



SHAFFER, KLINE & WARREN, P.A.

CIVIL ENGINEERS — LAND SURVEYORS — LANDSCAPE ARCHITECTS
LAND PLANNERS — TRANSPORTATION & TRAFFIC ENGINEERS

11100 WEST 91st STREET
OVERLAND PARK, KANSAS 66214
913/888-7800 FAX NO. 913/888-7868

LETTER OF TRANSMITTAL

TO City of Wichita, KS
Engineering Dept.
7th FLOOR

DATE	5-3-91	JOB NO.	50217
ATTENTION	Vicky Huang		
RE:	USPS-WICHITA (Midland Station)		

GENTLEMEN:

WE ARE SENDING YOU Attached Under separate cover via _____ the following items:

Shop drawings Prints Plans Samples Specifications

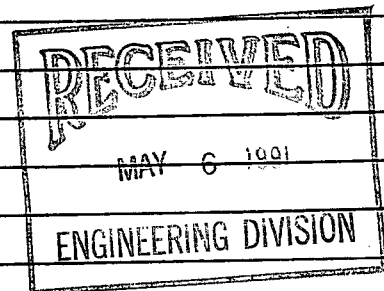
Copy of letter Change order _____

COPIES	DATE	NO.	DESCRIPTION
1	4-15-91		TR-55 TABULAR DISCHARGE
1	4-30-91		DET. BASIN ROUTING

THESE ARE TRANSMITTED as checked below:

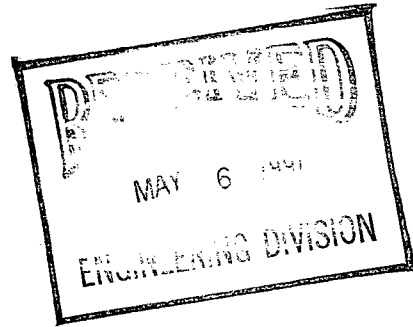
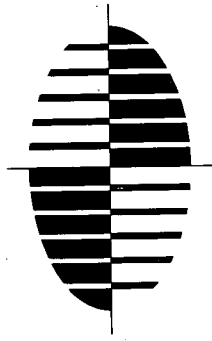
- For approval
- For your use
- As requested
- For review and comment
- FOR BIDS DUE _____ 19____
- Approved as submitted
- Approved as noted
- Returned for corrections
- _____
- Resubmit _____ copies for approval
- Submit _____ copies for distribution
- Return _____ corrected prints
- PRINTS RETURNED AFTER LOAN TO US

REMARKS I forgot to include this with my other
letter to you.



COPY TO _____

SIGNED: Amie Fullock



SHAFFER, KLINE & WARREN, P.A.

CIVIL ENGINEERS—LAND SURVEYORS—LANDSCAPE ARCHITECTS
LAND PLANNERS—TRANSPORTATION & TRAFFIC ENGINEERS

May 2, 1991

Ms. Vicky Huang, P.E.
City of Wichita
Engineering Department
City Hall, 7th Floor
455 N. Main Street
Wichita, Kansas 67202

Re: New Postal Facility
Southwest Corner Hydraulic Avenue and 31st Street South

Dear Vicky:

Enclosed herewith please find two copies of the Grading Plan, Storm Sewer Profiles, and Underground Detention Basin Details for the above referenced project. Also attached is a copy of our detention basin routing calculations and inflow hydrograph and the TR-55 Tabular Discharge Method for the 5-year and 100-year storm frequencies.

Shown on the Grading Plan in the northwest corner of the project site is our proposed grading for an open air detention basin which will discharge to a wet well manhole and pump to the existing curb inlet on Victoria Street. In the upper right hand corner of the Grading Plan sheet is the alternate plan for an underground detention basin system using multiple 72-inch reinforced concrete pipes which would also discharge to a wet well manhole and be pumped to the curb inlet on Victoria Street.

Using the peak discharge for the 5-year frequency storm (undeveloped conditions) we have an allowable peak discharge of 13 cfs. The 100-year frequency storm (developed conditions) has allowable peak discharge of 31 cfs. We have also examined the capacity of the existing 15-inch RCP that drains west from the existing curb inlet on the east side of Victoria Street, and it has a maximum capacity of 6.5 cfs. This is approximately one-half of the 13 cfs that will discharge to this inlet using the 5-year frequency storm (undeveloped conditions) noted above.

One cfs is equal to approximately 448 gallons per minute which we have used in analyzing the pumping rate we would select for the allowable discharge from the detention basin. If we were to discharge at the allowable 13 cfs, this would equate to approximately 5,800 gallons per minute. Obviously this is not practical for the existing 15-inch storm sewer pipe we would be flowing to. It will also require approximately a 50 horsepower pump, which would be cost prohibitive. The discharge line from the wet well manhole to the curb inlet on Victoria Street would require a 16-inch ductile iron pipe.

Ms. Vicky Huang, P.E.
City of Wichita
May 2, 1991
Page 2

The volume of storage required to detain the 5-year frequency storm as shown on the detention basin routing computations is based on a pumping rate of 3 cfs which would equate to approximately 1,300 gallons per minute. This would require a 15 horsepower pump and an 8-inch ductile iron pipe, which would connect to the curb inlet on Victoria Street. Using the configuration for the open air basin that is shown on the Grading Plan, we would need approximately 24,500 cubic feet of storage with a depth of approximately 4.4 feet in the reinforced concrete detention basin we are proposing. The underground detention system as proposed also contains a storage volume of 24,500 cubic feet.

The elevation that we have selected for the top of wall of the concrete detention basin of 83.0 was determined by using outlet control from each of the curb inlets that are proposed on our Grading Plan. The hydraulic grade line that is shown red marked on the storm sewer profile included with these prints indicates that the highest elevation water can pond in the detention basin without causing a backup or tail water condition at the curb inlets is elevation 83.0. Therefore, we have elected to grade down from elevation 90.0 to elevation 83.0 on a 3 to 1 slope to reduce the cost of the concrete walls required to construct the basin.

Please review the methods of detention that we are proposing, both open air concrete basin and the underground multiple pipe system, and let us know at your earliest convenience if one or both of these methods are acceptable to the City. We are preparing cost estimates at this time, which we believe will indicate that both approaches are approximately the same cost. The U.S.P.S. project manager we are working with has expressed a desire to use the underground system because it would be more aesthetically pleasing than the open air basin.

I would be happy to discuss with you in further detail our reasoning for selecting the discharge rate of 3 cfs and any other aspects concerning our design approach for this detention basin. Please feel free to call me if you have any questions.

Respectfully,

SHAFER, KLINE & WARREN, P.A.



Charles A. Tulloch, Jr., R.L.S., CET
Project Manager

CAT:prs

Enc.

cc: Mr. Bill Pulliam

Project : U.S.P.S. (WICHITA) User: DDM Date: 04-15-91
 County : SEDGWICK State: KS Checked: _____ Date: _____
 Subtitle: DETENTION ANALYSIS

0.0077 mi²

Total watershed area: ~~0.015~~ sq mi Rainfall type: II Frequency: 5 years

----- Subareas -----

EXIST. PROPO.

