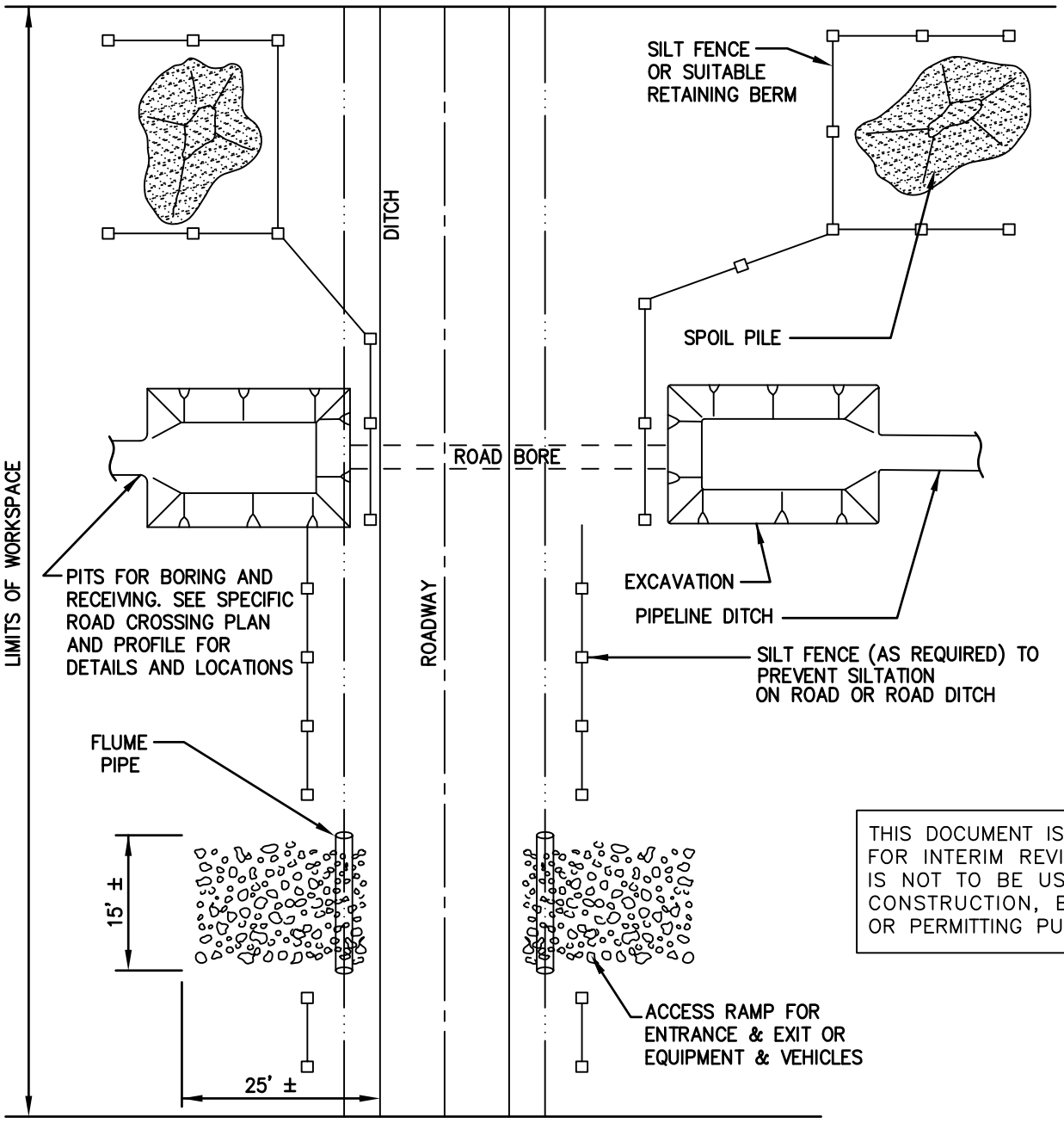
APPENDIX A

BEST MANAGEMENT PRACTICES FIGURES

TYPICAL BORED CROSSINGS CONTROL DETAILS



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NOTES:

1. SEE DRAWING FOR EQUIPMENT CROSSING DETAILS.
2. SEE ALIGNMENT SHEETS FOR EXTRA WORKSPACE REQUIREMENTS FOR EACH SPECIFIC ROAD.

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TYPICAL BORED CROSSING CONTROL DETAILS

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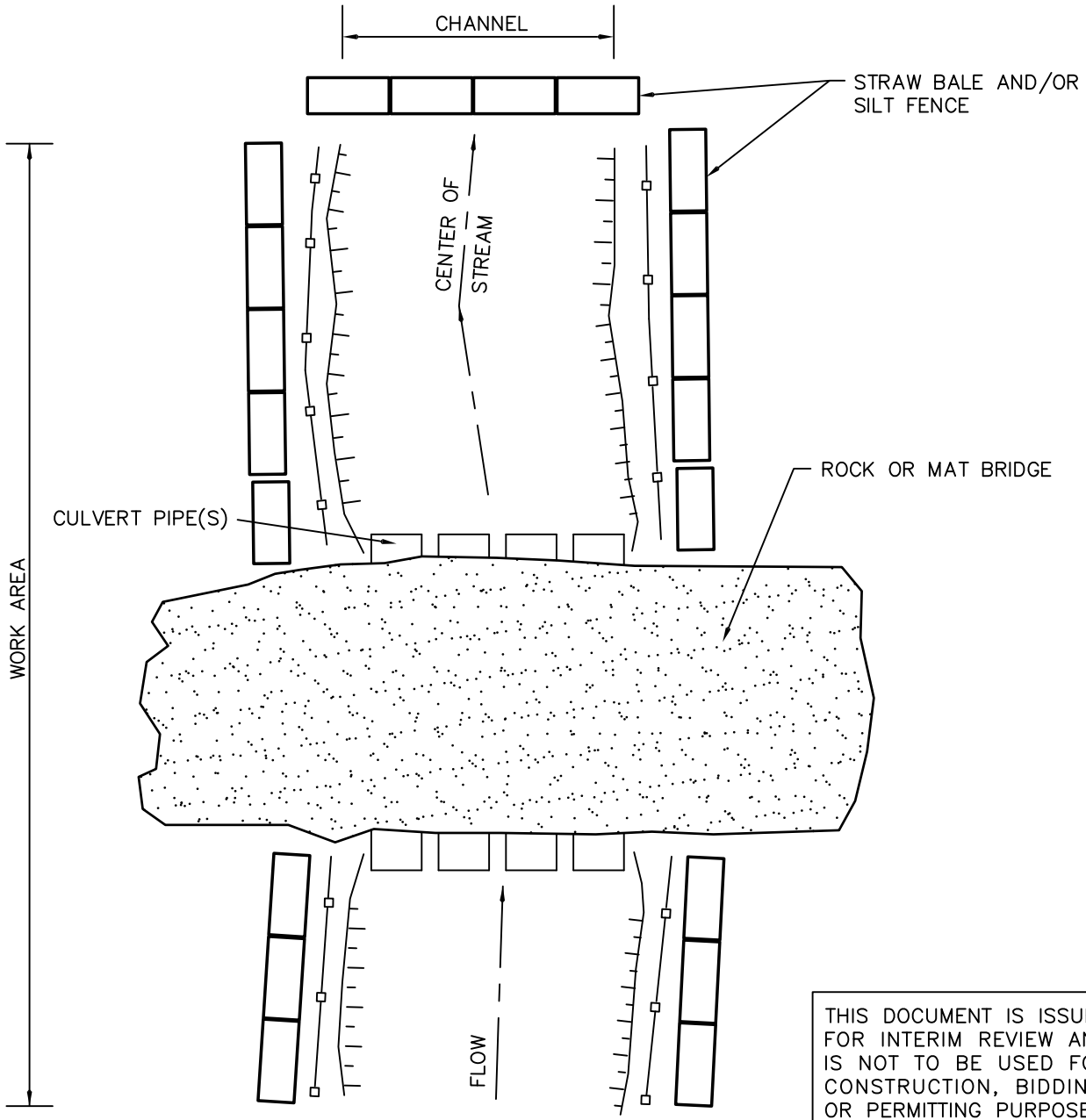

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NOTE:
1. USE AS MANY CULVERT PIPE(S) AS REQUIRED TO ENSURE NORMAL STREAM FLOW IS NOT OBSTRUCTED BY ROCK OR MAT BRIDGE.

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TYPICAL ROCK OR MAT BRIDGE WITH CULVERTS

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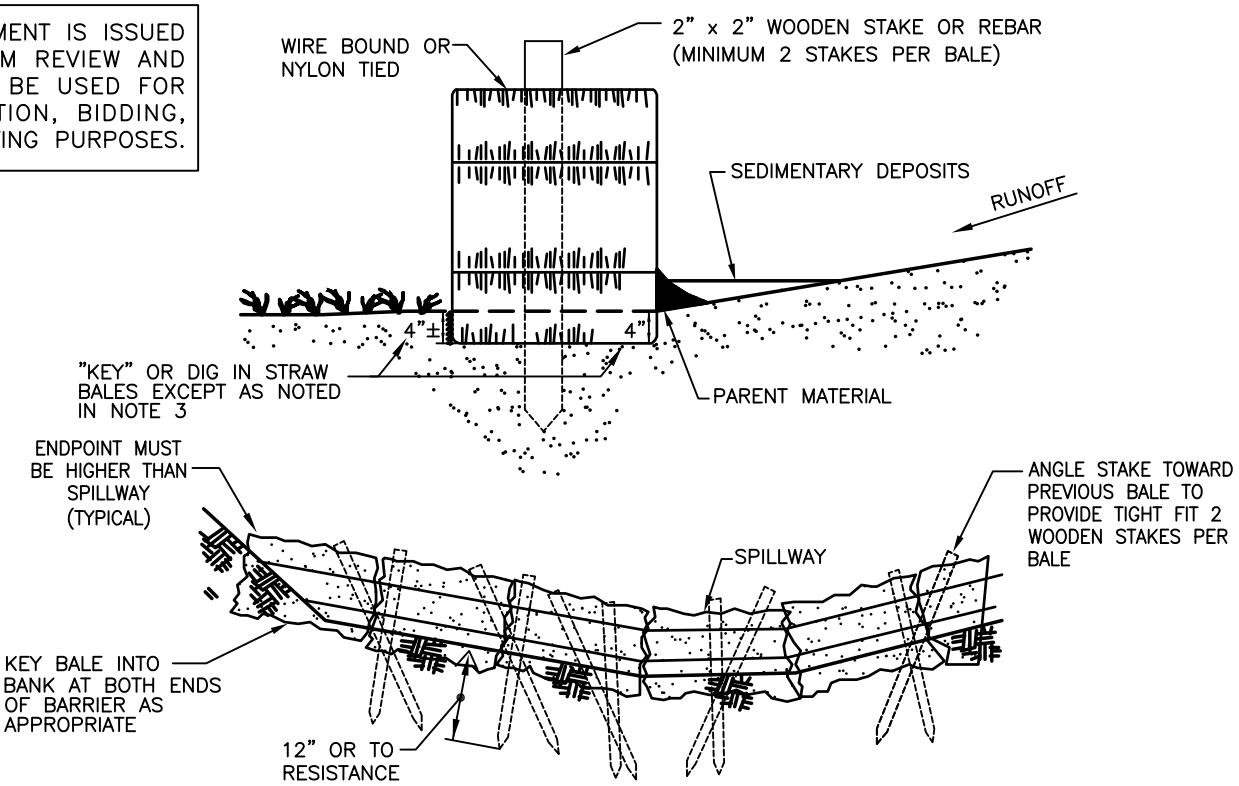

PROFILE

NOTES:

1. STRAW BALE SEDIMENT BARRIERS MAY BE INSTALLED AT THE FOLLOWING LOCATIONS:
   - THE BASE OF ALL SLOPES ABOVE ROADS, SPRINGS, WETLANDS, IMPOUNDMENTS AND STREAMS;
   - THE DOWNSLOPE RIGHT–OF–WAY EDGE WHERE ANY OF THE ABOVE–MENTIONED LOCATIONS ARE ADJACENT TO THE RIGHT–OF–WAY;
   - BETWEEN TOPSOIL/SPOIL STOCKPILES AND STREAMS OR WETLANDS AS NEEDED;
   - ALONG R.O.W. BOUNDARIES IN WETLAND CONSTRUCTION;
   - ACROSS CONSTRUCTION R.O.W. AT ALL WATERBODY CROSSINGS;
   - AS SPECIFIED IN THE SPILL PREVENTION, CONTAINMENT, AND COUNTERMEASURE PLAN;
   - AS DIRECTED BY THE INSPECTOR.
2. STRAW BALE SEDIMENT BARRIERS SHALL CONSIST OF A ROW OF STRAW BALES, PLACED ON THE FIBER–CUT EDGE (TIES NOT IN CONTACT WITH THE GROUND). BALES SHALL BE TIGHTLY ABUTTED TO ONE ANOTHER. THE BARRIER SHALL BE ONE BALE HIGH. ONLY CERTIFIED "NOXIOUS WEED–FREE" STRAW SHALL BE USED WHENEVER POSSIBLE.
3. ENTRENCH ("KEY") STRAW BALES INTO THE GROUND TO A DEPTH OF 4" EXCEPT IN FROZEN, SATURATED, OR EXTREMELY ROCKY SOILS. PLACE PARENT MATERIAL ON UPSTREAM SIDE OF STRAW BALES TO PREVENT UNDERMINING.
4. WALK ON STRAW BALES TO INSURE ADEQUATE BALE–TO–SOIL CONTACT.
5. ANCHOR STRAW BALES SECURELY IN PLACE WITH TWO WOODEN OR STEEL REBAR STAKES DRIVEN THROUGH THE TOPS OF THE BALES. THE STAKES SHALL PENETRATE THE GROUND A DISTANCE OF 12" UNLESS ROCK OR AN IMPERMEABLE LAYER IS ENCOUNTERED:
   - THE FIRST, CENTER AND END BALES OF THE BARRIER SHALL HAVE STAKES DRIVEN VERTICALLY THROUGH THE BALE;
   - BALES, OTHER THAN THOSE LOCATED AT THE ENDS OR CENTER OF THE BARRIER, SHALL HAVE THE FIRST STAKE DRIVEN THROUGH THE TOP OF THE BALE AT AN ANGLE SO THAT THE STAKE PASSES THROUGH THE PREVIOUSLY PLACED BALE, IN ORDER TO PROVIDE TIGHT CONTACT BETWEEN BALES. THE SECOND STAKE SHALL BE DRIVEN VERTICALLY THROUGH THE TOP OF THE BALE.

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EROSION CONTROL STRAW BALE SEDIMENT BARRIER

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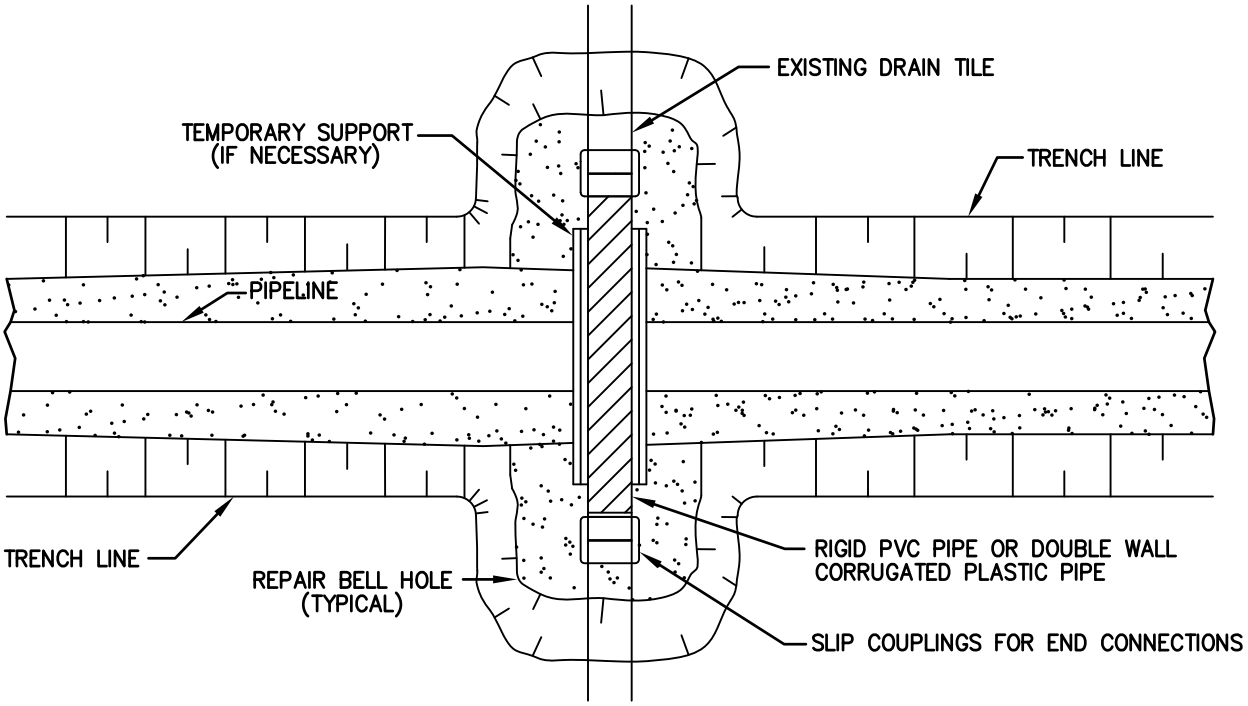
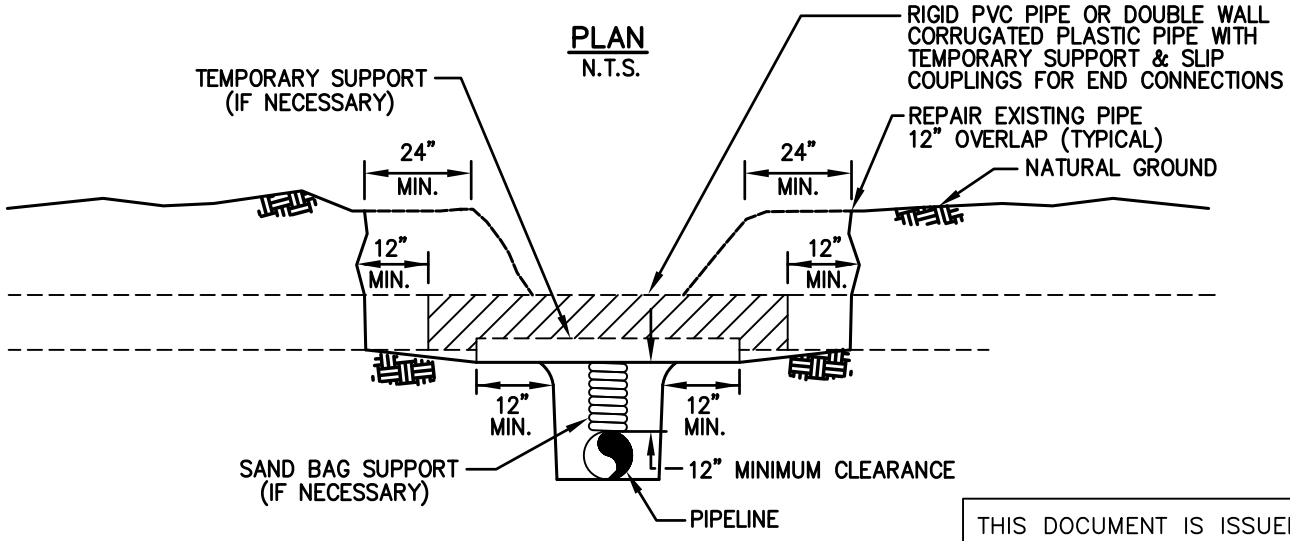


PLAN
N.T.S.



