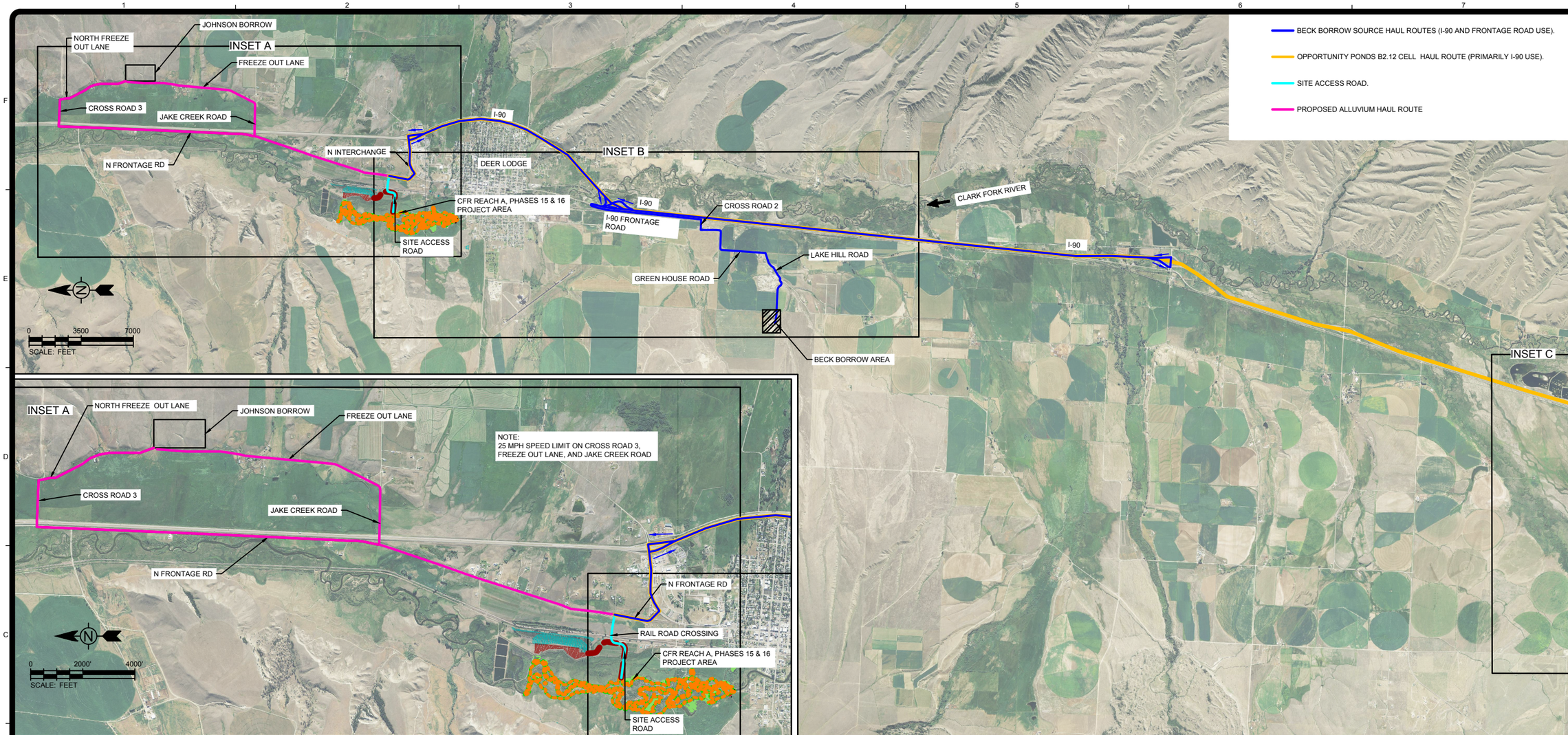

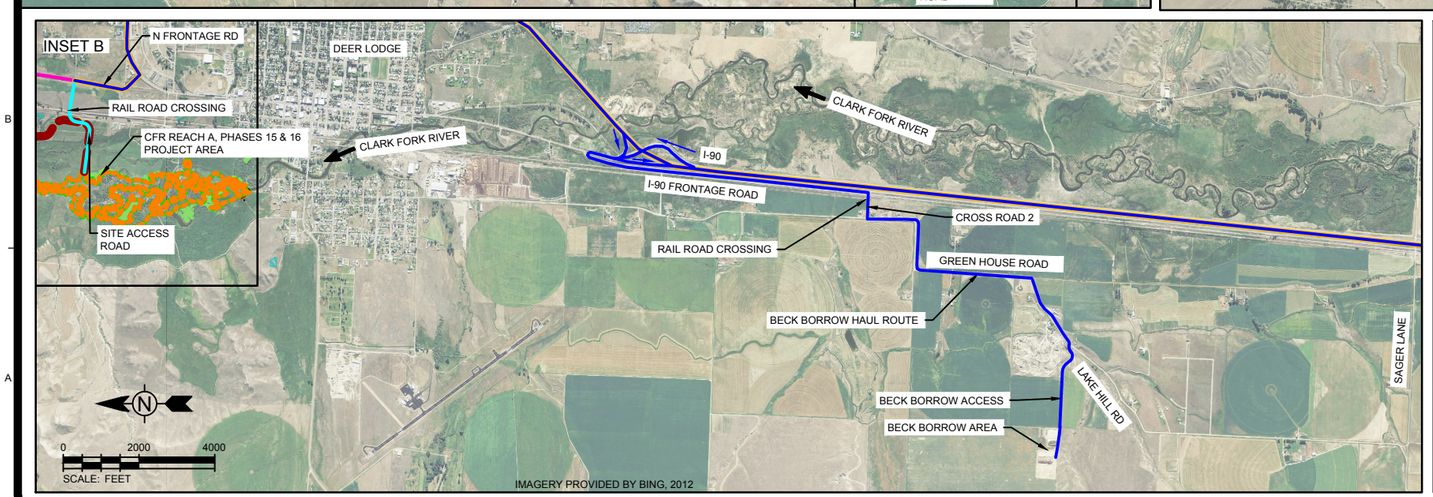

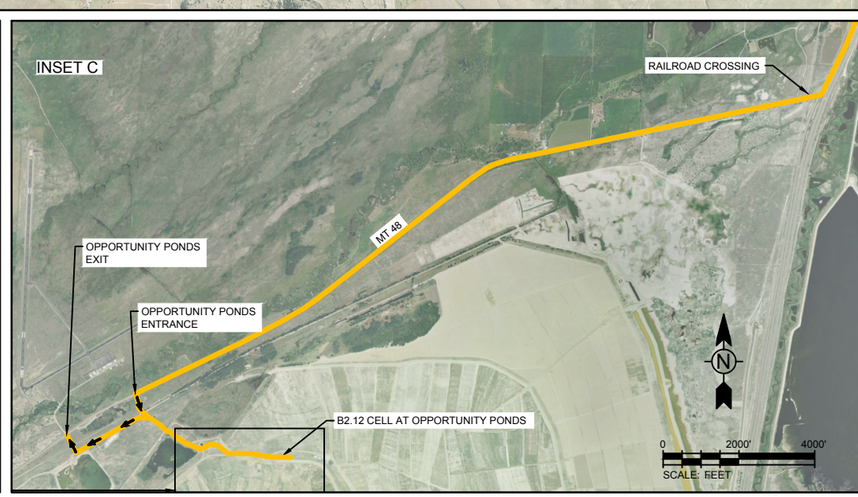

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PHONE: 406-443-5210 FAX: 406-442-7182

DEQ Montana Department of Environmental Quality

MARK	DATE	DESCRIPTION	BY
0	7/20/18	ISSUED FOR CONSTRUCTION	SEF

Client: DEPARTMENT OF ENVIRONMENTAL QUALITY
Proj. Loc.: DEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

TRANSPORTATION PLAN

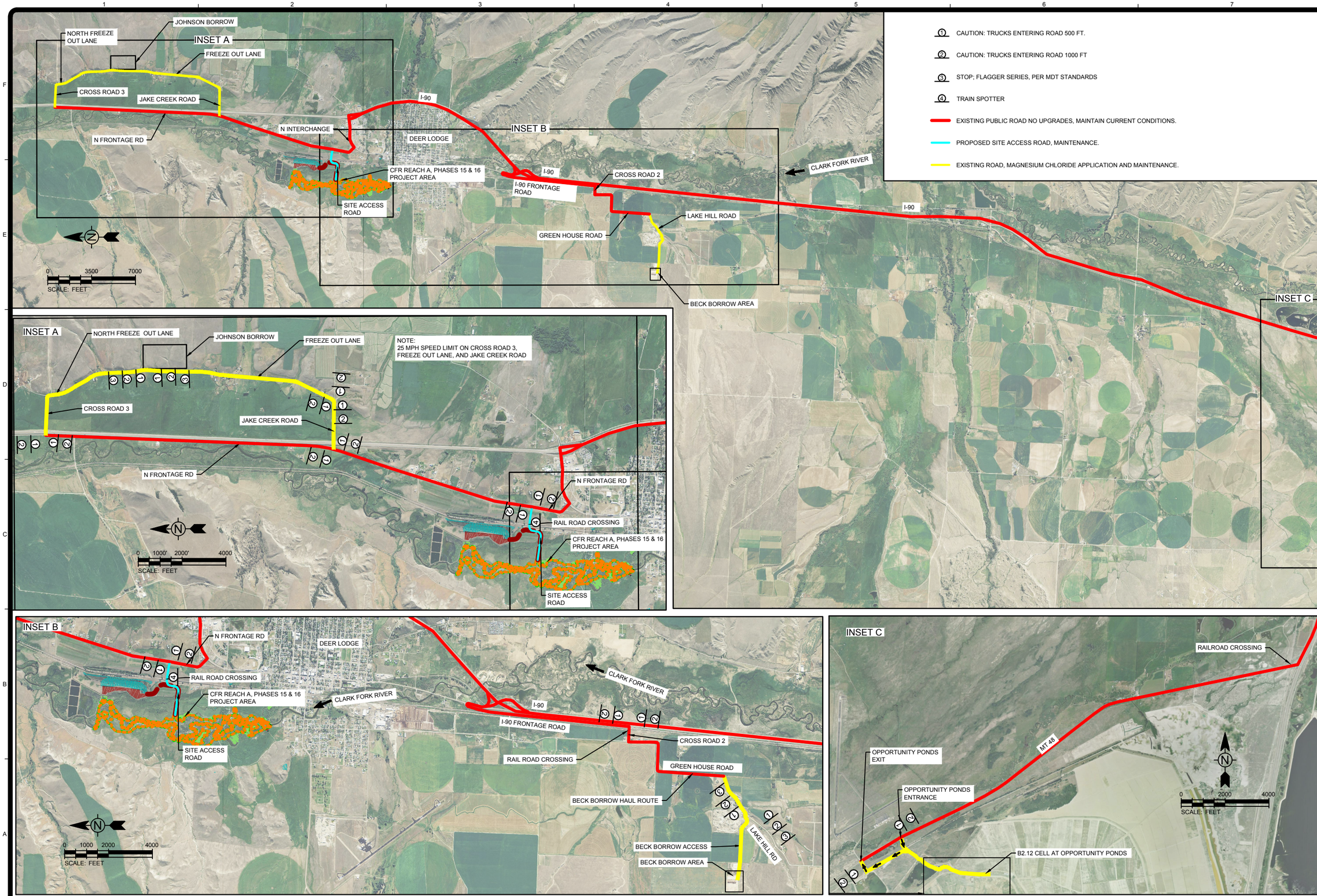
Project No.:	114-560584
Designed By:	MLH
Drawn By:	SEF
Checked By:	MLH

C31

Copyright: Tetra Tech

Bar Measures 1 inch

7/18/2018 3:42:07 PM - O:\H:\MIMONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY\114-560584 - TO 38 CFR PHASE 15&16 CM\110-2D CADD\SHEETFILES\C-31-32-TRANSPORT & TRAFFIC CONTROL PLANS.DWG - FIELD, STEVE



IMAGERY PROVIDED BY BING, 2012

1. CAUTION: TRUCKS ENTERING ROAD 500 FT.
2. CAUTION: TRUCKS ENTERING ROAD 1000 FT
3. STOP; FLAGGER SERIES, PER MDT STANDARDS
4. TRAIN SPOTTER

EXISTING PUBLIC ROAD NO UPGRADES, MAINTAIN CURRENT CONDITIONS.

PROPOSED SITE ACCESS ROAD, MAINTENANCE.

EXISTING ROAD, MAGNESIUM CHLORIDE APPLICATION AND MAINTENANCE.

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Client: DEPARTMENT OF ENVIRONMENTAL QUALITY
Proj. Loc.: DEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

TRAFFIC CONTROL PLAN

Project No.:	114-560584
Designed By:	MLH
Drawn By:	SPK
Checked By:	MLH

C32

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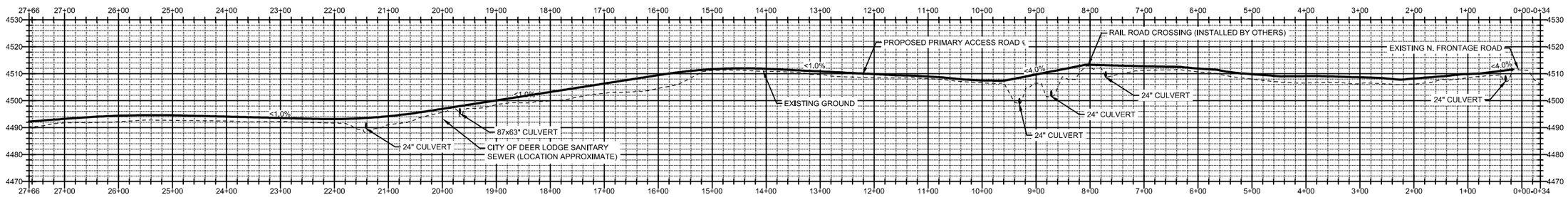
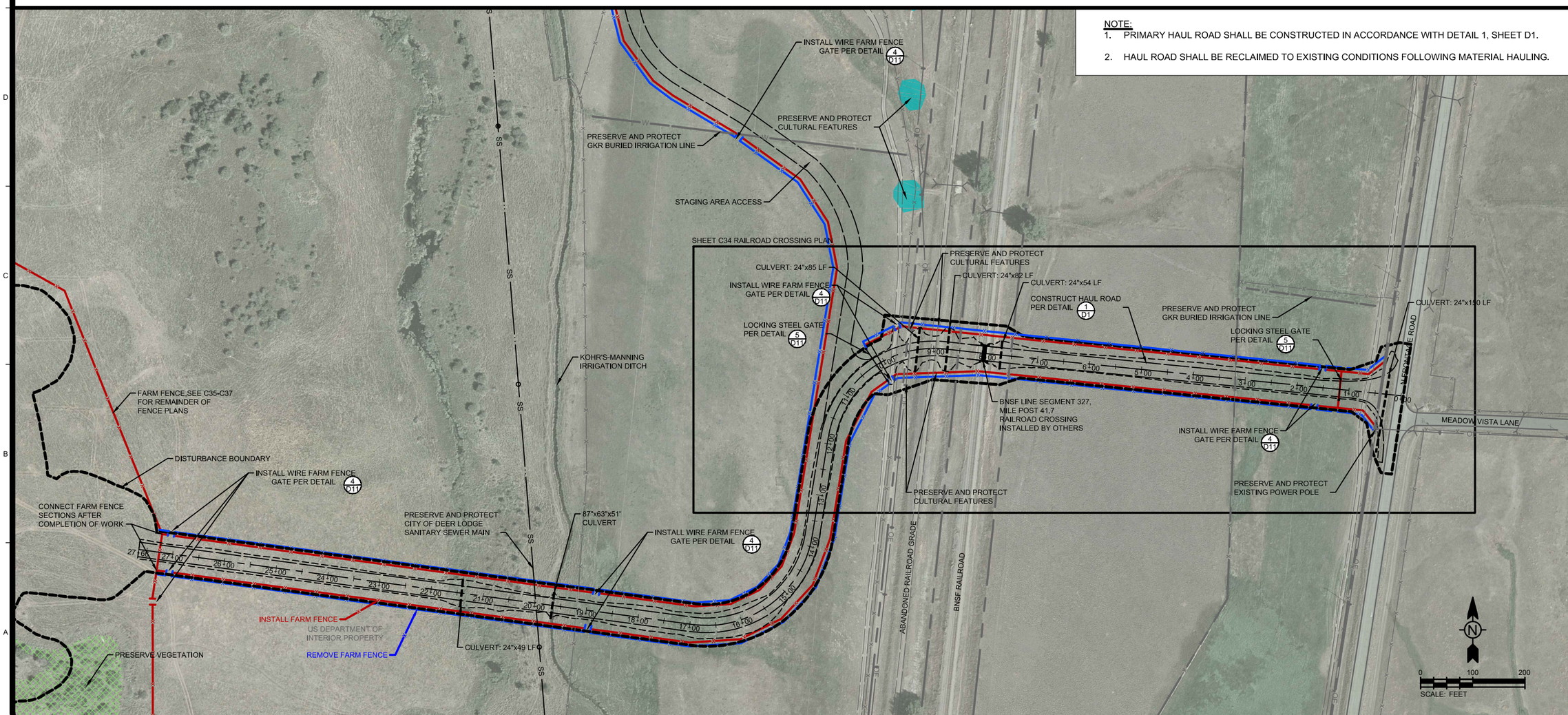
Bar Measures 1 inch

7/18/2018 3:42:24 PM - O:\H-M\MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY\114-560584 - TO 38 CFR PHASE 15&16 CM\10-2D CADD\SHEETFILES\C-31-32-TRANSPORT & TRAFFIC CONTROL PLANS.DWG - FIELD: STEVE



PROPOSED PRIMARY ACCESS HAUL ROAD OPTION A PROFILE

SCALE: 1" = 100' H 1" = 20' V



NOTE:

1. PRIMARY HAUL ROAD SHALL BE CONSTRUCTED IN ACCORDANCE WITH DETAIL 1, SHEET D1.
2. HAUL ROAD SHALL BE RECLAIMED TO EXISTING CONDITIONS FOLLOWING MATERIAL HAULING.

