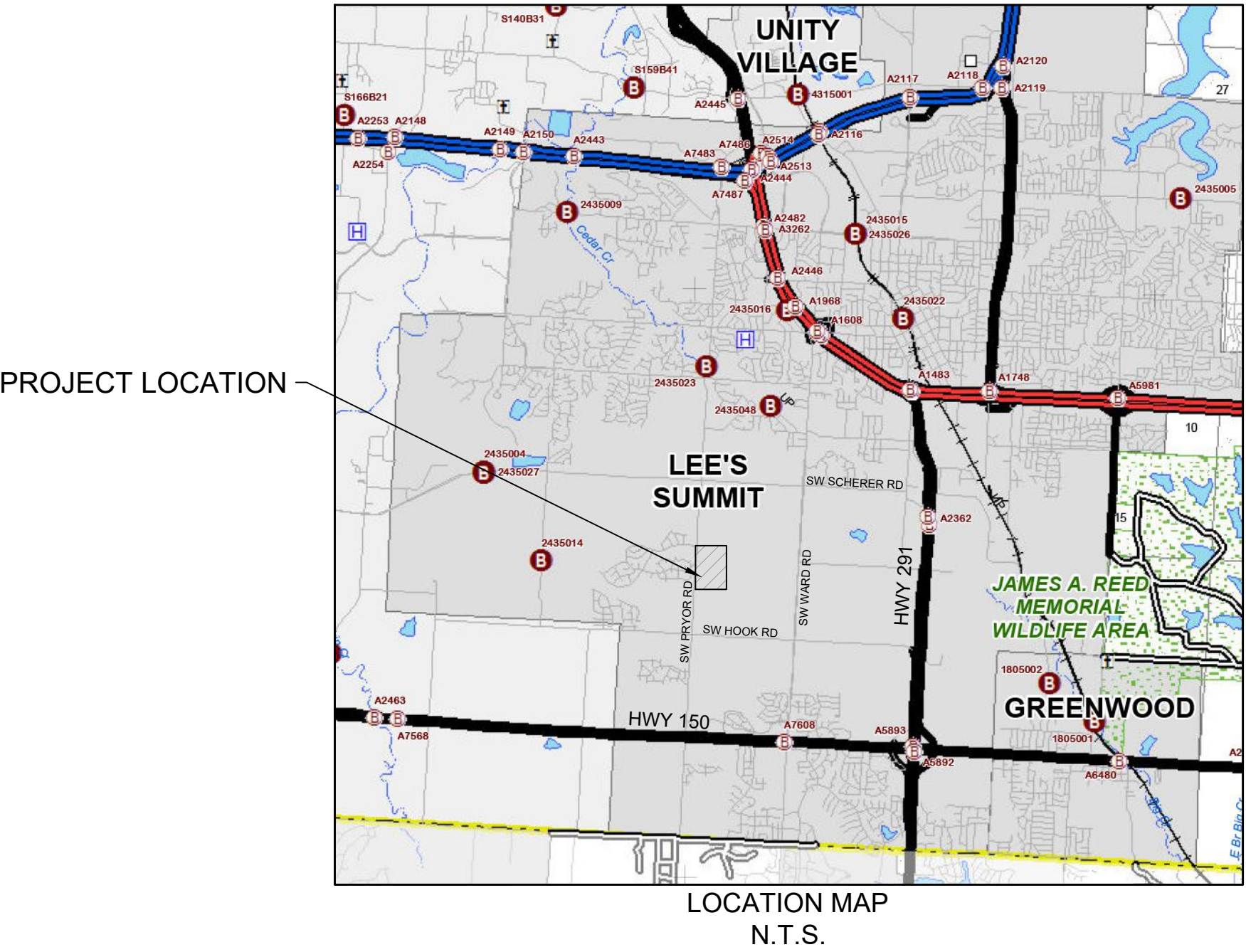


CONSTRUCTION PLANS
FOR
WHISPERING WOODS 3RD PLAT CREEK RESTORATION
CITY OF LEE'S SUMMIT
JACKSON COUNTY, MISSOURI

INCLUDES TRIPLE
BOX CULVERT

RELEASED FOR CONSTRUCTION
As Noted on Plan Review
Development Services Department
Lee's Summit, Missouri
08/26/2025

PROJECT BENCH MARK
ELEV. 1006.89 (NAVD 1988 DATUM)
MISSOURI DEPARTMENT OF NATURAL RESOURCES GRS
ALUMINUM DISK STAMPED "JA-47" LOCATED NEAR THE
INTERSECTION OF HWY 150 WITH REGGATA DRIVE AND HWY 291



Sheet List Table

Sheet Number	Sheet Title
C1.0	TITLE SHEET
C2.0	EXISTING CONDITIONS
C2.1	OVERALL GRADING
C2.2	CHANNEL PLAN & PROFILE
C3.0	CHANNEL CROSS SECTIONS
C3.1	CHANNEL CROSS SECTIONS
C3.2	CHANNEL CROSS SECTIONS
C3.3	CHANNEL CROSS SECTIONS
C4.0	LANDSCAPE - TREES
C4.1	LANDSCAPE - GRASS
C5.0	BOX CULVERT PLAN AND PROFILE
C5.1	BOX CULVERT DETAILS
C5.2	BOX CULVERT DETAILS
C5.3	BOX CULVERT DETAILS
C5.4	BOX CULVERT DETAILS
C5.5	BOX CULVERT DETAILS
C5.6	BOX CULVERT DETAILS
C5.7	BOX CULVERT DETAILS

APPROVED:

City Engineer

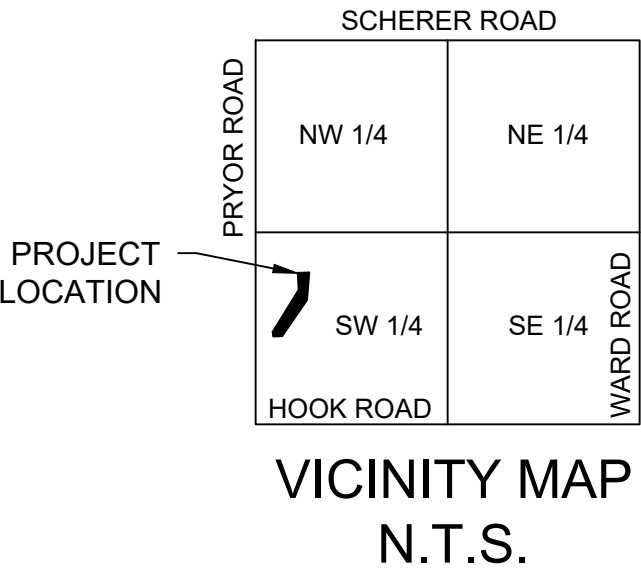
Date

PRSUBD20243308

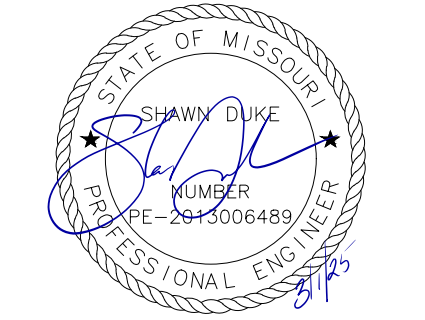
DEVELOPER:

WHISPERING WOODS LAND, L.L.C.
803 P.C.A. ROAD
WARRENSBURG, MO 64093
AGENT: RICK FRYE
PHONE: 816.564.2230
FAX: 660.429.1801

UTILITY SERVICE NUMBERS	
SPECTRUM	886-874-2389
EVERGY	816-220-5213
SPIRE GAS	816-399-9633
LEE'S SUMMIT PUBLIC WORKS	816-969-1800
CITY PLANNING & DEVELOPMENT	816-969-1600
FIRE DEPARTMENT	816-969-1300



MARK	REVISION	DATE	BY
Engineer: SD	Checked By: SD	Scale: 1" =	
Technician: BT	Date: 04-15-2022	T-R-S: 47N-32W-24	
Snyder & Associates Engineers & Planners, Inc. Missouri State Certificate of Authority #2006008544			
Sheet C1.0			



SHAWN DUKE - ENGINEER
MO PE#2013006489

WHISPERING WOODS CREEK RESTORATION

TITLE SHEET

LEE'S SUMMIT, MO

SNYDER & ASSOCIATES

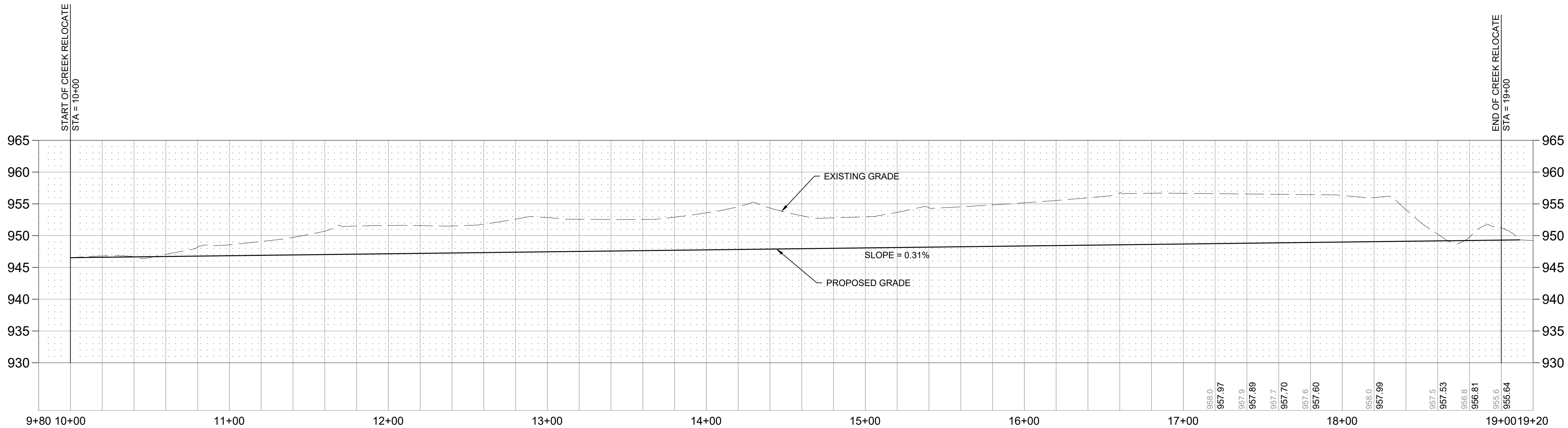
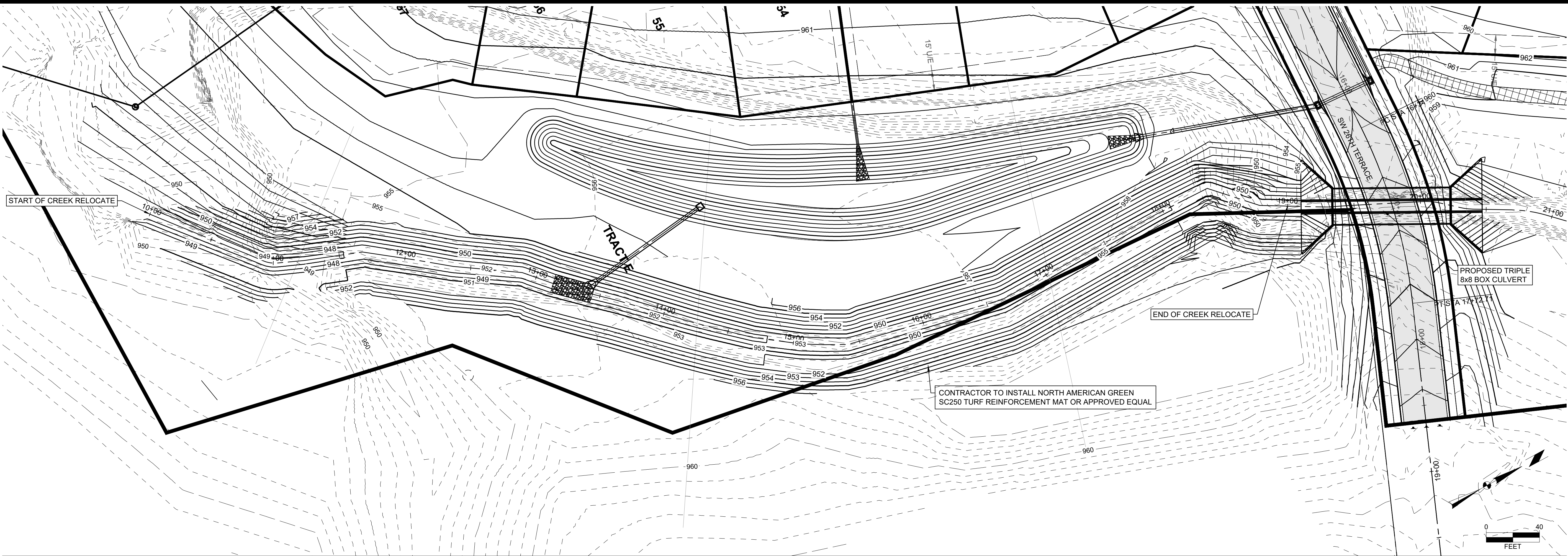
ENGINEERS & PLANNERS, INC.

802 FRANCIS STREET
ST. JOSEPH, MISSOURI 64501
816-364-5222 | www.snyder-associates.com



Project No: 120.0485.11
Sheet C1.0

V:\Projects\2025\120.0485.1\CD\DWG\SP - 120.0485_SnyderPlan3122.dwg, JOHN STONE, CHANNEL PLAN & PROFILE, 2025/02/26 9:59 AM, ANSI FULL BLEED D (34.00 X 22.00 INCHES)



RELEASED FOR CONSTRUCTION
As Noted on Plan Review

Development Services Department
Lee's Summit, Missouri

08/26/2025

MARK	REVISION	DATE	BY
Engineer: SD	Checked By: SD	Scale: 1" = 40'	
Technician: BT	Date: 04-15-2022	T-R-S: 47N-32W-24	

Snyder & Associates Engineers & Planners, Inc.
Missouri State Certificate of Authority #200608544

SHAWN DUKE - ENGINEER
MO PE#2013006489

STATE OF MISSOURI
SHAWN DUKE
NUMBER
PE-2013006489
PROFESSIONAL ENGINEER

WHISPERING WOODS CREEK RESTORATION

CHANNEL PLAN & PROFILE

SNYDER & ASSOCIATES
ENGINEERS & PLANNERS, INC.

