

**APPENDIX C – CIG’S UPLAND EROSION CONTROL,
REVEGETATION, AND MAINTENANCE PLAN (PLAN)**

Upland Erosion Control, Revegetation, and Maintenance Plan

Colorado Interstate Gas Company

**High Plains Expansion Project
Adams, Morgan, Weld Counties, Colorado**

UPLAND EROSION CONTROL, REVEGETATION, AND MAINTENANCE PLAN (PLAN)

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APPENDIX 1 – CROSS SECTIONS AND TYPICAL DRAWINGS

UPLAND EROSION CONTROL, REVEGETATION, AND MAINTENANCE PLAN (PLAN)

I. APPLICABILITY

- A. The intent of this Plan is to assist applicants by identifying baseline mitigation measures for minimizing erosion and enhancing revegetation. The project sponsors should specify in their applications for a FERC Certificate (Certificate) any individual measures in this Plan they consider unnecessary, technically infeasible, or unsuitable due to local conditions and to fully describe any alternative measures they would use. Applicants should also explain how those alternative measures would achieve a comparable level of mitigation.

Once a project is certificated, further changes can be approved. Any such changes from the measures in this Plan (or the applicant's approved plan) will be approved by the Director of the Office of Energy Projects (Director), upon the applicant's written request, if the Director agrees that an alternative measure:

1. provides equal or better environmental protection;
2. is necessary because a portion of this Plan is infeasible or unworkable based on project-specific conditions; or
3. is specifically required in writing by another Federal, state, or Native American land management agency for the portion of the project on its land or under its jurisdiction.

Any requirements in this Plan to file material with the Secretary of the FERC (Secretary) do not apply to projects undertaken under the provisions of the blanket certificate program. This exemption does not apply to a request for alternative measures.

Project-related impacts on wetland and waterbody systems are addressed in the staff's Wetland and Waterbody Construction and Mitigation Procedures (Procedures).

II. SUPERVISION AND INSPECTION

A. ENVIRONMENTAL INSPECTION

At least one Environmental Inspector is required for each construction spread during construction and restoration (as defined by section V). The number and experience of Environmental Inspectors assigned to each construction spread should be appropriate for the length of the construction spread and the number/significance of resources affected.

2. Environmental Inspectors shall have peer status with all other activity inspectors. **The EI will be supervised by and responsible to the Chief Inspector (CI) who has overall authority over construction.**
3. Environmental Inspectors shall have the authority to stop activities that violate the environmental conditions of the Certificate Order, state and Federal environmental permit conditions, or landowner requirements; and to order appropriate corrective action.

B. RESPONSIBILITIES OF ENVIRONMENTAL INSPECTORS

At a minimum, the Environmental Inspector(s) shall be responsible for:

1. Ensuring **and documenting** compliance with the requirements of this Plan, the Procedures, the environmental conditions of the Certificate authorization, the mitigation measures proposed by the applicant (as approved and/or modified by the Certificate), other environmental permits and approvals, and environmental requirements in landowner easement agreements. ***This includes responsibility for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract and any other authorizing document;***
2. Identifying, documenting, and overseeing corrective actions, as necessary to bring an activity back into compliance;
3. Verifying that the limits of authorized construction work areas and locations of access roads are properly marked before clearing;
4. Verifying the location of signs and highly visible flagging marking the boundaries of sensitive resource areas, waterbodies, wetlands, or areas with special requirements along the construction work area;
5. Identifying erosion/sediment control and soil stabilization needs in all areas;
6. Ensuring that the location of dewatering structures and slope breakers will not direct water into known cultural resources sites or locations of sensitive species;
7. Verifying that trench dewatering activities do not result in the deposition of sand, silt, and/or sediment near the point of discharge into a wetland or waterbody. If such deposition is occurring, the dewatering activity shall be stopped and the design of the discharge shall be changed to prevent reoccurrence;
8. Ensuring that subsoil and topsoil are tested in agricultural and residential areas to measure compaction and determine the need for corrective action;
9. Advising the Chief Construction Inspector when conditions (such as wet weather) make it advisable to restrict construction activities to avoid excessive rutting;
10. Ensuring restoration of contours and topsoil;
11. Verifying that the soils imported for agricultural or residential use have been certified as free of noxious weeds and soil pests, unless otherwise approved by the landowner;
12. Determining the need for and ensuring that erosion controls are properly installed, as necessary to prevent sediment flow into wetlands, waterbodies, sensitive areas, and onto roads;
13. Inspecting and ensuring the maintenance of temporary erosion control measures at least:
 - a. on a daily basis in areas of active construction or equipment operation;
 - b. on a weekly basis in areas with no construction or equipment operation; and

- c. within 24 hours of each 0.5 inch of rainfall;
- 14. Ensuring the repair of all ineffective temporary erosion control measures within 24 hours of identification;
- 15. Keeping records of compliance with the environmental conditions of the FERC certificate, and the mitigation measures proposed by the project sponsor in the application submitted to the FERC, and other Federal or state environmental permits during active construction and restoration; and
- 16. Identifying areas that should be given special attention to ensure stabilization and restoration after the construction phase;

III. PRECONSTRUCTION PLANNING

The project sponsor shall do the following before construction:

A. CONSTRUCTION WORK AREAS

- 1. Identify all construction work areas (e.g., construction right-of-way, extra work space areas, pipe storage and contractor yards, borrow and disposal areas, access roads, etc.) that would be needed for safe construction. The project sponsor must ensure that appropriate cultural resources and biological surveys have been conducted.
- 2. Project sponsors are encouraged to consider expanding any required cultural resources and endangered species surveys in anticipation of the need for activities outside of certificated work areas.

B. DRAIN TILE AND IRRIGATION SYSTEMS

- 1. Attempt to locate existing drain tiles and irrigation systems.
- 2. Contact landowners and local soil conservation authorities to determine the locations of future drain tiles that are likely to be installed within 3 years of the authorized construction.
- 3. Develop procedures for constructing through drain-tiled areas, maintaining irrigation systems during construction, and repairing drain tiles and irrigation systems after construction.
- 4. Engage qualified drain tile specialists, as needed to conduct or monitor repairs to drain tile systems affected by construction. Use drain tile specialists from the project area, if available.

C. GRAZING DEFERMENT

Develop grazing deferment plans with willing landowners, grazing permittees, and land management agencies to minimize grazing disturbance of revegetation efforts.

D. ROAD CROSSINGS AND ACCESS POINTS

Plan for safe and accessible conditions at all roadway crossings and access points during

construction and restoration.

E. DISPOSAL PLANNING

Determine methods and locations for the disposal of construction debris (e.g., timber, slash, mats, garbage, drilling fluids, excess rock, etc). Off-site disposal in other than commercially operated disposal locations is subject to compliance with all applicable survey, landowner permission, and mitigation requirements.

F. AGENCY COORDINATION

The project sponsor must coordinate with the appropriate local, state, and Federal agencies as outlined in this Plan and in the Certificate.

1. Obtain written recommendations from the local soil conservation authorities or land management agencies regarding permanent erosion control and revegetation specifications.
2. Develop specific procedures in coordination with the appropriate agency to prevent the introduction or spread of noxious weeds and soil pests resulting from construction and restoration activities.

G. STORMWATER POLLUTION PREVENTION PLAN

Make available on each construction spread the Stormwater Pollution Prevention Plan (SWPPP) prepared for compliance with the U.S. Environmental Protection Agency's National Stormwater Program General Permit requirements. **This Plan, along with the CIG's Waste and Spill Management Specifications make up the components of an SWPPP for compliance with the U.S. Environmental Protection Agency's and/or state(s) National Pollution Discharge and Elimination System (NPDES) Program. These components of the SWPPP will be retained at the construction offices associated with this project throughout the period of construction.**

IV. INSTALLATION

A. APPROVED AREAS OF DISTURBANCE

1. Project-related ground disturbance shall be limited to the construction right-of-way, extra work space areas, pipe storage yards, borrow and disposal areas, access roads, and other areas approved in the Certificate. Any project-related ground disturbing activities outside these Certificated areas, except those needed to comply with the Plan and Procedures (e.g., slope breakers, energy-dissipating devices, dewatering structures, drain tile system repairs) will require prior Director approval. All construction or restoration activities outside of the Certificated areas are subject to all applicable survey and mitigation requirements.
2. The construction right-of-way width for a project shall not exceed 85 feet or that described in the FERC application unless otherwise modified by a Certificate condition. However, in limited, non-wetland areas, this construction right-of-way width may be expanded by up to 25 feet without Director approval to accommodate full construction right-of-way topsoil segregation and to ensure safe construction where topographic conditions (such as side-slopes) or soil limitations require it. Twenty-five feet of extra construction right-of-way width may

also be used in limited, non-wetland or non-forested areas for truck turn-arounds where no reasonable alternative access exists.

Figures Plan-2A-E (Appendix 1, Typical Drawings) shows typical rights-of-way configurations where construction activities will take place. Figures Plan-2F, 2G, and Plan-3 through Plan-6 (Appendix 1, Typical Drawings) show typical erosion control devices used during clearing, grading, and ditching phases of construction (i.e., water bars, silt fence, hay/straw bales, trench breakers, respectively).

Variance: CIG is seeking FERC authorization to use a nominal 100-foot construction width in order to allow construction to progress in a reasonably uniform manner across widely varying types of terrain and soil conditions and for safety considerations. First, having a uniform nominal construction width will permit CIG and its contractor to efficiently perform the various construction activities required with minimal off right-of-way damage. Second, the use of the 100-foot nominal construction width will permit adequate topsoil segregation. Specifically, CIG is planning to segregate topsoil over the ditchline for the length of the project unless otherwise requested in writing by a landowner. The ditchline width is anticipated to be between 14 to 18 feet. CIG will place the ditchline topsoil adjacent to the working side of the ditch. The temporary construction work space means that the heavy tracked construction equipment can be kept away from the ditch and off the topsoil for most of the construction activities. Based on CIG's past construction experience, the use of a 100-foot nominal construction width has worked extremely well.

Project use of these additional limited areas is subject to landowner approval and compliance with all applicable survey and mitigation requirements. When such additional areas are used, each one should be identified and the need explained in the weekly or biweekly construction reports to the FERC, if required. The following material should be included in the reports:

- a. the location of each additional area by station number and reference to a previously filed alignment sheet, or updated alignment sheets showing the additional areas;
- b. identification of where the Commission's records contain evidence that the additional areas were previously surveyed; and
- c. a statement that landowner approval has been obtained and is available in project files.

Prior written approval of the Director is required when the Certificated construction right-of-way width would be expanded by more than 25 feet.

B. TOPSOIL SEGREGATION

1. Unless the landowner or land management agency specifically approves otherwise, prevent the mixing of topsoil with subsoil by stripping topsoil from either the full work area or from the trench and subsoil storage area (ditch plus spoil side method) in:
 - a. actively cultivated or rotated croplands and pastures;

- b. residential areas;
- c. hayfields; and
- d. other areas at the landowner's or land managing agency's request.

Variance: For all areas, including Prime Farmland, ditch line only topsoiling is the suggested method, a variance from the FERC plan. Topsoil will be stored on the working side and will be stabilized by the skids and pipe. The low threat of compaction and the desire to leave vegetation, topsoil, seed bank, and roots intact wherever possible make this a feasible option on rangeland and CRP land. Using ditch line topsoiling on Prime Farmland (FERC's Plan requires full right-of-way topsoil removal and storage) and any cropland is suggested to eliminate as much soil handling as possible in order to avoid wind erosion. Once cleanup reaches the croplands, the working side will be tested for compaction, ripped if necessary to a depth not to exceed 12 inches, and any stones brought to the surface will be removed. During construction, work would not be delayed due to rutting on wet cropland soil.

