

## CHAPTER 151: EROSION CONTROL

- [151.01](#) Definitions
- [151.02](#) Applicability
- [151.03](#) Standards for design
- [151.04](#) Maintenance of control measures
- [151.05](#) General erosion and sediment control permits
- [151.06](#) Erosion, sediment, and stormwater control measures
- [151.07](#) Maintenance of permanent stormwater control measures
- [151.08](#) Enforcement and stop work order fee
- [151.09](#) Appeals Board
- [151.10](#) Appeals to Appeals Board
- [151.11](#) Appeals to Court
- [151.12](#) Standard for stormwater design analysis
- [151.13](#) Sediment control
- [151.99](#) Penalty

### § 151.01 DEFINITIONS.

For the purpose of this chapter, the following definitions shall apply unless the context clearly indicates or requires a different meaning.

**ADJACENT LANDS.** Surrounding land that may either impact a site or be impacted by potential soil erosion, sediment, and/or stormwater runoff as a result of land disturbing activities conducted on a site, and at a minimum is an area within 50 feet of the site.

**APPEALS BOARD.** The Erosion, Sediment, and Stormwater Control Appeals Board.

**AREAS OF CONCENTRATED FLOW OR BODIES OF WATER.** Any area where water may accumulate or flow, whether continual or as the result of a storm event including, but not limited to, lakes, rivers, streams, creeks, ponds, ditches, swales, gullies, ravines, street gutters, and other similar features.

**COMMISSION.** The Tri-County Regional Planning Commission.

**CONTROL MEASURE.** Any proposed temporary or permanent measures to be installed to control erosion, sediment, and stormwater runoff from a project area.

**COUNTY.** The County of Tazewell, Illinois.

**DEPARTMENT.** The Tazewell County Community Development Department.

**DEVELOPMENT.** The division of a parcel of land into two or more parcels; the construction, reconstruction, conversion, structural alteration, relocation, or enlargement of any structure; any mining, excavation, landfill, or land disturbance; and any use or extension of the use of land.

**DISTURBED AREA.** Any area of land on which the pre-development ground surface will be affected or altered by the development activities. This includes, but is not limited to, grading, clearing, stockpiling, tracking, and other similar activities.

**EROSION CONTROL ADMINISTRATOR.** The person appointed by the Tazewell County Board to administer this chapter.

**FIVE-YEAR FREQUENCY STORM EVENT.** The storm event rainfall depth during a 24-hour period which is exceeded, on the average, once every five years.

**FLOOD INSURANCE RATE MAPS (FIRM).** Maps prepared by the federal emergency management agency (FEMA) that depict the special flood hazard areas (SFHA) within a community. These maps include insurance rate zones and floodplains any may or may not depict floodways.

**INSTITUTIONAL USE.** A religious or public use such as a church, library, public or private school, hospital, or government owner or operated building, structure, or land use for public purpose.

**LAND DISTURBING ACTIVITY.** Any change in land which may result in soil erosion from water or wind and the movement of sediments into state or county waters or onto lands in the county, or a change in the amount and/or intensity of stormwater runoff including, but not limited to, the covering with an impervious surface, stockpiling, clearing, grading, excavating, rehabilitating, transporting, depositing, or filling of land.

**NORMAL AGRICULTURAL PRACTICES.** Activities associated with the preparation and tilling of land for the purposes of growing crops or raising livestock which may include, but are not limited to, the construction of conservation measures, plowing, disking, and cultivating.

**PERIMETER CONTROL.** Any control measure installed between the down slope side of the disturbed area and the property line and/or between the down slope side of the disturbed area and any area of concentrated flow.

**PRE-PROJECT CONDITION.** A condition that may impact erosion, sediment, or stormwater runoff characteristics of a site prior to start of construction activity. The **PRE-PROJECT CONDITION** shall be based on the predominant land use for the past five years. For example, if a site has been cropland for four of the past five years, and in grass just prior to development, the land use would be cropland for the pre-project condition.

**PROJECT.** Any development involving modification to land which involves a land disturbing activity.

**REGIONAL STORMWATER MANAGEMENT SYSTEM.** A system which is designed, constructed, and maintained to provide stormwater control for multiple land owners.

**ROAD.** Any right-of-way that has been improved for the purposes of providing a surface for vehicular traffic, including any federal, state, county, township, and municipal controlled facilities.

**SINGLE-FAMILY DWELLING.** A building designed for or occupied by one family.

**SITE.** The lot or parcel on which the project is to be developed.

**SITE SPECIFIC PLAN.** A general erosion and sediment control permit required for projects where slope is greater than 10% and/or the site contains areas of concentrated flow or bodies of water. Slope shall be determined by the maximum slope indicated on the site according to the USDA Soil Survey or topographic survey as prepared by a state registered surveyor.

**STANDARD PLAN.** A general erosion and sediment control permit for projects where slope is less than 10%, and there are no areas of concentrated flows or bodies of water on or water on or immediately adjacent to the site. Slope shall be determined by the maximum slope indicated on the site according to the USDA Soil Survey or topographic survey as prepared by a state registered surveyor.

**STANDARDS.** The Illinois Environmental Protection Agency's *Illinois Urban Manual, A Technical Manual designed for Urban Ecosystem Protection and Enhancement* published in 1995 and *Illinois Procedures and Standards for Urban Soil Erosion and Sedimentation Control* published in 1988 by the Urban Committee of the Association of Illinois Soil and Water Conservation District now in effect or as hereafter amended, which is incorporated by reference herein, and the county standards for stormwater design analysis, found at § [151.12](#), and the erosion and sediment control criteria and specifications found in § [151.13](#).

**SUBSTANTIAL COMPLETION.** The point at which all exterior work is completed and the site can be used for the use intended.

**TWENTY-FIVE-YEAR FREQUENCY STORM EVENT.** The storm event rainfall depth during a 24-hour period which is exceeded, on the average, once every 25 years.

**TWO-FAMILY DWELLING.** A building designed for or occupied by two families.

**TWO-YEAR FREQUENCY STORM EVENT.** The storm event rainfall depth during a 24-hour period which is exceeded, on the average, once every two years.

**UTILITY SERVICE LINE.** Means by which utility service is provided to service users, such as electric, telephone, and television cable, or gas, water, and sewer pipes.

**WORKING DAY.** Shall not include Saturday, Sunday, or any holiday when the county offices are closed.

(Prior Code, 8 TCC 3-1)

#### **§ 151.02 APPLICABILITY.**

This chapter shall apply to:

- (A) All projects within the boundaries and jurisdiction of the county. No land surface shall be disturbed unless an erosion and sediment control permit or an erosion sediment and stormwater control permit has first been issued for that project, except as follows:
  - (1) Land disturbing activities which do not involve the construction of any new single- or two- family dwellings, and for which the disturbed area is less than 5,000 square feet;
  - (2) Normal agricultural practices; or
  - (3) Routine maintenance of roads and utility service lines.
- (B) County road departments. The Erosion Control Administrator reserves the right to require any non-agricultural, construction development activity, regardless of disturbed area or type of activity, to comply with this chapter if it is determined to be the cause of, or a contributor to, an existing or potential erosion, sediment, or stormwater impact; and
- (C) Any land within the boundaries and jurisdiction of the county on which there is located a permanent stormwater control measure which was installed pursuant to this chapter.

(Prior Code, 8 TCC 3-2)

#### **§ 151.03 STANDARDS FOR DESIGN.**

- (A) *Erosion and sediment control measures.* All control measures required under this chapter shall conform to the design criteria, standards, and specifications provided in the applicable standards referenced in § [151.13](#) now in effect or as hereafter amended. All control measures installed shall be sufficient to prevent sediment from leaving the permit site during a five-year frequency storm event. Measures shall be taken to prevent sediment from leaving the site. When sediment does leave the site, the owner, developer, or contractor shall remove the sediment within four hours, or by no later than the end of the work day. For example, installing a rock construction drive or cleaning tires could be used to minimize tracking of sediment onto public roads.
- (B) *Permanent stormwater control measures.* All stormwater controls shall be designed so that the peak discharge rate from the permitted area resulting from the two-year and 25-year frequency storm events for the post-project condition do not exceed the corresponding storm event peak discharges for the pre-project condition. Evaluation of submitted plans shall be based on the Stormwater Design Analyses Standards in § [151.12](#).
- (C) *Regional stormwater control systems.* To allow for the beneficial development and maintenance of regional stormwater management systems, where they are available and they are appropriate, an applicant may submit a design dependent on such a system. The applicant may submit documentation of the approval for the use of the regional stormwater management facility from the governmental agency having jurisdiction over it. The applicant shall submit evidence showing that there will be no adverse flooding impact to any receiving stream between the point of discharge and the regional stormwater facility. If the applicant is approved to use the regional stormwater management system, the applicant may request exemption from the requirements in this section for permanent on-site stormwater controls from the Erosion Control Administrator. Such exemption shall not apply to any temporary stormwater control measures required by this chapter.

(Prior Code, 8 TCC 3-3)

#### **§ 151.04 MAINTENANCE OF CONTROL MEASURES.**

- (A) *Erosion, sediment, and temporary stormwater control measures.*
  - (1) On-site sediment control measures shall be constructed and functional prior to initiating clearing, grading, stripping, excavating, or fill activities on the site.

- (2) Sediment control measures and temporary stormwater control measures are to be maintained so they are operating effectively until permanent ground surface protection and permanent stormwater control measures are established in a manner specified in the applicable permit issued pursuant to this chapter.
  - (3) Fully functioning temporary sediment control measures (including, but not limited to, perimeter sediment controls) shall remain in place until the ground is stabilized with permanent ground cover. The intent of the chapter is to keep the sites protected at all times until the ground is permanently stabilized. In cases where it is not practical to leave the temporary sediment control measures in place prior to establishing permanent ground cover (for example when control measures need to be removed in order to grade the area or install pavement or sod) an exception will be made only if one of the conditions listed below will be met. In no way does adhering to one of the conditions below relieve the owner of responsibility to clean-up or repair any damages caused from sediment or stormwater runoff leaving the site.
    - (a) Permanent ground cover shall be established with pavement, aggregate, or sod within three days of the removal of sediment barriers.
    - (b) Permanent vegetation shall be established by seeding with anchored mulch within three days of removal of sediment barriers during the spring or fall seeding periods. However, on project areas with slopes not exceeding 5%, permanent vegetation shall be established by seeding within three days of the removal of sediment barriers during the spring or fall seeding periods. Summer seeding is acceptable on project areas which shall be watered. This does not apply to concentrated flow areas.
- (B) *Additional control measures.* The Erosion Control Administrator may require additional control measures pursuant to the standards if determined as necessary after site inspection, and prior to issuing the permit.

(Prior Code, 8 TCC 3-4)

#### **§ 151.05 GENERAL EROSION AND SEDIMENT CONTROL PERMITS.**

Before commencing any project involving construction of any new single- or two-family dwelling or commencing any project with an area of 5,000 square feet or greater, the owner of the land or his or her representative shall be required to file an application for a general erosion and sediment control permit, as either a standard or site specific plan, except as otherwise provided in §§ [151.02](#) and [151.06](#).