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Proj. Loc.: DEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

PRIMARY ACCESS HAUL ROAD PLAN AND PROFILE

Project No.:	114-560584
Designed By:	MEB/RWE
Drawn By:	MEB
Checked By:	MLH

C33

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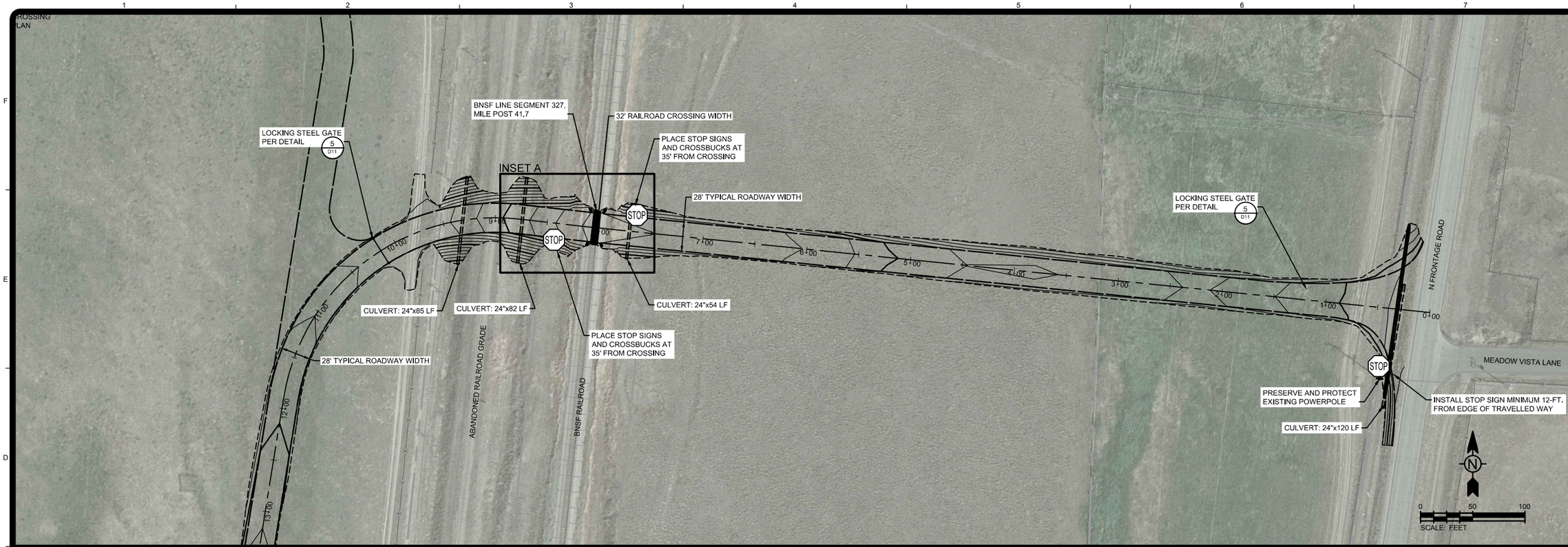
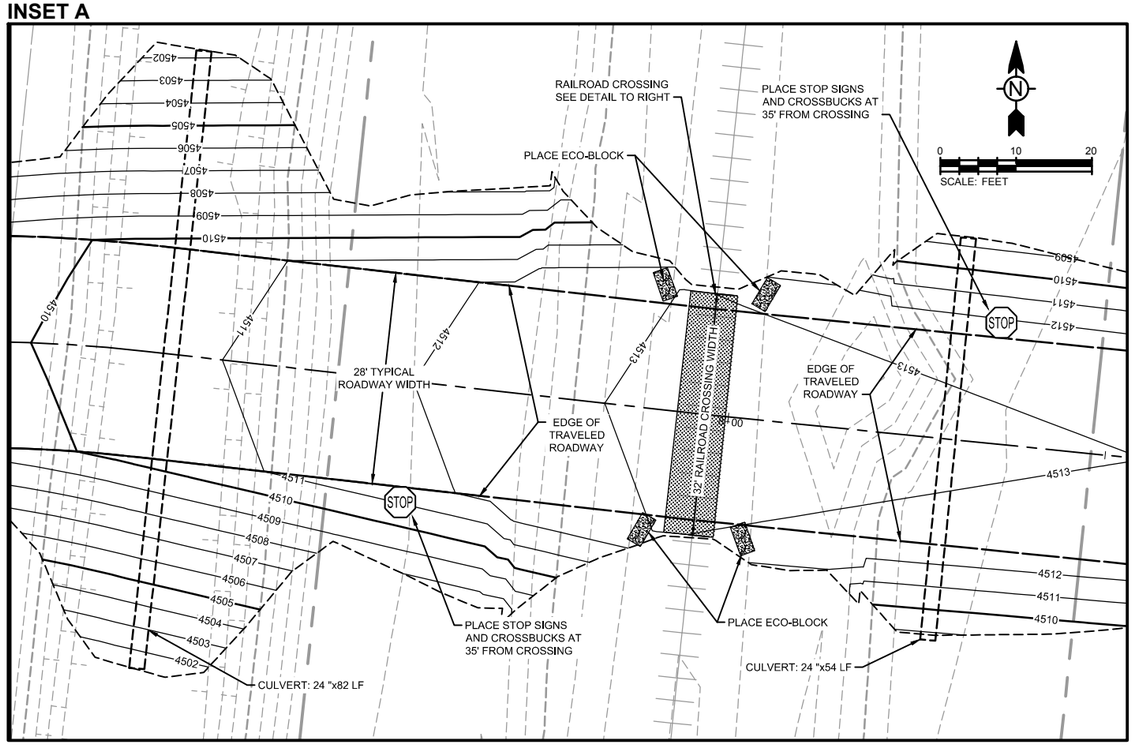
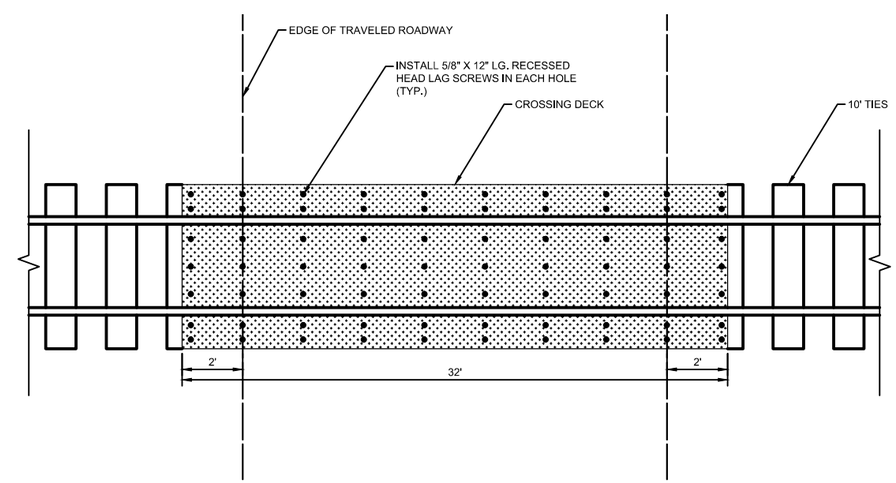
Bar Measures 1 inch

7/18/2018 5:04:49 PM - O:\H-M\MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY\114-560584 - TO 38 CFR PHASE 15&16 CM\110-2D CADD\SHEETFILES\C-33-PRIMARY ACCESS HAUL ROAD PLAN AND PROFILE.DWG - FIELD, STEVE



INSET A





RAILROAD CROSSING DETAIL (BY OTHERS)

NTS

NOTES

1. HAUL TRAFFIC MUST COME TO A COMPLETE STOP.
2. FAILURE TO STOP AND/OR YIELD RIGHT OF WAY TO RAIL TRAFFIC IS CAUSE FOR IMMEDIATE WORK STOPPAGE AND/OR TERMINATION OF CONTRACT.
3. INSTALL ECO-BLOCKS AT THE EDGES OF THE RAIL CROSSING AS SHOWN.
4. RAILROAD CROSSING COMPLETED BY OTHERS.
5. APPROACH SHALL BE CONSTRUCTED BY CONTRACTOR.

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Proj. Loc.: DEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

RAILROAD CROSSING PLAN

Project No.:	114-560584
Designed By:	MEB/RWE
Drawn By:	MEB
Checked By:	MLH

C34

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Bar Measures 1 inch

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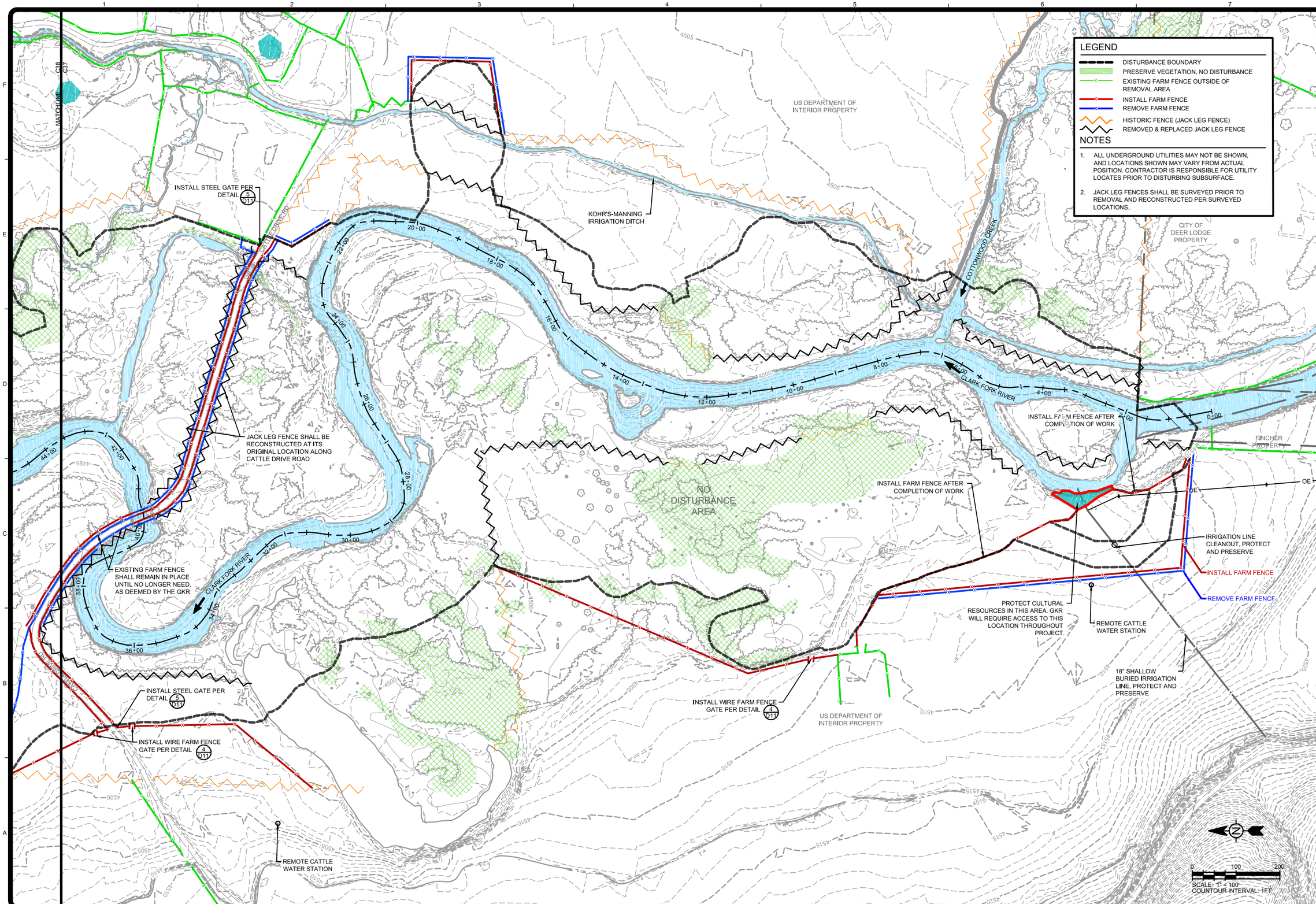

LEGEND

- DISTURBANCE BOUNDARY
- PRESERVE VEGETATION, NO DISTURBANCE
- EXISTING FARM FENCE OUTSIDE OF REMOVAL AREA
- INSTALL FARM FENCE
- REMOVE FARM FENCE
- HISTORIC FENCE (JACK LEG FENCE)
- REMOVED & REPLACED JACK LEG FENCE

NOTES

1. ALL UNDERGROUND UTILITIES MAY NOT BE SHOWN, AND LOCATIONS SHOWN MAY VARY FROM ACTUAL POSITION. CONTRACTOR IS RESPONSIBLE FOR UTILITY LOCATES PRIOR TO DISTURBING SUBSURFACE.
2. JACK LEG FENCES SHALL BE SURVEYED PRIOR TO REMOVAL AND RECONSTRUCTED PER SURVEYED LOCATIONS..

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Client: DEPARTMENT OF ENVIRONMENTAL QUALITY
Proj. Loc.: DEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

FENCE PLAN

Project No.:	114-560584
Designed By:	MLH
Drawn By:	SEF
Checked By:	MLH

C35

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Bar Measures 1 inch

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FOR REMAINING FARM FENCE ALONG PRIMARY HAUL ROAD, SEE SHEET C33

US DEPARTMENT OF INTERIOR PROPERTY

MATCHLINE C38

MATCHLINE C38 C37

INSTALL WIRE FARM FENCE GATE PER DETAIL 4/D11

INSTALL WIRE FARM FENCE GATE PER DETAIL 4/D11

CONNECT 5-STRAND WIRE FENCES ACROSS PRIMARY HAUL ROAD AFTER CONSTRUCTION IS COMPLETED AND THE HAUL ROAD IS REMOVED.

CLARK FORK RIVER

CLARK FORK RIVER

INSTALL WIRE FARM FENCE GATE PER DETAIL 4/D11

CATTLE ACCESS WATER GAP WITH LONG GATE DURING CONSTRUCTION

REMOTE CATTLE WATER STATION

CATTLE ACCESS WATER GAP WITH LONG GATE DURING CONSTRUCTION

INSTALL WIRE FARM FENCE GATE PER DETAIL 4/D11

INSTALL WIRE FARM FENCE GATE PER DETAIL 4/D11

NO DISTURBANCE AREA

US DEPARTMENT OF INTERIOR PROPERTY

REMOTE CATTLE WATER STATION

LEGEND

- DISTURBANCE BOUNDARY
- PRESERVE VEGETATION, NO DISTURBANCE
- EXISTING FARM FENCE OUTSIDE OF REMOVAL AREA
- INSTALL FARM FENCE
- REMOVE FARM FENCE
- HISTORIC FENCE (JACK LEG FENCE)
- REMOVED & REPLACED JACK LEG FENCE

NOTES

1. ALL UNDERGROUND UTILITIES MAY NOT BE SHOWN, AND LOCATIONS SHOWN MAY VARY FROM ACTUAL POSITION. CONTRACTOR IS RESPONSIBLE FOR UTILITY LOCATES PRIOR TO DISTURBING SUBSURFACE.
2. JACK LEG FENCES SHALL BE SURVEYED PRIOR TO REMOVAL AND RECONSTRUCTED PER SURVEYED LOCATIONS..

SCALE: 1" = 100'
COUNTOUR INTERVAL: 1FT

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Proj. Loc.: DEER LODGE, MONTANA
CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

FENCE PLAN

Project No.:	114-560584
Designed By:	MEH
Drawn By:	SEF
Checked By:	MEH

C36

Bar Measures 1 inch

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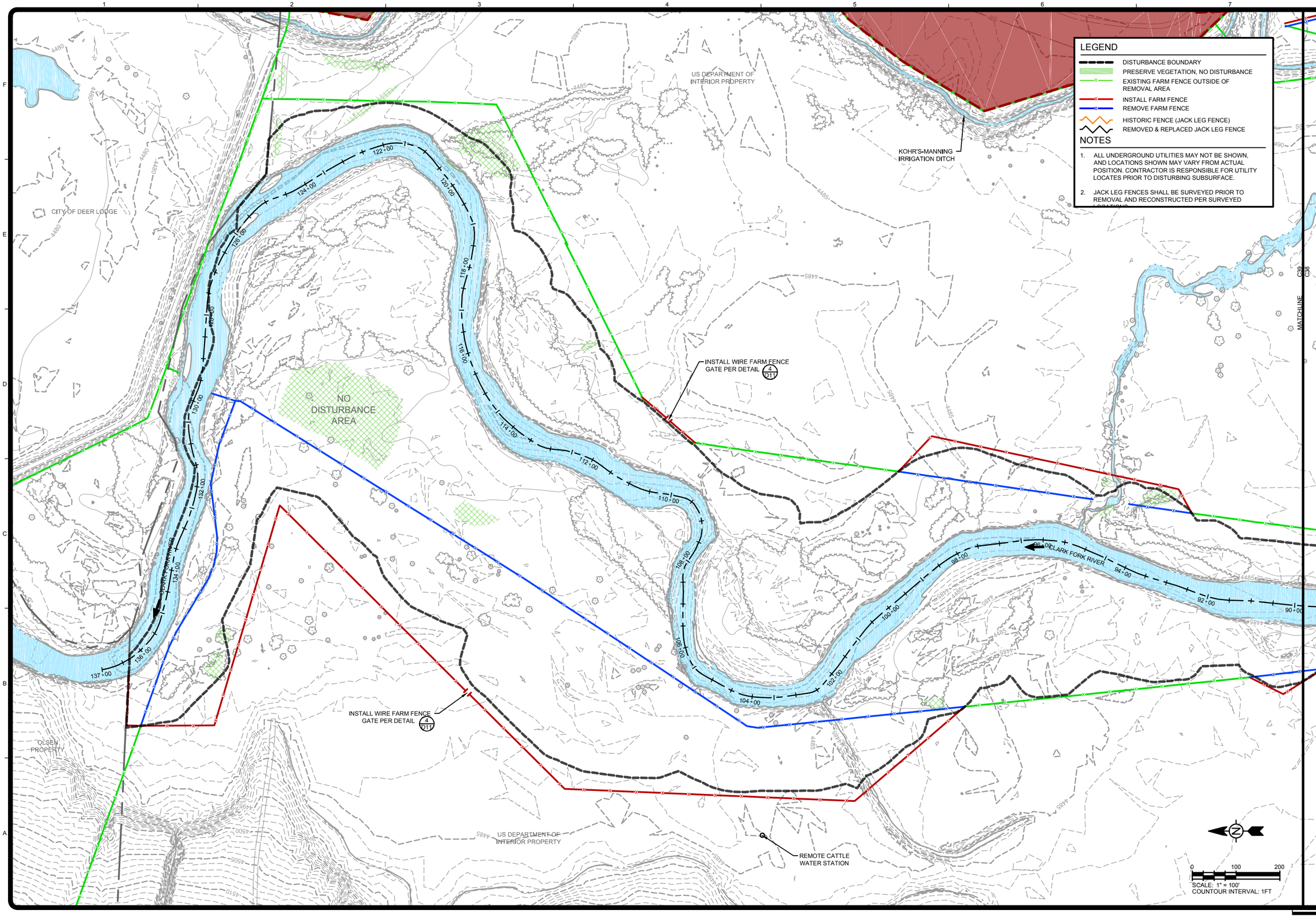
7/19/2018 8:28:28 AM - O:\H:\MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY\114-560584 - TO 38 CFR PHASE 15&16 CM\110-2D CADD\SHEETFILES\C-35-36-37-FENCE PLANS.DWG - FIELD, STEVE



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Proj. Loc.: DEER LODGE, MONTANA
CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

FENCE PLAN

Project No.:	114-560584
Designed By:	MLH
Drawn By:	SEF
Checked By:	MLH

C37

Bar Measures 1 inch

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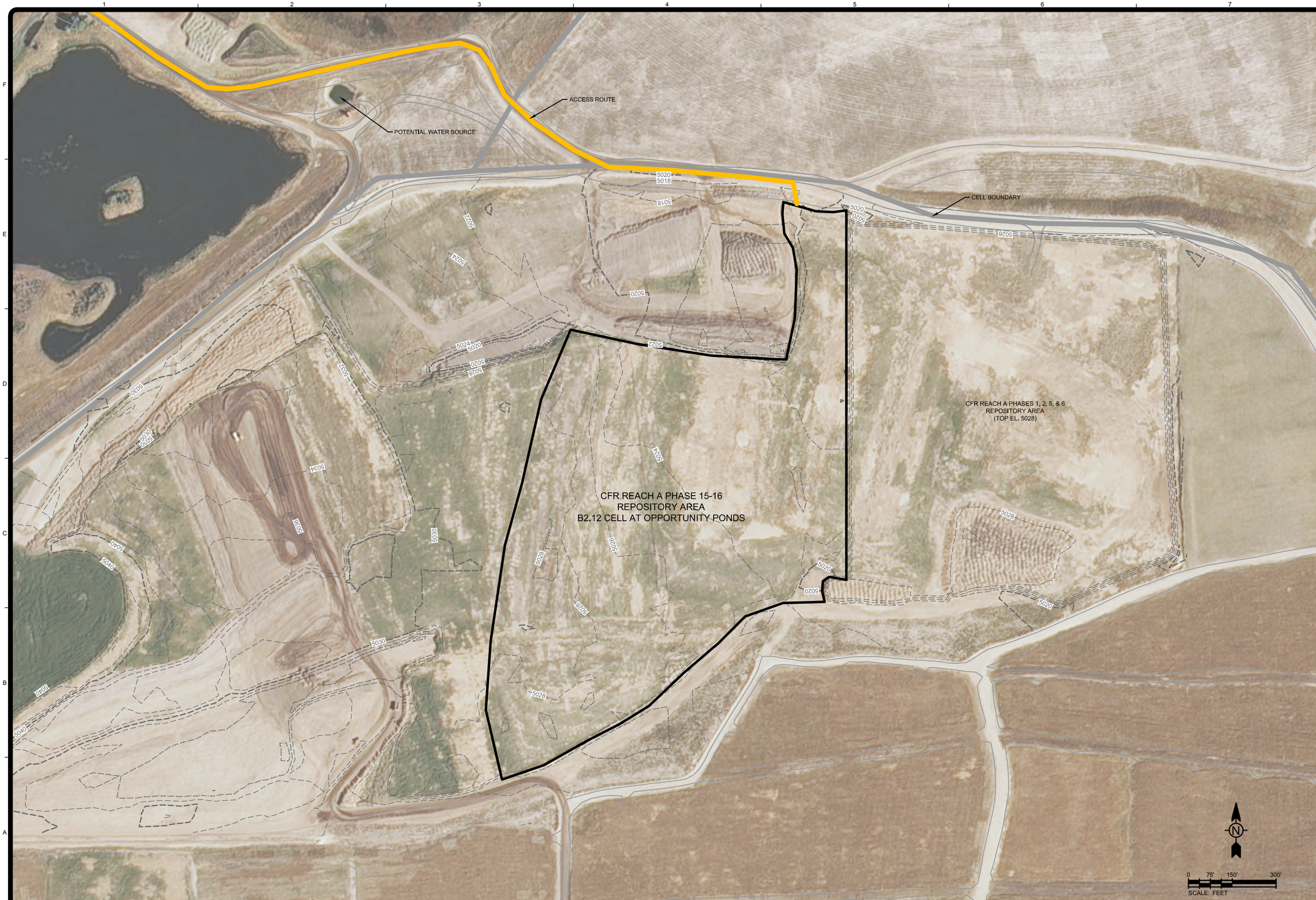

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CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

REPOSITORY PLAN
B2.12 CELL
AT OPPORTUNITY PONDS

Project No.:	114-560584
Designed By:	SEF
Drawn By:	SEF
Checked By:	MLH

C38

Bar Measures 1 inch

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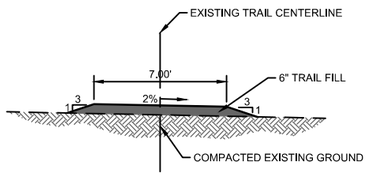
LEGEND

	LENGTH (FT)
WIDEN EXISTING TRAIL	1,071 FEET
CONSTRUCT NEW TRAIL	1,685 FEET

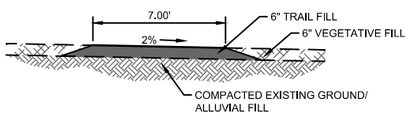
NOTES

1. TRAIL GRADE NOT TO EXCEED 5%.
2. TRAIL CROSS-SLOPE NOT TO EXCEED 5%.
3. TRAIL FILL TO BE CRUSHED 1/4" MINUS COMPACTED GRAVEL ON COMPACTED SUBGRADE ALLUVIUM.



