Revegetation Best Management Practices:

AFTER EARTH DISTURBANCE ACTIVITY IS COMPLETED, THE DISTURBED AREA MUST BE REVEGETATED. THE VEGETATIVE COVER MUST BE A UNIFORM 85% PERENNIAL VEGETATIVE COVER, WITH A DENSITY CAPABLE OF RESISTING ACCELERATED EROSION AND SEDIMENTATION. ANOTHER OPTION IS TO USE AN ACCEPTABLE BMP WHICH PERMANENTLY MINIMIZES ACCELERATED EROSION AND SEDIMENTATION.

1. SEED MIXTURES - STANDARD SEED MIXTURES, THAT HAVE BEEN SHOWN TO BE EFFECTIVE IN STABILIZING AREAS IN OHIO ARE RECOMMENDED. THIS INFORMATION IS SUMMARIZED IN TABLES 13 THROUGH 16. ALTHOUGH THESE RECOMMENDED MIXTURES WILL BE SUITABLE FOR MOST SITES, THEY MAY NOT BE DESIRABLE FOR ALL SITUATIONS THAT MAY BE ENCOUNTERED IN SUCH INSTANCES, THE COMPANY SHOULD BE CONTRACTED FOR ADDITIONAL GUIDANCE. THE WEBSITE WWW.PLANT-MATERIALS.NRCS.USDA.GOV <HTTP://WWW.PLANT-MATERIALS.NRCS.USDA.GOV> IS ANOTHER EXCELLENT SOURCE OF INFORMATION.
   - A. A SEED MIX SHOULD CONTAIN MORE THAN ONE VARIETY OF SEED AND INCLUDE THE APPLICATION RATE (E.G. LB./ACRE), AND GERMINATION SEASON.
   - B. IF THE AREA TO BE VEGETATED IS A STEEP SLOPE ($\geq$ 3:1), A STEEP SLOPE MIXTURE SHOULD BE USED. OTHER LIMITATIONS, SUCH AS DROUGHTY OR SATURATED CONDITIONS, ACID SOILS, AND SHADED AREAS SHOULD ALSO BE ADDRESSED BY THE PROPOSED SEEDING PLAN (SEE TABLES 13 THOUGH 16).
   - C. WHEREVER TALL RESCUE IS PROPOSED, AN ENDOPHYTE FREE VARIETY (E.G. JOHNSTONE, BARCEL, OR FESTORINA) SHOULD BE USED.
   - D. SEED MIXTURES SHOULD INCLUDE A LEGUME. WHEN USED IN AREAS DIFFICULT TO VEGETATE, LEGUME SEED LOTS SHOULD CONTAIN A CERTAIN AMOUNT OF HARD SEED (SEE TABLE 13 FOR RECOMMENDED SPECIFICATIONS). LEGUME SEED MUST BE INOCULATED IN ORDER TO FORM NODULES ON THE ROOTS WHICH FIX ATMOSPHERIC NITROGEN. USE ONLY SEED WHICH HAS BEEN FRESHLY AND PROPERLY INOCULATED.
   - E. WARM SEASON GRASSES MAY HAVE SOME LIMITATIONS FOR USE IN EROSION CONTROL AND MUST BE CONSIDERED WHEN SELECTING A SEED MIXTURE, THEY GROW MUCH MORE SLOWLY DURING THE SPRING AND FALL MONTHS. THEY TEND TO FORM BUNCHES, RATHER THAN SOD. THEREFORE, THE COVERAGE MAY NOT BE AS UNIFORM AS DESIRED.

TABLE 13 PLANT TOLERANCES OF SOIL LIMITATION FACTORS

SPECIES	GROWTH HABIT	TOLERATES: WET SOIL	DRY SITE	LOW FERTILITY	② ACID SOIL (pH 5–5.5)	MINIMUM SEED SPECIFICATIONS ③: PURITY (%)	READY GERM (%)	HARD SEED (%)	TOTAL GERM (%)	SEEDS/lb (1,000s)
WARM–SEASON GRASSES										
DEERTOUNGUE	BUNCH	YES	YES	YES	YES	95	75		75	250
WEEPING LOVEGRASS	BUNCH	NO	YES	YES	YES	97	75		75	1,500
SWITCHGRASS ④	BUNCH	YES	YES	YES	YES	(60 PLS)				390
BIG BLUESTEM	BUNCH	NO	YES	YES	YES	(60 PLS)				150
COOL–SEASON GRASSES										
TALL FESCUE	BUNCH	YES	NO	YES	NO	95	80		80	227
REDTOP	SOD	YES	YES	YES	YES	92	80		80	5,000
FINE FESCUES	SOD	NO	NO	YES	NO	95	80		80	400
PERENNIAL RYEGRASS	BUNCH	YES	NO	NO	NO	95	85		85	227
ANNUAL RYEGRASS	BUNCH	YES	NO	YES	NO	95	85		85	227
KENTUCKY BLUEGRASS	SOD	NO	NO	NO	NO	85	75		75	2,200
REEDCANARYGRASS	SOD	YES	YES	YES	NO	95	70		70	520
ORCHARDGRASS	BUNCH	YES	YES	YES	YES	95	80		80	654
TIMOTHY	BUNCH	YES	NO	YES	YES	95	80		80	1,230
SMOOTH BROMEGRASS	SOD	NO	YES	YES	NO	95	80		80	136
LEGUMES ⑤										
CROWNVETCH	SOD	NO	YES	YES	NO	98	40	30	65	120
BIRDSFOOT TREFOIL ⑥	BUNCH	YES	NO	YES	YES	98	60	20	80	400
FLATPEA	SOD	NO	NO	YES	YES	98	55	20	75	10
SERECIA LESPEDEZA	BUNCH	NO	YES	YES	YES	98	60	20	80	335
CEREALS										
WINTER WHEAT	BUNCH	NO	NO	NO	NO	98	85		85	15
WINTER RYE	BUNCH	NO	NO	YES	YES	98	85		85	18
SPRING OATS	BUNCH	NO	NO	NO	NO	98	85		85	13
SUNDANGRASS	BUNCH	NO	YES	NO	NO	98	85		85	55
JAPANESE MILLET	BUNCH	YES	NO	YES	YES	98	80		80	155

① GROWTH HABIT REFERS TO THE ABILITY OF THE SPECIES TO EITHER FORM A DENSE SOD BY VEGETATIVE MEANS (STOLONS, RHIZOMES, OR ROOTS) OR REMAIN IN A BUNCH OR SINGLE PLANT FORM. IF SEEDED HEAVILY ENOUGH, EVEN BUNCH FORMERS CAN PRODUCE A VERY DENSE STAND. THIS IS SOMETIMES CALLED A SOD, BUT NOT IN THE SENSE OF A SOD FORMED BY VEGETATION MEANS.

② ONCE ESTABLISHED, PLANTS MAY GROW AT A SOMEWHAT LOWER PH, BUT COVER GENERALLY IS ONLY ADEQUATE AT PH 6.0 OR ABOVE.

③ MINIMUM SEEDLOTS ARE TRULY MINIMUM, AND SEEDLOTS TO BE USED FOR REVEGETATION PURPOSES SHOULD EQUAL OR EXCEED THESE STANDARDS. THUS, DEERTONGUE GRASS SHOULD GERMINATE 75% OR BETTER. CROWNVETCH SHOULD HAVE ATLEAST 40% READILY GERMINABLE SEED AND 30% HARD SEED. COMMONLY, SEEDLOTS ARE AVAILABLE THAT EQUAL OR EXCEED MINIMUM SPECIFICATIONS. REMEMBER THAT DISTURBED SITES ARE ADVERSE FOR PLANT ESTABLISHMENT. READY GERMINATION REFERS TO SEED THAT GERMINATES DURING THE PERIOD OF THE GERMINATION TEST AND THAT WOULD BE EXPECTED, IF CONDITIONS ARE FAVORABLE, TO GERMINATE RAPIDLY WHEN PLANTED. THE OPPOSITE OF READY GERMINATION IS DORMANT SEED, OF WHICH HARD SEED IS ONE TYPE.

④ SWITCHGRASS SEED IS SOLD ONLY ON THE BASIS OF PURE LIVE SEED (PLS).

⑤ NEED SPECIFIC LEGUME INOCULANT, INOCULANT SUITABLE FOR GARDEN PEAS AND SWEETPEAS USUALLY IS SATISFACTORY FOR FLATPEA.

⑥ BIRDSFOOT TREFOIL IS ADAPTED OVER THE ENTIRE STATE, EXCEPT IN THE EXTREME SOUTHEAST WHERE CROWN AND ROOT ROTS MAY INJURE STANDS.

TABLE 14. RECOMMENDED PERMANENT SEED MIXTURES COOL AND WARM SEASON GRASSES

MIXTURE NUMBER	SEASON	SPECIES	SEEDING RATE lb,/ac.
1	COOL	TALL FESCUE*,OR FINE FESCUE,PLUS REDTOP,OR PERENNAIL RYEFRASS,PLUS BIRDSFOOT TREFOIL	79 46 4 19 8
2	COOL	BIRDSFOOT TREFOIL,PLUS TALL FESCUE*	8 40
3	COOL	ORCHARDGRASS,OR SMOOTH BROMEGRASS,PLUS BIRDSFOOT TREFOIL	26 33 8
4	WARM	FLATPEA,PLUS TALL FESCUE*,OR PERENNIAL RYEGRASS	27 26 25
5	WARM	DEERTONGUE,PLUS BIRDSFOOT TREEFOIL	21 8
6	WARM	SWITCHGRASS,OR BIG BLUESTEM,PLUS BIRDSFOOT,TREFOIL	15 15 8

* USE ONLY ENDOPHYTE TREE VARIETIES SUCH AS JOHNSTONE, BARCEL OR FESTORINA.

TEMPORARY SEEDING SPECIFICATIONS

SEEDING DATES	SPECIES	LB. PER 1,000 SQ. FT.	PER ACRE
MARCH 1 TO AUGUST 15	OATS	3	4 BUSHELS
	TALL FESCUE	1	40 LB
	ANNUAL RYEGRASS	1	40 LB
	PERENNIAL RYEGRASS	1	40 LB
	TALL FESCUE	1	40 LB
	ANNUAL RYEGRASS	1	40 LB
AUGUST 1 TO NOVEMBER 1	RYE	3	2 BUSHELS
	TALL FESCUE	1	40 LB
	ANNUAL RYEGRASS	1	40 LB
	WHEAT	3	2 BUSHELS
	TALL FESCUE	1	40 LB
	ANNUAL RYEGRASS	1	40 LB
	PERENNIAL RYEGRASS	1	40 LB
	TALL FESCUE	1	40 LB
	ANNUAL RYEGRASS	1	40 LB
NOVEMBER 1 TO SPRING	USE HEAVY STRAW-MULCH & DORMANT SEEDING, WOOD CHIPS OR PERMANENT SODDING.		
NOTE: OTHER APPROVED SEED SPECIES MAY BE SUBSTITUTED.			

TABLE 16. RECOMMENDED SEED MIXTURES FOR STABILIZING DISTURBED AREAS

STIE CONDITION	SEED MIXTURE (SELECT ONE MIXTURE)
CUT SLOPES AND FILLS (NOT MOWED)	
WELL-DRAINED	2,4, OR 6
VARIABLE DRAINAGE	2
CUT SLOPES AND FILLS (MOWED)	1
CUT SLOPES AND FILLS(GRAZED/HAY)	1,2,OR 3
GULLIES AND ERODED AREAS	2 OR 6
EROSION CONTROL BMPS	
CHANNELS, DRAINAGE DITCHES, TRAP EMBANKMENTS, ETC.	1 OR 2
FOR HAY OR SILAGE	2 OR 3
RIGHT-OF-WAY	
WELL-DRAINED	4 OR 6
VARIABLE DRAINAGE	2
WELL-DRAINED AREAS FOR GRAZING/HAY	2 OR 3
STRIP MINED AREAS	
SPOILS, WASTE AREAS, FLY ASH, SLAG, ETC. (LIME TO SOIL TEST)	2,4,OR 5
FOR GRAZING/HAY	2,3,OR 6

2. SOIL AMENDMENTS. A SOIL TEST IS RECOMMENDED TO DETERMINE THE TYPE AND RATE OF APPLICATION OF SOIL AMENDMENTS, ESPECIALLY WHEN THE COUNTY SOIL SURVEY INDICATES THE PRESENCE OF SOILS WITH LOW FERTILITY OR A PH RANGING BELOW 5.5 IT IS ALSO RECOMMENDED WHERE DIFFICULTIES HAVE BEEN ENCOUNTERED IN ESTABLISHING A GOOD COVER (E.G. ABANDONED MINED LANDS). THE COSTS OF SOIL TESTING ARE MINIMAL AND CAN RESULT IN HUGE SAVINGS IN SOIL AMENDMENTS AND THE COSTS OF RE-SEEDING. IN THE ABSENCE OF A SOIL TEST:
   - A. THE LIMING RATE SHOULD BE AT LEAST 4 TO 5 TONS/ACRE. FOR TEMPORARY SEEDING, A LIMING RATE OF 2 TONS/ACRE IS ACCEPTABLE. NO MORE THAN 4 TONS/ACRE SHOULD BE ADDED TO AGRICULTURAL LAND.
   - B. FERTILIZER SHOULD BE APPLIED AT THE RATE OFF 100LB N, 200 LB. OF P205, AND 200 LB. OF K20 PER ACRE (E.G. 1000 LB./ACRE OF 10-20-20 FERTILIZER). FOR TEMPORARY SEEDING, A RATE OF 50 LB. N, 50 LB. P205, 50 LB. K20 PER ACRE(E.G. 500 LB. OF 10-10-10 FERTILIZER) IS ACCEPTABLE.
3. MULCHING-MULCH ABSORBS RAINFALL IMPACT, INCREASES THE RATE OF INFILTRATION, REDUCES SOIL MOISTURE LOSS DUE TO EVAPORATION, MODERATES SOIL TEMPERATURES, PROVIDES A SUITABLE ENVIRONMENT FOR GERMINATION, AND PROTECTS THE SEEDING FROM INTENSE SUNLIGHT. ALL SEEDED AREAS SHOULD BE MULCHED UNLESS THE SEED MIXTURE IS DRILLED AND INCLUDES A NURSE CROP (SEE TABLE 4-17). MULCHING MAY ALSO BE USED AS A TEMPORARY STABILIZATION OF DISTURBED AREAS IN NON-GERMINATING SEASONS.
   - A. THE MINIMUM APPLICATION RATE FOR HAY OR STRAW MULCH SHOULD BE 3 TONS/ACRE. ON STEEP SLOPES THE HAY OR STRAW SHOULD BE CRIMPED, TACKED, NETTED, OR OTHERWISE ANCHORED.
   - B. WOOD CELLULOSE IS NOT RECOMMENDED FOR STEEP SLOPE ($\geq$ 1:3 H:V) APPLICATIONS, WHERE USED, THE MINIMUM RATE OF APPLICATION SHOULD BE 2000 LB./ACRE.
   - C. EROSION CONTROL BLANKETING SHOULD BE CONSIDERED FOR STEEP SLOPE ($\geq$ 1:3 H:V) SITUATIONS AND IN CRITICAL AREAS (E.G. STREAM CROSSINGS, ADJACENT WETLANDS, ETC.)

TABLE 17. MULCH APPLICATION RATES

MULCH TYPE	APPLICTION RATE (MIN.): PER ACRE	PER 1,000 sq.ft.	PER 1,000 sq.yd.	NOTES
STRAW	2 TONS	90 lb.	810 lb.	EITHER WHEAT OR OAT STRAW,FREE OF WEEDS, NOT CHOPPED OR FINELY BROKEN
HAY	2 TONS	90 lb.	810 lb.	TIMOTHY, MIXED CLOVER AND TIMOTHY OR OTHER NATIVE FORAGE GRASSES
WOOD CELLULOSE	2,000 lb.	46 lb.	414 lb.	DO NOT USE ALONE IN WINTER DURING HOT AND DRY WEATHER, OR ON STEEP SLOPES(>3:1)
WOOD CHIPS	6 TONS			MAY PREVENT GERMINATION OF GRASSES AND LEGUMES

NOTE:
AFTER SOIL PH ANALYSIS IS PERFORMED, A SUITABLE MIX SHALL BE DETERMINED FROM THE TABLES.