CROSS SECTION
N.T.S.

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NOTES:

1. IMMEDIATELY REPAIR TILE IF WATER IS FLOWING THROUGH TILE AT TIME OF TRENCHING.
2. SCREEN ALL EXPOSED ENDS OF TILE LINES.

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DRAINAGE AND IRRIGATION
TEMPORARY DRAIN TILE REPAIR (TDR)

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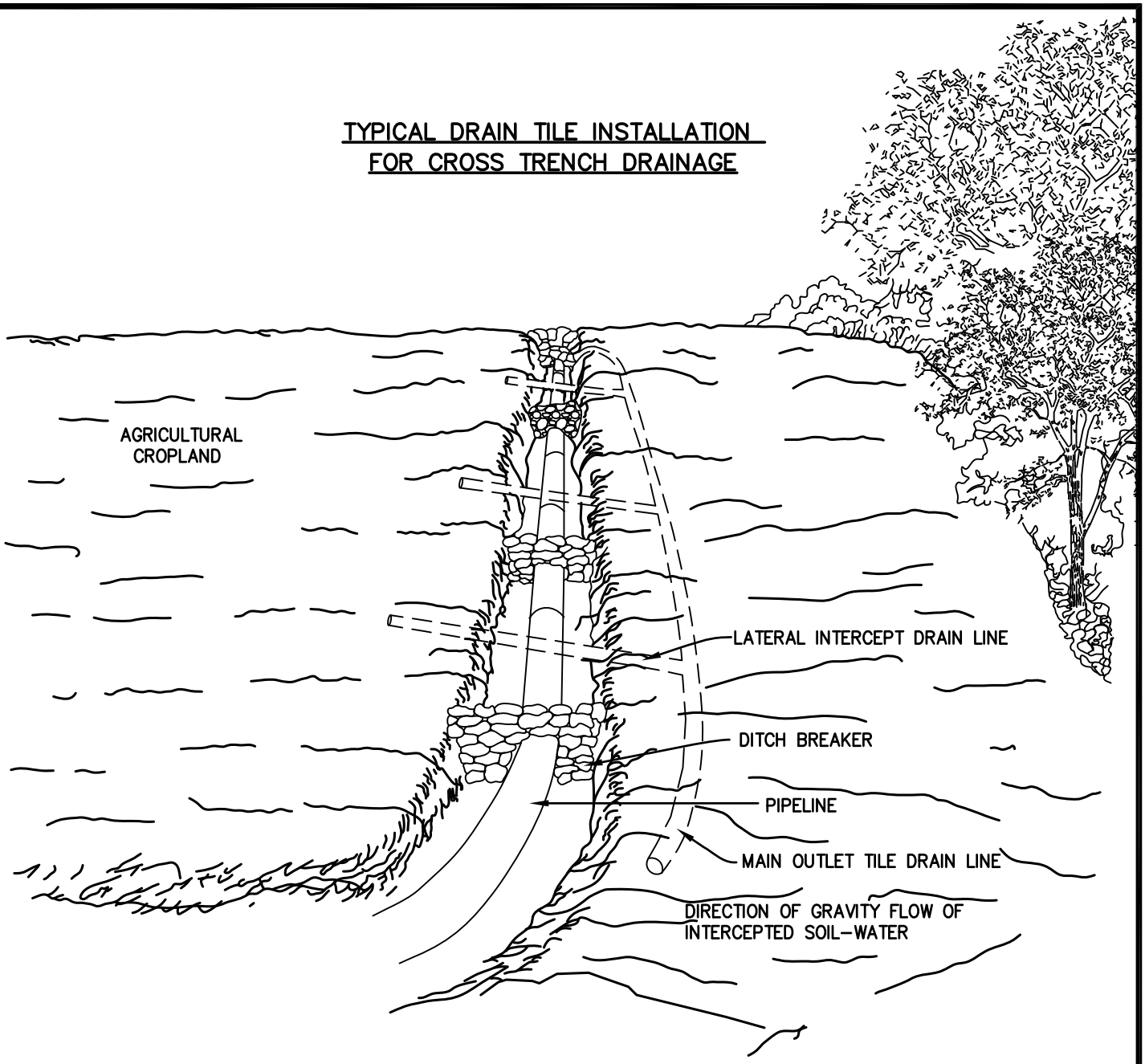
TYPICAL DRAIN TILE INSTALLATION FOR CROSS TRENCH DRAINAGE



NOTES:

1. CROSS TRENCH DRAINAGE MAY BE UTILIZED IN SLOPING AREAS OR IN AGRICULTURAL CROPLAND AREAS WHERE REQUIRED.
2. FINAL ALIGNMENT OF TILE LINES TO BE BASED ON OUTLETTING FOR GRAVITY FLOW.

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TYPICAL DRAIN TILE INSTALLATION FOR CROSS TRENCH DRAINAGE

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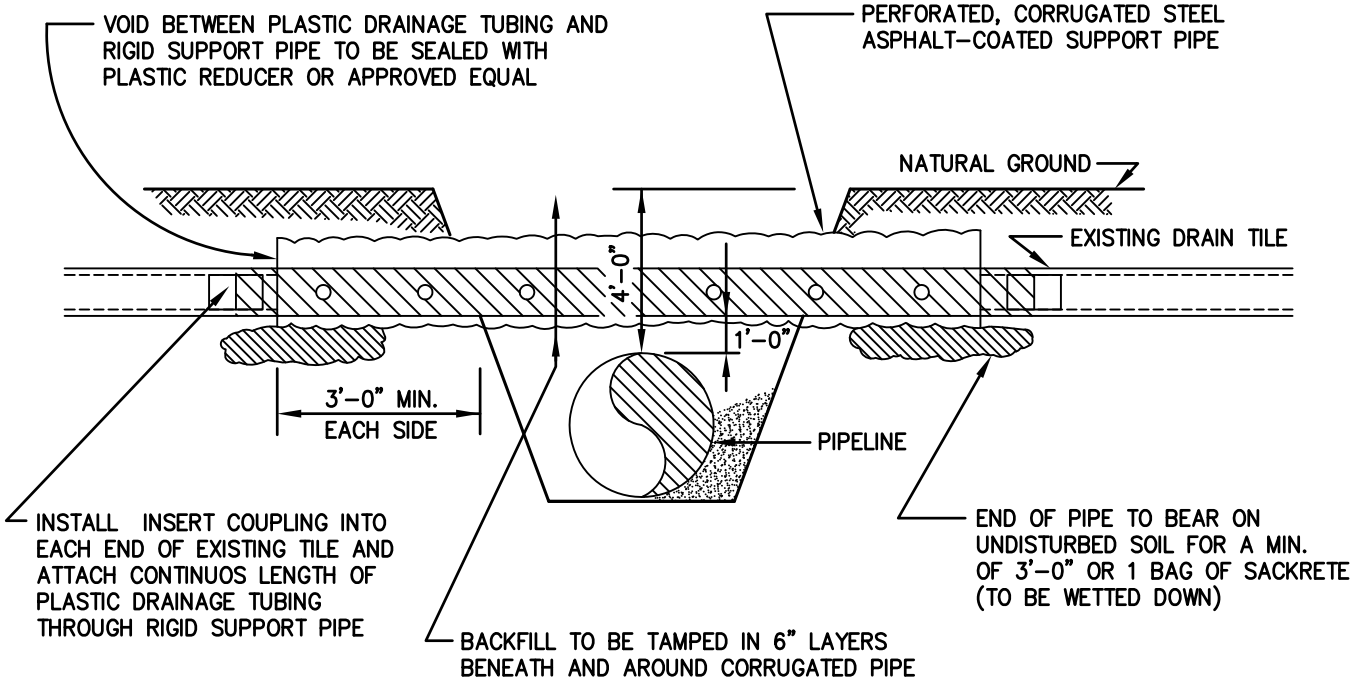
DRAIN TILE RESTORATION



TUBING SIZE	CORRUGATED PIPE SIZE
4"	6"
6"	8"
8"	10"
10"	12"
12"	16"
16"	20"

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NOTES:

1. ALL CORRUGATED PIPE TO BE OF 16 GAUGE GALVANIZED STEEL
2. PLASTIC DRAINAGE TUBING AND CORRUGATED PIPE TO BE INSTALLED SO THAT THE HOLES ARE CENTERED ON EACH SIDE OF THE BOTTOM OF PIPE
3. ALL MATERIAL TO BE CONTRACTOR SUPPLIED.

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DRAIN TILE RESTORATION

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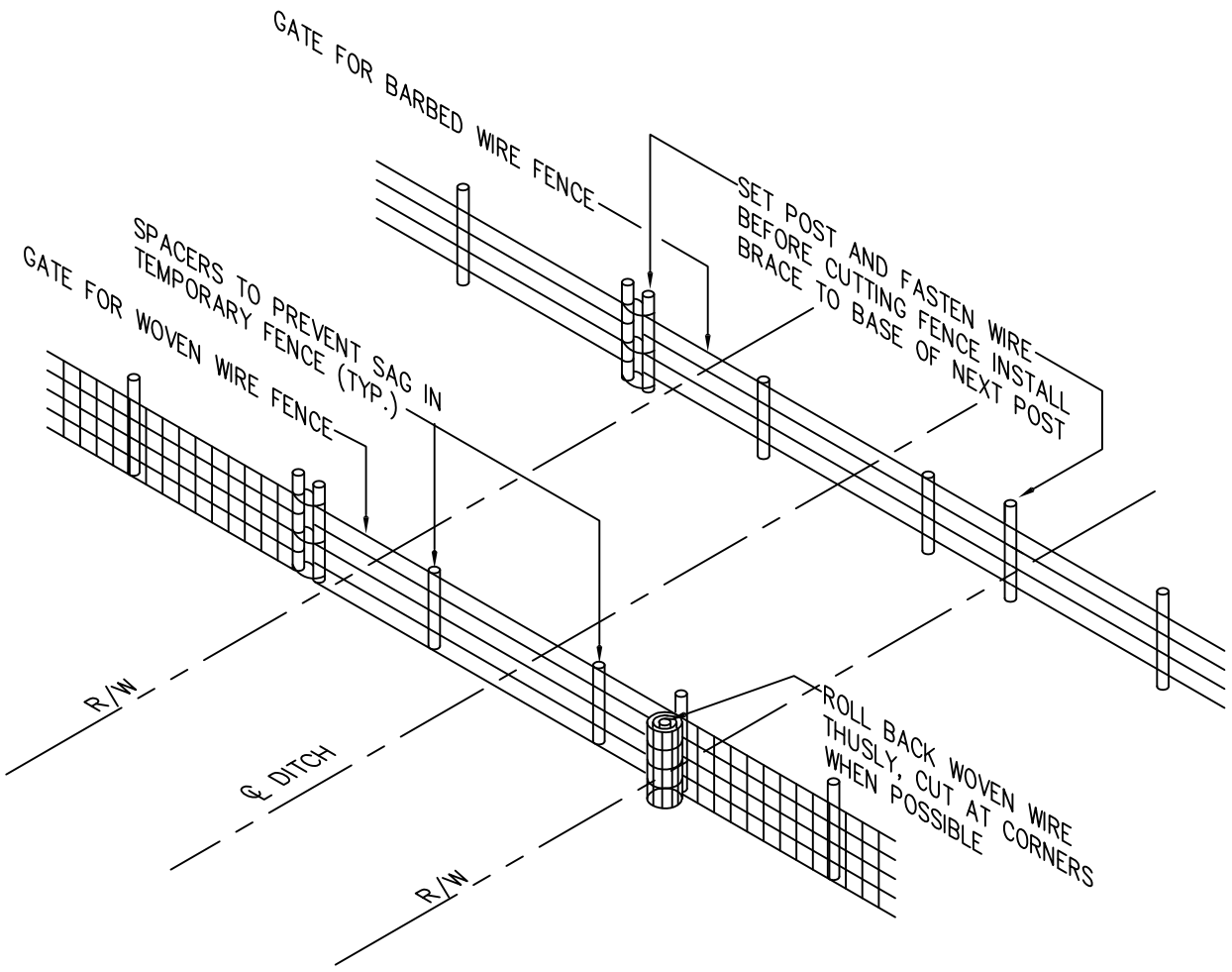

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TEMPORARY FENCE DETAIL FOR WOVEN WIRE & BARBED WIRE FENCES

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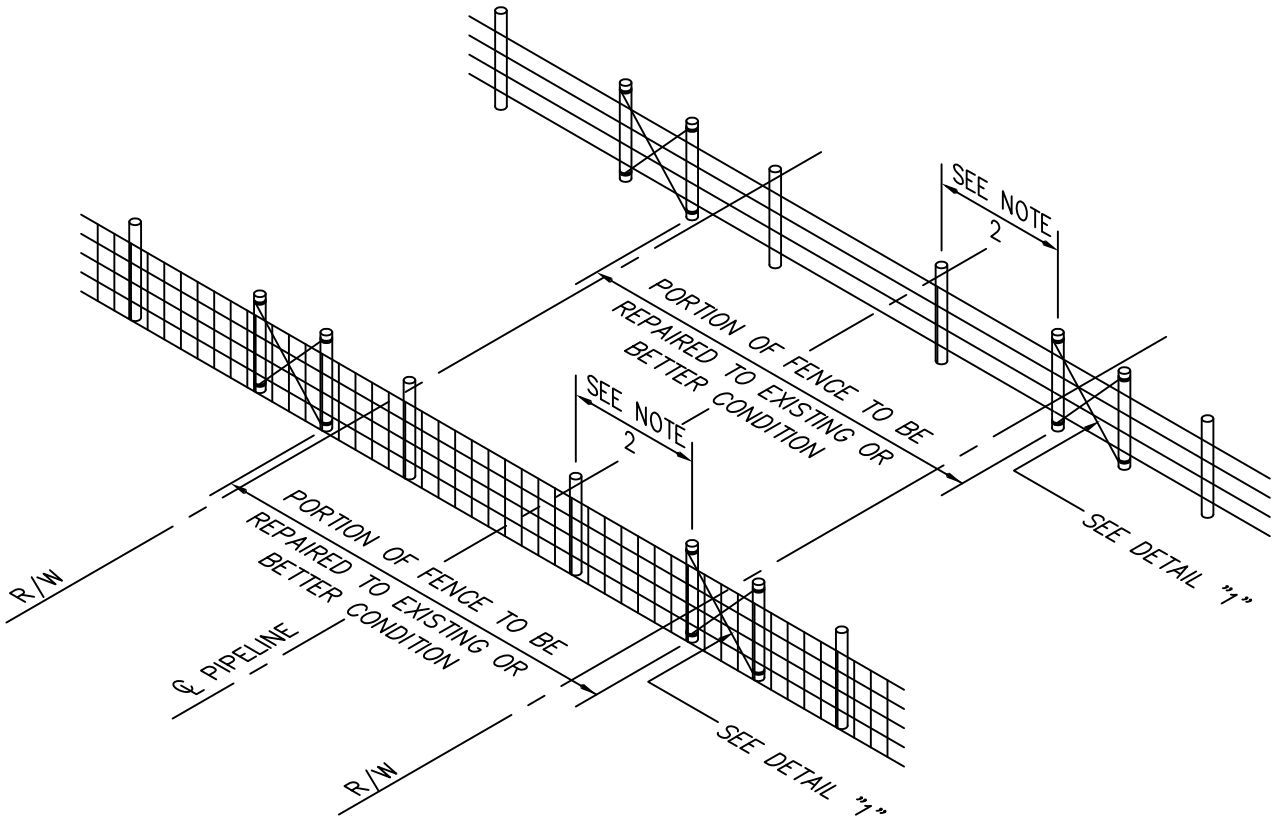
SCALE: N.T.S.	APP.:		



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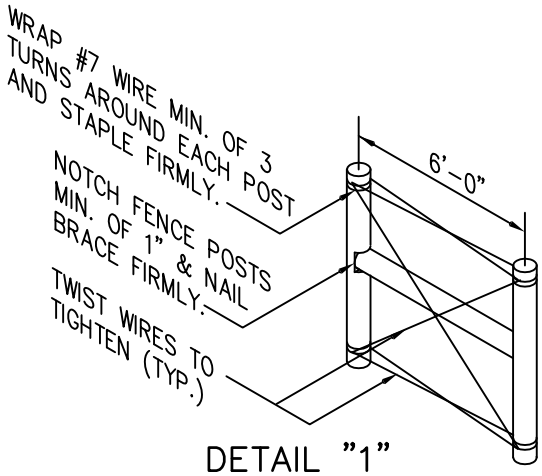

DETAIL "1"
N.T.S.

NOTES:

1. ALL NEW FENCE POSTS MUST EXTEND A MINIMUM OF 2' BELOW GRADE & HAVE A HEIGHT EQUAL TO EXISTING POSTS.
2. POST TO BE A MAXIMUM OF 10' CENTER TO CENTER.
3. POST AT EACH END OF REPAIRED SECTION TO BE H BRACED TO THE ADJOINING POSTS.
4. ALL FENCES SHALL BE REPAIRED WITH NEW WIRE OF LIKE MESH AS EXISTING FENCE , OR WIRE MATCHING EXISTING GAUGE AND SPECIFICATIONS & OF THE SAME NUMBER OF STRANDS & NUMBER OF WIRES EXISTING ON THE FENCE PRIOR TO CONSTRUCTION OF THE PIPELINE.
5. ALL POST ON PERMANENT RIGHT OF WAY TO BE PAINTED PER COMPANY PAINTING SPECIFICATIONS.

