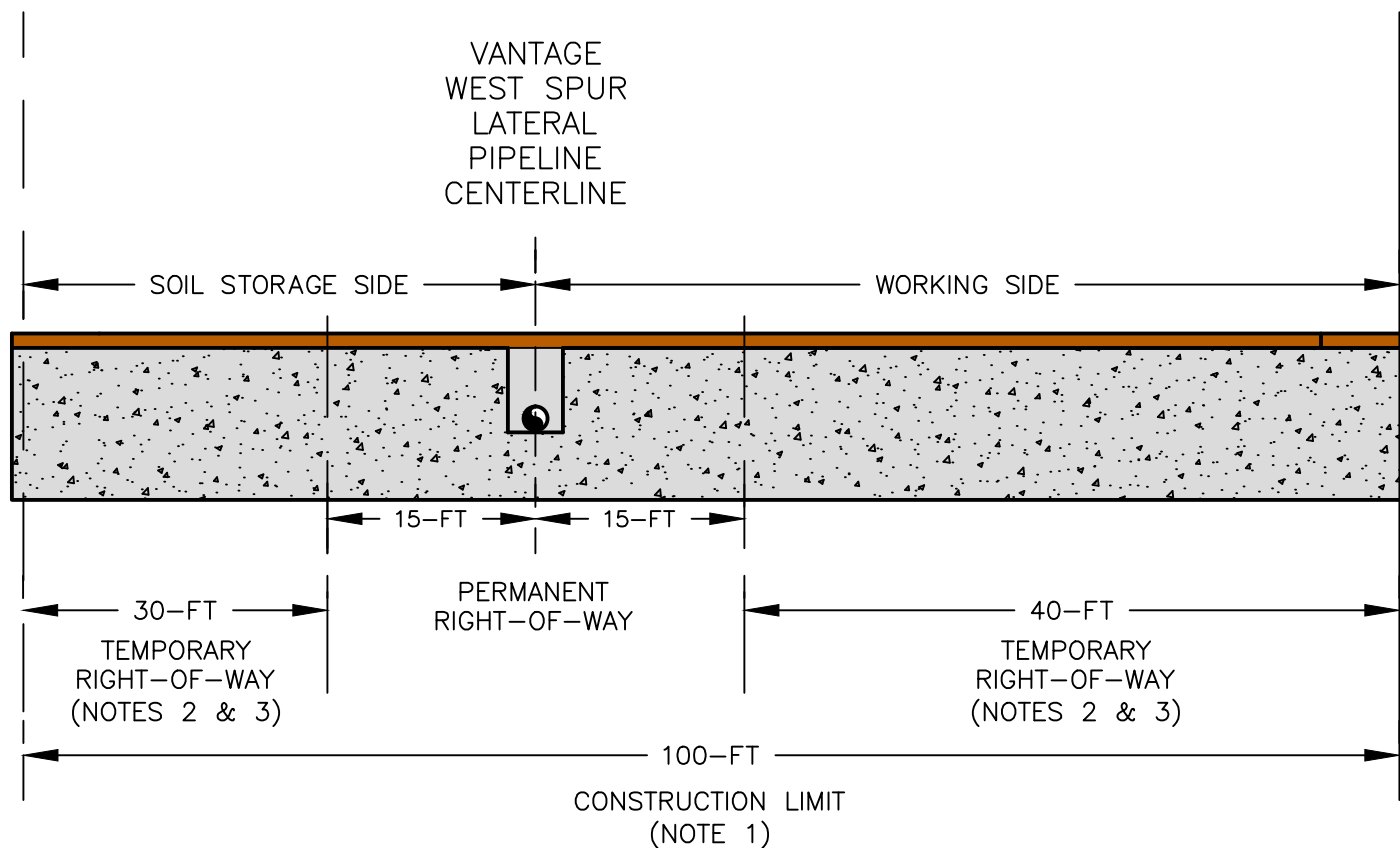


Exhibit J.1

Typical Details

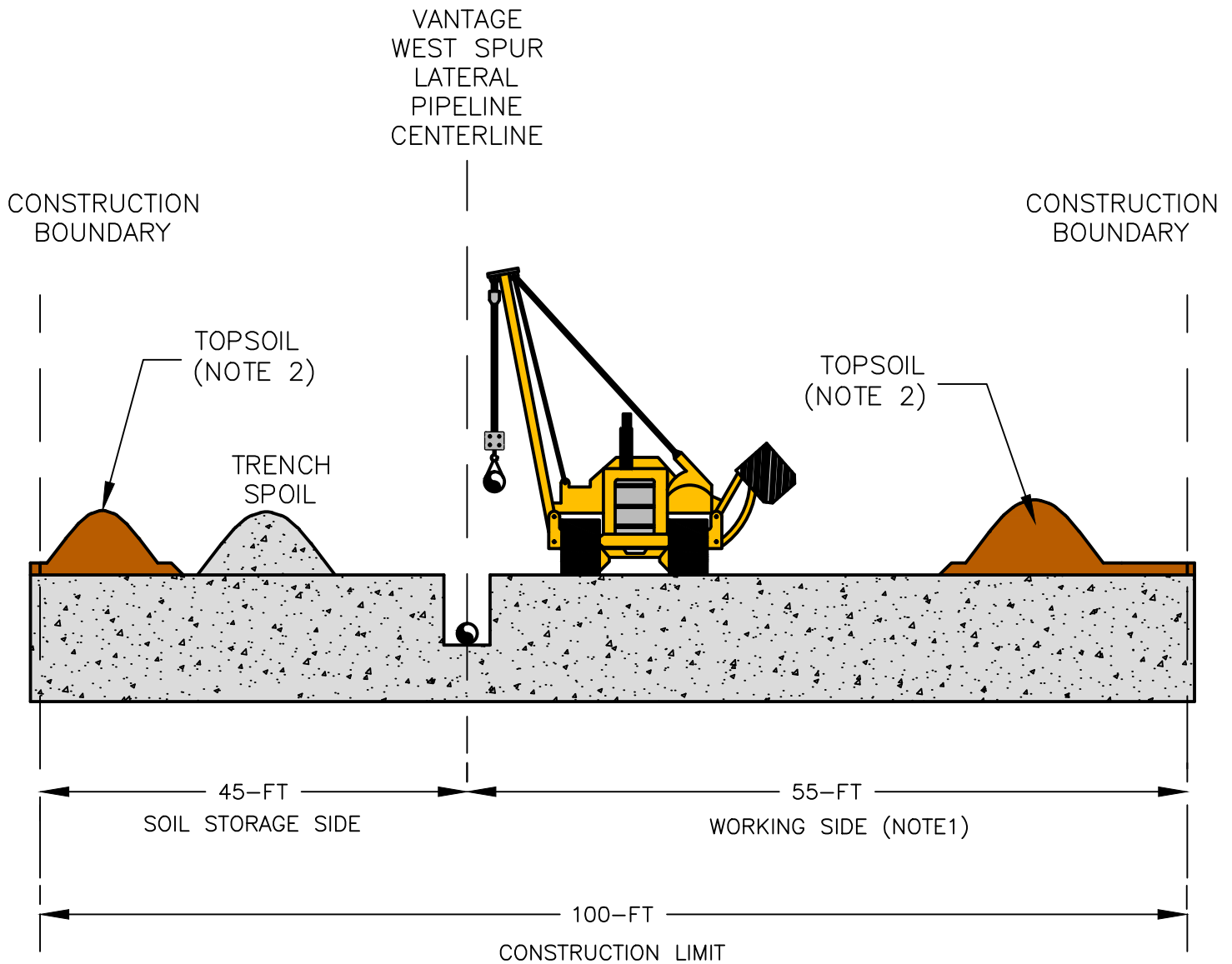
CONSTRUCTION
BOUNDARY

CONSTRUCTION
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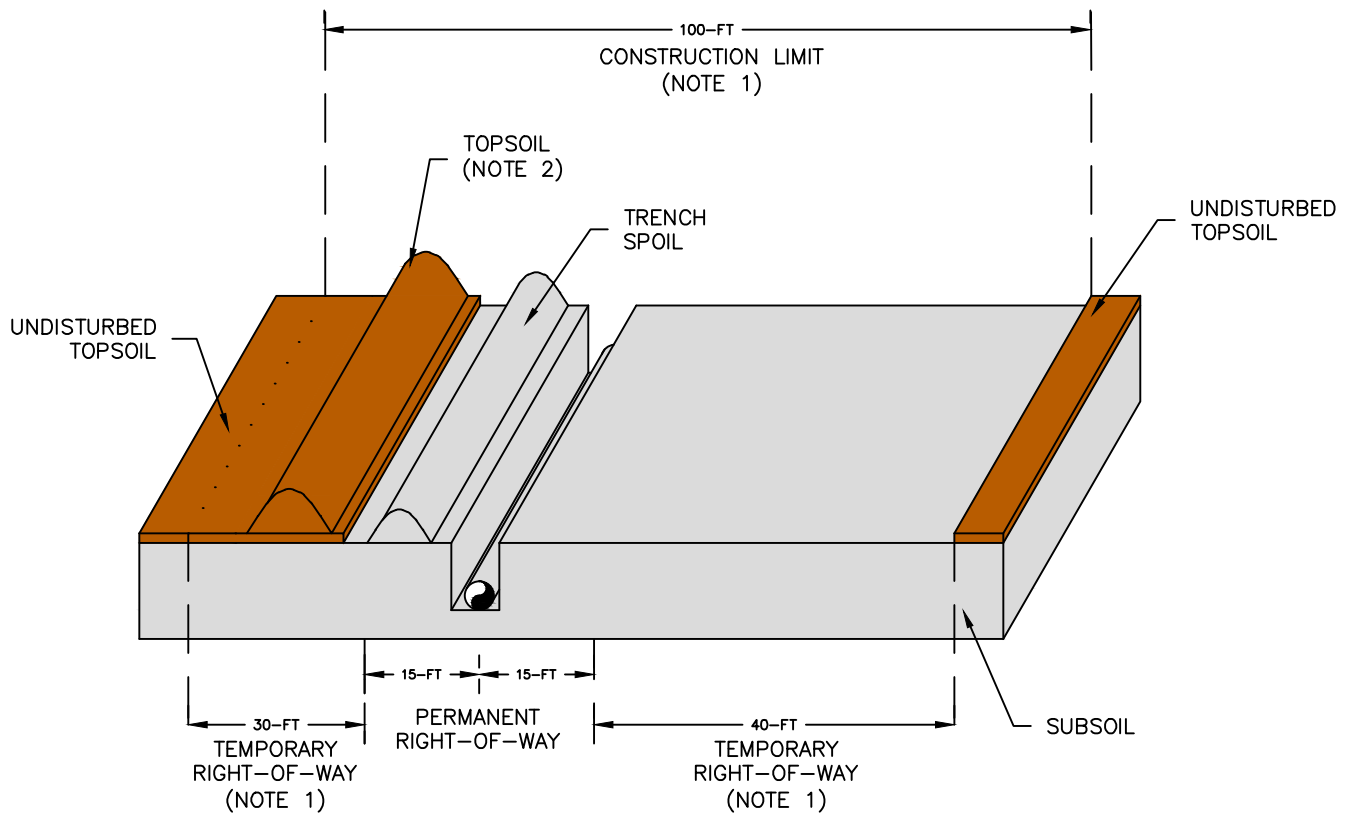
NOTES:

1. THE TYPICAL CONSTRUCTION LIMIT WIDTH WILL BE 100 FEET. THE WIDTH OF THE WORKING SIDE MAY BE DECREASED FOR SHORT DISTANCES IN LOCATIONS IDENTIFIED ON THE PLANS OR AS DIRECTED BY THE OWNER.
2. TEMPORARY RIGHT-OF-WAY WOULD BE LOCATED ON THE RIGHT SIDE OF THE ALIGNMENT UNLESS OTHERWISE NOTED ON THE PLANS.
3. ADDITIONAL TEMPORARY WORK SPACE MAY BE REQUIRED AT ROAD CROSSING LOCATIONS OR OTHER LOCATIONS IDENTIFIED ON THE CONSTRUCTION PLANS.
4. RIGHT-OF-WAY TYPICAL DRAWN WITH DIRECTION OF CONSTRUCTION NORTH OR EAST.
5. THIS DETAIL HAS BEEN PREPARED FOR ENVIRONMENTAL REVIEW PURPOSES ONLY.



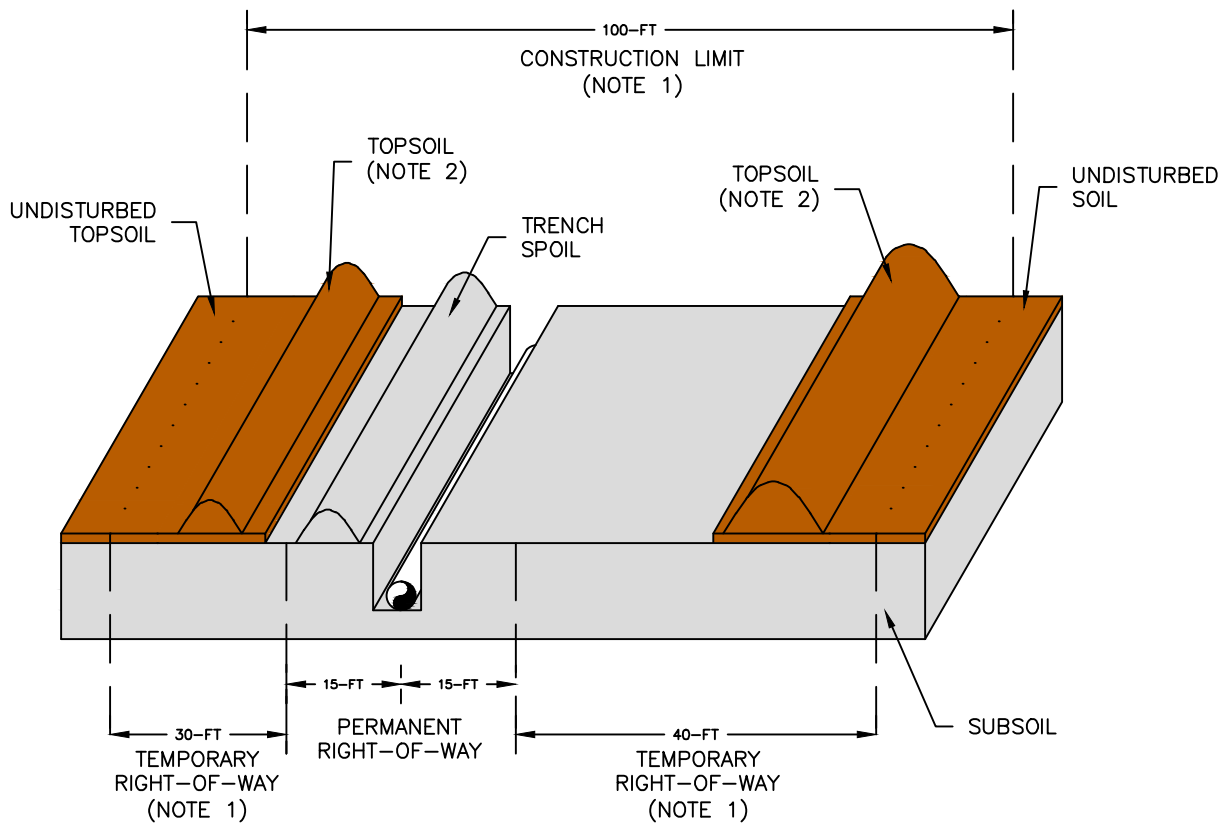
NOTES:

1. THE TYPICAL CONSTRUCTION LIMIT WIDTH WILL BE 100 FEET. THE WIDTH OF THE WORKING SIDE WOULD BE DECREASED FOR SHORT DISTANCES IN LOCATIONS IDENTIFIED ON THE PLANS OR AS DIRECTED BY THE PROJECT ENGINEER.
2. STOCKPILE TOPSOIL AND TRENCH SPOIL SEPARATELY. TOPSOIL MAY BE PLACED IN A SINGLE STOCK PILE OR SPLIT INTO TWO LOCATIONS. REFER TO SOIL HANDLING DETAILS 3 THROUGH 7.
3. ENSURE ADEQUATE SEPARATION BUFFER BETWEEN TOPSOIL AND SPOIL STOCKPILES TO PREVENT ADMIXING.
4. TYPICAL DRAWN WITH DIRECTION OF CONSTRUCTION NORTH OR EAST.
5. THIS DETAIL HAS BEEN PREPARED FOR ENVIRONMENTAL REVIEW PURPOSES ONLY.