Upland Seed Mix Option:

SHOWY NORTHEAST NATIVE WILDFLOWER MIX: ERNMX-153
ERNST CONSERVATION SEED
9006 MERCER PIKE
MEADVILLE, PA 16335-9299
TELEPHONE: 800-873-3321 / 814-336-2404
FAX: 814-336-5191
EMAIL: ernst@ernstseed.com
APPLICATION RATE: 15 lbs/acre (BULK) THOROUGHLY MIXED WITH ANNUAL RYEGRASS (LOLIUM MULTIFLORUM) AT 10 lbs/acre.
NOTE: STRAW MULCH LIGHTLY AND COVER WITH JUTE MAT, INSTALLED PER MANUFACTURER'S SPECS.

PERCENT BY NO. OF SEEDS (NOT WEIGHT)	SCIENTIFIC NAME	COMMON NAME
15%	ANDROPOGON SCOPARIUS	LITTLE BLUESTEM
10%	BOUTELOUA CURTIPENDULA	SIDE OATS GRAMA
10%	ELYMUS VILLOSUS	SILKY WILD RYE
10%	SORGHASTRUM NUTANS	INDIAN GRASS
7%	CHAMAECRISTA FASCICULATA	PARTRIDGE PEA
6%	HELIOPSIS HELIANTHOIDES	OX EYE SUNFLOWER
5%	ANDROPOGON GERARDII, NIAGARA	NIAGARA BIG BLUESTEM
5%	PENSTEMON DIGITALIS	TALL WHITE BEARD TONGUE
5%	RUDBECKIA HIRTA	BLACK EYED SUSAN
5%	SENNA HEBECARPA	WILD SENNA
4%	ASTER PRENANTHOIDES/NOVIBELGI MIX	ZIGZAG ASTER/NEW YORK ASTER MIX
3%	HYPERICUM PYRAMIDATUM	GREAT ST. JOHN'S WORT
2.5%	ZIZIA AUREA	GOLDEN ALEXANDERS
2%	ASCLEPIAS SYRIACA	COMMON MILKWEED
2%	ASCLEPIAS TUBEROSA	BUTTERFLY MILKWEED
2%	TRADESCANTIA OHIOENSIS	OHIO SPIDERWORT
1.5%	ASTER NOVAEANGLIAE	NEW ENGLAND ASTER
1.5%	LUPINIUS PERENNIS	WILD BLUE LUPINE
1.5%	MONARDA FISTULOSA	WILD BERGAMOT
1%	BAPTISIA AUSTRALIS	BLUE FALSE INDIGO
1%	LESPEDEZA CAPITATA	ROUNDHEAD LESPEDEZA

Wetland Seed Method :

1. WETLAND AREAS SHALL BE TOPSOILED WITH THE NATURAL TOPSOIL. AN ANNUAL RYE MIX SHALL BE PLANTED IN THE INTERIM UNTIL THE NATURAL PLANTS INUNDATE THE DISTURBED AREAS.
2. NO LIME OR FERTILIZER SHALL BE USED IN WETLAND AREAS.

Streambank & Wetland Seed Mix Option:

"RETENTION BASIN FLOOR SEEDING FOR WILDLIFE & PLANT DIVERSITY MIX – ERNMX-127" APPLIED AT A SEEDING RATE OF 15 BULK LBS PER ACRE OR 1/3-1/2 LBS PER 1,000 FT2, SEWN ALONG WITH 10 LBS/ACRE OF CEREAL OATS (AVENA SATIVA) OR GRAIN (CEREAL) RYE (SECALE CEREAL) AVAILABLE FROM:
ERNST CONSERVATION SEEDS
9006 MERCER PIKE
MEADVILLE, PA 16335
PHONE: (800) 873-3321 (814) 336-2404
FAX: (814) 336-5191
EMAIL: SALES@ERNSTSEED.COM <mailto:SALES@ERNSTSEED.COM>

General Construction Notes:

EROSION CONTROL BLANKET FOR STEEP SLOPES

STEEP SLOPES THAT ARE DISTRIBUTED FOR UTILITY LINE CONSTRUCTION SUCH AS ROADWAY/RAILROAD CUT OR EMBANKMENT SLOPES GREATER THAN OR EQUAL TO 3 HORIZONTAL TO 1 VERTICAL SHOULD BE PROTECTED AGAINST EROSION WITH EROSION CONTROL BLANKETS OR MATS SUITABLE FOR THE ESTABLISHMENT OF VEGETATION. THE EROSION CONTROL BLANKETS SHOULD BE INSTALLED IMMEDIATELY AFTER THE SOIL AMENDMENTS AND THE SEED ARE APPLIED. EROSION CONTROL BLANKETS SHOULD ALSO BE INSTALLED ON OTHER STEEP RIGHT-OF-WAY SLOPES WHERE EROSION WILL BE A PROBLEM UNTIL VEGETATION IS ESTABLISHED.

THE INSTALLATION PROCEDURE SHOULD COMPLY WITH THE MANUFACTURER'S RECOMMENDATIONS, INCLUDING SLOPE PREPARATION, ORIENTATION, TRENCHING, OVERLAP AND SPACING OF STAPLES.

STABILIZATION DURING NON-GROWING SEASONS

ALL UTILITY LINE CONSTRUCTION SHOULD BE PLANNED FOR COMPLETION WITHIN THE RECOMMENDED DATES FOR THE APPLICATION OF PERMANENT SEEDING AND ESTABLISHMENT OF PERMANENT VEGETATIVE COVER. HOWEVER, WHEN EMERGENCY UTILITY LINE CONSTRUCTION MUST BE DONE AND IS COMPLETED DURING A NON-GROWING SEASON (WINTERTIME, ETC.), INTERIM STABILIZATION BMP'S MUST BE IMPLEMENTED AND ADEQUATELY MAINTAINED. THE APPLICATION OF STRAW MULCH AT THE RATE OF TWO TONS PER ACRE IS RECOMMENDED. THE BMP'S SHOULD BE CHECKED WEEKLY (UNLESS SNOW COVERED) TO IDENTIFY AREAS THAT BECOME BARE.

THESE BARE AREAS SHOULD BE COVERED WITH A PROPERLY INSTALLED EROSION CONTROL BLANKET. ALL TEMPORARY EROSION AND SEDIMENT POLLUTION CONTROLS MUST BE MAINTAINED UNTIL PERENNIAL VEGETATION IS ESTABLISHED.

A PRE-WINTER STABILIZATION MEETING NEEDS TO BE HELD IF THE PROJECT IS TO REMAIN OPEN THROUGH WINTER. PLANNING SHOULD BE SUCH THAT THE SITE IS ABLE TO BE SEEDED DURING THE GROWING SEASON. IF SEEDING IS NOT POSSIBLE, THEN THE SITE WILL HAVE TO BE MULCHED AND POSSIBLY DORMANT SEEDED

PERMANENT STABILIZATION

PERMANENT CONTROL BMP'S SUCH AS SLOPE BREAKERS/INTERCEPTOR DIKES/WATER BARS, ETC., SHOULD BE IN PLACE PRIOR TO APPLICATION OF SOIL AMENDMENTS, SEED AND MULCH. THE OBJECTIVE SHOULD BE TO OBTAIN PERENNIAL VEGETATIVE COVER THAT IS RESISTANT TO EROSION. THE ACCEPTABLE STANDARD FOR VEGETATIVE STABILIZATION IS A UNIFORM 85% COVER.

RESPONSIBILITY FOR E&S CONTROL FACILITIES:

DURING IMPROVEMENTS CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION, STABILIZATION & MAINTENANCE OF ALL SITE EROSION & SEDIMENTATION CONTROL FACILITIES. AFTER CONTRACTOR INVOLVEMENT CEASES, RESPONSIBILITY SHALL REVERT TO THE PROJECT OWNER.

SEDIMENT RE-DISTRIBUTION

WASHING OF FILTER STONE AND RE-DISTRIBUTION OF WET SEDIMENT FROM BASINS, TRAPS OR OTHER FACILITIES SHALL ONLY BE PERMITTED UPHILL OF AN EFFECTIVE SEDIMENT FILTER FACILITY. SILT LADEN RUNOFF SHALL NOT BE ALLOWED TO FLOW DIRECTLY TO UNPROTECTED CATCH BASINS, PONDS, ADJACENT PROPERTIES, ROADS OR WETLANDS.

OFF-SITE BORROW OR DISPOSAL AREAS

IT IS INTENDED THAT ANY BORROW OR DISPOSAL AREAS FOR THIS SITE SHALL BE ACQUIRED FROM OR DISPOSED OF ON THIS SITE. THE CONTRACTOR SHALL UTILIZE THIS APPROVED PLAN.

ASSURANCE OF DESIGN PERFORMANCE

THE SPECIFICATIONS AND REQUIREMENTS OF THE PROJECT PLANS, NARRATIVE AND SPECIFICATION ARE THE MINIMUM ACCEPTABLE CONSTRUCTION CRITERIA FOR THIS PROJECT.

DURING SITE DEVELOPMENT CONSTRUCTION, ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL FACILITIES MUST BE CHECKED BY THE CONTRACTOR AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY DAMAGE TO THE FACILITIES MUST BE REPAIRED IMMEDIATELY. ANY LOST SOIL MATERIAL SHALL BE RECOVERED, IF POSSIBLE. WASHED OUT LAWN OR SLOPE AREAS MUST HAVE TOPSOIL REPLACED AND THEN MUST BE RE-SEEDED AND MULCHED.

IF, FOR ANY REASON, THE DESIGNED FACILITIES OR MEASURES DO NOT PROVIDE THE NECESSARY PROTECTION, THE CONTRACTOR SHALL ADJUST THE EROSION CONTROL MEASURES AND SEDIMENT CONTROL MEASURES TO ACHIEVE A COMPLETE NON-ERODED STABILIZED SITE CONDITION.

REFUELING AREAS

ALL ABOVE-GROUND GAS OR LIQUID STORAGE TANKS SHALL BE ANCHORED TO PREVENT FLOTATION OR LATERAL MOVEMENT RESULTING FROM HYDRODYNAMIC AND HYDROSTATIC LOADS IF THEY ARE LOCATED WITHIN 1,000 FT OF A FLOODWAY, 100-YEAR FLOODPLAIN, OR A 500-YEAR FLOODPLAIN.

ALL FUEL TANKS AND DRUMS SHALL BE STORED IN A MARKED STORAGE AREA. A DIKE SHALL BE CONSTRCUTED AROUND THIS STORAGE AREA ACCORDING TO ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

WASTE DISPOSAL

AREAS DESIGNATED FOR STORAGE DISPOSAL OF SOLID, SANITARY AND TOXIC WASTES (DUMPSTER AREAS, CEMENT TRUCK WASHOUT, VEHICLE FUELING) SHALL BE CLEARLY IDENTIFIED.

COVERED CONTAINERS SHALL BE AVAILABLE FOR DISPOSAL OF DEBRIS TRASH AND HAZARDOUS WASTES.

DUST CONTROL

FUGITIVE DUST RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE MINIMIZED TO THE MAXIMUM EXTENT PRACTICAL BY IMPLEMENTING APPROPRIATE CONTROL MEASURES. THESE MEASURES INCLUDE THE APPLICATION OF MULCH, WATER, STONE, OR APPROVED CHEMICAL AGENTS ON ACCESS ROADS, EXPOSED SOILS, STOCKPILED SOILS, OR UNPAVED PUBLIC ROADS WHEN DRY AND WINDY CONDITIONS EXIST. A WATERING VEHICLE SHALL BE AVAILABLE FOR THE DURATION OF PROJECT ACTIVITIES, INCLUDING THROUGHOUT RESTORATION.

Standard Erosion And Sedimentation Control Plan Notes:

1. VEHICLES AND EQUIPMENT MAY NEITHER ENTER DIRECTLY TO NOR EXIT DIRECTLY FROM ANYWHERE EXCEPT AT THE PROPOSED ROCK CONSTRUCTION ENTRANCES.
2. STOCKPILE HEIGHTS MUST NOT EXCEED 35 FEET. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.
3. THE OPERATOR SHALL ASSURE THAT THE APPROVED EROSION AND SEDIMENT CONTROL PLAN IS PROPERLY AND COMPLETELY IMPLEMENTED.
4. FAILURE TO CORRECTLY INSTALL SEDIMENT CONTROL FACILITIES OR FAILURE TO PREVENT SEDIMENT LADEN RUNOFF FROM LEAVING THE CONSTRUCTION SITE OR FAILURE TO TAKE CORRECTIVE ACTIONS TO IMMEDIATELY RESOLVE FAILURES OF SEDIMENT CONTROL FACILITIES MAY RESULT IN ADMINISTRATIVE, CIVIL AND/OR CRIMINAL PENALTIES BEING INSTITUTED.
5. UNTIL THE SITE ACHIEVES FINAL STABILIZATION, THE OPERATOR SHALL ASSURE THAT THE BEST MANAGEMENT PRACTICES ARE IMPLEMENTED, OPERATED, AND MAINTAINED PROPERLY AND COMPLETELY. MAINTENANCE SHALL INCLUDE INSPECTIONS OF ALL BEST MANAGEMENT PRACTICE FACILITIES. THE OPERATOR WILL MAINTAIN AND MAKE AVAILABLE TO THE DEPARTMENT AND APPLICABLE CONSERVATION DISTRICT, WRITTEN INSPECTION LOGS OF ALL THOSE INSPECTIONS. ALL MAINTENANCE WORK, INCLUDING CLEANING, REPAIR, REPLACEMENT, REGRADING, AND RESTABILIZATION SHALL BE PERFORMED IMMEDIATELY.
6. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.
7. ALL PUMPING OF SEDIMENT LADEN WATER SHALL BE THROUGH A SEDIMENT CONTROL BMP, SUCH AS A PUMPED WATER FILTER BAG DISCHARGING OVER NON-DISTURBED AREAS.
8. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES.
9. ONLY LIMITED DISTURBANCE WILL BE PERMITTED TO PROVIDE ACCESS TO SEDIMENT BASIN FOR GRADING AND ACQUIRING BORROW TO CONSTRUCT THOSE BMPS.
10. EROSION AND SEDIMENT BMPS MUST BE CONSTRUCTED, STABILIZED, AND FUNCTIONAL BEFORE SITE DISTURBANCE BEGINS WITHIN THE TRIBUTARY AREAS OF THOSE BMPS.
11. AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMPS CONTROLS MUST BE REMOVED. AREAS DISTURBED DURING REMOVAL OF THE BMPS MUST BE STABILIZED IMMEDIATELY.
12. AT LEAST 7 DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, THE OPERATOR SHALL INVITE ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES, THE LANDOWNER, ALL APPROPRIATE MUNICIPAL OFFICIALS, THE EROSION AND SEDIMENT CONTROL PLAN PREPARER, AND THE CONSERVATION DISTRICT TO AN ON-SITE MEETING. ALSO, AT LEAST 3 DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE ONE CALL SYSTEM INCORPORATED AT 1-800-362-2764 FOR BURIED UTILITIES LOCATIONS.
13. ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE CONSTRUCTION SEQUENCE. EACH STAGE SHALL BE COMPLETED BEFORE ANY FOLLOWING STAGE IS INITIATED. CLEARING AND GRUBBING SHALL BE LIMITED ONLY TO THOSE AREAS DESCRIBED IN EACH STAGE.
14. IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE, THE OPERATOR SHALL STABILIZE ANY AREAS DISTURBED BY THE ACTIVITIES. DURING NON-GERMINATING PERIODS, MULCH MUST BE APPLIED AT THE SPECIFIED RATES. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE REDISTURBED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY VEGETATIVE STABILIZATION SPECIFICATIONS. DISTURBED AREAS WHICH ARE AT FINISHED GRADE OR WHICH WILL NOT BE REDISTURBED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE PERMANENT VEGETATIVE STABILIZATION SPECIFICATIONS.
15. AN AREA SHALL BE CONSIDERED TO HAVE ACHIEVED FINAL STABILIZATION WHEN IT HAS A MINIMUM UNIFORM 85% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS SUFFICIENT TO RESIST SLIDING AND OTHER MOVEMENTS.

OTHER BMPS (SPECIFY)

1. SEDIMENT MUST BE REMOVED FROM STORM WATER INLET PROTECTION WHEN DEVICE IS HALF FULL..
2. AT STREAM CROSSINGS, 50' BUFFER AREAS SHOULD BE MAINTAINED. ON BUFFERS, CLEARING, SOD DISTURBANCES, EXCAVATION, AND EQUIPMENT TRAFFIC SHOULD BE MINIMIZED. ACTIVITIES SUCH AS STACKING LOGS, BURNING CLEARED BRUSH, DISCHARGING RAINWATER FROM TRENCHES, WELDING PIPE SECTIONS, REFUELING AND MAINTAINING EQUIPMENT SHOULD BE ACCOMPLISHED OUTSIDE OF BUFFERS.
3. ALL WETLANDS MUST BE DELINEATED AND PROTECTED WITH ORANGE SAFETY FENCE PRIOR TO ANY EARTH MOVING ACTIVITY.