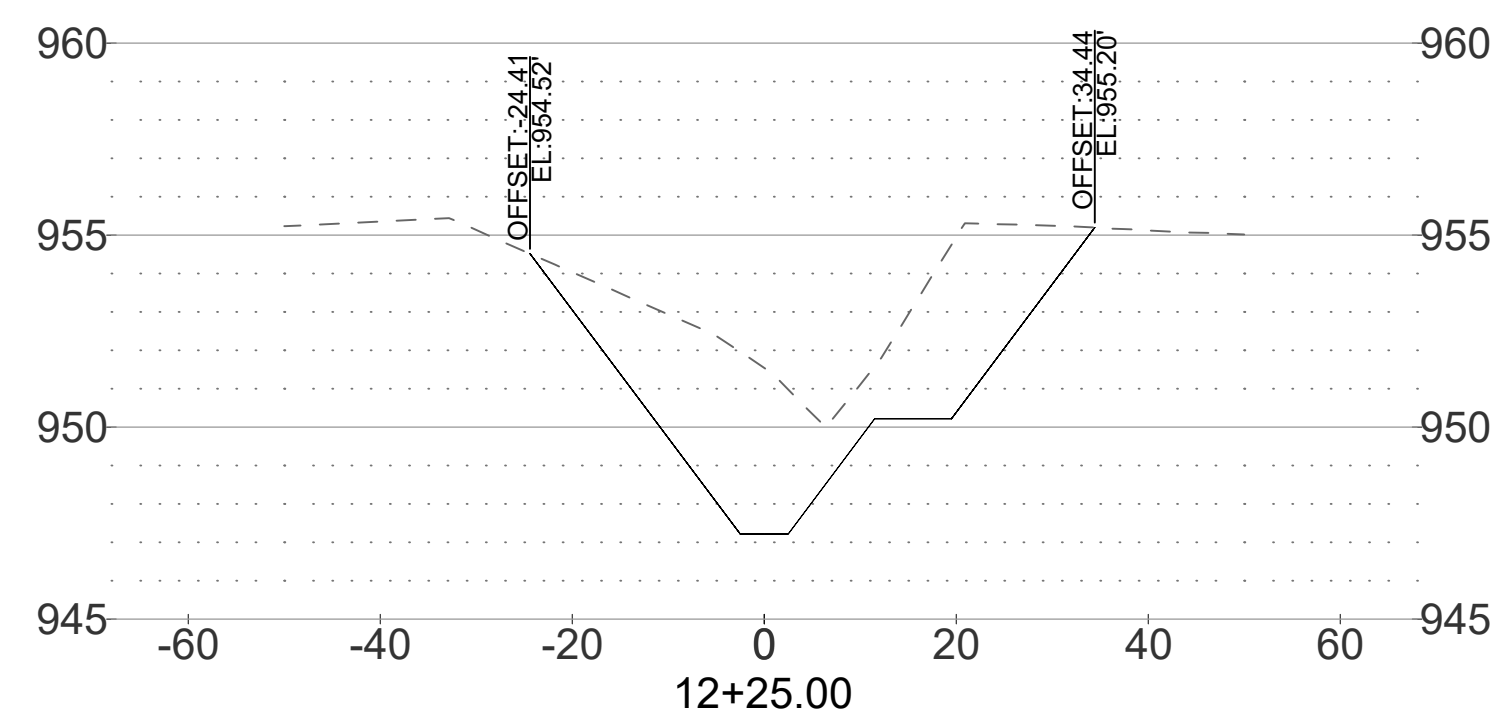
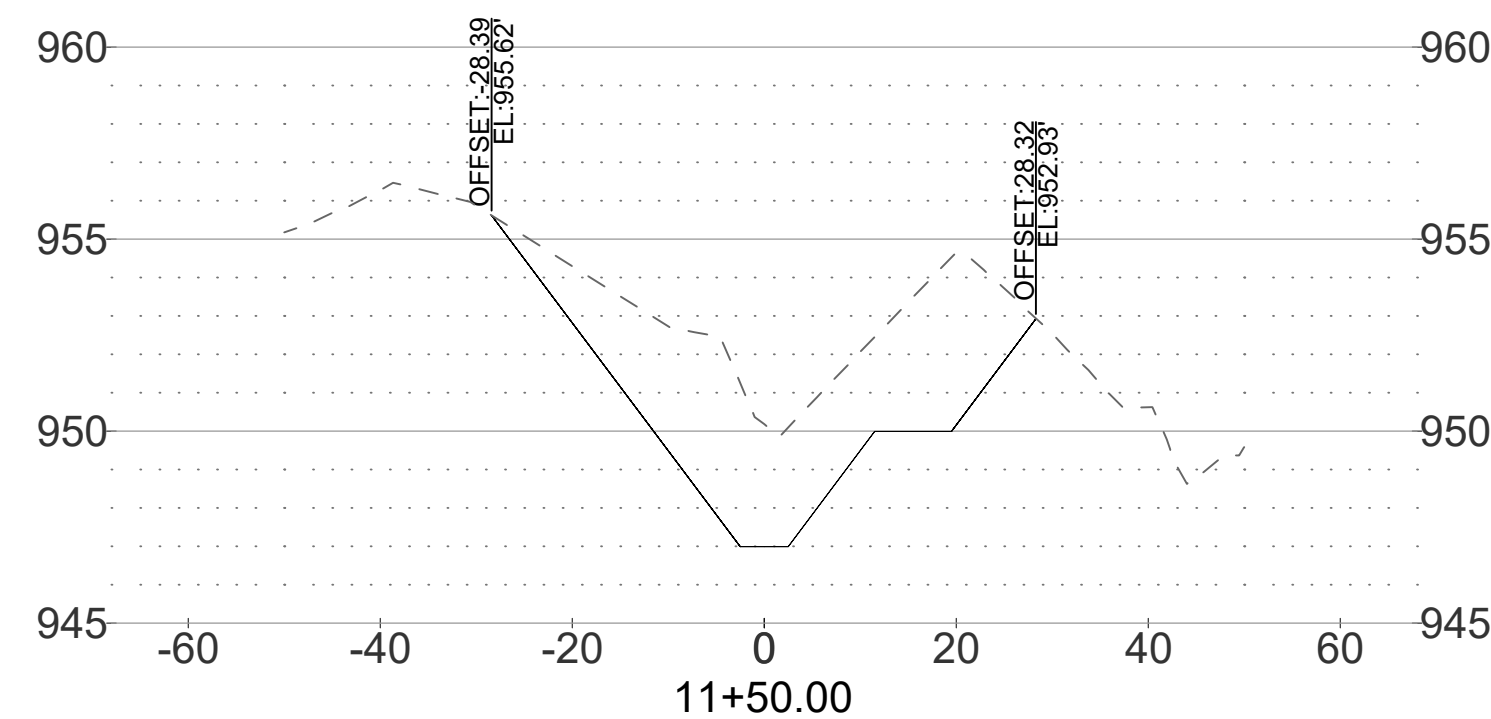
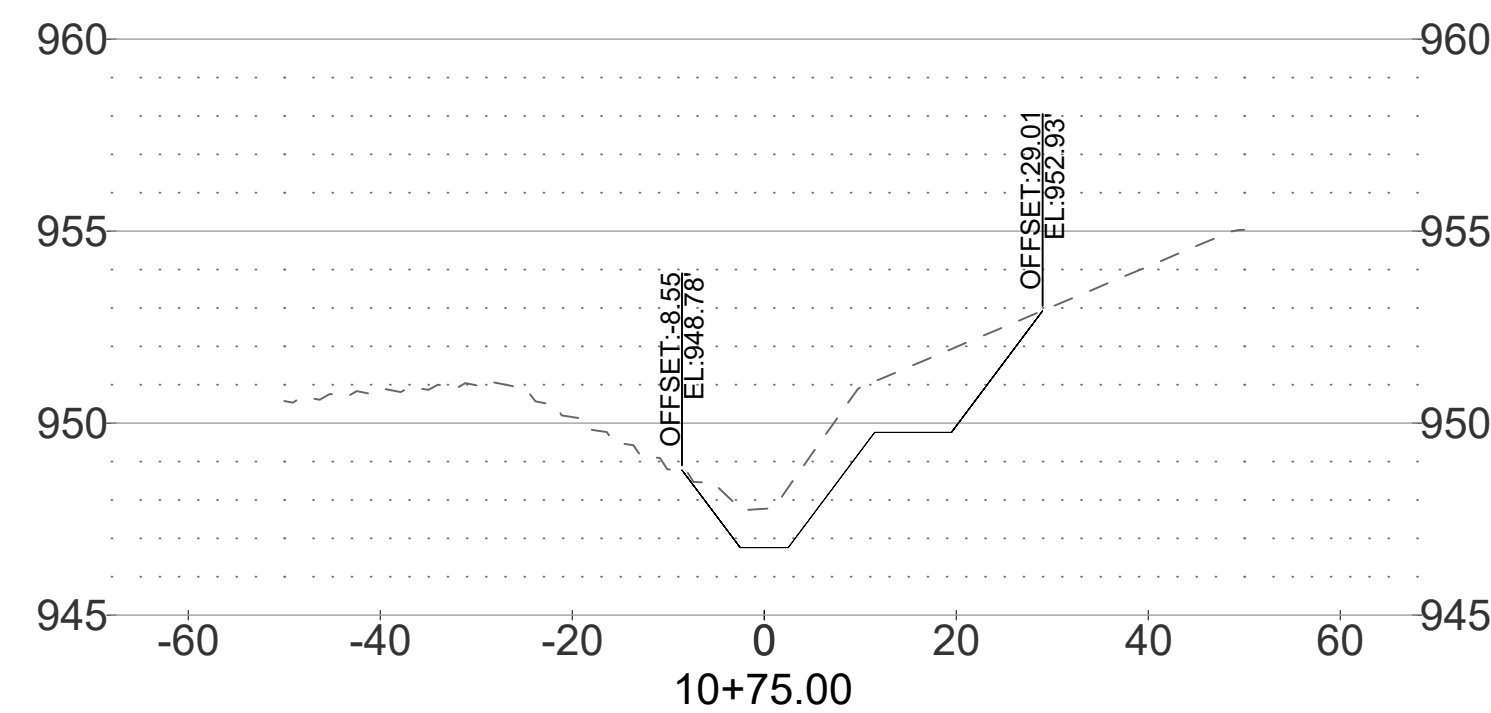
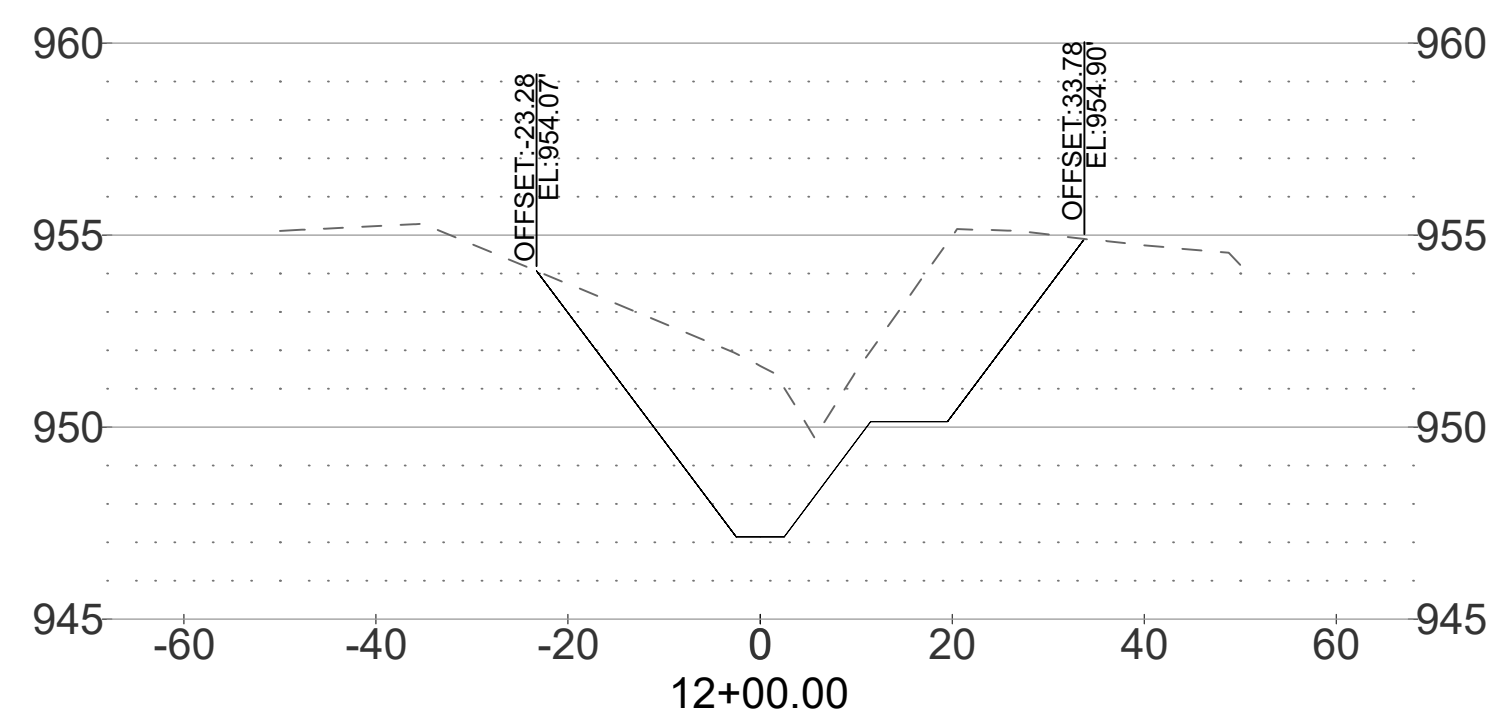
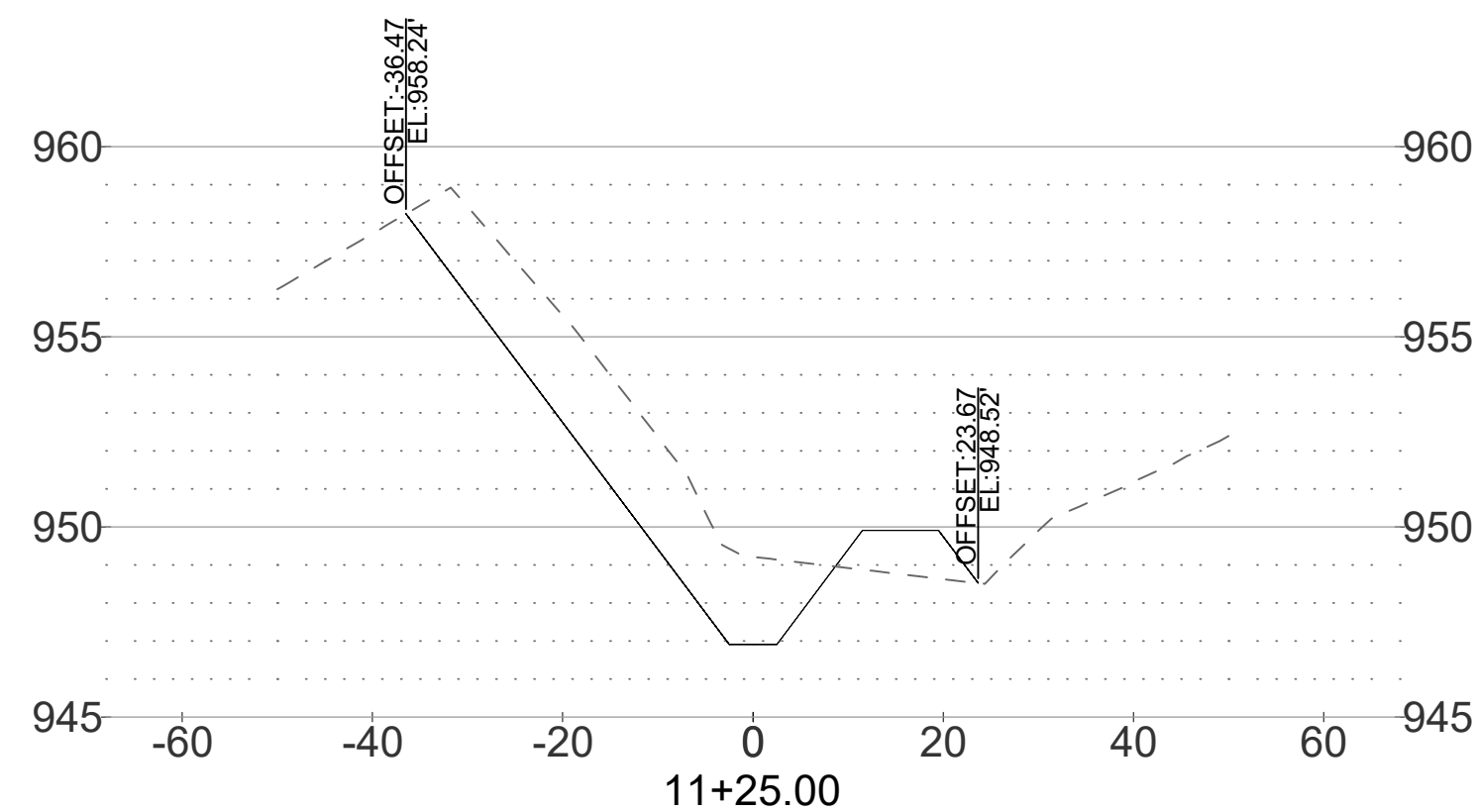
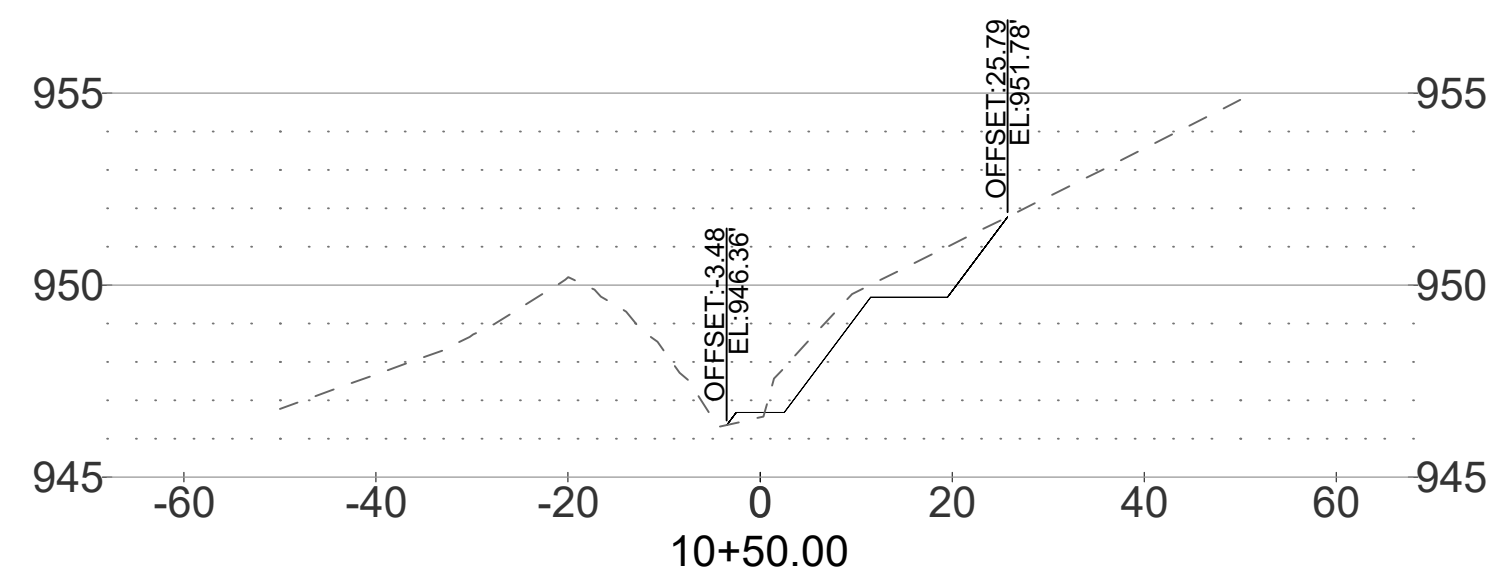
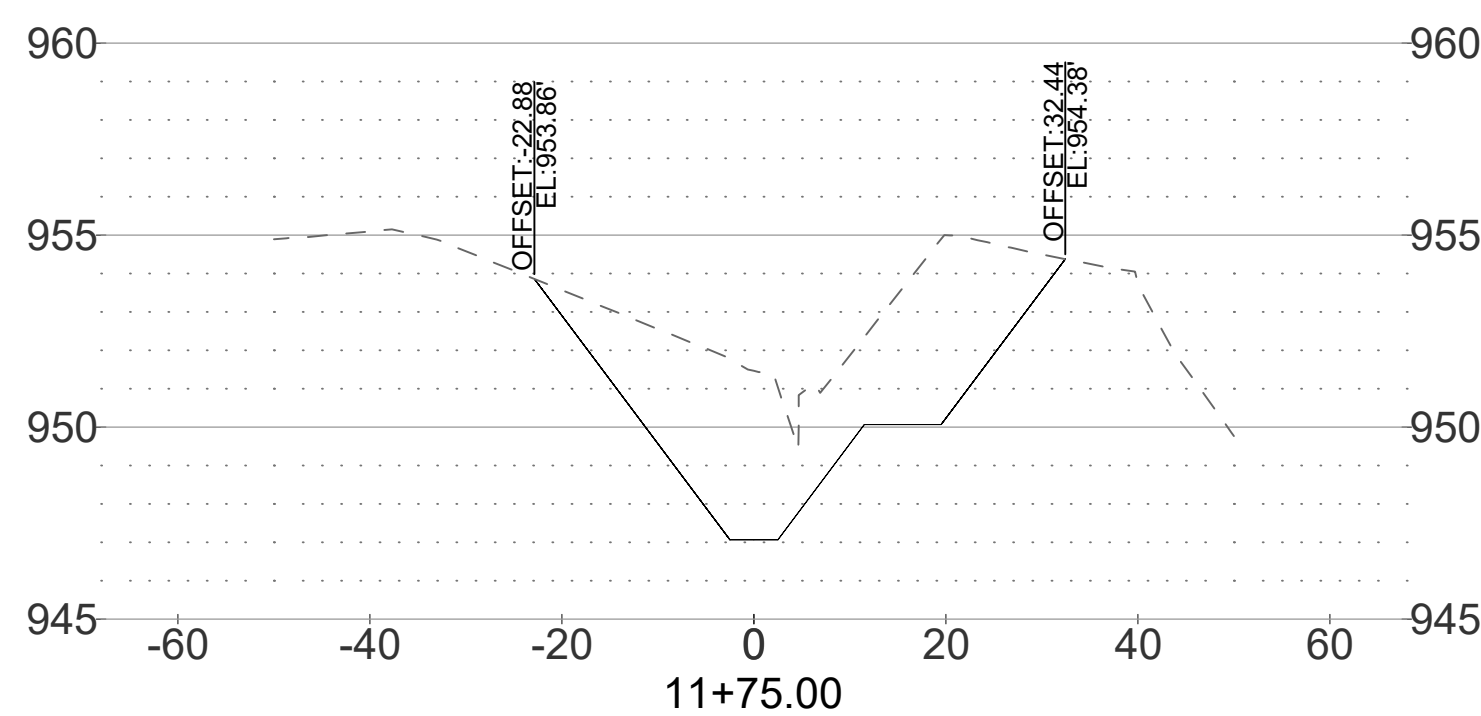
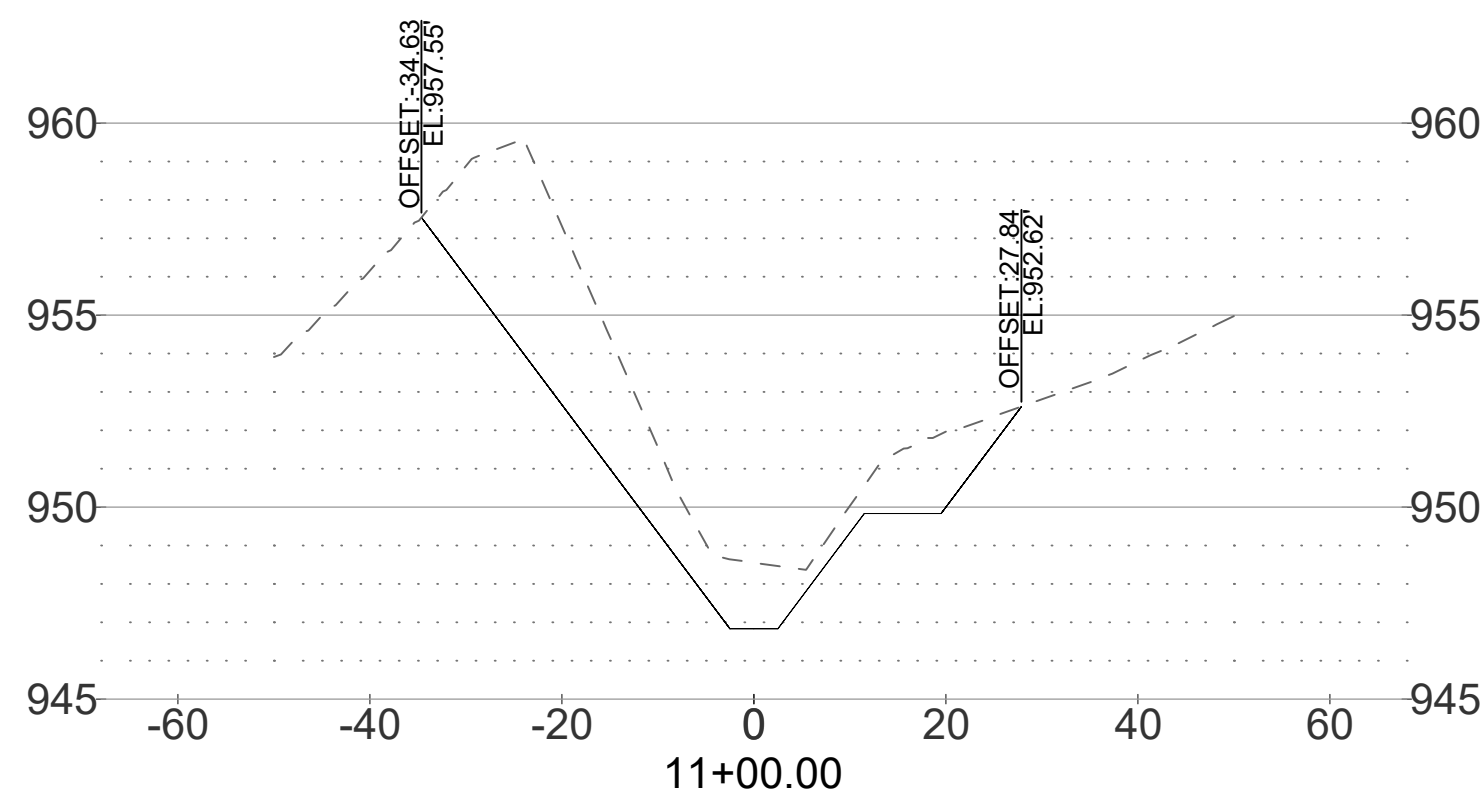
LEE'S SUMMIT, MO

802 FRANCIS STREET
ST. JOSEPH, MISSOURI 64501
816-364-5222 | www.snyder-associates.com



Project No: 120.0485.11

Sheet C2.2



08/26/2025

[illegible]

SHAWN DUKE - ENGINEER
MO PE#2013006489

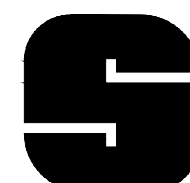
WHISPERING WOODS CREEK RESTORATION

LEE'S SUMMIT, MO

CHANNEL CROSS SECTIONS

SNYDER & ASSOCIATES
ENGINEERS & PLANNERS, INC.