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WOVEN WIRE & BARBED WIRE FENCE REPLACEMENT FENCE DETAIL

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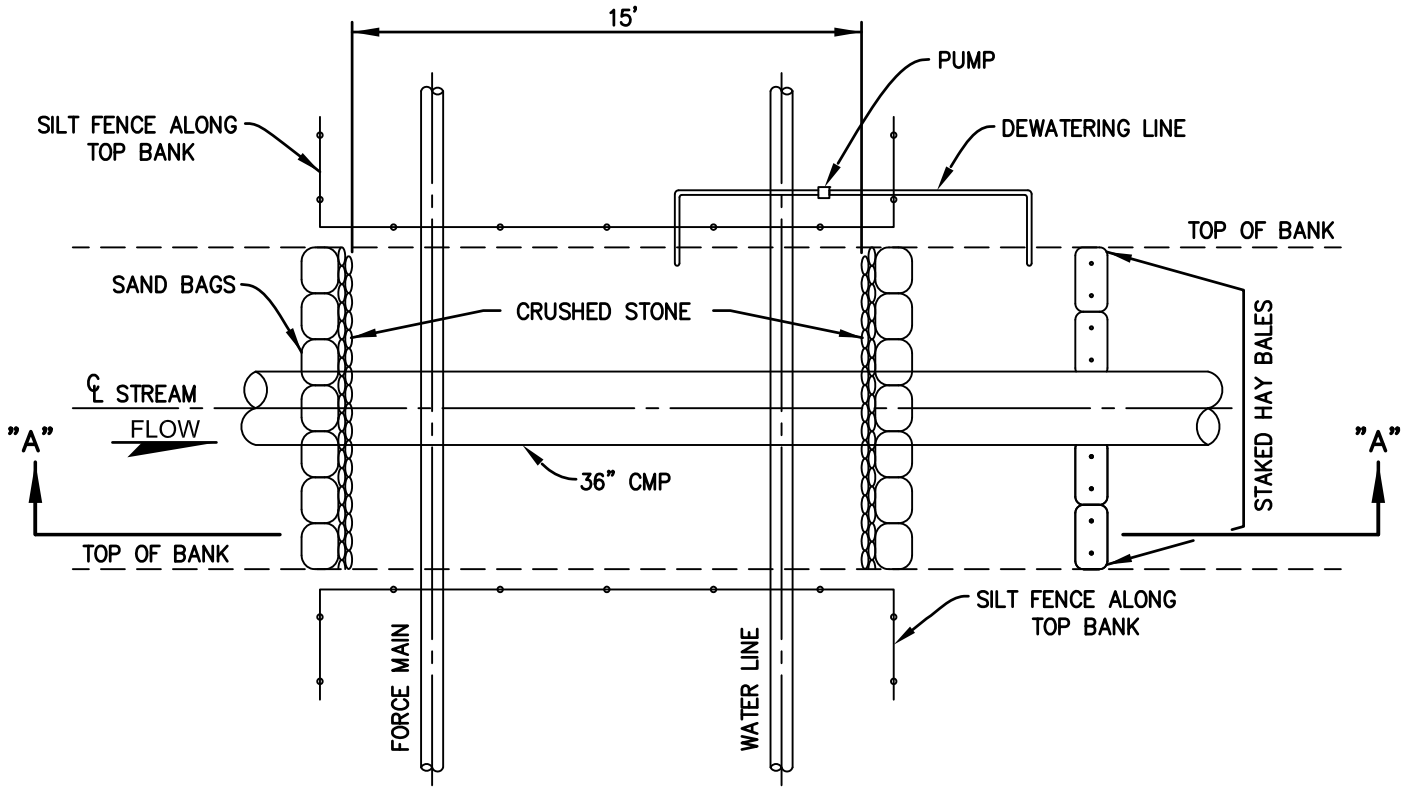
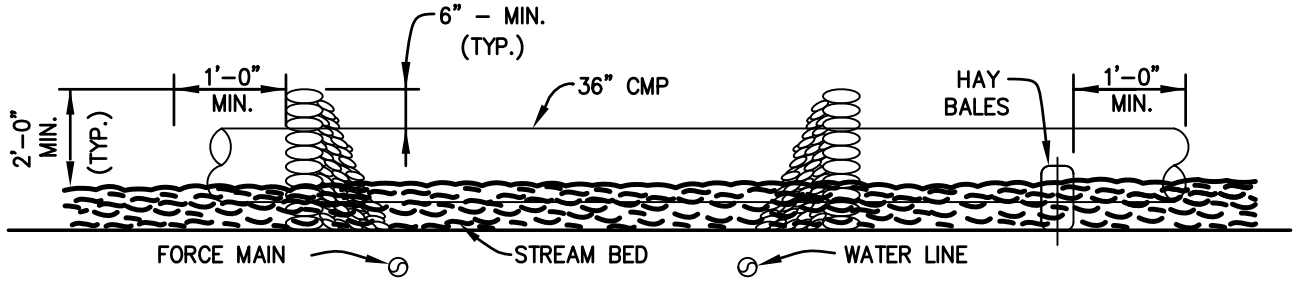
SCALE: N.T.S.	APP.:		



PLAN – TEMPORARY STREAM DIVERSION
N.T.S.



SECTION "A–A"
N.T.S.

NOTES:

1. CONTRACTOR SHALL MAINTAIN STREAM FLOW AT ALL TIMES.
2. ALL SANDBAGS, CRUSHED STONE AND FILL SHALL BE REMOVED AFTER INSTALLATION OF CROSSING AND STREAM BED AND BANKS SHALL BE RESTORED TO ORIGINAL SHAPE AND ELEVATION.
3. LIMIT OF DISTURBANCE TO BE 30' LONG x 15' WIDE (450 S.F. TOTAL).
4. STAGING AREAS: MATERIALS AND EQUIPMENT TO BE STAGED ALONG ABANDONED ROAD BED IN THE UPLANDS.
5. USE WET MEADOW SEED MIX AS SPECIFIED IN LANDSCAPING DETAILS TO RESEED ALL DISTURBED AREAS.

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PROPOSED PIPELINE
TEMPORARY STREAM DIVERSION

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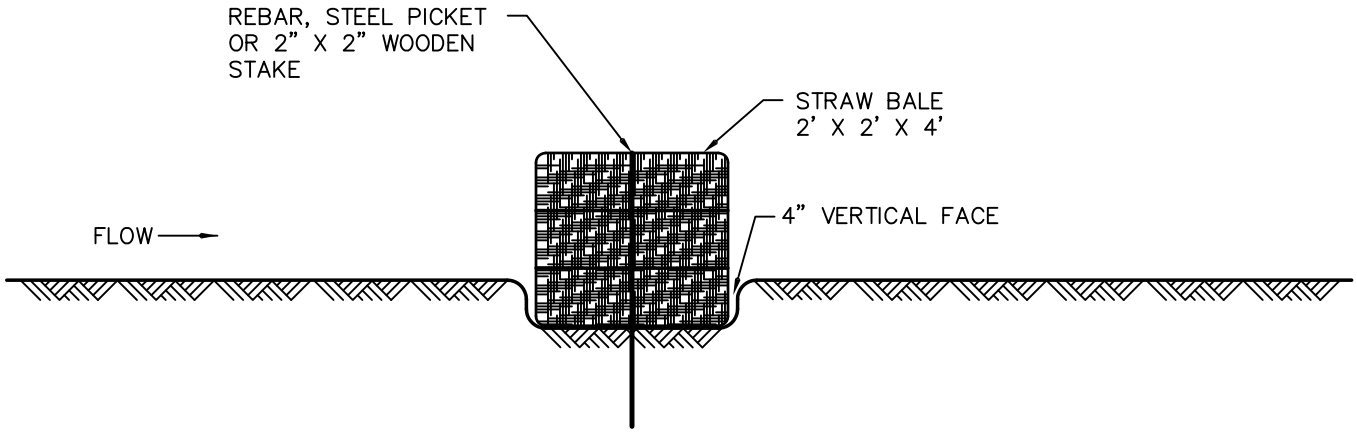
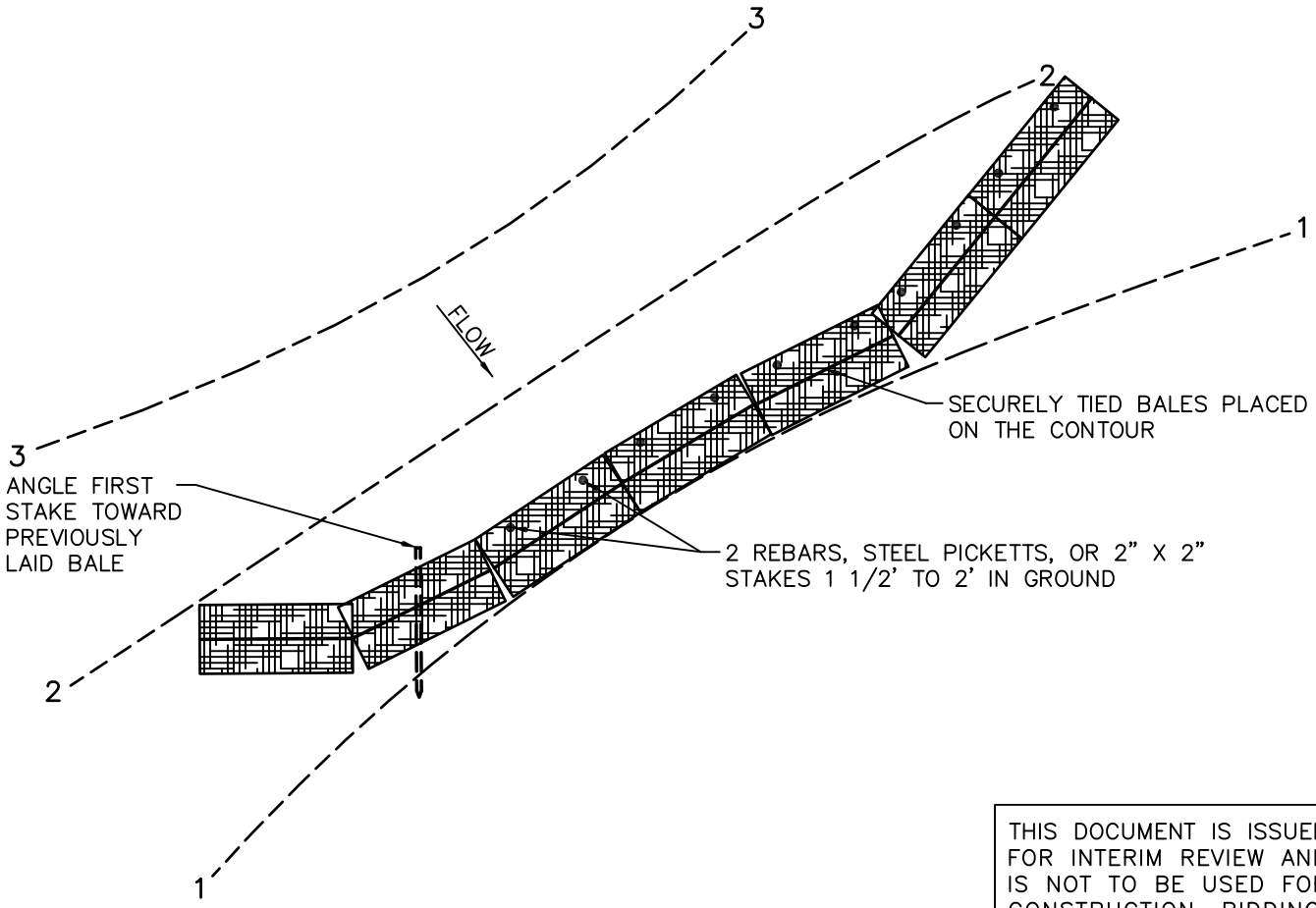


EMBEDDING DETAIL



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TYPICAL STRAW BALE FILTER

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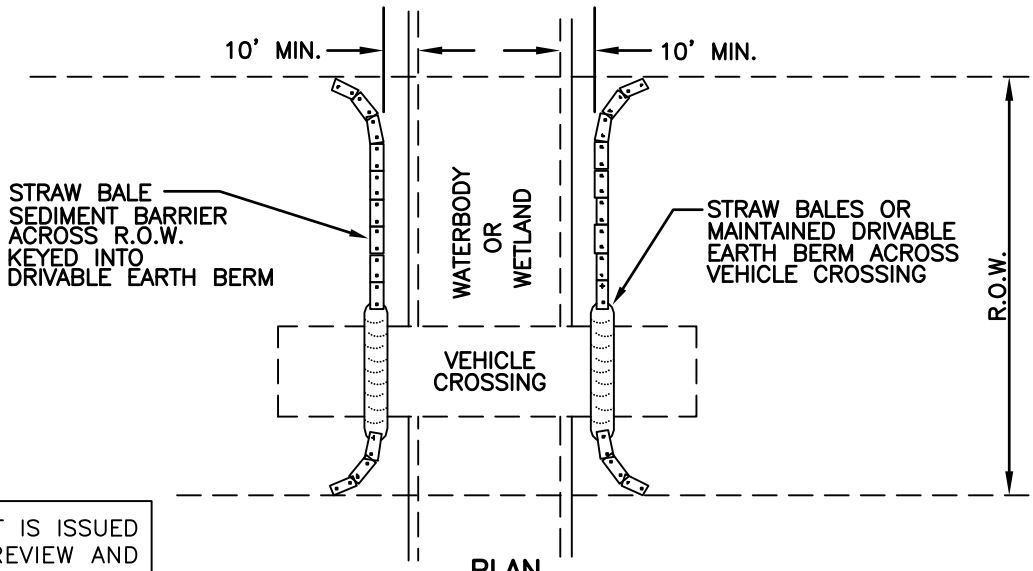
INSTALLATIONS AT VEHICLE CROSSINGS OF WATERBODIES AND WETLANDS



PLAN

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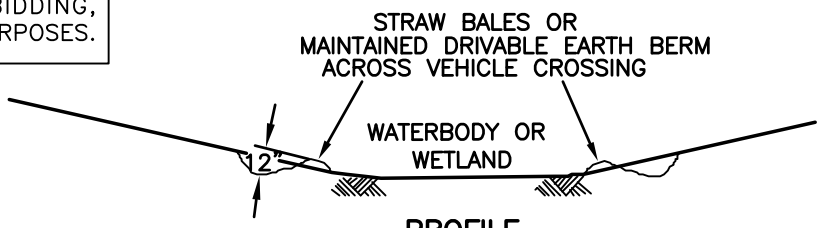

PROFILE

NOTES:

1. PLACE STRAW BALES SO THEY ARE EFFECTIVE BUT DO NOT HINDER CONSTRUCTION. IF NECESSARY, A 15' GAP IN STRAW BALE BARRIERS SHALL BE PROVIDED, AS NEEDED, TO ACCOMMODATE TRAFFIC ON TEMPORARY CONSTRUCTION ROADS. THE GAP SHALL BE CLOSED AT THE END OF EACH WORK DAY USING STRAW BALE BARRIERS, OR A DRIVABLE EARTH BERM TIED INTO ADJACENT STRAW BALES. THE BALES USED TO CLOSE THE GAP SHALL BE PLACED ON THE UPHILL SIDE OF THE STRAW BALE BARRIER, THE END BALES OF THE GAP SEGMENT SHALL OVERLAP A MINIMUM OF 12".
2. A MAINTAINED DRIVABLE EARTH BERM MAY BE INSTALLED ACROSS VEHICLE CROSSING IN LIEU OF STRAW BALES DURING ACTIVE CONSTRUCTION.
3. BERM MUST BE TIED INTO STRAW BALES.
4. BERM MUST BE MAINTAINED TO ENSURE SEDIMENT TRAPPING CAPACITY.
5. WHEN ACTIVE CONSTRUCTION IS COMPLETE, INSTALL STRAW BALES ACROSS ENTIRE R.O.W.
6. MONITOR FOR UNDERMINING OR FLOW-AROUND. INSPECT BALE POSITION TO ASSURE THAT THEY REMAIN CLOSE TOGETHER. MAINTAIN STRAW BALE BARRIERS BY REPLACING DAMAGED BALES AND REMOVING SEDIMENT LOAD. WHEN SEDIMENT LOAD IS GREATER THAN 40% BEHIND THE BARRIER, SEDIMENT SHALL BE REMOVED AND PLACED IN AN AREA WHERE IT SHALL NOT REENTER THE BARRIER OR A WATERWAY. IF SEDIMENT BEHIND STRAW BALE BARRIERS CANNOT BE REMOVED, A SECOND ROW OF BALES SHALL BE INSTALLED UPSLOPE OF THE BARRIER.
7. WHERE STRAW BALES AND SILT FENCE ARE INSTALLED AS A UNIT, THE STRAW BALES SHALL BE INSTALLED ON THE DOWN SLOPE SIDE OF THE SILT FENCE.
8. EROSION CONTROL STRUCTURES SHALL BE INSPECTED DAILY IN AREAS OF ACTIVE CONSTRUCTION. STRUCTURES SHALL BE INSPECTED WEEKLY AT INACTIVE CONSTRUCTION AREAS AND WITHIN 24 HOURS OF EACH RAINFALL EVENT WITH 0.5 INCH OR MORE. STRUCTURES SHALL BE REPAIRED AS NECESSARY.
9. STRAW BALE BARRIERS SHALL BE REMOVED ONLY AS DIRECTED BY THE PIPELINE INSPECTOR.

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EROSION CONTROL
STRAW BALE SEDIMENT BARRIER

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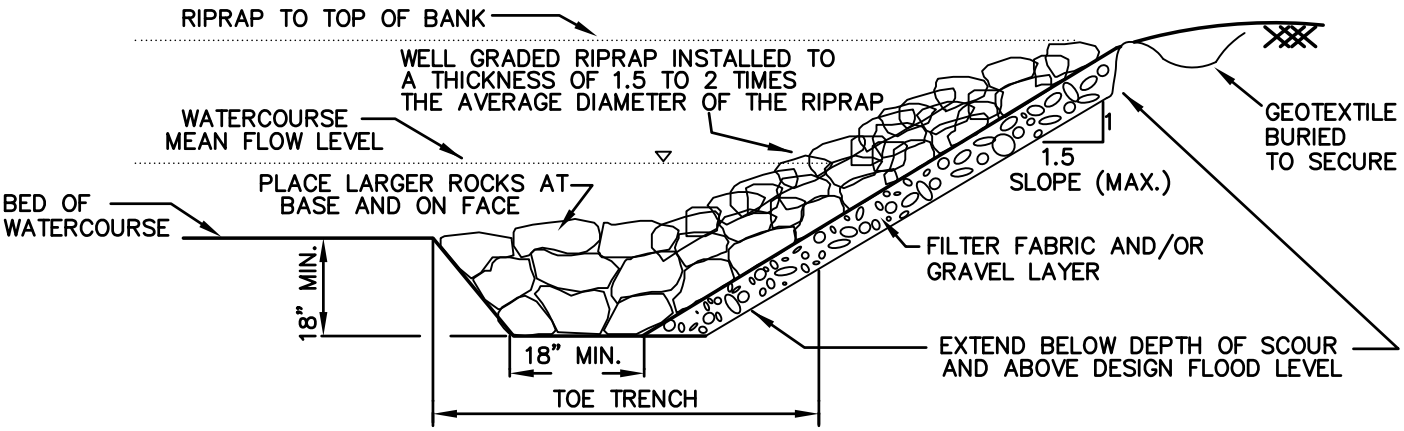
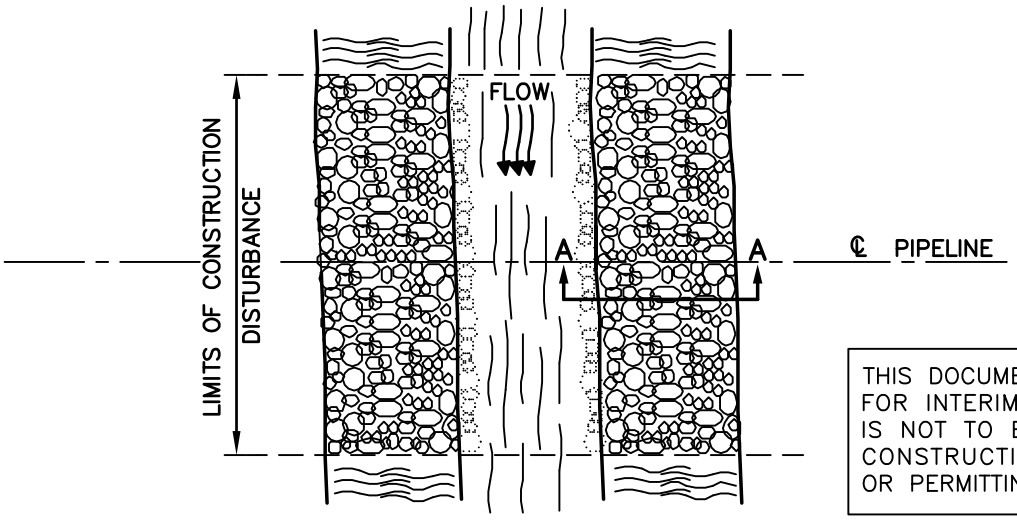


SECTION A–A



PLAN VIEW

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NOTES:

1. STREAM BANK RIPRAP STRUCTURES SHALL CONSIST OF A LAYER OF STONE UNDERLAIN WITH APPROVED GEOTEXTILE FILTER FABRIC OR A GRAVEL FILTER BLANKET DESIGNED TO PROTECT AND STABILIZE AREAS PRONE TO EROSION.
2. GRAVEL FILTER BLANKET SHALL MEET THE FOLLOWING SPECIFICATIONS:
   - HAVE A PERMEABILITY GREATER THAN THAT OF THE SUBGRADE SOIL;
   - IF A WELL–GRADED GRAVEL OR SAND–GRAVEL LAYER IS USED, THE LAYER SHALL BE A MINIMUM OF 6" THICK AND SPREAD IN A UNIFORM LAYER OVER THE SUBGRADE;
   - IF WATER TURBULENCE COULD RESULT IN EROSION OF BANK MATERIAL BETWEEN LARGE ROCKS (AS DETERMINED BY THE REPRESENTATIVE ENVIRONMENTAL INSPECTOR), A GEOTEXTILE FILTER FABRIC SHALL BE USED BETWEEN THE GRAVEL LAYER AND THE RIPRAP.
3. THE GEOTEXTILE FILTER FABRIC SHALL BE PERMATEX 4000 SERIES OR AN APPROVED EQUIVALENT MEETING THE FOLLOWING SPECIFICATIONS:
   (A) BE COMMERCIAL QUALITY NONWOVEN FABRIC DESIGNED FOR RIPRAP UNDERLAYMENT;
   (B) BE A MINIMUM OF 20 MILS IN THICKNESS;
   (C) HAVE A GRAB STRENGTH BETWEEN 90 TO 120 POUNDS;
   (D) HAVE A GREATER THAN 4% OPEN AREA (U.S. STANDARD SIEVE NUMBER 100 (0.15 MM.);
   (E) HAVE A DENSITY OF 8 oz. PER SQUARE YARD.
4. THE USE OF RIPRAP SHALL BE LIMITED TO AREAS WHERE FLOWING CONDITIONS PREVENT EFFECTIVE VEGETATIVE STABILIZATION TECHNIQUES.