- (A) *Application.* The applicant shall file the application with the Department on forms provided by the Department. The fee for a standard plan application shall be in the amount of \$150 for each permit, and the fee for a site specific plan application shall be \$200 for each permit. However, no fee shall be required for any project, the purpose of which is agricultural or initiated by a local unit of government. There shall be no refund of any fees paid and no application shall be accepted for filing unless the fee has been paid in full.
- (B) *Application review.* Review of a general erosion and sediment control permit application shall be limited to verifying that the required information and permit fee have been provided and that it meets the standards. The Erosion Control Administrator shall issue or deny an application by approving the permit for a standard plan within two working days of the filing of a complete application, or initiate the review process for a site specific plan and approve the same within five working days of the filing of a complete application. If the permit is denied, it shall be returned to the applicant with a written explanation of its denial. The application shall be deemed approved if no response is made within the time frames provided above.
- (C) *Duration.* The general erosion and sediment control permit shall be issued for a period not exceeding two years.
- (D) *Content of general erosion and sediment control permit.* The general erosion control permit shall contain at a minimum the following general conditions:
  - (1) Written approval be obtained from the Erosion Control Administrator prior to making any modification to the erosion and sediment control plan as set forth in the application;
  - (2) All control measures identified in the application shall be installed;
  - (3) All control measures shall be maintained during construction; and

- (4) Such other conditions as the Erosion Control Administrator deems appropriate to ensure compliance with the specific requirements and the intent of this chapter.
- (E) *Permanent ground surface cover.* Under all circumstances, temporary control measures shall be maintained in accordance with § [151.04](#). Without exception, all disturbed areas must have permanent ground cover within six months of project completion or within six months of occupancy, whichever comes first.

(Prior Code, 8 TCC 3-5) (Amended 3-26-2008)

#### **§ 151.06 EROSION, SEDIMENT, AND STORMWATER CONTROL MEASURES.**

Before commencing any commercial, institutional, multi-family, or industrial or industrial project with an area of more than one-half acre, or a project requiring subdivision approval by a unit of local government with an area of more than one-half acre, the owner of the land or his or her representative shall be required to file an application for an erosion, sediment, and stormwater control permit.

- (A) *Application.* The applicant shall file the application with the Department on forms provided by the Department. The applicant shall supply the number of copies of application documents as provided in the application. Each application shall be accompanied by the following information:
  - (1) A map of existing site conditions on a scale of at least one inch equals 100 feet, showing the site and immediately adjacent areas and the locations of the following site information:
    - (a) Site boundaries and adjacent lands which accurately identify site location;
    - (b) Lakes, streams, wetlands, channels, ditches, and other watercourses on and immediately adjacent to the site;
    - (c) Floodways and/or Zone A of the floodplain as determined on the flood insurance rate map (FIRM) and indicating the map panel number;
    - (d) All off-site drainage onto or through the project site;
    - (e) Location and dimensions of stormwater management systems on or adjacent to site;
    - (f) Locations and dimensions of structures, roads, highways, easements, and paved areas; and
    - (g) Site topography: show contours at vertical intervals as follows:
      - 1. Slope of 6% or less: two-foot intervals;
      - 2. Slope of over 6% but less than 15%: five-foot intervals; and
      - 3. Slope of over 15%: ten- or 20-foot intervals.
  - (2) A plan of final site conditions drawn to the same scale as the existing site map submitted pursuant to division (A) (1) above, and which includes information to accurately depict post-construction appearance of site (e.g., paved areas, buildings, landscaping, and other changes to the site), along with other predominant site features (e.g., open areas, bodies of water);
  - (3) Sediment and erosion control practices. A site construction plan including:
    - (a) Locations and dimensions of all proposed land disturbing activities;
    - (b) Locations and dimensions of all temporary soil and aggregate stockpiles;
    - (c) Location, dimensions, and construction details of all construction site management control measures necessary to meet the requirements of this chapter, and including proposed re-vegetation of disturbed areas; and
    - (d) Statement regarding provisions for maintenance and maintenance requirements of the construction site management control measures during construction;

- (4) Stormwater management plans and controls. Design calculations and information related to the permanent stormwater management system for any project with a net increase of impervious area greater than one-half of an acre. For the purposes of this section, the net increase is the cumulative change since the implementation of this chapter, April 15, 1996. For example, in year one, a commercial site increases the parking lot by 20,000 square feet. In year two, the same commercial site adds a building with an area of 20,000 square feet. In year one, no permanent stormwater control measures (or calculations) are required by the chapter. In year two, stormwater calculations shall be submitted and shall be based on the total increase of 40,000 square feet of impervious area. The following information shall also be provided by the applicant:
- (a) A map showing the drainage area divides, including off-site drainage areas that drain into the site;
  - (b) Location and identification of soil types for entire watershed;
  - (c) Location and identification of vegetative cover for entire watershed;
  - (d) Runoff curve number calculations for both pre- and post-project conditions for all sub-watersheds;
  - (e) Time of concentration calculations for both pre- and post-project conditions for all sub-watersheds, and include a map showing hydraulic flow lengths used;
  - (f) Peak flow-rate calculations for two-year and 25-year storms for both pre- and post- project conditions;
  - (g) Design calculations for detention basin outlets for both two-year and 25-year storms, include stage-storage table and discharge rating curve data or outflow calculations (refer to optional form in § [151.12](#));
  - (h) Location dimensions and construction details of proposed detention basins and outlets;
  - (i) Detention volume calculations; and
  - (j) Summary of peak flow-rates for pre, post, and proposed conditions with detention showing that the requirements of the chapter are met (refer to optional form in § [151.12](#)).
- (5) Schedule or sequence of development or installation of the elements of the site management control measures proposed above;
- (6) A detailed estimate of quantities and estimated costs, prepared by a registered professional engineer, of all control measures required under this section;
- (7) A plan of the continued management and maintenance of such permanent control measures; and
- (8) An application fee shall be submitted at the time of application. The fee shall be in the amount of \$75 per acre with a minimum fee of \$450 and a maximum fee of \$3,000. However, no fee shall be required for any project, the purpose of which is agricultural. A fractional acre shall be rounded to the nearest whole acre. There shall be no refund of any fees paid and no application shall be accepted for filing unless the fee has been paid in full.
- (B) *Application review.* Within five working days of submittal of the application, the Erosion Control Administrator shall respond in writing to the sediment and erosion control practices portion. Within 20 working days the Erosion Control Administrator shall respond to the stormwater management plans and control portion of the application by either issuing a permit, issuing a request for additional information, or issuing a statement denying the permit with an explanation of cause. The application shall be deemed approved if no response is made within the time frames stipulated above.
- (C) *Financial security agreement.* Before any erosion sediment and stormwater control permit is issued, the applicant shall deliver to the Erosion Control Administrator a cash bond in the name of the county for 100% of the applicant's engineer's estimated cost for all control measures required under this section. Said cash bond will be delivered by the Erosion Control Administrator to the County Treasurer and deposited in an interest bearing

escrow account in a county bank with interest to be paid to the applicant. Each security shall be accompanied by an agreement executed by the applicant, and approved by the Erosion Control Administrator, wherein the applicant agrees to install and maintain all maintenance control measures and specifying a date of completion in accordance with this chapter. If the control measures are necessitated by construction which is also subject to [Chapter 155](#), the applicant may submit cash bond to cover 100% of both the control measures required pursuant to this section and the improvements governed by [Chapter 155](#). A signed contractor's bid that meets the specifications of the engineer's estimate for the work can be used to establish the amount of security required, if such estimate is accepted by the Erosion Control Administrator.

- (D) *Duration.* The erosion sediment and stormwater control permit shall be issued for a period not exceeding two years.
- (E) *Permit conditions.* The erosion sediment and stormwater control permit shall contain, at a minimum, the following general conditions:
  - (1) The written approval shall be obtained from the Erosion Control Administrator prior to making any modification to the approved erosion and sediment control plan as set forth in the permit;
  - (2) All control measures required in the permit shall be installed;
  - (3) All control measures shall be maintained during construction; and
  - (4) Such other conditions as the Erosion Control Administrator deems appropriate.
- (F) *Permanent ground surface cover.* Without exception, all disturbed areas must have permanent ground cover within six months of project completion or within six months of occupancy, whichever comes first.
- (G) *Final inspection-notice of permanent stormwater control measures.* Within 14 days after completion of construction, the applicant may notify the Erosion Control Administrator that the permanent stormwater control measures are ready for final inspection. If the inspection shows that the control measures and maintenance plan comply with the standards in [§ 151.12](#), the Erosion Control Administrator shall issue a notice of permanent stormwater control measures. The owner shall record the notice with the County Recorder of Deeds within 15 days after the notice is issued.

(Prior Code, 8 TCC 3-6) (Amended 3-26-2008)

#### **§ 151.07 MAINTENANCE OF PERMANENT STORMWATER CONTROL MEASURES.**

Anyone owning property with a permanent stormwater control measure existing thereon and installed pursuant to this chapter shall maintain the control measures so that it functions in compliance with the standards.

(Prior Code, 8 TCC 3-7)

#### **§ 151.08 ENFORCEMENT AND STOP WORK ORDER FEE.**

- (A) This chapter shall be administered and enforced by the Erosion Control Administrator who shall make, or cause to be made, periodic inspections of all work authorized by permits issued in accordance with this chapter to ensure that said construction is in compliance with the provisions of the same. He or she shall make, or cause to be made, investigations of violations of this chapter and shall cause any violations to be corrected.
- (B) Any permit issued pursuant to this chapter shall be revoked by the Erosion Control Administrator when he or she finds from personal inspection or from competent evidence that the rules, regulations, or standards under which said permit was issued are being violated. To defray costs of administering stop work orders posted by the field inspectors as a result of a violation of any of the terms of this chapter, a fee of \$250 per violation will be charged and an additional \$20 will be charged per day as the violation exists.

(Prior Code, 8 TCC 3-8)

#### **§ 151.09 APPEALS BOARD.**

The Appeals Board shall consider and decide upon appeals of any decision, order, or requirement of the Erosion Control Administrator made pursuant to this chapter.

- (A) The Appeals Board is hereby authorized to be established. Said Appeals Board shall consist of five members. Each County Board Chairperson of the counties adopting this chapter shall appoint one member, the Soil and Water Conservation Districts shall collectively appoint one member, and the Chairperson of the Tri-County Regional Planning Commission shall appoint one member. The members shall be professional engineers, licensed architects, licensed landscape architects, landscape contractors, earthmoving contractors, home builders, or citizens who have extensive experience in control of stormwater and soil erosion. The five members on the first Appeals Board shall draw lots to establish terms of one, two, three, four, and five years, respectively. Thereafter, as terms expire, each appointment shall be for five years.
- (B) The Chairperson of the Appeals Board shall be elected at the beginning of each calendar year from among the members by a majority of the members.
- (C) All decisions of the Appeals Board must receive the support of a majority of its members. A majority of the members of the Appeals Board shall constitute a quorum for the transaction of business; and all questions which shall arise at meetings shall be determined by the votes of the majority of members present. The Appeals Board shall keep minutes of its proceedings showing the vote of each member upon every question or, if absent or failing to vote, indicating such facts, and shall keep records of its examinations and other official actions. Every rule, and every order, requirement, decision, or determination of the Appeals Board shall immediately be filed in the office of the Board and shall be a public record. The concurring vote of three members of the Appeals Board shall be necessary to reverse any order, requirement, decision, or determination of the Erosion Control Administrator. The Appeals Board shall adopt its own rules of procedure not in conflict with state law or this chapter.

