






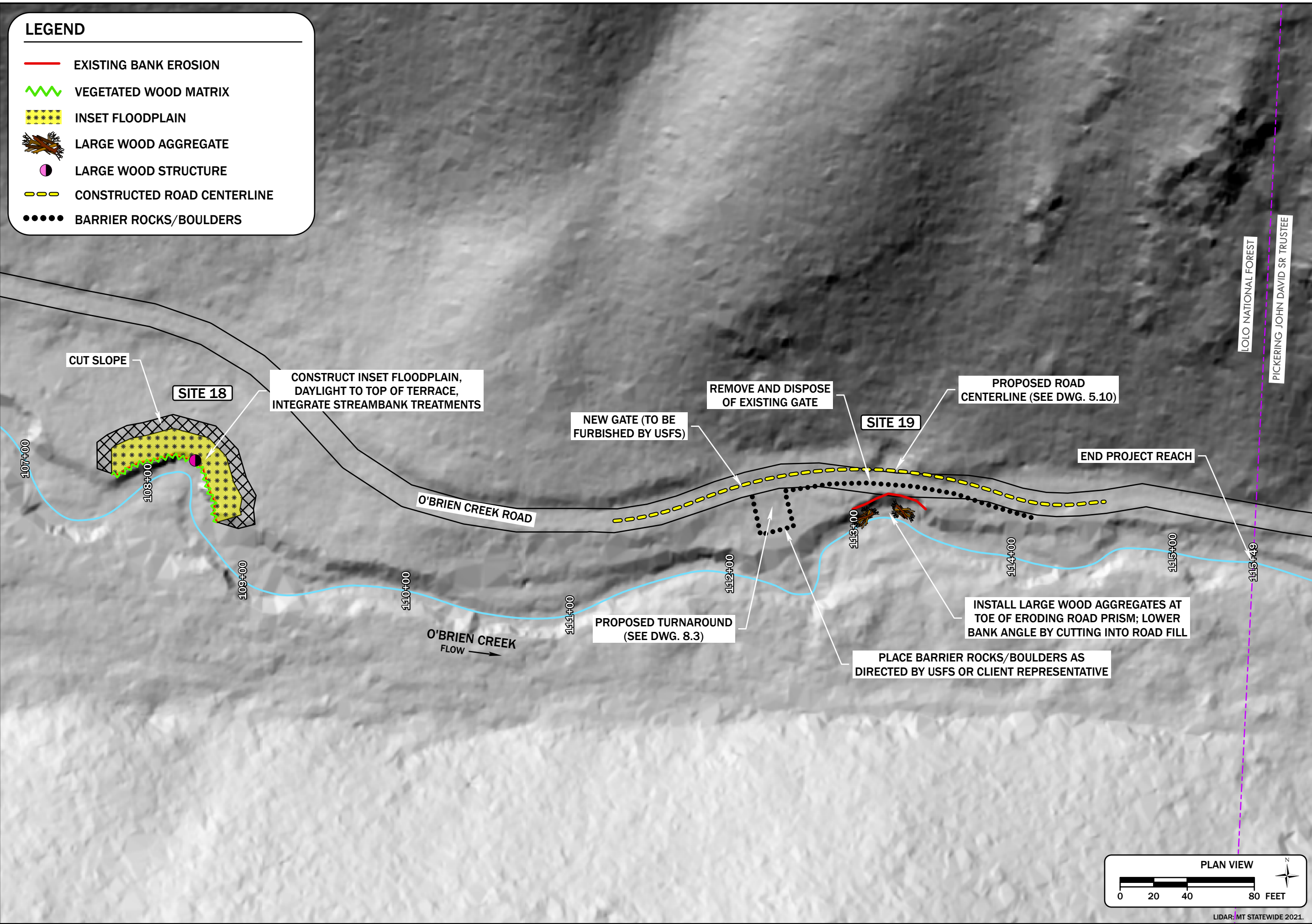


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LEGEND

-  EXISTING BANK EROSION
-  VEGETATED WOOD MATRIX
-  INSET FLOODPLAIN
-  LARGE WOOD AGGREGATE
-  LARGE WOOD STRUCTURE
-  CONSTRUCTED ROAD CENTERLINE
-  BARRIER ROCKS/BOULDERS



LOLO NATIONAL FOREST
PICKERING JOHN DAVID SR TRUSTEE

SWCA
ENVIRONMENTAL CONSULTANTS
236 Wisconsin Avenue
Whitefish, MT 59937
tel. 541.738.2920
fax. 541.758.8524

PANEL 9
RESTORATION PLAN
UPPER O'BRIEN CREEK

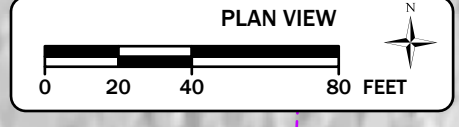
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2	02-15-24	DB	PRELIMINARY DESIGN	JM
3	03-13-26	DB	FINAL DESIGN	JM

PROJECT NUMBER
103361-000-CRB

DRAWING NUMBER

5.8

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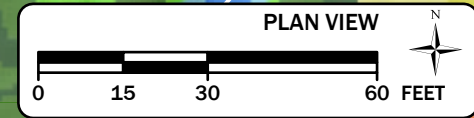
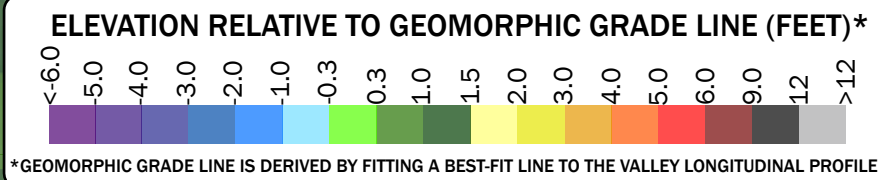
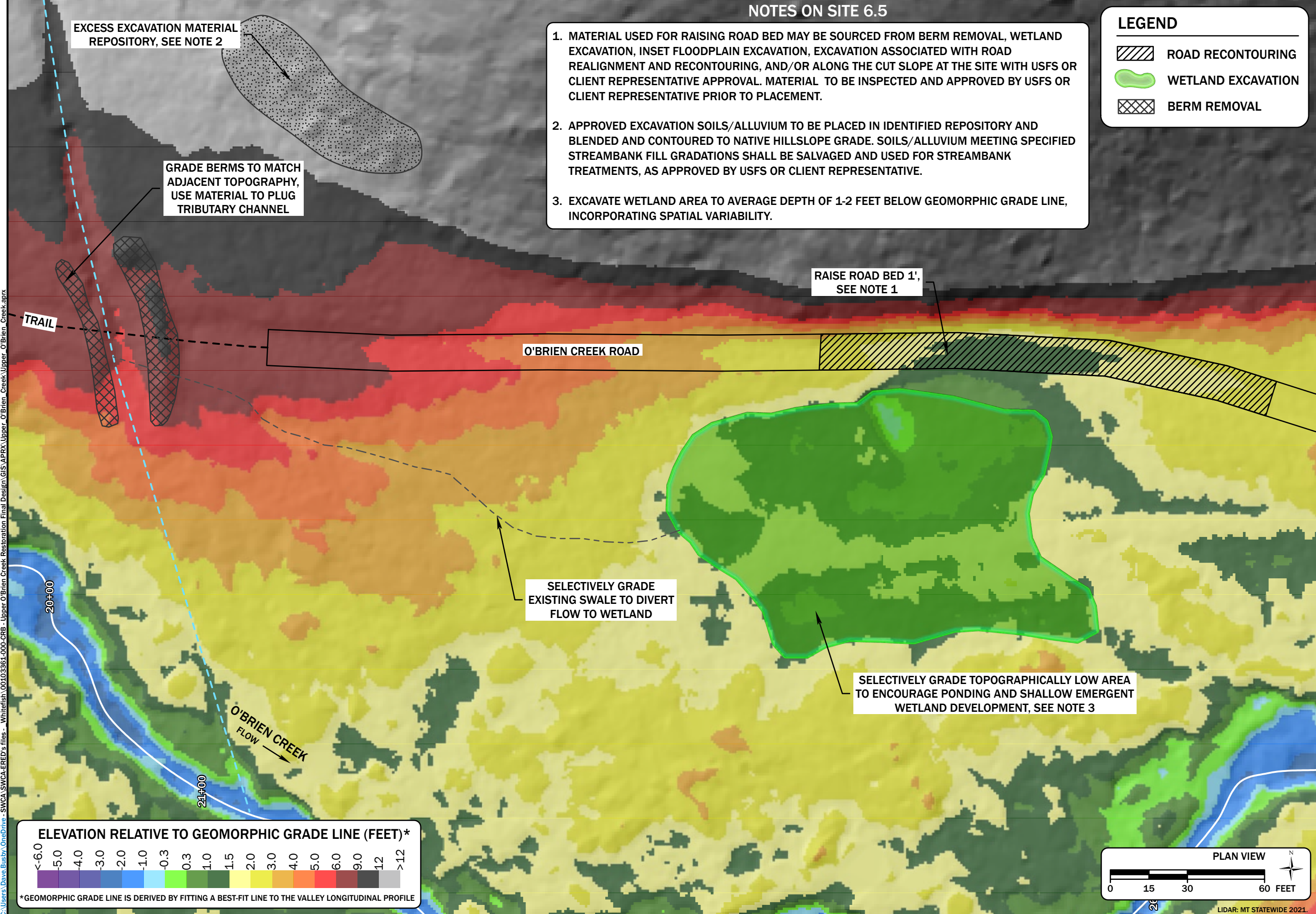
NOTES ON SITE 6.5

1. MATERIAL USED FOR RAISING ROAD BED MAY BE SOURCED FROM BERM REMOVAL, WETLAND EXCAVATION, INSET FLOODPLAIN EXCAVATION, EXCAVATION ASSOCIATED WITH ROAD REALIGNMENT AND RECONTOURING, AND/OR ALONG THE CUT SLOPE AT THE SITE WITH USFS OR CLIENT REPRESENTATIVE APPROVAL. MATERIAL TO BE INSPECTED AND APPROVED BY USFS OR CLIENT REPRESENTATIVE PRIOR TO PLACEMENT.
2. APPROVED EXCAVATION SOILS/ALLUVIUM TO BE PLACED IN IDENTIFIED REPOSITORY AND BLENDED AND CONTOURED TO NATIVE HILLSLOPE GRADE. SOILS/ALLUVIUM MEETING SPECIFIED STREAMBANK FILL GRADATIONS SHALL BE SALVAGED AND USED FOR STREAMBANK TREATMENTS, AS APPROVED BY USFS OR CLIENT REPRESENTATIVE.
3. EXCAVATE WETLAND AREA TO AVERAGE DEPTH OF 1-2 FEET BELOW GEOMORPHIC GRADE LINE, INCORPORATING SPATIAL VARIABILITY.

LEGEND

-  ROAD RECONTOURING
-  WETLAND EXCAVATION
-  BERM REMOVAL

SITE 6.5
RESTORATION PLAN
 UPPER O'BRIEN CREEK



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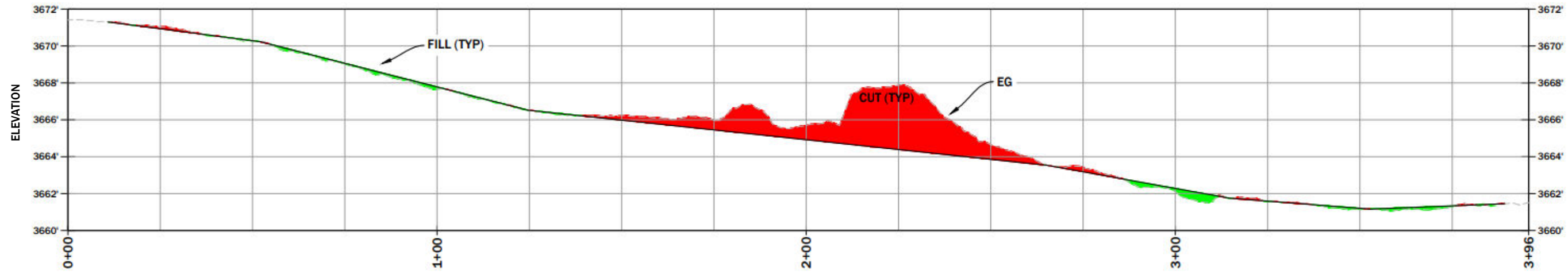
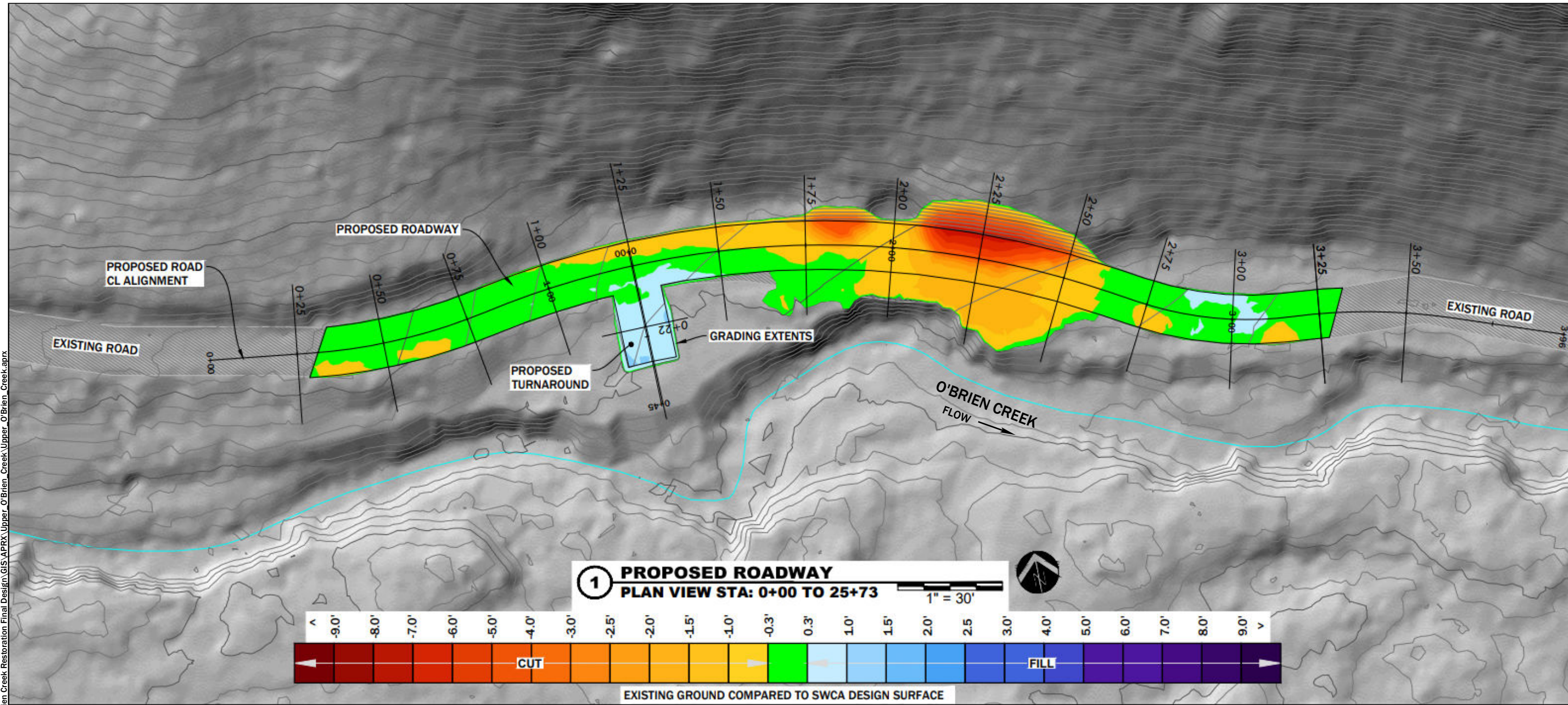
PROJECT NUMBER
103361-000-CRB

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5.9

SHEET 14 OF 34

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SITE 19
GRADING PLAN AND PROFILE
 UPPER O'BRIEN CREEK

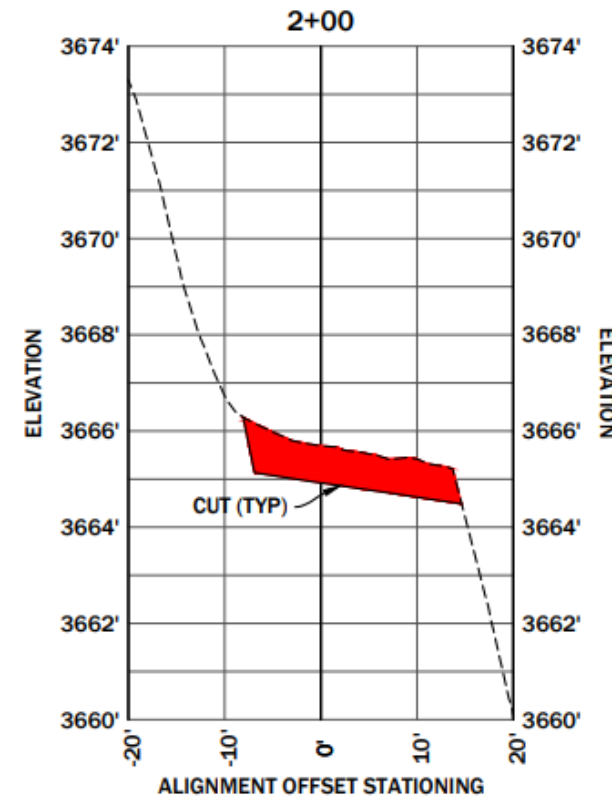
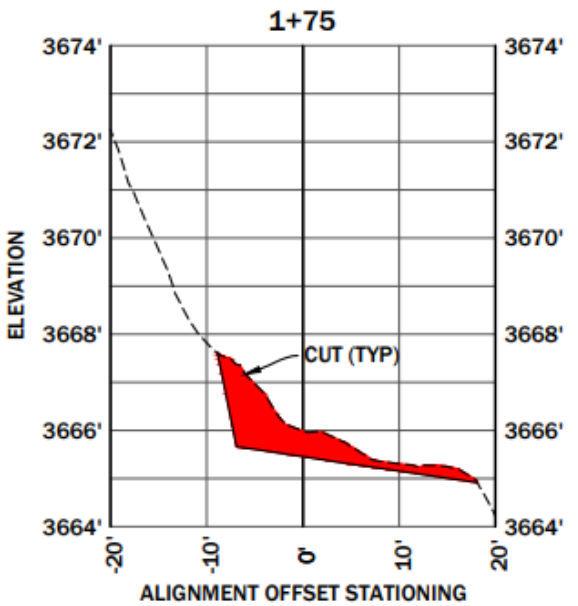
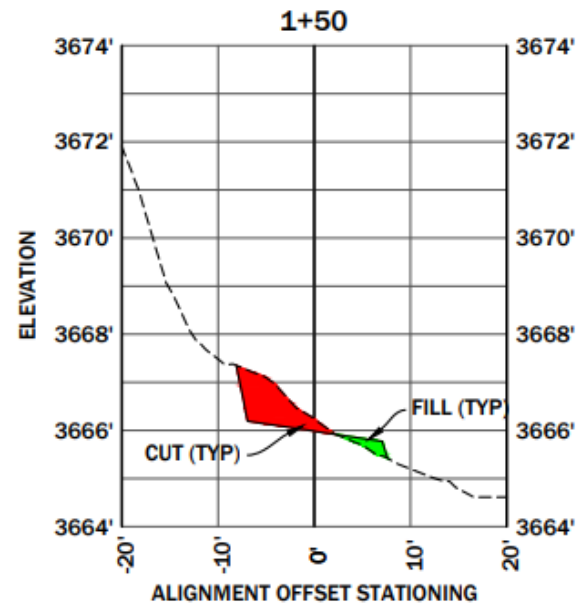
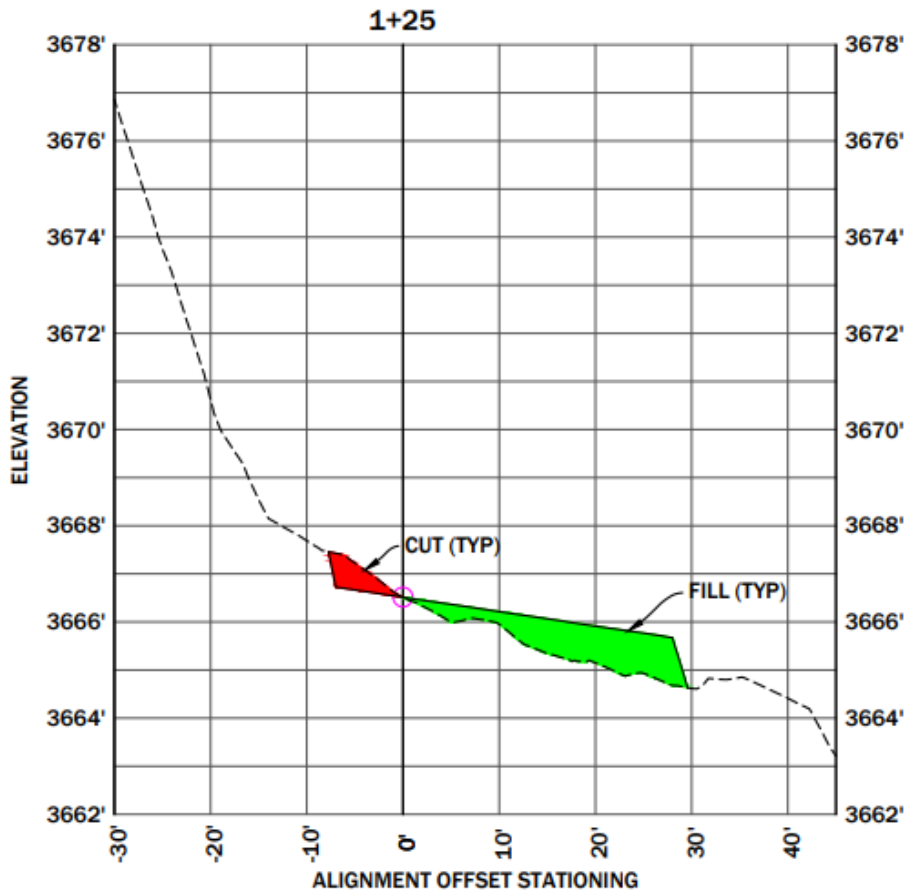
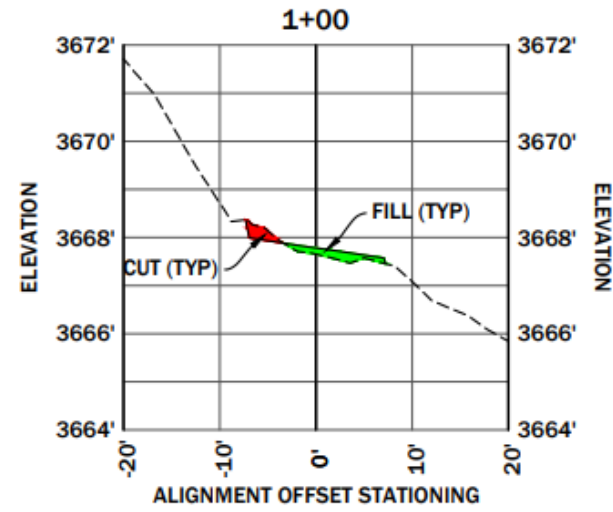
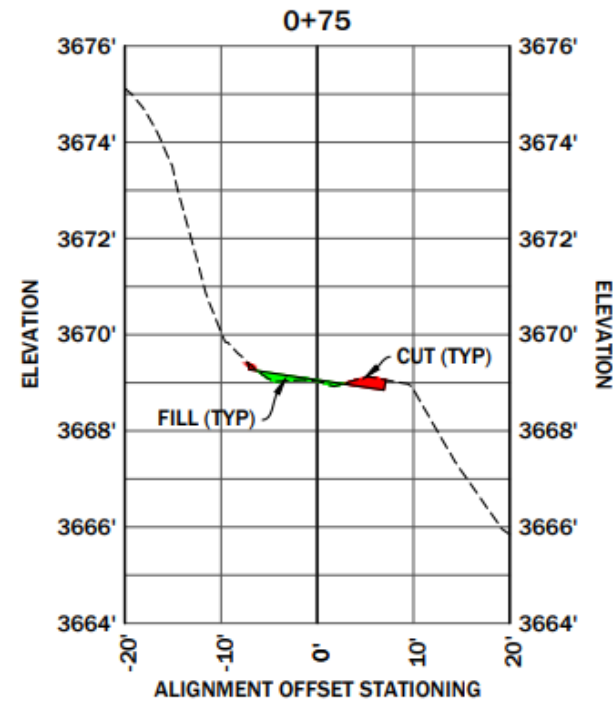
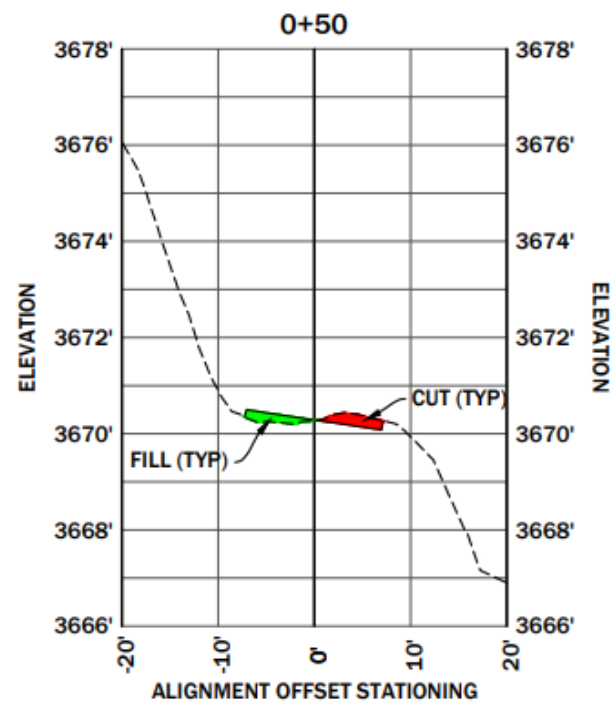
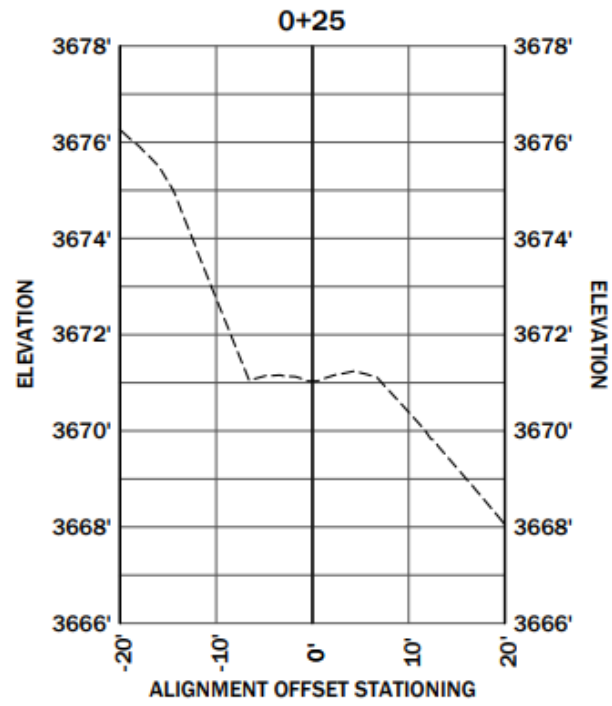
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1 PROPOSED ALIGNMENT CROSS SECTIONS
SECTION VIEW

