

PICKETT RAY & SILVER

333 Mid Rivers Mall Dr
St. Peters, MO 63376

Civil Engineers
Planners
Land Surveyors

441-1211
278-1211

PROJECT NAME MICELLO MANOR
PROJECT #/JOB ORDER # 94-010 / 31749
DATE JULY 6, 1994
DESIGNER JIM C. / MARVIN G.
PAGE 1

TOTAL ONSITE : 69.51 ACRES

PREDEVELOPED CONDITIONS: (ONSITE DRAINING TO CROOKED CREEK)

ONSITE 64.79 ACRES @ 2.31 = 149.66 CFS (ALLOWABLE RELEASE OVERALL)

POST DEVELOPED CONDITIONS: (ONSITE DRAINING TO CROOKED CREEK)

ONSITE 68.00 ACRES @ 3.26 = 221.68 CFS

Q 25 TO BASIN "A": (PEAK INFLOW)

OFFSITE 0.50 ACRES @ 3.26 = 1.63 CFS

ONSITE 48.96 ACRES @ 3.26 = 159.61 CFS

49.46 ACRES = 161.24 CFS

BYPASS BASIN: 18.54 ACRES @ 3.26 = 60.44 CFS

68.00 ACRES 221.68 CFS

DETENTION REQUIRED:

221.68 CFS - 149.66 CFS = 72.02 CFS

72.02 CFS X 30 MIN. X 60 SEC. = 129,636 CFS

ALLOWABLE RELEASE:

149.66 CFS - 60.44 CFS BYPASS BASIN = 89.22 CFS (RELEASE ALLOWED OUT OF BASIN)

89.22 CFS OUT + 72.02 CFS DETENTION = 161.24 CFS T.O. TO BASIN

Q 10 TO BASIN "A": (PEAK INFLOW)

OFFSITE 0.50 ACRES @ 2.46 = 1.23 CFS

ONSITE 48.96 ACRES @ 2.46 = 120.44 CFS

49.46 ACRES = 121.67 CFS

Q 100 TO BASIN "A": (PEAK INFLOW)

OFFSITE 0.50 ACRES @ 4.43 = 2.02 CFS

ONSITE 48.96 ACRES @ 4.43 = 194.39 CFS

49.46 ACRES 199.33 CFS
206.25 CFS

Peak discharge is OKAY

PICKETT RAY & SILVER

333 Mid Rivers Mall Dr.
St. Peters, MO 63376

Civil Engineers
Planners
Land Surveyors

441-1211
278-1211

PROJECT NAME MONTICELLO - VILLAGE D
PROJECT #/JOB ORDER # 85-064 U
DATE FEB. 6, 1991
DESIGNER MARVIN GLORE (CALL'S.)
PAGE 1 OF 5

REVISED 3/8/91

<u>DETENTION BASIN</u> <u>VILLAGE D</u>		25 YEAR / 30 MIN. STORM DESIGN
<u>EXISTING WATERSHED RUNOFF TO O'FALLON ROAD :</u>		
40.38 AC @ 2.31 = 93.28 cfs Q25		
<u>DEVELOPED AREA TO O'FALLON ROAD :</u>		
DEVELOPED LOTS = 24.10 AC @ 3.26 = 78.57 cfs		
COMMON GROUND = 8.63 AC @ 2.31 = 19.74 cfs		
COMMERCIAL TRACT = 19.76 AC @ 4.75 = 93.86 cfs		
52.49 AC.		192.37 cfs
<u>DETENTION REQUIRED! (25 YEAR)</u>		
192.37 cfs (DEVELOPED) - 93.28 cfs (UNDEVELOPED) = 99.09 cfs		
99.09 cfs X 30 MIN X 60 SEC/MIN = (178,362 CU. FT. VOLUME STORAGE REQUIRED)		
<u>MAXIMUM OUTFLOW ALLOWED :</u>		
<u>Q25 FLOW TO BASIN :</u>		
DEVELOPED LOTS = 23.16 AC @ 3.26 = 75.50 cfs		
COMMON GROUND = 7.70 AC @ 2.31 = 17.79 cfs		
COMMERCIAL TRACT = 18.02 AC @ 4.75 = 85.60 cfs		
48.88 FC		178.89 cfs
Q25 FLOW TO BASIN = 178.89 cfs		
Q25 DETENTION = - 99.09 cfs		
		<u>79.80 cfs (OUTFLOW ALLOWED)</u>
WATER FLOW BYPASS DETENTION BASIN = + 13.48 cfs		
		<u>93.28 cfs (DISCHARGE ALLOWED)</u>