1 / C39 TRAIL WIDENING TYPICAL SECTION

1" = 4'



2 / C39 NEW TRAIL TYPICAL SECTION

1" = 4'

EXISTING TRAIL

WIDEN EXISTING TRAIL AND IMPROVE TRAIL BED. SEE DETAIL 1/C39

REMOVAL AREA BOUNDARY

KOHRS-MANNING IRRIGATION DITCH

CATTLE DRIVE RD

CONSTRUCT NEW TRAIL. SEE 2/C39

CLARK FORK RIVER

COTTONWOOD CREEK

0 100 200
SCALE: 1" = 100'

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Proj. Loc.: DEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

NATIONAL PARK SERVICE SCENIC TRAIL PLAN

Project No.:	114-560584
Designed By:	SEF
Drawn By:	SEF
Checked By:	MLH

C39

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Bar Measures 1 inch

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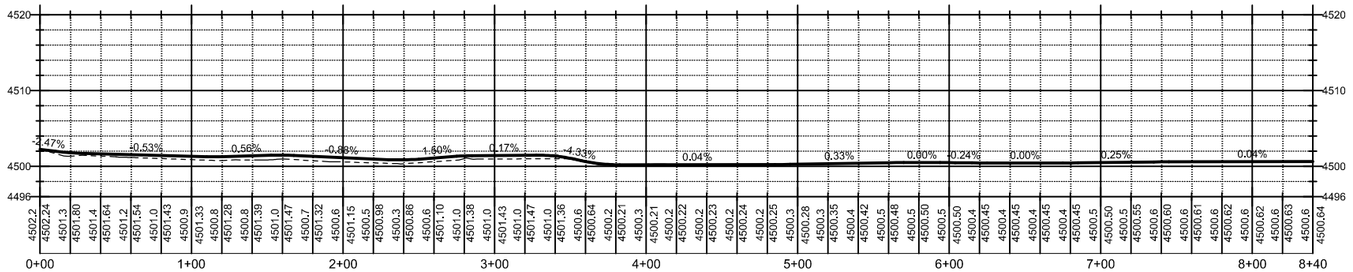
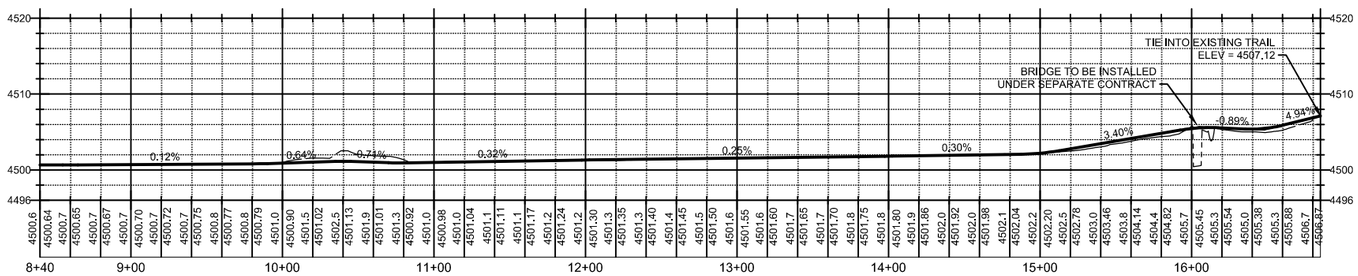




GRANT-KOHRS RANCH TRAIL PROFILE

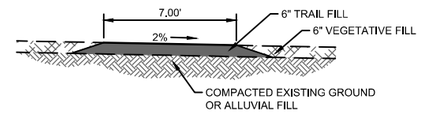
1" = 50' H 1" = 10' V

NOTES

1. CONTOUR INTERVAL = 0.5FT.
2. TRAIL GRADE NOT TO EXCEED 5%.
3. TRAIL CROSS-SLOPE NOT TO EXCEED 5%.
4. TRAIL FILL TO BE CRUSHED 1/4" MINUS COMPACTED GRAVEL ON COMPACTED SUBGRADE ALLUVIUM.

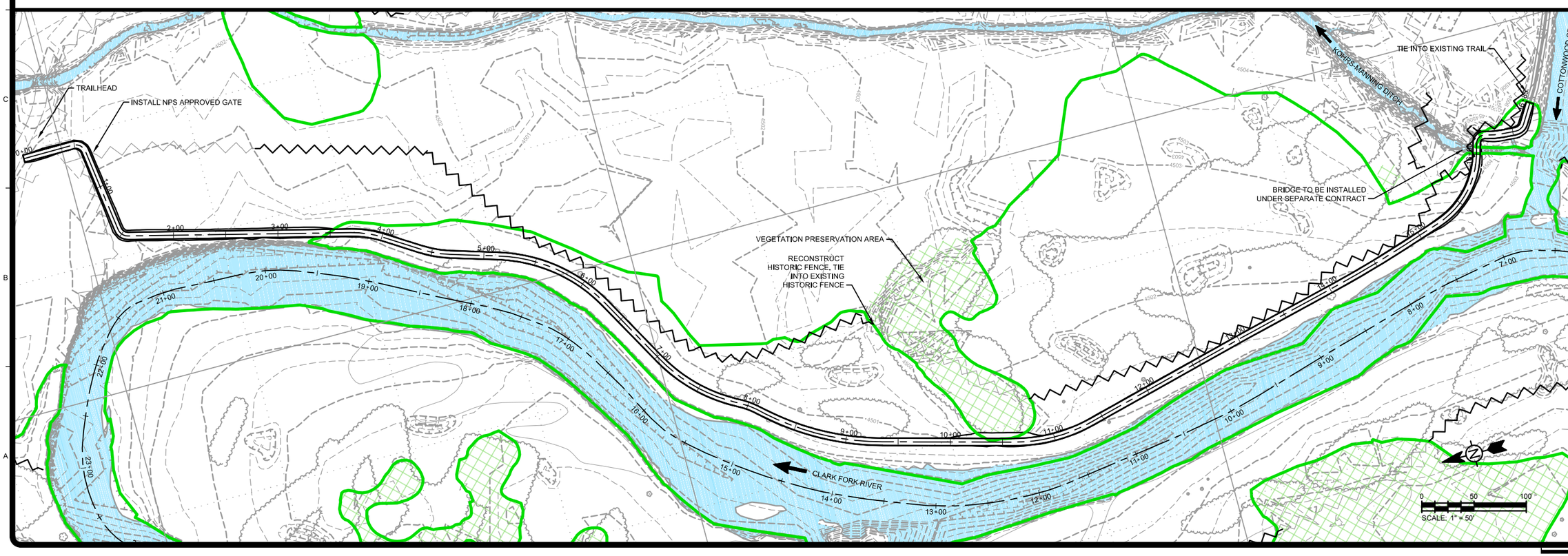
LEGEND

- TRAIL MAJOR CONTOUR
- TRAIL MINOR CONTOUR
- FLOODPLAIN REGRADING BOUNDARY



1 C36 TRAIL TYPICAL SECTION

1" = 4'



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Client: DEPARTMENT OF ENVIRONMENTAL QUALITY
Proj. Loc.: DEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

NATIONAL PARK SERVICE SCENIC TRAIL CONSTRUCTION PLAN AND PROFILE

Project No.:	114-560584
Designed By:	SEF
Drawn By:	SEF
Checked By:	MLH

C40

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Bar Measures 1 inch

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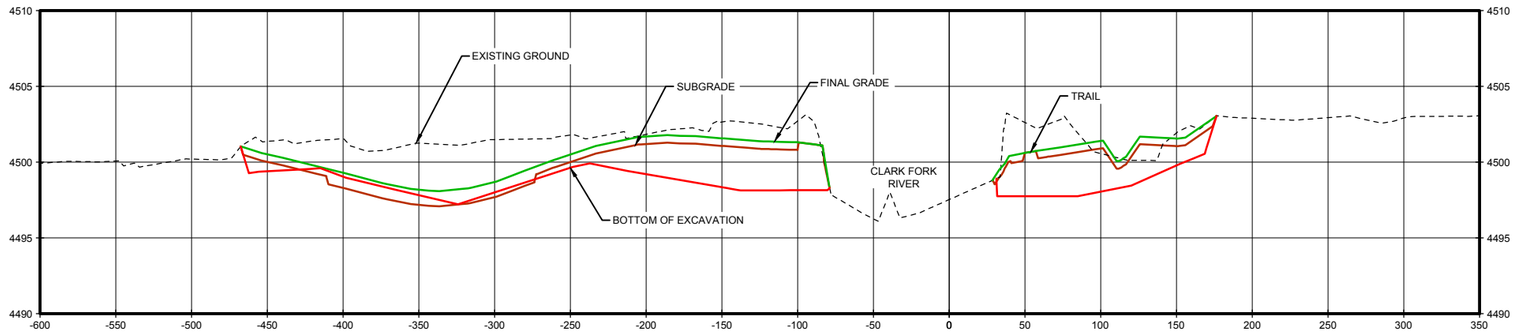
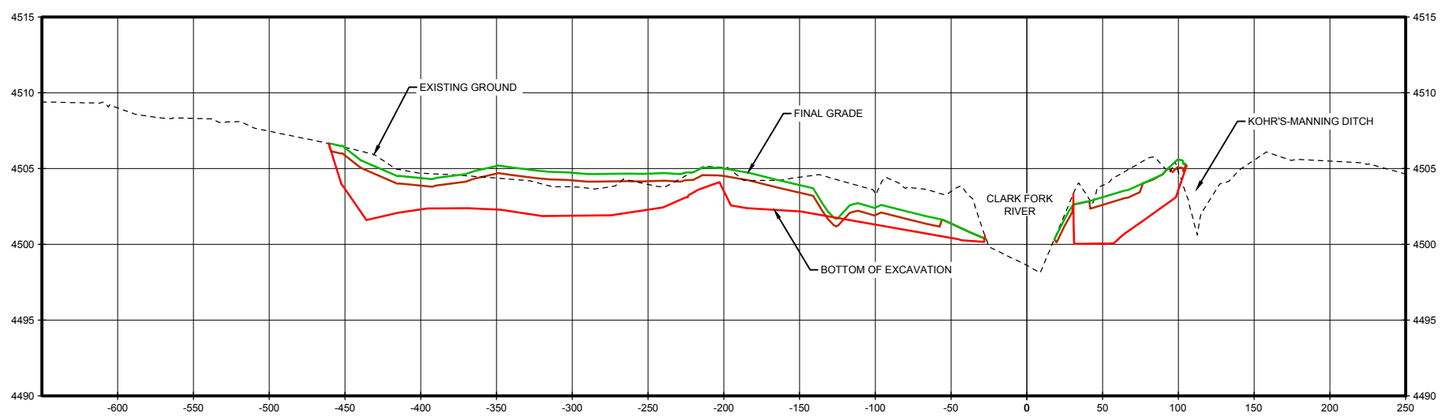


2 C1-C24 SECTION STATION 14+00

1" = 50' H 1" = 5' V



1 C1-C24 SECTION STATION 7+00

1" = 50' H 1" = 5' V

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Proj. Loc.: DEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

FLOODPLAIN CROSS-SECTIONS

Project No.:	114-560584
Designed By:	SEF
Drawn By:	SEF
Checked By:	MLH

XS1

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Bar Measures 1 inch

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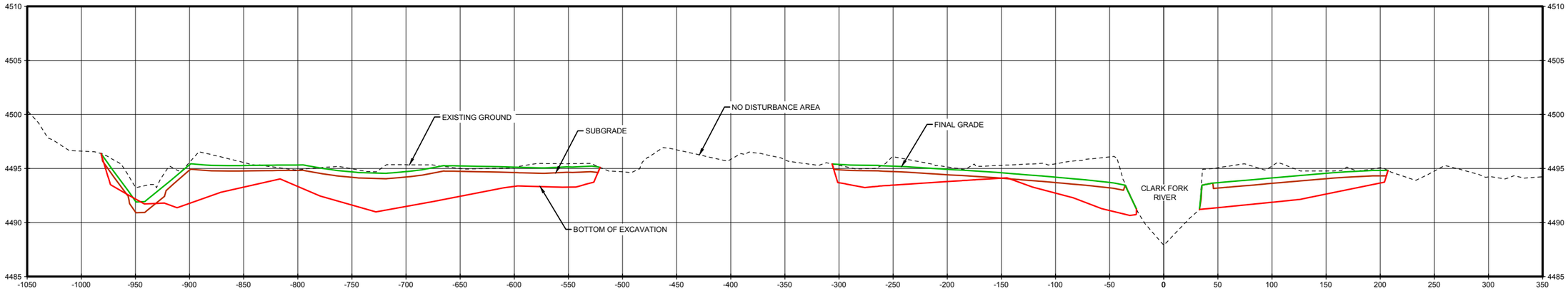
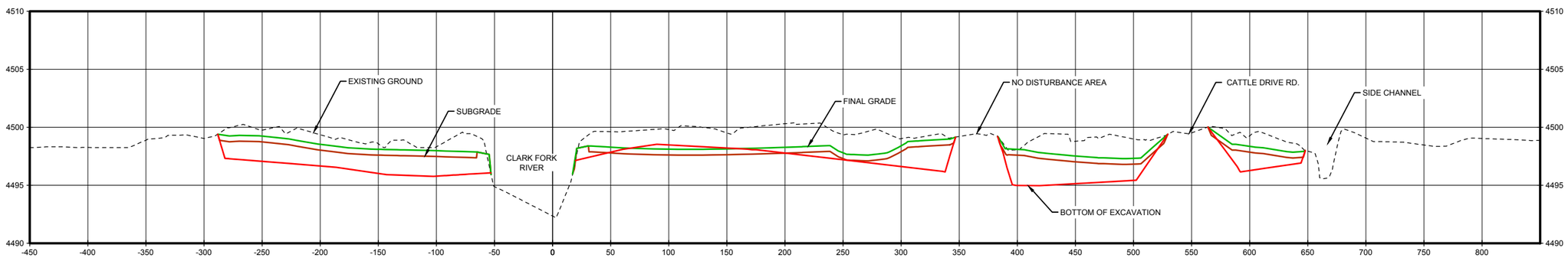


4 C1-C24 SECTION STATION 50+00
1" = 50' H 1" = 5' V



3 C1-C24 SECTION STATION 31+50
1" = 50' H 1" = 5' V

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Proj. Loc.: DEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

FLOODPLAIN CROSS-SECTIONS

Project No.:	114-560584
Designed By:	SEF
Drawn By:	SEF
Checked By:	MLH

XS2

Bar Measures 1 inch

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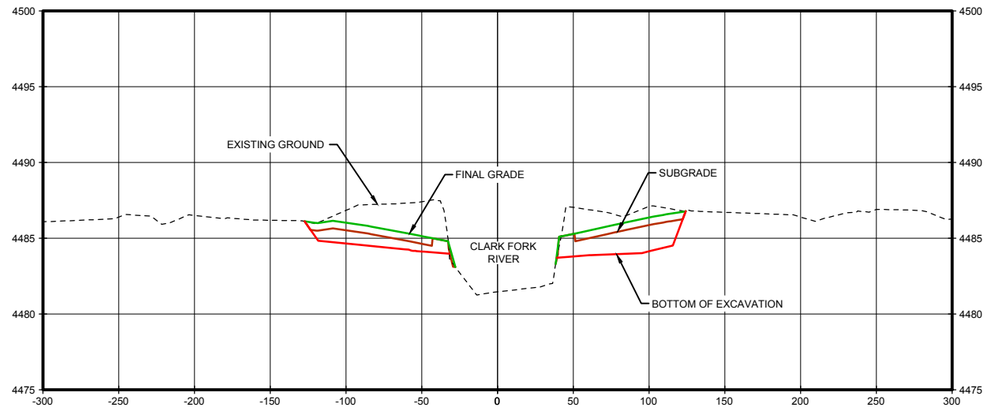
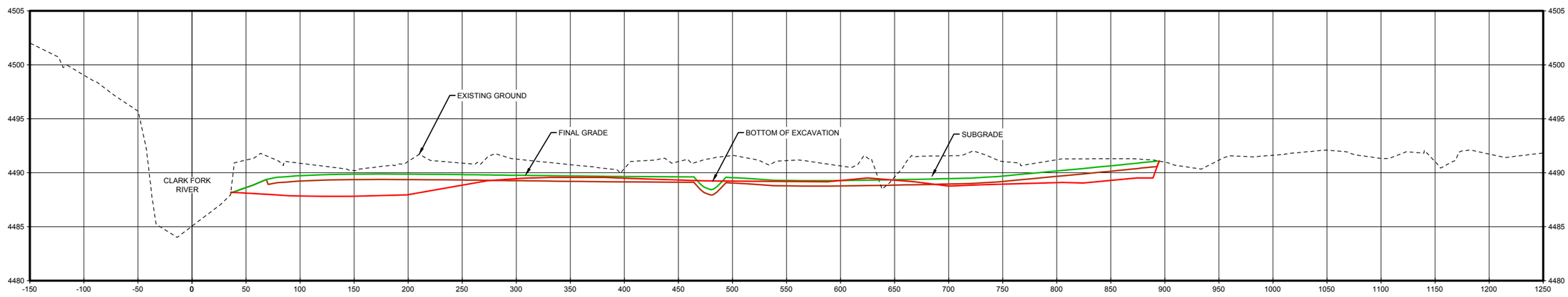


6 C1-C24 SECTION STATION 92+00
1" = 50' H 1" = 5' V



5 C1-C24 SECTION STATION 71+25
1" = 50' H 1" = 5' V

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DEQ Montana Department of Environmental Quality

MARK	DATE	DESCRIPTION	BY
0	7/20/18	ISSUED FOR CONSTRUCTION	SEF

Client: DEPARTMENT OF ENVIRONMENTAL QUALITY
Proj. Loc.: DEER LODGE, MONTANA
CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

FLOODPLAIN CROSS-SECTIONS

Project No.:	114-560584
Designed By:	SEF
Drawn By:	SEF
Checked By:	MLH

XS3

Bar Measures 1 inch

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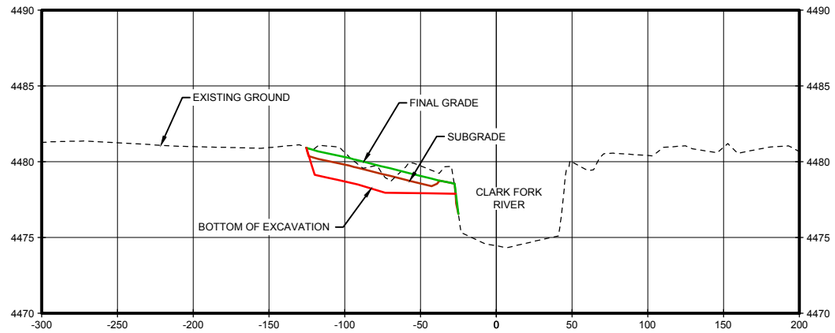