TEMPORARY STABILIZATION & PERMANENT STABILIZATION

1. HAY OR STRAW MULCH MUST BE APPLIED AT 2.0 TONS PER ACRE.
2. MULCH WITH MULCH CONTROL NETTING OR EROSION CONTROL BLANKETS MUST BE INSTALLED ON ALL SLOPES 3:1 AND STEEPER."
3. STRAW MULCH SHALL BE APPLIED IN LONG STRANDS, NOT CHOPPED OR FINELY BROKEN.
4. UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENT BMPS MUST BE MAINTAINED PROPERLY. MAINTENANCES MUST INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENT CONTROL BMPS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGARDING, RESEEDING, REMULCHING, AND RENETTING, MUST BE PERFORMED IMMEDIATELY. IF EROSION AND SEDIMENT CONTROL BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS, OR MODIFICATIONS OF THOSE INSTALLED WILL BE REQUIRED.
5. SEDIMENT REMOVED FROM BMPS SHALL BE DISPOSED OF IN LANDSCAPED AREAS OUTSIDE OF STEEP SLOPES, WETLANDS, FLOODPLAINS OR DRAINAGE SWALES AND IMMEDIATELY STABILIZED, OR PLACED IN TOPSOIL STOCKPILES.
6. THE OPERATOR SHALL REMOVE FROM THE SITE, RECYCLE, OR DISPOSE OF ALL BUILDING MATERIALS AND WASTES IN ACCORDANCE WITH OHIO EPA. THE CONTRACTOR SHALL NOT ILLEGALLY BURY, DUMP, OR DISCHARGE ANY BUILDING MATERIAL OR WASTES AT THE SITE."

STREAMBANK STABILIZATION SPECIFICATIONS

1. FILTER BAGS USED TO REMOVE SEDIMENTS FROM SEDIMENT-LADEN PUMPED WATER FROM THE WORK CELL SHALL BE "DIRT BAG" BRAND NAME OR APPROVED EQUIVALENT. THE FILTER BAG SHALL BE PLACED IN AN UPLAND AREA, DOWNSTREAM AND ADJACENT TO THE UNDISTURBED AREAS OF THE SITE WHEN IN USE.
2. JUTE MATTING OR MATTING SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS ON ALL DISTURBED AND SEEDED/MULCHED SLOPES IN EXCESS OF 4:1 SLOPE, OR AS SPECIFIED IN STREAM CROSS-SECTIONS. .
3. LIVE STAKES SHALL BE INSTALLED RANDOMLY WITH 3-5 FT SPACING THROUGHOUT THE ENTIRE UPPER BANK (BARE SOIL AREAS) ABOVE RIP-RAP, OR AS SHOWN IN THE STREAM CROSS-SECTIONS. SPECIES SHALL INCLUDE STREAMCO WILLOW (SALIX PURPUREA), SILKY WILLOW (SALIX SERICEA), SANDBAR WILLOW (SALIX EXIGUA SSP INTERIOR), SILKY DOGWOOD (CORNUS AMOMUM), AND/OR ELDERBERRY (SAMBUCUS CANADENSIS).

Pipe Line Construction Plan Notes:

BEST MANAGEMENT PRACTICES

LIMITING EXPOSED AREAS

EARTH DISTURBANCE ACTIVITIES SHALL BE PLANNED AND CONDUCTED TO MINIMIZE THE EXTENT AND DURATION OF THE DISTURBANCE.

THE LENGTH OF TIME FOR CONSTRUCTING ACCESS ROADS, UTILITY LINE TRENCHING, TRENCH BACK-FILLING, FINAL GRADING AND CLEANUP SHOULD BE KEPT TO A MINIMUM. GOOD PLANNING AND SCHEDULING OF THE VARIOUS UTILITY CONSTRUCTION ITEMS, TOGETHER WITH TIMELY AVAILABILITY OF MATERIALS, ADEQUATE EQUIPMENT, AND ADEQUATE MANPOWER, WILL HELP REDUCE THE TIME OF EXPOSURE OF DISTURBED LAND.

PIPELINES WITH JOINTS THAT ALLOW A MANUFACTURED LENGTH OF PIPE TO BE PLACED IN THE TRENCH WITH THE PIPE JOIN ASSEMBLED/MADE IN THE TRENCH REQUIRE AN OPEN PIPELINE TRENCH THAT IS ONLY SLIGHTLY LONGER THAN THE LENGTH OF PIPE BEING INSTALLED.

LARGE DIAMETER STEEL PIPELINES WITH WELDED JOINTS WHERE THE PIPE JOINTS ARE WELDED WHILE THE PIPE IS OUT OF THE TRENCH USUALLY REQUIRE A FAIRLY LONG LENGTH OF OPEN PIPELINE TRENCH. THE TOTAL TIME FROM TRENCH EXCAVATION TO PLACEMENT OF BACKFILL FOR THIS TYPE OF PIPELINE CONSTRUCTION SHOULD GENERALLY BE LIMITED TO NO MORE THAN THIRTY (30) CALENDAR DAYS AT ANY GIVEN POINT ALONG THE PIPELINE. THIS MEANS THAT, FOR EXAMPLE, THAT FROM THE TIME THAT TRENCH EXCAVATION ACTIVITIES COMMENCE AT STATION 1+00 UNTIL THE TRENCH IS BACKFILLED AT STATION 1+00, NO MORE THAN THIRTY (30) CALENDAR DAYS SHOULD EXPIRE. AT ANY GIVEN PLACE ALONG THE PIPELINE TRENCH WHERE THE TIME TO EXCAVATE AND BACKFILL THE TRENCH WILL EXCEED THIRTY (30) CALENDAR DAYS, OR THE TIME SPECIFIED IN THE PERMIT, THE CONTRACTOR SHALL CONTACT THE COMPANY TO DETERMINE IF THE ADDITIONAL TIME CAN BE APPROVED UNDER A MINOR MODIFICATION. WHERE EARTH DISTURBANCE ACTIVITY IS NOT COMPLETED IN AN AREA WHERE THE TRENCH HAS BEEN BACKFILLED, BMPS SHOULD BE MAINTAINED AND TEMPORARY STABILIZATION PROVIDED AS REQUIRED.. WHERE DISTURBANCE ACTIVITIES HAVE BEEN COMPLETED, PERMANENT STABILIZATION SHALL BE PROVIDED AS REQUIRED.

SWALE/DITCH/CHANNEL/WATERWAYS CROSSINGS

ADEQUATELY SIZED PIPE CULVERTS SHOULD BE INSTALLED FOR ACCESS ROADS AT ALL LOCATIONS WHERE ACCESS ROADS CROSS A SWALE/DITCH/CHANNEL OR WATERWAY WHETHER OR NOT FLOWING WATER IS ENCOUNTERED. WHERE THE PIPE LINE TRENCH CROSSES A SWALE/DITCH/CHANNEL OR WATERWAY WITH FLOWING WATER, THEN A TEMPORARY PIPE CULVERT PROPERLY "SAND BAGGED" SHOULD BE INSTALLED PRIOR TO THE TRENCHING OPERATION AND MAINTAINED UNTIL THE PIPE LINE IS INSTALLED, THE TRENCH BACKFILLED, AND THE SWALE/DITCH/CHANNEL OR WATERWAY IS RESTORED AND STABILIZED. WHERE A UTILITY LINE CROSSES A "DRY" SWALE/DITCH/CHANNEL OR WATERWAY AND THE EXCAVATED TRENCH MUST REMAIN OPEN FOR MORE THAN ONE WORKING DAY, THEN A TEMPORARY PIPE CULVERT PROPERLY "SAND BAGGED" SHOULD BE INSTALLED AND MAINTAINED UNTIL THE SWALE/DITCH/CHANNEL OR WATERWAY IS RESTORED AND STABILIZED. FLOWING WATER NEEDS TO BE PROPERLY HANDLED WHERE UTILITY LINES CROSS STREAMS OR WETLANDS.

CHANNEL AND STREAMBANK STABILIZATION

ADEQUATE STREAM BANK STABILIZATION MUST BE PROVIDED AT ALL LOCATIONS WHERE STREAM BANKS ARE DISTURBED. THE STREAM BANK STABILIZATION SHOULD BE DESIGNED TO WITHSTAND THE ANTICIPATED WATER FLOW VELOCITIES OR THE MAXIMUM ANTICIPATED SHEAR STRESS. ALL EXISTING SWALES/DITCHES/CHANNELS OR WATERWAYS THAT ARE DISTURBED NEED TO BE STABILIZED TO WITHSTAND ANTICIPATED WATER FLOW VELOCITIES OR MAXIMUM ANTICIPATED SHEAR STRESS WHEN THEY ARE REOPENED. PROPOSED DITCHES AND CHANNELS SHOULD BE PROVIDED WITH ADEQUATE STABILIZATION TO WITHSTAND DESIGN FLOW VELOCITIES OR MAXIMUM ANTICIPATED SHEAR STRESS WHEN THEY ARE INSTALLED.

PERMANENT STABILIZATION

THE INSTALLATION OF PAVEMENT, ROCK RIP RAP OR GABIONS ARE SOME EXAMPLES OF STABILIZATION. THE STANDARD FOR VEGETATIVE COVER AS STABILIZATION IS PERENNIAL VEGETATION THAT IS ESTABLISHED WITH A UNIFORM COVERAGE OR DENSITY OF 85% ACROSS THE DISTURBED AREA. THE APPLICATION OF LIME, FERTILIZER, SEED, AND MULCH IS USUALLY DONE TO ACHIEVE PERMANENT STABILIZATION. THE MULCH IS CONSIDERED TO BE AN INTERIM STABILIZATION MEASURE TO ASSIST IN THE ESTABLISHMENT OF THE PERMANENT VEGETATIVE COVER.

INTERIM STABILIZATION

TEMPORARY SEEDING WITH MULCH COVER FOR INTERIM STABILIZATION IS A TYPE OF BMP THAT CAN USUALLY BE PROVIDED WHERE THE EARTH DISTURBANCE ACTIVITY TEMPORARILY CEASES.

THE INSTALLATION OF AN EROSION CONTROL BLANKET OR APPLICATION OF MULCH UPON SEEDED AREAS ARE BOTH CONSIDERED TO BE INTERIM STABILIZATION BMP'S TO PROTECT THE SEEDBED UNTIL VEGETATION IS ESTABLISHED.

SLOPE BREAKERS/INTERCEPTOR DIKES/WATER BARS

TEMPORARY SLOPE BREAKERS/INTERCEPTOR DIKES/WATER BARS SHOULD BE INSTALLED ACROSS DISTURBED AREAS (ACCESS ROAD, ETC.) OF THE UTILITY LINE RIGHT-OF-WAY ON ALL SLOPES GREATER THAN 5% AND DISCHARGE INTO WELL-VEGETATED AREAS. PERMANENT SLOPE BREAKERS/INTERCEPTOR DIKES/WATER BARS NOT ONLY COLLECT RUNOFF FROM THE DISTURBED AREAS AND DISCHARGE IT TO WELL VEGETATED AREAS UNTIL PERMANENT VEGETATION IS ESTABLISHED, BUT ALSO PROVIDE LONG-TERM EROSION CONTROL ON THE COMPLETED RIGHT-OF-WAY.

SOLIDS SEPARATION

STRAW BALE BARRIERS, FILTER FABRIC FENCE, REINFORCED FILTER FABRIC FENCE, ROCK FILTER BERMS, ROCK FILTERS AND STORM INLET PROTECTION ARE ALL EXAMPLES OF SOLIDS SEPARATION BMP'S. THEY SHOULD REMOVE SEDIMENT BY EITHER TEMPORARILY IMPOUNDING THE SEDIMENT LADEN RUNOFF OR BY SUFFICIENTLY SLOWING THE VELOCITY OF THE RUNOFF TO INDUCE SETTING OF THE SEDIMENT PARTICLES.

THE "PUMPED WATER FILTER BAG" IS USED AS A SOLIDS SEPARATION DEVICE TO REMOVE SEDIMENT FROM MUDDY WATER PUMPED FROM TRENCHES OR EXCAVATIONS.

SILT SOCK INSTALLATION

IT IS EXPECTED THAT THE EXISTING SURFACE BE PREPARED PRIOR TO INSTALLATION OF FILTER SOCKS TO CREATE A DIRECT CONTACT BETWEEN THE BOTTOM OF THE SILT SOCKS AND THE EARTH ON WHICH THEY ARE PLACED. WHEN INSPECTORS (DEP AND INTERNAL) INDICATE THAT THIS CONTACT IS NOT BEING ACHIEVED, THE COMPANY WILL REQUIRE THE PLACEMENT OF MULCH UPGRADIENT OF THE FILTER SOCKS. THEREFORE, THE BEST WAY TO AVOID THE USE OF THE MULCH UPGRADIENT OF THE FILTER SOCKS IS TO INSTALL THE FILTER SOCKS CORRECTLY AND IMPLEMENT GOOD HOUSEKEEPING PRACTICES ALONG PIPELINE RIGHT-OF-WAYS AND OTHER DISTURBED AREAS.

Soils Limitations And Resolutions Chart

SOIL LIMITATIONS	RESOLUTIONS
CUTBANKS CAVE	LAYBACK SLOPES
CORROSIVE TO CONCRETE/STEEL	CATHODIC PROTECTION AND/OR CORROSION RESISTANT CONCRETE
DROUGHTY	N/A
EASILY ERODIBLE	MAINTAIN EROSION BMPS
FLOODING	RAISE ELEVATION OUTSIDE FLOOD LEVEL OR POSTPONE CONSTRUCTION
DEPTH TO SATURATED ZONE/SEASONAL HIGH WATER TABLE	KNOW DEPTH TO SEASONAL HIGH WATER TABLE AND AVOID IMPACTS TO SITE DEVELOPMENT PLANS
HYDRIC/HYDRIC INCLUSIONS	AVOID
LOW STRENGTH/LANDSLIDE PRONE	LAYBACK SLOPES–DESIGN FOR CONDITION
SLOW PERCOLATION	DRAINAGE DITCH
PIPING	TEMPORARILY LOWER GROUND WATER TABLE OR PROVIDE FILTERS
POOR SOURCE OF TOPSOIL	AVOID REUSE AS TOPSOIL FOR SUPPORT OF VEGETATION
FROST ACTION	LOWER FOOTINGS BELOW FROST DEPTHS, PROVIDE POSITIVE SUBGRADE
SHRINK–SWELL	AVOID USE OF HIGHLY PLASTIC CLAYS IN BUILDING AREAS
POTENTIAL SINKHOLE	PLUG OR MITIGATE KNOWN SINKHOLES, PROVIDE POSITIVE SURFACE
PONDING	PROVIDE POSITIVE DRAINAGE
WETNESS	USE SUNNY WEATHER COMBINED WITH MECHANICAL ACTIONS TO LOWER GROUNDWATER TABLE OR AVOID USING THESE SOILS

GENERAL NOTES:
1. ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMPS SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMPS MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

E&SPC TYPICAL DETAIL SHEET 2

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SEAL

NO.	REVISIONS	DATE

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ	PROJECT NO. NRG–1007
CHECKED BY: SJC	
DATE: 12.15.14	SHEET NO. 84 OF 88
SCALE: AS NOTED	

Hanover
Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Pumped Water Filter Bag Detail

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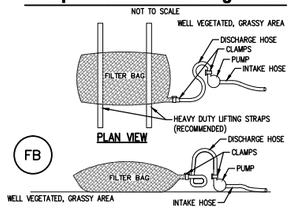


NOTES:

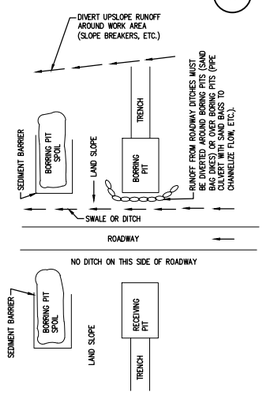
1. LOW VOLUME FILTER BAGS SHALL BE MADE FROM NON-WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS. HIGH VOLUME FILTER BAGS SHALL BE MADE FROM WOVEN GEOTEXTILES THAT MEET THE FOLLOWING STANDARDS:

PROPERTY	TEST METHOD	MINIMUM STANDARD
AVG. WIDE WIDTH STRENGTH	ASTM D-4884	60 LB/IN
GRAB TENSILE	ASTM D-4632	205 LB
PUNCTURE	ASTM D-4833	110 LB
MULLEN BURST	ASTM D-3786	350 PSI
UV RESISTANCE	ASTM D-4355	85%
AOS % RETAINED	ASTM D-4751	80 SIEVE

2. A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES SHALL BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED. BAGS SHALL BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.
3. BAGS SHALL BE LOCATED IN WELL-VEGETATED (GRASSY) AREA, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACED ON FILTER STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%. FOR SLOPES EXCEEDING 5%, CLEAN ROCK OR OTHER NON-ERODIBLE AND NON-POLLUTING MATERIAL MAY BE PLACED UNDER THE BAG TO REDUCE SLOPE STEEPNESS.
4. NO DOWNSLOPE SEDIMENT BARRIER IS REQUIRED FOR MOST INSTALLATIONS.
5. THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.
6. THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.
7. FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

Utility Line Highway/Roadway Crossing Boring Method (HWB)

NOT TO SCALE



Sandbag Dike (SC)

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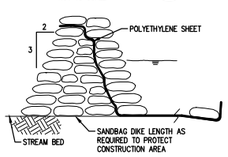

Stone/Dirt Twp. Road Crossing

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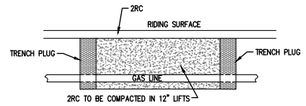

Paved Twp. Road Crossing

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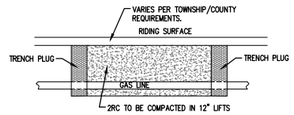
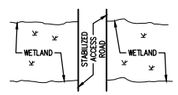


Access Road Wetland And Crossing

NOT TO SCALE

REMOVAL OF TREES, TREE STUMPS ,BRUSH AND VEGETATION SHOULD BE KEPT TO A MINIMUM IN THE WETLAND. GRADING SHOULD BE LIMITED TO THE AREA DIRECTLY OVER THE TRENCH TO THE EXTENT POSSIBLE. WHERE CLEARING OF TREES AND VEGETATION IS REQUIRED FOR THE EQUIPMENT ACCESS AREAS, THE TREE AND VEGETATION ROOT MASS IS TO REMAIN UNDISTURBED. VEGETATION MAY BE CUT AT/NEAR THE GROUND LINE AND SHOULD BE REMOVED FROM THE WETLAND. TREES SHOULD BE CUT ABOVE THE GROUND LINE AND SHOULD BE REMOVED FROM THE WETLAND. TREES SHOULD BE CUT ABOVE THE GROUND LINE WITH THE STUMPS LEFT IN PLACE, EXCEPT WHERE REMOVAL IS REQUIRED FOR SAFETY REASONS.

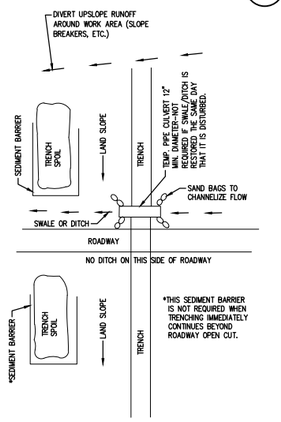


PLAN

THE MOVEMENT OF VEHICLES AND/OR EQUIPMENT ACROSS WETLANDS, SHOULD BE KEPT TO AN ABSOLUTE MINIMUM. THE ACCESS ROAD WIDTH SHOULD BE KEPT TO A MINIMUM AND BE STABILIZED AS SPECIFIED IN THE EROSION AND SEDIMENTATION CONTROL PLAN. THE ACCESS ROAD MAY BE STABILIZED BY PLACING GRAVEL OR CRUSHED AGGREGATE UPON GEOTEXTILE FABRIC, OR BY PLACING TIMBER RIP RAP OR PREFABRICATED SWAMP MATS. THE TIMBER RIP RAP OR PREFABRICATED SWAMP MATS SHOULD NOT BE MORE THAN 2 LAYERS THICK. A PROPERLY DESIGNED PLANK ROAD MAY ALSO BE UTILIZED. DIRT, ROCK, STUMPS OR BRUSH SHALL NOT BE USED TO STABILIZE THE WETLAND. ALL MATERIAL USED TO STABILIZE THE ACCESS ROAD MUST BE REMOVED FROM THE WETLAND WHEN UTILITY CONSTRUCTION IS COMPLETED.

Utility Line Highway/Roadway Crossing Open Cut Method (HWC)

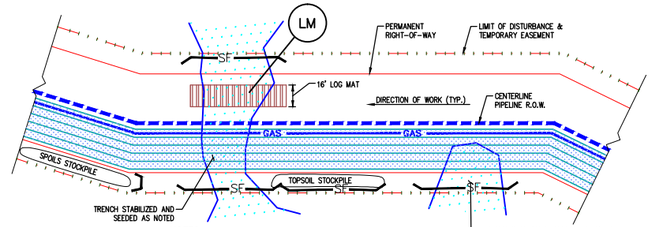
NOT TO SCALE



*THIS SEDIMENT BARRIER IS NOT REQUIRED WHEN TRENCHING IMMEDIATELY CONTINUES BEYOND ROADWAY OPEN CUT.

Typical Trench E&S Controls For Wetland Areas (WC)

NOT TO SCALE

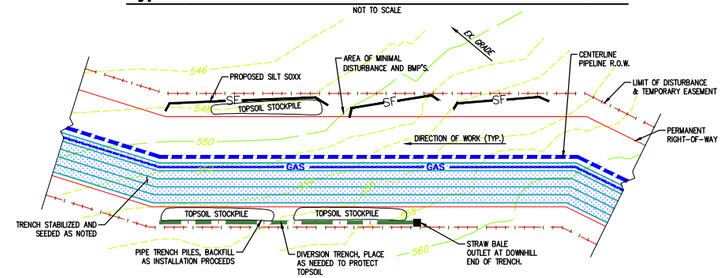


NOTES:

1. NO LIME OR FERTILIZER SHALL BE USED IN WETLAND AREAS.
2. CONTRACTOR HAS THE OPTION TO USE LOG MATTING, STEEL PLATING OR GEOTEXTILE WITH CLEAN FILL OVER WETLANDS.
3. ONCE TEMPORARY CROSSING IS REMOVED, THIS AREA MUST BE PERMANENTLY STABALIZED WITHIN 2 DAYS.

Typical Trench E&S Controls For Areas Outside Of Wetlands

NOT TO SCALE

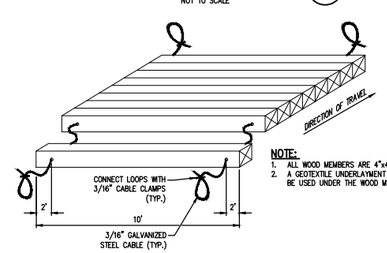


NOTES:

1. SILT BARRIER TO BE INSTALLED DOWNGRADIENT OF ALL EXPOSED AREAS AS WORK PROGRESSES, AND CONTINUALLY KEPT DOWNGRADIENT OF ALL EXPOSED TRENCHES DURING CONSTRUCTION OPERATIONS. UPON BACKFILLING OF TRENCH, THE SILT FENCE MAY BE MOVED TO THE NEXT APPROPRIATE LOCATION.
2. ANY STOCKPILES FOR FUTURE USE SHALL BE IMMEDIATELY STABILIZED AND SHALL HAVE SILT FENCE PLACED DOWNSLOPE.
3. WHEN CROSSING PAVEMENT, 8" SILT SOCK SHALL BE USED.
4. IF TOPSOIL PILES ARE TO BE LEFT FOR ANY AMOUNT OF TIME, DIVERSION TRENCHES SHALL BE CONSTRUCTED UPHILL. STRAW BALE OUTLET PROTECTION SHALL BE PLACED AT THE ENDS OF THESE TRENCHES.
5. BREAKS IN SOIL STOCKPILES ARE TO BE INSTALLED AS NEEDED TO PREVENT PONDING/RUNOFF BEHIND STOCKPILE.
6. ONCE TEMPORARY CROSSING IS REMOVED, THIS AREA MUST BE PERMANENTLY STABALIZED WITHIN 2 DAYS.

Typical Log Mat Detail (LM)

NOT TO SCALE

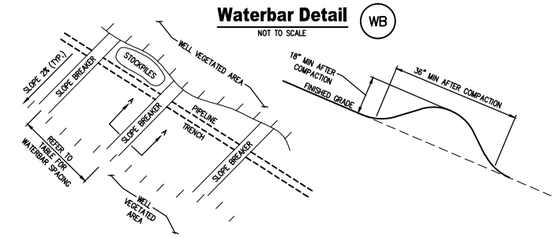


NOTE:

1. ALL WOOD MEMBERS ARE 4"x4".
2. A GEOTEXTILE UNDERLAYMENT SHALL BE USED UNDER THE WOOD MAT.

Waterbar Detail (WB)

NOT TO SCALE



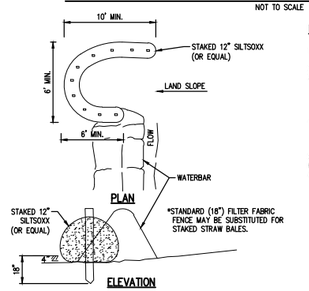
Required Spacing For Temporary Waterbars

PERCENT SLOPE	SPACING (FT.)
< 5	250
5 – 15	150
15 – 30	100
> 30	50

* PERMANENT WATERBARS ARE REQUIRED AT ALL STREAM, RIVER, AND OTHER WATER BODY CROSSINGS AS WELL AS UPSLOPE FROM ROADWAY AND RAILROAD CUT SLOPES. OTHERWISE NOT REQUIRED.

Sediment Filter-Sock Protection At Waterbar Outlet (SSO)

NOT TO SCALE

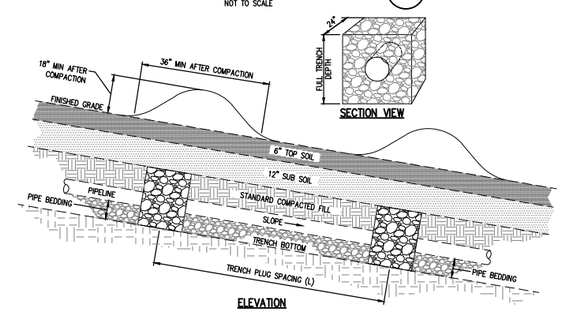


NOTES:

1. BACKFILL MATERIAL SHOULD BE MOUNDED OVER THE EXCAVATED AREA TO ALLOW FOR SETTLING, AND SEEDED AND MULCHED.
2. THE EXCAVATED AREA MUST BE STABILIZED WITHIN 72 HOURS.
3. STAGING AREAS, ASSEMBLY AREAS, TEMPORARY EQUIPMENT AND NON-HAZARDOUS MATERIAL STORAGE AREAS SHOULD BE LOCATED OUTSIDE THE 100 YEAR FLOODWAY. HAZARDOUS OR POLLUTIVE MATERIAL STORAGE AREAS SHOULD BE LOCATED AT LEAST 100 FEET BACK FROM TOP OF STREAM BANK.
4. WHETHER OR NOT BLASTING WILL BE REQUIRED SHOULD BE DETERMINED PRIOR TO COMMENCING THE TRENCH EXCAVATION FOR A STREAM CROSSING, SINCE THIS MAY AFFECT THE STAGING FOR THE CROSSING.
5. AT DRAINAGE SWALES CROSSING THE DISTURBED AREAS ARE TO BE STABILIZED WITH RIP-RAP OR JUTE MATTING WITH VEGETATION, AS APPROPRIATE.

Trench Breakers/Trench Plugs (TB/P)

NOT TO SCALE



Required Spacing And Materials For Trench Breakers/Trench Plugs

TRENCH SLOPE	SPACING (L) IN FEET	PLUG MATERIAL
0–5%	1,000	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
5–15%	500	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
15–25%	300	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
25–35%	200	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
35–100%	100	CLAY, BENTONITE, OR CONCRETE FILLED SACKS
OVER 100%	50	CLAY, BENTONITE, OR CONCRETE FILLED SACKS

NOTES:

1. IMPERVIOUS TRENCH PLUGS ARE REQUIRED FOR ALL STREAM, RIVER, WETLAND, OR OTHER BODY CROSSING REGARDLESS OF TRENCH SLOPE
2. TO ENSURE PROPER TOPSOIL CONSERVATION, TOPSOIL SHOULD NOT BE USED IN EARTH FILLED SACKS.
3. PLACE AT ALL VERTICAL ANGLE POINTS (TOP AND BOTTOM OF SLOPE).
4. TRENCH BREAKRES/TRENCH PLUGS SHOULD BE INSTALLED IN ALL UTILITY LINE TRENCHERS PER TABLE ABOVE. TABLE ABOVE INDICATES THE REQUIRED SPACING AND MATERIALS FOR THE TRENCH BREAKERS/TRENCH PLUGS.

GENERAL NOTES:

1. ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMP'S SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMP'S MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

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SEAL

NO.	REVISIONS	DATE

E&SPC TYPICAL DETAIL SHEET 3

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG–1007
SHEET NO. 85 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

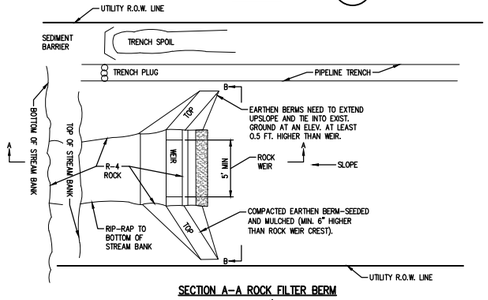
Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-007-TYPICAL DETAILS.dwg Dec 14,2014 - 4:44pm

Rock Filter Berm

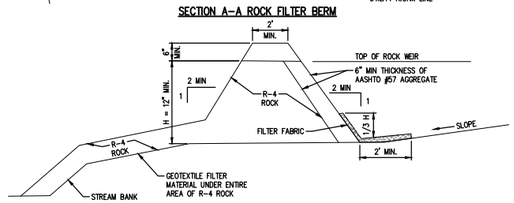
NOT TO SCALE

RFB

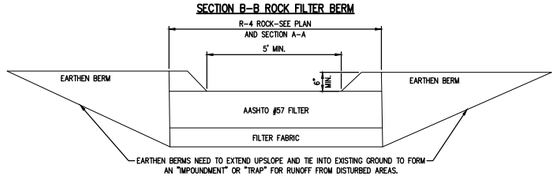
PLAN VIEW



SECTION A-A ROCK FILTER BERM



SECTION B-B ROCK FILTER BERM

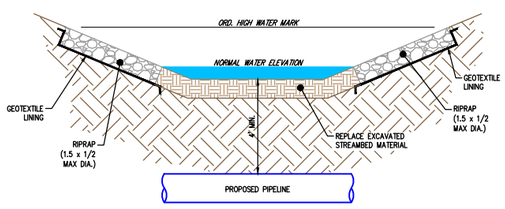


NOTES:

1. THE "ROCK FILTER BERM" SHOULD ONLY BE USED AT THE BOTTOM OF VERY STEEP UTILITY LINE SLOPES THAT DISCHARGE DIRECTLY TO A STREAM OR RIVER AND WHERE THERE IS NOT SUFFICIENT AREA TO INSTALL CONVENTIONAL SEDIMENT POLLUTION CONTROLS (SEDIMENT TRAPS, ETC.).
2. GEOTEXTILE FILTER MATERIAL SHOULD BE PLACED UNDER THE ENTIRE AREA OF THE R-4 ROCK. R-4 ROCK SHOULD BE PLACED IN THE FLOW PATH FROM THE ROCK FILTER TO THE BOTTOM OF THE STREAM BANK. IF THE STREAM BANK IS TOO STEEP TO PROPERLY PLACE THE R-4 ROCK, THEN THE GEOTEXTILE MATERIAL ALONE SHOULD EXTEND DOWN OVER THE STREAM BANK AND BE SECURED TO PREVENT ITS MOVEMENT OR DISPLACEMENT.
3. THE EARTHEN BERMS NEED TO EXTEND UPSLOPE AND TIE INTO EXISTING GROUND AT AN ELEVATION AT LEAST 0.5 FEET HIGHER THAN THE ROCK WEIR CREST. THE OBJECTIVE IS TO COLLECT RUNOFF FROM DISTURBED AREAS AND MAKE THAT RUNOFF FLOW THROUGH THE FILTER MEDIA.
4. IF AN ACCESS ROAD PARALLEL TO THE TRENCH IS NEEDED, THE AFFECTED EARTHEN BERM SHOULD BE DESIGNED AND INSTALLED SO THAT TRAFFIC CAN SAFELY PASS OVER IT. ALSO, THE BEM SHOULD BE "REINFORCED" TO PREVENT "BREAKDOWN" FROM HEAVY VEHICLES.
5. ALL OF THE AREAS THAT ARE DISTURBED TO INSTALL THE ROCK FILTER BERM SHOULD BE SEEDED AND MULCHED.
6. SEDIMENT SHOULD BE REMOVED FROM THE FILTER WHEN IT REACHES HALF OF THE HEIGHT OF THE FILTER FABRIC ON THE UPSLOPE SIDE OF THE FILTER. THE REMOVED SEDIMENT SHOULD BE DISPOSED OF AT A LOCATION THAT PREVENTS SEDIMENT FROM DISCHARGING TO A STREAM.

