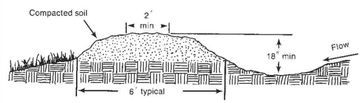
CONSTRUCTION SPECIFICATIONS:

1. Remove and properly dispose of all trees, brush, stumps, and other objectionable material.
2. Ensure that the minimum constructed cross section meets all design requirements.
3. Ensure that the top of the dike is not lower at any point than the design elevation plus the specified settlement.
4. Provide sufficient room around diversions to permit machine regrading and cleanout.
5. Vegetate the ridge immediately after construction, unless it will remain in place less than 30 working days.

MAINTENANCE

Inspect temporary diversions once a week and after every rainfall. Immediately remove sediment from the flow area and repair the diversion ridge. Carefully check outlets and make timely repairs as needed. When the area protected is permanently stabilized, remove the ridge and the channel to blend with the natural ground level and appropriately stabilize it.



TEMPORARY DIVERSIONS

LOCATION IN MANUAL : 6-20

CONSTRUCTION SPECIFICATIONS

1. Clear, grub, and strip the area under the embankment of all vegetation and root mat. Remove all surface soil containing high amounts of organic matter, and stockpile or dispose of it properly. Haul all objectionable material to the designated disposal area.
2. Ensure that fill material for the embankment is free of roots, woody vegetation, organic matter, and other objectionable material. Place the fill in lifts not to exceed 9 inches, and machine compact it. Over fill the embankment 6 inches to allow for settlement.
3. Construct the outlet section in the embankment. Protect the connection between the riprap and the soil from piping by using filter fabric or a keyway cutoff trench between the riprap structure and soil. • Place the filter fabric between the riprap and the soil. Extend the fabric across the spillway foundation and sides to the top of the dam; or • Excavate a keyway trench along the center line of the spillway foundation extending up the sides to the height of the dam. The trench should be at least 2 feet deep and 2 feet wide with 1:1 side slopes.
4. Clear the pond area below the elevation of the crest of the spillway to facilitate sediment cleanout.
5. All cut and fill slopes should be 2:1 or flatter.
6. Ensure that the stone (drainage) section of the embankment has a minimum bottom width of 3 feet and maximum side slopes of 1:1 that extend to the bottom of the spillway section.
7. Construct the minimum finished stone spillway bottom width, as shown on the plans, with 2:1 side slopes extending to the top of the over filled embankment. Keep the thickness of the sides of the spillway outlet structure at a minimum of 21 inches. The weir must be level and constructed to grade to assure design capacity.
8. Material used in the stone section should be a well-graded mixture of stone with a d50 size of 9 inches (class B erosion control stone is recommended) and a maximum stone size of 14 inches. The stone may be machine placed and the smaller stones worked into the voids of the larger stones. The stone should be hard, angular, and highly weather-resistant.
9. Discharge inlet water into the basin in a manner to prevent erosion. Use temporary slope drains or diversions with outlet protection to divert sediment-laden water to the upper end of the pool area to improve basin trap efficiency (References: Runoff Control Measures and Outlet Protection).
10. Ensure that the stone spillway outlet section extends downstream past the toe of the embankment until stable conditions are reached and outlet velocity is acceptable for the receiving stream. Keep the edges of the stone outlet section flush with the surrounding ground, and shape the center to confine the outflow stream (References: Outlet Protection).
11. Direct emergency bypass to natural, stable areas. Locate bypass outlets so that flow will not damage the embankment.
12. Stabilize the embankment and all disturbed areas above the sediment pool and downstream from the trap immediately after construction (References: Surface Stabilization).
13. Show the distance from the top of the spillway to the sediment cleanout level (1/2 the design depth) on the plans and mark it in the field.
14. Install porous baffles as specified in Practice 6.65, Porous Baffles.

MAINTENANCE

Inspect temporary sediment traps at least weekly and after each significant (1/2 inch or greater) rainfall event and repair immediately. Remove sediment, and restore the trap to its original dimensions when the sediment has accumulated to one-half the design depth of the trap. Place the sediment that is removed in the designated disposal area, and replace the part of the gravel facing that is impaired by sediment.

Check the structure for damage from erosion or piping. Periodically check the depth of the spillway to ensure it is a minimum of 1.5 feet below the low point of the embankment. Immediately fill any settlement of the embankment to slightly above design grade. Any riprap displaced from the spillway must be replaced immediately.

After all sediment-producing areas have been permanently stabilized, remove the structure and all unstable sediment. Smooth the area to blend with the adjoining areas, and stabilize properly (References: Surface Stabilization).