8 C1-C24 SECTION STATION 133+00

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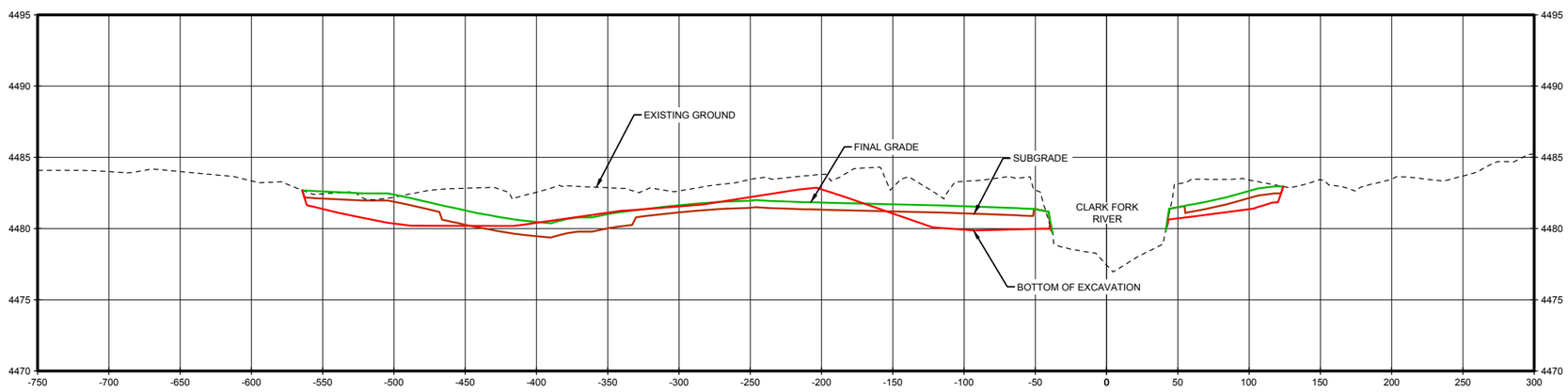

7 C1-C24 SECTION STATION 111+00

1" = 50' H 1" = 5' V

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Proj. Loc.: DEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

FLOODPLAIN CROSS-SECTIONS

Project No.:	114-560584
Designed By:	SEF
Drawn By:	SEF
Checked By:	MLH

XS4

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Bar Measures 1 inch

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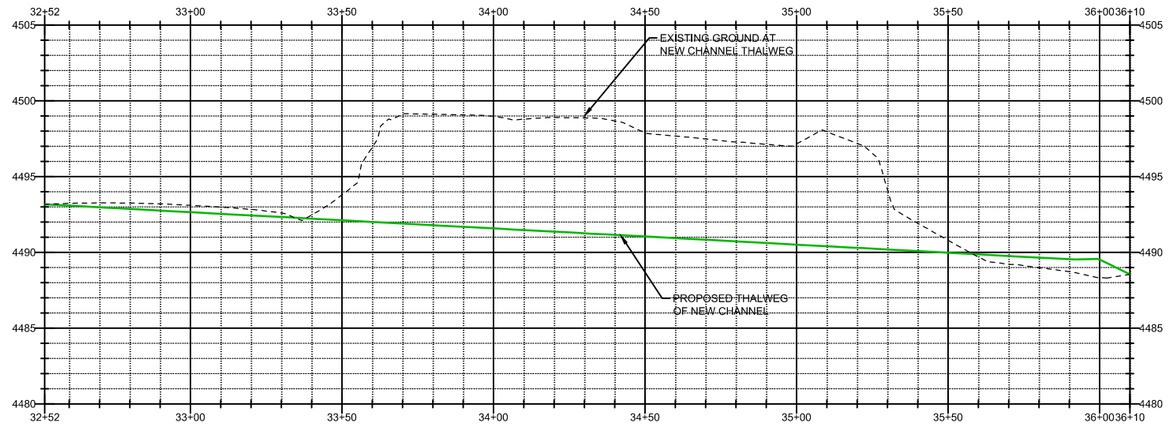
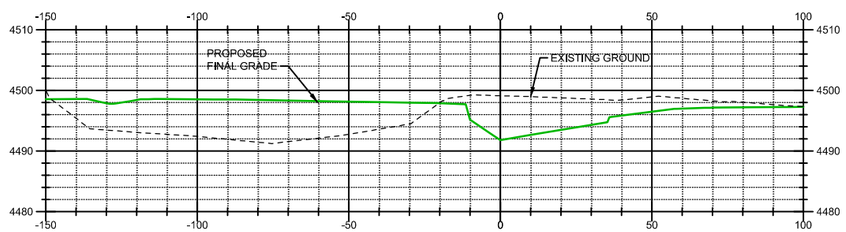
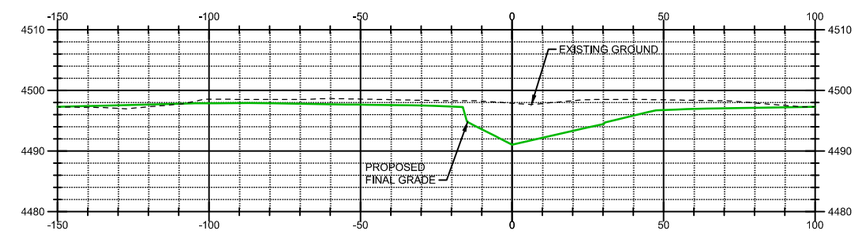


NEW CHANNEL THALWEG PROFILE



1 C25 SECTION STATION 33+80



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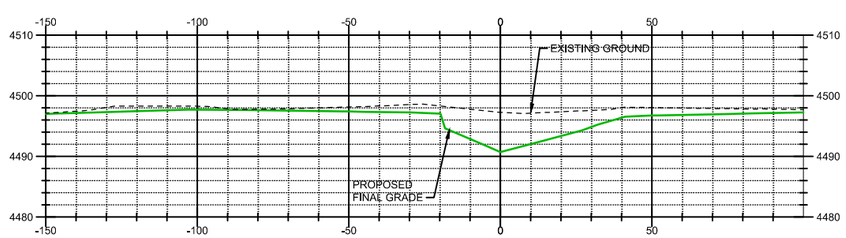

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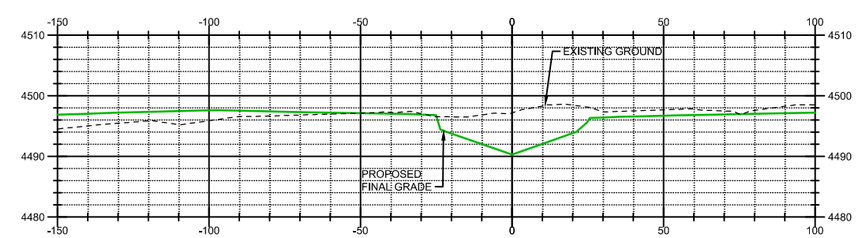

4 C25 SECTION STATION 35+20

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Client: DEPARTMENT OF ENVIRONMENTAL QUALITY
Proj. Loc.: DEER LODGE, MONTANA
CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

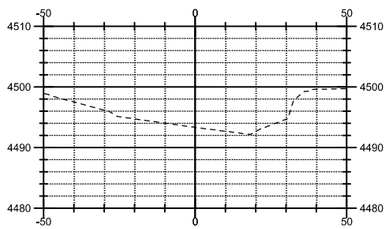
NEW CHANNEL CROSS-SECTIONS AND PROFILE

Project No.:	114-560584
Designed By:	LC
Drawn By:	SEF/MEB
Checked By:	MLH

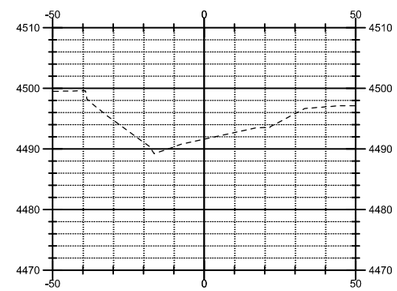
XS5

Bar Measures 1 inch

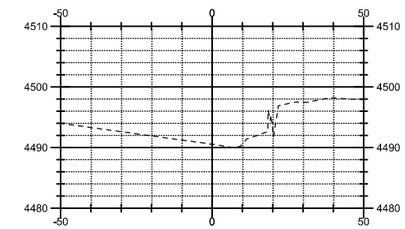
7/19/2018 10:00:18 AM - O:\H-M\MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY\114-560584 - TO 38 CFR PHASE 15&16 CM\110-2D CADD\SHEETFILES\XS-05-NEW CHANNEL CROSS SECTIONS AND PROFILE.DWG - FIELD, STEVE



1 C26 COFFER DAMS C & D
SECTION STATION 33+00



2 C26 COFFER DAM A
SECTION STATION 39+00



3 C26 COFFER DAM B
SECTION STATION 42+25

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Client: DEPARTMENT OF ENVIRONMENTAL QUALITY
Proj. Loc.: BEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

TEMPORARY CHANNEL COFFER DAM CROSS-SECTIONS

Project No.:	114-560584
Designed By:	LC
Drawn By:	SEF/MEB
Checked By:	MLH

XS6

Bar Measures 1 inch

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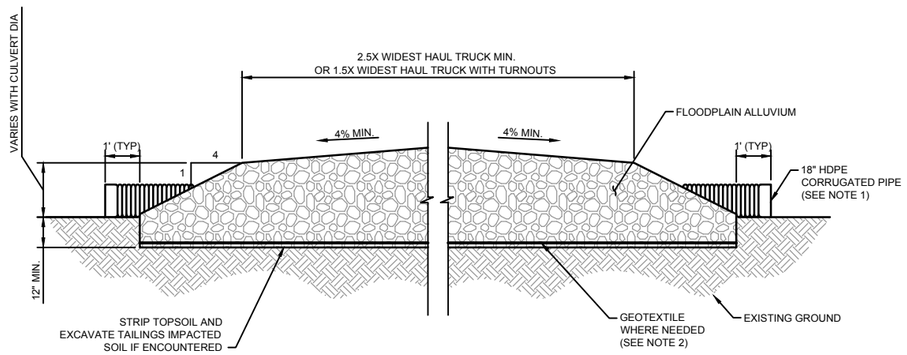
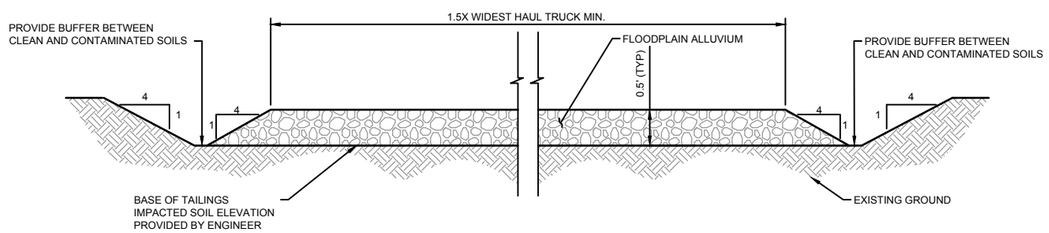


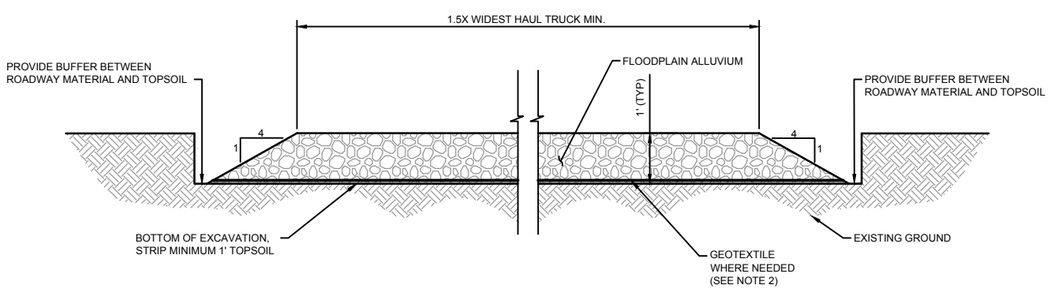
1 - PRIMARY INTERNAL HAUL ROAD TYPICAL

NTS



2 - SECONDARY INTERNAL HAUL ROAD TYPICAL

NTS



3 - SECONDARY INTERNAL HAUL ROAD TYPICAL (NON-IMPACTED AREAS)

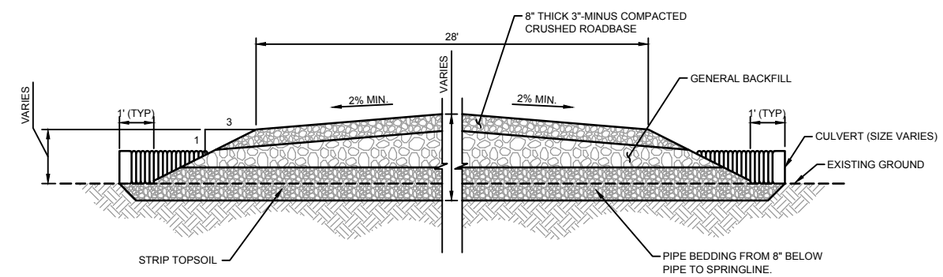
NTS

NOTES:

1. CONTRACTOR SHALL INSTALL DRAINAGE CULVERTS AS REQUIRED. NO MORE THAN 5 DRAINAGE CULVERTS ARE ANTICIPATED AS PART OF THE PRIMARY HAUL ROAD CONSTRUCTION. CULVERTS SHALL BE LOAD RATED FOR THE HEAVIEST EQUIPMENT AND SHALL HAVE SUFFICIENT FILL ATOP THE CULVERT, PER THE MANUFACTURER'S RECOMMENDATION. CULVERT INLET SHALL BE A MINIMUM OF 0.1" HIGHER THAN THE CULVERT OUTLET. CULVERTS SHALL BE INSTALLED AT A UNIFORM GRADE. BEDDING MATERIAL AND BACKFILL SHALL CONSIST OF NATIVE MATERIALS.

2. PLACE GEOTEXTILE IN ACCORDANCE WITH BID ITEM NO. 7 & 8 CONSTRUCT, MAINTAIN, AND RECLAIM PRIMARY AND SECONDARY HAUL ROADS AND COMPLY WITH MANUFACTURER'S RECOMMENDATIONS.

3. IF 4:1 SIDE SLOPES (DETAILS 1 AND 2) CANNOT BE ACHIEVED, CONTRACTOR SHALL INSTALL BERMING ALONG THE SHOULDERS OF THE ROAD TO THE MID-AXLE HEIGHT OF THE LARGEST SELF-PROPELLED MOBILE EQUIPMENT WHICH TRAVELS THE ROADWAY. MINIMUM ROADWAY WIDTH SHALL BE MAINTAINED PER DETAIL 1, SHEET D1.



PIPE BEDDING SHALL CONSIST OF GRAVEL, SAND, OR SANDY GRAVEL WITH A MAX. SIZE OF ¾" AND A PLASTICITY INDEX OF 6 OR LESS. PLACE IN 8" LIFTS AND COMPACT.

4 - JOHNSON BORROW HAUL ROAD TYPICAL

NTS

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Client: DEPARTMENT OF ENVIRONMENTAL QUALITY
Proj. Loc.: DEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

HAUL ROAD DETAILS

Project No.:	114-560584
Designed By:	MLH
Drawn By:	SPK
Checked By:	MLH

D1

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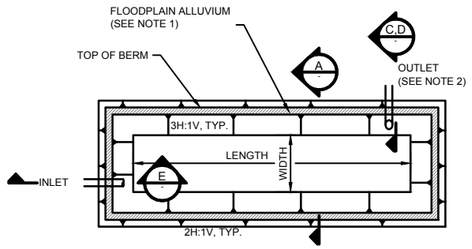
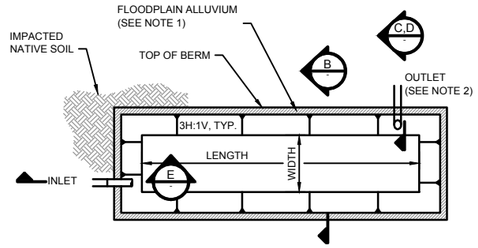
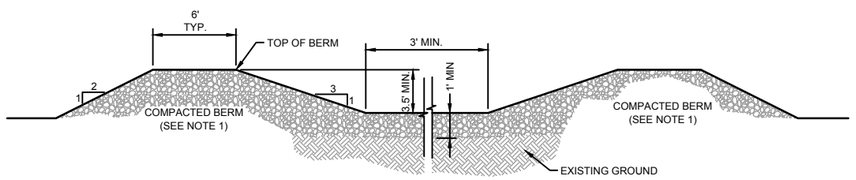


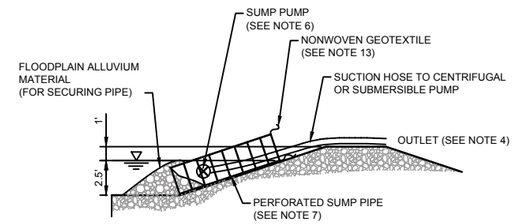
1 RAISED SEDIMENT DETENTION POND
NTS



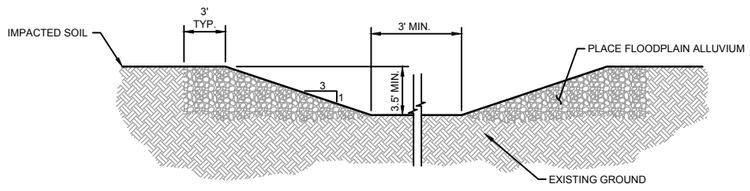
2 RECESSED SEDIMENT DETENTION POND
NTS



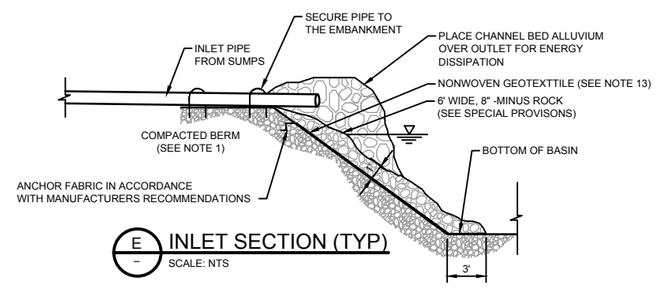
A SEDIMENT DETENTION POND
SCALE: NTS



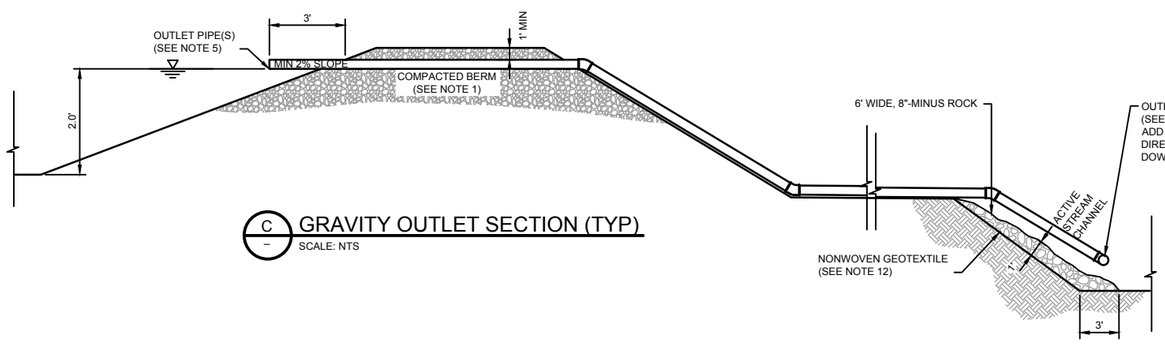
D PUMP OUTLET
(TYP SEE NOTE 11)
SCALE: NTS



B SEDIMENT DETENTION POND
SCALE: NTS



E INLET SECTION (TYP)
SCALE: NTS



C GRAVITY OUTLET SECTION (TYP)
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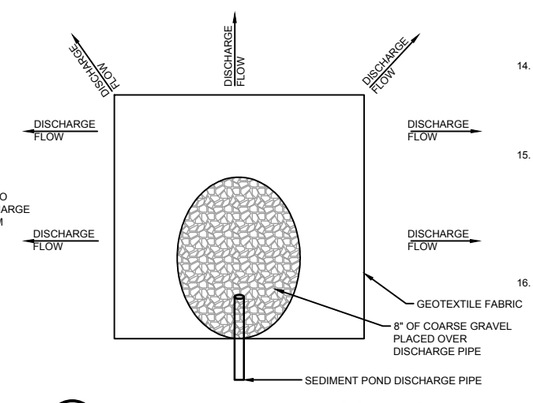

3 HARDENED BUFFER DISCHARGE
NTS

GENERAL NOTES:

1. FILL FOR CONSTRUCTING SEDIMENT DETENTION PONDS SHALL BE CLEAN LOCAL FLOODPLAIN ALLUVIUM. FILL SHALL BE PLACED IN 1' LIFTS AND MECHANICALLY COMPACTED. FILL SHALL HAVE NO ROCKS LARGER THAN 6" DIAMETER. EACH COMPACTED LIFT SHALL BE SCARIFIED TO A DEPTH OF AT LEAST 2" PRIOR TO THE PLACEMENT OF THE NEXT LIFT.