(Prior Code, 8 TCC 3-10)

#### **§ 151.10 APPEALS TO APPEALS BOARD.**

- (A) Any person directly aggrieved by any decision, order, requirement, or determination of the Erosion Control Administrator made pursuant to this chapter shall have the right to appeal such action to the Appeals Board. Such appeal shall be made within 35 days from the date of the action appealed from, shall be filed in writing, and shall include a short, concise statement of why the action is being appealed. The fee for such an appeal shall be \$45 payable to the Commission and is due with the application. In addition, the person filing the appeal shall pay all required publication costs associated with the appeal.
- (B) Upon receipt of a notice of appeal, the Commission shall set a date for a public hearing before the Appeals Board. Such public hearing shall commence not sooner than 15 days nor more than 30 days after the date of receipt of the notice of appeal. At least 15 days' notice of the time and place of such hearing shall be published in a newspaper of general circulation in the county. The Appeals Board shall decide the appeal within seven days after the conclusion of the public hearing. The Appeals Board may affirm, modify, or reverse any appealed action.

(Prior Code, 8 TCC 3-11)

#### **§ 151.11 APPEALS TO COURT.**

Appeals from the Appeals Board shall be made in conformity with the provisions of the state's Administrative Review Act, 735 ILCS 5/3-101 et seq. Copies of any orders or proceedings ordered by the appellant shall be furnished to him or her at his or her own cost.

(Prior Code, 8 TCC 3-12)

#### **§ 151.12 STANDARD FOR STORMWATER DESIGN ANALYSIS.**

The following are the minimum standard methods and procedures to be used to comply with this chapter. If an applicant determines that different methods are necessary based on site-specific conditions, the applicant must request approval from the Erosion Control Administrator to use other methods prior to submittal.

- (A) *Design methods.* The design methods listed below are readily available in a number of computer programs, including the Soil Conservation Service's TR 20 (SCS) and HEC-1 (U.S. Army Corps of Engineers). Additionally, a simplified methodology which is based on the use of these methods is available in TR 55 (SCS, 1986). TR 55 can be applied using either manual computations or a computerized version.



- (1) *Rainfall depth and intensity data.* Use data for the county from the state's water survey, BUL-70/89, 1989, as presented in division (B) below and graphically in division (C) below.
- (2) *Storm event rainfall runoff.* Use the SCS Runoff Curve Number Method to determine rainfall runoff depth. See divisions (D) and (F) through (H) below from TR 55. Soil type information is available from the SCS county soil survey, 1992.
- (3) *Storm distribution (cumulative rainfall versus time).* Use the SCS Type II storm distribution. See divisions (J) and (K) below.
- (4) *Runoff hydrograph.* Use the SCS dimensionless hydrograph. See SCS (1974) for information regarding this procedure. As a substitute for detailed hydrograph analysis, TR 55 (SCS, 1986) can be used, either manually or computer program.
- (5) *Storage routing (detention pond analysis).* Use the continuity equation, also known as the Modified-Puls and Storage Indication Methods. As a substitute for detailed storage routing of a hydrograph, TR 55 (SCS, 1986) can be used, either manually or computer program. If TR 55 is used and a detention basin with a two-stage outlet control structure including a rectangular weir and/or orifice outlet is included as a part of the control measures, use the attached detention basin outlet worksheet to determine and present the structure design information.

(B) *Table 1, rainfall depth, duration, and frequency.*

Duration	Rainfall Depth (inches) for Given Frequency					
	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
5-min.	0.36	0.45	0.53	0.64	0.73	0.83
10-min.	0.66	0.83	0.98	1.17	1.34	1.52
15-min.	0.81	1.02	1.20	1.44	1.64	1.87
30-min.	1.12	1.39	1.64	1.97	2.25	2.56
1-hr.	1.42	1.77	2.09	2.50	2.86	3.25
2-hr.	1.78	2.22	2.62	3.14	3.59	4.08
3-hr.	1.93	2.41	2.85	3.41	3.89	4.43
6-hr.	2.26	2.82	3.33	3.99	4.56	5.19
12-hr.	2.62	3.27	3.87	4.63	5.29	6.02
18-hr.	2.75	3.46	4.09	4.90	5.59	6.37
24-hr.	3.02	3.76	4.45	5.32	6.08	6.92
48-hr.	3.38	4.19	4.86	5.78	6.62	7.51
72-hr.	3.70	4.55	5.26	6.15	7.25	8.16
5-day	4.17	5.11	5.84	6.96	7.98	9.21
10-day	5.12	6.27	7.10	8.19	9.10	10.18

Source: ISWS/BUL-70/89

(C) Figure 1, rainfall depth, duration, and frequency data.

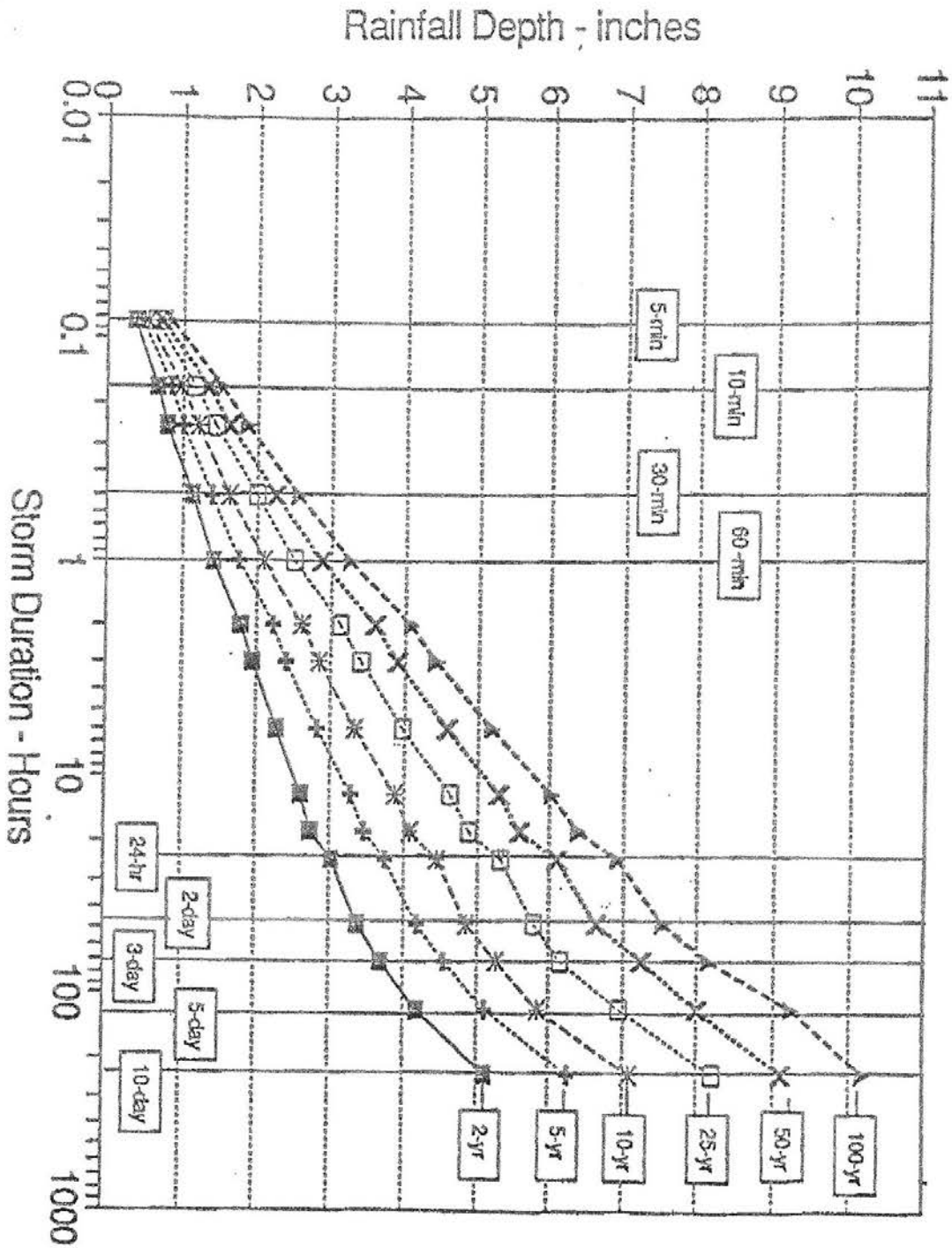
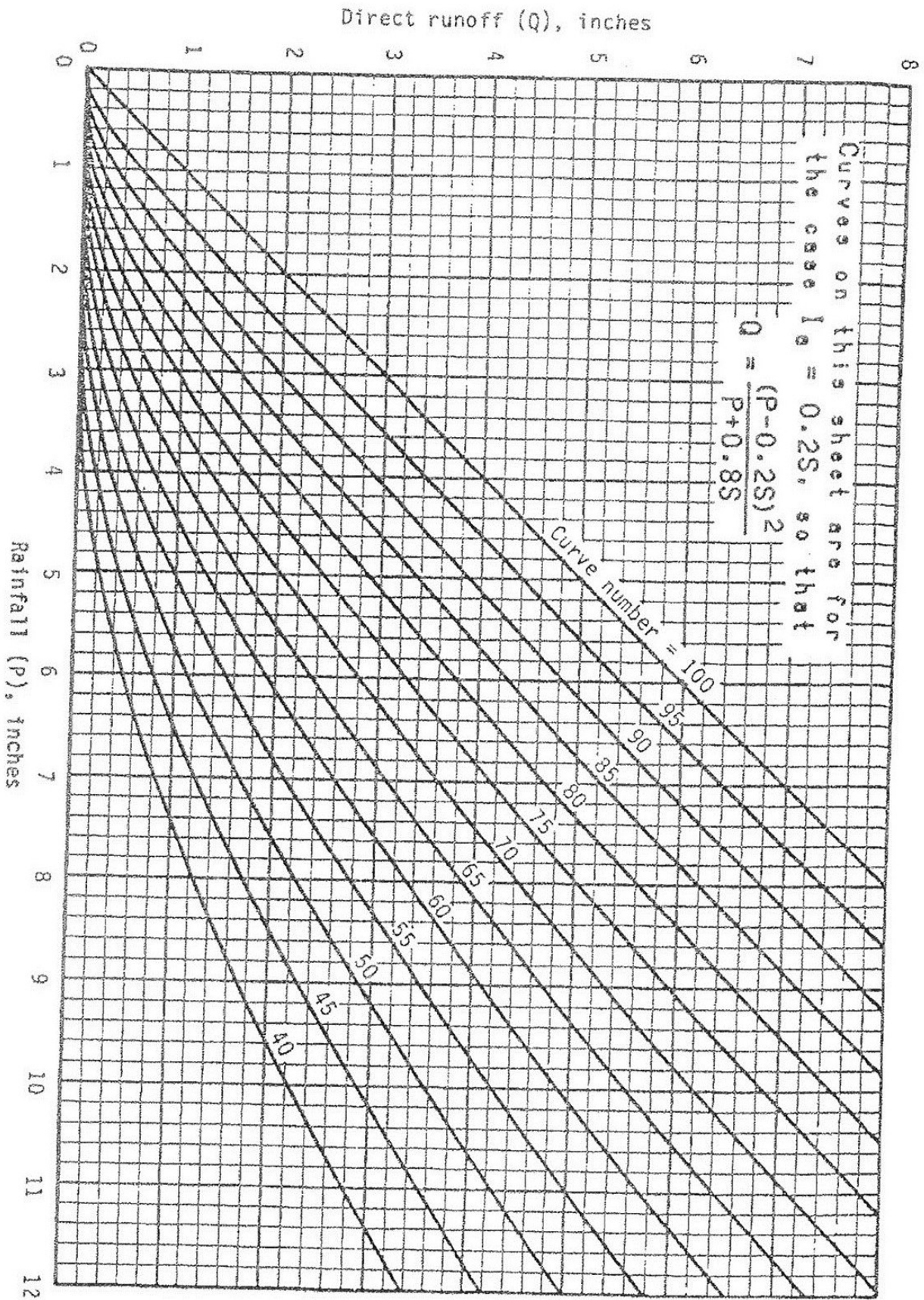


Figure 1. Rainfall Depth-Duration-Frequency Data

(D) Figure 2.1, solution of runoff equation.