Area(sq mi)	0.01	0.01
Rainfall(in)	4.8	4.8
Curve number	74	89
Runoff(in)	2.21	3.58
Tc (hrs)	0.25	0.25
(Used)	0.20	0.20
TimeToOutlet	0.00	0.00
Ia/P	0.15	0.05
(Used)	0.15	0.10

----- Subarea Contribution to Total Flow (cfs) -----

Time (hr)	EXIST.	PROPO.
11.0	0	1
11.3	0	1
11.6	1	1
11.9	3	6
12.0	6	11
12.1	12	20
12.2	13P	22P
12.3	8	13
12.4	4	7
12.5	3	5
12.6	2	4
12.7	2	3
12.8	2	2
13.0	1	2
13.2	1	2
13.4	1	1
13.6	1	1
13.8	1	1
14.0	1	1
14.3	1	1
14.6	1	1
15.0	1	1
15.5	1	1
16.0	0	1
16.5	0	1
17.0	0	1
17.5	0	1
18.0	0	0
19.0	0	0
20.0	0	0
22.0	0	0
26.0	0	0

Allowable discharge 13 c.f.s. (Peak)

11.7 2
11.8 3

2
1
1

Project : U.S.P.S. (WICHITA) User: DDM Date: 04-15-91
 County : SEDGWICK State: KS Checked: _____ Date: _____
 Subtitle: DETENTION ANALYSIS

0.0077 mi.²

Total watershed area: ~~4.035~~ sq mi Rainfall type: II Frequency: 100 years

----- Subareas -----

	EXIST.	PROPO.
Area(sq mi)	0.01	0.01
Rainfall(in)	8.2	8.2
Curve number	74	89
Runoff(in)	5.07	6.84
Tc (hrs)	0.25	0.25
(Used)	0.20	0.20
TimeToOutlet	0.00	0.00
Ia/P	0.09	0.03
(Used)	0.10	0.10

Time ----- Subarea Contribution to Total Flow (cfs) -----
 (hr) EXIST. PROPO.

11.0	1	1
11.3	1	2
11.6	2	2
11.9	8	11
12.0	16	21
12.1	29	39
12.2	31P	42P
12.3	19	25
12.4	10	13
12.5	6	9
12.6	5	7
12.7	4	5
12.8	3	5
13.0	3	4
13.2	2	3
13.4	2	3
13.6	2	3
13.8	2	2
14.0	2	2
14.3	1	2
14.6	1	2
15.0	1	2
15.5	1	1
16.0	1	1
16.5	1	1
17.0	1	1
17.5	1	1
18.0	1	1
19.0	1	1
20.0	1	1
22.0	0	1
26.0	0	0

11.7 5
11.8 8

Allowable discharge 31 c.f.s. (Peak)

HOUR OF DURATION	INFLOW "1"	INFLOW HYDROGRAPH DESIRED INFLOW "2"	2*S"1"/t	0"1"
11.9	0	6	0.00	0.00
12.0	6	11	5.58	0.42
12.1	11	20	20.62	1.54
12.2	20	22	47.08	3.00
12.3	22	13	83.08	3.00
12.4	13	7	112.08	3.00
12.5	7	5	126.08	3.00
12.6	5	4	132.08	3.00
12.7	4	3	135.08	3.00
12.8	3	2	136.08	3.00
12.9	2	2	135.08	3.00
13.0	2	2	133.08	3.00
13.1	2	2	131.08	3.00
13.2	2	1	129.08	3.00
13.3	1	1	126.08	3.00
13.4	1	1	122.08	3.00
13.5	1	1	118.08	3.00
13.6	1	1	114.08	3.00
13.7	1	1	110.08	3.00
13.8	1	1	106.08	3.00
13.9	1	1	102.08	3.00
14.0	1	1	98.08	3.00

DETENTION BASIN ROUTING FOR SELECTED EARTHEN OR STRUCTURAL BASIN

Storage - Indication Curve Method With Routing Increment = 0.1 hours
 Route Peak 2.1 Hours Of SCS 24 - Hour Type II Storm

1" means beginning of routing period

Formula: $INFLOW"1"+INFLOW"2"+[2*STORAGE"1"/ROUTING\ INCREMENT]-OUTFLOW"1"=[(2*STORAGE"2"/ROUTING\ INCREMENT)+OUTFLOW"2"]$

FORMULA: $[(2*STORAGE"2"/ROUTING\ INCREMENT)+OUTFLOW"2"]-OUTFLOW"2"=2*STORAGE"2"/ROUTING\ INCREMENT$

STORM FREQUENCY: 5-YEAR

DATE:

30-Apr-91

01:09 PM

DESCRIPTION: U.S.P.S. (WICHITA)

D.D.M. 4-30-91

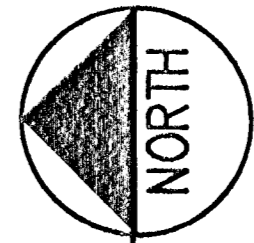
STAGE ELEVATIONS DESIRED	STAGE STORAGE VOL. CU. FT.	STAGE OUTFLOW C.F.S.	2*S/t	(2*S/t)+0
1	0	0	0.00	0.00
2	7225	3	40.14	43.14
3	14450	3	80.28	83.28
4	21675	3	120.42	123.42
5	28900	3	160.56	163.56
6	36125	3	200.69	203.69
7	43350	3	240.83	243.83
8	50575	3	280.97	283.97
9	57800	3	321.11	324.11
NA	NA	NA	NA	NA
NA	NA	NA	NA	NA
NA	NA	NA	NA	NA
NA	NA	NA	NA	NA
NA	NA	NA	NA	NA

HOUR OF DURATION	READ SIC CURVE 2*S"2"/t+0"2"	BASIN RELEASE RATES 0"2"	2*S"2"/t	BASIN STORAGE VOLUMES S"2"
11.9	6.00	0.42	5.58	1004.89
12.0	22.17	1.54	20.62	3712.33
12.1	50.08	3.00	47.08	8474.87
12.2	86.08	3.00	83.08	14954.87
12.3	115.08	3.00	112.08	20174.87
12.4	129.08	3.00	126.08	22694.87
12.5	135.08	3.00	132.08	23774.87
12.6	138.08	3.00	135.08	24314.87
12.7	139.08	3.00	136.08	24494.87
12.8	138.08	3.00	135.08	24314.87
12.9	136.08	3.00	133.08	23954.87
13.0	134.08	3.00	131.08	23594.87
13.1	132.08	3.00	129.08	23234.87
13.2	129.08	3.00	126.08	22694.87
13.3	125.08	3.00	122.08	21974.87
13.4	121.08	3.00	118.08	21254.87
13.5	117.08	3.00	114.08	20534.87
13.6	113.08	3.00	110.08	19814.87
13.7	109.08	3.00	106.08	19094.87
13.8	105.08	3.00	102.08	18374.87
13.9	101.08	3.00	98.08	17654.87
14.0	97.08	3.00	94.08	16934.87