NOTES:
 USE FULL ROW STRIPPING ON CULTIVATED LAND, AND IN MOST CONDITIONS EXCEPT WHEN INDICATED IN ENVIRONMENTAL ALIGNMENT SHEETS.

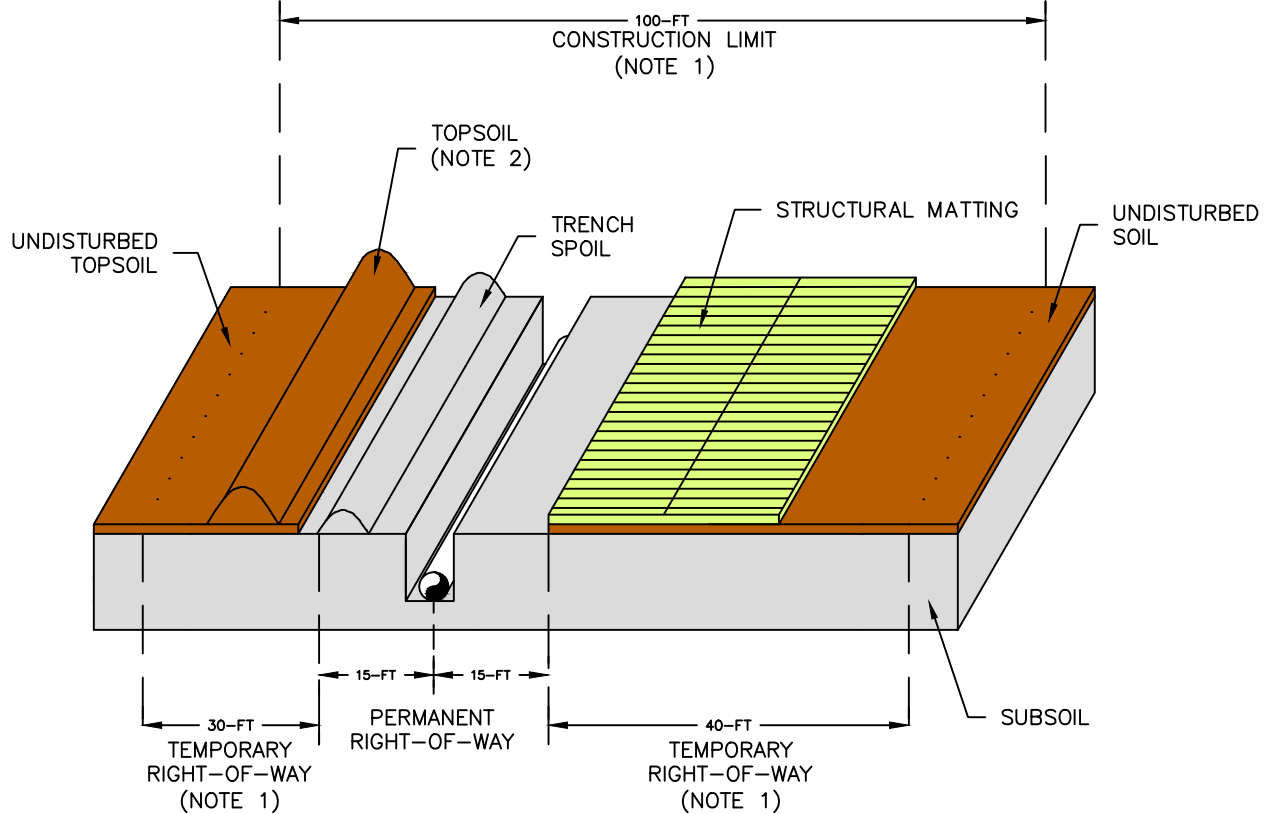
1. THE TYPICAL CONSTRUCTION WIDTH WILL BE 100 FEET. THE WIDTH OF THE WORKING SIDE MAY BE DECREASED FOR SHORT DISTANCES IN LOCATIONS IDENTIFIED ON THE PLANS OR AS DIRECTED BY THE PROJECT ENGINEER.
2. TOPSOIL SHALL BE STRIPPED FROM THE AREA REQUIRED FOR SPOIL STORAGE, ABOVE THE TRENCH AND FROM THE WORK AREA. STRIP AND STOCKPILE TOPSOIL AND TRENCH SPOIL SEPARATELY. TOPSOIL STRIPPING IS NOT REQUIRED BELOW THE AREA REQUIRED FOR TOPSOIL STORAGE. PROVIDE ADEQUATE SEPARATION BETWEEN TOPSOIL AND SPOIL STOCKPILES TO PREVENT MIXING. TYPICAL A HORIZON DEPTH (TOPSOIL) FROM THE NRCS SOIL SURVEY IS INDICATED ON THE ALIGNMENT SHEETS AND IS INTEND AS A GUIDELINE. THE ACTUAL TOPSOIL SALVAGE DEPTH WILL VARY LOCALLY AND ADJUSTMENT OF DEPTH WILL BE REQUIRED TO SALVAGE ALL AVAILABLE TOPSOIL. SEVERAL PASSES USING A GRADER OR OTHER EQUIPMENT MAY BE REQUIRED. STRIPPING WIDTH SHALL FOLLOW ENVIRONMENTAL ALIGNMENT SHEETS.
3. SOIL SALVAGE ACTIVITIES SHOULD NOT BE CONDUCTED IN WET CONDITIONS OR DURING HIGH WINDS IF SOIL IS PRONE TO WIND EROSION. DISCONTINUE STRIPPING IN LOCATIONS WHERE BUFFERS ARE REQUIRED AT WATERWAYS, WETLANDS, OR OTHER SENSITIVE AREAS. SOIL ADMIXING NOT PERMITTED.
4. BACKFILL TRENCH WITH SPOIL AND COMPACT IN ACCORDANCE WITH PROJECT SPECIFICATIONS. PROVIDE CROWN OVER TRENCH USING AVAILABLE SPOIL TO ACCOMMODATE SETTLEMENT. CROWN SHOULD BE DISCONTINUED ACROSS DRAINAGE WAYS. DISPERSE EXCESS TOPSOIL ACROSS RIGHT-OF-WAY.
5. PROVIDE SUBSOIL COMPACTION RELIEF IF REQUIRED AND DISC TO BREAKUP LARGE CLOUDS IF NECESSARY. REMOVE OVERSIZED BOULDERS PRIOR TO TOPSOIL PLACEMENT.
6. PLACE TOPSOIL EVENLY ACROSS ENTIRE WORK AREA USING GRADER OR OTHER EQUIPMENT. MAINTAIN CROWN OVER TRENCH CENTERLINE. REMOVE OVERSIZED MATERIALS FROM FINAL SURFACE TO BE CONSISTENT WITH LOCAL CONDITIONS OR IN ACCORDANCE WITH ANY SPECIAL REQUIREMENTS.
7. AREAS REQUIRED STRIPPING WHEN TREES OR SHRUBS ARE PRESENT MUST COMPLY WITH THE APPROVED NDPCS TREE AND SHRUB MITIGATION PLAN.



NOTES:

USE FULL ROW STRIPPING ON CULTIVATED LAND, AND IN MOST CONDITIONS EXCEPT WHEN INDICATED IN ENVIRONMENTAL ALIGNMENT SHEETS. SAME AS OPTION 1 WITH ALTERNATE SOIL SALVAGE PILE LOCATIONS.

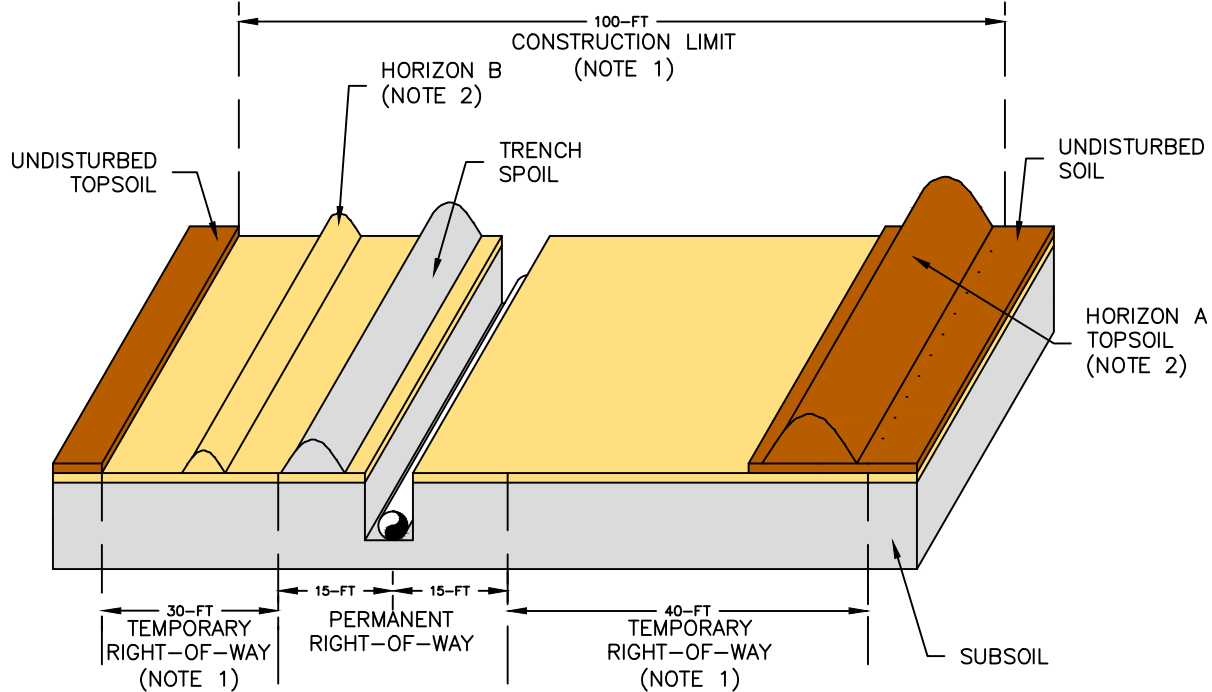
1. THE TYPICAL CONSTRUCTION WIDTH WILL BE 100 FEET. THE WIDTH OF THE WORKING SIDE MAY BE DECREASED FOR SHORT DISTANCES IN LOCATIONS IDENTIFIED ON THE PLANS OR AS DIRECTED BY THE PROJECT ENGINEER.
2. TOPSOIL SHALL BE STRIPPED FROM THE AREA REQUIRED FOR SPOIL STORAGE, ABOVE THE TRENCH AND FROM THE WORK AREA. STRIP AND STOCKPILE TOPSOIL AND TRENCH SPOIL SEPARATELY. TOPSOIL STRIPPING IS NOT REQUIRED BELOW THE AREA REQUIRED FOR TOPSOIL STORAGE. PROVIDE ADEQUATE SEPARATION BETWEEN TOPSOIL AND SPOIL STOCKPILES TO PREVENT MIXING. TYPICAL A HORIZON DEPTH (TOPSOIL) FROM THE NRCS SOIL SURVEY IS INDICATED ON THE ALIGNMENT SHEETS AND IS INTEND AS A GUIDELINE. THE ACTUAL TOPSOIL SALVAGE DEPTH WILL VARY LOCALLY AND ADJUSTMENT OF DEPTH WILL BE REQUIRED TO SALVAGE ALL AVAILABLE TOPSOIL. SEVERAL PASSES USING A GRADER OR OTHER EQUIPMENT MAY BE REQUIRED. STRIPPING WIDTH SHALL FOLLOW ENVIRONMENTAL ALIGNMENT SHEETS.
3. SOIL SALVAGE ACTIVITIES SHOULD NOT BE CONDUCTED IN WET CONDITIONS OR DURING HIGH WINDS IF SOIL IS PRONE TO WIND EROSION. DISCONTINUE STRIPPING IN LOCATIONS WHERE BUFFERS ARE REQUIRED AT WATERWAYS, WETLANDS, OR OTHER SENSITIVE AREAS. SOIL ADMIXING NOT PERMITTED.
4. BACKFILL TRENCH WITH SPOIL AND COMPACT IN ACCORDANCE WITH PROJECT SPECIFICATIONS. PROVIDE CROWN OVER TRENCH USING AVAILABLE SPOIL TO ACCOMMODATE SETTLEMENT. CROWN SHOULD BE DISCONTINUED ACROSS DRAINAGE WAYS. DISPERSE EXCESS TOPSOIL ACROSS ROW.
5. PROVIDE SUBSOIL COMPACTION RELIEF IF REQUIRED AND DISC TO BREAKUP LARGE CLODS IF NECESSARY. REMOVE OVERSIZED BOULDERS PRIOR TO TOPSOIL PLACEMENT.
6. PLACE TOPSOIL EVENLY ACROSS ENTIRE WORK AREA USING GRADER OR OTHER EQUIPMENT. MAINTAIN CROWN OVER TRENCH CENTERLINE. REMOVE OVERSIZED MATERIALS FROM FINAL SURFACE TO BE CONSISTENT WITH LOCAL CONDITIONS OR IN ACCORDANCE WITH ANY SPECIAL REQUIREMENTS.
7. AREAS REQUIRED STRIPPING WHEN TREES OR SHRUBS ARE PRESENT MUST COMPLY WITH THE APPROVED NDPSO TREE AND SHRUB MITIGATION PLAN.