Variance: In rangelands or CRP lands, ditchline only topsoil removal is the preferred method of right-of-way preparation. During periods of high precipitation when soil compaction and excessive rutting become a threat, many construction activities may be required to cease until conditions allow work to continue without the mixing of subsoil and topsoil. This requirement will not apply in areas where the entire right of way has been topsoiled. In agricultural areas, if rutting exceeds 12 inches in depth, significantly increasing the chance of topsoil mixing with subsoils, work would continue and the rutted area would be covered with at least an adequate volume of new topsoil to replace mixed soils and subsoils, such topsoil purchased in the immediate vicinity. This will allow continuation of construction during inclement weather at a cost of supplying new topsoil. Other options for soil enhancements, such as spreading manure, may be reviewed and implemented as well. This variance allows for continuation of construction during inclement weather at a cost of supplying new topsoil. Other options for soil enhancements, such as spreading manure, may be reviewed and implemented as well. This departure from the FERC Plan would not apply to rangelands or CRP lands. On the latter categories of land, if blading is necessary to smooth out the working side and more than one inch of topsoil will be disturbed, then topsoil segregation will be necessary on the entire working side. On sideslopes, all of the right-of-way, spoil and working side, will require topsoil removal and storage.

- 2. In residential areas importation of topsoil is an acceptable alternative to topsoil segregation.
- 3. In deep soils (more than 12 inches of topsoil), segregate at least 12 inches of topsoil. In soils with less than 12 inches of topsoil make every effort to segregate the entire topsoil layer.

Variance: *In areas where topsoil segregation is required and the landowner or land managing agency specifically approves in writing, the Company proposes to segregate no less than six inches and no more than 12 inches where topsoil is available. In general, if topsoil is present at all, a six-inch salvage is necessary to capture topsoil. A lesser depth would involve too small of a volume, a volume that could be easily lost. The native seed base is contained in the top 12 inches of topsoil. Removal of deeper soil will dilute this seed base and will not promote return of native vegetation as well. Further, most topsoil along the Project is less than six inches in depth.*

4. Where topsoil segregation is required, maintain separation of salvaged topsoil and subsoil throughout all construction activities.
5. Segregated topsoil may not be used for padding the pipe.

C. DRAIN TILES

1. Mark locations of drain tiles damaged during construction.
2. Probe all drainage tile systems within the area of disturbance to check for damage.
3. Repair damaged drain tiles to their original or better condition. Do not use filter-covered drain tiles unless the local soil conservation authorities and the landowner agree. Use qualified specialists for testing and repairs.
4. For new pipelines in areas where drain tiles exist or are planned, ensure that the depth of cover over the pipeline is sufficient to avoid interference with drain tile systems. For adjacent pipeline loops in agricultural areas, install the new pipeline with at least the same depth of cover as the existing pipeline(s).

D. IRRIGATION

Maintain water flow in crop irrigation systems, unless shutoff is coordinated with affected parties.

E. ROAD CROSSINGS AND ACCESS POINTS

1. Maintain safe and accessible conditions at all road crossings and access points during construction.
2. If crushed stone access pads are used in residential, or active agricultural areas, place the stone on synthetic fabric to facilitate removal (**Appendix 1, Typical Drawings, Plan-7**).

F. TEMPORARY EROSION CONTROL

Install temporary erosion controls immediately after initial disturbance of the soil. Temporary erosion controls must be properly maintained throughout construction (on a daily basis) and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration is complete.

1. Temporary Slope Breakers (**Appendix 1, Typical Drawings, Plan-3**)

- a. Temporary slope breakers are intended to reduce runoff velocity and divert water off the construction right-of-way. Temporary slope breakers may be constructed of materials such as soil, silt fence, staked hay or straw bales, or sand bags.
- b. Install temporary slope breakers on all disturbed areas, as necessary to avoid excessive erosion. Temporary slope breakers must be installed on slopes greater than 5 percent where the base of the slope is less than 50 feet from waterbody, wetland, and road crossings at the following spacing (closer spacing should be used if necessary):

<u>Slope (%)</u>	<u>Spacing (feet)</u>
5 - 15	300
>15 - 30	200
>30	100

- c. Direct the outfall of each temporary slope breaker to a stable, well vegetated area or construct an energy-dissipating device at the end of the slope breaker and off the construction right-of-way.
- d. Position the outfall of each temporary slope breaker to prevent sediment discharge into wetlands, waterbodies, or other sensitive resources.

2. Sediment Barriers

- a. Sediment barriers are intended to stop the flow of sediments and to prevent the deposition of sediments into sensitive resources. They may be constructed of materials such as silt fence, staked hay or straw bales, compacted earth (e.g., driveable berms across travelways), sand bags, or other appropriate materials.
- b. At a minimum, install and maintain temporary sediment barriers across the entire construction right-of-way at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a waterbody, wetland, or road crossing until revegetation is successful as defined in this Plan. Leave adequate room between the base of the slope and the sediment barrier to accommodate ponding of water and sediment deposition.
- c. Where wetlands or waterbodies are adjacent to and downslope of construction work areas, install sediment barriers along the edge of these areas, as necessary to prevent sediment flow into the wetland or waterbody.

3. Mulch

- a. Apply mulch on all slopes (except in actively cultivated cropland) concurrent with or immediately after seeding, where necessary to stabilize the soil surface and to reduce wind and water erosion. Spread mulch uniformly over the area to cover at least 75 percent of the ground surface at a rate of **1.5 tons/acre** of straw or its equivalent, unless the local soil conservation authority, landowner, or land managing agency approves otherwise in writing.
- b. Mulch can consist of weed-free straw or hay, wood fiber hydromulch, erosion control fabric, or some functional equivalent.

- c. Mulch before seeding if:
 - (1) final grading and installation of permanent erosion control measures, will not be completed in an area within 20 days after the trench in that area is backfilled (10 days in residential areas), as required in section V.A.1; or
 - (2) construction or restoration activity is interrupted for extended periods, such as when seeding cannot be completed due to seeding period restrictions.
- d. If mulching before seeding, increase mulch application on all slopes within 100 feet of waterbodies and wetlands to a rate of 4 tons/acre of straw or equivalent.
- e. If wood chips are used as mulch, do not use more than 1 ton/acre and add the equivalent of 11 lbs/acre available nitrogen (at least 50 percent of which is slow release).
- f. Ensure that mulch is adequately anchored to minimize loss due to wind and water.
- g. When anchoring with liquid mulch binders, use rates recommended by the manufacturer. Do not use liquid mulch binders within 100 feet of wetlands or waterbodies.
- h. Install erosion control fabric on waterbody banks at the time of final bank recontouring. Anchor the erosion control fabric with pegs, staples or other appropriate devices (**Appendix 1, Typical Drawings, Plan-8**).

V. RESTORATION

A. CLEANUP

1. Commence cleanup operations immediately following backfill operations. Complete final grading, topsoil replacement, and installation of permanent erosion control structures within 20 days after backfilling the trench (10 days in residential areas). If seasonal or other weather conditions prevent compliance with these time frames, maintain temporary erosion controls (temporary slope breakers and sediment barriers) until conditions allow completion of cleanup.

The project sponsor should file with the Secretary for the review and written approval of the Director, a winterization plan if construction will continue into the winter season when conditions could delay successful decompaction, topsoil replacement, or seeding until the following spring.

2. A travel lane may be left open temporarily to allow access by construction traffic if the temporary erosion control structures are installed as specified in section IV.F. and inspected and maintained as specified in sections II.B.12 through 14. When access is no longer required the travel lane must be removed and the right-of-way restored.
3. Rock excavated from the trench may be used to backfill the trench only to the top of the existing bedrock profile. Rock that is not returned to the trench should be considered construction debris, unless approved for use as mulch or for some

other use on the construction work areas by the landowner or land managing agency.

4. Remove excess rock from at least the top 12 inches of soil in all actively cultivated or rotated cropland and pastures, hayfields, and residential areas, as well as other areas at the landowner's request. The size, density, and distribution of rock on the construction work area should be similar to adjacent areas not disturbed by construction. The landowner may approve other provisions in writing.
5. Grade the construction right-of-way to restore pre-construction contours and leave the soil in the proper condition for planting.
6. Remove construction debris from all construction work areas unless the landowner or land managing agency approves otherwise.
7. Remove temporary sediment barriers when replaced by permanent erosion control measures or when revegetation is successful.

B. PERMANENT EROSION CONTROL DEVICES

1. Trench Breakers (**Appendix 1, Typical Drawings, Plan-6**)

- a. Trench breakers are intended to slow the flow of subsurface water along the trench. Trench breakers may be constructed of materials such as sand bags or polyurethane foam. Do not use topsoil in trench breakers.
- b. An engineer or similarly qualified professional shall determine the need for and spacing of trench breakers. Otherwise, trench breakers shall be installed at the same spacing as and upslope of permanent slope breakers.
- c. In agricultural fields and residential areas where slope breakers are not typically required, install trench breakers at the same spacing as if permanent slope breakers were required.
- d. At a minimum, install a trench breaker at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a waterbody or wetland and where needed to avoid draining a waterbody or wetland.

2. Permanent Slope Breakers (**Appendix 1, Typical Drawings, Plan-3**)

- a. Permanent slope breakers are intended to reduce runoff velocity, divert water off the construction right-of-way, and prevent sediment deposition into sensitive resources. Permanent slope breakers may be constructed of materials such as soil or some functional equivalent. *For this project, sandbags will not be used in this application (as the structure of the permanent slope breaker itself), due to their limited durability under conditions of the regional climate and off-road traffic, and the potential for accelerated erosion and sedimentation if such a structure fails. These conditions have been noted in the area on other existing Rights-of Way.*
- b. Construct and maintain permanent slope breakers in all areas, except cultivated areas and lawns, using spacing recommendations obtained from the local soil conservation authority or land managing agency.

In the absence of written recommendations, use the following spacing unless closer spacing is necessary to avoid excessive erosion on the construction right-of-way:

<u>Slope (%)</u>	<u>Spacing (feet)</u>
5 - 15	300
>15 - 30	200
>30	100

- c. Construct slope breakers to divert surface flow to a stable area without causing water to pool or erode behind the breaker. In the absence of a stable area, construct appropriate energy-dissipating devices at the end of the breaker.
- d. Slope breakers may extend slightly beyond the edge of the construction right-of-way to effectively drain water off the disturbed area. Where slope breakers extend beyond the edge of the construction right-of-way, they are subject to compliance with all applicable survey requirements.

C. SOIL COMPACTION MITIGATION

- 1. Test topsoil and subsoil for compaction at regular intervals in agricultural and residential areas disturbed by construction activities. Conduct tests on the same soil type under similar moisture conditions in undisturbed areas to approximate preconstruction conditions. Use penetrometers or other appropriate devices to conduct tests.
- 2. Plow severely compacted agricultural areas with a paraplow or other deep tillage implement. In areas where topsoil has been segregated, plow the subsoil before replacing the segregated topsoil.

Alternatively, make arrangements with the landowner to plant and plow under a "green manure" crop, such as alfalfa, to decrease soil bulk density and improve soil structure. If subsequent construction and cleanup activities result in further compaction, conduct additional tilling.

- 3. Perform appropriate soil compaction mitigation in severely compacted residential areas.

D. REVEGETATION

1. General

- a. The project sponsor is responsible for ensuring successful revegetation of soils disturbed by project-related activities, except as noted in section V.D.1.b.
- b. Restore all turf, ornamental shrubs, and specialized landscaping in accordance with the landowner's request, or compensate the landowner. Restoration work must be performed by personnel familiar with local horticultural and turf establishment practices.

2. Soil Additives

Fertilize and add soil pH modifiers in accordance with written recommendations obtained from the local soil conservation authority, land management agencies, or landowner. Incorporate recommended soil pH modifier and fertilizer into the top 2 inches of soil as soon as possible after application.

