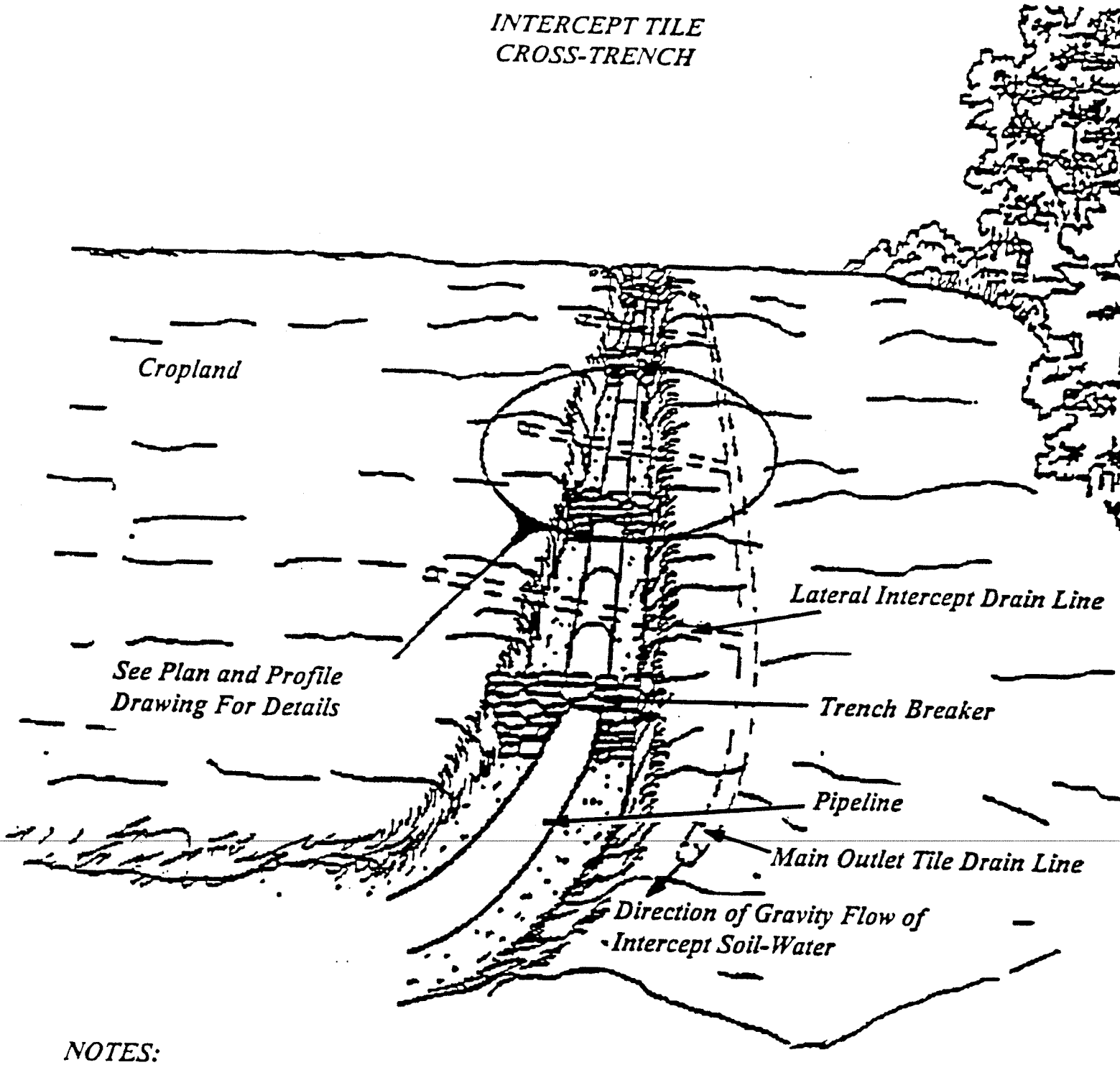
INTERCEPT TILE
CROSS-TRENCH

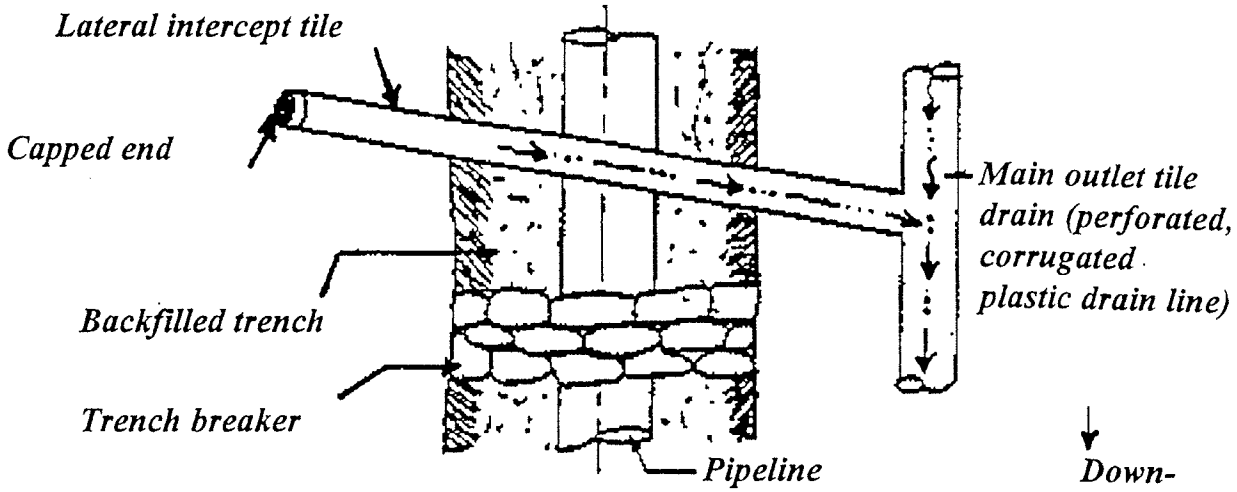


NOTES:

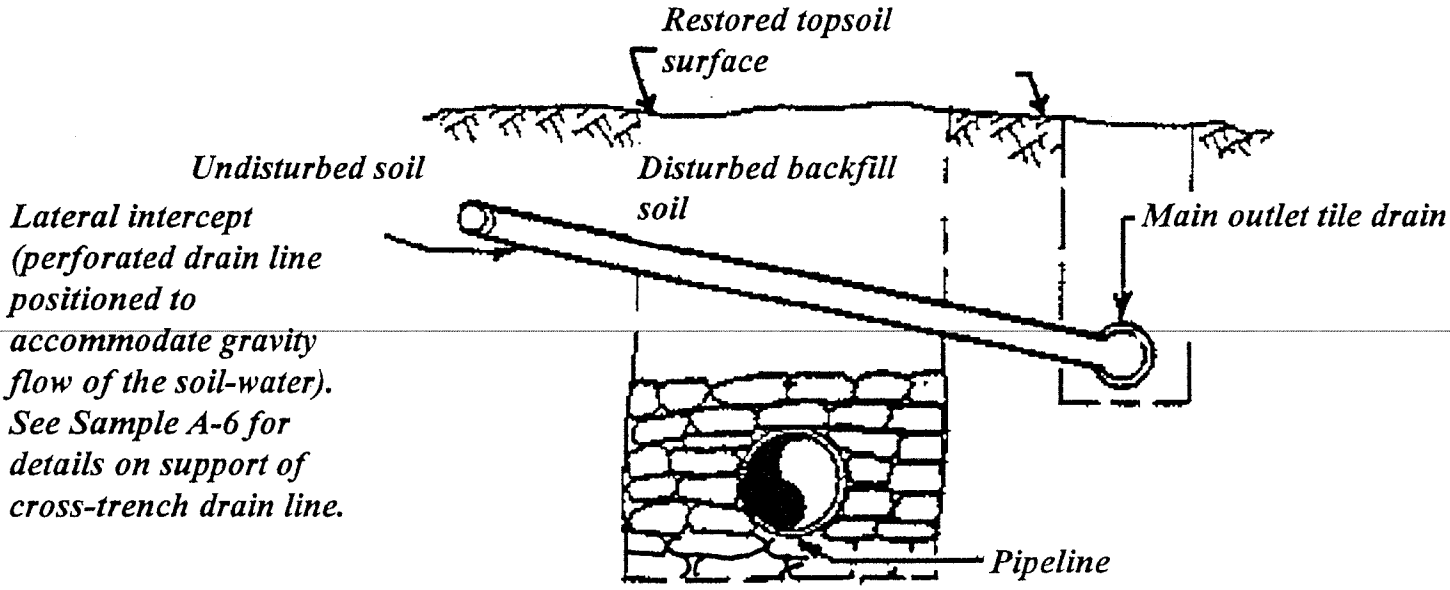
1. *Cross trench drainage may be utilized in sloping areas or in agricultural cropland areas where required.*
2. *Final alignment of tile lines to be based on outletting for gravity flow.*
3. *See SAMPLE A-2 drawing for plan and profile.*

SAMPLE
A-1

INTERCEPT TILE
CROSS-TRENCH



PLAN - SECTION A-A



Lateral intercept (perforated drain line positioned to accommodate gravity flow of the soil-water). See Sample A-6 for details on support of cross-trench drain line.

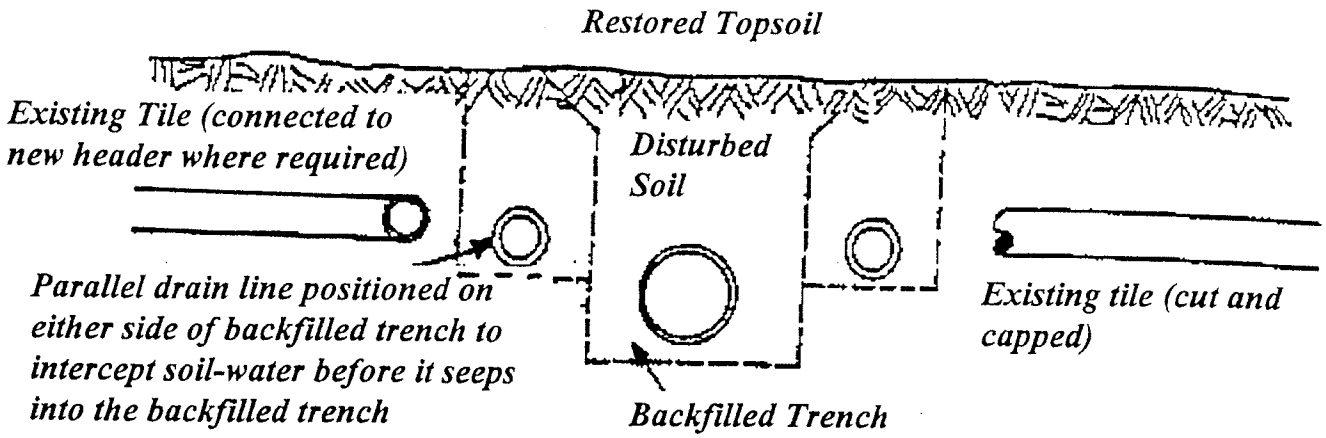
PROFILE - SECTION A-A

NOTES:

1. *Trench breakers prevent gullying erosion while trench is open and inhibit water piping and water blowouts down the course of the pipeline after backfilling.*
2. *Intercepting drain lines absorb the soil-water seepages which drain naturally from the undisturbed soil profile into the disturbed backfill soil material of the trench. The intercept drain lines help prevent saturated soil conditions.*
3. *Agricultural drainage may require either or both cross trench drainage and parallel trench drainage for controlling soil saturation.*

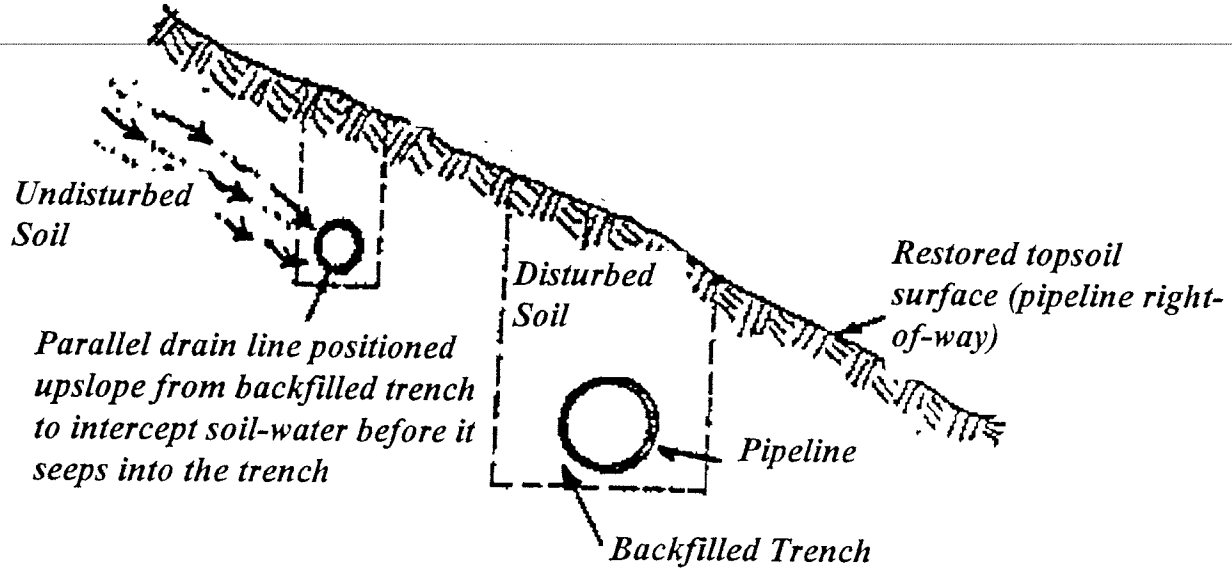
INTERCEPT TILE

PARALLEL



NOTE:

1. *Parallel drain tile installation to be approved for site specific agricultural soils where repair of exisiting cross tiles would be less effective.*