TEMPORARY SEDIMENT TRAP

LOCATION IN MANUAL : 6-60

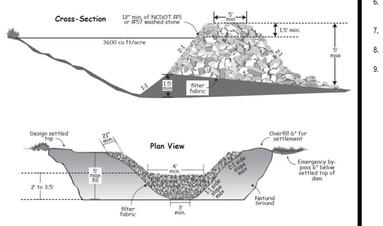


Figure 6.60a Plan view and cross-section view of a temporary sediment trap.

TEMPORARY SEDIMENT TRAP DETAIL

LOCATION IN MANUAL : 6-60

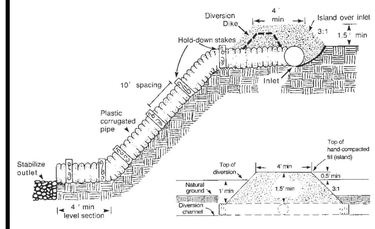
CONSTRUCTION SPECIFICATIONS

A common failure of slope drains is caused by water saturating the soil and seeping along the pipe. This creates voids from inadequate soil compaction and causes washouts. Proper backfilling around and under the pipe "haunches" with stable soil material and hand compacting in 6-inch lifts to achieve firm contact between the pipe and the soil at all points will eliminate this type of failure.

1. Place slope drains on undisturbed soil or well compacted fill at locations and elevations shown on the plan.
2. Slightly slope the section of pipe under the dike toward its outlet.
3. Hand tamp the soil under and around the entrance section in lifts not to exceed 6 inches.
4. Ensure that fill over the drain at the top of the slope has minimum dimensions of 1.5 feet deep, 4 feet top width, and 3:1 side slopes.
5. Ensure that all slope drain connections are watertight.
6. Ensure that all fill material is well-compacted, Securely fasten the exposed section of the drain with gommets or stakes spaced no more than 10 feet apart.
7. Extend the drain beyond the top of the slope, and adequately protect the outlet from erosion.
8. Make the settled, compacted dike ridge no less than 1 feet above the top of the pipe at every point.
9. Immediately stabilize all disturbed areas following construction.

MAINTENANCE

Inspect the slope drain and supporting diversion after every rainfall, and promptly make necessary repairs. When the protected area has been permanently stabilized, temporary measured may be removed, materials disposed of properly, and all disturbed areas stabilized appropriately.



TEMPORARY SEDIMENT TRAP

LOCATION IN MANUAL : 6-32

CONSTRUCTION SPECIFICATIONS

1. Place stone to the lines and dimensions shown in the plan on a filter fabric foundation.
2. Keep the center stone section at least 9 inches below natural ground level where the dam abuts the channel banks.
3. Extend stone at least 1.5 feet beyond the ditch bank (Figure 6.83b) to keep water from cutting around the ends of the check dam.
4. Set spacing between dams to assure that the elevation at the top of the lower dam is the same as the toe elevation of the upper dam.
5. Protect the channel after the lowest check dam from heavy flow that could cause erosion.
6. Make sure that the channel reach above the most upstream dam is stable.
7. Ensure that other areas of the channel, such as culvert entrances below the check dams, are not subject to damage or blockage from displaced stones.

MAINTENANCE

Inspect check dams and channels at least weekly and after each significant (1/2 inch or greater) rainfall event and repair immediately. Clean out sediment, straw, limbs, or other debris that could clog the channel when needed.

Anticipate submergence and deposition above the check dam and erosion from high flows around the edges of the dam. Correct all damage immediately. If significant erosion occurs between dams, additional measures can be taken such as, installing a protective riprap liner in that portion of the channel (Practice 6.31, Riprap-line and Paved Channels).

Remove sediment accumulated behind the dams as needed to prevent damage to channel vegetation, allow the channel to drain through the stone check dam, and prevent large flows from carrying sediment over the dam. Add stones to dams as needed to maintain design height and cross section.

Figure 6.83a - Space check dams in a channel so that the crest of downstream dam is at elevation of the top of the upstream dam

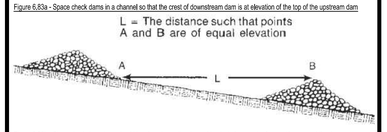
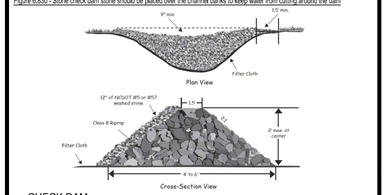


Figure 6.83b - Stone check dam stone should be placed over the channel banks to keep water from cutting around the dam



CHECK DAM

LOCATION IN MANUAL : 6-83

TEMPORARY SEEDING SPECIFICATIONS

DEFINITION:
PLANTING RAPID-GROWING ANNUAL GRASSES, SMALL GRAINS, OR LEGUMES TO PROVIDE INITIAL, TEMPORARY COVER FOR EROSION CONTROL ON DISTURBED AREAS.