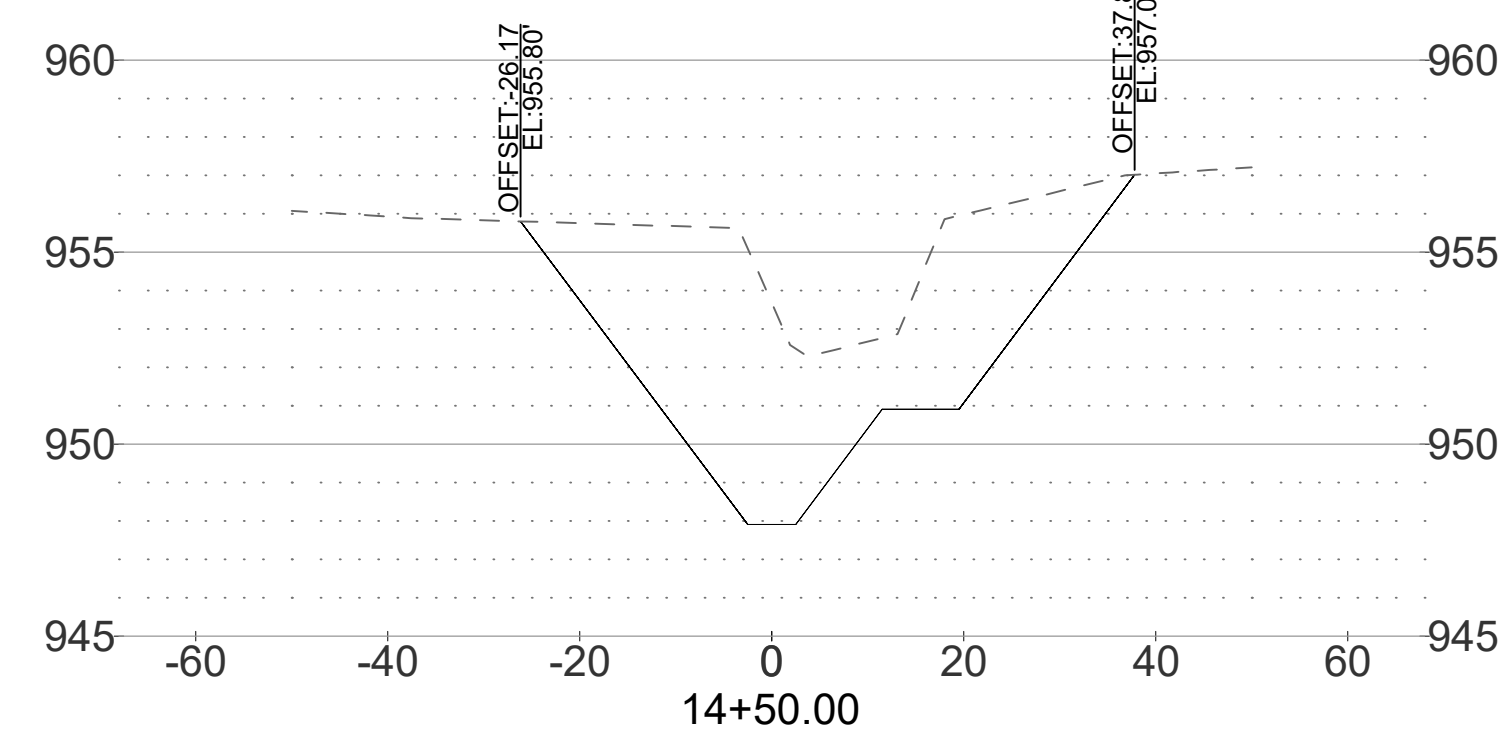
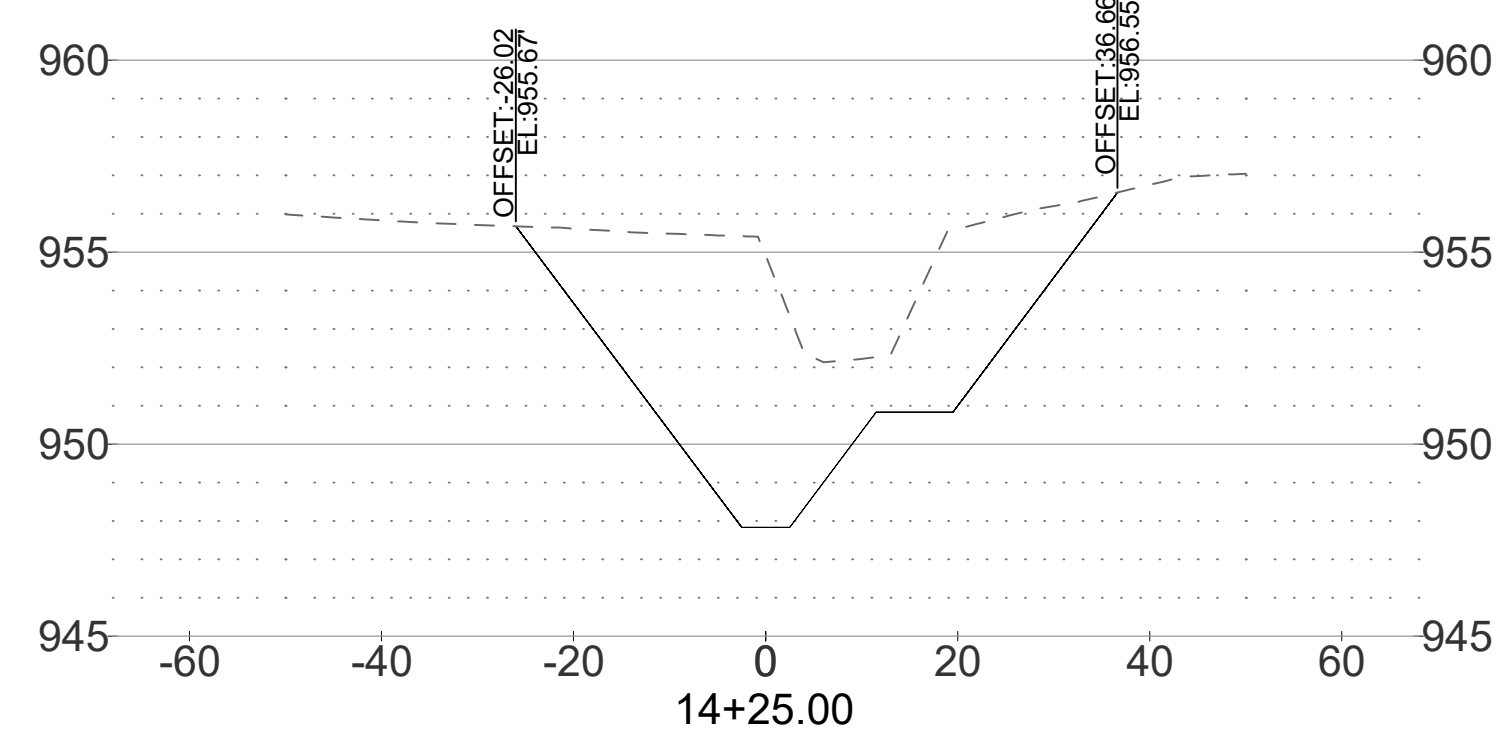
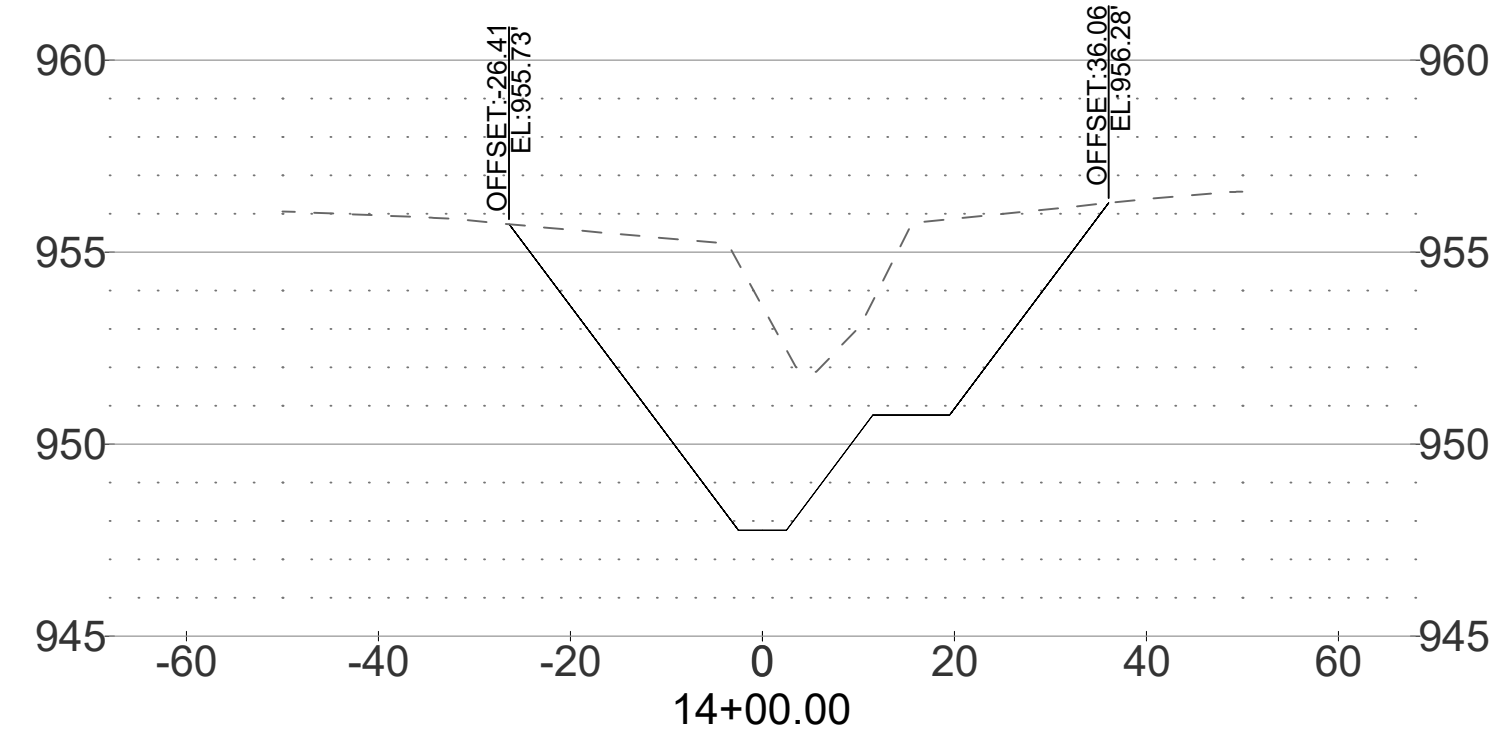
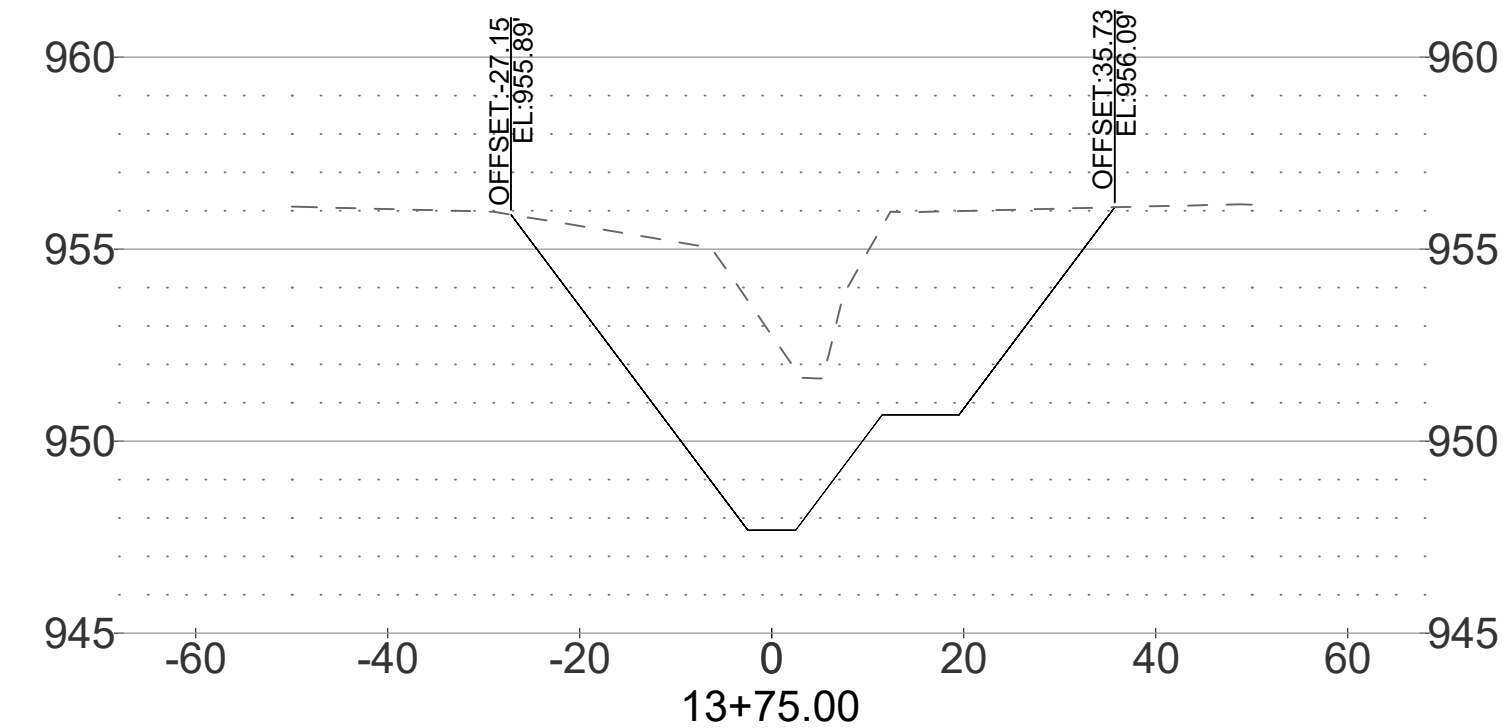
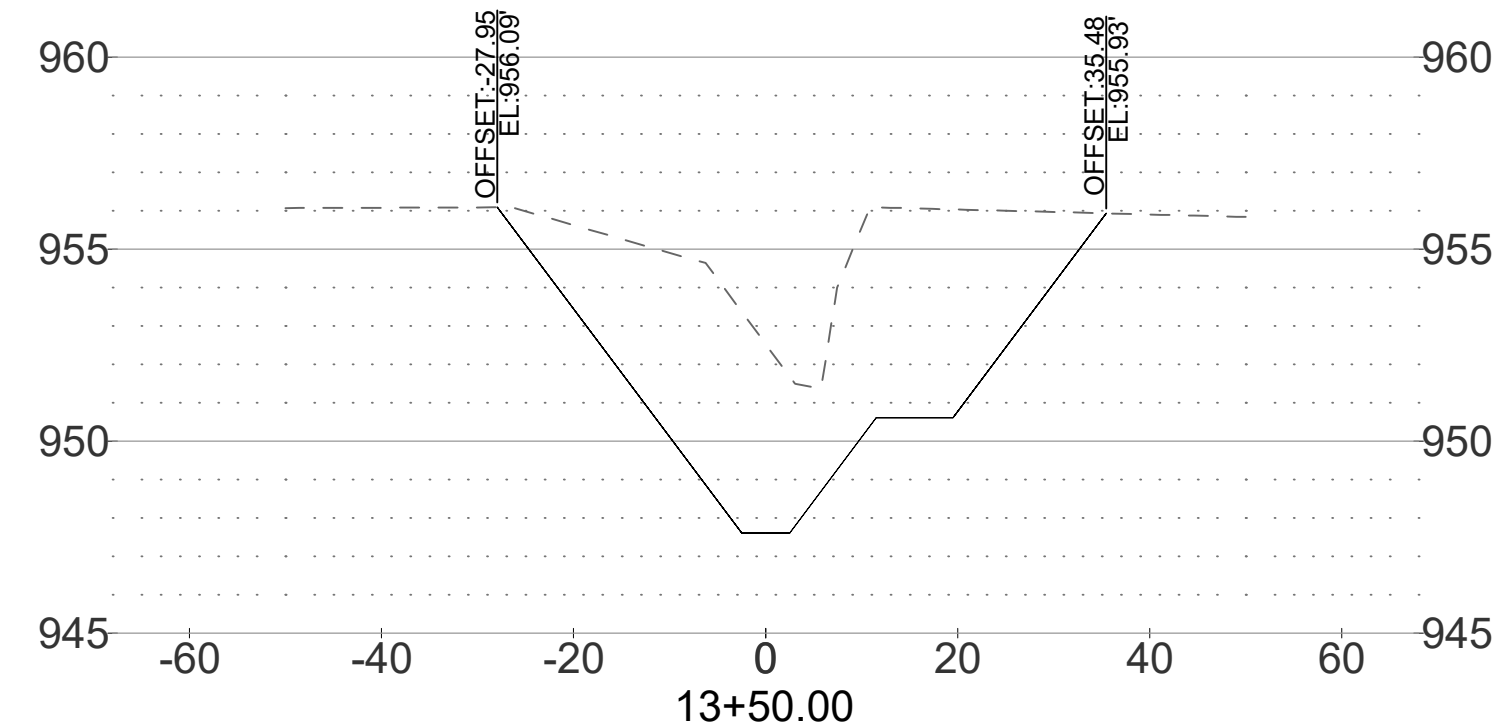
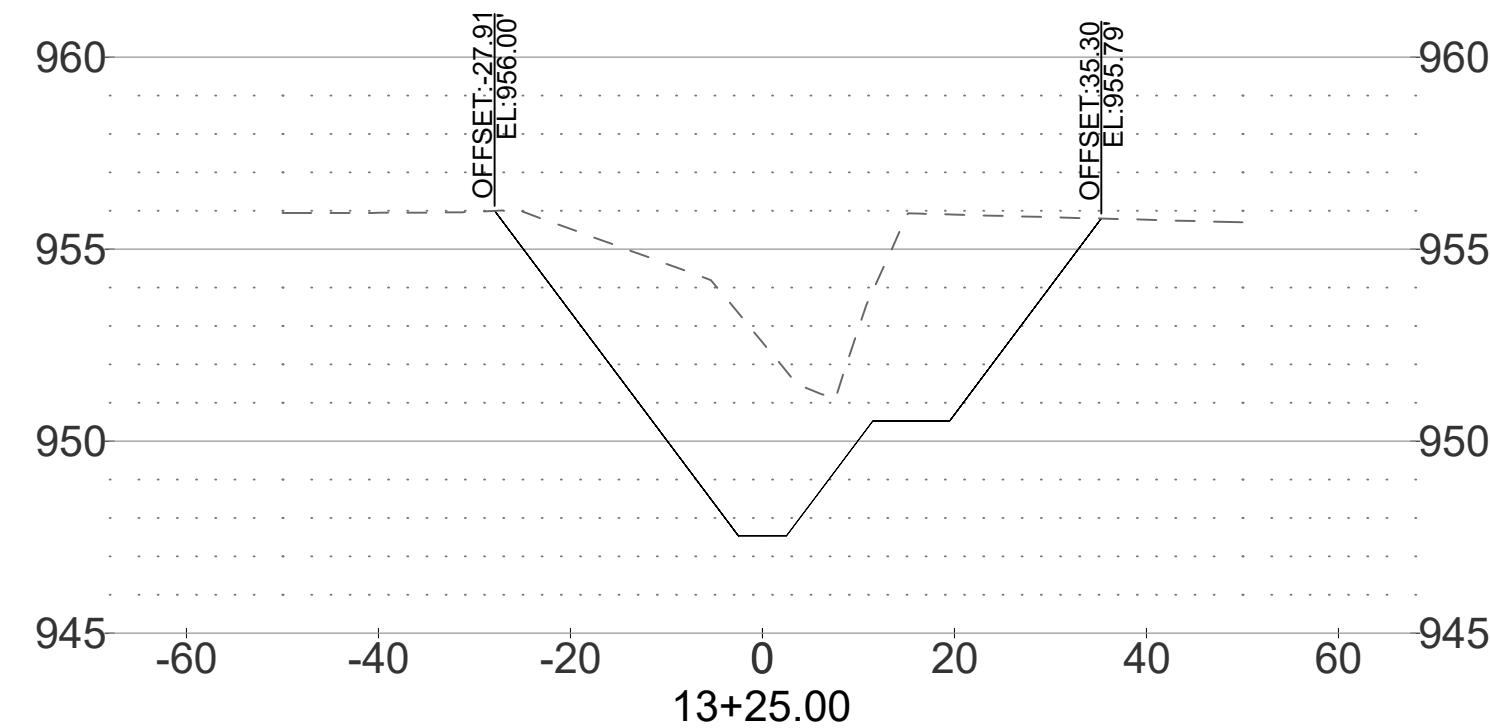
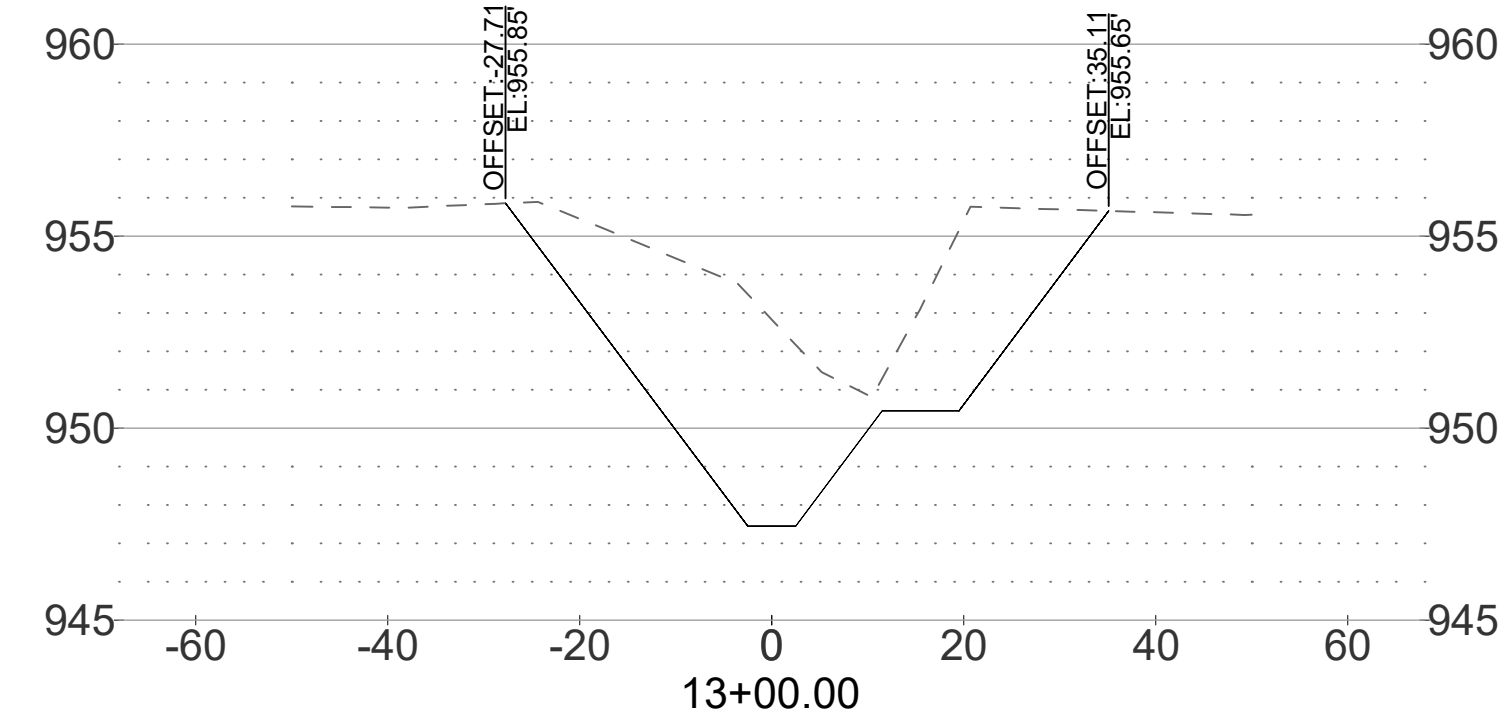
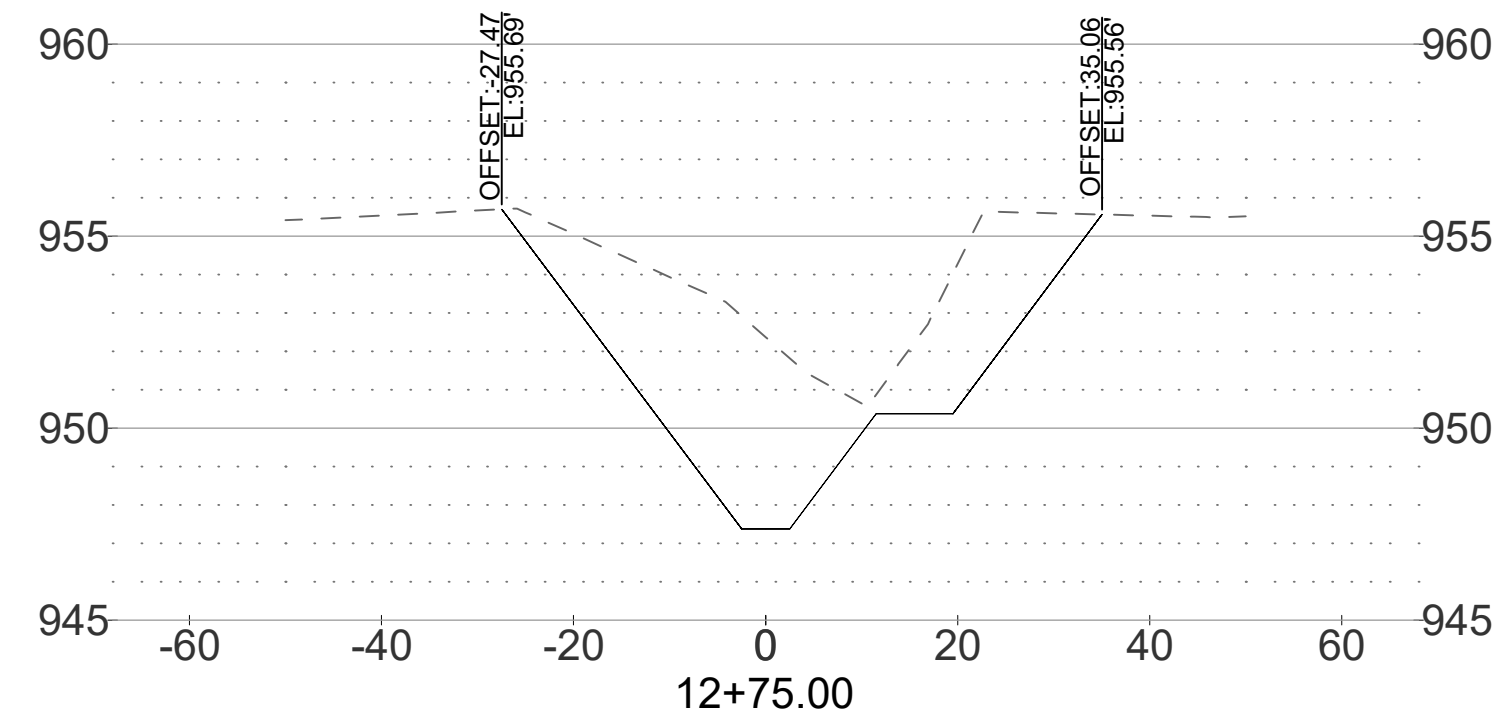
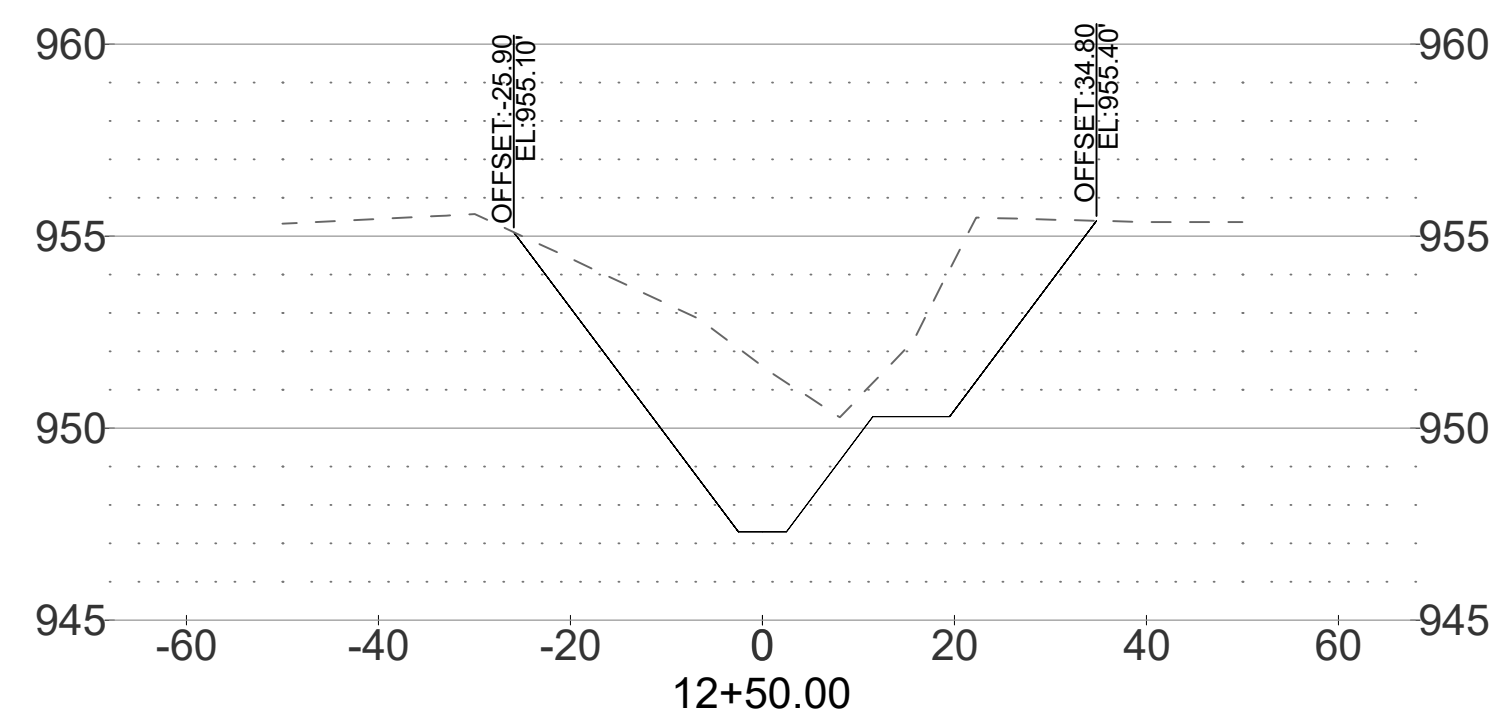
ST. JOSEPH, MISSOURI 64501
816-364-5222 | www.snyder-associates.com