(E) *Estimating runoff.*

(1) *SCS Runoff Curve Number Method.*

- (a) The SCS Runoff Curve Number (Cn) Method is described in detail in NEH-4 (SCS 1985). The SCS runoff equation is (Eq. 2-1):

$$Q = \frac{(P - I_a)^2}{(P - I_a) + S}$$

- (b) Where: Q = runoff (in.); P = rainfall (in.); S = potential maximum retention after runoff begins (in.); and  $I_a$  = initial abstraction (in.).
- (c) Initial abstraction ( $I_a$ ) is all losses before runoff begins. It includes water retained in surface depressions, water intercepted by vegetation, evaporation, and infiltration.  $I_a$  is highly variable but generally is correlated with soil and cover parameters. Through studies of many small agricultural watersheds,  $I_a$  was found to be approximated by the following empirical equation (Eq. 2-2):

$$I_a = 0.2S$$

- (d) By removing  $I_a$  as an independent parameter, this approximation allows use of a combination of S and P to produce a unique runoff amount. Substituting equation 2-2 into equation 2-1 gives (Eq. 2-3):

$$Q = \frac{(P - 0.2S)^2}{(P - 0.8S)}$$

- (e) S is related to the soil and cover conditions of the watershed through the CN. CN has a range of 0 to 100, and S is related to CN by (Eq. 2-4):

$$S = \frac{1,000}{CN} - 10$$

- (f) Division (D) above and table 2-1 solve equations 2-3 and 2-4 for a range of CNs and rainfall.

(2) *Factors considered in determining runoff curve numbers.*

- (a) The major factors that determine CN are the hydrologic soil group (HSG), cover type, treatment, hydrologic condition, and antecedent runoff condition (ARC). Another factor considered is whether impervious areas outlet directly to the drainage system (connected) or whether the flow spreads over pervious areas before entering the drainage system (unconnected). Figure 2-2 is provided to aid in selecting the appropriate figure or table for determining curve numbers.
- (b) CNs in divisions (F) through (H) represent average antecedent runoff condition for urban, cultivated agricultural, other agricultural, and arid and semiarid rangeland uses. Divisions (F) through (H) assumes impervious areas are directly connected. The following sections explain how to determine CNs and how to modify them for urban conditions.

(3) *Hydrologic soil groups.*

- (a) Infiltration rates of soils vary widely and are affected by subsurface permeability as well as surface intake rates. Soils are classified into four HSGs (A, B, C, and D) according to their minimum infiltration rate, which is obtained for bare soil after prolonged wetting. This section defines the four groups and provides a list of most of the soils in the United States and their group classification. The soils in the area of interest may be identified from a soil survey report, which can be obtained from local SCS offices or soil and water conservation district offices.
- (b) Most urban areas are only partially covered by impervious surfaces; the soil remains an important factor in runoff estimates. Urbanization has a greater effect on runoff in watersheds with soils having high infiltration rates (sands and gravels) than in watersheds predominantly of silts and clays, which generally have low infiltration rates.

- (c) Any disturbance of a soil profile can significantly change its infiltration characteristics. With urbanization, native soil profiles may be mixed or removed or fill material from other areas may be introduced. Therefore, a method based on soil texture is given in Exhibit 2.2 for determining the HSG classification for disturbed soils.
- (4) *Cover type.* Divisions (F) through (H) below address most cover types, such as vegetation, bare soil, and impervious surfaces. There are a number of methods for determining cover type. The most common are field reconnaissance, aerial photographs, and land use maps.
- (5) *Treatment.* Treatment is a cover type modifier (used only in division (G) below) to describe the management of cultivated agricultural lands. It includes mechanical practices, such as contouring and terracing, and management practices, such as crop rotations and reduced or no tillage.
- (6) *Hydrologic condition.* Hydrologic condition indicates the effect of cover type and treatment on infiltration and runoff and is generally estimated from density of plan and residue cover on sample areas. Good hydrologic condition indicates that the soil usually has a low runoff potential for that specific hydrologic soil group, cover type, and treatment. Some factors to consider in estimating the effect of cover on infiltration and runoff are canopy or density of lawns, crops, or other vegetative areas; amount of year-round cover; amount of grass or close-seeded legumes in rotations; percent of residue cover; and degree of surface roughness.
- (7) *Antecedent runoff condition.* The index of runoff potential before a storm event is the antecedent runoff condition (ARC). ARC is an attempt to account for the variation in CN at a site from storm to storm. CN for the average ARC at a site is the median value as taken from sample rainfall and runoff data. The CNs in divisions (F) through (H) are for the average ARC, which is primarily used for design applications. See the SCS NEH-4 and Rallison and Miller for more detailed discussion of storm to storm variation and a demonstration of upper and lower enveloping curves.
- (8) *Urban impervious area modifications.* Several factors, such as the percentage of impervious area and the means of conveying runoff from impervious areas to the drainage system, should be considered in computing CN for urban areas. For example, do the impervious areas connect directly to the drainage system, or do they outlet onto lawns or other pervious areas where infiltration can occur?
- (9) *Connected impervious areas.*
  - (a) An impervious area is considered connected if runoff from it flows directly into the drainage system. It is also considered connected if runoff from it occurs as concentrated shallow flow that runs over a pervious area and then into a drainage system.
  - (b)
    1. Urban CNs, division (F) below, were developed for typical land use relationships based on specific assumed percentages of impervious area.
    2. These CN values were developed on the assumptions that pervious urban areas are equivalent to pasture in good hydrologic condition and impervious areas have a CN of 98 and are directly connected to the drainage system.
    3. Some assumed percentages of impervious area are shown in division (F) below.

(F) *Runoff curve numbers for urban areas*<sup>1</sup>:

Cover Description	Average percent impervious area <sup>2</sup>	Curve Numbers for Hydrologic Soil Group			
		A	B	C	D
<i>Fully developed urban areas (vegetation established):</i>					
Open space (lawns, parks, golf courses, cemeteries, etc.):					
Poor condition (grass cover < 50%).....		68	79	86	89
Fair condition (grass cover 50% to 75%).....		49	69	79	84
Good condition (grass over > 75%).....		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way).....		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way).....		83	89	92	93
Gravel (including right-of-way).....		76	85	89	91
Dirt (including right-of-way).....		72	82	87	89
Urban districts:					
Commercial and business.....	85	89	92	94	95
Industrial.....	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (townhouses).....	65	77	85	90	92
1/4 acre.....	38	61	75	83	87
1/3 acre.....	30	57	72	81	86
1/2 acre.....	25	54	70	80	85
1 acre.....	20	51	68	79	84
2 acres.....	12	46	65	77	82
<i>Developing urban areas:</i>					
Newly graded areas (pervious areas only, no vegetation).....		77	86	91	94

1 Average runoff condition and  $I_a = 0.2S$ .

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: Impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and

pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using Figure 2-3 or 2-4 in TR 55.

Source: SCS TR 55, 1986.

(G) *Runoff curve numbers for agricultural lands*<sup>1</sup>.

Cover Description			Curve Numbers for Hydrologic Soil Group			
Cover type	Treatment 2	Hydrologic Condition 3	A	B	C	D
Fallow	Bare soil	--	77	86	91	94
	Crop residue cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row Crops	Straight row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & terraced (C&T)	Poor	66	74	80	82
		Good	62	71	78	81
	C&T + CR	Poor	65	73	79	81
		Good	61	70	77	80
Small Grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C&T	Poor	61	72	79	82
		Good	59	70	78	81
	C&T + CR	Poor	60	71	78	81
		Good	58	69	77	80
Close-seeded or	SR	Poor Good	66 58	77 72	85 81	89 85

broadcast						
legumes or rotation	C	Poor Good	64 55	75 69	83 78	85 83
meadow	C&T	Poor Good	63 51	73 67	80 76	83 80

1 Average runoff condition and  $1_a = 0.2S$ .

2 Crop residue cover applies only if residue is on at least 5% of the surface throughout the year.

3 Hydrologic condition is based on combination of factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes in rotations, (d) percent of residue cover on land surface (good  $\geq 20\%$ ), and (e) degree of surface roughness.

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

Source: SCS TR 55, 1986.

(H) *Runoff curve numbers for other agricultural lands*<sup>1</sup>.

Cover Description	Hydrologic Condition 3	Curve Numbers for Hydrologic Soil Group			
		A	B	C	D
Pasture, grassland, or range-- Continuous forage for grazing 2	Poor Fair Good	68 49 39	79 69 61	86 79 74	89 84 80
Meadow-- Continuous grass, protected from grazing and generally mowed for hay	Poor	30	58	71	78
Brush-- Brush-weed-grass mixture with brush the major element 3	Poor Fair Good	48 35 30 4	67 56 48	77 70 65	83 77 73
Woods-- Grass combination (orchard or tree farm) 5	Poor Fair Good	57 43 32	73 65 58	82 76 72	86 82 79
Woods 6	Poor Fair Good	45 36 30 4	66 60 55	77 73 70	83 79 77
Farmsteads-- Buildings, lanes, driveways, and surrounding lots	Poor	59	74	82	86



- 1 Average runoff condition and  $I_a = 0.2S$ .
  - 2 Poor: <50% ground cover or heavily grazed with no mulch.  
Fair: 50 to 75% ground cover and not heavily grazed.  
Good: >75% ground cover and lightly or only occasionally grazed.
  - 3 Poor: <50% ground cover.  
Fair: 50 to 75% ground cover.  
Good: >75% ground cover.
  - 4 Actual curve number is less than 30; use CN=30 for runoff computations.
  - 5 CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.
  - 6 Poor: Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.  
Fair: Woods are grazed but not burned, and some forest litter covers the soil.  
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.
- Source: SCS TR 55, 1986.

