HAMPDEN COUNTY
CHICOPEE, MASSACHUSETTS

CHICOPEE FALLS DAM
MA-00719

NATIONAL DAM INSPECTION PROGRAM
CORPS OF ENGINEERS

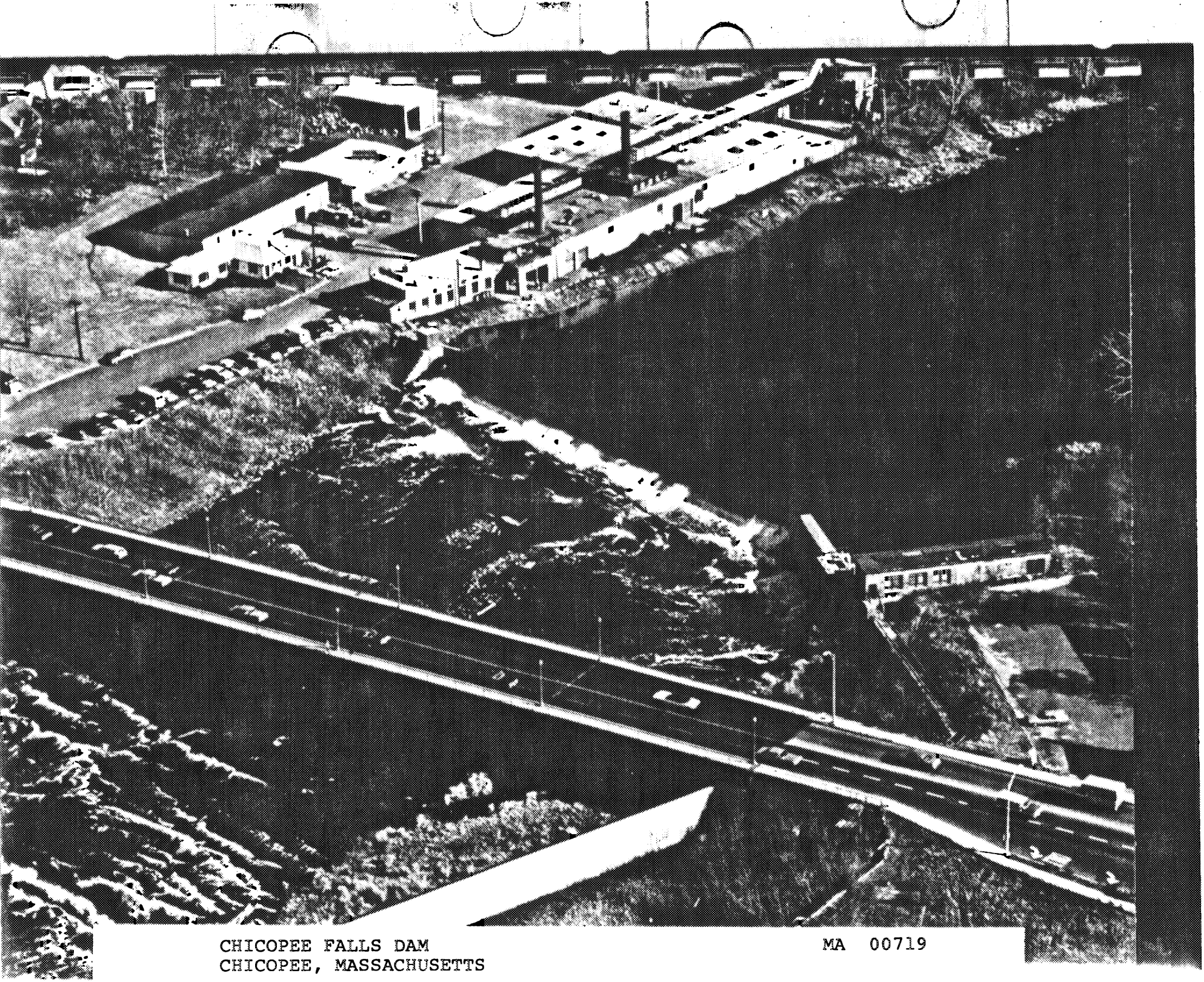
CHICOPEE FALLS DAM

IDENTIFICATION NO: MA 00719 CITY: Chicopee

STREAM: Chicopee River COUNTY & STATE: Hampden County, MA

Chicopee Falls Dam is a 290± foot long stone masonry run-of-the-river spillway founded on rock outcrop. The left abutment area contains an additional 60± foot long concrete spillway and a 30± foot long sluice gate structure. A gaging station is located on the stone masonry abutment of the right side. The maximum height of the main spillway is approximately 9± feet.