3. Seeding Requirements

- a. Prepare a seedbed in disturbed areas to a depth of 3 to 4 inches using appropriate equipment to provide a firm seedbed. When hydroseeding, scarify the seedbed to facilitate lodging and germination of seed.
- b. Seed disturbed areas in accordance with written recommendations for seed mixes, rates, and dates obtained from the local soil conservation authority or the request of the landowner or land management agency. Seeding is not required in actively cultivated croplands unless requested by the landowner.
- c. Perform seeding of permanent vegetation within the recommended seeding dates. If seeding cannot be done within those dates, use appropriate temporary erosion control measures discussed in section IV.F. and perform seeding of permanent vegetation at the beginning of the next recommended seeding season. **However, the Company plans to seed whenever the clean up is complete, even if it is not in the recommended seeding season. This will permit establishment of at least some seed and does not relieve the Company of its responsibility to achieve acceptable reclamation after construction. Company will mulch all areas seeded outside the recommended season, at mulch rates described herein for seeded areas.** Lawns may be seeded on a schedule established with the landowner.
- d. In the absence of written recommendations from the local soil conservation authorities, seed all disturbed soils within 6 working days of final grading, weather and soil conditions permitting, subject to the specifications in section V.D.3.a-c. **Due to the length of this project and potential for separation between seeding crews and final clean up crews, the Company proposes to extend the time between these activities from six working days to twelve working days (fourteen calendar days), weather permitting, subject to approval of the affected landowner or land managing agency.**

- e. Base seeding rates on Pure Live Seed. Use seed within 12 months of seed testing.
- f. Treat legume seed with an inoculant specific to the species using the manufacturer's recommended rate of inoculant appropriate for the seeding method (broadcast, drill, or hydro).
- g. In the absence of written recommendations from the local soil conservation authorities, landowner, or land managing agency to the contrary, a seed drill equipped with a cultipacker is preferred for seed application.

Broadcast or hydroseeding can be used in lieu of drilling at double the recommended seeding rates. Where seed is broadcast, firm the seedbed with a cultipacker or roller after seeding. In rocky soils or where site conditions may limit the effectiveness of this equipment, other alternatives may be appropriate (e.g., use of a chain drag) to lightly cover seed after application, as approved by the Environmental Inspector.

VI. OFF-ROAD VEHICLE CONTROL

To each owner or manager of forested lands offer to install and maintain measures to control unauthorized vehicle access to the right-of-way. These measures may include:

- A. Signs;
- B. Fences with locking gates;
- C. Slash and timber barriers, pipe barriers, or a line of boulders across the right-of-way; and
- D. Conifers or other appropriate trees/or shrubs across the right-of-way.

VII. POST-CONSTRUCTION ACTIVITIES

A. MONITORING AND MAINTENANCE

1. Conduct follow-up inspections of all disturbed areas after the first and second growing seasons to determine the success of revegetation.
2. Revegetation in non-agricultural areas shall be considered successful if upon visual survey the density and cover of non-nuisance vegetation are similar in density and cover to adjacent undisturbed lands. In agricultural areas, revegetation shall be considered successful if crop yields are similar to adjacent undisturbed portions of the same field.

Continue revegetation efforts until revegetation is successful. .

3. Monitor and correct problems with drainage and irrigation systems resulting from pipeline construction in active agricultural areas until restoration is successful.
4. Restoration shall be considered successful if the right-of-way surface condition is similar to adjacent undisturbed lands, construction debris is removed (unless requested otherwise by the land owner or land managing agency), revegetation is successful, and proper drainage has been restored.

5. Routine vegetation maintenance clearing shall not be done more frequently than every 3 years. However, to facilitate periodic corrosion and leak surveys, a corridor not exceeding 10 feet in width centered on the pipeline may be maintained annually in a herbaceous state. In no case shall routine vegetation maintenance clearing occur between April 15 and August 1 of any year.
6. Efforts to control unauthorized off-road vehicle use, in cooperation with the landowner, shall continue throughout the life of the project. Maintain signs, gates, and vehicle trails as necessary.

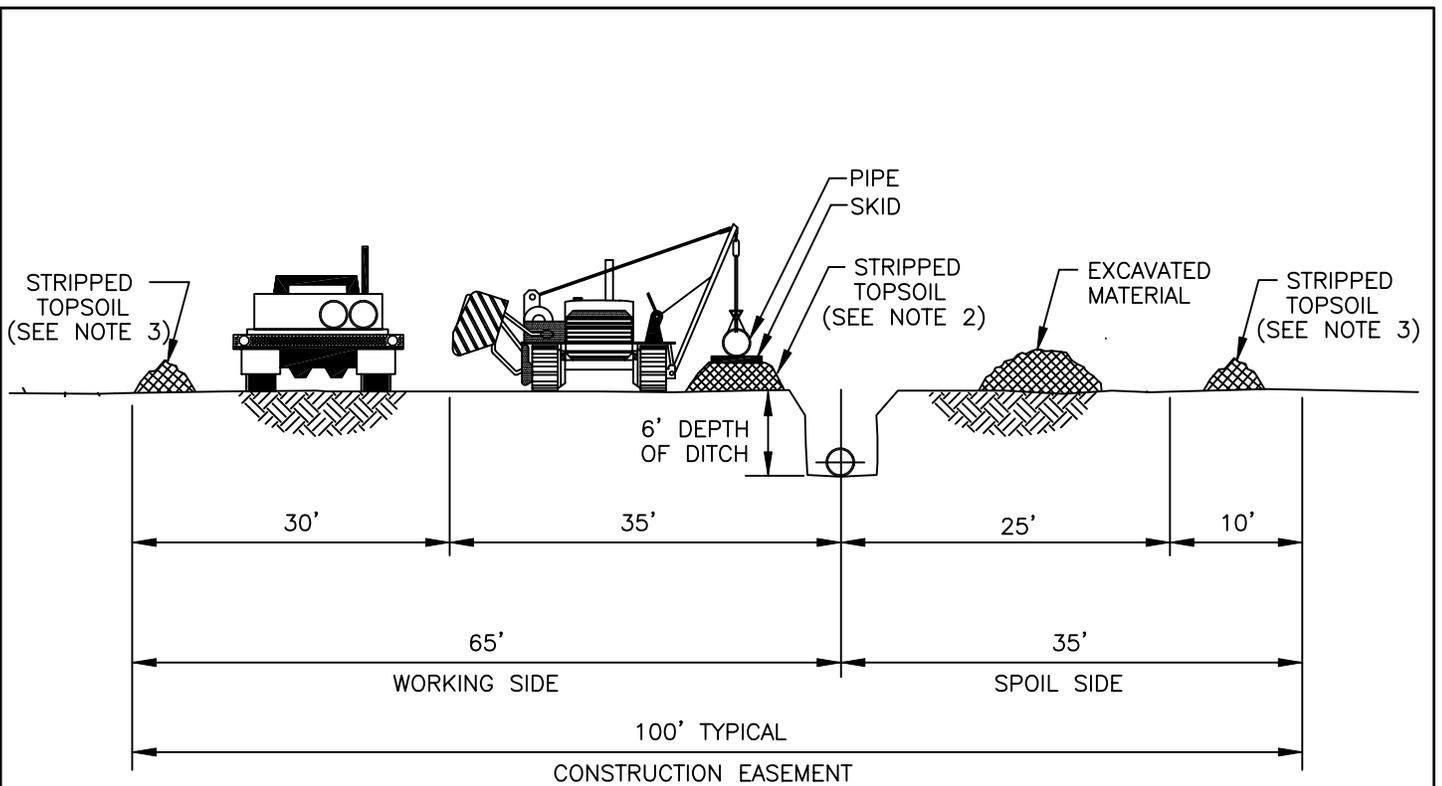
B. REPORTING

1. The project sponsor shall maintain records that identify by milepost:
 - a. method of application, application rate, and type of fertilizer, pH modifying agent, seed, and mulch used;
 - b. acreage treated;
 - c. dates of backfilling and seeding;
 - d. names of landowners requesting special seeding treatment and a description of the follow-up actions; and
 - e. any problem areas and how they were addressed.
2. The project sponsor shall file with the Secretary quarterly activity reports documenting problems, including those identified by the landowner, and corrective actions taken for at least 2 years following construction.

Appendix 1

Cross-Sections and Typical Drawings

Plan 2A	Cross-Section - Open Flat Country
Plan 2B	Cross-Section - Working Side Adjacent to Pipeline or Cable (50' C/L to C/L)
Plan 2C	Cross-Section - Spoil Side Adjacent to Pipeline or Cable (35' C/L to C/L)
Plan 2C1	Cross-Section - Spoil Side Adjacent to Pipeline or Cable (25' C/L to C/L)
Plan 2D	Cross-Section - Wetland Areas
Plan 2E	Cross-Section - Spoil Adjacent to Pipeline or Cable and Working Side Over Existing Pipeline or Cable
Plan 2F	Incised Channel Crossing
Plan 2G	Equipment Cleaning Station
Plan 3	Permanent Water Bars or Terraces
Plan 4	Silt Fence Installation
Plan 5	Hay/Straw Bale Installation
Plan 6	Trench Breakers
Plan 7	Rock Construction Entrance
Plan 8	Erosion Control Fabric



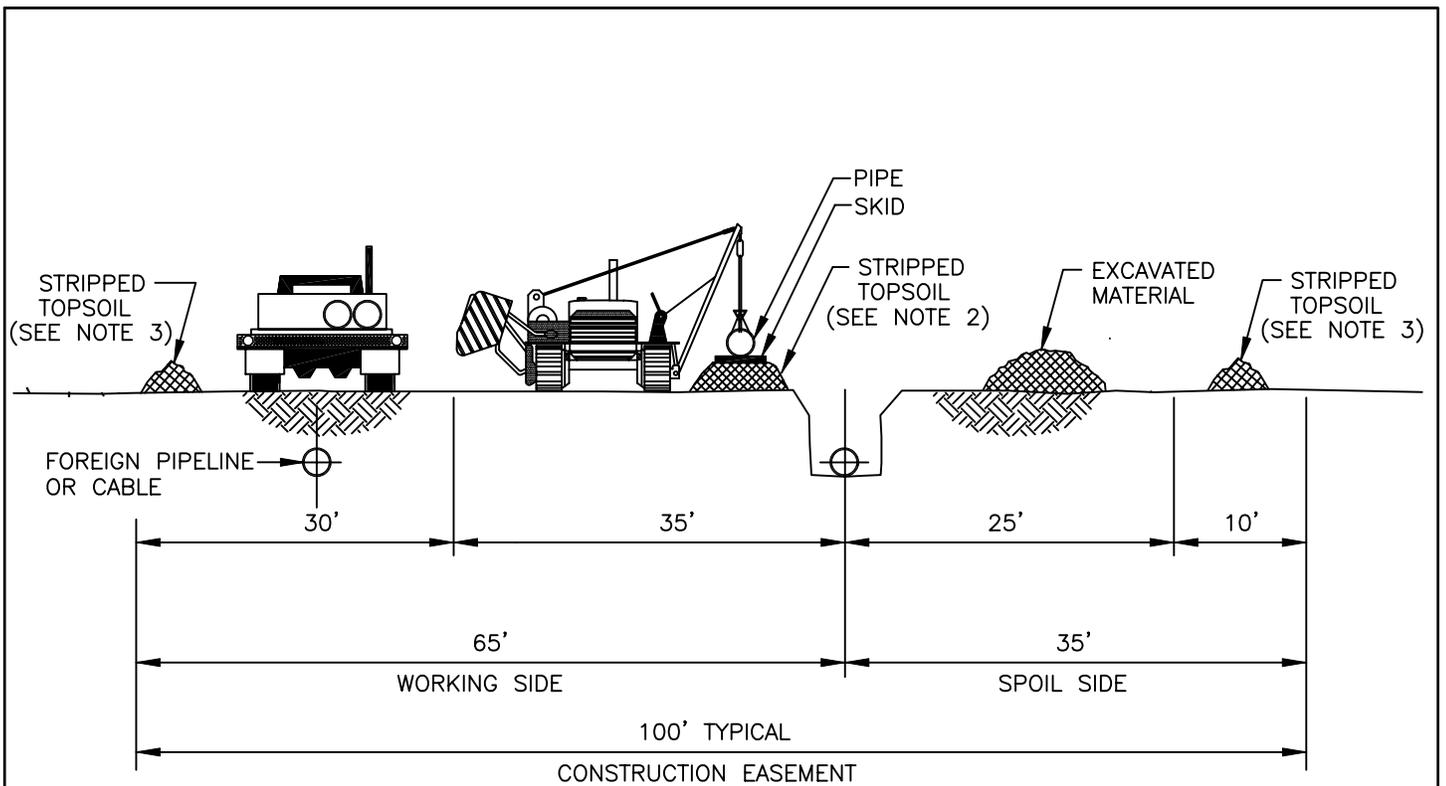
CROSS-SECTION OF PIPELINE CONSTRUCTION RIGHT-OF-WAY OPEN FLAT COUNTRY

NOTES:

1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 100' WIDE. THE PERMANENT RIGHT-OF-WAY WILL BE 50' WIDE CENTERED ON PIPE.
AS REQUIRED, ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL, RIVER CROSSINGS, SIDESLOPES, WHERE FULL RIGHT-OF-WAY TOPSOIL STRIPPING IS CONDUCTED AND OTHER SPECIAL CIRCUMSTANCES.
2. STOCKPILE TOPSOIL SEPARATELY FROM DITCH SPOIL. TOPSOIL IS TO BE PLACED ADJACENT TO DITCH ON THE WORKING SIDE OF THE RIGHT-OF-WAY FOR DITCH LINE ONLY TOP SOIL SEGREGATION.
3. STOCKPILE TOPSOIL ON OUTSIDE EDGE OF RIGHT-OF-WAY IF GRADING OF RIGHT-OF-WAY IS REQUIRED OR REQUIRED BY THE ENVIRONMENTAL INSPECTOR. SNOW MAY ALSO BE PLACED IN THIS AREA.

PLAN-2A





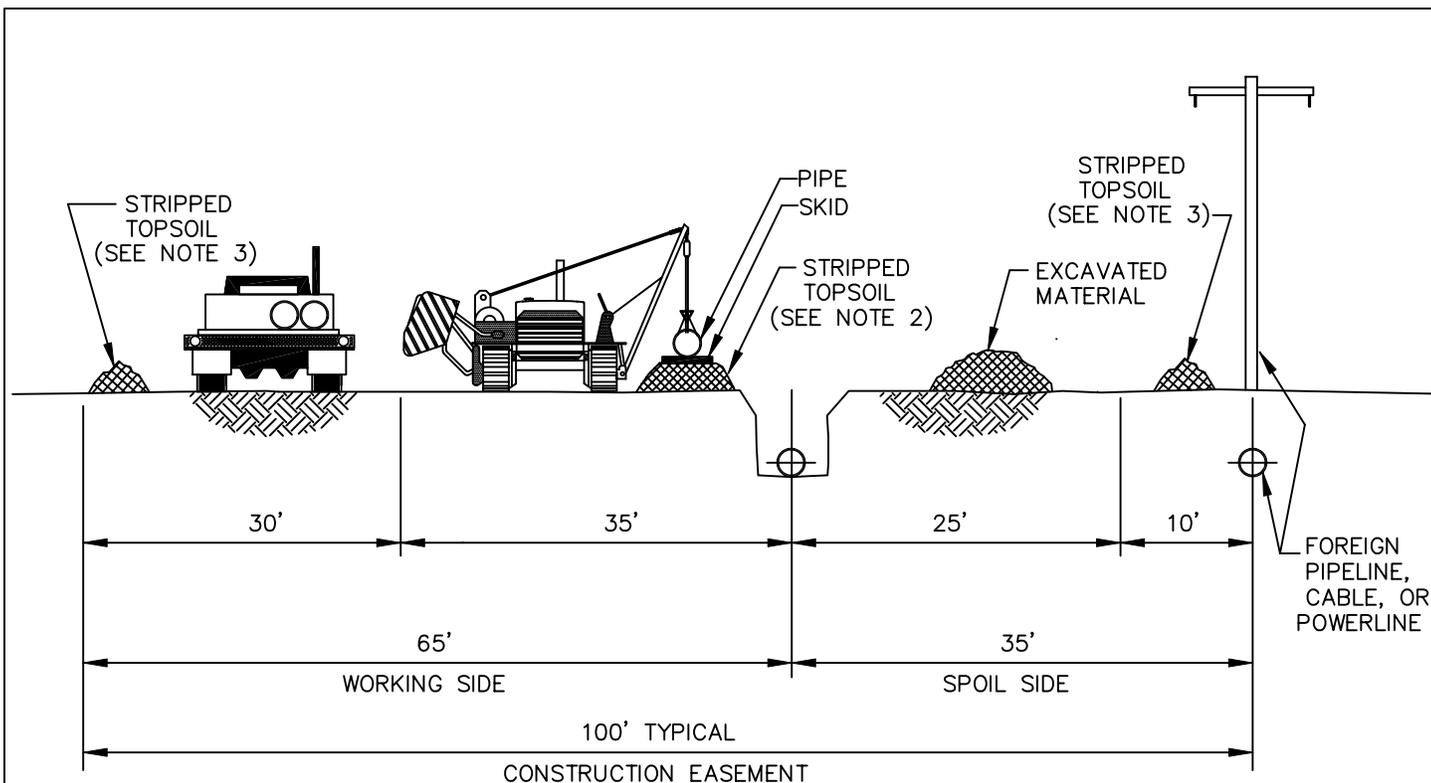
**CROSS-SECTION OF PIPELINE CONSTRUCTION
 RIGHT-OF-WAY – WORKING SIDE
 ADJACENT TO PIPELINE OR CABLE
 (50' C/L TO C/L)**

NOTES:

1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 100' WIDE. THE PERMANENT RIGHT-OF-WAY WILL BE 50' WIDE CENTERED ON PIPE. AS REQUIRED, ADDITIONAL TEMPORARY WORKSPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL, RIVER CROSSINGS, SIDESLOPES, WHERE FULL RIGHT-OF-WAY TOPSOIL STRIPPING IS CONDUCTED AND OTHER SPECIAL CIRCUMSTANCES.
2. STOCKPILE TOPSOIL SEPARATELY FROM DITCH SPOIL. TOPSOIL IS TO BE PLACED ADJACENT TO DITCH ON THE WORKING SIDE OF THE RIGHT-OF-WAY FOR DITCH LINE ONLY TOP SOIL SEGREGATION.
3. STOCKPILE TOPSOIL ON OUTSIDE EDGE OF RIGHT-OF-WAY IF GRADING OF RIGHT-OF-WAY IS REQUIRED OR REQUIRED BY THE ENVIRONMENTAL INSPECTOR. SNOW MAY ALSO BE PLACED IN THIS AREA.

PLAN-2B





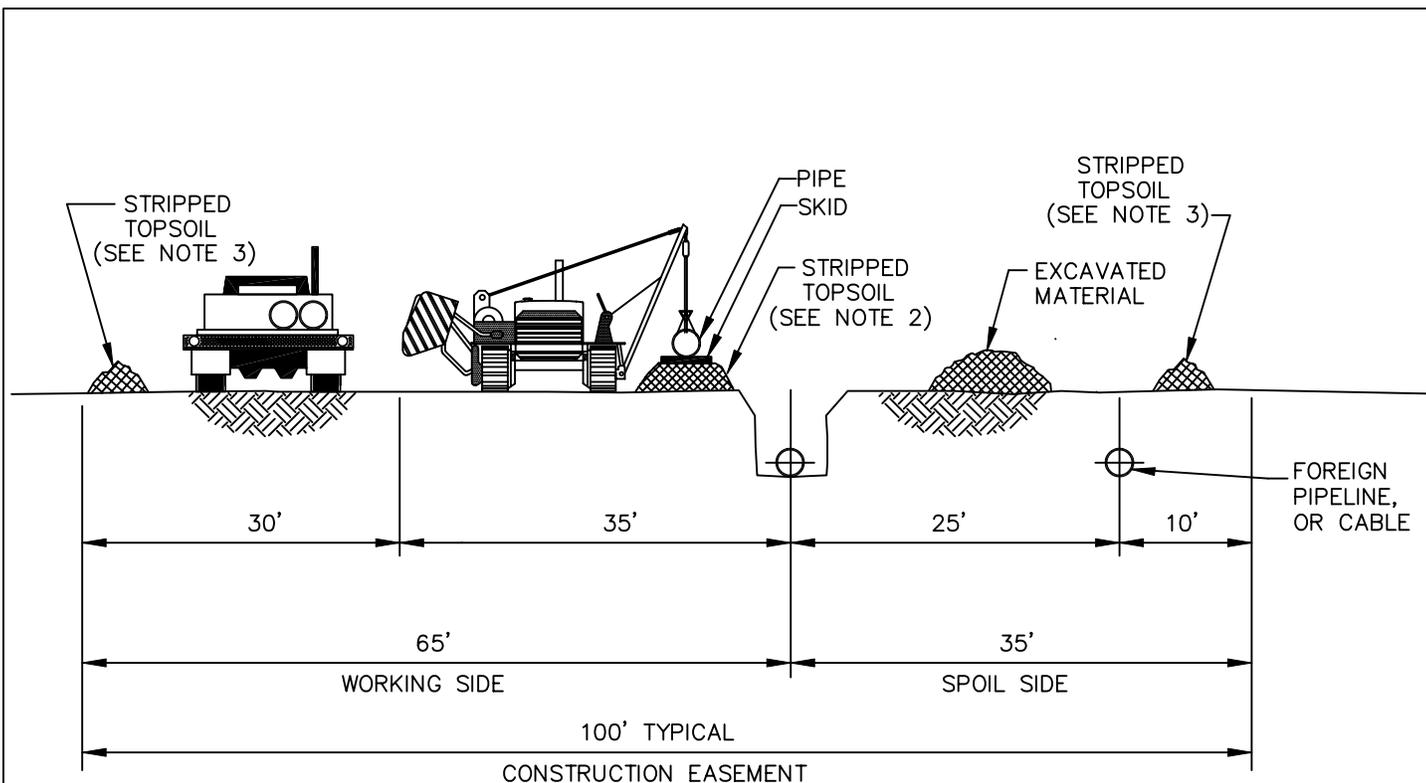
CROSS-SECTION OF PIPELINE CONSTRUCTION RIGHT-OF-WAY - SPOIL SIDE ADJACENT TO PIPELINE OR CABLE (35' C/L TO C/L)

NOTES:

1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 100' WIDE. THE PERMANENT RIGHT-OF-WAY WILL BE 50' WIDE CENTERED ON PIPE. ADDITIONAL TEMPORARY WORKSPACE MAY BE NECESSARY AT MAJOR ROAD, RAIL, RIVER CROSSINGS, SIDESLOPES, WHERE FULL RIGHT-OF-WAY TOPSOIL STRIPPING IS CONDUCTED AND FOR OTHER SPECIAL CIRCUMSTANCES.
2. STOCKPILE TOPSOIL SEPARATELY FROM DITCH SPOIL. TOPSOIL IS TO BE PLACED ADJACENT TO DITCH ON THE WORKING SIDE OF THE RIGHT-OF-WAY FOR DITCH LINE ONLY TOP SOIL SEGREGATION.
3. STOCKPILE TOPSOIL ON OUTSIDE EDGE OF RIGHT-OF-WAY IF GRADING OF RIGHT-OF-WAY IS REQUIRED OR REQUIRED BY THE ENVIRONMENTAL INSPECTOR. SNOW MAY ALSO BE PLACED IN THIS AREA.
4. WHERE APPLICABLE, THE OFFSET FROM THE CONSTRUCTION RIGHT-OF-WAY TO AN ACTIVE FOREIGN PIPELINE OR CABLE WILL BE 5'. DISTANCES MAY INCREASE OR DECREASE TO ACCOMMODATE SITE SPECIFIC CONSTRUCTION OR ADJACENT PIPELINE/CABLE COMPANY REQUIREMENTS.