NOTES:

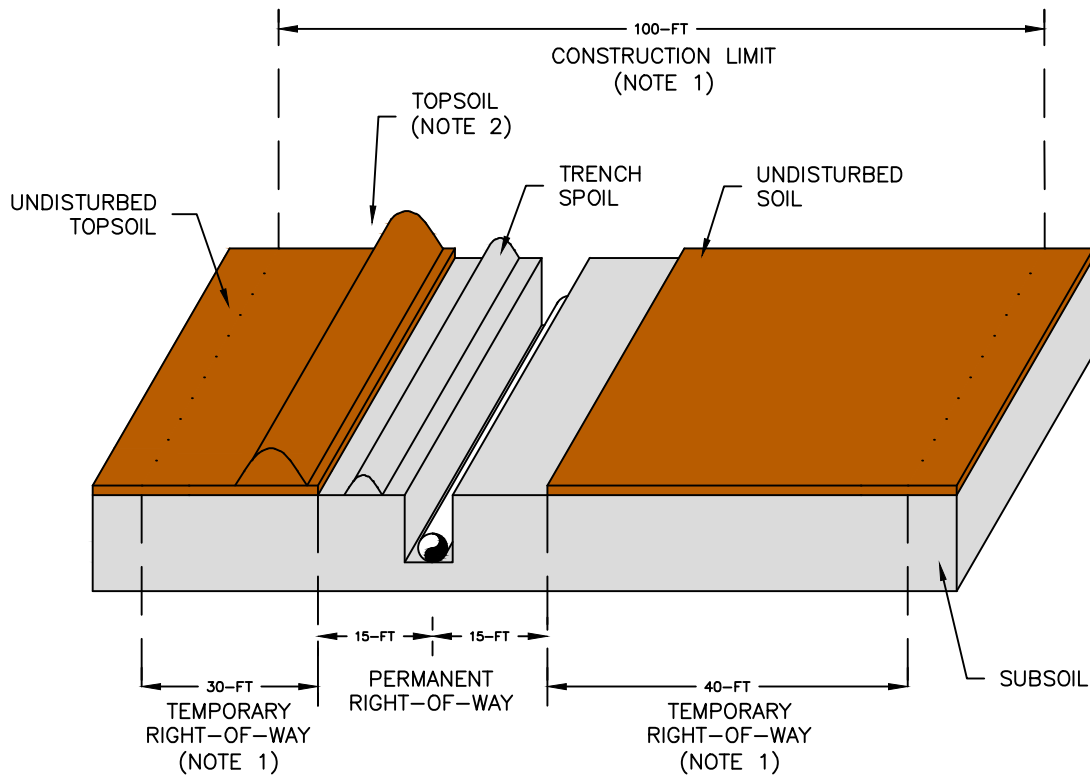
LIMIT STRIPPING TO PERMANENT ROW ON NATIVE PRAIRIE, GRASSLAND OR IMPROVED PASTURE LAND FOR WET SOILS OR SOILS PRONE TO EXCESSIVE WIND EROSION. OPTION 3 MAY BE USED IN LOCATIONS WHERE THE WIDTH OF STRIPPING WOULD BE LIMITED.

1. THE TYPICAL CONSTRUCTION WIDTH WILL BE 100 FEET. THE WIDTH OF THE WORKING SIDE WILL BE DECREASED FOR SHORT DISTANCES IN LOCATIONS IDENTIFIED ON THE PLANS OR AS DIRECTED BY THE PROJECT ENGINEER.
2. TOPSOIL SHALL BE STRIPPED FROM THE AREA ABOVE THE TRENCH. STRIP AND STOCKPILE TOPSOIL AND TRENCH SPOIL SEPARATELY. TOPSOIL STRIPPING IS NOT REQUIRED BELOW THE AREA REQUIRED FOR TOPSOIL AND SPOIL STORAGE. PROVIDE ADEQUATE SEPARATION BETWEEN TOPSOIL AND SPOIL STOCKPILES TO PREVENT MIXING. TYPICAL A HORIZON DEPTH (TOPSOIL) FROM THE NRCS SOIL SURVEY IS INDICATED ON THE ALIGNMENT SHEETS AND IS INTEND AS A GUIDELINE. THE ACTUAL TOPSOIL SALVAGE DEPTH WILL VARY LOCALLY AND ADJUSTMENT OF DEPTH WILL BE REQUIRED TO SALVAGE ALL AVAILABLE TOPSOIL. STRIPPING WIDTH SHALL FOLLOW ENVIRONMENTAL ALIGNMENT SHEETS.
3. SOIL SALVAGE ACTIVITIES SHOULD NOT BE CONDUCTED IN WET CONDITIONS OR DURING HIGH WINDS IF SOIL IS PRONE TO WIND EROSION. DISCONTINUE STRIPPING IN LOCATIONS WHERE BUFFERS ARE REQUIRED AT WATERWAYS, WETLANDS, OR OTHER SENSITIVE AREAS. SOIL ADMIXING NOT PERMITTED.
4. BACKFILL TRENCH WITH SPOIL AND COMPACT IN ACCORDANCE WITH PROJECT SPECIFICATIONS. PROVIDE CROWN OVER TRENCH USING AVAILABLE SPOIL TO ACCOMMODATE SETTLEMENT. CROWN SHOULD BE DISCONTINUED ACROSS DRAINAGE WAYS. DISPERSE EXCESS TOPSOIL ACROSS ROW.
5. REMOVE OVERSIZED BOULDERS FROM SURFACE PRIOR TO TOPSOIL PLACEMENT.
6. PLACE TOPSOIL EVENLY ACROSS ENTIRE WORK AREA USING GRADER OR OTHER EQUIPMENT. MAINTAIN CROWN OVER TRENCH CENTERLINE. REMOVE OVERSIZED MATERIALS FROM FINAL SURFACE TO BE CONSISTENT WITH LOCAL CONDITIONS OR IN ACCORDANCE WITH ANY SPECIAL REQUIREMENTS.
7. AREAS REQUIRED STRIPPING WHEN TREES OR SHRUBS ARE PRESENT MUST COMPLY WITH THE APPROVED NDPSO TREE AND SHRUB MITIGATION PLAN.



NOTES:
 FULL WIDTH ROW STRIPPING ON LAND DESIGNATED AS PRIME FARMLAND. THE A & B SOIL HORIZONS WILL BE SALVAGED SEPARATELY AT PRIME FARMLAND LOCATIONS IDENTIFIED ON ENVIRONMENTAL ALIGNMENT SHEETS.

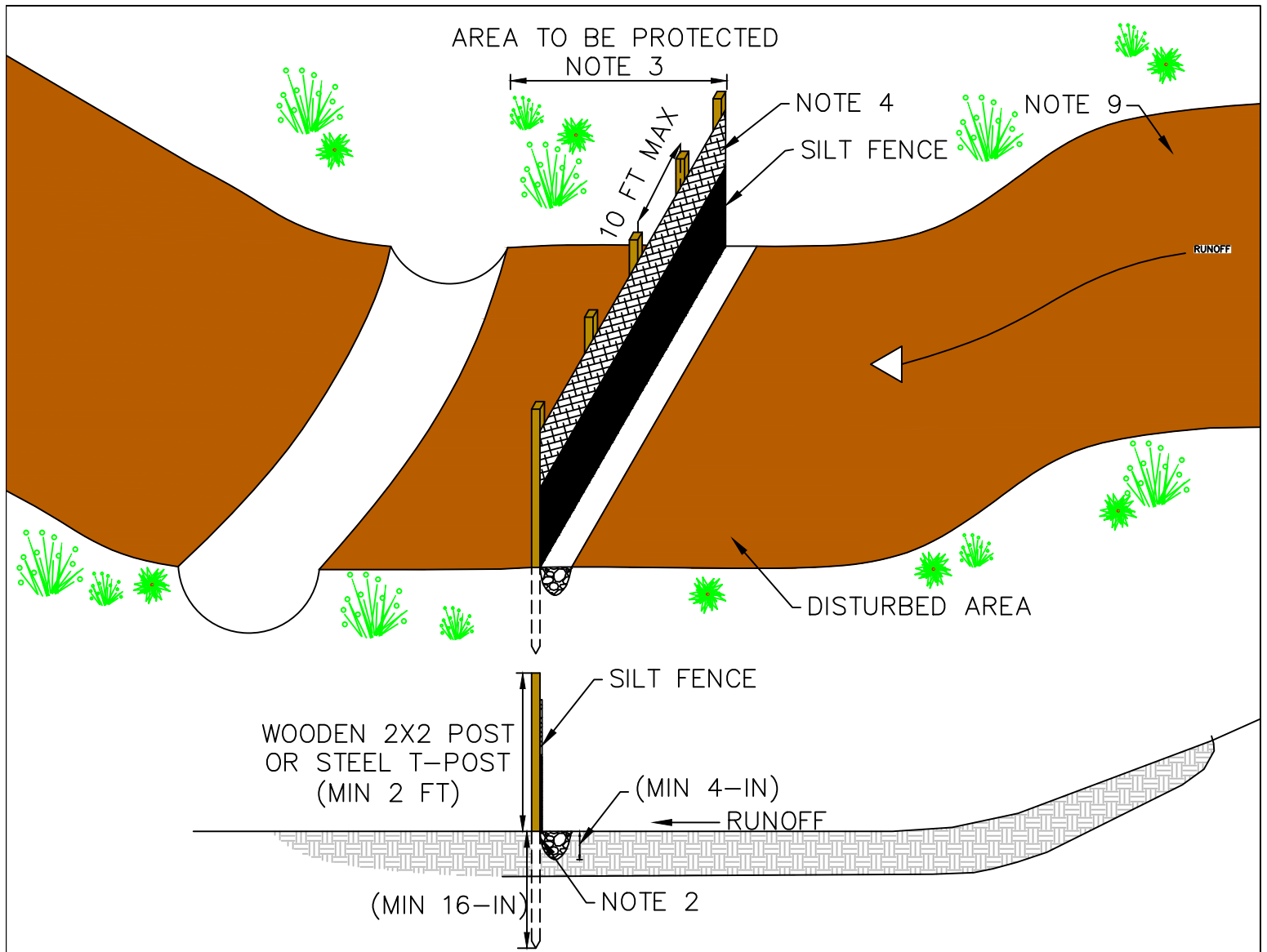
1. THE TYPICAL CONSTRUCTION WIDTH WILL BE 100 FEET. THE WIDTH OF THE WORKING SIDE MAY BE DECREASED FOR SHORT DISTANCES IN LOCATIONS IDENTIFIED ON THE PLANS OR AS DIRECTED BY THE PROJECT ENGINEER.
2. TOPSOIL (A HORIZON SOIL) SHALL BE STRIPPED TO EXPOSE THE B HORIZON SOIL. THE A HORIZON SOIL WOULD BE STOCKPILED AT THE OUTSIDE EDGE OF THE TEMPORARY ROW. B HORIZON SOIL WOULD BE STRIPPED AND STOCKPILED WITHIN THE PERMANENT ROW. EXCAVATE TRENCH SPOIL AND STOCKPILE ADJACENT TO TRENCH. STOCKPILE B HORIZON SOIL AND TRENCH SPOIL SEPARATELY. TOPSOIL STRIPPING IS NOT REQUIRED BELOW THE AREA REQUIRED FOR TOPSOIL STORAGE. TYPICAL A AND B HORIZON DEPTHS BASED ON THE NRCS SOIL SURVEY IS INDICATED ON THE ALIGNMENT SHEETS AND IS INTEND AS A GUIDELINE. ACTUAL DEPTH OF B HORIZON TO BE DETERMINED BY THE ONSITE ENVIRONMENTAL REPRESENTATIVE. THE ACTUAL DEPTHS OF SOIL SALVAGE WILL VARY LOCALLY AND ADJUSTMENT OF DEPTH WILL BE REQUIRED TO SALVAGE AVAILABLE SOILS. SEVERAL PASSES USING A GRADER OR OTHER EQUIPMENT MAY BE REQUIRED. STRIPPING WIDTH SHALL FOLLOW ENVIRONMENTAL ALIGNMENT SHEETS.
3. SOIL SALVAGE ACTIVITIES SHOULD NOT BE CONDUCTED WHEN IN WET CONDITIONS OR DURING HIGH WINDS IF SOIL IS PRONE TO WIND EROSION. DISCONTINUE STRIPPING IN LOCATIONS WHERE BUFFERS ARE REQUIRED AT WATERWAYS, WETLANDS, OR OTHER SENSITIVE AREAS. SOIL ADMIXING NOT PERMITTED.
4. BACKFILL TRENCH WITH SPOIL AND COMPACT PRIOR TO PLACING B HORIZON SOIL. USE CARE TO ENSURE SPOILS ARE REMOVED FROM B HORIZON SOILS BELOW SPOIL PILE. REPLACE AND COMPACT B HORIZON SOIL INTO TRENCH AND COMPACT IN ACCORDANCE WITH PROJECT SPECIFICATIONS. PROVIDE CROWN OVER TRENCH TO ACCOMMODATE SETTLEMENT. CROWN SHOULD BE DISCONTINUED ACROSS DRAINAGE WAYS. DISPERSE EXCESS TOPSOIL ACROSS ROW.
5. PROVIDE COMPACTION RELIEF IF REQUIRED AND DISK IF TO BREAKUP LARGE CLOUDS IF NECESSARY. REMOVE OVERSIZED BOULDERS PRIOR TO TOPSOIL PLACEMENT.
6. PLACE TOPSOIL EVENLY ACROSS ENTIRE WORK AREA USING GRADER OR OTHER EQUIPMENT. MAINTAIN CROWN OVER TRENCH CENTERLINE. REMOVE OVERSIZED MATERIALS FROM FINAL SURFACE TO BE CONSISTENT WITH LOCAL CONDITIONS OR IN ACCORDANCE WITH ANY SPECIAL REQUIREMENTS.
7. AREAS REQUIRED STRIPPING WHEN TREES OR SHRUBS ARE PRESENT MUST COMPLY WITH THE APPROVED NDPSC TREE AND SHRUB MITIGATION PLAN.



NOTES:

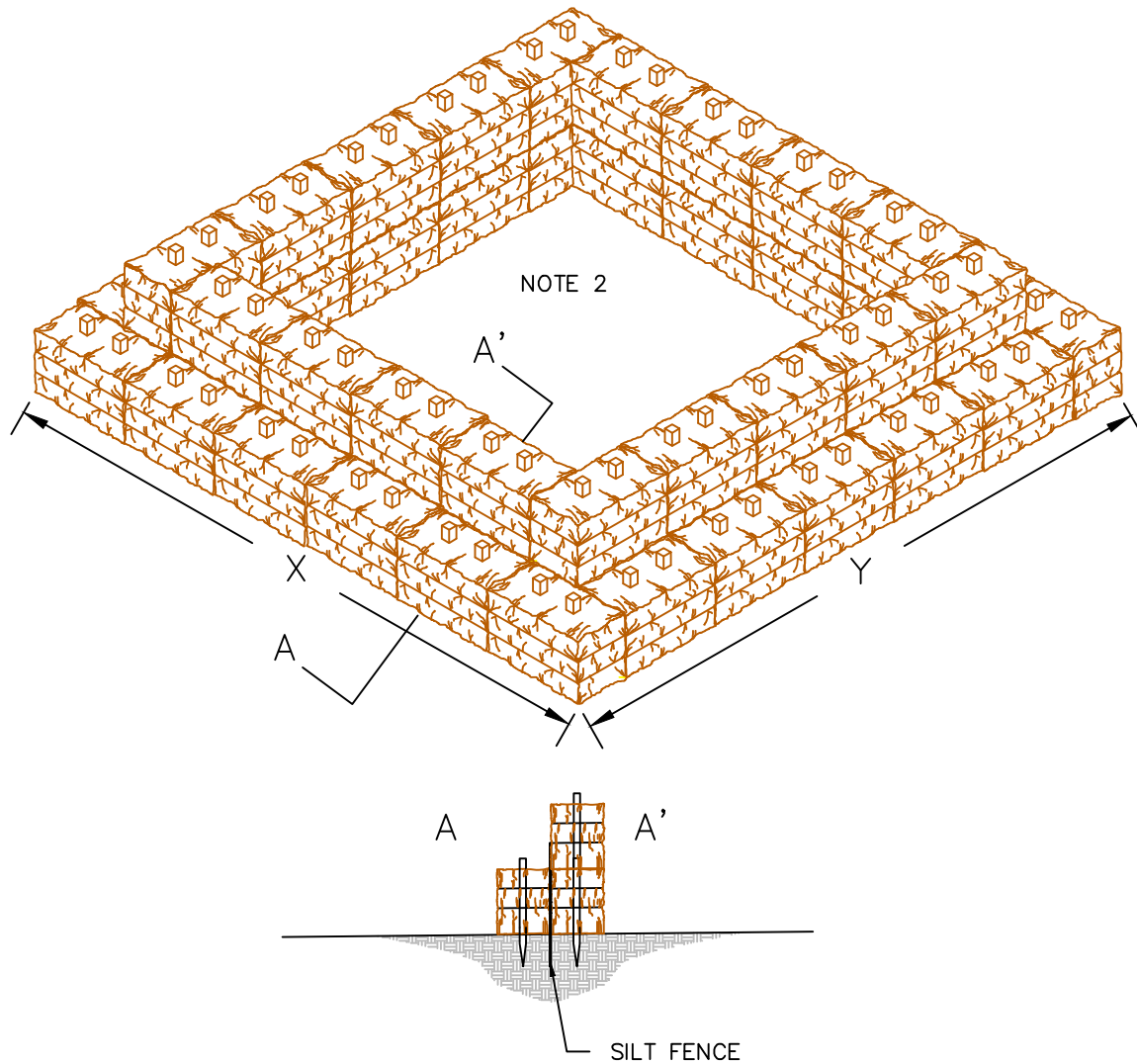
LIMIT STRIPPING TO ABOVE THE TRENCH LINE ONLY ON NATIVE PRAIRIE, GRASSLAND, IMPROVED PASTURE LAND, OR WETLANDS. OPTION 5 MAY BE USED IN LOCATIONS WHERE THE WIDTH OF STRIPPING WOULD BE LIMITED.

