

Construction Survey

Clearing and Grading

Trenching (Rock Free)

Blasting

Trenching (Rock)

Padding Trench Bottom

Stringing

Bending

Pipe Assembly and Welding

X-Ray and Weld Repair

Coating Field Welds

Inspection and Repair of Coating

Lowering in and Tie-ins

As-Built Survey

Pad and Backfill

Hydrostatic Test and Final Tie-in

Cleanup and Restoration

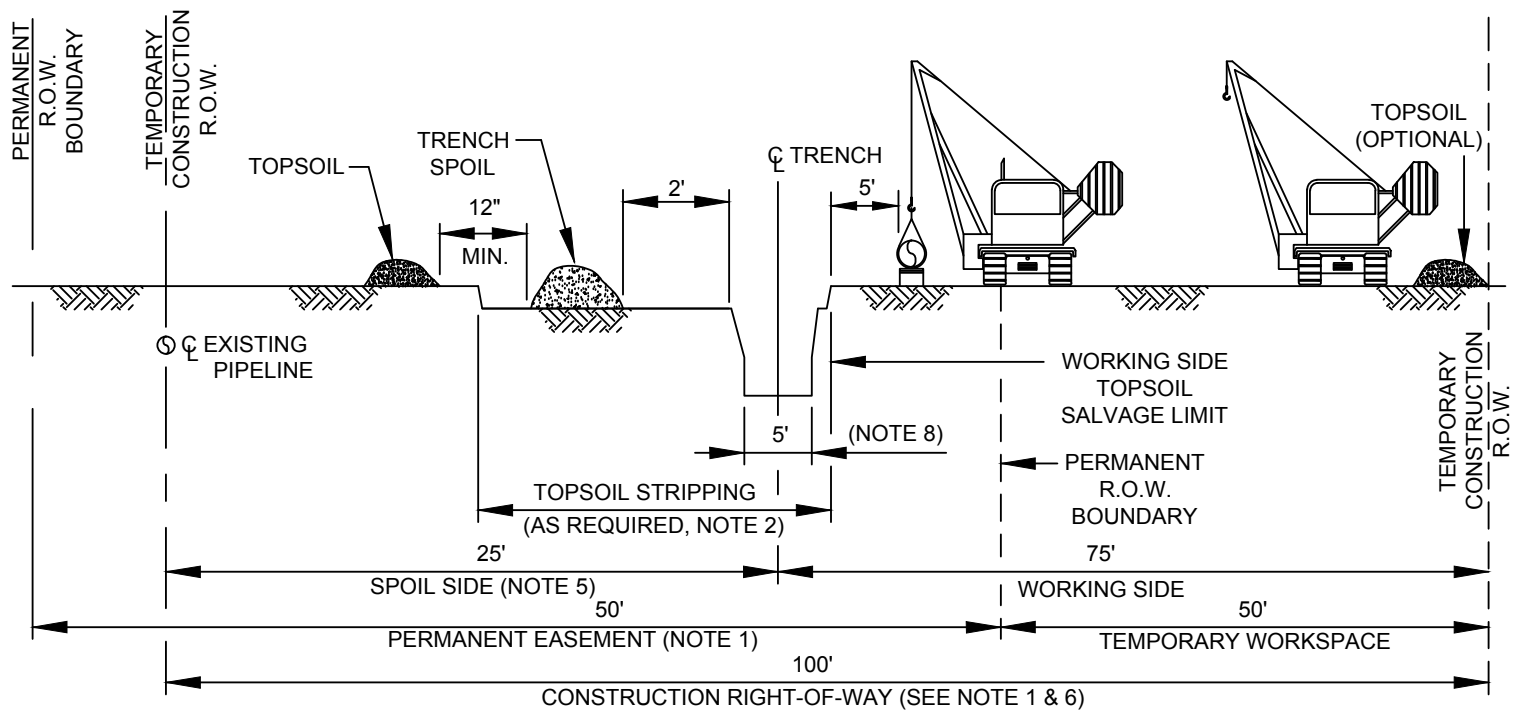
DESIGNED IN ACCORDANCE WITH TITLE 48 PART 132 OF MINIMUM FEDERAL SAFETY STANDARDS AND OPTIC GUIDE FOR GAS TRANSMISSION AND DISTRIBUTION PIPING SYSTEMS, LATEST EDITION.

PREPARED BY:  
**ENEngineering**  
 28100 TORCH PARKWAY  
 WARRENVILLE, IL 60555  
 TEL. 630-353-4089  
 FAX 630-353-7777  
 WWW.ENENGINEERING.COM

REV. LEVEL	DATE	BY	DESCRIPTION	CHK.	APP.
A	04/17/15	KBW	ISSUED FOR PERMIT	DK	JM
REVISIONS					



<b>NST EXPRESS PIPELINE</b>					
<b>PIPELINE CONSTRUCTION SEQUENCE</b>					
MCKENZIE COUNTY					
DATE	PILOT DATE	DRAWN BY	CHECK NO.	ISSUING NUMBER	NORTH DAKOTA
04/13/15	-	KBW	-	CS	REV. A



PROFILE  
NOT TO SCALE

**NOTES:**

1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 100' WIDE CONSISTING OF 50' OF PERMANENT EASEMENT AND 50' OF TEMPORARY WORKSPACE. EXTRA TEMPORARY WORKSPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL, RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES, AS REQUIRED. CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.
2. THIS DRAWING REFLECTS "TRENCH AND SPOIL SIDE" TOPSOIL STRIPPING PROCEDURE. SALVAGE TOPSOIL OVER TRENCH AND UNDER THE SPOIL PILE AT LOCATIONS IDENTIFIED ON THE CONSTRUCTION ALIGNMENT SHEETS, OR AS DIRECTED BY THE COMPANY INSPECTOR. DEPTH OF TOPSOIL STRIPPING IS NOT TO EXCEED 12".
3. STOCKPILE TOPSOIL AS SHOWN OR IN ANY CONFIGURATION APPROVED BY THE COMPANY INSPECTOR. KEEP TOPSOIL AND SPOIL PILES CLEAN OF ALL CONSTRUCTION DEBRIS. MAINTAIN A MINIMUM OF 12" OF SEPARATION BETWEEN TOPSOIL AND TRENCH SPOIL PILES.
4. 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. AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING TOPSOIL AND SPOIL PILES.
5. THE OFFSET FROM EXISTING PIPELINE, WHERE APPLICABLE, WILL BE 25', BUT MAY BE INCREASED OR DECREASED DEPENDING ON THE SITE SPECIFIC CONSTRUCTION REQUIREMENTS.
6. TEMPORARILY SUSPEND TOPSOIL HANDLING OPERATIONS DURING EXCESSIVELY WINDY CONDITIONS UNTIL MITIGATIVE MEASURES TO MINIMIZE WIND EROSION CAN BE IMPLEMENTED.
7. BOTTOM OF TRENCH WIDTH WILL BE AN AVERAGE OF 5' (TYPICAL) HOWEVER, UNDER CERTAIN CIRCUMSTANCES, THE TRENCH MAY BE A MAXIMUM OF 10' WIDE.
8. TOPSOIL AND TRENCH SPOIL RELATIVE POSITIONS CAN, AS DIRECTED BY THE COMPANY INSPECTOR, BE REVERSED.

