

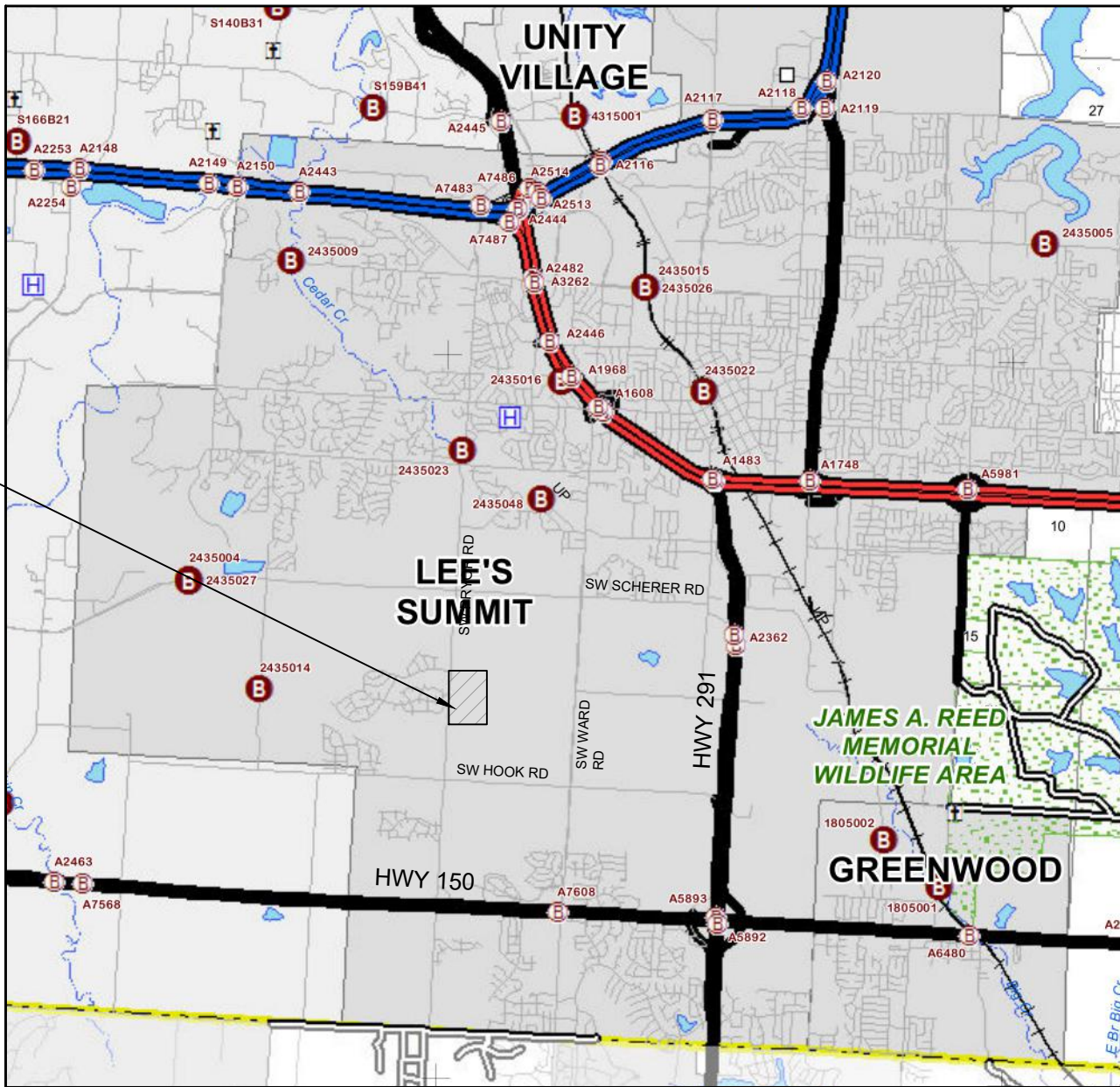
CONSTRUCTION PLANS
FOR
WHISPERING WOODS 3RD PLAT CREEK RESTORATION
CITY OF LEE'S SUMMIT
JACKSON COUNTY, MISSOURI

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

PROJECT LOCATION



LOCATION MAP
N.T.S.

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:

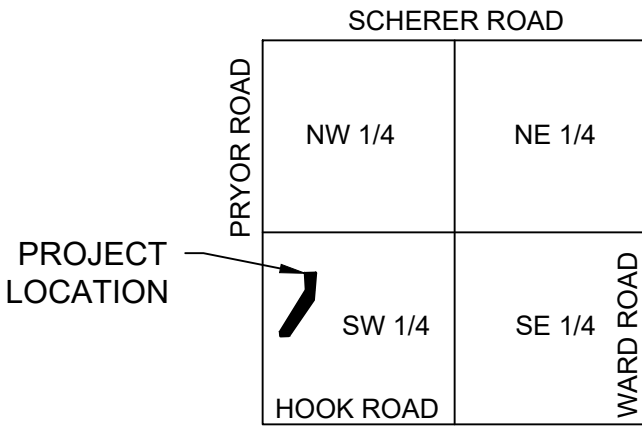
City Engineer

Date

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



VICINITY MAP
N.T.S.

MARK	REVISION	DATE	BY
Engineer: SD	Checked By: SD	Scale: 1" =	
Technician: BT	Date: 04-15-2022	T-R-S: 47N-32W-24	
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Sheet C1.0			



SHAWN DUKE - ENGINEER
MO PE#2013006489

WHISPERING WOODS CREEK RESTORATION

TITLE SHEET

LEE'S SUMMIT, MO

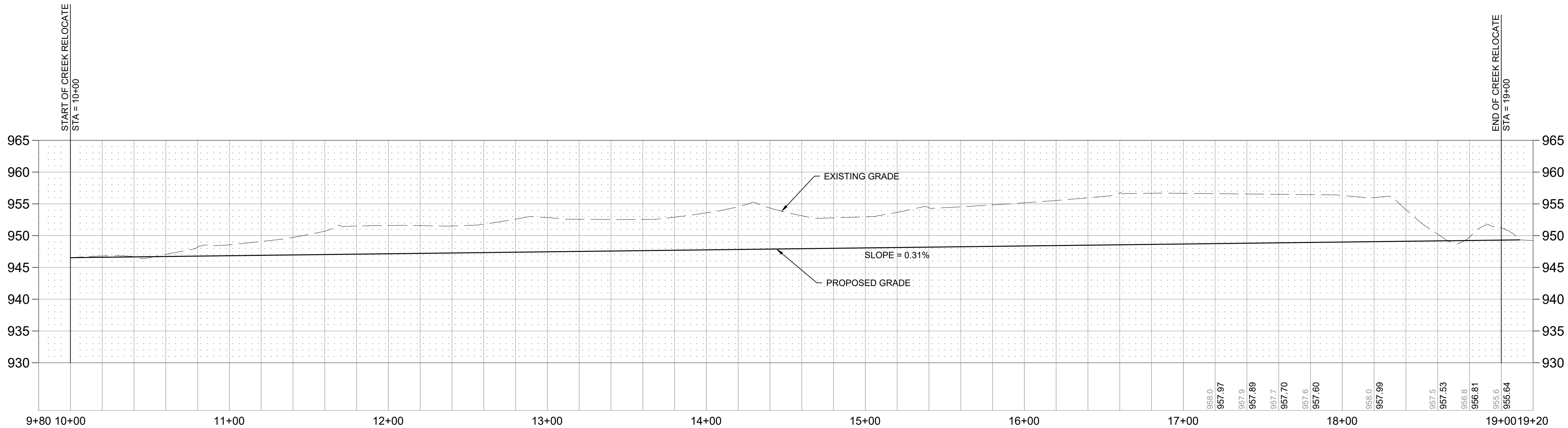
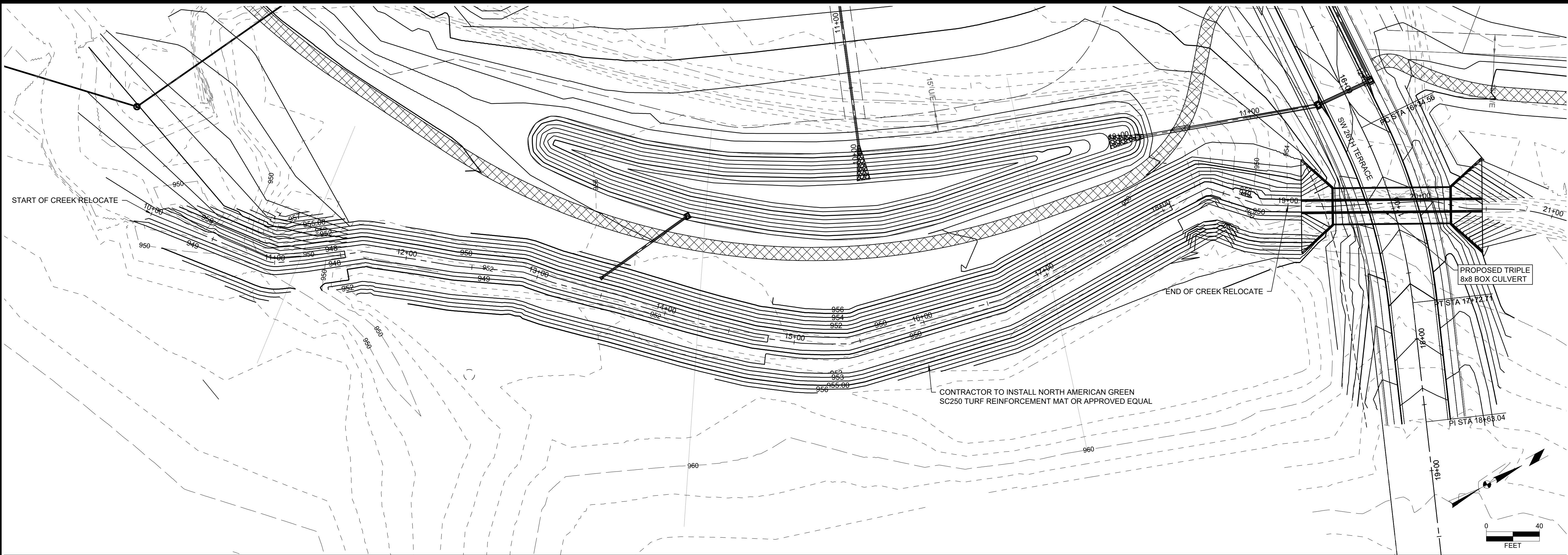
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V:\Projects\2021\120.0485.1\120.0485.1\CD\03.DWG RYAN SNYDER, CHANNEL PLAN & PROFILE, 2023/10/16, 12:42 AM, ANSI FULL BLEED D (34.00 X 22.00 INCHES)



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Technician: BT	Date: 04-15-2022	T-R-S: 47N-32W-24	

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Missouri State Certificate of Authority #2060608544