1. THE TYPICAL CONSTRUCTION WIDTH WILL BE 100 FEET. THE WIDTH OF THE WORKING SIDE MAY BE DECREASED FOR SHORT DISTANCES IN LOCATIONS IDENTIFIED ON THE PLANS OR AS DIRECTED BY THE PROJECT ENGINEER.
2. TOPSOIL SHALL BE STRIPPED ONLY FROM THE AREA ABOVE THE TRENCH. STRIP AND STOCKPILE TOPSOIL AND TRENCH SPOIL SEPARATELY. PROVIDE ADEQUATE SEPARATION BETWEEN TOPSOIL AND SPOIL STOCKPILES TO PREVENT MIXING. TYPICAL A HORIZON DEPTH (TOPSOIL) FROM THE NRCS SOIL SURVEY IS INDICATED ON THE ALIGNMENT SHEETS AND IS INTEND AS A GUIDELINE. THE ACTUAL TOPSOIL SALVAGE DEPTH WILL VARY LOCALLY AND ADJUSTMENT OF DEPTH WILL BE REQUIRED TO SALVAGE ALL AVAILABLE TOPSOIL. SEVERAL PASSES USING A GRADER OR OTHER EQUIPMENT MAY BE REQUIRED. STRIPPING WIDTH SHALL FOLLOW ENVIRONMENTAL ALIGNMENT SHEETS.
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4. BACKFILL TRENCH WITH SPOIL AND COMPACT IN ACCORDANCE WITH PROJECT SPECIFICATIONS. PROVIDE CROWN USING AVAILABLE SPOIL OVER TRENCH TO ACCOMMODATE SETTLEMENT. AVOID DAMAGE TO SOD LAYER BELOW SPOIL. CROWN SHOULD BE DISCONTINUED ACROSS DRAINAGE WAYS. DISPERSE EXCESS TOPSOIL ACROSS ROW.
5. REMOVE OVERSIZED BOULDERS FROM SUBSOIL SURFACE PRIOR TO TOPSOIL PLACEMENT.
6. PLACE TOPSOIL EVENLY ACROSS TRENCH AREA USING GRADER OR OTHER EQUIPMENT. MAINTAIN CROWN OVER TRENCH CENTERLINE. REMOVE OVERSIZED MATERIALS TO BE CONSISTENT WITH LOCAL CONDITIONS OR IN ACCORDANCE WITH ANY SPECIAL REQUIREMENTS.
7. AREAS REQUIRED STRIPPING WHEN TREES OR SHRUBS ARE PRESENT MUST COMPLY WITH THE APPROVED NDPCS TREE AND SHRUB MITIGATION PLAN.



NOTES:

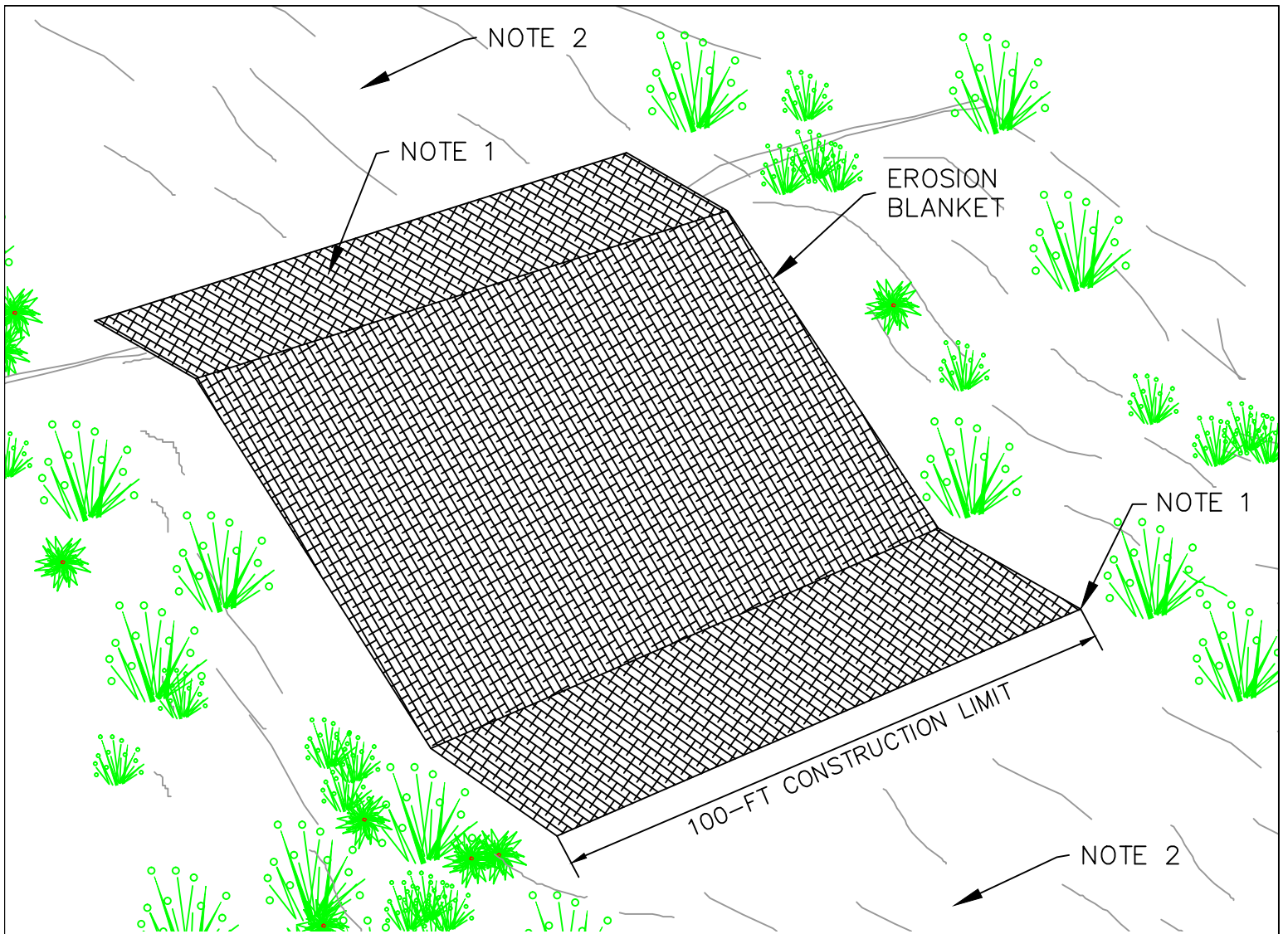
1. TEMPORARY SEDIMENT FENCE SHALL BE INSTALLED PRIOR TO ANY GRADING WORK IN THE AREA TO BE PROTECTED.
2. SILT FENCE MAY BE INSTALLED EITHER BY EXCAVATING AN ANCHOR TRENCH OR USING A SILT FENCE PLOW. ANCHOR TRENCH SHALL BE LOCATED ON UPHILL SIDE OF FENCE. SILT FENCE MUST BE KEYED IN.
3. FIELD LOCATE SILT FENCING TO PROVIDE SEDIMENT CONTROL BETWEEN WATERWAYS OR WETLANDS LOCATED ADJACENT AND DOWNGRADIENT OF CONSTRUCTION DISTURBANCE. SILT FENCE SHOULD BE LOCATED TO PROVIDE A BUFFER OF UNDISTURBED VEGETATION BETWEEN WORK AREA AND PROTECTED AREA.
4. FOR LONG-TERM APPLICATIONS, WOVEN WIRE FENCE MAY BE FASTENED TO FENCE POST WITH TIES OR STAPLES.
5. FILTER CLOTH TO BE FASTENED SECURELY TO SMOOTH WIRE OR WOVEN WIRE FENCE WITH TIES.SPACED EVERY 24" ALONG TOP OF FABRIC.
6. WHEN TWO (2) SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX (6) INCHES AND FOLDED
7. SEDIMENT ACCUMULATION SHALL BE REMOVED WHEN BULGES DEVELOP IN THE SILT FENCE.
8. SILT FENCE SHALL BE MAINTAINED, AS NEEDED, THROUGHOUT THE CONSTRUCTION PERIOD AND REMOVED IN CONJUNCTION WITH THE FINAL GRADING AND SITE STABILIZATION.
9. PROVIDE SLOPE BREAKERS ABOVE SILT FENCE WHEN REQUIRED.
10. THIS DETAIL HAS BEEN PREPARED FOR ENVIRONMENTAL REVIEW PURPOSES ONLY.



NOTES:

1. ARRANGE THE STRAW BALES TO THE X AND Y DIMENSIONS AS SPECIFIED BELOW FOR THE REQUIRED PUMPING RATE.
2. PROTECT SUMP FLOOR FROM EROSION. LINE ENTIRE SUMP FLOOR WITH GEOTEXTILE FILTER FABRIC OR OTHER MATERIALS TO PREVENT EROSION.
3. INSTALLATION TO FOLLOW ON-SITE COMPANY ENVIRONMENTAL INSPECTOR.
4. THIS DETAIL HAS BEEN PREPARED FOR ENVIRONMENTAL PREVIEW PURPOSES ONLY.

X-DIMENSION	Y-DIMENSION	PUMPING RATE
FT	FT	GPM
10	20	300
15	20	350
20	20	400
20	25	450
25	25	500



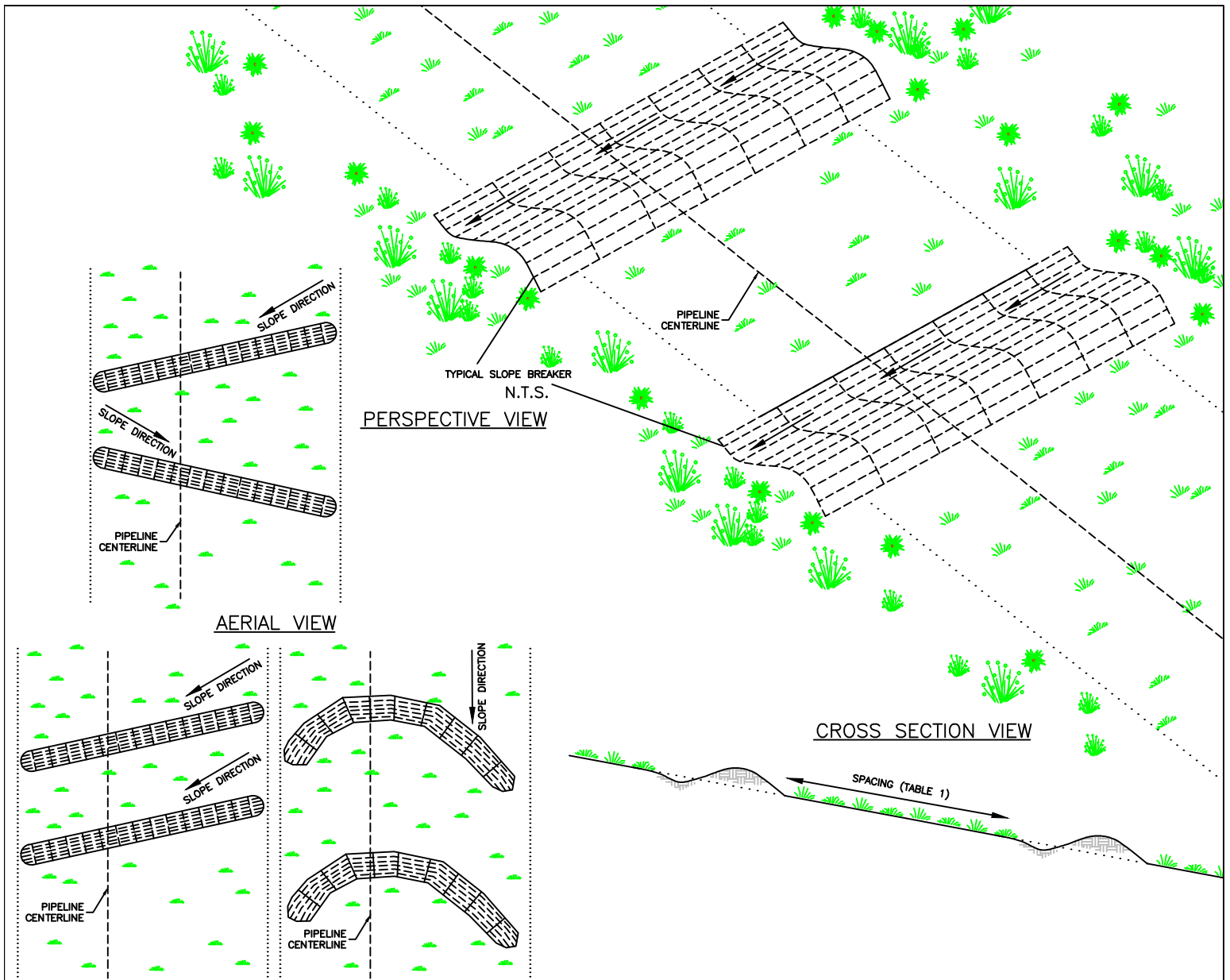
NOTES:

ROLLED EROSION CONTROL PRODUCTS (RECP). TEMPORARY DESIGNED FOR SHORT TERM (UP TO 1 YR).

USE DEGRADABLE MATERIALS (GENERALLY PREFERRED AND MORE PREVALENT) MADE FROM NATURALLY DECOMPOSING MATERIALS. DIFFERENT FIBERS YIELD DIFFERENT CHARACTERISTICS AND BREAKDOWN PATTERNS. RECPS ARE EITHER: PHOTODEGRADABLE – BROKEN DOWN BY SUNLIGHT EXPOSURE OR BIODEGRADABLE – DETERIORATED BY ACTION OF BIOLOGICAL ORGANISMS.