(I) Computation sheet.

**COMPUTATION SHEET**  
**FOR 2-STAGE DETENTION BASIN OUTLET DESIGN**  
(to be used with TR 55 worksheet 6a or computer printout for storage routing)

Project Name: \_\_\_\_\_ Structure ID: \_\_\_\_\_ Date: \_\_\_\_\_

Note: attach TR 55 worksheet 6a or computer printout with basin routing information

**First Stage**

Maximum stage for two-year storm ( $E_{2\text{-yr}}$ ) = \_\_\_\_\_ ft

First stage control elevation ( $E_1$ ) = \_\_\_\_\_ ft

Head on first stage structure ( $H_{2\text{-yr}} = E_{2\text{-yr}} - E_1$ ) = \_\_\_\_\_ ft

Allowable discharge for two-year storm ( $q_{2\text{-yr}}$ ) = \_\_\_\_\_ cfs

For rectangular weir outlet:

$$\text{Required weir length } L_1 = q_{2\text{-yr}} / (3.2 * H_{2\text{-yr}}^{1.5}) = \frac{\text{_____}}{(3.2 * \text{_____}^{1.5})}$$
$$= \text{_____ ft}$$

For orifice outlet:

$$\text{Required orifice area } A_1 = q_{2\text{-yr}} / (4.98 * H_{2\text{-yr}}^{0.5}) = \frac{\text{_____}}{(4.98 * \text{_____}^{0.5})}$$
$$= \text{_____ sq ft}$$

**Second Stage**

Maximum stage for twenty-five-year storm ( $E_{25\text{-yr}}$ ) = \_\_\_\_\_ ft

Second stage control elevation ( $E_2$ ) = \_\_\_\_\_ ft

Head on second stage structure ( $H_{25\text{-yr}} = E_{25\text{-yr}} - E_2$ ) = \_\_\_\_\_ ft

Allowable discharge for twenty-five-year storm ( $q_{25\text{-yr}}$ ) = \_\_\_\_\_ cfs

Twenty-five-year storm discharge through first stage:

$$\text{Weir: } q' = 3.2 * L_1 * (E_{25\text{-yr}} - E_1)^{1.5} = 3.2 * \text{_____} * (\text{_____} - \text{_____})^{1.5}$$
$$= \text{_____ cfs}$$

$$\text{Orifice: } q' = 4.98 * A_1 * (E_{25\text{-yr}} - E_1)^{0.5} = 4.98 * \text{_____} * (\text{_____} - \text{_____})^{0.5}$$
$$= \text{_____ cfs}$$

Allowable discharge through second stage ( $q''$ )  $q_{25\text{-yr}} - q' = \text{_____ cfs}$

For rectangular weir outlet:

$$\text{Required weir length } L_2 = q'' / (3.2 * H_{25\text{-yr}}^{1.5})$$
$$= \frac{\text{_____}}{(3.2 * \text{_____}^{1.5})} = \text{_____ ft}$$

For orifice outlet:

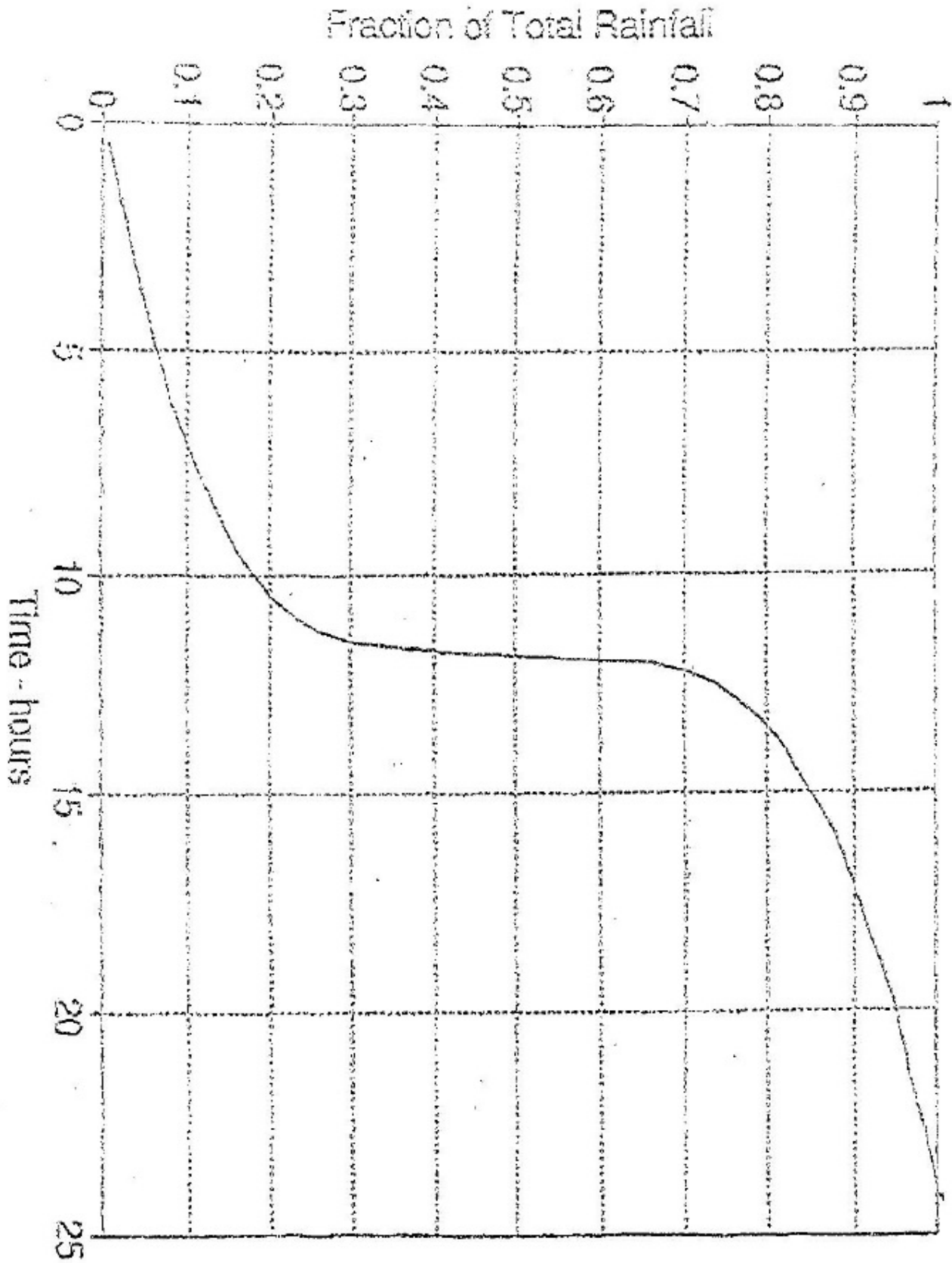
$$\text{Required orifice area } A_2 = q'' / (4.98 * H_{25\text{-yr}}^{0.5})$$
$$= \frac{\text{_____}}{(4.98 * \text{_____}^{0.5})} = \text{_____ sq}$$

(J) SCS Type II rainfall distribution.

Time		
Hour	Fraction of Total	Fraction of Total Rainfall
0.50	0.021	0.005
1.00	0.042	0.011
1.50	0.063	0.017
2.00	0.083	0.023
2.50	0.104	0.029
3.00	0.125	0.035
3.50	0.146	0.042
4.00	0.167	0.049
4.50	0.188	0.056
5.00	0.208	0.064
5.50	0.229	0.072
6.00	0.250	0.080
6.50	0.271	0.090
7.00	0.292	0.100
7.50	0.313	0.110
8.00	0.333	0.120
8.50	0.354	0.134
9.00	0.375	0.147
9.50	0.396	0.163
10.00	0.417	0.181
10.50	0.438	0.204
11.00	0.458	0.235
11.25	0.468	0.260
11.50	0.479	0.300
11.75	0.490	0.420

Time		
Hour	Fraction of Total	Fraction of Total Rainfall
12.00	0.500	0.663
12.25	0.510	0.710
12.50	0.521	0.735
13.00	0.542	0.772
13.50	0.563	0.799
14.00	0.583	0.820
14.50	0.604	0.835
15.00	0.625	0.850
15.50	0.646	0.865
16.00	0.667	0.880
16.50	0.688	0.889
17.00	0.708	0.898
17.50	0.729	0.907
18.00	0.750	0.916
18.50	0.771	0.925
19.00	0.792	0.934
19.50	0.813	0.943
20.00	0.833	0.952
20.50	0.854	0.958
21.00	0.875	0.964
21.50	0.896	0.970
22.00	0.917	0.976
22.50	0.938	0.982
23.00	0.958	0.988
23.50	0.979	0.994
24.00	1.000	1.000

(K) Figure 3, SCS Type II storm distribution.



**§ 151.13 SEDIMENT CONTROL.**

(A) *General provisions.*

- (1) There are three ways to accomplish urban soil erosion and sedimentation control:
  - (a) Allow erosion to take place and then control sediment before it leaves a site;
  - (b) Stop erosion in the watershed (project area) by soil stabilization or runoff control measures; and
  - (c) A combination of the two (most desirable).
- (2) The following is a list of common measures that can be used to control erosion and sediment. It is by no means an exhaustive list. Some standard drawings are included in this appendix. Additional drawings, standards, and specifications can be found in the *Illinois Urban Manual*, IEPA and USDA, NRCS, 1995 and the *Illinois Standards for Urban Soil Erosion and Sediment Control*, the Urban Committee of the Association of the state's Soil and Water Conservation Districts, revised July 1988.

(B) *Control measures.*

- (1) (a) Perimeter sediment control measures are to be installed between disturbed areas (including stockpiles) and property lines or drainage ways in order to protect off-site areas.
- (b) Control measures should be installed on the down-slope sides of the disturbed areas where runoff will leave the site.
- (2) Control measures for different slopes.

Slope Range	Control Measure	Comments
less than 2%	Vegetative (grass) filter strips; no minimum width requirement	
2% to <5%	Vegetative (grass) filter strips; 10' wide, minimum	Size should be increased in proportion to the drainage area and slope
	Filter fence	Drainage area less than 1/2 acre per 100 feet; see standard for spacing criteria
	Straw bales	For use in small drainage areas; see standard for spacing criteria; maximum life is 3 months
	Vegetative buffer area (other than grass), about 50' wide, minimum	Minimizing disturbed areas is desirable; increase buffer size in proportion to drainage area and slope
	Sediment basin	Can handle sediment from a larger area
5% to <10%	Vegetative (grass) filter strips 20' wide, minimum	Size should be increased in proportion to the drainage area and slope
	Filter fence	Drainage area less than 1/2 acre per 100 ft.; see standard for spacing criteria
	Straw bales	For use in small drainage areas; see standard for spacing criteria; maximum life is 3 months
	Vegetative buffer area (other than grass), about 100' wide, minimum	Minimizing disturbed areas is desirable; increase buffer size in proportion to drainage area and slope
	Sediment basin	Can handle sediment from a larger area
>10%	Filter fence	Drainage area less than 1/2 acre per 100 ft.; see standard for spacing criteria
	Sediment basin	Can handle sediment from a larger area

- (3) (a) Inlet sediment control is to be installed around storm sewer or other inlets to prevent sediment from entering the system. There are many different types depending on the type of inlet.
- (b) Common measures include:
  - 1. Inlet protection - excavated drain (division (F) below);
  - 2. Inlet protection - block and gravel (division (G) below); and
  - 3. Inlet protection - staked straw bales (division (H) below).
- (4) (a) Mud and dust control is used to prevent mud and dust from leaving the site.
- (b) Common measures include:
  - 1. Stabilized construction entrance (division (I) below); and
  - 2. Dust control, see the standards and specifications.