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EROSION CONTROL RIPRAP AT WATERBODY BANKS

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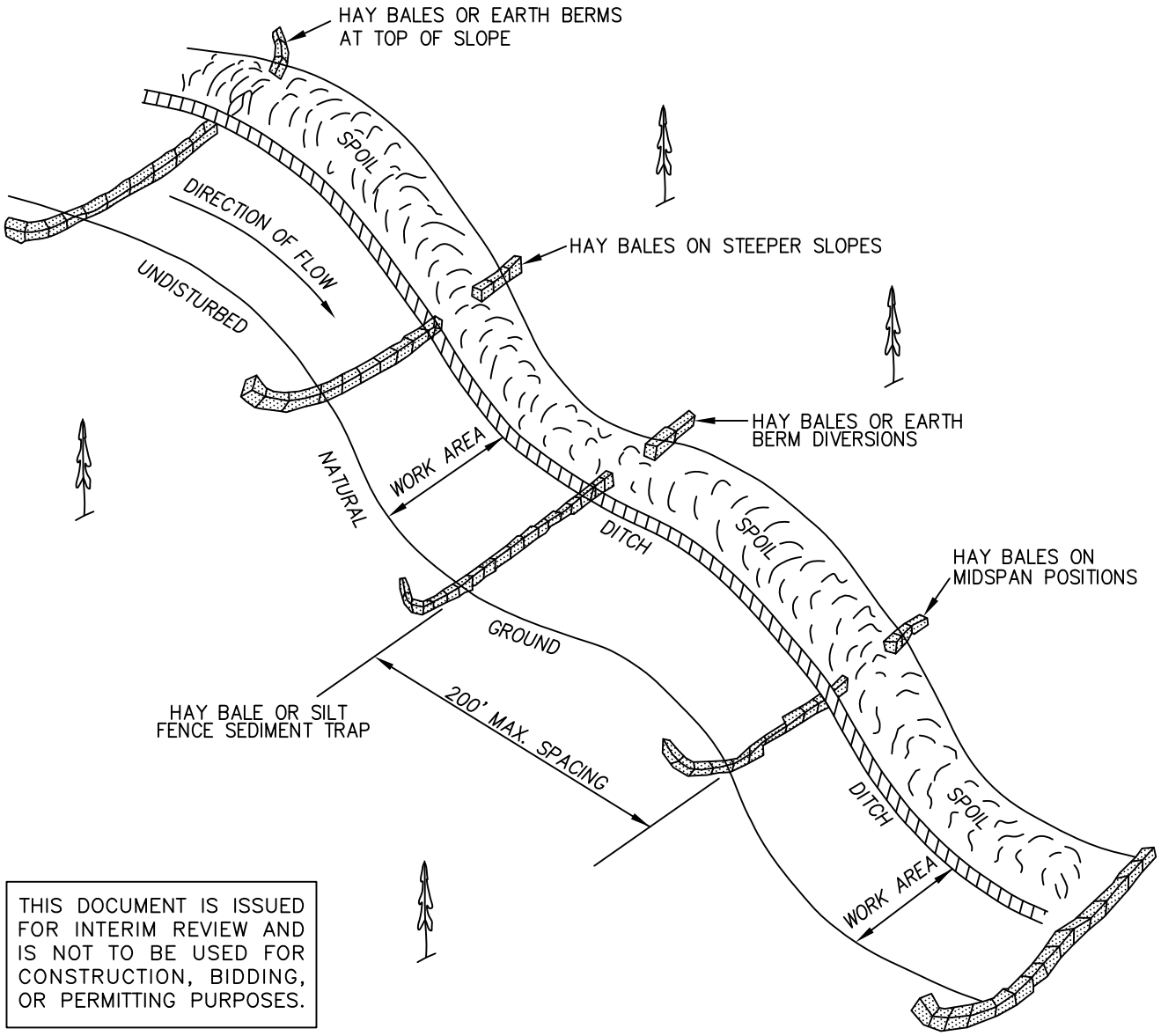

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TEMPORARY S&E CONTROL MEASURES
SLOPE DIRECTION WITH SLOPE
SLOPE PERCENT >15%

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SCALE: N.T.S.	APP.:		

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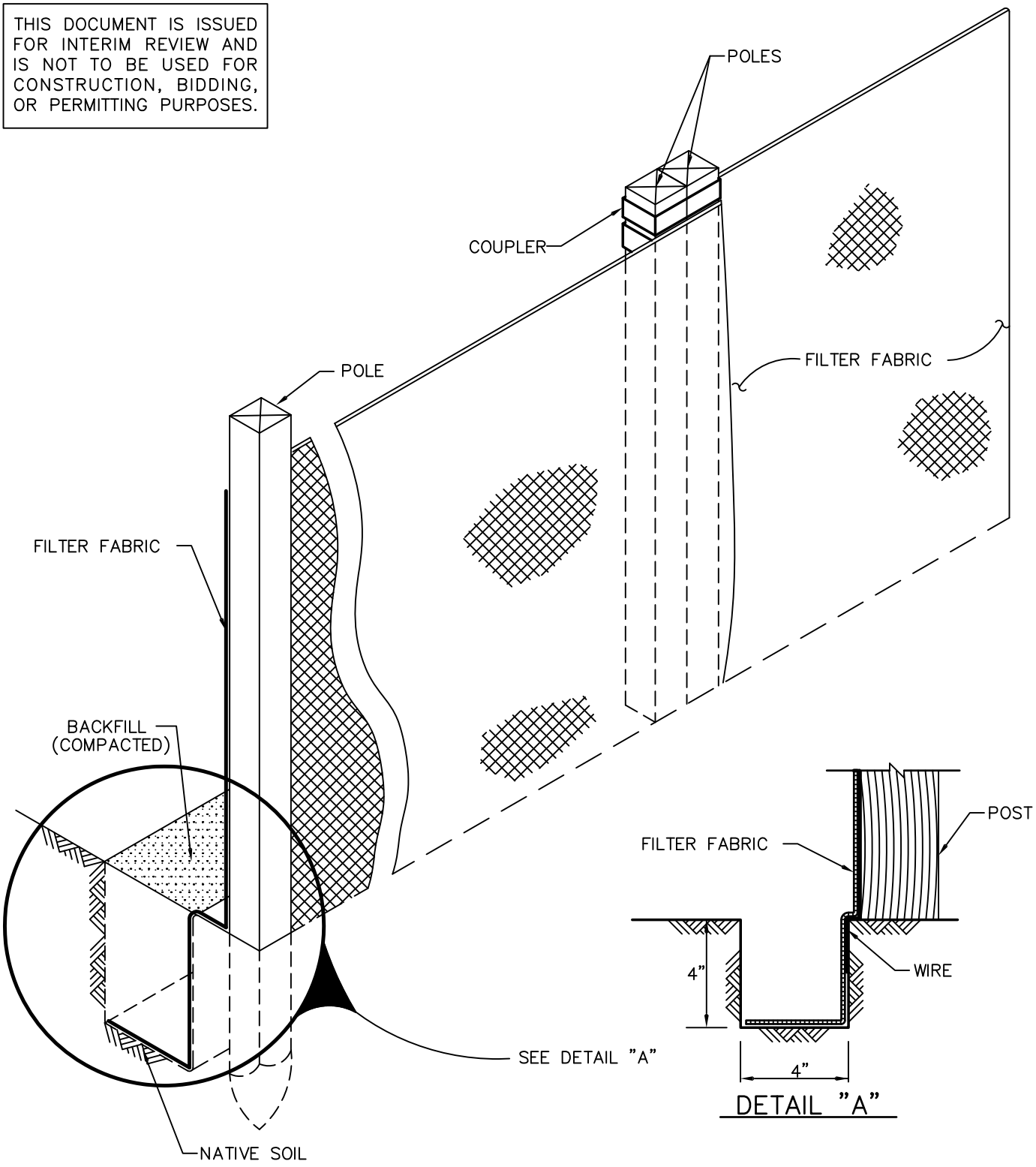

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TYPICAL SILT FENCE

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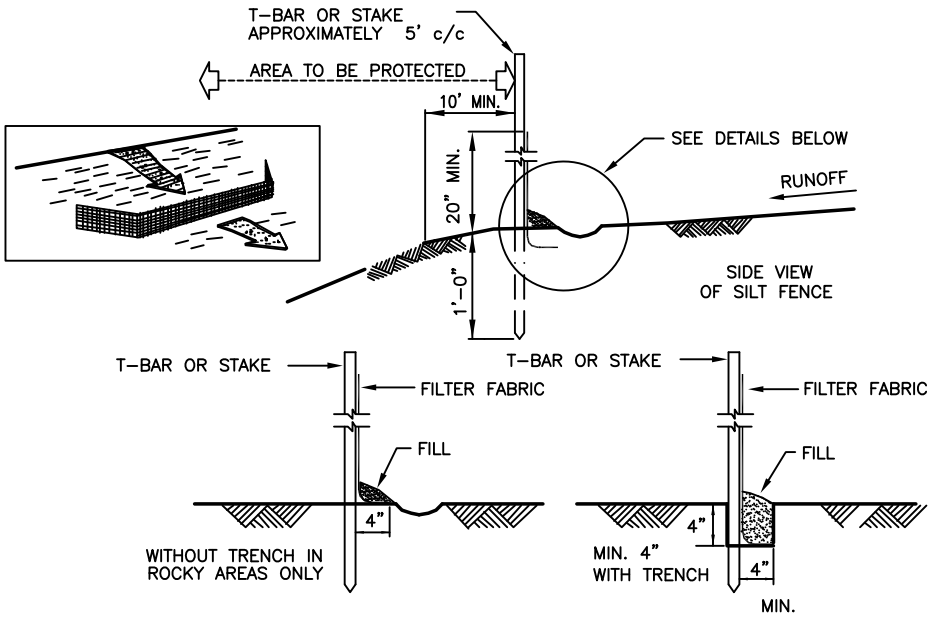

NOTE:

1. GENERALLY WHEN A LONG SEDIMENT BARRIER IS REQUIRED, SILT FENCE WILL BE UTILIZED RATHER THAN STRAW BALES AT:

- THE BASE OF ALL SLOPES ABOVE ROADS, SPRINGS, WETLANDS, IMPOUNDMENTS AND PERENNIAL AND INTERMITTENT STREAMS.
- THE DOWN SLOPE RIGHT-OF-WAY EDGE WHERE ANY OF THE ABOVE MENTIONED LOCATIONS ARE ADJACENT TO THE RIGHT-OF-WAY.
- BETWEEN TOPSOIL/SPOIL STOCKPILES AND PERENNIAL OR INTERMITTENT STREAMS OR WETLANDS WHERE BUFFER ZONE REQUIREMENTS CANNOT BE MET.
- ALONG R.O.W. BOUNDARIES OF WETLAND CONSTRUCTION.
- ACROSS CONSTRUCTION R.O.W. AT ALL WATERBODY CROSSINGS.
- AS SPECIFIED IN THE SPILL PREVENTION, CONTAINMENT, AND COUNTERMEASURE PLAN.
- AS DIRECTED BY THE INSPECTOR.

2. THE SILT FENCE SHALL BE CONSTRUCTED AS FOLLOWS:

- FABRIC USED FOR THE SILT FENCE SHALL BE A "STANDARD STRENGTH" GEOTEXTILE, SUCH AS MIRAFI 100X OR AN APPROVED EQUIVALENT.
- THE FABRIC SHALL BE CUT FROM A CONTINUOUS FABRIC ROLL.
- THE HEIGHT OF THE FENCE SHALL NOT EXCEED 36".
- SPLICES SHALL ONLY BE DONE AT POSTS AND SHALL CONSIST OF A MINIMUM OF 6" OF OVERLAP WITH BOTH ENDS SECURED TO THE POST.
- POSTS SHALL BE POSITIONED A MAXIMUM OF 5' APART.
- POSTS SHALL CONSIST OF 2"X2" WOODEN STAKES OF SUFFICIENT LENGTH TO EXTEND A MINIMUM OF 12" INTO THE GROUND.
- FABRIC SHALL BE STAPLED OR WIRED TO POSTS A MAXIMUM OF EVERY 9".

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3. THE SILT FENCE SHALL BE INSTALLED AS SPECIFIED BY THE MANUFACTURER OR AS FOLLOWS:

- A TRENCH, 4" WIDE AND 4" DEEP, SHALL BE EXCAVATED ALONG THE CONTOUR. THE POST SHALL BE DRIVEN INTO THE BOTTOM OF THE TRENCH ON THE DOWSTREAM SIDE OF THE FILTER FABRIC. THE TRENCH SHALL BE BACK FILLED AND COMPACTED, ENSURING 4" OF FENCE IS BURIED WITHIN THE TRENCH.
- IN AREAS WHERE THE TERRAIN IS TOO ROCKY FOR TRENCHING, A 4" GROUND FLAP WITH ROCK FILL TO HOLD IT IN PLACE SHALL BE USED.

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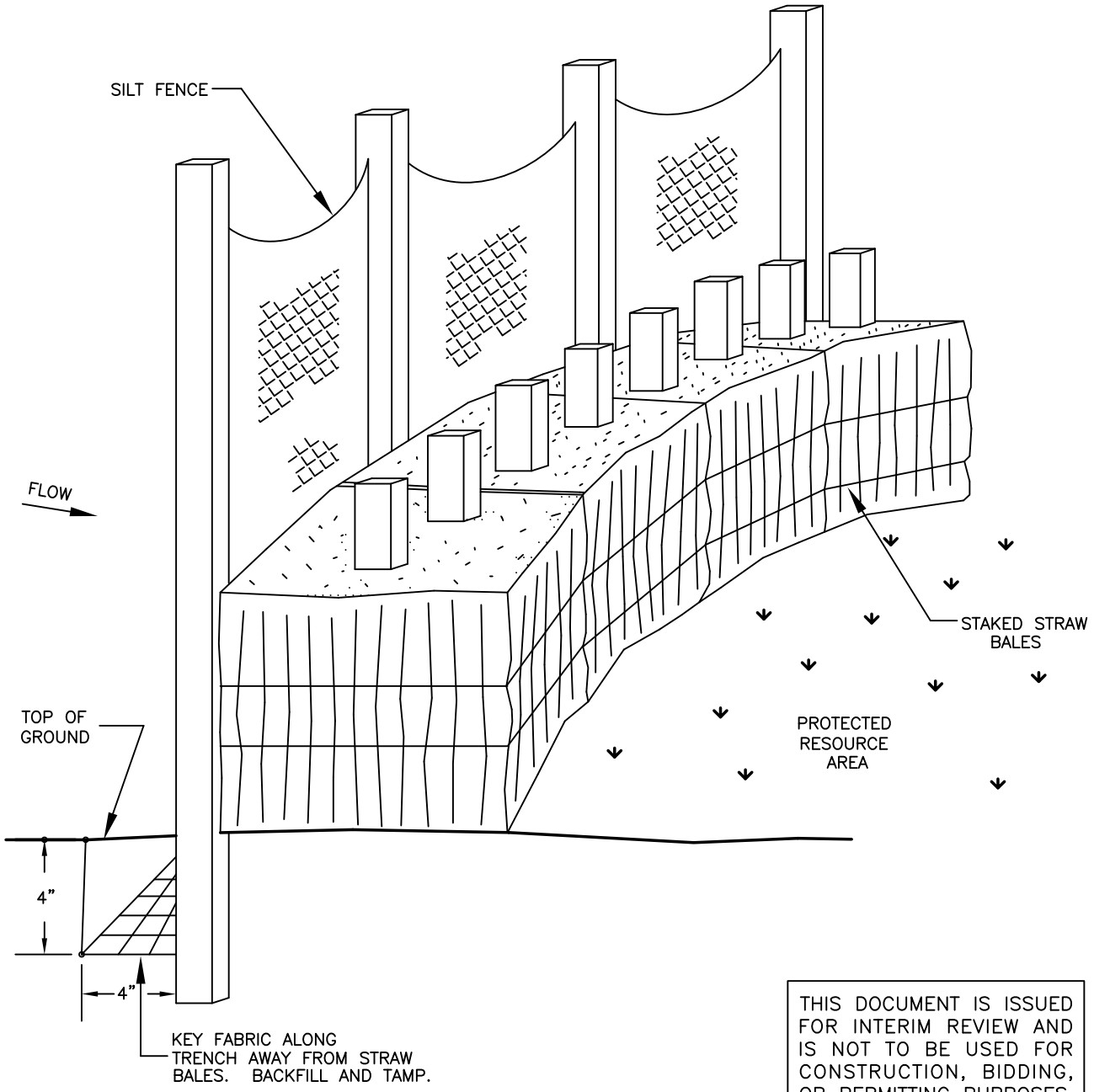
PROJECT NO. 10395700

DAPL/ETCOP

EROSION CONTROL SILT FENCE SEDIMENT BARRIER

DRAWN BY: DAH	DATE: 08/07/14	DWG. NO. P12-15	REV. A
CHECKED BY: DAH	DATE: 08/07/14		
SCALE: N.T.S.	APP.:		



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NOTE:

1. WHERE EXTREMELY ERODIBLE SOIL CONDITIONS EXIST AND AT THE DIRECTION OF THE INSPECTOR, A COMBINED STRAW BALE AND SILT FENCE SEDIMENT CONTROL BARRIER SHALL BE INSTALLED.