PURPOSE:
TO TEMPORARILY STABILIZE DENUDED AREAS THAT WILL NOT BE BROUGHT TO FINAL GRADE FOR A PERIOD OF MORE THAN 21 CALENDAR DAYS.

TEMPORARY SEEDING CONTROLS RUNOFF AND EROSION UNTIL PERMANENT VEGETATION OR OTHER EROSION CONTROL MEASURES CAN BE ESTABLISHED. IN ADDITION, IT PROVIDES RESIDUE FOR SOIL PROTECTION AND SEEDBED PREPARATION, AND REDUCES PROBLEMS OF MUD AND DUST PRODUCTION FROM BARE SOIL SURFACES DURING CONSTRUCTION.

CONDITIONS WHERE PRACTICE APPLIES:
ON ANY CLEARED, UNVEGETATED, OR SPARSELY VEGETATED SOIL SURFACE WHERE VEGETATIVE COVER IS NEEDED FOR LESS THAN 1 YEAR. APPLICATIONS OF THIS PRACTICE INCLUDE DIVERSIONS, DAMS, TEMPORARY SEDIMENT BASINS, TEMPORARY ROAD BANKS, AND TOPSOIL STOCKPILES.

PLANNING CONSIDERATIONS:
ANNUAL PLANTS, WHICH SPROUT AND GROW RAPIDLY AND SURVIVE FOR ONLY ONE SEASON, ARE SUITABLE FOR ESTABLISHING INITIAL OR TEMPORARY VEGETATIVE COVER. TEMPORARY SEEDING PRESERVES THE INTEGRITY OF EARTHEN SEDIMENT CONTROL STRUCTURES SUCH AS DIKES, DIVERSIONS, AND THE BANKS OF DAMS AND SEDIMENT BASINS, IT CAN ALSO REDUCE THE AMOUNT OF MAINTENANCE ASSOCIATED WITH THESE DEVICES. FOR EXAMPLE, THE FREQUENCY OF SEDIMENT BASIN CLEANOUTS WILL BE REDUCED IF WATERSHED AREAS, OUTSIDE THE ACTIVE CONSTRUCTION ZONE, ARE STABILIZED.

PROPER SEEDBED PREPARATION, SELECTION OF APPROPRIATE SPECIES, AND USE OF QUALITY SEED ARE AS IMPORTANT IN THIS PRACTICE AS IN PRACTICE 6.11, PERMANENT SEEDING. FAILURE TO FOLLOW ESTABLISHED GUIDELINES AND RECOMMENDATIONS CAREFULLY MAY RESULT IN AN INADEQUATE OR SHORT-LIVED STAND OF VEGETATION THAT WILL NOT CONTROL EROSION.

TEMPORARY SEEDING PROVIDES PROTECTION FOR NO MORE THAN 1 YEAR, DURING WHICH TIME PERMANENT STABILIZATION SHOULD BE INITIATED.

SPECIFICATIONS:
COMPLETE GRADING BEFORE PREPARING SEEDBEDS, AND INSTALL ALL NECESSARY EROSION CONTROL PRACTICES SUCH AS, DIKES, WATERWAYS, AND BASINS. MINIMIZE STEEP SLOPES BECAUSE THEY MAKE SEEDBED PREPARATION DIFFICULT AND INCREASE THE EROSION HAZARD. IF SOILS BECOME COMPACTED DURING GRADING, LOOSEN THEM TO A DEPTH OF 6-8 INCHES USING A RIPPER, HARROW, OR CHISEL PLOW.

SEEDBED PREPARATION:
GOOD SEEDBED PREPARATION IS ESSENTIAL TO SUCCESSFUL PLANT ESTABLISHMENT. A GOOD SEEDBED IS WELL-PULVERIZED, LOOSE, AND UNIFORM. WHERE HYDROSEEDING METHODS ARE USED, THE SURFACE MAY BE LEFT WITH A MORE IRREGULAR SURFACE OF LARGE CLODS AND STONES.

LIMING:
APPLY LIME ACCORDING TO SOIL TEST RECOMMENDATIONS. IF THE PH (ACIDITY) OF THE SOIL IS NOT KNOWN, AN APPLICATION OF GROUND AGRICULTURAL LIMESTONE AT THE RATE OF 1 TO 1 1/2 TONS/ACRE ON COARSE-TEXTURED SOILS AND 2-3 TONS/ACRE ON FINE-TEXTURED SOILS IS USUALLY SUFFICIENT. APPLY LIMESTONE UNIFORMLY AND INCORPORATE INTO THE TOP 4-6 INCHES OF SOIL. SOILS WITH A PH OF 6 OR HIGHER NEED NOT BE LIMED.