PEAK STORAGE (CU. FT.): 24494.87
 PEAK DISCHARGE (C.F.S.): 3.00
 PEAK ELEVATION: 4.39

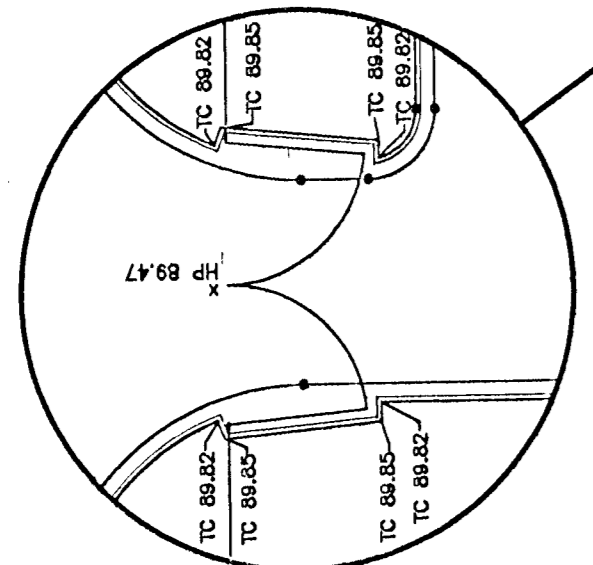
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- LEGEND**
- DENOTES ASPHALT CONCRETE PAVEMENT (SEE SHEET C14 FOR PAVEMENT THICKNESS)
 - DENOTES PORTLAND CEMENT CONCRETE PAVEMENT
 - DENOTES CONCRETE SIDEWALK
 - DENOTES PROPOSED PIPE BOLLARD

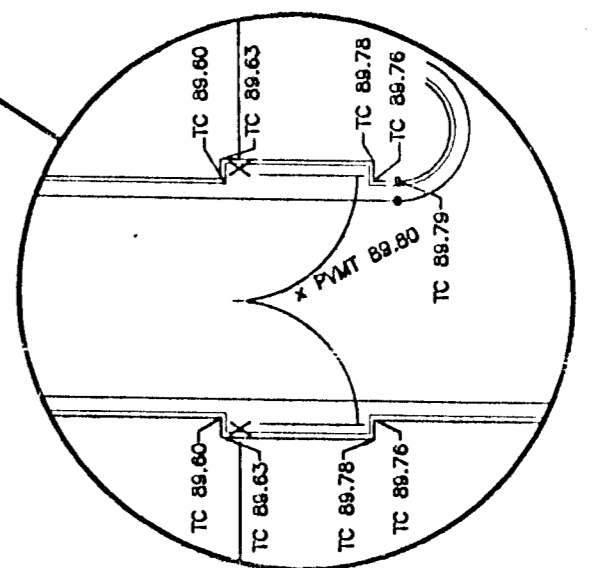
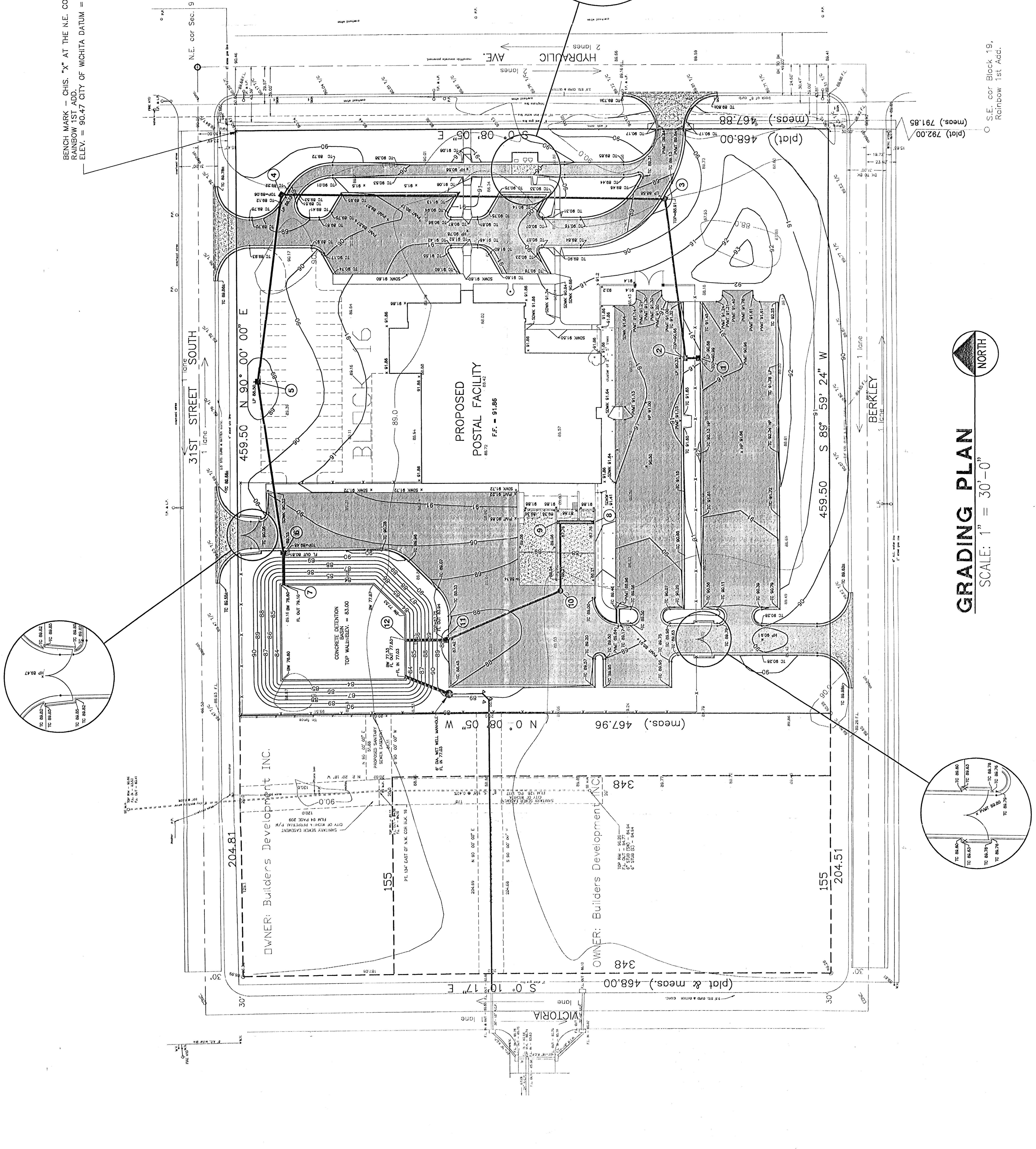
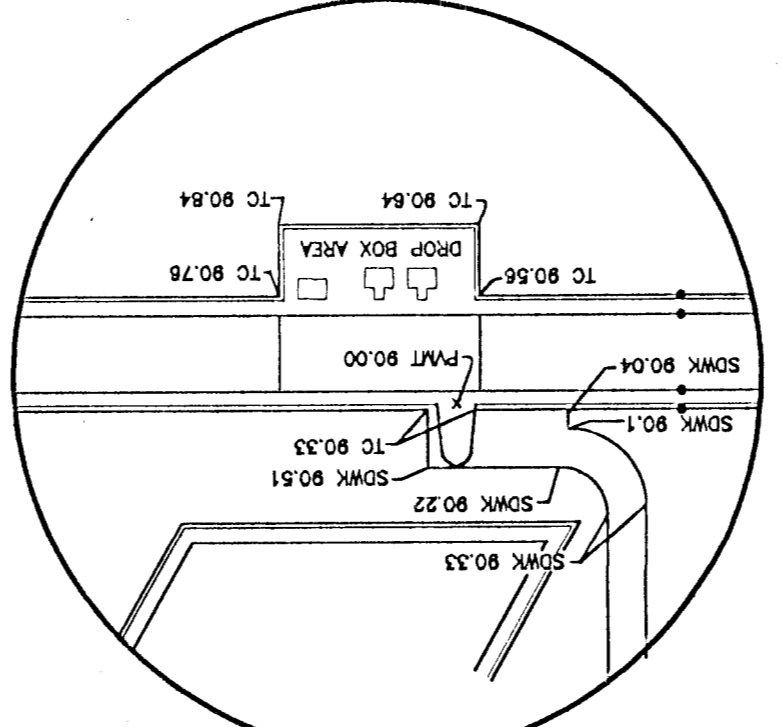
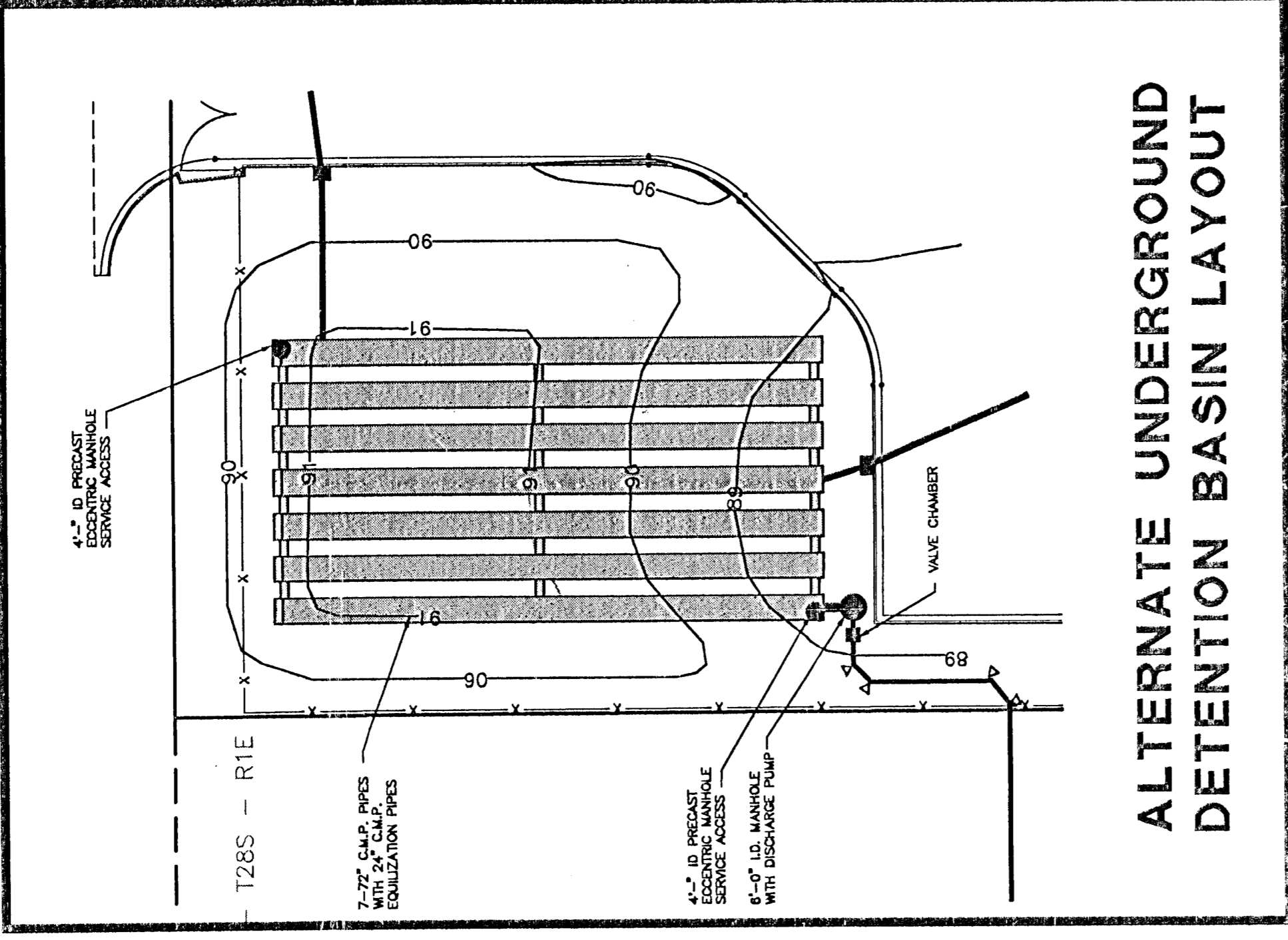


