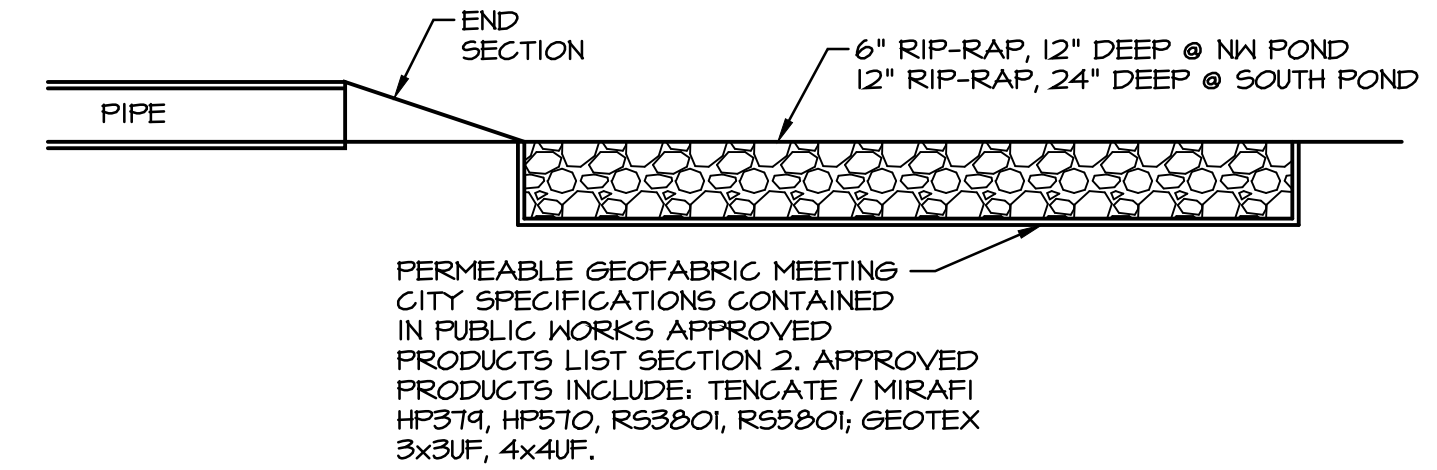
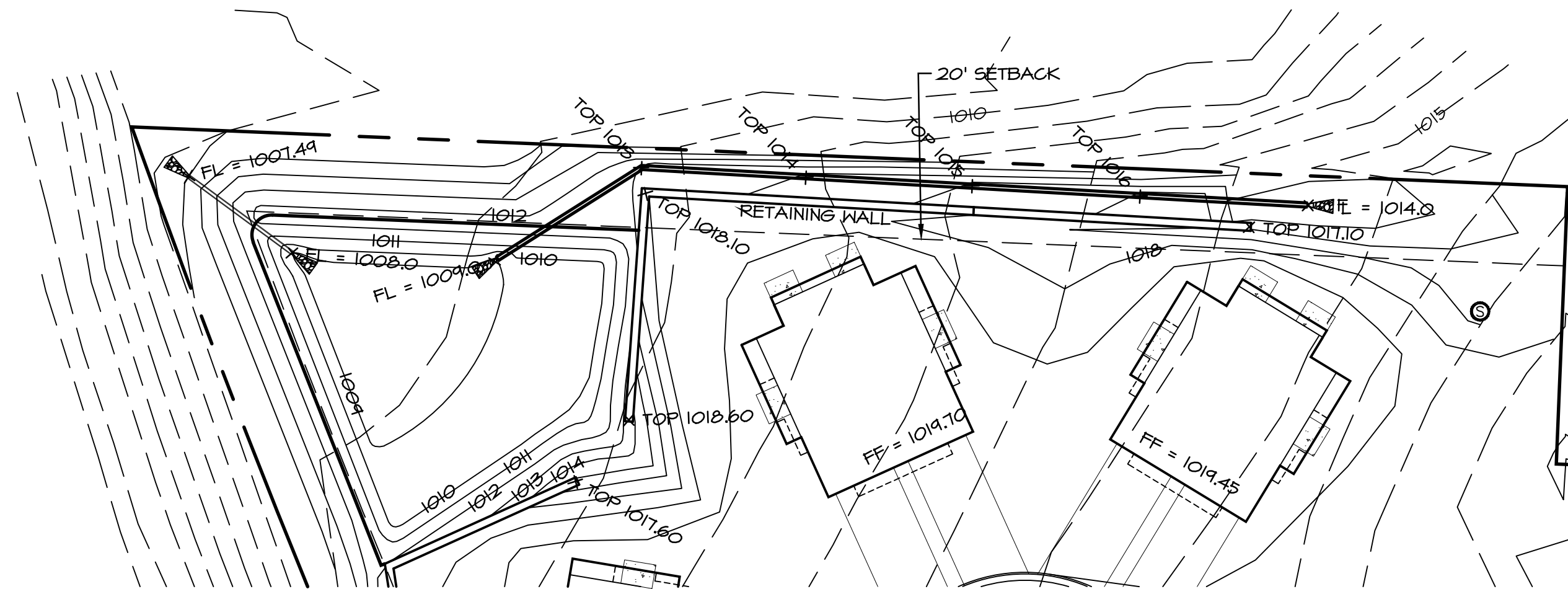