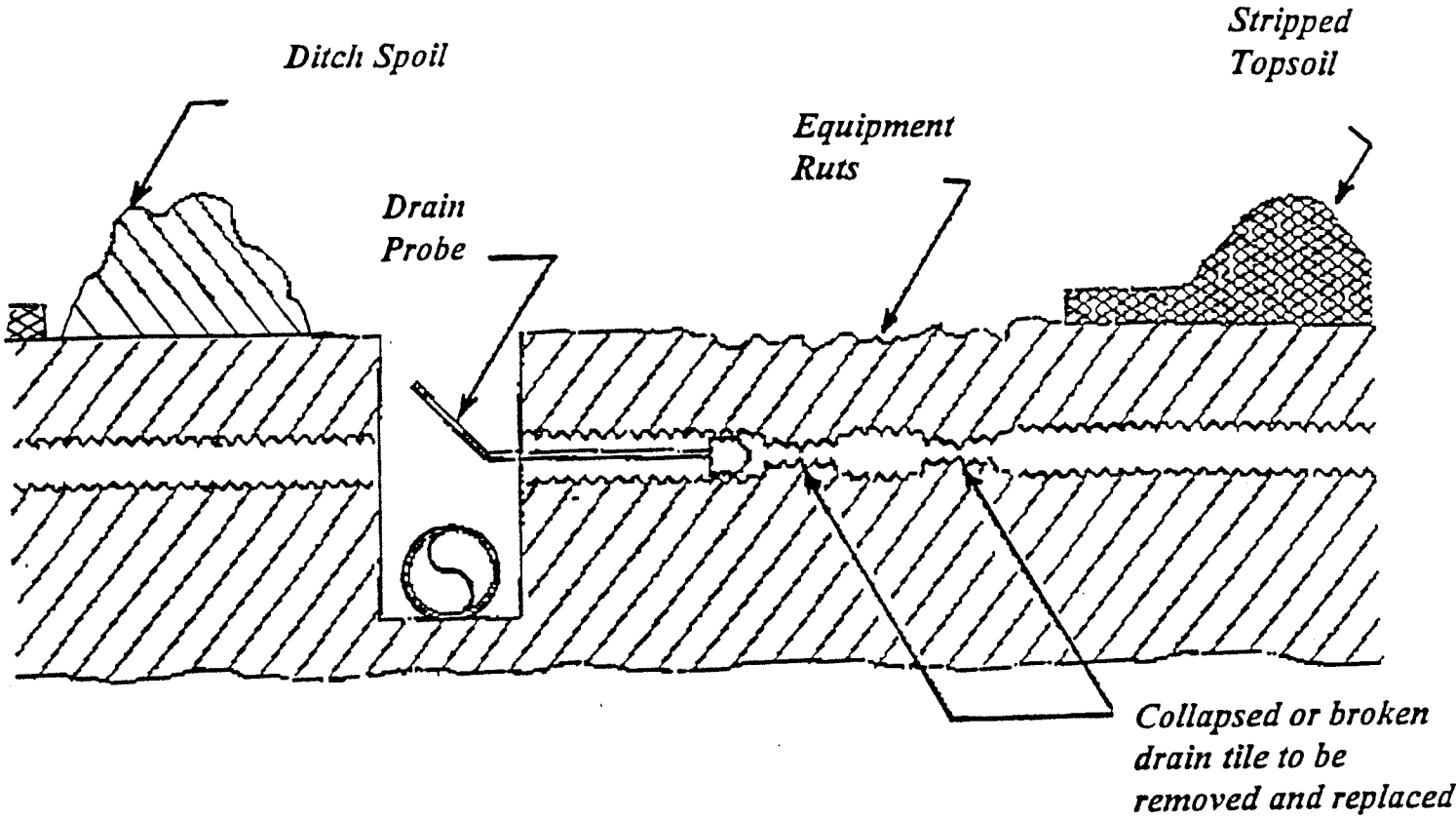


NOTE:

1. *Parallel drain tile installation to be approved for site specific locations based on soil characteristics and slope conditions.*

SAMPLE

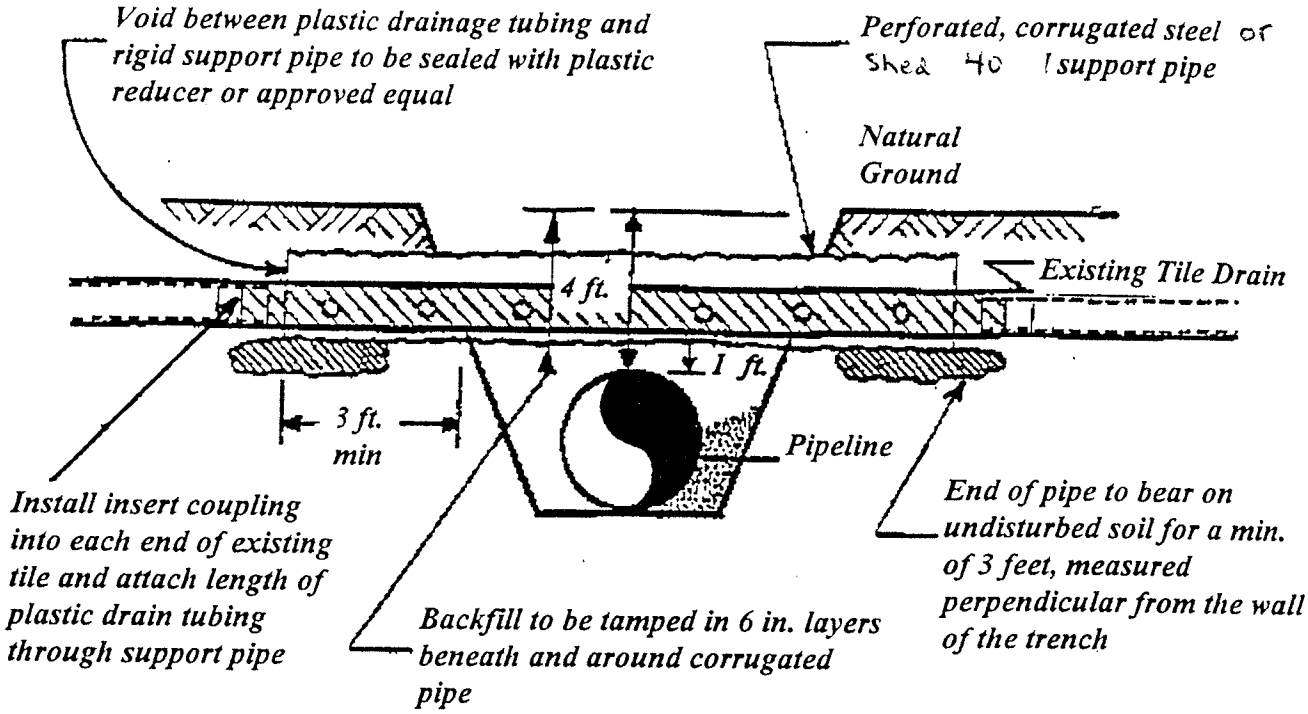
DRAIN TILE PROBE



NOTES:

1. *Clean out drain tiles to the permanent R-O-W limit on the working side.*
2. *Replace damaged tiles and repair tiles and joints that require work and are within the areas of construction activities.*