SHAWN DUKE - ENGINEER
MO PE#2013006489

STATE OF MISSOURI
SHAWN DUKE
ENGINEER
PE-2013006489
PROFESSIONAL ENGINEER

WHISPERING WOODS CREEK RESTORATION

CHANNEL PLAN & PROFILE

LEE'S SUMMIT, MO

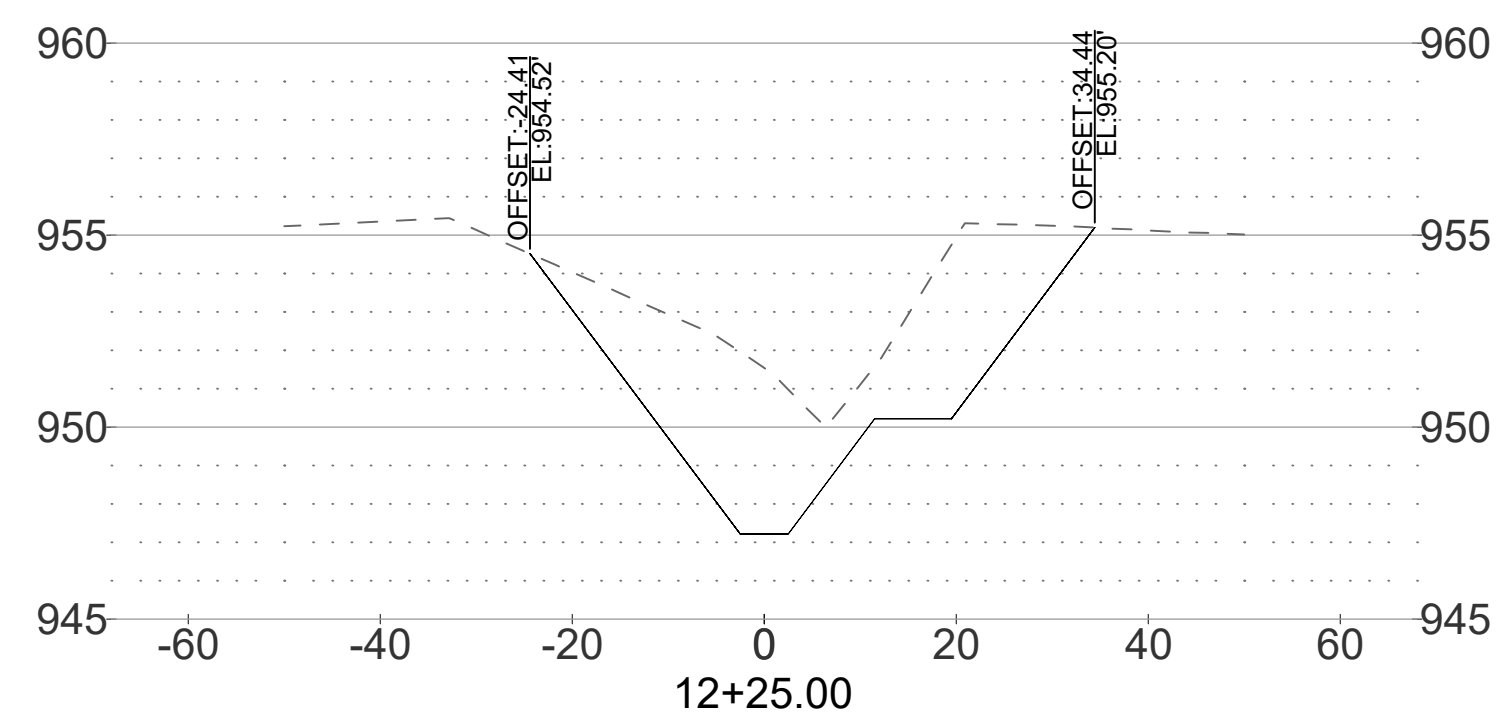
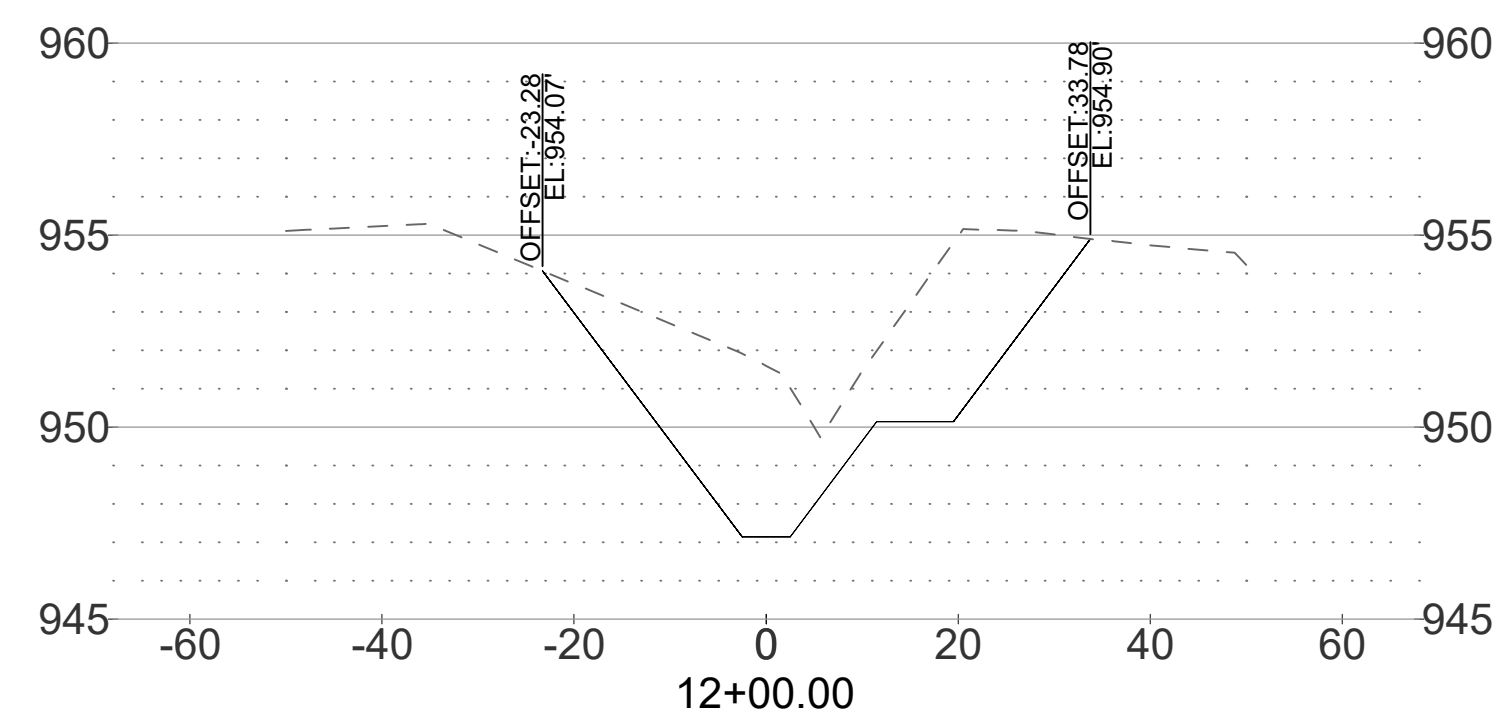
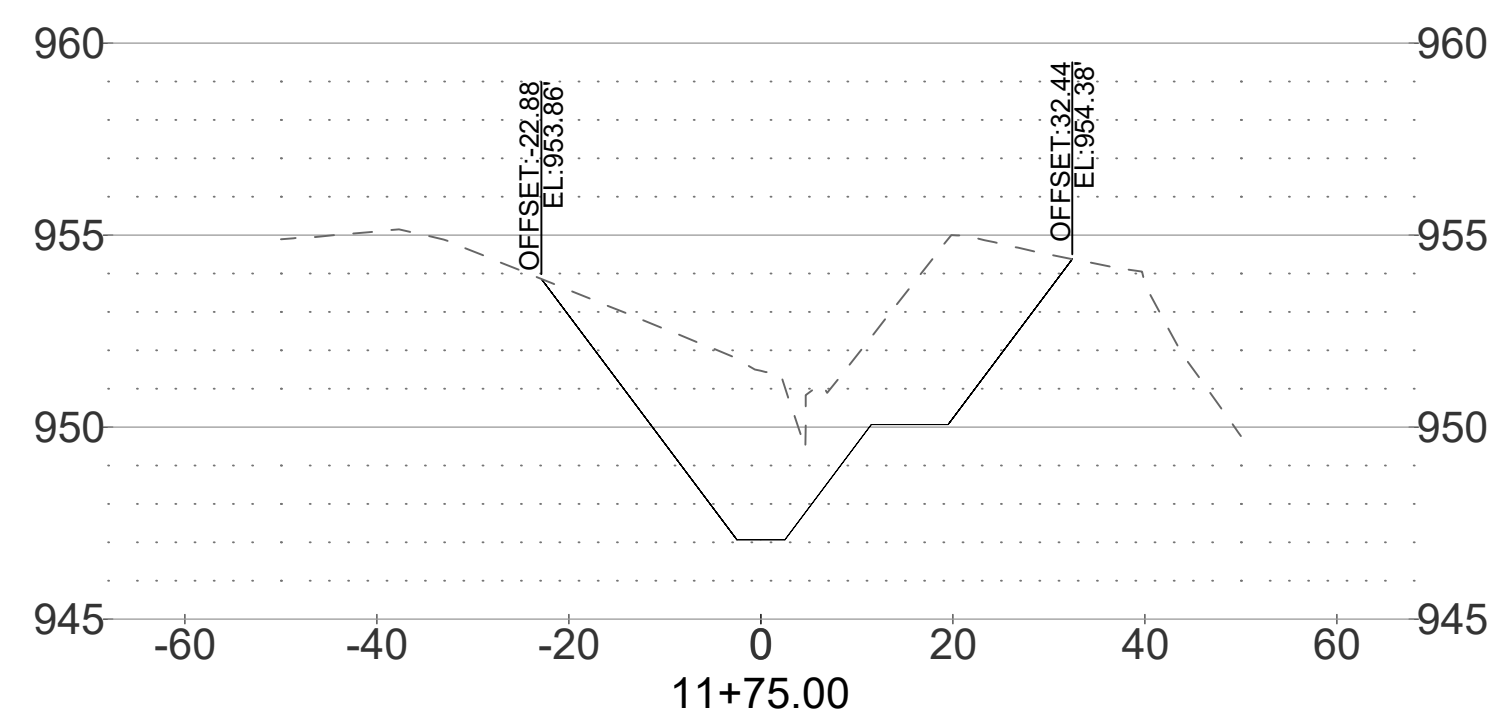
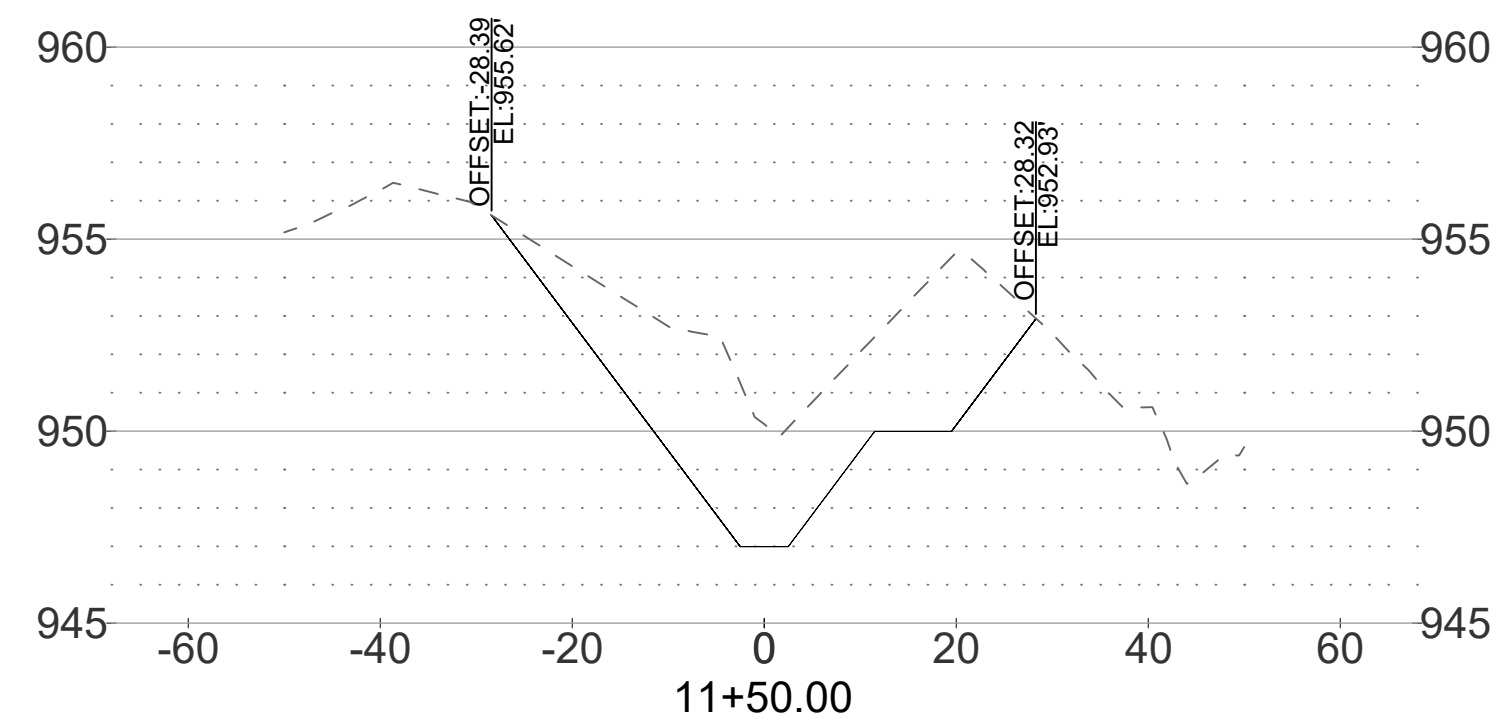
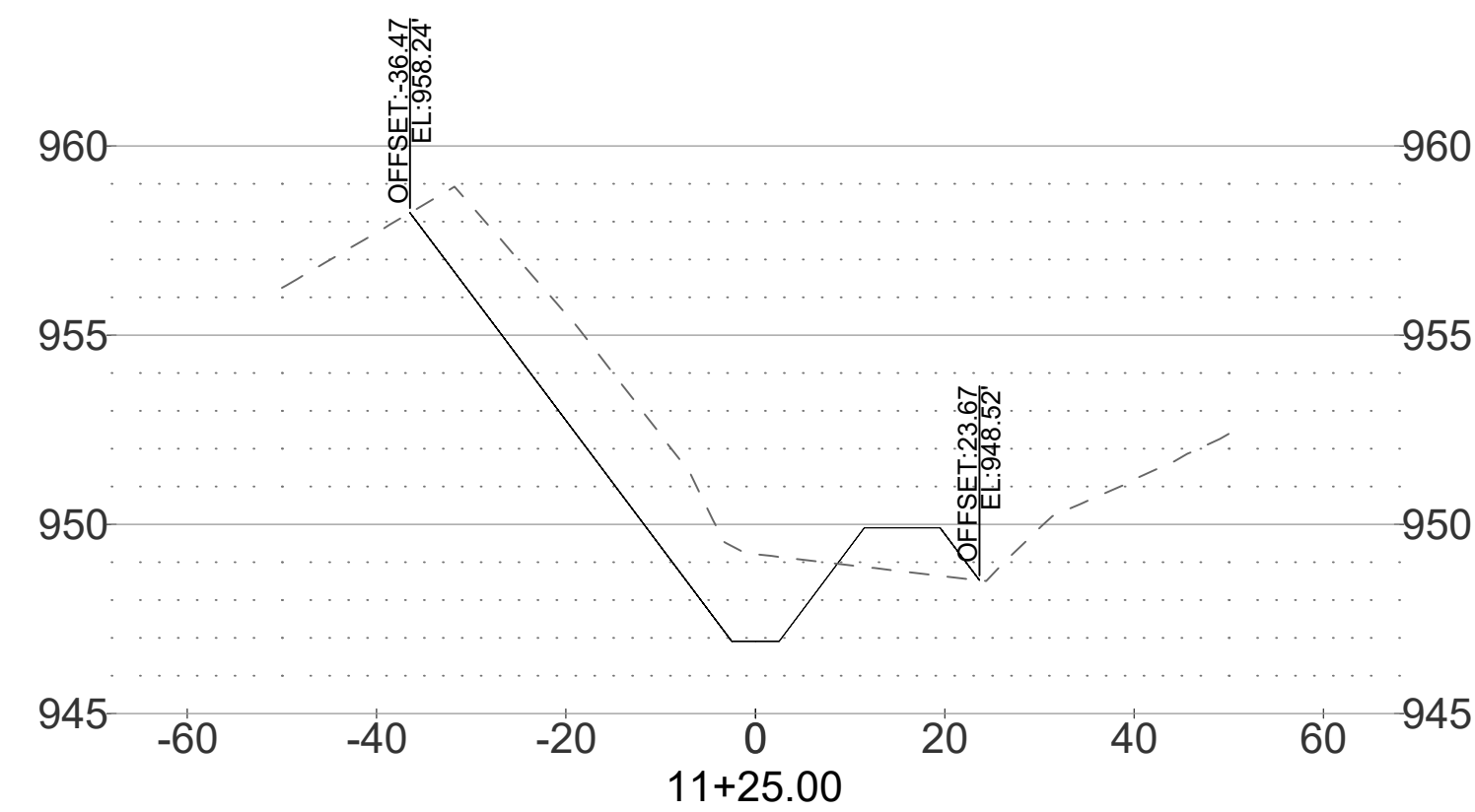
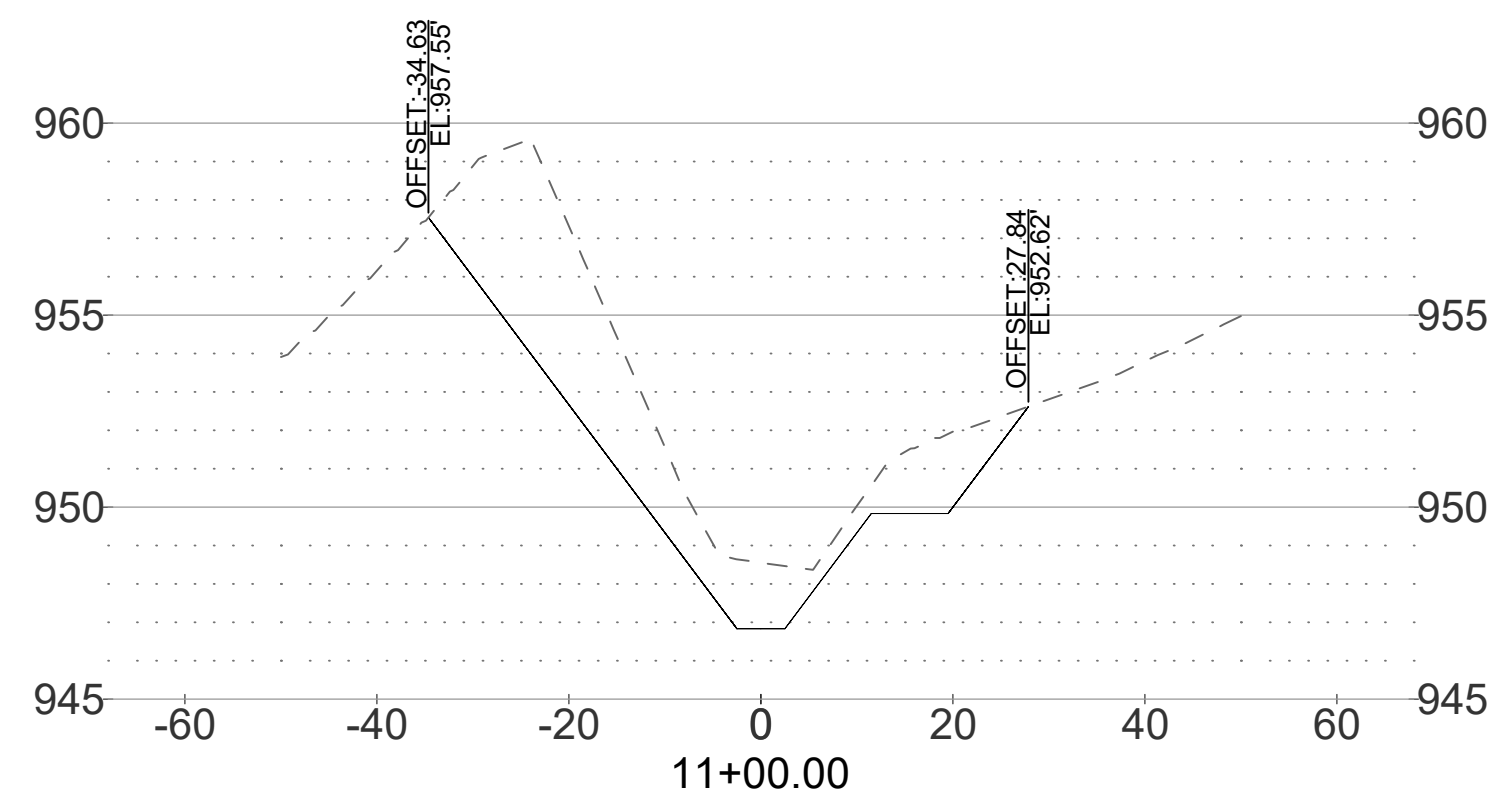
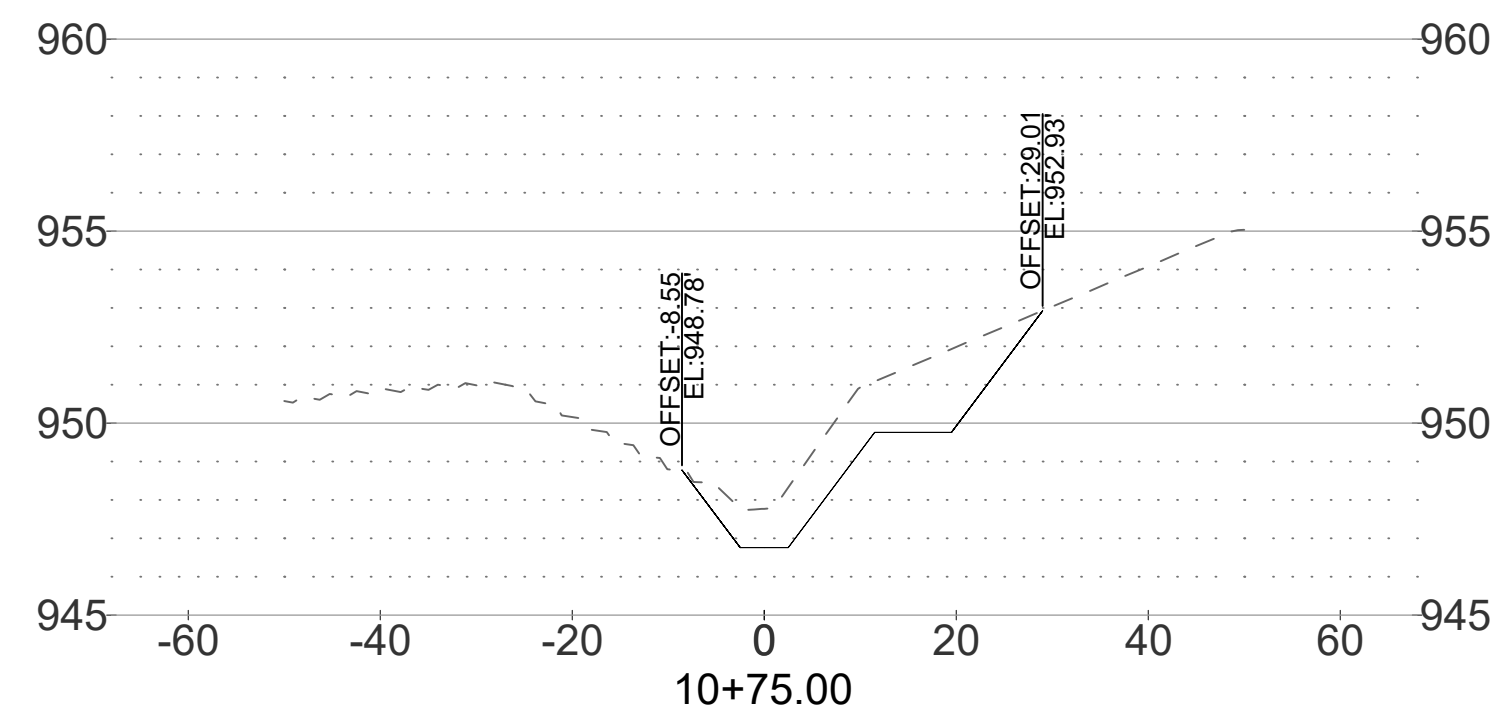
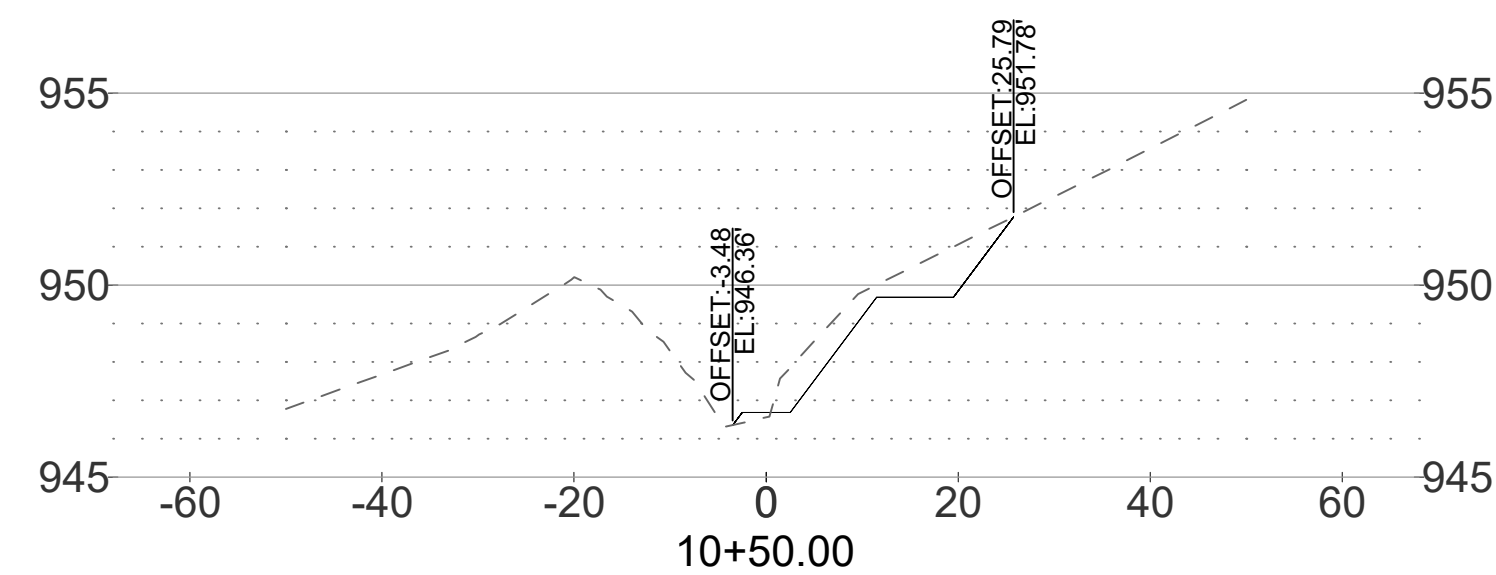
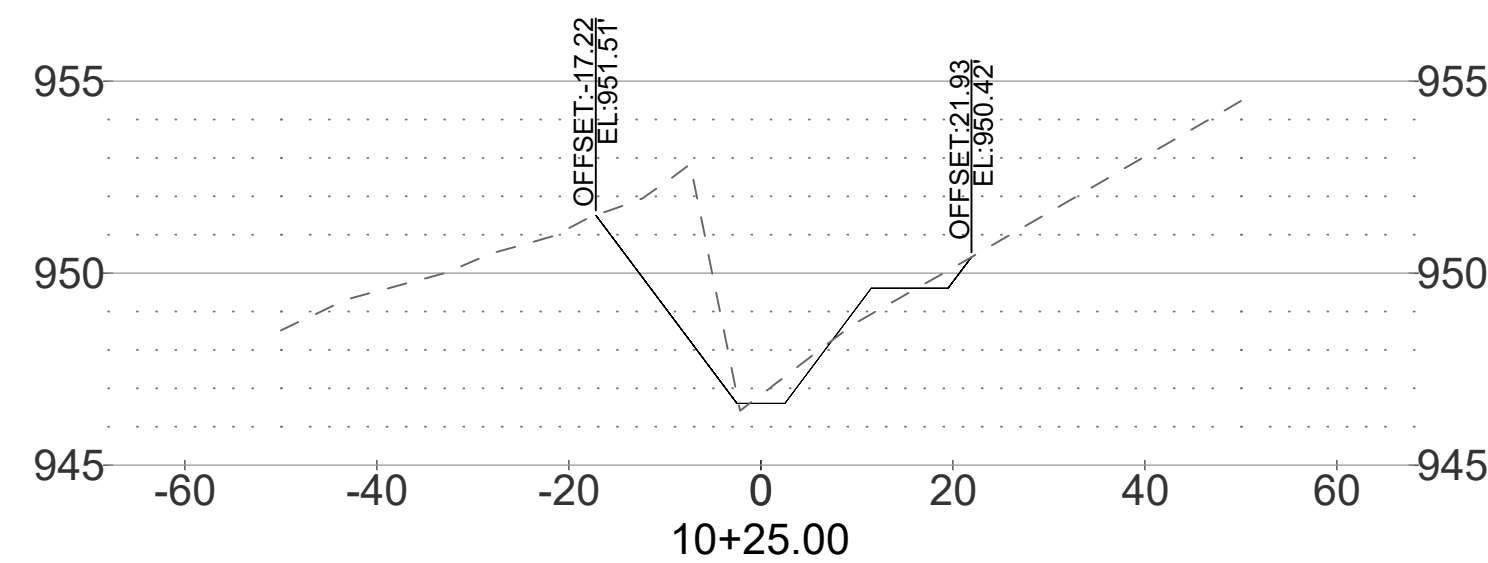
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Project No: 120.0485.11