SNYDER
& ASSOCIATES

Project No: 120.0485.11

Sheet C3.0



RELEASED FOR CONSTRUCTION
As Noted on Plan Review

Development Services Department
Lee's Summit, Missouri
08/26/2025

[illegible]

SHAWN DUKE - ENGINEER
MO PE#2013006489

WHISPERING WOODS CREEK RESTORATION

CHANNEL CROSS SECTIONS

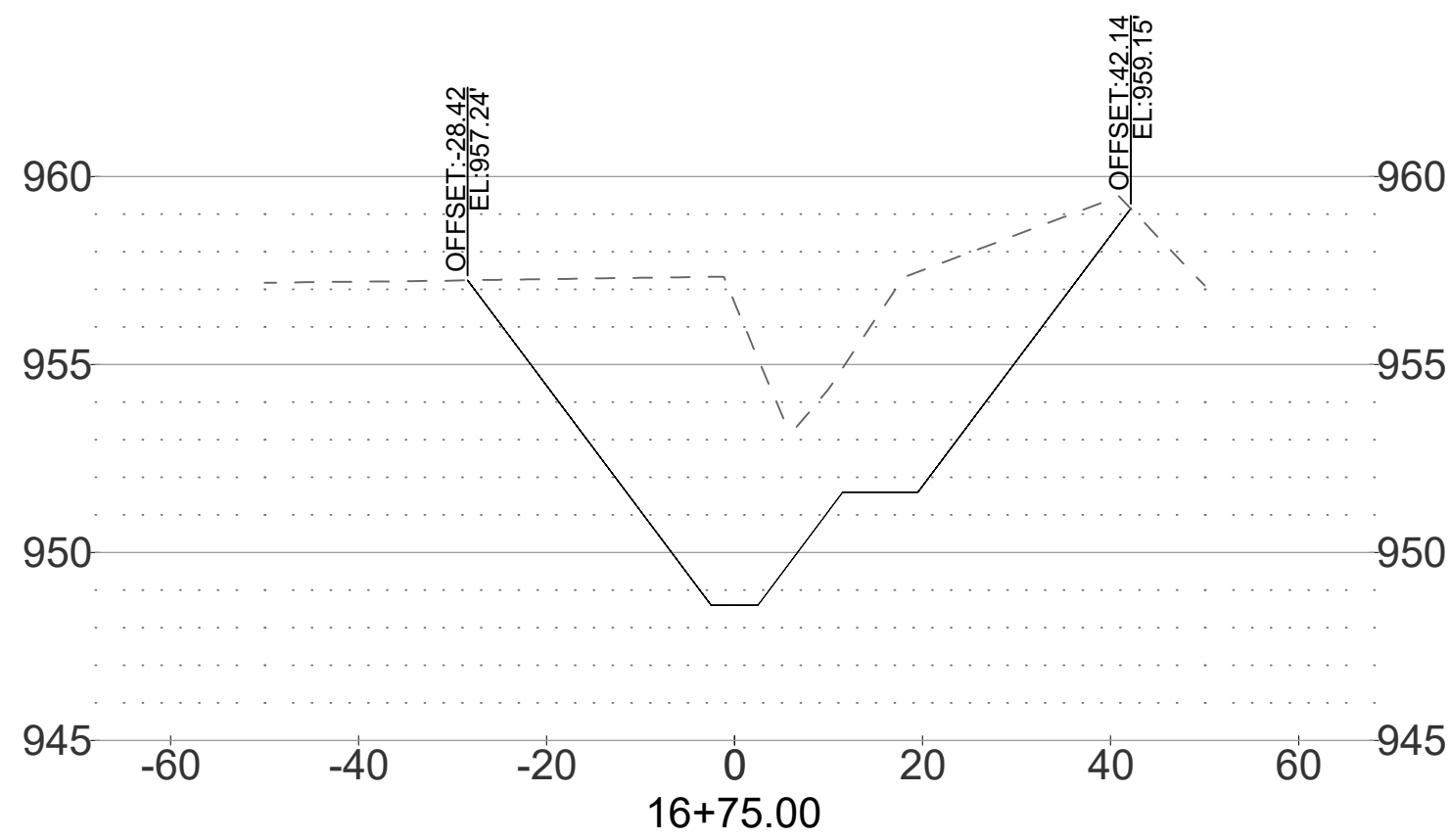
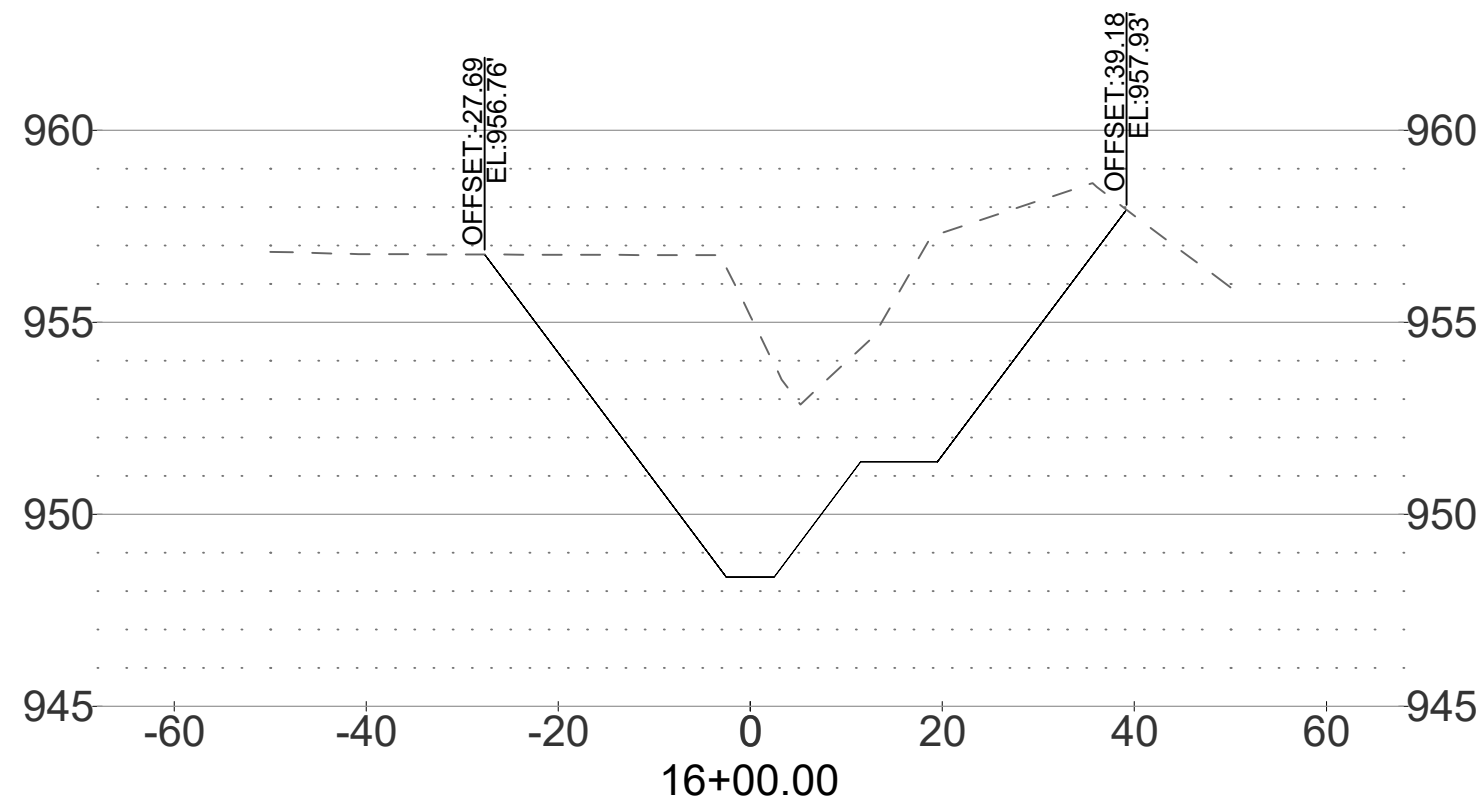
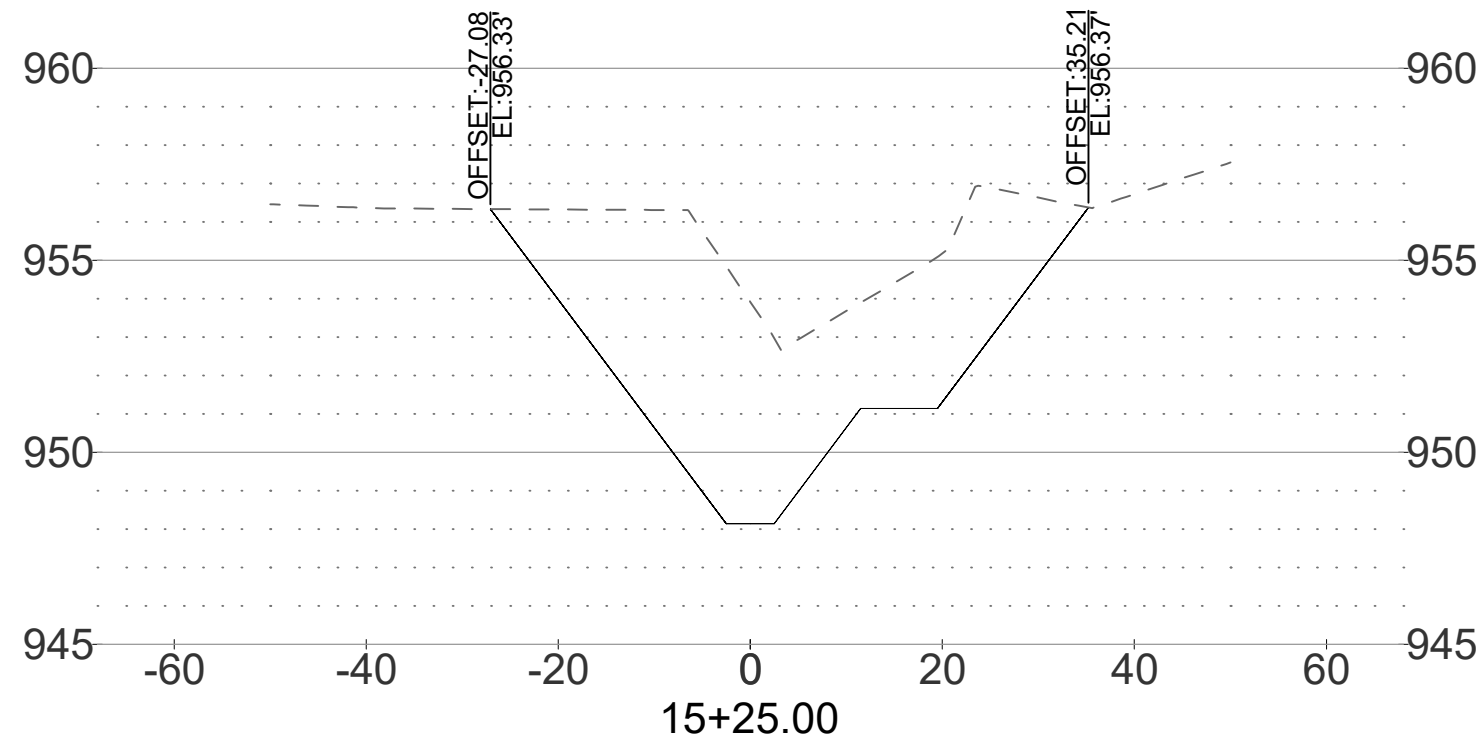
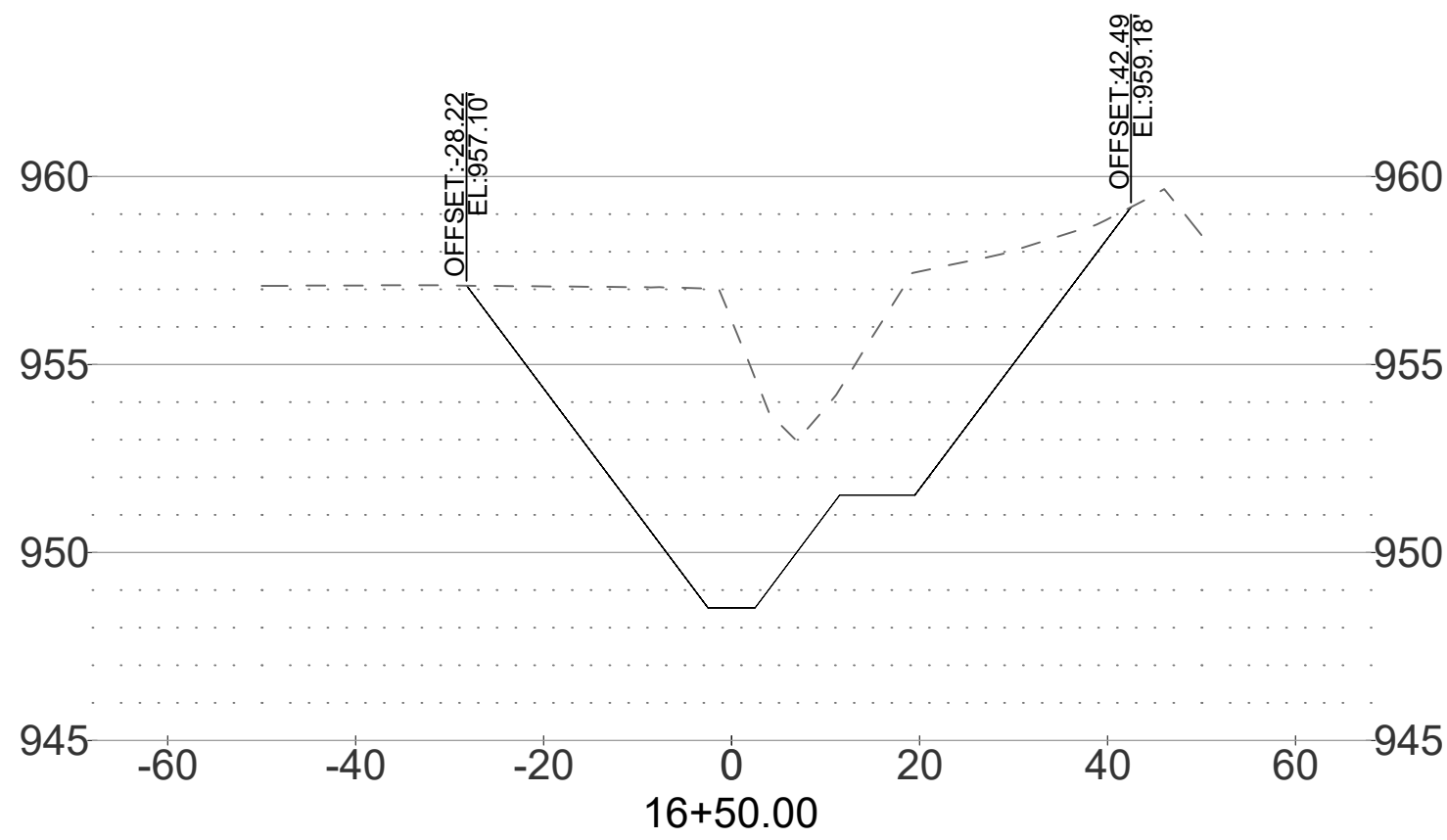
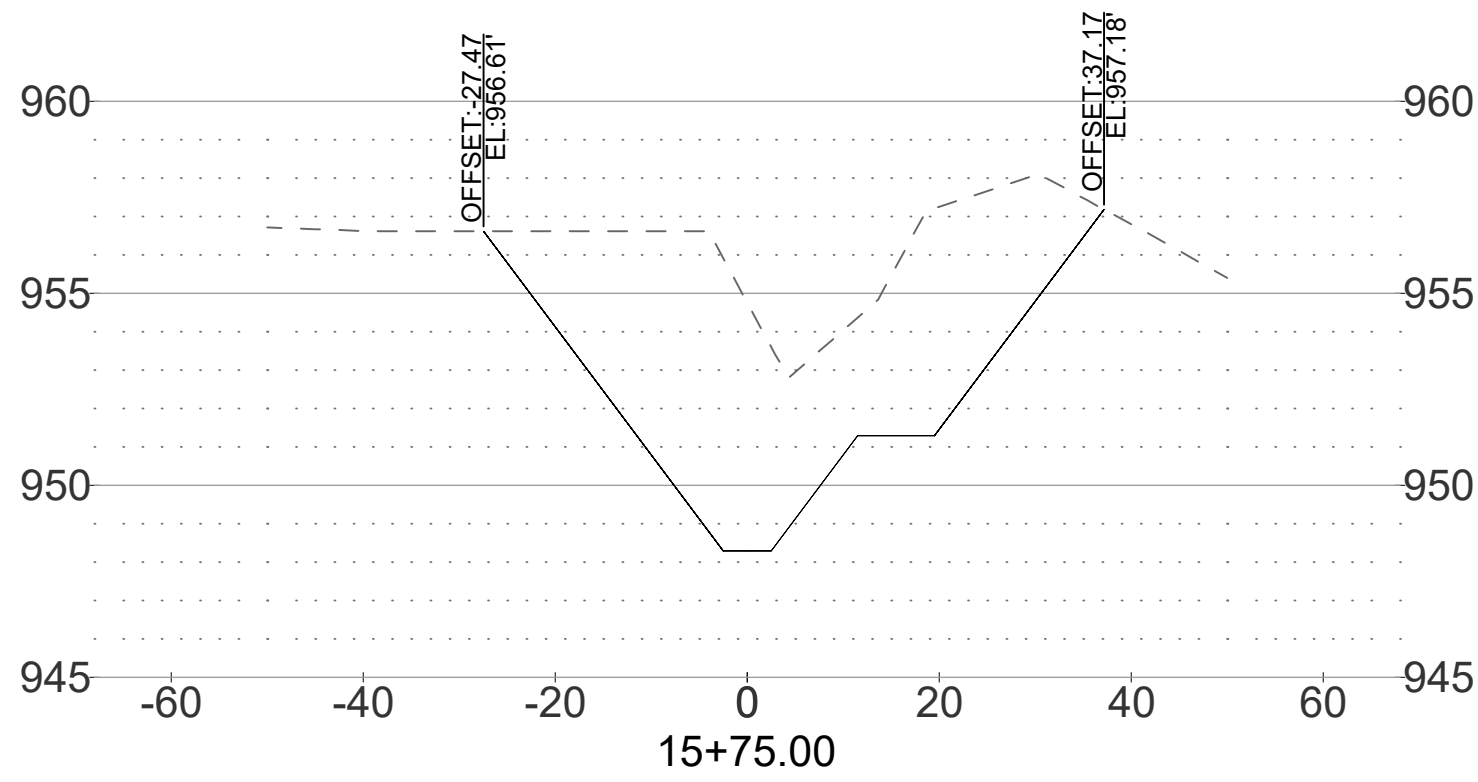
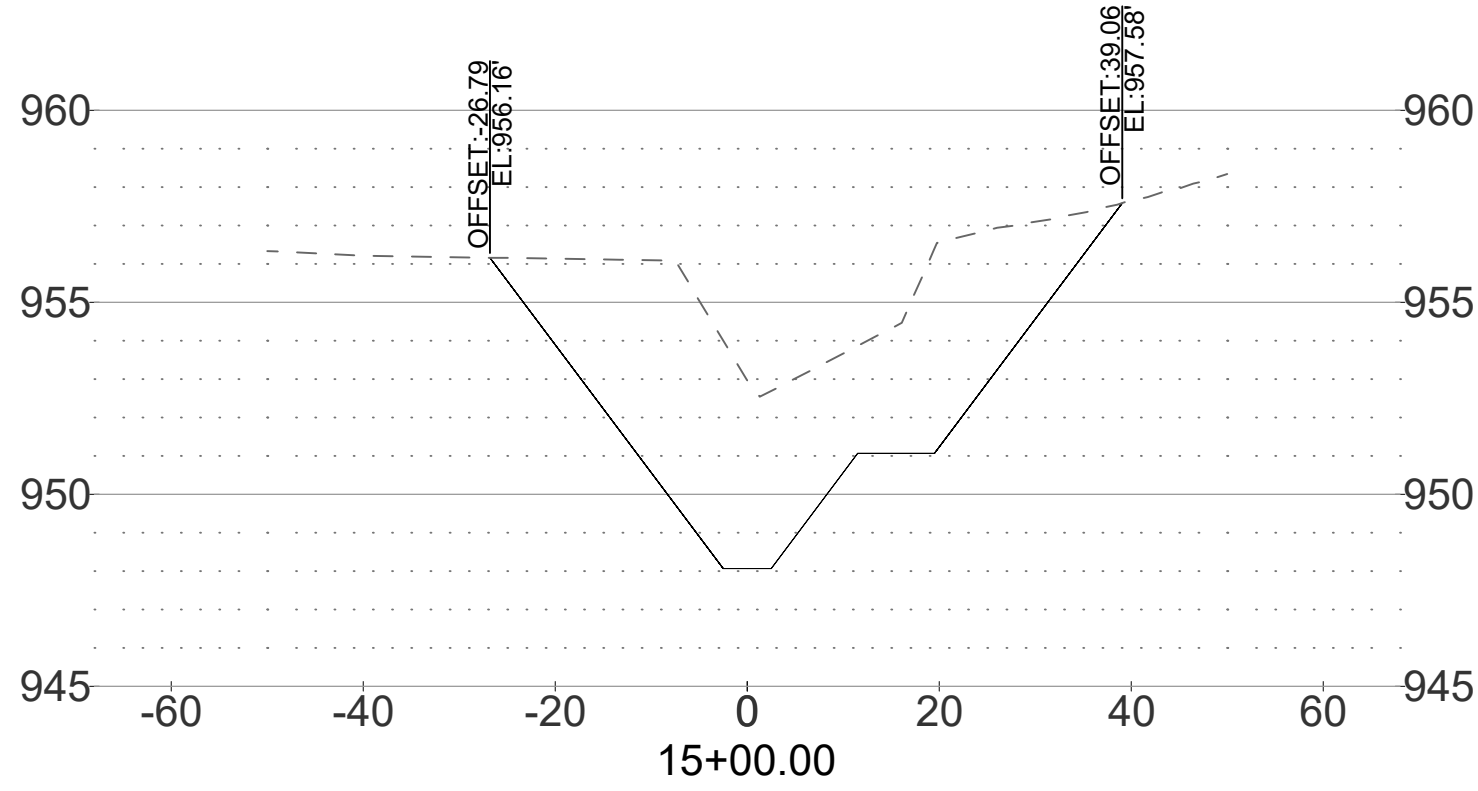
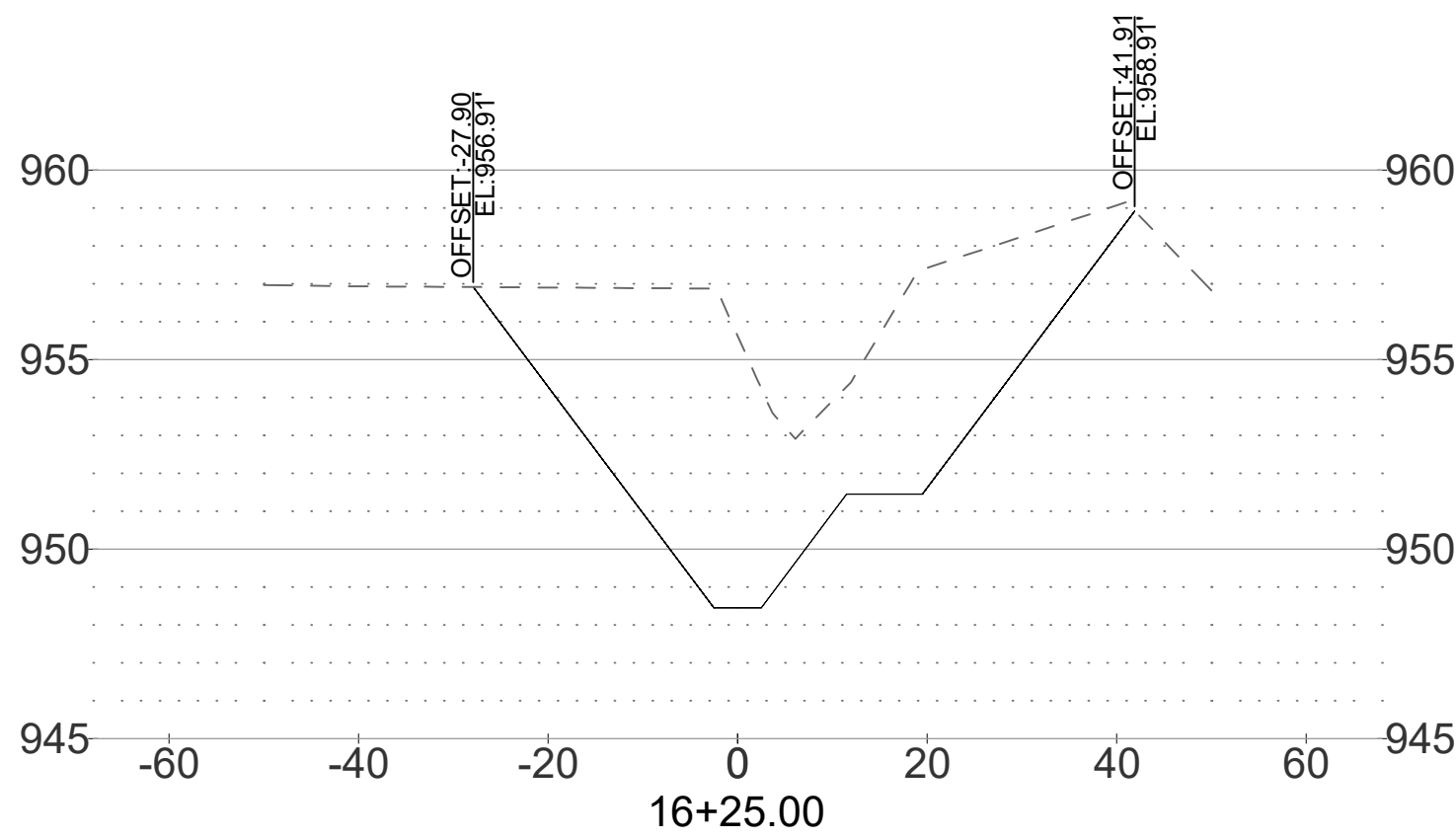
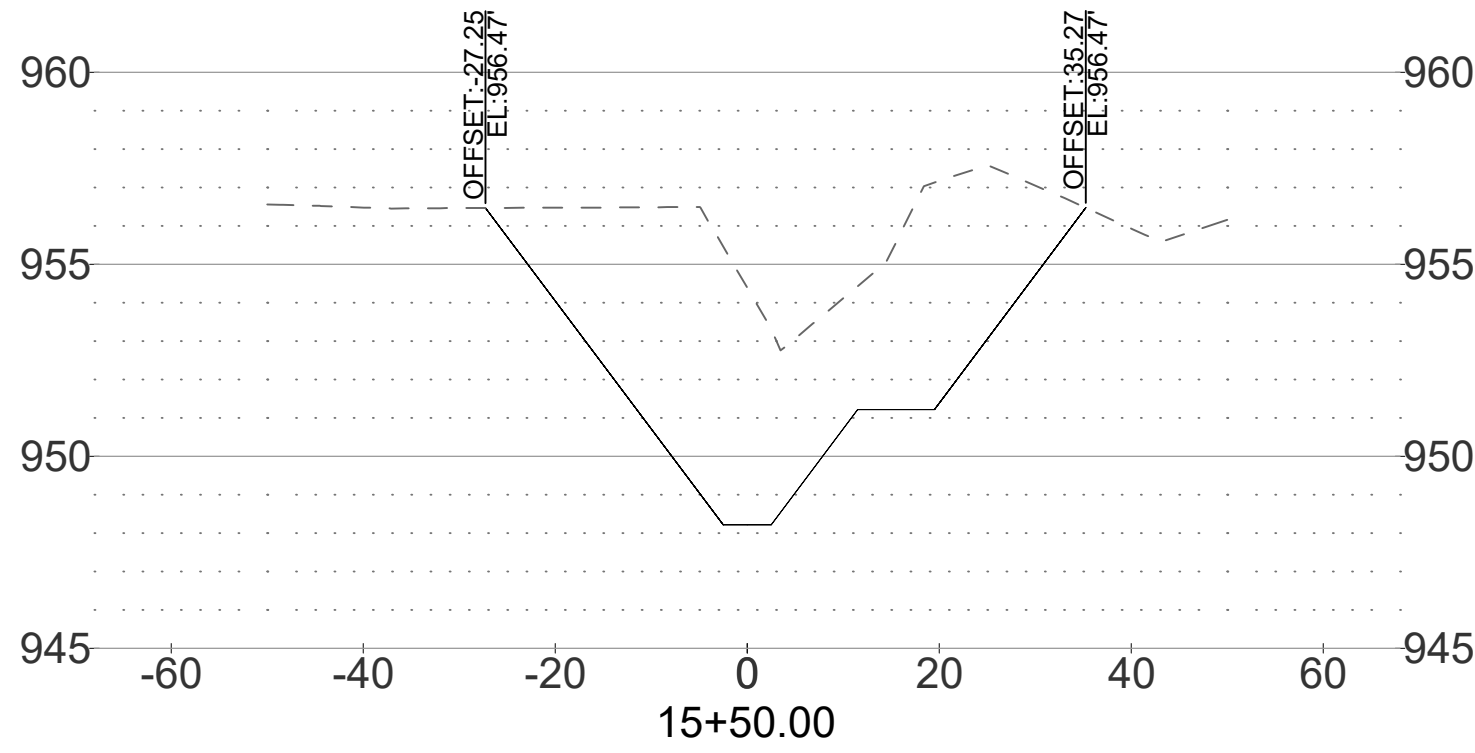
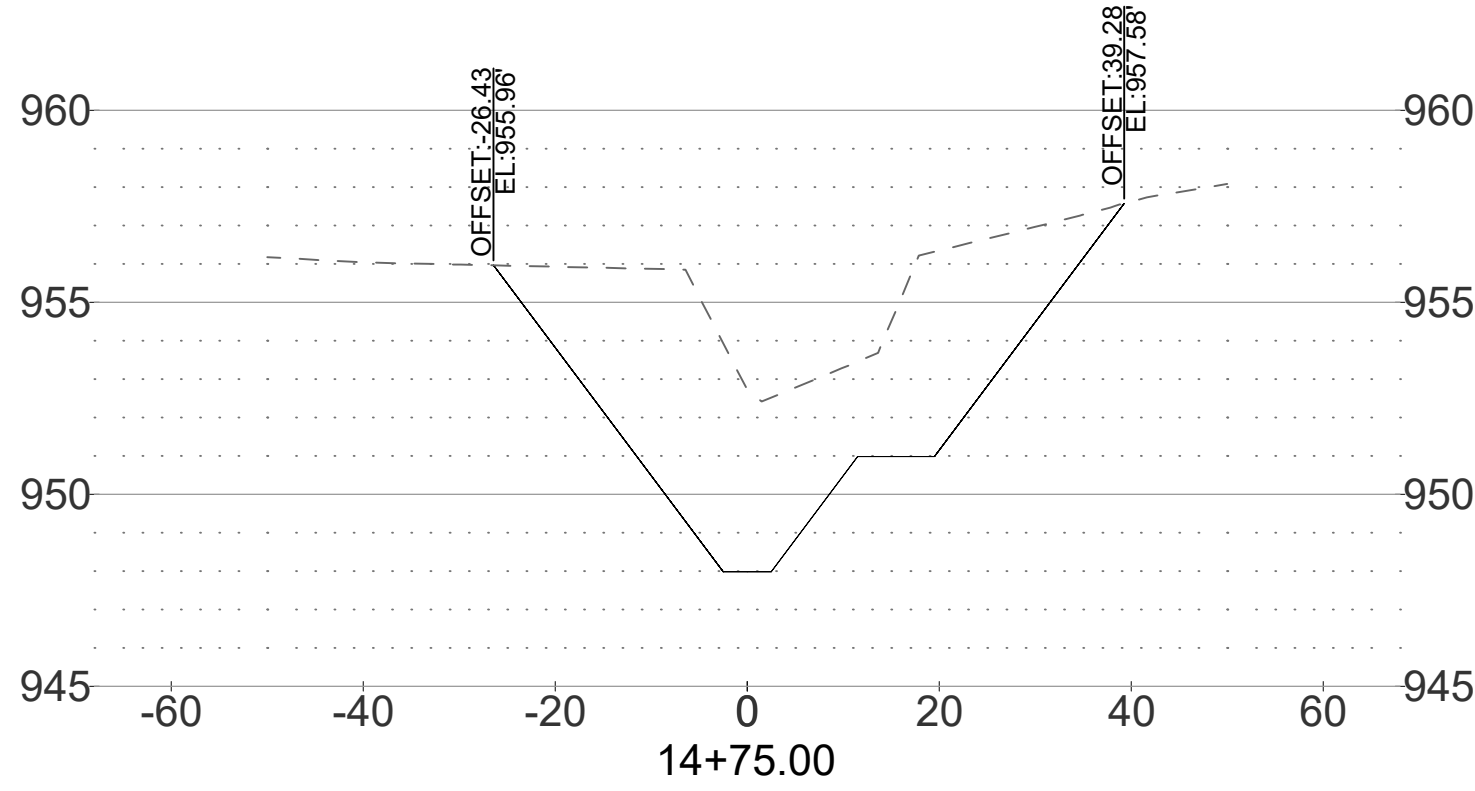
SNYDER & ASSOCIATES
ENGINEERS & PLANNERS, INC.