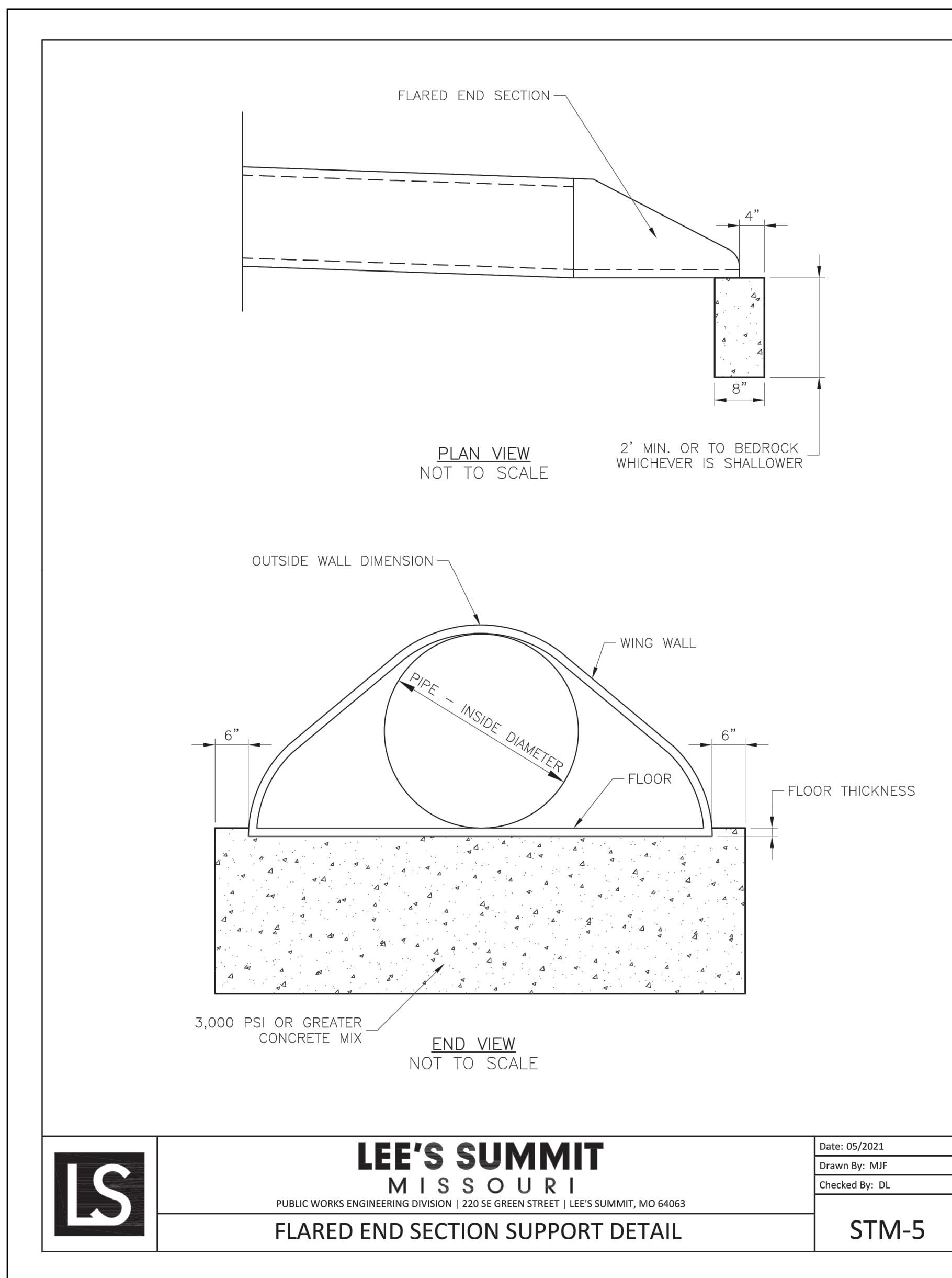