Sheet C2.2

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WHISPERING WOODS CREEK RESTORATION

LEE'S SUMMIT, MO

CHANNEL CROSS SECTIONS

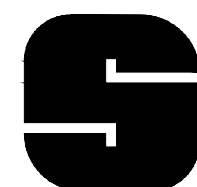
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802 FRANCIS STREET

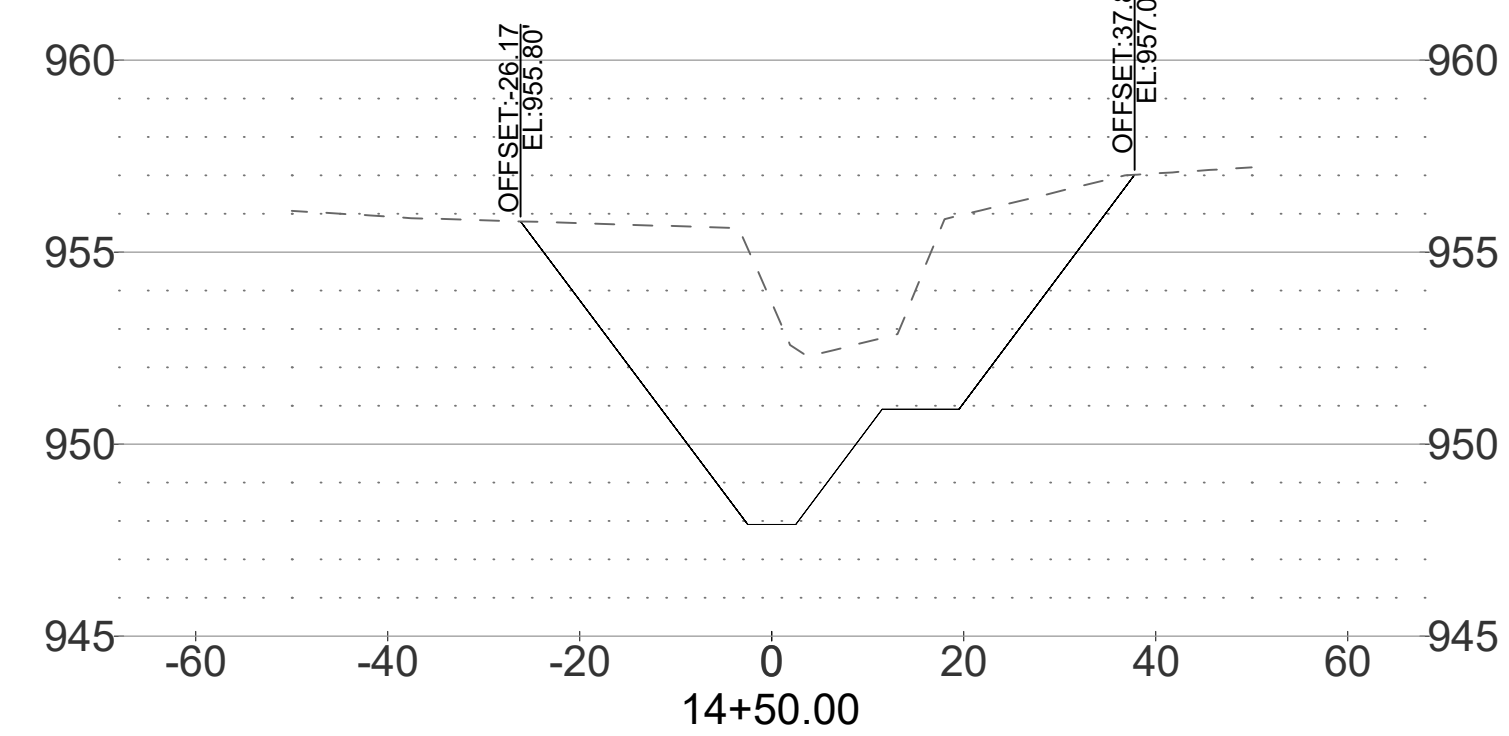
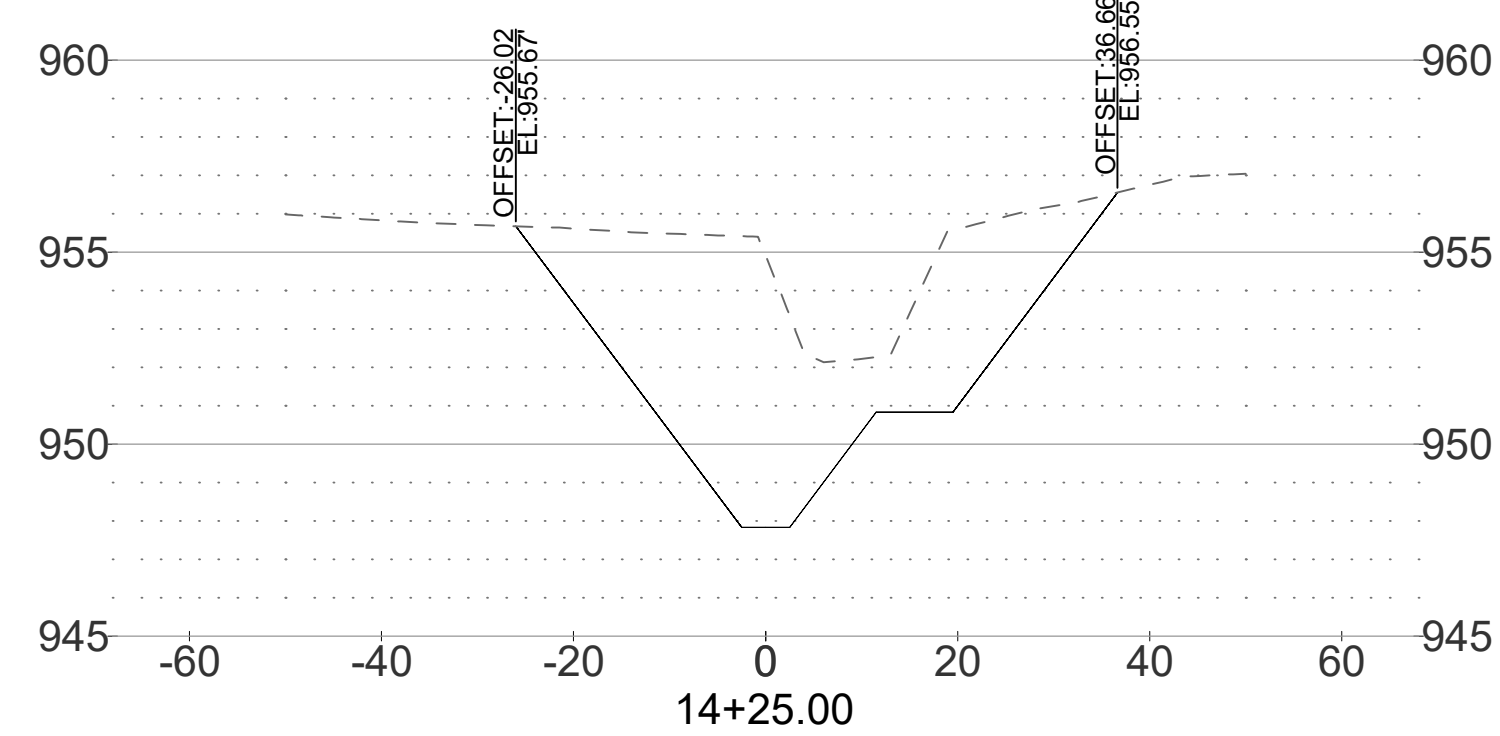
