Construction Mitigation for Projects on Agricultural Lands

Intended for Project Planning, Construction, Restoration, and Post-Construction Monitoring

Replaces New York State Department of Agricultural and Markets Guidelines:

Guidelines for Electric Transmission Right-of-Way Projects

Guidelines for Agricultural Mitigation for Wind Power Projects (Revision 4/19/2018)

Pipeline Right-of-Way Construction Projects – Agricultural Mitigation through the Stages of Project Planning, Construction/Restoration and Follow-up Monitoring

Fertilizer, Lime, and Seeding Recommendations for Restoration of Construction Projects on Farmland in New York State

Division of Land and Water Resources

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Table of Contents

Table of Contents 2
1 INTRODUCTION 4
2 PLANNING 4
2.1 AGRICULTURAL INSPECTOR 4
2.2 PLAN MAPS 5
2.2.1 TYPES OF AGRICULTURAL LAND AND FACILITIES 5
2.2.2 VULNERABLE AGRICULTURAL SOILS 6
2.2.3 OTHER FEATURES 7
2.3 DOCUMENTATION OF IMPLEMENTATION PROCEDURES 8
2.4 TOXIC TREE AND SHRUBS CLEARING WITHIN LIVESTOCK AREAS 9
2.5 AGRICULTURAL CROSSING THROUGH CONSTRUCTION 9
2.6 UNDERLAYMENT FOR ROCK/GRAVEL FILL 11
2.7 DEPTH OF COVER 11
2.7.1 CROPLAND, HAYLAND AND IMPROVED PASTURE 11
2.7.2 UNIMPROVED PERMANENT PASTURE 11
2.7.3 AREAS OF SHALLOW SOILS 12
2.8 SUBSURFACE DRAIN REPAIR 14
2.9 PROPOSED SUBSURFACE DRAINAGE 14
2.10 ALTERNATIVE GRAZING PLANS 20
2.11 LIMITS OF DISTRUBANCES (LOD) 20
3 CONSTRUCTION 22
3.1 TOPSOIL PROTECTION 22
3.1.1 EQUIPMENT ACCESS 25
3.2 SUBSOIL PROTECTION - SHALLOW SOILS 26
3.3 BLASTING REQUIREMENTS 26
3.4 DRILLING 27
3.5 CONTROL OF OPEN TRENCH WASHOUTS, WATER PIPING, AND BLOWOUTS 27
3.6 SUPPLEMENTAL BACKFILL MATERIALS 28
4 AGRICULTURAL RESTORATION 29
4.1 HOUSEKEEPING 29

4.2 OPEN-HOLE OR TRENCH BACKFILL PROFILE AND CROWNING 29
4.3 DECOMPACTION, STONE REMOVAL, AND TOPSOIL REPLACEMENT 31
4.3.1 SEEDBED PREPARATION 32
4.3.2 FERTILIZER FOR RE-SEEDING OF DISTURBED AREAS 32
4.3.3 AGRICULTURAL LIME 32
4.3.4 SEEDING 33
5 POST-CONSTRUCTION TWO-YEAR MONITORING AND REMEDIATION PHASE 34
5.1 GENERAL MONITORING AND REMEDIATION 34
5.1.1 CONTROL OF SOIL SATURTIONS AND SEEPS 35
5.1.2 TOPSOIL DEFICENCIES 35
5.1.3 VEGETATIVE OBSERVATIONS 36
5.1.4 AGRICULTURE FENCING AND GATES 36
5.2 REPORTING 36

List of Figures

FIGURE 1 10
FIGURE 2 13
FIGURE 3 15
FIGURE 4 16
FIGURE 5 17
FIGURE 6 18
FIGURE 7 19
FIGURE 8 21
FIGURE 9 24
FIGURE 10 28
FIGURE 11 30

List of Tables

TABLE 1 6
TABLE 2 9
TABLE 3 27

1 INTRODUCTION

The following construction mitigation standards are designed to apply to energy generation and transmission construction projects that affect agricultural land. These standards and practices apply to the early planning stage of the project through construction, restoration, follow-up restoration, and post-construction monitoring. The intent of the New York State Department of Agriculture and Markets (AGM) construction mitigation standards is to preserve New York State agricultural resources for continued agricultural production. The specific details regarding significant or unique areas of agricultural resources should be evaluated by the Project Certificate/Permit Holder and the Project-Appointed Agricultural Inspector, approved by AGM for the intention of agricultural soil conservation.

These construction mitigation standards and practices for planning, construction, restoration, and monitoring of agricultural lands are for mineral soils only and, therefore, do not pertain to organic muckland soils. Due to the sensitive nature of muckland soils, AGM recommends complete project avoidance by routing around agricultural organic muckland soils. When this is not possible, project-specific development of agricultural mitigation techniques will be required for AGM's review. The Project Certificate/Permit Holder should contact AGM during preliminary planning for such sites.

2 PLANNING

2.1 AGRICULTURAL INSPECTOR

AGM recommends that the Project Certificate/Permit Holder retain at least one qualified Agricultural Inspector to assist plan development. Minimally, the Project Certificate /Permit Holder should prepare for a required Agricultural Inspector for construction compliance, restoration, post-construction monitoring, and follow-up restoration phases. The Agricultural Inspector shall be an individual with a confident understanding of normal agriculture practices and able to identify how the project might affect the following common agricultural items: cultivation, drainage (subsurface and/or surface), agricultural equipment operation, fencing, and site-specific conditions including soils and plant identification. The Agricultural Inspector should also have experience with record keeping and the use of a soil penetrometer for soil compaction testing. The Agricultural Inspector may serve dual inspection roles associated with other Project permits and/or construction duties, if the agricultural workload allows. If AGM finds the Agricultural Inspector is not effective, or if the Inspector's dual role causes a lack of attention to the Project, AGM will request alternative staffing, eliminating the dual role or adding additional Agricultural Inspectors. Projects involving multiple spreads or phases occurring in tandem will most likely require multiple Agricultural Inspectors with an acting lead Agricultural Inspector for consistency.

The Agricultural Inspector should be available to provide site-specific agricultural information for plan development to the Project Certificate/Permit Holder and AGM staff. This information will be obtained by field reviews and direct contact with affected farm operators, AGM and others. The Agricultural Inspector will maintain regular contact with the environmental and engineering construction supervisors, and appropriate on-site Project Inspectors throughout the construction phase.

The Agricultural Inspector should also maintain regular contact with affected farmers and AGM concerning farm resources and management matters pertinent to the agricultural operations and the site-specific implementation of the plan during the various stages of the project. The Project Certificate/Permit Holder and Agricultural Inspector will consult with AGM whenever construction changes occur on agricultural lands. The Project Certificate/Permit Holder should provide all farm owners/operators with contact information to facilitate direct communication with the Agricultural Inspector through all the stages of the project.

2.2 PLAN MAPS

The Project Certificate/Permit Holder will develop a Preliminary Plan map with the assistance of the Agricultural Inspector, who should be able to provide agricultural operational needs concerning implementation in agricultural areas/uses (further described below).

2.2.1 TYPES OF AGRICULTURAL LAND AND FACILITIES

A. Pasture/Grazing
    1. Unimproved grazing areas (brushy or wooded land used by livestock)
    2. Permanent open pasture (land devoted only to pasture use, not suited to tillage rotation)
    3. Improved pasture (including tillable rotation pasture/hayland)
B. Cropland
    1. Rotation cropland
    2. Long-term cropland (such lands will be identified through consultation with the Landowner, Farm Operator and offices of the United States Department of Agriculture (USDA) Farm Service Agency and/or the county Soil and Water Conservation District)
    3. Hayland
C. Unique Agricultural Lands (avoidance routing is strongly recommended)
    1. Specialty cropland (vegetables, berries, etc.)
    2. Orchard
    3. Vineyard
    4. Maple sugarbush
    5. Organic muckland
    6. Permanent irrigation systems

2.2.2 VULNERABLE AGRICULTURAL SOILS

Vulnerable agricultural soils are defined as areas of cropland, hayland, or pasture that are more highly sensitive than other agricultural soils to construction disturbance due to slope, relative soil wetness, and/or shallowness to bedrock. Wetness conditions are the result of factors such as landscape position, soil texture, seasonal water table, and/or slowly permeable subsoil horizons (e.g., areas of laterally draining subsoils). All vulnerable agricultural soils including, but not limited to, those identified in the county soil survey as fragipans, lacustrines, dense basal tills, soils with a seasonally high-water table, or soils with less than five (5) feet of depth to bedrock are to be located and identified on the project map using the codes represented in Table 1 (including more agricultural specific legend symbols).

Table 1 – Vulnerable Agricultural Soils Codes and Agricultural and Related Symbols

V/E	Designate the general area of vulnerability of erosion due to Right of Way (ROW) factor(s) of slope and/or the texture of exposed soil
V/W	Designate the general area of vulnerability to soil horizon
V/B	Designate the general area of vulnerability due to shallow depth to bedrock
V/OR	Designate the location of unavoidable organic mucklands
C	Cropland[1]
C-U/1	Cropland, unique - orchards and/or vineyards
C-U/2	Cropland, unique - vegetables and/or berries
C-U/3	Cropland, unique - ornamental (nurseries, Christmas trees)
C-VE	Cropland, vulnerable - erosion
C-VW	Cropland, vulnerable - wetness
C-VE,W	Cropland, vulnerable - erosion and wetness
C-V/OR	Cropland, vulnerable - organic muckland
H	Hayland
H-V/E	Hayland, vulnerable - erosion
H-V/W	Hayland, vulnerable - wetness
H-V/E,W	Hayland, vulnerable - erosion and wetness
PI	Improved pasture
PI-V/E	Improved pasture, vulnerable - erosion
PI-V/W	Improved pasture, vulnerable - wetness
P2	Native pasture, unimproved
P3	Wooded pasture
SGB	Sugarbush, maple syrup production

[1] "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" (unless separate identification of hayland is desired).

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 30 inches of surface
*BDR*2	Bedrock 30 - 48 inches from the surface
*BDR*3	Bedrock 48 - 60 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 fence-line needed
—x—x—	Permanent fence, existing
O	Well or spring, existing
SPS	Septic system, existing

2.2.3 OTHER FEATURES

The Project Certificate/Permit Holder will provide the following information on the Preliminary Plan maps:

A. Land and Water Management Features
    1. Subsurface drainage – indicate if the project has identified confirmed, known, or suspected subsurface drainage pattern locations. Investigations should minimally include the consultation with current farmer. Technologies such as ground penetrating radar should be considered.
    2. Open Ditch
    3. Diversion Terrace
    4. Buried water lines (farmstead consumptive use)
    5. Water source (developed springs, ponds, etc.)
    6. Unnamed water flows
B. Depth of Cover – identify areas where depth of cover differed from the agricultural standard. If applicable, these areas should correspond to Vulnerable Agricultural Soils, V/B (VULNERABLE AGRICULTURAL SOILS).
C. Existing Farmlands – proposed to be utilized by the Project as well as those crossing Project access and work areas.