PICKETT RAY & SILVER

333 Mid Rivers Mall Dr.
St. Peters, MO 63376

Civil Engineers
Planners
Land Surveyors

441-1211
278-1211

PROJECT NAME MONTICELLO - VILLAGED

PROJECT #/JOB ORDER # 85-064 U

DATE FEB. 6, 1991

DESIGNER MARVIN GLORE (CALC'S.)

PAGE 2 OF 5

REVISED 3/8/91

STORAGE OF BASIN

ELEV.	AREA SQ. FT.	AUG. SQ. FT.	CU. FT.	CUMMULATIVE CU. FT.
504.00	0			
505.00	4,700	2,350	2,350	2,350
506.00	29,375	17,038	17,038	19,388
508.00	62,050	45,713	91,426	110,814
510.00	75,575	68,813	137,626	248,440
510.10	76,795	76,185	7,619	256,059 ← Q25 DETENTION PROVIDED
511.00	87,775	82,285	74,057	330,116

Q25 STORAGE = 256,059 CU. FT. - 4,378 CFT (72.97 CFS) = **251,681 CU. FT.**

OUTFALL STRUCTURE: 84" DIAM. STANDPIPE

(HEAD OVER STRUCTURE)

LOW FLOW PIPE: 36" CONC. PIPE

$$Q_{25} = C L H^{3/2}$$

$$Q = C A \sqrt{2gH}$$

$$178.89 = 3.0 \times 21.99 \times H^{3/2}$$

$$Q = 0.60 \times 7.069 \times \sqrt{64.4 \times 4.00}$$

$$178.89 = 65.97 \times H^{3/2}$$

$$Q = 4.24 \times 17.21$$

$$\frac{178.89}{65.97} = H^{3/2}$$

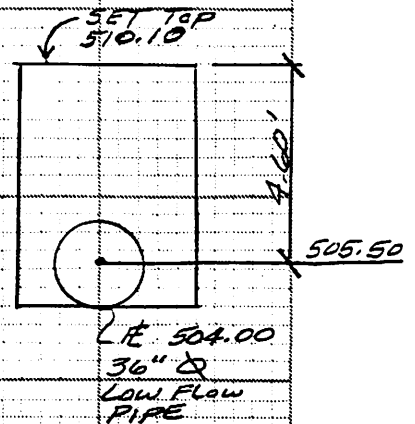
$$Q = 72.97 \text{ CFS}$$

$$2.71' = H^{3/2}$$

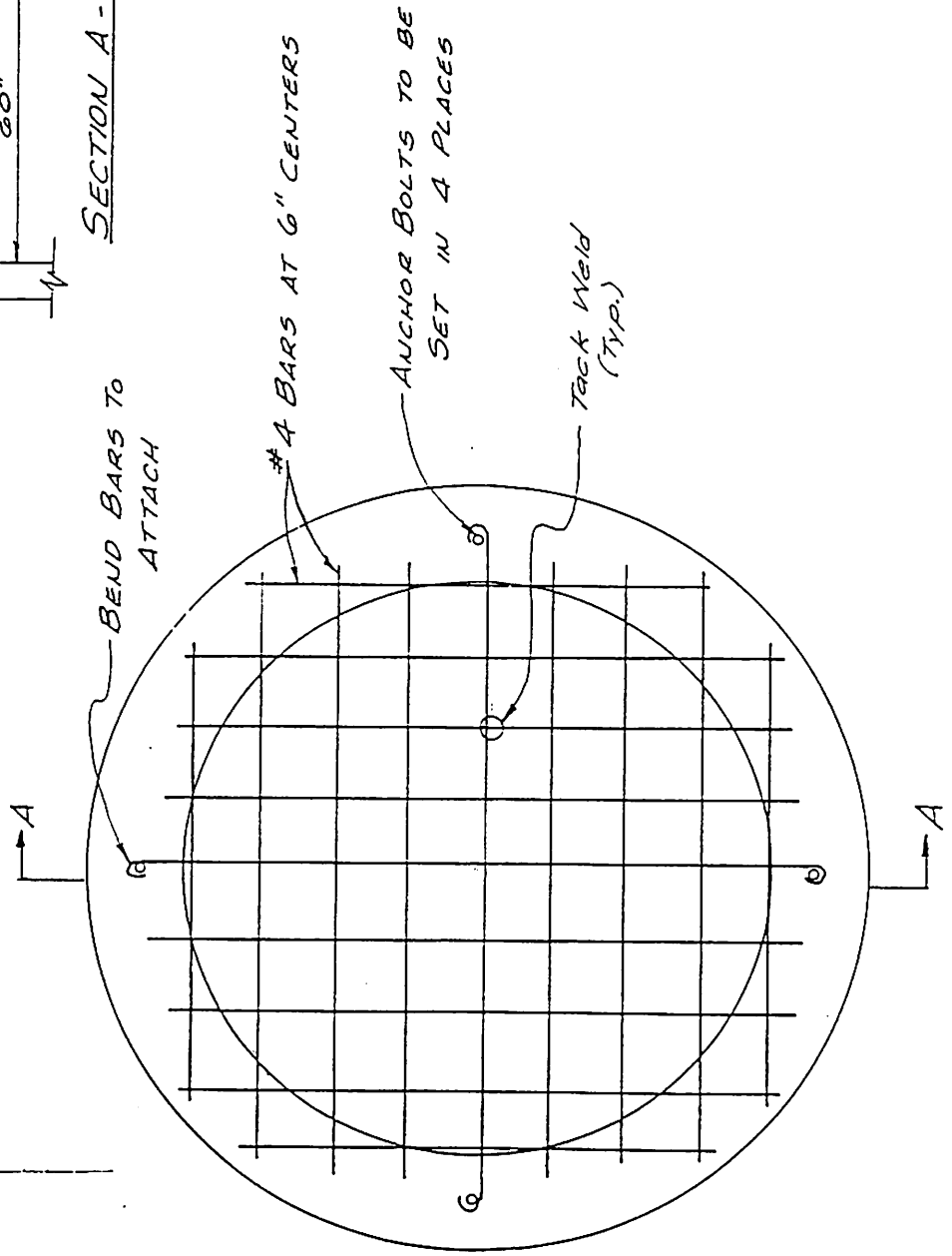
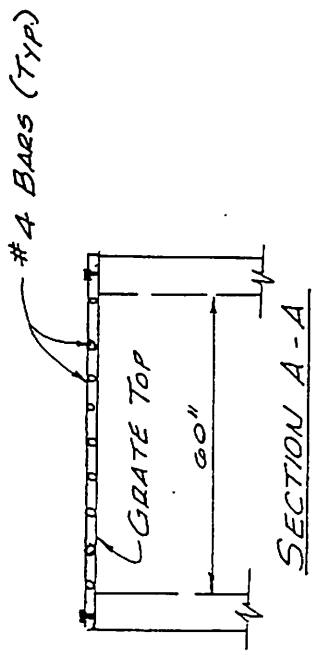
(ALLOWED OUT = 79.80 cfs)

$$2.71'^{2/3} = H$$

$$1.94' = H$$



PROJECT NAME MONTICELLO - VILLAGE D
 PROJECT #/JOB ORDER # 85-0644
 DATE _____
 DESIGNER MARVIN GLORE (CALCS.)
 PAGE 3 OF 5