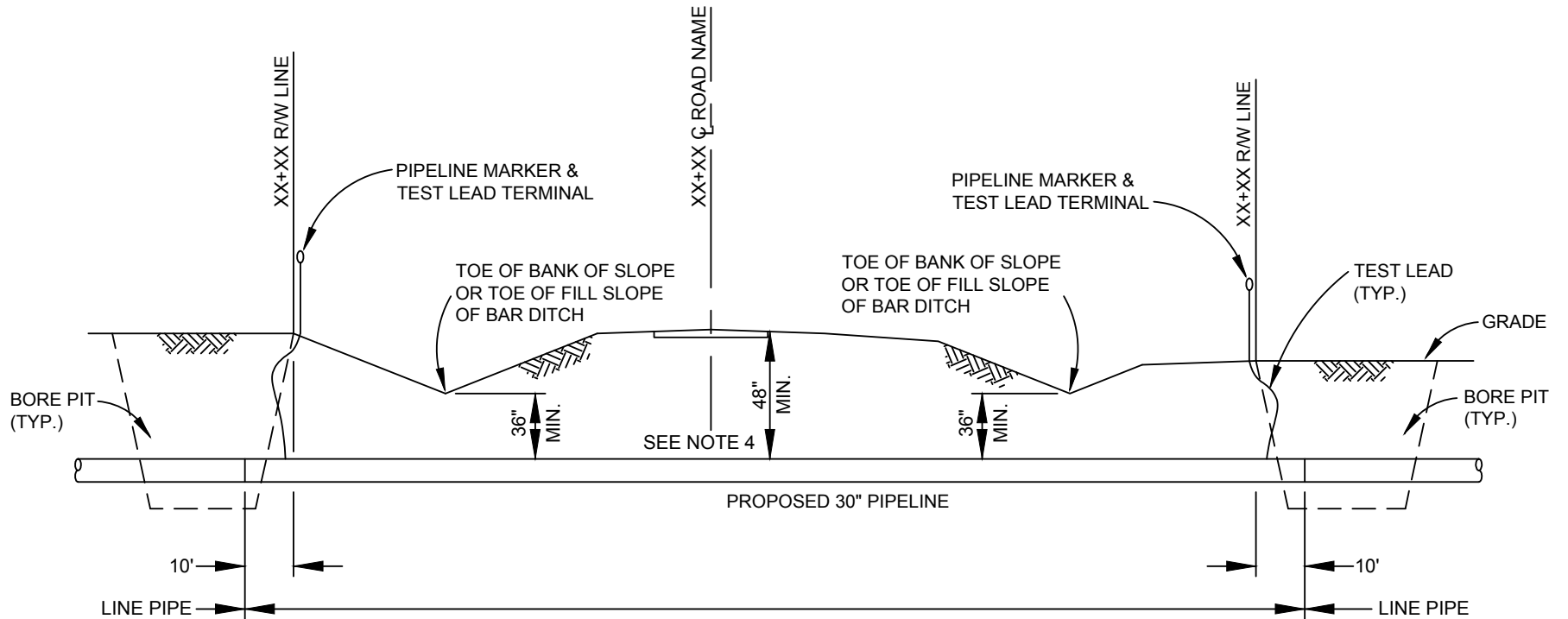
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PREPARED BY:  
**enEngineering**  
28100 TORCH PARKWAY  
WARRENVILLE, IL 60555  
TEL. 630-353-4000  
FAX 630-353-7777  
WWW.ENENGINEERING.COM

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A	04/17/15	KBW	ISSUED FOR PERMIT	DK	JN
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<b>NST EXPRESS PIPELINE</b>					
<b>TOPSOIL SALVAGE TRENCH AND SPOIL SIDE</b>					
DATE		REV. DATE		DRAWING NUMBER	
04/13/15	-	KBW	-	R3A	
MCKENZIE COUNTY					NORTH DAKOTA
SHEET NO.					REV.
					A



**IMPROVED UNCASSED ROAD - CROSSING BORING METHOD**

**NOTES:**

1. DESIGN FACTOR: IN ACCORDANCE WITH ALIGNMENT SHEETS
2. 100% X-RAY INSPECT ALL WELDS ON CARRIER PIPE IN ACCORDANCE WITH API STANDARD 1104 AND CONTRACT DOCUMENTS.
3. CONTRACTOR TO SLICK BORE CARRIER PIPE WITH A PROCEDURE SUBMITTED BY CONTRACTOR AND APPROVED BY THE COMPANY.
4. MINIMUM DEPTH OF COVER UNDER ROAD TO TOP OF PIPE SHALL BE 4'-0" OR SHALL CONFORM TO THE ROAD CROSSING PERMIT, WHICHEVER IS GREATER. ROAD CROSSING PIPE TO EXTEND 10' BEYOND ON EITHER SIDED OF DESIGNATED ROAD RIGHT-OF-WAY.
5. CATHODIC TEST STATION TO BE INSTALLED (IF REQUIRED), SEE CST-P-1085-B030.
6. PIPELINE MARKER TO BE INSTALLED PER DRAWING STD-P-0100-A200 AND STD-P-0100-A205.
7. PIPELINE MARKER & TEST STATIONS TO BE INSTALLED ON ROW LINE NEXT TO FENCE IF POSSIBLE.
8. CARRIER PIPE IS TO BE COATED WITH APPROVED EXTERNAL PROTECTIVE COATING, SEE ENGINEERING SECTION #M8380.
9. CROSSING TO BE AS NEAR TO 90° TO THE CENTERLINE OF ROADWAY AS PRACTICAL.
10. CONTRACTOR TO COMPLY TO THE SPECIFICATION REQUIREMENTS.