D. Project Access and Work Locations – including both temporary and permanent locations with proposed modifications to existing land and water management features and proposed stormwater management. Include off-ROW access roads (applicable to utility projects). Avoid dividing larger fields into smaller fields, which are more difficult to farm, by locating access roads along the edges of agricultural fields (hedgerows and field boundaries) and in nonagricultural areas where possible.
E. Laydown, Marshalling, or Storage Areas – provide the proposed locations, access, and the size of all culverts, as needed.
F. Above Ground Project Infrastructure – agricultural areas should be avoided when siting any above ground facilities, as infrastructure installed above ground can create long term interference with agricultural land use. Typical above ground infrastructure include but are not limited to: compressor stations, valve stations, metering and regulating stations, cathodic protections, substations, overhead electric transmission structures, grounding grids, guy wires, transformers, switch gear, junction boxes, wind or meteorological towers, etc. When overhead interconnect and transmission lines must cross farmland, the project shall minimize agricultural impacts by using taller pole structures that provide longer spanning distances and locate pole structures on field edges to the greatest extent practicable. The line location and pole placements shall be reviewed with the Department and the Agricultural Inspector prior to final design.
G. Underground Infrastructure – provide the location of proposed and existing pipelines; electrical duct banks and collection lines; marking tape and/or tracer lines; details of imported backfill; trench breakers (CONTROL OF OPEN TRENCH WASHOUTS, WATER PIPING, AND BLOWOUTS); and proposed interceptor subsurface (PROPOSED SUBSURFACE DRAINAGE) to control soil saturation and/or aid trench breakers in minimizing water piping, based on the vulnerable agricultural soils data and site monitoring. Such locations will generally coincide with "V/W" vulnerable agricultural soils and breaks in slopes (VULNERABLE AGRICULTURAL SOILS).
H. Topsoil and Sub-soil Stockpiles – as applicable (CONSTRUCTION)
I. Post-Construction Stormwater Management Practices – determine how practices limit or convert pre-existing agricultural use.

2.3 DOCUMENTATION OF IMPLEMENTATION PROCEDURES

The Project Certificate/Permit Holder will provide a detailed description of the Best Management Practices (BMPs) proposed for construction in the Project Narrative in addition to the Plan and Profile Drawings. This description will show the respective BMPs proposed to be utilized for agricultural construction mitigation. It will also describe the method by which the on-site Project staff and contractors will be trained on the agricultural construction mitigation BMPs.

2.4 TOXIC TREE AND SHRUBS CLEARING WITHIN LIVESTOCK AREAS

The Project Certificate/Permit Holder will identify trees and shrubs proposed for clearing near or within active (or soon to be active) livestock use areas during Project plan development. Cut vegetation shall not be stockpiled in areas accessible to livestock. During the clearing phase, such vegetation (more specifically the leaves) will be disposed of in a manner that eliminates contact with livestock. Specific toxic woody species of concern are discussed in Table 2.

Table 2

Species	**Toxin of Concern - Symptoms**
Yew (Taxus SPP.)	Taxine alkaloids kill by stopping the heart
Rhododendron and related species	Grayanotoxins cause colic and nausea
Oak trees (leaves, acorns, or bark)	Tannins and related compounds cause anorexia and constipation, red or brown urine, depression, abdominal pain, nasal discharge, polydipsia, polyuria, increased respiratory rate, and fever
Cherries, peaches, and other stone fruits of the Prunus species	Cyanogenic/Hydrogen Cyanide (HCN) causes tremors, dyspnea, involuntary urination, and clonic convulsions
Red Maple	Methemoglobinemia, methemoglobinuria, Heinz body hemolytic anemia

2.5 AGRICULTURAL CROSSING THROUGH CONSTRUCTION

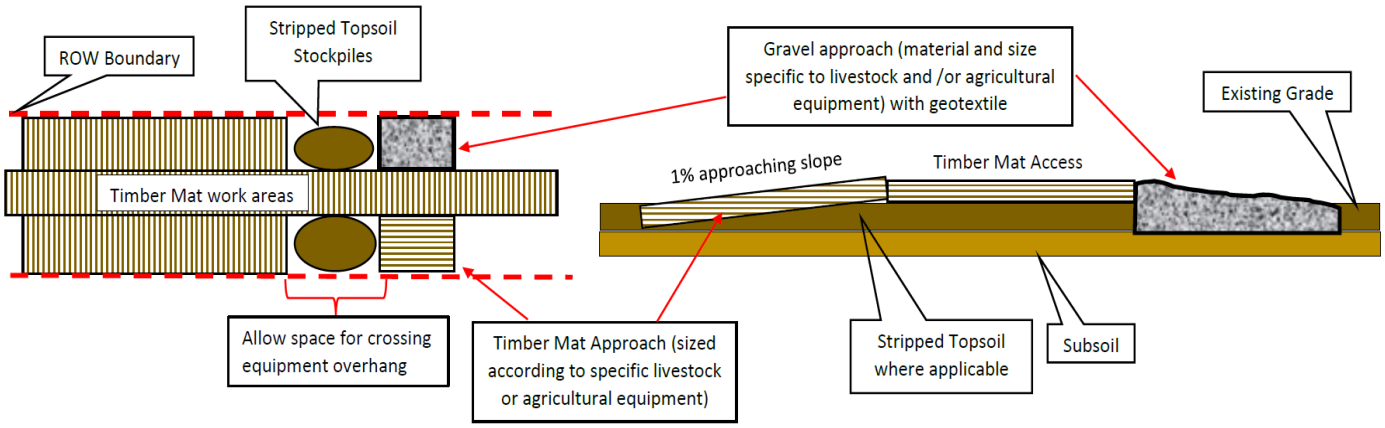
The Project Certificate/Permit Holder should plan for the anticipated need to maintain normal agricultural activities outside of the project Limits of Disturbance (LOD). As previously discussed, the Agricultural Inspector should advise the Project Certificate/Permit Holder on likely locations of agricultural crossing utilizing aerial imagery, field reviews, and initial farm operator consultations. At least two weeks in advance of the commencement of construction activities, the Agricultural Inspector will coordinate with the involved farm operator on the need for agricultural crossings for the duration of construction. Discussion with the farm operator(s) should include the construction schedule and proposed temporary barriers (open trenches, linear soil stockpiles, timber matting, restoration areas, other environmental sensitive areas) limiting agricultural access. The Agricultural Inspector, with the farm operator, shall identify access for mechanized farming activities to impacted crops or needed pasture areas.

Livestock crossings will require temporary livestock fencing equivalent or exceed the pre-existing fencing materials. This will be determined by the Agricultural Inspector in consultation with the farm operator. The Natural Resources Conservation Service National Handbook of Conservation Practices–Code 382 and applicable technical notes, including

Confinement/Exclusion Fence, are recommended references for specifications for temporary installed fence lines, as well as repairs to pre-existing temporarily intercepted fences intended for permanent use. Livestock crossings must be developed for the specific type of livestock with consideration for livestock temperaments and acceptable footing. If possible, the Agricultural Inspector should develop an agreement with the farm operation to pasture animals elsewhere during the duration of the construction, restoration, and vegetation establishment. Vegetation intended for pasturing is considered "established" once the intended crop achieves eight (8) inches or greater in height.

For open trenches, elaborated trench plugs (aka "hard crossing") (Figure 6) or bridging with timber mats (Figure 1) must be provided. Timber matted construction access in excess of four (4) inches must provide a ramped approach for agricultural equipment and livestock crossing. The Project Certificate/Permit Holder must identify topsoil stockpile areas on project plans. Siting of agricultural specific crossings should consider the associated agricultural equipment's ground clearances (relative to adjacent timber matting, topsoil stockpiles, etc.), as well as the height of the equipment relative to overhead utility sag.

Figure 1



Preferred installation in pre-existing farm lanes locations avoiding construction work areas and overhead electrical midspan sag

Where agricultural fields are temporarily bisected, and therefore limit efficient equipment operation, no agricultural crossing is necessary due to the inability to perform normal agricultural operations. In this case, a crop loss payment should be considered to the associated farm operation (not necessarily the landowner) for the calculated crop loss for the applicable growing season(s). Crop loss payments should be considered for any impacted farmland outside of the lands fee-owned or leased ROW. Calculations should

include the estimated yield[2] of the existing crop that was expected to be produced on the affected acreage.

2.6 UNDERLAYMENT FOR ROCK/GRAVEL FILL

Where access ramps are required from public roadways to matted construction areas in agricultural fields, an underlayment of durable, geotextile matting will be placed over the exposed subsoil surface prior to the use of temporary gravel access fill material. All such material will be removed upon completion of the Project. The use of durable, geotextile matting as an underlayment helps prevent rock and stone from becoming embedded in the subsoil material. Complete removal of the access ramp upon completion of the Project and restoration of the impacted site is required prior to topsoil replacement.

2.7 DEPTH OF COVER

In existing agricultural fields where existing or proposed surface and subsurface drainage plans have been identified by the landowner or farm operator, or where they are on-file with the Soil and Water Conservation District prior to plan development, the Project Certificate/Permit Holder will provide adequate cover over the installed utility to allow the installation of future agricultural or farm drainage infrastructure. This condition also should be considered for the operation and maintenance of open ditch surface drainage. The Agricultural Inspector shall determine the required trench depth of the installed utility for clearance between the bottom of future drain systems and the top of the utility. Deviations to the standard depth of cover will be specified in the Plan, as detailed below.

2.7.1 CROPLAND, HAYLAND AND IMPROVED PASTURE

In cropland, hayland, and improved pasture, a minimum depth of 48 inches of cover will be required over underground utilities, except where the proposed utility is located parallel and adjacent to an older existing underground utility with less than 48 inches of cover. If such a situation occurs and the original utility is being abandoned, a minimum depth of cover of the previous utility will be required. This condition is illustrated for a utility in Figure 2.

2.7.2 UNIMPROVED PERMANENT PASTURE

In unimproved grazing areas and land permanently devoted to pasture, a minimum depth of 36 inches of cover will be required over underground utilities, except where the new proposed utility is located parallel and adjacent to an older existing underground utility that was buried with less than 36 inches of cover. If such a situation occurs and the original utility is being abandoned, a minimum depth of cover of the previous utility will be required. This condition is illustrated for a utility in Figure 2.

[2] Yields defined according to the producer and verified by the USDA Natural Resources Conservation Service (NRCS) County Soil Survey.

2.7.3 AREAS OF SHALLOW SOILS

In areas where the depth of soil over bedrock ranges from zero to 48 inches, the underground utility shall be buried entirely below the top of the rippable[3] bedrock or at the depth specified for the particular land use (see above), whichever is less. All variances from this will be clearly stated in construction drawings, or detailed drawings for special areas or crossings. This condition is illustrated for a utility in Figure 2.