2. DISCHARGES FROM SEDIMENT PONDS CAN OCCUR USING EITHER OF THE FOLLOWING METHODS:
   2.1. CONTRACTOR MAY DISCHARGE VISUALLY CLEAR (LITTLE TO NO TURBIDITY AS DETERMINED BY ENGINEER) FROM THE SEDIMENT POND DIRECTLY TO SURFACE WATER WHERE A MINIMUM OF 2 FEET OF WATER IS PRESENT, OR CHANNEL IS FREE OF FINE MATERIAL.
   2.2. CONTRACTOR SHALL PROTECT THE DISCHARGE OUTLETS OF THE SEDIMENT PONDS FROM EROSION WITH NONWOVEN GEOTEXTILE COVERED BY 8-INCH MINUS ROCK AS ON DETAILS SHEET D2, DEWATERING DETAILS.

3. INSTALL THE DISCHARGE OUTLET PIPING FROM THE SEDIMENT POND WITHIN THE STREAM CHANNEL AND BELOW THE CURRENT SURFACE WATER ELEVATION. ANCHOR THE DISCHARGE OUTLET PIPING IN THE STREAM UTILIZING SAND BAGS. INSTALL TYPE 1 RIPRAP OUTLET APRON AT LOCATIONS REQUESTED BY ENGINEER.

4. STREAM CHANNEL BANKS SHALL BE PROTECTED FROM EROSION IN A SIMILAR MANNER AS THE GRAVITY OUTLET DISCHARGES AT THE SEDIMENT POND PUMP OUTLET (SEE SECTION C, SHEET D2).

5. SEDIMENT DETENTION POND PUMP DISCHARGE PIPE SHALL HAVE A MINIMUM CAPACITY EQUAL TO THE SEDIMENT POND INFLUENT FLOW RATE.

6. THE SEDIMENT POND PUMP SHALL HAVE A MINIMUM CAPACITY OF 100 GAL/MIN/100FT OF TRENCH, OR 100 GAL/MIN PER POINT SUMP.

7. SUMP PIPE SHALL HAVE MINIMUM DIAMETER OF 24". OPEN SPACE OF PERFORATIONS IN SUMP PIPE SHALL EXCEED 80 SQUARE INCHES PER 100 FEET OF TRENCH. WRAP PIPE WITH GEOTEXTILE AS DESCRIBED IN BID ITEM NO. 14, GROUNDWATER DEWATERING SUMPS.

8. PROVIDE SUITABLE RIGID SUPPORT FOR PIPING AND ELECTRICAL CROSSINGS OF DEWATERING TRENCHES, AND ACTIVE STREAM CHANNEL.

9. SEDIMENT ACCUMULATED IN PONDS AND FLOODPLAIN ALLUVIUM USED AS FILL IN THE DEWATERING SYSTEM SHALL BE CONSIDERED CONTAMINATED UPON ABANDONMENT AND SHALL BE DISPOSED IN ACCORDANCE WITH BID ITEM NO. 21. EXCAVATE, HAUL AND PLACE TAILINGS/IMPACTED SOIL.

10. ALL PETROLEUM POWERED PUMPS AND FUEL CONTAINERS SHALL BE PLACED IN SECONDARY CONTAINMENT WITH A MINIMUM CAPACITY OF 200% OF THE FUEL VOLUME.

11. IF GRAVITY OUTLET FROM THE SEDIMENT DETENTION POND CANNOT BE INSTALLED, A PUMP OUTLET SHALL BE USED.

12. SEDIMENT PONDS ARE DESIGNED TO TREAT UP TO 500 GPM. OTHER TREATMENT CAPACITIES AND DIMENSIONS CAN BE CONSTRUCTED WITH APPROVAL OF ENGINEER

NOTES FOR SECTIONS C & D:

13. THE DISCHARGE AREAS FROM THE PONDS INTO THE EXISTING OR RECONSTRUCTED STREAM CHANNEL SHALL BE PROTECTED WITH NONWOVEN GEOTEXTILE AND 8-INCH MINUS ROCK. CONTRACTOR SHALL SUBMIT PERMEATEX 4040 NONWOVEN GEOTEXTILE MATERIAL SPECIFICATIONS TO ENGINEER IN ACCORDANCE WITH SPECIAL PROVISIONS, PARAGRAPH 23, SUBMITTALS.

14. PLACE AND ANCHOR GEOTEXTILE ON THE APPROVED SMOOTH-GRADED SURFACE. FOR SLOPE PROTECTION, PLACE THE LONG DIMENSION OF THE GEOTEXTILE DOWN THE SLOPE. FOR STREAM BANK PROTECTION, PLACE THE LONG DIMENSION OF THE GEOTEXTILE PARALLEL TO THE CENTERLINE OF THE CHANNEL.

15. OVERLAP THE GEOTEXTILE A MINIMUM OF 12 INCHES AT THE ENDS AND SIDES OF ADJOINING SHEETS OR SEW THE GEOTEXTILE JOINTS ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. OVERLAP THE UPHILL OR UPSTREAM SHEET OVER THE DOWNHILL OR DOWNSTREAM SHEET. OFFSET END JOINTS OR ADJACENT SHEETS A MINIMUM OF 5 FEET. PINS MAY BE USED TO HOLD THE GEOTEXTILE IN PLACE. SPACE PINS ALONG THE OVERLAPS AT APPROXIMATELY 3 FOOT CENTERS.

16. PLACE AGGREGATE, SLOPE PROTECTION OR RIPRAP ON THE GEOTEXTILE STARTING AT THE TOE OF THE SLOPE AND PROCEED UPWARD. PLACE 8-INCH MINUS ROCK ONTO THE GEOTEXTILE FROM A HEIGHT OF LESS THAN 12 INCHES. PLACE SLOPE PROTECTION ROCK OR AGGREGATE BACKFILL ONTO THE GOETEXTILE FROM A HEIGHT OF LESS THAN 3 FEET. IN UNDERWATER APPLICATIONS, PLACE THE GEOTEXTILE AND COVER MATERIAL WITHIN THE SAME DAY.

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Proj. Loc.: DEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

DEWATERING DETAILS

Project No.:	114-560584
Designed By:	MLH
Drawn By:	SPK
Checked By:	MLH

D2

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Bar Measures 1 inch

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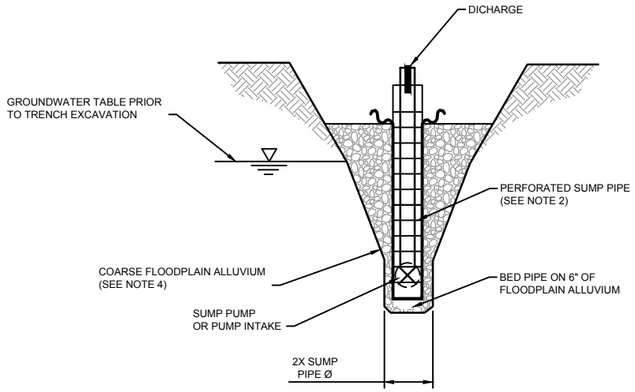
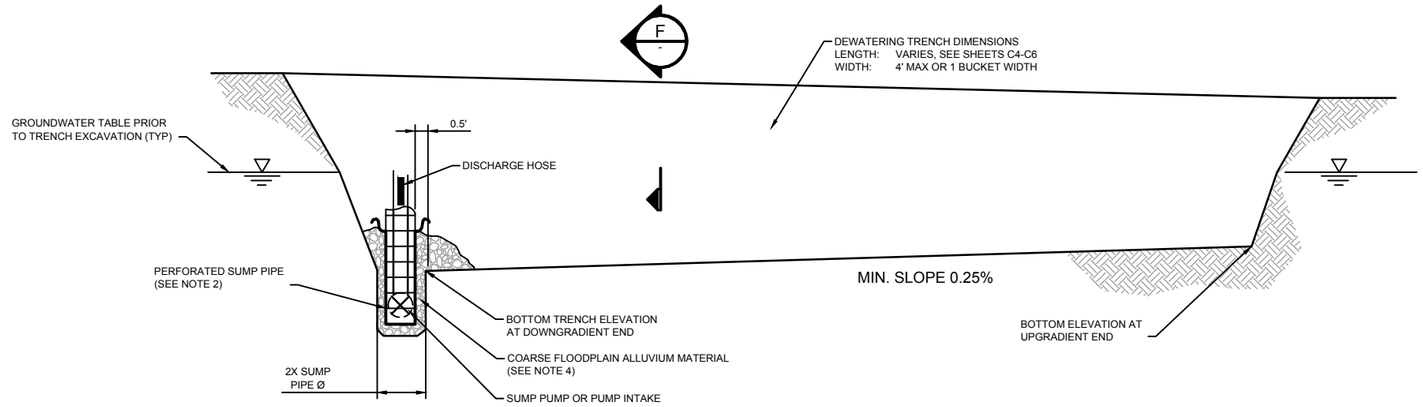
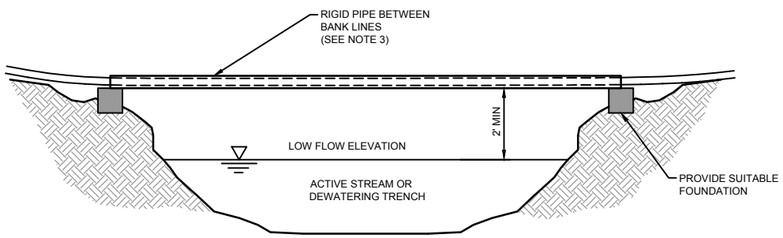


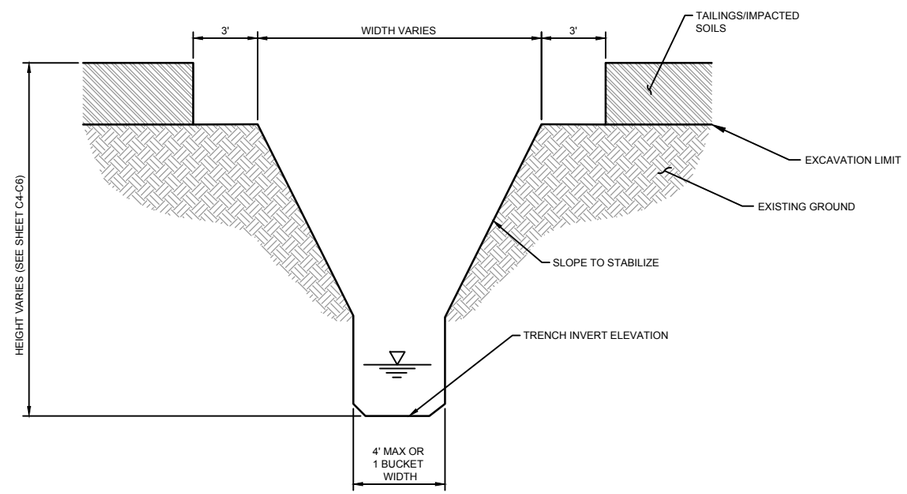
4 GROUNDWATER DEWATERING SUMP PROFILE
NTS



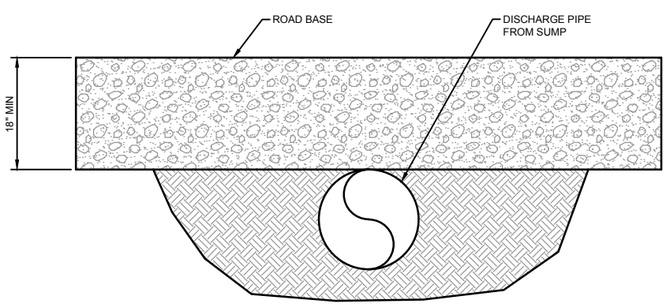
5 GROUNDWATER DEWATERING TRENCH AND SUMP PROFILE (TYP)
NTS



6 STREAM CHANNEL CROSSING
NTS



F DEWATERING TRENCH SECTION
NTS



7 SUMP DISCHARGE PIPE ROAD CROSSING
NTS

GENERAL NOTES:

1. THE PUMP SHALL HAVE A MINIMUM CAPACITY OF 100GAL/MIN/100FT OF TRENCH, OR 100GAL/MIN PER GROUNDWATER DEWATERING SUMP.
2. SUMP PIPE SHALL HAVE MINIMUM DIAMETER OF 24". OPEN SPACE OF PERFORATIONS IN SUMP PIPE SHALL EXCEED 80 SQUARE INCHES PER 100 FEET OF TRENCH.
3. PROVIDE RIGID SUPPORT FOR PIPING AND ELECTRICAL CROSSINGS OF DEWATERING TRENCHES, AND ACTIVE STREAM CHANNEL.
4. COARSE FLOODPLAIN ALLUVIUM USED AS FILL IN THE DEWATERING SYSTEM SHALL BE CONSIDERED CONTAMINATED UPON ABANDONMENT. FILL SHALL BE DISPOSED OF IN ACCORDANCE WITH BID ITEM NO. 21, EXCAVATE, HAUL AND PLACE TAILINGS/IMPACTED SOIL.
5. ALL GENERATORS AND FUEL CONTAINERS SHALL BE PLACED IN SECONDARY CONTAINMENT WITH A MINIMUM CAPACITY OF 200% OF THE FUEL VOLUME.

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DEQ Montana Department of Environmental Quality

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0	7/20/18	ISSUED FOR CONSTRUCTION	SEF

Client: DEPARTMENT OF ENVIRONMENTAL QUALITY
Proj. Loc.: DEER LODGE, MONTANA
CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

DETWATERING DETAILS

Project No.:	114-560584
Designed By:	MLH
Drawn By:	SPK
Checked By:	MLH

D3

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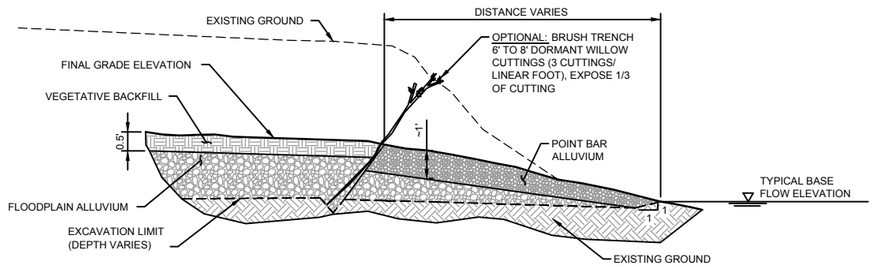
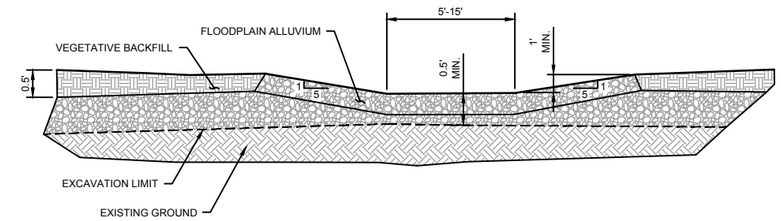
Bar Measures 1 inch

7/19/2018 10:34:06 AM - O:\H-M\MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY\114-560584 - TO 38 CFR PHASE 15&16 CM\110-2D CADD\SHEETFILES\D-01-13-DETAILS.DWG - FIELD, STEVE



3 POINT BAR BANK TREATMENT
NTS



6 TRIBUTARY CHANNEL DETAIL
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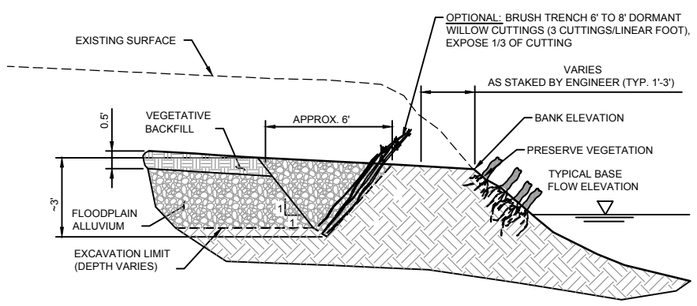
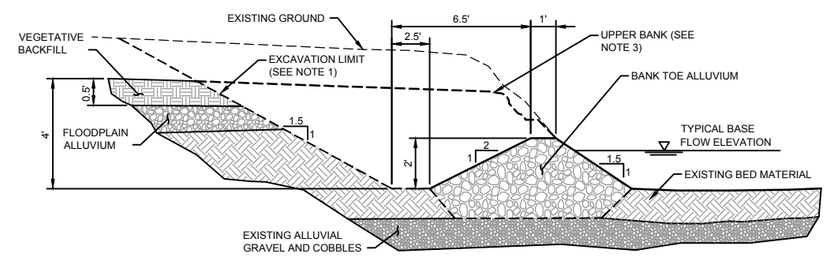


4 PRESERVE VEG. BANK TREATMENT
NTS



7 BANK TOE PROTECTION
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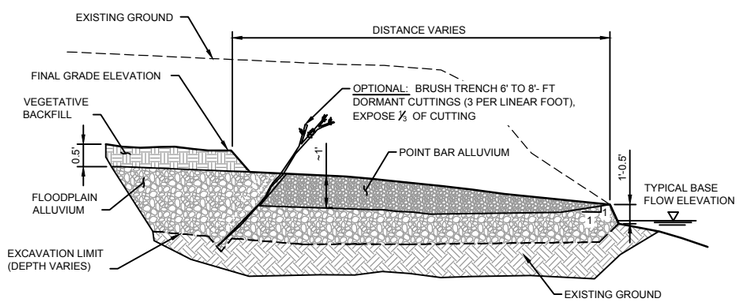

5 LATERAL BAR BANK TREATMENT
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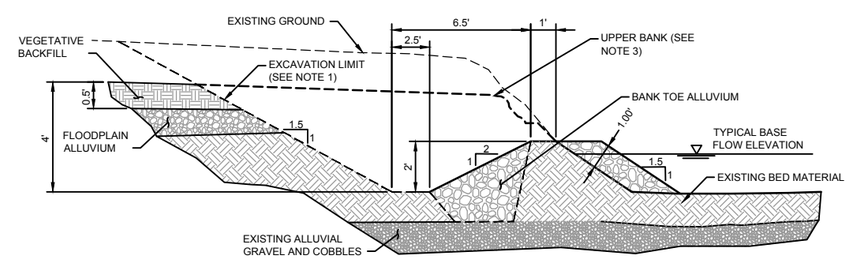

7A ALTERNATIVE BANK TOE PROTECTION
NTS

BANK TOE NOTES:

1. ELEVATION OF BASE OF BANK TOE PROTECTION IS THE ELEVATION OF EXISTING ALLUVIUM OR SCOUR DEPTH, WHICH EVER IS HIGHER. ELEVATION OF TOP OF BANK TOE PROTECTION IS 2 FT. BELOW TOP OF FINAL BANK. SCOUR DEPTH TO BE DETERMINED BY ENGINEER WHERE REQUIRED.
2. TYPICAL SCOUR DEPTH ON BENDS ARE 5-7 FT PER BID ITEM 35. BELOW FINISHED BANK ELEVATION.
3. UPPER BANK IS DVSL BANK TREATMENT AS SHOWN IN DETAIL 8, SHEET D5.
4. INSTALL COFFER DAM AS NECESSARY.

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Proj.Loc.: DEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

STREAMBANK TREATMENT DETAILS

Project No.:	114-560584
Designed By:	MLH
Drawn By:	SPK
Checked By:	MLH

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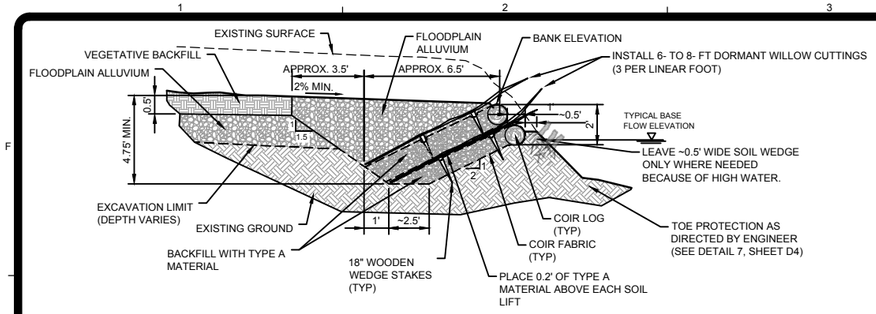
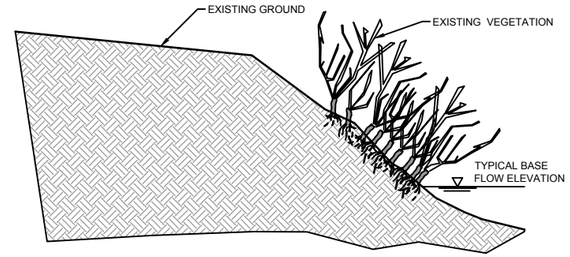


8 DOUBLE VEGETATED SOIL LIFT (DVSL)

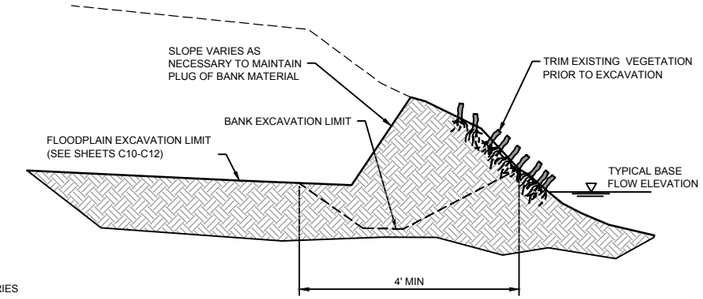
NTS



NOTE:
1. BANK EXCAVATION SLOPE VARIES DEPENDING ON MATERIAL'S ANGLE OF REPOSE.