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PROJECT NO. 10395700

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EROSION CONTROL STRAW BALE AND SILT FENCE

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CHECKED BY: DAH	DATE: 08/07/14		
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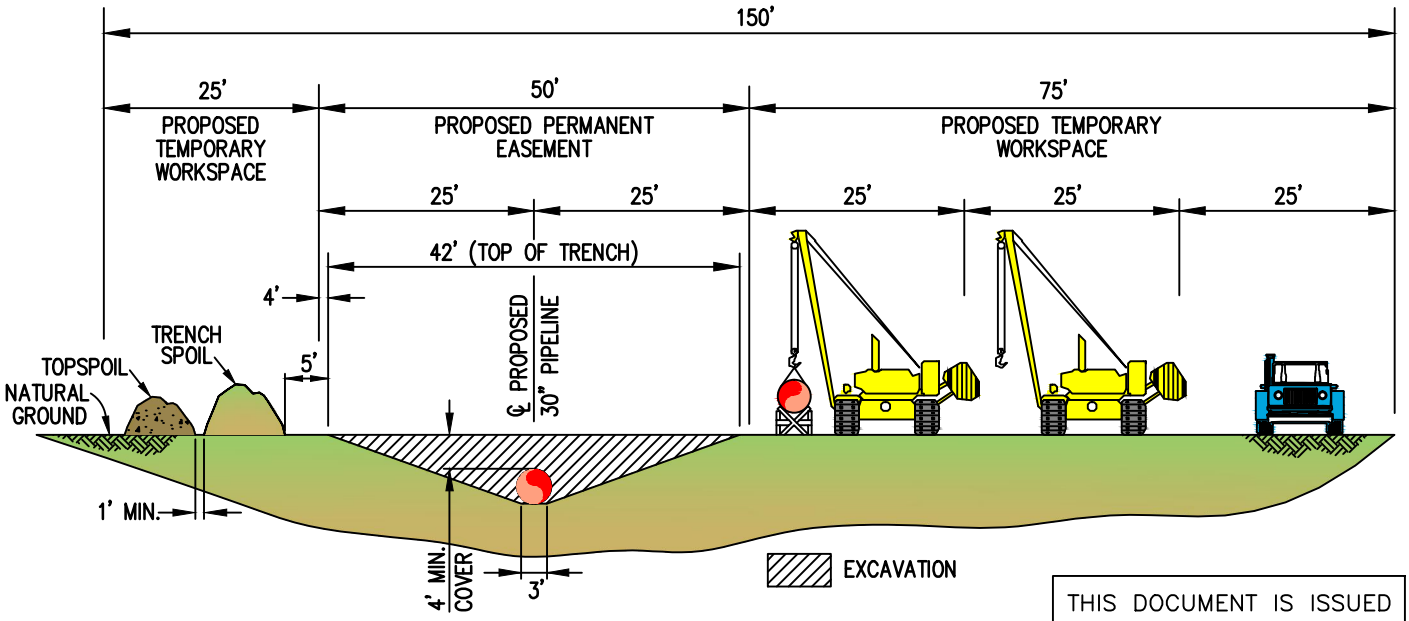

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NOTES:

1. CONSTRUCTION RIGHT–OF–WAY WILL TYPICALLY BE 150 FEET WIDE CONSISTING OF 50 FEET PERMANENT EASEMENT AND UP TO 100 FEET OF TEMPORARY WORKSPACE. EXTRA TEMPORARY WORK SPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL AND RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES, AS REQUIRED. CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.
2. UTILIZE THE "TRENCH ONLY" TOPSOIL SALVAGE METHOD AT LOCATIONS SUCH AS RIPARIAN AREAS OR UNMANAGED WOODLAND, WHERE IDENTIFIED ON THE CONSTRUCTION DRAWINGS, OR AS DIRECTED BY THE PIPELINE INSPECTOR.
3. THE TRENCH ONLY METHOD IS NOT TO BE USED ON AGRICULTURAL LAND EXCEPT AS DIRECTED BY THE INSPECTOR (PER LANDOWNER REQUEST).
4. FOR TRENCH ONLY STRIPPING, THE STRIPPED AREA SHALL BE WIDE ENOUGH TO ACCOMMODATE TRENCHING EQUIPMENT.
5. DEPTH OF TOPSOIL STRIPPING IS A MINIMUM OF 12 INCHES.
6. STOCKPILE TOPSOIL AS SHOWN OR IN ANY CONFIGURATION APPROVED BY THE PIPELINE INSPECTOR. KEEP TOPSOIL AND SPOIL PILES CLEAN OF ALL CONSTRUCTION DEBRIS. MAINTAIN A MINIMUM 12 INCHES OF SEPERATION BETWEEN TOPSOIL AND TRENCH SPOIL PILES.
7. LEAVE GAPS IN TOPSOIL AND SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH UPLAND SOILS INTO CREEKS OR WETLANDS. DO NOT USE TOPSOIL FOR PADDING.
8. AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING SPOIL AND TOPSOIL PILES.
9. SAME LAYOUT APPLIES WHERE CONSTRUCTION R.O.W. DOES NOT ABUT EXISTING R.O.W.
10. TEMPORARILY SUSPEND TOPSOIL HANDLING OPERATIONS DURING INORDINATELY WINDY CONDITIONS UNTIL MITIGATIVE MEASURES TO MINIMIZE WIND EROSION CAN BE IMPLEMENTED.
11. TOPSOIL AND TRENCH SPOIL RELATIVE POSITIONS CAN, AS DIRECTED BY THE PIPELINE INSPECTOR, BE REVERSED.

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PROJECT NO. 10395700

DAPL/ETCOP

CONSTRUCTION RIGHT–OF–WAY ARRANGEMENT

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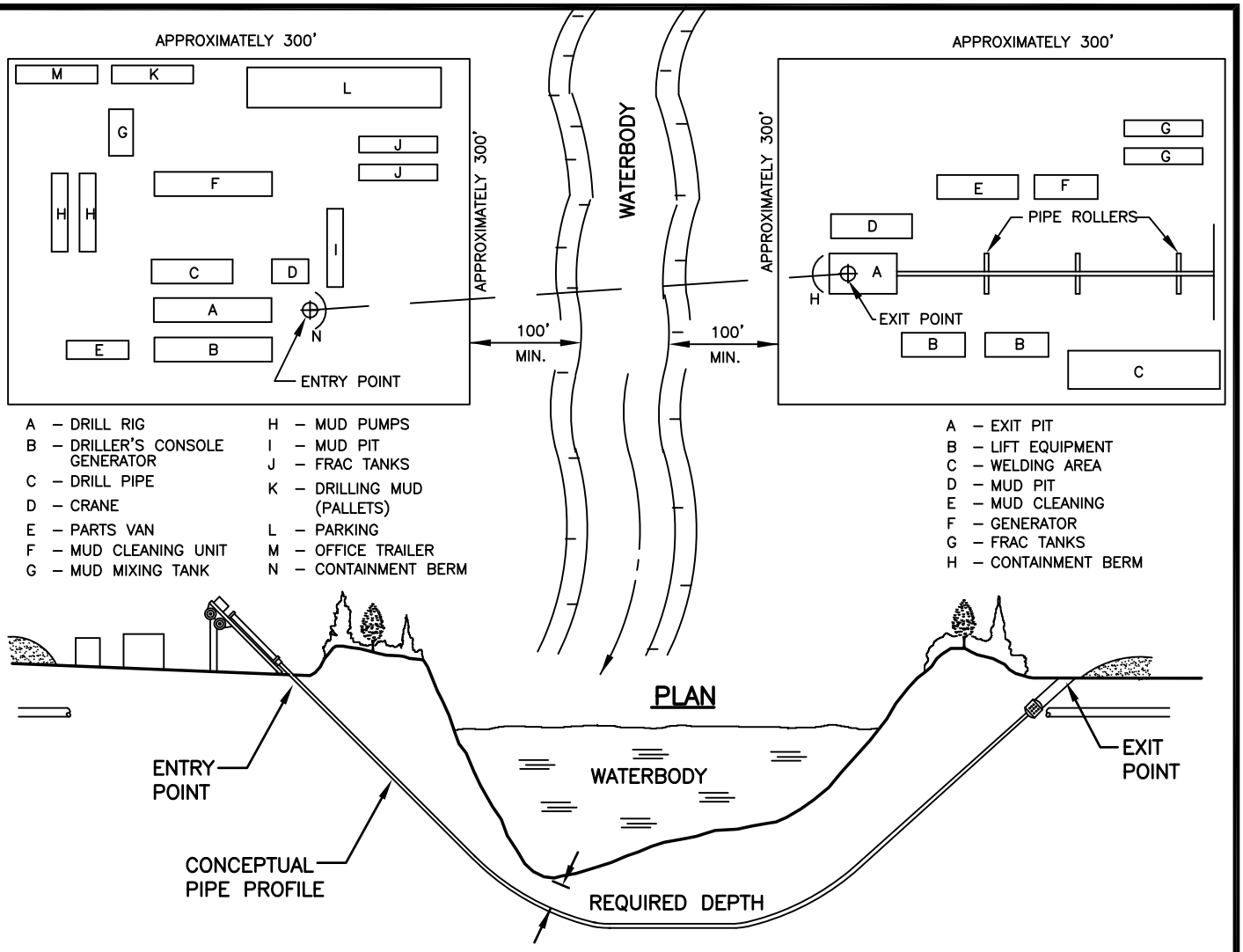

NOTES:

1. SET UP DRILLING EQUIPMENT A MINIMUM OF 300 FEET FROM THE EDGE OF THE WATERCOURSE. DO NOT CLEAR OR GRADE WITHIN THE 100 FOOT ZONE.
2. ENSURE THAT ONLY BENTONITE BASED DRILLING MUD IS USED. DO NOT ALLOW THE USE OF ANY ADDITIVES TO THE DRILLING MUD WITHOUT THE APPROVAL OF THE APPROPRIATE REGULATORY AUTHORITIES AND CLIENTS REPRESENTATIVE.
3. INSTALL SUITABLE DRILLING MUD TANKS OR SUMPS TO PREVENT CONTAMINATION OF WATERCOURSE.
4. INSTALL BERMS DOWNSLOPE FROM THE DRILL ENTRY AND ANTICIPATED EXIT POINTS TO CONTAIN ANY RELEASE OF DRILLING MUD.
5. DISPOSE OF DRILLING MUD IN ACCORDANCE WITH THE APPROPRIATE REGULATORY AUTHORITY REQUIREMENTS.

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DAPL/ETCOP

WATERBODY CROSSING HORIZANTAL DIRECTIONAL DRILL

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CHECKED BY: DAH	DATE: 08/07/14		
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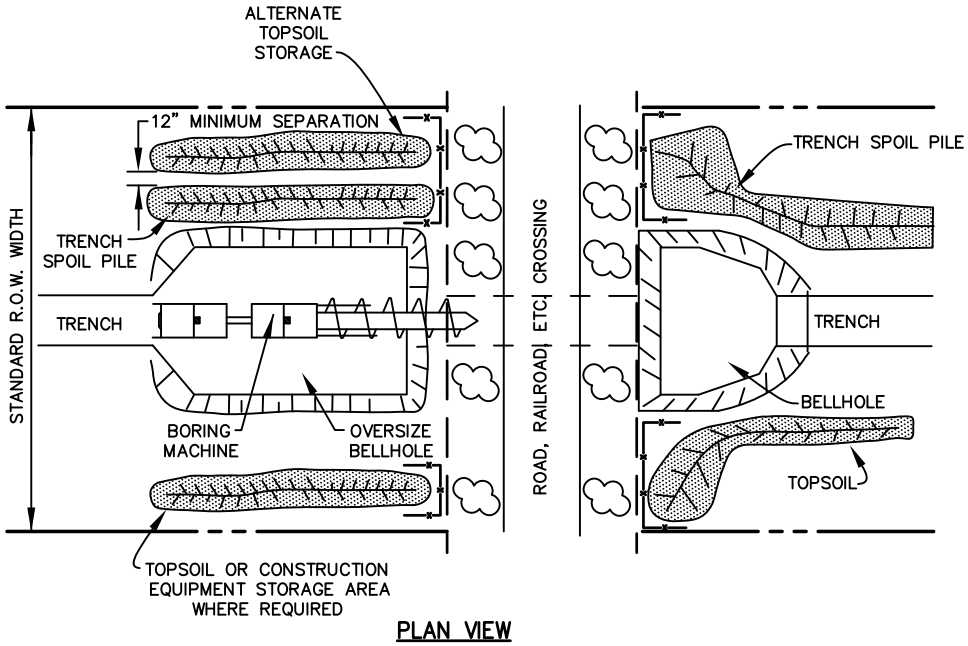

PLAN VIEW
N.T.S.

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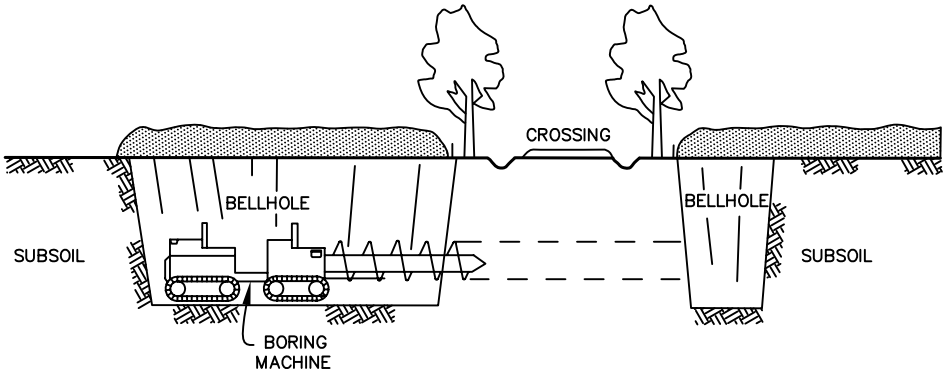

PROFILE
N.T.S.

NOTES:

1. STRIP TOPSOIL FROM BELLHOLE AREA IN UNMANAGED WOODLANDS. STRIP TOPSOIL FROM THE BELLHOLE AND SPOIL STORAGE AREA ON AGRICULTURAL LAND.
2. EXCAVATE BELLHOLE, STORING TRENCH SPOIL ON OPPOSITE SIDE OF RIGHT-OF-WAY FROM TOPSOIL, OR ADJACENT TO TOPSOIL MAINTAINING A 12" MINIMUM SEPARATION TO AVOID MIXING TOPSOIL AND TRENCH SPOIL.
3. AFTER COMPLETION OF PIPE TIE-INS, BACKFILL AND COMPACT. LEAVE A CROWN TO ALLOW FOR SUBSIDENCE.
4. INSTALL TEMPORARY EROSION CONTROL PROCEDURES AS SPECIFIED BY THE PIPELINE INSPECTOR.

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PROJECT NO. 10395700

DAPL/ETCOP

TOPSOIL SALVAGE CROSSING BORE (CB)

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CHECKED BY: DAH	DATE: 08/07/14		
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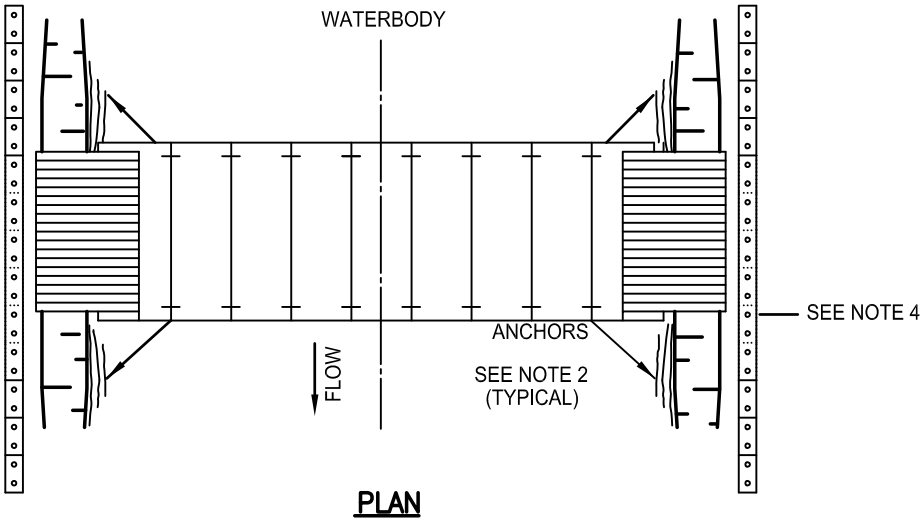
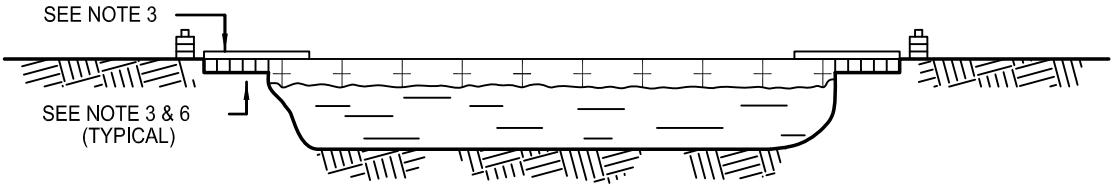


PLAN



PROFILE

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NOTES:

1. THIS TYPE OF BRIDGE IS GENERALLY USED ON WIDE, CROSSINGS.
2. BRIDGE SHALL BE ANCHORED AND/OR TIED OFF TO ANCHOR BLOCKS FOR STABILITY.
3. IF REQUIRED, UTILIZE APPROACH FILLS OF CLEAN ROCK MATERIAL, SWAMP MATS, SKIDS OR OTHER SUITABLE MATERIALS TO AVOID CUTTING THE BANKS WHEREVER FEASIBLE. ENSURE ADEQUATE FREEBOARD. ENSURE THAT FILL MATERIAL, IF USED, DOES NOT SPILL INTO WATERCOURSE.
4. CONSTRUCT SEDIMENT BARRIERS ACROSS THE ENTIRE CONSTRUCTION R.O.W. TO PREVENT SILT LADEN WATER AND SPOIL FORM FLOWING BACK INTO WATERBODY. BARRIERS MAY BE TEMPORARILY REMOVED TO ALLOW CONSTRUCTION ACTIVITIES BUT MUST BE REPLACED BY THE END OF EACH WORK DAY. SILT FENCE, STRAW BALES OR SANDBAGS MAY BE USED INTERCHANGEABLY.
5. REMOVE FLOATING BRIDGES AS SOON AS POSSIBLE AFTER PERMANENT SEEDING UNLESS OTHERWISE DIRECTED BY REPRESENTATIVE. THE STRUCTURE IS TO BE REMOVED IF THERE IS MORE THAN ONE MONTH BETWEEN FINAL GRADING AND SEEDING, AND ALTERNATIVE ACCESS TO THE CONSTRUCTION R.O.W. IS AVAILABLE.
6. DISPOSE OF A ROCK AS DIRECTED BY COMPANY REPRESENTATIVE.
7. RESTORE AND STABILIZE BED AND BANKS TO APPROXIMATE PRE-CONSTRUCTION CONDITIONS.

