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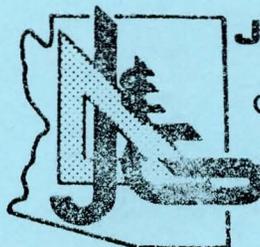
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DRAINAGE REPORT

I-10, ELLIOT ROAD, 56TH STREET

IMPROVEMENT DISTRICT

JUNE 1979



**JOHANNESSEN
& GIRANO**

CONSULTING ENGINEERS

Civil/Survey • Structural
Mechanical • Electrical

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26. 0-00-7-06/79

A024.305

LOCATION:

The proposed development will be a light industrial subdivision located in the northeast quadrant of the I-10 Elliot Road interchange.

The site is bounded by I-10 on the west, 56th Street on the east, Elliot Road on the south, and Carmen Street on the north.

Offsite runoffs affecting the site are those from the South Mountain passing through I-10 by means of culverts.

PURPOSE:

The purpose of this report is to present alternative solutions for the conveyance of offsite runoffs which would affect the proposed development.

OFFSITE HYDRAULICS:

In estimating culvert capacities the "Hydraulic Engineering Circular No. 5" (prepared by the U.S. Department of Commerce Bureau of Public Roads) was used.

The average rainfall intensity (ins/hr) is based on a 100 year 1 hour storm (2.40").

Culvert types, sizes and discharges are shown in Tables I, II, and III.

ALTERNATIVES FOR OFFSITE RUNOFFS:

A's - Immediate solutions with future possibilities.

B's - (Major Project) for the future or with immediate possibilities.

ALTERNATIVE "A":

This alternative consists of providing storage within the development area for one hours maximum discharge from the structures under I-10. Retarding (storage) Basins would be constructed adjacent to the existing right-of-way for I-10. Basins are calculated to accept and store the runoff, thereby reducing the peak, and to release reduced flows to the next basin, (see exhibit 1 and graph's A,B,C,D). Four basins would be constructed, with the outflow at Basin "D" limited to 44 c.f.s. at Elliot Road.

Several options are available at this point:

A-1 - The outflow from Basin "D" would be carried to a point located at Elliot Road and 56th Street by means of an open channel or ditch. (See Exhibit I).

A-2 - The 30" concrete pipe acting as the outlet from Basin "D" could continue through the Elliot Road and I-10 ramp and discharge on the south side of Elliot Road and be carried east by means of an open channel or ditch to 56th Street.

A-3 - An alternate to A-2 could be a lined channel running parallel to I-10 and discharging into an existing borrow pit located approximately 1.73 miles south of Elliot Road.

This alternative would pick up the additional runoff passing through I-10 and could be considered as a future improvement if not immediate (See Exhibit III).

ALTERNATIVE "B":

