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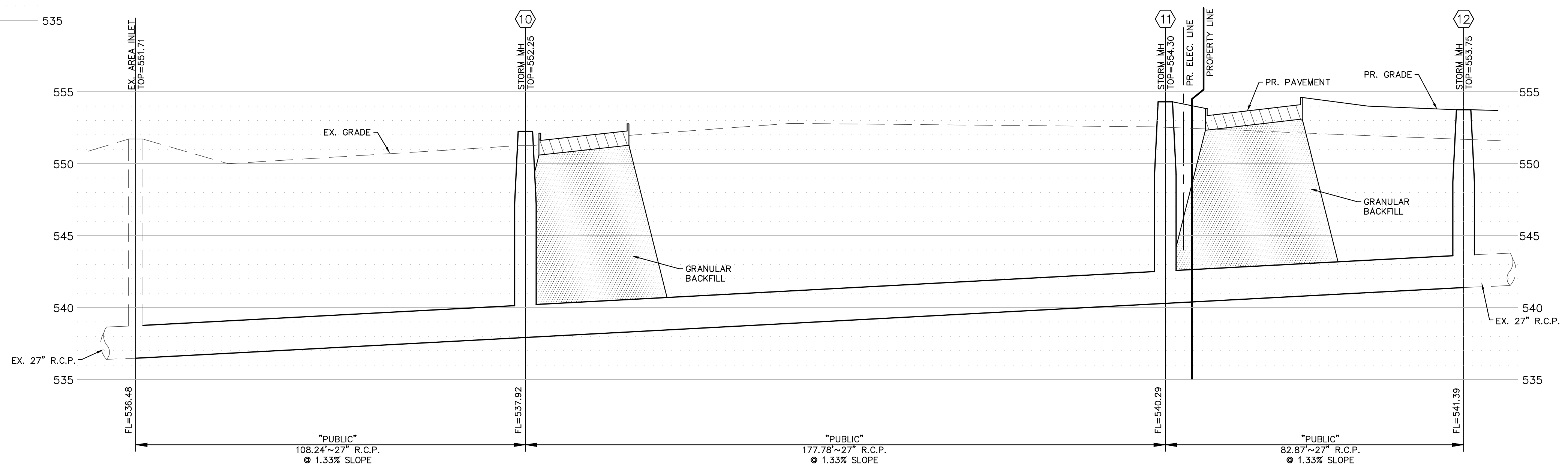