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PROJECT NO. 10395700

DAPL/ETCOP

PROPOSED PIPELINE
WATERBODY BRIDGE FLEXI FLOAT TYPE (FF)

DRAWN BY: DAH	DATE: 08/07/14	DWG. NO. P12–20	REV. A
CHECKED BY: DAH	DATE: 08/07/14		
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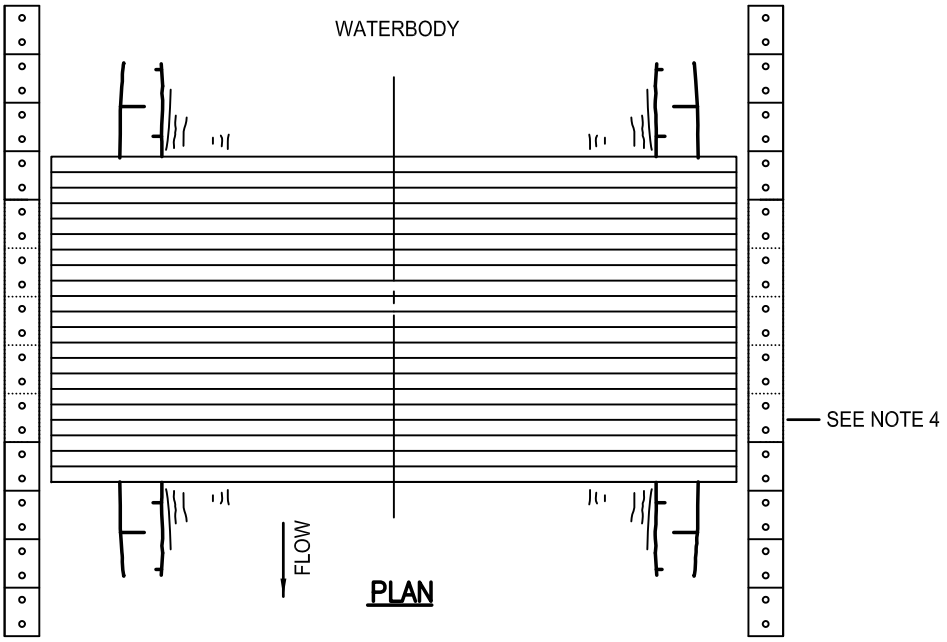

PLAN

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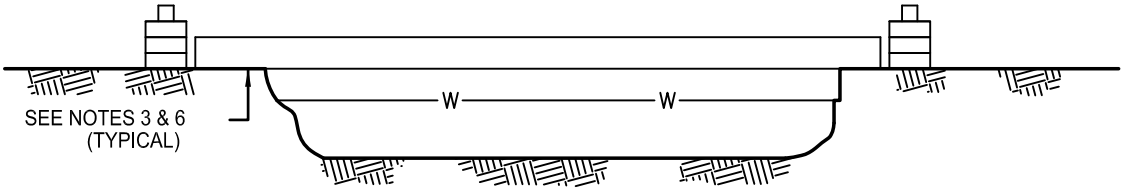

PROFILE

NOTES:

1. THIS TYPE OF BRIDGE IS GENERALLY USED ON NARROW CROSSINGS, LESS THAN 20 FEET WIDE WITH APPROPRIATE BANK CONFIGURATION. MULTIPLE MATS MAY BE LAYERED FOR HEAVIER EQUIPMENT CROSSINGS.

2. BRIDGE SHALL BE TEMPORARILY REMOVED IF HIGH WATER RENDERS IT UNSAFE TO USE.

3. IF REQUIRED, UTILIZE APPROACH FILLS OF CLEAN ROCK MATERIAL, SWAMP MATS, SKIDS OR OTHER SUITABLE MATERIALS TO AVOID CUTTING THE BANKS WHEREVER FEASIBLE. ENSURE ADEQUATE FREEBOARD. ENSURE THAT FILL MATERIAL, IF USED, DOES NOT SPILL INTO WATERCOURSE INCLUDING REMOVAL OF DIRT FROM DECK DURING OPERATION.

4. CONSTRUCT SEDIMENT BARRIERS ACROSS THE ENTIRE CONSTRUCTION R.O.W. TO PREVENT SILT LADEN WATER AND SPOIL FORM FLOWING BACK INTO WATERBODY. BARRIERS MAY BE TEMPORARILY REMOVED TO ALLOW CONSTRUCTION ACTIVITIES BUT MUST BE REPLACED BY THE END OF EACH WORK DAY. SILT FENCE, STRAW BALES OR SANDBAGS MAY BE USED INTERCHANGEABLY.

5. REMOVE TIMBER MATS AS SOON AS POSSIBLE AFTER PERMANENT SEEDING UNLESS OTHERWISE DIRECTED BY REPRESENTATIVE. THE STRUCTURE IS TO BE REMOVED IF THERE IS MORE THAN ONE MONTH BETWEEN FINAL GRADING AND SEEDING, AND ALTERNATIVE ACCESS TO THE CONSTRUCTION R.O.W. IS AVAILABLE.

6. DISPOSE OF A ROCK AS DIRECTED BY COMPANY REPRESENTATIVE.

7. RESTORE AND STABILIZE BED AND BANKS TO APPROXIMATE PRE-CONSTRUCTION CONDITIONS.

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PROPOSED PIPELINE
WATERBODY BRIDGE TIMBER MAT (TM)

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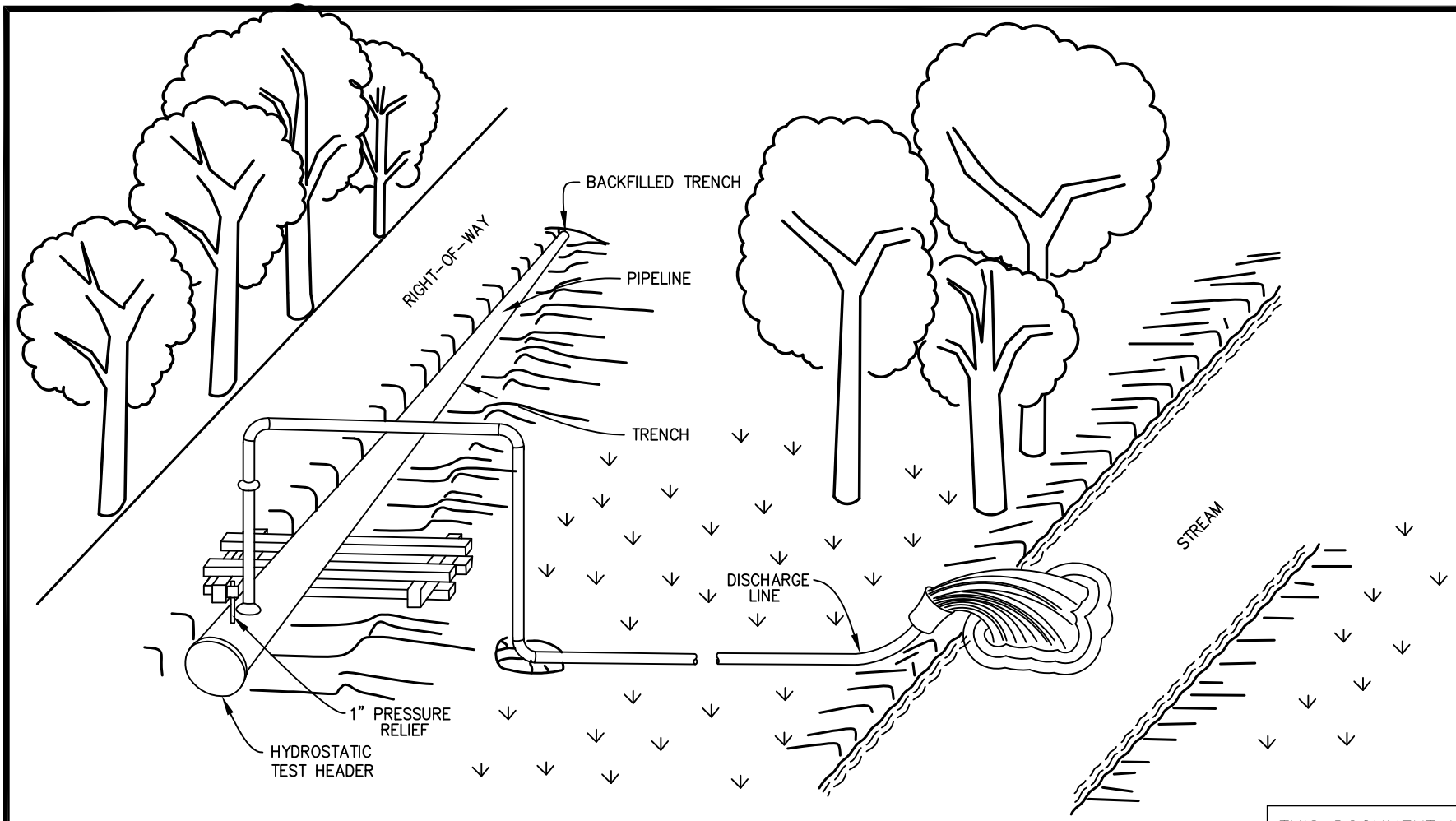

TYPICAL HYDROSTATIC TEST DEWATERING INTO STREAM

N.T.S.

NOTES:

1. PRESSURE IS RELEASED INITIALLY THROUGH 1" PRESSURE RELIEF. WATER IS THEN RELEASED THROUGH DISCHARGE LINE TO COMPANY APPROVED METHOD OF DISSIPATION WATER.
2. COMPANY MAY ALSO APPROVE OTHER METHODS OF DISSIPATING WATER.
3. THIS METHOD MAY ALSO BE INITIATED WHEN PUMPING WATER FROM DITCH.

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TYPICAL HYDROSTATIC TEST DEWATERING INTO STREAM

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CHECKED BY: DAH	DATE: 08/07/14		
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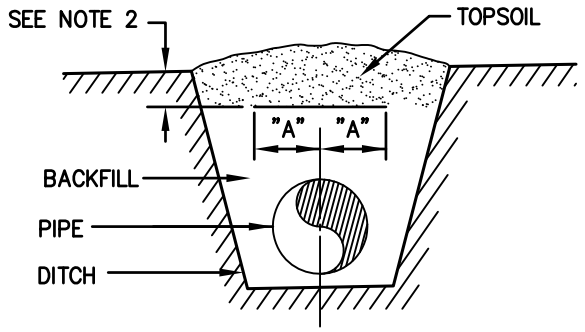
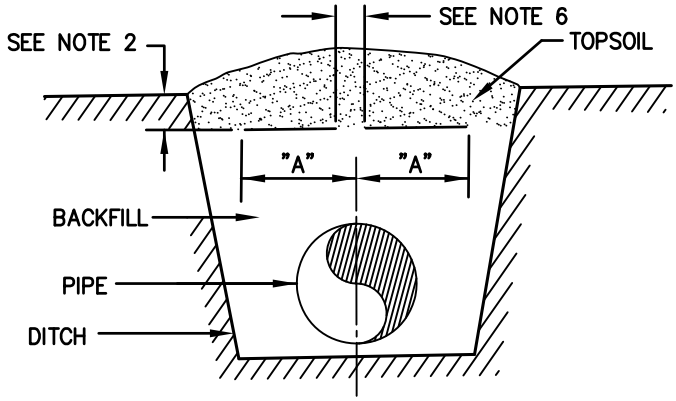
PIPELINE MARKING TAPE INSTALLATION

SINGLE R.O.W.



PIPE DIA.	TAPE WIDTH	"A"
6"	24"	12"
8"	24"	12"
10"	24"	12"
12"	24"	12"
14"	24"	12"
16"	24"	12"

DOUBLE R.O.W.



PIPE DIA.	TAPE WIDTH	"A"
20"	24"	25"
24"	24"	25"
30"	24"	25"
34"	24"	25"
36"	24"	25"
42"	24"	26"
48"	24"	36"

NOTES:

1. PIPELINE MARKING TAPE SHALL BE INSTALLED AT OPEN CUT ROAD AND IN-GROUND UTILITY CROSSINGS AND AT ALL CLASS 2, 3 & 4 LOCATIONS, OR AS DIRECTED BY COMPANY.
2. TAPE IS TO BE INSTALLED 1 FOOT (1') BELOW GRADE EXCEPT IN AGRICULTURAL AREAS, WHERE IT SHALL BE LAID 1'-8" BELOW GRADE. FOR CONVENIENCE, TAPE CAN BE INSTALLED LEVEL AT ROAD CROSSINGS, 1 FOOT (1') BELOW ROAD DITCHES.
3. TAPE IS TO BE INSTALLED ACROSS AND 15 FEET (15') UPSTREAM AND DOWNSTREAM OR ROAD OR UTILITY RIGHT'S-OF-WAY, INCLUDING EXPOSED PORTION OF BORED CROSSINGS.
4. TAPE IS TO BE INSTALLED 15 FEET (15') UPSTREAM AND DOWNSTREAM OF UTILITY CROSSING IF NO RIGHT-OF-WAY EXISTS.
5. TOP OF BACKFILL SHALL BE AS LEVEL AS POSSIBLE PRIOR TO INSTALLATION OF TAPE.
6. GAP BETWEEN ADJACENT TAPES SHALL BE 2".

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PIPELINE MARKING TAPE INSTALLATION

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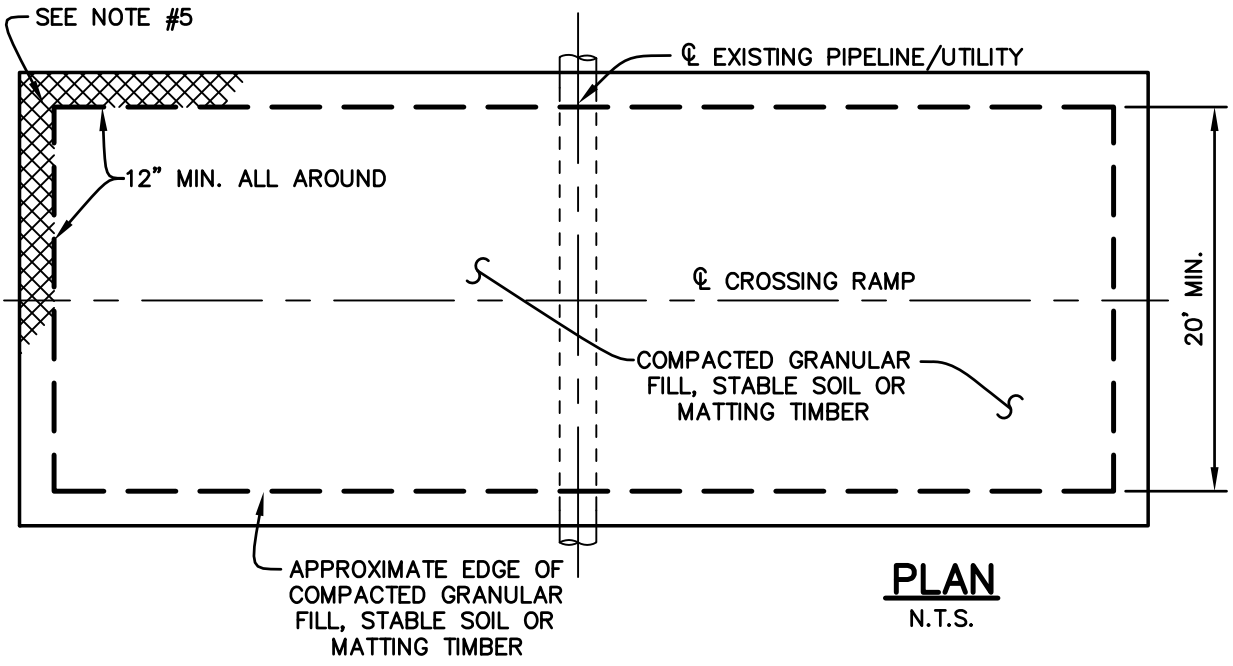

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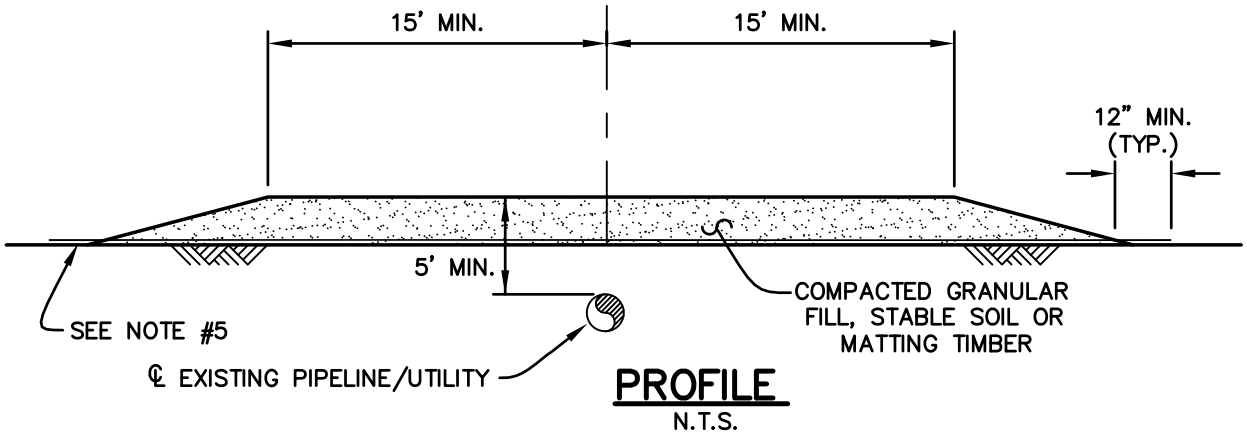

PROFILE
N.T.S.

NOTES:

1. CONTRACTOR TO NOTIFY EXISTING PIPELINE/UTILITY COMPANY PRIOR TO INSTALLATION OF CROSSING RAMP.
2. LENGTH OF RAMP TO VARY IN ACCORDANCE WITH CROSSING ANGLE. MINIMUM CROSSING ANGLE TO BE 45 DEGREES.
3. VEHICLES OR EQUIPMENT USING CROSSINGS SHALL PROCEED SLOWLY & WITH CAUTION TO MINIMIZE IMPACT LOADING & REDUCTION ON DEPTH OF COVER OVER PIPELINE/UTILITY.
4. ON COMPLETION OF CONSTRUCTION, CONTRACTOR TO REMOVE COMPLETE RAMP & RESTORE AREA TO THE SATISFACTION OF THE EXISTING PIPELINE/UTILITY COMPANY & THE CLIENT INSPECTOR.
5. GEOTEXTILE FABRIC (& GEOTEXTILE GRID WHERE REQUIRED) SHALL BE INSTALLED TO PROTECT NATIVE TOP SOIL AS DIRECTED BY THE CLIENT INSPECTOR WHEN IMPORTED GRANULAR FILL, NATIVE SUBSOIL FILL OR MATTING TIMBER MATERIAL IS UTILIZED. IMPORTED GRANULAR FILL MATERIAL OR NATIVE SUBSOIL FILL MATERIAL TO BE REMOVED & DISPOSED OF AS DIRECTED BY THE CLIENT INSPECTOR.