PLAN-2C





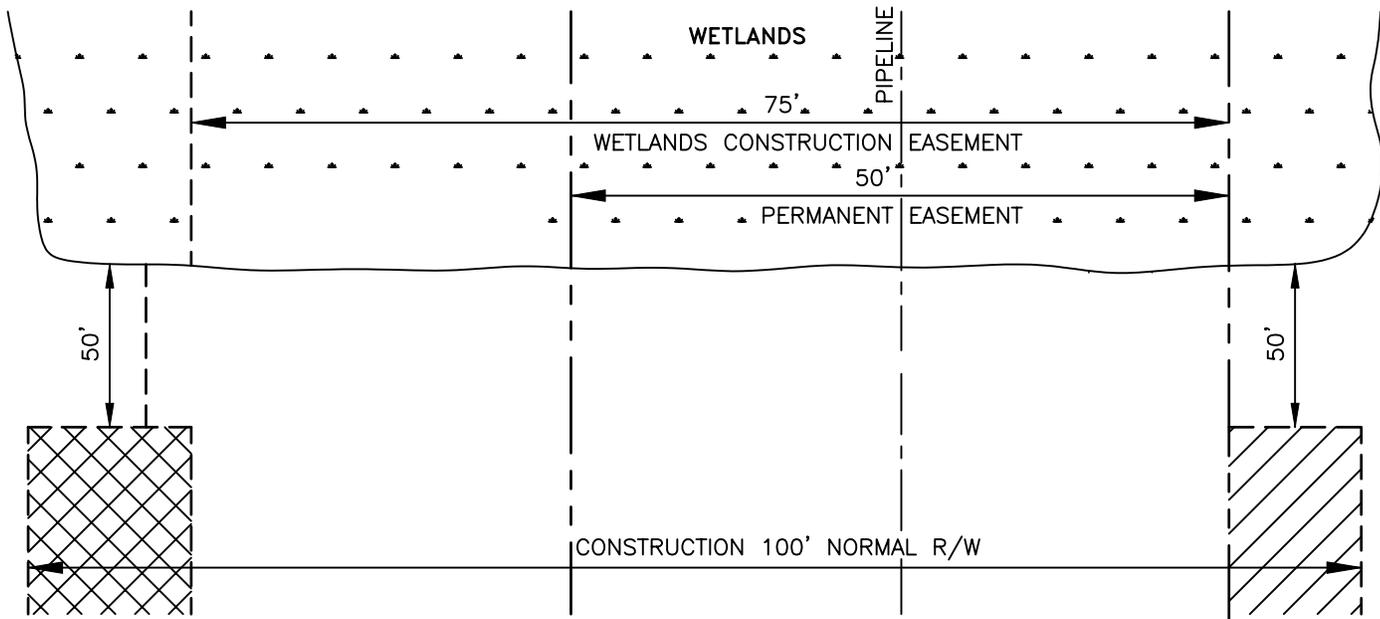
CROSS-SECTION OF PIPELINE CONSTRUCTION RIGHT-OF-WAY - SPOIL SIDE ADJACENT TO PIPELINE OR CABLE (25' C/L TO C/L)

NOTES:

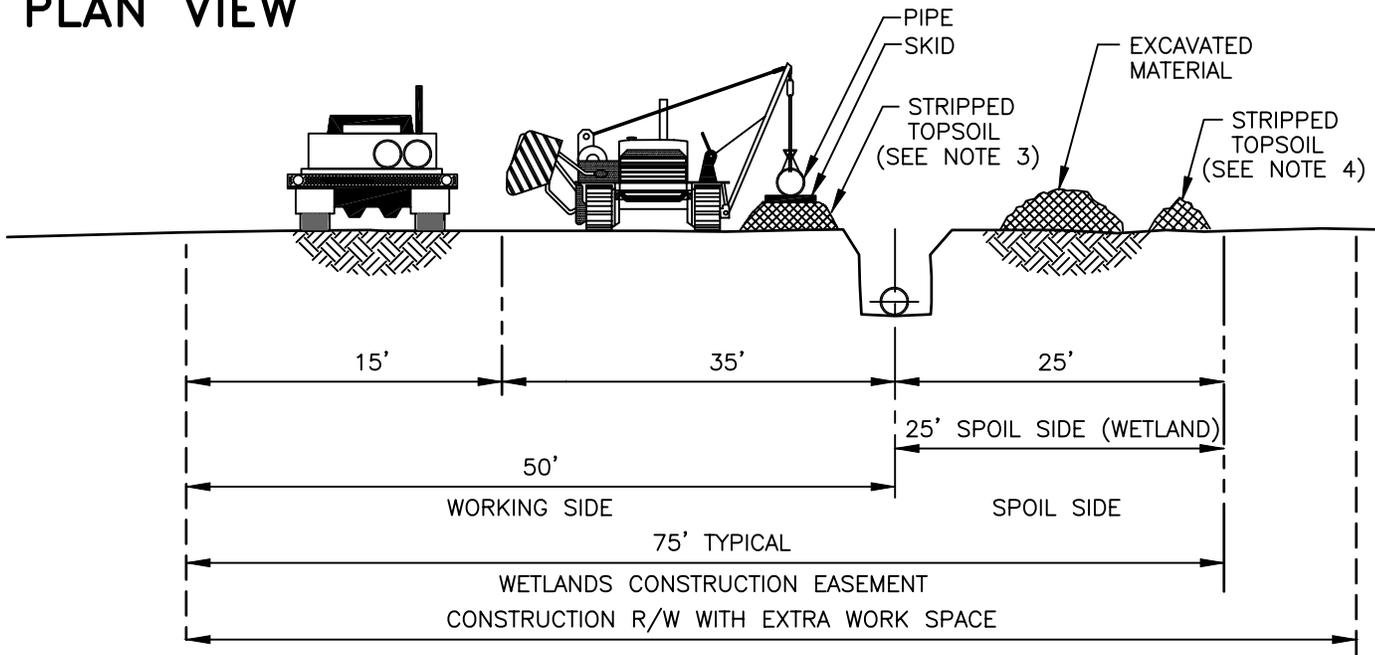
1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 100' WIDE. THE PERMANENT RIGHT-OF-WAY WILL BE 50' WIDE CENTERED ON PIPE. ADDITIONAL TEMPORARY WORKSPACE MAY BE NECESSARY AT MAJOR ROAD, RAIL, RIVER CROSSINGS, SIDESLOPES, WHERE FULL RIGHT-OF-WAY TOPSOIL STRIPPING IS CONDUCTED AND FOR OTHER SPECIAL CIRCUMSTANCES.
2. STOCKPILE TOPSOIL SEPARATELY FROM DITCH SPOIL. TOPSOIL IS TO BE PLACED ADJACENT TO DITCH ON THE WORKING SIDE OF THE RIGHT-OF-WAY FOR DITCH LINE ONLY TOP SOIL SEGREGATION.
3. STOCKPILE TOPSOIL ON OUTSIDE EDGE OF RIGHT-OF-WAY IF GRADING OF RIGHT-OF-WAY IS REQUIRED OR REQUIRED BY THE ENVIRONMENTAL INSPECTOR. SNOW MAY ALSO BE PLACED IN THIS AREA.
4. WHERE APPLICABLE, THE OFFSET FROM THE CONSTRUCTION RIGHT-OF-WAY TO AN ACTIVE FOREIGN PIPELINE OR CABLE WILL BE 5'. DISTANCES MAY INCREASE OR DECREASE TO ACCOMMODATE SITE SPECIFIC CONSTRUCTION OR ADJACENT PIPELINE/CABLE COMPANY REQUIREMENTS.

PLAN-2C-1





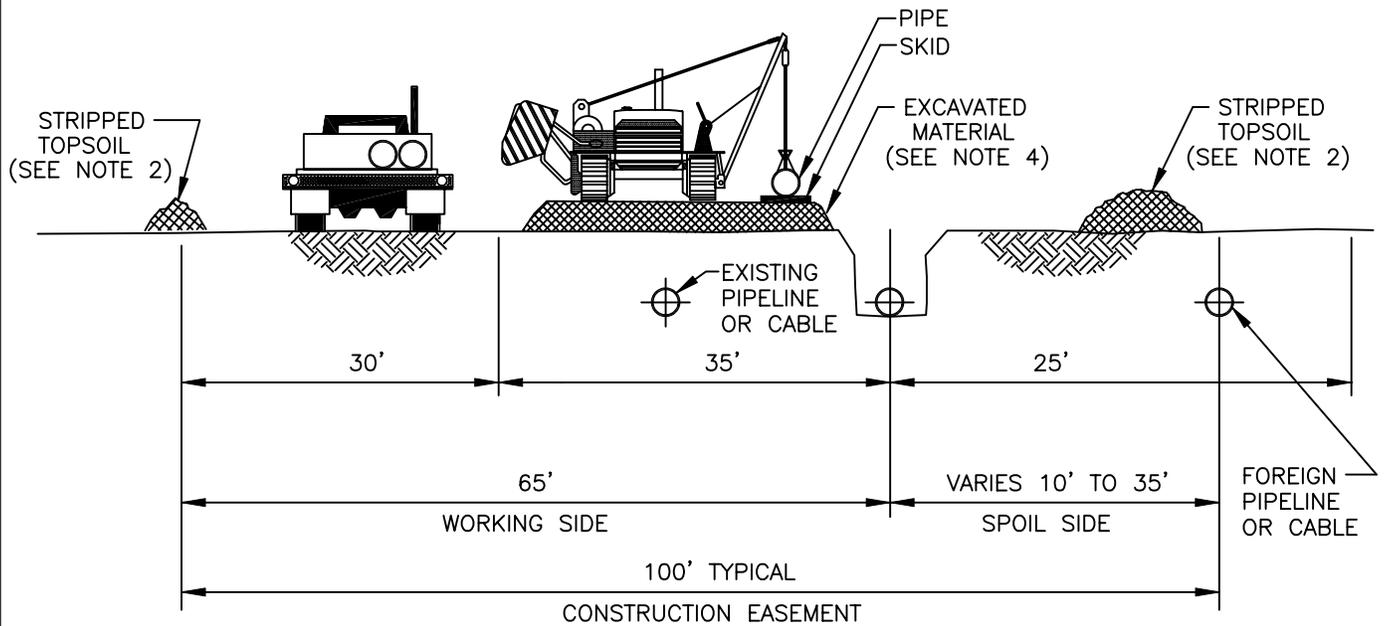
PLAN VIEW



CROSS-SECTION OF PIPELINE CONSTRUCTION RIGHT-OF-WAY CROSSING WETLAND AREAS

NOTES:

1. WETLANDS CONSTRUCTION RIGHT-OF-WAY WILL BE LIMITED TO 75' WIDE ACROSS ANY WETLANDS UNLESS INCREASED OR DECREASED BY SPECIFIC CONSTRUCTION REQUIREMENTS. PERMANENT RIGHT-OF-WAY WILL BE 50' WIDE CENTERED ON PIPE.
2. THE 100' NORMAL CONSTRUCTION RIGHT-OF-WAY EXTENDS TO THE EDGE OF THE WETLAND BOUNDARY. ADDITIONAL WIDTH CONSTRUCTION RIGHT-OF-WAY IF SPECIFIED BEGINS AND ENDS 50' FROM EACH SIDE OF THE WETLAND BOUNDARY.
3. STOCKPILE TOPSOIL SEPARATELY FROM DITCH SPOIL. TOPSOIL IS TO BE PLACED ADJACENT TO DITCH ON THE WORKING SIDE OF THE RIGHT-OF-WAY FOR DITCH LINE ONLY TOP SOIL SEGREGATION.
4. STOCKPILE TOPSOIL ON OUTSIDE EDGE OF RIGHT-OF-WAY IF GRADING OF RIGHT-OF-WAY IS REQUIRED OR WITH PERMISSION OF ENVIRONMENTAL INSPECTOR.