[3] The rippability of earth material is a measure of the ability to excavate and/or remove the material with typical excavation equipment (ex. backhoe, dozer, etc.).

Figure 2

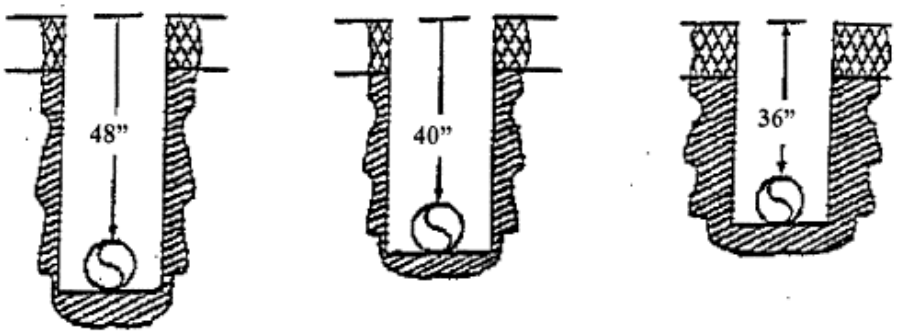
MI! **MINIMUM UTILTIY DEPTH OF COVER FOR**

1. NON BEDROCK CONDITIONS

Cropland, Haylands, Rotation Land, Improved Pasture

Unimproved Pasture and Other Areas

(a) (b) (c)



(a) ***a) Utility is the only utility on the right-of-way or, is adjacent to existing utility with 40" or more depth of cover.***

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

Topsoil

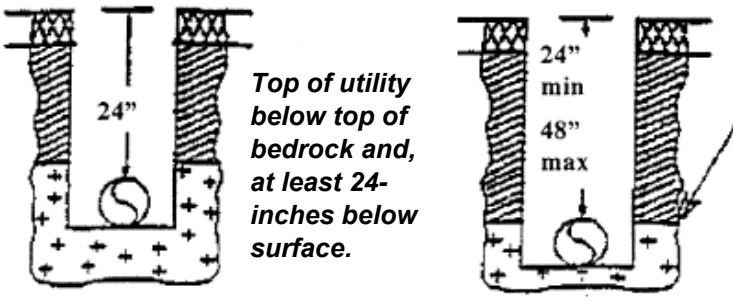
Subsoil

Bedrock

2. *BEDROCK CONDITION **

Bedrock less than 24" from surface

Bedrock between 24"-48" from surface



Top of utility below top of bedrock and, at least 24-inches below surface.

Top of utility below top of bedrock

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

2.8 SUBSURFACE DRAIN REPAIR

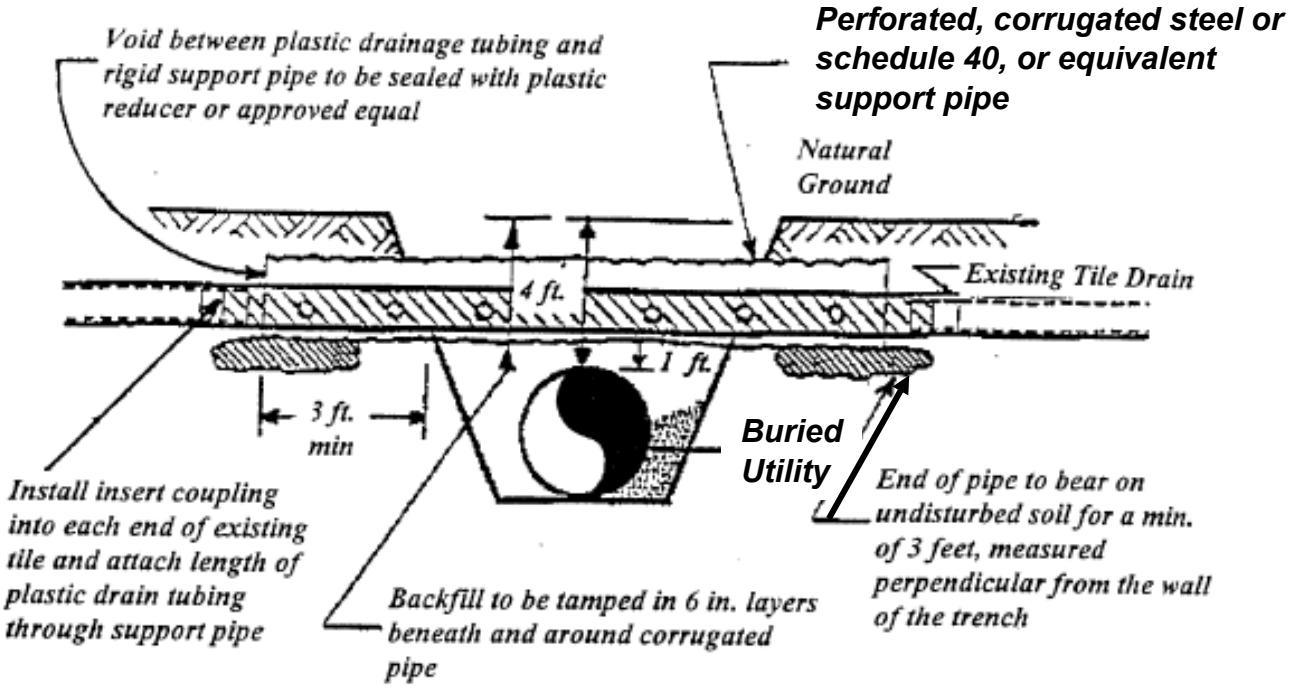
During preparation of the Plan, a detailed drainage line repair procedure will be developed by the Agricultural Inspector, in consultation with AGM, for the repair of crushed/severed clay tile and plastic drain lines. Specific drawings showing the generic technique to be implemented for drain line repairs will be provided by the Project Certificate/Permit Holder. A sample plan involving a pipeline is provided in Figures 3 and 4. The plan for the replacement of functional drainage systems severed during underground utility installation shall be prepared during the restoration phase by the Agricultural Inspector, in consultation with AGM. Subsurface drainage repairs performed shall be photo documented, geo-referenced, and provided to AGM and the landowner upon request.

2.9 PROPOSED SUBSURFACE DRAINAGE

Intercept drainage may be proposed to benefit underground utilities during construction, as well as for permanent use improving operation and maintenance of the underground utility. Examples of AGM recommended intercept subsurface drainage are provided in Figures 5, 6, and 7.

Figure 3

REPAIR OF SEVERED TILE LINE

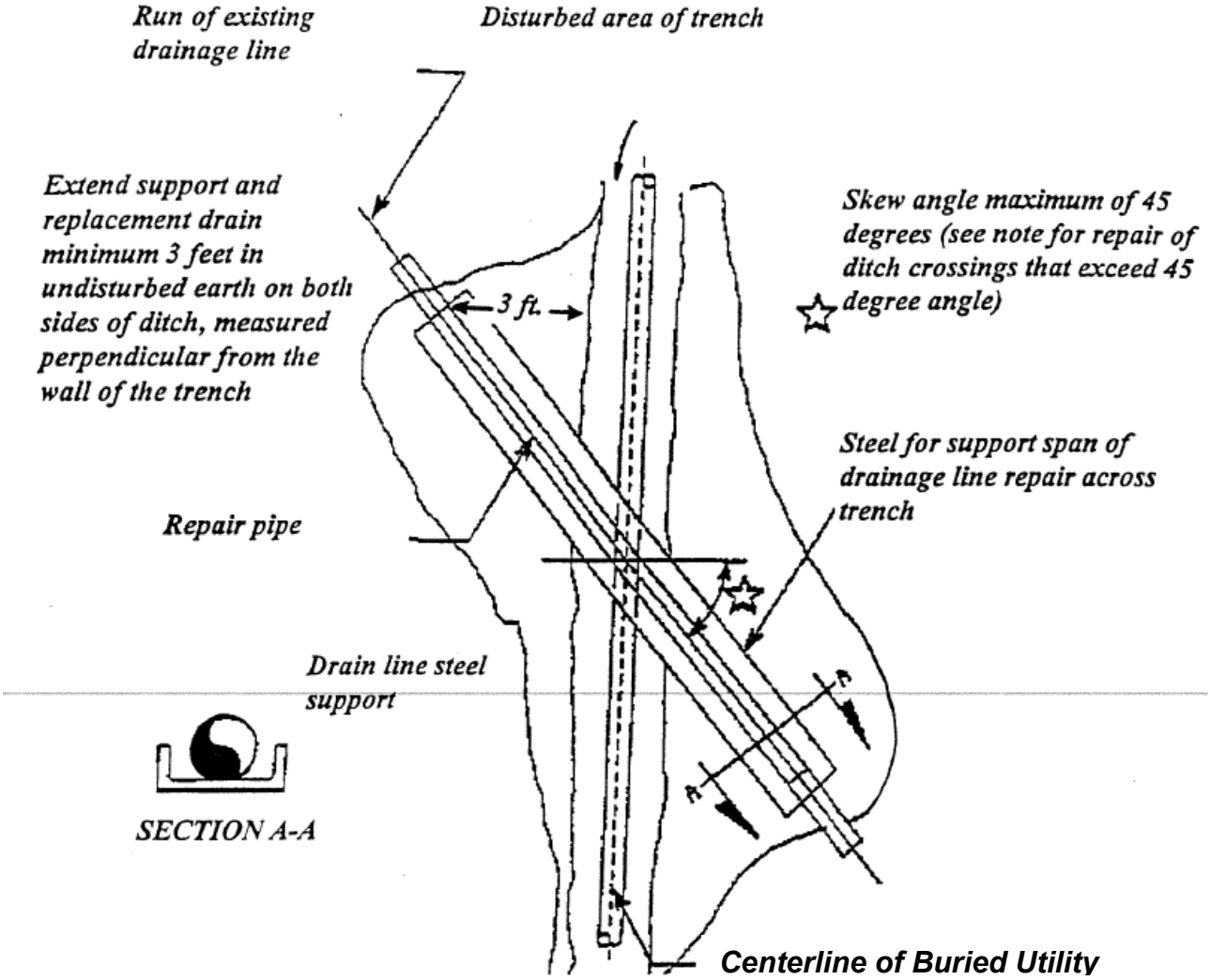


Tubing size	Corrugated pipe size
4"	6"
6"	8"
8"	10"
10"	12"
12"	18"
18"	20"