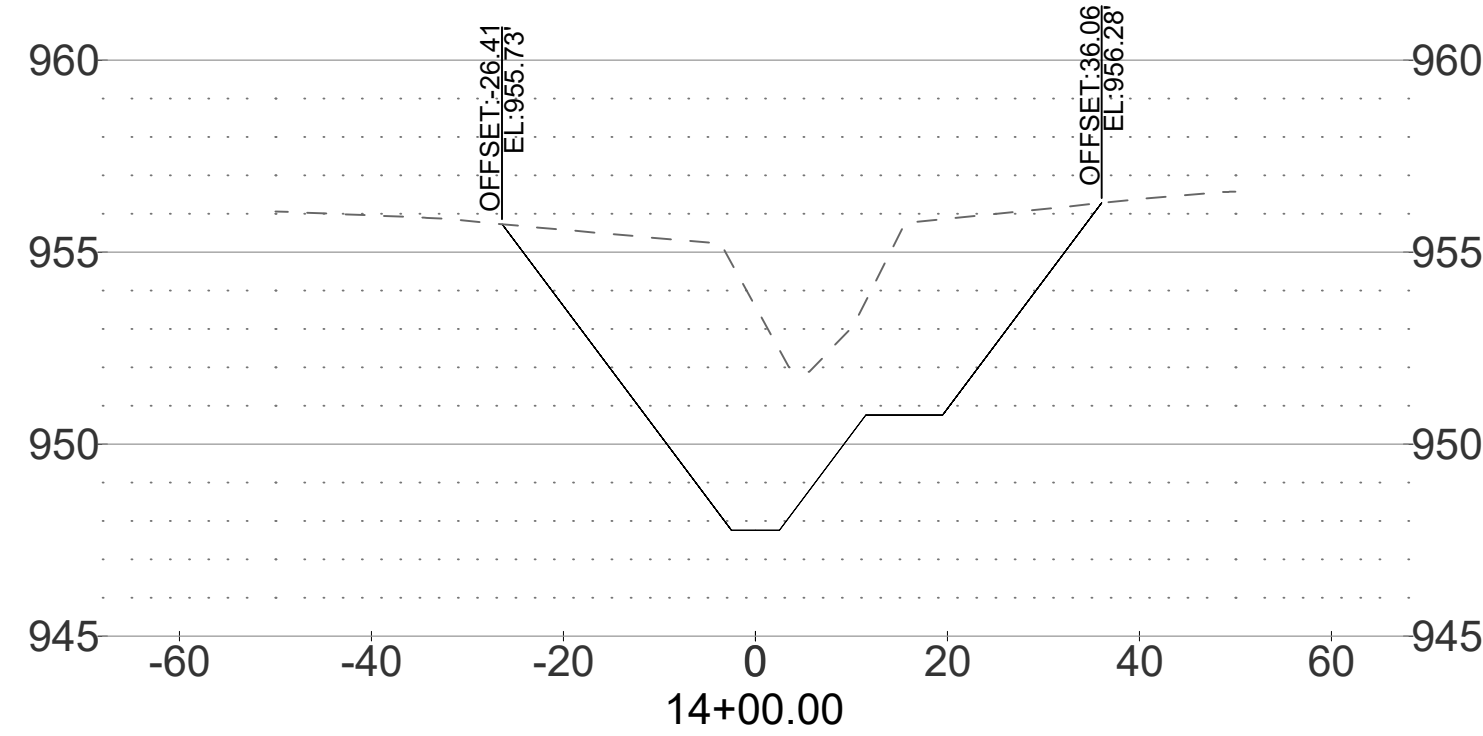
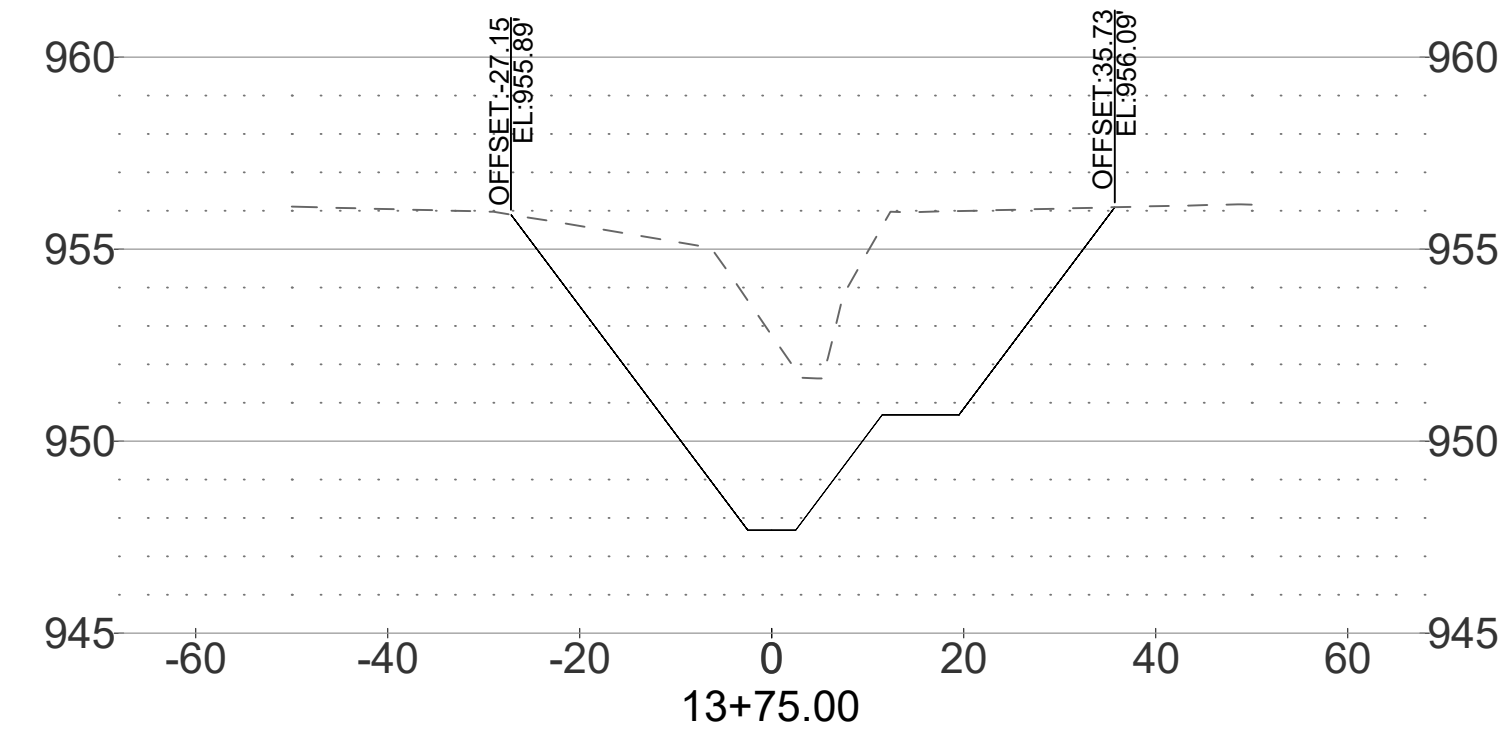
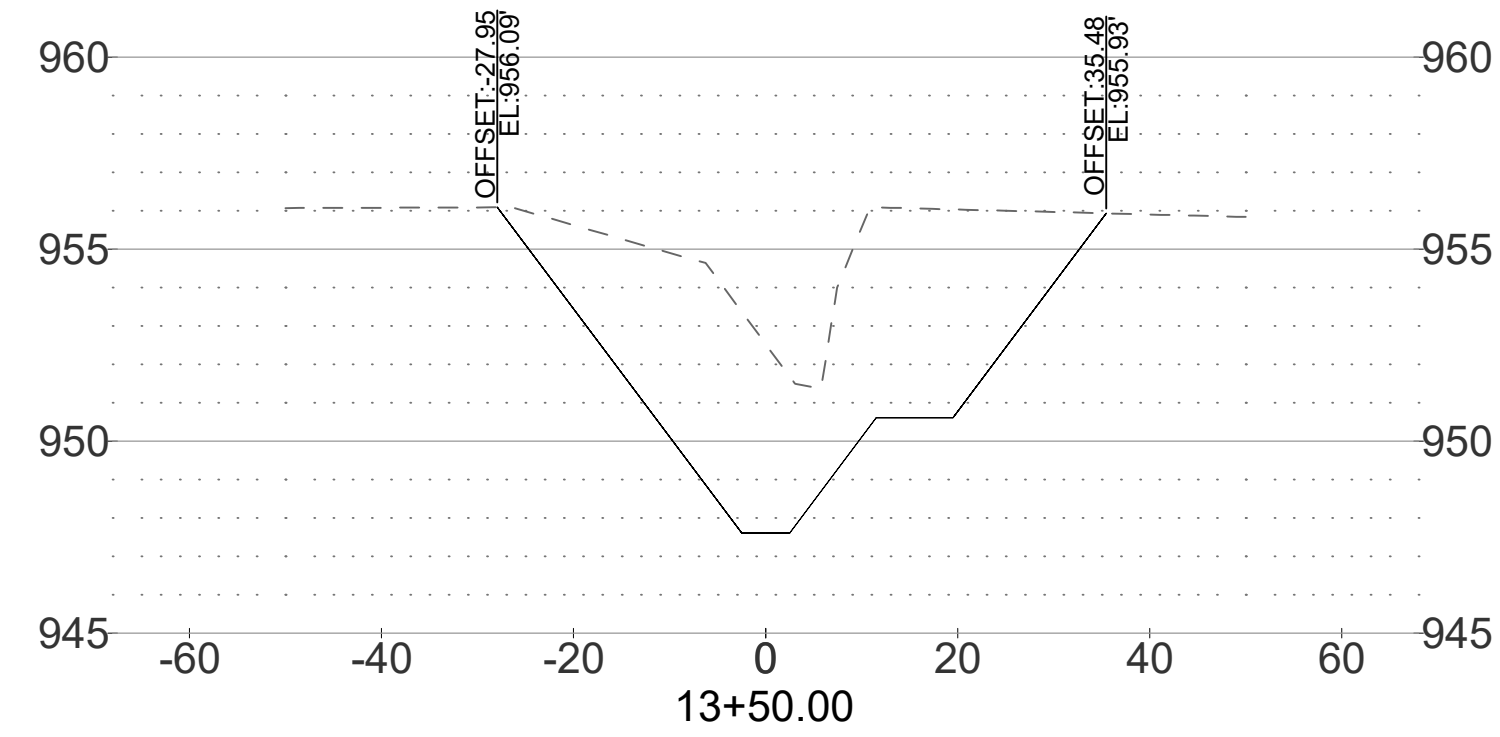
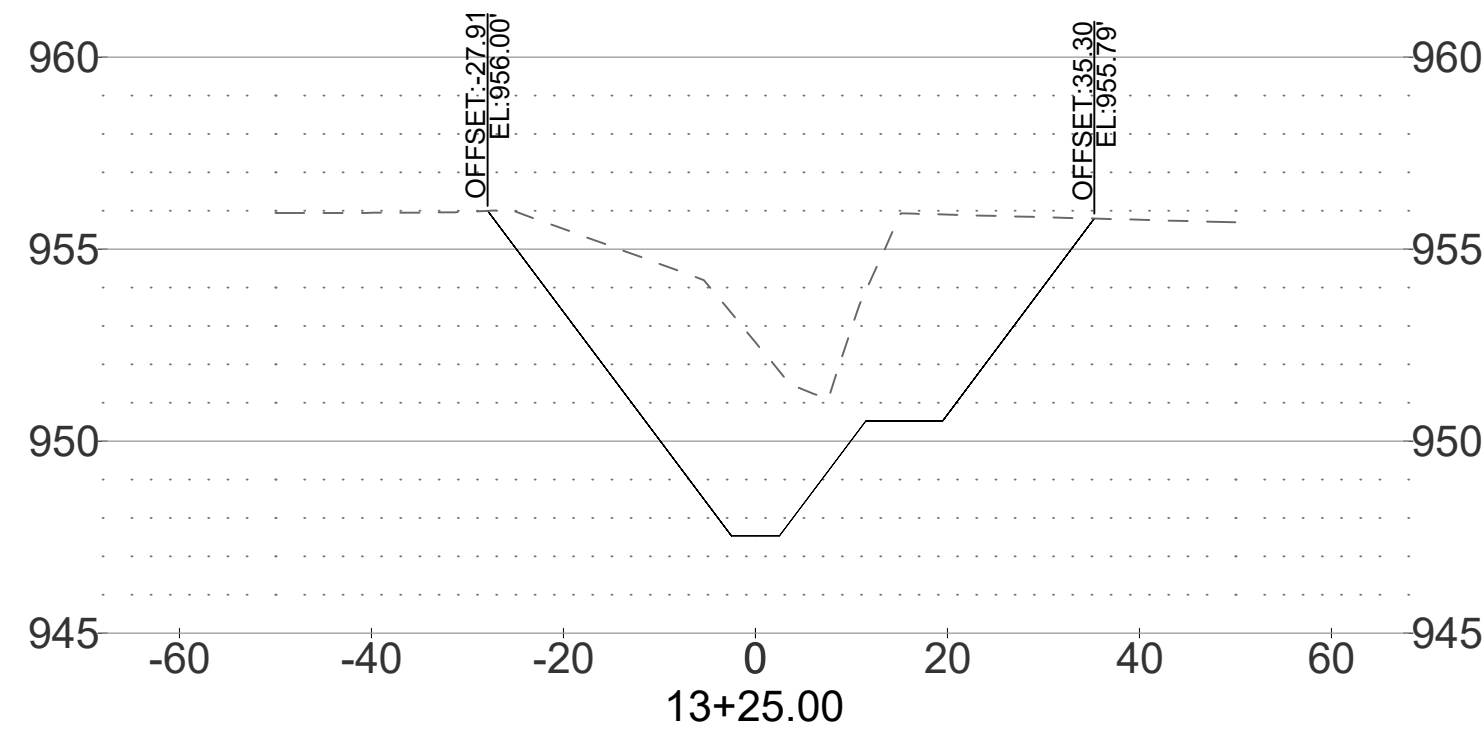
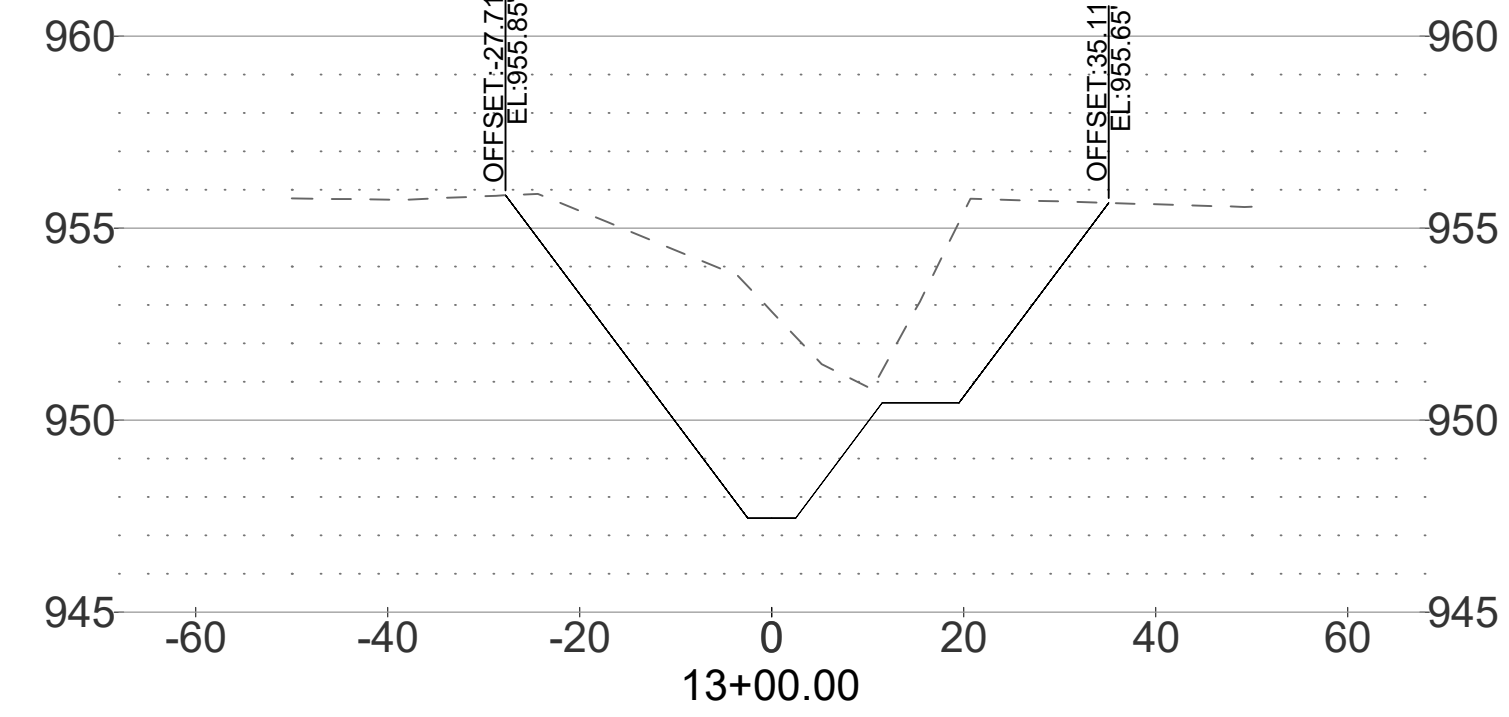
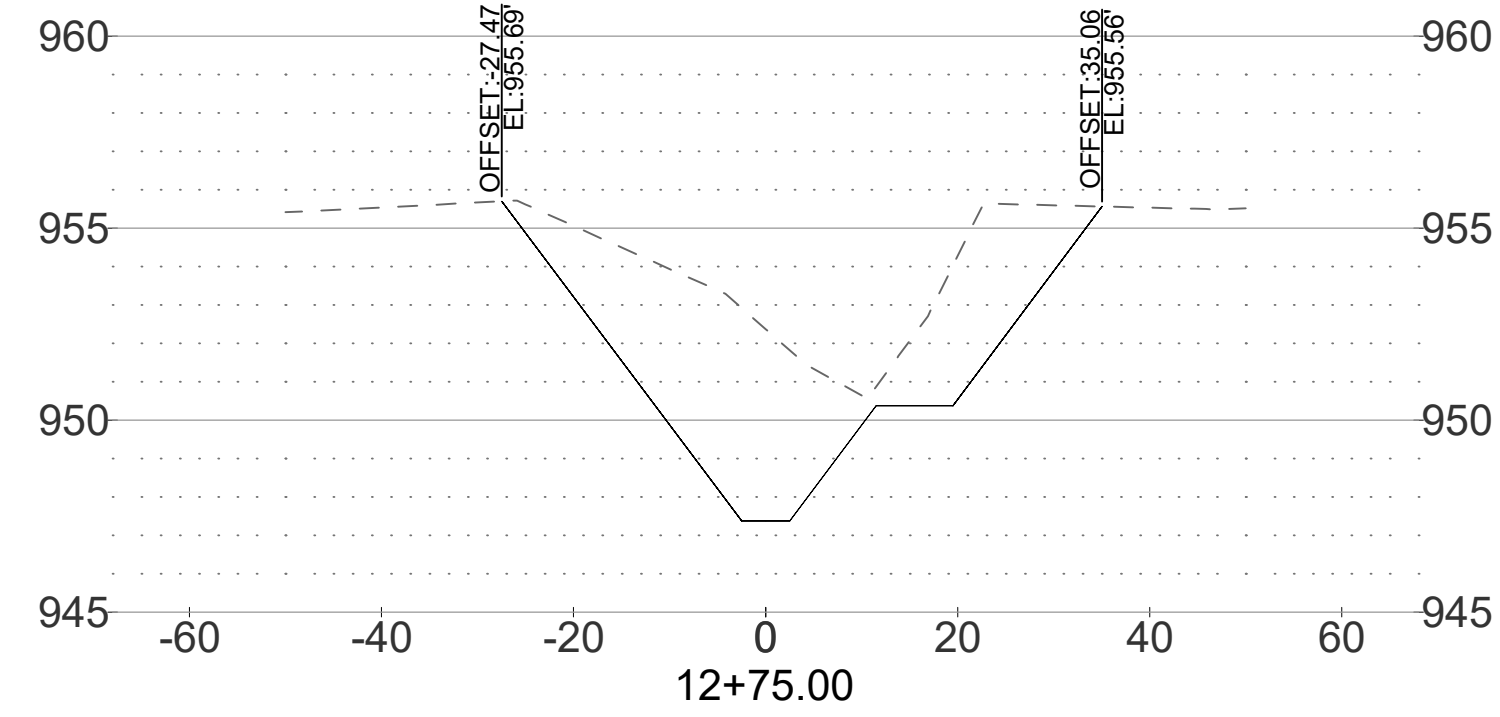
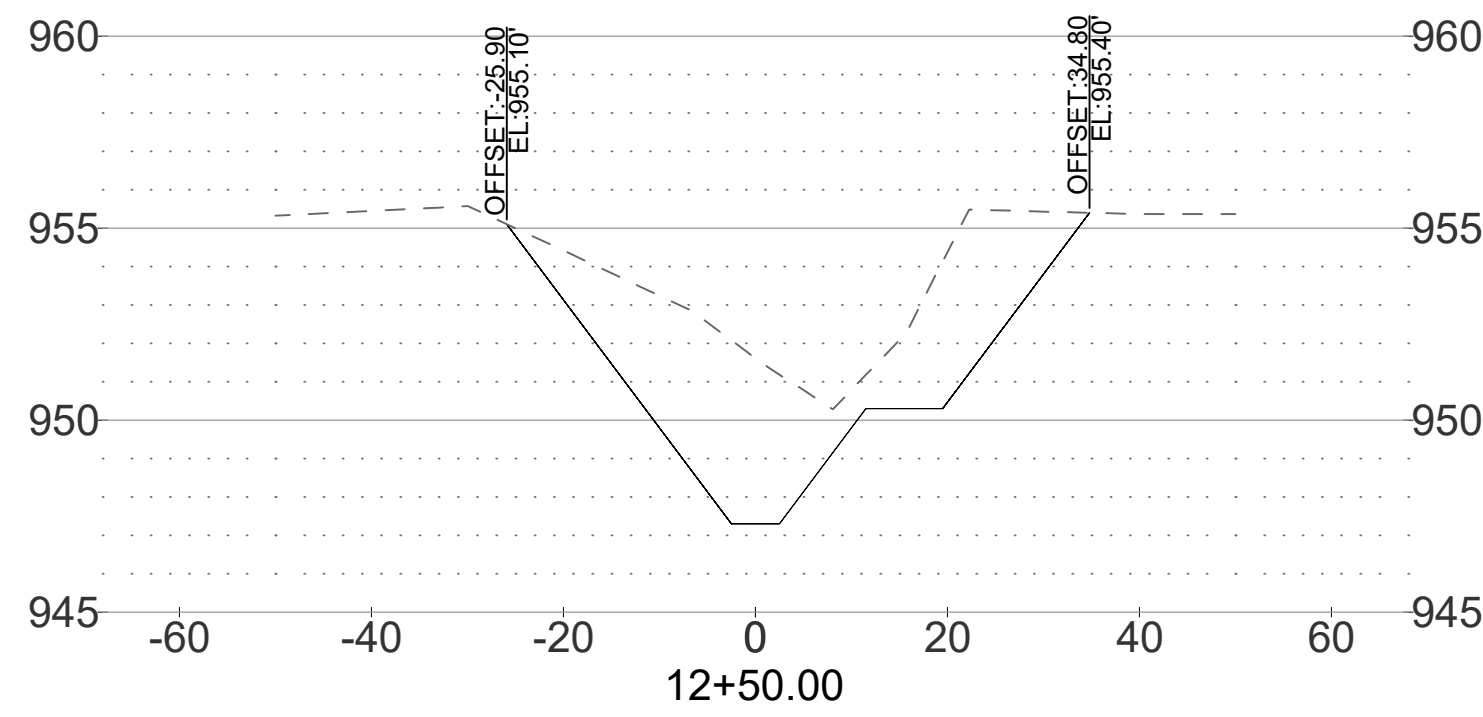
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Sheet C3.0