H:1"=20' V:1"=4'

SITE 19 CROSS SECTIONS
UPPER O'BRIEN CREEK

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3	03-13-26	DB	FINAL DESIGN	JM

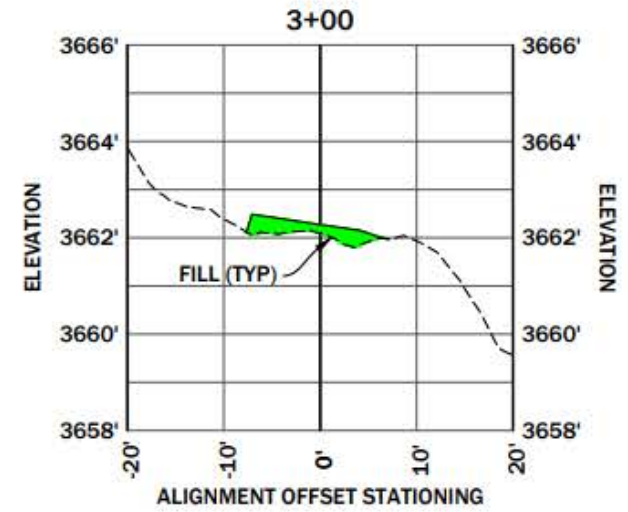
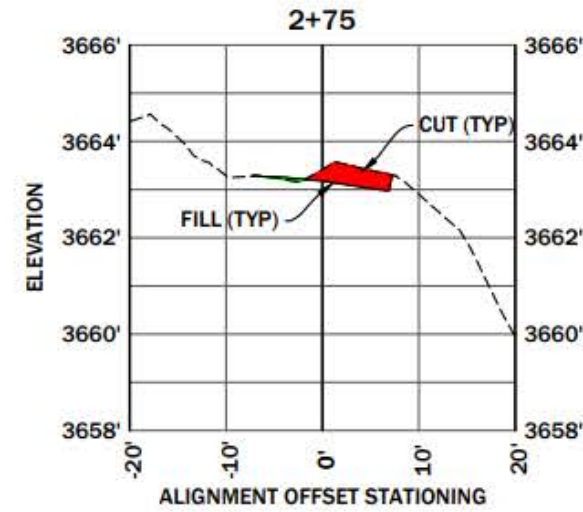
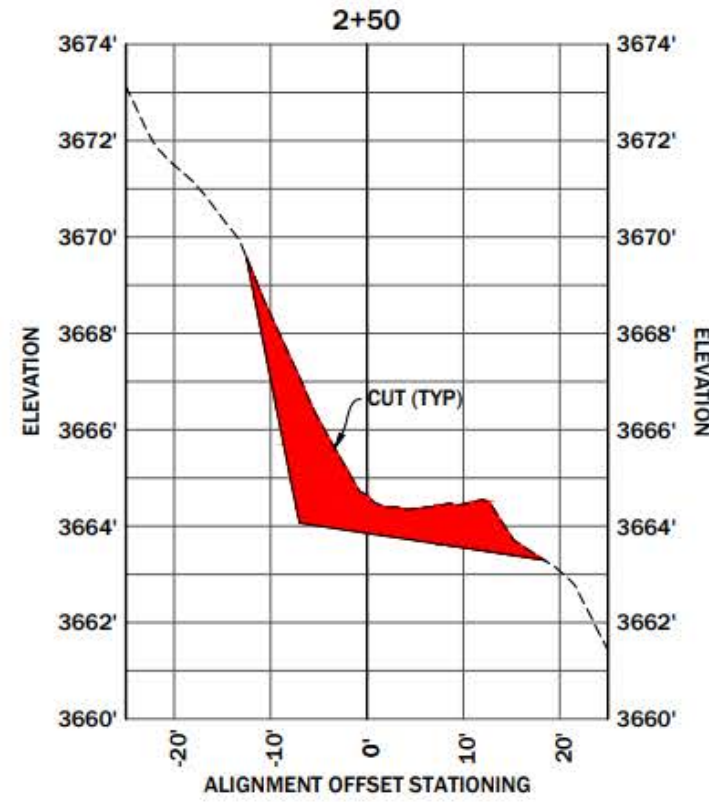
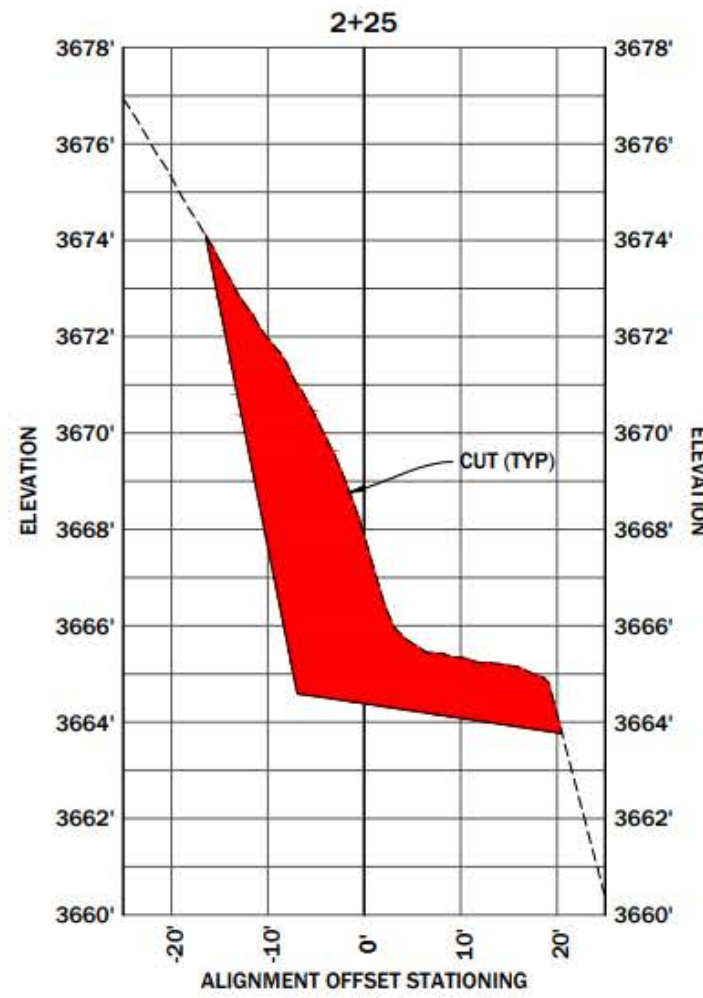
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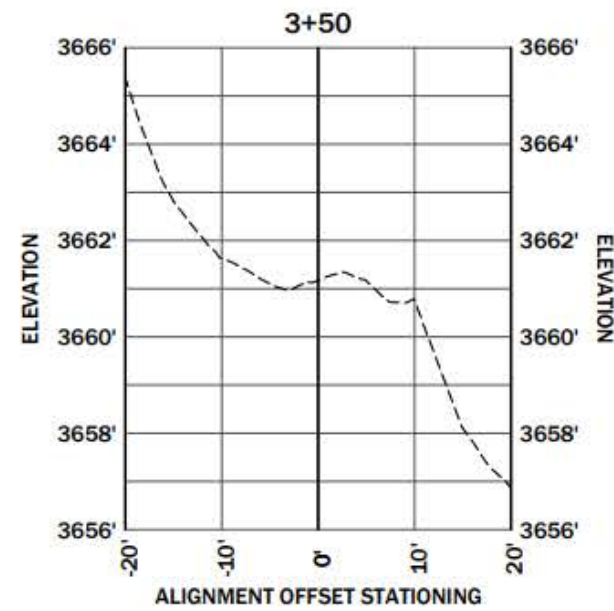
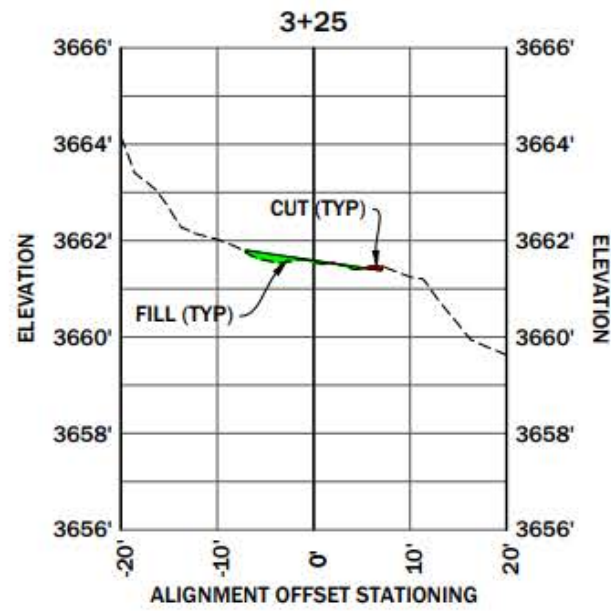
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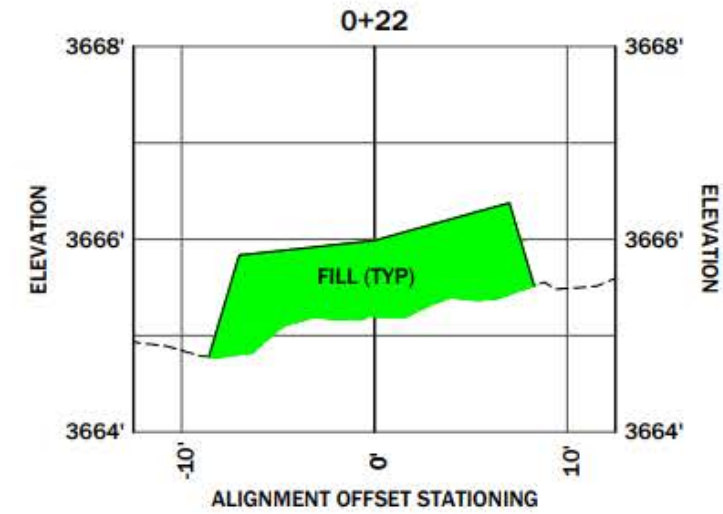
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1 PROPOSED SECTIONS CL STA: 2+25 - STA: 3+00
SECTION VIEWS
H:1"=20' V:1"=4'



2 PROPOSED SECTIONS CL STA: 2+25 - STA: 3+50
SECTION VIEWS
H:1"=20' V:1"=4'



3 PROPOSED SECTION TURNAROUND STA: 0+22.00
SECTION VIEW
H:1"=10' V:1"=2'

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PROJECT NUMBER
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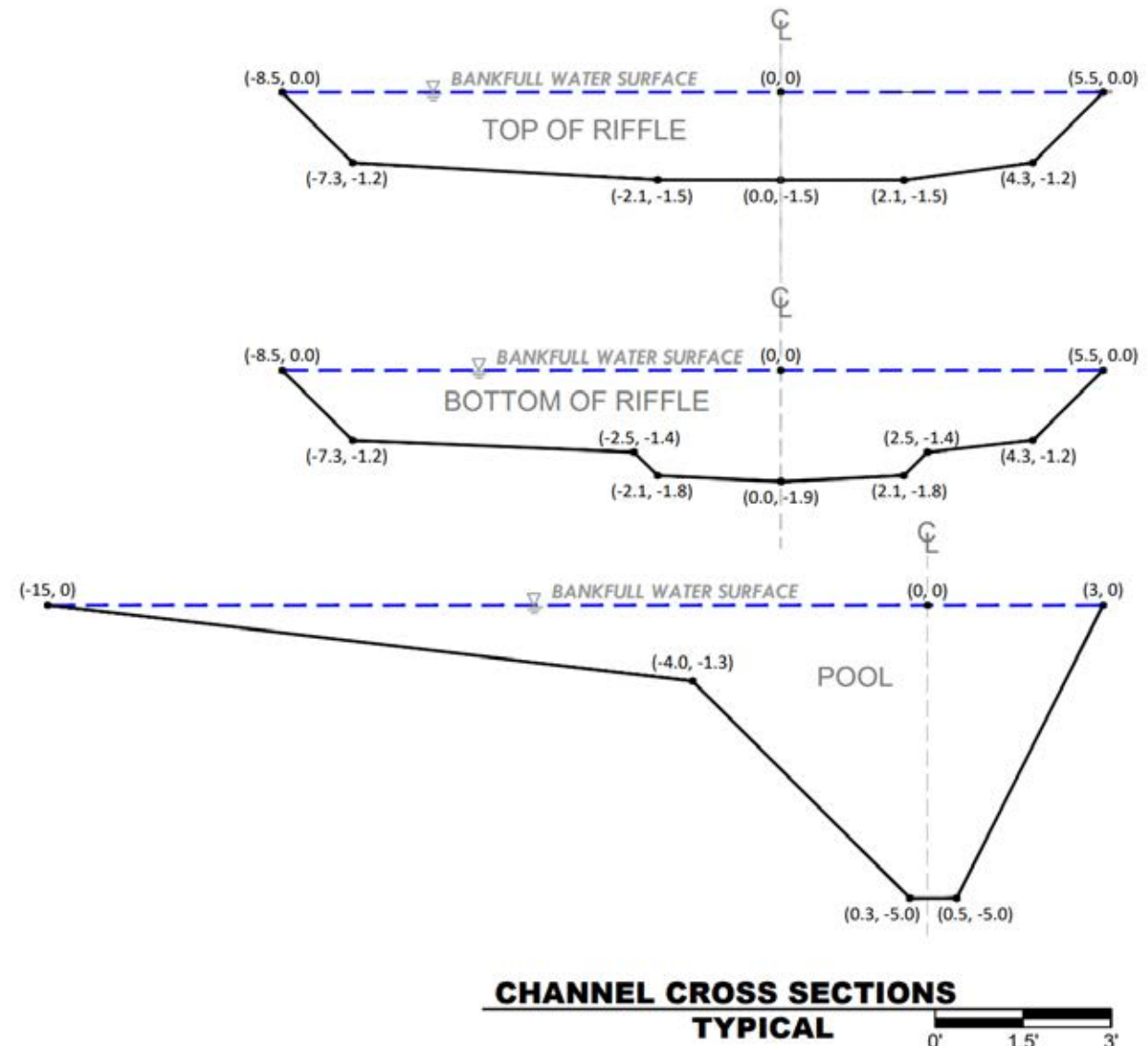
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SHEET 17 OF 34

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BANKFULL CROSS SECTION DESIGN DIMENSIONS			
	Riffle	Run	Pool
	Value (ft)	Value (ft)	Value (ft)
Area	17	18	24
Width/Depth	12	9	14
Range (Low)	10	7	12
Range (High)	14	11	16
Width			
Average	14	13	18
Range (Low)	13	11	17
Range (High)	16	14	20
Avg. Depth			
Average	1.2	1.4	1.3
Range (Low)	1.1	1.3	1.2
Range (High)	1.3	1.6	1.4
Max. Depth			
Average	1.8	2.4	4.3
Range (Low)	1.6	2.1	3.7
Range (High)	2.1	2.8	4.9
Max. Scour	2.4	3.0	5.1



NOTE: COORDINATES ARE REFERENCED FROM TOP OF BANK THALWEG

TYPICAL CHANNEL CROSS SECTION DIMENSIONS
 UPPER O'BRIEN CREEK

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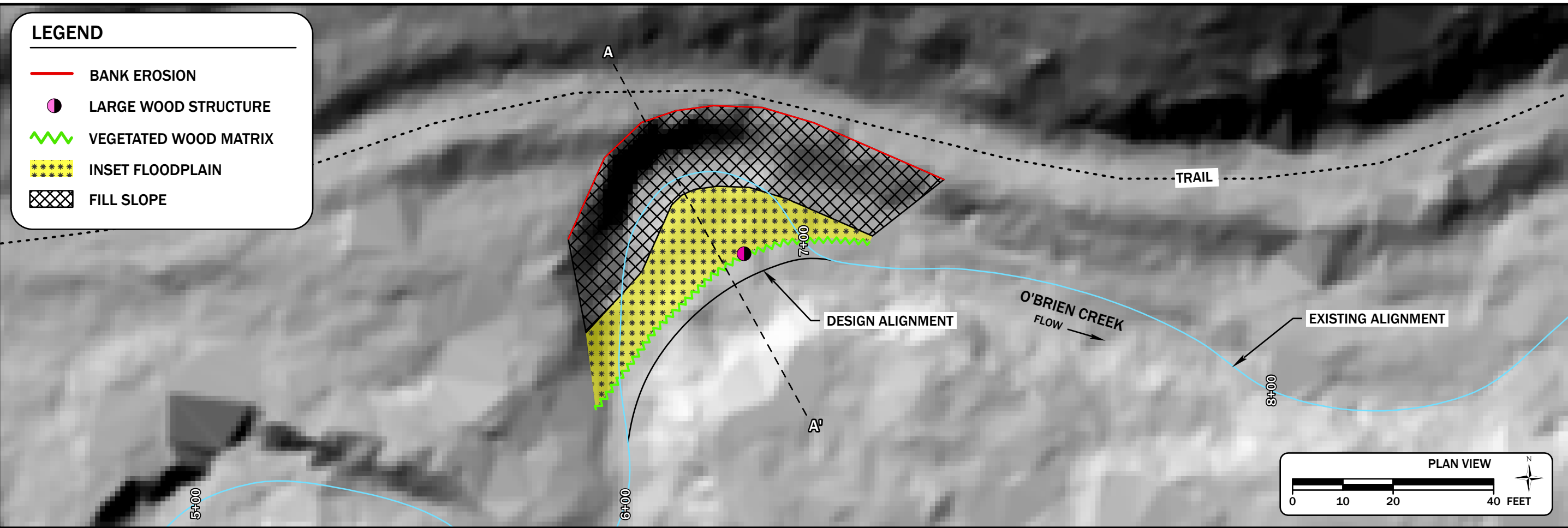
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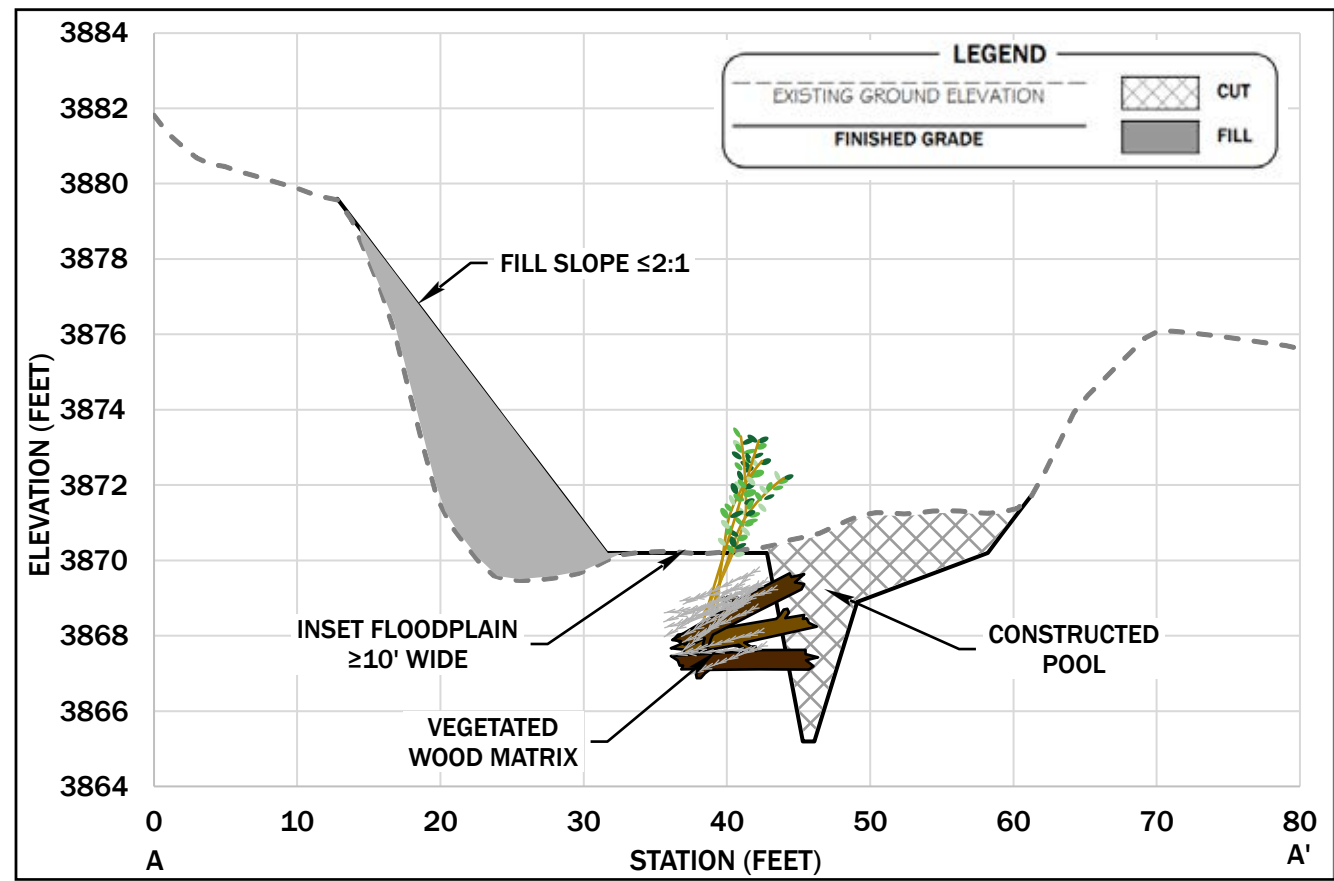
LEGEND

-  BANK EROSION
-  LARGE WOOD STRUCTURE
-  VEGETATED WOOD MATRIX
-  INSET FLOODPLAIN
-  FILL SLOPE



NOTES ON CHANNEL REALIGNMENT

1. CHANNEL REALIGNMENT TREATMENT TO BE IMPLEMENTED AT SITE 3 AND SITE 14.
2. LOCATION OF CONSTRUCTED CHANNEL AND BED UNIT TRANSITIONS WILL BE STAKED BY CONSTRUCTION MANAGER.
3. MATERIAL USED FOR STREAMBANK TREATMENTS AND SLOPE FILL MAY BE SOURCED FROM BERM REMOVAL, WETLAND EXCAVATION, INSET FLOODPLAIN EXCAVATION, AND/OR EXCAVATION ASSOCIATED WITH ROAD REALIGNMENT AND RECONTOURING. MATERIAL TO BE INSPECTED AND APPROVED BY USFS OR CLIENT REPRESENTATIVE PRIOR TO IMPLEMENTATION.
4. SEED ALL DISTURBED AREAS FOLLOWING CONSTRUCTION.