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.*

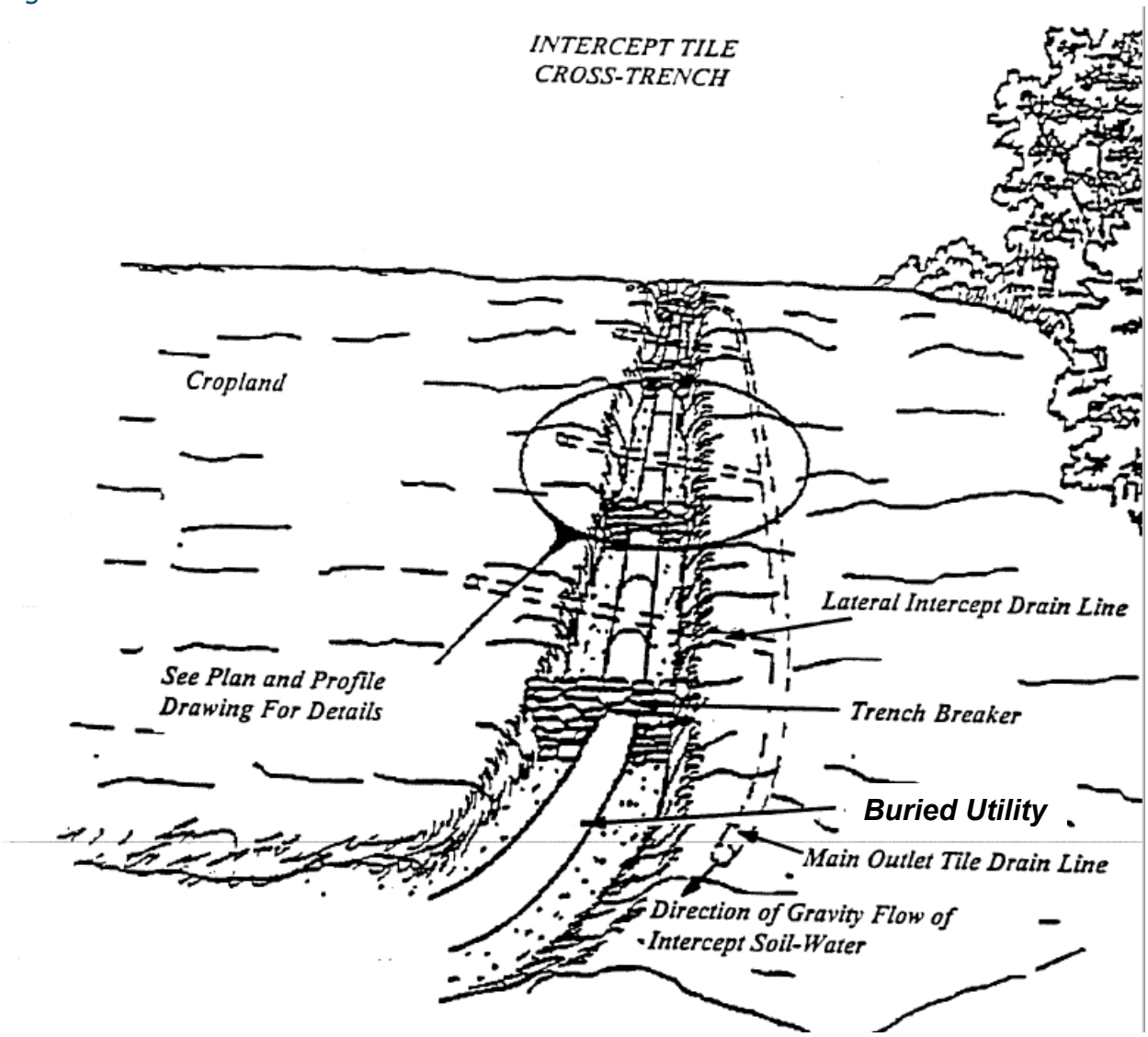
Figure 4



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 disturbed soils or out of conflict with the newly installed utilities ditch. Replacement drain is to be installed to match elevation of existing drain tiles.***

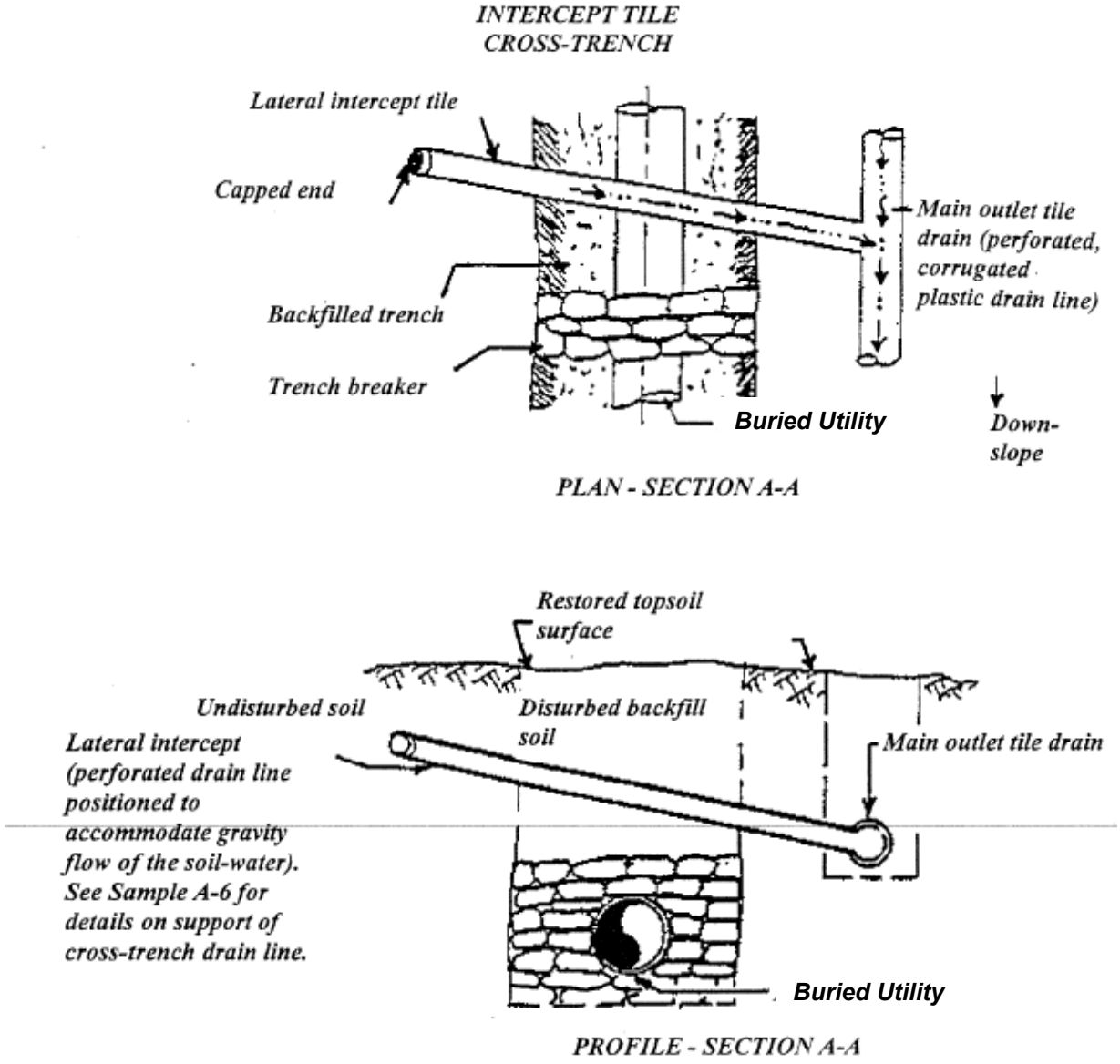
Figure 5



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 Figure 6 drawing for plan and profile. Refer to NRCS, NY Conservation Practice Standard, Subsurface Drain, code 606.***

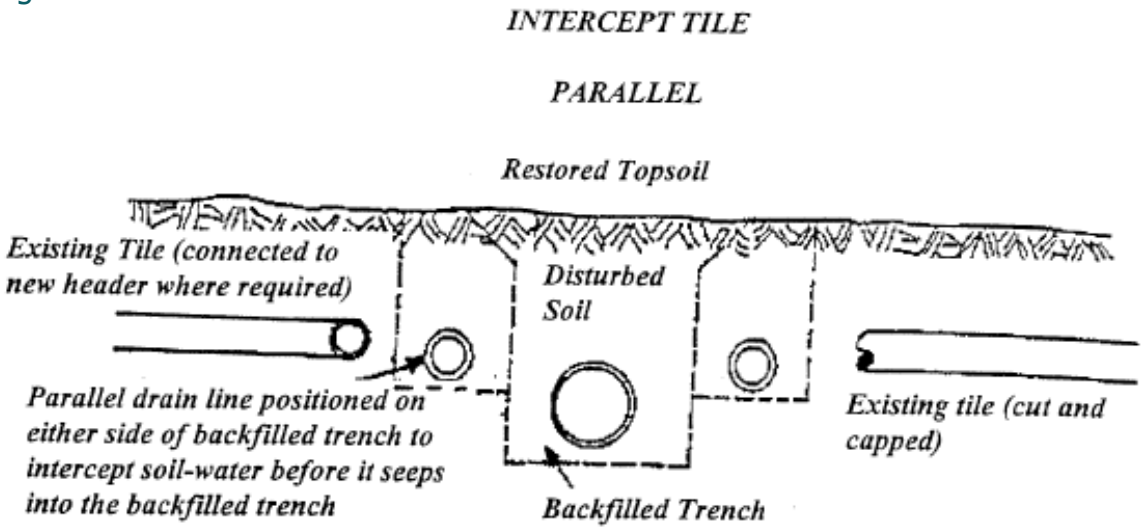
Figure 6



Note:

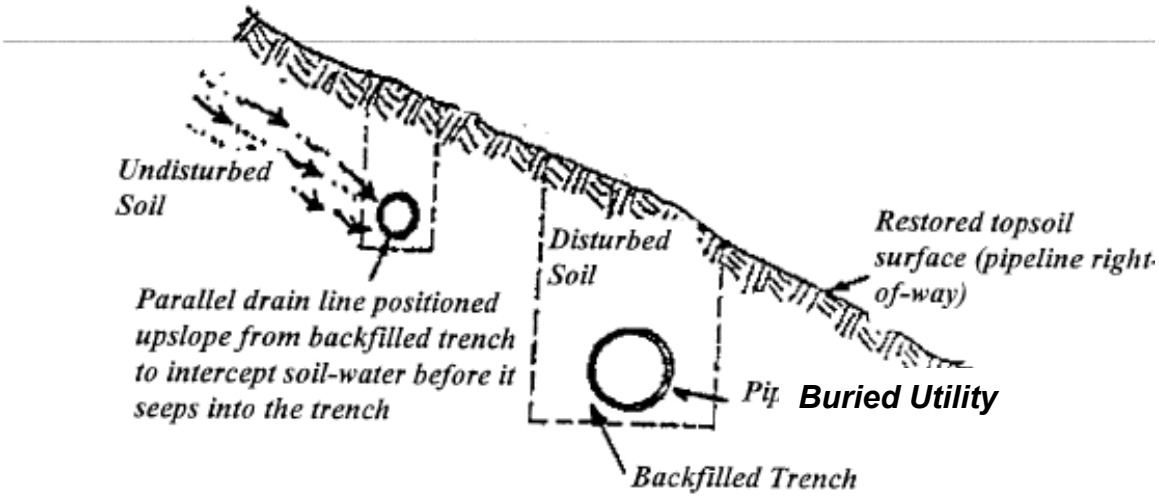
1. ***Trench Breakers prevent gullying erosion while Trench is open and inhibit water piping and water blowouts down the course of the underground utility after backfilling.***
2. ***Intercepting drain lines absorb the soil-water seepages that drain naturally from the undisturbed soil profile into the 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.***
4. ***Main outlet tile drain may be installed in trench as an acceptable alternative in consultation with the Department (AGM staff).***

Figure 7



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.