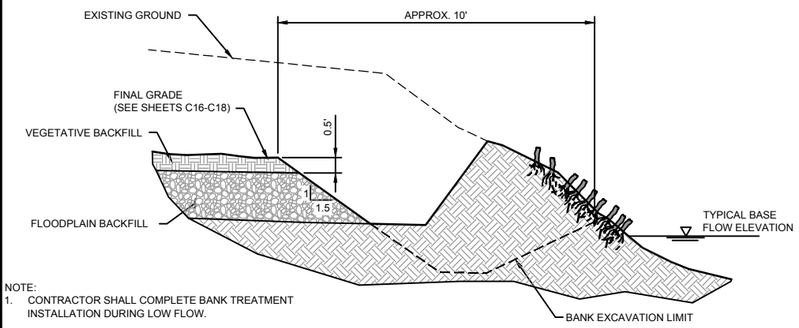
STEP 1: DVSL BANK TREATMENT - EXISTING CONDITIONS

SCALE: NTS



STEP 2: DVSL BANK TREATMENT - FLOODPLAIN EXCAVATION

SCALE: NTS

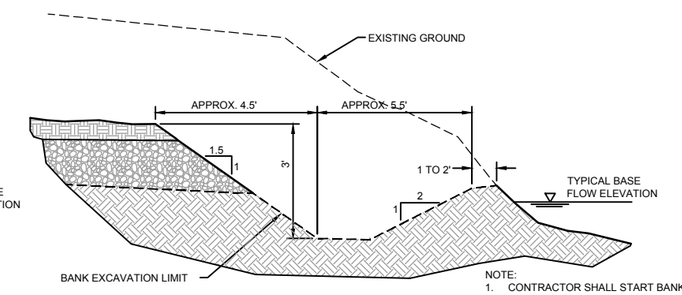


NOTE:
1. CONTRACTOR SHALL COMPLETE BANK TREATMENT INSTALLATION DURING LOW FLOW.

DVSL - DOUBLE VEGETATED SOIL LIFT

STEP 3: DVSL BANK TREATMENT - FLOODPLAIN BACKFILL

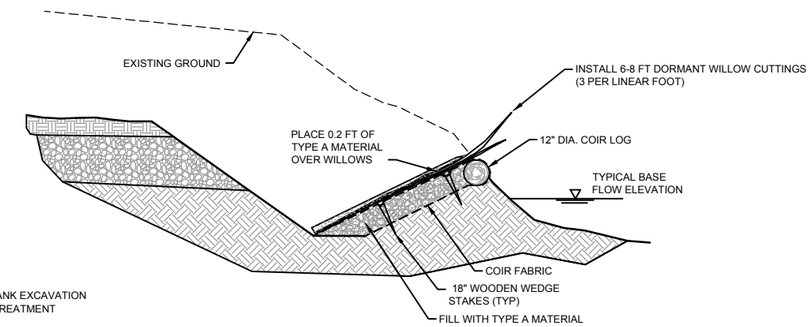
SCALE: NTS



NOTE:
1. CONTRACTOR SHALL START BANK EXCAVATION IMMEDIATELY BEFORE BANK TREATMENT INSTALLATION.

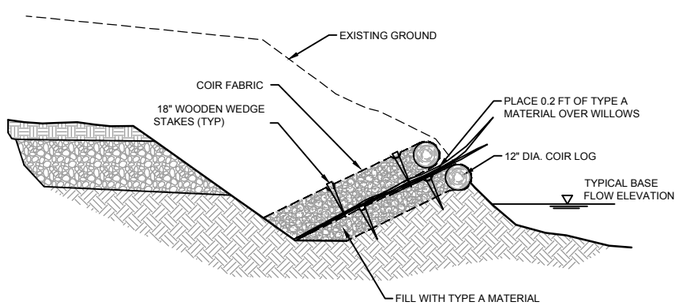
STEP 4: DVSL BANK TREATMENT - BANK EXCAVATION

SCALE: NTS



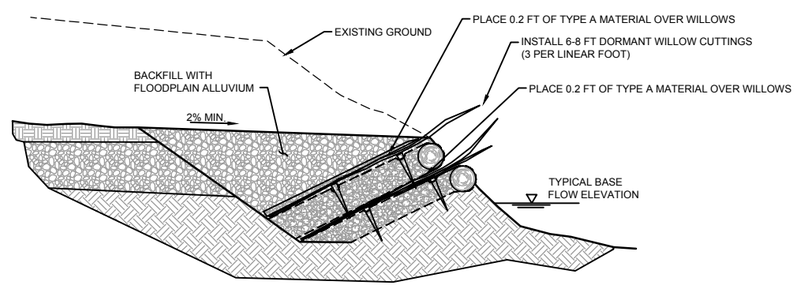
STEP 5: DVSL BANK TREATMENT - LOWER COIR LIFT INSTALLATION

SCALE: NTS



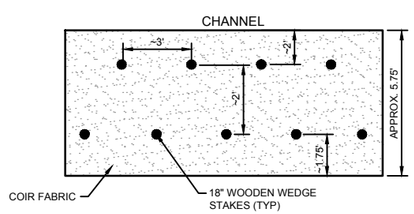
STEP 6: DVSL BANK TREATMENT - UPPER COIR LIFT INSTALLATION

SCALE: NTS



STEP 7: DVSL BANK TREATMENT - BANK BACKFILL

SCALE: NTS



SOIL LIFT STAKING PATTERN

SCALE: NTS

NOTES ON COIR FABRIC INSTALLATION

1. UNROLL COIR FABRIC PARALLEL TO THE CHANNEL.
2. OVERLAPS SHALL BE MADE SO THAT THE UPSTREAM FABRIC LIES OVER DOWNSTREAM FABRIC. ALL OVERLAPS IN COIR FABRIC SHALL BE STAKED WITH A MINIMUM OF 2 STAKES. OVERLAPS SHALL BE A MINIMUM OF 3 FT.
3. WHERE VEGETATED SOILS LIFTS END, CONTRACTOR SHALL SECURE THE COIR FABRIC ENDS BY FOLDING THE COIR FABRIC WITH THE TOP EDGE OF THE FOLDS GOING WITH THE DIRECTION OF THE STREAM FLOW.

DOUBLE VEGETATED SOIL LIFT INSTALLATION (DVSL) NOTES:

1. EXCAVATE LIMITS OF BANK CONSTRUCTION. THIS EXCAVATED MATERIAL IS CONSIDERED CONTAMINATED AND SHALL BE HAULED TO THE REPOSITORY AS DESCRIBED IN BID ITEM NO. 21 - EXCAVATE, HAUL AND PLACE TAILINGS / IMPACTED SOILS.
2. AFTER EXCAVATION TO LIMITS OF BANK CONSTRUCTION IS COMPLETED, THE ENGINEER SHALL DETERMINE IF ADEQUATE TOE MATERIAL IS PRESENT. IF NO ADEQUATE BANK TOE IS LOCATED AT BASE OF EXCAVATION, EXCAVATION SHALL CONTINUE UNTIL GRAVEL AND COBBLES ARE ENCOUNTERED. IF NO GRAVELS AND COBBLES ARE ENCOUNTERED BEFORE THE SCOUR DEPTH IS REACHED, EXCAVATION SHALL CEASE AT THE SCOUR DEPTH. SCOUR DEPTH SHALL BE DETERMINED BY ENGINEER. SEE BID ITEM NO. 35, CONSTRUCT BANK TOE FOR DISCUSSION OF BANK TOE REQUIREMENTS.
3. CONSTRUCT BANK TOE BY PLACING BANK TOE ALLUVIUM AS SHOWN ON SHEET D4 DETAIL 7. BUCKET COMPACT TO THE EXTENT POSSIBLE.
4. IF EXCAVATION IS LOWER THAN BOTTOM OF SOIL LIFT, PLACE AND BUCKET COMPACT FLOODPLAIN ALLUVIUM BEHIND THE EXISTING BANK TO CREATE THE BASE FOR THE FIRST LIFT OF THE DVSL.
5. LAY COIR OUTER FABRIC ON BASE FOR THE LOWER LIFT OF THE DVSL WITH APPROXIMATELY TWO-THIRDS EXTENDING BEYOND THE FONT EDGE OF THE BASE. PLACE INNER FABRIC ON TOP OF OUTER COIR FABRIC.
6. PLACE COIR LOGS AT POSITION SHOWN ON DRAWINGS AND BACKFILL BEHIND COIR LOGS WITH FLOODPLAIN ALLUVIUM APPROXIMATELY 1 FOOT THICK. COMPACT BACKFILL WITH BUCKET. VERIFY THAT COIR LOG IS PLACED WITH ITS TOP AT THE CORRECT ELEVATION AS DETERMINED FROM FINAL GRADING SURFACE.
7. WRAP INNER FABRIC AND OUTER COIR FABRIC OVER TOP OF COIR LOGS. PULL FABRICS TIGHT WITH MINIMUM WRINKLES AND STAKE IN PLACE USING STAKING PATTERN SHOWN ON THE SOIL LIFT STAKING PATTERN DETAIL, SHEET D5.
8. PLACE 6- TO 8- FOOT LONG DORMANT WILLOW CUTTINGS ON LOWER SOIL LIFT AS SHOWN ON STEP 5, SHEET D5. PLACE WILLOW CUTTINGS AT A DENSITY OF 3 STEMS PER LINEAR FOOT. WILLOW CUTTINGS STEMS MAY OVERLAP. THE CUT ENDS SHALL BE PLACED AT THE BASE OF THE SLOPE WITH THE UNCUT ENDS EXTENDING BEYOND THE EDGE OF THE COIR LOG SO THAT APPROXIMATELY ONE-THIRD OF THE TOTAL CUTTING LENGTH IS EXPOSED. PLACE 0.2 FEET OF TYPE A MATERIAL OVER WILLOWS.
9. LAY COIR OUTER FABRIC ON COMPLETED FIRST LIFT OF THE DVSL WITH APPROXIMATELY TWO-THIRDS EXTENDING BEYOND THE FROM EDGE OF THE FIRST LIFT. PLACE INNER FABRIC ON TOP OF OUTER COIR FABRIC.
10. PLACE COIR LOGS AT POSITION SHOWN ON THE DRAWING AND BACKFILL BEHIND COIR LOGS WITH TYPE A MATERIAL. BID ITEM NO. 29, PROVIDE HAUL, AND PLACE TYPE A MATERIAL BACKFILL. COMPACT BACKFILL WITH BUCKET.
11. WRAP INNER AND OUTER COIR FABRIC OVER TOP OF COIR LOGS AND FILL. PULL FABRIC TIGHT WITH MINIMUM WRINKLES AND STAKE IN PLACE AS SHOWN USING STAKING PATTERN SHOWN ON THE SOIL LIFT STAKING PATTERN DETAIL, SHEET D5.
12. PLACE 6- TO 8- FOOT LONG DORMANT WILLOW CUTTING ON UPPER SOIL LIFT AS SHOWN ON STEP 7, SHEET D5. PLACE WILLOW CUTTING AT A DENSITY OF 3 STEMS PER LINEAR FOOT ON TOP OF UPPER SOIL LIFT. WILLOW CUTTINGS STEMS MAY OVERLAP. THE CUT ENDS SHALL BE PLACED AT THE BASE OF THE SLOPE WITH THE UNCUT ENDS EXTENDING BEYOND THE EDGE OF COIR LOG OR TRENCH SO THAT APPROXIMATELY ONE-THIRD OF THE TOTAL CUTTING LENGTH IS EXPOSED.
13. PLACE AND BUCKET COMPACT FLOODPLAIN ALLUVIUM OVER DVSL AS SHOWN ON STEP 7, SHEET D5. FINAL GRADE SHALL SLOPE TOWARDS THE TOP OF THE DVSL WITH APPROXIMATELY 2 PERCENT SLOPE. NO LOW AREAS SHALL BE LEFT BEHIND THE CONSTRUCTED BANK.

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Client: DEPARTMENT OF ENVIRONMENTAL QUALITY
Proj. Loc.: DEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

STREAMBANK TREATMENT DETAILS

Project No.:	114-560584
Designed By:	MLH
Drawn By:	SPK
Checked By:	MLH

D5

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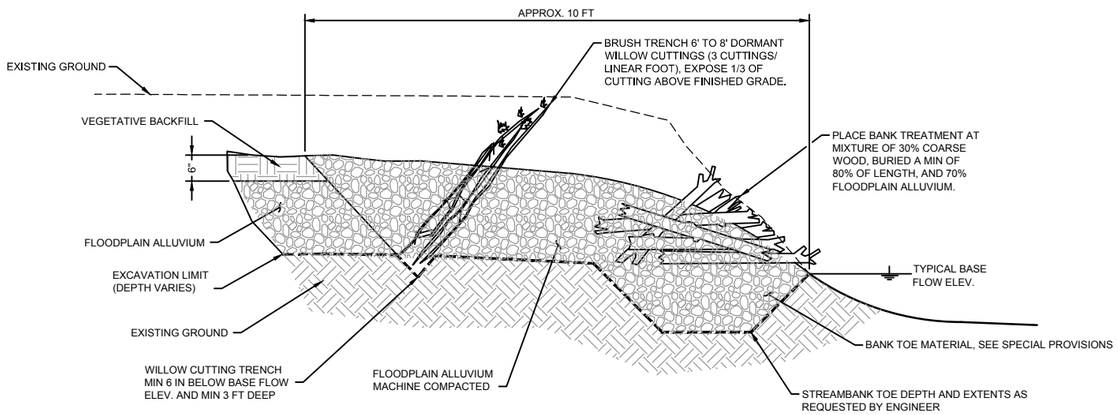
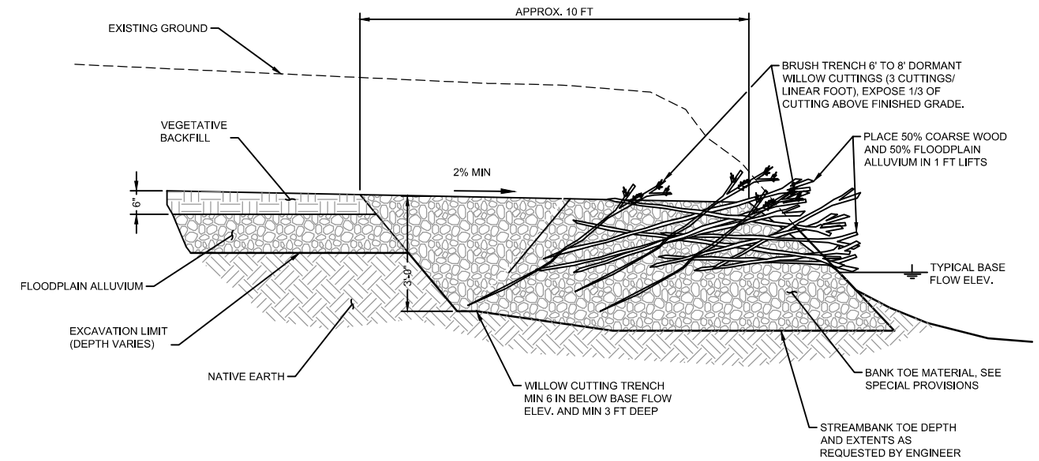


9 BIFURCATION STREAMBANK TREATMENT (BIF)

NTS

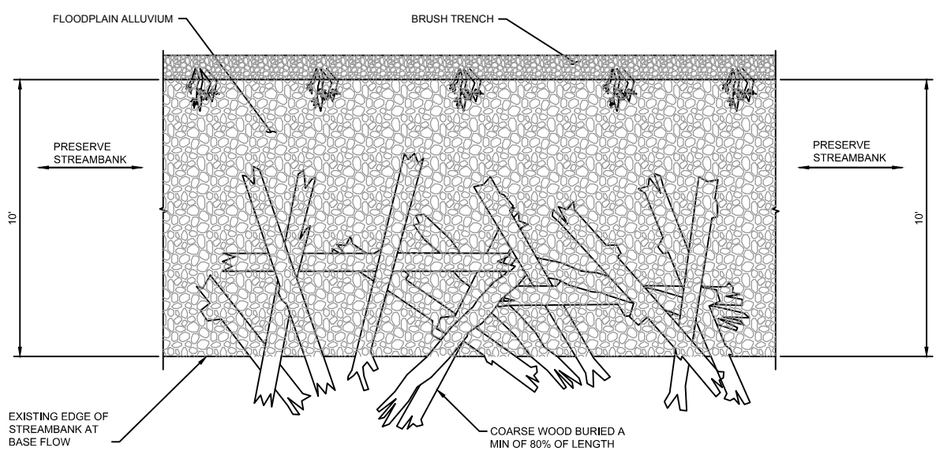


10 BRUSH MATRIX BANK TREATMENT

NTS

BRUSH TRENCH NOTES:

1. EXCAVATE FOR BRUSH TRENCH AT THE SAME TIME GROUND BETWEEN BRUSH TRENCH AND STREAM IS EXCAVATED AND BACKFILLED.
2. COMPLETE BACKFILL IF THIS AREA WILL BECOME INACCESSIBLE AFTER CONSTRUCTION OF BRUSH TRENCH.
3. PLACE 6- TO 8- FOOT LONG DORMANT WILLOW CUTTING ON THE STREAM SIDE SLOPE OF THE BRUSH TRENCH EXCAVATION AS SHOWN ON DETAIL 10, SHEET D6. PLACE WILLOW CUTTING AT A DENSITY OF 3 STEMS PER LINEAR FOOT. WILLOW CUTTING STEMS MAY OVERLAP. THE CUT ENDS SHALL BE PLACED AT THE BASE OF THE SLOPES WITH THE UNCUT END EXTENDING BEYOND THE EDGE OF TRENCH SO THAT APPROXIMATELY ONE-THIRD OF THE TOTAL CUTTINGS LENGTH IS EXPOSED.



BIFURCATION BANK TREATMENT PLAN VIEW

SCALE: NTS

GENERAL NOTES:

1. IF STREAMBANK CONSTRUCTION WILL OCCUR AFTER FLOODPLAIN EXCAVATION IS COMPLETE IN THE VICINITY OF THE STREAM BANKS, LEAVE ABOUT 5 FEET OF MATERIAL BETWEEN EXCAVATION AND EXISTING STREAM BANKS TO MAINTAIN STABILITY UNTIL STREAMBANK CONSTRUCTION OCCURS.
2. BANK EXCAVATION SLOPE VARIES DEPENDING ON THE EXISTING MATERIALS ANGLE OF REPOSE.
3. THE FLOODPLAIN SHALL BE BACKFILLED AND SLOPED 2% TOWARDS THE BANKS. IF HIGH WATER PREVENTS REDUCTION OF THE BANK HEIGHT, THIS WORK WILL NEED TO BE PERFORMED AFTER WATER RECEDES.
4. MICROTOPOGRAPHY AND WOODY MATERIAL EXTENDS TO STREAMBANK. SEE SHEET D9 FOR DETAILS.