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WHISPERING WOODS CREEK RESTORATION

CHANNEL CROSS SECTIONS

LEE'S SUMMIT, MO

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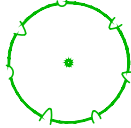
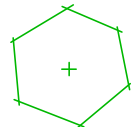
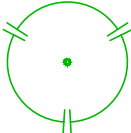
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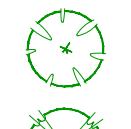
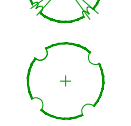
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PLANT LEGEND

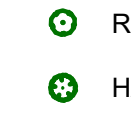
CANOPY TREES

- SYCAMORE
- SHUMARD RED OAK
- BUR OAK
- COMMON HACKBERRY

MEDIUM TREES

- HOPHORNBEAM
- RED HAWTHORNE
- FLOWERING DOGWOOD
- SERVICEBERRY

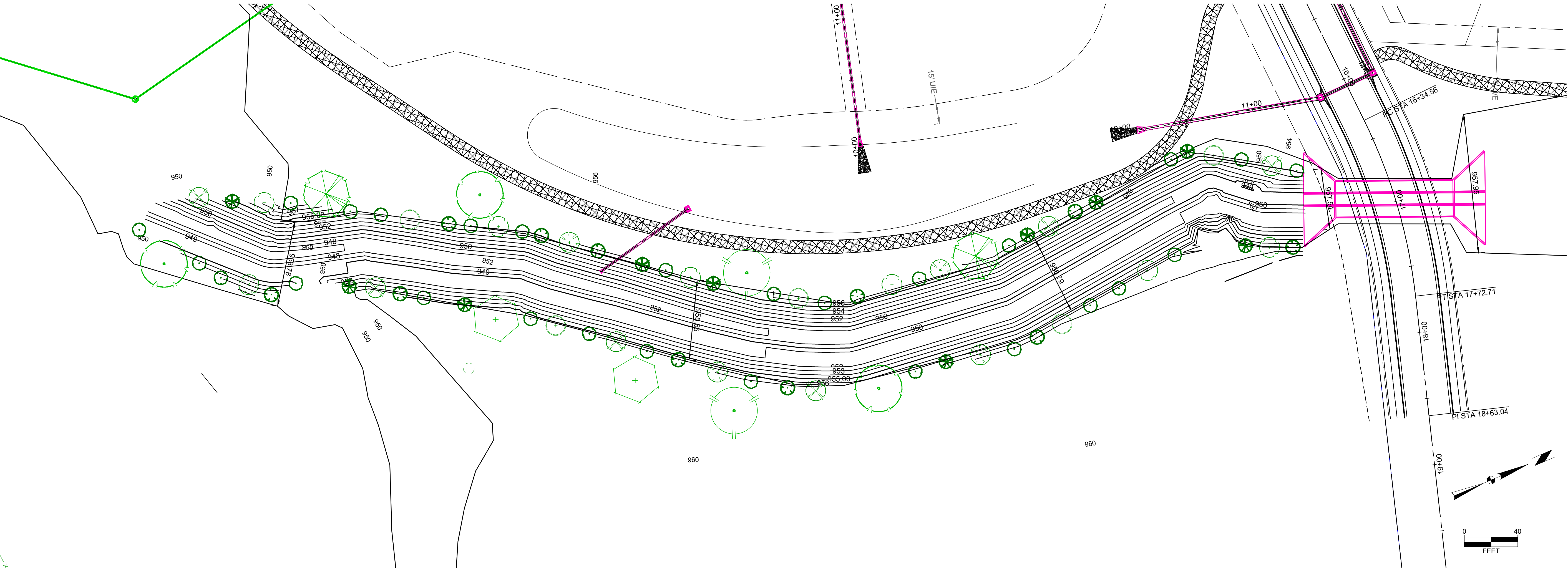
SHRUBS

- SKY DOGWOOD
- ROUGHLEAF DOGWOOD
- RED-TWIG DOGWOOD
- HAZELNUT

TREE AND SHRUB SPECIES LIST

COMMON NAME	SCIENTIFIC NAME	AMOUNT
SHRUBS		
SKY DOGWOOD	CORNUS AMOMUM	10
ROUGHLEAF DOGWOOD	CORNUS DRUMMONDII	16
RED-TWIG DOGWOOD	CORNUS SERICEA 'CARDINAL'	11
HAZELNUT	CORYLUS AMERICANA	11
MEDIUM TREES		
HOPHORNBEAM	OSTRYA VIRGINIANA	5
RED HAWTHORNE	CRATAEGUS MOLLIS	6
FLOWERING DOGWOOD	DIOSPYROS VIRGINIANA	6
SERVICEBERRY	AMELANCHIER ARBOREA	5
CANOPY		
BUR OAK	QUERCUS MACROCARPA	2
SHUMARD RED OAK	QUERCUS SHUMARDII	3
SYCAMORE	PLANTANUS OCCIDENTALIS	2
HACKBERRY	CELTIS OCCIDENTALIS	2

NI = NO INDICATOR



WHISPERING WOODS CREEK RESTORATION

LANDSCAPE - TREES

LEE'S SUMMIT, MO

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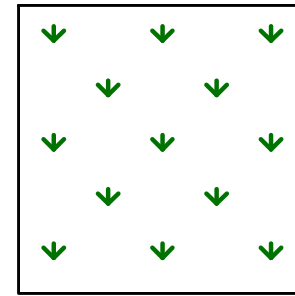
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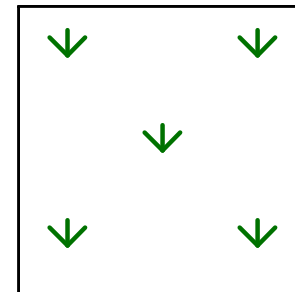
SHAWN DUKE - ENGINEER
MO PE#2013006489