2.10 ALTERNATIVE GRAZING PLANS

Livestock pasture areas may require temporary livestock fencing equivalent to or exceeding the pre-existing fencing materials. This will be determined by the Agricultural Inspector in consultation with the farm operator, to segregate livestock from construction and restoration activities. The Agricultural Inspector will work with the farm operators during the planning phase to develop a plan to delay the pasturing of the ROW, during and following construction, until pasture areas are adequately revegetated. The Project Certificate/Permit Holder will be responsible for maintaining the temporary fences on the Project until the Agricultural Inspector verifies that the vegetation established is the intended species and minimally an eight (8) inch height has been achieved to accommodate grazing. At such time, the Project Certificate/Permit Holder will be responsible for the removal of the fences.

2.11 LIMITS OF DISTRUBANCES (LOD)

The Project Certificate/Permit Holder should assess the required clearing plans, grading plans, and other work areas to determine the required limits of clearing and grading. Prior to establishing the proposed LOD and/or construction easement, the Agricultural Inspector, in consultation with AGM staff, should identify the estimated volume of topsoil to be stripped (see Section 3.1) as well as identify the volume and location of other subsoil stockpiles. Volume of topsoil should be determined by field verification and or the USDA soil survey for the areas. Cultivated crop areas usually have a topsoil depth consistent with the tillage depth. Additional space may be required for equipment on the backside of the stockpiles during restoration (Figure 8).

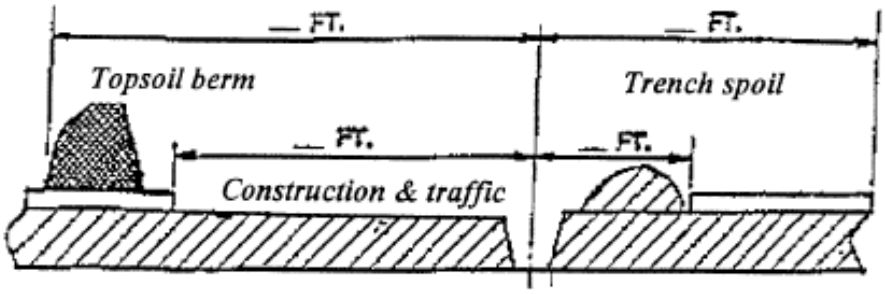
Work areas in agricultural lands should include the area necessary to allow adequate space for traffic and the separate stockpiles of both topsoil and spoil material. With exception of special conditions where a road or stream crossing may require a greater work area, the temporary construction area should provide a minimum[4] of 80 feet for a 12-to-24-inch open trench, to a maximum of 125 feet for a 36-to-48-inch open trench.

[4] The term “minimum” refers to the absolute minimum width of the temporary construction right-of-way, under the very best of working conditions: that is, a level farmscape on deep, well-drained soil. An 80-foot width, however, is not adequate as the initial “available width” through farmlands with mild, rolling, or moderately steep slopes, or on soils that are less than well drained or shallow to bedrock. In those situations, the minimum available width of temporary construction right-of-way should be 90 feet. This allows for the inherent cut-and-fill grading; the drift of wet subsoil muds/spoil materials; and the special concerns of shallow bedrock soils, without jeopardizing the protection of the stockpiled topsoil materials. Certain site-specific conditions may accommodate the farmland protection in a slightly narrower space, leaving some of the temporary right-of-way unused. Nevertheless, the availability of the 90 feet for the construction of a 12-inch open trench should be provided for the temporary periods of construction and restoration.

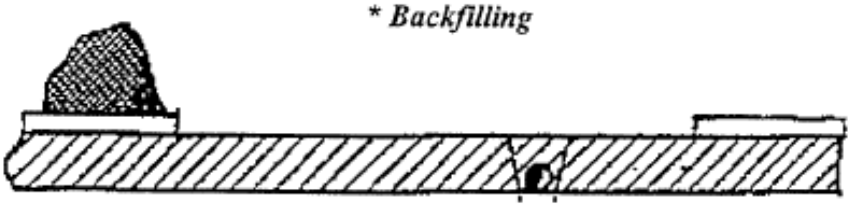
Figure 8

CONSTRUCTION AND RESTORATION SEQUENCE THROUGH AGRICULTURAL SOILS

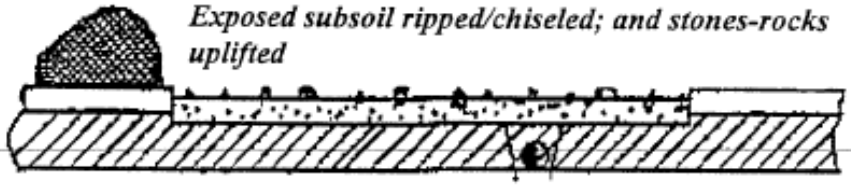
Topsoil stripping and trenching



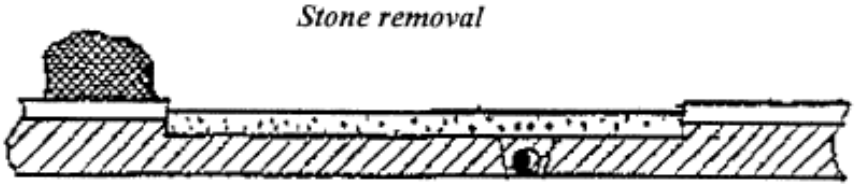
** Backfilling*



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.*

3 CONSTRUCTION

3.1 TOPSOIL PROTECTION

In all grading activities in agricultural areas associated with utility construction (including but not limited to: open trench installation of underground utilities, subsurface drainage repair, temporary access or work areas, etc.), topsoil will be stripped and stockpiled separately from any necessary work areas (including, but not limited to: subsoil stockpiles, trenching areas, construction assembly areas, laydown yards, traffic zones, etc.).

Before the topsoil is stripped, representative soil samples should be obtained from the areas to be disturbed. The soil sampling should be consistent with Cornell University soil testing guidelines and samples should be submitted to a laboratory for testing of pH, percentage of organic material, cation exchange capacity, Phosphorus/Phosphate (P), and Potassium/Potash (K). The results are used to determine the lime and fertilizer rate to apply for the respective soils at the time of restoration. If soil sampling is not performed, general fertilizer and lime application recommendations for disturbed areas are recommended in Section 4.3.

All topsoil material will be stripped and (regardless of depth) stockpiled immediately outside the required work areas (but within the LOD). Stockpiles should be located directly adjacent to the area of disturbance so that the replacement of soils during restoration may be performed uniformly, when possible. Topsoil removal up to a depth of 12 inches will be required in specially designated soils encountered within the work area as identified in the Plan. All topsoil will be stockpiled and separated from other excavated materials. A minimum distance of two (2) feet of separation shall be maintained between segregated stockpiles. The Agricultural Inspector will determine depth of topsoil in each soil unit of affected agricultural areas during Plan development and onsite observation. The USDA Soil Survey may be utilized as a planning tool. During the clearing or access establishment phase, site specific depths of topsoil stripping will be monitored by the Agricultural Inspector. Where construction requires cut-and-fill of the soil profile across grades, to the extent practicable, topsoil stockpiling will be located upslope of the work area. Where topsoil cannot be stored upslope, suitable space will be provided on the downslope side to ensure the complete segregation of the topsoil from all cut-and-fill material. Changes or additions to the designated stockpile areas may be appropriate based on field conditions and in consultation with the Agricultural Inspector. Figure illustrates preferred siting of stockpiles.

i. Topsoil stockpiles on agricultural areas left in place prior to October 31 of each calendar year should be seeded with Aroostook Winter Rye or equivalent at an application rate of three bushels (168 pounds) per acre and mulched in accordance with "Mulching" per the New York State Standards and Specifications for Erosion and Sediment Control (NYS Bluebook).

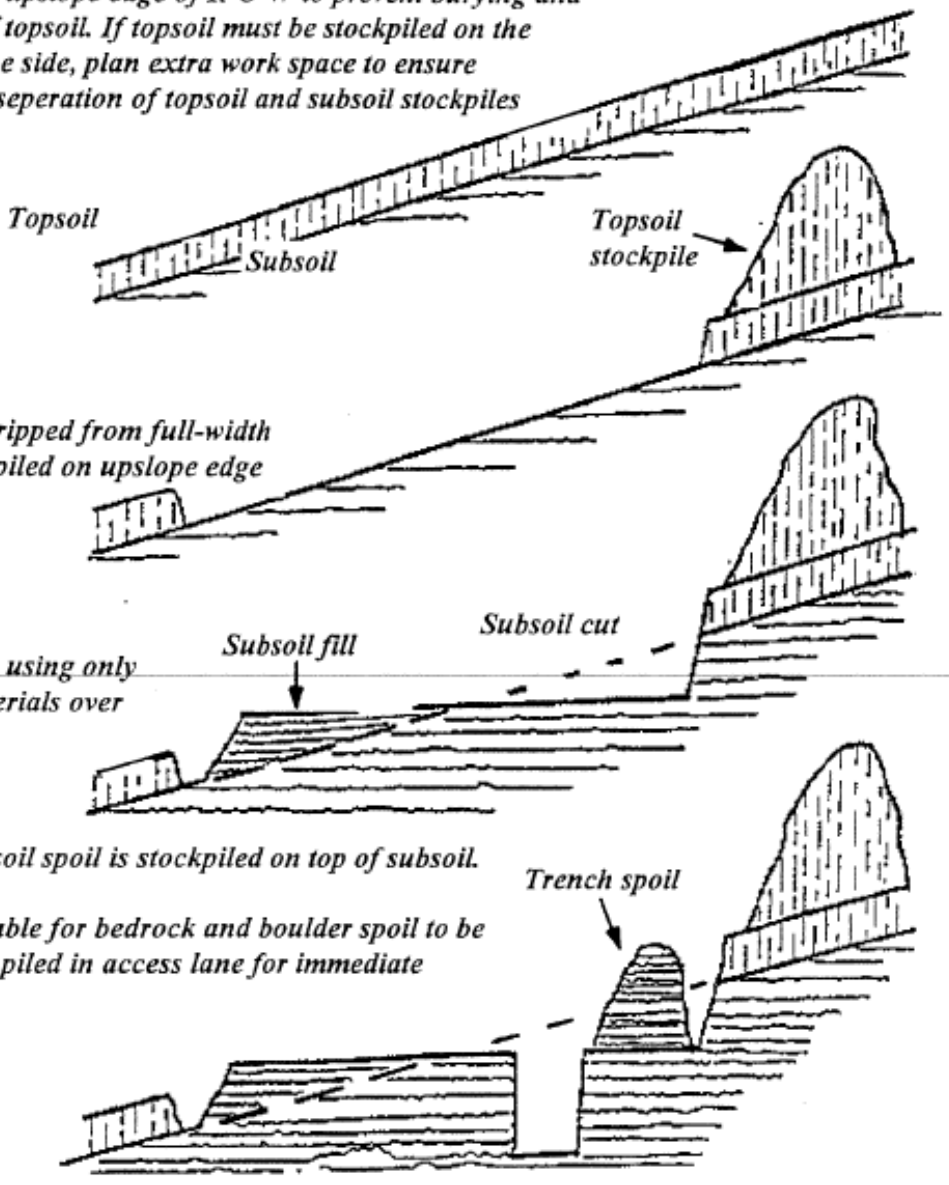
ii. Topsoil stockpiles left in place between October 31 and May 31 of each calendar year should be mulched in accordance with "Winter Stabilization" per the New York State Standards and Specifications for Erosion and Sediment Control (NYS Bluebook).