Dam failure analysis was made with water assumed to the crest of the right abutment. Using Corps guidelines an outflow of 5100 cfs was determined. Just prior to failure, the outflow over the spillway would be 7700 cfs for a total of 12,800 cfs. This flow is significantly less than the 100 year storm and would be contained within the river improvements and flood control structures downstream. These flood control structures were installed by the Corps in 1963-1965.



CHICOPEE FALLS DAM
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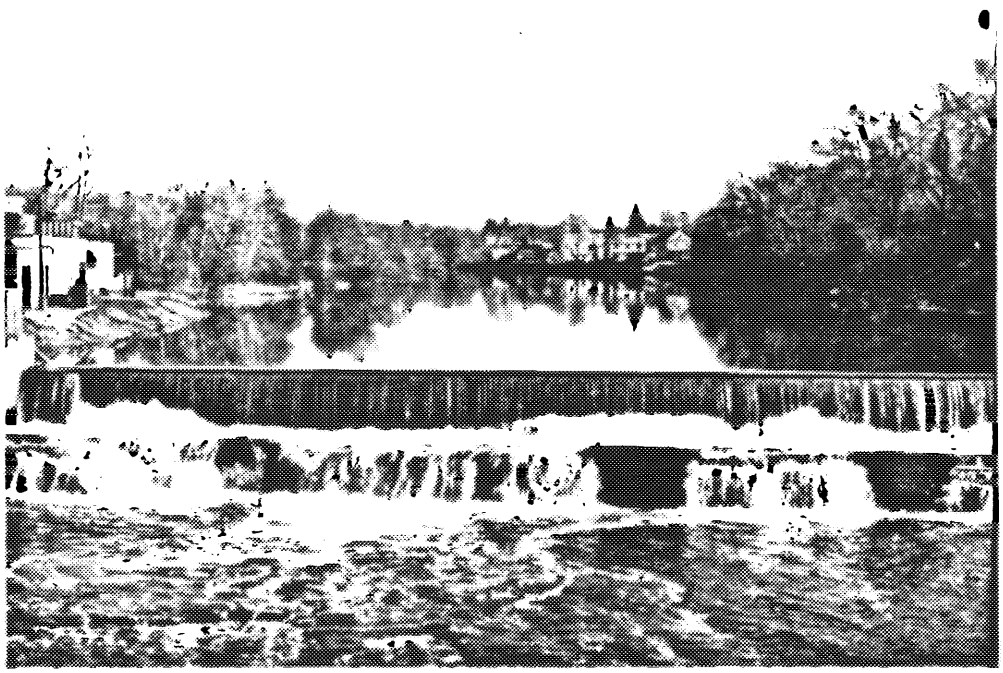
Downstream channel and channel improvements.



Downstream spillway face and upstream reservoir viewed from downstream bridge.

Sluice gates and old gatehouse
located on left side of dam.