Utility Trench Crossing

NOT TO SCALE



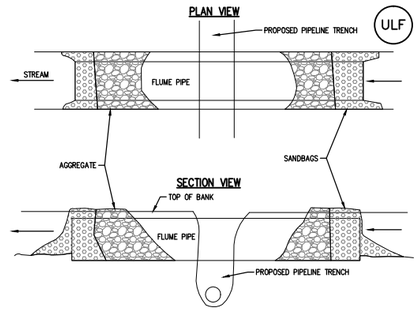
* ONLY REQUIRED IF EROSIVE CONDITIONS PREVAIL.

Utility Line Stream Crossing With Pipe Flume

NOT TO SCALE

ULF

PLAN VIEW

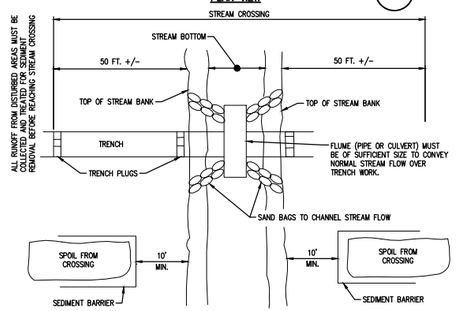


Utility Line Stream Crossing With Pipe Flume

NOT TO SCALE

ULF

PLAN VIEW



NOTES:

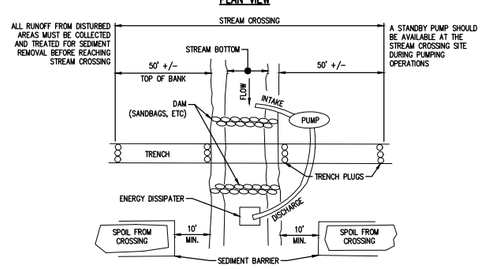
1. TRENCH EXCAVATION FOR UTILITY LINE CROSSINGS SHOULD BE UNDERTAKEN FROM THE TOP OF BANKS WHENEVER POSSIBLE. THE CROSSING SHOULD BE PERPENDICULAR TO THE LENGTH OF THE STREAM TO MINIMIZE THE DISTURBED AREA IN THE STREAM.
2. ALL EXCAVATED CHANNEL MATERIALS THAT WILL BE SUBSEQUENTLY USED AS BACKFILL WILL BE PLACED IN A TEMPORARY STOCKPILE LOCATED OUTSIDE OF THE CHANNEL. THESE STORAGE AREAS MUST BE ENCIRCLED WITH A BARRIER OR SEDIMENT REMOVAL STRUCTURE TO PREVENT SEDIMENT LADEN RUNOFF FROM RE-ENTERING THE CHANNEL. ALL EXCAVATED MATERIALS THAT WILL NOT BE USED ON THE SITE CANNOT BE STORED IN THE FLOODPLAIN AND MUST BE HAULED TO A DISPOSAL SITE LOCATED OUTSIDE OF THE FLOODPLAIN.
3. DISTURBED AREAS SHOULD BE STABILIZED WHEN THE CROSSING IS COMPLETED.
4. ALL WORK, INCLUDING STABILIZATION, SHOULD BE PLANNED FOR PERIODS OF LOW STREAM FLOWS. THE SCHEDULE SHOULD ALLOW SUFFICIENT TIME TO ALLOW FOR THE ESTABLISHMENT OF AN EROSION RESISTANT VEGETATIVE COVER ON DISTURBED AREAS BEFORE THE START OF THE DORMANT SEASON UNLESS OTHER MEANS TO STABILIZE AGAINST EROSION ARE USED.
5. TEMPORARY ACCESS ROADS, CROSSINGS WHERE REPEATED TRAFFIC IS PLANNED, AND ANY OTHER FORM OF TEMPORARY FILL OR BALLAST LOCATED WITHIN THE CHANNEL, WILL BE CONSTRUCTED WITH CLEAN ROCK FILL.

Utility Line Stream Crossing With Dam And Pumping

NOT TO SCALE

ULP

PLAN VIEW

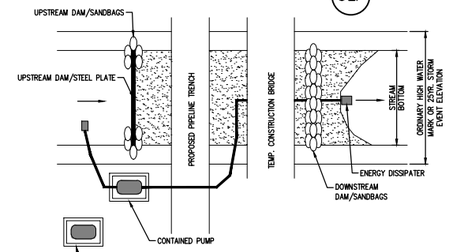


Utility Line Stream Crossing With Steel Plate

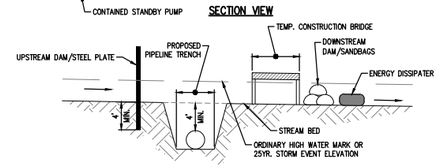
NOT TO SCALE

ULP

PLAN VIEW



SECTION VIEW



Utility Line Crossing General Notes:

THESE COMMENTS APPLY TO BOTH "UTILITY LINE STREAM CROSSING WITH PIPE FLUME" AND "UTILITY LINE STREAM CROSSING WITH DAM AND PUMPING".

UTILITY LINE STREAM CROSSING ARE CONSIDERED TO BEGIN (OR END) 50 FEET BACK FROM THE TOP OF THE STREAM BANK ON BOTH SIDES OF THE STREAM. PIPELINES WITH THE PIPE JOINTS ASSEMBLED/MADE IN THE TRENCH SHOULD MAINTAIN A 50 FOOT BUFFER ON BOTH SIDES OF THE STREAM UNTIL THE STREAM CROSSING COMMENCES. LARGE DIAMETER STEEL PIPELINES WITH WELDED JOINTS WHERE THE PIPE JOINTS ARE WELDED WHILE THE PIPELINE IS OUT OF THE TRENCH SHOULD MAINTAIN A 25 FOOT BUFFER ON BOTH SIDES OF THE STREAM UNTIL THE STREAM CROSSING COMMENCES.

A UTILITY LINE STREAM CROSSING OF A STREAM 10 FEET IN (BOTTOM) WIDTH OR LESS SHOULD BE COMPLETED WITHIN 24 HOURS (FROM START TO FINISH) INCLUDING THE TRENCH BACKFILLING.

FACILITIES FOR REMOVING SEDIMENT FROM PUMPED WATER SHOULD BE AVAILABLE AT THE UTILITY LINE STREAM CROSSING SITE BEFORE TRENCHING COMMENCES AND MAINTAINED UNTIL TRENCH BACKFILLING IS COMPLETED.

ASSEMBLY AREAS, TEMPORARY EQUIPMENT AND NON-HAZARDOUS MATERIAL STORAGE AREAS SHOULD BE LOCATED AT LEAST 50 FEET BACK FROM THE TOP OF THE STREAM BANK.

HAZARDOUS OR POLLUTIVE MATERIAL STORAGE AREAS SHOULD BE LOCATED AT LEAST 100 FEET BACK FROM THE TOP OF THE STREAM BANK.

ALL EXCESS EXCAVATED MATERIAL SHALL BE IMMEDIATELY REMOVED FROM STREAM CROSSING.

UTILITY LINE CROSSING OF A STREAM CHANNEL WITH A BOTTOM WIDTH OF 10 FEET OR LESS SHALL BE COMPLETED WITH 24 HOURS FROM START TO FINISH. CROSSINGS WITH A BOTTOM WIDTH OF 10 FEET TO 100 FEET SHALL BE COMPLETED WITHIN 48 HOURS FROM START TO FINISH. COMPLETION INCLUDES THE STABILIZATION OF STREAM BANKS AND THE STABILIZATION OF THE AREA 50 FEET BACK FROM THE TOP OF EACH STREAM BANK.

UTILITY LINE WETLAND CROSSING

STAGING AREAS OR WORK AREAS REQUIRED TO MAKE THE WETLAND CROSSING SHOULD BE LOCATED IN AN UPLAND AT LEAST 50 FEET FROM THE WETLAND EDGE AND INDICATED ON THE SITE DRAWINGS. STREAM/RIVER CROSSINGS MUST BE CAREFULLY PLANNED AND CONSTRUCTED WHERE WETLANDS ARE ADJACENT TO THE STREAM/RIVER CROSSING. WHERE TRENCH SPOIL FROM THE STREAM/RIVER CROSSING MUST BE TEMPORARILY PLACED/STORED ON AN ADJACENT WETLAND, SUFFICIENT RIGHT-OF-WAY SHOULD BE FURNISHED FOR THE TRENCH SPOIL AND THE STREAM/RIVER CROSSING WORK AND PRECAUTIONS SHOULD BE TAKEN TO PREVENT THE TRENCH SPOIL FROM INTERMINGLING WITH THE WETLANDS SOILS. IT MAY BE NECESSARY TO PLACE A LAYER OF GEOTEXTILE MATERIAL OR OTHER COVER ON THE WETLAND TO TEMPORARILY STORE THE STREAM CROSSING TRENCH SPOIL.

WHEN GRADING AND TRENCH EXCAVATION OCCUR WITHIN THE WETLAND, THE WETLAND TOPSOIL (WITH THE VEGETATION ROOT MASS) SHALL BE CAREFULLY REMOVED AND STOCKPILED SEPARATELY FROM THE SUBSOIL. THE FOREGOING WILL NOT BE REQUIRED WHERE THERE IS STANDING WATER OR THE TOPSOIL IS SATURATED TO THE POINT THAT IT CANNOT BE SEGREGATED. SHORTLY AFTER THE PIPELINE IS INSTALLED AND THE TRENCH BACKFILLED, THE TOPSOIL SHOULD BE RESTORED TO THE GRADED AREAS.

SEDIMENT POLLUTION CONTROLS SHOULD BE PROVIDED AS NECESSARY TO PREVENT SEDIMENT DISCHARGES FROM DISTURBED AREAS INTO WETLANDS AND OFF THE RIGHT-OF-WAY FROM WETLAND CONSTRUCTION. WATER PUMPED OR REMOVED FROM TRENCHES SHALL NOT BE DISCHARGED INTO WETLANDS WITHOUT PROPER SEDIMENT REMOVAL TREATMENT.

BMP'S (TRENCH PLUGS, ETC.) SHOULD BE IMPLEMENTED TO PREVENT THE TRENCH FROM PERMANENTLY DRAINING THE WETLAND OR CHANGING THE SITE HYDROLOGY. THE STOCKPILED WETLAND TOPSOIL SHOULD BE RETURNED TO ITS ORIGINAL HORIZON. ALL TEMPORARY RIGHT-OF-WAY STABILIZATION FOR THE ACCESS ROAD SHOULD BE REMOVED.

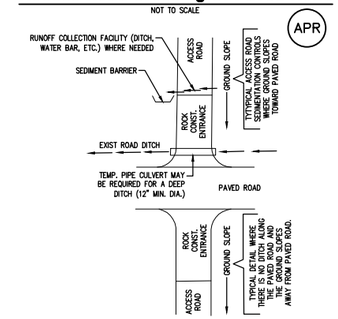
ORIGINAL CONTOURS AND CROSS DRAINAGES SHOULD BE RESTORED. ALL EXCESS SPOIL MUST BE REMOVED FROM THE WETLAND AND PROPERLY DISPOSED OF.

IN GENERAL, ANNUAL RYEGRASS AT THE RATE OF 40 POUNDS PER ACRE SHOULD BE APPLIED TO ALL DISTURBED AREAS WHERE STANDING WATER IS NOT PREVALENT. STRAW MULCH, WITHOUT BINDING AGENTS, SHOULD BE APPLIED AT THE RATE OF 3 TONS PER ACRE ON AREAS SEEDED WITH ANNUAL RYEGRASS. FUELS OR HAZARDOUS MATERIALS SHOULD NOT BE STORED WITHIN 100 FEET OF A WETLAND. APPLICATION OF CONCRETE COATING OF PIPES SHOULD NOT BE PERFORMED WITHIN 100 FEET OF A WETLAND.

Access Road Crossing Of Paved Road

NOT TO SCALE

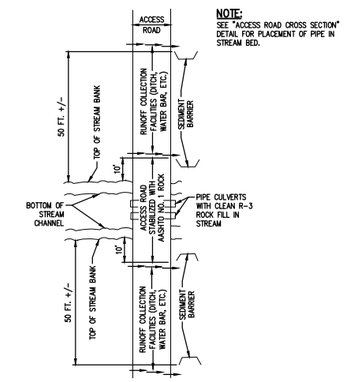
APR



Access Road Stream Crossing With Pipe Culverts

NOT TO SCALE

ARC



NOTE:
SEE "ACCESS ROAD CROSS SECTION" DETAIL FOR PLACEMENT OF PIPE IN STREAM BED.

Access Road Cross Section

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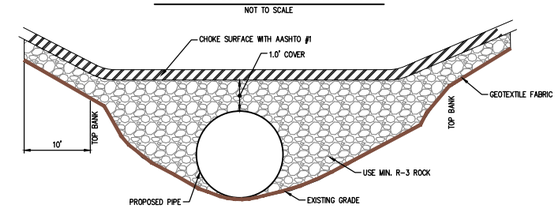

GENERAL NOTES:

1. ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMPS SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMPS MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

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NO.	REVISIONS	DATE

SEAL

E&SPC TYPICAL DETAIL SHEET 4

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED

PROJECT NO. NRG-1007

SHEET NO. 86 OF 88

Hanover
Engineering Associates Inc
3355 Route 611, Suite 1
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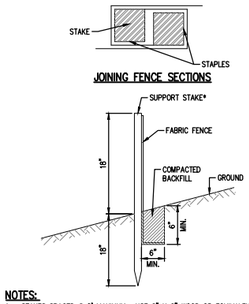
Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-007-TYPICAL DETAILS.dwg Dec 14,2014 - 4:44pm

Standard Construction Detail #19
Standard Filter Fabric Fence (18" High)

NOT TO SCALE

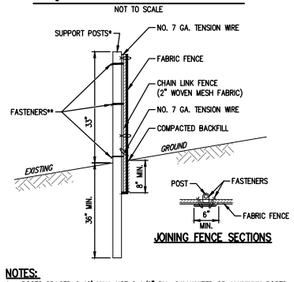


NOTES:

*1. STAKES SPACED @ 8' MAXIMUM. USE 2" X 2" WOOD OR EQUIVALENT STEEL STAKES.
2. FILTER FABRIC FENCE MUST BE PLACED AT LEVEL EXISTING GRADE. BOTH ENDS OF THE BARRIER MUST BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT.
3. SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
4. ANY SECTION OF FILTER FABRIC FENCE WHICH HAS BEEN UNDERMINED OR TOPPED MUST BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET. SEE STANDARD CONSTRUCTION DETAIL #18.

Standard Construction Detail #22
Super Filter Fabric Fence

NOT TO SCALE

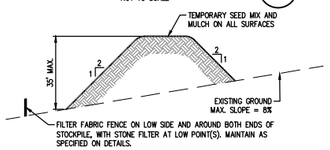


NOTES:

*1. POSTS SPACED @ 10' MAX. USE 2 1/2" DIA. GALVANIZED OR ALUMINUM POSTS.
**2. CHAIN LINK TO POST FASTENERS SPACED @ 14" MAX. USE NO. 6 GA. ALUMINUM WIRE OR NO. 9 GALVANIZED STEEL PRE-FORMED CLIPS. CHAIN LINK TO TENSION WIRE FASTENERS SPACED @ 60" MAX. USE NO. 10 GA. GALVANIZED STEEL WIRE. FABRIC TO CHAIN FASTENERS SPACED @ 24" MAX. C TO C.
3. NO. 7 GA. TENSION WIRE INSTALLED HORIZONTALLY AT TOP AND BOTTOM OF CHAIN-LINK FENCE.
4. FILTER FABRIC FENCE MUST BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER MUST BE EXTENDED AT LEAST 8 FEET UPSLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT.
5. SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.