CROSS-SECTION OF PIPELINE CONSTRUCTION RIGHT-OF-WAY

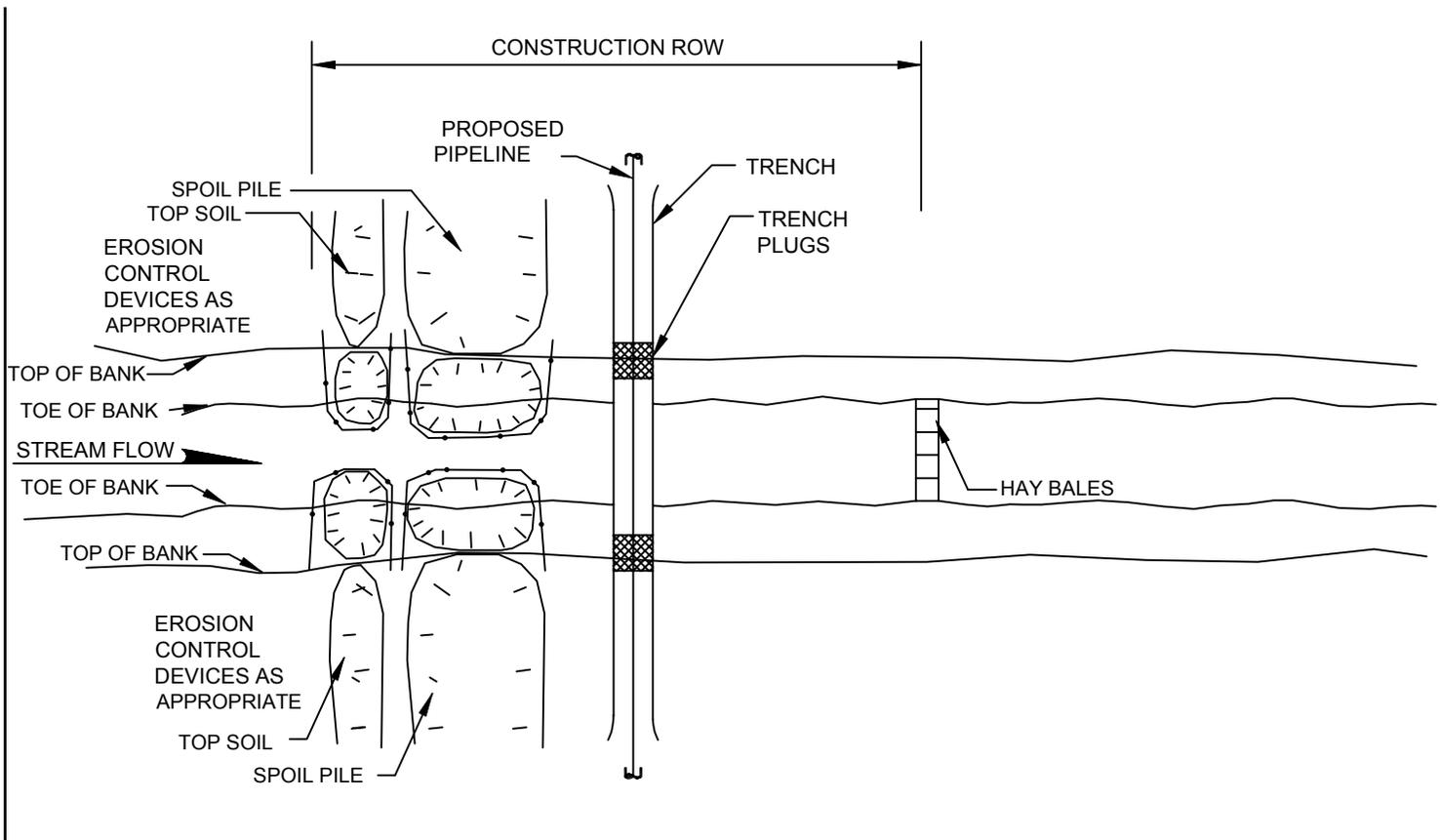
SPOIL SIDE – ADJACENT TO PIPELINE OR CABLE
WORKING SIDE – OVER EXISTING PIPELINE OR CABLE

NOTES:

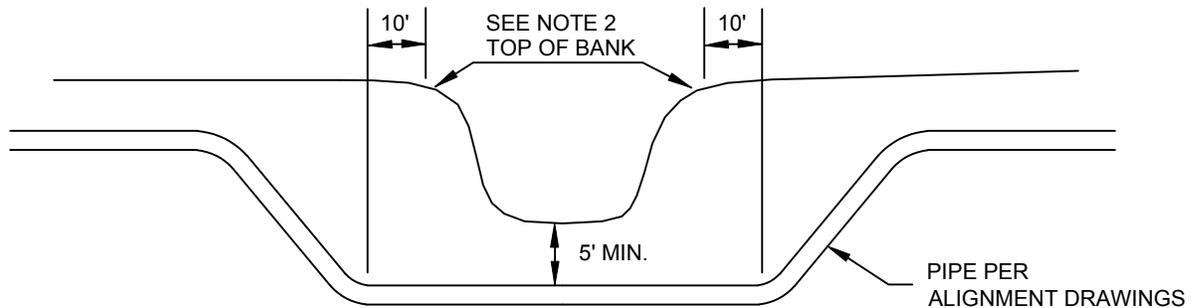
1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 100' WIDE. THE PERMANENT RIGHT-OF-WAY WILL BE 50' WIDE CENTERED ON PIPE. ADDITIONAL TEMPORARY WORKSPACE MAY BE NECESSARY WHERE FULL RIGHT-OF-WAY TOPSOIL STRIPPING IS CONDUCTED AND FOR OTHER SPECIAL CIRCUMSTANCES.
2. STOCKPILE TOPSOIL SEPARATELY FROM DITCH SPOIL. TOPSOIL MAY BE LOCATED AT EITHER SHOWN LOCATION AS CIRCUMSTANCES DICTATE.
3. WHERE APPLICABLE, THE OFFSET FROM THE CONSTRUCTION RIGHT-OF-WAY TO AN ACTIVE FOREIGN PIPELINE OR CABLE WILL BE 5'. DISTANCES MAY INCREASE OR DECREASE TO ACCOMMODATE SITE SPECIFIC CONSTRUCTION OR ADJACENT PIPELINE/CABLE COMPANY REQUIREMENTS. CONSTRUCTION EASEMENT MAY SHIFT AS NECESSARY.
4. WORKING OVER OR ADJACENT TO EXISTING PIPELINE OR CABLE REQUIRES PIPELINE OR CABLE OPERATORS APPROVAL.

PLAN-2E





CROSS SECTION



NOTE:

1. PORTABLE BRIDGES OR MATS WITH FLUMES MAY BE USED FOR EQUIPMENT CROSSING IF CONTOURS ALLOW.
2. PIPE SHALL BE LEVEL UNDER CHANNEL TO THE LENGTH AND DEPTH AS SHOWN ABOVE EXCEPT IN ROCK FORMATIONS WHERE THE TOP OF PIPE MAY BE LAID TO A MINIMUM OF 36" COVER.
3. BANKS OF CHANNEL ARE TO BE RESTORED AFTER INSTALLATION IN ACCORDANCE WITH PLAN 8.
4. STOCKPILE TOP SOIL SEPARATELY FROM DITCH SPOIL.

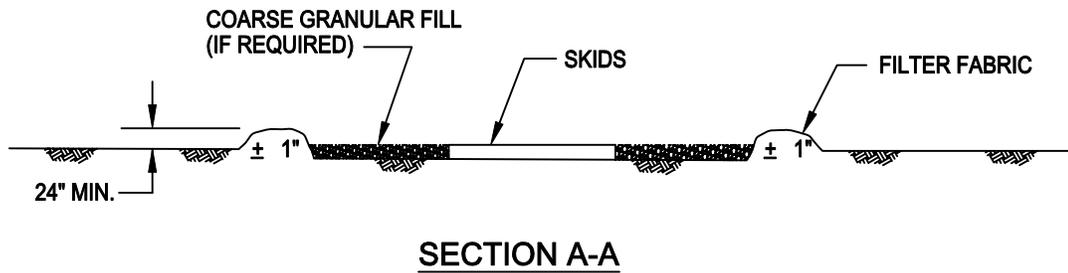
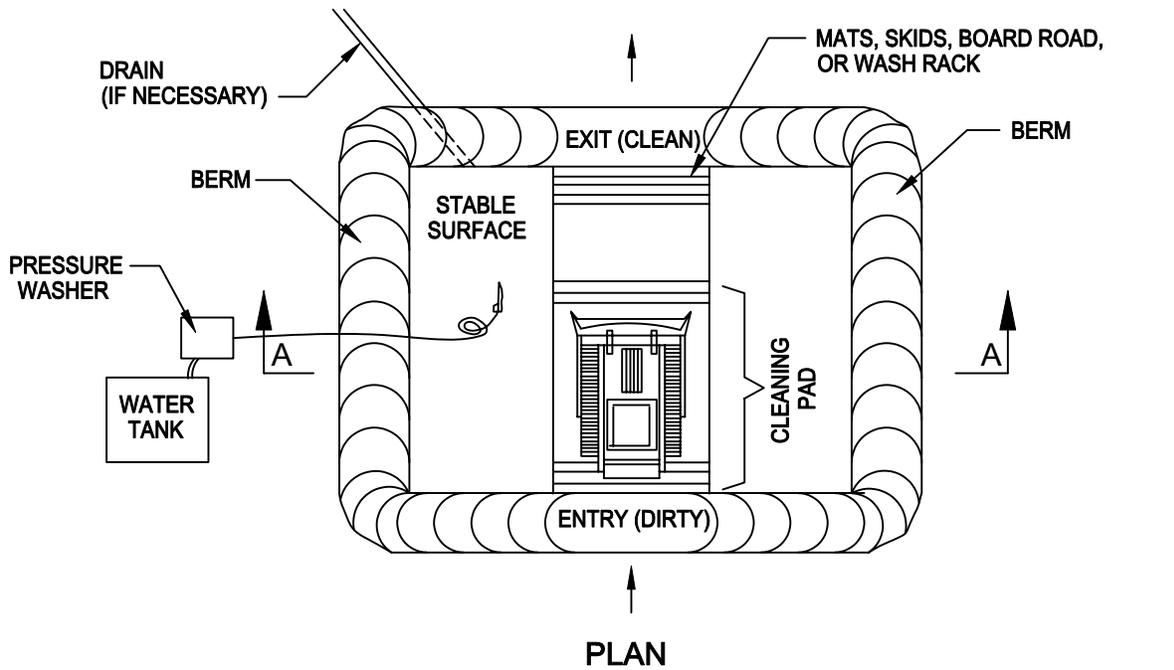
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TYPICAL
INCISED CHANNEL
CROSSING

DWG. P I Δ N - 2 F

NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.



NOTES:

1. ALL EQUIPMENT AND VEHICLES SHALL BE REQUIRED TO BE WASHED AT WASH STATIONS LOCATED AS SHOWN ON THE CONSTRUCTION DRAWINGS OR AS DIRECTED IN THE NOXIOUS WEED MANAGEMENT PLAN. WASH STATIONS SHALL BE CONSTRUCTED BY THE CONTRACTOR. WASHINGS SHALL BE CARRIED OUT UNDER THE SUPERVISION AND TO THE SATISFACTION OF THE COMPANY REPRESENTATIVE.
2. TOP SOIL TO BE SEGREGATED AND STORED SEPARATELY.
3. WASH WATER USED FOR CLEANING SHALL NOT BE ALLOWED TO ENTER ANY WATERBODY, WETLAND, OR IRRIGATION CANAL/DITCH. ANY SOILS CONTAMINATED BY PETROLEUM-BASED OR OTHER UNDESIRABLE MATERIALS FROM WASH STATIONS SHALL BE REMOVED IN ACCORDANCE WITH APPLICABLE REQUIREMENTS.
4. SIZE OF STATION TO BE ADEQUATE TO ACCOMODATE MAXIMUM SIZE OF EQUIPMENT EXPECTED AND REQUIRED WORK.
5. EQUIPMENT TO ENTER A "DIRTY END" AND EXIT A "CLEAN END".
6. STABLE DRAINAGE FROM SITE (IF NECESSARY) TO BE PROVIDED. DO NOT DISCHARGE TO A STREAM OR WETLAND.
7. DISPOSAL OF GRAVEL FILL (IF REQUIRED) AND FILTER FABRIC IS TO BE APPROVED BY ENVIRONMENTAL INSPECTOR.
8. WASH STATIONS ARE TO BE EQUIPPED WITH SKID PADS OR WASH RACKS TO PREVENT SOIL FROM BEING CARRIED ON TRACKS OR TIRES AS EQUIPMENT AND VEHICLES EXIT THE WASH STATION.