NO. [illegible]
1/19/79
MC
BY FDD 2/6/79

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CONSULTING ENGINEERS
BOSTON, MASSACHUSETTS

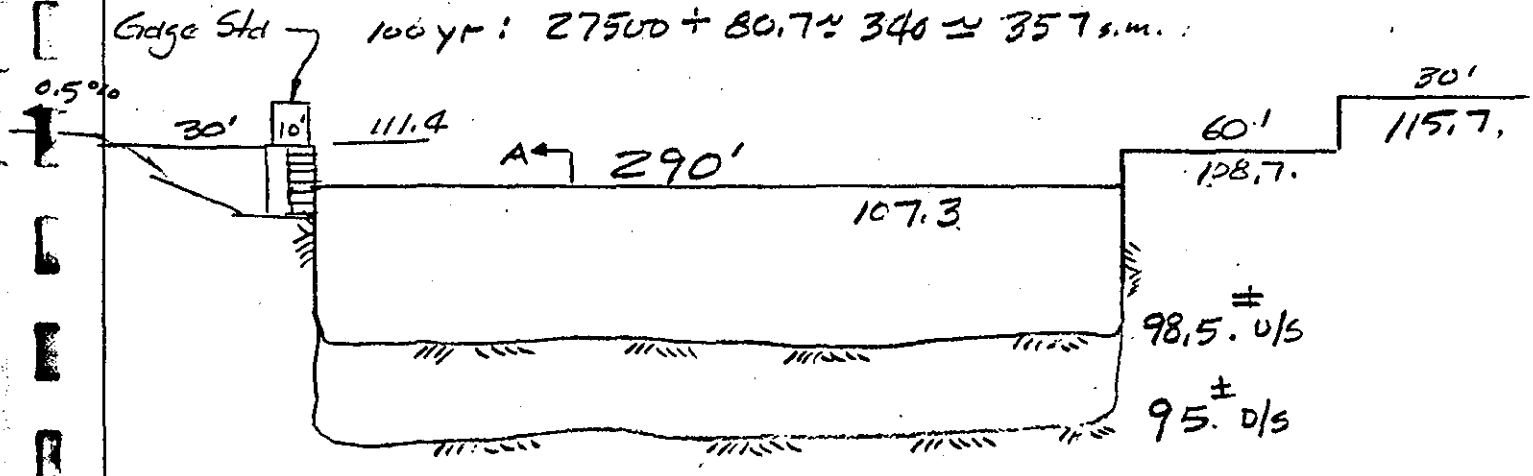
SHEET NO. 1
JOB Dams
SUBJECT Chicopee
CLIENT Corps

Chicopee Falls Dam Built 1895±, power supply.

Drainage Areas

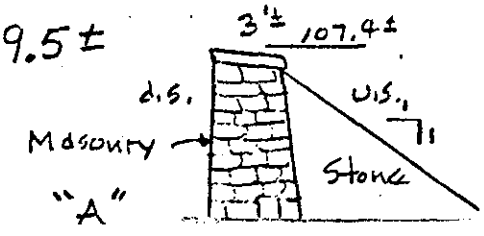
Indian Orchard Dam	+688 sm	
Mansfield Hollow Controlled	-159.	Controlled Flow
Quabin Res.	-186	" "
to Chicopee	+14	
At Chicopee	357 sm.	

Storage Capacity = 550 a-f, Height ≈ 15'
Size Class = Small
Hazard Potential = Low, d.s. development protected by walls & dikes.
SDF 50 yr to 100 yr, use 100 yr, check 1/2 PMF
1/2 PMF 1/2 × 702 × 150' = 52,650 cfs entire area
" 1/2 × 360 × 250 = 45,000 cfs reduced area
100 yr: 27500 ÷ 80.7 ≈ 340 ≈ 357 s.m.