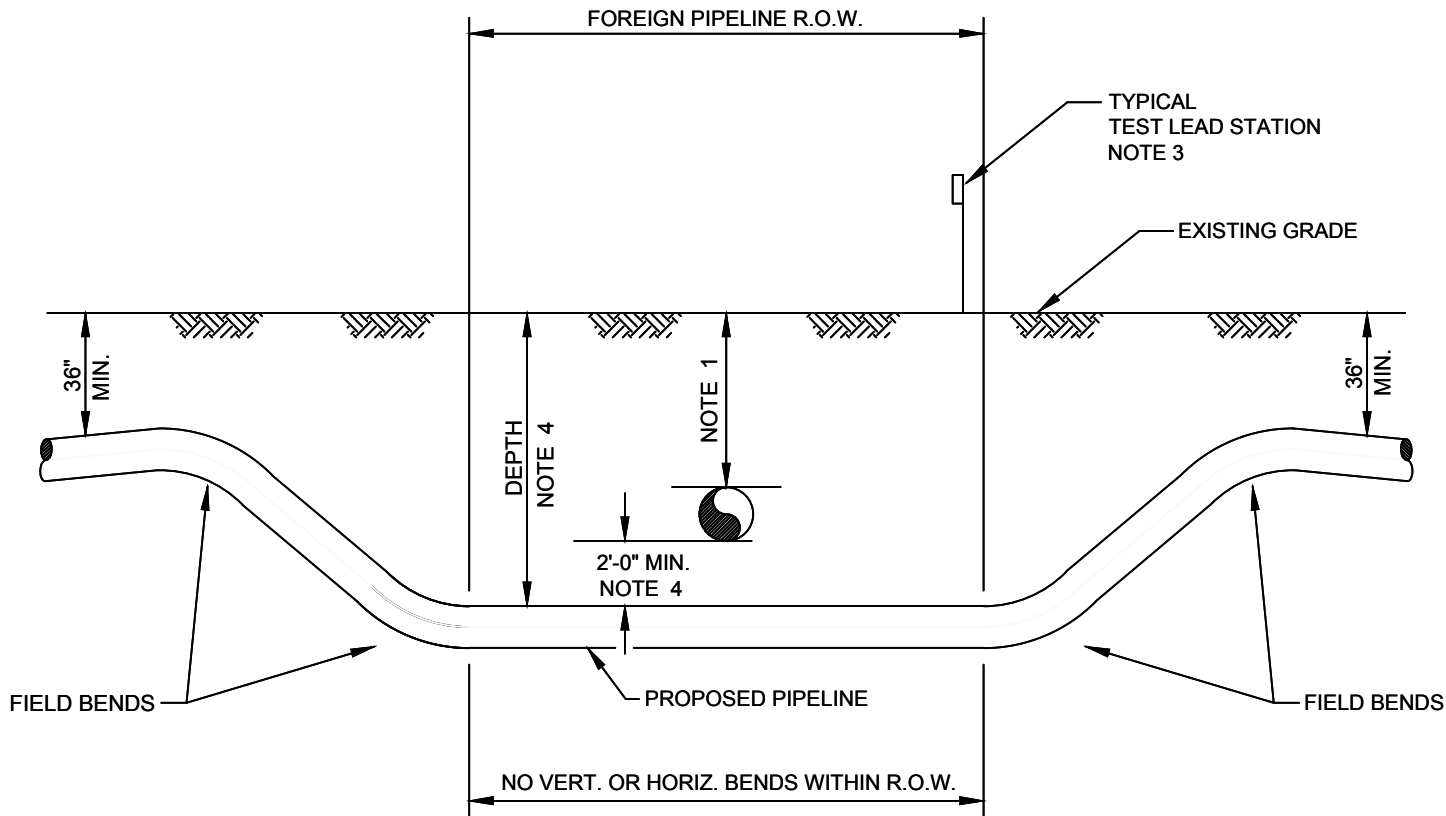
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 28100 TORCH PARKWAY  
 WARRENVILLE, IL 60555  
 TEL. 630-353-4089  
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 WWW.ENENGINEERING.COM

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<b>REVISIONS</b>					



<b>NST EXPRESS PIPELINE</b>					
<b>BORED ROAD CROSSING</b>					
MCKENZIE COUNTY					
DATE	PILOT DATE	DRAWN BY	COC. NO.	ISSUING NUMBER	NORTH DAKOTA
04/13/15	-	KBW	-	BRC	REV: A



CROSS SECTION OF FOREIGN P/L R.O.W.

**NOTES:**

1. FOREIGN PIPELINE LOCATIONS & DEPTHS TO BE DETERMINED BY ELECTRONIC MEANS IN ADVANCE OF PIPELINE CONSTRUCTION AND CONFIRMED BY CAREFULLY EXPOSING BY HAND DIGGING WITHIN 24" IN ANY DIRECTION FROM THE PIPELINE.
2. OWNER OF FOREIGN PIPELINE(S) SHALL BE NOTIFIED A MINIMUM OF 48 HOURS IN ADVANCE OF EXCAVATION OF CROSSING.
3. TEST LEAD STATION TO BE INSTALLED WHERE PRACTICAL AT THE NEAREST FENCE, HEDGE ROW OR FIELD EDGE, AND WHERE READILY ACCESSIBLE. INSTALL COMPANY-SUPPLIED PERMANENT REFERENCE CELL AND EXTEND CELL LEAD TO TEST LEAD STATION.
4. DEPTH OF PIPELINE INCLUDING 2'-0" MIN. CLEARANCE SHALL BE MAINTAINED FOR ALL FULL ANGULAR WIDTH OF FOREIGN PIPELINE R.O.W.
5. PROPOSED PIPELINE MAY CROSS ABOVE THE FOREIGN PIPELINE(S) ONLY WHERE REQUESTED BY OR APPROVED BY FOREIGN OWNER IN WRITING.

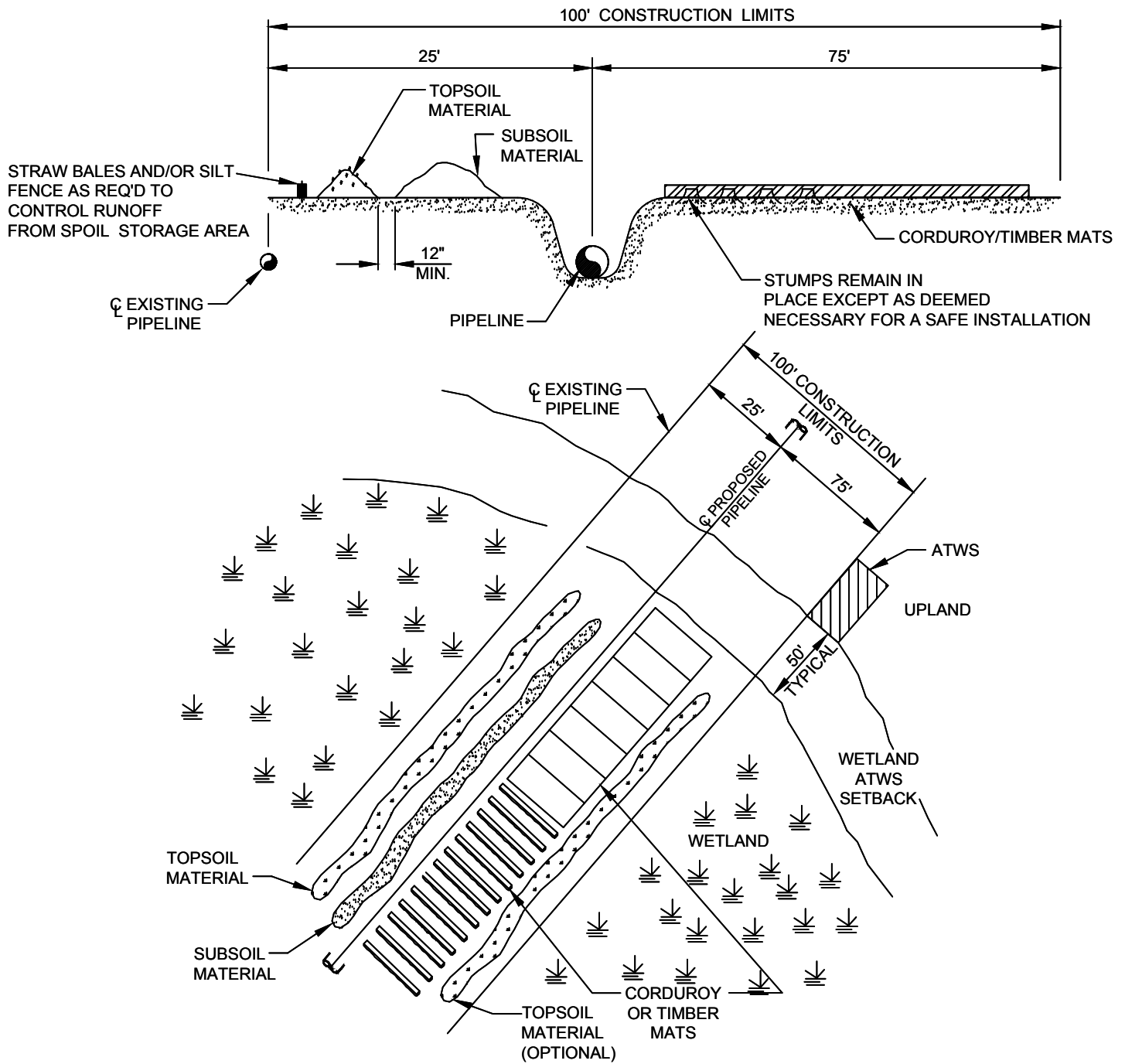
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**engineering**  
 28100 TORCH PARKWAY  
 WARRENVILLE, IL 60555  
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 WWW.ENGINEERING.COM