(C) *Runoff control.*

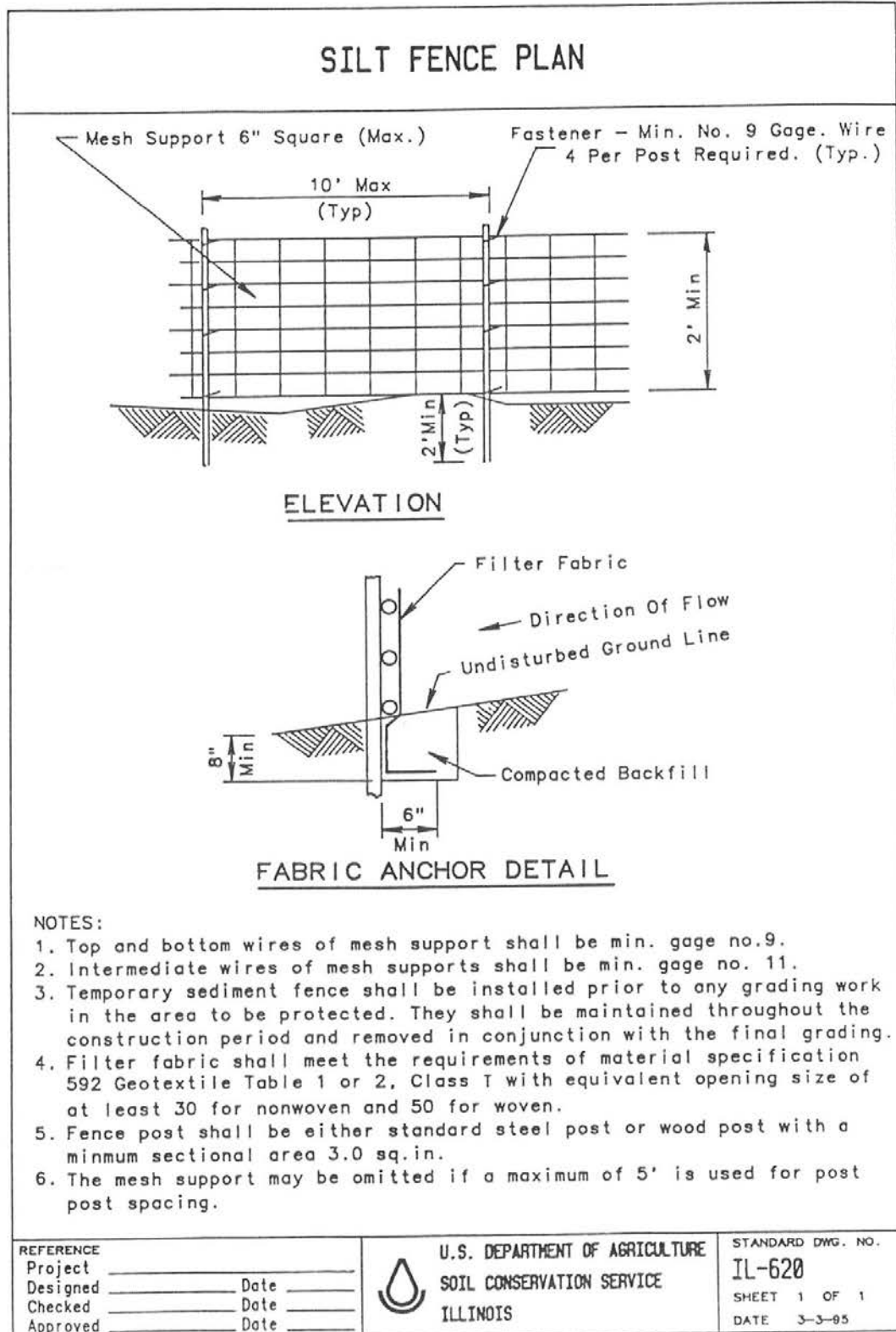
- (1) *Concentrated flow areas.*
  - (a) Temporary erosion control measures should be installed to protect drainage ways such as road ditches and waterways until the area is permanently stabilized.
  - (b) Common measures include:
    - 1. Rock checks for waterways (division (J) below);
    - 2. Fabric checks for waterways (division (K) below); and
    - 3. Erosion blanket.
- (2) *Outlet protection.*
  - (a) All outlets should be stabilized to prevent downstream areas from erosion.
  - (b) Common practices include:
    - 1. Pipe outlet channel (division (L) below); and
    - 2. Pipe outlet to flat area.
- (3) *Diversions.* Surface runoff from adjacent areas should be diverted around disturbed areas to stable outlets to reduce erosion due to surface runoff.

(D) *Soil stabilization.* (Recommended seeding dates for central Illinois are shown in bold.)

- (1) *Vegetative soil cover.*
  - (a) Temporary seeding is provided a temporary quick cover to control erosion when permanent seeding is not desired or the time of year is inappropriate. (**Early Spring - September 30.**)
  - (b) Permanent seeding provides permanent vegetative cover to control erosion, filters sediment from water; may be part of final landscaping plan. (**Spring seeding: early Spring - May 15; Fall seeding: August 1 - September 10.**)
  - (c) Dormant seeding is the same as permanent seeding except seeding is done during dormant season. Higher rates of seed application are required. If no mulch is applied, then perimeter controls should be maintained until the vegetation is established. (**November 15 - March 1.**)

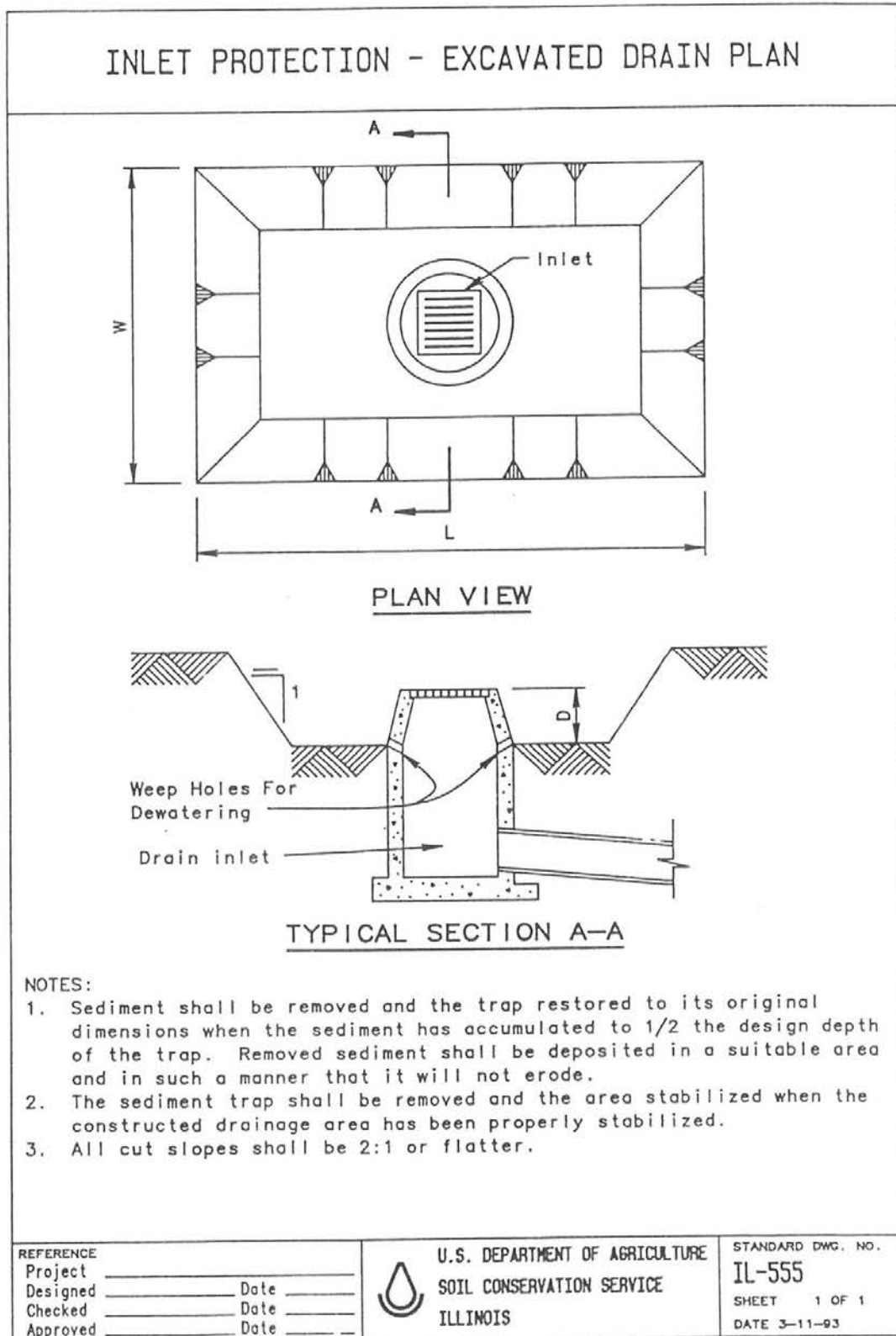
- (d) Sodding is quick, permanent cover to control erosion; quick way to establish vegetative filter strip; and can be used on steep slopes or in drainage ways where seeding may be difficult. (**Anytime, except when the ground is frozen.**)
  - (e) Ground cover provides ground cover, shrubs, and trees in addition to permanent vegetation; may be used as part of a final landscape plan along with shrubs and trees.
- (2) *Non-vegetative soil cover.*
- (a) Mulching provides added insurance of a successful temporary or permanent seeding, controls unwanted vegetation and preserves moisture, and provides cover where vegetation cannot be established.
  - (b) Aggregate cover provides soil cover on roads and parking lots and areas where vegetation cannot be established; prevents mud from being picked up and transported off-site.
  - (c) Paving provides permanent cover on parking lots, roads, or other areas where vegetation cannot be established.

(E) Silt fence plan.