CHANNEL REALIGNMENT
SECTION A-A' NTS

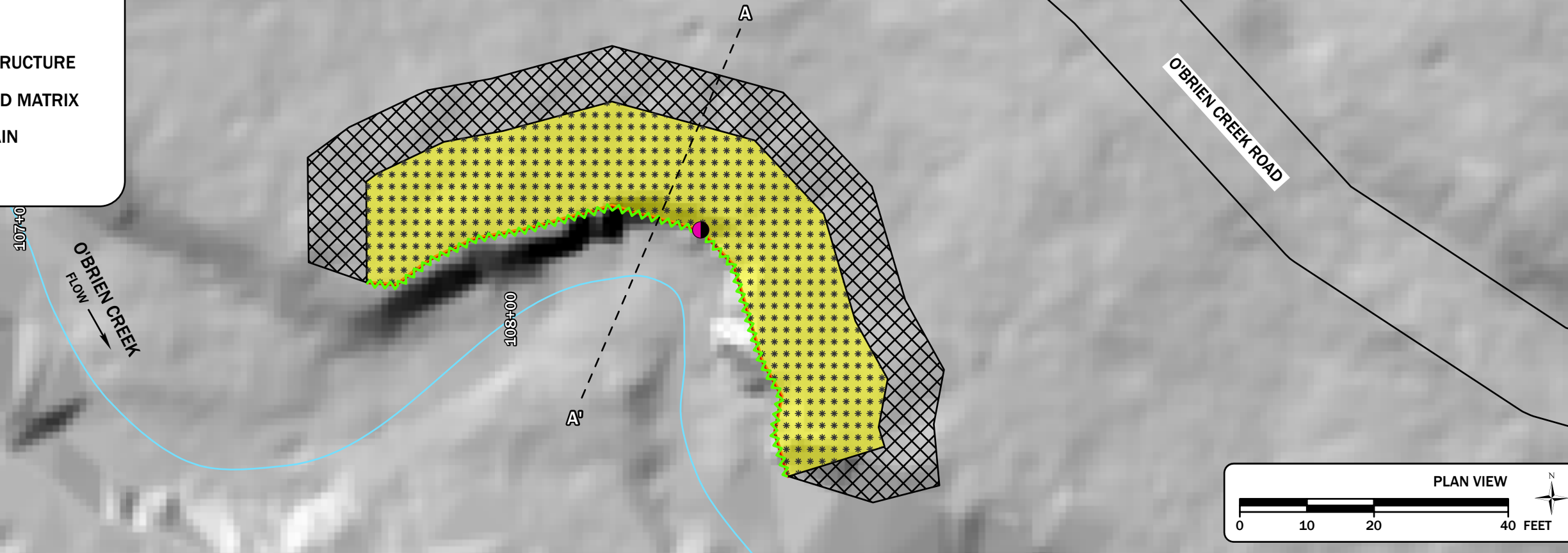
**TYPICAL CHANNEL
REALIGNMENT DETAIL**
UPPER O'BRIEN CREEK

NO.	DATE	BY	DESCRIPTION	CHK
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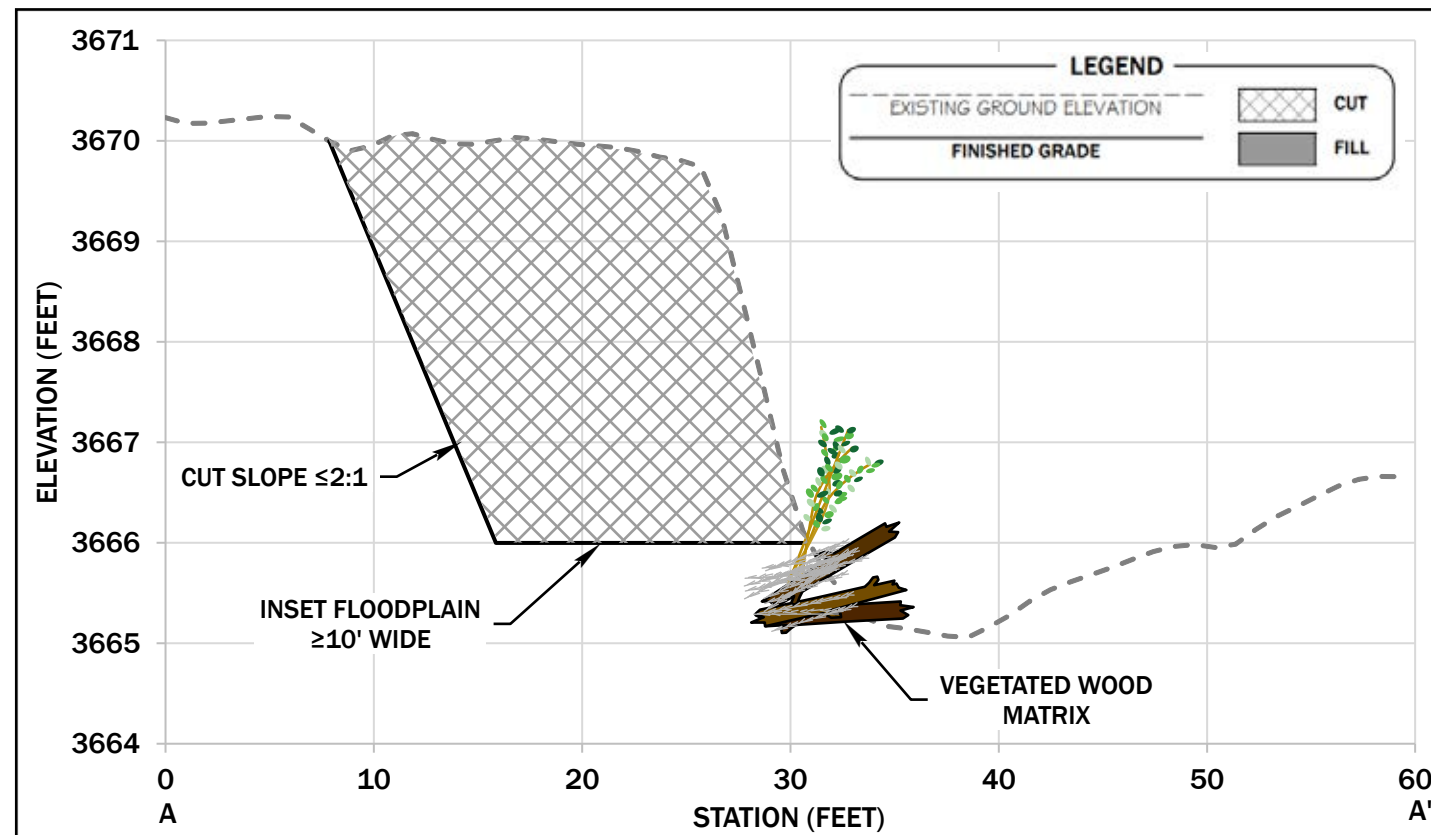
LEGEND

-  BANK EROSION
-  LARGE WOOD STRUCTURE
-  VEGETATED WOOD MATRIX
-  INSET FLOODPLAIN
-  CUT SLOPE



NOTES ON INSET FLOODPLAIN CONSTRUCTION

1. INSET FLOODPLAIN TREATMENT TO BE IMPLEMENTED AT SITES 5, 10, 11, 12, 18, AND 19.
2. MATERIAL USED FOR STREAMBANK TREATMENTS MAY BE SOURCED FROM BERM REMOVAL, WETLAND EXCAVATION, INSET FLOODPLAIN EXCAVATION, AND/OR EXCAVATION ASSOCIATED WITH ROAD REALIGNMENT AND RECONTOURING. MATERIAL TO BE INSPECTED AND APPROVED BY USFS OR CLIENT REPRESENTATIVE PRIOR TO IMPLEMENTATION.
3. SEED ALL DISTURBED AREAS FOLLOWING CONSTRUCTION.



INSET FLOODPLAIN
SECTION A-A' NTS

**TYPICAL INSET
FLOODPLAIN DETAIL**
UPPER O'BRIEN CREEK

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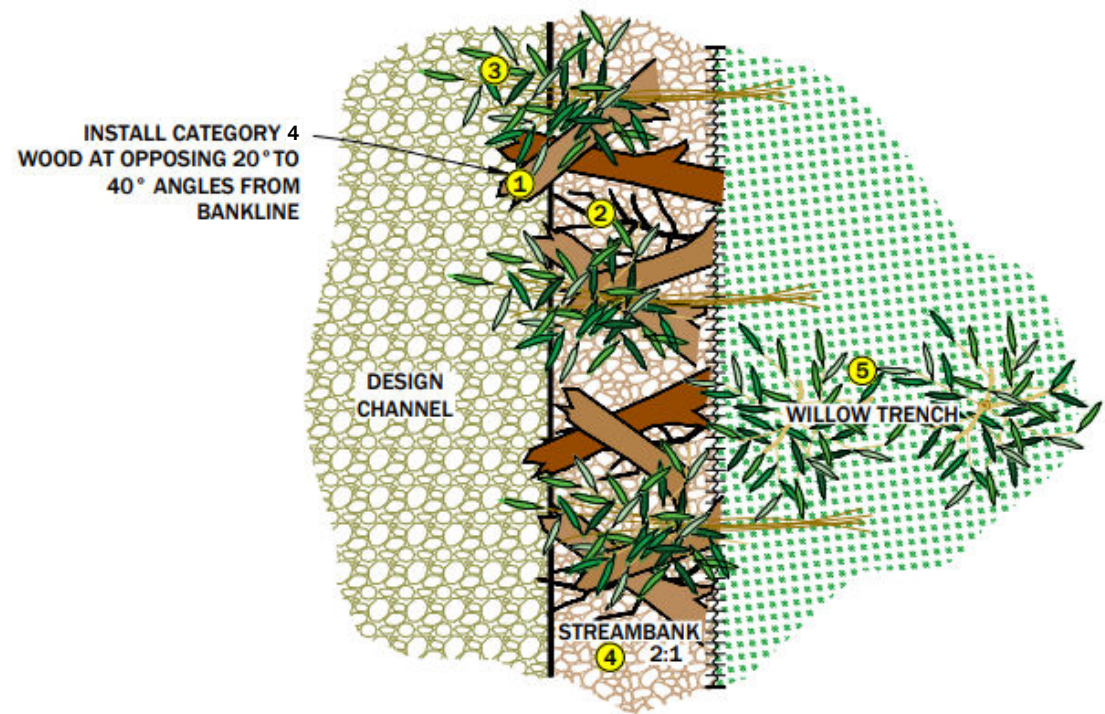
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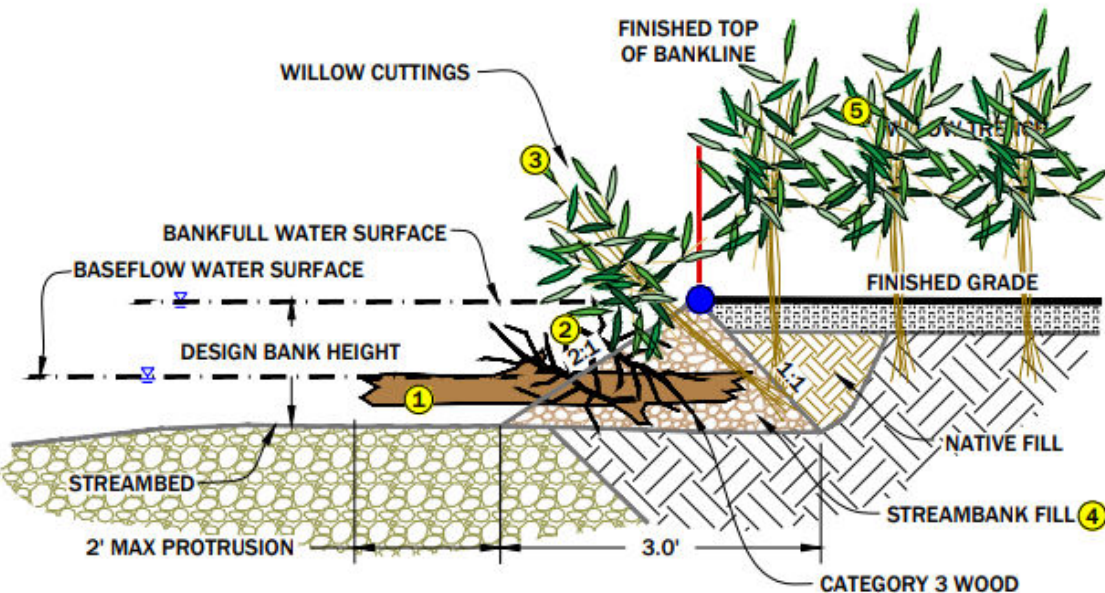
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SHEET 20 OF 34

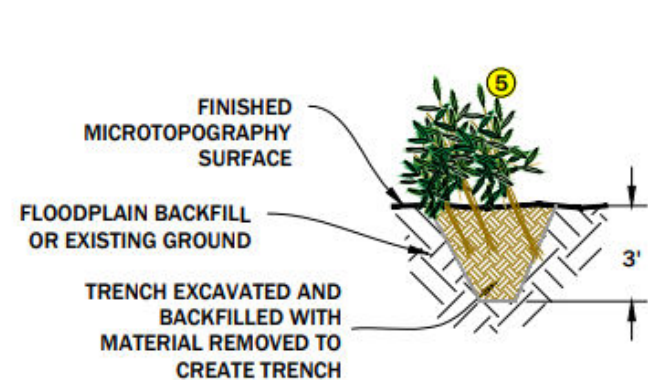
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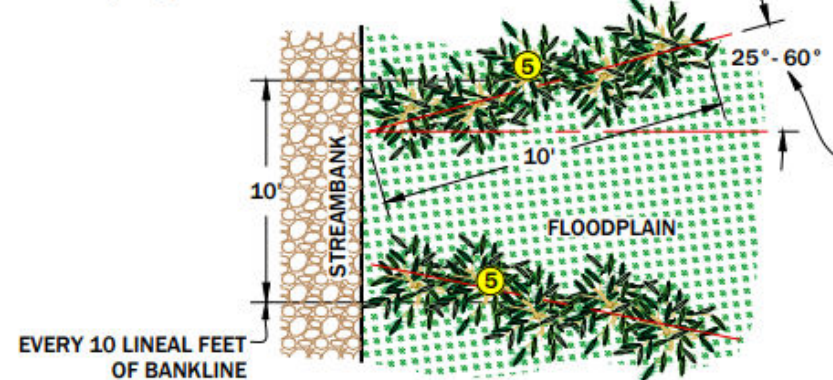
1 VEGETATED WOOD MATRIX - TYPE 1
PLAN VIEW
1" = 3'



2 VEGETATED WOOD MATRIX - TYPE 1
SECTION VIEW
1" = 3'

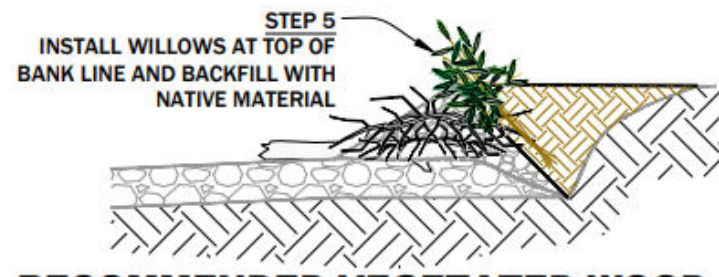
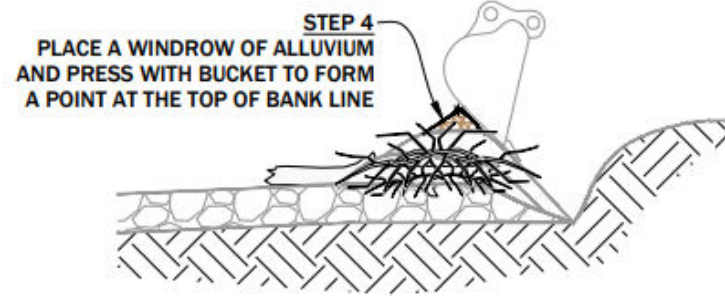
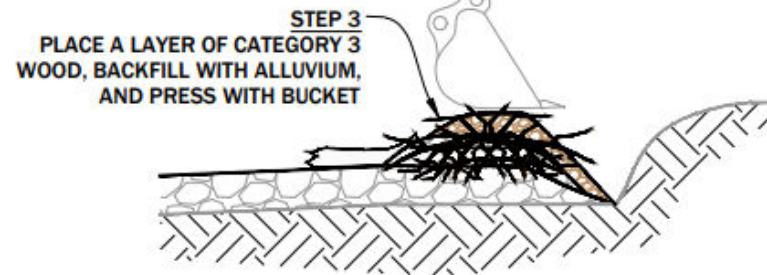
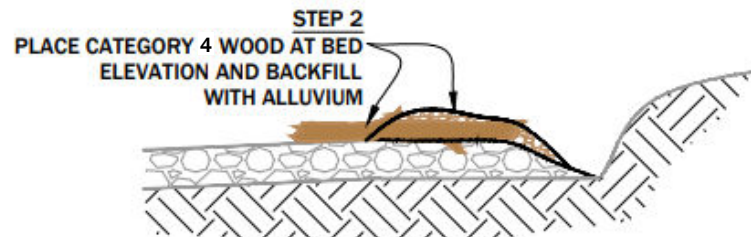
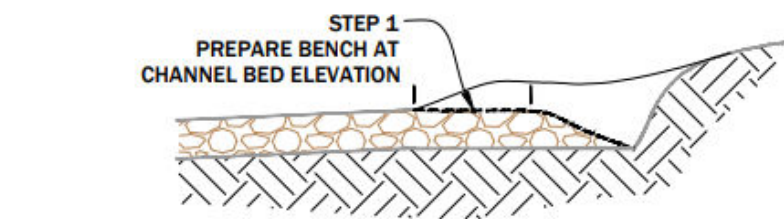


4 WILLOW TRENCH
SECTION VIEW
NTS



5 WILLOW TRENCH
PLAN VIEW
NTS

EVERY 10 LINEAL FEET OF BANKLINE INSTALL A 10 FOOT LONG WILLOW TRENCH



3 RECOMMENDED VEGETATED WOOD MATRIX INSTALLATION SEQUENCE
SECTION VIEW
1" = 5'

STREAMBANK FILL GRADATION	
SIZE (IN)	PERCENT PASSING
10	100
6	90-100
4	50-80
3	30-50
1	10-30
0.08	10

NOTE: MIX SALVAGED MATERIAL AND IMPORTED MATERIAL TO ACHIEVE SPECIFIED GRADATION

TYPE 1 - VEGETATED WOOD MATRIX MATERIAL SCHEDULE (PER LINEAL FOOT)			
ITEM	DIA. (IN)	QTY.	
1	CATEGORY 4 WOOD	2"-4"	0.2500
2	CATEGORY 3 WOOD	< 2"	2
3	WILLOW CUTTINGS	0.25"-1.0"	3
4	STREAMBANK ALLUVIUM	6" MINUS	0.1 CY

WILLOW TRENCH MATERIAL SCHEDULE (PER LINEAL FOOT)			
ITEM	DIA.	QUANTITY (EA)	
5	WILLOW CUTTINGS	0.25" - 1"	5

GENERAL NOTES

1. CONSTRUCTION OF THE VEGETATED WOOD MATRIX WILL OCCUR AFTER THE CHANNEL AND FLOODPLAIN BACKFILL IS PLACED AND THE CHANNEL STREAMBED IS CONSTRUCTED. INSTALLATION OF FLOODPLAIN TREATMENT SHALL BE COMPLETED AFTER VEGETATED WOOD MATRIXES ARE INSTALLED.
2. IF VEGETATED WOOD MATRIX STRUCTURES ARE INSTALLED PRIOR TO OCTOBER 1, LEAVE BACK TRENCH UNFILLED AND COMPLETE STRUCTURE WHEN DORMANT WILLOWS ARE AVAILABLE.
3. IT IS CONTRACTOR'S RESPONSIBILITY TO CUT WOOD INTO APPROPRIATE SIZE LENGTHS TO FIT STRUCTURE DIMENSIONS.
4. ANY CHANGES TO THE CONSTRUCTION SEQUENCE MUST BE APPROVED BY CONSTRUCTION MANAGER.
5. CONTRACTOR SHALL MARK AND CONSTRUCTION ENGINEER SHALL APPROVE THE GENERAL LOCATION FOR EACH VEGETATED WOOD MATRIX STRUCTURE PRIOR TO CONSTRUCTION.