GRADING PLAN

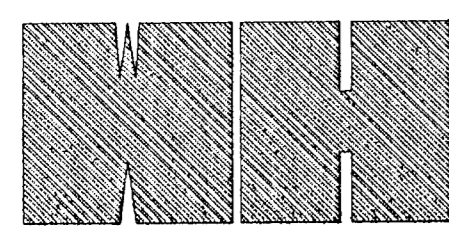
SCALE: 1" = 30'-0"



BENCH MARK - CHIS. "X" AT THE N.E. CORNER OF BLOCK 16, RAINBOW 1ST ADD. ELEV. = 90.47 CITY OF WICHITA DATUM = 1277.87 MEAN SEA LEVEL



S.E. cor Block 19, Rainbow 1st Add.



THE HOLLIS + MILLER GROUP Architecture Planning Interior Design

816-525-5600 Lee's Summit, Missouri 64083

United States Postal Service Kit of Parts

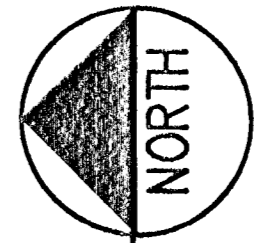
Facilities Services Office

Midland Station

Grading Plan

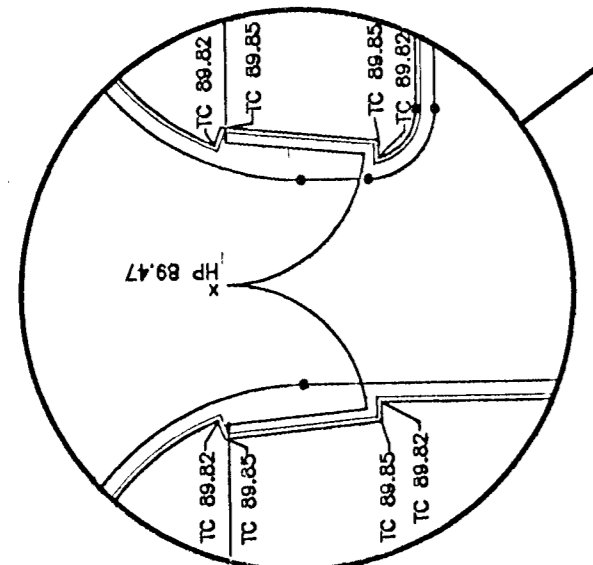
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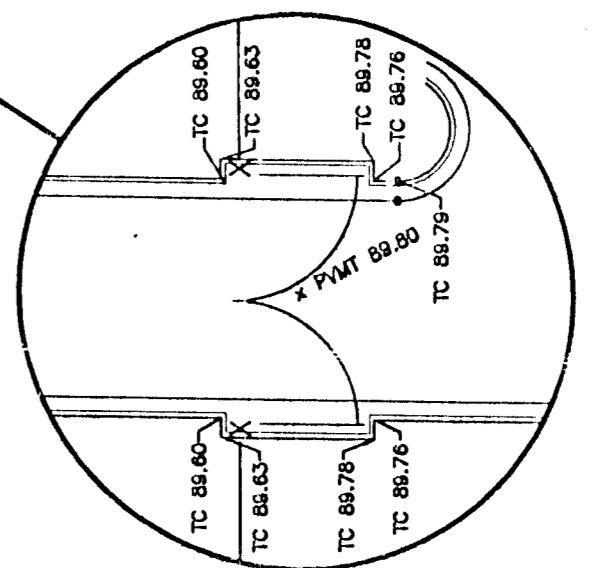
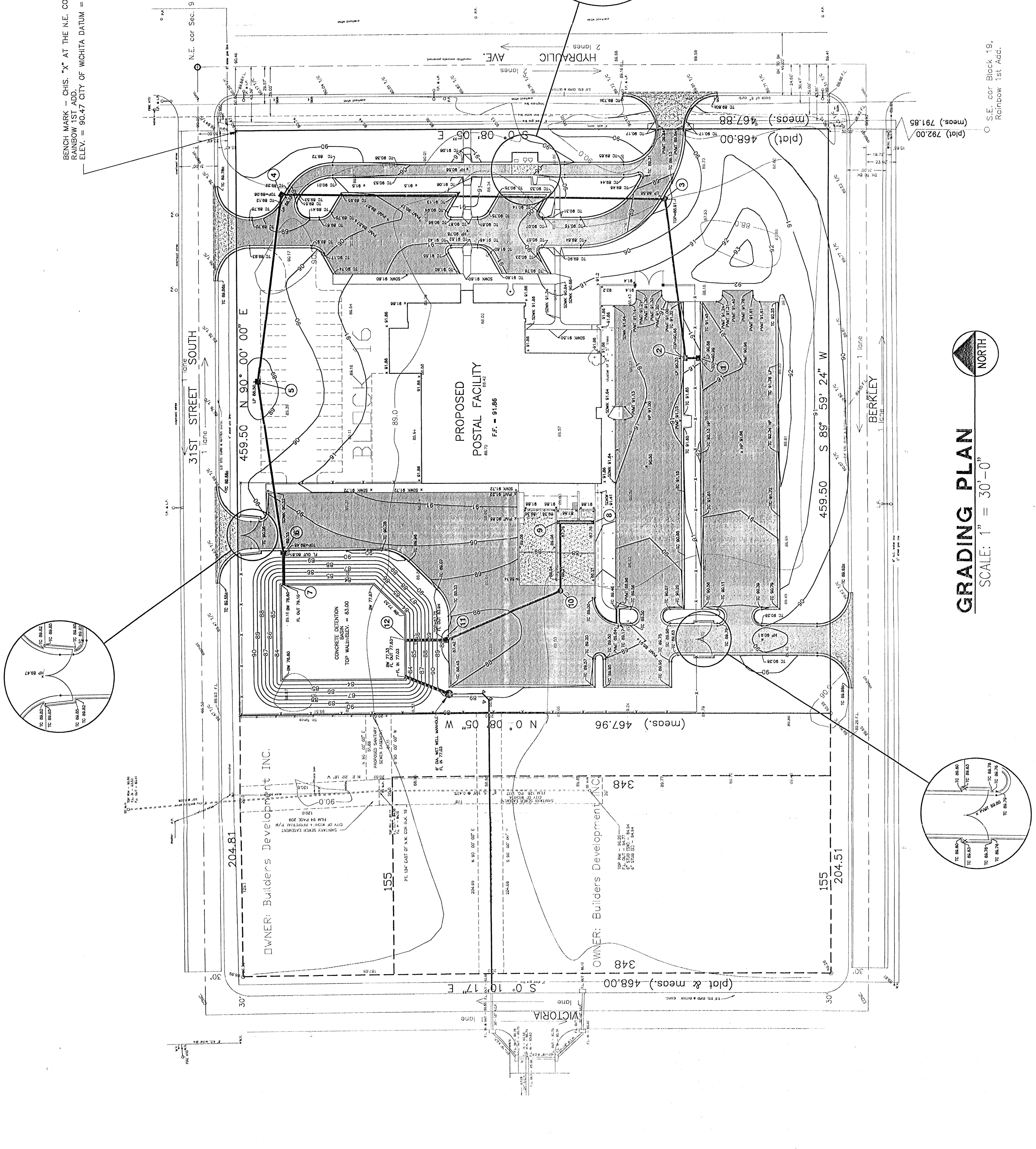
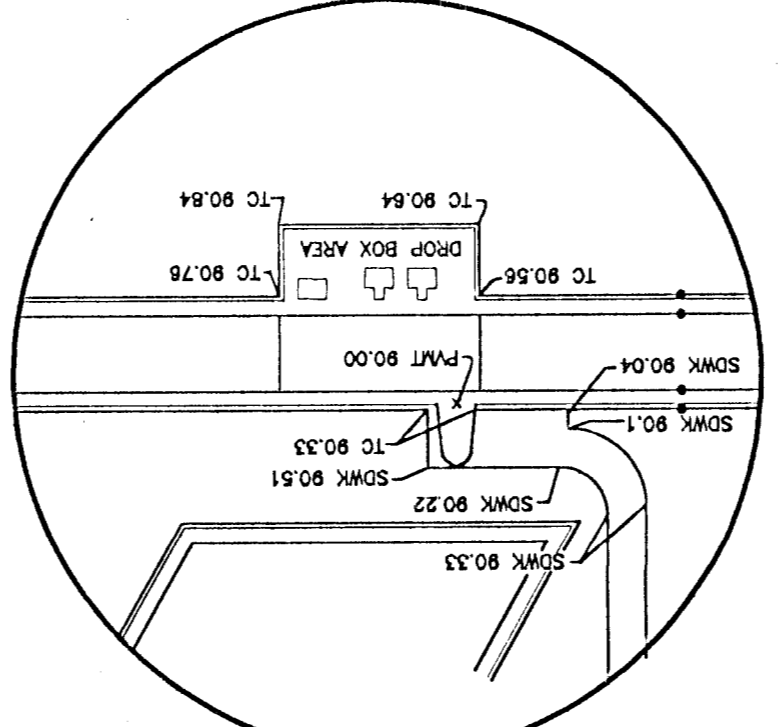
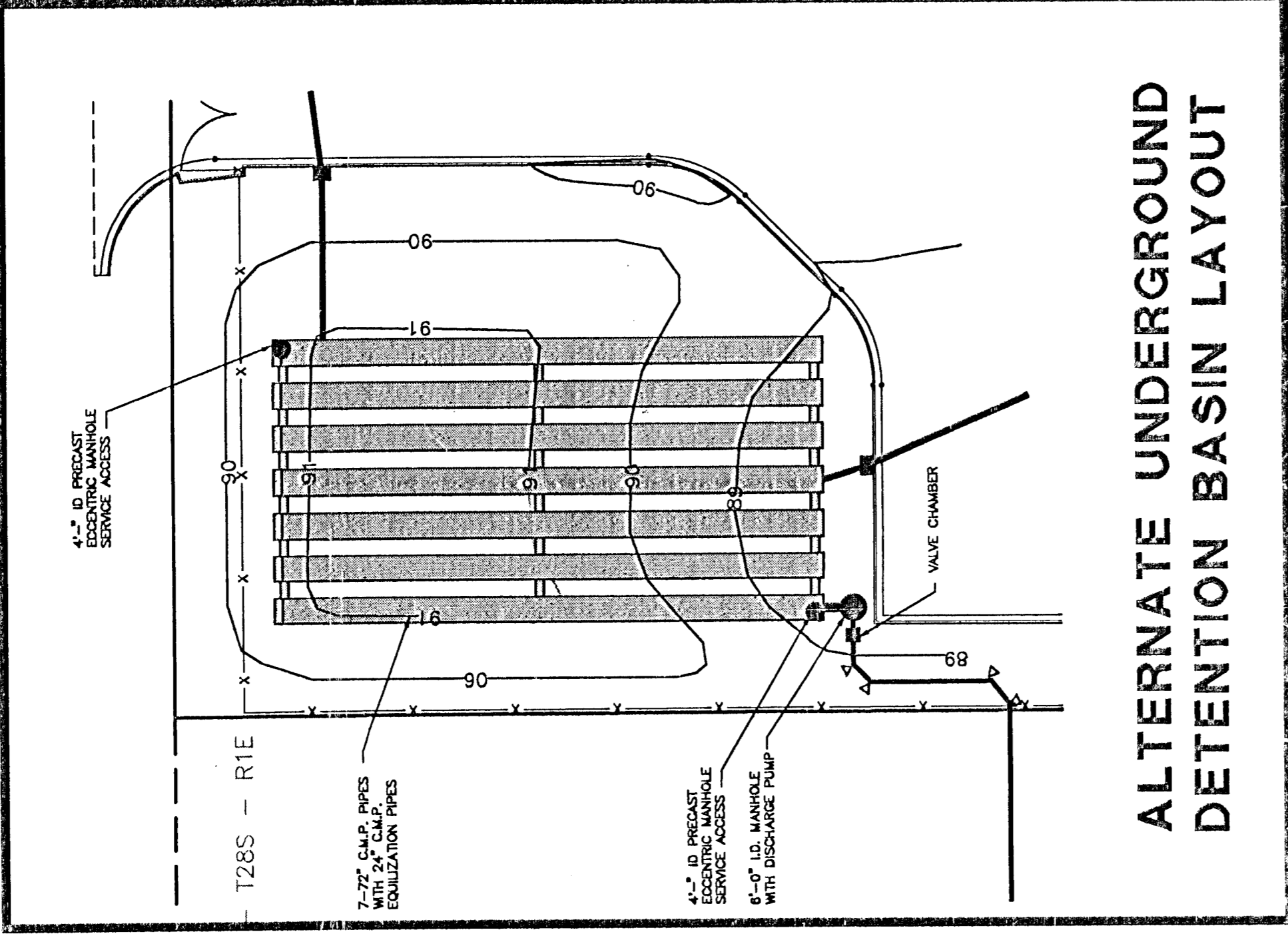