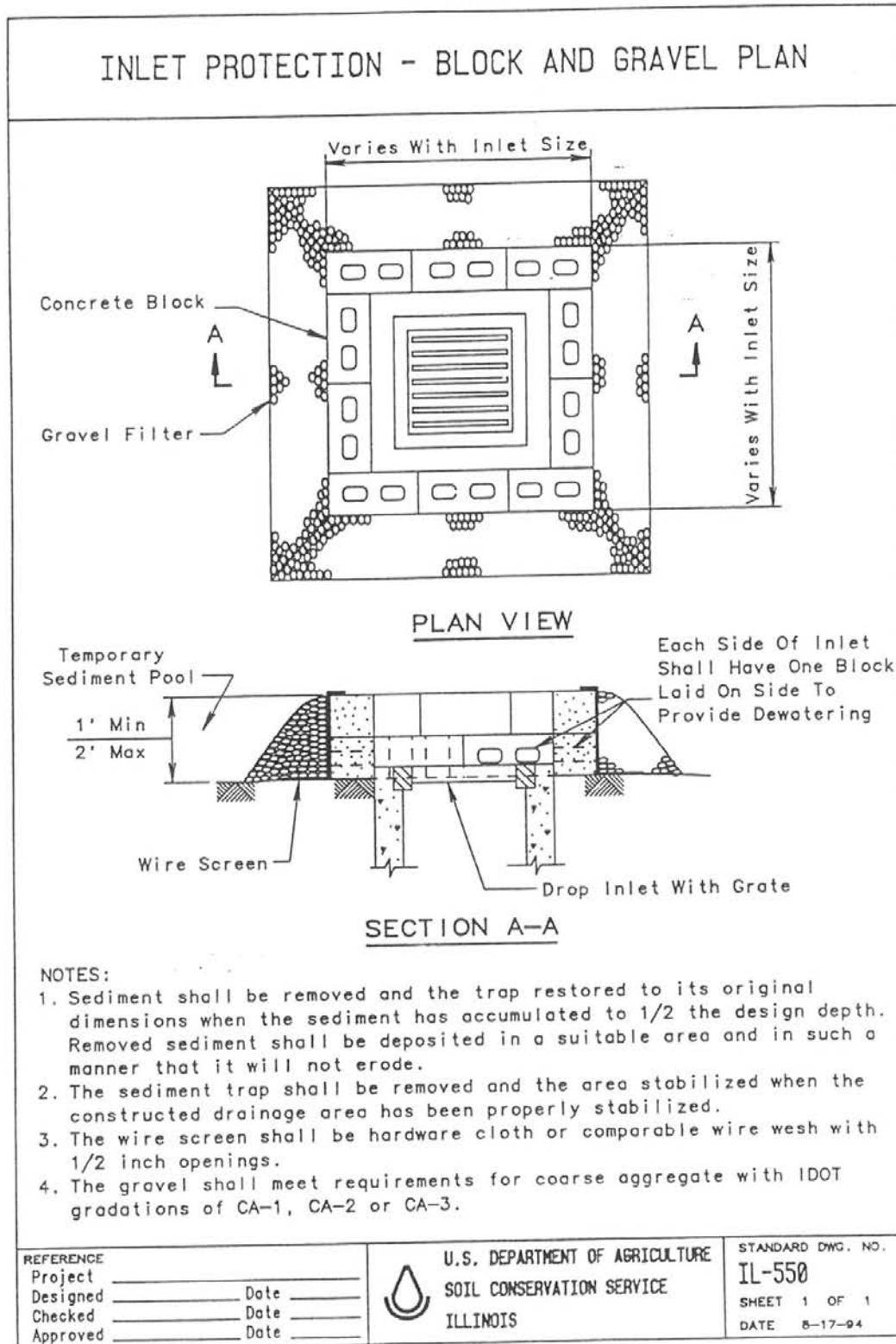




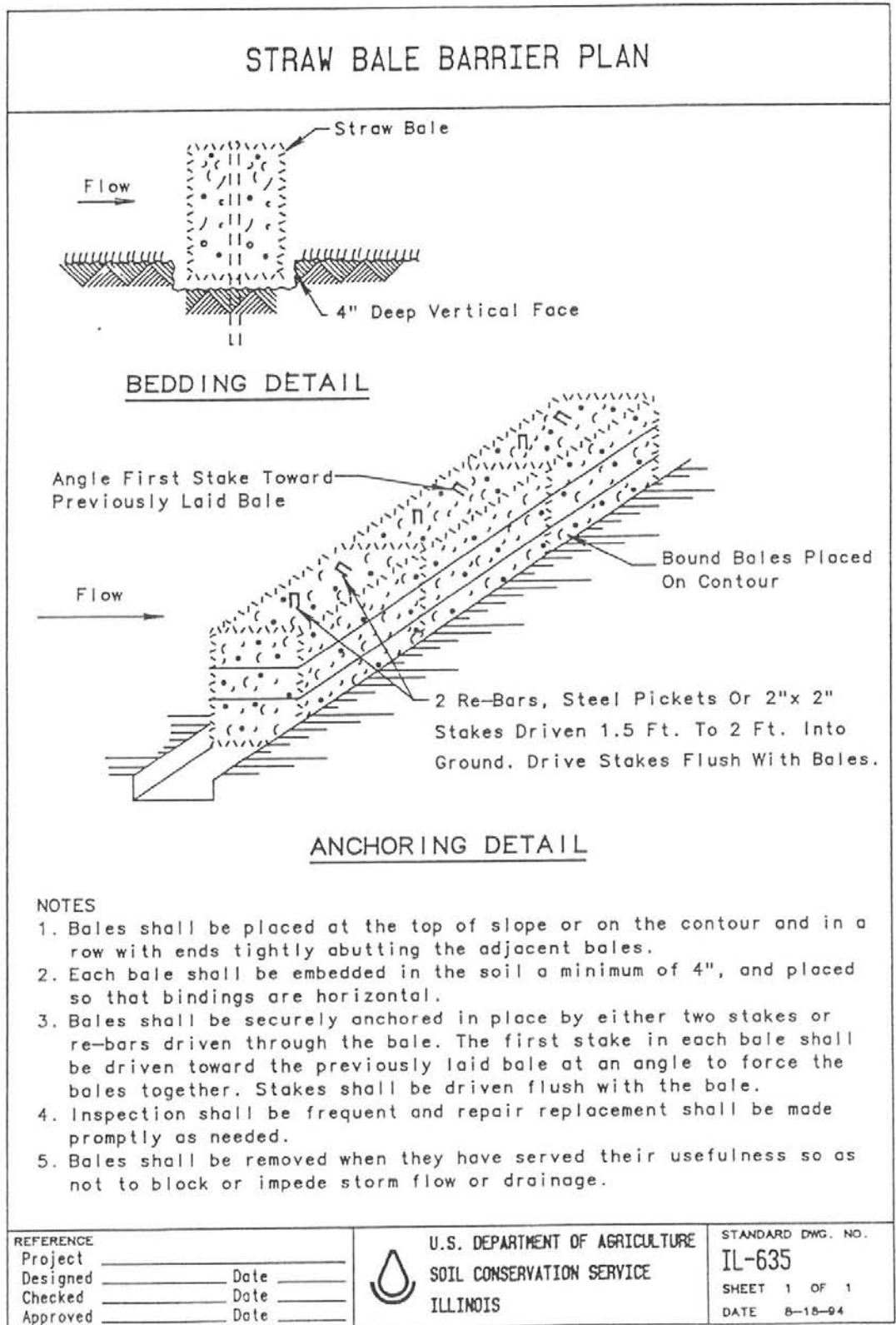
(F) Inlet protection, excavated drain plan.



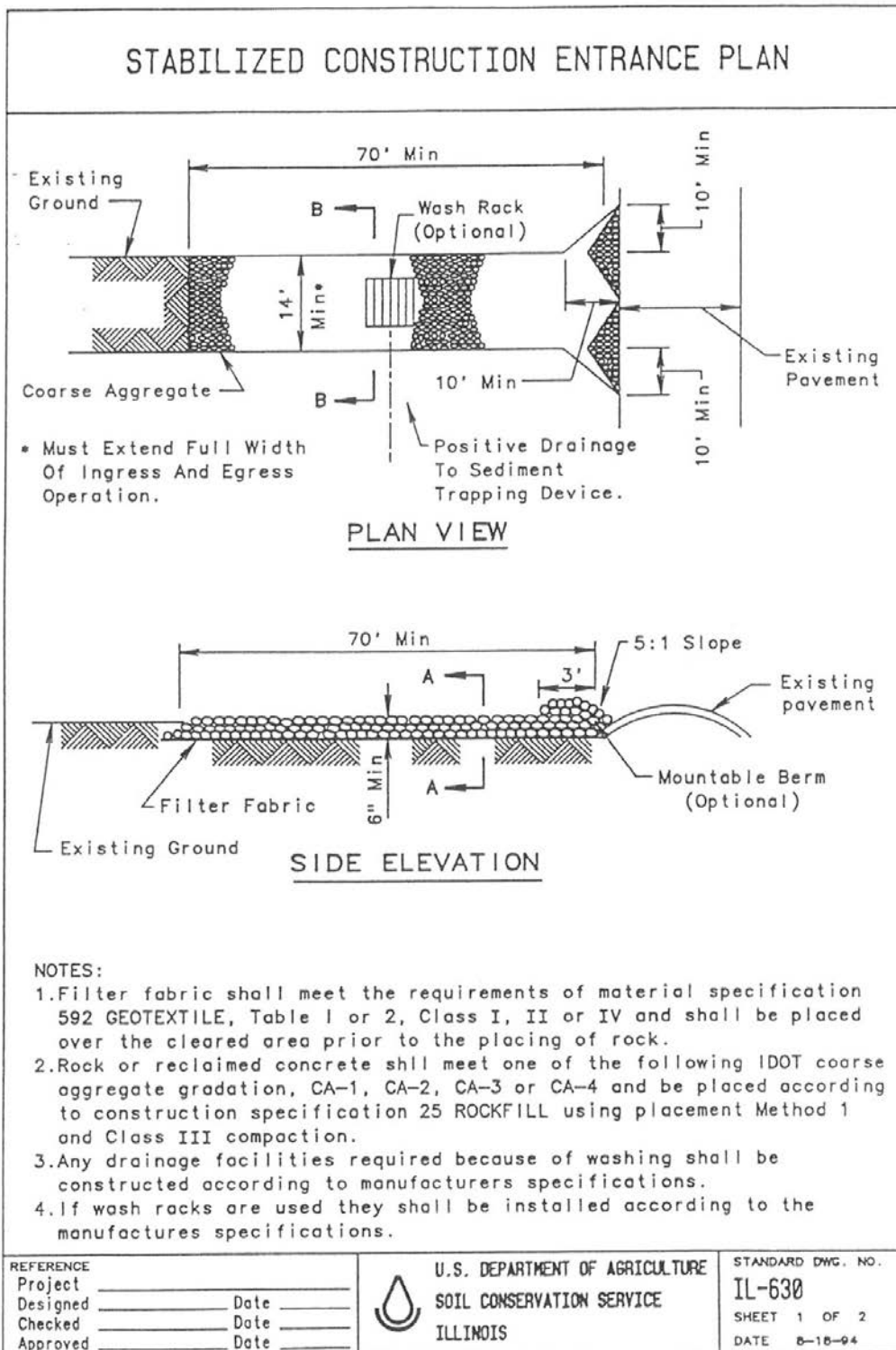
(G) Inlet protection, block and gravel plan.