REV. LEVEL	DATE	BY	DESCRIPTION	CK.	APP.
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REVISIONS					



<b>NST EXPRESS PIPELINE</b>					
<b>FOREIGN PIPELINES CROSSING</b>					
MCKENZIE COUNTY		DRAWN BY		DRAWING NUMBER	
DATE	REV. DATE	BY	LOC. NO.	NO.	NO.
04/13/15	-	KBW	-	FPC	-
					SHEET NO. / REV. / A



**NOTES:**

1. SEGREGATE TOPSOIL FROM THE AREA DISTURBED BY TRENCHING, EXCEPT IN AREAS WHERE STANDING WATER IS PRESENT OR SOILS ARE SATURATED OR FROZEN.
2. RE-SEED WITH ANNUAL RYEGRASS @ 40 LBS/ACRE (NOT TO EXCEED 48 LBS/ACRE) IN ALL AREAS WITHOUT STANDING WATER UNLESS ALTERNATIVES HAVE BEEN APPROVED BY MANAGING AGENCY.
3. NO FERTILIZER OR LIME SHALL BE USED.
4. INSTALL TRENCH PLUGS & WATERBAR ON BOTH SIDES OF WETLAND IF THE HYDROLOGICAL CONDITIONS WOULD DRAIN THE WETLAND.
5. DO NOT USE LIQUID MULCH BINDERS WITHIN 100' OF WETLANDS OR WATERBODIES.
6. IT IS ACCEPTABLE FOR E&S BMPs TO BE TEMPORARILY REMOVED FROM EQUIPMENT CROSSING PATHWAYS DURING PERIODS OF ACTIVE CONSTRUCTION IF THESE CONTROLS WILL BE PROPERLY REINSTALLED AT THE END OF EACH WORK DAY.
7. WETLAND MATS WILL BE PERMANENTLY REMOVED AFTER CLEAN UP/RESTORATION
8. MATS WILL BE 12' WIDE AND LENGTH IS DEPENDENT ON THE WETLAND CROSSING LENGTH FROM START TO END.

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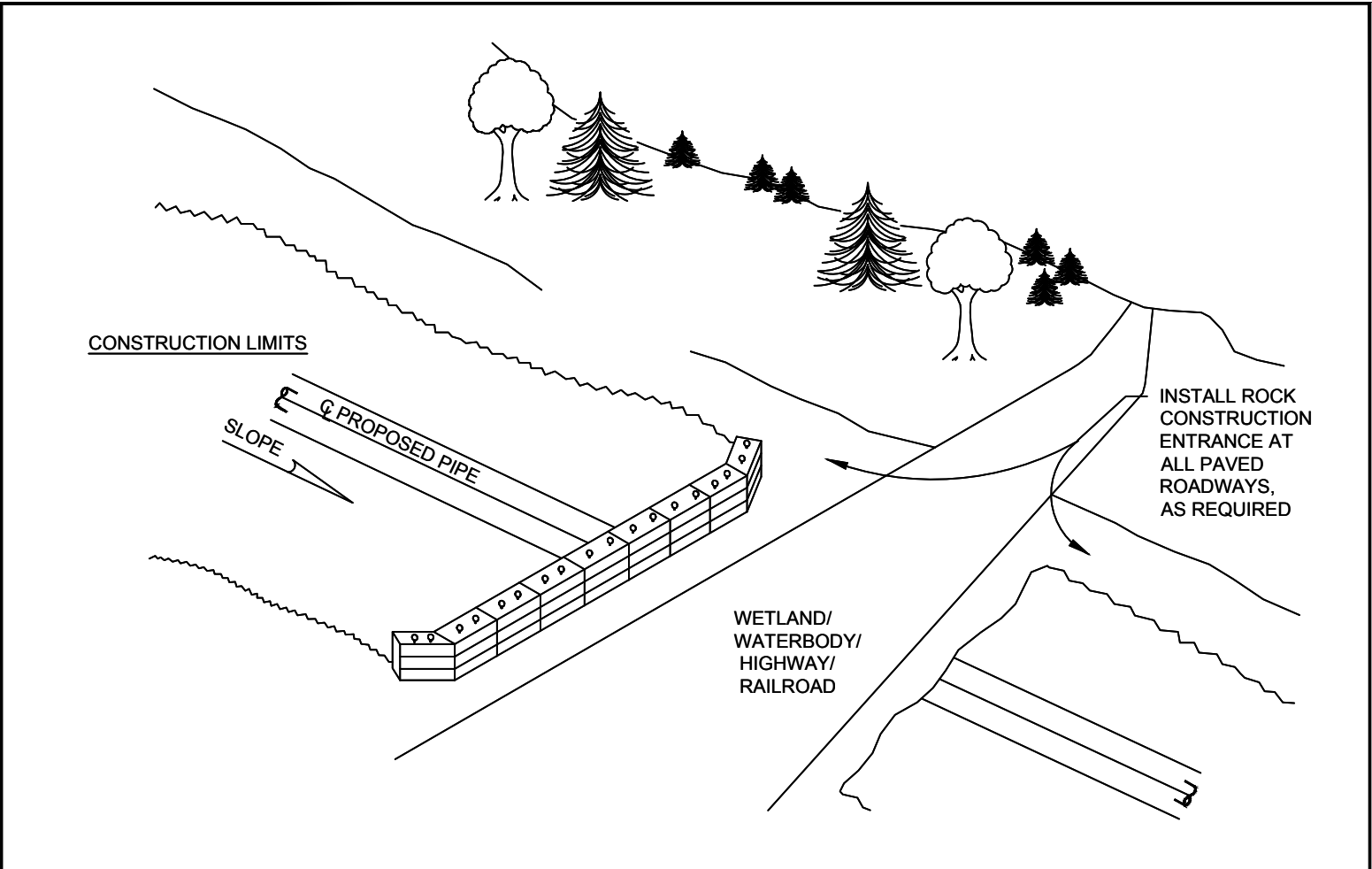
PREPARED BY:  
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 28100 TORCH PARKWAY  
 WARRENVILLE, IL 60555  
 TEL. 630-353-4000  
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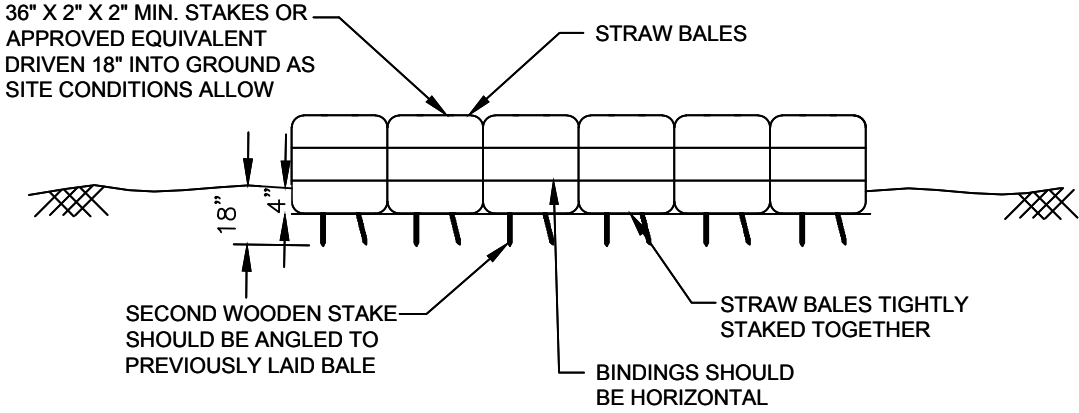