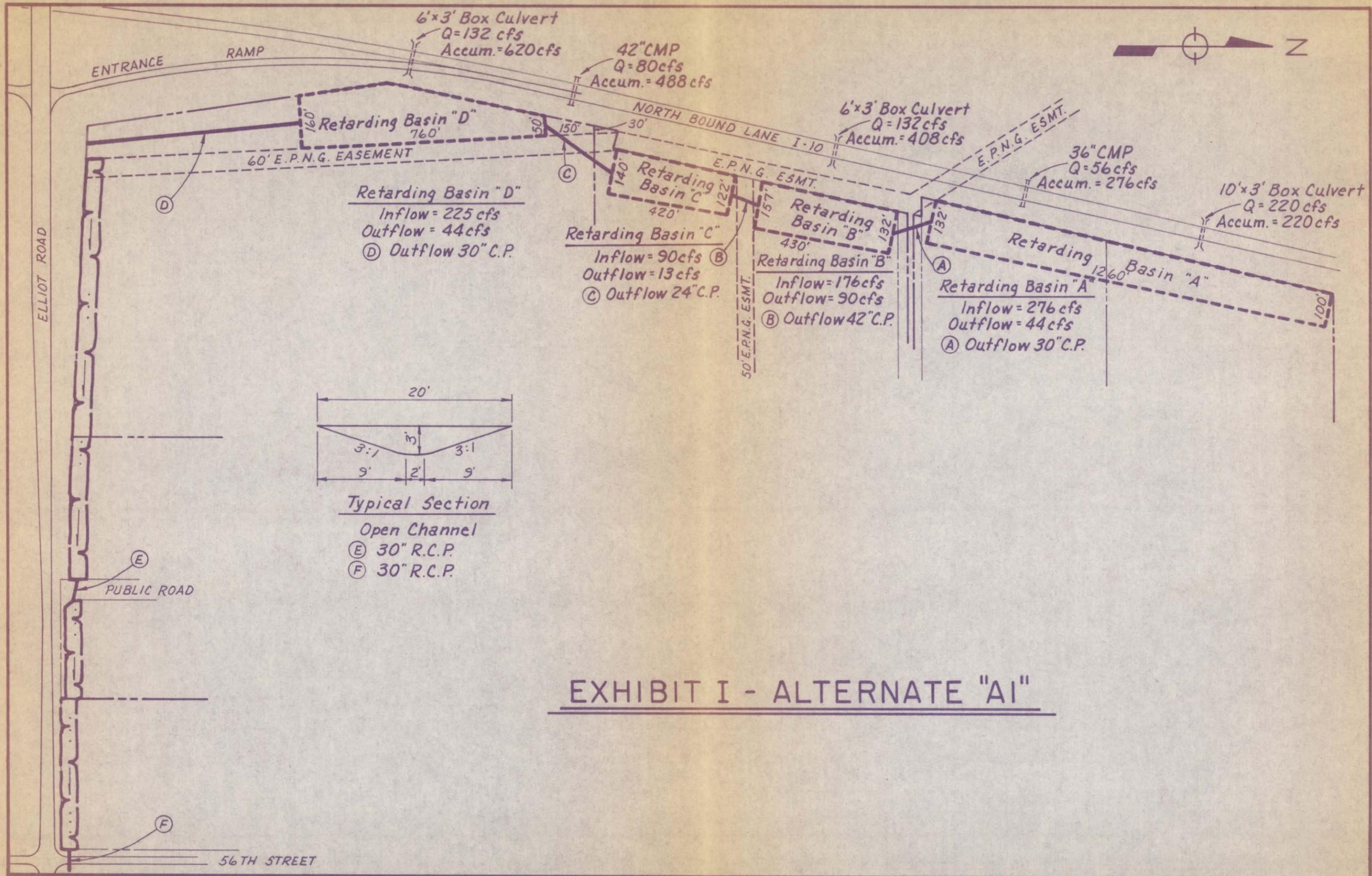
This alternate consists of constructing approximately 2.0 miles of lined channel running north to south, parallel to I-10, from Carmen Street to an existing borrow pit.

This alternate would require major construction items apart from the lined channel, such as the jacking of a 84" R.C.P. under Elliot Road, and a major box culvert (3)12' x 10.5') through Warner Road. Additionally, this would involve property owners not associated with this development. (See Exhibit II)

COST COMPARISONS:

A preliminary construction cost estimate was made of each of alternates as was an estimate of possible right-of-way acquisition costs.

The results of these estimates are shown in Tables IV, V and VI.