Project No: 120.0485.11

Sheet C3.1

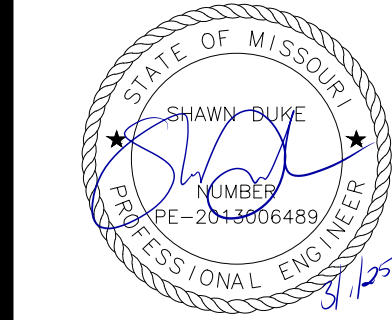
V:\Projects\2020\120.0485.1\CADD\ISP - 120.0485_Snyder\mws372.dwg, CHA STONE CHANNEL CROSS SECTIONS, 2025/02/26, 4:50 AM, ANSI FULL BLEED D (34.00 X 22.00 INCHES)



RELEASED FOR CONSTRUCTION
As Noted on Plan Review

Development Services Department
Lee's Summit, Missouri

08/26/2025



SHAWN DUKE - ENGINEER
MO PE#2013006489

WHISPERING WOODS CREEK RESTORATION

CHANNEL CROSS SECTIONS

LEE'S SUMMIT, MO

SNYDER & ASSOCIATES
ENGINEERS & PLANNERS, INC.

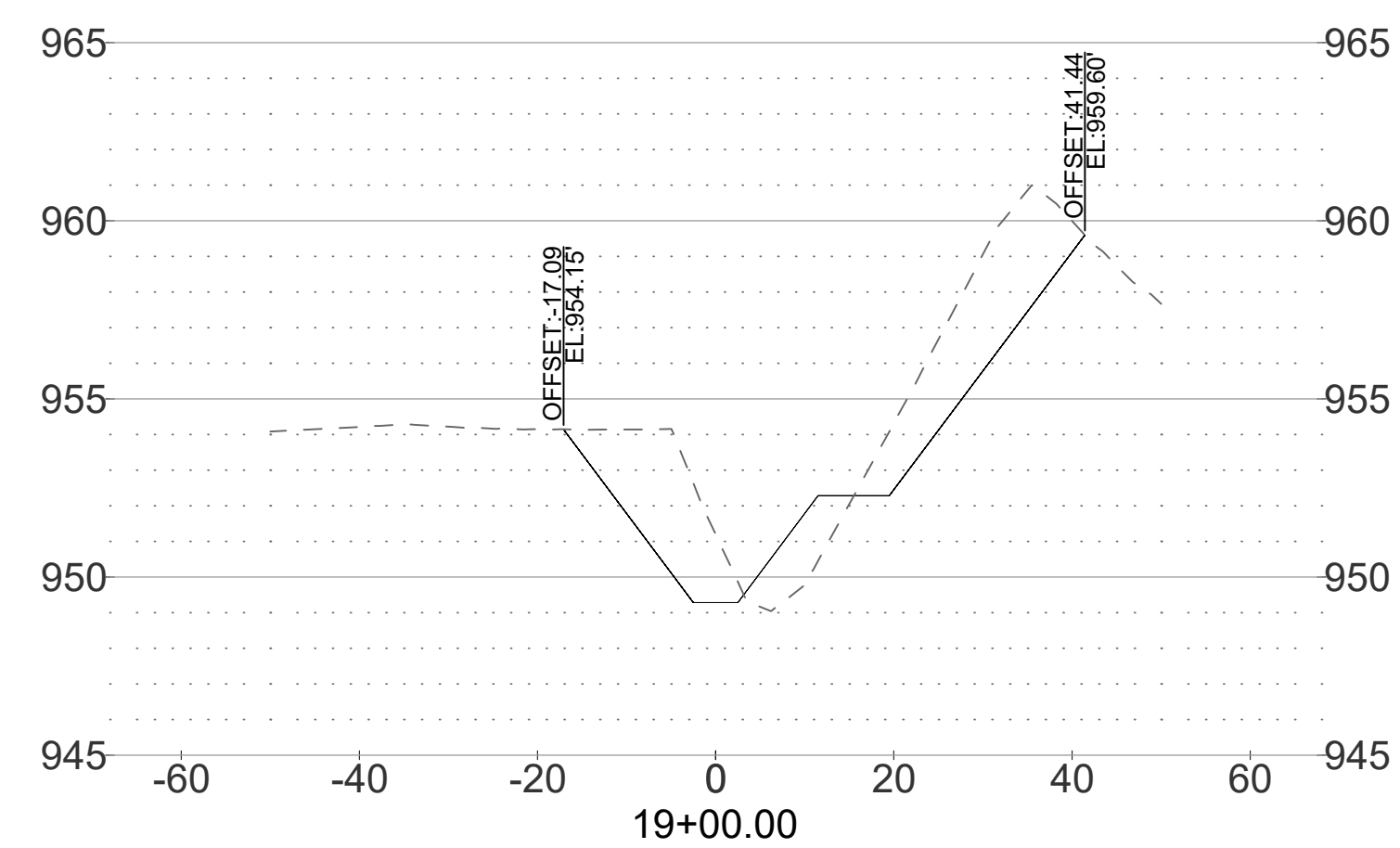
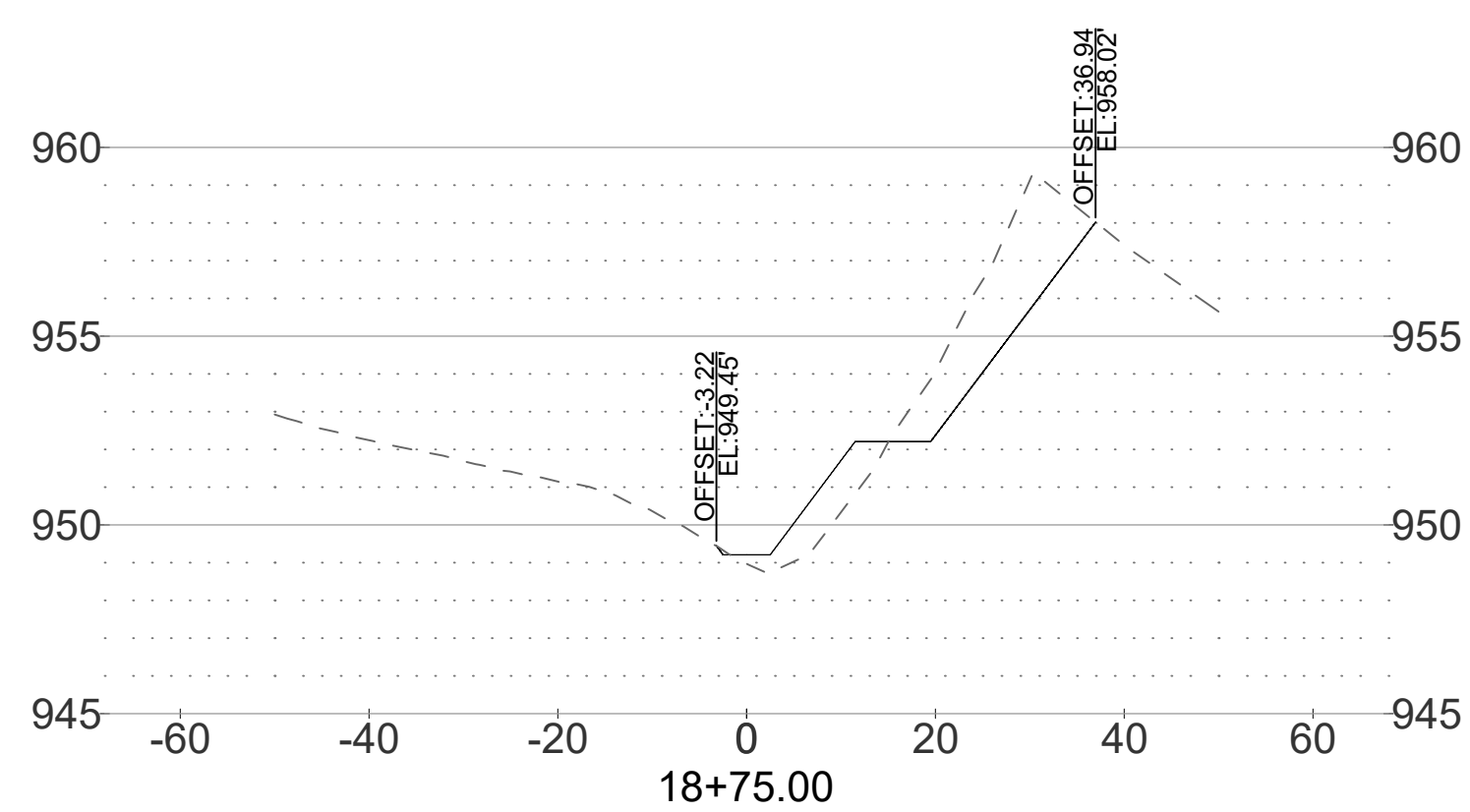
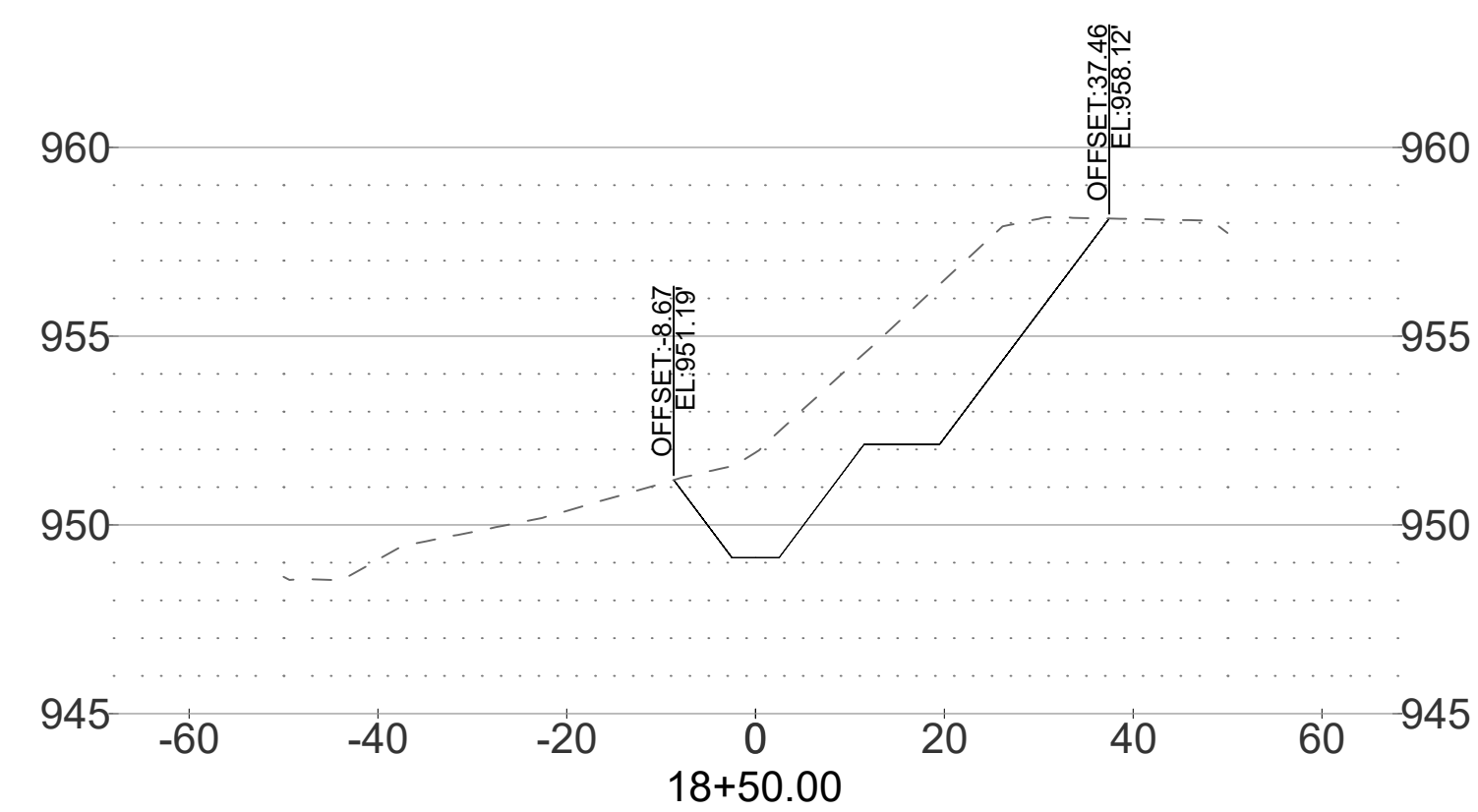
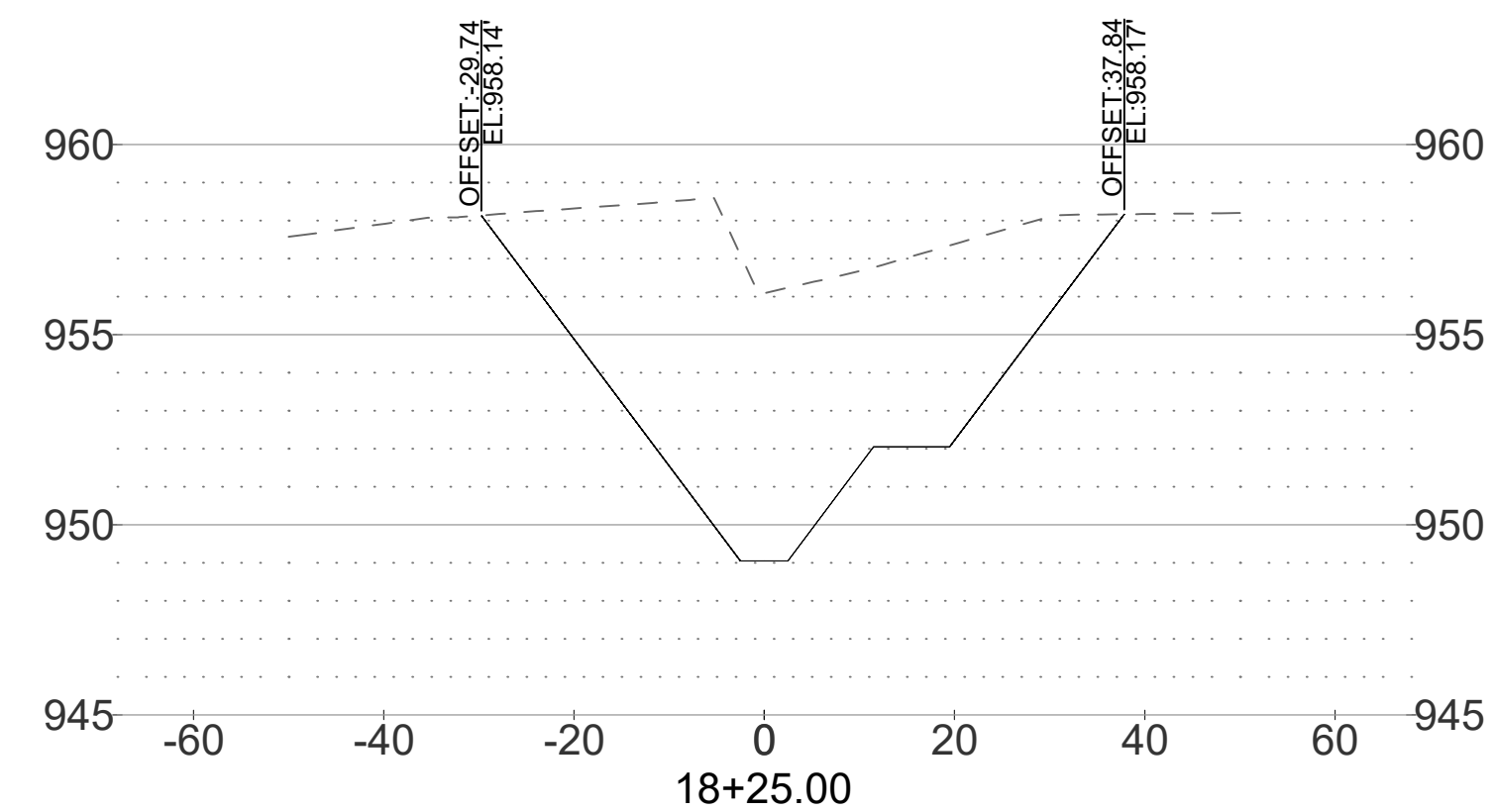
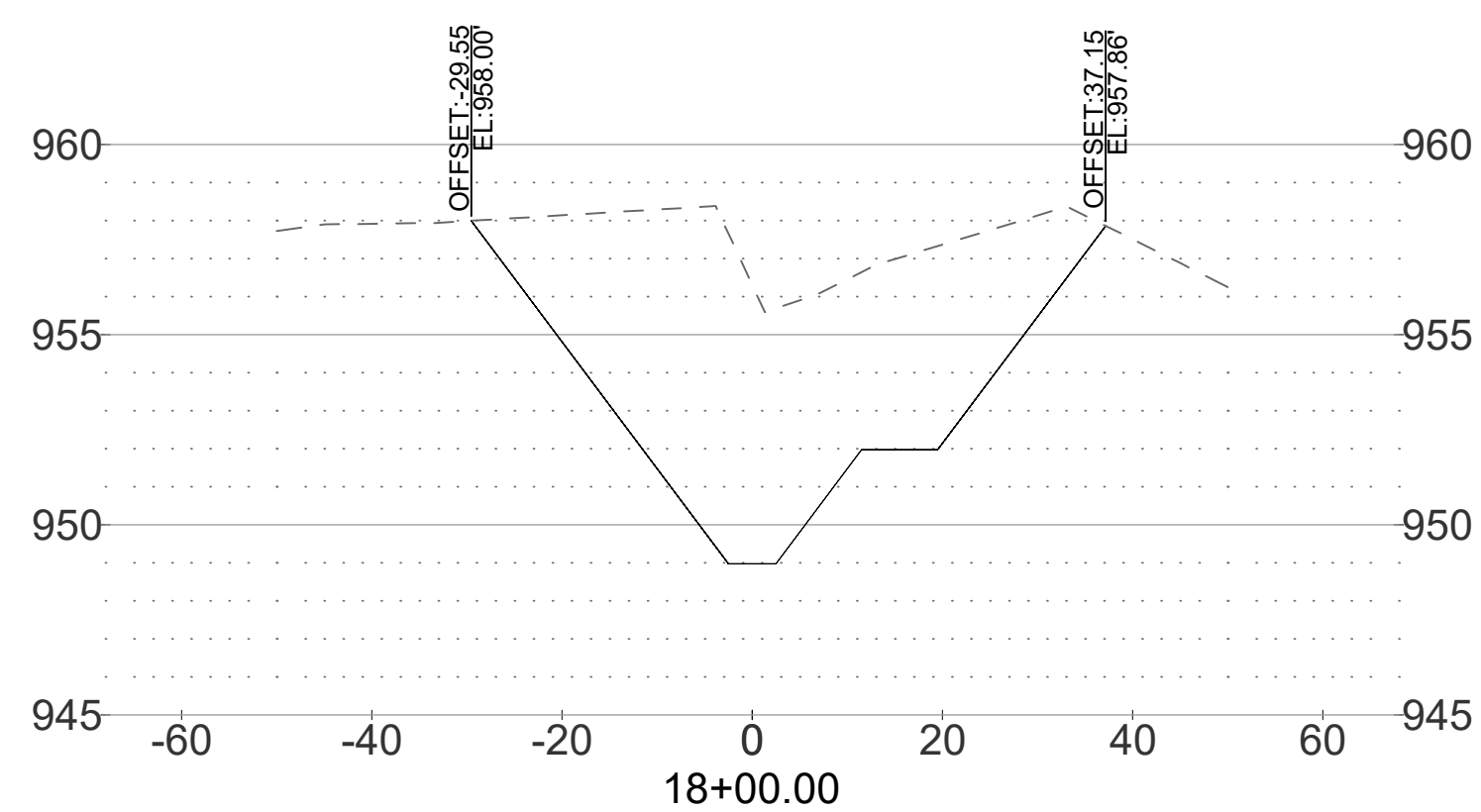
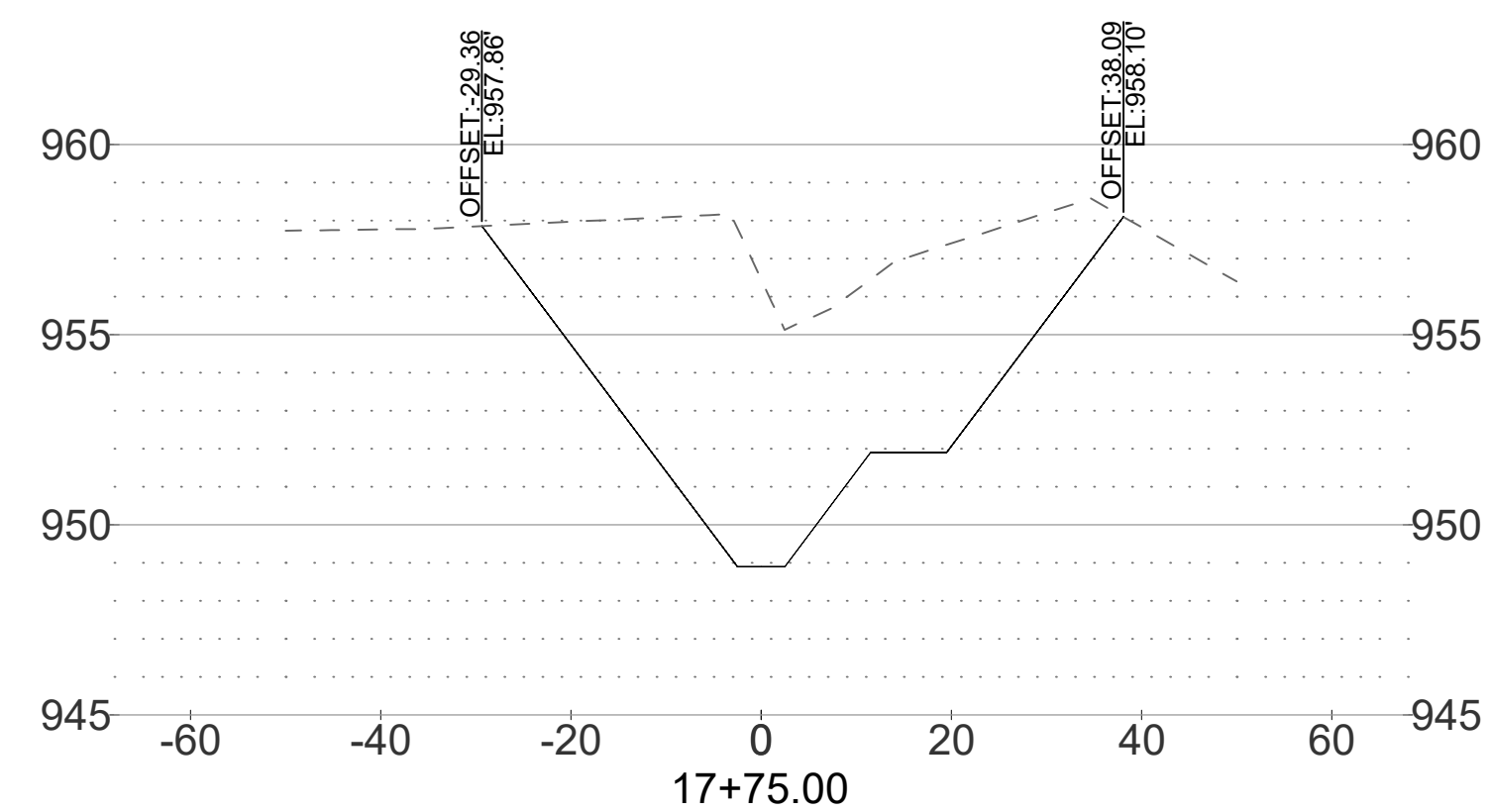
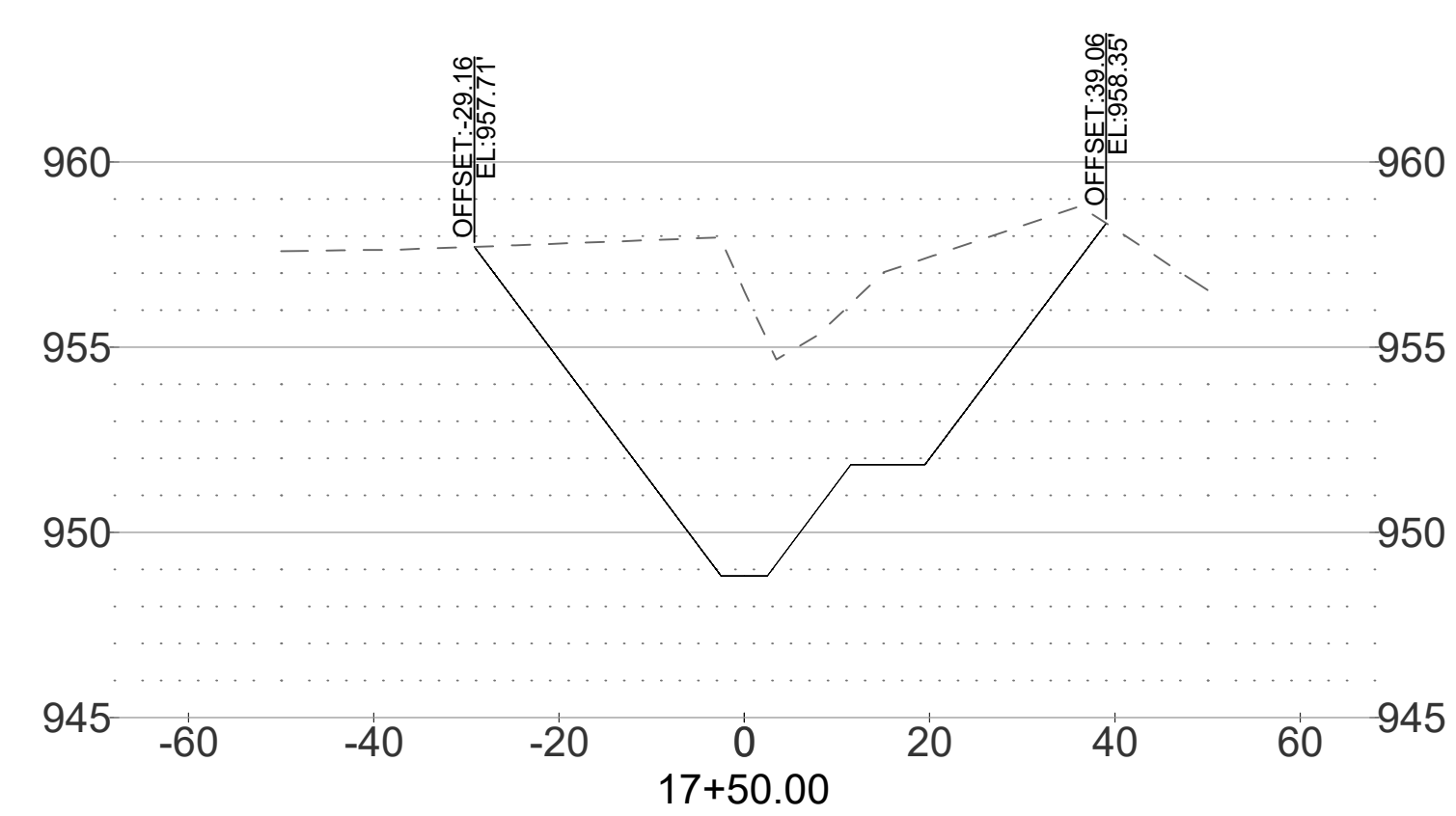
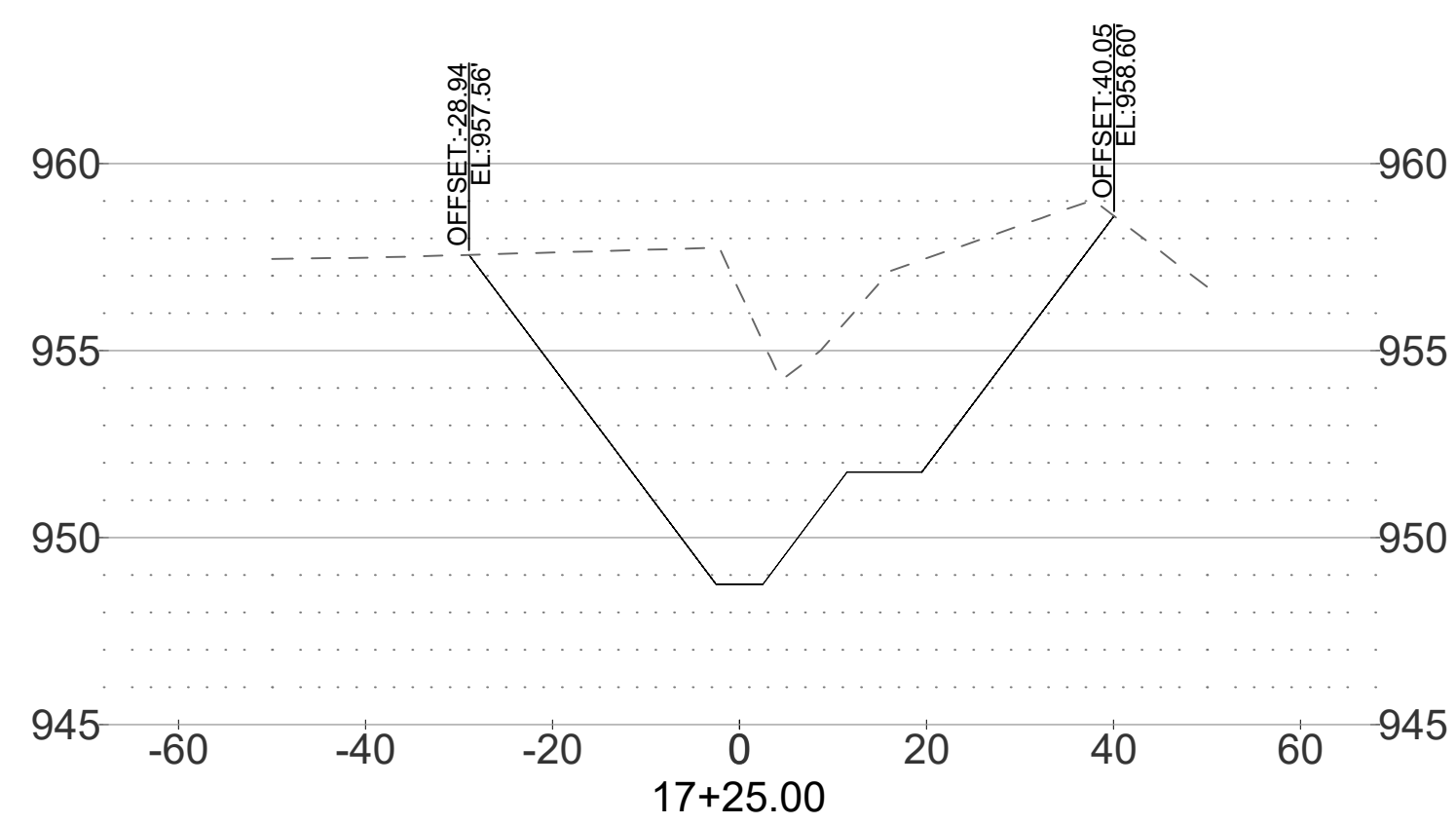
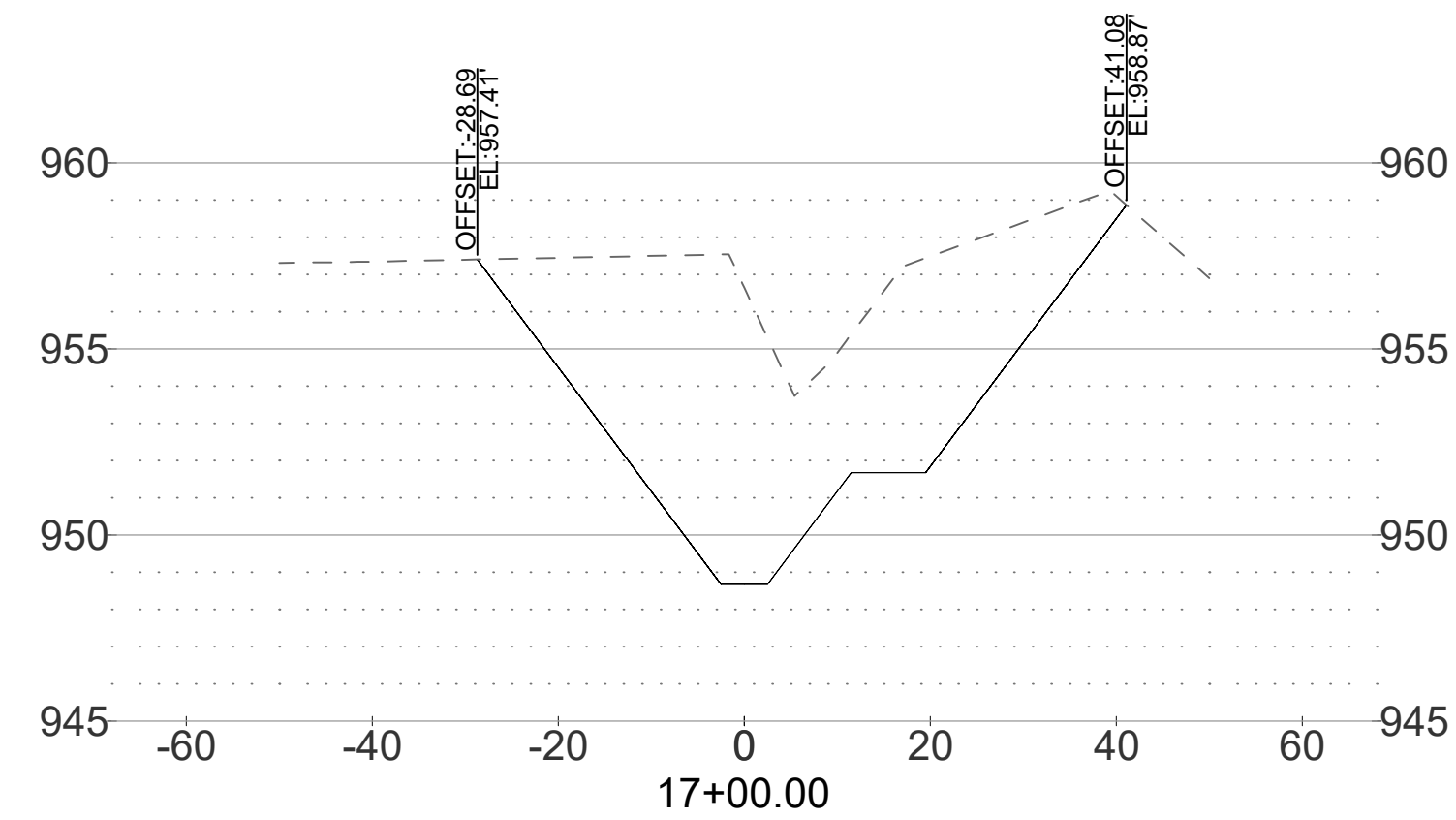
802 FRANCIS STREET
ST. JOSEPH, MISSOURI 64501
816-364-5222 | www.snyder-associates.com