PROFILE		BY	DATE
NOTE BOOK	SURVEYED		
	PLOTTED		
	GRADES CHECKED		
	B.M.'s NOTED		
No. _____	STRUCTURE NOTATIONS CHECKED		

PROFILE					
	SURVEYED			BY	DATE
	PLOTTED				
	GRADES CHECKED				
	B.M.'s NOTED				
	STRUCTURE NOTATIONS CHECKED				
	No. _____				



TYPICAL RIP-RAP DETAIL

NO SCALE

RELEASED FOR CONSTRUCTION
As Noted on Plan Review

Development Services Department
Lee's Summit, Missouri

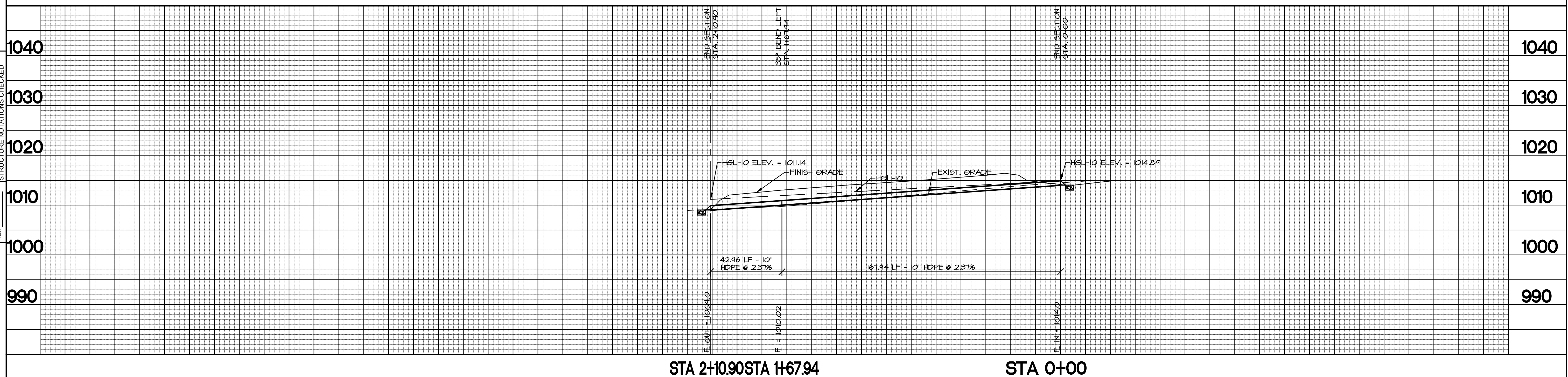
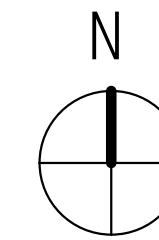
09/26/2023