SECTION _____

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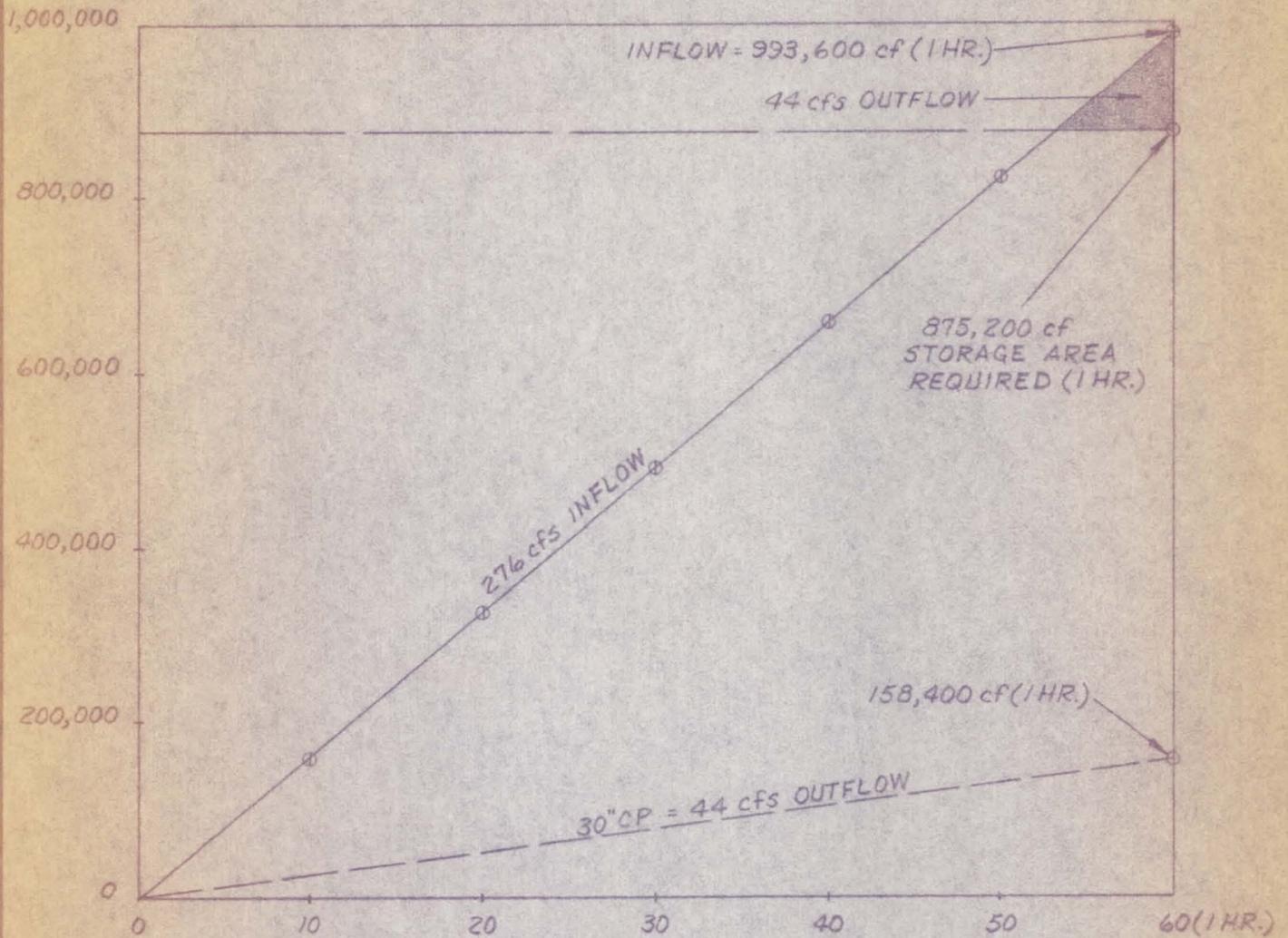
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JOB. NO. _____

RETARDING BASIN "A"