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DAPL/ETCOP

TYPICAL TEMPORARY CROSSING RAMP OVER EXISTING PIPELINE/UTILITY

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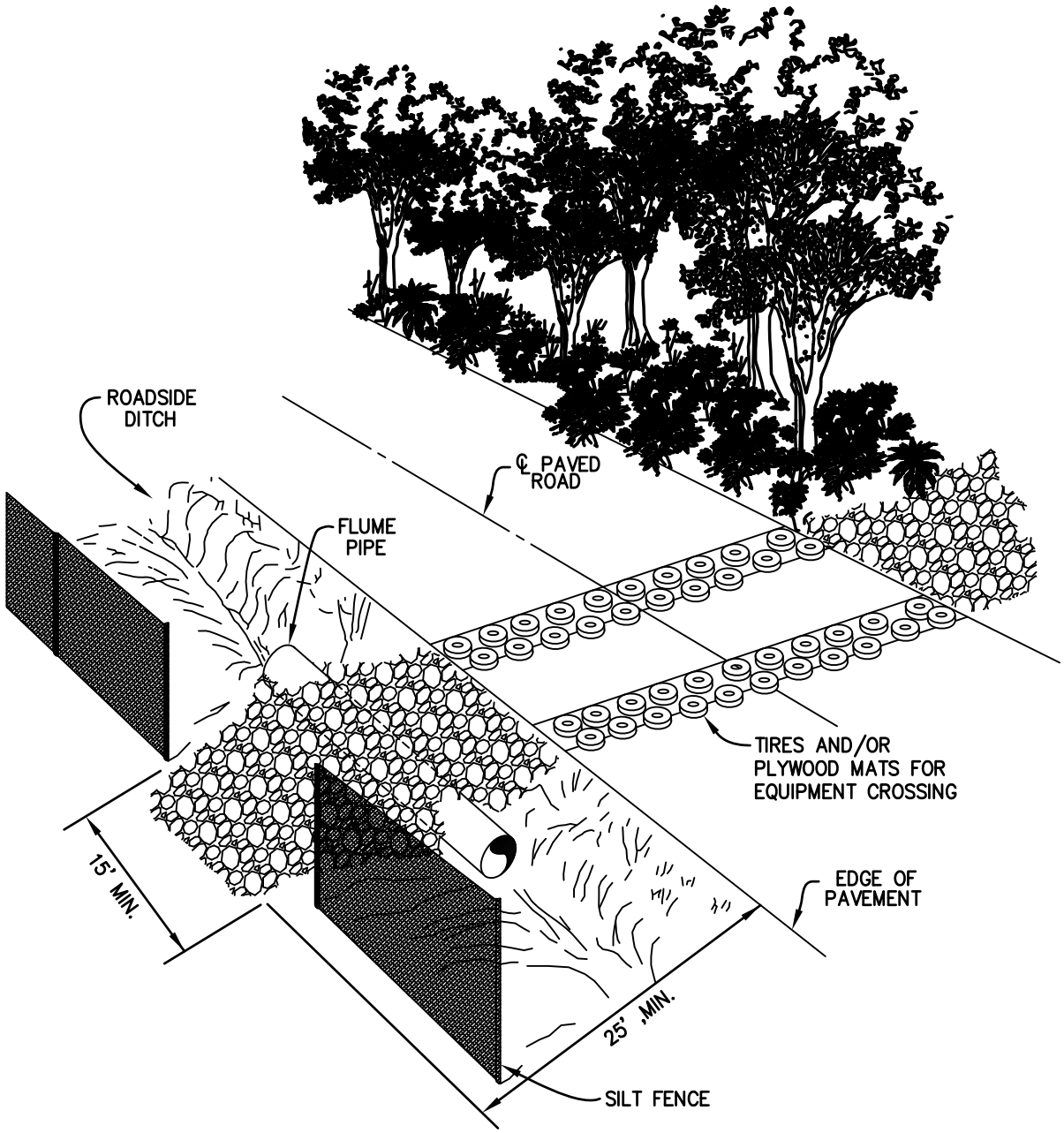
TYPICAL PAVED ROAD CROSSING CONTROL DETAILS



NOTES:

CRUSHED STONE RAMP (WITH FABRIC MAT IN AGRICULTURAL AREAS) TO CONSTRUCTED FOR ENTRANCE AND EXIT OF VEHICLES AND EQUIPMENT.

ALL VEHICLES SHALL TRAVEL ON ACCESS RAMP WHEN ENTERING OR EXITING THE RIGHT-OF-WAY.

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DAPL/ETCOP

TYPICAL PAVED ROAD CROSSING CONTROL DETAILS

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CHECKED BY: DAH	DATE: 08/07/14	P12-25	A
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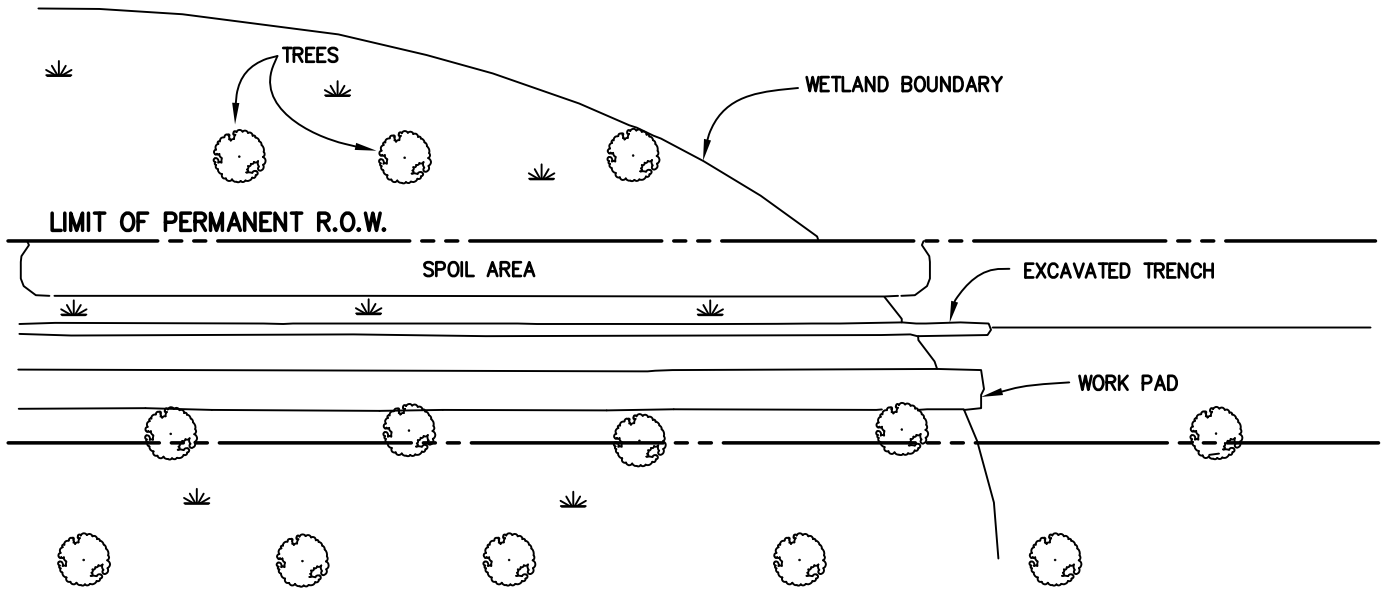

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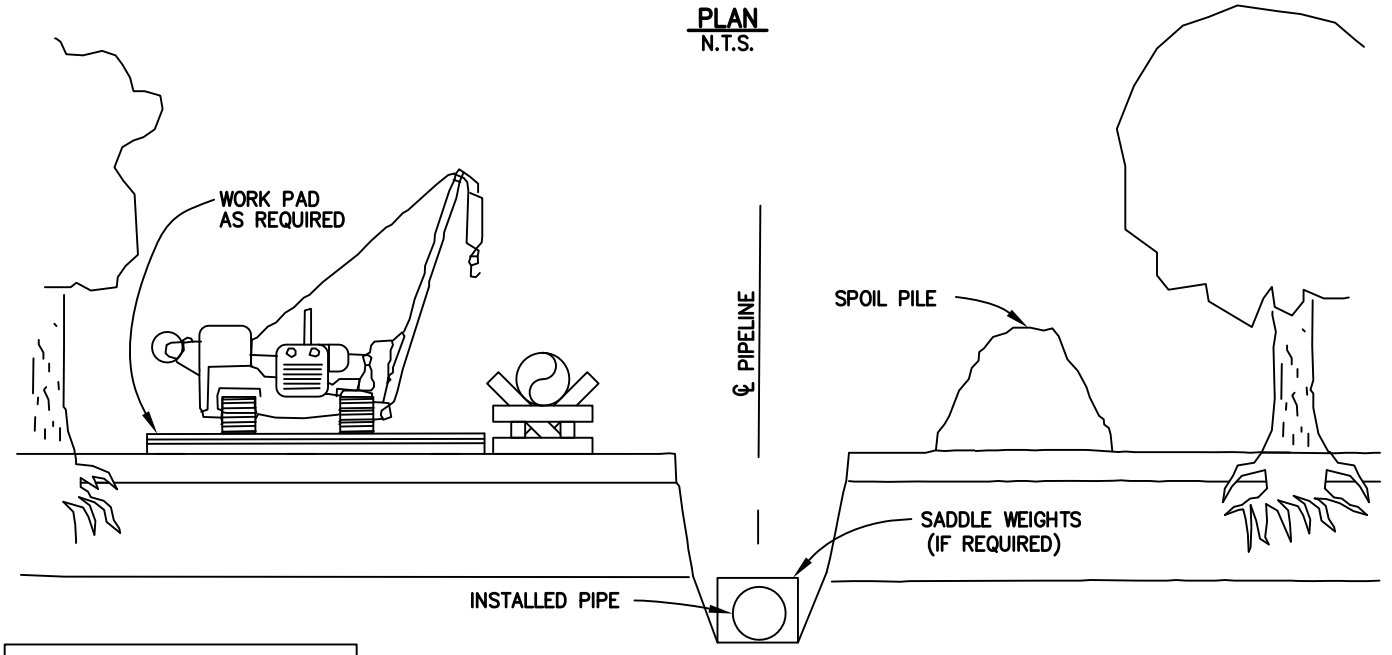

CROSS SECTION THROUGH RIGHT-OF-WAY

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NOTES

1. WORK PAD AND / OR EQUIPMENT MATS TO BE INSTALLED AS REQUIRED.
2. STUMPS TO BE REMOVED FROM WORKING RIGHT-OF-WAY.

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PROJECT NO. 10395700

DAPL/ETCOP

FORESTED WETLAND

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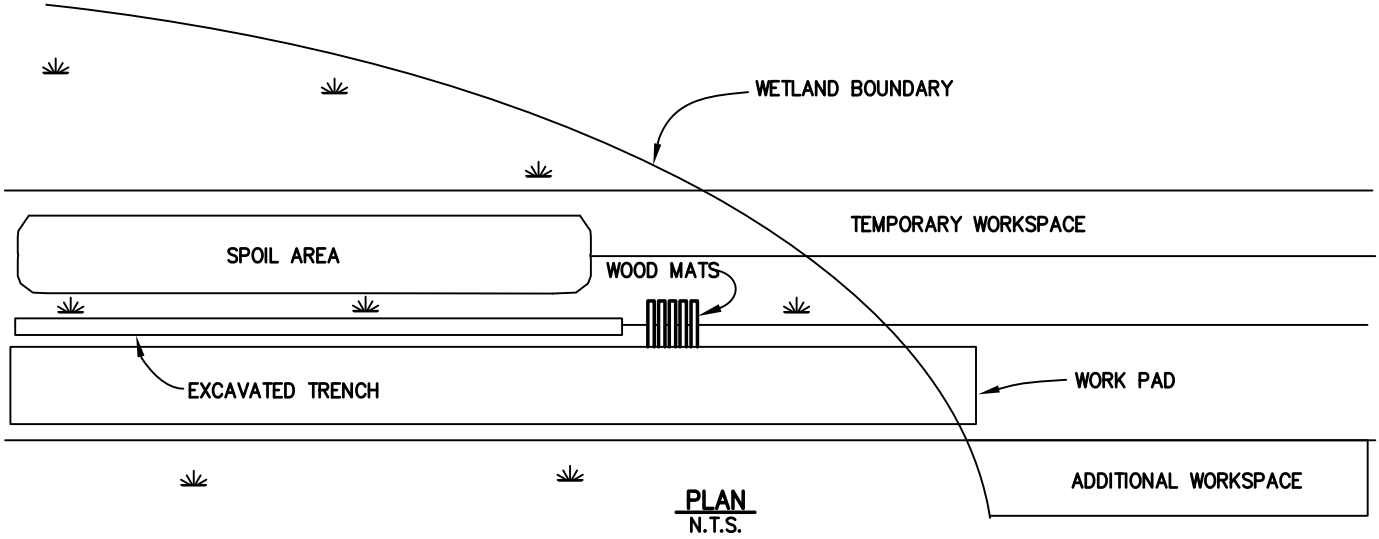

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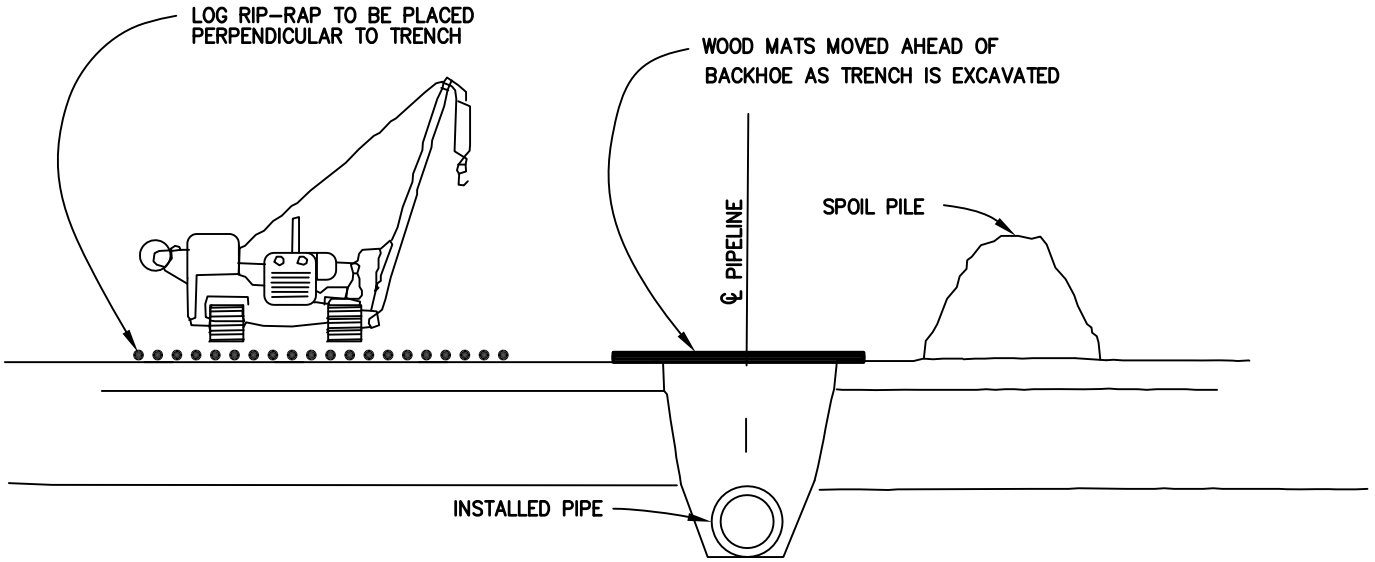

CROSS SECTION THROUGH RIGHT-OF-WAY

NOTES

1. WORK PAD OF RIP-RAP CONSTRUCTED FOR ACCESS OF TRACKED EQUIPMENT ONLY.
2. PIPE SECTION TO BE FABRICATED IN WORK AREA AND CARRIED INTO WETLAND.
3. ACCESS FOR VEHICLES AROUND WETLAND.
4. TRENCH TO BE EXCAVATED BY BACKHOE POSITIONED ON WOOD MATS.

