________________________
(Name) 8—2707

(Address)
Riverside  Dec 6 1933

2.06 H.  490 Current Power  2/8
430 Computed

5-0-5 Future

Recommend that the following be placed on the minutes of a future meeting of the Department of Agriculture:

For purpose of coordination of the Agricultural Adjustment Administration

The proposed national plan and any necessary recommendations of the Department of Agriculture

That the necessary recommendations made as a result of the above

Opportunity to the practice of some adequately selected some form of

I am in order to support the

Please submit to the

Provide some of the necessary adjustments of price levels, and also

Recommends that government financing in the form of direct

The terms be submitted to the
VEGETABLE AND
FRUIT GROWERS
DISCUSS CODES

To weeklies
For release THURSDAY Dec. 7, 1933

Vegetable and fruit growers of the state are scheduled to meet in Denver Thursday, Dec. 7, to discuss methods of improving the prices they receive for their products. Shippers and dealers also will attend.

Regional meetings of this nature already have been held in Pueblo, Greeley, Alamosa and Grand Junction, at which special problems in each section were given particular attention.

Recommendations are being made to Secretary of Agriculture Wallace for consideration by the Agricultural Adjustment Administration in preparing a national fruit and vegetable code or marketing agreement. Growers have been assisted in drawing up these resolutions by William M. Case, extension horticulturist at the Colorado Agricultural College.

Among the various suggestions made was a statement of strong opposition to the practice of stores deliberately selling some farm products at a loss in order to attract trade.

Proper grading of vegetables and fruits to avoid the disastrous effects of marketing low-grade products was approved. It also was recommended that government financing in the form of crop production loans be supplied to producers.
MEMORANDUM CONCERNING THE MEASUREMENT OF
DISCHARGE OF THE RIVERSIDE AND EMPIRE RESERVOIR INLETS.

At present these inlets are each provided with a concrete structure
near the reservoir, these structures being essentially drops and used
also as a measuring device. For the Riverside reservoir inlet, the
structure has a crest length of 48.8 feet, the crest being 1 foot wide with
height upstream side approximately 4 feet. This is essentially a weir
without end contractions. It is believed that for the low to average
flow, the nappe is not properly aerated. It is suggested that a 10- or
12-inch pipe be set on the outside of the side walls extending verti-
cally downward to a point below the crest line, and from this pipe
an elbow leading through the wall into the space beneath the nappe which
is for the purpose of providing full aeration. It may be that because
of the counterforts on the wall downstream, special tubes will be neces-
sary to properly vent the inside panels or sections. For a fully aerated
condition the enclosed discharge curve should apply within reasonable
limits. To obviate the uncertainty of weir coefficients, it is sug-
gested that a 6-inch angle iron crest be placed on the top of the present
wall, and at each end a similar piece of angle iron extending vertically
to form the side of the weir. This new crest will raise the nappe suf-
iciently to provide complete aeration, and the vertical sides of the
weir will give ample space for the air to be drawn in at the sides of
the nappe. For this latter condition, the standard Francis formula
should apply within reasonable limits.

For the concrete structure on the Empire Reservoir Inlet, the
transverse wall is about 12 inches thick, is approximately 11 feet high on the downstream side, and about 3 feet high on the upstream side. The length between side walls is 39.8 feet. The top face of this crest wall has a horizontal surface which extends downstream about 0.4 foot from the upstream edge. The downstream portion is rounded off on a radius of 6 or 8 inches. For certain heads the nappe will jump free; however it adheres to the side walls because this weir may be considered one without end contractions. It is believed that this condition might be improved by pipes placed on the outside of the two side walls and outletted at a point beneath the nappe as previously suggested; or, further, an angle iron crest and sides would be recommended for this structure as a means of more closely approximating a standard weir.

Both these inlets carry a substantial amount of sand, and it is assumed that sooner or later the pondage upstream from the structures will become filled, thus resulting in an uncertain value of velocity of approach. For these conditions the weir, whether in its present form or improved, with angle iron crest, will need to be calibrated by means of current meter gagings. It is further assumed that this condition of filling will not be constant and will probably vary with the rate of discharge. It is believed that the use of a suitable Parshall measuring flume might be used advantageously to meet this condition, where the diverging section is eliminated. It is appreciated that discharge measurements in these inlets will be made during the winter, and ice accumulations on the walls of the converging section of a Parshall flume may be objectionable;
however, any other device operating under such conditions may also be found unsuitable. I am unable to state at this time the relative effects of ice on the walls of a Parshall flume as against the effect of velocity of approach for a weir for equal flows. I am reasonably sure that the measurement of the discharge through the flume by current meter gaging can be conveniently done, whereas for the weir the only opportunity, at present, is to make the gaging in the earth section of the canal, either by wading or cable suspension from a bridge or by resorting to floats.

P. L. Parshall
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Water Resources Archive
Colorado State University Libraries
Weir on Riverside Intake

Dec. 28, 1932.

G.H. 1.05
Discharge Curve for Broad Crest Weir (Fully Aerated) Riverside Reservoir Inlet Near Fort Morgan, Colo.

Irrigation Investigations Fort Collins, Colo.

Flow

Without end Contractions

Jan-1933
Discharge Curve for Broad Crest Weir (Fully Aerated) Empire Reservoir Inlet Near Fort Morgan, Colo.

Irrigation Investigations Fort Collins, Colo.

Jan. 1933