GRAPH-A



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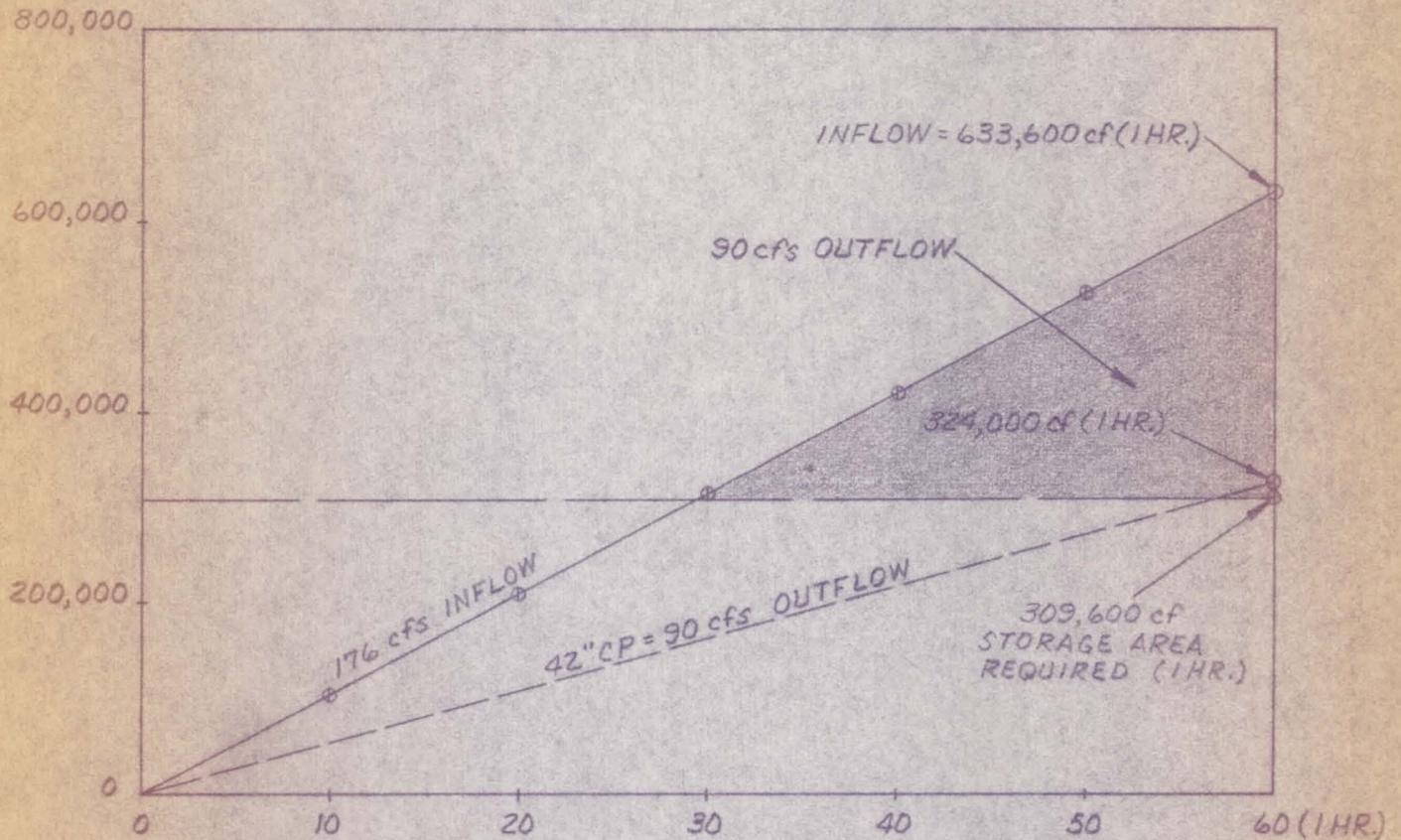
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RETARDING BASIN "B"