**NST EXPRESS PIPELINE**  
 TYPICAL  
 WETLAND CONSTRUCTION

MCKENZIE COUNTY	DATE	REV. DATE	BY	CHK. NO.	DRAWING NUMBER	SHEET NO.	REV.	NORTH DAKOTA
	04/13/15	-	KBW	-	WW2A	-	A	



**FRONT VIEW**



**NOTES:**

1. STRAW BALES TO BE EMBEDDED 4" MIN. INTO GROUND AS SITE CONDITIONS ALLOW.
2. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATIONS REACH 1/3 THE ABOVE GROUNDS HEIGHT OF THE BARRIER.
3. STRAW BALES REMOVED FOR ACCESS PURPOSES DURING THE DAY MUST BE REINSTALLED AFTER THE CONSTRUCTION ACTIVITY HAS PASSED THROUGH OR BY THE END OF THE DAY.
4. STRAW BALES SHOULD NOT BE USED FOR PROJECTS LASTING MORE THAN 3 MONTHS.
5. STAKES TO BE DRIVEN FLUSH WITH THE TOP OF THE BALE. BOTH ENDS OF THE BARRIER TO BE EXTENDED AT LEAST 8' UP SLOPE AT 45 DEGREES TO MAIN BARRIER ALIGNMENT.
6. STRAW BALE BARRIERS THAT ARE UNDERMINED OR TOPPED SHALL BE REPLACED WITH A ROCK FILTER OUTLET.
7. BALES WILL BE REMOVED WHEN PERMANENT STABILIZATION IS ACHIEVED.
8. COMPACTED BACKFILL WILL BE PLACED ON DISTURBED SIDE.

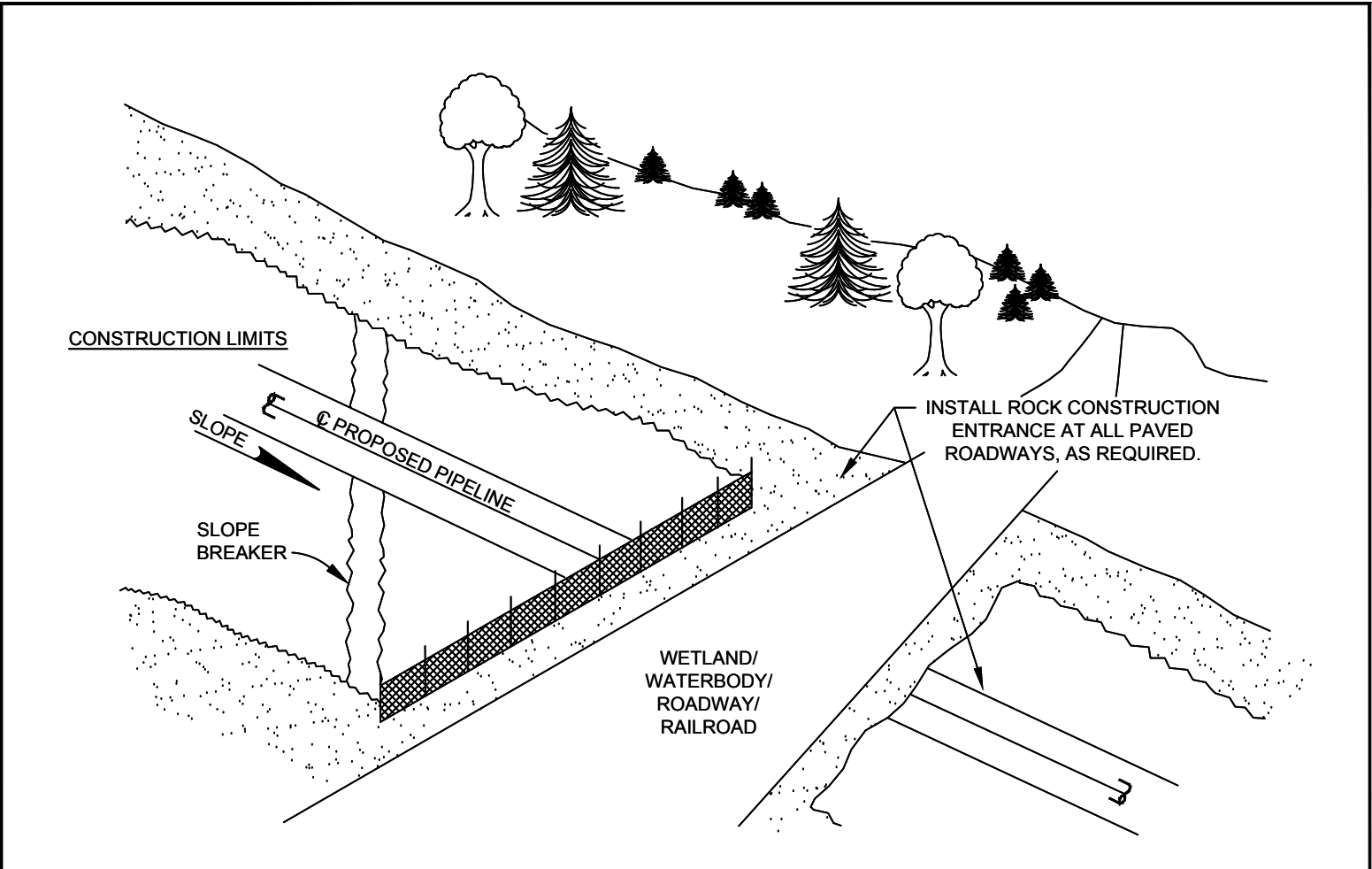
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 TEL. 630-353-4000  
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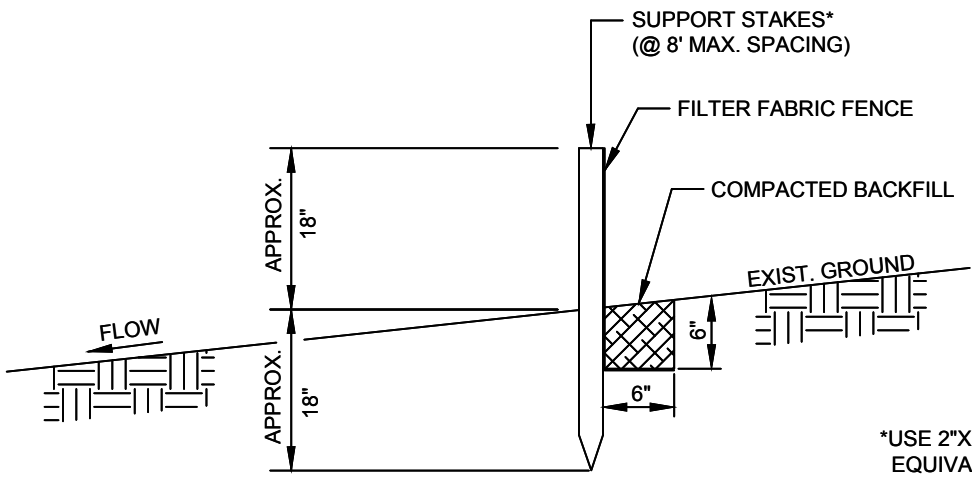
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<b>NST EXPRESS PIPELINE</b>					
TYPICAL STRAW BALE INSTALLATION					
MCKENZIE COUNTY	DATE	REV. DATE	DRAWN BY	LOC. NO.	DRAWING NUMBER
	04/14/15	-	KBW	-	ST1
NORTH DAKOTA	SHEET NO.	REV.			
	-	A			