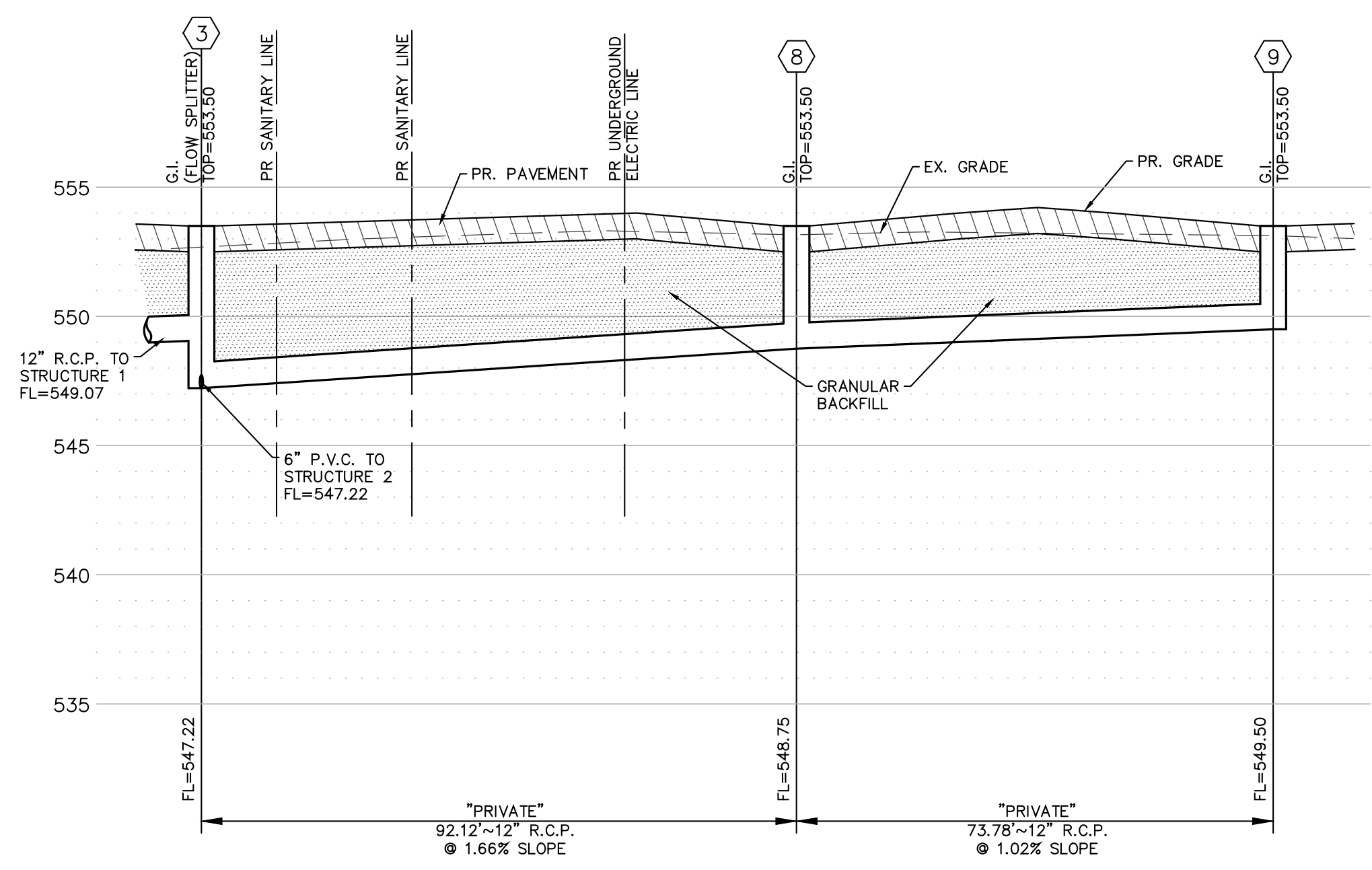
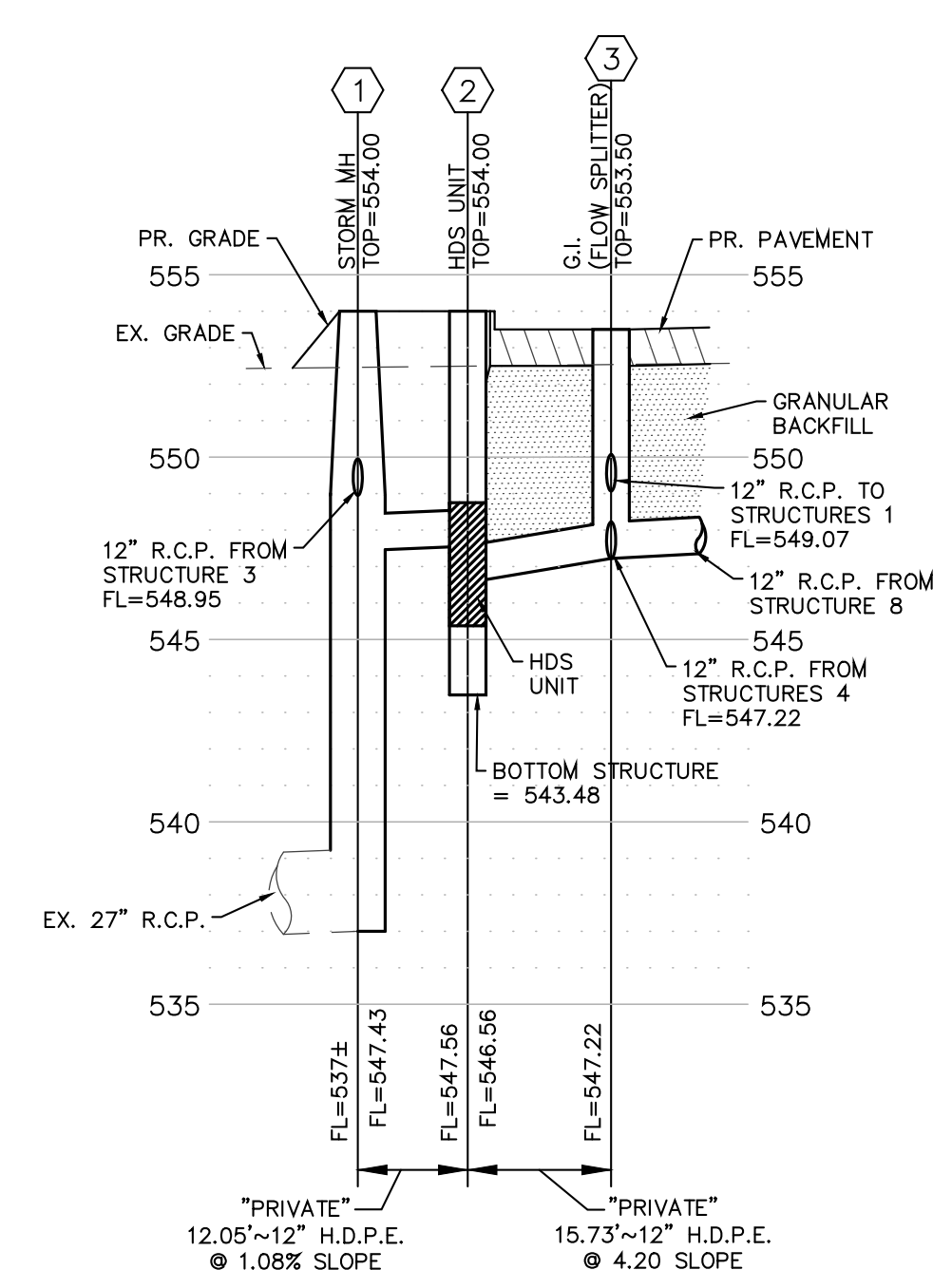
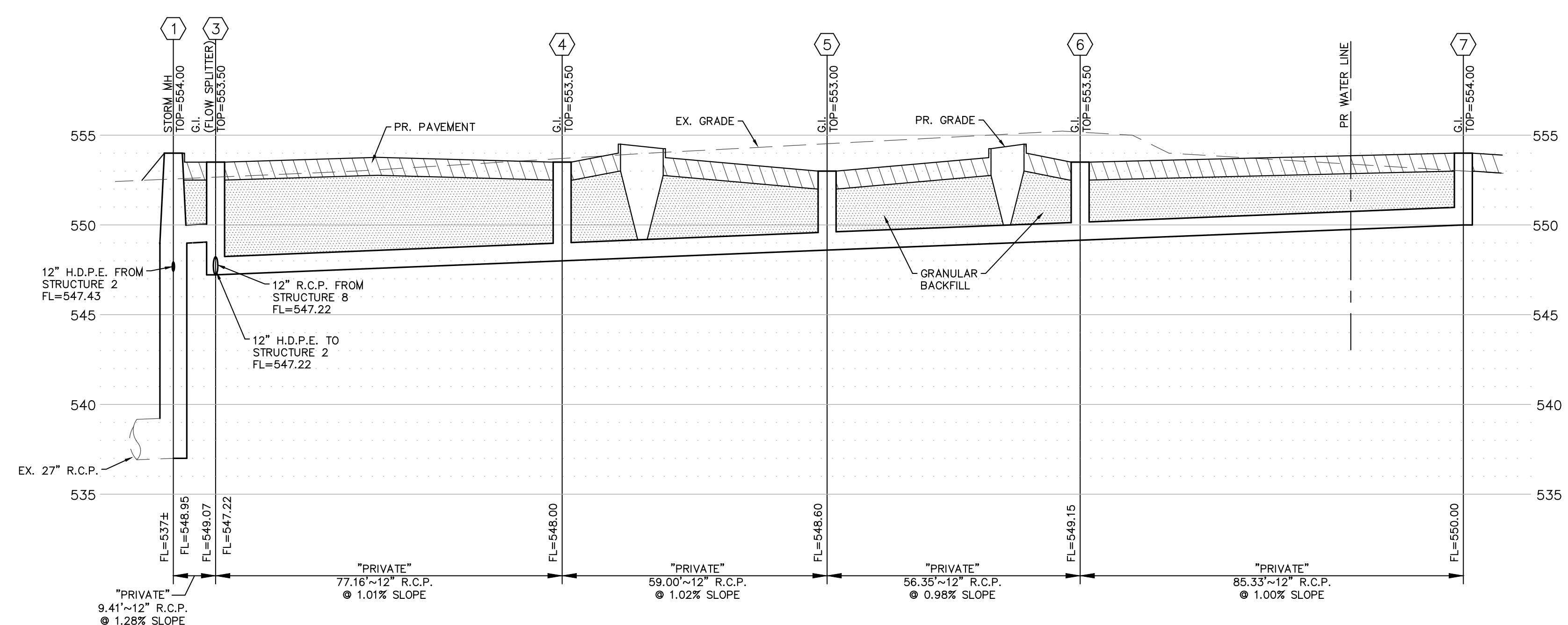
Site Improvement Plans
Lion's Choice Restaurant
4520 HIGHWAY K
O'Fallon, Missouri 63368