GRAPH-B



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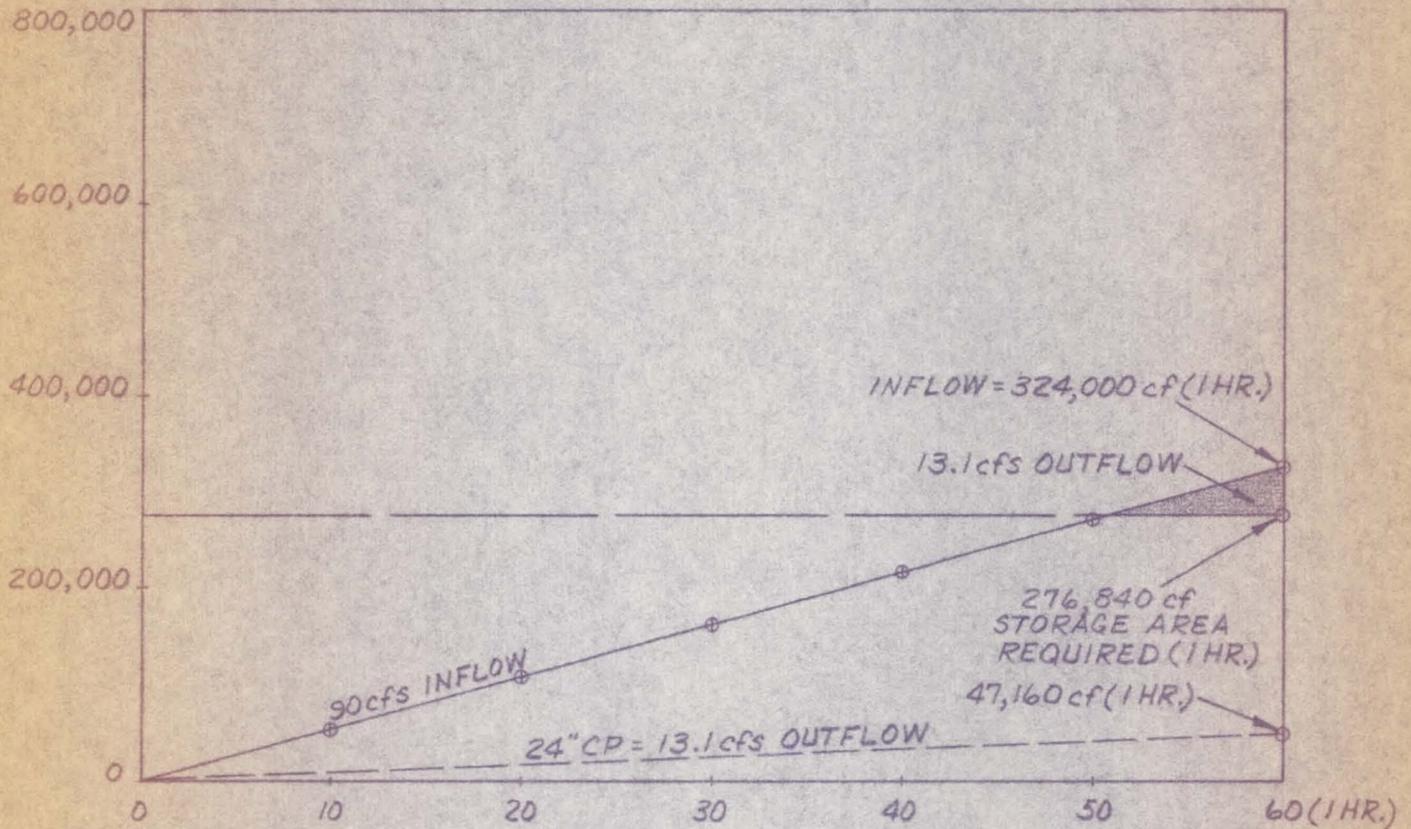


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JOB NO. _____

RETARDING BASIN "C"