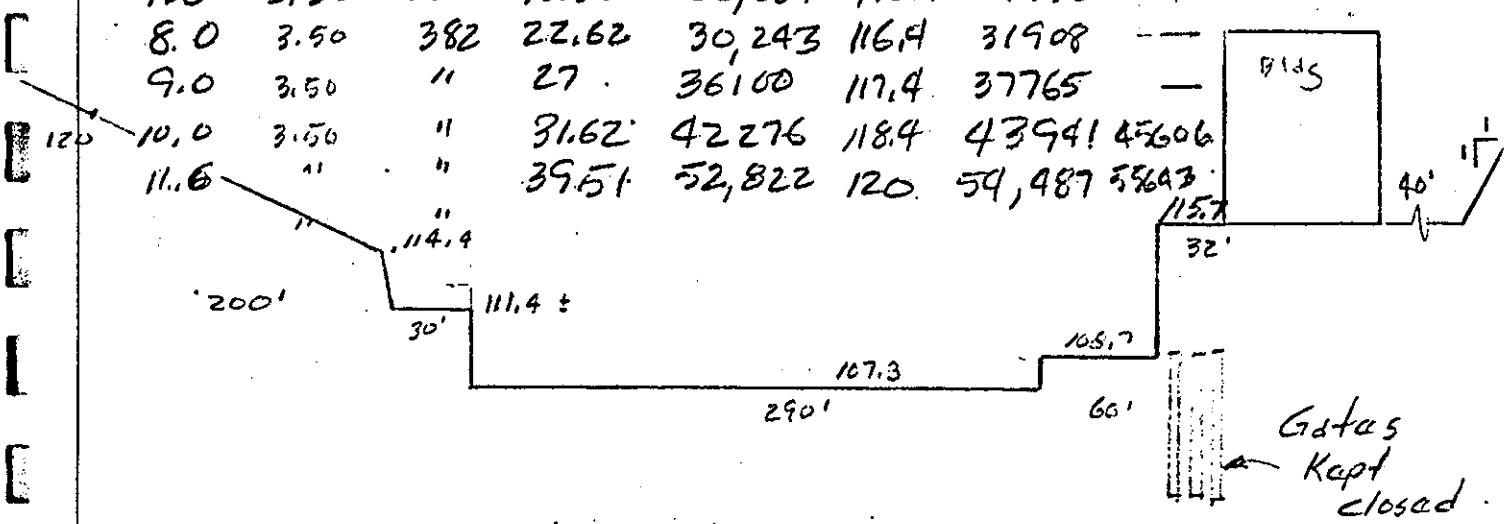
1/2 PMF = 52,650 cfs
1955 flood = 27,500 cfs (from USGS TP 1420 crest 114.5' (actually ~115.5)

1/2 PMF over-tops dam to elev 119.5± flows onto adjacent river banks & into developed areas.



Flow @ Spillway (King - 5-13)

D	C	L	$H^{3/2}$	Q	Elev	Q_T	Q_T'
"0" 1.4	3.46	290	1.66	1665	108.7	1,665.	1665
3.0	3.32	350	5.2	6042	111.4	7707	9200
4.0	3.39	"	8.	9492	112.4	11157	12600
5.0	3.46	"	11.18	13,539	113.4	15204	16800
7.0	3.50	350	18.52	22,687	115.4	24352	—
8.0	3.50	382	22.62	30,243	116.4	31908	—
9.0	3.50	"	27.	36100	117.4	37765	—
120 10.0	3.50	"	31.62	42276	118.4	43941	45606
11.6	"	"	39.51	52,822	120.	54,487	55693



Leakage flow

$K = \frac{1.486}{0.05}(0.0001)^{1/2} = 0.297 \sim 0.3$ $Q = VA$

Base 111.4

Elev	D	A	WP	$R^{2/3}$	K	V	Q
112.4	1.	30	31	0.98	.3	.3	9
114.4	3.0	95	33	2.03	"	.61	58
115.7	4.3	169	66	1.88	"	.56	95
120.	8.6	1420	320'	2.71	"	.81	1156

Dam Failure Analysis

Dam actually long, low spillway. Top dam Elev 111.4±, above which Rt bank begins to be flooded.

$$Q_F = \frac{8}{27}(.4 \times \overset{116}{290})\sqrt{32.2}\,(8.8)^{1.5} = 5092 \text{ cfs} \pm$$

released storage

Q just prior to failure = 7710 cfs

Failure flow = 7710 + 5092 = 12,800± cfs.

This flow is less than 1955 flood, due to channel improvements and lack of development below dam (except for low dams & bridges), this flow will be dissipated, without causing damage to d.s. development.