Figure 9

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



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.*

3.1.1 EQUIPMENT ACCESS

3.1.1.1 Existing Access

Existing farm roads/lanes shall be utilized to the extent possible. Segments of farm roads utilized for access should be improved for the anticipated construction needs, following consultation with the landowner (and/or farm operator) and AGM prior to use. Such improvements should include the installation of geotextile fabric and crushed stone. Geotextile is to prevent aggregate material mixing with native soils intended to be restored. Where construction entrances are required from public roadways to the proposed construction area in agricultural field laneways, select fill over geotextile fabric should be placed over the exposed subsoil (as supported by the New York State Department of Environmental Conservation's Standard and Specifications for Stabilized Construction Access (located within the New York State Standards and Specifications for Erosion and Sediment Control (NYS Bluebook), which requires "Geotextile…to be placed over the entire area to be covered with aggregate.") Culverts and other drainage structures may be required at construction entrances and for other associated access road drainage. All accesses shall be restored to pre-construction conditions or better.

3.1.1.2 Proposed Construction Access

As previously specified in Section 3.2.1, where repeated temporary access is necessary across agricultural lands, topsoil should be stripped and stockpiled, unless timber mats (e.g. typical dimensions four (4) foot wide by 16 foot long by eight (8) inches thick) or a solid decked mat equivalent that displaces equipment loads is utilized. Nonflexible solid-decked lighter duty matting may be used in all areas where equipment proposed to be utilized excludes heavy construction equipment, (i.e. cranes, dump trucks, concrete trucks, rubber-tired skidders/forwarders, etc.). Mats should be layered where necessary to provide a level access surface.

3.1.1.3 Low Ground Pressure Access

Rutting from equipment accessing agricultural lands is prohibited. Access over land (with no additional access preparation) may be allowed for one-time non-recurring access subject to soil condition. This may be considered for activities proposed prior to civil construction (e.g. tree clearing), associated with Low Ground Pressure (LGP) equipment.[5] Access is generally acceptable if environmental conditions (frozen soils, significant snowpack, dry conditions, etc.) limit the potential of LGP equipment that could result in a visible rut, soil compaction, or the mixing of stratified soil layers. Such access must be permitted as approved by the Agricultural Inspector with following condition:

The Agricultural Inspector shall approve the use of LGP equipment access (daily or otherwise as needed) and will monitor equipment operation, weather, and related soil conditions for the duration of the LGP equipment activity. If rutting occurs following work

[5] This type of equipment is generally limited to well-dispersed weight via tracked equipment or all-terrain vehicles.

activity, low ground pressure access shall cease, and restoration shall be conducted under relatively dry conditions. LGP access should not be approved if forecasted weather predicts significate thawing, snowmelt, or saturated conditions.

3.2 SUBSOIL PROTECTION - SHALLOW SOILS

Shallow soils are considered soils with a limited depth to restrictive features potentially limiting normal agricultural practices. Construction through agricultural soils dominated by a shallow depth to bedrock can result in a significant loss or permanent damage to the subsoil and corresponding damage to the soil profile, regardless of the measures employed to protect the topsoil. The structure and thickness of the thin layer of remaining subsoil over bedrock can be adversely impacted because of grading, construction traffic, and trench excavation, as well as backfilling that involves bedrock material. The actual need for subsoil protection, as well as the method to be employed, must be based on project-specific factors including the width of the open trench required, the site-specific depth to bedrock, and the thickness of the subsoil. The Agricultural Inspector may direct the following measures to help minimize damages:

i. Stripping and separately stockpiling subsoil work area for a maximum depth of 12 inches or to the top of the bedrock (whichever is shallower); or stripping and separately stockpiling subsoil.
ii. Removing excavated bedrock materials from the site at the time of excavation.
iii. Backfilling the work trench with imported subsoil material.

3.3 BLASTING REQUIREMENTS

In agricultural areas over bedrock that requires blasting, the Project Certificate/Permit Holder will utilize matting or controlled blasting to limit the dispersion of blast rock fragments. Farm owners/operators will be given timely notice to coordinate livestock concerns prior to blasting on or near the farm property.

3.4 DRILLING

When drilling is proposed, agricultural topsoil and subsoils should be segregated and conserved for the restoration. Excavated and segregated materials should be utilized in the event of required backfill in agricultural areas (e.g. the removal of electric transmission structures to a minimum of four (4) feet deep). Any backfill should be performed in stages to restore the natural soil profile. Restoration of deep fills should utilize excavated subsoils to the pre-existing subsoil elevation, including a six- (6) to 12-inch crowning required to remediate expected settlement of the backfilled materials. Preserved topsoil should be used to cap a deep backfill back to the pre-existing topsoil depth.

All mud and rock from drilling activities shall be removed from agricultural areas. Water will be pumped into a sediment catching device or a prepared pit, as appropriate. All pits should be located outside of agricultural areas to the maximum extent practicable.

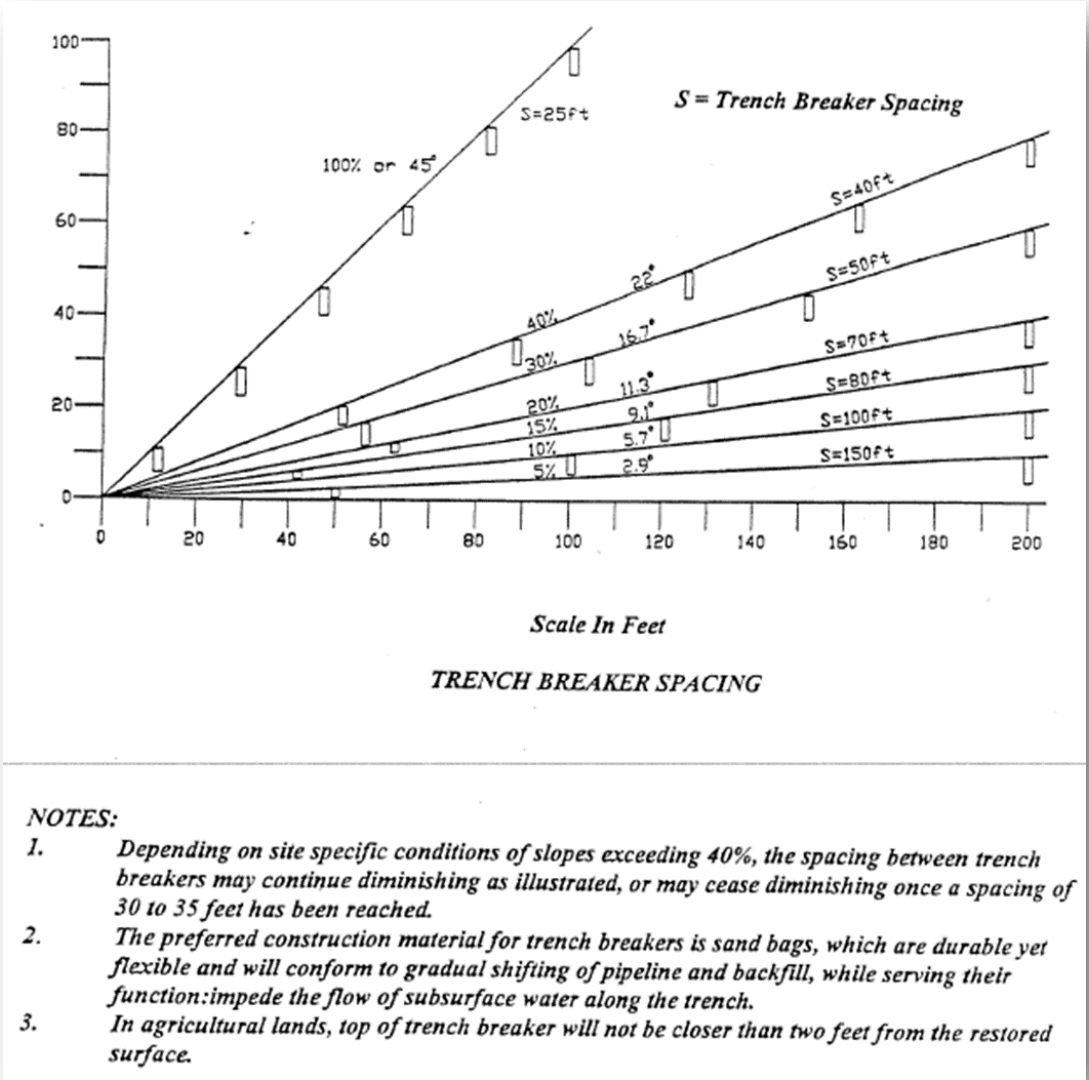
3.5 CONTROL OF OPEN TRENCH WASHOUTS, WATER PIPING, AND BLOWOUTS

Trench breakers are installed for the dual purpose of preventing trench washouts during construction and abating water piping and blowouts after trench backfill. The distance between permanent trench breakers may range from the relatively close-spaced formula of the toe of the upper trench breaker being level with the head of the lower trench breaker, to the relatively greater spacing as detailed on Figure 9, "TRENCH BREAKER SPACING," or an alternative "PERMANENT SLOPE BREAKER SPACING" found in Table 3. The Project Certificate/Permit Holder will geolocate each installed trench breaker location.