NOTES ON VEGETATED WOOD MATRIX INSTALLATION

1. EXCAVATE TO THE EXCAVATION LIMITS AS SHOWN. EXCAVATED MATERIAL SHALL BE STOCKPILED ON THE FLOODPLAIN OUTSIDE OF THE IMMEDIATE WORK AREA.
2. PREPARE THE BENCH OF THE STRUCTURE BY PLACING CHANNEL STREAMBED ALLUVIUM FROM THE BASE OF THE EXCAVATION DEPTH/BOTTOM OF EXCAVATION TO WITHIN 1.0-FT. OF FINISHED GRADE.
3. CATEGORY 4 AND CATEGORY 3 WOOD, AND CHANNEL STREAMBED ALLUVIUM SHALL BE PLACED IN ALTERNATING LAYERS AND BUCKET COMPACTED UP TO THE TOP OF BANK ELEVATION AS SHOWN BELOW IN THE INSTALLATION SEQUENCE. PLACE SIX (6) FT TO EIGHT (8) FT. DORMANT WILLOW CUTTINGS AT A DENSITY OF 5 PER LINEAL FT ALONG THE TOP OF BANK LINE ELEVATION. WILLOW CUTTINGS SHALL SLOPE AT AN APPROXIMATE 1:1 SLOPE AS SHOWN IN SECTION VIEW. STEMS MAY OVERLAP. THE CUT ENDS SHALL BE PLACED AT THE BASE OF THE SLOPES WITH THE UN-CUT ENDS EXTENDING BEYOND THE EDGE OF THE TRENCH SO NO GREATER THAN ONE-THIRD OF THE TOTAL CUTTING LENGTH IS EXPOSED BEYOND THE TOP OF BANK EDGE. WILLOW CUTTINGS SHOULD INTERCEPT THE DESIGN TOP OF BANK LINE AS SHOWN IN STEP 5 OF THE INSTALLATION SEQUENCE.
4. THE UPSTREAM AND DOWNSTREAM ENDS OF THE STRUCTURE SHALL TRANSITION SMOOTHLY INTO ADJACENT STREAMBANK STRUCTURES TO MINIMIZE EROSION, FLANKING, AND BANK FAILURE. STRUCTURE ENDS MAY BE STABILIZED WITH ADDITIONAL CATEGORY 1 ROCK AS APPROVED BY ENGINEER.
5. AFTER INSTALLATION OF THE VEGETATED WOOD MATRIX, BACKFILL THE STRUCTURE WITH STOCKPILED MATERIAL TO FINISHED GRADE, AND BUCKET COMPACT. INSTALL WILLOW TRENCHES AT A RATE OF 2 PER LINEAL FOOT (OR 20 PER TRENCH) AS SHOWN. NO AREAS BEHIND THE FINISHED BANKLINE ARE TO BE LEFT BELOW FINISHED GRADE.

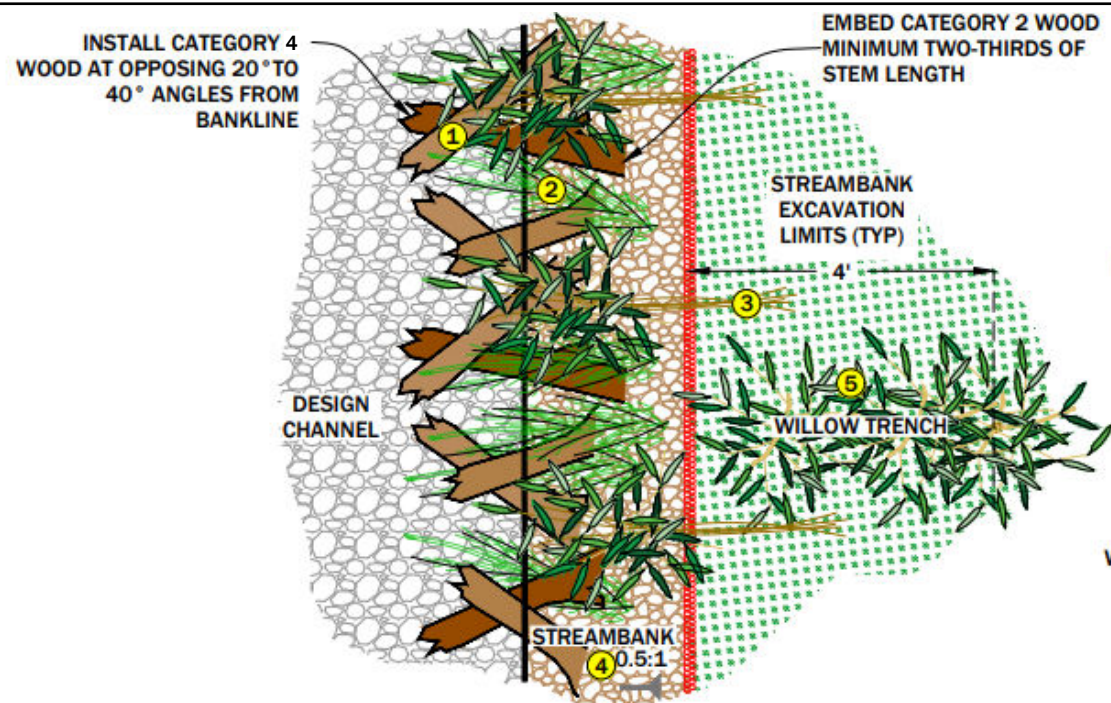
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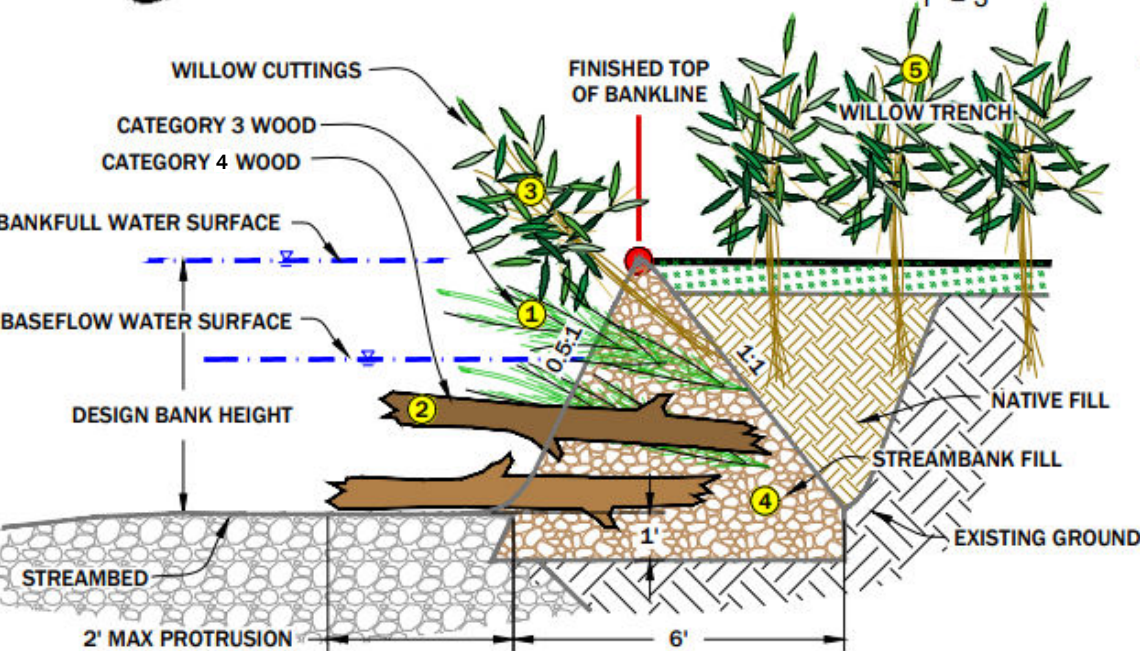
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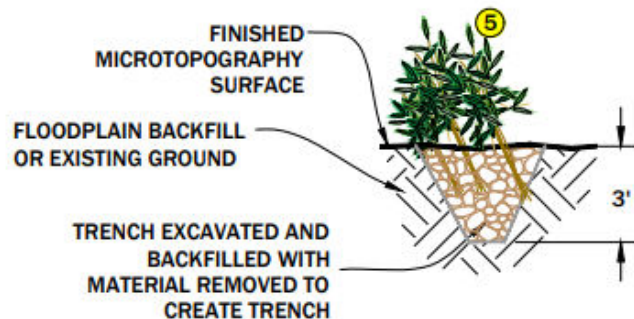
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1 VEGETATED WOOD MATRIX - TYPE 2
PLAN VIEW
1" = 3'

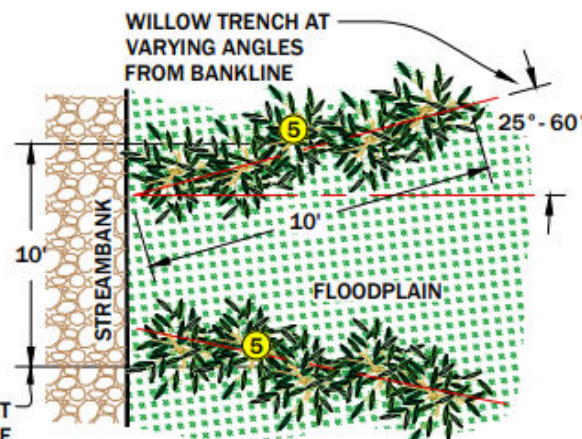


2 VEGETATED WOOD MATRIX - TYPE 2
SECTION VIEW
1" = 3'

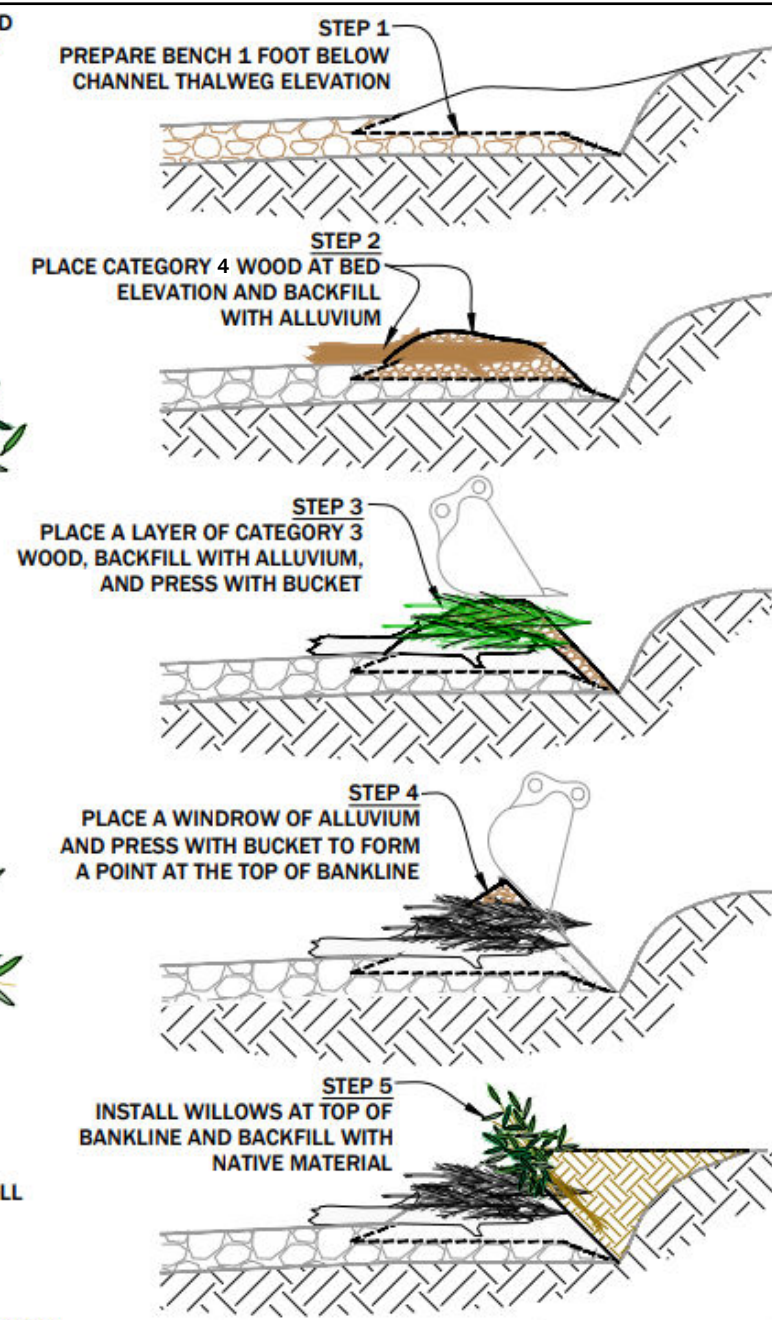


4 WILLOW TRENCH
SECTION VIEW
NTS

EVERY 10 LINEAL FEET OF BANKLINE INSTALL A 10 FOOT LONG WILLOW TRENCH



5 WILLOW TRENCH
PLAN VIEW
NTS



3 RECOMMENDED VEGETATED WOOD MATRIX INSTALLATION SEQUENCE
SECTION VIEW
1" = 5'

GENERAL NOTES

- IF VEGETATED WOOD MATRIX STRUCTURES ARE INSTALLED PRIOR TO OCTOBER 1, LEAVE BACK TRENCH UNFILLED AND COMPLETE STRUCTURE WHEN DORMANT WILLOWS ARE AVAILABLE.
- IT IS CONTRACTOR'S RESPONSIBILITY TO CUT WOOD INTO APPROPRIATE SIZE LENGTHS TO FIT STRUCTURE DIMENSIONS.
- ANY CHANGES TO THE CONSTRUCTION SEQUENCE MUST BE APPROVED BY CONSTRUCTION MANAGER.
- CONTRACTOR SHALL MARK AND CONSTRUCTION ENGINEER SHALL APPROVE THE GENERAL LOCATION FOR EACH VEGETATED WOOD MATRIX STRUCTURE PRIOR TO CONSTRUCTION.

INSTALLATION NOTES

- EXCAVATE TO THE EXCAVATION LIMITS AS SHOWN. EXCAVATED MATERIAL SHALL BE STOCKPILED ON THE FLOODPLAIN OUTSIDE OF THE IMMEDIATE WORK AREA.
- PREPARE THE BENCH OF THE STRUCTURE BY PLACING STREAMBED ALLUVIUM MINIMUM 1 FOOT BELOW CHANNEL THALWEG ELEVATION.
- CATEGORY 4 AND CATEGORY 3 WOOD, AND STREAMBED ALLUVIUM SHALL BE PLACED IN ALTERNATING LIFTS AND BUCKET COMPACTED UP TO THE TOP OF BANK ELEVATION AS SHOWN IN THE INSTALLATION SEQUENCE. PLACE 6 FT TO 8 FT. DORMANT WILLOW CUTTINGS AT A DENSITY OF 5 PER LINEAR FT ALONG THE TOP OF BANK LINE ELEVATION. WILLOW CUTTINGS SHALL SLOPE AT AN APPROXIMATE 1:1 SLOPE AS SHOWN IN SECTION VIEW. STEMS MAY OVERLAP. THE CUT ENDS SHALL BE PLACED AT THE BASE OF THE SLOPES WITH THE UN-CUT ENDS EXTENDING BEYOND THE EDGE OF THE TRENCH SO NO GREATER THAN ONE-THIRD OF THE TOTAL CUTTING LENGTH IS EXPOSED BEYOND THE TOP OF BANKLINE. WILLOW CUTTINGS SHOULD INTERCEPT THE DESIGN TOP OF BANKLINE AS SHOWN IN STEP 5 OF THE INSTALLATION SEQUENCE.
- THE UPSTREAM AND DOWNSTREAM ENDS OF THE STRUCTURE SHALL TRANSITION SMOOTHLY INTO ADJACENT STREAMBANK STRUCTURES TO MINIMIZE EROSION, FLANKING, AND BANK FAILURE.
- AFTER INSTALLATION OF THE VEGETATED WOOD MATRIX, BACKFILL THE STRUCTURE WITH STOCKPILED MATERIAL TO FINISHED GRADE, AND BUCKET COMPACT. INSTALL WILLOW TRENCHES AT A RATE OF 5 PER LINEAR FOOT (OR 50 PER TRENCH) AS SHOWN. NO AREAS BEHIND THE FINISHED BANKLINE ARE TO BE LEFT BELOW FINISHED GRADE.

TYPE 2 - VEGETATED WOOD MATRIX MATERIAL SCHEDULE (PER LINEAR FOOT)		
ITEM	DIA. (IN)	QTY.
1 CATEGORY 4 WOOD	2"-4"	0.25
2 CATEGORY 3 WOOD	< 2"	2
3 BANK WILLOW CUTTINGS	0.25"-1.0"	5
4 STREAMBANK ALLUVIUM	6" MINUS	0.3 CY

WILLOW TRENCH MATERIAL SCHEDULE (PER LINEAL FOOT)		
ITEM	DIA.	QUANTITY (EA)
5 TRENCH WILLOW CUTTINGS	0.25" - 1"	5

STREAMBANK FILL GRADATION	
SIZE (IN)	PERCENT PASSING
6	100
4	90-100
3	50-80
1	30-50
0.05	10-30
FINES	10

NOTE: MIX SALVAGED MATERIAL AND IMPORTED MATERIAL TO ACHIEVE SPECIFIED GRADATION

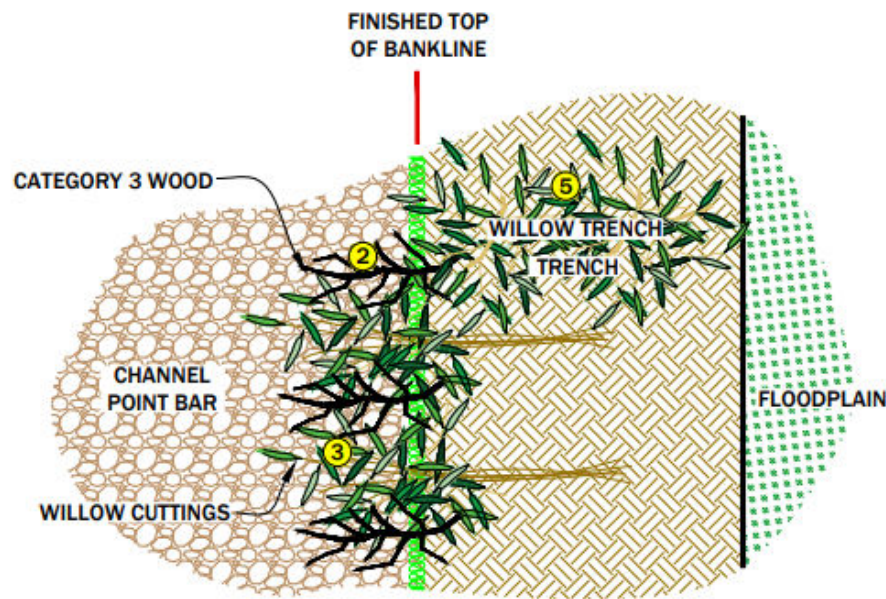
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JM	FINAL DESIGN	DB	03-13-26	3

PROJECT NUMBER
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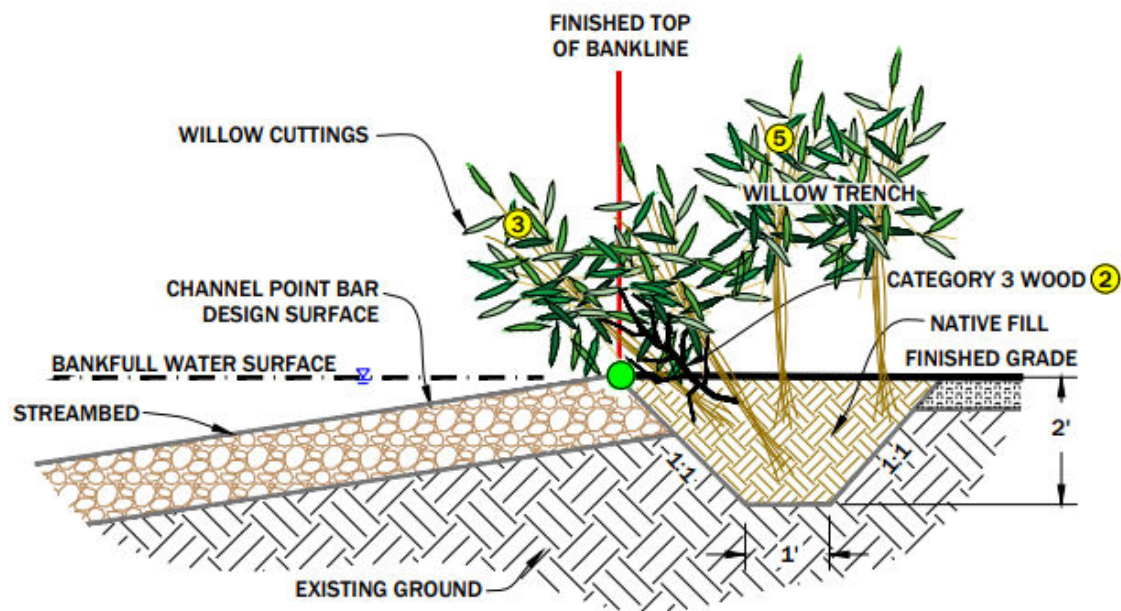
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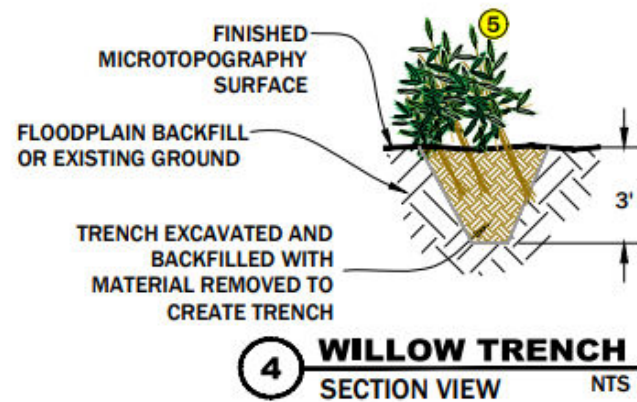
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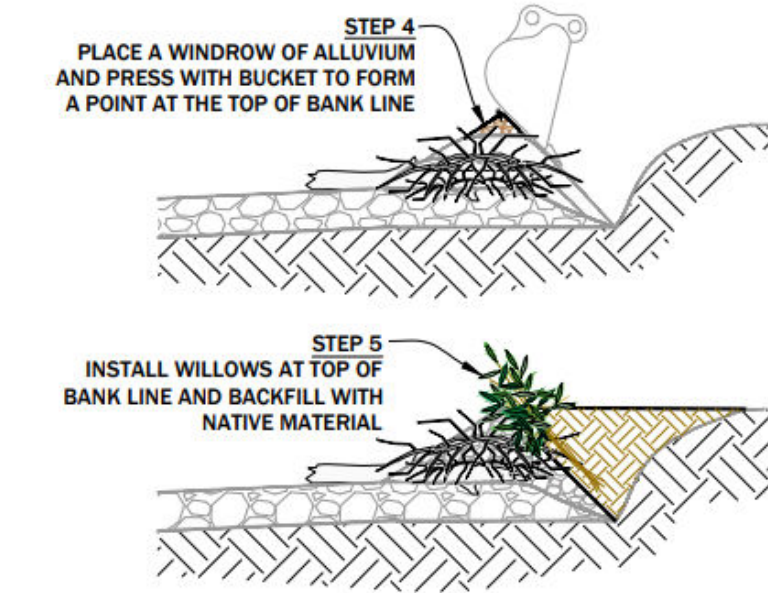
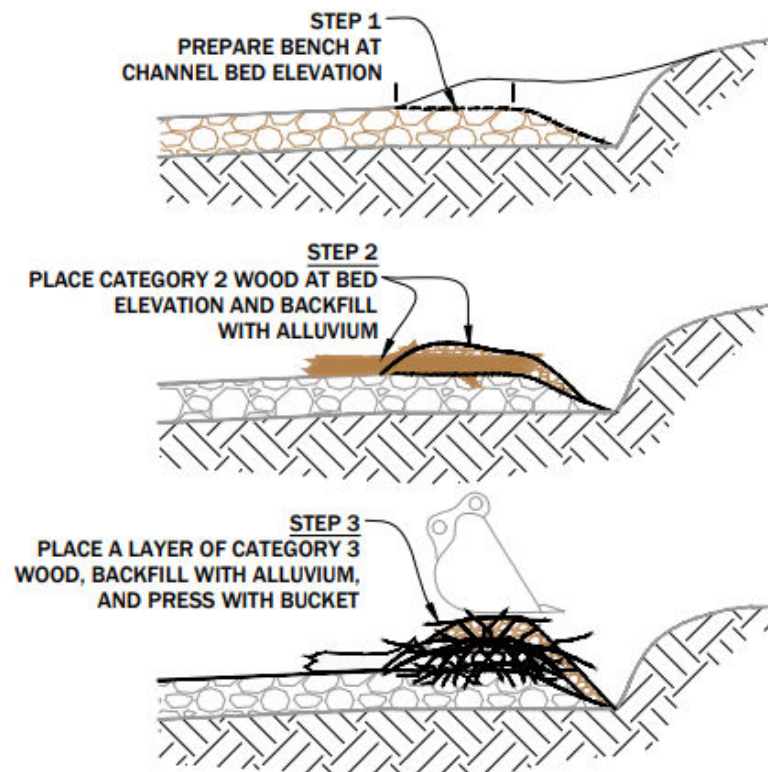
1 VEGETATED WOOD MATRIX - TYPE 3
PLAN VIEW
1" = 3'