CONSULT PRODUCT DISTRIBUTORS FOR RECOMMENDATIONS REGARDING RECP SELECTION AND PERFORMANCE CRITERIA SUITABLE FOR SITE-SPECIFIC REQUIREMENTS. EVALUATE: DURATION, SLOPE GRADIENT, SOIL TYPE & ERODIBILITY, SEASONAL TEMPERATURE & WEATHER PATTERNS, REGIONAL PRECIPITATION DISTRIBUTION, VEGETATION NEEDS, ESPECIALLY WHERE GERMINATION CONDITIONS ARE NOT OPTIMAL.

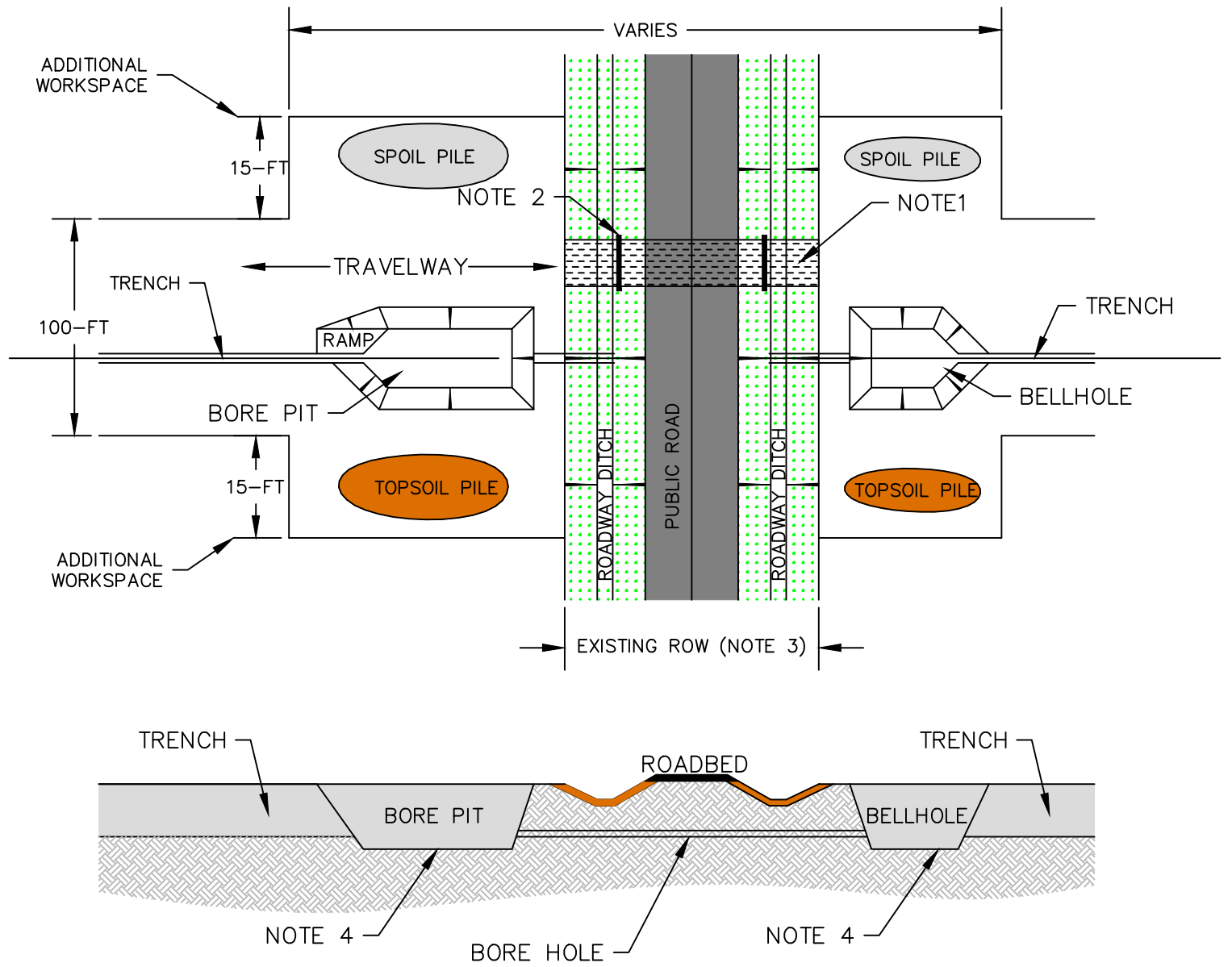
1. ANCHOR RECP A MINIMUM OF 5 FEET ABOVE OR BELOW SLOPE BREAKS ACCORDING TO PRODUCT SPECIFICATIONS.
2. RECP TO MATCH GRADE ALONG ADJACENT RECLAIMED AND SEEDED TEMPORARY ROW. PROVIDE SLOPE BREAKERS ABOVE RECP APPLICATION, WHEN REQUIRED.
3. INSTALLATION TO FOLLOW ON-SITE COMPANY ENVIRONMENTAL INSPECTOR.
4. THIS DETAIL HAS BEEN PREPARED FOR ENVIRONMENTAL REVIEW PURPOSES ONLY.



NOTES:

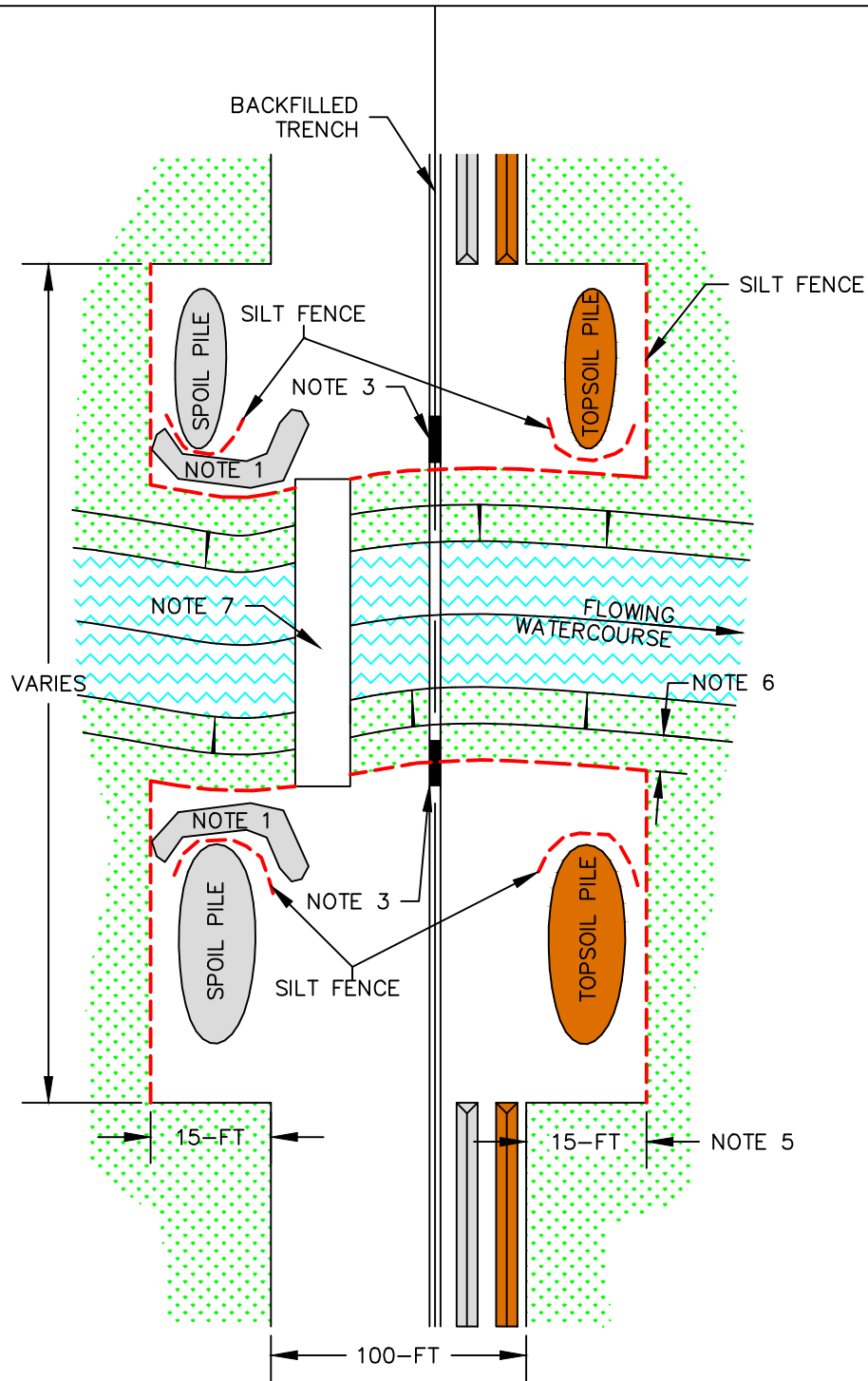
1. INSTALL PERMANENT SLOPE BREAKERS ACCORDING TO THE SPACING IN TABLE 1.
2. IF THE LENGTH OF THE SLOPE IS LESS THAN THE DISTANCE OF THE REQUIRED SPACING IN TABLE 1, NO SLOPE BREAKERS ARE REQUIRED UNLESS THE SLOPE IS ABOVE A WATERCOURSE; IN THIS CASE ONE LARGE BREAKER SHOULD BE INSTALLED AT THE TOE OF THE SLOPE.
3. DO NOT INSTALL PERMANENT SLOPE BREAKERS ON AGRICULTURAL LAND UNLESS SPECIFICALLY REQUESTED BY THE LANDOWNER.
4. ALIGNMENT OF THE SLOPE BREAKERS WILL BE AT THE DISCRETION OF THE ENVIRONMENTAL INSPECTOR.
5. THIS DETAIL HAS BEEN PREPARED FOR ENVIRONMENTAL REVIEW PURPOSES ONLY.

TABLE 1	
SLOPE (%)	SPACING (FT)
5-15%	300 FT
>15-30%	200 FT
>30%	75 FT



NOTES:

1. INSTALL TEMPORARY CROSSING OVER ROADWAY AND BORROW PITS. PROTECTIVE LAYER SHALL BE USED ON PAVED ROAD SURFACES TO PREVENT DAMAGE FROM TRACKED EQUIPMENT.
2. IF NECESSARY, INSTALL TEMPORARY CULVERT AND FILL IN BORROW PIT.
3. MAINTAIN EXISTING VEGETATION IN BORROW PITS. STRIPPING SHOULD BE LIMITED TO THE AREA OF TEMPORARY CROSSING. PROVIDE SEDIMENT CONTROLS IN ACCORDANCE WITH SWPPP.
4. COVER BELOW ROADWAY AND BORROW PITS.
5. THIS DETAIL HAS BEEN PREPARED FOR ENVIRONMENTAL REVIEW PURPOSES ONLY.



NOTES:

THIS METHOD APPLIES TO FLOWING WATERWAYS.

1. TOPSOIL AND SPOIL SHOULD BE STRIPPED FROM THE TRENCHLINE ONLY IN WETLAND AND RIPARIAN AREAS WHERE THE OPEN CUT METHOD IS APPROPRIATE. STOCKPILE WET MATERIALS IN TEMPORARY WORK AREAS WITHIN SEDIMENT CONTAINMENT BERM CONSTRUCTED FROM SUBSOILS OBTAINED FROM THE STRIPPED ROW.
2. NO HEAVY SILT LADEN WATER SHALL BE DISCHARGED TO THE WATERBODY. USE STRAW BALE DEWATERING STRUCTURES TO TREAT WATER PUMPED FROM THE TRENCH.
3. DITCH PLUGS MUST REMAIN INPLACE TO SEPARATE THE MAINLINE DITCH FROM THE WATERBODY CROSSING UNTIL BACKFILL IS COMPLETE. CONTRACTOR SHALL EXCAVATE TRENCH IN CROSSING AS EXPEDITIOUSLY AS POSSIBLE AND INSTALL PIPE TO REDUCE DURATION OF WORK IN WATERBODY. TRENCH PLUGS SHALL BE INSTALLED UP SLOPE FROM SLOPE BREAKERS ADJACENT TO CROSSING.
4. CONTRACTOR SHALL RESTORE WATERBODY CHANNEL AND BANKS TO PRECONSTRUCTION CONTOUR, UNLESS OTHERWISE APPROVED BY THE PROJECT ENGINEER. INSTALL EROSION CONTROLS AT CROSSING AS PROVIDED IN THE SWPPP. MAINTAIN STORMWATER BMPS UNTIL ADJACENT ROW IS STABILIZED.
5. PROVIDE ADDITIONAL WORKSPACE WHEN INDICATED ON THE CONSTRUCTION PLANS FOR STORAGE OF TOPSOIL AND SPOIL EXCAVATED FROM THE CROSSING. DO NOT STOCKPILE TOPSOIL OR SPOIL WITHIN THE WATERWAY.
6. PROVIDE A 10-FT BUFFER BETWEEN STRIPPED AREA AND TOP OF STREAM BANK. STRIPPING WITHIN WATERCOURSE SHOULD BE LIMITED TO THE AREA OF TEMPORARY CROSSING. PROVIDE SEDIMENT CONTROLS WITHIN THE WATERCOURSE IN ACCORDANCE WITH SWPPP.
7. INSTALL TEMPORARY CROSSING (OPTIONAL) OVER WATERWAY AS REQUIRED FOR SITE SPECIFIC CONDITIONS.
8. THIS DETAIL HAS BEEN PREPARED FOR ENVIRONMENTAL REVIEW PURPOSES ONLY.