HYDRAULIC GRADE LINE CALCULATION

DESIGN STORM = 10 YEARS
 $Q_{10} = 2.20 \text{ CFS}$
 PIPE DIAMETER = 10" HDPE
 PIPE LENGTH = 210.9'
 $SLOPE = 0.0231 \text{ FT/FT}$
 $PIPE \text{ AREA} = 0.5454 \text{ FT}^2$
 $PIPE \text{ MANNING COEFFICIENT} = 0.010$
 $PIPE \text{ HYDRAULIC RADIUS} = 0.411 / 2 = 0.208 \text{ FT}$
 ESTIMATED TAILWATER DEPTH = 0.31' ABOVE PIPE FL
 $GRAVITATIONAL \text{ CONSTANT} = 32.2 \text{ FT/SEC}^2$
 $OUTLET \text{ VELOCITY} = 2.20 / (\pi * (0.833/2)^2) = 4.034 \text{ FPS}$
 $VELOCITY \text{ HEAD} = 4.034^2 / (2 * 32.2) = 0.253 \text{ FT}$
 $EXIT \text{ LOSS} = 1.0 * [(0.253) / 0.253 \text{ FT} (\text{ASSUME DISCHARGE INTO RESERVOIR})]$
 $PIPE \text{ FRICTION LOSS} = [10.47 * (0.010) * (1.486 * 0.545 * 0.208^{4.73})] * 2 = 0.006 \text{ FT/FT}$
 $INITIAL \text{ HEADLOSS COEFFICIENT} = 0.5$
 $PIPE \text{ DIAMETER CORRECTION FACTOR} = 1.0$
 $PIPE \text{ CORRECTION FOR FLOW DEPTH} = 1.0$
 $PIPE \text{ CORRECTION FOR RELATIVE FLOW} = 1.0$
 $PIPE \text{ CORRECTION FOR PLUNGING FLOW} = 1.0$
 $CORRECTION \text{ FOR BENCHING} = 1.0$
 $STRUCTURE \text{ LOSSES} = 0.5 * 1.0 * 0.5 = 0.5$
 $ENERGY \text{ GRADE LINE - OUTLET} = 0.253 + (0.31 + 0.833/2) = 0.825'$
 $ENERGY \text{ GRADE LINE - INLET} = 1.258 + 0.825 = 2.083'$
 $HYDRAULIC \text{ GRADE LINE} = 2.083 - 0.253 = 1.83'$



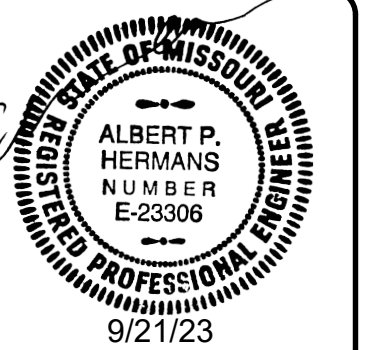
SCALE: 1" = 30'-0"



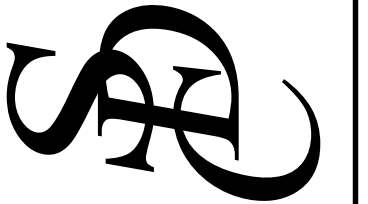
COPYRIGHT 2023 BY
SDC ENGINEERING, INC.
DRAWINGS MAY NOT BE
DUPLICATED WITHOUT
WRITTEN PERMISSION.

THIS DRAWING HAS
BEEN DEVELOPED BY
SDC ENGINEERING, INC.
EXCLUSIVELY FOR:
PARCHARD PARK DEV.
FOR THE PROJECT
LISTED IN THIS TITLE
BLOCK. ANY OTHER
UNAUTHORIZED USE IS
PROHIBITED.

SEQUOIA RESIDENTIAL
500 NW OLIVE STREET
LEE'S SUMMIT, MO



ENGINEERING, INC.



DATE:	9/12/23
REVISION	
1	9/21/23
2	
3	
4	

C09A