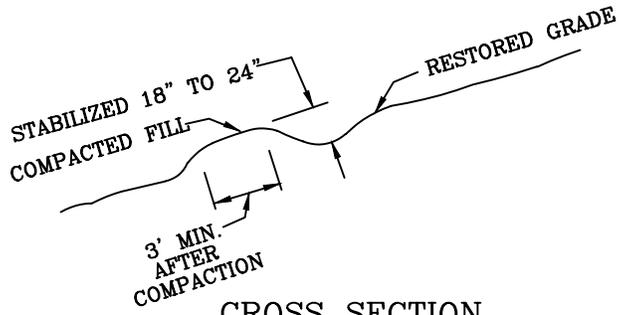
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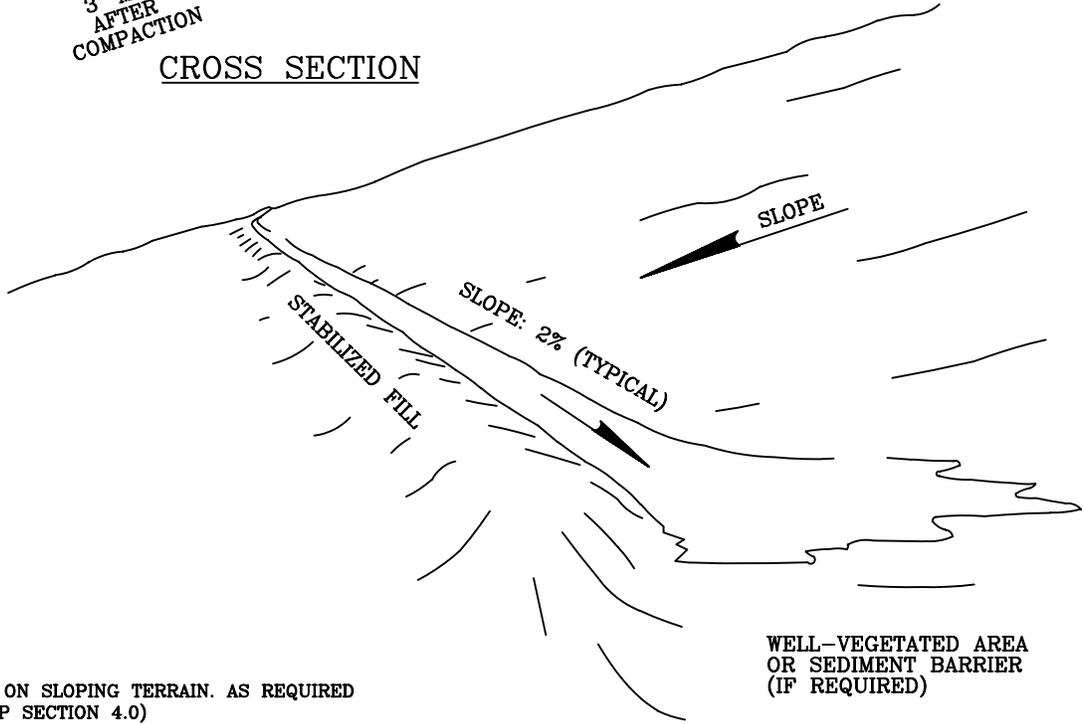
TYPICAL EQUIPMENT
CLEANING STATION

NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.

DWG. NO. PLAN-2G



CROSS SECTION



NOTES:

1. INSTALL ON SLOPING TERRAIN. AS REQUIRED (SEE ECP SECTION 4.0)

Required Spacing for Permanent Waterbars	
Slope Percent	FERC's Spacing (Ft.)
5 - 15	300
15 - 30	200
> 30	100

2. MAINTAIN THROUGHOUT CONSTRUCTION AND REPAIR AT THE END OF EACH DAY.
3. OUTLET INTO AREAS STABILIZED BY EXISTING VEGETATION OR INSTALL STAKED STRAW BALES/SILT FENCE.
4. CONTOUR TO ALLOW PASSAGE OF CONSTRUCTION EQUIPMENT
5. MINIMUM 2% LATERAL SLOPE.
6. TEMPORARY WATER BARS/TERRACES MUST BE DESIGNED TO PREVENT WATER FROM ENTERING THE TRENCH. A SOFT/HARD PLUG MAY BE USED TO ALLOW A CONTINUOUS WATER BAR/TERRACE TO CROSS THE TRENCHLINE.

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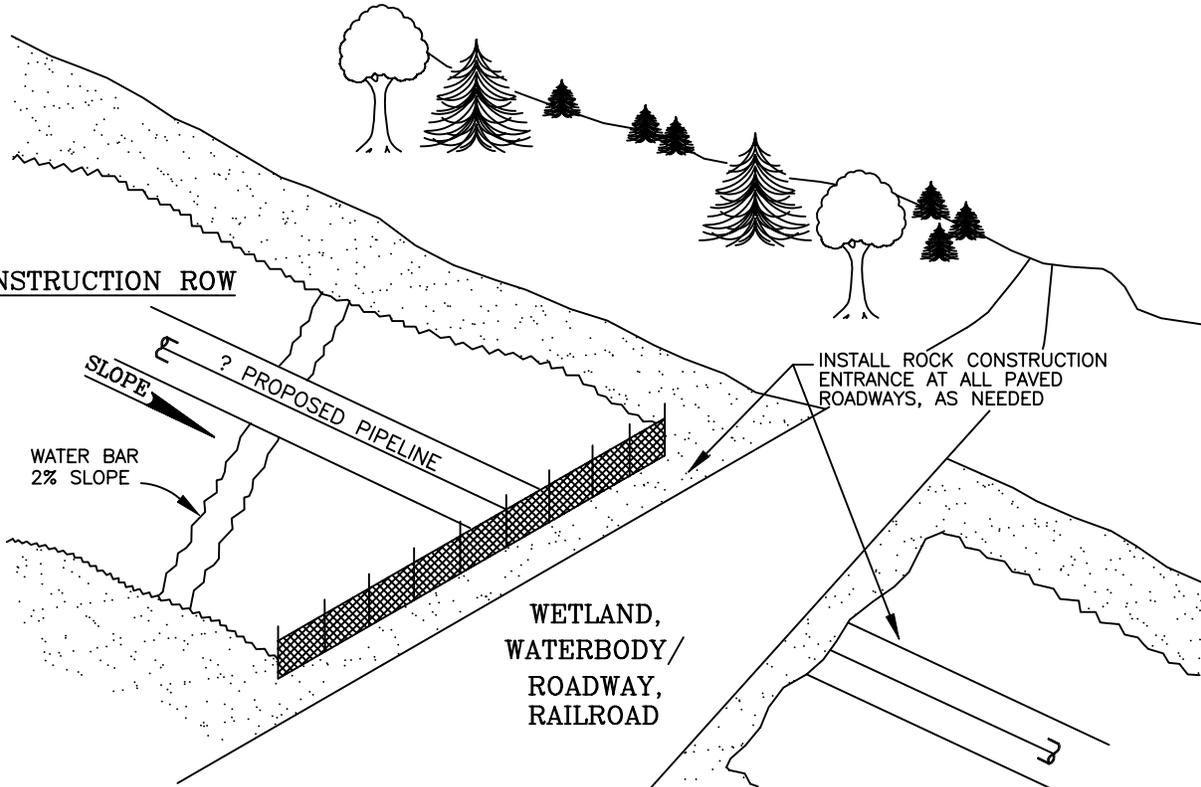
TYPICAL PERMANENT WATER BARS OR TERRACES

NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					

DWG. NO.

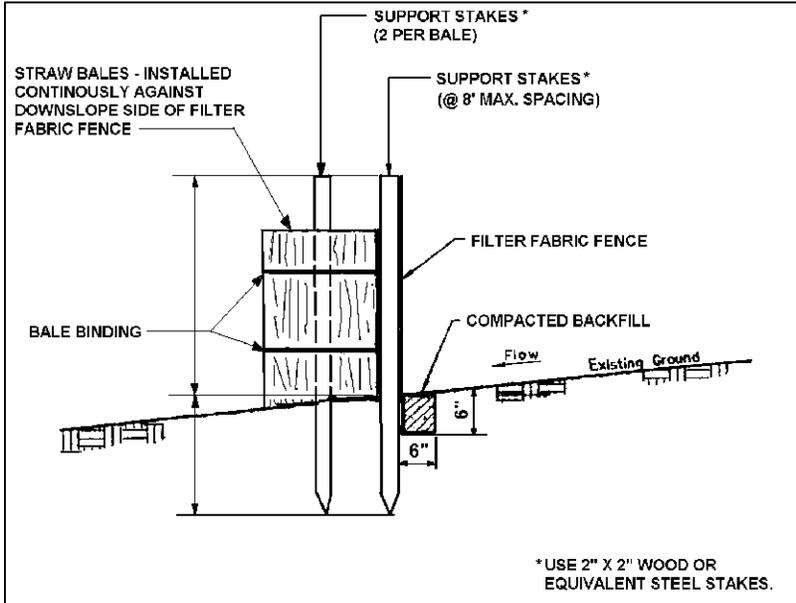
PLAN-3

CONSTRUCTION ROW



NOTES:

1. Silt fence must be left in place until vegetation has been established.
2. If paved roadway is used for vehicle access, install rock construction entrance (Figure 4-9).
3. Install permanent waterbars upslope of all roadway, railroad, waterbody, and wetland crossings, as required.
4. Install permanent trench breakers as required.



5. Filter fabric fence must be installed at existing level grade.
6. Sediment must be removed where accumulations reach 1/2 the above ground height of the fence.

