

Mobile Manor South 2<sup>nd</sup> Addition Drainage

Basin Areas

- Area 1 = 35527 ft<sup>2</sup>
- Area 2 = 37491 ft<sup>2</sup>
- Area 3 = 187018 ft<sup>2</sup>
- Area 4 = 79510 ft<sup>2</sup>
- Area 5 = 301327 ft<sup>2</sup>
- Area 6 = 99238 ft<sup>2</sup>
- Area 7 = 1502852 ft<sup>2</sup>
- Area 8 = 150364 ft<sup>2</sup>

Basin Runoff Coefficients (100 year)

- Area 1, C = 0.93 (70% impervious)
- Area 2, C = 0.93 (60% impervious)
- Area 3, C = 0.93 (100% impervious)
- Area 4, C = 0.67 (50% impervious)
- Area 5, C = 0.67 (50% impervious)
- Area 6, C = 0.37 (0% impervious)
- Area 7, C = 0.61 (40% impervious)
- Area 8, C = 0.80 (storage basin)

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2-19-90

Areas discharging off-site

Area 1

$Q = C I A$  (Rational Formula)  
 $C_5 = 0.87$   
 $C_{100} = 0.93$   
 $I_5 = 4.56''/hr$   
 $I_{100} = 7.37''/hr$   
 $Q_5 = 0.87 (0.87 \times 4.56) = 3.44 \text{ cfs}$   
 $Q_{100} = 0.93 (0.87 \times 7.37) = 5.96 \text{ cfs}$

$A = \frac{70173}{35527} = 1.97 \text{ acres}$

Area 2

$C_5 = 0.87$   
 $C_{100} = 0.93$   
 $I_5 = 4.56''/hr$   
 $I_{100} = 7.37''/hr$   
 $Q_5 = 0.87 (0.87 \times 4.56) = 3.44 \text{ cfs}$   
 $Q_{100} = 0.93 (0.87 \times 7.37) = 5.96 \text{ cfs}$

$A = \frac{5495}{37491} = 0.146 \text{ acres}$

Area 4

$C_5 = 0.52$   
 $C_{100} = 0.67$   
 $I_5 = 4.56''/hr$   
 $I_{100} = 7.37''/hr$   
 $Q_5 = 0.52 (1.83 \times 4.56) = 4.4 \text{ cfs}$   
 $Q_{100} = 0.67 (1.83 \times 7.37) = 9.0 \text{ cfs}$

$A = 79510 = 1.83 \text{ acres}$

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Areas Retained on-site

Use 100 year design storm  $I = 7.80''$

Runoff Volumes

Area 3,  $V = C(A)I = 0.93(187018) \left(\frac{7.80}{12}\right) = 113,052 \text{ ft}^3$