Proj. # 1654

No.	Description	Date
1	Rev. per City/Client	7/13/17
	To Cottleville FPD	7/17/17
	City Resubmittal	7/28/17
	City Resubmittal	8/17/17
	City Resubmittal	8/31/17

SEWER PROFILES AND HYDRAULIC DATA

C08



15 YR HYDRAULIC CALCULATION SHEET (SEE DRAINAGE AREA PLAN FOR P.I. AND Q (inflow) FOR EACH STRUCTURE)

Project name: Lion's Choice (O'Fallon)		Calculated By: JWD		Project number: 1654		Checked By: BAH		Head Coefficients:										Hydraulic Elevations									
Project Location: O'Fallon, MO		Date: 7/18/2017		S=0.06		S=0.24		S=0.40		S=0.50		S=0.57		S=0.64		S=0.70		S=0.77		S=0.84		S=0.91		S=0.98		S=1.05	
Structure Number	LINE	Upper structure	Lower structure	Length (ft)	Flowline Grade (ft)	Pipe Size (in.)	Full Flow Cap. (cfs)	Total (Q) (cfs)	Mean Full Flow Vel. (ft/s)	Bend Coef.	Velocity Head (V _h) (ft)	Q _v (ft ³ /s)	Pipe Coef. (s)	H _f (ft)	Junction (ft)	Bend (ft)	Total H _{loss}	Upper F.L. + Dia.	Lower H.E. + H _f	Lower H.E.	Upper Structure H.E.	TOP Structure Elevation	Free Board	Structure Number			
9	9	8	548.50	548.75	75.78	0.0102	12	3.60	0.38	0.00	0.00	0.00	0.013	0.01	0.00	0.00	0.00	550.50	549.77	549.76	550.50	553.50	3.00	9			
8	8	3	548.75	547.22	92.12	0.0166	12	4.60	0.64	0.81	0.70	0.01	0.01	0.013	0.03	0.01	0.00	549.75	548.25	548.22	549.76	553.50	3.74	8			
3																			550.50	549.77	549.76	550.50	553.50	3.00	9		
7	7	6	550.00	549.15	85.33	0.0100	12	3.57	0.46	0.59	0.00	0.01	0.00	0.013	0.01	0.01	0.00	551.00	550.88	550.86	551.01	554.00	2.99	7			
6	6	5	549.15	548.60	56.35	0.0098	12	3.53	0.84	1.07	0.70	0.02	0.01	0.013	0.03	0.02	0.00	550.15	550.84	550.81	550.86	553.50	2.64	6			
5	5	4	548.60	548.00	59.00	0.0102	12	3.60	1.80	2.29	0.00	0.08	0.15	0.013	0.15	0.10	0.00	549.60	550.71	550.56	550.81	553.00	2.19	5			
4	4	3	548.00	547.22	77.16	0.0101	12	3.59	2.06	2.62	0.70	0.11	0.22	0.013	0.26	0.05	0.06	549.00	550.46	550.20	550.56	553.50	2.94	4			
3	3	1	549.07	548.95	9.41	0.0128	12	4.03	2.32	2.95	0.70	0.14	0.21	0.013	0.04	0.05	0.07	0.13	550.07	549.99	549.95	550.20	553.50	3.30	3		
1	1	Ex.	537.00	536.48	49.62	0.0129	27	35.22	2.52	0.58	0.00	0.01	0.01	0.013	0.00	0.00	0.00	539.25	538.73	539.35	534.00	14.35	1				
Ex.																			538.73	538.73	538.73	534.00	14.73	1			

FORMULAS:
MEAN FULL FLOW VELOCITY: $V = Q_{ACT} / A_{PIPE}$
FRICTION LOSS (H_f): $H_f = 2.47 n^2 (LV^{1.48}) / D^{4.75}$
VELOCITY HEAD: $V_h = V^2 / 2g$
JUNCTION LOSSES (JUNC.) = $\sum (Q_{in} V_{in}) - \sum (Q_{out} V_{out}) \times 1.33 Q_{out}$
BEND LOSSES (BEND) = $(V^2 / 2g) \times \text{ANGLE COEFFICIENT}$
Note: 1. IF MORE THAN ONE INCOMING LINE, CALCULATE EACH BEND LOSS AND ADD TOGETHER.
2. NO STRUCTURE LOSSES TO BE CALCULATED AT A DROP.
3. IF $Q_{in} > Q_{out}$, NO JUNCTION LOSSES TO BE CALCULATED.