Project No: 120.0485.11
Sheet C3.2

Sheet C3.2

MARK	REVISION	DATE	BY
Engineer: SD	Checked By: SD	Scale: 1" = 40'	
Technician: BT	Date: 04-15-2022	T-R-S: 47N-32W-24	
Snyder & Associates Engineers & Planners, Inc. Missouri State Certificate of Authority #206003544			



RELEASED FOR CONSTRUCTION
As Noted on Plan Review

As Noted on Plan Review

Development Services Department
Lee's Summit, Missouri

Lee's Summit, Missouri

08/26/2025



SHAWN DUKE - ENGINEER
MO PE#2013006489

HAWN DUKE - ENGINEER
MO PE#2013006489

WHISPERING WOODS CREEK RESTORATION

CHANNEL CROSS SECTIONS **LEE'S SUMMIT, MO**

LEE'S SUMMIT, MO

SNYDER & ASSOCIATES
ENGINEERS & PLANNERS, INC.

ENGINEERS & PLANNERS, INC.
ST. JOSEPH, MISSOURI 64501
816-364-5222 | www.snyder-associates.com

802 FRANCIS STREET
ST. JOSEPH, MISSOURI 64501

ST. JOSEPH, MISSOURI 64501

816-364-5222 | www.snyder-associates.com



Project No: 120.0485.11

Sheet C3.3



USE A TRANSVERSE JOINT WHEN BARREL LENGTH IS OVER 80 FEET.
USE ADDITIONAL JOINTS TO LIMIT CUT SECTION LENGTH AND END
SECTION BARREL LENGTH MEASURED ALONG CENTERLINE OF CULVERT TO
50 FEET.

MINIMUM END SECTION LENGTH SHALL BE 3 FEET MEASURED ALONG THE
SHORTEST WALL FROM THE INSIDE FACE OF HEADWALL TO THE
TRANSVERSE JOINT.

TRAVELED WAY IS THE ROADWAY WIDTH MINUS SHOULDER WIDTHS.

FOR CUT SECTION DETAILS, SEE DETAIL SHEET C5.4.

RELEASED FOR CONSTRUCTION
As Noted on Plan Review

Development Services Department
Lee's Summit, Missouri

08/26/2025

CONSTRUCTION JOIN KEY NOT SHOWN FOR CLARITY IN PLAN AND ELEVATION, SEE DETAIL SHEET C5.3 FOR DETAILS.

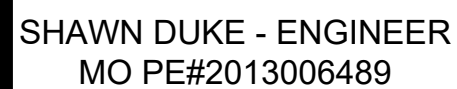
DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1".

LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

(b) VARIES, 12" MAXIMUM

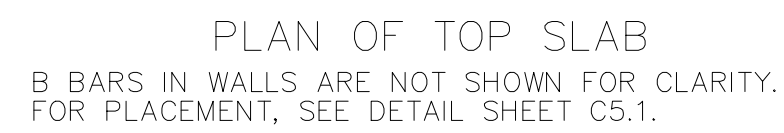
[illegible]

SNYDER & ASSOCIATES |
ENGINEERS & PLANNERS, INC.



Project No: 120.0485.11
 Sheet C5.1

Development Services Department
Lee's Summit, Missouri
08/26/2025



PER LEE'S SUMMIT DCM:
2604.3.D. Cast-in-Place Box Culvert Support Slab:
Cast in place box culverts shall have a 3 inch thick grade slab cast under the bottom slab with 6" crushed stone under grade slab.
The grade slab shall be at least as wide as the structure and shall stop short of the toe walls.
Commercial grade concrete may be used with minimum 2500 psi compressive strength.
The slab should be set with proper grade control to match the elevations required for the culvert.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN PLAN AND SECTION, SEE DETAIL SHEET C5.3 FOR DETAILS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1".

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

(b) VARIES, 12" MAXIMUM



TOP OF WEIR WALL

CONTINUOUS #5-W1 OR W2 BARS (TYP.)

#5-E1 BARS

12"

12"

WEIR WALL DETAILS

#5-W1 OR W2 BARS (TYP.)

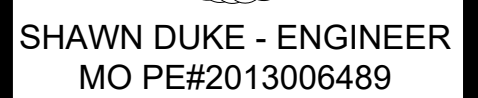
12"

8"

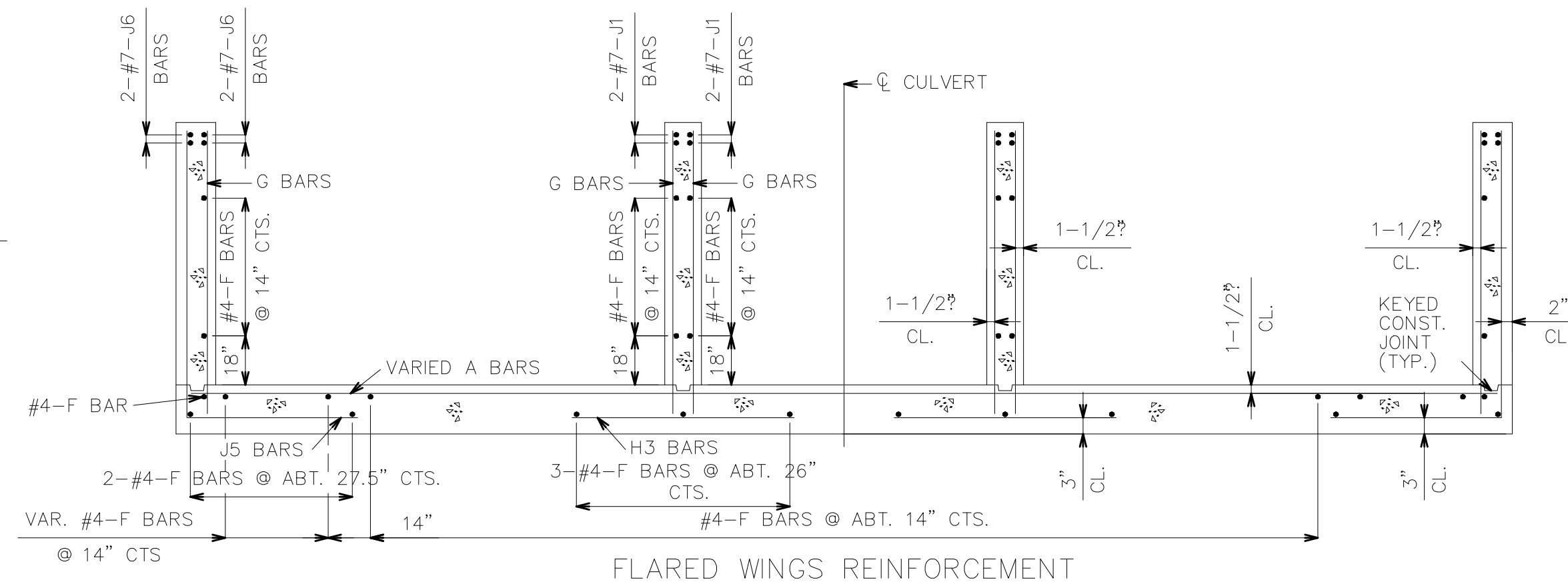
#4-W BARS SPA. @12"

1

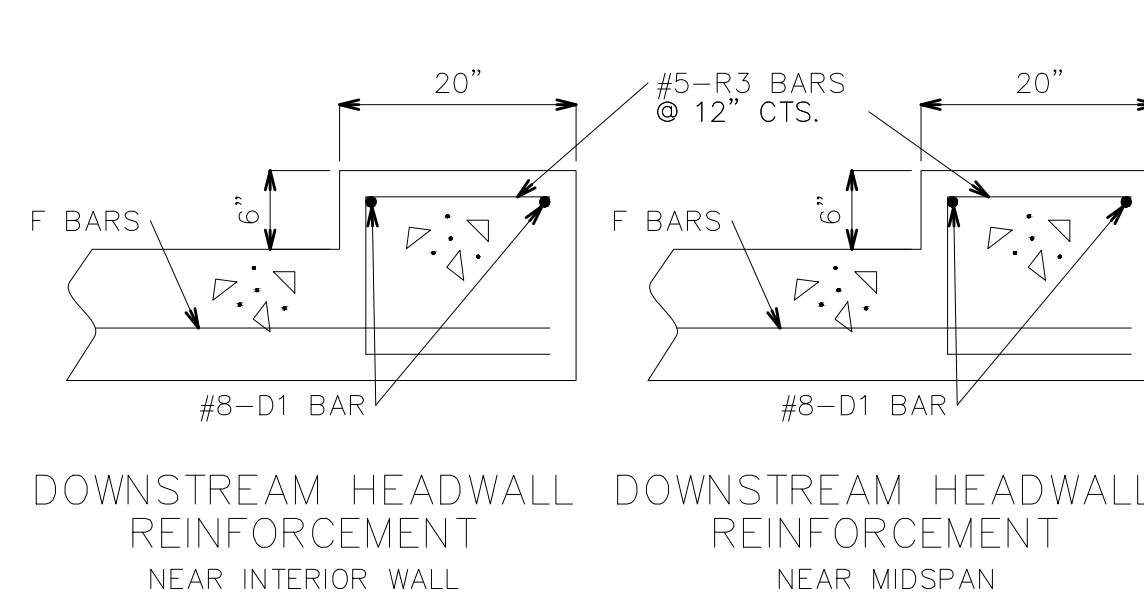
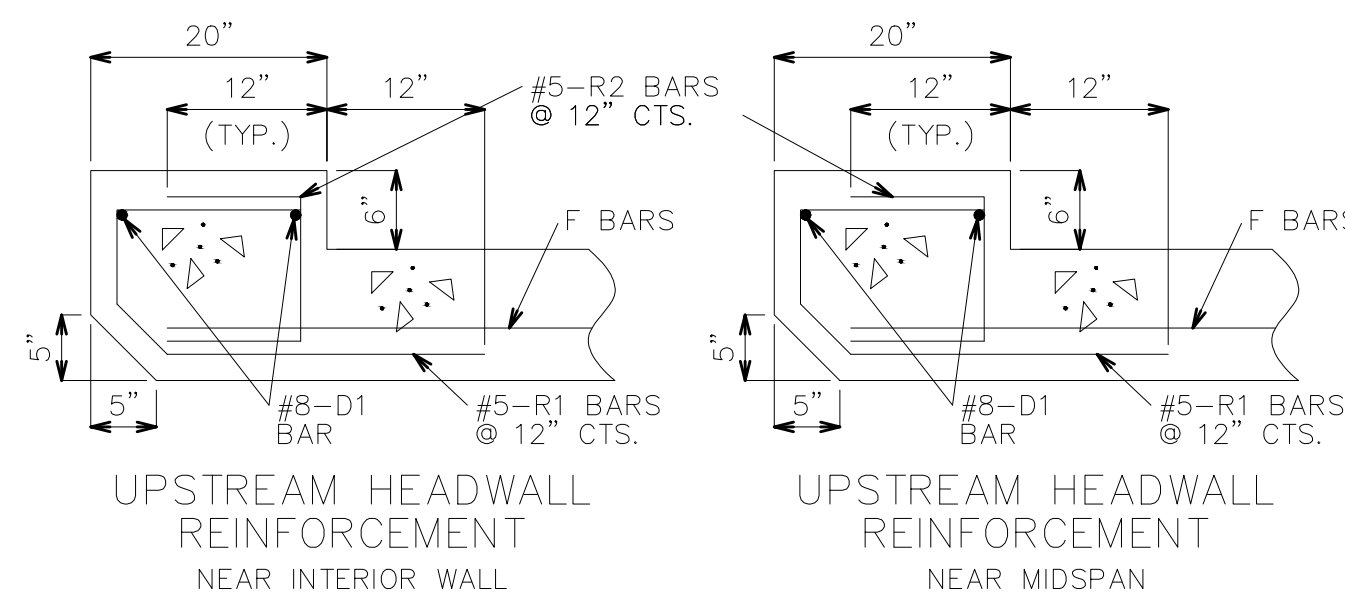
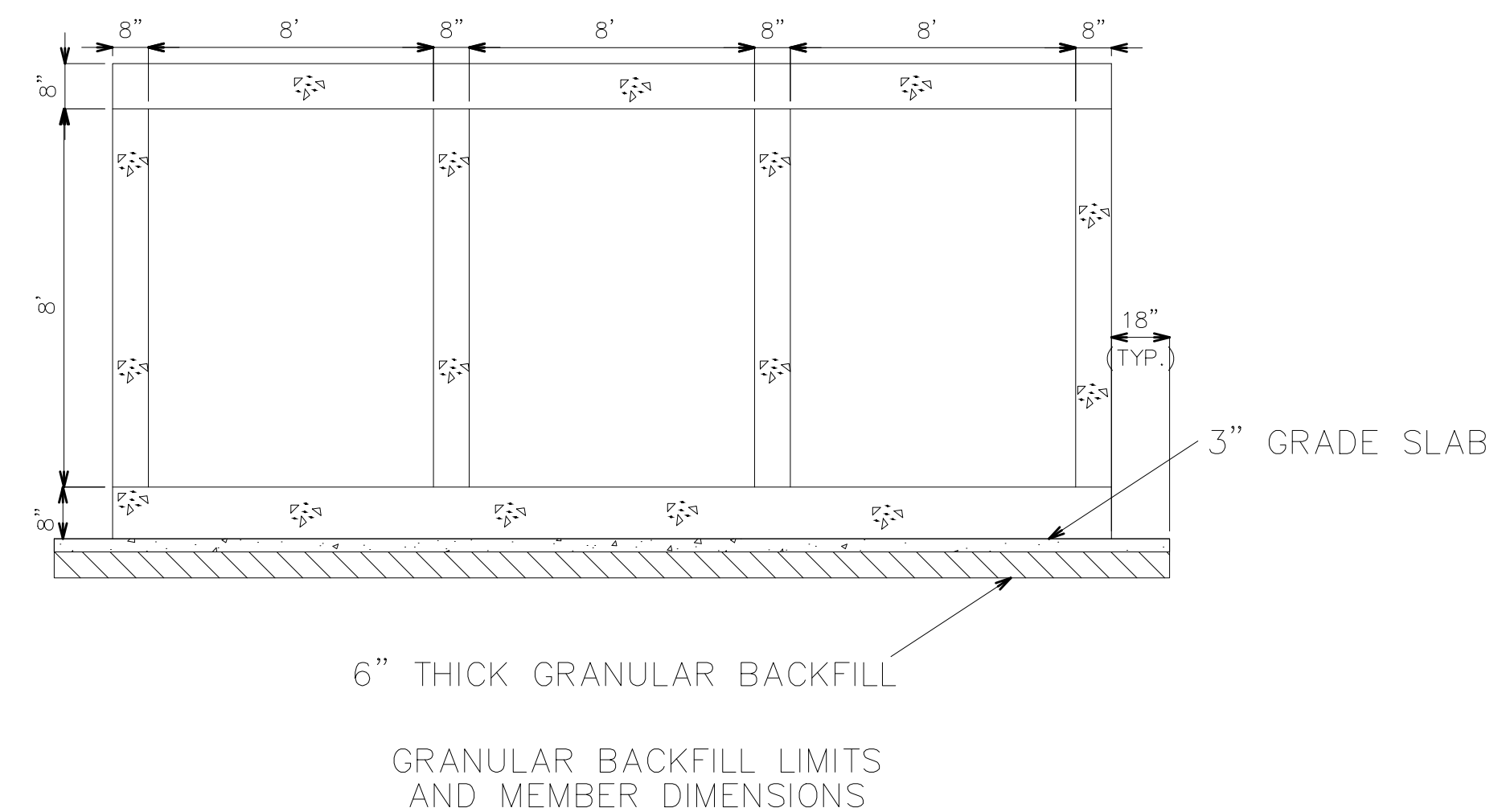
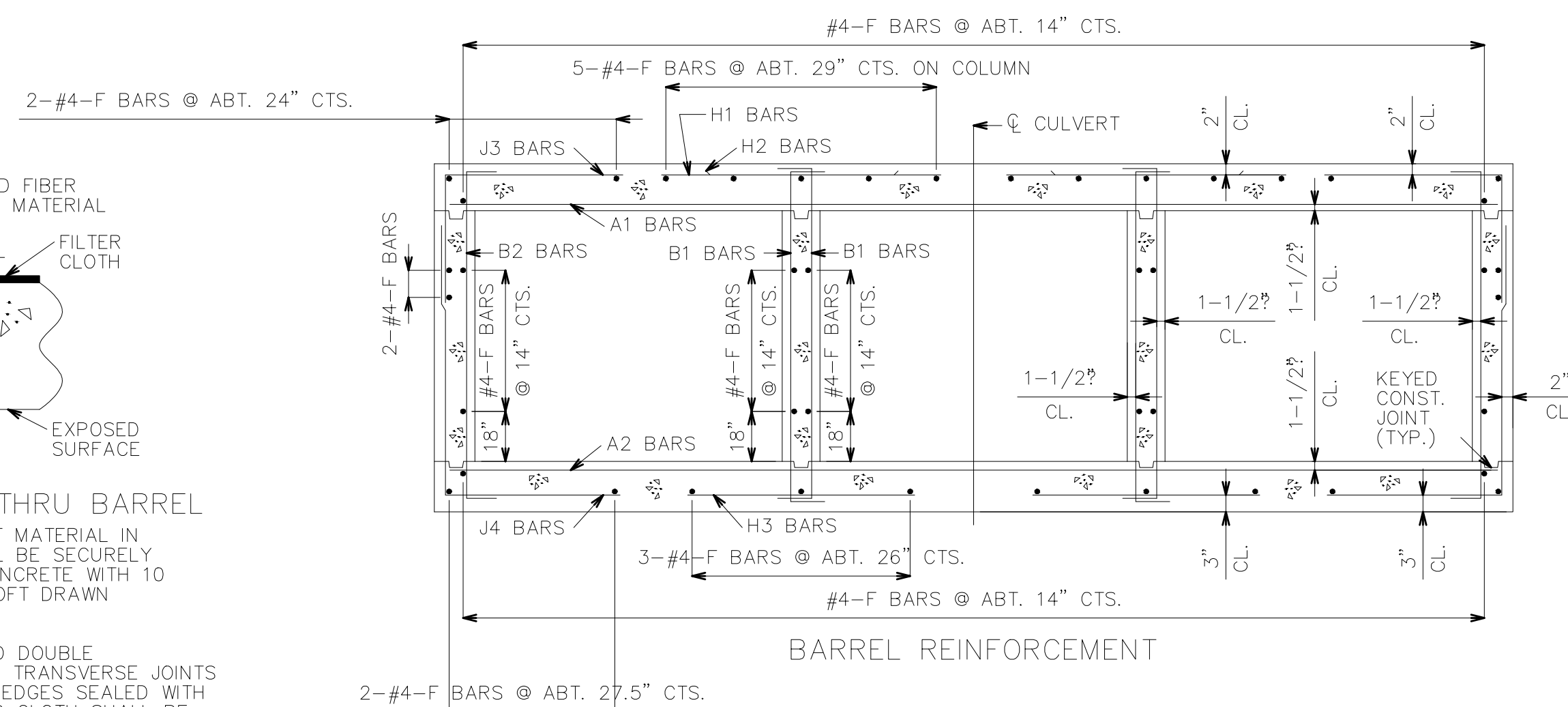
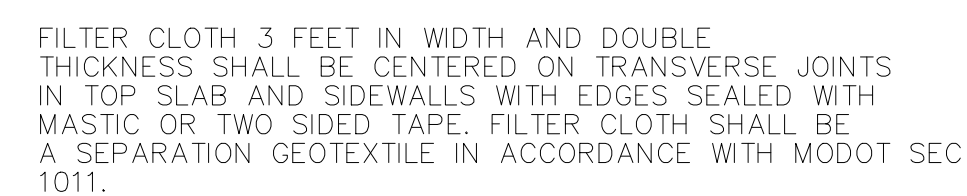
ST. JOSEPH, MISSOURI 64501
816-364-5222 | www.snyder-associates.com