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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 #2006005544			
Sheet C4.0			

FORBS, & WETLANDS

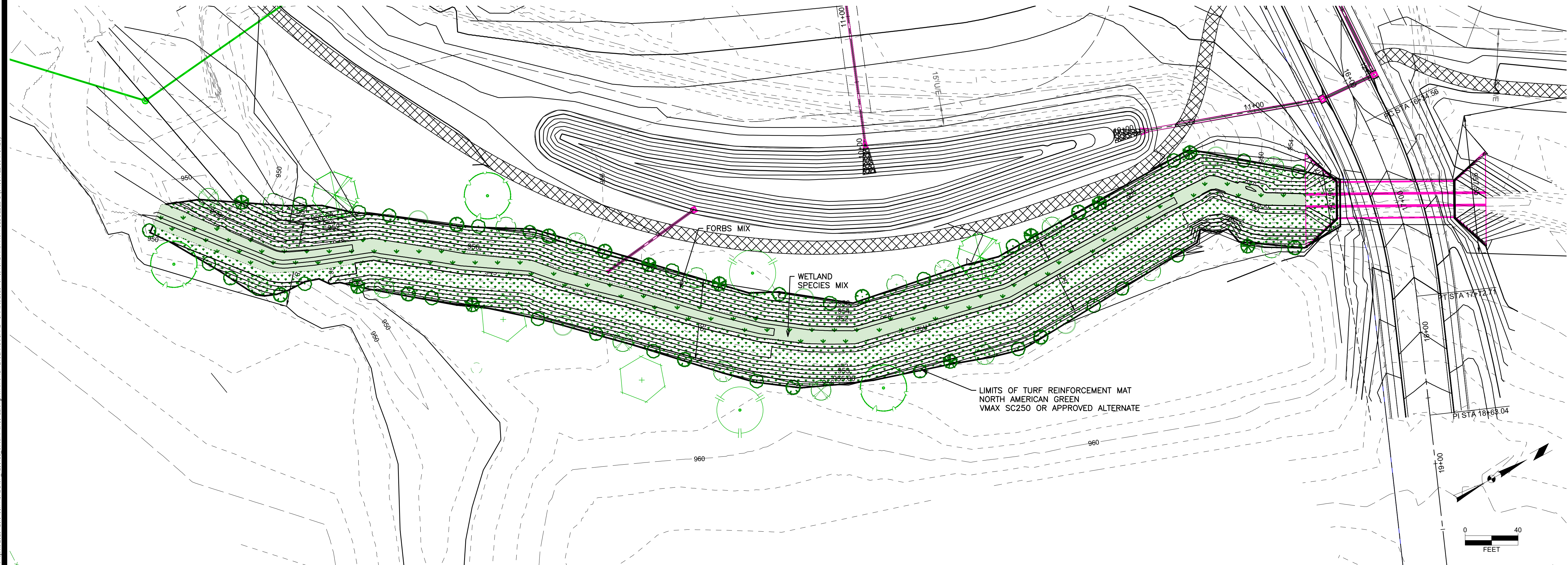


FORBS MIX: (TOTAL 44,869 SF 1.03AC)



WETLAND SPECIES MIX (TOTAL: 12,515 SF .29 AC)

COMMON NAME	SCIENTIFIC NAME	AMOUNT
FORBS		
PARTRIDGE PEA	<i>CHAMAECRISTA FASCICULATA</i>	4.0 LBS/ACRE
BLACK-EYED SUSAN	<i>RUDBECKIA HIRTA</i>	0.5 LBS/ACRE
YELLOW CONEFLOWER	<i>RATIBIDA PINNATA</i>	0.5 LBS/ACRE
PURPLE CONEFLOWER	<i>ECHINACEA PURPUREA</i>	2.0 LBS/ACRE
PURPLE PRAIRIE CLOVER	<i>DALEA PURPUREA</i>	0.5 LBS/ACRE
WETLANDS		
DARK GREEN BULRUSH	<i>SCIRPUS ATROVIRENS</i>	128 PLUGS
SOFTSTEM BULRUSH	<i>SCIRPUS VALIDUS</i>	128 PLUGS
RIVER BULRUSH	<i>SCIRPUS FLUVIATILIS</i>	128 PLUGS
PRAIRIE CORDGRASS	<i>SPARTINE PECTINATA</i>	128 PLUGS
SWITCHGRASS	<i>PANICUM VIRGATUM</i>	1.0 LBS/ACRE
FOX SEDGE	<i>CAREX VULPINOIDEA</i>	0.5 LBS/ACRE
COW PARSNIP	<i>HERACLEUM MAXIMUM</i>	3.5 LBS/ACRE
VIRGINIA WILD RYE	<i>ELYMUS VIRGINICUS</i>	6.0 LBS/ACRE
SMARTWEED	<i>POLYGONUM PENNSYLVANICUM</i>	1.5 LBS/ACRE
BLUE VERVAIN	<i>VERBENA HASTATA</i>	0.5 LBS/ACRE
GOLDEN ALEXANDER	<i>ZIZIA AUREA</i>	1.0 LBS/ACRE



SHAWN DUKE - ENGINEER
MO PE#2013006489

WHISPERING WOODS CREEK RESTORATION

LEE'S SUMMIT, MO

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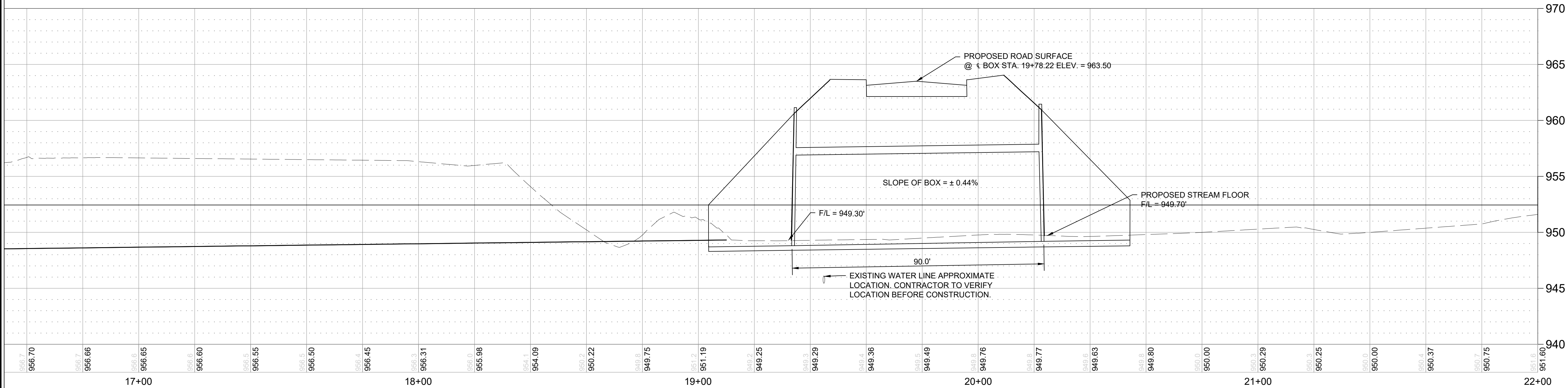
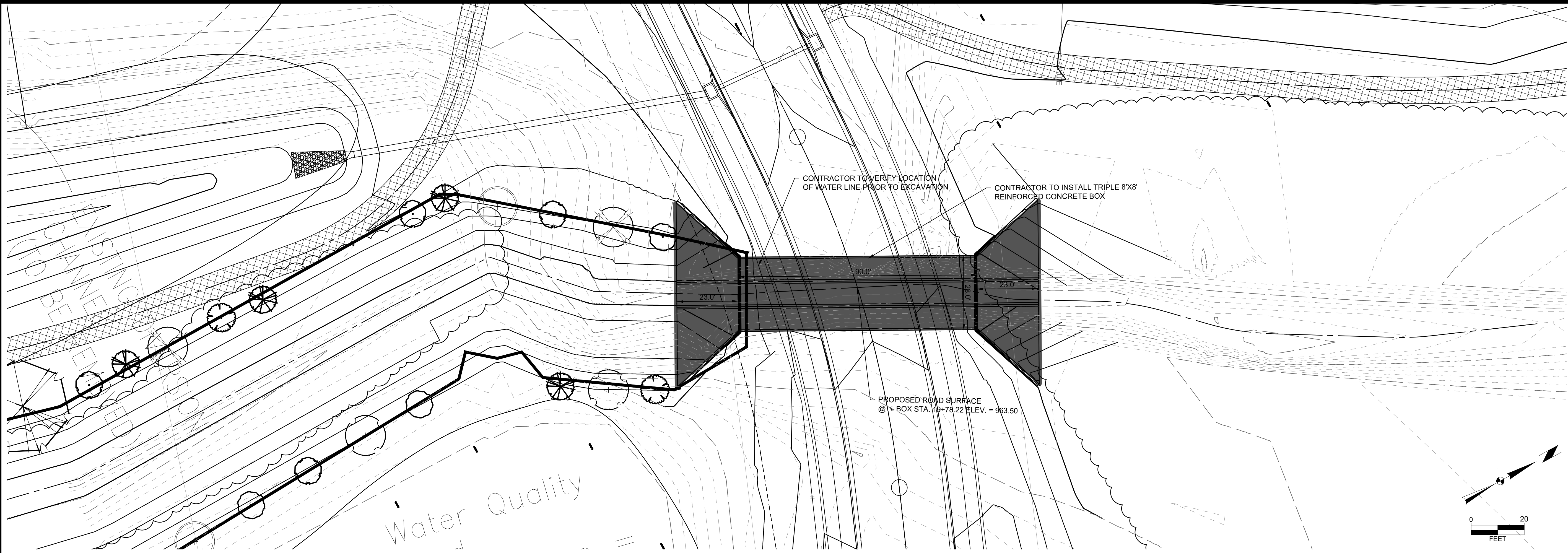
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Sheet C4.1

Sheet C4.1

Missouri State Certificate of Authority #2006008544

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MARK	REVISION	DATE	BY
Engineer: SD	Checked By: SD	Scale: 1" = 20'	
Technician: BT	Date: 04-15-2022	T-R-S: 47N-32W-24	

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SHAWN DUKE - ENGINEER
MO PE#2013006489

WHISPERING WOODS CREEK RESTORATION

BOX CULVERT PLAN AND PROFILE

LEE'S SUMMIT, MO

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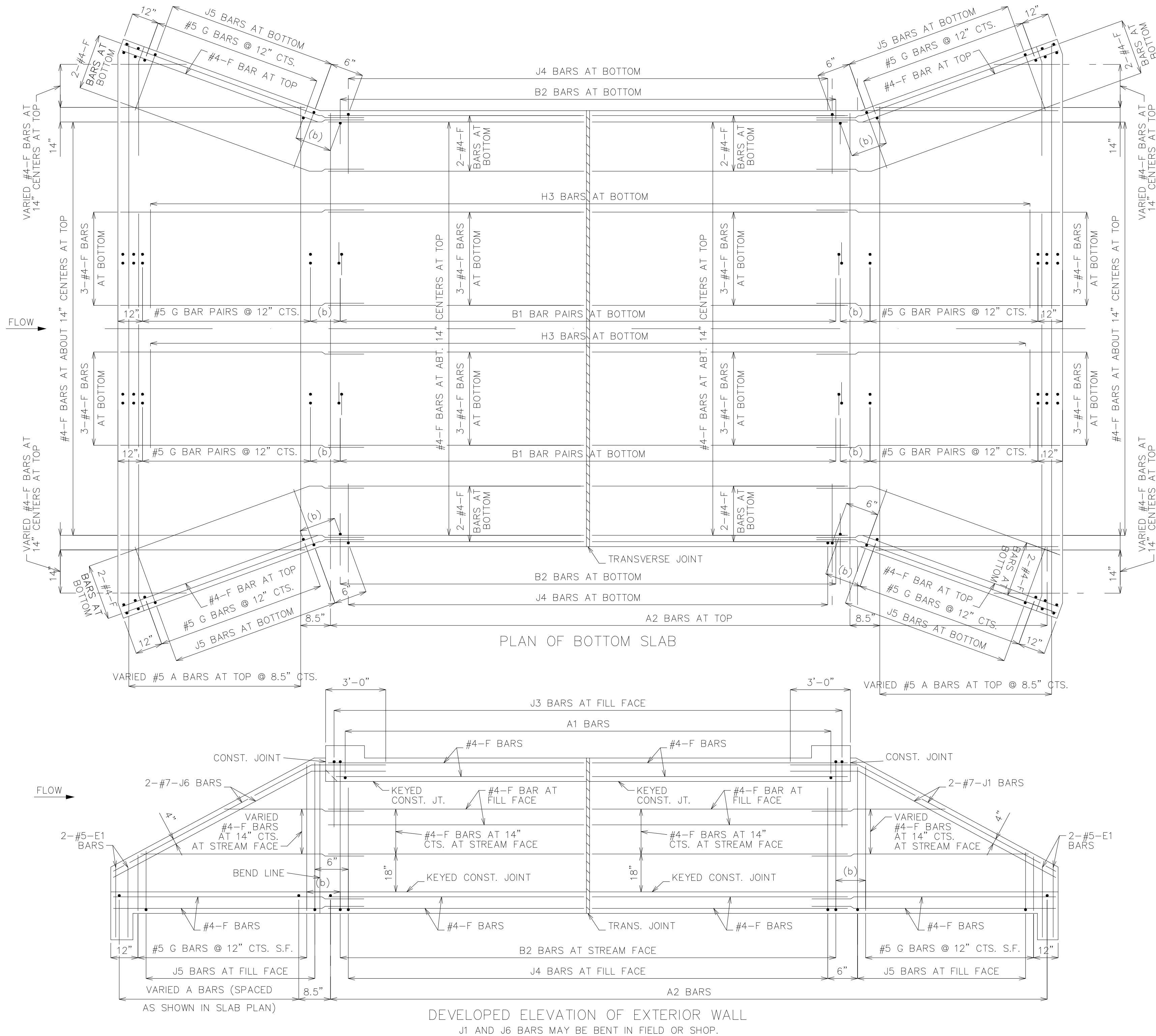
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Project No: 120.0485.11

Sheet C5.0

V:\Projects\2020\120.0485.1\CD\120485 Box Culvert Elevation.dwg RYAN SHEVEY BOX CULVERT DETAILS 2023/10/16 10:44 AM AND FILL BLEED D (14.00 X 22.00 INCHES)



LAYING OUT TRANVERSE JOINTS

UNLESS SHOWN ON BRIDGE PLANS

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.

GENERAL NOTES:

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE DETAIL SHEET C5.3. FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT SEE DETAIL SHEET C5.5.