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PROJECT NO. 10395700

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SATURATED WETLAND

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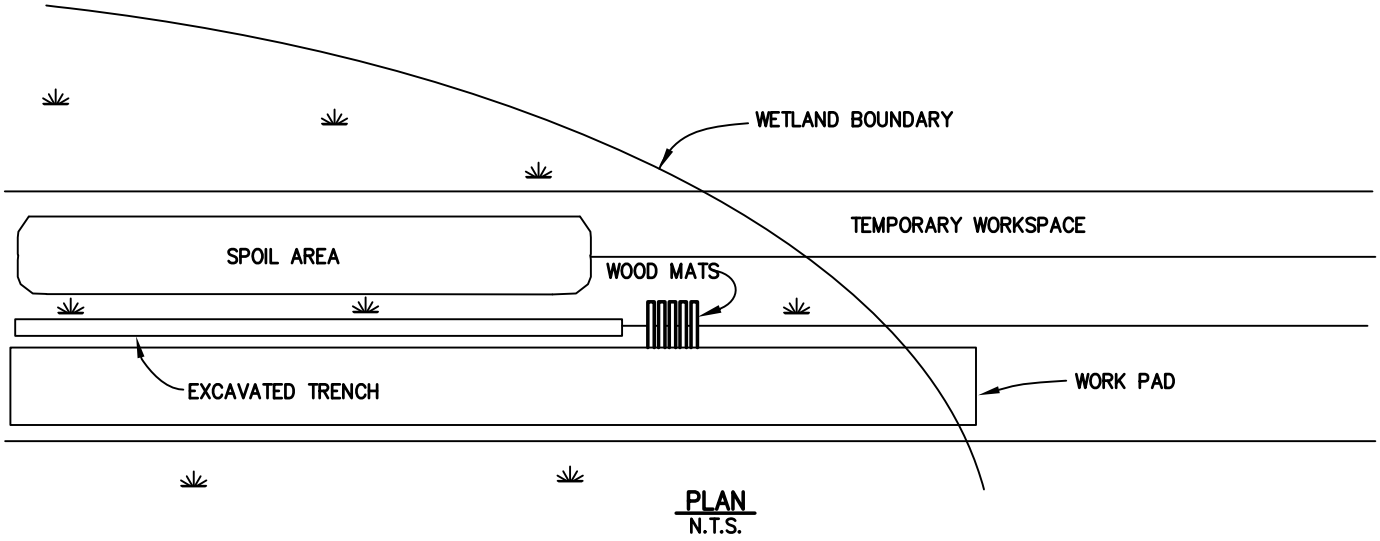

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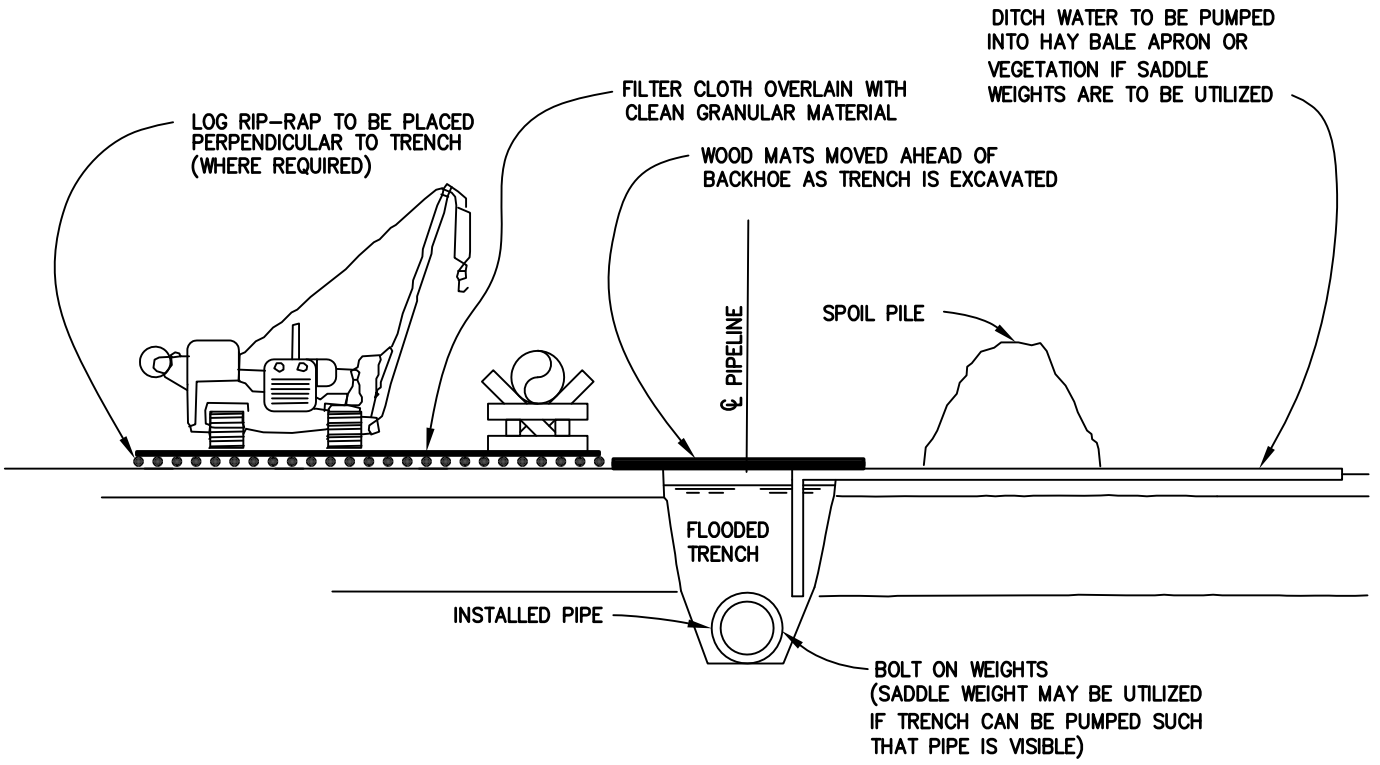

CROSS SECTION THROUGH RIGHT-OF-WAY

NOTES

1. WORK PAD OF LOG RIP-RAP AND / OR FILTER CLOTH WITH GRANULAR MATERIAL TO BE CONSTRUCTED FOR ACCESS FOR ALL EQUIPMENT.
2. TRENCH TO BE EXCAVATED BY BACKHOE POSITIONED ON WOOD MATS.
3. PIPE TO BE FABRICATED ON WORK PAD WITHIN WETLAND.

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SATURATED WETLAND

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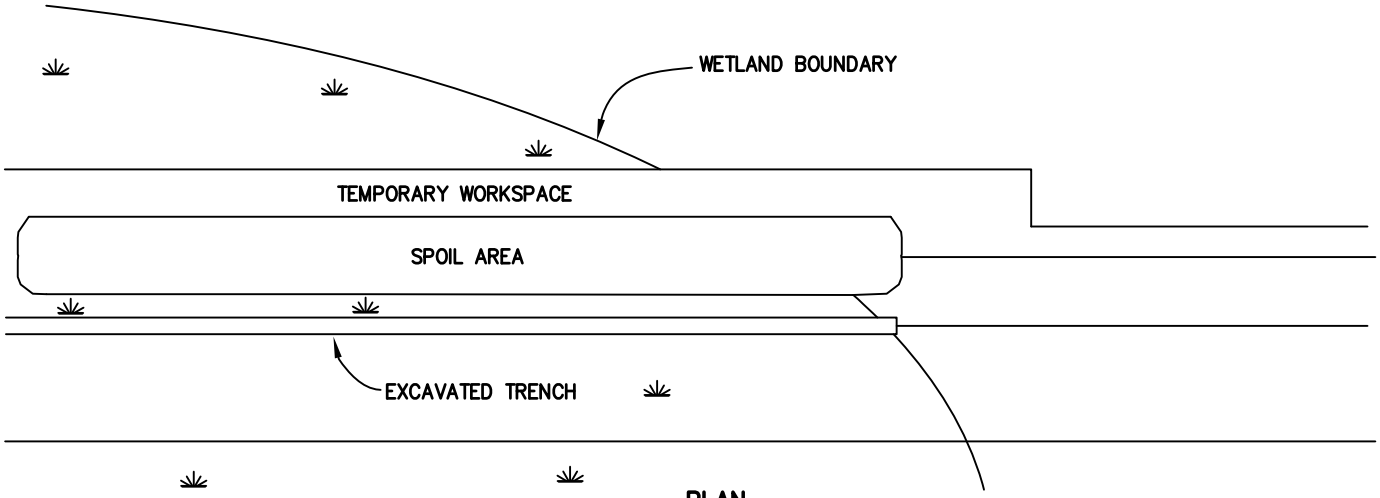

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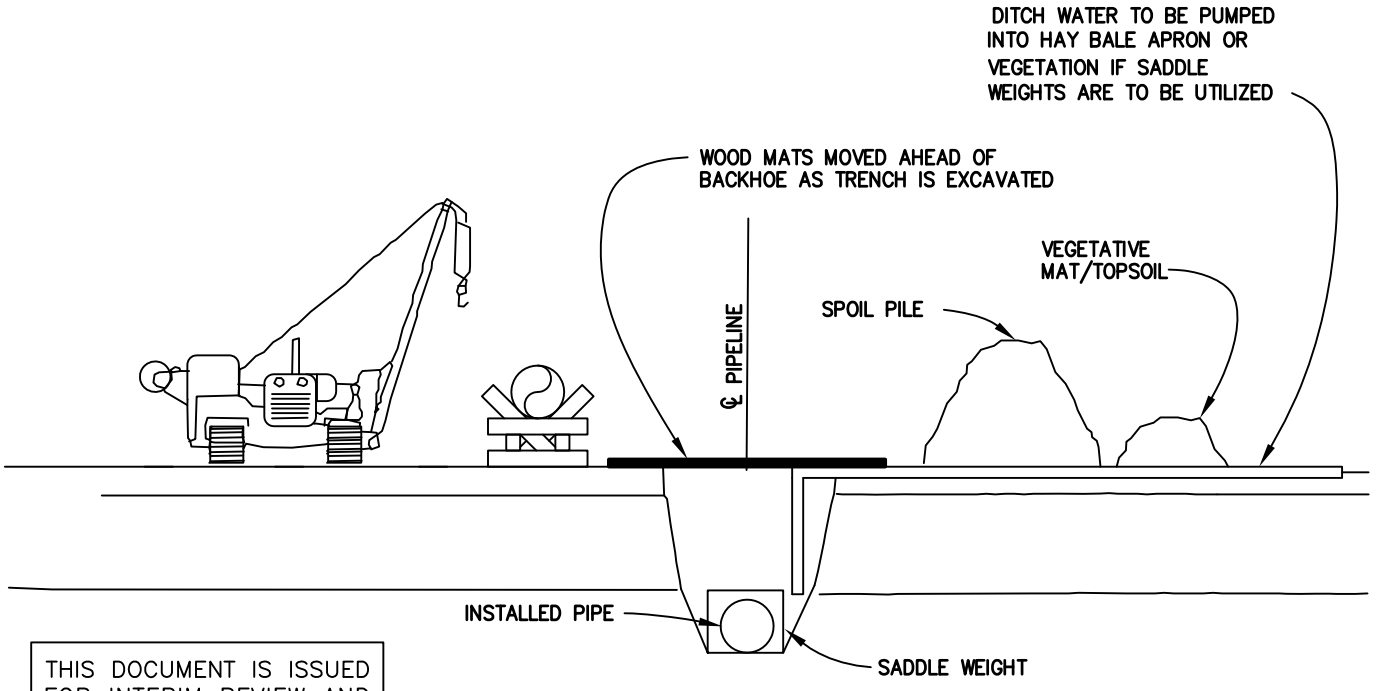

CROSS SECTION THROUGH RIGHT-OF-WAY

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NOTES

1. NO-WORK PAD NECESSARY. ACCESS FOR ALL EQUIPMENT AND VEHICLES THROUGH WETLANDS.
2. PIPE SECTION FABRICATED WITHIN WETLAND.
3. TOPSOIL/VEGETATIVE MAT STRIPPED INTO SPOIL PILE AND IN VICINITY OF TRENCH.

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NON-SATURATED WETLAND

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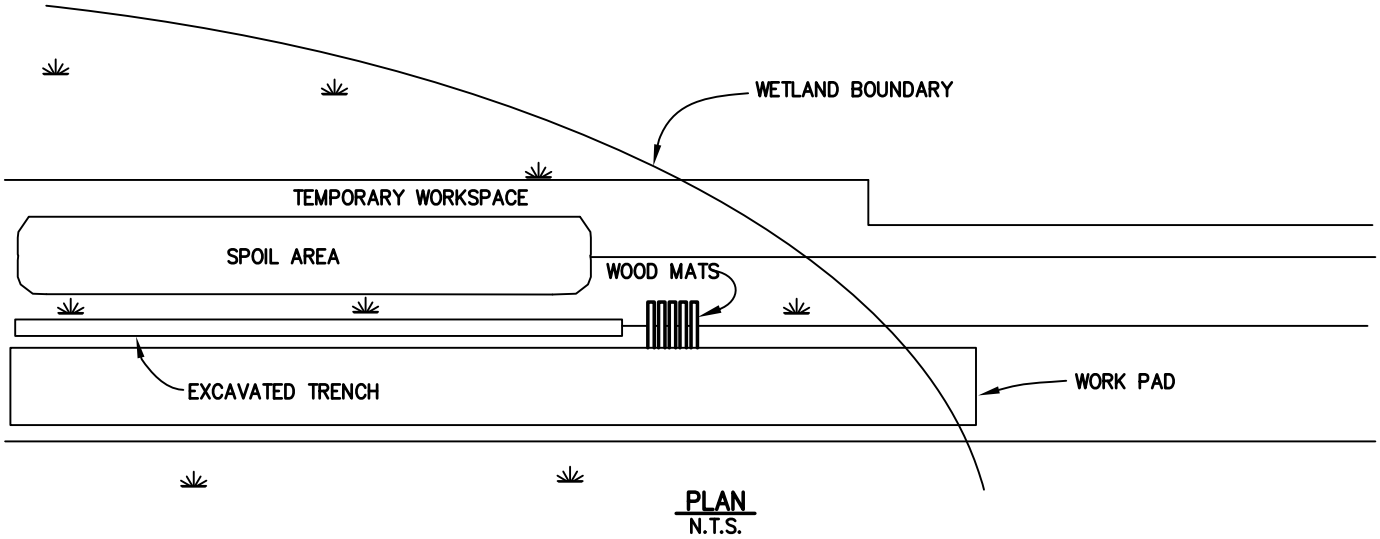

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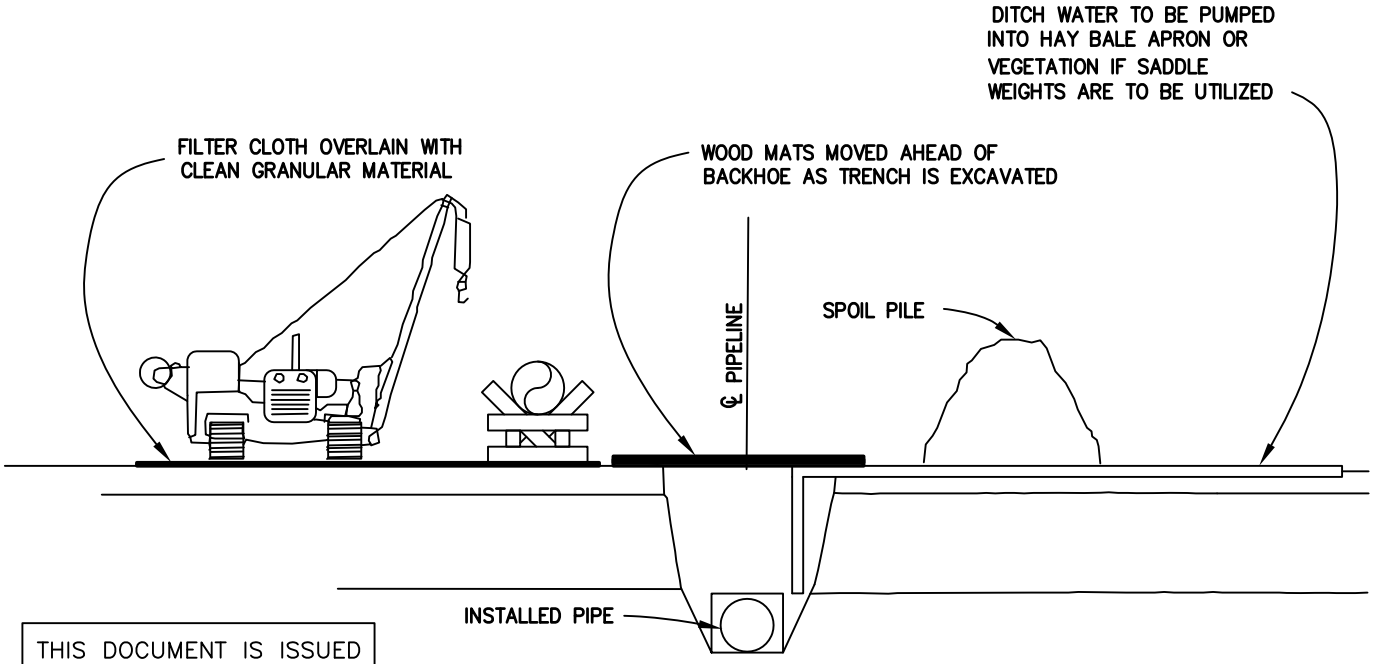

CROSS SECTION THROUGH RIGHT-OF-WAY

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NOTES

1. WORK PAD OF FILTER CLOTH WITH GRANULAR MATERIAL TO BE CONSTRUCTED FOR ACCESS OF ALL EQUIPMENT AND VEHICLES.
2. PIPE TO BE FABRICATED ON WORK PAD WITHIN WETLAND.
3. TRENCH TO BE EXCAVATED BY BACKHOE POSITIONED ON WOOD MATS.

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NON-SATURATED WETLAND

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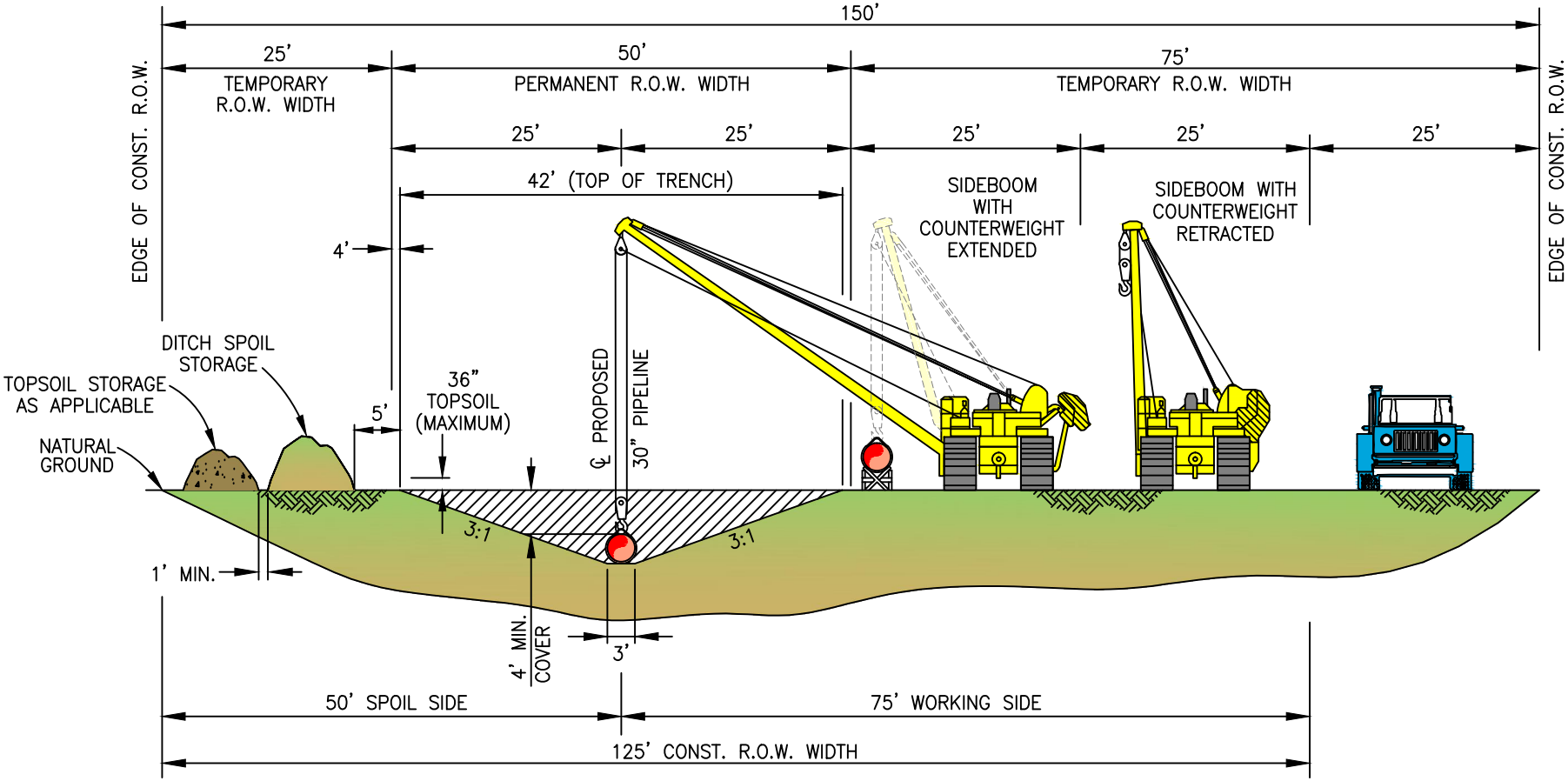

NOTE:
DEPTH OF TOPSOIL STRIPPING IS A MINIMUM OF 12 INCHES.

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CONSTRUCTION RIGHT-OF-WAY ARRANGEMENT

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