**NOTES:**



\*USE 2"X2" WOOD OR EQUIVALENT STEEL STAKES

PERMANENT STABILIZATION IS DEFINED AS MINIMUM, UNIFORM, PERENNIAL 70% VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED EROSION.

DESIGNED IN ACCORDANCE WITH TITLE 49 PART 192 OF MINIMUM FEDERAL SAFETY STANDARDS AND OPTIC GUIDE FOR GAS TRANSMISSION AND DISTRIBUTION PIPING SYSTEMS, LATEST EDITION.

PREPARED BY:  
**engineering**  
 28100 TORCH PARKWAY  
 WARRENVILLE, IL 60555  
 TEL. 630-353-4000  
 FAX 630-353-7777  
 WWW.ENENGINEERING.COM

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<b>NST EXPRESS PIPELINE</b>			
TYPICAL STANDARD 18" SILT FENCE INSTALLATION (SHEET 1 OF 2)			
MCKENZIE COUNTY	DATE	PROJ. DATE	BY
	04/14/15	-	KBW
DRAWING NUMBER	LOC. NO.	SHEET NO.	REV.
SF1		-	A

**NOTES:**

1. SILT FENCE MUST BE LEFT IN PLACE UNTIL PERMANENT STABILIZATION.
2. FILTER FABRIC FENCE MUST BE INSTALLED AT EXISTING LEVEL GRADE.
3. SEDIMENT MUST BE REMOVED WHERE ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
4. ANY SECTION OF SILT FENCE WHICH HAS BEEN UNDERMINED OR TOPPED MUST BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET.
5. AT A MINIMUM, THE FABRIC SHOULD HAVE THE FOLLOWING PROPERTIES:

FABRIC PROPERTY	MINIMUM ACCEPTABLE VALUE	TEST METHOD
GRAB TENSILE STRENGTH (lb)	120	ASTM D1682
ELONGATION AT FAILURE (%)	20% MAX.	ASTM D1682
MULLEN BURST STRENGTH (lb)	200	ASTM D3786
TRAPEZOIDAL TEAR STRENGTH (lb)	50	
PUNCTURE STRENGTH (lb)	40	ASTM D 751 (MODIFIED)
SLURRY FLOW RATE (gal/min/sf)	0.3	
EQUIVALENT OPENING SIZE	30	US STD. SIEVE CW-02215
ULTRAVIOLET RADIATION STABILITY (%)	80	ASTM G-26

6. SILT FENCE MUST BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER WILL BE EXTENDED 8' UPSLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT.

DESIGNED IN ACCORDANCE WITH TITLE 49 PART 192 OF MINIMUM FEDERAL SAFETY STANDARDS AND OPTIC GUIDE FOR GAS TRANSMISSION AND DISTRIBUTION PIPING SYSTEMS, LATEST EDITION.

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 WARRENVILLE, IL 60555  
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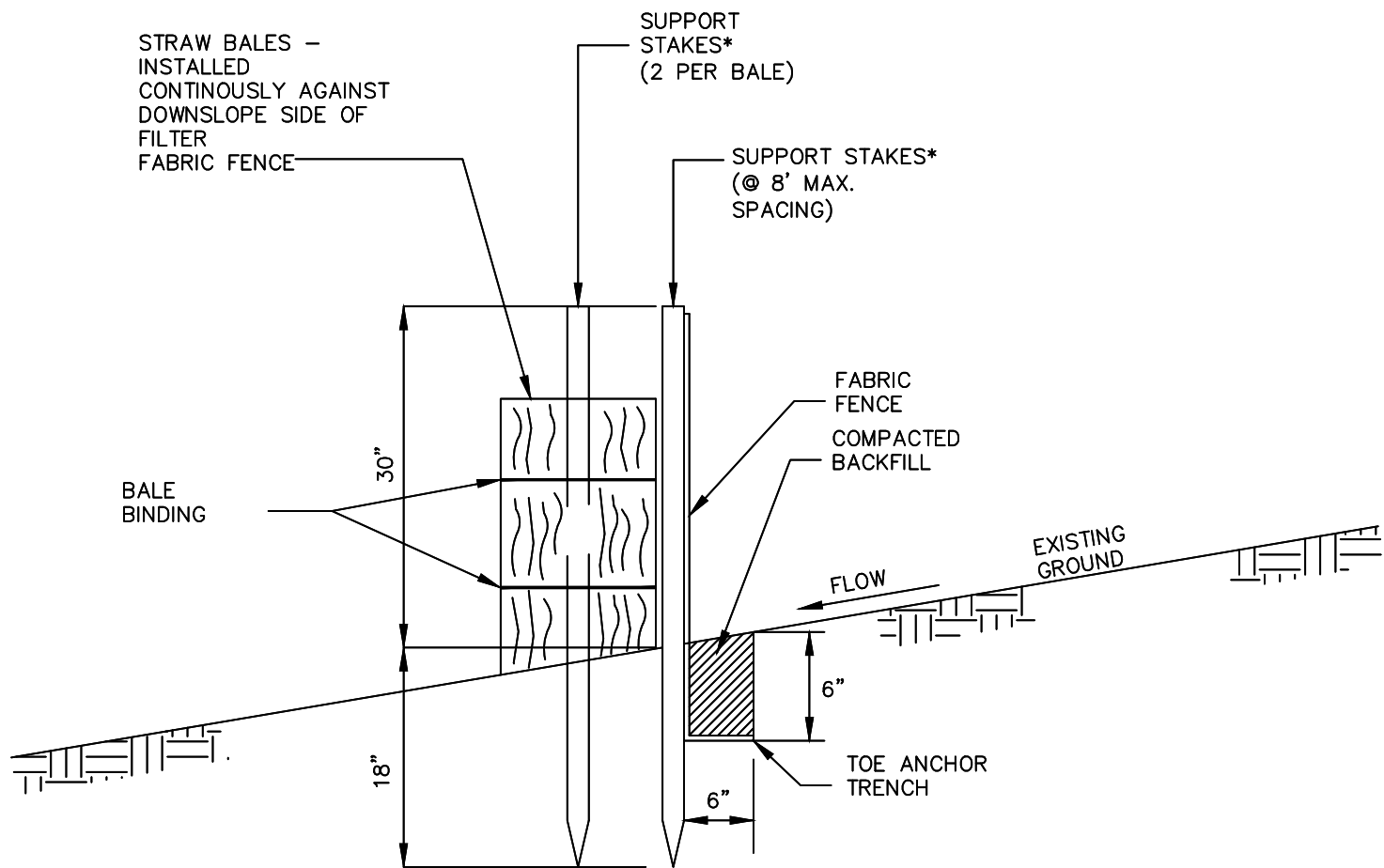
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**NST EXPRESS PIPELINE**