Typical Soil Stockpile (SP)

NOT TO SCALE

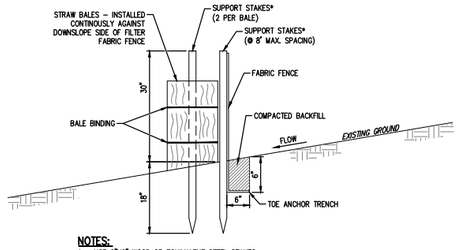


SOIL STOCKPILE MAINTENANCE

1. STOCKPILE TOPSOIL OR EXCAVATED SOIL MATERIAL AT LOCATIONS SHOWN FOR EACH PHASE OF CONSTRUCTION.
2. HEIGHT AND SIDES LOPES SHALL NOT EXCEED MAXIMUM VALUES SHOWN ON DETAIL.
3. INSTALL FILTER FENCE PRIOR TO STOCKPILING OF MATERIAL. REPLACE ANY FENCE REMOVED FOR VEHICULAR ACCESS AFTER EACH WORK DAY.
4. APPLY A TEMPORARY SEED MIX AND MULCH WHEN PILE WILL REMAIN FOR 30 DAYS OR MORE.
5. TOPSOIL PILES AND TRENCH SPOIL STOCKPILES SHOULD BE SEPARATED BY A MINIMUM OF 2 FEET TO AVOID CONTAMINATION OF TOPSOIL.

Standard Construction Detail #21
Filter Fabric Fence Reinforced By Staked Straw Bales

NOT TO SCALE

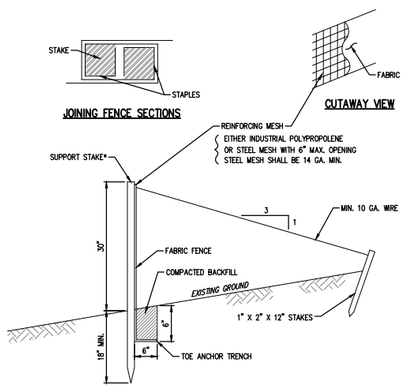


NOTES:

*1. USE 2"x2" WOOD OR EQUIVALENT STEEL STAKES.
2. FILTER FABRIC FENCE STAKES TO BE ACTUAL SIZE NOTED IN DETAILS.
3. FILTER FABRIC FENCE MUST BE INSTALLED AT EXISTING LEVEL GRADE. BOTH ENDS OF EACH FENCE SECTION MUST BE EXTENDED AT LEAST 8 FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.
4. SEDIMENT MUST BE REMOVED WHERE ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
5. ANY FENCE SECTION WHICH HAS BEEN UNDERMINED OR TOPPED MUST BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET.

Standard Construction Detail #20 Reinforced Filter Fabric Fence (30" High)

NOT TO SCALE



NOTES:

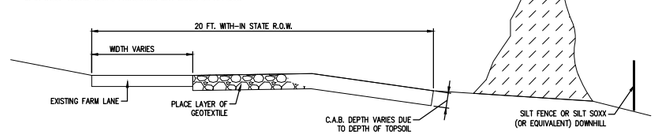
*1. STAKES SPACED @ 8' MAX. USE 2" X 2" WOOD OR EQUIVALENT STEEL STAKES.
2. SHOW ALL DETAILS AND CONSTRUCTION DIMENSIONS ON PLAN DRAWINGS.
3. FILTER FABRIC FENCE MUST BE INSTALLED AT EXISTING LEVEL GRADE. BOTH ENDS OF EACH FENCE SECTION MUST BE EXTENDED AT LEAST 8 FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.
4. SEDIMENT MUST BE REMOVED WHERE ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
5. ANY FENCE SECTION WHICH HAS BEEN UNDERMINED OR TOPPED MUST BE IMMEDIATELY REPLACED WITH A ROCK FILTER OUTLET. SEE STANDARD CONSTRUCTION DETAIL #18.
6. ALL FENCE INSTALLATIONS SHOULD BE INSPECTED AFTER EVERY RUNOFF EVENT AND OR WEEKLY. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY.

Access Road For Pipe Installation (AR)

NOT TO SCALE

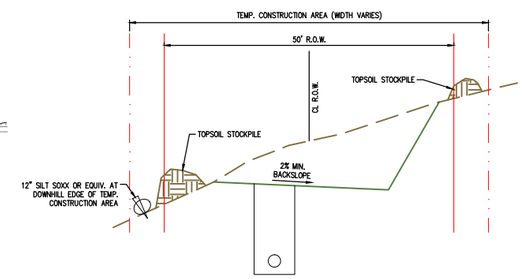
NOTES:

1. THE LOCATIONS OF THESE ACCESS ROADS SHALL ONLY BE PLACED AT LOCATION AS SHOWN ON THE PLANS.
2. AFTER THE PIPE IS INSTALLED AND BACKFILLED, THESE ROADS SHALL BE REMOVED AND RESTORED TO THE NATURAL STATE.
3. THE CONTRACTOR SHALL REMOVE STONE AND GEOTEXTILE AND SCARIFY THE AREA UNDER THE STONE.
5. REPLACE TOPSOIL. FERTILIZE, LIME, SEED AND MULCH PER THE PERMANENT SEEDING SPECS. NOTED ON THE DETAIL SHEETS.
6. IN STEEP AREAS, SLOPE PROTECTION MAT SHALL BE APPLIED.

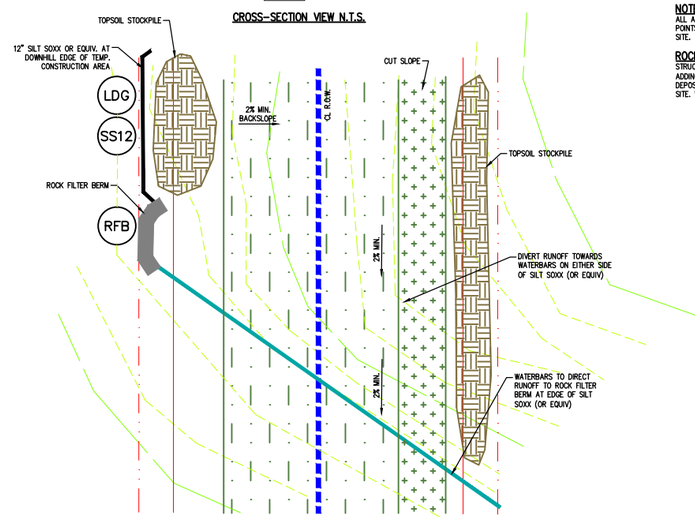


Longitudinal Diversion Grading Method (LDG)

NOT TO SCALE



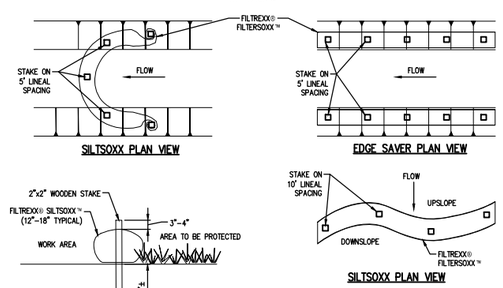
CROSS-SECTION VIEW N.T.S.



PLAN VIEW

Silt Soxx Staking Details

NOT TO SCALE

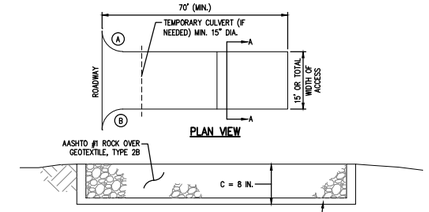


NOTES:

1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. FILTERSOXX™ COMPOST/JSOL/ROCK/SEED FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

Rock Construction Entrance (RCE)

NOT TO SCALE



SECTION A-A

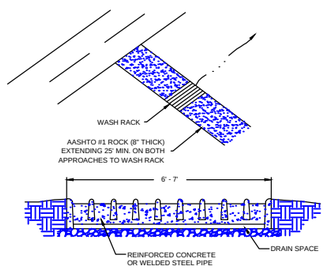
(A) RADIUS=35'
(B) AREAS TO RECEIVE RADIUS TO FIT SITE CONDITIONS(MIN.-10 FT.)
(C) ROADSIDE DITCH FLOWS TO BE MAINTAINED. USE APPROPRIATE SIZED CULVERTS AS NECESSARY.

NOTE:
ALL ACCESS TO THE SITE MUST BE VIA AN APPROVED ROCK CONSTRUCTION ENTRANCE. POINTS OF POTENTIAL UNAUTHORIZED SITE ACCESS MUST BE PHYSICALLY BARRICADED AT THE SITE.

ROCK CONSTRUCTION ENTRANCE MAINTENANCE:
STRUCTURE THICKNESS MUST BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSION BY ADDING ROCK (AS NECESSARY). AT THE END OF EACH CONSTRUCTION DAY, ALL SEDIMENT DEPOSITED ON PUBLIC ROADWAYS, MUST BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE. WASHING OF THE ROADWAY WITH WATER IS NOT PERMITTED.

ROCK CONSTRUCTION ENTRANCE WITH WASH RACK (RCE)

N.T.S.



NOTES:

WASH RACK SHALL BE 20 FEET (MIN.) WIDE OR TOTAL WIDTH OF ACCESS.

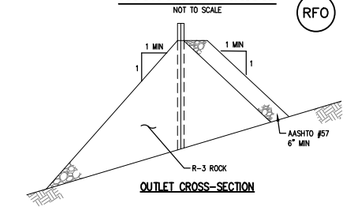
WASH RACK SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE ANTICIPATED CONSTRUCTION VEHICULAR TRAFFIC.

A WATER SUPPLY SHALL BE MADE AVAILABLE TO WASH THE WHEELS OF ALL VEHICLES EXITING THE SITE.

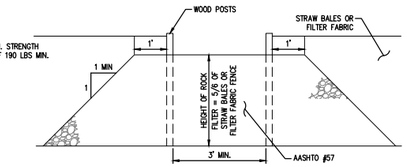
MAINTENANCE: ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE OF ROCK MATERIAL SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. DRAIN SPACE UNDER WASH RACK SHALL BE KEPT OPEN AT ALL TIMES. DAMAGE TO THE WASH RACK SHALL BE REPAIRED PRIOR TO FURTHER USE OF THE RACK. ALL SEDIMENT DEPOSITED ON ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY. WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.

Standard Construction Detail #18
Rock Filter Outlets

NOT TO SCALE (RFO)



OUTLET CROSS-SECTION



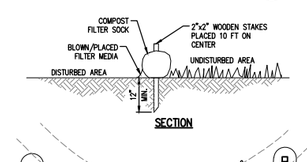
UP-SLOPE FACE

NOTES:

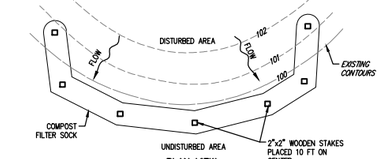
1. SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/3 THE HEIGHT OF THE OUTLET.
2. ALL INSTALLATIONS SHOULD BE INSPECTED AFTER EVERY RUNOFF EVENT AND OR WEEKLY. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY.

Siltsoxx Details (SS)

NOT TO SCALE
INSTALL PER MANUFACTURERS SPECIFICATIONS



SECTION



PLAN VIEW

NOTES:

1. SOCK FABRIC SHALL MEET STANDARDS OF CHAPTER 6 OF THE RAINWATER & LAND DEVELOPMENT MANUAL FOR OHIO. COMPOST SHALL MEET THE STANDARDS OF CHAPTER 6 OF THE RAINWATER & LAND DEVELOPMENT MANUAL FOR OHIO.
2. COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE BARRIER SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN BARRIER ALIGNMENT. MAXIMUM SLOPE LENGTH ABOVE ANY BARRIER SHALL NOT EXCEED THAT SPECIFIED FOR THE SIZE OF THE SOCK AND THE SLOPE OF ITS TRIBUTARY AREA.
3. TRAFFIC SHALL NOT BE PERMITTED TO CROSS COMPOST FILTER SOCKS.
4. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE ABOVE GROUND HEIGHT OF THE BARRIER AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
5. COMPOST FILTER SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER REPLACED WITHIN 24 HOURS OF INSPECTION.
6. BIODEGRADABLE COMPOST FILTER SOCKS SHALL BE REPLACED AFTER 6 MONTHS; PHOTODEGRADABLE SOCKS AFTER 1 YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER.
7. UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.
8. THE EXISTING SURFACE SHOULD BE PREPARED PRIOR TO INSTALLATION OF SILT SOCKS TO CREATE A DIRECT CONTACT BETWEEN THE BOTTOM OF THE SILT SOCKS AND THE EARTH ON WHICH THEY ARE PLACED.

GENERAL NOTES:

1. ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMPS SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMPS MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

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SEAL

NO.	REVISIONS	DATE

E&SPC TYPICAL DETAIL SHEET 5

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED
PROJECT NO. NRG-1007
SHEET NO. 87 OF 88

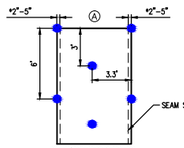
Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Y:\Projects\Energy\NRG Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-007-TYPICAL DETAILS.dwg Dec 14,2014 - 4:44pm

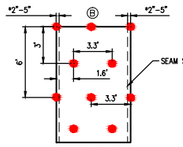
Staple Pattern Guide

MT

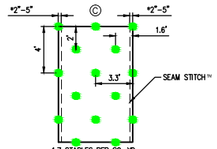
NOT TO SCALE



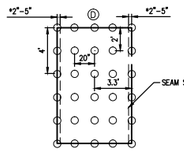
0.7 STAPLES PER SQ. YD.
(0.8 STAPLES PER SQ. M)
FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE BLUE COLORED DOTS.



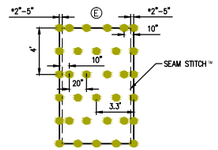
1.15 STAPLES PER SQ. YD.
(1.35 STAPLES PER SQ. M)
FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE RED COLORED DOTS.



1.7 STAPLES PER SQ. YD.
(2.0 STAPLES PER SQ. M)
FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE GREEN COLORED DOTS.



3.4 STAPLES PER SQ. YD.
(4.1 STAPLES PER SQ. M)
FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE WHITE COLORED DOTS.



3.75 STAPLES PER SQ. YD.
(4.5 STAPLES PER SQ. M)
FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM™ PLACE STAPLES/STAKES THROUGH EACH OF THE YELLOW COLORED DOTS.

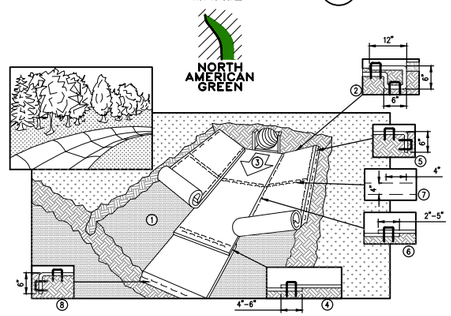
*LOCATION OF SEAM STITCH™ WILL VARY DEPENDING ON NORTH AMERICAN GREEN PRODUCT TYPE.

14649 HIGHWAY 41 NORTH, EVANSVILLE, INDIANA 47725
USA 1-800-772-2040 CANADA 1-800-448-2040
www.nagreen.com

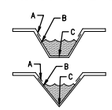
Channel Installation

MT

NOT TO SCALE



1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL CENTER BLANKET IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM™, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. PLACE CONSECUTIVE BLANKETS END OVER END (SHINGLE STYLE) WITH A 4"-6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE BLANKETS.
5. FULL LENGTH EDGE OF BLANKETS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT BLANKETS MUST BE OVERLAPPED APPROXIMATELY 2"-5" (DEPENDING ON BLANKET TYPE) AND STAPLED. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH™ ON THE BLANKET BEING OVERLAPPED.
7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE BLANKETS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.



CRITICAL POINTS
A. OVERLAPS AND SEAMS
B. PROJECTED WATER LINE
C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

NOTE:
* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.
** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY ANCHOR THE BLANKETS.