GRADING PLAN

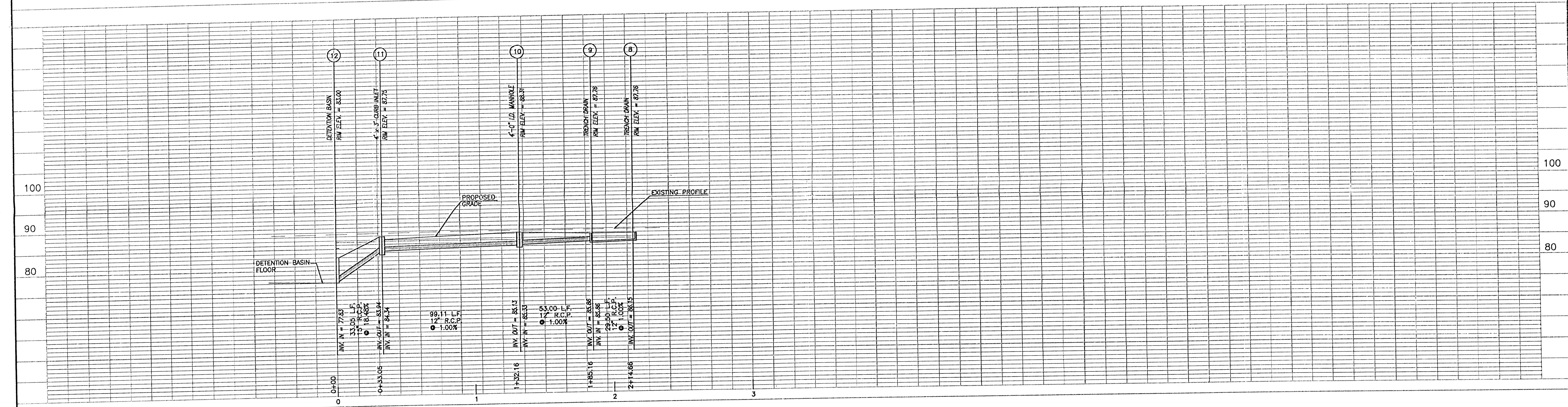
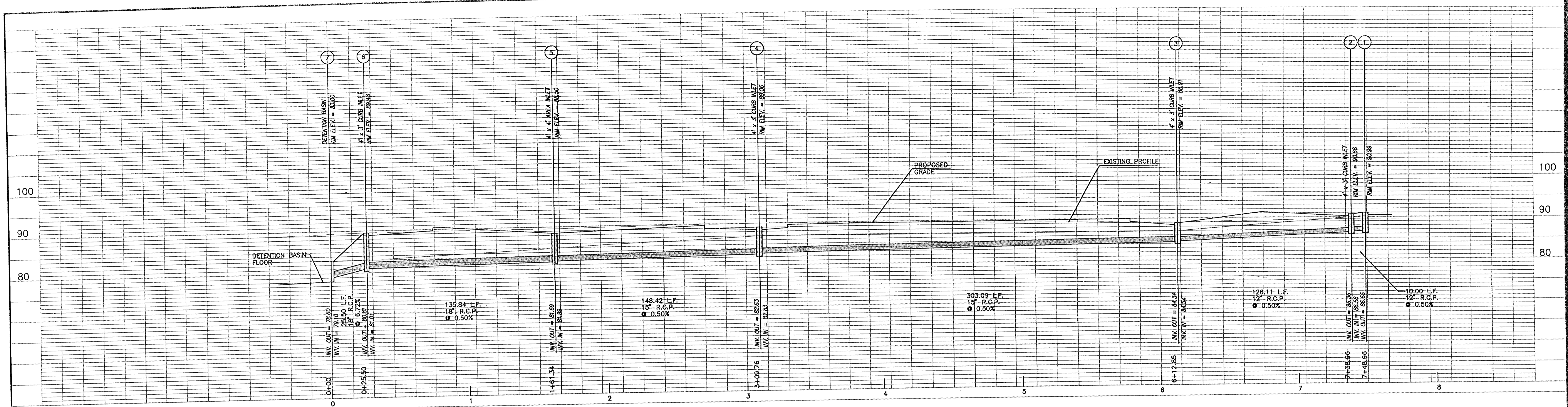
SCALE: 1" = 30'-0"