**VANTAGE WEST SPUR PIPELINE PROJECT
ENVIRO. TYPICAL 13 - FLOWING WATERCOURSE CROSSING**

KC HARVEY
ENVIRONMENTAL, LLC

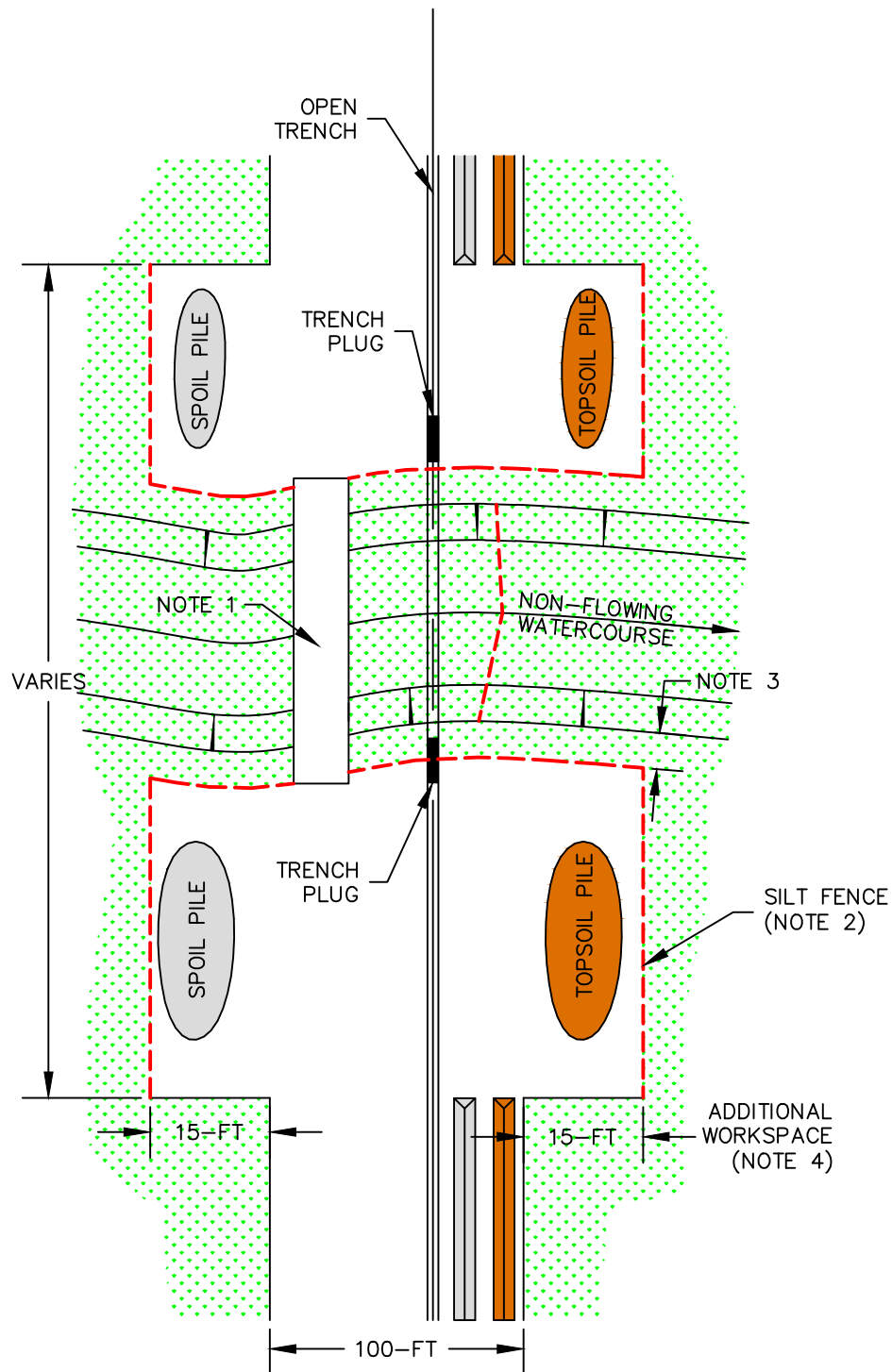
VANTAGE
PIPELINE US LP

FILE: VANTAGE_WESTSPUR_EPP_DETAILS_043015.DWG

DATE: APRIL 2015

REV. 0

SCALE: NTS



NOTES:

THIS METHOD APPLIES TO NON-FLOWING WATERWAYS.

1. INSTALL TEMPORARY CROSSING (OPTIONAL) OVER WATERWAY AS REQUIRED FOR SITE SPECIFIC CONDITIONS.
2. INSTALL SILT FENCE OR OTHER EROSION CONTROLS IN ACCORDANCE WITH THE SWPPP. SEDIMENT CONTROLS TO BE INSTALLED ALONG STRIPPING LIMITS TO BE MAINTAINED UNTIL CONSTRUCTION OF THE CROSSING IS COMPLETED. UPON COMPLETION OF CROSSING RECLAMATION REINSTALL AND MAINTAIN SEDIMENT AND EROSION CONTROLS UNTIL CROSSING AREA IS STABILIZED.
3. PROVIDE A 10-FT BUFFER BETWEEN STRIPPED AREA AND TOP OF STREAM BANK. STRIPPING WITHIN WATERCOURSE SHOULD BE LIMITED TO THE AREA OF TEMPORARY CROSSING. PROVIDE SEDIMENT CONTROLS WITHIN THE WATERCOURSE IN ACCORDANCE WITH SWPPP.
4. PROVIDE ADDITIONAL WORKSPACE WHEN INDICATED ON THE CONSTRUCTION PLANS FOR STORAGE OF TOPSOIL AND SPOIL EXCAVATED FROM THE CROSSING. DO NOT STOCKPILE TOPSOIL OR SPOIL WITHIN THE WATERWAY.
5. THIS DETAIL HAS BEEN PREPARED FOR ENVIRONMENTAL REVIEW PURPOSES ONLY.

**VANTAGE WEST SPUR PIPELINE PROJECT
ENVIRO. TYPICAL 14 - NON-FLOWING WATERCOURSE X-ING**

KC HARVEY
ENVIRONMENTAL, LLC

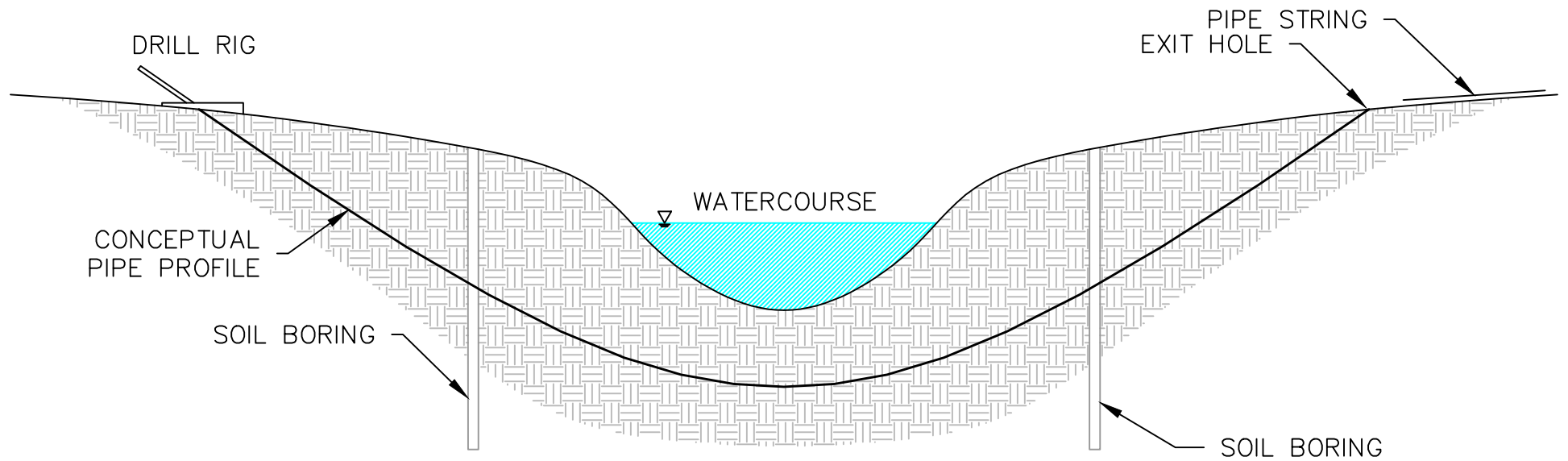
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DATE: APRIL 2015

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NOTES:

USE DIRECTIONAL BORING METHOD FOR WATERCOURSES AND WETLANDS WHERE OPEN CUT METHOD IS NOT APPROVED. PIPELINE WOULD BE INSTALLED AT CROSSING BY DRILLING A PILOT HOLE, REAMING THE HOLE AND PIPE PULL BACK.

1. CONTRACTOR SHALL PERFORM GEOTECHNICAL INVESTIGATION TO CHARACTERIZE SUBSURFACE CONDITIONS AND DETERMINE FEASIBILITY FOR DIRECTIONAL BORING METHOD. DIRECTIONAL BORING MAY BE PROBLEMATIC IF UNCONSOLIDATED GRAVELS OCCUR.
2. CONTRACTOR SHALL PROVIDE BORE LOCATION PLAN TO PROJECT ENGINEER FOR APPROVAL. THE PLAN SHOULD PROVIDE LOCATIONS OF MUD CONTAINMENT AND STORMWATER BMPS. PLAN SHOULD IDENTIFY EQUIPMENT AND CONTINGENCIES TO CONTAIN MUD IN THE EVENT OF A RELEASE.
3. MAINTAIN A BUFFER ZONE (10-FT MIN.) BETWEEN BOTH THE BORING LOCATION AND EXIT LOCATIONS AND THE STREAMBANK. PROVIDE STORMWATER BMPS IN ACCORDANCE WITH THE SWPPP AS APPROVED. DO NOT STRIP TOPSOIL OR VEGETATION FROM THE BUFFER ZONE.
4. MANAGE DRILL MUD TO PREVENT DISCHARGE TO WATERCOURSE. PROVIDE MUD STORAGE IN TANKS OR PITS, FULL TIME MONITORING SHOULD BE PROVIDED TO DETECT RELEASE TO STREAM. DISCONTINUE BORING IF DISCHARGE IS DETECTED. DRILL MUD SHOULD CONSIST OF BENTONITE WITHOUT ANY ADDITIVES, UNLESS APPROVED.
5. THIS DETAIL HAS BEEN PREPARED FOR ENVIRONMENTAL REVIEW PURPOSES ONLY.
6. THIS BORING METHOD MAY BE APPLIED IN OTHER SITUATIONS WHERE THE OPEN CUT METHOD IS NOT APPROVED (E.G., GRASSLAND EASEMENTS, EXCLUSION ZONES).

**VANTAGE WEST SPUR PIPELINE PROJECT
ENVIRO. TYPICAL 15 - BORING UNDER A WATERCOURSE**

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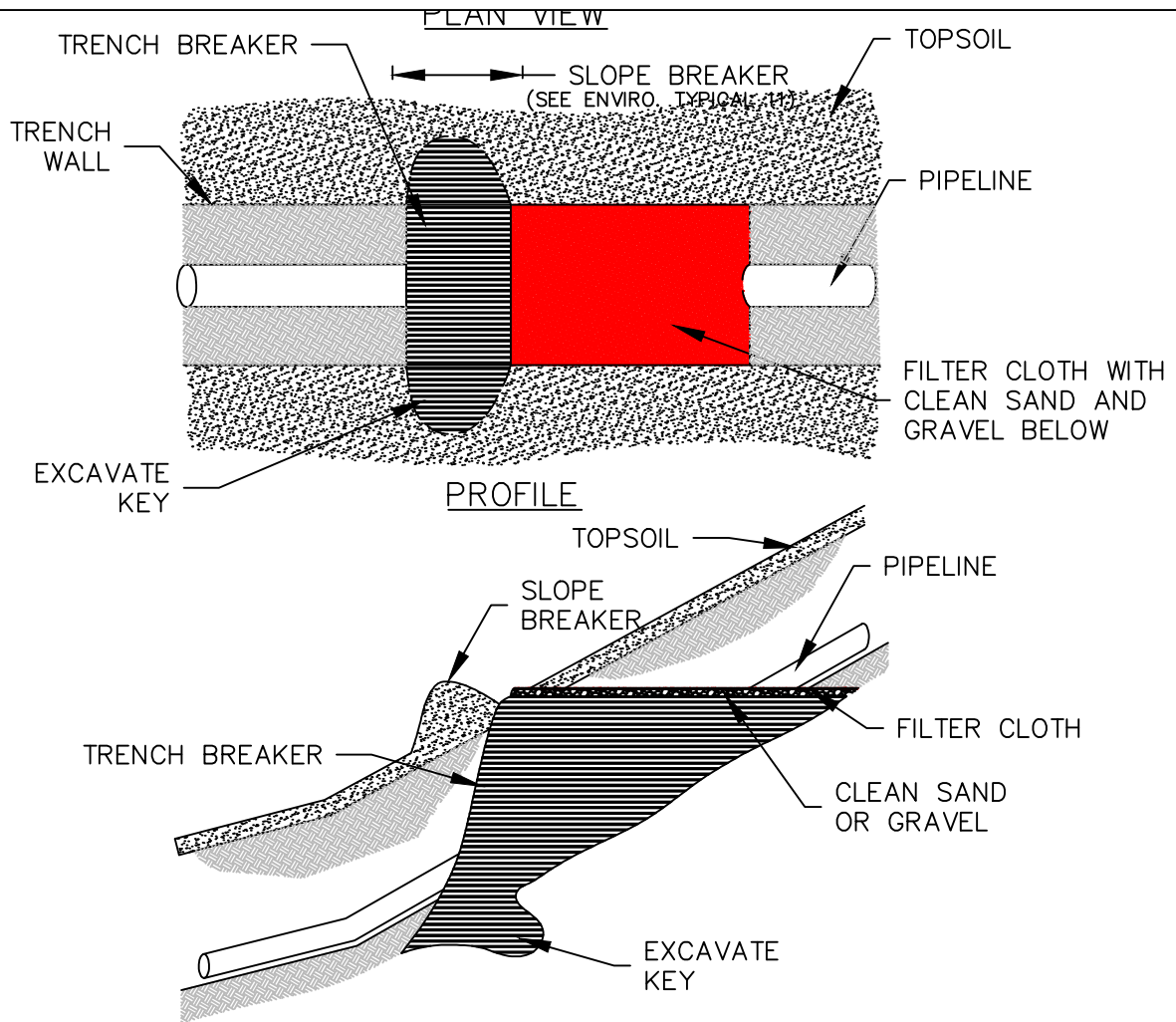
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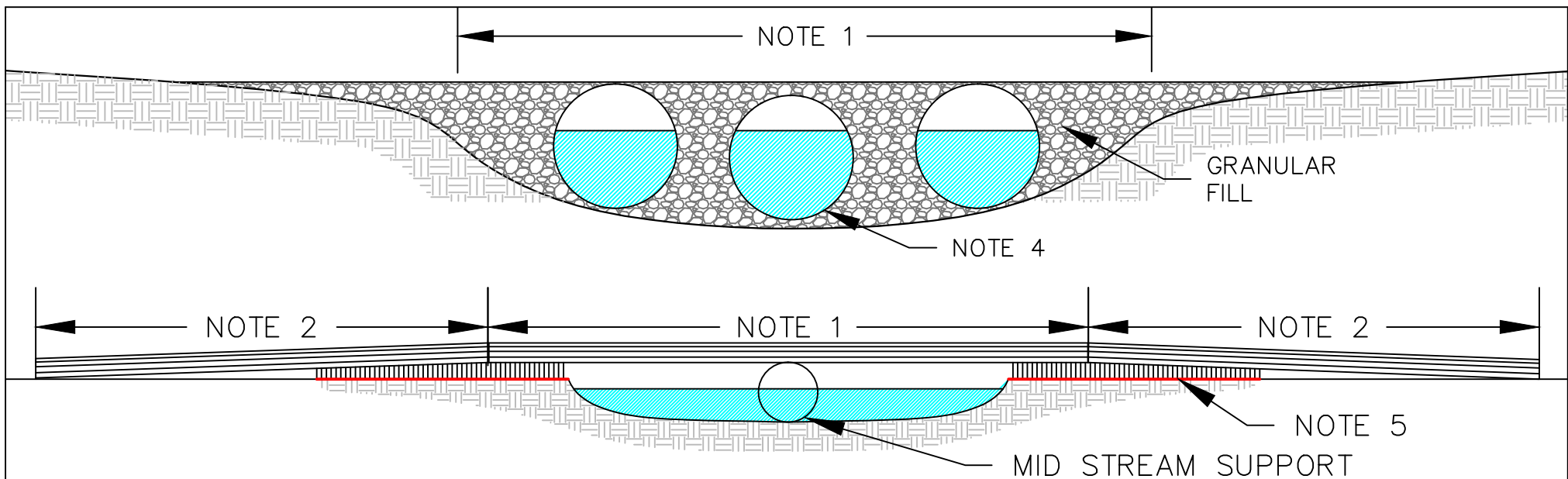
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SCALE: NTS