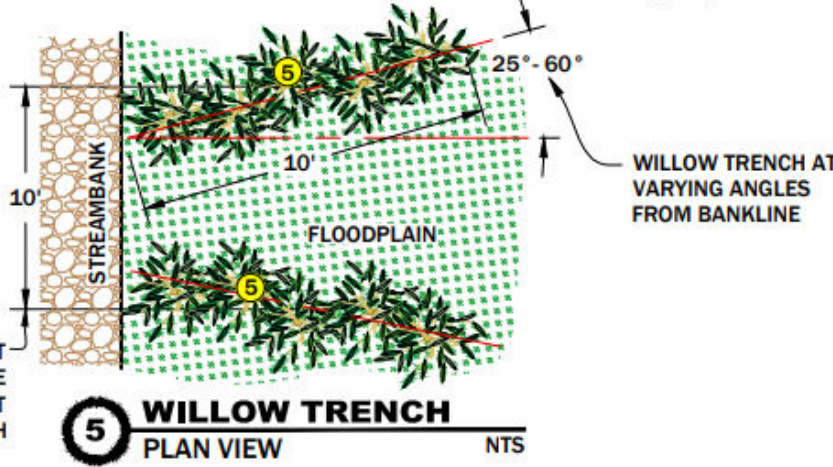
2 VEGETATED WOOD MATRIX - TYPE 3
SECTION VIEW
1" = 3'



4 WILLOW TRENCH
SECTION VIEW
NTS



3 RECOMMENDED VEGETATED WOOD MATRIX INSTALLATION SEQUENCE
SECTION VIEW
1" = 5'



5 WILLOW TRENCH
PLAN VIEW
NTS

GENERAL NOTES

1. CONSTRUCTION OF THE VEGETATED WOOD MATRIX WILL OCCUR AFTER THE CHANNEL AND FLOODPLAIN BACKFILL IS PLACED AND THE CHANNEL STREAMBED IS CONSTRUCTED. INSTALLATION OF FLOODPLAIN TREATMENT SHALL BE COMPLETED AFTER VEGETATED WOOD MATRIXES ARE INSTALLED.
2. IF VEGETATED WOOD MATRIX STRUCTURES ARE INSTALLED PRIOR TO OCTOBER 1, LEAVE BACK TRENCH UNFILLED AND COMPLETE STRUCTURE WHEN DORMANT WILLOWS ARE AVAILABLE.
3. IT IS CONTRACTOR'S RESPONSIBILITY TO CUT WOOD INTO APPROPRIATE SIZE LENGTHS TO FIT STRUCTURE DIMENSIONS.
4. ANY CHANGES TO THE CONSTRUCTION SEQUENCE MUST BE APPROVED BY CONSTRUCTION MANAGER.
5. CONTRACTOR SHALL MARK AND CONSTRUCTION ENGINEER SHALL APPROVE THE GENERAL LOCATION FOR EACH VEGETATED WOOD MATRIX STRUCTURE PRIOR TO CONSTRUCTION.

NOTES ON VEGETATED WOOD MATRIX INSTALLATION

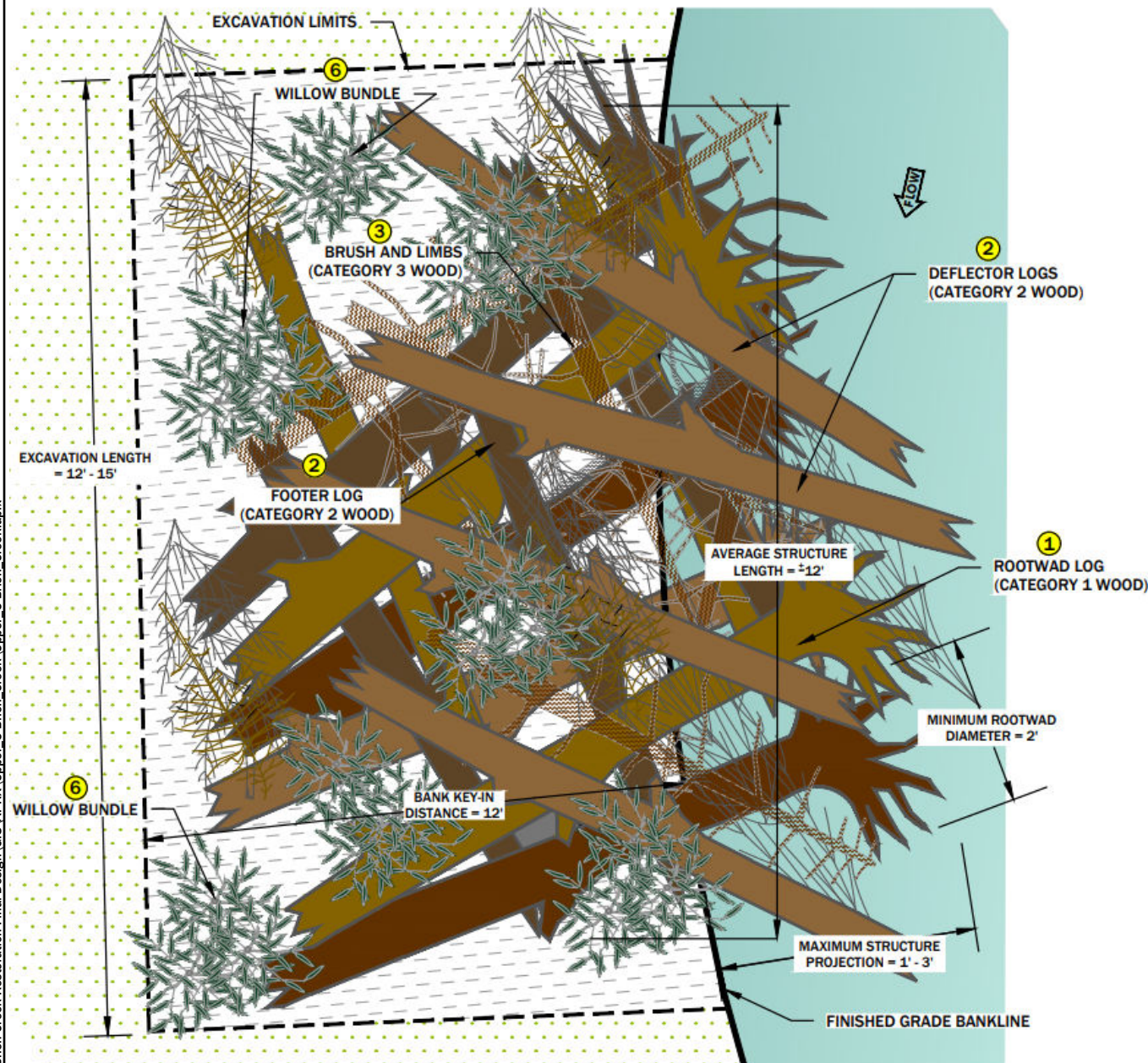
1. EXCAVATE TO THE EXCAVATION LIMITS AS SHOWN. EXCAVATED MATERIAL SHALL BE STOCKPILED ON THE FLOODPLAIN OUTSIDE OF THE IMMEDIATE WORK AREA.
2. PREPARE THE BENCH OF THE STRUCTURE BY PLACING CHANNEL STREAMBED ALLUVIUM FROM THE BASE OF THE EXCAVATION DEPTH/BOTTOM OF EXCAVATION TO WITHIN 1.0-FT. OF FINISHED GRADE.
3. CATEGORY 2 AND CATEGORY 3 WOOD, AND CHANNEL STREAMBED ALLUVIUM SHALL BE PLACED IN ALTERNATING LAYERS AND BUCKET COMPACTED UP TO THE TOP OF BANK ELEVATION AS SHOWN BELOW IN THE INSTALLATION SEQUENCE. PLACE SIX (6) FT TO EIGHT (8) FT. DORMANT WILLOW CUTTINGS AT A DENSITY OF 5 PER LINEAR FT ALONG THE TOP OF BANK LINE ELEVATION. WILLOW CUTTINGS SHALL SLOPE AT AN APPROXIMATE 1:1 SLOPE AS SHOWN IN SECTION VIEW. STEMS MAY OVERLAP. THE CUT ENDS SHALL BE PLACED AT THE BASE OF THE SLOPES WITH THE UN-CUT ENDS EXTENDING BEYOND THE EDGE OF THE TRENCH SO NO GREATER THAN ONE-THIRD OF THE TOTAL CUTTING LENGTH IS EXPOSED BEYOND THE TOP OF BANK EDGE. WILLOW CUTTINGS SHOULD INTERCEPT THE DESIGN TOP OF BANK LINE AS SHOWN IN STEP 5 OF THE INSTALLATION SEQUENCE.
4. THE UPSTREAM AND DOWNSTREAM ENDS OF THE STRUCTURE SHALL TRANSITION SMOOTHLY INTO ADJACENT STREAMBANK STRUCTURES TO MINIMIZE EROSION, FLANKING, AND BANK FAILURE. STRUCTURE ENDS MAY BE STABILIZED WITH ADDITIONAL CATEGORY 1 ROCK AS APPROVED BY ENGINEER.
5. AFTER INSTALLATION OF THE VEGETATED WOOD MATRIX, BACKFILL THE STRUCTURE WITH STOCKPILED MATERIAL TO FINISHED GRADE, AND BUCKET COMPACT. INSTALL WILLOW TRENCHES AT A RATE OF 2 PER LINEAR FOOT (OR 20 PER TRENCH) AS SHOWN. NO AREAS BEHIND THE FINISHED BANKLINE ARE TO BE LEFT BELOW FINISHED GRADE.

TYPE 3 - VEGETATED WOOD MATRIX MATERIAL SCHEDULE (PER LINEAR FOOT)		
ITEM	DIA. (IN)	QTY.
1 CATEGORY 3 WOOD	< 2"	2
2 WILLOW CUTTINGS	0.25"-1.0"	3

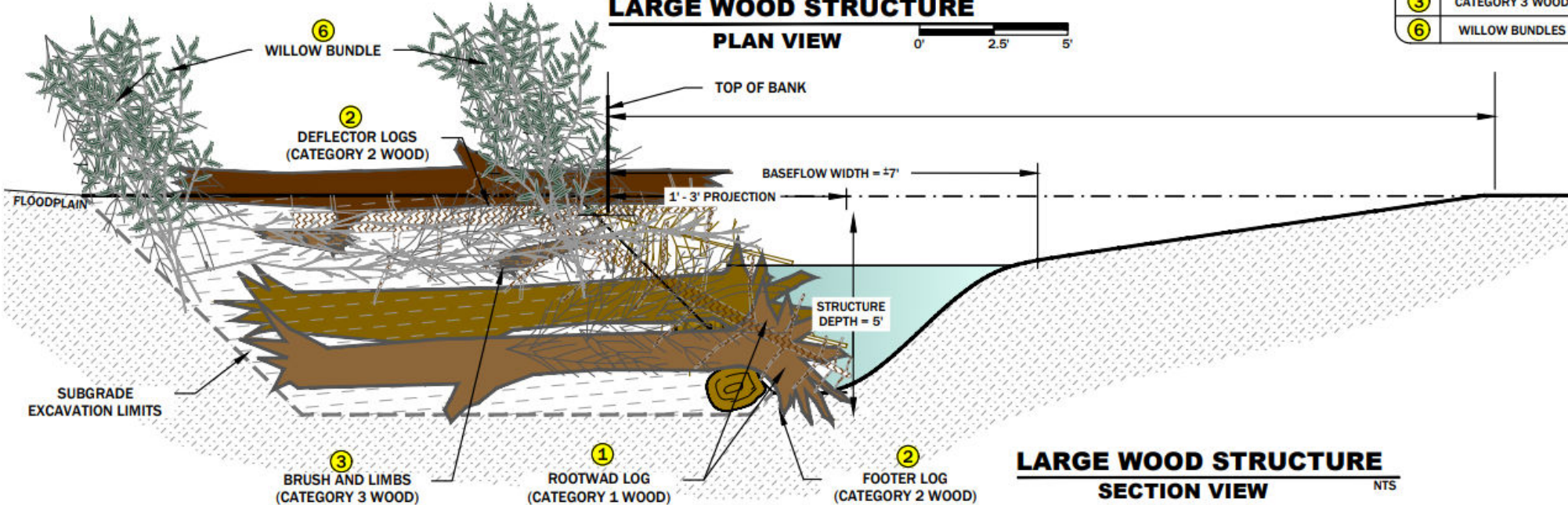
WILLOW TRENCH MATERIAL SCHEDULE (PER LINEAR FOOT)		
ITEM	DIA.	QUANTITY (EA)
5 WILLOW CUTTINGS	0.25" - 1"	5

NO.	DATE	BY	DESCRIPTION	CHK
1	02-01-24	DB	PRELIMINARY DESIGN	JM
2	02-15-24	DB	PRELIMINARY DESIGN	JM
3	03-13-26	DB	FINAL DESIGN	JM

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LARGE WOOD STRUCTURE PLAN VIEW



LARGE WOOD STRUCTURE SECTION VIEW NTS

GENERAL NOTES

1. CONSTRUCTION OF THE LARGE WOOD STRUCTURE WILL OCCUR BEFORE THE CONSTRUCTED CHANNEL STREAMBED AND VEGETATED WOOD MATRIX BANK TREATMENTS ARE INSTALLED. INSTALLATION OF FLOODPLAIN TREATMENT SHALL BE COMPLETED AFTER THE LARGE WOOD STRUCTURES ARE INSTALLED.
2. ANY CHANGES TO THE CONSTRUCTION SEQUENCE MUST BE APPROVED BY THE CONSTRUCTION MANAGER.
3. CONSTRUCTION MANAGER SHALL MARK THE GENERAL CONSTRUCTION LOCATION FOR EACH LARGE WOOD STRUCTURE PRIOR TO CONSTRUCTION.

NOTES ON LARGE WOOD STRUCTURE INSTALLATION

1. EXCAVATE TO THE EXCAVATION LIMITS. EXCAVATED MATERIAL SHALL BE STOCKPILED ON THE FLOODPLAIN OUTSIDE OF THE IMMEDIATE WORK AREA.
2. INSTALL TWO FOOTER LOGS (CATEGORY 2 WOOD) AT THE BASE OF THE EXCAVATED TRENCH AT THE ORIENTATIONS NOTED IN PLAN VIEW. FOOTER LOGS SHALL PROJECT INTO THE DESIGN CHANNEL NO GREATER THAN 3 FT OR AT DISTANCE DIRECTED BY THE CONSTRUCTION MANAGER. EXPOSED ENDS OF FOOTER LOGS SHALL BE BROKEN/ROUGHENED SO AS TO APPEAR NATURAL. SAWED ENDS OF FOOTER LOGS SHALL NOT BE EXPOSED.
3. INSTALL TWO ROOTWAD LOGS (CATEGORY 1 WOOD) INTERSECTING BOTH FOOTER LOGS AT THE ORIENTATION NOTED IN PLAN VIEW. THE UPSTREAM ROOTWAD SHALL NOT PROJECT INTO THE CHANNEL AND SHALL BE FLUSH WITH THE FINISHED BANK LINE. THE DOWNSTREAM ROOTWAD SHALL PROJECT NO GREATER THAN 1 - 3 FT. BEYOND THE FINISHED BANK LINE.
4. BACKFILL TRENCH WITH STOCKPILED MATERIAL UP TO THE TOP OF THE ROOTWAD LOGS. BACKFILL SHALL BE BUCKET COMPACTED.
5. INSTALL BRUSH AND LIMBS (CATEGORY 3 WOOD) AT APPROXIMATE 45° ANGLE TO ROOTWAD STEMS. BRUSH AND LIMBS SHALL PROJECT NO GREATER THAN 3 FT BEYOND THE FINISHED BANK LINE.
6. INSTALL ONE ROOTWAD LOG (CATEGORY 1 WOOD) ON TOP OF THE BRUSH AND LIMBS AT THE ORIENTATION NOTED IN PLAN VIEW. THE TOP OF THE ROOTWAD STEMS SHALL SIT AT OR BELOW BASEFLOW ELEVATION. THE UPSTREAM ROOTWAD SHALL NOT PROJECT INTO THE CHANNEL AND SHALL BE FLUSH WITH THE FINISHED BANK LINE. THE DOWNSTREAM ROOTWAD SHALL PROJECT NO GREATER THAN 3 FT. BEYOND THE FINISHED BANK LINE.
7. INSTALL BRUSH AND LIMBS (CATEGORY 3 WOOD) UP TO TOP OF BANK AT APPROXIMATE 45° ANGLE TO ROOTWAD STEMS. BRUSH AND LIMBS SHALL PROJECT NO GREATER THAN 3 FT BEYOND THE FINISHED BANK LINE.
8. PLACE TWO WILLOW BUNDLES INTERWOVEN INTO WOOD MATRIX AS SHOWN IN THE PLAN VIEW. WILLOW BUNDLES SHALL BE SET AS TO BE IN CONTACT WITH LOW FLOW WATER SURFACE ELEVATION.
9. BACKFILL STRUCTURE WITH STOCKPILED MATERIAL UP TO THE TOP OF BANK LINE ELEVATION. BACKFILL SHALL BE BUCKET COMPACTED.
10. INSTALL TWO DEFLECTOR LOGS (CATEGORY 2 WOOD) AT APPROXIMATE 45° ANGLE TO ROOTWAD STEMS. TOP OF DEFLECTOR LOGS CAN BE UP TO 0.5 FT ABOVE TOP OF BANK ELEVATION AND SHALL PROJECT NO GREATER THAN 3 FT. BEYOND THE FINISHED BANK LINE. EXPOSED ENDS OF FOOTER LOGS SHALL BE BROKEN/ROUGHENED SO AS TO APPEAR NATURAL. SAWED ENDS OF FOOTER LOGS SHALL NOT BE EXPOSED.
11. PLACE AND BUCKET COMPACT STOCKPILED MATERIAL TO THE FINISHED BANK LINE. NO AREAS BEHIND THE FINISHED BANKLINE ARE TO BE LEFT BELOW FINISHED GRADE.

MATERIAL SCHEDULE (PER STRUCTURE)

ITEM	DIA.	QUANTITY
1	CATEGORY 1 WOOD 10" - 14"	5
2	CATEGORY 2 WOOD 6" - 12"	4
3	CATEGORY 3 WOOD < 2"	10
6	WILLOW BUNDLES 0.25" - 1"	4



EXAMPLE OF A LARGE WOOD STRUCTURE

LARGE WOOD STRUCTURE DETAIL
UPPER O'BRIEN CREEK

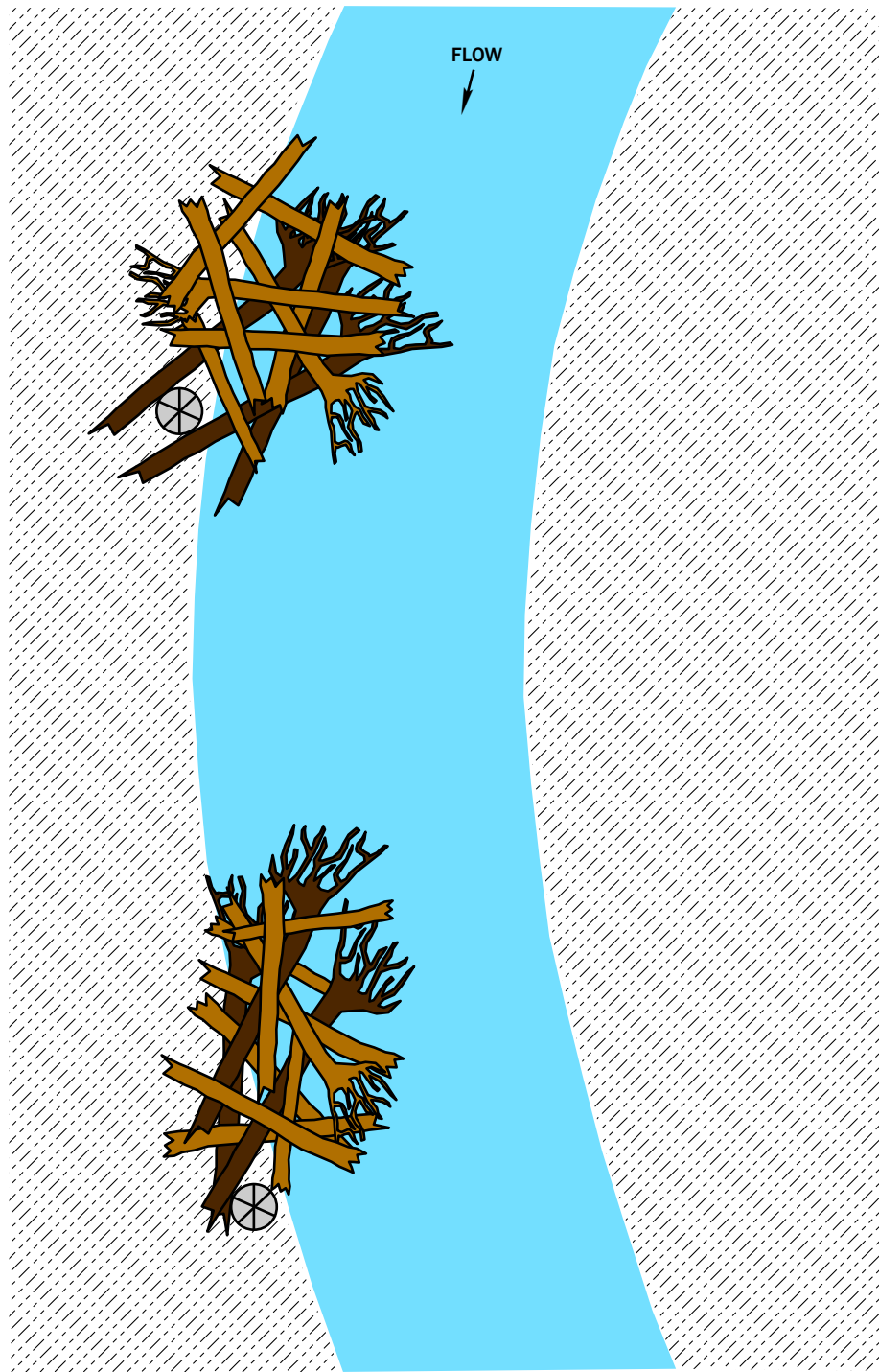
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DRAWING NUMBER

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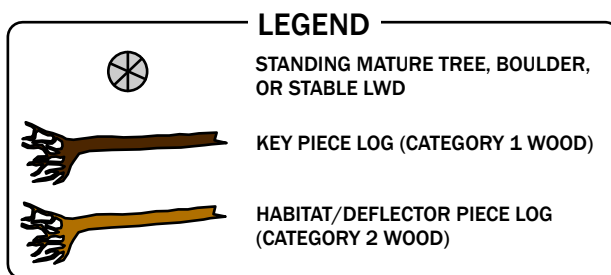
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LARGE WOOD AGGREGATE

PLAN VIEW

NTS

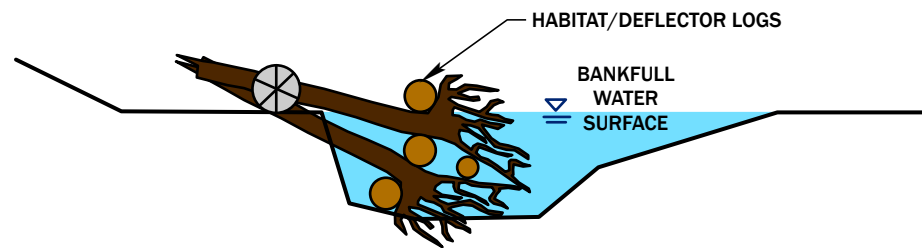


NOTES ON LARGE WOOD AGGREGATE INSTALLATION

1. PLACE KEY PIECES (MINIMUM OF 2 KEY PIECES) PARALLEL TO FLOW WITH ROOT FAN POINTED UPSTREAM AND STEM POINTED DOWNSTREAM. ANCHOR KEY PIECES TO EXISTING MATURE TREES, BOULDERS, ESTABLISHED LWD OR OTHER KEY PIECES. ANCHOR KEY PIECES BY PLACING KEY PIECES UPSTREAM OF THE ESTABLISHED ANCHORING STRUCTURE.
2. IF NO STABILIZING STRUCTURE IS PRESENT, A MINIMUM OF 3 KEY PIECES ARE NECESSARY. KEY PIECES WILL BE SET FLUSH WITH THE STREAMBED TO THE EXTENT POSSIBLE BY MINIMALLY EXCAVATING AROUND THE ROOT FAN SO THAT THE STEM IS IN CONTACT WITH THE BED.
3. AUGMENT KEY PIECES WITH ADDITIONAL HABITAT/DEFLECTOR PIECES. PLACE HABITAT/DEFLECTOR PIECES TO INCREASE HYDRAULIC INFLUENCE AND ANCHOR TO KEY PIECES AND EXISTING ANCHORING STRUCTURES.
4. AGGREGATES WILL BE COMPRISED OF APPROXIMATELY 4 TO 5 KEY PIECES AND A MINIMUM OF 10 HABITAT/DEFLECTOR PIECES TO AUGMENT THE KEY PIECES. TOTAL PIECES OF WOOD PER ARRAY WILL VARY ACCORDING TO SITE CONDITIONS, AVAILABLE ON-SITE LWD, AND LWD IMPORTATION LIMITATIONS (E.G., CANOPY DENSITY, FLOODPLAIN WIDTH).
5. LIMBS WILL BE LEFT INTACT ON TREES, ALTHOUGH LIMBS ARE NOT DEPICTED IN THE TYPICAL DRAWING FOR CLARITY.