REPAIR OF SEVERED TILE LINE



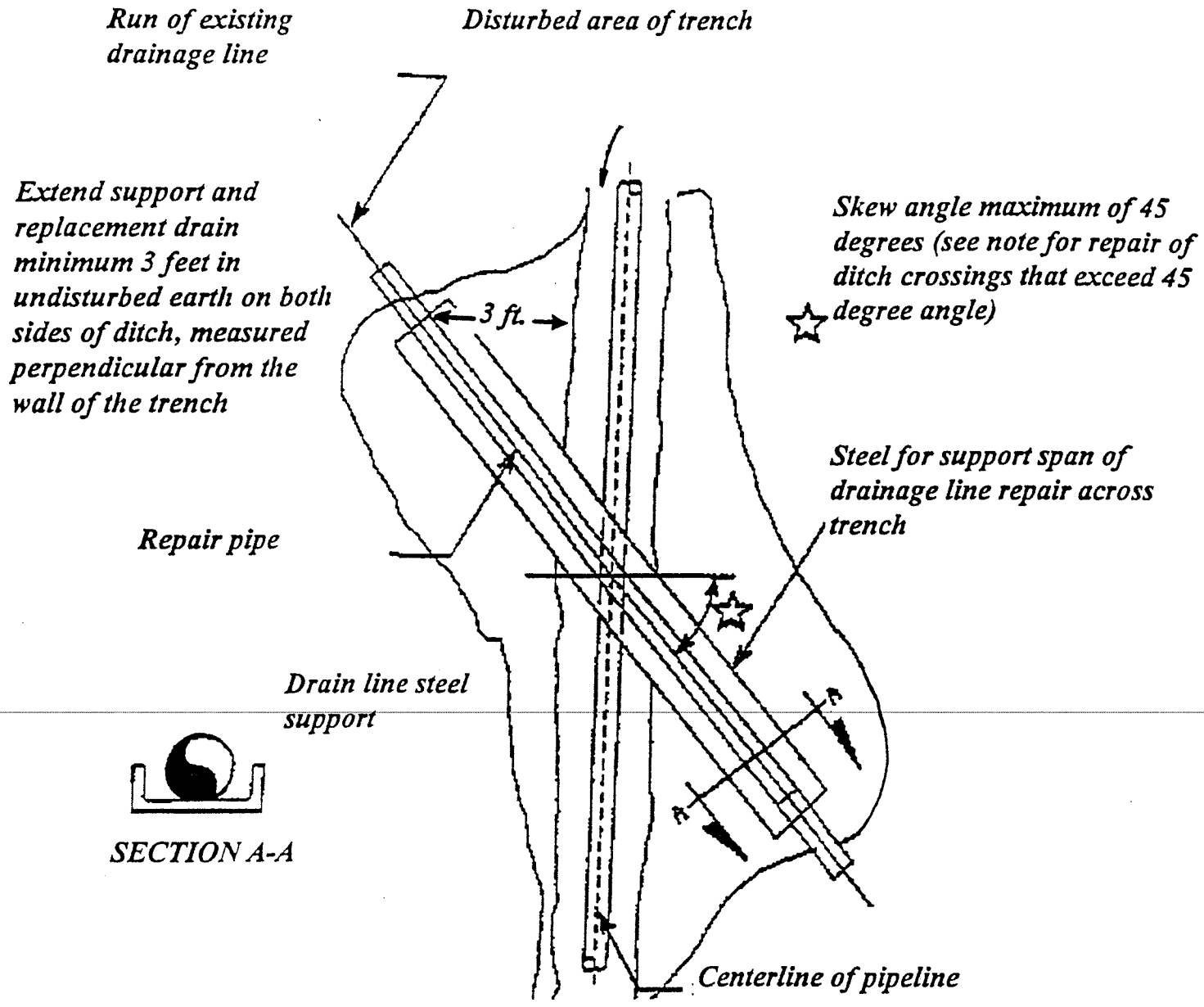
Tubing size	*Corrugated pipe size*
4"	*6"*
6"	*8"*
8"	*10"*
10"	*12"*
12"	*18"*
18"	*20"*

NOTES:

1. *All corrugated pipe to be 16 gauge steel.*
2. *Plastic drain tubing and corrugated pipe to be installed so the holes are centered on each side of the bottom of the pipe.*
3. *All material to be contractor supplied.*
4. *The perforated rigid support pipe is shouldered back into the firm, undisturbed soil profile to ensure consistent gravity flow gradient of the tile line across the trench as the backfill material gradually settles for up to two years.*

SAMPLE

REPAIR OF SEVERED DRAIN TILE



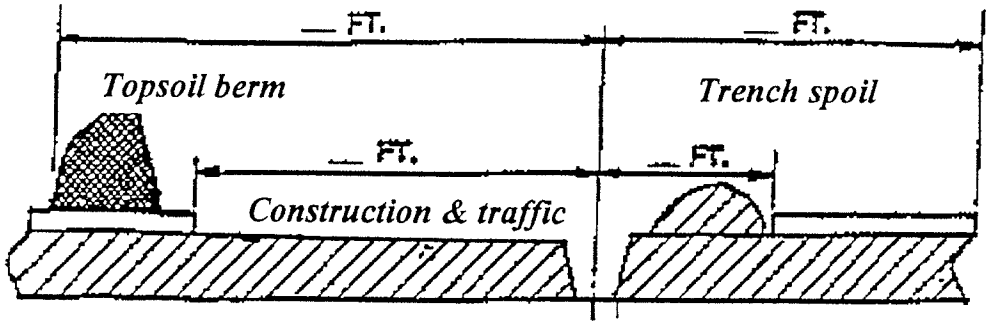
NOTES:

1. *Provide a steel support for drain tile or plastic pipe to maintain function while ditch is open.*
2. *Should a drain tile cross a ditch at a skew of greater than 45 degrees, the replacement drain is to be relocated into undisturbed soil or out of conflict with the pipeline ditch. Replacement drain line is to be installed to match elevation of existing drain tiles.*