GRAPH-C



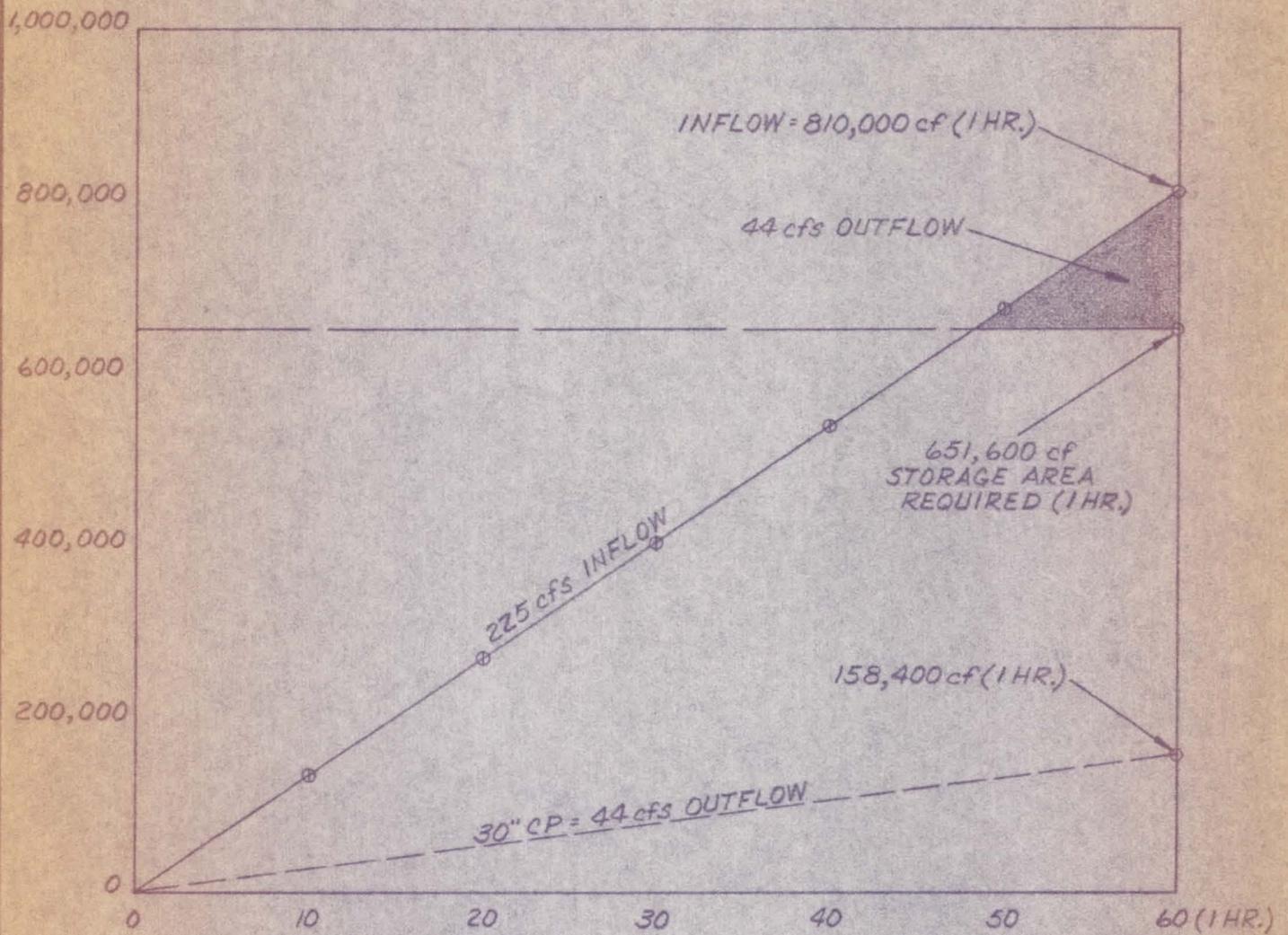
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JOB. NO. _____