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STREAMBANK TREATMENT DETIALS

Project No.:	114-560584
Designed By:	MLH
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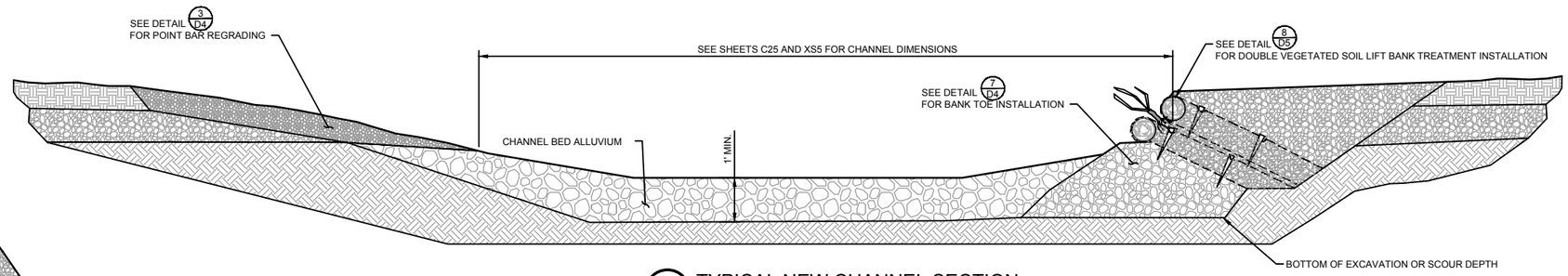
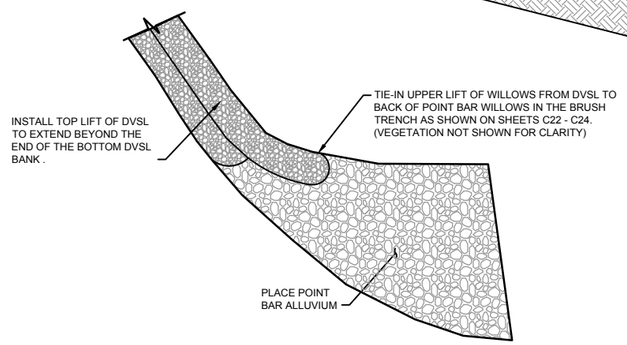
NOTES:

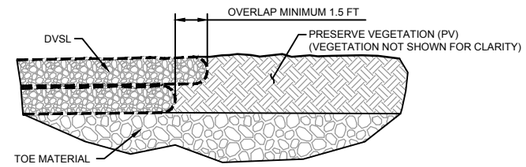
1. SEE SHEET XS5 FOR CHANNEL RECONSTRUCTION PROFILE AND CROSS SECTIONS.
2. FINAL CHANNEL GRADE SHALL BE PROVIDED BY ENGINEER
3. BANK TOE EXTENDS TO BOTTOM OF EXCAVATION OR, SCOUR DEPTH. WHICHEVER IS LOWER (SEE SPECIAL PROVISIONS FOR FURTHER EXPLANATION).



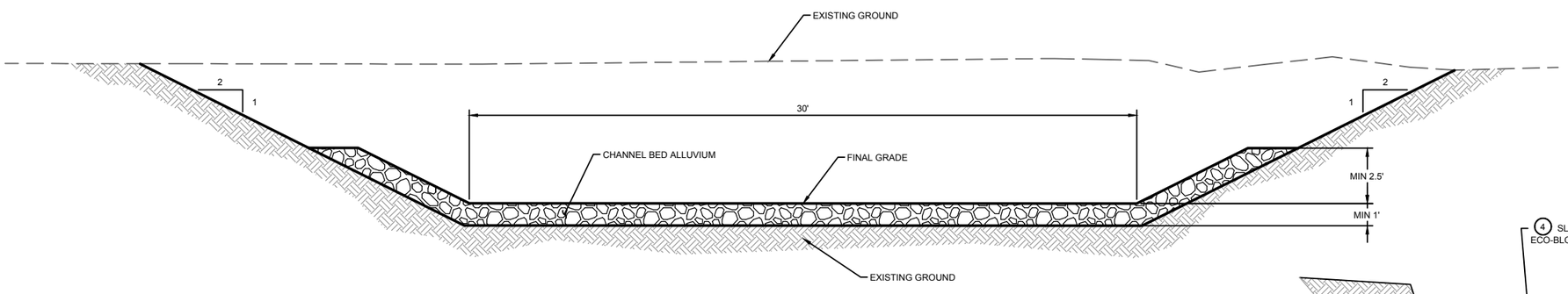
1 TYPICAL NEW CHANNEL SECTION
SCALE: NTS



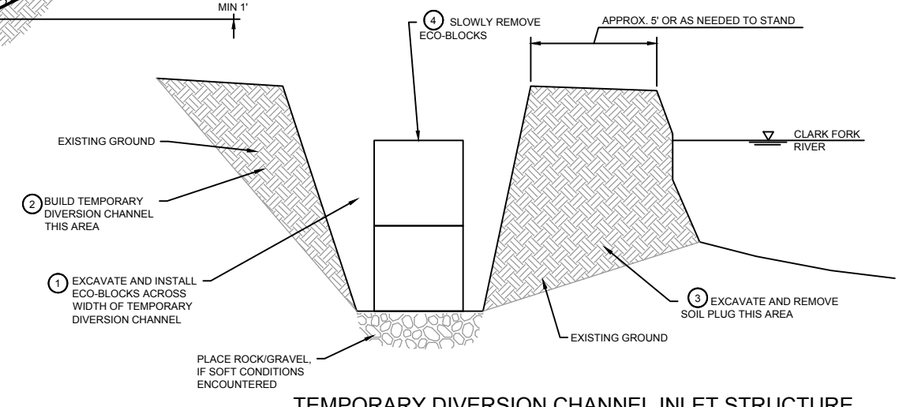
2 DVSL TO POINT BAR TRANSITION- PLAN VIEW
NTS



3 DVSL TO PV TRANSITION- SECTION LOOKING INTO BANK
NTS



4 TYPICAL TEMPORARY DIVERSION CHANNEL SECTION
SCALE: NTS



5 TEMPORARY DIVERSION CHANNEL INLET STRUCTURE DETAIL & WORK SEQUENCE
SCALE: NTS

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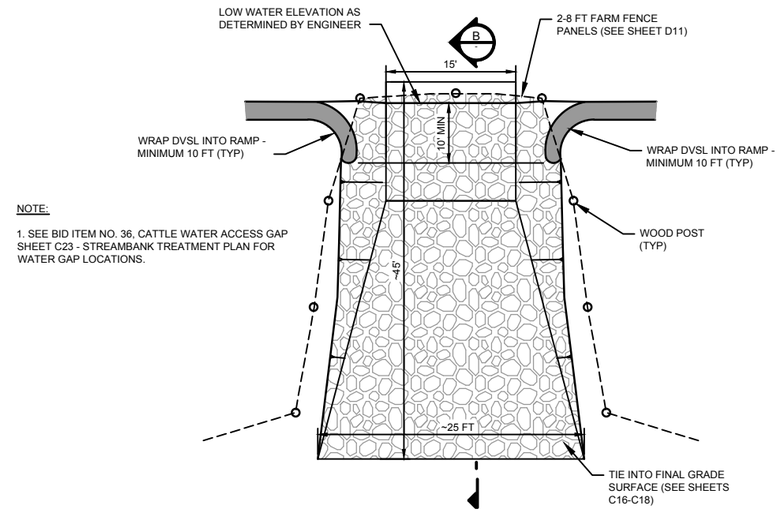
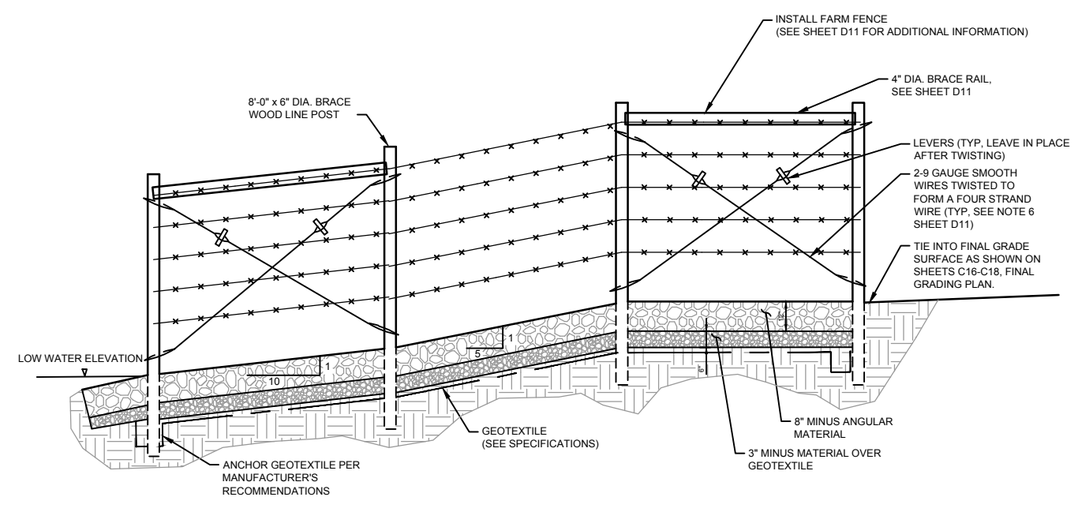


NOTE:

1. SEE BID ITEM NO. 36, CATTLE WATER ACCESS GAP SHEET C23 - STREAMBANK TREATMENT PLAN FOR WATER GAP LOCATIONS.

2 CATTLE WATER ACCESS GAP - PLAN VIEW

NTS



NOTE:

1. SECTION B SHOWS INSTALLATION OF CATTLE WATER ACCESS GAP AND FARM FENCING AT WATER GAP. INSTALL ONLY THOSE ITEMS REQUIRED IN THE SPECIAL PROVISIONS AT EACH LOCATION.
2. INSTALL CROSSING AND/OR FARM FENCE WHERE APPLICABLE. SEE BID ITEM NO. 36 CATTLE WATER ACCESS GAP.

B CATTLE WATER ACCESS CHANNEL CROSSING - SECTION

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CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

STREAMBANK TREATMENT DETAILS

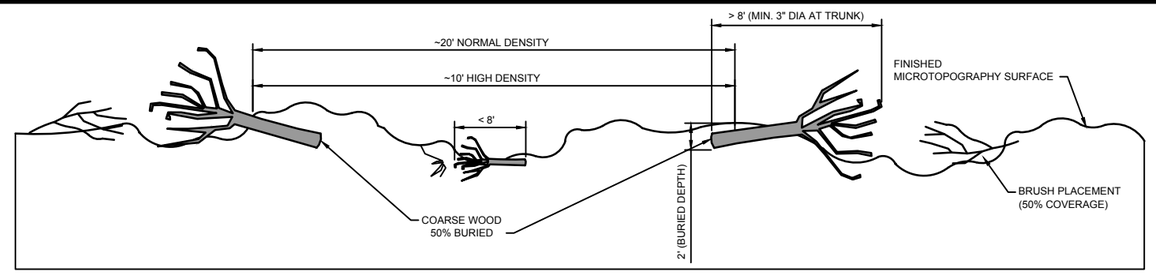
Project No.:	114-560584
Designed By:	MLH
Drawn By:	SPK
Checked By:	MLH

D8

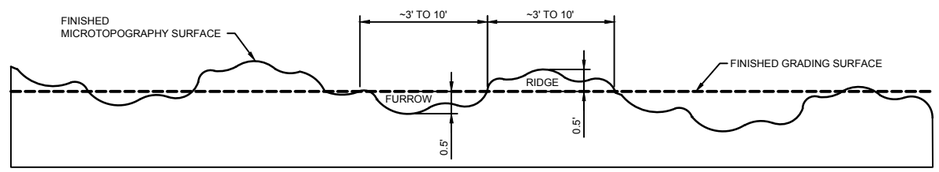
Copyright: Tetra Tech

Bar Measures 1 inch

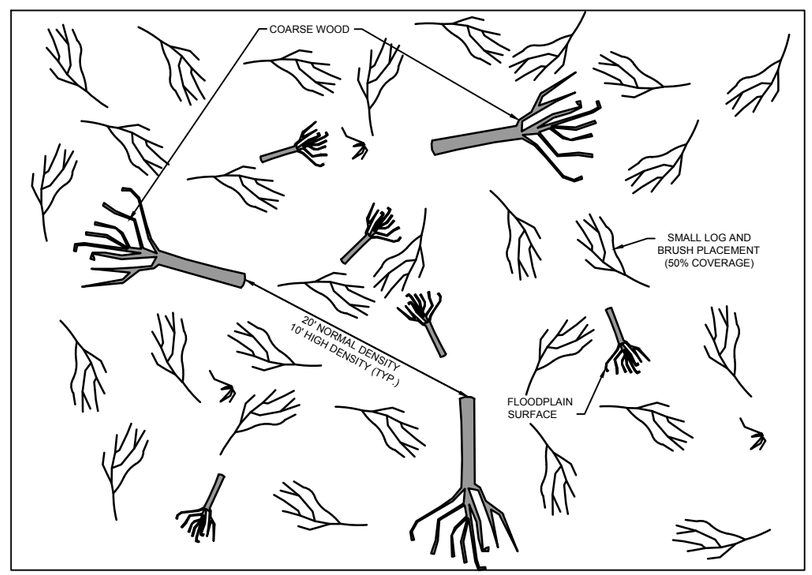
7/19/2018 10:34:17 AM - O:\H-M\MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY\114-560584 - TO 38 CFR PHASE 15&16 CM\110-2D CADD\SHEETFILES\D-01-13-DETAILS.DWG - FIELD, STEVE



1 TYPICAL WOOD AND BRUSH PLACEMENT
SCALE: NTS



2 TYPICAL MICROTOPOGRAPHY GRADING
SCALE: NTS



3 WOOD AND BRUSH PLACEMENT - PLAN VIEW
SCALE: NTS

NOTES:
1. DEVELOP MICROTOPOGRAPHY AND PLACE WOODY MATERIAL IN ACCORDANCE WITH BID ITEM NO. 39. PLACE HIGH DENSITY WOODY MATERIAL IN THE LOCATIONS SHOWN ON SHEETS C19 - C21, MICROTOPOGRAPHY, WOOD & BRUSH PLACEMENT.
2. BURY COURSE WOOD WITHIN THE FLOODPLAIN SURFACE WITH ONE HALF OF THE LENGTH BURIED TO A DEPTH OF 2 FEET AND ONE HALF AS SHOWN ON DETAILS.
3. CONSTRUCT LOW AND HIGH FEATURES (RIDGES AND FURROWS) AS SHOWN ON DETAILS. MAXIMUM HEIGHT OF RIDGES AND DEPTH OF FURROWS SHALL BE NO GREATER THAN 0.5 FEET RELATIVE TO FINAL GRADE, IN ACCORDANCE WITH BID ITEM NO. 39, DEVELOP MICROTOPOGRAPHY.

TETRA TECH
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Helena, Montana 59602
PHONE: 406-443-5210 FAX: 406-442-7182

DEQ Montana Department of Environmental Quality

MARK	DATE	DESCRIPTION	BY
0	7/20/18	ISSUED FOR CONSTRUCTION	SEF

Client: DEPARTMENT OF ENVIRONMENTAL QUALITY
Proj. Loc.: DEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

MICROTOPOGRAPHY, WOOD AND BRUSH PLACEMENT DETAILS

Project No.:	114-560584
Designed By:	MLH
Drawn By:	SPK
Checked By:	MLH

D9

Bar Measures 1 inch

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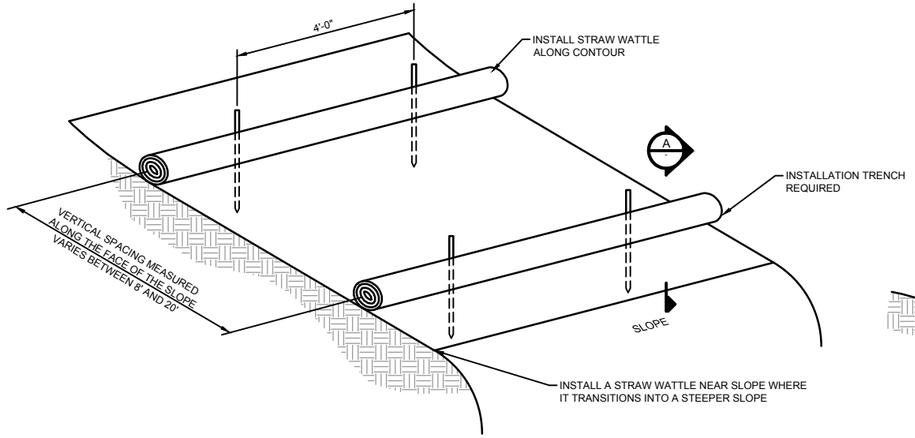
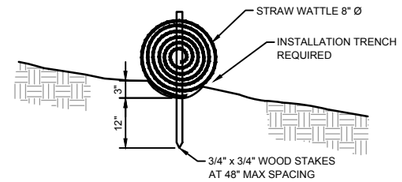


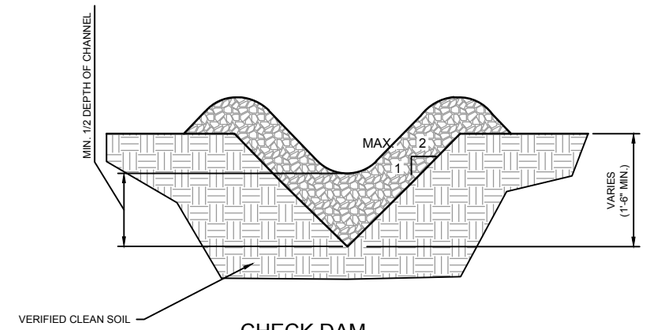
1 – STRAW WATTLES
NTS



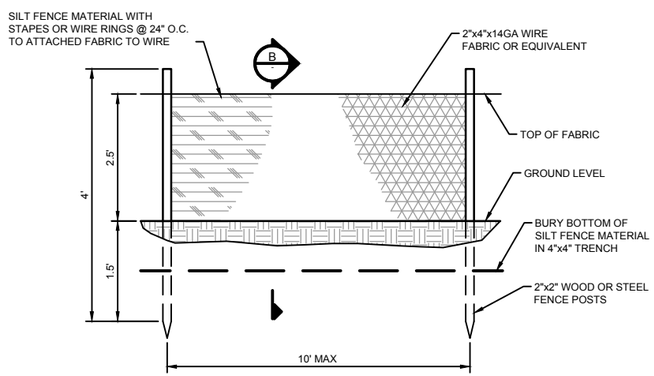
A – STRAW WATTLE
SCALE: NTS

NOTE:

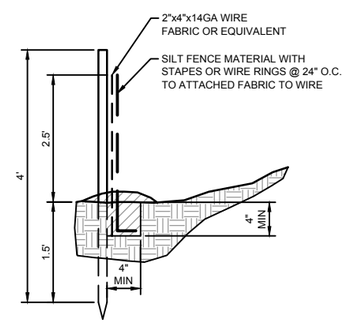
1. SEE BID ITEM 6 EROSION CONTROLS FOR INSTALLATION, MAINTENANCE AND REMOVAL OF EROSION CONTROL.