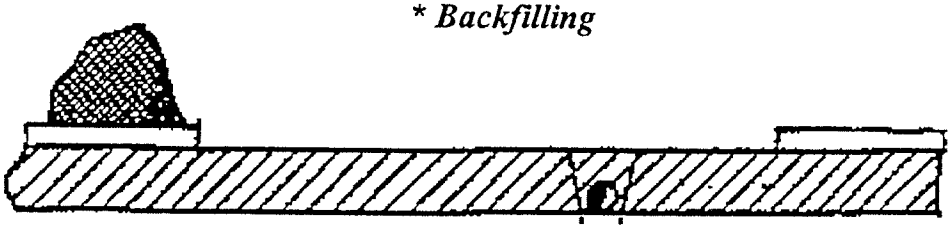
SAMPLE

CONSTRUCTION AND RESTORATION SEQUENCE
THROUGH AGRICULTURAL SOILS

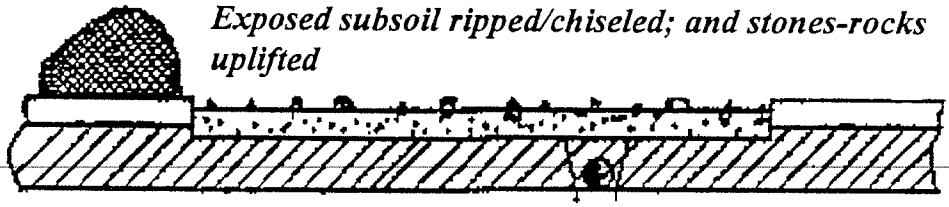
Topsoil stripping and trenching



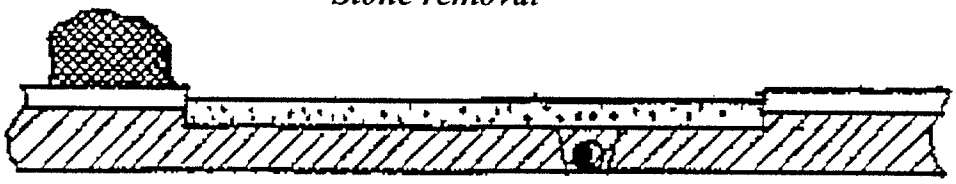
** Backfilling*



Exposed subsoil ripped/chiseled; and stones-rocks uplifted



Stone removal

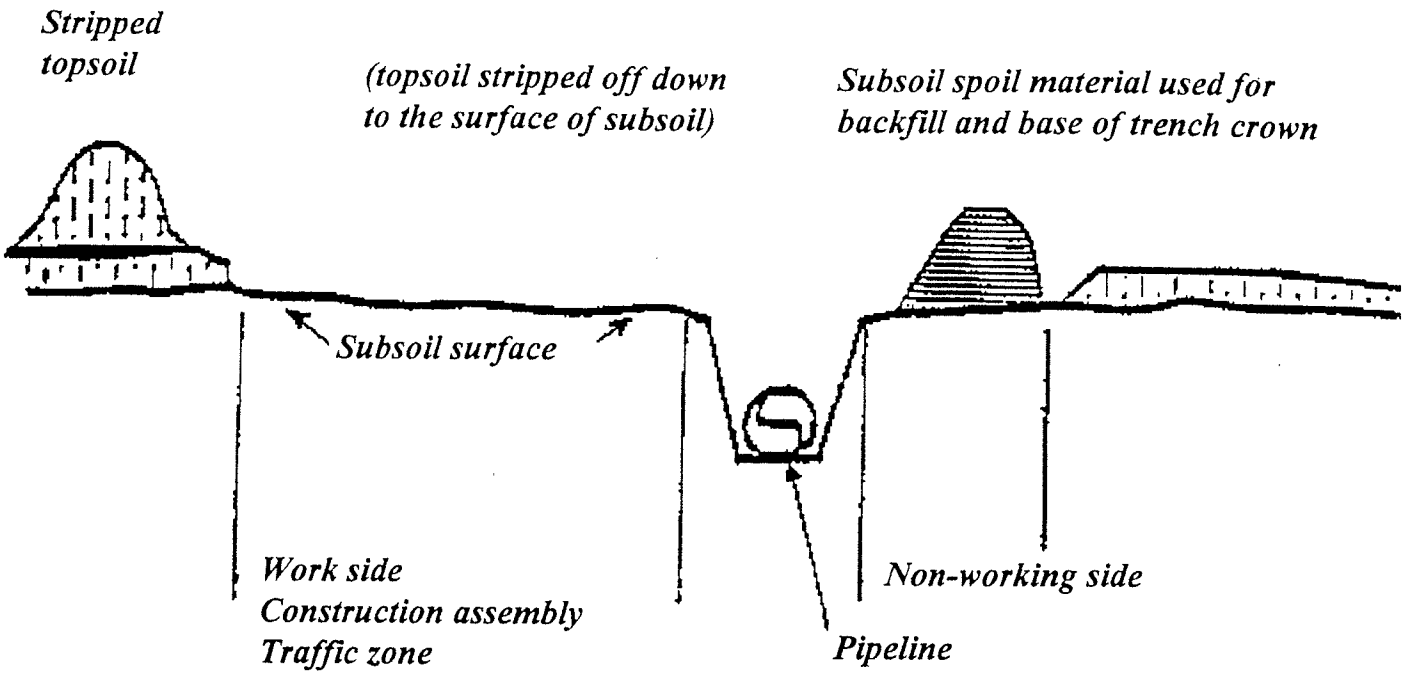


**Restoration of topsoil and deep, angled-leg shattering of the subsoil*

NOTES:

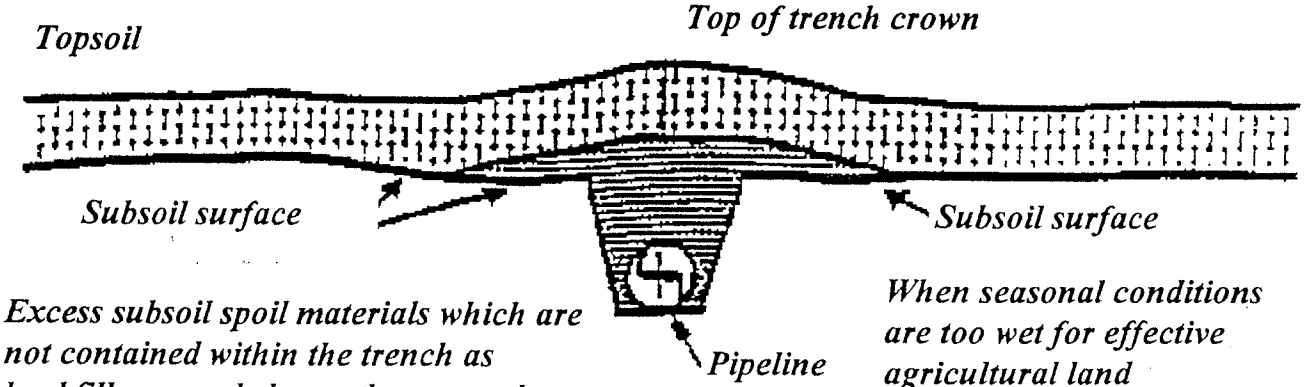
1. *Additional temporary area for topsoil stockpiles may be required on either side of the right-of-way (additional area to be identified on site-specific basis).*
2. **Trench crowning not shown in this illustration due to relative scale.*

TRENCH CROWNING SEQUENCE



After -
The trench is backfilled and semi-crowned with spoil, the exposed subsoil of the right-of-way is ripped and chiseled, and the uplifted stones and rocks are removed;