MATERIAL SCHEDULE (PER STRUCTURE)

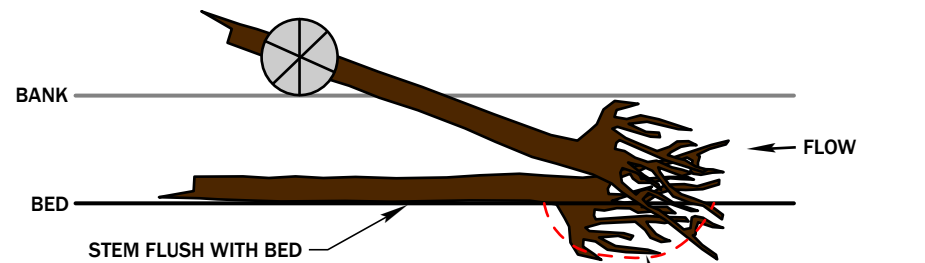
ITEM	DIA.	MIN. STEM LENGTH	QUANTITY	ROOTWAD?
CATEGORY 1 WOOD	10" - 14"	12'	4	YES
CATEGORY 2 WOOD	6" - 12"	6'	10	OPTIONAL



LARGE WOOD AGGREGATE

SECTION VIEW

NTS



KEY PIECE PLACEMENT

PROFILE VIEW

NTS



EXAMPLE LARGE WOOD AGGREGATE

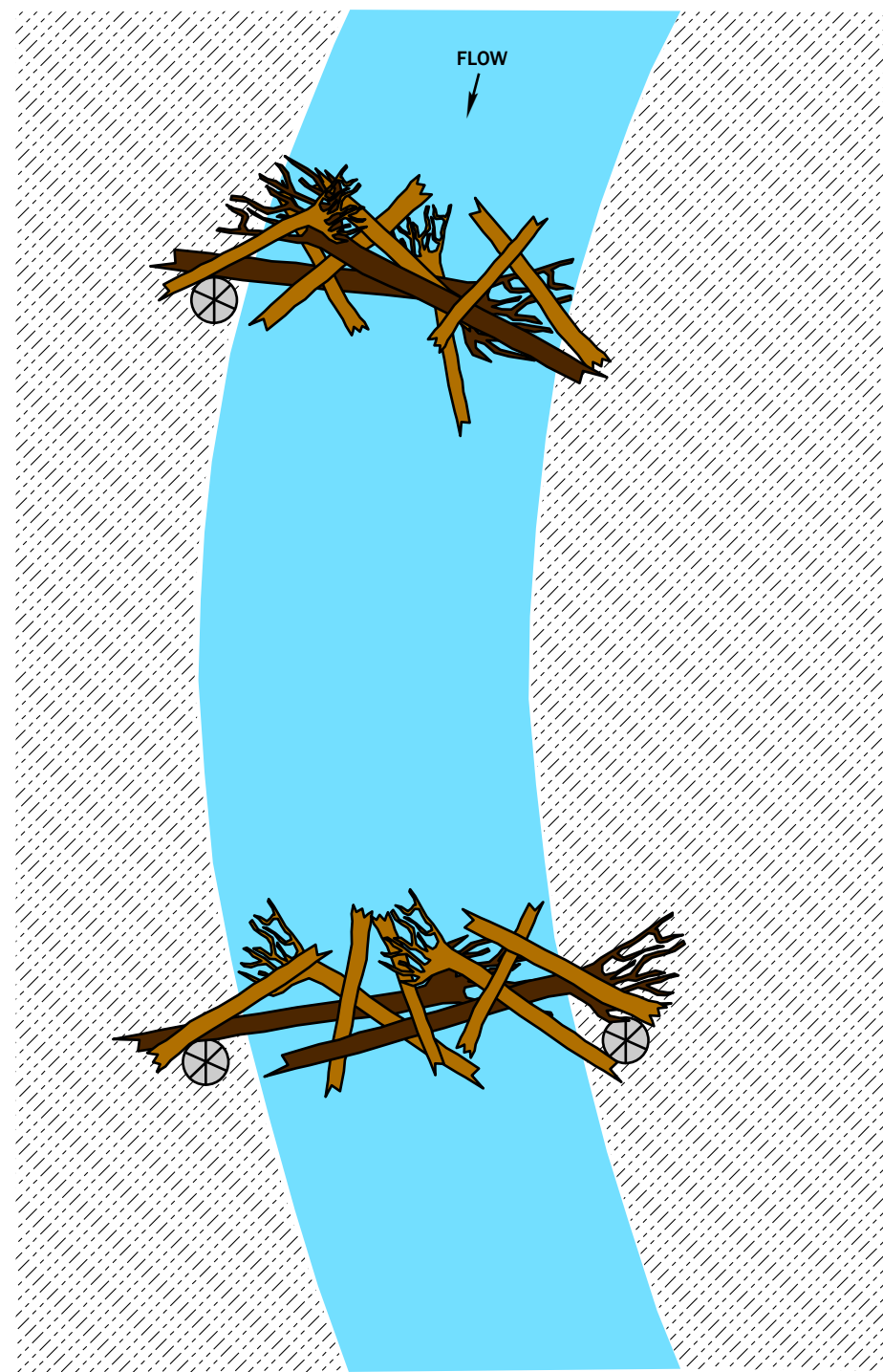
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PROJECT NUMBER
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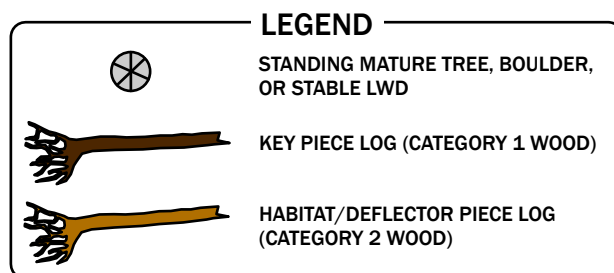
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CHANNEL-SPANNING LOG ARRAY

PLAN VIEW

NTS

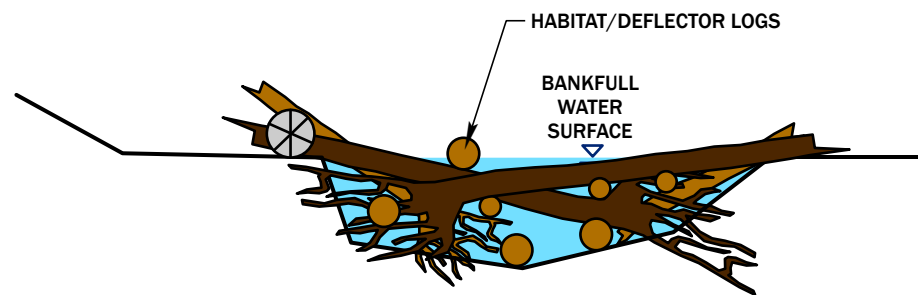


NOTES ON CHANNEL-SPANNING LOG ARRAY INSTALLATION

1. PLACE KEY PIECE(S) PERPENDICULAR TO FLOW AND ANCHOR TO EXISTING MATURE TREES, BOULDERS, ESTABLISHED LWD OR OTHER KEY PIECES. ANCHOR KEY PIECES BY PLACING KEY PIECES UPSTREAM OF THE ESTABLISHED STABLE STRUCTURE. IF NO STABILIZING STRUCTURE IS PRESENT, SPANNING LOG TAPERED END MAY BE ANCHORED INTO THE BANK BY EXCAVATING THE STREAMBANK, PLACING THE LOG, AND BACKFILLING WITH THE EXCAVATED MATERIAL. STABLE ARRAY ANCHORING WILL BE THE PRERRED METHOD OF ARRAY ANCHORING.
2. AUGMENT KEY PIECE(S) WITH ADDITIONAL HABITAT/DEFLECTOR PIECES. PLACE HABITAT/DEFLECTOR PIECES TO INCREASE HYDRAULIC INFLUENCE AND ANCHOR TO KEY PIECES AND EXISTING ANCHORING STRUCTURES.
3. BRUSH AND CONIFER BOUGHS MAY BE INTEGRATED INTO ARRAY TO REDUCE PERMEABILITY. WEAVE AND STACK BRUSH OF VARYING LENGTHS INTO THE ARRAY, PERPEDICULAR TO FLOW. ARRAY PERMEABILITY IS UP TO THE DISCRETION OF THE CONSTRUCTION MANAGER.
4. PLACE CHANNEL-SPANNING LOG ARRAYS WHERE THE CHANNEL IS MORE CONFINED TO ENSURE THAT CHANNEL-SPANNING LOG EXTENDS ACROSS THE ENTIRE CHANNEL.
5. CHANNEL-SPANNING LOGS MAY BE PLACED AT VARIOUS ELEVATIONS AND ANGLES RELATIVE TO THE CHANNEL BED. ARRAY PLACEMENT IS UP TO THE DISCRETION OF THE CONSTRUCTION MANAGER.
6. TOTAL NUMBER OF KEY PIECES AND HABITAT/DEFLECTOR PIECES WILL VARY PER ARRAY ACCORDING TO SITE CONDITIONS AND IS UP TO THE DISCRETION OF THE CONSTRUCTION MANAGER.
7. LIMBS WILL BE LEFT INTACT ON TREES, ALTHOUGH LIMBS ARE NOT DEPICTED IN THE TYPICAL DRAWING FOR CLARITY.

MATERIAL SCHEDULE (PER STRUCTURE)

ITEM	DIA.	MIN. STEM LENGTH	QUANTITY	ROOTWAD?
CATEGORY 1 WOOD	10" - 14"	16'	2	YES
CATEGORY 2 WOOD	6" - 12"	6'	6 - 8	OPTIONAL



CHANNEL-SPANNING LOG ARRAY

SECTION VIEW

NTS



EXAMPLE CHANNEL-SPANNING LOG ARRAY

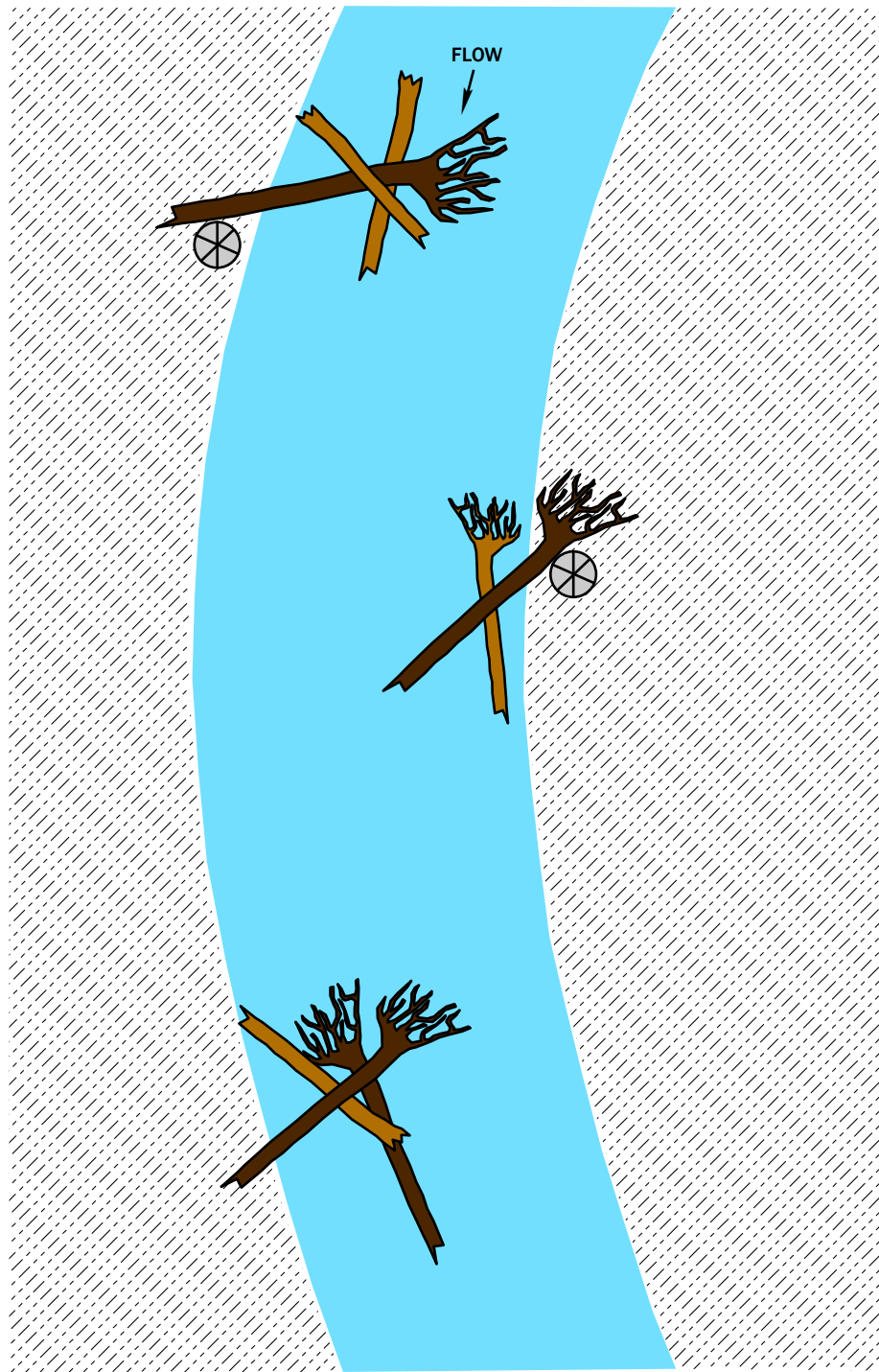
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3	03-13-26	DB	FINAL DESIGN	JM

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PASSIVE LWD
PLAN VIEW NTS

LEGEND

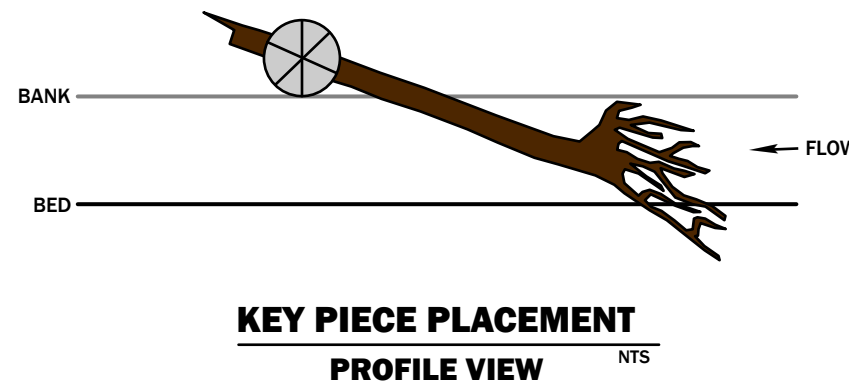
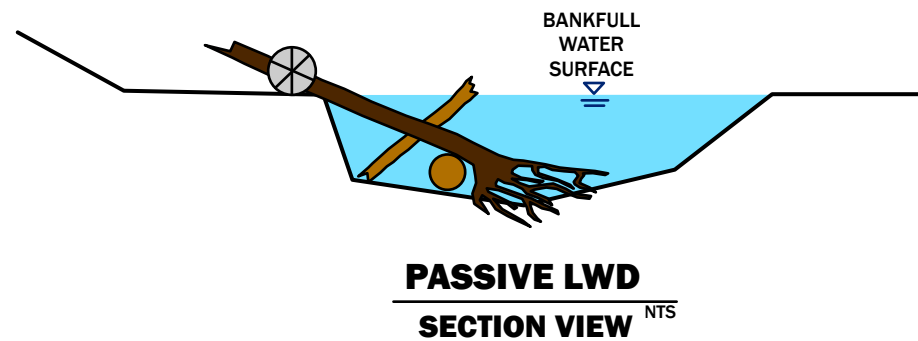
- STANDING MATURE TREE, BOULDER, OR STABLE LWD
- KEY PIECE LOG (CATEGORY 1 WOOD)
- HABITAT/DEFLECTOR PIECE LOG (CATEGORY 2 WOOD)

NOTES ON PASSIVE LARGE WOODY DEBRIS (LWD) INSTALLATION

1. KEY PIECES MAY BE PLACED AT VARIOUS ANGLES RELATIVE TO FLOW TO MAXIMIZE HYDRAULIC INFLUENCE. WHERE STABILIZING STRUCTURES ARE PRESENT, ANCHOR KEY PIECES TO EXISTING MATURE TREES, BOULDERS, ESTABLISHED LWD OR OTHER KEY PIECES. ANCHOR KEY PIECES BY PLACING KEY PIECES UPSTREAM OF THE ESTABLISHED ANCHORING STRUCTURE. IF NO STABILIZING STRUCTURE IS PRESENT, KEY PIECES MAY BE PLACED AS DIRECTED BY THE CONSTRUCTION MANAGER.
2. AUGMENT KEY PIECE(S) WITH ADDITIONAL HABITAT/DEFLECTOR PIECES. PLACE HABITAT/DEFLECTOR PIECES TO INCREASE HYDRAULIC INFLUENCE AND ANCHOR TO KEY PIECES AND EXISTING ANCHORING STRUCTURES.
3. LIMBS WILL BE LEFT INTACT ON TREES, ALTHOUGH LIMBS ARE NOT DEPICTED IN THE TYPICAL DRAWING FOR CLARITY.

MATERIAL SCHEDULE (PER STRUCTURE)

ITEM	DIA.	MIN. STEM LENGTH	QUANTITY	ROOTWAD?
CATEGORY 1 WOOD	10" - 14"	8'	1-2	YES
CATEGORY 2 WOOD	6" - 12"	6'	1-3	OPTIONAL



EXAMPLE PASSIVE LARGE WOODY DEBRIS PLACEMENT.

**PASSIVE LARGE WOODY
DEBRIS DETAIL
UPPER O'BRIEN CREEK**

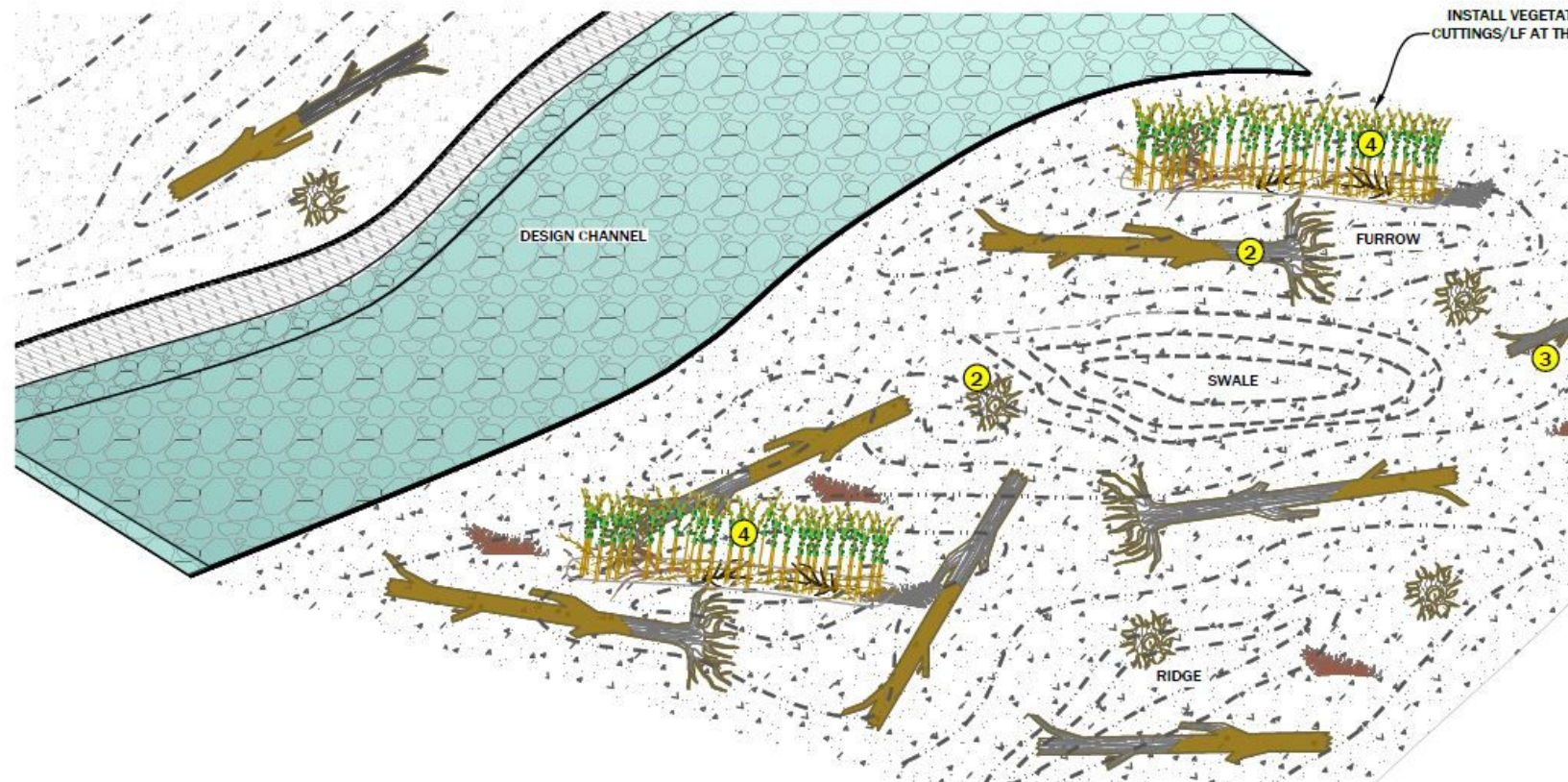
NO.	DATE	BY	DESCRIPTION	CHK
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3	03-13-26	DB	FINAL DESIGN	JM

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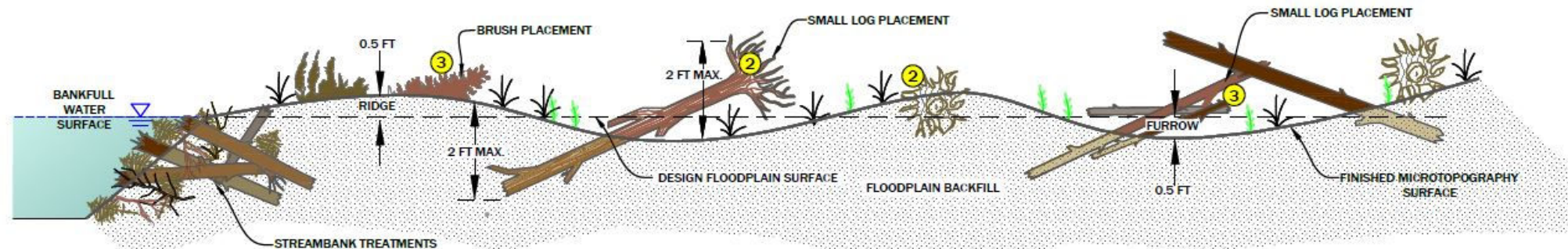
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1 MICROTOPOGRAPHY AND FLOODPLAIN WOOD PLACEMENT
3D VIEW NTS



2 FLOODPLAIN ROUGHNESS DETAIL
TYPICAL CROSS SECTION NTS

GENERAL NOTES

1. CONSTRUCTION OF FLOODPLAIN TREATMENT WILL OCCUR AFTER CONSTRUCTION OF THE CHANNEL STREAMBED, INSTALLATION OF LARGE WOOD STRUCTURE BANK TREATMENT, INSTALLATION OF VEGETATED WOOD MATRIX BANK TREATMENT.
2. ANY CHANGES TO THE CONSTRUCTION SEQUENCE MUST BE APPROVED BY THE CONSTRUCTION MANAGER.