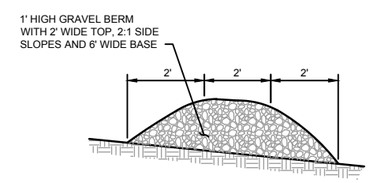
4 – CHECK DAM EROSION CONTROL DITCH
NTS



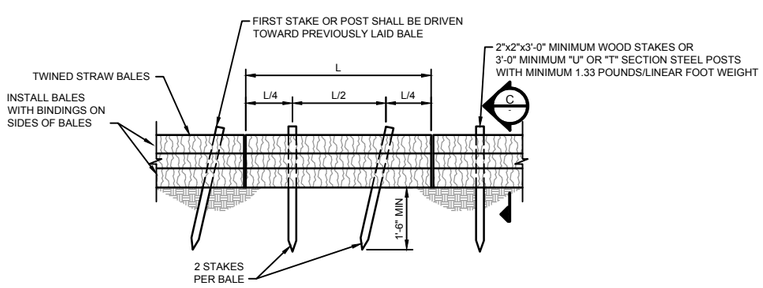
2 – SILT FENCE
NTS



B – SILT FENCE
SCALE: NTS



5 – ROCK BERM
NTS



3 – STRAW BALE
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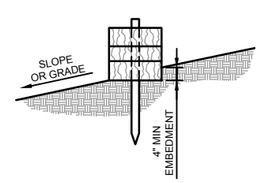

C – STRAW BALE
SCALE: NTS

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DEQ Montana Department of Environmental Quality

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0	7/20/18	ISSUED FOR CONSTRUCTION	SEF

Client: DEPARTMENT OF ENVIRONMENTAL QUALITY
Proj. Loc.: DEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

EROSION CONTROL DETAILS

Project No.:	114-560584
Designed By:	MLH
Drawn By:	SPK
Checked By:	MLH

D10

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Bar Measures 1 inch

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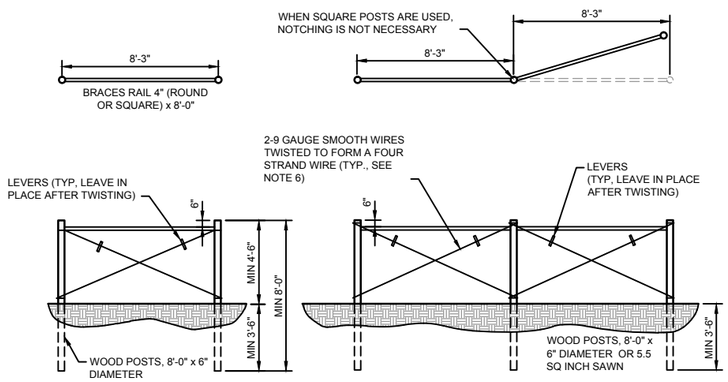
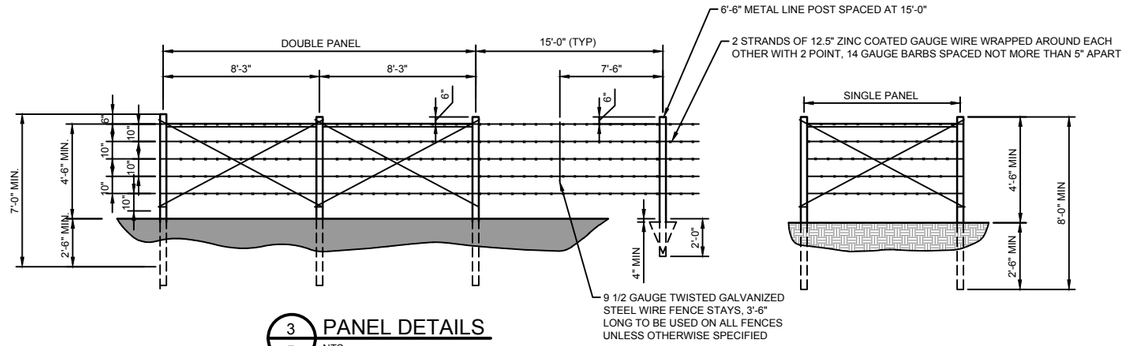


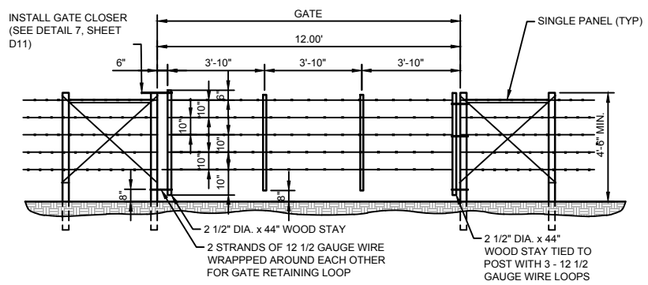
1 SINGLE PANEL
NTS

2 DOUBLE PANEL
NTS

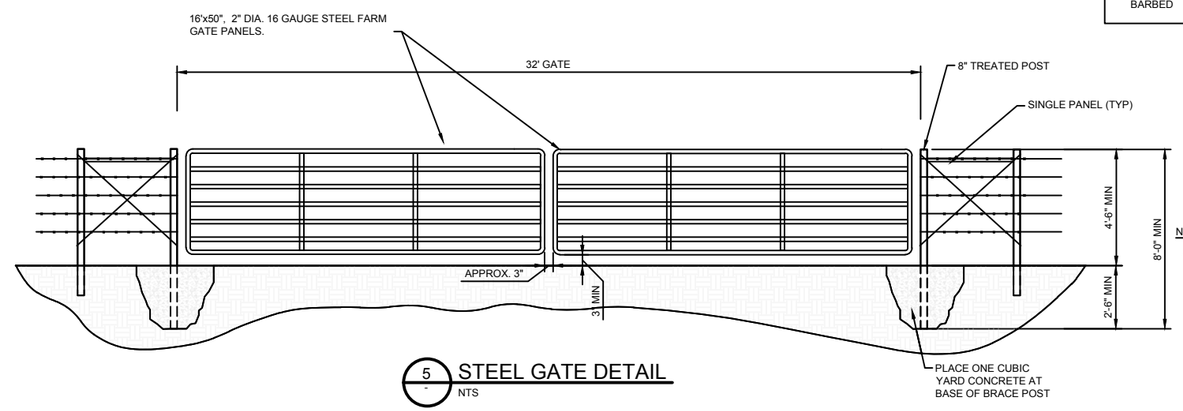


3 PANEL DETAILS
NTS

STRAIGHT RUN REQUIREMENTS		
FENCE TYPE	PANELS L=RUN	PANELS REQUIRED
BARBED	66' - 660'	SINGLE
	660' - 990'	DOUBLE



4 WIRE FARM FENCE - GATE DETAIL
NTS

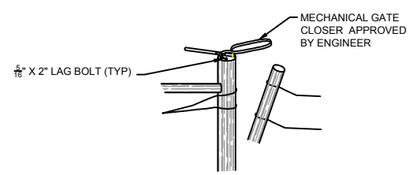


5 STEEL GATE DETAIL
NTS

NOTES:

1. SINGLE 16' STEEL FARM GATE PANEL CONSTRUCTED SIMILAR, SEE SHEET C35

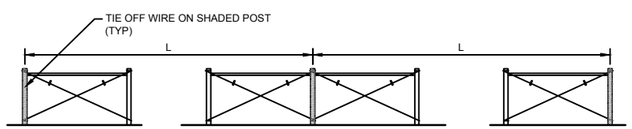
6 FENCE POST DETAIL
NTS



7 MECHANICAL GATE CLOSER DETAIL
NTS

NOTES:

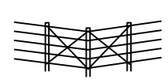
1. ALL FENCE WIRE TO BE PLACE ON SIDE OF POST AS DIRECTED BY ENGINEER. THE WIRE SHALL BE PLACED ON THE OUTSIDE OF THE CURVE. IN AREAS SUBJECT TO HIGH VELOCITY WINDS AND MOVING DEBRIS, WIRES MAY ALL BE PLACED ON WINDWARD SIDE OF POSTS, EXCEPT ON CURVES.
2. POST SPACING MEASURED GENERALLY PARALLEL TO THE GROUND.
3. LINE POST SHALL NORMALLY BE SPACED 15'-0" APART. ALSO 15'-0" FROM BRACE OR PANEL POSTS.
4. A DEADMAN MAY BE A CONCRETE BLOCK, A CAST-IN-PLACE CONCRETE BLOCK, A ROCK OR OTHER APPROVED OBJECT, WEIGHING AT LEAST 150 POUNDS AND COVERED AT LEAST 2 FEET.
5. FOR AREAS BORDERING STATE LAND, TOP WIRE SHALL BE SMOOTH 12.5 GAUGE OR LARGER WIRE.
6. WIRES SHALL NOT BE INTERWOVEN AT POINT OF CROSSING.
7. SINGLE PANELS ARE USED FOR PULLING, STRETCHING, CHANGES IN VERTICAL ALIGNMENT, OR PANELS ON A RUN LESS THAN 660' (SEE SHEET D13).
8. SINGLE CORNER PANELS ARE USED FOR RUNS LESS THAN 660' AND/OR CHANGES IN HORIZONTAL ALIGNMENT LESS THAN 15 DEGREES (SEE SHEET D13).
9. DOUBLE CORNER PANELS ARE USED FOR RUNS BETWEEN 660'-990' AND/OR CHANGES IN HORIZONTAL ALIGNMENT GREATER THAN 15 DEGREES (SEE SHEET D13).



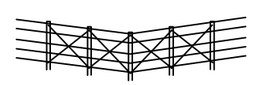
8 SINGLE PANEL
NTS

9 DOUBLE PANEL
NTS

10 SINGLE PANEL
NTS



11 SINGLE CORNER PANEL
NTS



12 DOUBLE CORNER PANEL
NTS

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825 West Custer Avenue
Helena, Montana 59602
PHONE: 406-443-5210 FAX: 406-442-7182

DEQ Montana Department of Environmental Quality

MARK	DATE	DESCRIPTION	BY
0	7/20/18	ISSUED FOR CONSTRUCTION	SEF

Client: DEPARTMENT OF ENVIRONMENTAL QUALITY
Proj. Loc.: BEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

FENCING DETAILS

Project No.:	114-560584
Designed By:	MLH
Drawn By:	SPK
Checked By:	MLH

D11

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Bar Measures 1 inch

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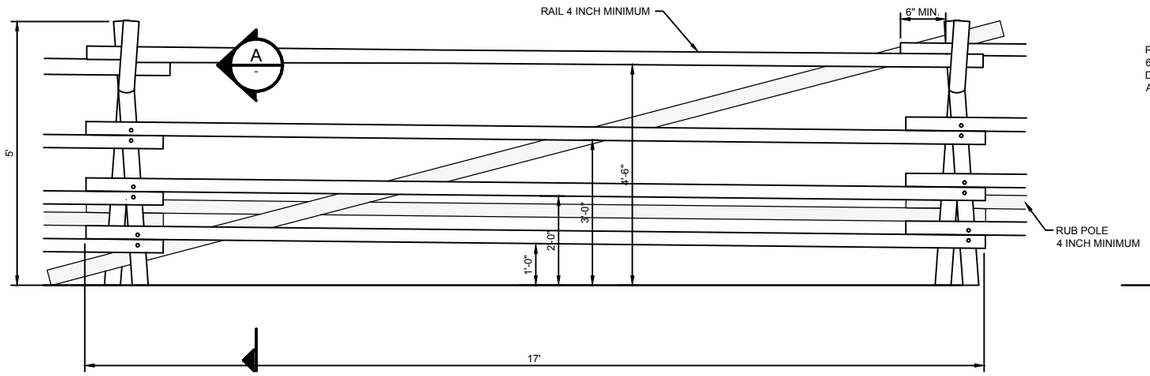
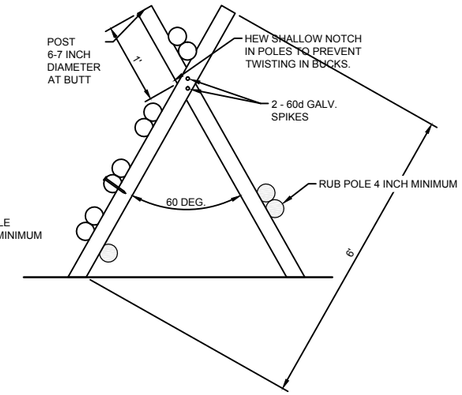
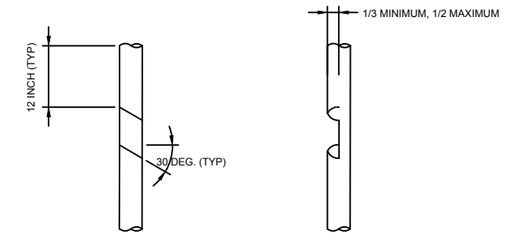


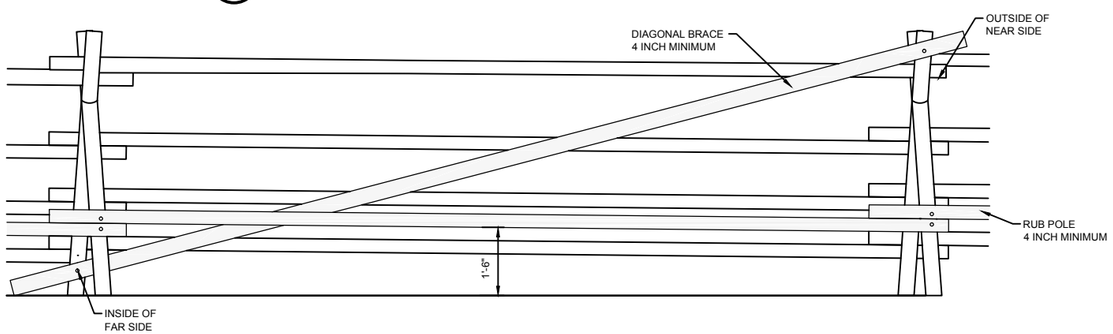
12 JACK LEG WITH RAILS & DIAGONAL BRACE
NTS



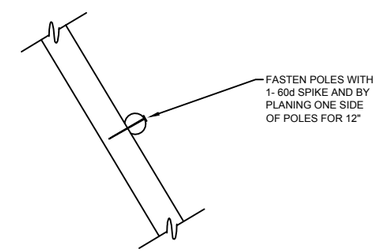
A TYPICAL JACK LEG WITH DIAGONALBRACE
NTS



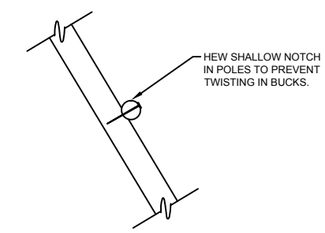
C TYPICAL CUT SECTION
NTS



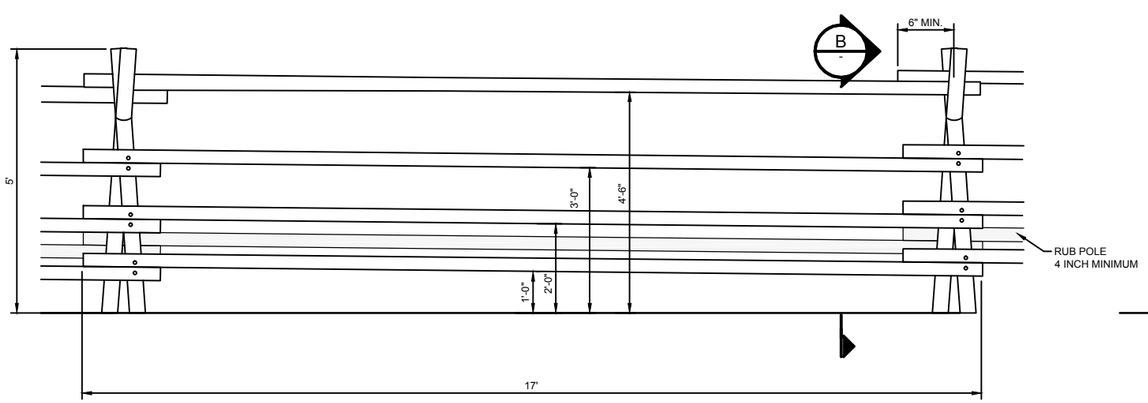
13 JACK LEG DIAGONAL & RUB POLE
NTS



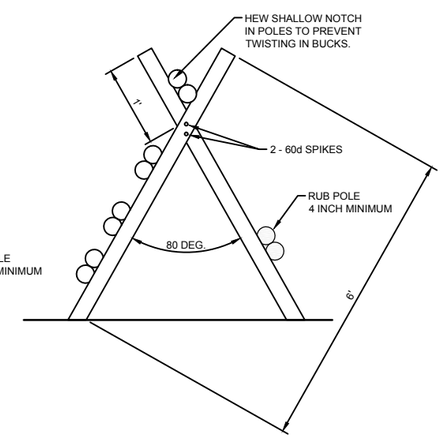
D SPIKE DETAIL
NTS



E NOTCH DETAIL
NTS



14 JACK LEG WITH ONLY RAILS AND RUB POLE
NTS



B TYPICAL JACK LEG NO DIAGONAL BRACE
NTS

GENERAL NOTES:

1. POSTS SHALL BE PEELED LODGE POLE PINE, 6 TO 7 INCH DIAMETER AT BUTT AND 6 FEET LONG.
2. FENCE AND GATE LOCATIONS AS STAKED IN THE FIELD.
3. PRE-DRILL HOLES FOR FASTENERS TO PREVENT SPLITTING OF BRACING OR POSTS.
4. ALL SPIKES SHALL BE 60d GALVANIZED.

TETRA TECH
www.tetratech.com
825 West Custer Avenue
Helena, Montana 59602
PHONE: 406-443-5210 FAX: 406-442-7182

DEQ Montana Department of Environmental Quality

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Proj. Loc.: DEER LODGE, MONTANA
CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE
FENCING DETAILS

Project No.:	114-560584
Designed By:	MLH
Drawn By:	SPK
Checked By:	RMVE

D12

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Bar Measures 1 inch

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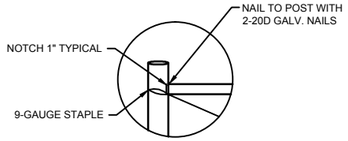
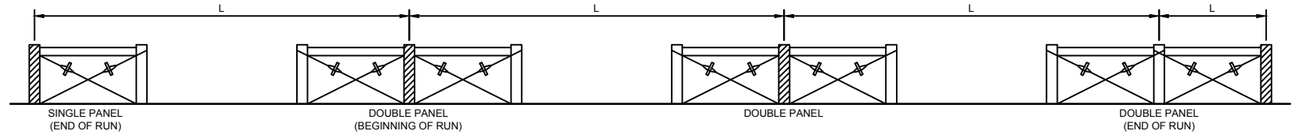
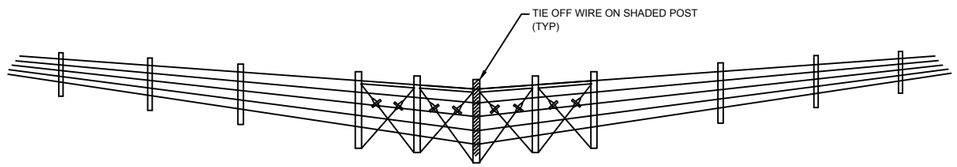


15 – FENCE POST DETAIL
NTS

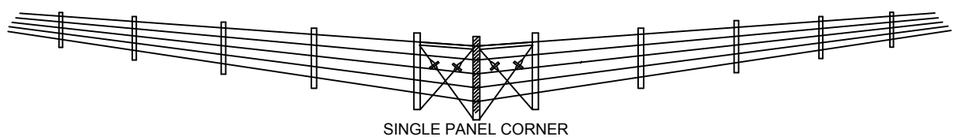


STRAIGHT RUN REQUIREMENTS		
FENCE TYPE	PANELS L=RUN	PANELS REQUIRED
WILDLIFE	66' OR LESS	TERMINAL POST
	66' - 660'	SINGLE
	660' - 990'	DOUBLE



DOUBLE PANEL CORNER

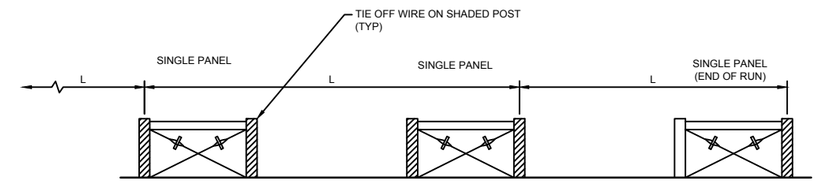
FOR RUNS LESS THAN 660 FT OR WHERE CHANGES IN HORIZONTAL ALIGNMENT IS GREATER THAN 15 DEGREES.



SINGLE PANEL CORNER

FOR RUNS BETWEEN 660 FT AND 990 FT.

16 – CORNER PANELS
NTS



18 – PANEL DETAILS
NTS

FENCING NOTES:

1. SEE TECHNICAL SPECIFICATIONS FOR POST AND GATE REQUIREMENTS.
2. PLACE ALL FENCE WIRE ON PASTURE SIDE OF POST, EXCEPT CURVES, THEN WIRE SHALL BE PLACED ON THE OUTSIDE OF THE CURVE. IN AREAS SUBJECT TO HIGH VELOCITY WINDS AND MOVING DEBRIS, WIRES MAY BE PLACED ON WINDWARD SIDE OF POSTS, EXCEPT ON CURVES.
3. POST SPACING MEASURED GENERALLY PARALLEL TO GROUND.
4. LINE POST SHALL NORMALLY BE SPACED 12.5 FT CENTER TO CENTER APART. ALSO 12.5 FT. FROM BRACE OR PANEL POSTS.
5. TO ATTACH WOVEN WIRE TO AN END POST, REMOVE TWO OR THREE VERTICAL STAY WIRES FROM THE END OF THE FENCE. PLACE THE FIRST COMPLETE VERTICAL STAY WIRE AGAINST THE POST. START AT THE MIDDLE OF THE HORIZONTAL LINE WIRES, WRAPPING AROUND THE END POST AT LEAST TWO TIMES AND THEN WRAPPING AROUND ITSELF FIVE TIMES.
6. A DEADMAN MAY BE A PRECAST CONCRETE BLOCK, A CAST-IN-PLACE CONCRETE BLOCK, A ROCK OR OTHER APPROVED OBJECT, WEIGHING AT LEAST 265 POUNDS AND COVERED AT LEAST 2 FEET. ATTACH THE DEADMAN TO THE FENCE WITH 3 STRANDS OF 9 GAUGE WIRE OR 6 STRANDS FOR 12.5 GAUGE WIRE.
7. STAPLE THE BOTTOM, TOP, CENTER AND ALTERNATE WIRES OF WOVEN FENCE TO WOOD LINE POSTS.
8. STAPLE ALL WIRES OF WOVEN WIRE TO WOOD CORNER POSTS OR POST USED TO TIE-OFF WIRE.

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Proj. Loc.: DEER LODGE, MONTANA

CFR REACH A, PHASES 15 AND 16
CLARK FORK SITE

FENCING DETAILS

Project No.:	114-560584
Designed By:	MLH
Drawn By:	SPK
Checked By:	MLH

D13

Bar Measures 1 inch

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