FERTILIZER:
BASE APPLICATION RATES ON SOIL TESTS. WHEN THESE ARE NOT POSSIBLE, APPLY A 10-10-10 GRADE FERTILIZER AT 700-1,000 LB/ACRE. BOTH FERTILIZER AND LIME SHOULD BE INCORPORATED INTO THE TOP 4-6 INCHES OF SOIL. IF A HYDRAULIC SEEDER IS USED, DO NOT MIX SEED AND FERTILIZER MORE THAN 30 MINUTES BEFORE APPLICATION.

SURFACE ROUGHENING:
IF RECENT TILLAGE OPERATIONS HAVE RESULTED IN A LOOSE SURFACE, ADDITIONAL ROUGHENING MAY NOT BE REQUIRED, EXCEPT TO BREAK UP LARGE CLODS. IF RAINFALL CAUSES THE SURFACE TO BECOME SEALED OR CRUSTED, LOOSEN IT JUST PRIOR TO SEEDING BY DISKING, RAKING, HARROWING, OR OTHER SUITABLE METHODS. GROOVE OR FURROW SLOPES STEEPER THAN 3:1 ON THE CONTOUR BEFORE SEEDING.

PLANT SELECTION:
SELECT AN APPROPRIATE SPECIES OR SPECIES MIXTURE FROM TABLE 6.10A FOR SEEDING IN LATE WINTER AND EARLY SPRING, TABLE 6.10B FOR SUMMER, AND TABLE 6.10C FOR FALL.

IN THE MOUNTAINS, DECEMBER AND JANUARY SEEDINGS HAVE POOR CHANCES OF SUCCESS. WHEN IT IS NECESSARY TO PLANT AT THESE TIMES, USE RECOMMENDATIONS FOR FALL AND A SECURELY TACKED MULCH.

SEEDING:
EVENLY APPLY SEED USING A CYCLONE SEEDER (BROADCAST), DRILL, CULTIPACKER SEEDER, OR HYDROSEEDER. USE SEEDING RATES GIVEN IN TABLES 6.10A-6.10C. BROADCAST SEEDING AND HYDROSEEDING ARE APPROPRIATE FOR STEEP SLOPES WHERE EQUIPMENT CANNOT BE DRIVEN. HAND BROADCASTING IS NOT RECOMMENDED BECAUSE OF THE DIFFICULTY IN ACHIEVING A UNIFORM DISTRIBUTION.

SMALL GRAINS SHOULD BE PLANTED NO MORE THAN 1 INCH DEEP, AND GRASSES AND LEGUMES NO MORE THAN 1/2 INCH. BROADCAST SEED MUST BE COVERED BY RAKING OR CHAIN DRAGGING, AND THEN LIGHTLY FIRMED WITH A ROLLER OR CULTIPACKER. HYDROSEEDED MIXTURES SHOULD INCLUDE A WOOD FIBER (CELLULOSE) MULCH.

MULCHING:
THE USE OF AN APPROPRIATE MULCH WILL HELP ENSURE ESTABLISHMENT UNDER NORMAL CONDITIONS, AND IS ESSENTIAL TO SEEDING SUCCESS UNDER HARSH SITE CONDITIONS. HARSH SITE CONDITIONS INCLUDE:
- SEEDING IN FALL FOR WINTER COVER (WOOD FIBER MULCHES ARE NOT CONSIDERED ADEQUATE FOR THIS USE).
- SLOPES STEEPER THAN 3:1,
- EXCESSIVELY HOT OR DRY WEATHER,
- ADVERSE SOILS (SHALLOW, ROCKY, OR HIGH IN CLAY OR SAND), AND
- AREAS RECEIVING CONCENTRATED FLOW.

IF THE AREA TO BE MULCHED IS SUBJECT TO CONCENTRATED WATERFLOW, AS IN CHANNELS, ANCHOR MULCH WITH NETTING.

MAINTENANCE:
RESEED AND MULCH AREAS WHERE SEEDLING EMERGENCE IS POOR, OR WHERE EROSION OCCURS, AS SOON AS POSSIBLE. DO NOT MOW. PROTECT FROM TRAFFIC AS MULCH AS POSSIBLE.