RETARDING BASIN "D"
GRAPH-D



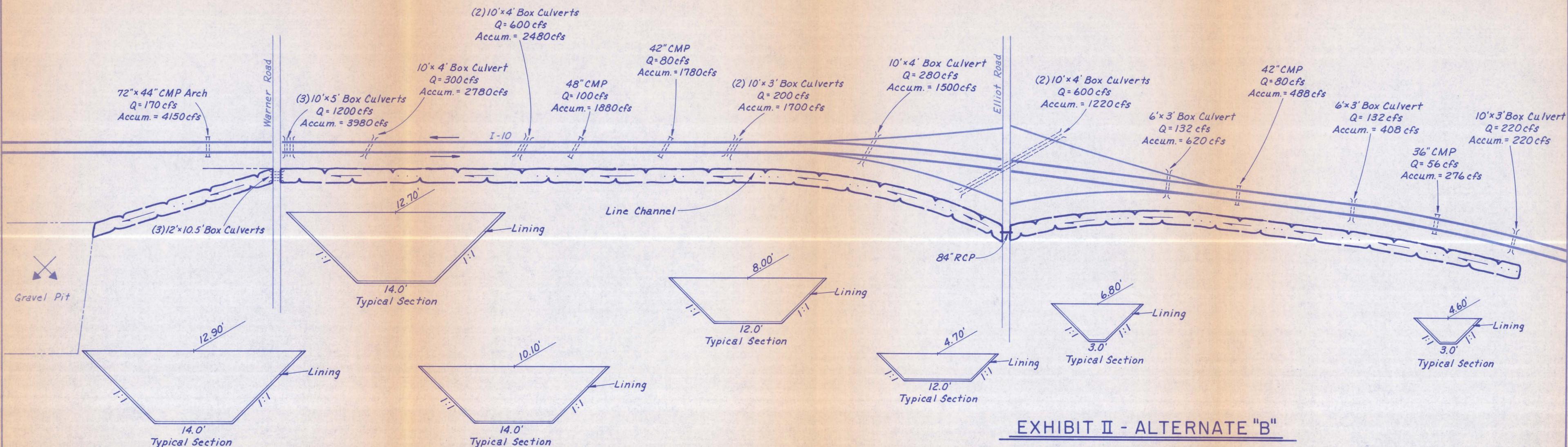


EXHIBIT II - ALTERNATE "B"

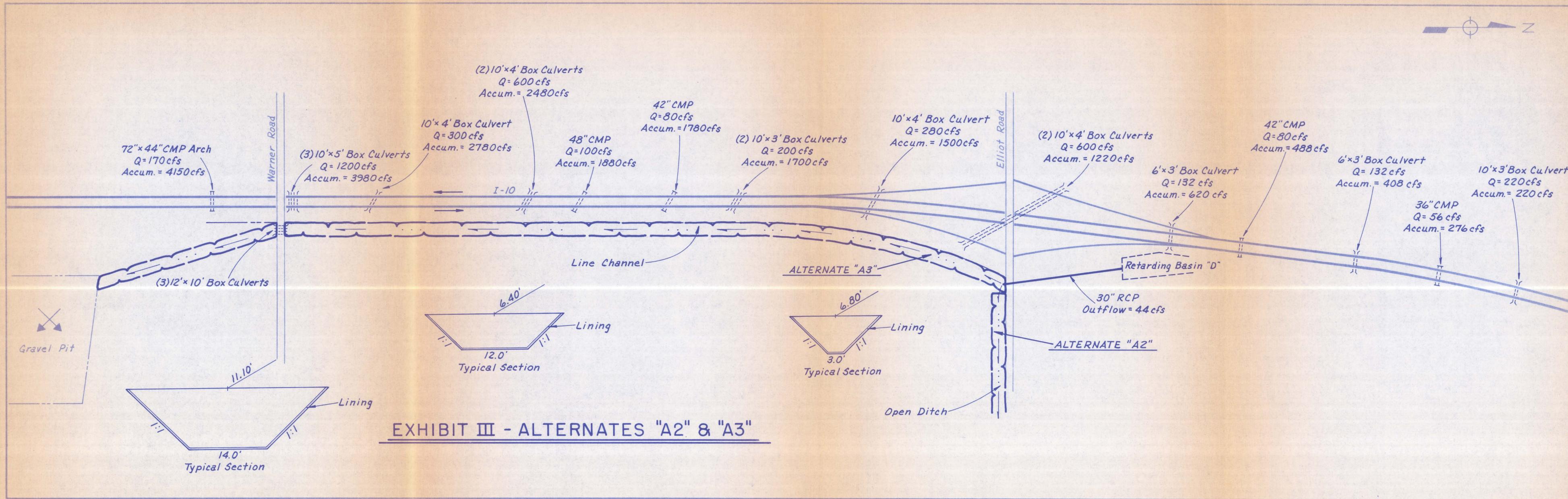


EXHIBIT III - ALTERNATES "A2" & "A3"