BENCH MARK - CHIS. "X" AT THE N.E. CORNER OF BLOCK 16, RAINBOW 1ST ADD. ELEV. = 90.47 CITY OF WICHITA DATUM = 1277.87 MEAN SEA LEVEL



S.E. cor Block 19, Rainbow 1st Add.




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 OFFICE: 913-888-7800 FAX: 913-888-7888

C2.3

Number: 9046
Date: 5/15/91

Revisions: REV

Storm Sewer Profiles

Wichita, Kansas 07210-0908

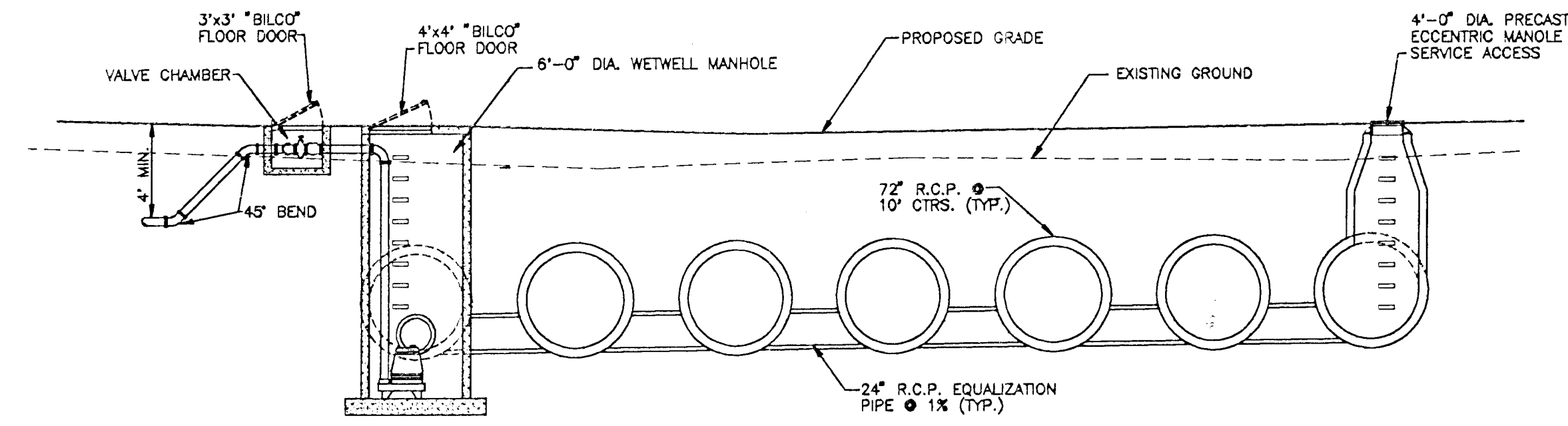
Facilities Service Office
8600 West 64th Street
Overland Park, KS 66202-4171

United States Postal Service
Facilities Department

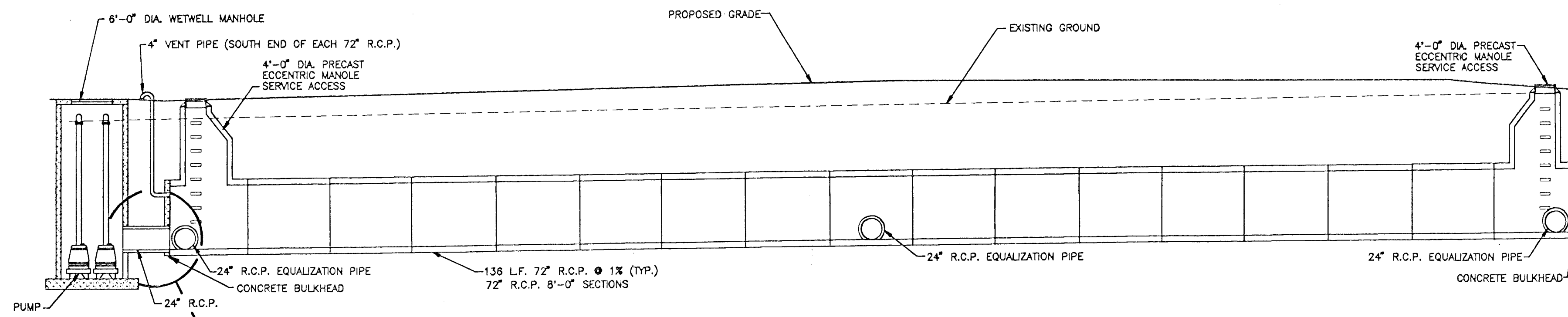
UNITED STATES POST OFFICE

THE HOLLIS + MILLER GROUP
 Architecture Planning Interior Design
 309 S.W. Market Street
 Lee's Summit, Missouri 64083
 816-525-5600