NOTES:

1. INSTALL TRENCH BREAKER ON MODERATE/STEEP SLOPES TO CONTROL SEEPAGE CHANNELING ALONG THE TRENCH LINE AND PREVENT EROSION OF PADDING AND BACKFILL MATERIAL.
2. TRENCH BREAKERS TO BE CONSTRUCTED OF EITHER SANDBAGS (MIXTURE OF SAND AND CEMENT 6:1), BENTONITE, POLYURETHANE FOAM, OR EQUIVALENT MATERIALS TO PROVIDE A BARRIER TO WATER SEEPAGE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
3. EXCAVATE KEYS INTO TRENCH BOTTOM AND SIDES TO THE EXTENT FEASIBLE FOR ADDED STABILITY.
4. THE DRAWINGS ABOVE PROVIDE A SCHEMATIC REPRESENTATION OF TRENCH BREAKER INSTALLATION. FINAL LOCATIONS AND DESIGN OF TRENCH BREAKERS WILL BE DETERMINED BY VANTAGE'S ENVIRONMENTAL INSPECTOR BASED ON SITE-SPECIFIC CONDITIONS AT THE TIME OF CONSTRUCTION.
5. INSTALL TRENCH BREAKER AS INDICATED IN THE ENVIRONMENTAL TYPICAL ABOVE TO SLOPE DOWNHILL TO ALLOW DRAINAGE TO THE SLOPE BREAKER AS ILLUSTRATED IN ENVIRONMENTAL TYPICAL 11..
6. INSTALL A PREFABRICATED DRAIN OR A LAYER OF SAND OR GRAVEL COVERED WITH FILTER CLOTH OVER THE BREAKER.
7. INSTALL TRENCH BREAKERS AT LOCATIONS ALONG THE TRENCH WHERE THE PROFILE IS 5% SLOPE OR GREATER. INSTALL TRENCH BREAKERS AT LOCATIONS AT THE BASE OF SLOPE ADJACENT TO WATERBODIES AND WETLANDS WHERE NEEDED TO AVOID DRAINING OF WETLANDS INTO TRENCH.
8. FINAL LOCATIONS FOR TRENCH BREAKERS TO BE DETERMINED BY PROJECT ENGINEER BASED ON SITE SPECIFIC CONDITIONS. TYPICAL SPACING REQUIREMENT ARE AS FOLLOWS:
 - 5 TO 15 % SLOPE – MINIMUM 300 FT SPACING
 - 15 TO 30 % SLOPE – MINIMUM 200 FT. SPACING
 - GREATER THAN 30 % SLOPE – MINIMUM 75 FT SPACING.
9. BACKFILL DOWNSLOPE SIDE OF TRENCH BREAKER PRIOR TO PLACING FILL ON UPSLOPE SIDE OF TRENCH BREAKER.
10. THIS DETAIL HAS BEEN PREPARED FOR ENVIRONMENTAL REVIEW PURPOSES ONLY.



NOTES:

1. BRIDGE MUST SPAN FROM TOP OF BANK TO TOP OF BANK. CONSTRUCT BRIDGE IN ACCORDANCE WITH REQUIREMENTS IN CONSTRUCTION DOCUMENTS. THE CROSSING MAY BE CONSTRUCTED WITH EITHER STRUCTURAL MATTING OR USING IN-STREAM CULVERT AND GRANULAR FILL AS APPROVED BY THE PROJECT ENGINEER. THE BRIDGE MUST BE FIRMLY ANCHORED TO PREVENT IT FROM BEING TRANSPORTED OR ERODED DOWNSTREAM DURING HIGH FLOW.
2. CONSTRUCT BRIDGE RAMPS USING STRUCTURAL MATTING AND MATCH GRADE AT EDGE OF STREAMBANK BUFFER. IF CONDITIONS PROHIBIT WOOD OR METAL RAMPS, EARTHEN RAMPS MAY BE USED AS APPROVED. SUPPORT MUST BE PROVIDED AT TOP OF BANK AND UNDER SPAN IF SETTLEMENT OCCURS.
3. INSPECT BRIDGE OPENING PERIODICALLY AND FOLLOWING RAINFALLS OF OVER ½". REMOVE ANY DEBRIS RESTRICTING FLOW. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE SWPPP.
4. IF GRANULAR FILL IS USED IN CHANNEL PROVIDE ADEQUATE CULVERT CAPACITY FOR ANTICIPATED FLOW. REMOVE ALL FILL FROM CHANNEL AND RESTORE TO ORIGINAL CONTOUR.
5. BRIDGE SUPPORT MATERIAL SHALL BE COMPACT SUBSOIL OR ALTERNATIVE. GEOTECHNICAL CLOTH BUFFER MAY BE REQUIRED TO PREVENT THE ADMIXING OF SOILS, AT THE DIRECTION OF THE ON-SITE ENVIRONMENTAL INSPECTOR.
6. THIS DETAIL HAS BEEN PREPARED FOR ENVIRONMENTAL REVIEW PURPOSES ONLY.

**VANTAGE WEST SPUR PIPELINE PROJECT
ENVIRO. TYPICAL 17 - TYPICAL BRIDGE DETAILS**

KC HARVEY
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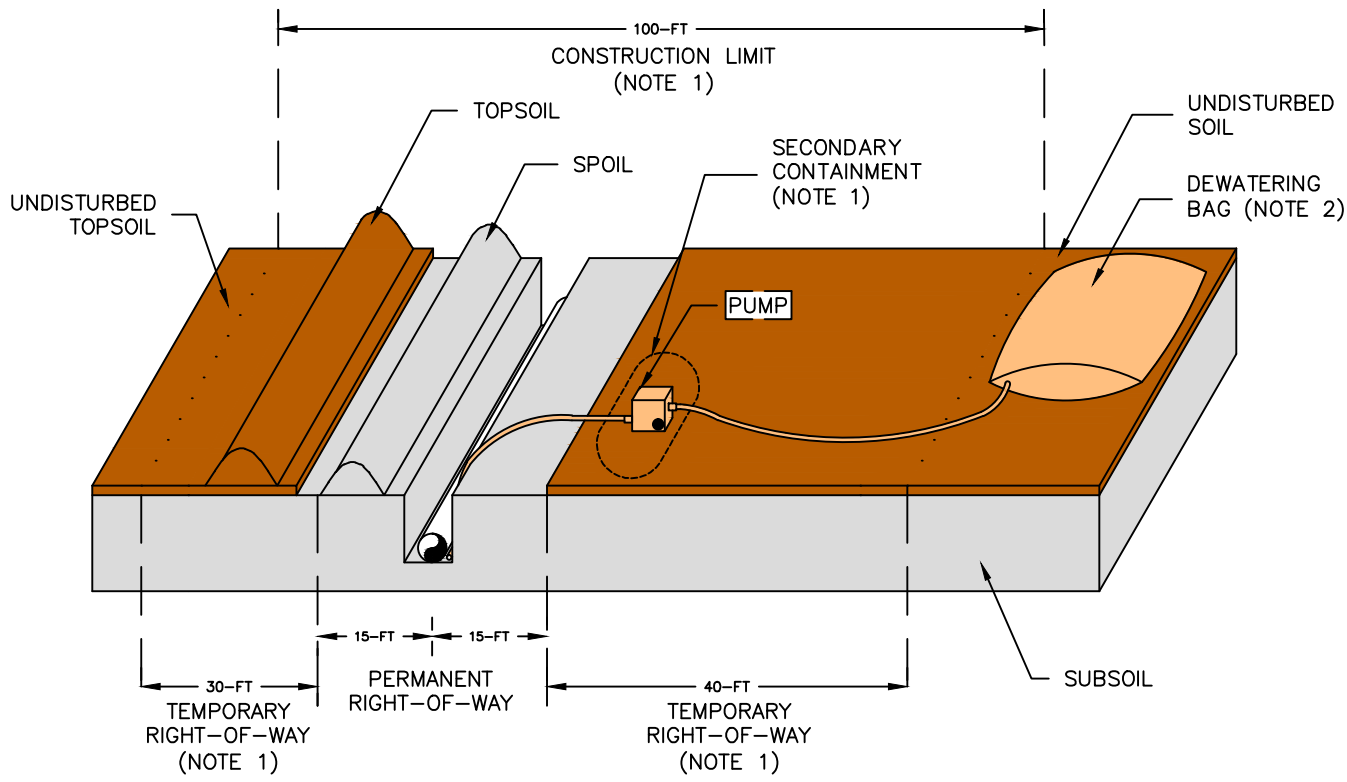
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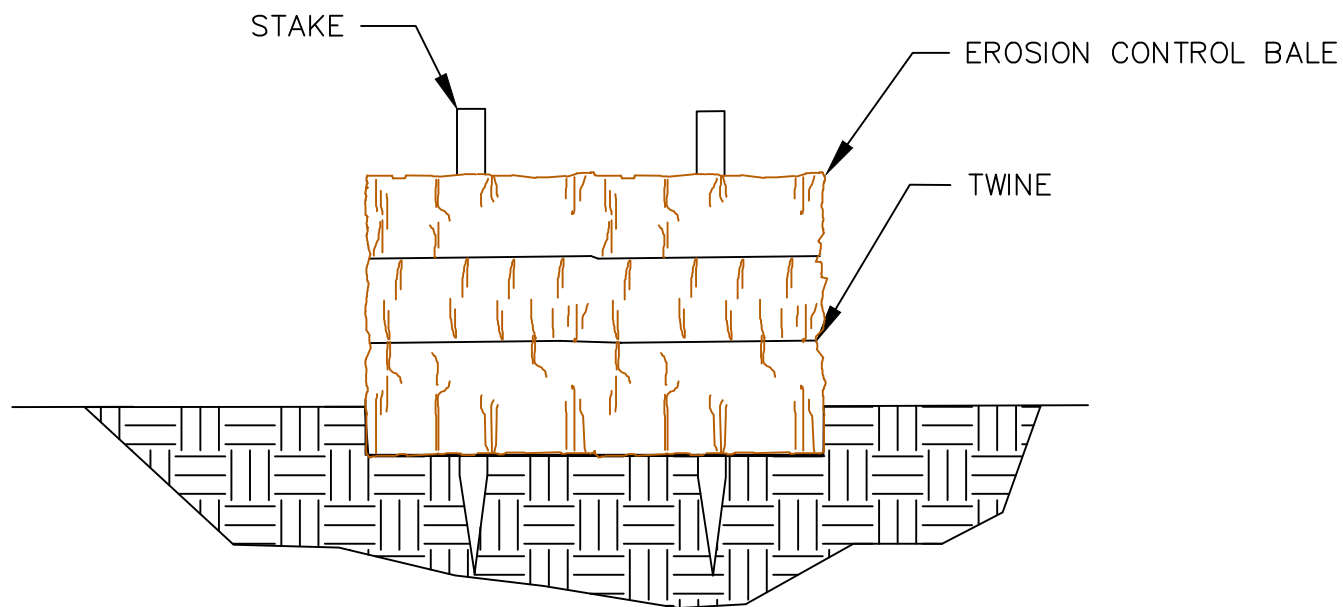
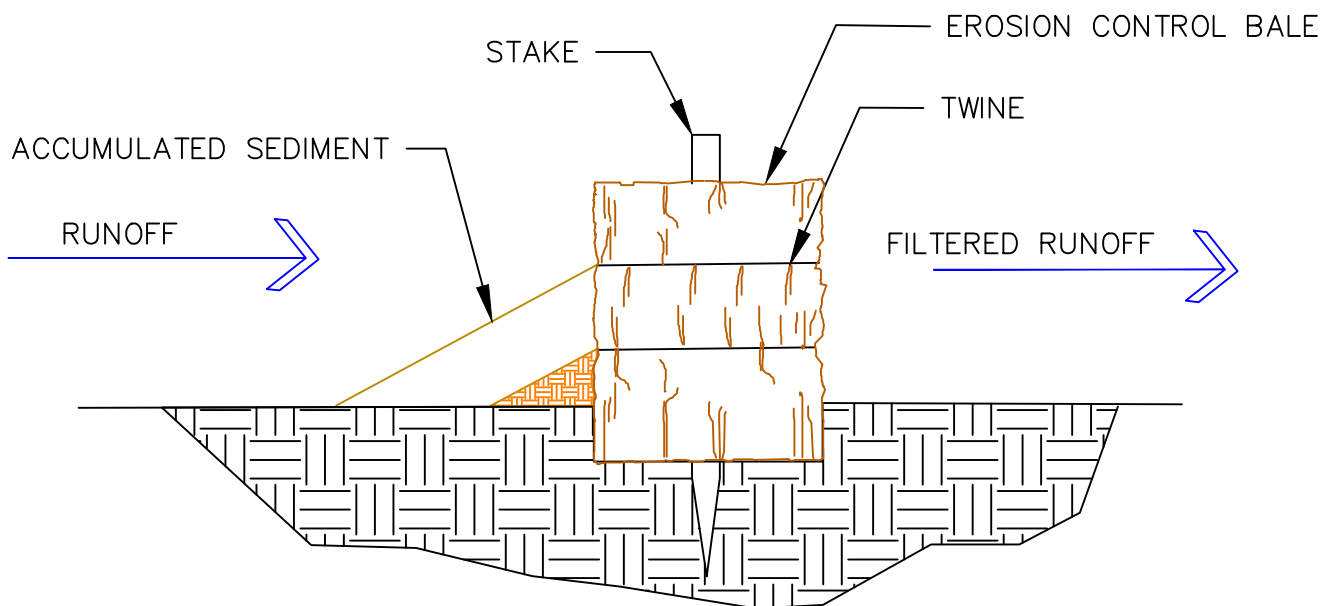
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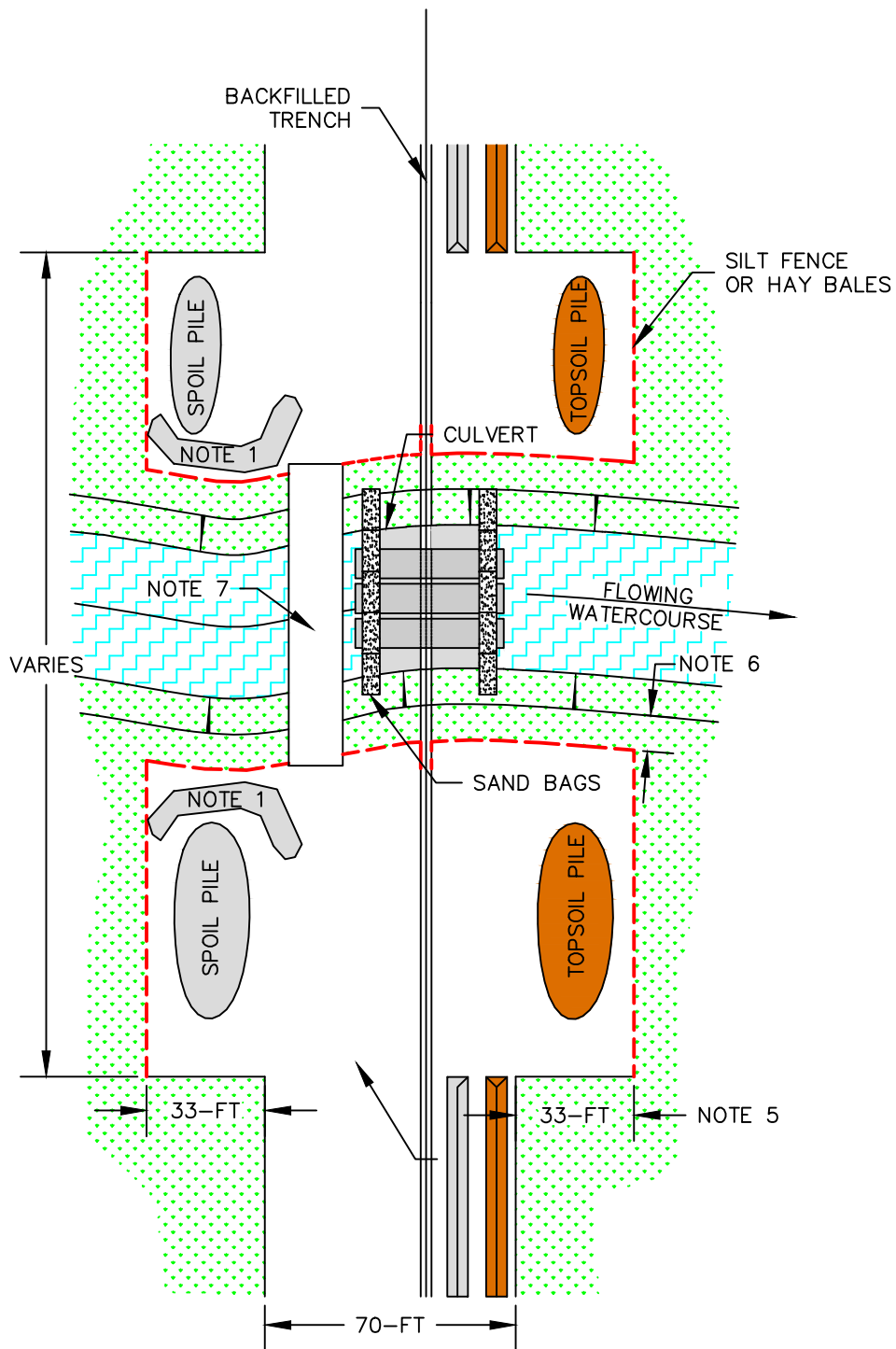