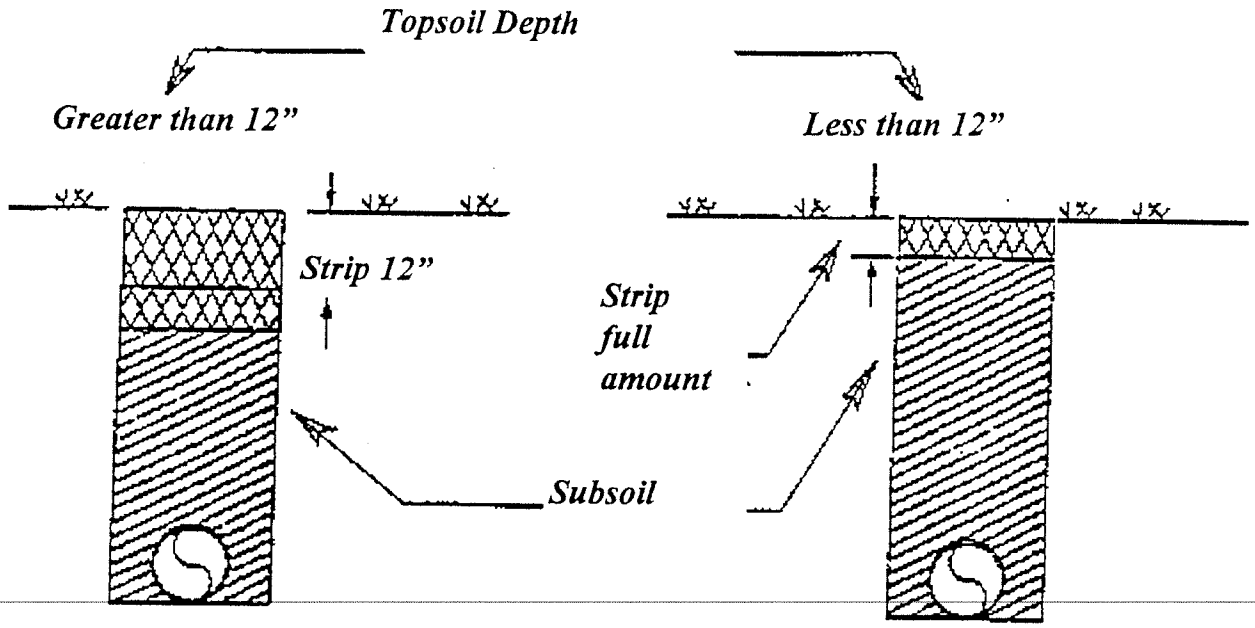
Then...
The stripped topsoil is replaced across the right-of-way, uniformly over the crowning of subsoil over the trench to allow for settling; and, final deep-shattering of the subsoil is applied with a deep, angle leg subsoiler



Excess subsoil spoil materials which are not contained within the trench as backfill are graded over the exposed subsoil surface not over the topsoil.

When seasonal conditions are too wet for effective agricultural land restoration, the trench is backfilled and the work site is "winterized" and further restoration is postponed.

DEPTH OF TOPSOIL REMOVAL



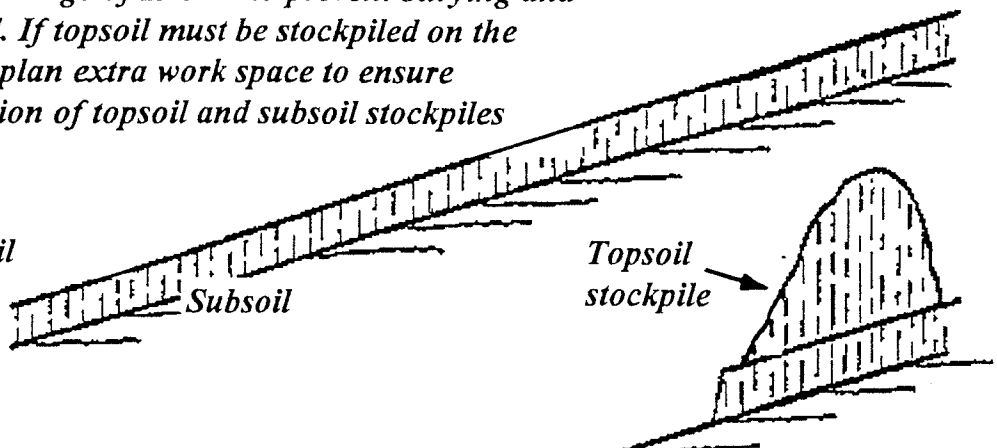
NOTE:

1. *In instances where the topsoil is very finely textured and is deeper than 12 inches, stripping down to the depth of the subsoil or 16 inches, whichever is less, may be required.*

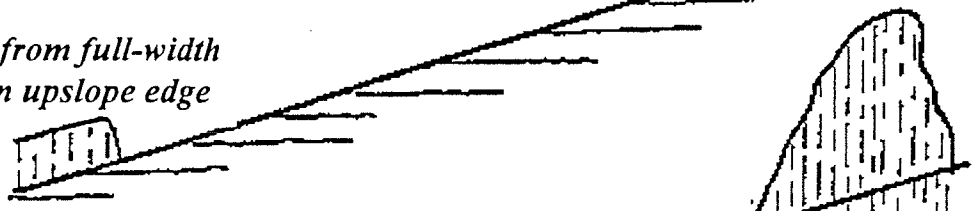
TOPSOIL STOCKPILING ON SLOPES

REQUIRING CUT AND FILL GRADE

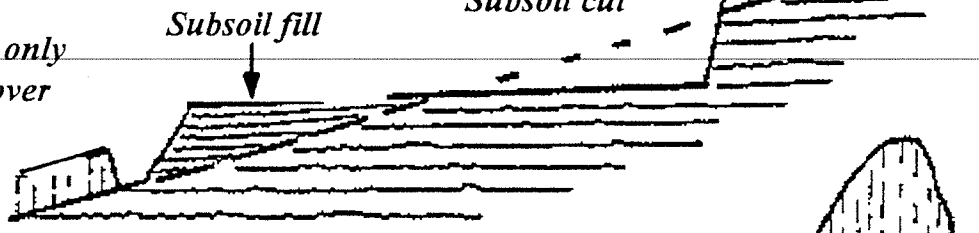
In situations where R-O-W crosses agricultural slopes and construction cuts/grading will occur, stockpile all topsoil on upslope edge of R-O-W to prevent burying and mixing of topsoil. If topsoil must be stockpiled on the Downslope side, plan extra work space to ensure complete seperation of topsoil and subsoil stockpiles



Topsoil stripped from full-width and stockpiled on upslope edge

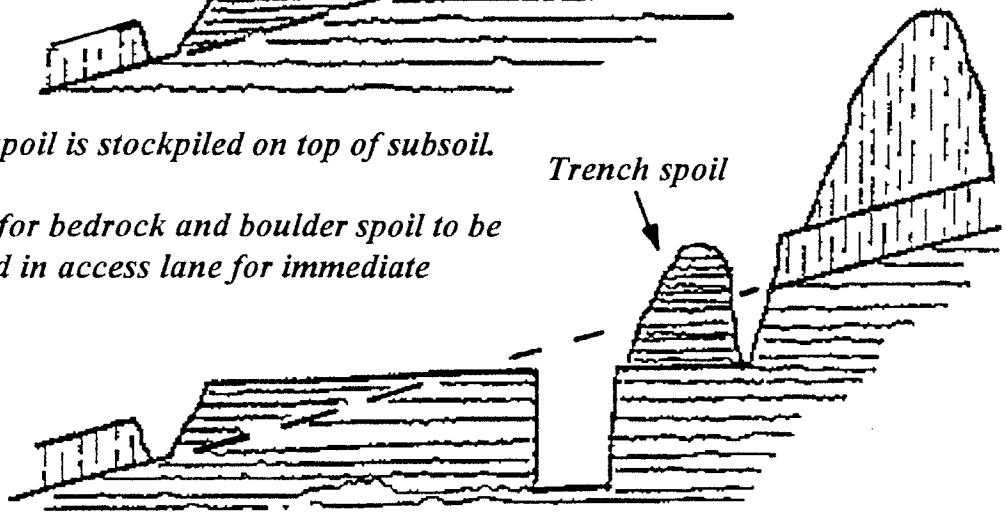


Cut-and-fill using only subsoil materials over subsoil



Trench subsoil spoil is stockpiled on top of subsoil.