TEMPORARY SEEDING

LOCATION IN MANUAL : 6-10

TABLE 6-10a
TEMPORARY SEEDING RECOMMENDATIONS FOR LATE WINTER AND EARLY SPRING

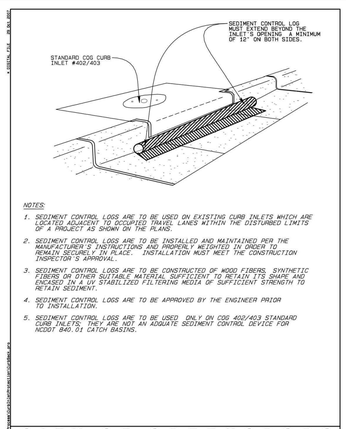
SEEDING MIXTURE SPECIES	RATE (LB/ACRE)
RYE (GRAIN)	120
ANNUAL LESPEDEZA (KOBE IN PIEDMONT AND COASTAL PLAIN; KOREAN IN MOUNTAIN)	50
OMIT ANNUAL LESPEDEZA WHEN DURATION OF TEMPORARY COVER IS NOT TO EXTEND BEYOND JUNE.	
SEEDING DATES	
MOUNTAINS - ABOVE 2500 FT: FEBRUARY 15 – MAY 15 - BELOW 2500 FT: FEBRUARY 1 – MAY 1	
PIEDMONT: JANUARY 1 – MAY 1	
COASTAL PLAIN: DECEMBER 1 – APRIL 15	
SOIL AMENDMENTS	
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10-10-10 FERTILIZER.	
MULCH	
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.	
MAINTENANCE	
REPAIR AND REFERTILIZE DAMAGED AREAS IMMEDIATELY. TOPDRESS WITH 50LB/ACRE OF NITROGEN IN MARCH, IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND JUNE 15. OVERSEED WITH 50LB/ACRE KOBE (PIEDMONT AND COASTAL PLAIN) OR KOREAN (MOUNTAINS) LESPEDEZA IN LATE FEBRUARY OR EARLY MARCH.	

TABLE 6-10b
TEMPORARY SEEDING RECOMMENDATIONS FOR SUMMER

SEEDING MIXTURE SPECIES	RATE (LB/ACRE)
GERMAN MILLET	40
IN THE PIEDMONT AND MOUNTAINS, A SMALL/LATEMIXED SUDANGRASS MAY BE SUBSTITUTED AT A RATE OF 50LB/ACRE.	
SEEDING DATES	
MOUNTAINS: MAY 15 – AUGUST 15	
PIEDMONT: MAY 1 – AUGUST 1	
COASTAL PLAIN: APRIL 15 – AUGUST 15	
SOIL AMENDMENTS	
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10-10-10 FERTILIZER.	
MULCH	
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.	
MAINTENANCE	
REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, REFERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE.	

TABLE 6-10c
TEMPORARY SEEDING RECOMMENDATIONS FOR FALL

SEEDING MIXTURE SPECIES	RATE (LB/ACRE)
RYE (GRAIN)	120
SEEDING DATES	
MOUNTAINS: AUGUST 15 – DECEMBER 15	
COASTAL PLAIN AND PIEDMONT: AUGUST 15 – DECEMBER 30	
SOIL AMENDMENTS	
FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 1,000 LB/ACRE 10-10-10 FERTILIZER.	
MULCH	
APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL.	
MAINTENANCE	
REPAIR AND REFERTILIZE DAMAGED AREAS IMMEDIATELY. TOPDRESS WITH 50LB/ACRE OF NITROGEN IN MARCH, IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND JUNE 15. OVERSEED WITH 50LB/ACRE KOBE (PIEDMONT AND COASTAL PLAIN) OR KOREAN (MOUNTAINS) LESPEDEZA IN LATE FEBRUARY OR EARLY MARCH.	

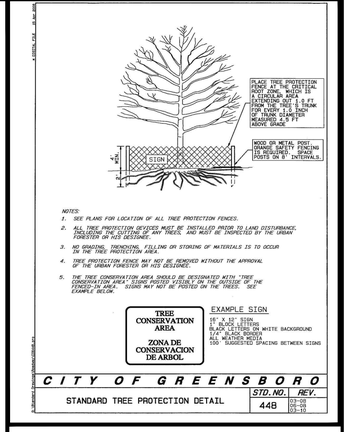


NOTES:

1. SEDIMENT CONTROL LOGS ARE TO BE USED ON EXISTING CURB INLETS WHICH ARE LOCATED ADJACENT TO OCCUPIED TRAVEL LANES WITHIN THE DISTURBED LIMITS OF A PROJECT AS SHOWN ON THE PLANS.
2. SEDIMENT CONTROL LOGS ARE TO BE INSTALLED AND MAINTAINED PER THE MANUFACTURER'S INSTRUCTIONS AND PROPERLY WEIGHTED IN ORDER TO REMAIN SECURELY IN PLACE. INSTALLATION MUST MEET THE CONSTRUCTION INSPECTOR'S APPROVAL.
3. SEDIMENT CONTROL LOGS ARE TO BE CONSTRUCTED OF WOOD FIBERS, SYNTHETIC FIBERS OR OTHER SUITABLE MATERIAL SUFFICIENT TO RETAIN ITS SHAPE AND ENCASED IN A UV STABILIZED FILTERING MEDIA OF SUFFICIENT STRENGTH TO RETAIN SEDIMENT.
4. SEDIMENT CONTROL LOGS ARE TO BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
5. SEDIMENT CONTROL LOGS ARE TO BE USED ONLY ON CGS 402/403 STANDARD CURB INLETS. THEY ARE NOT AN ADQUATE SEDIMENT CONTROL DEVICE FOR NCDOT 840.01 CATCH BASINS.

CITY OF GREENSBORO

SEDIMENT CONTROL LOG INSTALLATION FOR EXISTING CURB INLETS NEXT TO TRAFFIC	STD.NO.	REV.
	450	03/09



NOTES:

1. SEE PLANS FOR LOCATION OF ALL TREE PROTECTION FENCES.
2. ALL TREE PROTECTION DEVICES MUST BE INSTALLED PRIOR TO LAND DISTURBANCE. THIS INCLUDE THE CUTTING OF ANY TREES, AND MUST BE INSPECTED BY THE URBAN FORESTER ON SITE BEFORE.
3. NO GRADING, TRENCHING, FILLING OR STORING OF MATERIALS IS TO OCCUR IN THE TREE PROTECTION AREA.
4. TREE PROTECTION FENCE MAY NOT BE REMOVED WITHOUT THE APPROVAL OF THE URBAN FORESTER OR HIS DESIGNEE.
5. THE TREE CONSERVATION AREA SHOULD BE DESIGNATED WITH "TREE CONSERVATION AREA" SIGNS POSTED EITHER IN THE OUTSIDE OF THE FENCED-IN AREA. SIGNS MAY NOT BE POSTED ON THE TREES. SEE EXAMPLE BELOW.

CITY OF GREENSBORO

STANDARD TREE PROTECTION DETAIL	STD.NO.	REV.
	448	03-06 06-08 03-10

SODDING SPECIFICATIONS

DEFINITION
PERMANENTLY STABILIZING AREAS BY LAYING A CONTINUOUS COVER OF GRASS SOD.

PURPOSE
TO PREVENT EROSION AND DAMAGE FROM SEDIMENT AND RUNOFF BY STABILIZING THE SOIL SURFACE WITH PERMANENT VEGETATION WHERE SPECIFIC GOALS MIGHT BE:
- TO PROVIDE IMMEDIATE VEGETATIVE COVER OF CRITICAL AREAS.
- TO STABILIZE DISTURBED AREAS WITH A SUITABLE PLANT MATERIAL THAT CANNOT BE ESTABLISHED BY SEED, OR
- TO STABILIZE DRAINAGEWAYS, CHANNELS, AND OTHER AREAS OF CONCENTRATED FLOW WHERE FLOW VELOCITIES WILL NOT EXCEED THAT SPECIFIED FOR A GRASS LINING.

CONDITIONS WHERE PRACTICE APPLIES
DISTURBED AREAS WHICH REQUIRE IMMEDIATE AND PERMANENT VEGETATIVE COVER, OR WHERE SODDING IS PREFERRED TO OTHER MEANS OF GRASS ESTABLISHMENT. LOCATIONS PARTICULARLY SUITED TO STABILIZATION WITH SOD ARE:
- WATERWAYS AND CHANNELS CARRYING INTERMITTENT FLOW AT ACCEPTABLE VELOCITIES.
- AREAS AROUND DROP INLETS, WHEN THE DRAINAGE AREA HAS BEEN STABILIZED
- RESIDENTIAL OR COMMERCIAL LAWNS AND GOLF COURSES WHERE PROMPT USE AND AESTHETICS ARE IMPORTANT, AND
- STEEP CRITICAL AREAS.

PLANNING CONSIDERATIONS
QUALITY TURF CAN BE ESTABLISHED WITH EITHER SEED OR SOD. SITE PREPARATION FOR THE TWO METHODS IS SIMILAR, THE PRACTICE OF SODDING FOR SOIL STABILIZATION ELIMINATES BOTH THE SEEDING AND MULCHING OPERATIONS, AND IS A MUCH MORE RELIABLE METHOD OF PRODUCING ADEQUATE COVER AND SEDIMENT CONTROL. HOWEVER, COMPARED TO SEED, SOD IS MORE DIFFICULT TO OBTAIN, TRANSPORT, AND STORE.