TYPICAL STANDARD  
 18" SILT FENCE INSTALLATION  
 (SHEET 2 OF 2)

MCKENZIE COUNTY				NORTH DAKOTA			
DATE	REV. DATE	DRAWN BY	LOC. NO.	DRAWING NUMBER	SHEET NO.	REV.	
04/14/15	-	KBW	-	SF1	-	A	



\*USE 2"x2" WOOD OR EQUIVALENT STEEL STAKES.

REPLACE BALES AT LEAST EVERY 3 MONTHS.

FILTER FABRIC FENCE MUST BE INSTALLED AT EXISTING LEVEL GRADE. BOTH ENDS OF EACH FENCE SECTION MUST BE EXTENDED AT LEAST 8' UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.

SEDIMENT MUST BE REMOVED WHERE ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.

PERMANENT STABILIZATION IS DEFINED AS A MINIMUM UNIFORM, PERENNIAL 70% VEGETATIVE COVER OR OTHER PERMANENT NON-VEGTATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED EROSION.

SILT FENCE MUST BE LEFT IN PLACE UNTIL PERMANENT STABILIZATION.

ANY FENCE SECTION THAT HAS BEEN UNDERMINED OR TOPPED MUST BE REPLACED WITH A ROCK FILTER OUTLET.

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 28100 TORCH PARKWAY  
 WARRENVILLE, IL 60555  
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REVISIONS					



<b>NST EXPRESS PIPELINE</b>					
STANDARD CONSTRUCTION DETAIL REINFORCED 30" SILT FENCE INSTALLATION (SHEET 1 OF 3)					
MCKENZIE COUNTY				NORTH DAKOTA	
DATE	REV. DATE	DRAWN BY	CHECK NO.	DRAWING NUMBER	SHEET NO.
04/14/15	-	KBW	-	SF2	A



AT A MINIMUM THE FABRIC SHALL HAVE THE FOLLOWING PROPERTIES:

FABRIC PROPERTY	MINIMUM ACCEPTABLE VALUE	TEST METHOD
GRAB TENSILE STRENGTH (lb)	120	ASTM D1682
ELONGATION AT FAILURE (%)	20% MAX.	ASTM D1682
MULLEN BURST STRENGTH (lb)	200	ASTM D3786
TRAPEZOIDAL TEAR STRENGTH (lb)	50	
PUNCTURE STRENGTH (lb)	40	ASTM D 751 (MODIFIED)
SLURRY FLOW RATE (gal/min/sf)	0.3	
EQUIVALENT OPENING SIZE	30	US STD. SIEVE CW-02215
ULTRAVIOLET RADIATION STABILITY (%)	80	ASTM G-26

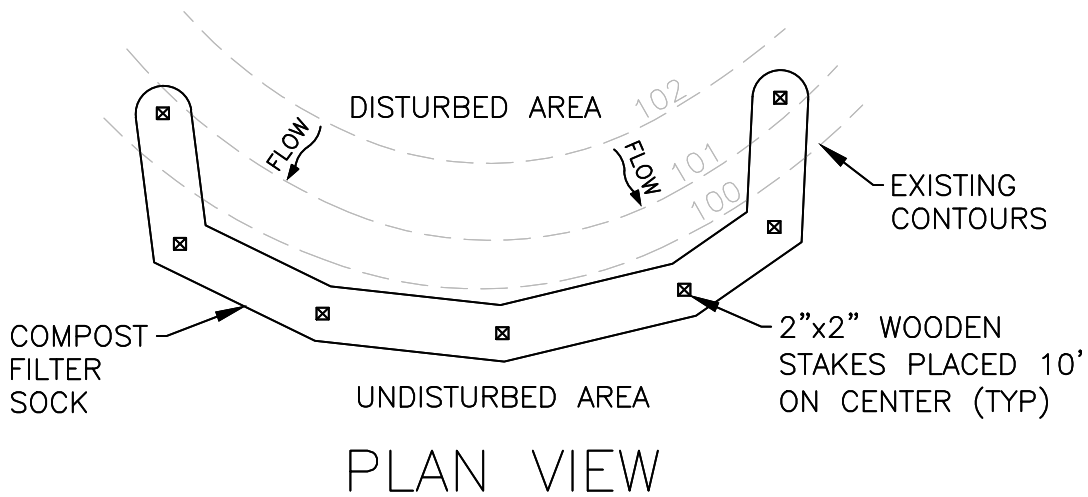
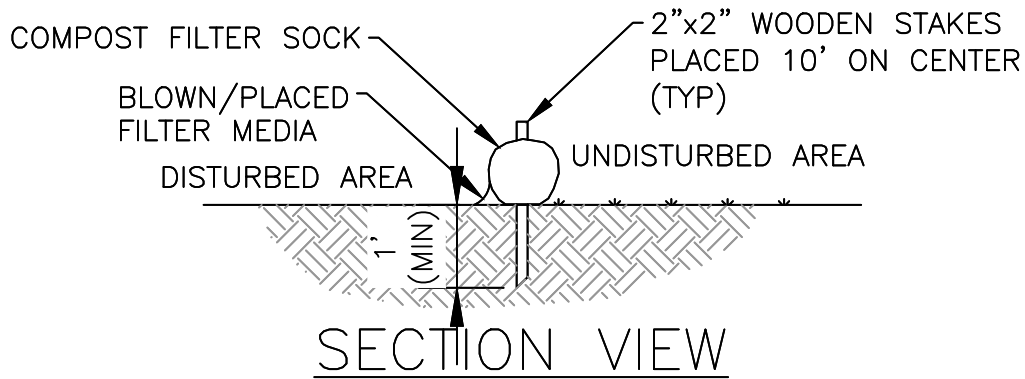
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<b>REVISIONS</b>					



<b>NST EXPRESS PIPELINE</b>					
<b>STANDARD CONSTRUCTION DETAIL</b>					
<b>REINFORCED 30" SILT FENCE INSTALLANTION</b>					
<b>(SHEET 3 OF 3)</b>					
MCKENZIE COUNTY				NORTH DAKOTA	
DATE	REV. DATE	DRAWN BY	LOC. NO.	DRAWING NUMBER	SHEET NO.
04/14/15	-	KBW	-	SF2	A



**NOTES:**

1. SOCK FABRIC AND COMPOST MATERIAL SHALL MEET ALL STATE STANDARDS.
2. COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY BARRIER SHALL NOT EXCEED THAT SPECIFIED FOR THE SIZE OF THE SOCK AND THE SLOPE OF ITS TRIBUTARY AREA.
3. TRAFFIC SHALL NOT BE PERMITTED TO CROSS COMPOST FILTER SOCKS.
4. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE BARRIER AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
5. COMPOST FILTER SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.
6. BIO-DEGRADABLE COMPOST FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTO-DEGRADABLE SOCKS AFTER 1 YEARS. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
7. UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS SOIL SUPPLEMENT.