NOTES ON FLOODPLAIN ROUGHNESS INSTALLATION

1. CONTRACTOR SHALL DEVELOP MICROTOPOGRAPHY AND PLACE WOODY MATERIAL IN THE CONSTRUCTED FLOODPLAIN.
2. INSTALL VEGETATED BRUSH TRENCHES ACROSS THE FLOODPLAIN PER THE DIRECTION OF THE PROJECT MANAGER AND SHEET 7.4. BACKFILL TRENCH TO FLOODPLAIN GRADE AND COMPACT TO REMOVE ANY AIR VOIDS.
3. TRANSPORT CATEGORY 4, AND CATEGORY 3 WOOD FROM DESIGNATED STOCKPILE AREAS. PLACE CATEGORY 4 WOOD AT A RATE OF 35 PIECES PER ACRE AND SPACED AT AN AVERAGE DISTANCE OF 20 FEET FROM OTHER CATEGORY 4 WOOD. PLACE CATEGORY 3 WOOD SO IT COVERS 25 PERCENT OF THE FLOODPLAIN SURFACE (APPROXIMATELY 250 PIECES PER ACRE).
4. BURY CATEGORY 4 WOOD WITHIN THE FLOODPLAIN SURFACE, WITH ONE HALF OF THE LENGTH BURIED TO A DEPTH OF 2-FT., AND ONE HALF EXPOSED A MAXIMUM OF 2-FT ABOVE FINISHED GRADE AS SHOWN ON DRAWING. PLACE CATEGORY 3 WOOD ON THE SURFACE. CATEGORY 3 WOOD DOES NOT NEED TO BE BURIED.
5. CONSTRUCT LOW AND HIGH FEATURES (RIDGES AND FURROWS) AS SHOWN ON THE DRAWINGS. MAXIMUM HEIGHT OF RIDGES AND DEPTH OF FURROWS SHALL BE NO GREATER THAN 0.5-FT. RELATIVE TO FINISHED FLOODPLAIN SURFACE.

MATERIAL SCHEDULE (PER ACRE)

ITEM	DIA.	LENGTH	QUANTITY	UNIT
② CATEGORY 4 WOOD	2" - 4"	10' - 12'	35	EA
③ CATEGORY 3 WOOD	< 2"	10' - 12'	25	% COVER*
④ VEGETATED BRUSH TRENCH			SEE SHEET 7.4	

*APPROXIMATELY 250 PIECES/ACRE



EXAMPLE OF CONSTRUCTED FLOODPLAIN ROUGHNESS



EXAMPLE OF CONSTRUCTED FLOODPLAIN ROUGHNESS



EXAMPLE OF CONSTRUCTED FLOODPLAIN SWALE

FLOODPLAIN TREATMENT DETAIL

UPPER O'BRIEN CREEK

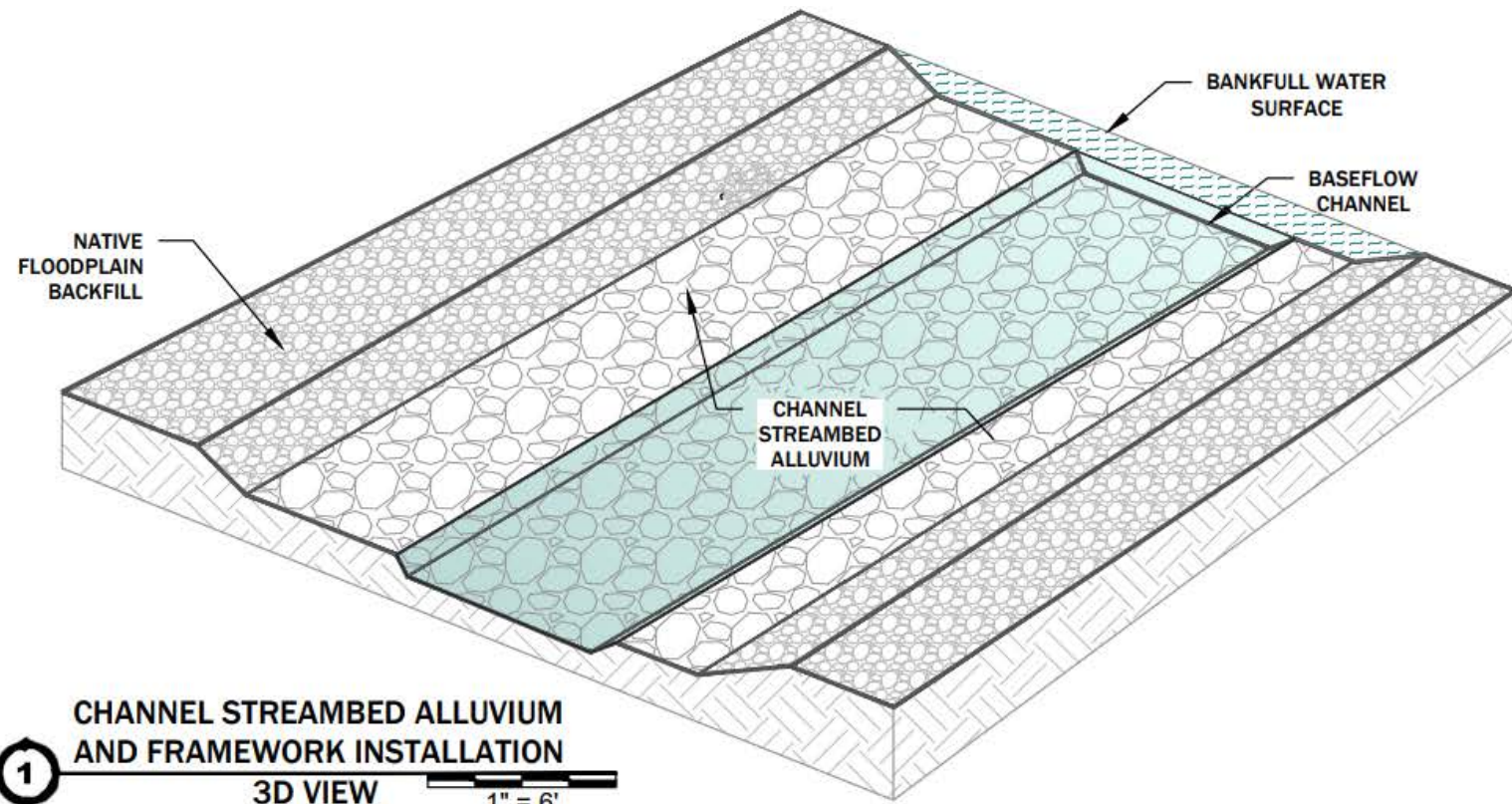
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2	02-15-24	DB	PRELIMINARY DESIGN	JM
3	03-13-26	DB	FINAL DESIGN	JM

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DRAWING NUMBER

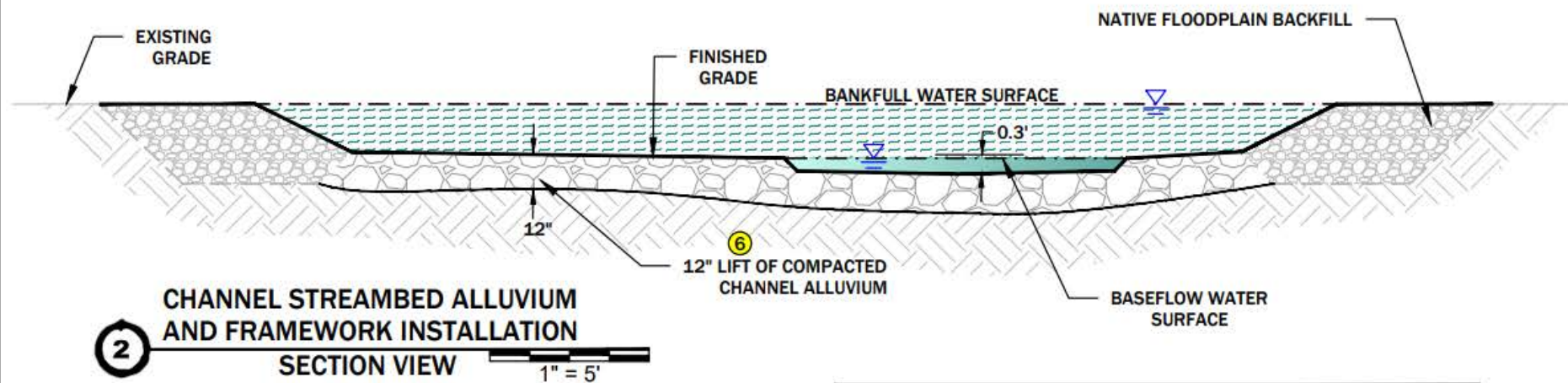
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NOTES ON CONSTRUCTED CHANNEL STREAMBED INSTALLATION

1. CONSTRUCTION OF THE CHANNEL STREAMBED WILL OCCUR AFTER THE CHANNEL SUBGRADE IS PREPARED.
2. ANY CHANGES TO THE CONSTRUCTION SEQUENCE MUST BE APPROVED BY THE CONSTRUCTION MANAGER.
3. CONTRACTOR SHALL MARK THE UPSTREAM AND DOWNSTREAM EXTENTS OF THE LOCATIONS OF THE CONSTRUCTED CHANNEL STREAMBED STRUCTURES.
4. PRIOR TO CONSTRUCTION OF THE CHANNEL STREAMBED, CONSTRUCTION MANAGER SHALL VERIFY CHANNEL SUBGRADE ELEVATIONS. CHANNEL SUBGRADE SERVES AS THE FOUNDATION FOR THE CONSTRUCTED CHANNEL STREAMBED.
5. CONTRACTOR SHALL STOCKPILE CHANNEL ALLUVIUM PER SPECIFICATIONS NOTED ON THE DRAWING.



STREAMBED ALLUVIUM GRADATION

SIZE (INCHES)	PERCENT PASSING	REPRESENTATIVE SIZE CLASS
10	95	D100
8	90-95	D95
5	85-90	D84
3	65 - 85	D65
2	50 - 65	D50
1	30 - 50	D35
0.5	10 - 30	D15
FINES	0-10	

MATERIAL SCHEDULE (PER LINEAR FOOT)

NO.	ITEM	DIA.	QUANTITY
6	CHANNEL STREAMBED ALLUVIUM	10" MINUS	0.35 CY



TYPICAL CONSTRUCTED STREAMBED THROUGH A RIFFLE FEATURE

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JM	PRELIMINARY DESIGN	DB	02-15-24
JM	FINAL DESIGN	DB	03-13-26

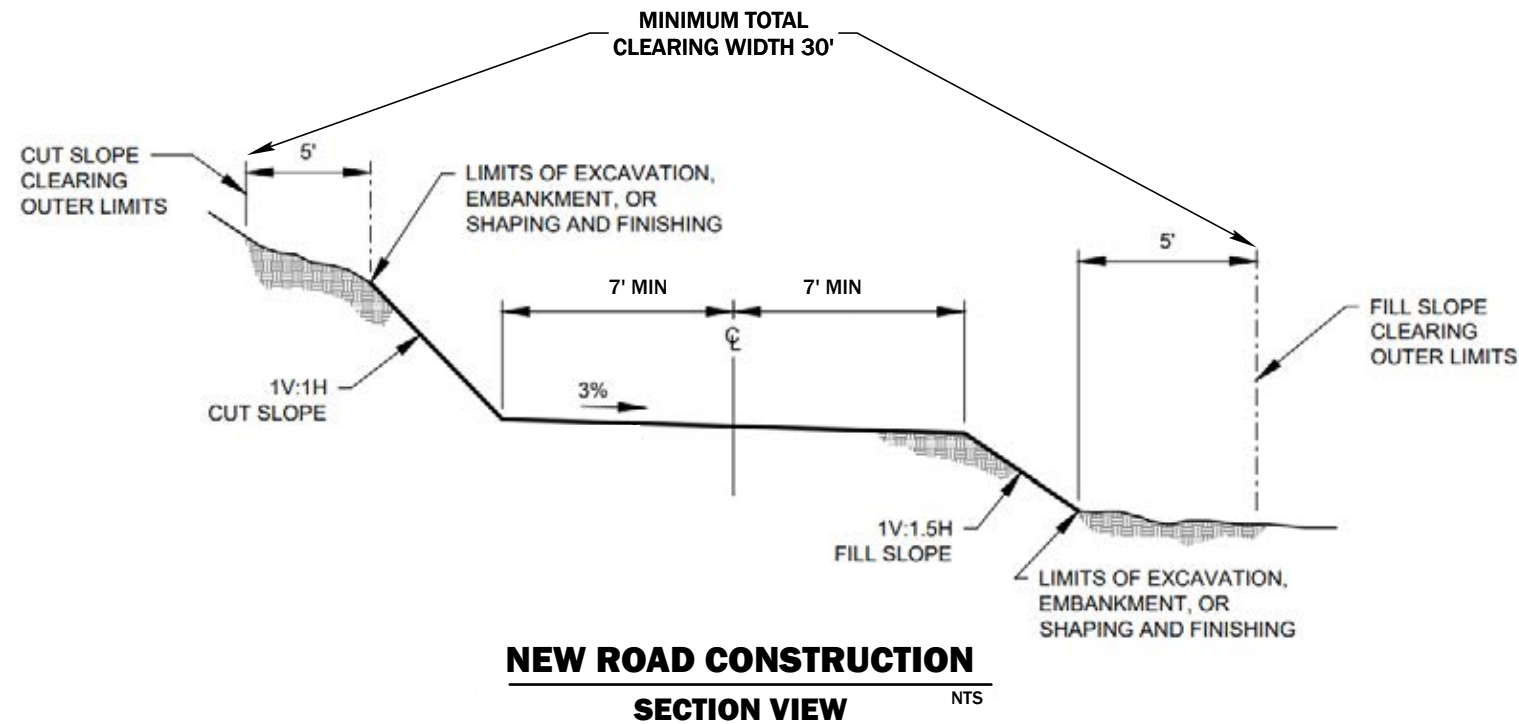
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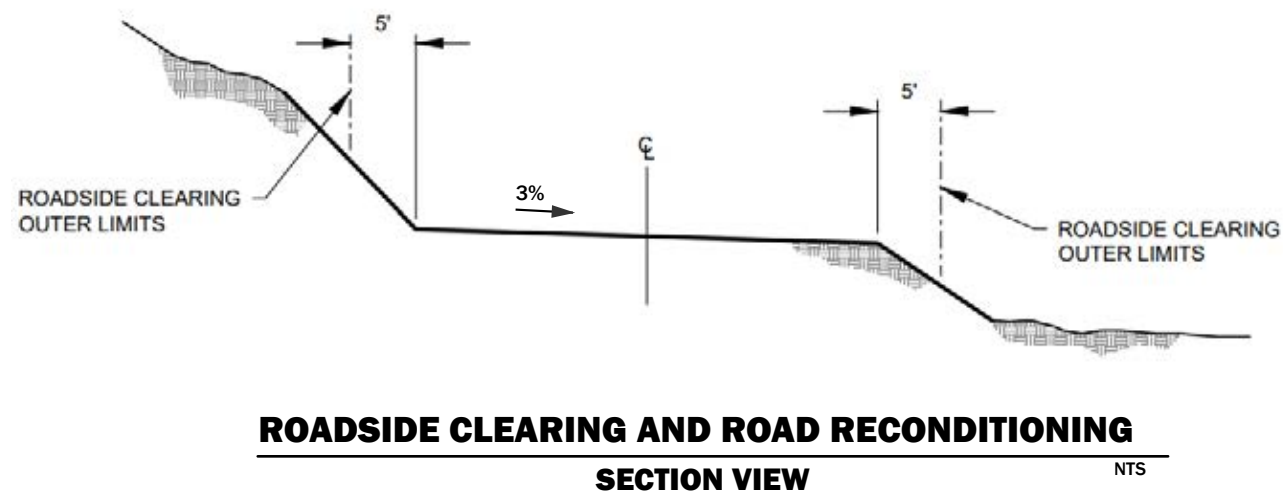
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NEW ROAD CONSTRUCTION
SECTION VIEW NTS



ROADSIDE CLEARING AND ROAD RECONDITIONING
SECTION VIEW NTS

NOTES ON COMPACTION METHOD

1. ADJUST THE MOISTURE CONTENT OF THE MATERIAL TO A MOISTURE CONTENT SUITABLE FOR COMPACTION.
2. FILL THE INTERSTICES AROUND THE ROCK WITH EARTH OR OTHER FINE MATERIAL AS PRACTICAL.
3. OPERATE HAULING AND SPREADING EQUIPMENT UNIFORMLY OVER THE FULL WIDTH OF EACH LAYER UNTIL THERE IS NO VISIBLE EVIDENCE OF FURTHER CONSOLIDATION. MAKE AT LEAST THREE COMPLETE PASSES.

NOTES ON CLEARING FOR NEW ROAD CONSTRUCTION

1. CLEAR VEGETATION INSIDE THE CLEARING LIMITS. GRUB STUMPS INSIDE THE LIMITS OF EXCAVATION.
2. RETAIN LARGE TREES WITH ROOTWADS ATTACHED AS DIRECTED FOR STREAM TREATMENTS.
3. IF VEGETATION IS NOT NEEDED FOR STREAM TREATMENTS OR SLASH, DECK MERCHANTABLE TREES ALONG THE ROAD, PILE SLASH, TOPS, AND SUB-MERCHANTABLE TREES IN NEAT PILES FOR FUTURE BURNING, AND BURY STUMPS.