ADVANTAGES OF PROPERLY INSTALLED SOD INCLUDE:
- IMMEDIATE EROSION AND DUST CONTROL.
- NEARLY YEAR-ROUND ESTABLISHMENT CAPABILITY.
- LESS CHANCE OF FAILURE THAN WITH SEEDINGS. • FREEDOM FROM WEEDS, AND
- RAPID STABILIZATION OF SURFACES FOR TRAFFIC AREAS, CHANNEL LININGS, OR CRITICAL AREAS.

SOD CAN BE LAID DURING TIMES OF THE YEAR WHEN SEEDED GRASSES MAY FAIL, PROVIDED THERE IS ADEQUATE WATER AVAILABLE FOR IRRIGATION IN THE EARLY WEEKS. IRRIGATION IS ESSENTIAL, AT ALL TIMES OF THE YEAR, TO INSTALL SOD. IT IS INITIALLY MORE COSTLY TO INSTALL SOD THAN TO PLANT SEED. HOWEVER, THE HIGHER COST MAY BE JUSTIFIED FOR SPECIFIC APPLICATIONS WHERE SOD PERFORMS BETTER THAN SEED.
IN WATERWAYS AND CHANNELS THAT CARRY CONCENTRATED FLOW, PROPERLY PEGGED SOD IS PREFERABLE TO SEED BECAUSE IT PROVIDES IMMEDIATE PROTECTION. DROP INLETS PLACED IN AREAS TO BE GRASSED CAN BE PROTECTED FROM SEDIMENT BY PLACING PERMANENT SOD STRIPS AROUND THE INLET. SOD ALSO MAINTAINS THE NECESSARY GRADE AROUND THE INLET.
BECAUSE SOD IS COMPOSED OF LIVING PLANTS THAT MUST RECEIVE ADEQUATE CARE, FINAL GRADING AND SOIL PREPARATION SHOULD BE COMPLETED BEFORE SOD IS DELIVERED. IF LEFT ROLLED OR STACKED, HEAT CAN BUILD UP INSIDE THE SOD, CAUSING SEVERE DAMAGE AND LOSS OF COSTLY PLANT MATERIAL.

SPECIFICATIONS
CHOOSING APPROPRIATE TYPES OF SOD :
THE TYPE OF SOD SELECTED SHOULD BE COMPOSED OF PLANTS ADAPTED TO BOTH THE SITE AND THE INTENDED PURPOSE. IN NORTH CAROLINA THESE ARE LIMITED TO KENTUCKY BLUEGRASS, TALL FESCUE, BLUEGRASS/TALL FESCUE BLENDS, FINE-TURF (HYBRID) BERMUDAGRASS, ST. AUGUSTINEGRASS, CENTIPEDEGRASS, AND ZOYSIAGRASS. SPECIES SELECTION IS PRIMARILY DETERMINED BY REGION, AVAILABILITY, AND INTENDED USE (TABLE 6.12A).
AVAILABILITY VARIES ACROSS THE STATE AND FROM YEAR TO YEAR. NEW VARIETIES ARE CONTINUALLY BEING DEVELOPED AND TESTED. A COMPLETE AND CURRENT LISTING OF SOD RECOMMENDATIONS CAN BE OBTAINED FROM SUPPLIERS OR THE STATE AGRICULTURAL EXTENSION OFFICE. SOD COMPOSED OF A MIXTURE OF VARIETIES MAY BE PREFERRED BECAUSE OF ITS BROADER RANGE OF ADAPTABILITY.

QUALITY OF SOD:
USE ONLY HIGH-QUALITY SOD OF KNOWN GENETIC ORIGIN, FREE OF NOXIOUS WEEDS, DISEASE, AND INSECT PROBLEMS. IT SHOULD APPEAR HEALTHY AND VIGOROUS, AND CONFORM TO THE FOLLOWING SPECIFICATIONS:
- SOD SHOULD BE MACHINE CUT AT A UNIFORM DEPTH OF 1/2 - 2 INCHES (EXCLUDING SHOOT GROWTH AND THATCH).
- SOD SHOULD NOT HAVE BEEN CUT IN EXCESSIVELY WET OR DRY WEATHER.
- SECTIONS OF SOD SHOULD BE A STANDARD SIZE AS DETERMINED BY THE SUPPLIER, UNIFORM, AND UNTORN.
- SECTIONS OF SOD SHOULD BE STRONG ENOUGH TO SUPPORT THEIR OWN WEIGHT, AND RETAIN THEIR SIZE AND SHAPE WHEN LIFTED BY ONE END.
- HARVEST, DELIVERY, AND INSTALLATION OF SOD SHOULD TAKE PLACE WITHIN A PERIOD OF 36 HOURS.