Table 3

Permanent Slope Breaker Spacing as Alternative Spacing Guideline for Trench Breakers	
Slope (%)	Spacing (Feet)
<5	125
5 to 10	100
10 to 20	75
20 to 35	50
>35	25
Slope Breaker and Water Bar are synonymous. See the most current version of the New York State Standards and Specification for Erosion and Sediment Control "Standards and Specification for Water Bars" for construction guidance.	

Figure 10



3.6 SUPPLEMENTAL BACKFILL MATERIALS

In agricultural areas where the excavated materials are insufficient to meet backfill requirements, agricultural lands shall not be used for borrow areas. Under no circumstances will any topsoil material be used for backfill. In situations where imported soil materials are used for backfill on agricultural lands, such material shall be of equal or better quality of the existing soils on site and shall be verified to be free of invasive species. If material is not certified by a liable vendor, verification may be made by visual observation of the desired material original location.

4 AGRICULTURAL RESTORATION

4.1 HOUSEKEEPING

All construction debris in agricultural areas including pieces of wire, bolts, and other unused metal objects will need to be removed and properly disposed of as soon as practical to prevent mixing with any topsoil. Excess concrete will not be buried or left on the surface in agricultural areas. Concrete washouts shall be located outside of agricultural areas. Remove all excess subsoil and rock unearthed from construction related activities occurring in areas intended to return to agricultural use. On-site disposal of such material is not permissible in active agricultural lands associated with crop production. Designated spoil disposal locations should be specified in the associated construction plans. If the approved construction plans do not allow for on-site disposal, material must be removed from the site.[6]

All structures, structure foundations, guy anchors, or buried decommissioned utilities must be removed from agricultural areas to a minimum depth of 48 inches below the soil surface.

All access roads must be regraded to pre-existing conditions and verified by the Agricultural Inspector prior to resumption of farm equipment crossing. Original surface drainage patterns impacted by construction must be restored.

4.2 OPEN-HOLE OR TRENCH BACKFILL PROFILE AND CROWNING

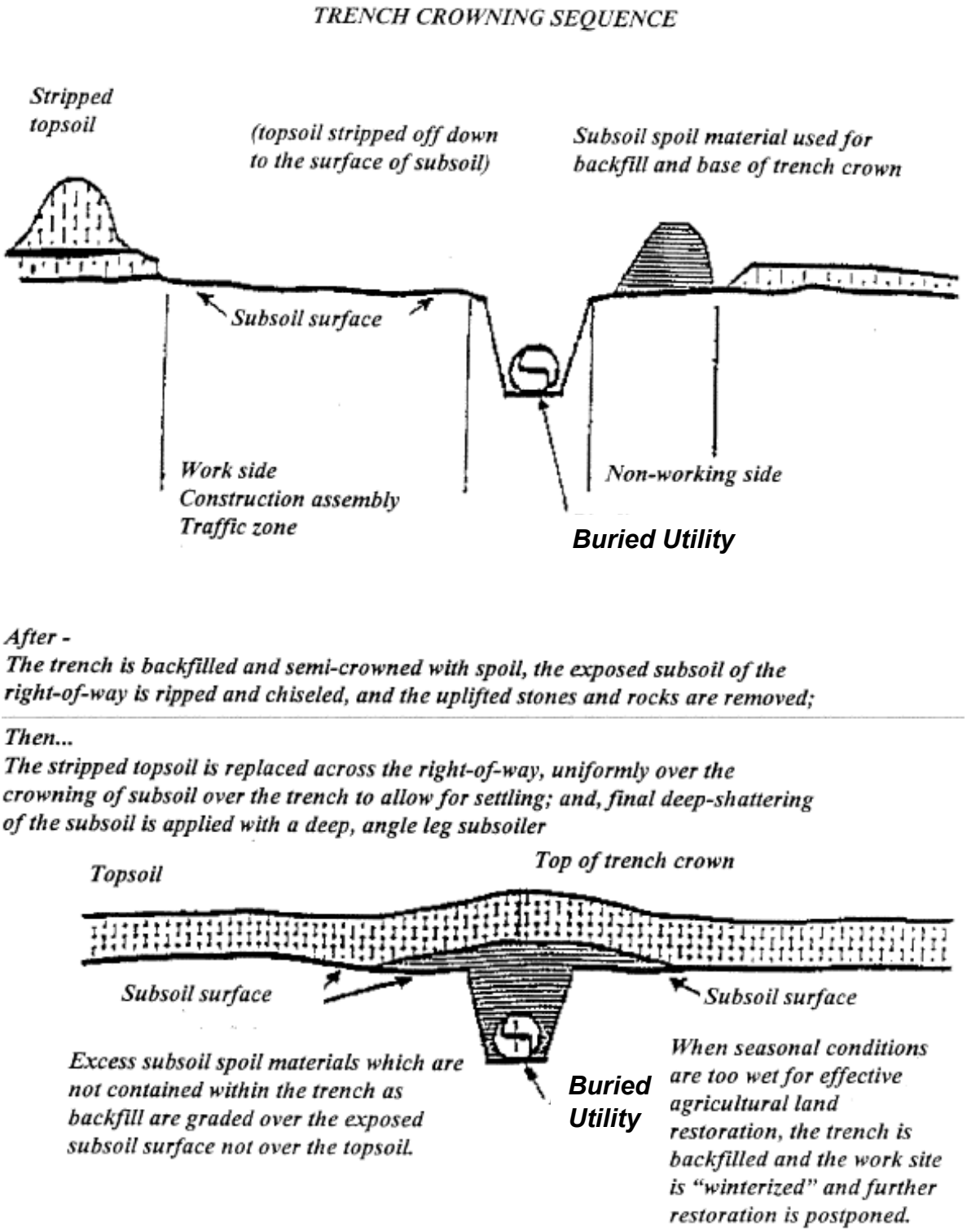
Excavated subsoil material and stockpiled topsoil should be used to restore the original soil profile to near pre-existing conditions. Excess subsoil material not used for backfilling should be removed from agricultural areas. Ripped or blasted bedrock or concentrated volumes of excavated stone or rock material may be used for backfill if the rock is representative of the original soil profile. Rock backfill depth shall be no closer than 24 inches in mesic soils or 30 inches in frigid soils from the exposed working construction surface of the right-of-way. (To determine the temperature regime[7] of the soil, consult the USDA NRCS applicable Soil Survey's Soil Taxonomy Classification.) All excess rock not utilized as trench backfill will be hauled away and disposed outside of agricultural areas.

Trench crowning should be achieved when backfilling with subsoil prior to topsoil replacement. All excavations should be backfilled to the same level as the adjacent area, plus six (6) to 12 inches of additional soil to allow for settling. See Figure 11 for Trench crowning illustrations. The stockpiled topsoil will be spread over the affected area, after the initial ripping of the exposed subsoil and the rock cleanup has been completed. In areas where trench settling occurs after topsoil spreading, imported topsoil of equal or

[6] Any permits necessary for disposal under local, State, and/or federal laws and regulations must be obtained by the Permit/Certificate Holder, with the cooperation of the landowner when required.
[7] Soil Temperature Regime – Soils are classified according to the mean annual soil temperature at 20-inches depth. Mesic= 47°F mean annual temperature, Frigid=<47°F mean annual temperature (Agricultural Land Classification System for New York).

better quality will be used to fill each depression. Topsoil from existing stockpiles will not be used to backfill depressions.

Figure 11



4.3 DECOMPACTION, STONE REMOVAL, AND TOPSOIL REPLACEMENT

In all agricultural areas where topsoil has been stripped and subjected to equipment traffic, the Agricultural Inspector shall measure soil compaction with a penetrometer and results should be no more than 250 pounds per square inch (PSI). Compaction tests shall be made at regular intervals throughout the affected areas, including at each soil type identified within the affected areas. If results are greater than 250 PSI, the Project Certificate/Permit Holder shall break up the soil to a minimum depth of 18 inches (unless bedrock is encountered at a depth of less than 18 inches) with deep tillage methods. After deep tilling, the affected agricultural areas compaction shall have equal or less than a 20% deviation from the adjacent undisturbed areas compaction. Following the deep tillage, all stone and rock material four (4) inches and larger shall be collected and taken off site for disposal. The Agricultural Inspector shall determine the extent of rock removal by comparing disturbed agricultural areas to the unaffected portions of the agricultural lands. If required rock removal associated with restoration creates a void according to the pre-existing grade, the Project Certificate/Permit Holder will be required to import soils in an effort to minimize the potential of establishing a low area within the Project restoration area.

On affected agricultural areas, any restoration should be postponed until favorable (workable, relatively dry) soil conditions exist. Restoration should not be conducted while soils are in a wet or plastic state. Stockpiled topsoil shall not be re-graded until soil is non-plastic, as determined by the Agricultural Inspector by preforming the Atterberg field test. Typically, restoration activities should not occur in agricultural fields between the months of October and May unless favorable soil conditions exist. The Agriculture Inspector shall coordinate with AGM and the landowner regarding a tentative restoration schedule pending weather and soil conditions.

Upon the Agricultural Inspector's approval of the subsoil decompaction and stone removal, the stockpiled topsoil shall then be uniformly replaced to pre-existing conditions. Excess stripped topsoil shall not be utilized for fill within the Project area. Any topsoil removed from permanently impacted areas (e.g., roads, equipment pads, etc.) shall be evenly spread in adjacent agricultural areas in a manner that does not significantly alter the hydrology of that area. Final restoration of topsoil shall involve deep subsoil shattering to be performed with agricultural subsoiling equipment, having angled legs. Additional stone (native or non-native) of greater than four (4) inches in size revealed after shattering shall be removed. If subsequent construction or clean-up activities result in additional compaction, additional deep tillage shall be performed.

If access methods employed did not strip topsoil (timber matting, LGP equipment, frozen conditions, etc.), the Agricultural Inspector shall determine compaction using a soil penetrometer once soil moisture conditions are equivalent to the adjacent undisturbed areas. The soil penetrometer may be used in an alternative manner from the stripped

topsoil situation noted above. Penetrating the soil penetrometer at a consistent rate not exceeding 250 PSI, the Agricultural Inspector shall measure the depth of penetration in impacted soils in comparison adjacent unimpacted areas. If the affected agricultural areas measured show compaction not more than a 20% deviation from the adjacent undisturbed areas, decompaction is not required. If decompaction is required (exceeding the 20% deviation), the contractor shall implement soil decompaction through the topsoil profile, in the manner previously described.

4.3.1 SEEDBED PREPARATION

A favorable seedbed must be prepared to improve soil to seed contact. The seedbed should be firm to support seeding equipment (but not compacted according to prior section), as well as absent of greater than four (4) inch stones and construction/clearing debris. Prior to planting seed, the soil should not be too plastic (soil should not stick to seeder or tractor tires).