(It is preferable for bedrock and boulder spoil to be temporarily piled in access lane for immediate removal)



NOTES:

1. *Subsoil is regraded to contour after pipe installation.*
2. *Topsoil is replaced over the R-O-W after the subsoil is decompacted and rocks/stones are removed.*

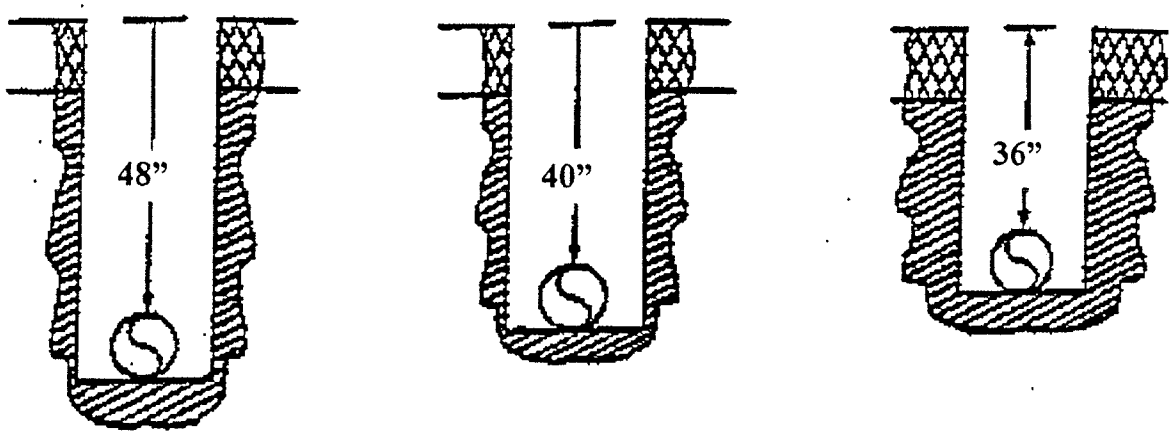
MINIMUM PIPELINE DEPTH OF COVER FOR AGRICULTURAL LAND

1. NON BEDROCK CONDITIONS

Cropland, Haylands, Rotation Land, Improved Pasture

Unimproved Pasture and Other Areas

(a) *(b)* *(c)*



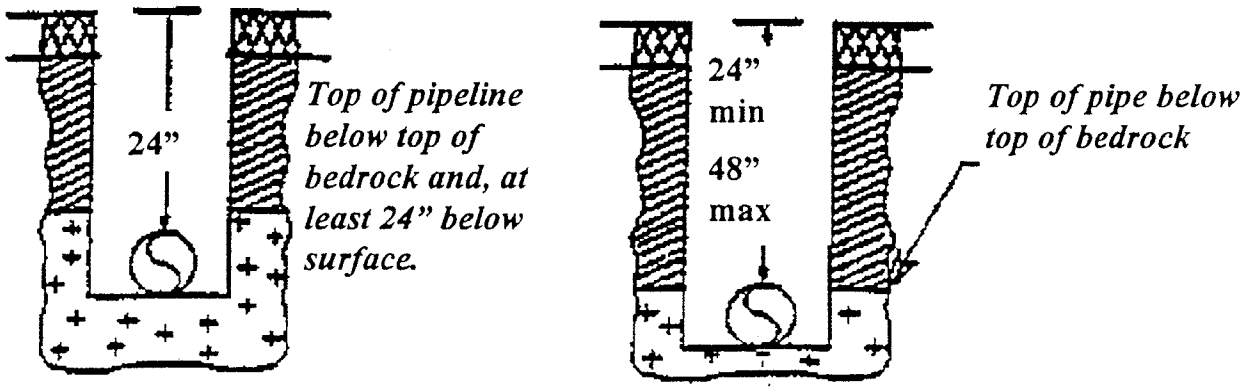
(a) *Pipe is the only pipeline on the right-of-way or is adjacent to existing pipeline with 40" or more depth of cover*

(b) *Pipe laid parallel and adjacent to an existing pipeline which has less than 40" depth of cover (except special areas as noted on construction drawings)*