**COMPOST FILTER SOCK DETAIL**

SCALE: NOT TO SCALE

DESIGNED IN ACCORDANCE WITH TITLE 49-PART 192 OF MINIMUM FEDERAL SAFETY STANDARDS AND OPTIC GUIDE FOR GAS TRANSMISSION AND DISTRIBUTION PIPING SYSTEMS, LATEST EDITION.

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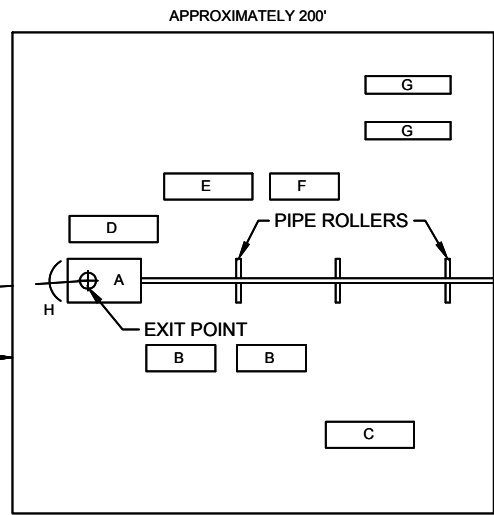
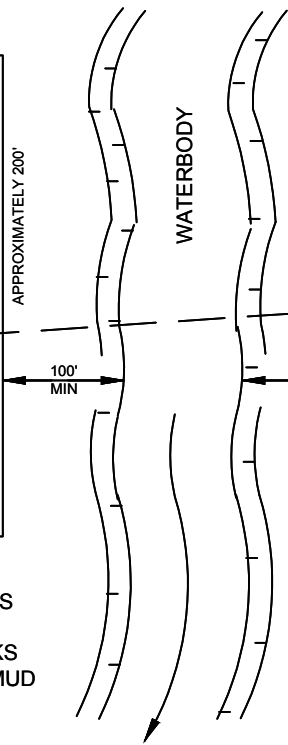
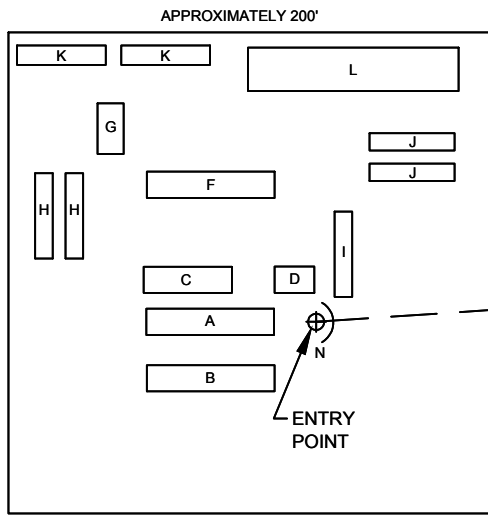
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NST EXPRESS PIPELINE

COMPOST FILTER SOCK DETAIL

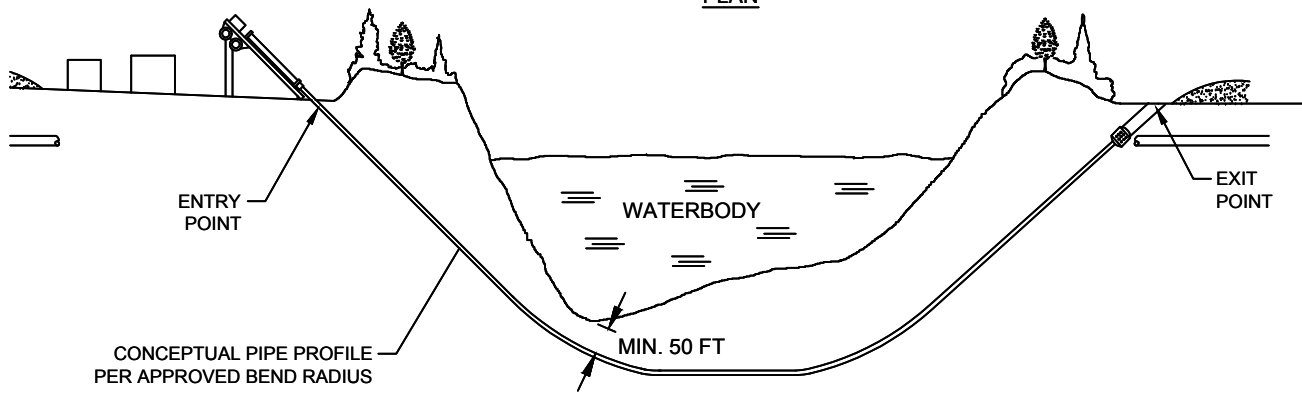
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	04/14/15	-	KBW	-	CFS	-	A



- A - DRILL RIG
- B - DRILLER'S CONSOLE
- C - DRILL PIPE
- D - CRANE
- E - PARTS VAN
- F - MUD CLEANING UNIT
- G - MUD MIXING TANK
- H - MUD PUMPS
- I - MUD PIT
- J - FRAC TANKS
- K - DRILLING MUD (PALLETS)
- L - PARKING
- M - OFFICE TRAILER
- N - CONTAINMENT BERM

- A - EXIT PIT
- B - LIFT EQUIPMENT
- C - WELDING AREA
- D - MUD PIT
- E - MUD CLEANING
- F - GENERATOR
- G - FRAC TANKS
- H - CONTAINMENT BERM

**PLAN**



**PROFILE**

**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 COMPANY'S INSPECTOR.
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.

DRAWING DEPICTED IS SUPERSEDED BY WRITTEN STANDARD, SCOPE OF WORK OR LINE LIST.

DESIGNED IN ACCORDANCE WITH TITLE 49 PART 192 OF MINIMUM FEDERAL SAFETY STANDARDS AND OPTIC GUIDE FOR GAS TRANSMISSION AND DISTRIBUTION PIPING SYSTEMS, LATEST EDITION.

PREPARED BY:  
**enEngineering**  
 28100 TORCH PARKWAY  
 WARRENVILLE, IL 60555  
 TEL. 630-353-4000  
 FAX 630-353-7777  
 WWW.ENENGINEERING.COM

REV	DATE	BY	DESCRIPTION	CK	APP
A	04/17/15	KBW	ISSUED FOR PERMIT	DK	JN
<b>REVISIONS</b>					



**NST EXPRESS PIPELINE**

**TYPICAL WATERBODY CROSSING  
 HORIZONTAL DIRECTIONAL DRILLING**

MCKENZIE COUNTY	DATE	REV DATE	BY	LOC. NO.	DRAWING NUMBER	NORTH DAKOTA
	04/14/15	-	KBW	-	WCHDD	A