Area 5,  $V = 0.67(301327) \left(\frac{7.80}{12}\right) = 131,228 \text{ ft}^3$

Area 6,  $V = 0.37(99238) \left(\frac{7.80}{12}\right) = 23,867 \text{ ft}^3$

Area 7,  $V = 0.61(1502852) \left(\frac{7.80}{12}\right) = 595,887 \text{ ft}^3$

Area 8,  $V = 0.80(150364) \left(\frac{7.80}{12}\right) = 78,189 \text{ ft}^3$

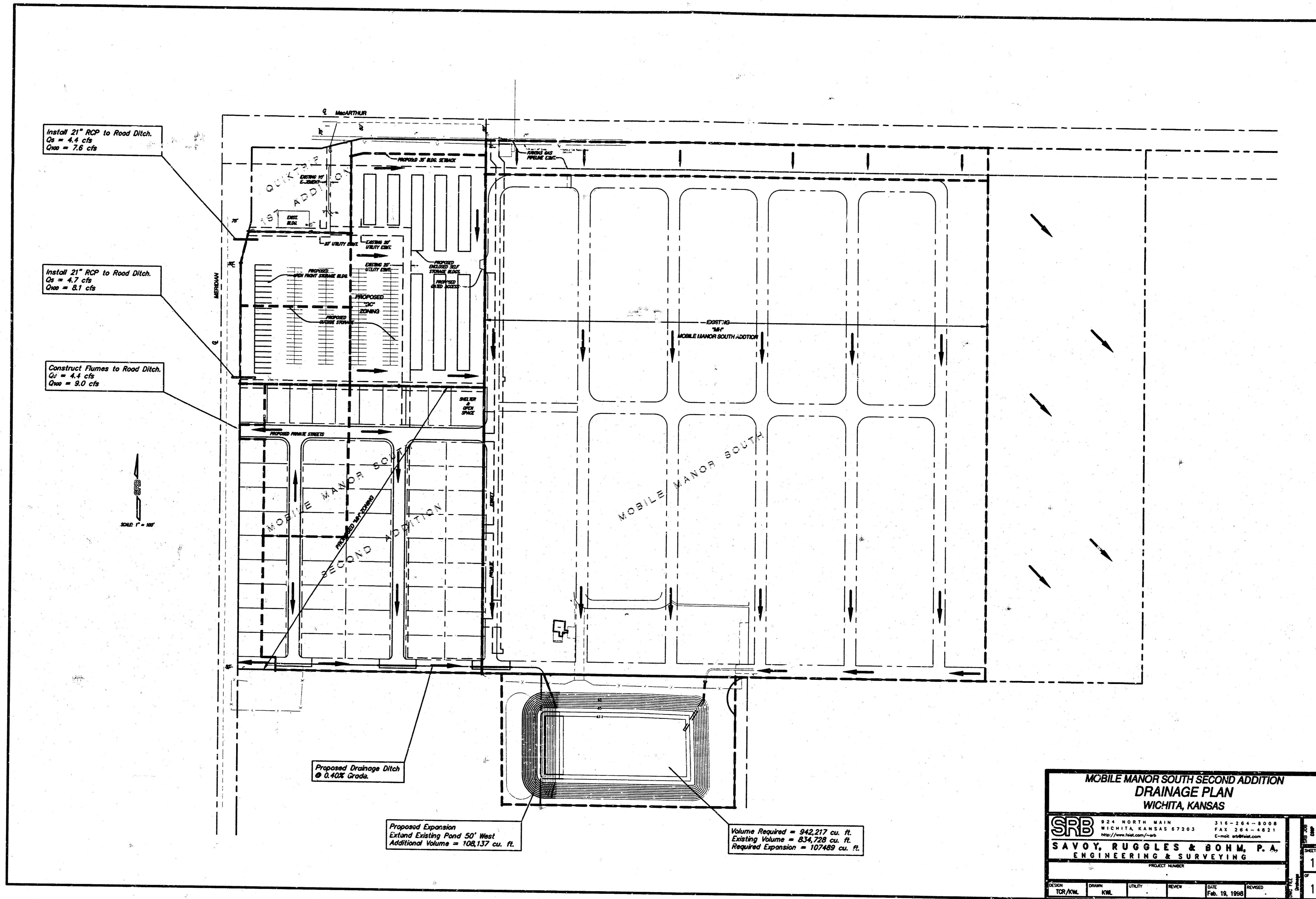
Volume Retained =  $113,052 + 131,228 + 23,867 + 595,887 + 78,189$   
 Volume =  $942,217 \text{ ft}^3$  required

Existing Pond Volume =  $834,720 \text{ ft}^3$

107,489 additional volume required  
 Pond Section Volume  $2350.5 \text{ ft}^3/\text{ft}$   
 $L = 107489 / 2350.5 = 45.7 \text{ ft}$  additional pond length

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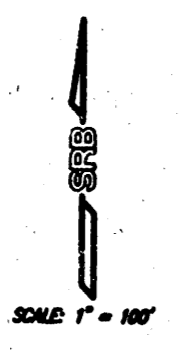
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Install 21" RCP to Road Ditch.  
 $Q_u = 4.4$  cfs  
 $Q_{ov} = 7.6$  cfs

Install 21" RCP to Road Ditch.  
 $Q_u = 4.7$  cfs  
 $Q_{ov} = 8.1$  cfs

Construct Flumes to Road Ditch.  
 $Q_u = 4.4$  cfs  
 $Q_{ov} = 9.0$  cfs



Proposed Drainage Ditch  
 @ 0.40% Grade

Proposed Expansion  
 Extend Existing Pond 50' West  
 Additional Volume = 106,137 cu. ft.

Volume Required = 942,217 cu. ft.  
 Existing Volume = 834,728 cu. ft.  
 Required Expansion = 107,489 cu. ft.

**MOBILE MANOR SOUTH SECOND ADDITION  
 DRAINAGE PLAN  
 WICHITA, KANSAS**

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	<b>SAVOY, RUGLES &amp; BOHM, P. A.</b> ENGINEERING & SURVEYING	
PROJECT NUMBER		
DESIGN TOR/AM	DRAWN KWL	DATE Feb. 15, 1999