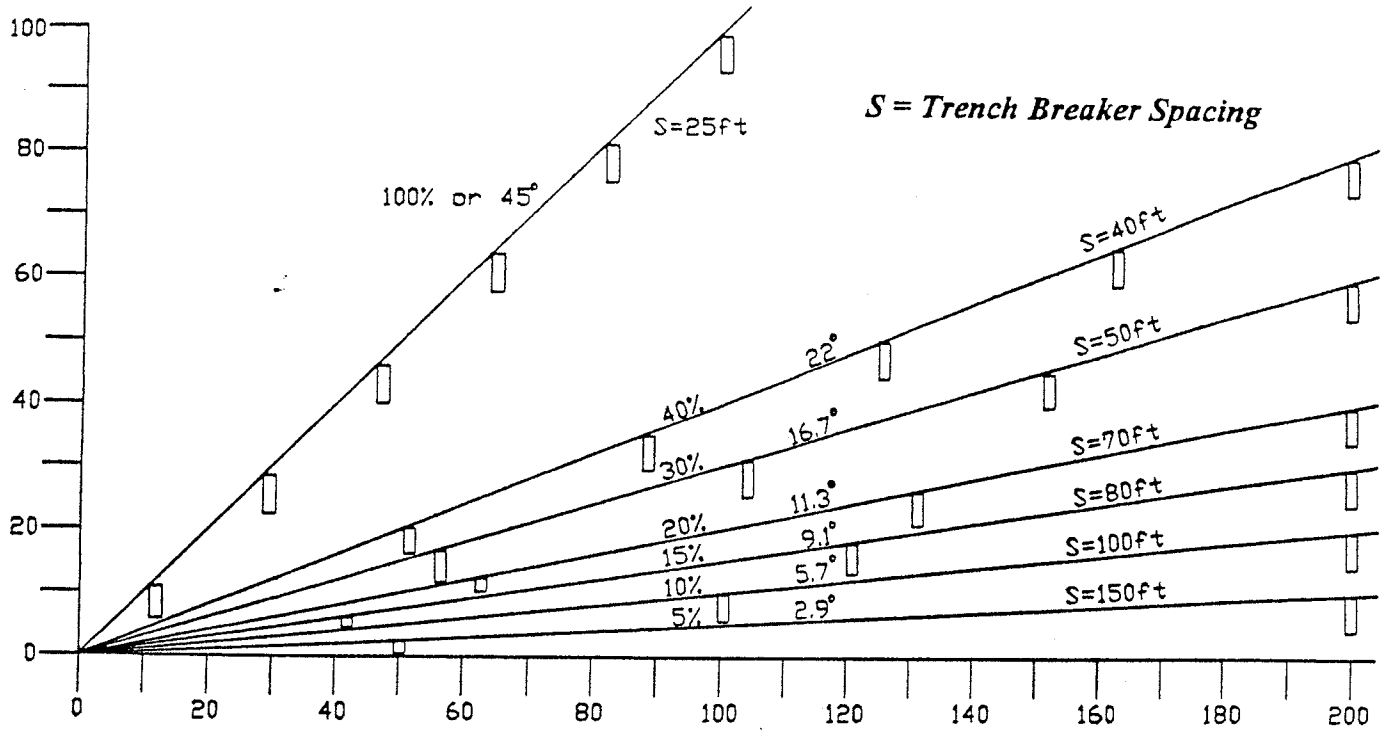
*2. BEDROCK CONDITION **

Bedrock less than 24" from surface

Bedrock between 24"-48" from surface



** Except where deeper burial depths are required by certifying agency or commision, etc.*



Scale In Feet

TRENCH BREAKER SPACING

NOTES:

1. *Depending on site specific conditions of slopes exceeding 40%, the spacing between trench breakers may continue diminishing as illustrated, or may cease diminishing once a spacing of 30 to 35 feet has been reached.*
2. *The preferred construction material for trench breakers is sand bags, which are durable yet flexible and will conform to gradual shifting of pipeline and backfill, while serving their function:impede the flow of subsurface water along the trench.*
3. *In agricultural lands, top of trench breaker will not be closer than two feet from the restored surface.*

SAMPLE

A-12

PERMANENT SLOPE BREAKER SPACING AS ALTERNATIVE SPACING GUIDELINE FOR TRENCH BREAKERS[1]

SLOPE (PERCENT)	*SPACING (FEET)*
<5	*125*
5 TO 10	*100*
10 TO 20	*75*
20 TO 35	*50*
>35	*25*

Source: New York Guidelines for Urban Erosion and Sediment Control (October 1991)

"Standards and Specifications for Water Bars," with the terms "Slope Breaker" and "Water Bar" being synonymous: "A ridge or ridge and channel constructed diagonally across a sloping road or utility right-of-way that is subject to erosion."

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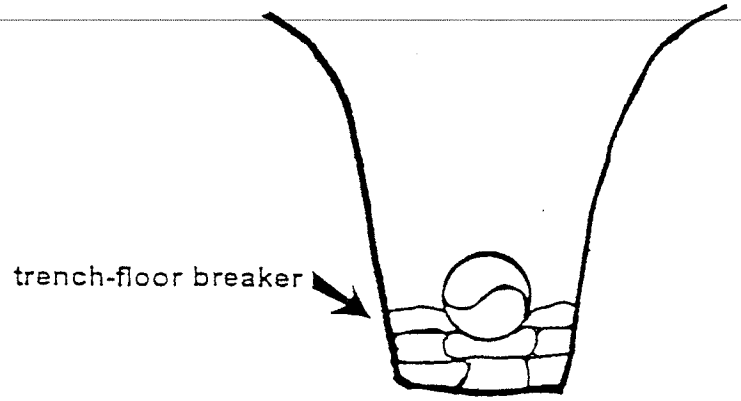
[1] *Basis of Permanent Slope Breaker Spacing as an Alternative Spacing Guideline for Trench Breakers is found in U.S. Federal Energy Regulatory Commission's 12/2/94 Upland Erosion Control, Revegetation and Maintenance Plan, VI. Restoration, B. Permanent Erosion Control Devices (pp. 8 and 9)*

SANDBAG TRENCH BARRIERS (with trench-floor breakers)

ALTERNATIVE SPACING[a]

Trench slope	Spacing between full barriers	Spacing between trench-floor breakers
<5%	NONE (no full barrier)	15 feet
5-15%	300 feet	15 feet
15-30%	200 feet	15 feet
>30%	100 feet	15 feet



[a] This "alternative spacing" chart is provided as a supplement to Sample A-12 and Sample A-13 in Pipeline Right-of Way Construction Projects -- Agricultural Mitigation Through the Stages of Project Planning, Construction/Restoration and FollowUp Monitoring, by the New York State Department of Agriculture and Markets.

LEGEND - AGRICULTURAL AND RELATED SYMBOLS

Examples For Environmental Management amd Construction Practices (EM&CP) Plan and Profile Maps

C	*Cropland **
C-U	*Cropland - unique (orchards, vegetables, ornamental, vineyard, etc.)*
- or -	
C-U/1	*Cropland, unique - orchards or vineyards*
C-U/2	*Cropland, unique - vegetables or berries*
C-U/3	*Cropland, unique - ornamental (nurseries, Christmas trees)*
C-V/E	*Cropland, vulnerable - erosion*
C-V/W	*Cropland, vulnerable - wetness*
C-V/E,W	*Cropland, vulnerable - erosion and wetness*
C-V/OR	*Cropland, vulnerable - organic muckland*

** **"Cropland"** includes not only long term croplands, rotation cropland, and tillable lands enrolled in USDA "set aside" or "conservation easement" programs but also includes **"Hayland"**. If separate identification of hayland is desired, then the following agricultural symbols may be used:*

H	*Hayland*
H-V/E	*Hayland, vulnerable - erosion*
H-V/W	*Hayland, vulnerable - wetness*
H-V/E,W	*Hayland, vulnerable - erosion and wetness*

LEGEND - AGRICULTURAL AND RELATED SYMBOLS (continued)

P1	*Improved pasture*
P1-V/E	*Improved pasture, vulnerable - erosion*
P1-V/W	*Improved pasture, vulnerable - wetness*
P2	*Native pasture, unimproved*
P3	*Wooded pasture*
SGB	*Sugarbush, maple syrup production*
AF	*Abandoned field*
F/TM	*Forest or woodlot with ongoing timber management*
F/UM	*Forest or woodlot without ongoing timber management*
EX	*Excavated area*
**BDR*1*	*Bedrock within thirty inches of surface*
**BDR*2*	*Bedrock thirty to forty-eight inches from the surface*
**BDR*3*	*Bedrock forty-eight to sixty inches from the surface*
—DV—	*Existing diversion terrace*
—T—	*Existing tile drain line - plastic, clay, stone (indicate each field)*
—ITS—	*Intercept tile drain lines (cross trench, and/or parallel) likely needed to control seepage*
OD	*Open ditch, existing*
WTL	*Water line, existing*
IRG	*Buried irrigation line, existing*
TFL	*Temporary fenceline needed*
–x–x–	*Permanent fence, existing*
O	*Well or spring, existing*
SPS	*Septic system, existing*

Note: For definitions of "cropland, "hayland", "pastureland" and cropland in vulnerable categories, refer to respective discussions in text of PIPELINE RIGHT-OF-WAY CONSTRUCTION PROJECTS - AGRICULTURAL MITIGATION. For information on intercept drain lines refer to respective discussions on vulnerable soils, site restoration and appended illustrations.