SOIL PREPARATION:
TEST SOIL TO DETERMINE THE EXACT REQUIREMENTS FOR LIME AND FERTILIZER. SOIL TESTS MAY BE CONDUCTED BY THE STATE SOIL TESTING LAB OR A REPUTABLE COMMERCIAL LABORATORY. INFORMATION ON FREE SOIL TESTING IS AVAILABLE FROM THE AGRONOMIC DIVISION OF THE NORTH CAROLINA DEPARTMENT OF AGRICULTURE OR THE AGRICULTURAL EXTENSION SERVICE. WHERE SODDING MUST BE PLANNED WITHOUT SOIL TESTS THE FOLLOWING SOIL AMENDMENTS MAY BE SUFFICIENT:

PULVERIZED AGRICULTURAL LIMESTONE AT A RATE OF 2TONS/ACRE (100LB/1,000FT2)
FERTILIZER AT A RATE OF 1,000 LB/ACRE (25 LB/1,000 FT2) OF 10-10-10 IN FALL OR 5-10-10 IN SPRING.

EQUIVALENT NUTRIENTS MAY BE APPLIED WITH OTHER FERTILIZER FORMULATIONS. THESE AMENDMENTS SHOULD BE SPREAD EVENLY OVER THE AREA, AND INCORPORATED INTO THE TOP 4-8 INCHES OF SOIL BY DISKING, HARROWING, OR OTHER EFFECTIVE MEANS. IF TOPSOIL IS APPLIED, FOLLOW SPECIFICATIONS GIVEN IN PRACTICE 6.04, TOPSOILING.

PRIOR TO LAYING SOD, CLEAR THE SOIL SURFACE OF TRASH, DEBRIS, ROOTS, BRANCHES, STONES, AND CLODS LARGER THAN 2 INCHES IN DIAMETER. FILL ON LEVEL LOW SPOTS IN ORDER TO AVOID STANDING WATER. RAKE OR HARROW THE SITE TO ACHIEVE A SMOOTH AND LEVEL FINAL GRADE.

COMPLETE SOIL PREPARATION BY ROLLING OR CULTIPACKING TO FIRM THE SOIL. AVOID USING HEAVY EQUIPMENT ON THE AREA, PARTICULARLY WHEN THE SOIL IS WET, AS THIS MAY CAUSE EXCESSIVE COMPACTION, AND MAKE IT DIFFICULT FOR THE SOD TO TAKE ROOT.

SOD INSTALLATION:
A STEP-BY-STEP PROCEDURE FOR INSTALLING SOD IS ILLUSTRATED IN FIGURE 6.12A AND DESCRIBED BELOW.
1. MOISTENING THE SOD AFTER IT IS UNROLLED HELPS MAINTAIN ITS VIABILITY. STORE IT IN THE SHADE DURING INSTALLATION.
2. RAKE THE SOIL SURFACE TO BREAK THE CRUST JUST BEFORE LAYING SOD. DURING THE SUMMER, LIGHTLY IRRIGATE THE SOIL IMMEDIATELY BEFORE LAYING THE SOD TO COOL THE SOIL. REDUCE ROOT BURNING, AND DEBACK.
3. DO NOT SOD ON GRAVEL, FROZEN SOILS, OR SOILS THAT HAVE BEEN TREATED RECENTLY WITH STERILANTS OR HERBICIDES.
4. LAY THE FIRST ROW OF SOD IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLELED TO AND BUTTING TIGHTLY AGAINST EACH OTHER. STAGGER STRIPS IN A BRICK-LIKE PATTERN. BE SURE THAT THE SOD IS NOT STREACHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED TIGHTLY TO PREVENT VOIDS. USE A KNIFE OR SHARP SPADE TO TRIM AND FIT IRREGULARLY SHAPED AREAS.
5. INSTALL STRIPS OF SOD WITH THEIR LONGEST DIMENSION PERPENDICULAR TO THE SLOPE, ON SLOPES 3:1 OR GREATER, OR WHEREVER EROSION MAY BE A PROBLEM, SECURE SOD WITH PEGS OR STAPLES.
6. AS SODDING OF CLEARLY DEFINED AREAS IS COMPLETED, ROLL SOD TO PROVIDE FIRM CONTACT BETWEEN ROOTS AND SOIL.
7. AFTER ROLLING, IRRIGATE UNTIL THE SOIL IS WET 4 INCHES BELOW THE SOD.
8. KEEP SODDED AREAS MOIST TO A DEPTH OF 4 INCHES UNTIL THE GRASS TAKES ROOT. THIS CAN BE DETERMINED BY GENTL