Tailwater at failure ≈ 4'± ∴ Failure depth = 4.8 + 4 = 8.8'±

2/4/79
MJ
B FDD 2/6/79

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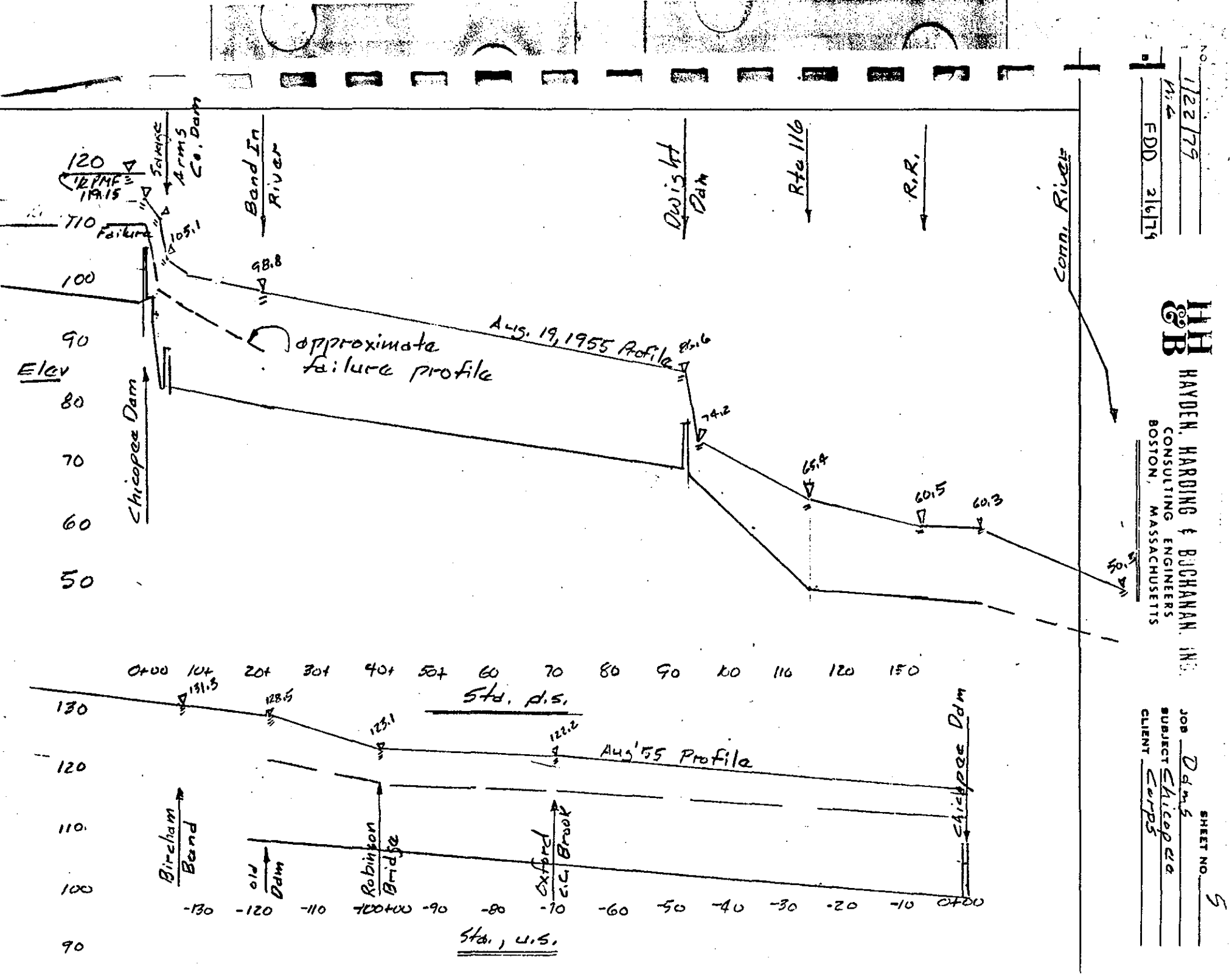
SHEET NO. 4
JOB Dams
SUBJECT Chicopee
CLIENT Corps

Storage

Elev ft.	D ft.	Area a	Ave Area a	Stor a-f	Accum Stor a-F
100.–	0	3.	3.	0	0.
107.3	7.4	147	75.	555.	555.
108.7	1.3	173	160.	208.	763.
110.–	1.3	202	188.	244.	1007.
111.4	1.4	231	217.	304.	1311.
114.4	3.0	294	263.	789.	2100.
115.7	1.3	321	308.	400.	2500.
120.–	4.3	410.	366	1572.	4072.