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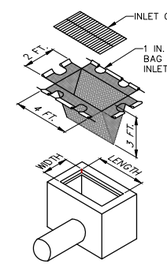
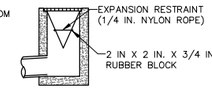
FILTER BAG INLET PROTECTION - TYPE M INLET

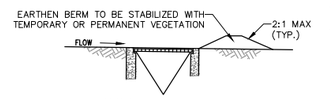
NOT TO SCALE



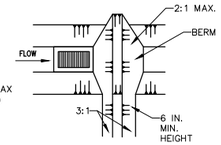
ISOMETRIC VIEW



INSTALLATION DETAIL



SECTION VIEW



PLAN VIEW

NOTES:

MAXIMUM DRAINAGE AREA = 1/2 ACRE.

INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.

ROLLED EARTHEN BERM IN ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM ON ROADWAY SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. EARTHEN BERM IN CHANNEL SHALL BE MAINTAINED UNTIL PERMANENT STABILIZATION IS COMPLETED OR REMAIN PERMANENTLY.

AT A MINIMUM, THE FABRIC SHALL HAVE A MINIMUM GRAB TENSILE STRENGTH OF 120 LBS., A MINIMUM BURST STRENGTH OF 200 PSI, AND A MINIMUM TRAPEZOIDAL TEAR STRENGTH OF 50 LBS. FILTER BAGS SHALL BE CAPABLE OF TRAPPING ALL PARTICLES NOT PASSING A NO. 40 SIEVE.

INLET FILTER BAGS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. BAGS SHALL BE EMPTIED AND RINSED OR REPLACED WHEN HALF FULL OR WHEN FLOW CAPACITY HAS BEEN REDUCED SO AS TO CAUSE FLOODING OR BYPASSING OF THE INLET. DAMAGED OR CLOGGED BAGS SHALL BE REPLACED. A SUPPLY SHALL BE MAINTAINED ON SITE FOR REPLACEMENT OF BAGS. ALL NEEDED REPAIRS SHALL BE INITIATED IMMEDIATELY AFTER THE INSPECTION. DISPOSE ACCUMULATED SEDIMENT AS WELL AS ALL USED BAGS ACCORDING TO THE PLAN NOTES.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

Rock Gradation Chart

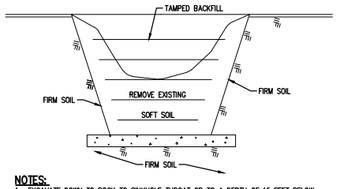
AASHTO NUMBER	NSA NUMBER	PA NUMBER	6 1/2"	4"	3 1/2"	2 1/2"	2"	1 1/2"	1"	3/4"	1/2"	3/8"	#4	#8	#16	#30	#100	#200
	FS-3		100			50									0			
1		4		100	90-100	25-60		0-15		0-5								
3		3A				100	90-100	35-70	0-15		0-5							
467							100	95		35-70		10-30	0-5					
	FS-2						100						50				0	
		2A					100			52-100		36-70	24-50	16-38	10-30			0-10
5								100	90-100	20-55	0-10	0-5						
57		2B						100	90-100		25-60		0-10	0-5				
		2NS						100	90-100		0-15							
67		2							100	90-100		20-55	0-10	0-5				
		1NS							100		90-100		0-15					
7										100	90-100	40-70	0-15	0-5				
8											100	85-100	10-30	0-10	0-5			
		1B									100	75-100	10-30	0-10				
10		1										100	75-100				10-30	
	FS-1											100				50	0	

Table 4-9 ROCK GRADATION, FILTER BLANKET REQUIREMENTS, MAXIMUM VELOCITIES

NSA NO.	GRADED ROCK SIZE (IN.)			FILTER BLANKET REQUIREMENTS		Vmax (FT/SEC)
	MAX	D	MIN.	SIZE NSA NO.	PLACEMENT THICKNESS	
R-1	1.5	0.75	NO. 8	FS-1	N/A	2.5
R-2	3	1.5	1	FS-1	N/A	4.5
R-3	6	3	2	FS-1	3	6.5
R-4	12	6	3	FS-2	4	9.0
R-5	18	9	5	FS-2	6	11.5
R-6	24	12	7	FS-3	8	13.0
R-7	30	15	12	FS-3	10	14.5

Sinkhole In Soil

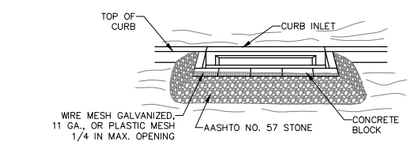
NOT TO SCALE



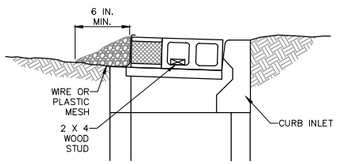
NOTES:
1. EXCAVATE DOWN TO ROCK TO SINKHOLE THROAT OR TO A DEPTH OF 15 FEET BELOW GRADE, WHICHEVER OCCURS FIRST.
2. IF ROCK IS ENCOUNTERED WITHIN 10 FEET, STOP EXCAVATION. THE LIMIT OF EXCAVATION SHALL BE DETERMINED BY THE ENGINEER. GENERALLY, A ZONE OF SOFT, IN-FILL MATERIAL WILL BE FOUND WHICH COVERS MOST OF THE BOTTOM OF THE EXCAVATION. COVER THIS AREA WITH FOUR(4) FEET OF CONCRETE EXTENDING AT LEAST 1 FOOT INTO FIRM SOIL. IF THE SOFT ZONE IS LARGE(+3FT.), REINFORCING STEEL SHOULD BE INCLUDED WITHIN THE CONCRETE CAP WITH 1" DIAMETER REBAR AT 24" ON CENTER EACH WAY. THE LIMIT OF CONCRETE SHOULD BE DETERMINED BY THE THE ENGINEER.
3. AFTER CONCRETE HAS SET OVERNIGHT, BACKFILL HOLE WITH RELATIVELY IMPERMEABLE CLAY SOIL. COMPACT SOIL IN 6" LIFTS WITH A POWER TAMPER OR RAMMER. THE TOP THREE(3) FEET SHALL BE BACKFILLED WITH 2RC CRUSHED AGGREGATE.
4. BACKFILL HOLE ABOVE EXISTING GRADE TO DIVERT SURFACE WATER.
5. WHEN SINKHOLE IS UNDER A PROPOSED UTILITY, CONCRETE IS TO BE SET 6" BELOW THE UTILITY TO ALLOW FOR A STONE BEDDING.

STONE AND CONCRETE BLOCK INLET PROTECTION - TYPE C INLET

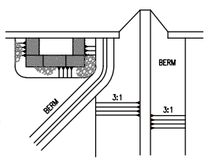
NOT TO SCALE



FRONT VIEW



SECTION VIEW



PLAN VIEW

NOTES:

MAXIMUM DRAINAGE AREA = 1 ACRE.

INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.

ROLLED EARTHEN BERM SHALL BE PROVIDED AND MAINTAINED IMMEDIATELY DOWN GRADIENT OF THE PROTECTED INLET UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. SIX INCH MINIMUM HEIGHT ASPHALT BERM SHALL BE MAINTAINED UNTIL ROADWAY SURFACE RECEIVES FINAL COAT.

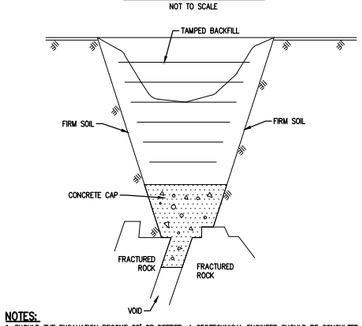
SEDIMENT SHALL BE REMOVED WHEN IT REACHES HALF THE HEIGHT OF THE STONE. DAMAGED OR CLOGGED INSTALLATIONS SHALL BE REPAIRED OR REPLACED IMMEDIATELY.

FOR SYSTEMS DISCHARGING TO HQ OR EV SURFACE WATER, A 6 INCH THICK COMPOST LAYER SHALL BE SECURELY ANCHORED ON OUTSIDE AND OVER TOP OF STONE.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

Sinkhole In Rock

NOT TO SCALE

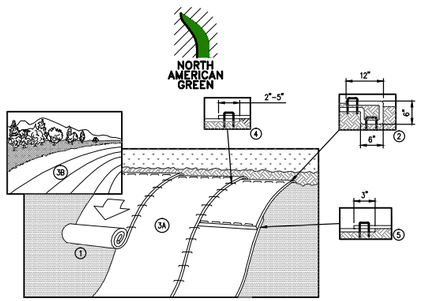


NOTES:
1. SHOULD THE EXCAVATION BECOME 20' OR DEEPER, A GEOTECHNICAL ENGINEER SHOULD BE CONSULTED AS TO THE CORRECT PROCEDURE TO BE CARRIED OUT.
2. EXCAVATE DOWN TO BEDROCK OR TO THE SINKHOLE THROAT.
3. EXPOSE THE ROCK SURFACE BY WASHING THE AREA WITH A SMALL HOSE WATER SPRAY AND INSTALL HIGHSUMP CEMENT INTO VOIDS AND CREVICES UNTIL VOIDS ARE FILLED AND A CAP COVERS THE AREA. THE LIMIT OF EXCAVATION AND CONCRETE SHALL BE DETERMINED BY THE ENGINEER.
4. AFTER CONCRETE HAS SET OVERNIGHT, BACKFILL HOLE WITH RELATIVELY IMPERMEABLE CLAY SOIL. COMPACT SOIL IN 6" LIFTS WITH A POWER TAMPER OR RAMMER. THE TOP THREE(3) FEET SHALL BE BACKFILLED WITH 2RC CRUSHED AGGREGATE.
5. BACKFILL HOLE ABOVE EXISTING GRADE TO DIVERT SURFACE WATER.
6. WHEN SINKHOLE IS UNDER A PROPOSED UTILITY, CONCRETE IS TO BE SET 6" BELOW THE UTILITY TO ALLOW FOR A STONE BEDDING.

Slope Installation

MT

NOT TO SCALE



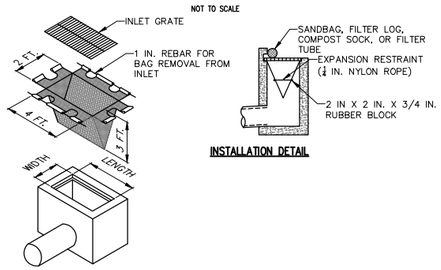
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM™, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"-5" OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH™ ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.

NOTE:
* IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

14649 HIGHWAY 41 NORTH, EVANSVILLE, INDIANA 47725
USA 1-800-772-2040 CANADA 1-800-448-2040
www.nagreen.com

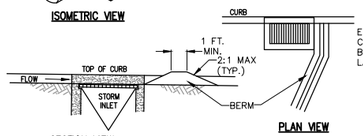
FILTER BAG INLET PROTECTION - TYPE C INLET

NOT TO SCALE



ISOMETRIC VIEW

INSTALLATION DETAIL



SECTION VIEW

PLAN VIEW

NOTES:

MAXIMUM DRAINAGE AREA = 1/2 ACRE.

INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.

ROLLED EARTHEN BERM SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. SIX INCH MINIMUM HEIGHT ASPHALT BERM SHALL BE MAINTAINED UNTIL ROADWAY SURFACE RECEIVES FINAL COAT.
AT A MINIMUM, THE FABRIC SHALL HAVE A MINIMUM GRAB TENSILE STRENGTH OF 120 LBS., A MINIMUM BURST STRENGTH OF 200 PSI, AND A MINIMUM TRAPEZOIDAL TEAR STRENGTH OF 50 LBS. FILTER BAGS SHALL BE CAPABLE OF TRAPPING ALL PARTICLES NOT PASSING A NO. 40 SIEVE.

INLET FILTER BAGS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. BAGS SHALL BE EMPTIED AND RINSED OR REPLACED WHEN HALF FULL OR WHEN FLOW CAPACITY HAS BEEN REDUCED SO AS TO CAUSE FLOODING OR BYPASSING OF THE INLET. DAMAGED OR CLOGGED BAGS SHALL BE REPLACED. A SUPPLY SHALL BE MAINTAINED ON SITE FOR REPLACEMENT OF BAGS. ALL NEEDED REPAIRS SHALL BE INITIATED IMMEDIATELY AFTER THE INSPECTION. DISPOSE OF ACCUMULATED SEDIMENT AS WELL AS ALL USED BAGS ACCORDING TO THE PLAN NOTES.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

GENERAL NOTES:
1. ALL BMP'S SHALL BE INSPECTED AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY NECESSARY REPAIRS MUST BE MADE IMMEDIATELY TO ENSURE EFFECTIVE AND EFFICIENT OPERATION.
2. BMPS SHOWN MAY NEED TO BE FIELD ADJUSTED TO FIT ACTUAL CONDITIONS.
3. IN SOME CASES, THE NEXT LARGER BMP MAY BE NEEDED DUE TO UNFORESEEN CONDITIONS.
4. ADDITIONAL BMPS MAY BE REQUIRED OTHER THAN THOSE SHOWN.
5. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE.

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SEAL

NO.	REVISIONS	DATE

E&SPC TYPICAL DETAIL SHEET 6

AVON LAKE GAS ADDITION PROJECT

CARLISLE, EATON & LAGRANGE TOWNSHIPS
AVON, AVON LAKE, ELYRIA &
NORTH RIDGEVILLE CITIES
LORAIN COUNTY
OHIO

DRAWN BY: AEJ
CHECKED BY: SJC
DATE: 12.15.14
SCALE: AS NOTED

PROJECT NO. NRG-1007

SHEET NO. 88 OF 88

Hanover Engineering Associates Inc
3355 Route 611, Suite 1
Bartonsville, PA 18321-7822
570.688.9550
Fax 570.688.9768

Y:\Projects\Energy\NRG_Energy\NRG-1007-Avon Lakes Pipeline\DWG\ESPC\ ESPC-NRG-1007-AVON LAKE-007-TYPICAL DETAILS.dwg Dec 14,2014 - 4:43pm

Appendix B

Affected Wetlands and Waterways

Avon Lake Gas Addition Project
NRG Ohio Pipeline Company LLC
Attachment B: Wetlands and Streams Crossed by the Project

Wetlands Affected by the Project

Wetland ID	Corwardin Class	ORAM Category	Temporary Impacts (Acres) [1]	Mile Post
3	PFO/PSS	2	0.0	1.1
4	PFO/PSS	2	0.3	1.2
5	PEM	1	0.6	1.4
6	PEM	1	2.6	1.8
7	PEM	2	4.8	2.1
8	PEM	2	2.8	3.6
9	PFO/PSS	2	0.1	4.0
10	PEM/PFO/PSS	2	1.0	4.2
12	PEM/PFO	2	1.8	4.8
13	PEM	2	0	5.1
14	PFO/PSS	1	0.3	5.8
15	PFO	2	0.1	6.0
16	PFO/PSS	2	0.1	6.1
17	PFO/PSS	2	0.4	6.7
18	PFO/PSS	2	0.1	6.7
19	PFO	2	0.3	6.8
20	PSS	2	0.0	6.9
21	PFO/PSS	2	0.5	7.1
22	PEM/PFO/PSS	2	21.5	7.5
24	PFO/PSS	2	3.6	9.8
25	PFO/PSS	2	0.7	10.0
25.1	PFO	2	0.4	10.2
26	PFO	2	1.7	11.4
27	PEM	1	0.2	11.8
29	PEM/PFO/PSS	2	6.1	12.5
32.1	PFO	1	0.9	13.5
33.1	PFO	1	0.4	13.7
34	PEM/PFO	2	0.1	14.0
35	PEM/PFO/PSS	2	1.3	14.0
37.1	PFO	2	2.5	14.8
38	PFO	2	0.7	15.3
41.1	PFO/PSS	2	0.3	16.4
43.1	PFO	2	0.1	16.7

Wetland ID	Corwardin Class	ORAM Category	Temporary Impacts (Acres) [1]	Mile Post
44	PEM/PFO	2	0.2	16.8
44.1	PFO	2	0.8	17.0
45	PFO	2	0.4	17.3
45.1	PEM	1	0.1	17.4
47	PFO	2	0.1	18.5
47.1	PFO	2	1.4	18.5
		Total	**59.4**	

[1]All impacts will be temporary and all grades will be returned to pre-construction contours

Streams Affected by the Project

Mile Post	Waterbody Name	Waterbody Type	Crossing Type
1.8	Stream 1	Intermittent	HDD
3.0	French Creek	Perennial	HDD
3.6	Unnamed Stream	Intermittent	Open Cut
3.7	Stream 2	Intermittent	HDD
4.1	Stream 3	Intermittent	Open Cut
4.6	Stream 4	Intermittent	Open Cut
5.3	Stream 5	Intermittent	Open Cut
5.9	Jungbluth Ditch	Perennial	Open Cut
7.5	Ridgeway Ditch	Perennial	HDD
7.9	Unnamed Stream	Intermittent	Open Cut
10.8	Unnamed Stream	Intermittent	Open Cut
11.4	Stream 7	Intermittent	Open Cut
13.0	Willow Creek	Intermittent	HDD
14.0	Jackson Ditch	Intermittent	Open Cut
15.3	Alexander Ditch	Intermittent	Open Cut
15.9	Unnamed Stream	Intermittent	Open Cut
16.5	East Branch of Black River	Perennial	HDD
18.9	Dent Ditch	Intermittent	Open Cut

Appendix C

Inspection Form

Construction Storm Water
Inspection and Maintenance Form

Type of Inspection: ___7 Day ___24-hour for >0.5-inch precipitation

Milepost/Station Location: _____to_____ Date: _____

Inspector: _____ Time: _____

Date of Precipitation Event (if applicable): _____

Amount of Rainfall (if applicable): _____inches

Inspect Construction areas for appropriate sediment control barriers
Identify locations where sediment barriers must be maintained or replaced, or where additional sediment barriers are necessary.