**ROAD CLEARING AND
CONSTRUCTION DETAIL**
UPPER O'BRIEN CREEK

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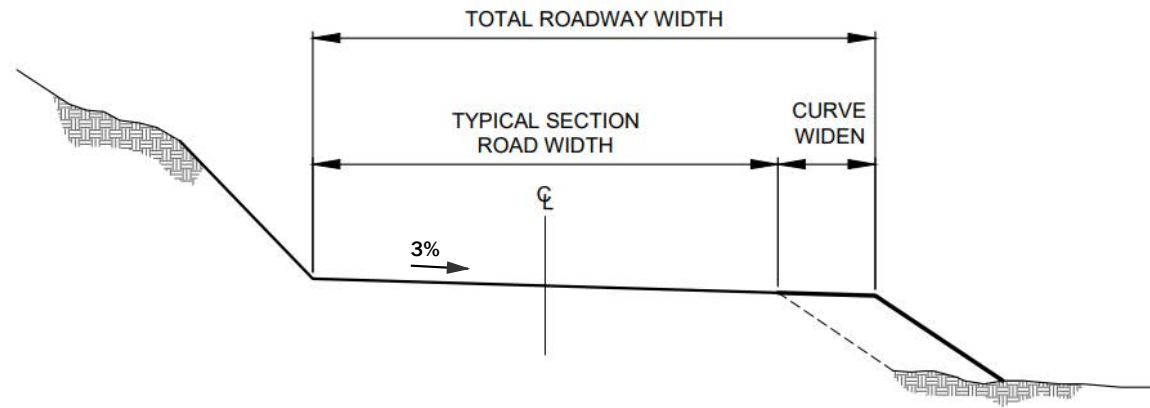
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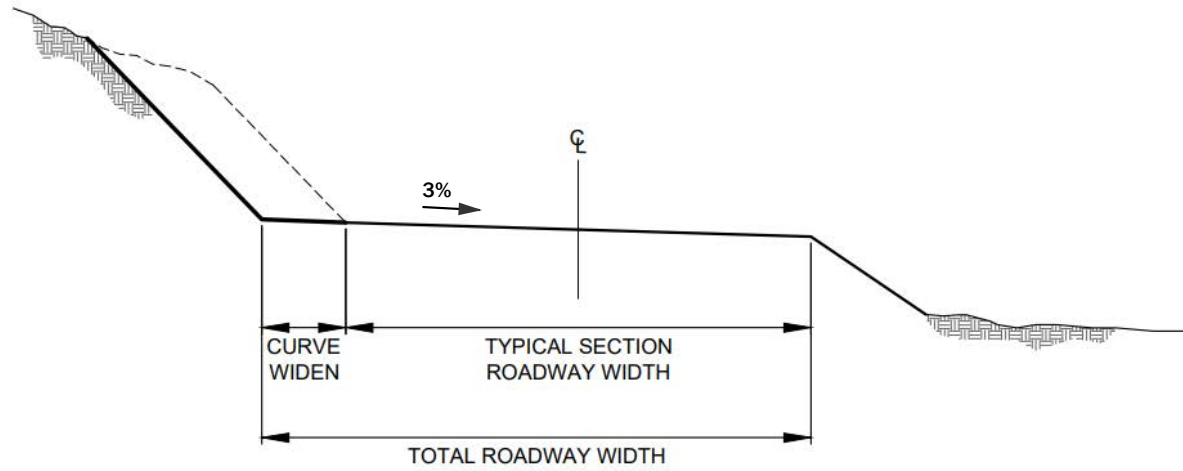


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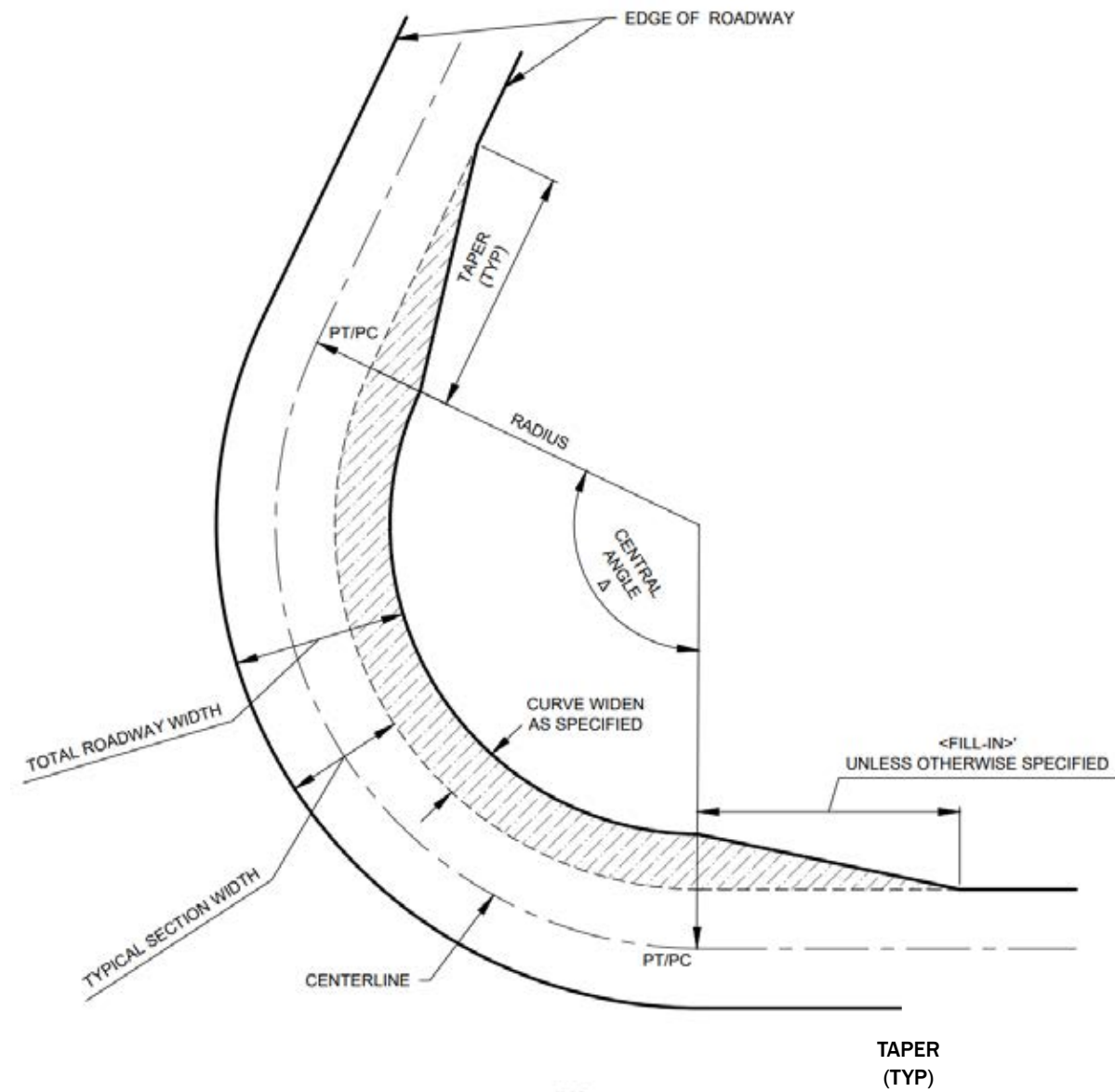


FILL SLOPE CURVE WIDENING
NOT TO SCALE

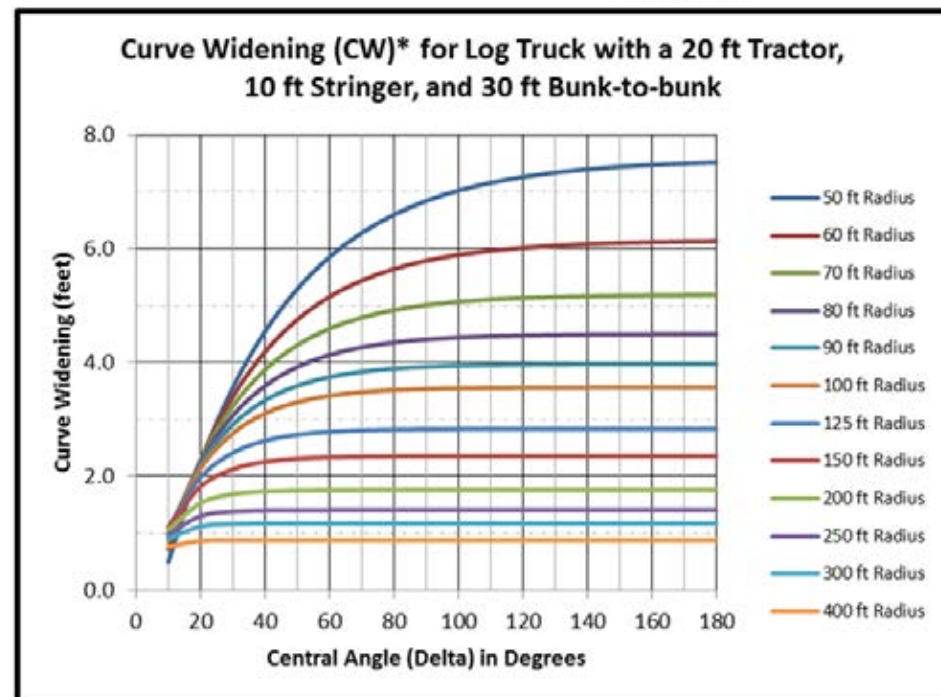


CUT SLOPE CURVE WIDENING
NOT TO SCALE

Curve Widening Taper Lengths	
Radius (in feet)	Taper Length (in feet)
<70	60
70-85	50
86-100	40
>100	30



NOTES:
1. ADD HORIZONTAL CURVE WIDENING TO THE INSIDE OF CURVES. WIDENING APPLIES TO THE ROADWAY THROUGH THE ENTIRE CURVE FROM PC TO PT.



*Add curve widening (CW) to lane width.



SOURCE: US FOREST SERVICE

CURVE WIDEN DETAIL
UPPER O'BRIEN CREEK

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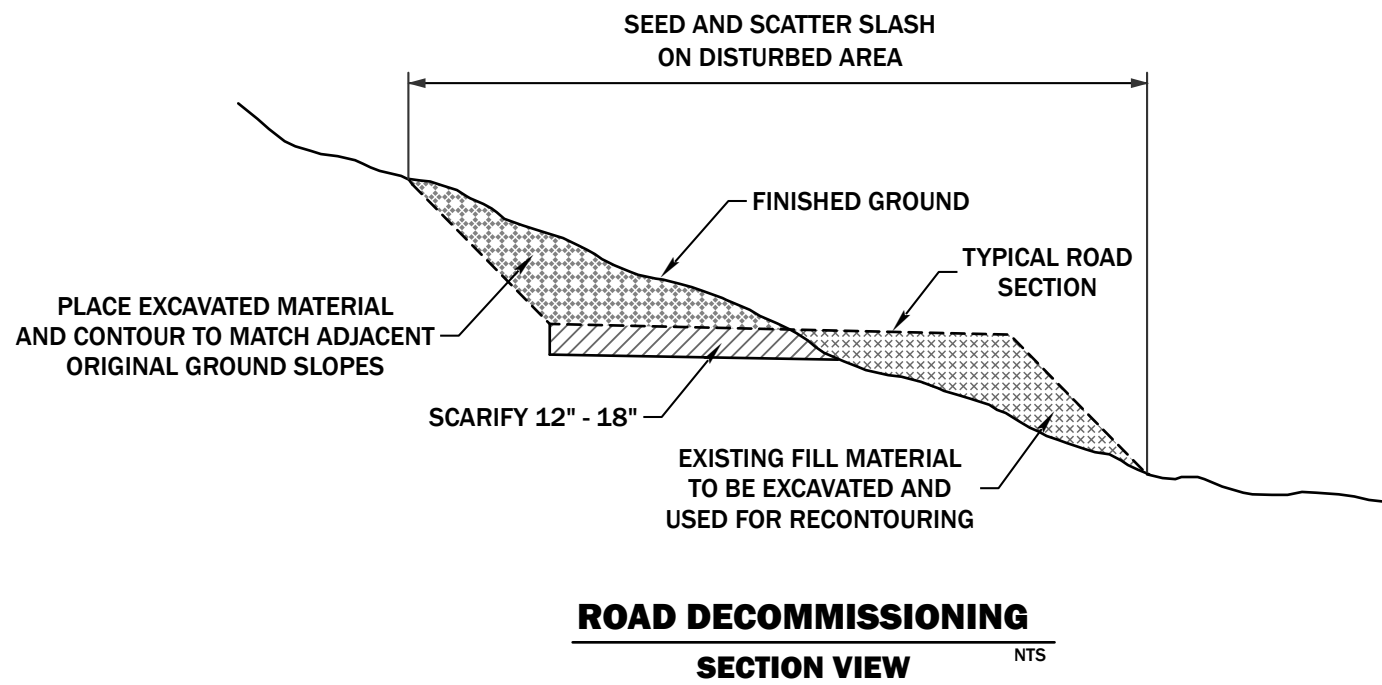
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ROAD DECOMMISSIONING
SECTION VIEW NTS

NOTES ON ROAD DECOMMISSIONING

1. DO NOT PLACE EXCAVATED MATERIAL AGAINST THE CUT SLOPE WHERE THERE IS EVIDENCE OF WET SEEPS OR SPRINGS.
2. ADD LOGS, CLUMP TRANSPLANTS, AND SOD MATS ON RECONTOURED ROAD AREAS AT GUIDANCE OF USFS OR CLIENT REPRESENTATIVE.



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ROAD DECOMMISSIONING DETAIL
UPPER O'BRIEN CREEK

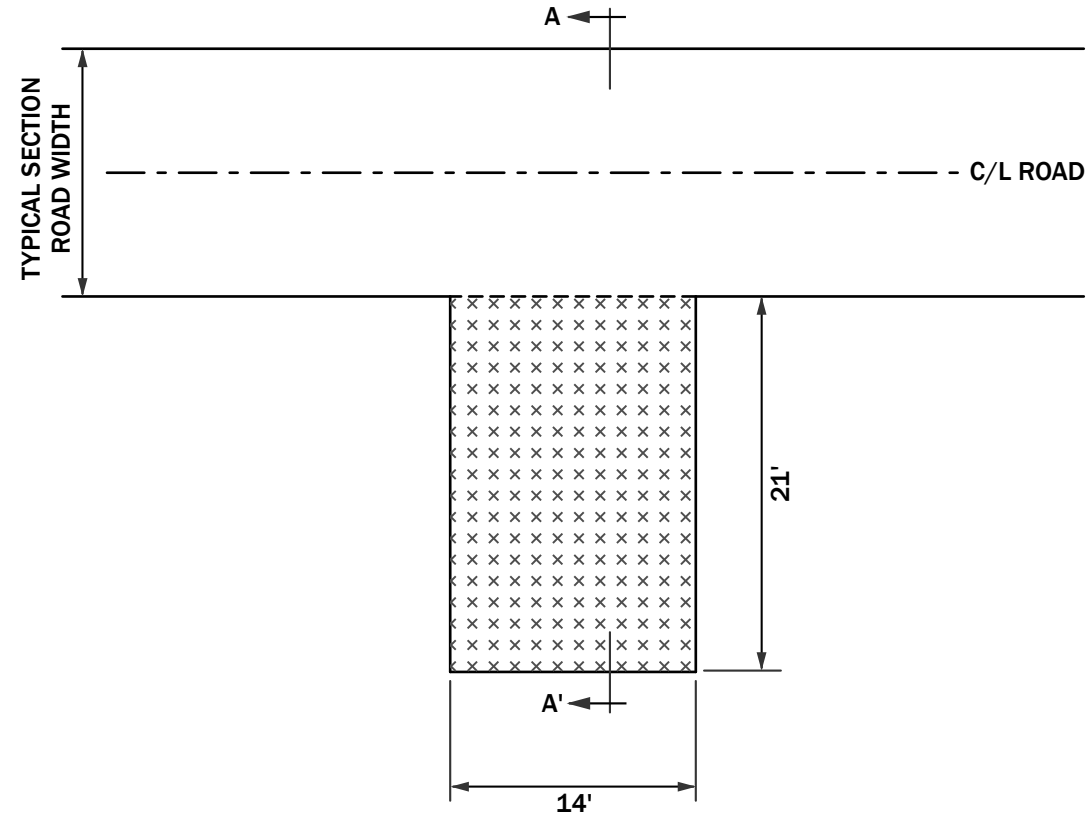
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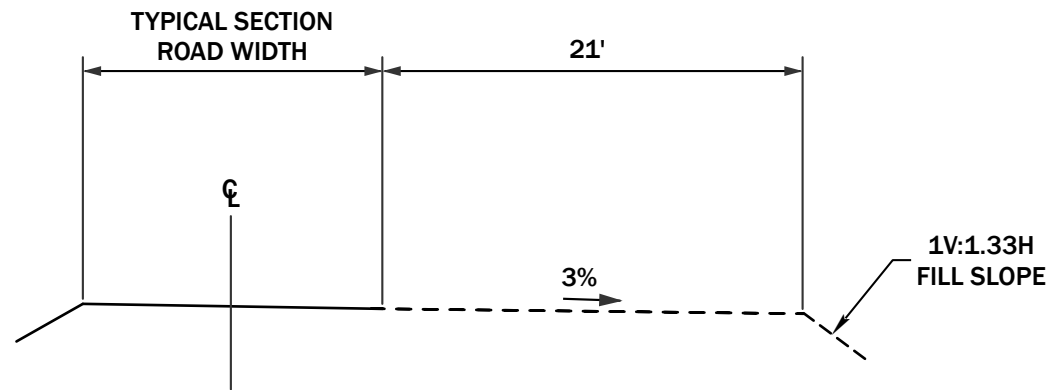
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TURNAROUND
PLAN VIEW NTS



TURNAROUND
SECTION A-A' NTS



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PROJECT NUMBER
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DRAWING NUMBER

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TURNAROUND DETAIL

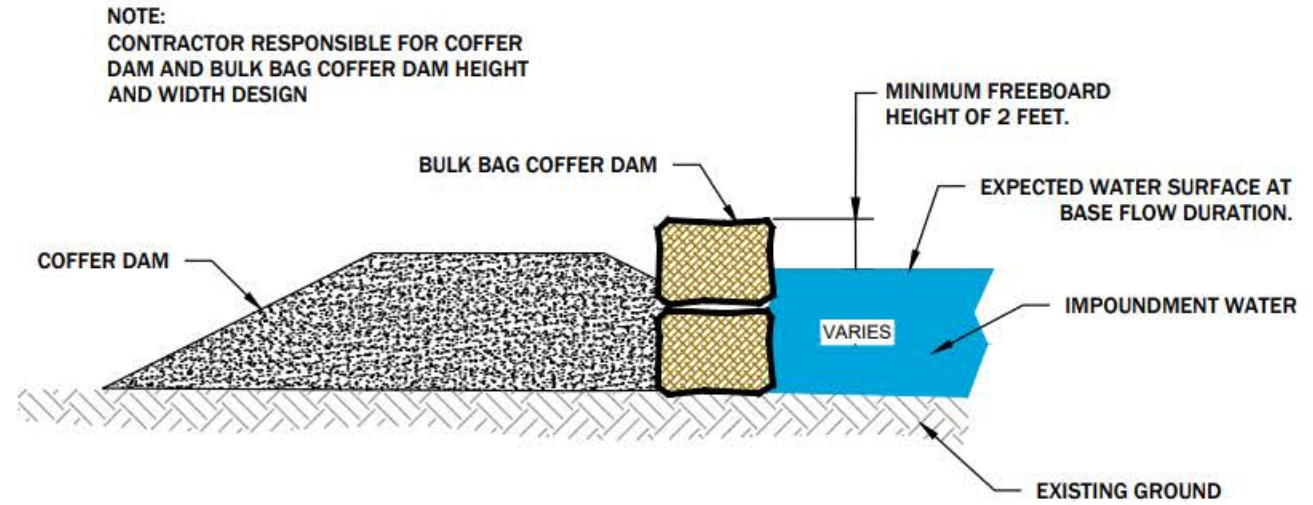
UPPER O'BRIEN CREEK

SWCA
ENVIRONMENTAL CONSULTANTS
236 Wisconsin Avenue
Whitefish, MT 59937
tel. 406.862.4927
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311 SW Jefferson Avenue
Conville, OR 97333
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fax. 541.758.8524



EXAMPLE OF BULK BAGS



NOTE:
CONTRACTOR RESPONSIBLE FOR COFFER
DAM AND BULK BAG COFFER DAM HEIGHT
AND WIDTH DESIGN

BULK BAG FILL GRADATION

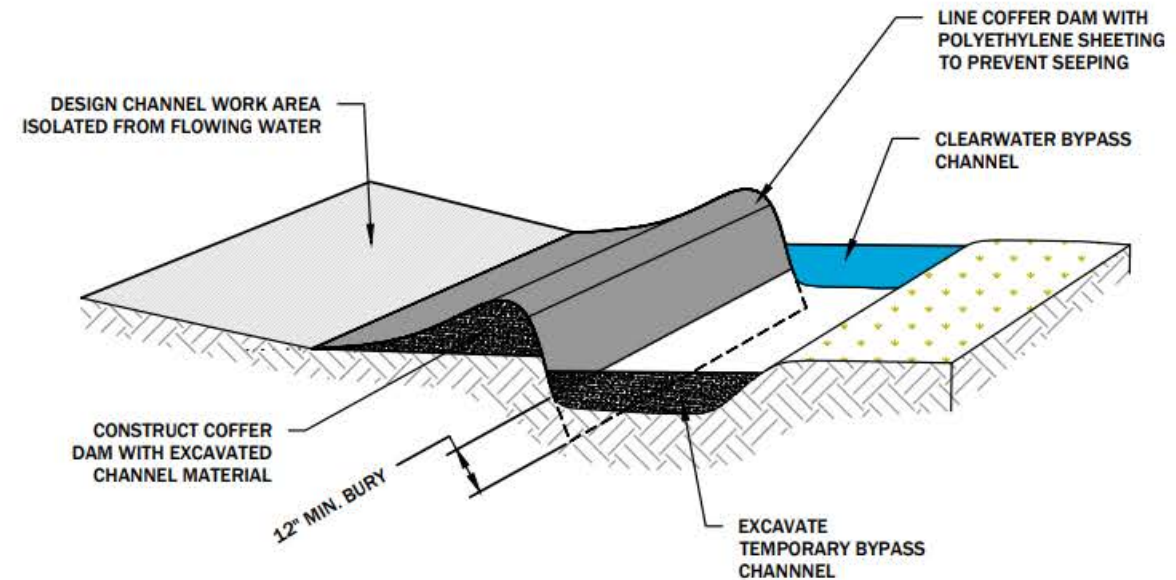
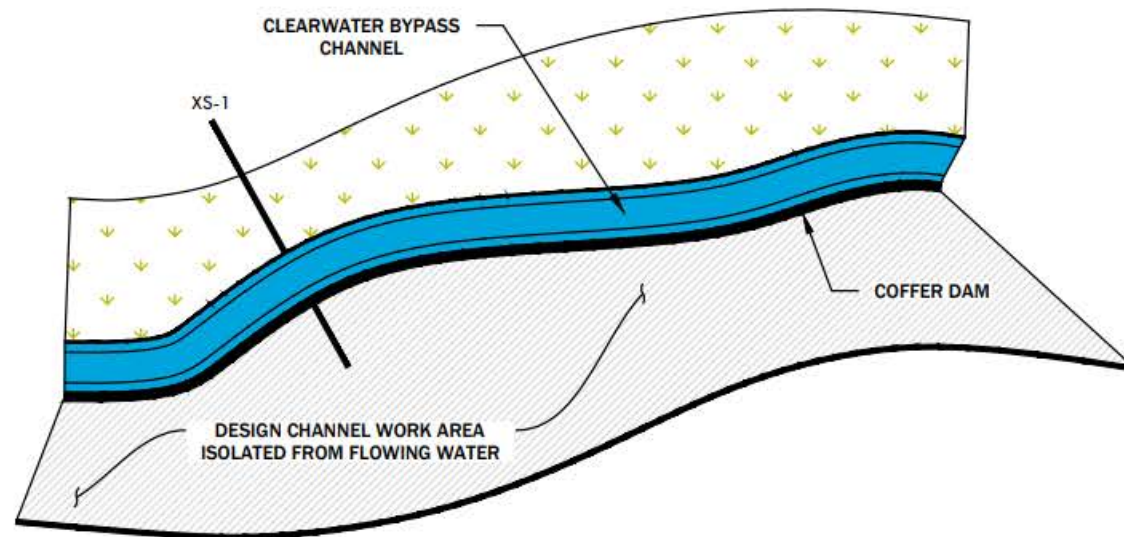
BULK PERCENTAGE	AVERAGE PARTICLE SIZE (INCHES)
20	1 1/2
30	3/4
30	1/2
20	3/8

GENERAL NOTES:

1. WORK AREA TO BE ISOLATED USING COFFERDAMS CONSTRUCTED WITH BULK BAGS, SAND BAGS, OR APPROVED ALTERNATIVE. BULK BAGS ARE ALSO CALLED FLEXIBLE INTERMEDIATE BULK CONTAINERS (FIBC) THAT CAN BE CUSTOM MADE FROM VARIOUS FABRIC. THE FOLLOWING REQUIREMENTS ARE NECESSARY FOR THE RIVER ENVIRONMENT:
2. **LARGE BULK BAGS** SHALL BE CONSTRUCTED OF 8 oz WOVEN FABRIC, 1200 HOUR UV RESISTANT WITH SEWN LIFTING LOOPS. FILL MATERIAL SHALL BE COMPRISED OF SPAWNING GRAVEL AND MEET THE GRADATION SHOWN IN FILL GRADATION TABLE. THE BAGS ARE APPROXIMATELY 6' WIDE x 6' LONG x 4' HIGH WHEN FILLED.
3. **SMALL BULK BAGS** SHALL BE CONSTRUCTED OF 8 oz WOVEN FABRIC, 1200 HOUR UV RESISTANT WITH SEWN LIFTING LOOPS. FILL MATERIAL SHALL BE COMPRISED OF SPAWNING GRAVEL AND MEET THE GRADATION GIVEN BY THE CITY OF BOISE SPECIFICATIONS (SHOWN BELOW). THE BAGS ARE APPROXIMATELY 3' WIDE x 3' LONG x 2.5' HIGH WHEN FILLED.
4. BULK BAGS SHALL BE CAREFULLY PLACED TO ENSURE NO TEARING OR CUTTING OF THE BAGS OCCURS.
5. BULK BAGS SHALL BE PLACED USING A HYDRAULIC CRANE OR TRACKHOE USING LIFTING BARS AND STEEL CABLES TO EQUALIZE LOAD ON LIFTING LOOPS.

1 BULK BAG INSTALLATION
DETAIL NTS

BMP'S SHALL BE INSTALLED AT THE DIRECTION OF THE CONSTRUCTION MANAGER



1 TEMPORARY COFFER DAM WITH BYPASS CHANNEL
DETAIL NTS

BMP'S SHALL BE INSTALLED AT THE DIRECTION OF THE CONSTRUCTION MANAGER

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