4.3.2 FERTILIZER FOR RE-SEEDING OF DISTURBED AREAS

Prior to construction, before the topsoil is stripped, representative soil samples should be obtained from the areas to be disturbed. The soil sampling should be consistent with Cornell University soil testing guidelines and samples should be submitted to a laboratory for testing of pH, percentage of organic material, cation exchange capacity, Phosphorus/Phosphate (P), and Potassium/Potash (K). The results will be used to determine the lime and fertilizer rate to apply for the respective soils and farms. If soil test results are not available, the following approximate fertilizer rates shall be used:

i. To establish a legume crop or legume and grass:
    a. 300 pounds per acre of 10-20-20 (10 pounds of nitrogen, 20 pounds of phosphorus, and pounds of potassium per 100 pounds of fertilizer) or,
    b. 600 pounds per acre of 5-10-10 seed crop.

ii. To establish a crop of grass hayland and/or grass pasture:
    a. 400 pounds per acre of 10-10-10.

Soil amendments should be incorporated into the top two inches of soil. Fertilizer is not recommended for temporary seed cover on the topsoil stockpile but is strongly recommended on the exposed subsoil surface. The surface of the exposed subsoil should be fertilized with 200 pounds per acre of 10-20-20 prior to temporary seeding.

4.3.3 AGRICULTURAL LIME

Consult soil testing performed prior to construction and farm records of recent lime application and apply agricultural lime as appropriate to reach a specific soil pH of 6.0. Where soil testing is not available, a minimum rate of three (3) tons of agricultural lime per acre for final restoration is recommended in naturally low-lime soils. A lower lime rate may be used on naturally high-lime soils. Application rates for pelletized and agricultural

lime are the same in tons per acre; however, pelletized lime is easier to handle and reacts to the soil quicker (do not use "liquid lime" on agricultural land). Soil amendments are recommended to be incorporated into the top two (2) inches of soil.

4.3.4 SEEDING

4.3.4.1 SESTABLISHING TEMPORARY COVER

Topsoil stockpile - topsoil that is stripped and stockpiled in late spring to mid-summer shall be seeded with Oats (96 pounds per acre) or Aroostook Winter Rye (100 pounds per acre). Invasive-free straw shall be spread at a rate of 1500 – 2000 pounds per acre. For large stockpiles, it may be necessary to grade the surface of the stockpile using small, light-weight equipment, to achieve a uniform seed application. Grading of the topsoil stockpile should be done on a limited basis only when soil conditions allow.

Exposed construction surface (subsoil) - if seeding before the end of October, apply Aroostook Winter Rye at the rate of: (1) 150 pounds per acre if a broadcast seeder is used, or (2) 100 pounds per acre if a drill seeder is used. The surface of the exposed subsoil should be scarified, generally parallel to the slope's contours if possible, and fertilized prior to temporary seeding. Apply invasive-free straw at a rate of approximately 1000 pounds per acre after seeding.

Winterization - Temporary seeding applied between mid-September and late October. Any topsoil stockpiles and exposed work surfaces (subsoil) should be seeded with Aroostook Winter Rye at the rate of: (1) 150 pounds per acre if using a broadcast seeder, or (2) 100 pounds per acre if using a drill seeder.

4.3.4.2 ESTABLISHING PERMANENT PERENIAL COVER

The following seeding rates are slightly higher than the standard seeding rates to compensate for less than favorable soil conditions. It is recommended to seed in mid-to-late spring, when the soils become more workable. Seeding after October 1 should be temporary only (see Section 4.3.4.1).

Unless the seed is already coated with inoculants, fresh inoculants must be mixed with all legumes (alfalfa, birdsfoot trefoil, clover, etc.) at the time of planting.

1. Common hayland plantings

    a. Alfalfa - 20 pounds per acre. If adding Timothy, Orchard, or Brome grass, they should be added at the rate of 8 pounds per acre.
    b. Pardee Birdsfoot trefoil - 16 pounds per acre and either: (a) Timothy, (b) Orchard, or (c) Brome grass at the rate of six (6) pounds per acre.
    c. Red Clover - 15 pounds per acre including: (a) Timothy, (b) Orchard, or (c) Brome grass at the rate of six (6) pounds per acre.

2. Common pasture plantings - Ladino White Clover – three (3) pounds per acre and either: (a) Timothy grass (six (6) pounds per acre), (b) Orchard grass (eight (8) pounds per acre), or (c) Brome grass (10 pounds per acre). Reed Canary grass can be seeded in wetter areas used for hay and/or pasture (with landowner approval) at a rate of 18 pounds per acre. Do not seed Reed Canary grass in non-agricultural wetlands.

Annual ryegrass can be added to the seed mixtures identified above to provide quick erosion control while the other plants are becoming adequately established. Annual ryegrass should be seeded at the rate of six to seven pounds per acre if a drill seeder is used, and 12 to 14 pounds per acre if a broadcast seeder is used.

5 POST-CONSTRUCTION TWO-YEAR MONITORING AND REMEDIATION PHASE

The Project Certificate/Permit Holder will provide a monitoring and remediation period of no less than two full growing seasons[8] after initial permanent seeding is completed. The Project Certificate/Permit Holder shall retain the Agricultural Inspector no less than part-time through this period. The monitoring and remediation phase will be used to identify any remaining agricultural impacts associated with the construction that requires further mitigation and to implement follow-up restoration.

5.1 GENERAL MONITORING AND REMEDIATION

Restored conditions will be assessed in comparison to adjacent unaffected crop within that field for: (1) comparative topsoil thickness; (2) relative content of rock and large stones; (3) settling of excavations (e.g., trenches, removed structures, etc.); (4) crop production (e.g., stunted growth, differences in color, etc.); (5) drainage (e.g., comparative soil moisture); (6) condition of repaired fences and gates (unless affected by non-project-related activities); and any other construction related impacts that required restoration. Impacts will be identified through the Agricultural Inspector's on-site monitoring of all agricultural areas along the restored areas as well as in consultation with the associated farm operator(s).

On-site monitoring shall be conducted at least three times during the growing season (one monitoring for each spring, summer, and fall) and shall include a comparison of growth and yield for crops in the project restoration areas and adjacent unaffected agricultural land. When the subsequent crop productivity is less than that of the adjacent unaffected agricultural land, the Agricultural Inspector will determine the appropriate rehabilitation measures for the Project Certificate/Permit Holder to implement within the restored area. Such measures will be developed in conjunction with the landowner

[8] The growing season can be approximated as the period of time between the average date of the last killing frost in the spring to the average date of the first killing frost in the fall. See nrcs.usda.gov/wps/portal/wcc/home/climateSupport/wetlandsClimateTables/growingSeasonDatesLength.

(and/or farm operator), Project Certificate/Permit Holder, AGM, and other applicable agencies. Because conditions that require remediation may not be noticeable at or shortly after the completion of construction, the signing of a release form prior to the end of the remediation period will not relieve the Project Certificate/Permit Holder of responsibility to fully address all project related impacts. When the success of restoration beyond visual observations is disputed, AGM can provide a yield monitoring procedure.

Completed restoration constitutes the beginning of the two-year monitoring period. Restoration is likely to occur in stages on large projects; therefore, post-construction monitoring may begin on portions of the completed restoration before other areas are eligible for post-construction monitoring (depending on available growing season). The Agricultural Inspector is required to provide monitoring records for each individual agricultural area/field, including the specific duration of monitoring. If additional cultivation or re-seeding is required to mitigate construction impacts, the two-year monitoring period may restart. Upon consultation with AGM, non-project related impacts may be excluded from future monitoring and remediation requirements.

5.1.1 CONTROL OF SOIL SATURTIONS AND SEEPS

The Agricultural Inspector shall visually inspect the restored agricultural areas for stunted crop growth due to seasonal saturation not previously experienced at the site and not resulting from the farm operation's irrigation management or excessive rainfall. Identified areas of stunted crop growth shall be compared to the nearest undisturbed adjacent areas under a substantially equivalent terrain and crop management plan. Drainage observations should be evaluated to determine if the Project affected surface or subsurface drainage during construction or restoration. Drainage issues caused by the Project affecting or likely to affect crop productivity of the adjacent areas must be remediated via a positive surface drainage, subsurface drainage repair or an equivalent. For agricultural lands disturbed within or adjoining the affected agricultural areas, the Project Certificate/Permit Holder will remediate such disturbance. See section 2.10. The Agricultural Inspector will be responsible for selecting the exact intercept drain line for installation. Drawings of such drain locations will be provided by the Project Certificate/Permit Holder during monitoring and remediation. All drain lines will be installed according to these Guidelines and/or the USDA NRCS NY Conservation Practice 606[9] and 608.[10]

5.1.2 TOPSOIL DEFICENCIES

Topsoil deficiency and trench settling shall be mitigated with imported topsoil free of invasive species that is consistent with the quality of topsoil on the affected site. Any other proposed mitigation methods shall require consultation with the Agricultural Inspector and AGM. Results will be compared to portions of the same field located outside

[9] efotg.sc.egov.usda.gov/api/CPSFile/43048/606_NY_CPS_Subsurface_Drain_2023
[10] efotg.sc.egov.usda.gov/api/CPSFile/4477/608_NY_CPS_Surface_Drain_Main_or_Lateral_2016

of the restored area. Once these areas have settled, these areas will be subject to rock and stone picking described in Section 4.3.1.

5.1.3 VEGETATIVE OBSERVATIONS

Seedings are considered acceptable if the plant density, vigor, and type are equal to or better than adjacent undisturbed areas, and weed population is less than the adjacent undisturbed areas. If an overpopulation of weeds exists, control measures shall be implemented as directed by the Agricultural Inspector in consultation with AGM and the farm operator.

The soil may be tested to determine if fertilizer application is appropriate. If soil test information is not available, the recommended hayland and pasture-land fertilizer application is 50 pounds of nitrogen, 10-30 pounds of phosphorus, and 50 pounds of potassium per acre. Annual row-crops should be addressed during the next scheduled planting by the Farm Operator with provided soils test comparison for the restored and unaffected portions of the same field.

5.1.4 AGRICULTURE FENCING AND GATES

The Agricultural Inspector shall inspect fencing and gates (installed, altered, or repaired) within the Project LOD. The Project Certificate/Permit Holder is responsible for maintaining gates and fences as well as replacing any damaged gates and fences to NRCS Standards or to the preexisting condition, whichever is better.

5.2 REPORTING

The Project Certificate/Permit Holder will consolidate each applicable growing season's observations into an annual report be provided to AGM. Annual reports should include date stamped photographs for each agricultural area/field illustrating crop growth in comparison with unaffected portions the agricultural areas. If a decline in crop productivity is apparent, the Agricultural Inspector shall determine whether the decline is due to Project activities and consult with the AGM on restoration methods. AGM staff must review and approve the proposed restoration plan prior to implementation. If further remediation is required to mitigate construction impacts, the two-year monitoring period shall restart.