- NOTES:**
1. WATER PUMPS SHALL BE CONTAINED WITHIN SECONDARY CONTAINMENT DEVICES WHILE WORKING IN WETLAND AREAS.
 2. WATER DISCHARGES SHOULD BE DIRECTED TO WELL VEGETATED UPLAND AREAS.
 3. THIS DETAIL HAS BEEN PREPARED FOR ENVIRONMENTAL REVIEW PURPOSES ONLY.



NOTES:

1. REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES ONE HALF OF THE EXPOSED BALE HEIGHT.
2. CONSTRUCT BALE DITCH CHECKS OF WHEAT STRAW, OAT STRAW, PRAIRIE HAY OR BROMEGRASS HAY THAT IS FREE OF NOXIOUS WEEDS.
3. STAKES USED TO ANCHOR THE BALES SHOULD BE MADE OF A HARDWOOD MATERIAL WITH MINIMUM DIMENSIONS: 2 INCHES SQUARE BY 4 FEET LONG.
4. BIODEGRADABLE TWINE SHOULD BE USED TO BIND BALES.
5. THIS DETAIL HAS BEEN PREPARED FOR ENVIRONMENTAL REVIEW PURPOSES ONLY.



NOTES:

THIS METHOD APPLIES TO FLOWING WATERWAYS.

1. TOPSOIL AND SPOIL SHOULD BE STRIPPED FROM THE TRENCHLINE ONLY IN WETLAND AND RIPARIAN AREAS WHERE THE OPEN CUT METHOD IS APPROPRIATE. STOCKPILE WET MATERIALS IN TEMPORARY WORK AREA WITHIN SEDIMENT CONTAINMENT BERM CONSTRUCTED FROM SUBSOILS OBTAINED FROM THE STRIPPED ROW.
2. USE SANDBAGS TO RESTRICT WATER FLOW THROUGH CULVERTS.
3. NO HEAVY SILT LADEN WATER SHALL BE DISCHARGED TO THE WATERBODY. USE A STRAWBALE DEWATERING STRUCTURE OR A DEWATERING BAG TO TREAT WATER PUMPED FROM THE TRENCH.
4. CONTRACTOR SHALL RESTORE WATERBODY CHANNEL AND BANKS TO PRECONSTRUCTION CONTOUR, UNLESS OTHERWISE APPROVED BY THE PROJECT ENGINEER. INSTALL EROSION CONTROLS AT CROSSING AS PROVIDED IN THE SWPPP. MAINTAIN STORMWATER BMPS UNTIL ADJACENT ROW IS STABILIZED.
5. PROVIDE ADDITIONAL WORKSPACE WHEN INDICATED ON THE CONSTRUCTION PLANS FOR STORAGE OF TOPSOIL AND SPOIL EXCAVATED FROM THE CROSSING. DO NOT STOCKPILE TOPSOIL OR SPOIL WITHIN THE WATERWAY.
6. PROVIDE A 10-FT BUFFER BETWEEN STRIPPED AREA AND TOP OF STREAM BANK. STRIPPING WITHIN WATERCOURSE SHOULD BE LIMITED TO THE AREA OF TEMPORARY CROSSING. PROVIDE SEDIMENT CONTROLS WITHIN THE WATERCOURSE IN ACCORDANCE WITH SWPPP.
7. INSTALL TEMPORARY CROSSING (OPTIONAL) OVER WATERWAY AS REQUIRED FOR SITE SPECIFIC CONDITIONS.
8. THIS DETAIL HAS BEEN PREPARED FOR ENVIRONMENTAL REVIEW PURPOSES ONLY.

**VANTAGE WEST SPUR PIPELINE PROJECT
ENVIRO. TYPICAL 20 - FLUME METHOD**

KC HARVEY
ENVIRONMENTAL, LLC

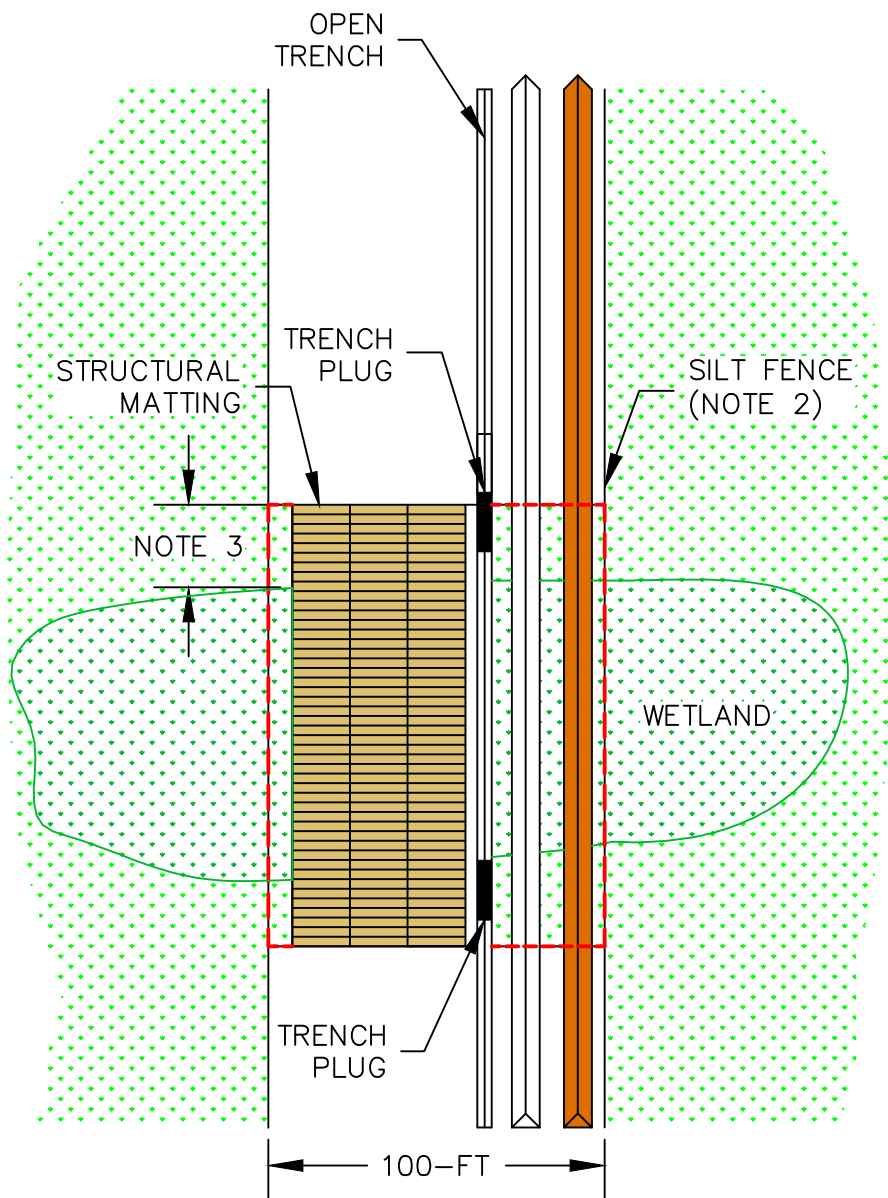
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NOTES:

THIS METHOD APPLIES TO WETLAND AREAS WHERE THE OPEN CUT METHOD IS APPROPRIATE.

1. INSTALL STRUCTURAL MATTING OVER WETLAND AREAS AS REQUIRED FOR SITE-SPECIFIC CONDITIONS.
2. FIELD LOCATE STORMWATER RUNOFF AREAS AND INSTALL SILT FENCE OR OTHER EROSION CONTROLS IN ACCORDANCE WITH THE SWPPP. SEDIMENT CONTROLS TO BE INSTALLED ALONG STRIPPING LIMITS ARE TO BE MAINTAINED UNTIL CONSTRUCTION OF THE CROSSING IS COMPLETED. UPON COMPLETION OF CROSSING RECLAMATION, REINSTALL AND MAINTAIN SEDIMENT AND EROSION CONTROLS UNTIL CROSSING AREA IS STABILIZED.
3. PROVIDE A 10-FT BUFFER BETWEEN STRIPPED AREA AND WETLAND.
4. INSTALL SEDIMENT CONTROLS IN ACCORDANCE WITH SWPPP.
5. PROVIDE ADDITIONAL WORKSPACE WHEN INDICATED ON THE CONSTRUCTION PLANS FOR STORAGE OF TOPSOIL AND SPOIL EXCAVATED FROM THE CROSSING. DO NOT STOCKPILE TOPSOIL OR SPOIL WITHIN THE WETLAND AREA.
6. SEE DETAIL 5 OR 7 FOR STRIPPING REQUIREMENTS IN WETLAND AREAS WHERE THE OPEN CUT METHOD HAS BEEN APPROVED.
7. THIS DETAIL HAS BEEN PREPARED FOR ENVIRONMENTAL REVIEW PURPOSES ONLY.

**VANTAGE WEST SPUR PIPELINE PROJECT
ENVIRO. TYPICAL 21 - WETLAND CROSSING**

KC HARVEY
ENVIRONMENTAL, LLC

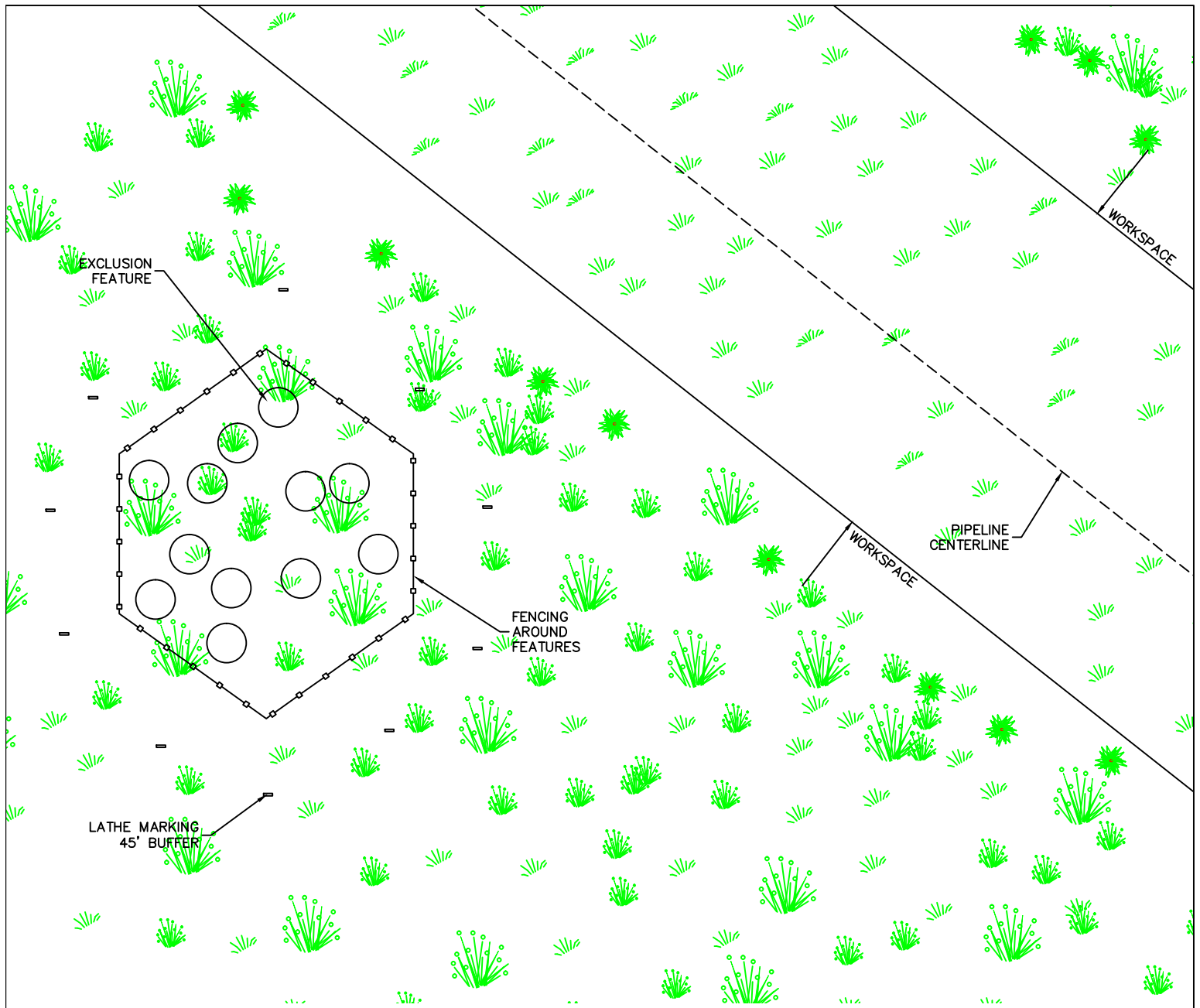
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NOTES:

1. FENCING WILL BE PLACED AND MAINTAINED BETWEEN THE EXCLUSION FEATURES AND CONSTRUCTION ACTIVITY THROUGHOUT CONSTRUCTION.
2. ENVIRONMENTAL INSPECTOR TO BE PRESENT WHEN FENCE IS PLACED.
3. NO GROUND DISTURBANCE, EQUIPMENT TRAFFIC, OR FOOT TRAFFIC BEYOND THE LIMITS OF THE FENCE.