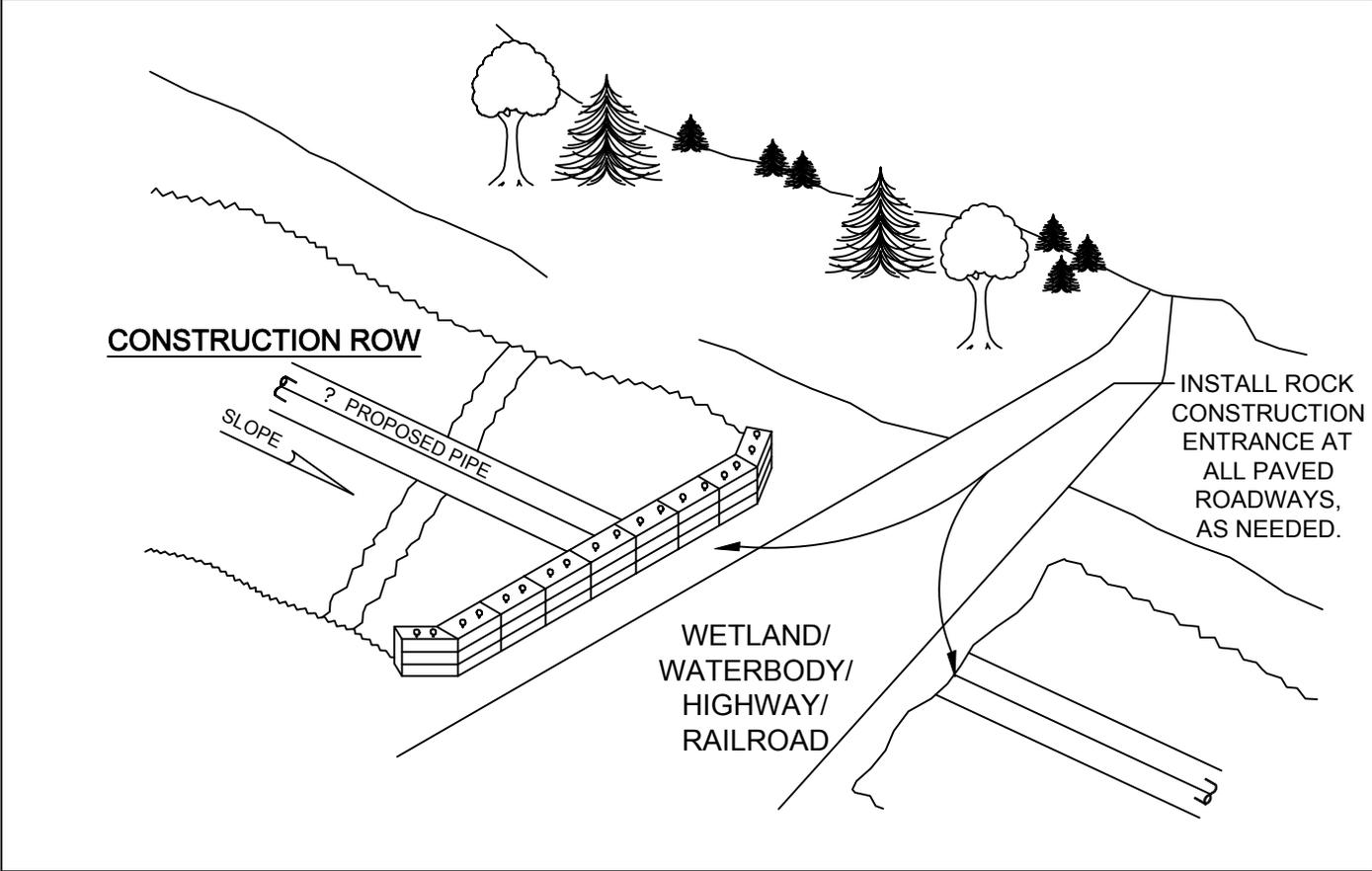
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TYPICAL SILT FENCE INSTALLATION

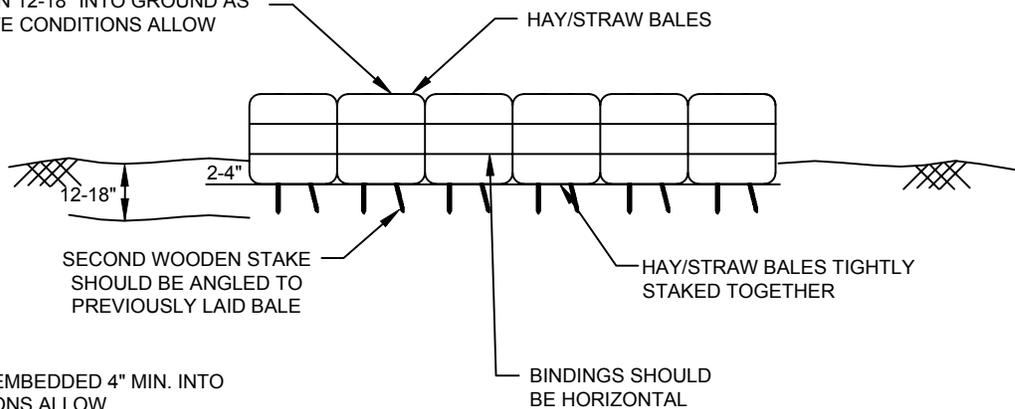
DWG. NO. **PLAN-4**

NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					



36" X 2" X 2" MIN. FENCE POSTS OR APPROVED EQUIVALENT DRIVEN 12-18" INTO GROUND AS SITE CONDITIONS ALLOW

FRONT VIEW



NOTE

1. HAY/STRAW BALES TO BE EMBEDDED 4" MIN. INTO GROUND AS SITE CONDITIONS ALLOW.
2. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE ABOVEGROUND HEIGHT OF THE BARRIER.
3. HAY/STRAW BALES REMOVED FOR ACCESS PURPOSES DURING THE DAY MUST BE REINSTALLED AFTER THE CONSTRUCTION ACTIVITY HAS PASSED THROUGH OR BY THE END OF THE DAY.

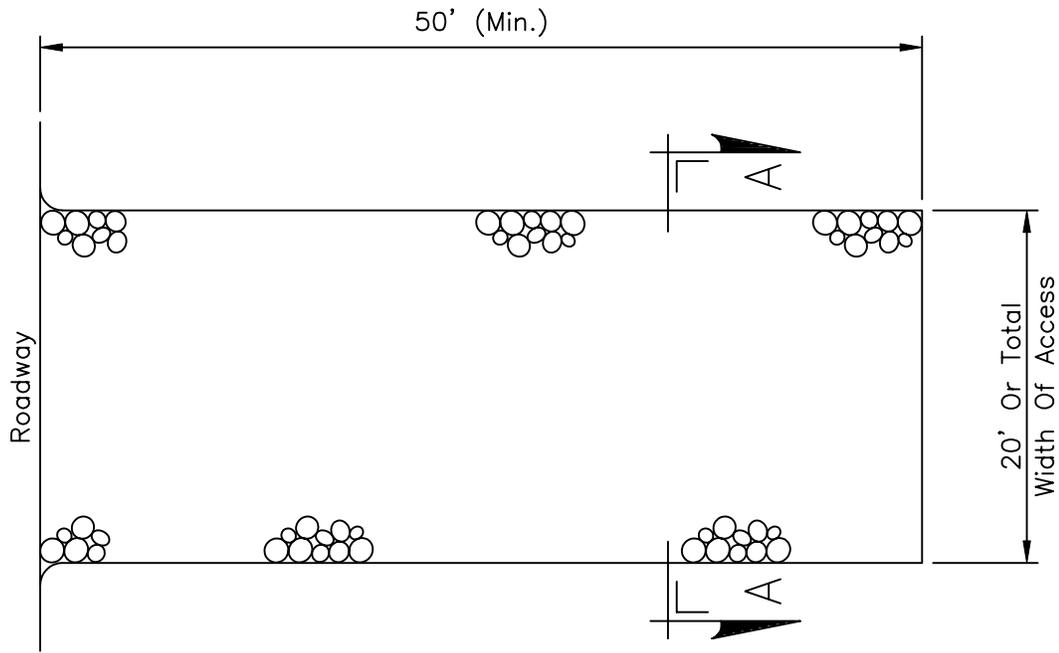
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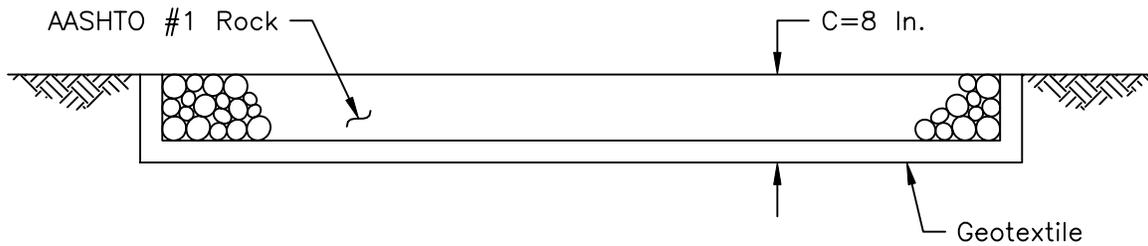
TYPICAL HAY/STRAW BALE INSTALLATION

DWG. NO. **PLAN-5**

NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					



PLAN VIEW



SECTION A-A

NOTE:

Install at intersection of public, paved roadway, and construction right-of-way. Rock Construction Entrance thickness shall be constantly maintained to the specified dimensions by adding rock. A stockpile shall be maintained on site for this purpose. At the end of each construction day, all sediment deposited on paved roadways shall be removed and returned to the construction site. Washing roadway is not permitted. Culverts or flume pipes must be installed under the rock entrance/exit to allow for water drainage, if required due to topographical conditions.

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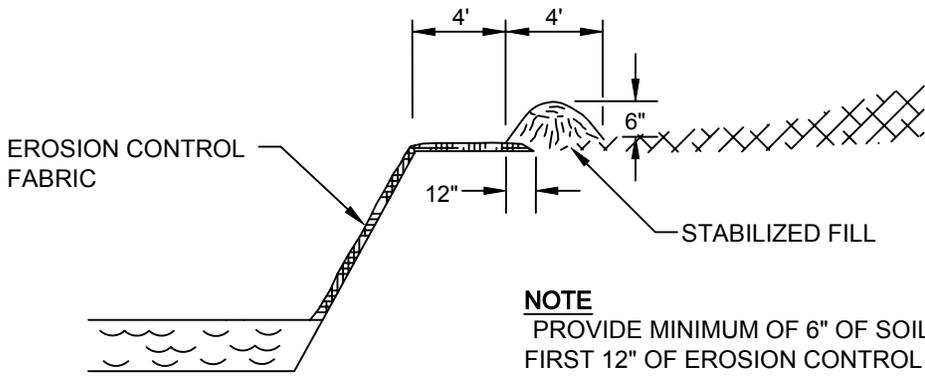
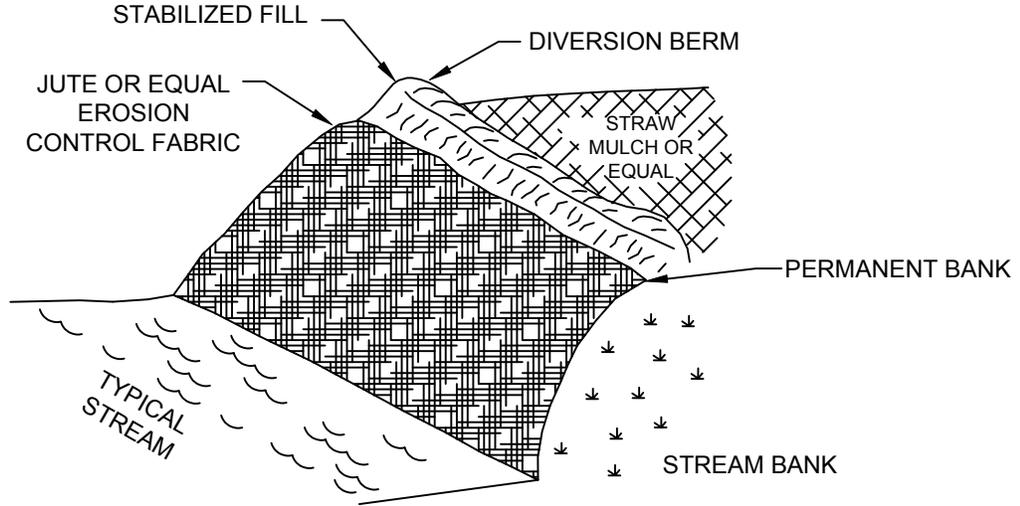


TYPICAL ROCK CONSTRUCTION ENTRANCE

DWG. NO. **PLAN-7**

NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					

**STAKE TO THE SLOPE WITH WOOD PEGS OR STAPLE
PER MANUFACTURERS SPECIFICATION**



NOTE
PROVIDE MINIMUM OF 6" OF SOIL COVER OVER
FIRST 12" OF EROSION CONTROL FABRIC AS
SHOWN.

SLOPE SECTION

ENG. RECORD	DATE
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DRAWING APPROVAL	
PROJECT APPROVAL	
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TYPICAL EROSION
CONTROL FABRIC

NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
REVISIONS					

DWG. NO. **PLAN-8**