CONSTRUCTION JOINT 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

WHISPERING WOODS CREEK RESTORATION

BOX CULVERT DETAILS

LEE'S SUMMIT, MO

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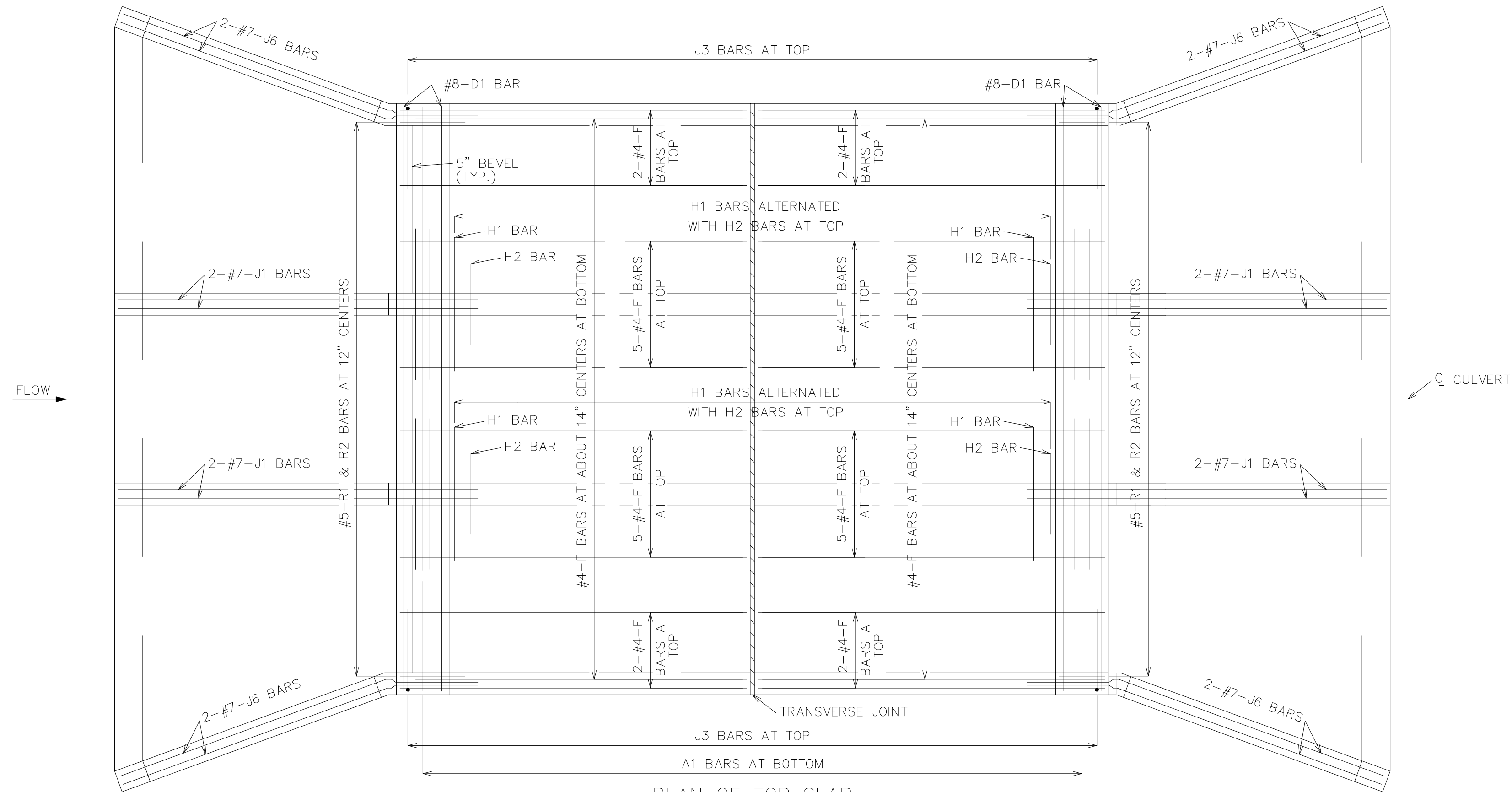
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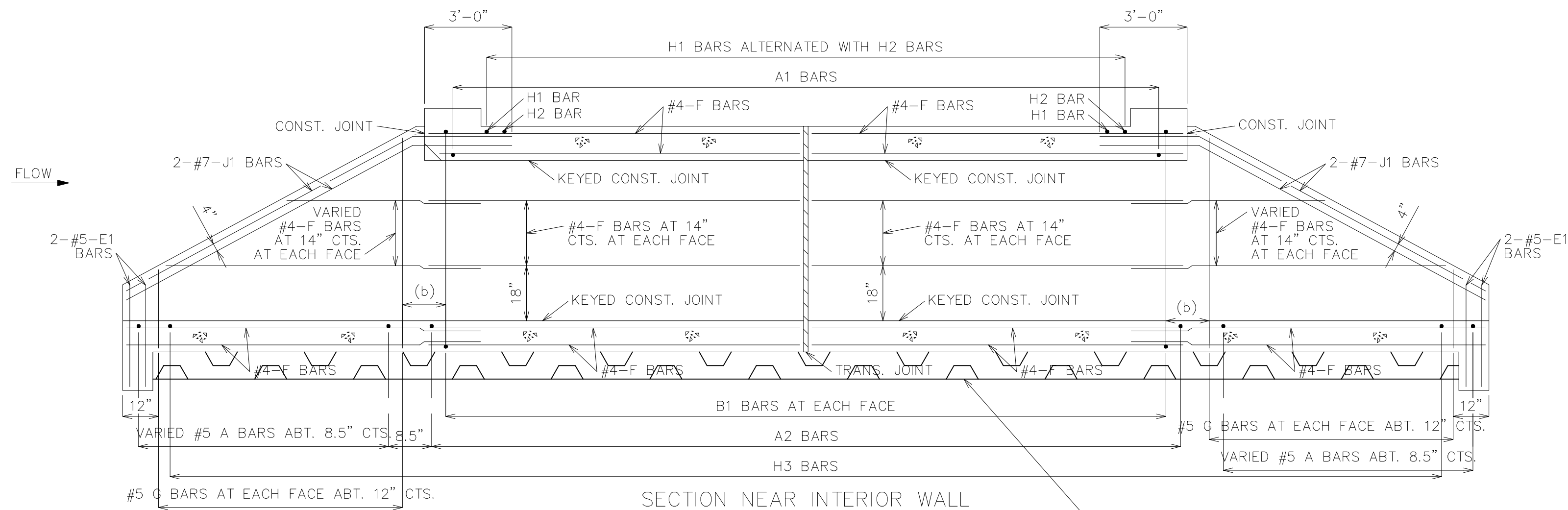
SHAWN DUKE - ENGINEER
MO PE#2013006489

MARK	REVISION	DATE	BY
Engineer: SD	Checked By: SD	Scale: 1" = 5'	
Technician: BT	Date: 04-15-2022	T-R-S: 47N-32W-24	
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Sheet C5.1			

V:\Projects\2020\120.0485.1\CD\120485 Box Culvert Details.dwg RYAN SNEYDER, BOX CULVERT DETAILS, 2023/10/16, 10:44 AM, AND FULL BLEED D (14.00 X 22.00 INCHES)



PLAN OF TOP SLAB
B BARS IN WALLS ARE NOT SHOWN FOR CLARITY.
FOR PLACEMENT, SEE DETAIL SHEET C5.1.



SECTION NEAR INTERIOR WALL
J1 BARS MAY BE BENT IN FIELD OR SHOP.

GRADE SLAB PER LEE'S SUMMIT DCM
SECTION 2604.3.D

GENERAL NOTES:

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.

FOR SECTIONS THRU BARREL, WINGS AND HEADWALLS, SEE DETAIL SHEET C5.3.
FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT
SEE DETAIL SHEET C5.5.

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LAP LONGITUDINAL BARS A MINIMUM OF 23" AT SPLICES.

BEVELED HEADWALL SHALL BE LOCATED AT UPSTREAM END.

(b) VARIES, 12" MAXIMUM

WHISPERING WOODS CREEK RESTORATION

BOX CULVERT DETAILS

LEE'S SUMMIT, MO

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ENGINEERS & PLANNERS, INC.

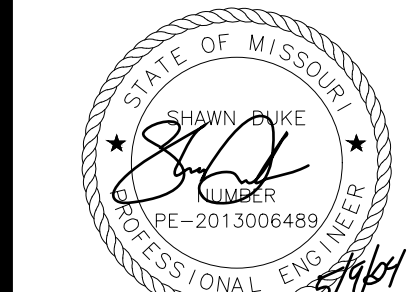
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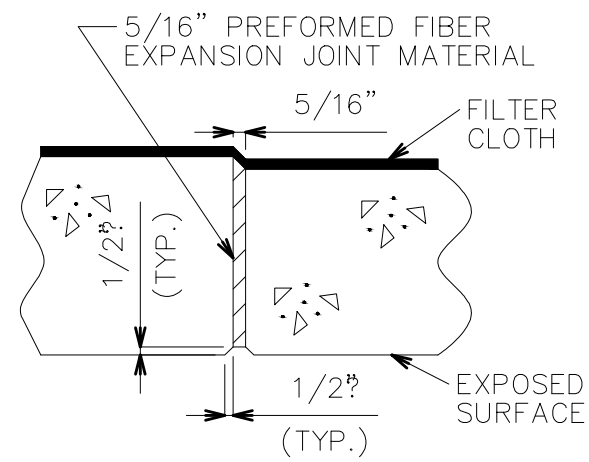
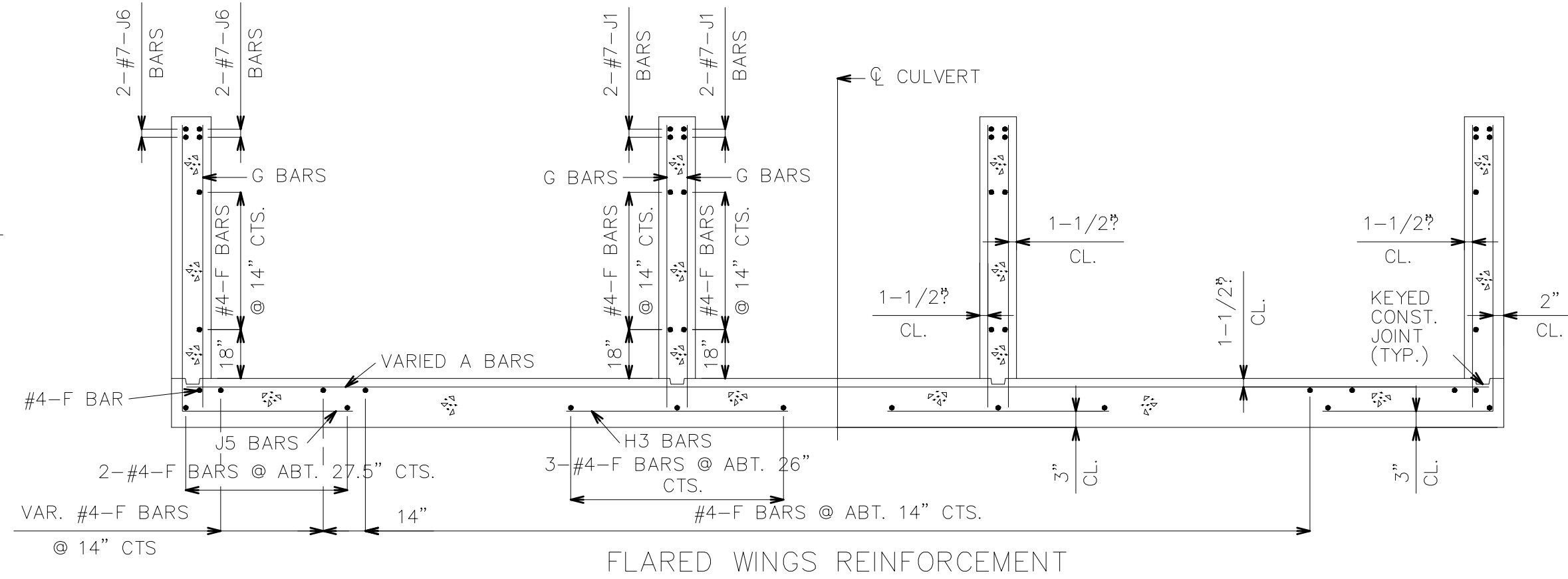
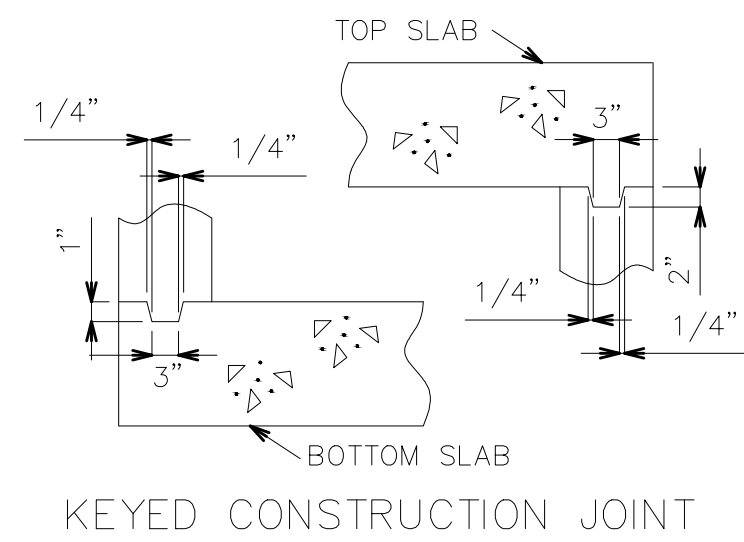
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SHAWN DUKE - ENGINEER
MO PE#2013006489

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Technician: BT	Date: 04-15-2022	T-R-S: 47N-32W-24	
Snyder & Associates Engineers & Planners, Inc. Missouri State Certificate of Authority #2006005544			
Sheet C5.2			

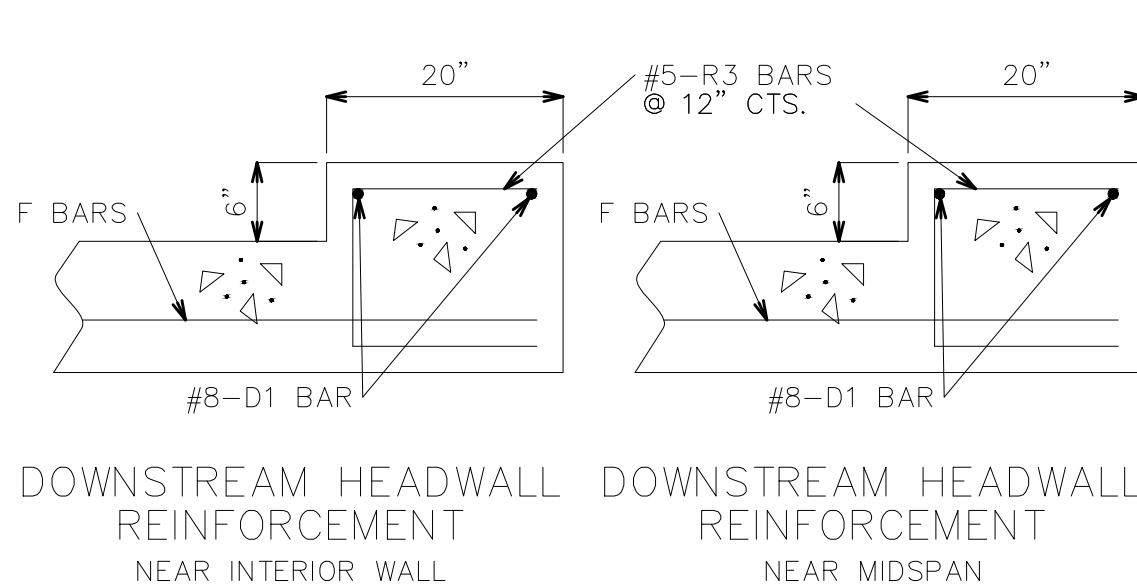
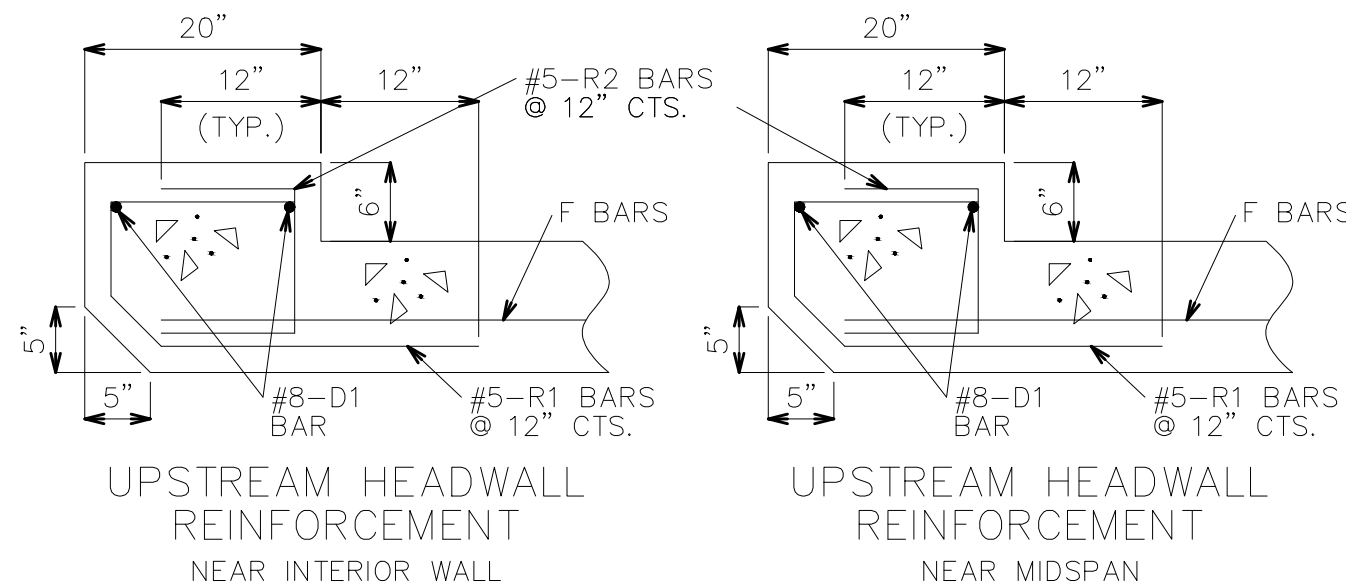
\\p0p0ch\2020\120\0485.1\CD\DD120485 Box Culvert Elevation.dwg RYAN SNEYDER BOX CULVERT DETAILS 2023/10/16 10:44 AM AND FULL BLEED 0.409 X 22.09 INCHES



TRANSVERSE JOINT THRU BARREL

PREFORMED FIBER EXPANSION JOINT MATERIAL IN ACCORDANCE WITH 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.