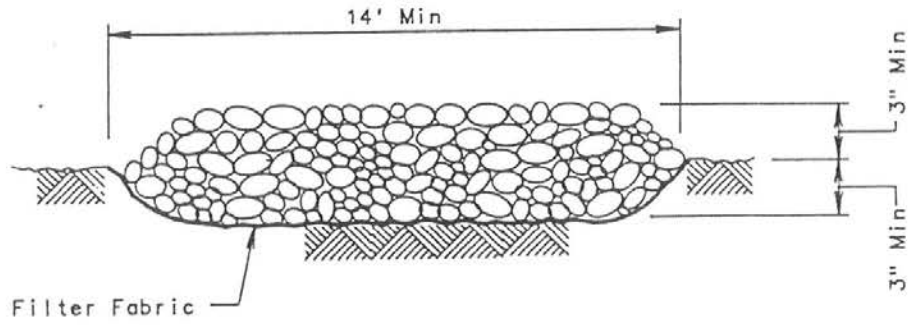
(H) Straw bale barrier plan.



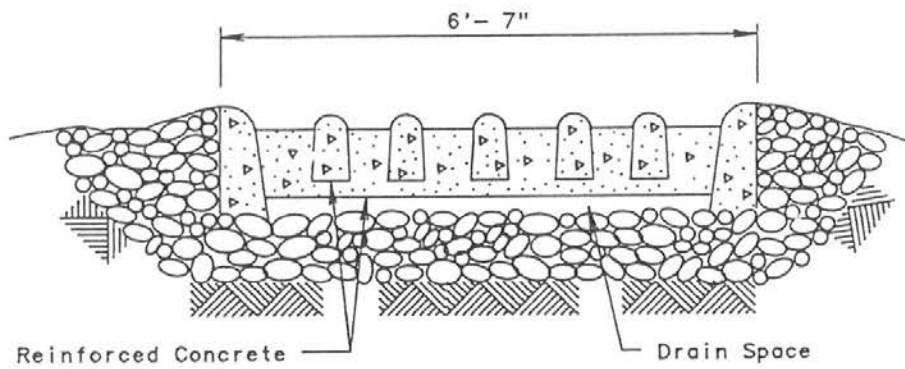
(I) Stabilized construction entrance plan.



# STABILIZED CONSTRUCTION ENTRANCE PLAN



SECTION A-A



SECTION B-B

REFERENCE  
 Project \_\_\_\_\_  
 Designed \_\_\_\_\_ Date \_\_\_\_\_  
 Checked \_\_\_\_\_ Date \_\_\_\_\_  
 Approved \_\_\_\_\_ Date \_\_\_\_\_



U.S. DEPARTMENT OF AGRICULTURE  
 SOIL CONSERVATION SERVICE  
 ILLINOIS

STANDARD DWG. NO.  
**IL-630**  
 SHEET 2 OF 2  
 DATE 8-18-94

## ROCK CHECKS FOR WATERWAYS

**PLAN VIEW**

**SECTION A-A**

WATERWAY NUMBER ..... \_\_\_\_\_

FROM STATION ..... \_\_\_\_\_

TO STATION ..... \_\_\_\_\_

CHECK SPACING (X) .. \_\_\_\_\_

CHECK WIDTH (2/3 TW) \_\_\_\_\_

**BILL OF MATERIALS**

Rock - IDOT RR3, or equivalent - \_\_\_\_\_ Tons

**NOTES:**

1. Excavate trench 12 inches wide or one backhoe bucket wide, whichever is greater.
2. Compact rock backfill by rolling with construction equipment.
3. Finished rock surface will be flush with the ground surface when completed.

**LOCATION PLAN**

County \_\_\_\_\_

Sec. \_\_\_\_\_ T \_\_\_\_\_ R \_\_\_\_\_

<p><b>REFERENCE</b></p> <p>Project _____</p> <p>Designed _____ Date _____</p> <p>Checked _____ Date _____</p> <p>Approved _____ Date _____</p>	<p>U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE ILLINOIS</p>	<p>STANDARD DWG. NO. <b>IL-541</b></p> <p>SHEET 1 OF 2</p> <p>DATE 8-17-94</p>
--	--	--

## ROCK CHECKS FOR WATERWAYS

### ROCK CHECK SPACING

WATERWAY GRADE %	MAXIMUM SPACING FT.
0 - 1.5	100
1.5 - 3.0	75
> 3.0	50

### ROCK QUANTITIES IN TONS - PER ROCK CHECK

DEPTH (In.)	ROCK CHECK WIDTH - 2/3 TW - IN FEET										
	10	12	14	16	18	20	22	24	26	28	30
15	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.1	4.4
18	1.8	2.1	2.5	2.8	3.2	3.6	3.9	4.3	4.6	5.0	5.3
24	2.4	2.8	3.3	3.8	4.3	4.7	5.2	5.7	6.2	6.6	7.1

Not : Quantities based on 2 foot wide trench and 1.6 Tons/Cu. Yd.  
(Divide quantities by 2 for 12 inch trench widths.)

### ROCK GRADATION - IDOT RR3

Size	% Passing By Weight
50 Lb.	100
10 Lb.	30 - 70
1 Lb.	0 - 16

REFERENCE	
Project _____	
Designed _____	Date _____
Checked _____	Date _____
Approved _____	Date _____



U.S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
ILLINOIS

STANDARD DWG. NO.  
**IL-541**  
SHEET 2 OF 2  
DATE 8-17-94

## FABRIC CHECKS FOR WATERWAYS

### FABRIC CHECK SPACING (FT.)

WATERWAY GRADE %	MAXIMUM SPACING FT.
0 - 1.5	100
1.5 - 3.0	75
> 3.0	50

### FABRIC QUANTITIES PER CHECK IN SQUARE YARDS

CHECK LENGTH (FT.)	15	18	21	24	27	30	33	36	39
FABRIC QUANTITY (SQ. YDS)	4.2	5.0	5.8	6.7	7.5	8.3	9.2	10.0	10.8

### FILTER FABRIC SPECIFICATION

1. Openings in filter fabric shall be equal to or smaller than the openings in a #40 sieve (0.42mm).
2. Filter fabric shall have a tear strength in excess of 50 pounds.

REFERENCE  
 Project \_\_\_\_\_  
 Designed \_\_\_\_\_ Date \_\_\_\_\_  
 Checked \_\_\_\_\_ Date \_\_\_\_\_  
 Approved \_\_\_\_\_ Date \_\_\_\_\_



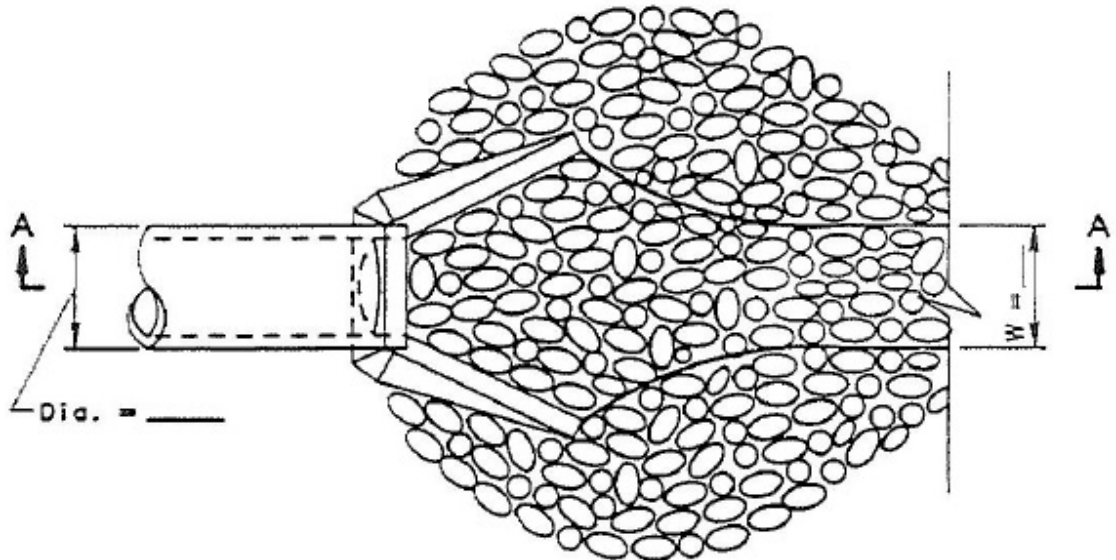
U.S. DEPARTMENT OF AGRICULTURE  
 SOIL CONSERVATION SERVICE  
 ILLINOIS

STANDARD DWG. NO.  
**IL-542**  
 SHEET 2 OF 2  
 DATE 8-17-64

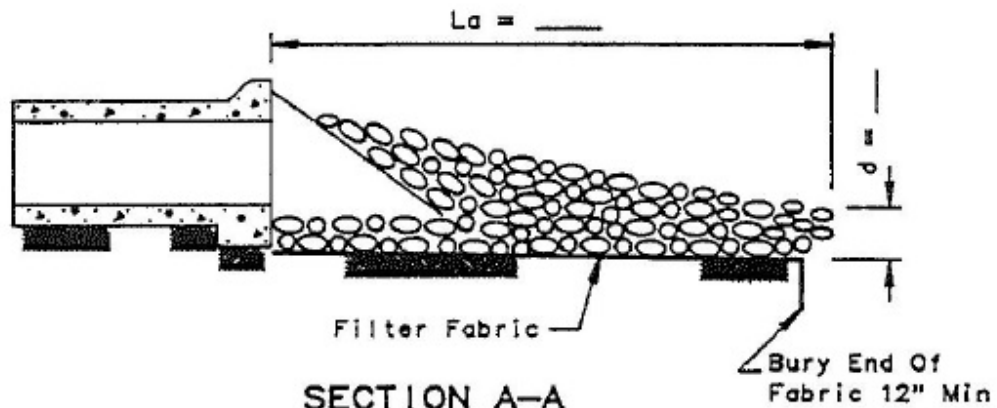


# PIPE OUTLET TO CHANNEL

Pipe Outlet To Well-Defined Channe




PLAN



SECTION A-A

**NOTES:**

1. The filter fabric shall meet the requirements in material specification 592 GEOTEXTILE Table 1 or 2, Class I, II or III.
2. The rock riprap shall meet the IDOT requirements for the following gradation \_\_\_\_\_.
3. The riprap shall be placed according to construction specification 61 LOOSE ROCK RIPRAP. The rock may be equipment placed.

<p><b>REFERENCE</b></p> <p>Project _____</p> <p>Designed _____ Date _____</p> <p>Checked _____ Date _____</p> <p>Approved _____ Date _____</p>	 <p>U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE ILLINOIS</p>	<p>STANDARD DWG. NO. <b>IL-611</b></p> <p>SHEET 1 OF 1</p> <p>DATE 8-18-84</p>
--	--	--

**§ 151.99 PENALTY.**

The violation of any of the terms of this chapter shall constitute an offense punishable by a fine not to exceed \$500, with each day the violation remains uncorrected constituting a separate offense. Such fine is in addition to any other remedy provided by law.

(Prior Code, 8 TCC 3-9)