TOP DETAIL
 OVERFLOW STRUCTURE

PICKETT RAY & SILVER

Civil Engineers
 Planners
 Land Surveyors

333 Mid Rivers Mall Dr.
 St. Peters, MO 63376

441-1211
 278-1211

PICKETT RAY & SILVER

333 Mid Rivers Mall Dr.
St. Peters, MO 63376

Civil Engineers
Planners
Land Surveyors

441-1211
278-1211

PROJECT NAME MONTICELLO - VILLAGE D

PROJECT #/JOB ORDER # 85-064 H

DATE FEB. 6, 1991

DESIGNER MARVIN GLORE (CALCS)

PAGE 4 OF 5

REVISED 3/8/91

(Q_{100} HEAD OVER STRUCTURE)

$$Q_{100} = CLH^{3/2}$$

$$228.85 = 3.0 \times 21.99 \times H^{3/2}$$

$$228.85 = 65.97 \times H^{3/2}$$

$$\frac{228.85}{65.97} = H^{3/2}$$

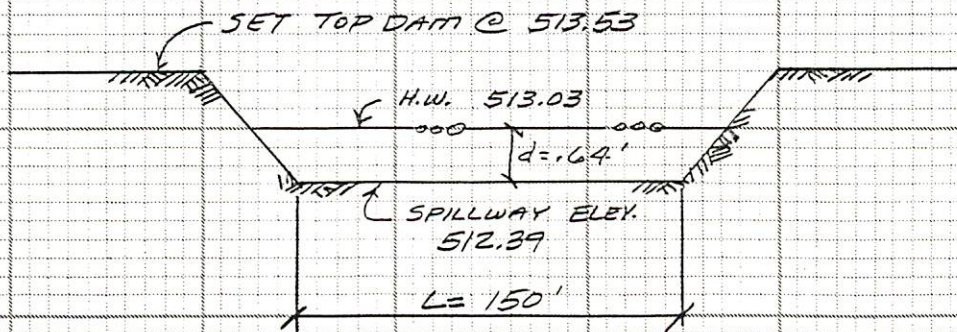
$$3.47' = H^{3/2}$$

$$3.47'^{2/3} = H$$

$$2.29' = H$$

SET EMERGENCY SPILLWAY @ $510.10 + 2.29 = 512.39$

GRASS EMERGENCY SPILLWAY:



$$Q_{100} = CLH^{3/2}$$

$$228.85 = 3.0 \times 150 \times H^{3/2}$$

$$228.85 = 450 \times H^{3/2}$$

$$\frac{228.85}{450} = H^{3/2}$$

$$0.51'^{2/3} = H$$

$$0.64' = H$$

PICKETT RAY & SILVER

333 Mid Rivers Mall Dr.
St. Peters, MO 63376

Civil Engineers
Planners
Land Surveyors

441-1211
278-1211

PROJECT NAME MONTICELLO - VILLAGE D

PROJECT #/JOB ORDER # 85-0644

DATE Feb. 6, 1991

DESIGNER MARVIN GLORE (CALC'S.)

PAGE 5 OF 5

REVISED 3/8/91

2 YEAR SEDIMENT STORAGE CALCULATIONS

SEDIMENT STORAGE REQUIRED: (IN DETENTION BASIN)

VILLAGE D = 30.86 AC

COMMERCIAL = 18.02 AC

TOTAL = 48.88 AC

48.88 AC X 120 CU. FT / ACRE = 5,866 CU. FT

5,866 CU. FT / PER YEAR X 2 YEARS = 11,732 CU. FT.

DETENTION REQUIRED = 178,362 CU. FT. (SHE. SHEET #1)

DETENTION PROVIDED = 251,681 CU. FT @ (510.10 ELEVATION)

SEDIMENT STORAGE REQUIRED = 11,732 CU. FT

VOLUME DETENTION

AFTER 2 YEAR SEDIMENT = 239,949 CU. FT.

NOTE: BASIN SIZED TO HANDLE SEDIMENT STORAGE AND STILL PROVIDING ADDITIONAL DETENTION.