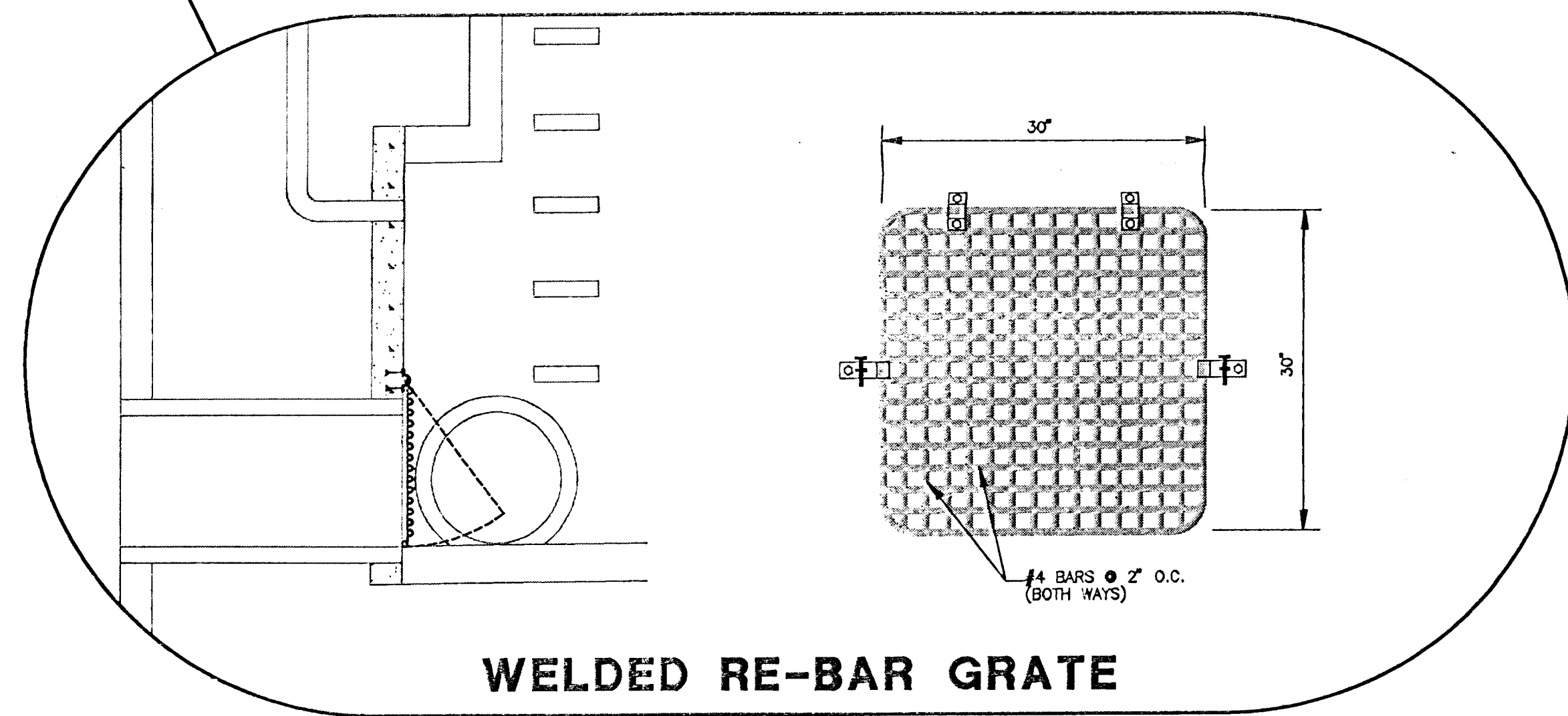
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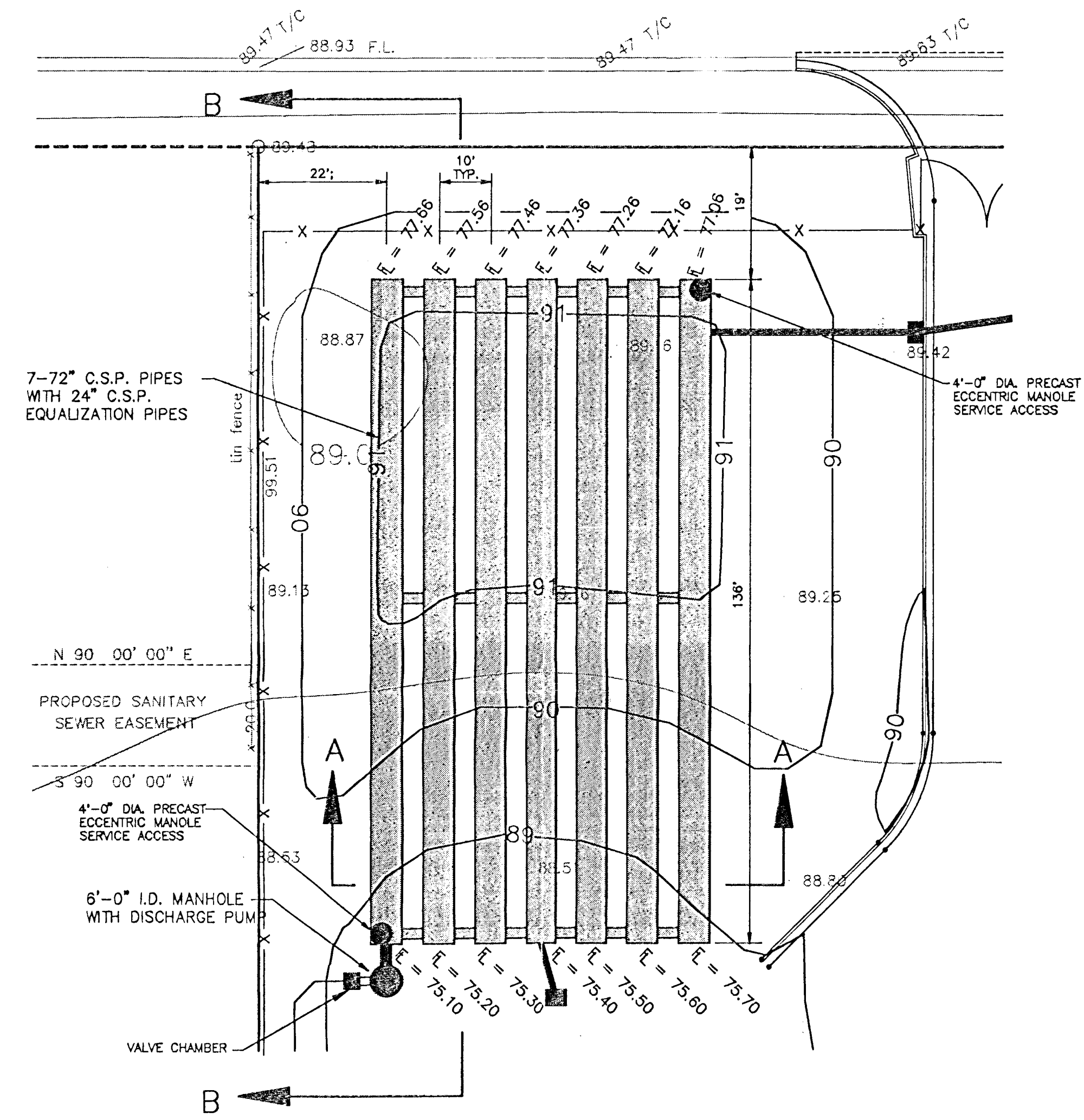
SECTION A-A



SECTION B-B



WELDED RE-BAR GRATE



PLAN VIEW

SHAFER, KLINE & WARREN, P.A.
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THE HOLLIS + MILLER GROUP
 Architecture Planning Interior Design
 309 S.W. Market Street
 Lee's Summit, Missouri 64163
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UNITED STATES POST OFFICE

DETENTION BASIN DETAILS
 Wichita, Kansas 67218-9998
 Midland Station
 Facilities Service Office
 6800 West 84th Street
 Overland Park, KS 66202-4171
 Date: 4/24/91
 Number: 9046
 Revisions:
 USFS File Number:

C2.5