TABLE I

OFFSITE RUNOFF TO ELLIOT RD, I-10 IMPROVEMENT
DISTRICT

STA I-10	CULVERT SIZE & TYPE	"Q" c.f.s. (Ref.) "Hydra.Eng No.5"	ACCUM. "Q" c.f.s.
629 + 35	10' x 3 Box	220	220
635 + 00	36" CMP	56	276
641 + 00	6' x 3' Box	132	408
649 + 34	42" CMP	80	488
654 + 46	6' x 3' Box	132	620

TABLE II
 RUNOFF FROM I-10, CARMEN ST. TO EXISTING BORROW PIT
 (BALANCE)

STA. I-10	CULVERT SIZE & TYPE	"Q" c.f.s. HYDRA-ENG NO. 5	ACCUM "Q" c.f.s.
629 + 35	10' x 3' Box	220	220
635 + 00	36" CMP	56	376
641 + 00	6' x 3' Box	132	408
649 + 34	42" CMP	80	488
654 + 46	6' x 3' Box	132	620
666 + 62	Elliot Rd. (2) 10' x 4' Box	600	1220
676 + 41	10' x 4' Box	280	1500
686 + 27	(2) 10' x 3 Box	200	1700
690 + 97	42" CMP	80	1780
697 + 38	48" CMP	100	1880
701 + 16	(2) 10 x 4 Box	600	2480
712 + 16	10' x 4' Box	300	2780
717 + 68	Warner Rd. (3) 10' x 5' Box	1200	3980
723 + 50	72" x 44" CMP ARCH	170	4150

TABLE III

RUNOFF FROM RETARDING BASIN "D" TO BORROW PIT

STA I-10	CULVERT SIZE & TYPE	"Q" c.f.s. (Ref.) "Hydra Eng No.5	ACCUM. "Q" c.f.s.
	30" RCP	FROM RETARDING BASIN "D"	44
666 + 62	(2) 10' x 4' Box	600	644
676 + 41	10' x 4' Box	280	924
686 + 27	(2) 10' x 3'	200	1124
690 + 97	42" CMP	80	1204
697 + 38	48" CMP	100	1304
701 + 16	(2) 10' x 4' Box	600	1904
712 + 16	10' x 4' Box	300	2204
717 + 68	WARNER RD. (3) 10' x 5' Box	1200	3404
723 + 50	72" x 44" CMP ARCH	170	3574

TABLE IV

PRELIMINARY COST ESTIMATE

ALTERNATE "A" - RETARDING BASINS-OUTFLOW TO 56th ST.

ITEM DESCRIPTION	COST (\$)
Excavation and Embankments For Retarding Basins & Ditches	148,050.00
Drainage Structures	74,000.00
	Construction Total - 222,050.00
Right A-Way Acquisition	178,370.00
	Grand Total \$400,420.00

TABLE V

PRELIMINARY COST ESTIMATE

ALTERNATE "B" LINED CHANNEL (+ 2.0 MILES)

ITEM DESCRIPTION	CONSTRUCTION COST (\$)
Channel Excavation and Lining	655,500.00
Drainage Structures	264,500.00
Construction Total -	920,000.00
Right A-Way Acquisition	72,760.00
Grand Total	\$992,760.00

TABLE VI

PRELIMINARY COST ESTIMATE

ALTERNATE A (3) RETARDING BASINS AND LINED CHANNEL

ITEM DESCRIPTION	CONSTRUCTION COST (\$)
Excavation Embankments for Retarding Basin, Channel and Channel Lining	614,459.00
Drainage Structures	261,400.00
Construction Total -	875,859.00
Right A-Way Acquisition	241,336.00
Grand Total	\$1,117,196.00