Areas for storage taken to sta –118+00 at old dam site above Robinson Bridge.



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NO. 1/22/75
M.C.
FDD 2/6/74

JOB Dams
SUBJECT Chicopee
CLIENT Corps

SHEET NO. 5

1/24/79
MA
FDD 2/6/79

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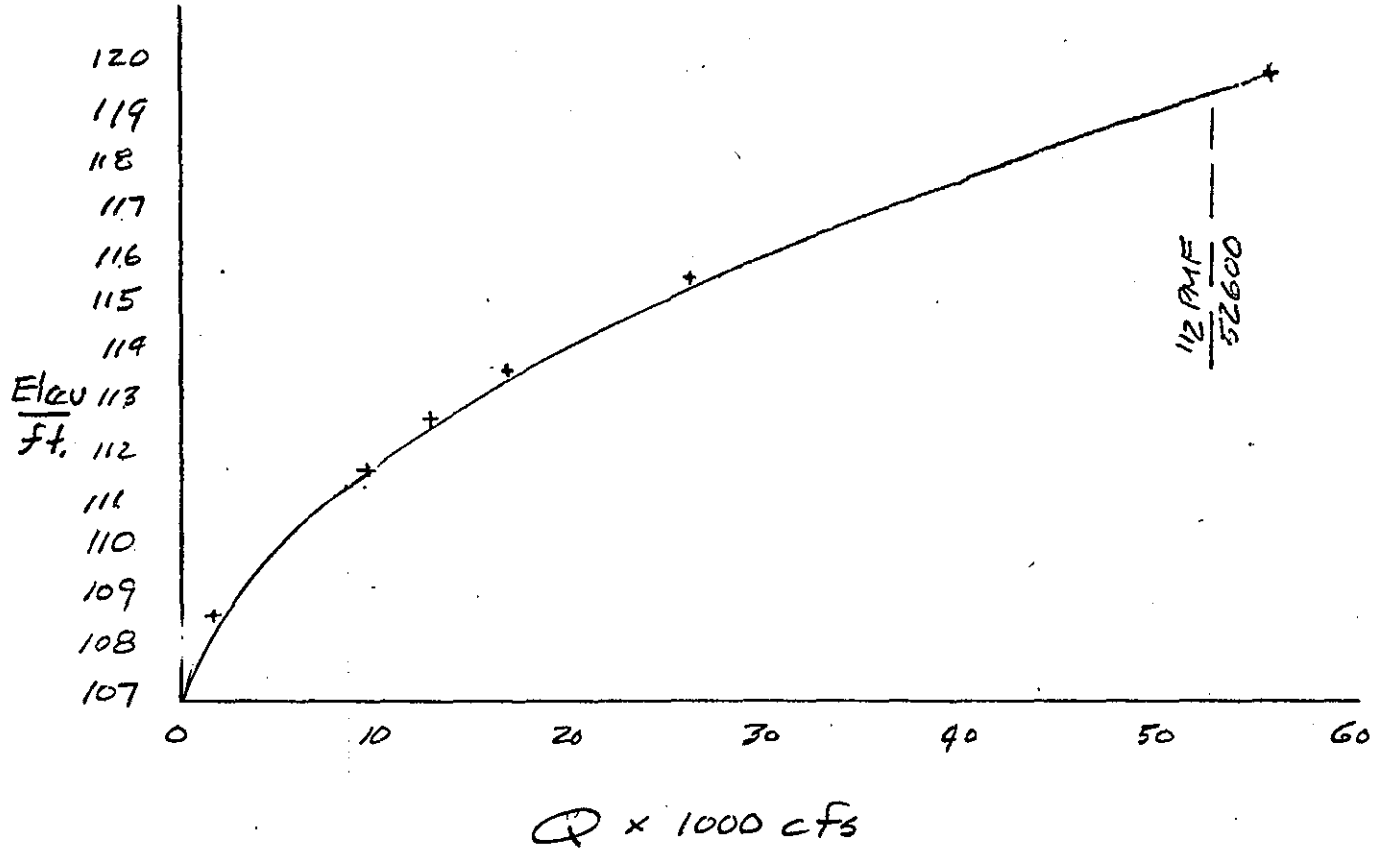
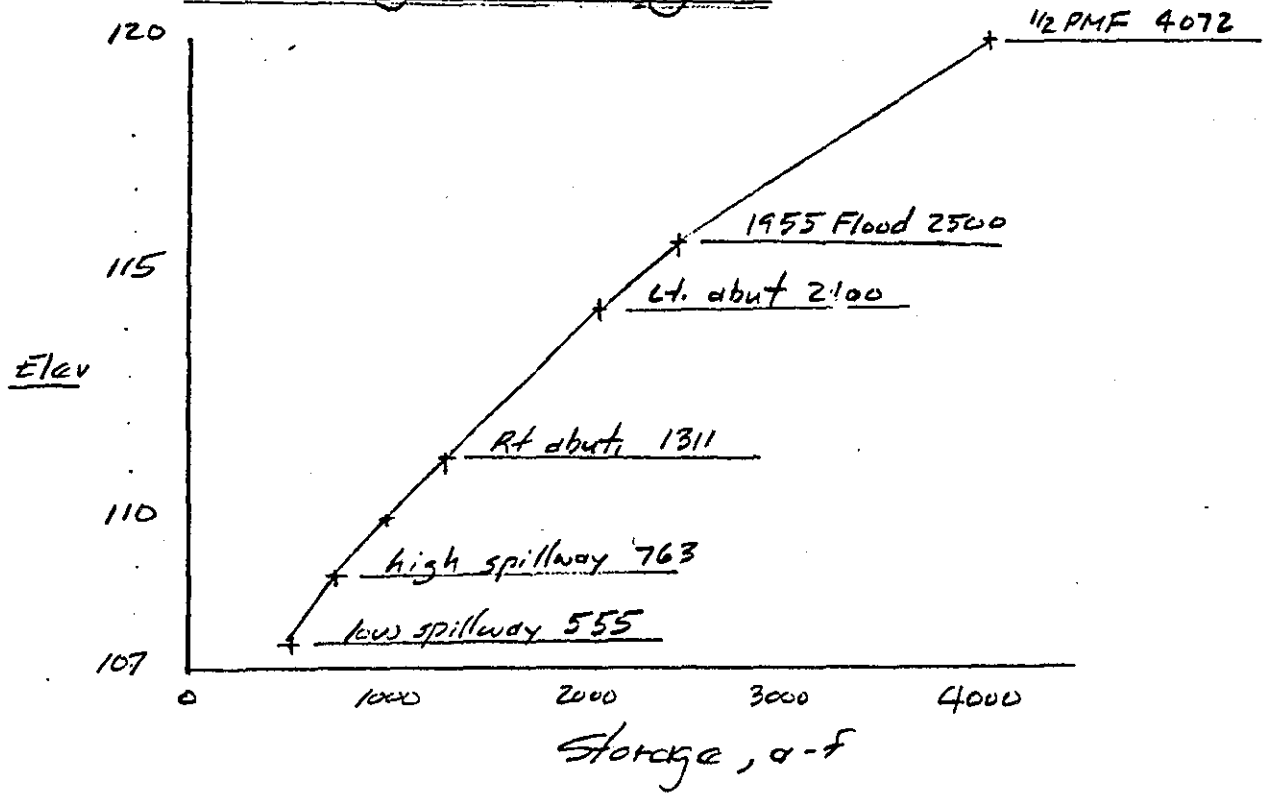
SHEET NO. 4
JOB Dams
SUBJECT Chicopee
CLIENT Corps

Stage Discharge



Stage Storage