[illegible]

Sheet C5.2

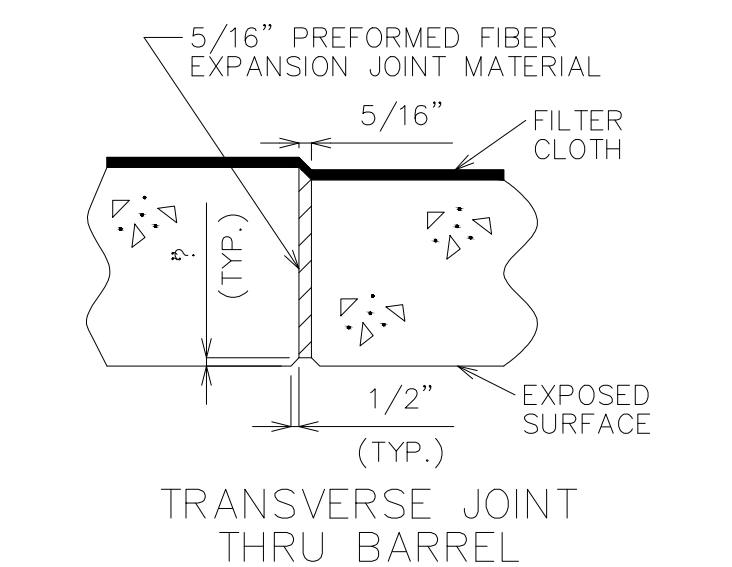
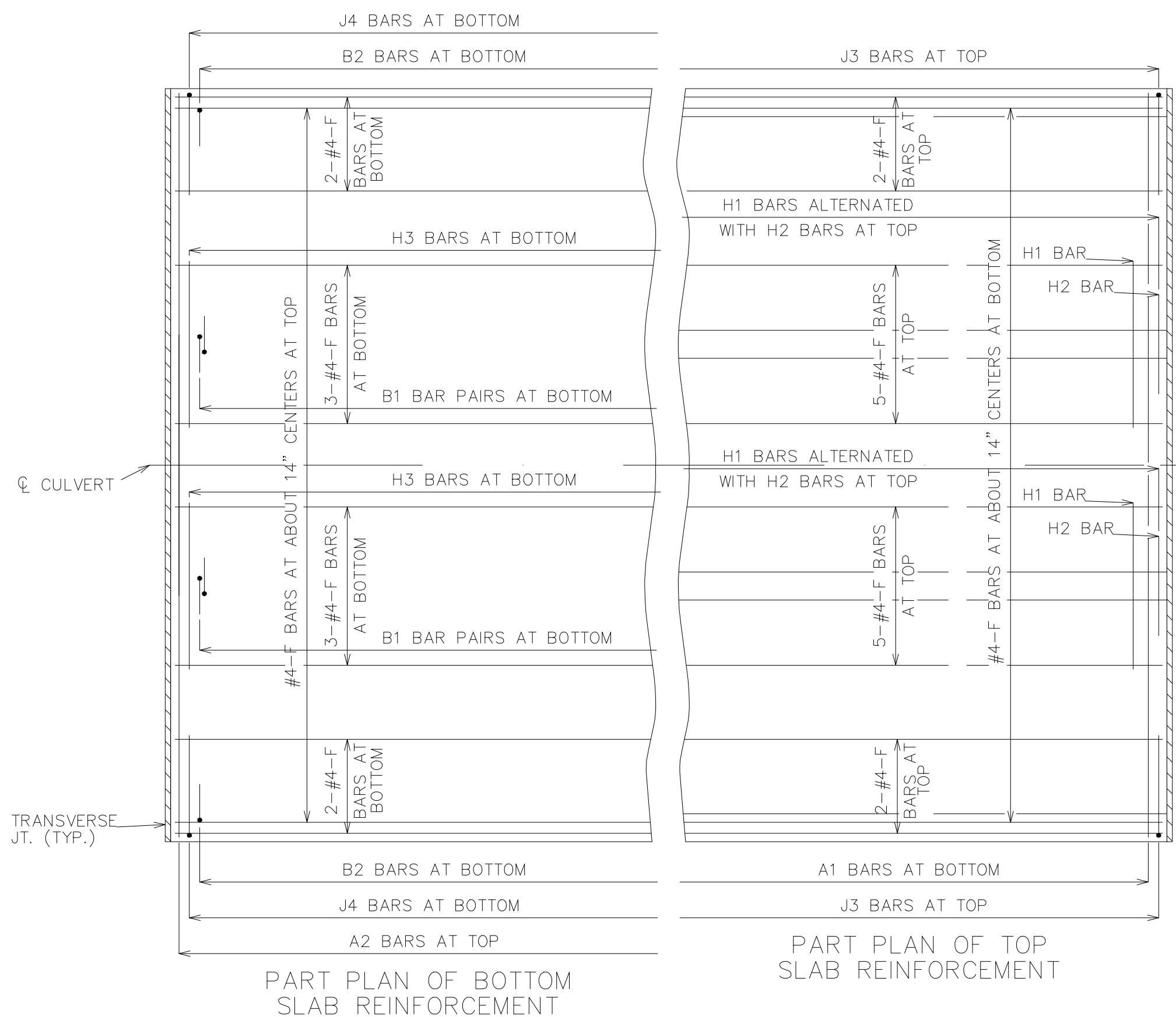


08/26/2025



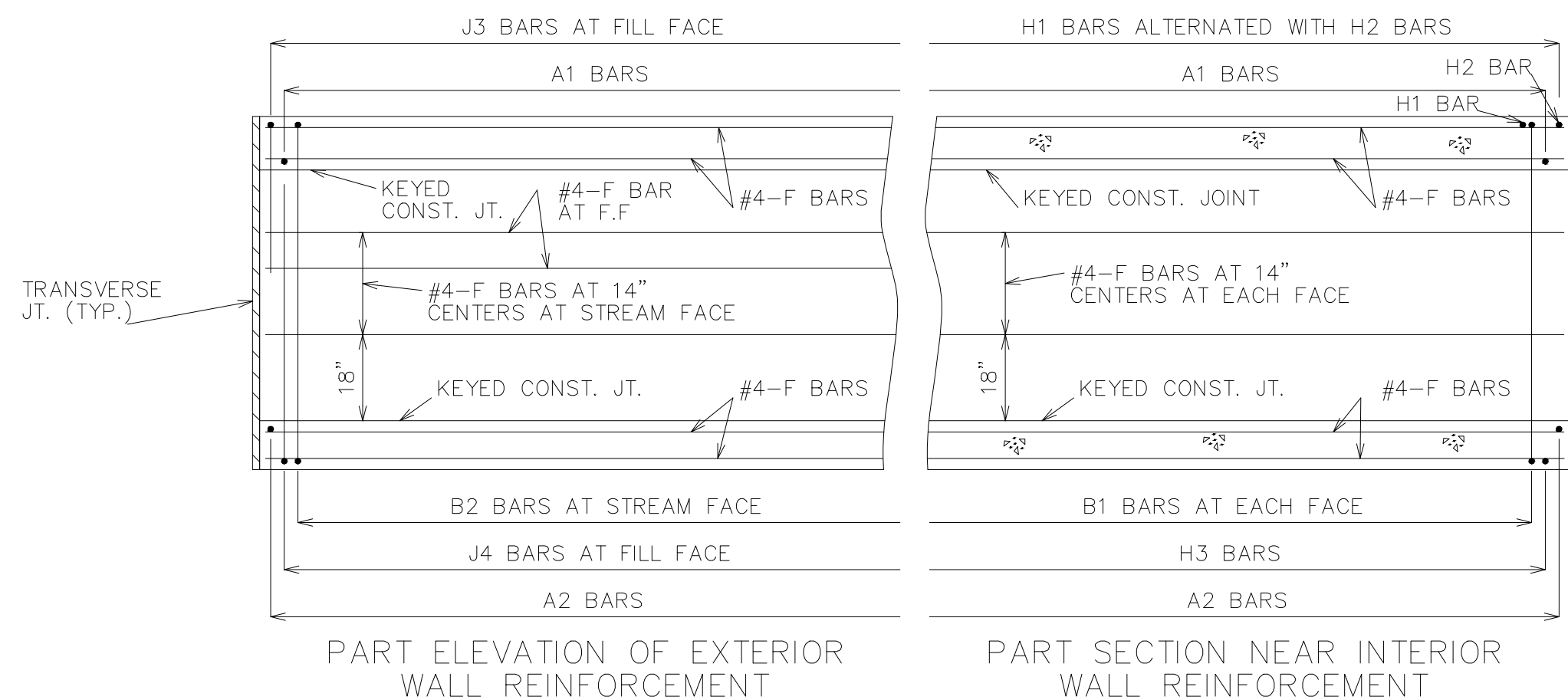
MINIMUM CLEARANCE TO REINFORCING
STEEL SHALL BE 1".





PREFORMED FIBER EXPANSION JOINT
MATERIAL IN ACCORDANCE WITH MODOT SEC
1057 SHALL BE SECURELY STITCHED TO
ONE FACE OF THE CONCRETE WITH 10
GAGE COPPER WIRE OR 12 GAGE SOFT
DRAWN GALVANIZED STEEL WIRE.

FILTER CLOTH 3 FEET IN WIDTH AND DOUBLE THICKNESS SHALL BE CENTERED ON TRANSVERSE JOINTS IN TOP SLAB AND SIDEWALLS WITH EDGES SEALED WITH MASTIC OR TWO SIDED TAPE. FILTER CLOTH SHALL BE A SEPARATION GEOTEXTILE IN ACCORDANCE WITH MODOT SEC 1011.



GENERAL NOTES

DESIGN SPECIFICATIONS:
2010 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND 2010 INTERIM REVISIONS

DESIGN LOADING:
VEHICULAR = HL-93 MINUS LANE LOAD, EARTH = 120 LB/CF
EQUIVALENT FLUID PRESSURE = 30 LB/CF (MIN.), 60 LB/CF (MAX.)

DESIGN UNIT STRESSES:
CLASS B-1 CONCRETE (BOX CULVERT) $f'_c = 4,000$ PSI
REINFORCING STEEL (GRADE 60) $f_y = 60,000$ PSI

MISCELLANEOUS:
FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND
DIMENSIONS, SEE DETAIL SHEET C5.5.

CONSTRUCTION JOINT KEY NOT SHOWN FOR CLARITY IN
PART PLANS, PART ELEVATION AND PART SECTION.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1".

RELEASED FOR CONSTRUCTION

As Noted on Plan Review

Development Services Department
Lee's Summit, Missouri

08/26/2025

[illegible]

SHAWN DUKE - ENGINEER
MO PE#2013006489

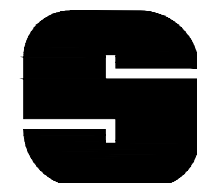
WHISPERING WOODS CREEK RESTORATION

BOX CULVERT DETAILS

LEE'S SUMMIT, MO

802 FRANCIS STREET
ST. JOSEPH, MISSOURI 64501
816-364-5222 | www.snyder-associates.com

SNYDER & ASSOCIATES
ENGINEERS & PLANNERS, INC.



SNYDER
& ASSOCIATES

Project No: 120.0485.11

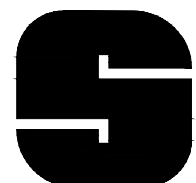
Sheet C5.4

08/26/2025

[illegible]

SHAWN DUKE - ENGINEER
MO PE#2013006489

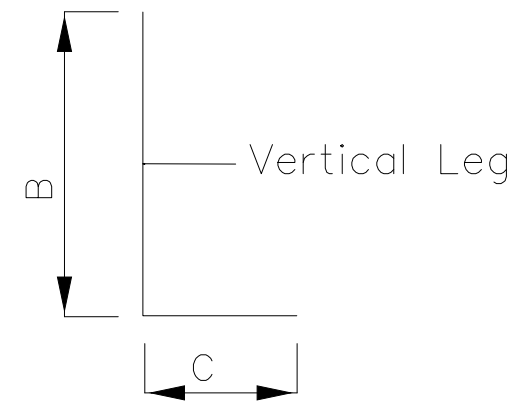
SNYDER & ASSOCIATES
ENGINEERS & PLANNERS, INC.



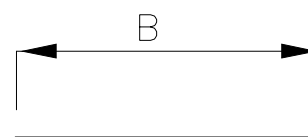
SNYDER
& ASSOCIATES

Project No: 120.0485.11

Sheet C5.6

[illegible]

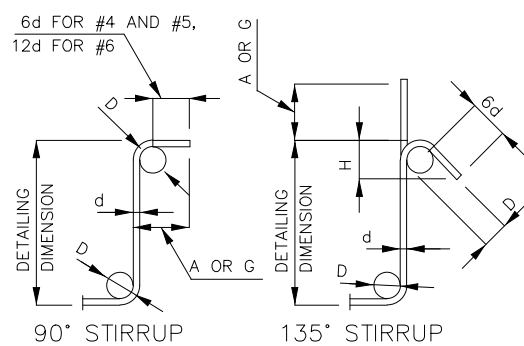
SHAPE 19



SHAPE 20

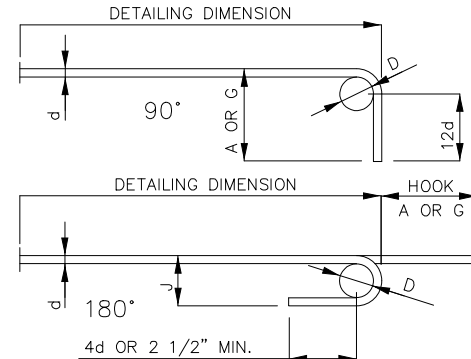
SPLICE LENGTH		MAX BAR LENGTH	
BAR SIZE	NON-EPOXY	BAR SIZE	NON-EPOXY
#4	21 IN.	#4	60 FT.
#5	26 IN.	#5	60 FT.
#6	31 IN.	#6	60 FT.
#7	39 IN.	#7	60 FT.
#8	51 IN.	#8	60 FT.
#9	65 IN.	#9	60 FT.
#10	82 IN.	#10	60 FT.
#11	101 IN.	#11	60 FT.

NOTE:
THE BAR LIST IS BASED ON THE MISSOURI
STANDARD PLANS.
THIS BAR LIST IS FOR QUANTITY
ESTIMATION PURPOSE ONLY AND SHALL BE
VERIFIED OR MODIFIED BY THE CONTRACTOR.



STIRRUP HOOK DIMENSIONS					
BAR SIZE	D (IN.)	90° HOOK		135 °HOOK	
		HOOK A OR G		HOOK A OR G	APPROX. H
#4	2"	4	1/2"	4	3"
#5	2 1/2"	6"	5	1/2"	3 3/4"
#6	4 1/2"	12"		8"	4 1/2"

NOTE: UNLESS OTHERWISE NOTED, DIAMETER "D" IS THE SAME FOR ALL BENDS AND HOOKS ON A BAR.



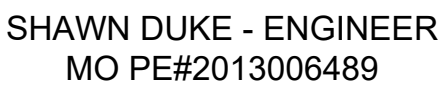
END HOOK DIMENSIONS					
BAR SIZE	D (IN.)	GRADE 60			
		180° HOOKS		90° HOOKS	
		A	O R G	A	O R G
#4	3"	6"	4"	8"	
#5	3 3/4"	7"	5"	10"	
#6	4 1/2"	8"	6"	12"	
#7	5 1/4"	10"	7"	14"	
#8	6"	11"	8"	16"	
#9	9 1/2"	15"	11	3 3/4"	19"
#10	10 3/4"	17"	13	1 3/4"	22"
#11	12"	19"	14	3 3/4"	24"

NOTE:
ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREE ARE TO BE BENT WITH SAME
PROCEDURE AS FOR 90 DEGREE STANDARD HOOKS.
HOOKS AND BENDS SHALL BE IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.
S = STIRRUP
V = BAR DIMENSIONS VARY IN EQUAL INCREMENTS BETWEEN DIMENSIONS SHOWN ON THIS LINE
AND THE NEXT LINE. THE SECOND LINE REPRESENTS THE SAME BAR DIMENSION AS THAT
IN THE FIRST LINE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ADD A SPLICE LENGTH TO A BAR
WHEN THE BAR FABRICATOR EXCEEDS ITS MAXIMUM ALLOWABLE LENGTH.
NO. EA. = NUMBER OF BARS OF EACH LENGTH.
NOMINAL LENGTHS ARE BASED ON OUT-TO-OUT DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED
FOR FABRICATION PURPOSES ONLY. (INCH)
ACTUAL LENGTHS ARE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.
PAYMENTS ARE BASED ON ACTUAL LENGTHS.
REINFORCING STEEL (GRADE 60) FY = 60,000 PSI.

08/26/2025

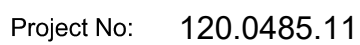


BILL OF REINFORCING STEEL																								
NO REQD.	MARK NO.	LOCATION	EPOXY (E)	SHAPE NO.	STIRRUP (S)	SUBSTR (X)	VARIES (V)	NO. EACH	DIMENSIONS								NOMINAL LENGTH		ACTUAL LENGTH		WEIGHT			
	SIZE MARK								B		C		D		E							F		H
									FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
		*BARREL SECTION**																						
180	4A1	TOP SLAB		20					26	4.000							26	4	26	4	3166			
127	5A2	BOTTOM SLAB		20					26	4.000							26	4	26	4	3488			
359	5B1	INTERIOR WALLS		10							1		8	10.920			9	10.9	9	10.9	3711			
180	5B2	EXTERIOR WALLS		10							1		8	10.920			9	10.9	9	10.9	1861			
288	6J3	EXTERIOR WALLS		19					2	8.000	3	11.750					6	7.75	6	7.75	2875			
336	6J4	EXTERIOR WALLS		19					8	4.000	4	7.000					12	11	12	11	6519			
135	5H1	TOP SLAB		20					12	3.480							12	3.48	12	3.48	1730			
135	5H2	TOP SLAB		20					4	7.000							4	7	4	7	645			
168	5H3	BOTTOM SLAB		20					6	6.000							6	6	6	6	1139			
37	4F	TOP SLAB		20					89	8.000							89	8	89	8	2216			
33	4F	BOTTOM SLAB		20					89	8.000							89	8	89	8	1977			
36	4F	INTERIOR WALLS		20					89	8.000							89	8	89	8	2156			
4	4F	EXTERIOR WALLS		20					89	8.000							89	8	89	8	240			
																	TOTAL BARREL SECTION = 31,723							
	HEADWALL																							
4	8D1	HEADWALL		20					26	4.000							26	4	26	4	281			
27	5R1	UPSTREAM HEADWALL		27					0	16.000	0	22.000		2		0	5.000	0	5.000	6	0	6	0	169
27	5R2	UPSTREAM HEADWALL		10							0	10.000	0	22.000					2	8	2	8	75	
27	5R3	DOWNSTREAM HEADWALL		10							0	16.000	0	22.000					3	2	3	2	89	
																	TOTAL HEADWALL SECTION = 614							



LEE'S SUMMIT, MO

802 FRANCIS STREET
ST. JOSEPH, MISSOURI 64501
816-364-5222 | www.snyder-associates.com



Sheet C5.7