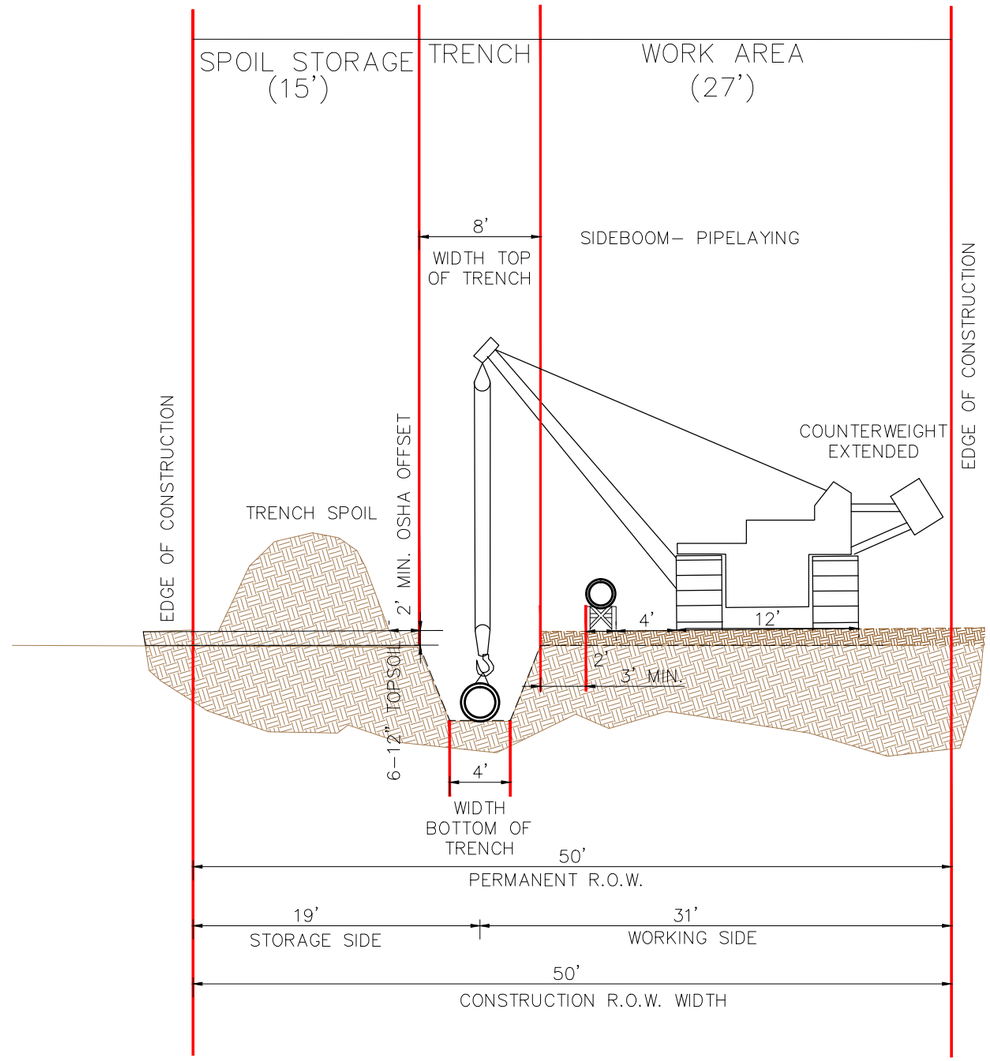
Location (Milepost/Stationing)	BMP Type	Required Activity	Date Maintenance Completed

Additional Inspection Notes:

Appendix D

Typical Construction Diagrams

CROSS SECTION
NOT TO SCALE



MAINLINE CONSTRUCTION
NON–PARALLEL CONSTRUCTION
WITH TOPSOIL SEGREGATION
50' RIGHT–OF–WAY

Know what's **below.**
Call before you dig.

SUMMARY

NO.	SUMMARY OF MATERIALS – DESCRIPTION (IN HORIZONTAL DISTANCE)	QTY.	REFERENCE DRAWINGS	REV.	REVISIONS	DATE	DRAWN	CHKD.	APPD.

NOT FOR CONSTRUCTION

DRAWING APPROVAL	SIGNATURE	DATE
DRAWN BY	JAG	9.15.14
CHECKED BY	SJC	
IN HOUSE APPD.		
CLIENT APPD.		
CLIENT APPD.		
PROJECT NUMBER	NRG–1003	

CLIENT
NRG OHIO PIPELINE COMPANY LLC

PROJECT TITLE
AVON LAKE NATURAL GAS PIPELINE PROJECT
PROPOSED 24" GAS PIPELINE

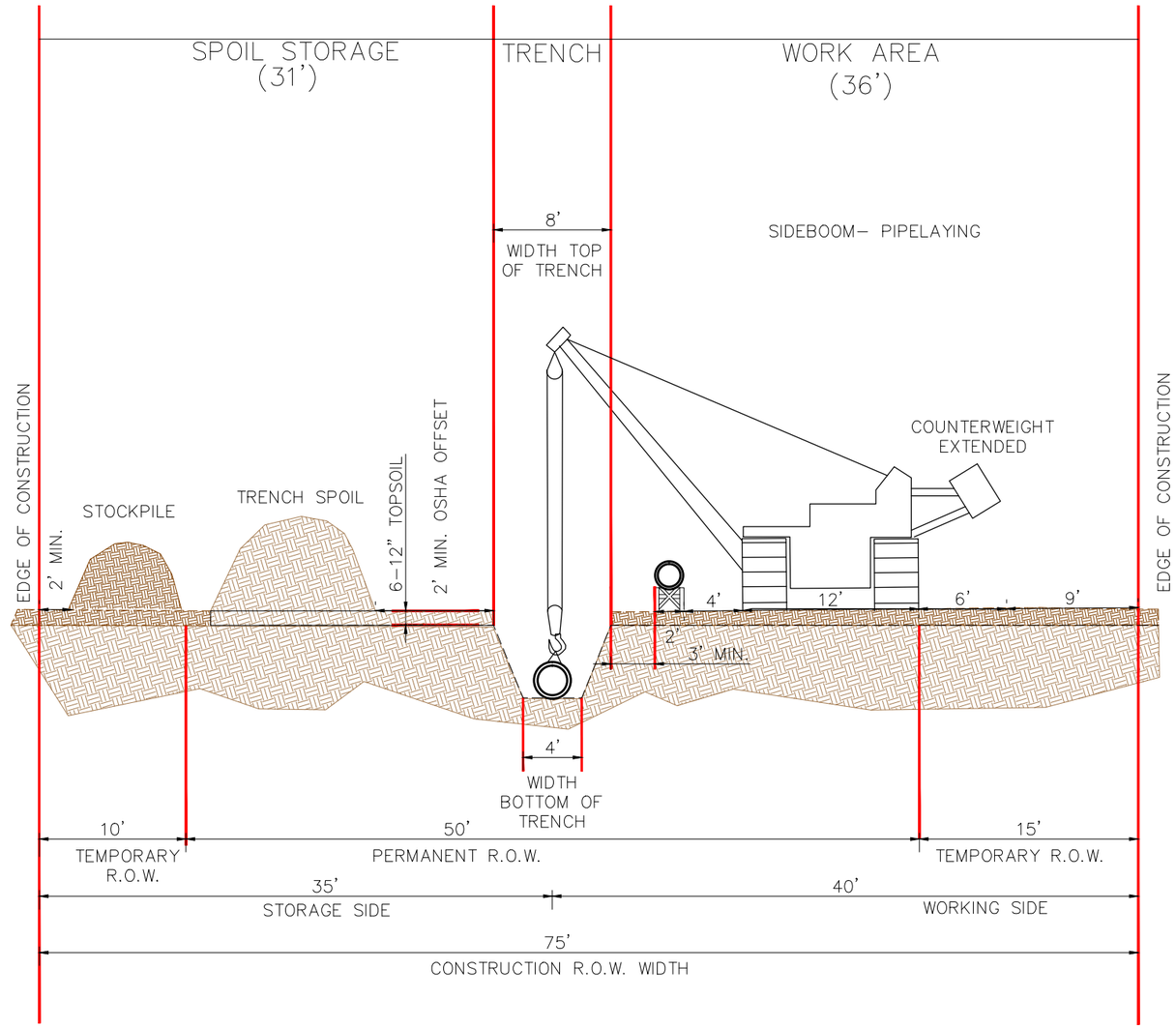
Hanover
Engineering Associates Inc

DWG. TITLE
MAINLINE NON–PARA CONST. WITH TOP SOIL SEGREGATION R.O.W.
CHAUTAUQUA COUNTY NEW YORK

SCALE AS NOTED | SHEET NO. 1 OF 1 | REV. 0

7.17.14

CROSS SECTION
NOT TO SCALE



MAINLINE CONSTRUCTION
NON–PARALLEL CONSTRUCTION
WITH TOPSOIL SEGREGATION
75' RIGHT–OF–WAY

Know what's **below.**
Call before you dig.

SUMMARY

NO.	SUMMARY OF MATERIALS – DESCRIPTION (IN HORIZONTAL DISTANCE)	QTY.	REFERENCE DRAWINGS	REV.	REVISIONS	DATE	DRAWN	CHKD.	APPD.

NOT FOR CONSTRUCTION

DRAWING APPROVAL

	SIGNATURE	DATE
DRAWN BY	JAG	9.15.14
CHECKED BY	SJC	
IN HOUSE APPD.		
CLIENT APPD.		
CLIENT APPD.		

PROJECT NUMBER
NRG–1003

CLIENT
NRG OHIO PIPELINE COMPANY LLC

PROJECT TITLE
AVON LAKE NATURAL GAS PIPELINE PROJECT
PROPOSED 24" GAS PIPELINE

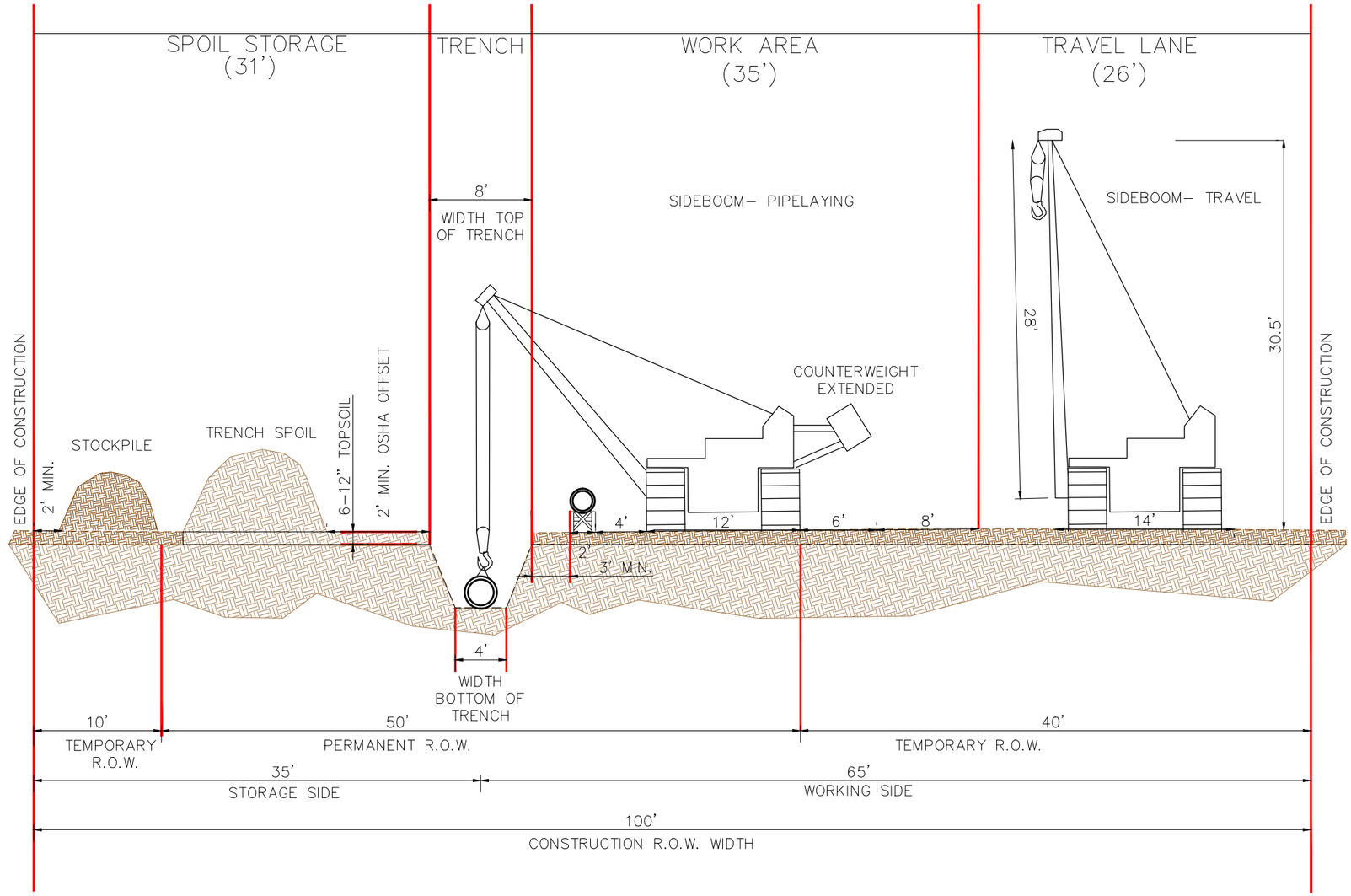
Hanover
Engineering Associates Inc

DWG. TITLE
MAINLINE NON–PARA CONST. WITH TOP SOIL SEGREGATION R.O.W.
CHAUTAUQUA COUNTY NEW YORK

SCALE AS NOTED | SHEET NO. 1 OF 1 | REV. 0

7.17.14

CROSS SECTION
NOT TO SCALE



MAINLINE CONSTRUCTION
NON–PARALLEL CONSTRUCTION
WITH TOPSOIL SEGREGATION
100' RIGHT–OF–WAY

Know what's **below.**
Call before you dig.

SUMMARY

NO.	SUMMARY OF MATERIALS – DESCRIPTION (IN HORIZONTAL DISTANCE)	QTY.	REFERENCE DRAWINGS	REV.	REVISIONS	DATE	DRAWN	CHKD.	APPD.

NOT FOR CONSTRUCTION

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CHECKED BY	SJC	
IN HOUSE APPD.		
CLIENT APPD.		
CLIENT APPD.		
PROJECT NUMBER		
NRG–1003		

CLIENT
NRG OHIO PIPELINE COMPANY LLC

PROJECT TITLE
AVON LAKE NATURAL GAS PIPELINE PROJECT
PROPOSED 24" GAS PIPELINE

Hanover
Engineering Associates Inc

DWG. TITLE
MAINLINE NON–PARA CONST. WITH TOP SOIL SEGREGATION R.O.W.
CHAUTAUQUA COUNTY NEW YORK

SCALE AS NOTED | SHEET NO. 1 OF 1 | REV. 0

7.17.14

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12/19/2014 12:57:20 PM

in

Case No(s). 14-1717-GA-BLN

Summary: Application of NRG Ohio Pipeline Company LLC continued - Attachment K (Part 7) electronically filed by Teresa Orahood on behalf of Sally Bloomfield