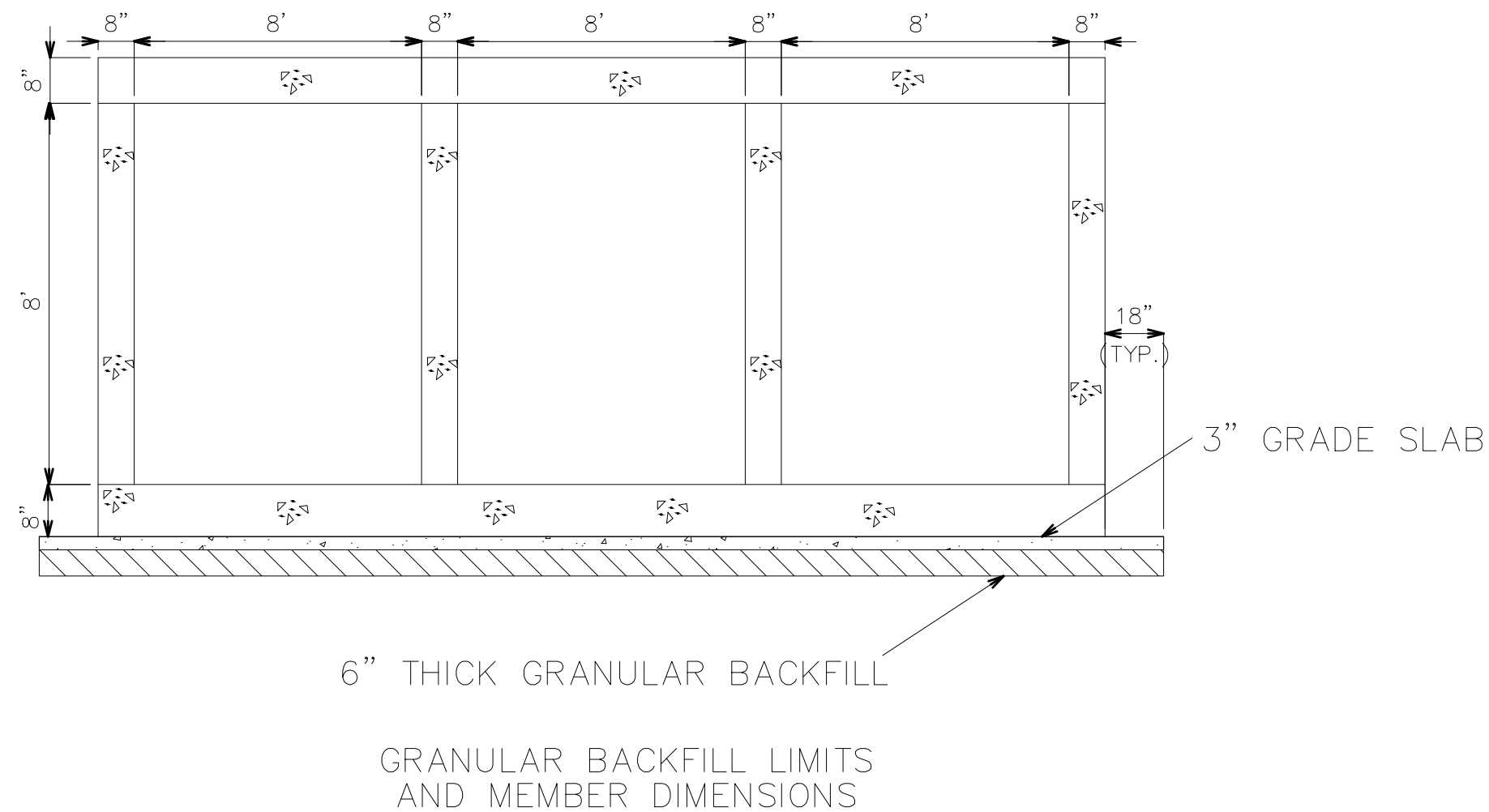
GENERAL NOTES:

FOR MEMBER THICKNESS AND FOR BAR SIZES, SPACING AND DIMENSIONS OF ALL REINFORCEMENT SEE DETAIL SHEET C5.5.

BARREL AND WINGS SECTIONS ARE SYMMETRICAL ABOUT AND NORMAL TO CL CULVERT. HEADWALL SECTIONS ARE NORMAL TO LONG DIRECTION OF HEADWALL.

DRAWING NOT TO SCALE. FOLLOW DIMENSIONS.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1".



WHISPERING WOODS CREEK RESTORATION

BOX CULVERT DETAILS

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 C5.3



SHAWN DUKE - ENGINEER
MO PE#2013006489

MARK	REVISION	DATE	BY
Engineer: SD	Checked By: SD	Scale: 1" = 5'	
Technician: BT	Date: 04-15-2022	T-R-S: 47N-32W-24	

Sheet C5.3

Snyder & Associates Engineers & Planners, Inc.
Missouri State Certificate of Authority #2006008544



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.



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.)

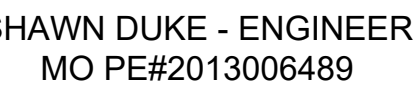
DESIGN UNIT STRESSES:
CLASS B-1 CONCRETE (BOX CULVERT) $f'_c = 4,000$ PSI
REINFORCING STEEL (GRADE 60) $f_y = 60,000$ PSI

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".



WHISPERING WOODS CREEK RESTORATION

BOX CULVERT DETAILS

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Project No: 120.0485.11

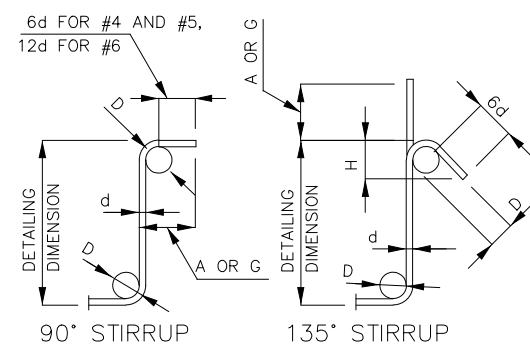
Sheet C5.4



WALL BARS				
B1 BARS		B2 BARS		
SIZE	SPACING	SIZE	SPACING	G1
#5	12"	#5	12"	12"

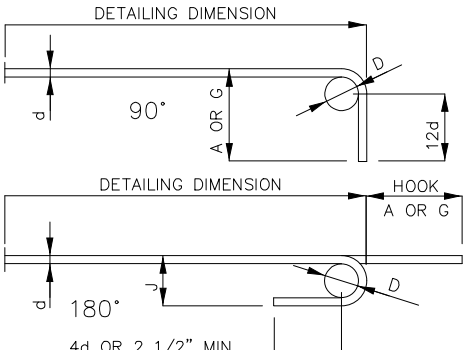
Project No:	120.0485.11
Sheet	C5.5

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
									FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.
	WINGS																					
6	4F	DOWNSTREAM WEST WING		20			V		6	1.080							6	1.1	6	1.1	67	
		INCR = 51.60 IN							27	6.600							27	6.6	27	6.6		
6	4F	DOWNSTREAM EAST WING		20			V		6	1.080							6	1.1	6	1.1	67	
		INCR = 51.60 IN							27	6.600							27	6.6	27	6.6		
6	4F	UPSTREAM WEST WING		20			V		6	4.800							6	4.8	6	4.8	68	
		INCR = 50.88 IN							27	7.320							27	7.3	27	7.3		
6	4F	UPSTREAM EAST WING		20			V		6	4.800							6	4.8	6	4.8	68	
		INCR = 50.88 IN							27	7.320							27	7.3	27	7.3		
31	5G	DOWNSTREAM WEST WING		20			V		0	7.200							0	7.2	0	7.2	151	
		INCR = 3.36 IN							8	9.000							8	9	8	9		
31	5G	DOWNSTREAM EAST WING		20			V		0	7.200							0	7.2	0	7.2	151	
		INCR = 3.36 IN							8	9.000							8	9	8	9		
31	5G	UPSTREAM WEST WING		20			V		0	7.200							0	7.2	0	7.2	153	
		INCR = 3.24 IN							8	10.200							8	10	8	10		
31	5G	UPSTREAM EAST WING		20			V		0	7.200							0	7.2	0	7.2	153	
		INCR = 3.24 IN							8	10.200							8	10	8	10		
8	7J6	DOWNSTREAM WINGS		20					31	8.000							31	8	31	8	518	
8	7J6	UPSTREAM WINGS		20					31	8.000							31	8	31	8	518	
	6J5	UPSTREAM WEST WING		19			V		1	7.125	1	7.500					3	2.6	3	2.6	0	
		INCR = 18.375 IN							2	0.750	5	9.000					7	9.8	7	9.8		
	6J5	UPSTREAM EAST WING		19			V		2	0.625	6	4.400					8	5	8	5	0	
		INCR = 1.875 IN							10	2.125	6	4.400					16	6.5	16	6.5		
	6J5	DOWNSTREAM WEST WING		19			V										0	0	0	0	0	
		INCR = 2.000 IN															0	0	0	0		
	6J5	DOWNSTREAM EAST WING		19			V										0	0	0	0	0	
		INCR = 18.375 IN															0	0	0	0		
	6J5	UPSTREAM WEST WING		19			V										0	0	0	0	0	
		INCR = 1.875 IN															0	0	0	0		
	6J5	DOWNSTREAM EAST WING		19			V										0	0	0	0	0	
	</																					



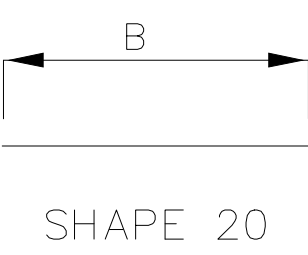
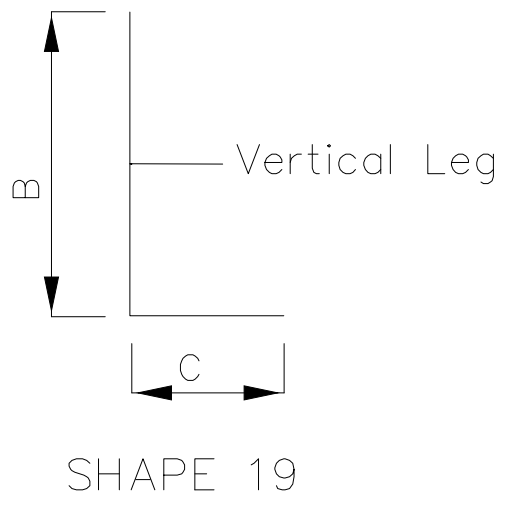
STIRRUP HOOK DIMENSIONS						
BAR SIZE	D (IN.)	90° HOOK		135° HOOK		
		HOOK A OR G	HOOK A OR G	HOOK A OR G	APPROX. H	
#4	2"	4	1 1/2"	4	1 1/2"	3"
#5	2 1/2"	6"	5	1 1/2"	3	3 4"
#6	4 1/2"	12"	8"	4	1 1/2"	

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 OR G	J	A OR 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 3/4"	19"
#10	10 3/4"	17"	13 1/4"	22"
#11	12"	19"	14 3/4"	24"

NOTE: ALL STANDARD HOOKS AND BENDS OTHER THAN 180 DEGREE ARE TO BE BENT WITH SAME PROCEDURES AS FOR 90 DEGREE STANDARD HOOKS.
STANDARD HOOKS AND BENDS ARE TO BE BENT IN ACCORDANCE WITH THE PROCEDURES AS SHOWN ON THIS SHEET.
FB = BAR MAY BE BENT IN FACT TO FIT.
S = STRIPUP
V BAR DIMENSIONS VARY IN EQUAL INCREMENTS BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE. A BLANK IN THE SECOND LINE REPRESENTS THE SAME BAR DIMENSION AS THAT IN THE FIRST LINE. THE GOVERNOR HAS THE RIGHT TO ADD A SPICE LENGTH TO A BAR IN LENGTH IF IT NEEDS A MAXIMUM ALLOWABLE LENGTH.
NO. EA. = NUMBER OF BARS OF EACH LENGTH
STANDARD HOOKS AND BENDS ARE TO BE BENT IN ACCORDANCE WITH THE DIMENSIONS SHOWN IN BENDING DIAGRAMS AND ARE LISTED FOR FABRICATORS USE. (NEAREST INCH)
STANDARD HOOKS AND BENDS ARE TO BE MEASURED ALONG CENTERLINE BAR TO THE NEAREST INCH.
PAYMENTS ARE BASED ON ACTUAL LENGTHS.
REINFORCING STEEL (GRADE 60) FY = 60,000 PSI.



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.

Diagram of Shape 10: A U-shaped profile. The height of the vertical legs is labeled C . The width of the base is labeled D .

A diagram of an L-shaped cross-section. The vertical leg is labeled 'B' with a double-headed arrow indicating its height. The horizontal leg is labeled 'C' with a double-headed arrow indicating its width. The text 'Vertical Leg' is placed next to the vertical leg.

A diagram of a stepped profile. The profile starts at a height C on the left, drops vertically to a height K , then slopes down to the right, and finally drops vertically to a height E on the right. The horizontal distance from the left edge to the start of the slope is B . The horizontal distance from the start of the slope to the right edge is H . The total horizontal distance is $B + H$.

SHAPE 27

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		K	
									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								

[illegible]

SHAWN DUKE - ENGINEER
MO PE#2013006489

WHISPERING WOODS CREEK RESTORATION

LEE'S SUMMIT, MO

SNYDER & ASSOCIATES
ENGINEERS & PLANNERS, INC.



Project No: 120.0485.11

Sheet C5.7