



**US ARMY CORPS
OF ENGINEERS
St. Louis District
Gateway to Excellence**

Public Notice

Reply To:
U.S. Army Corps of Engineers
Attn: CEMVS-OD-F
1222 Spruce Street
St. Louis, MO 63103-2833

Public Notice No. P-2508
Public Notice Date November 18, 2005

Expiration Date
December 9, 2005

Postmaster Please Post Conspicuously Until: December 9, 2005

**Joint Public Notice
U.S. Army Corps of Engineers
Illinois Environmental Protection Agency
Illinois Department of Natural Resources/Office of Water Resources**

**Re-Issuance of Regional Permit 16
Bank Stabilization Activities
In the State of Illinois**

1. **Proponent.** The U.S. Army Corps of Engineers districts listed below with regulatory jurisdiction in Illinois are pursuing this regional permit. If the regional permit is adopted, each Corps of Engineers district may add more restrictive conditions as needed for their district.

- U.S. Army Corps of Engineers, Rock Island District, Clock Tower Building, Post Office Box 2004, Rock Island, Illinois 61204-2004. Rock Island District is coordinating this Regional Permit.
- U.S. Army Corps of Engineers, St. Louis District, 1222 Spruce Street, St. Louis, Missouri 63103-2833.
- U.S. Army Corps of Engineers, Louisville District, Post Office Box 59, Louisville, Kentucky 40201-0059.
- U.S. Army Corps of Engineers, Memphis District, 167 North Main, B-202, Memphis Tennessee 38103-1894.

NOTE: This proposed regional permit will not be in effect in Cook, DuPage, Kane, Lake, McHenry and Will counties (areas under the jurisdiction of the Chicago District). Additional information concerning the separate permit procedures in effect in Chicago District may be obtained from: <http://www.lrc.usace.army.mil/co-r/web/rpp2004.pdf>.

2. **Project Location.** This regional permit will authorize work associated with fill material placed for bank stabilization in waters of the United States within the State of Illinois, **except** in Cook, DuPage, Kane, Lake, McHenry and Will counties.

3. **Project Description.** This regional permit, initially issued by Rock Island District on May 17, 1983, re-issued on December 17, 1987, January 2, 1993, December 22, 1997, and September 6, 2000, expired December 31, 2004. There were 157 individual projects authorized under this blanket regional permit between the period September 6, 2000, and December 31, 2004. The regional permit has been extended until December 31, 2006, while the re-issuance of the regional permit is being coordinated. The Rock Island District proposes to re-issue the regional permit for a period of 5 years. This revision of the regional permit will be valid until December 31, 2010. The purpose of the regional permit is to authorize work associated with fill material placed for bank stabilization in waters of the United States within the State of Illinois. Initially this regional permit generally paralleled Statewide Permit 9 issued by the Illinois Department of Natural Resources, Office of Water Resources.

- The following bank stabilization techniques will be authorized under this regional permit: blanket riprap, seawalls, gabions, minor bank shaping with appropriate biotechnical streambank protection techniques, bendway weirs, longitudinal peaked stone riprap, stone hardpoints, stream barbs, and rock riffles. For design projects not specifically listed, the plans must be approved by the Corps of Engineers and the Illinois Department of Natural Resources, Office of Water Resources.

a. **General restrictions.** These general restrictions must be met for all bank stabilization projects to be authorized under this regional permit.

(1) The total affected length of shoreline, stream bank, or channel to be protected shall not exceed 1000 feet.

(2) Generally, only those reaches of shoreline, stream bank, and channel which are experiencing erosion are covered by this regional permit. No material shall be placed in excess of the minimum needed for erosion protection.

(3) This regional permit does not authorize any of the following activities: stream channelization; channel modifications such as excavating pilot channels; the placement of materials other than on an area of eroded bank; and projects which conflict with a Federal, state, or local project or improvement.

(4) The following materials may not be used for projects to be authorized under this regional permit: auto bodies, tires, garbage or debris, scrap lumber, metal refuse, roofing materials, broken concrete containing asphalt, asphalt or other bituminous materials, or any material which would cause water pollution as defined by the Illinois Environmental Protection Agency. If approval is not specifically granted for a specific material, it is deemed to not be allowable under this regional permit authorization.

(5) The following materials may be used: suitable clean materials, free from debris, trash, and other deleterious materials; rock, broken concrete, steel sheet piling, cellular blocks, fabric-formed concrete, concrete filled fabric mats, gabion baskets, rock and wire mattresses, sand/cement filled bags, geotechnical fabric materials, natural vegetation (with proper grading), and treated timber. If broken concrete is used, all protruding material such as reinforcing rods shall be cut flush with the surface of the concrete and removed from the construction area. If approval is not specifically granted for a specific material, it is deemed to not be allowable under this regional permit authorization.

(6) All material utilized shall be properly sized or anchored to resist anticipated forces of current and wave action.

(7) Materials shall be placed in such a way which will not cause erosion, or the accumulation of debris on properties adjacent to or opposite the project.

(8) Materials shall be placed so that the modified bank full width and cross sectional area of the channel will conform to, or be no more restrictive than, that of the natural channel upstream and downstream of the site.

(9) Disturbance of vegetation shall be kept to a minimum during construction to prevent erosion and sedimentation. All disturbed areas shall be seeded or otherwise stabilized upon completion of construction.

(10) Excess material excavated during the construction of bank or shoreline protection shall be placed in accordance with local, state, and Federal laws and shall not be placed in a floodway or in any water of the U.S. including wetlands.

(11) The use of natural materials may be considered for bank protection where feasible and appropriate. When not feasible and/or appropriate and after riprap is placed, the proponent should promote revegetation of the area protected.

(12) Endangered Species.

(a) Individual projects proposed under this regional permit must not jeopardize the continued existence of any species or the critical habitat of any fish and wildlife, or plant which is designated as endangered or threatened pursuant to the Endangered Species Act of 1973 as amended (16 U.S.C. 1531 et seq.).

(b) The habitat range of the decurrent false aster (*Boltonia decurrens*) is located within the floodplain of the Mississippi River (St. Clair, Alexander, Jackson, Monroe, Randolph, and Union Counties) and the floodplain of the Illinois River (Bureau, Fulton, Jersey, Marshall, Mason, Morgan, Peoria, Putnam, Schuyler, Tazewell, Woodford, Brown, Calhoun, Cass, Green, Grundy, LaSalle, Madison, Pike, and Scott Counties). The proponent of any project proposed within one of these counties in the 100-year floodplain of the Mississippi River or the Illinois River or where a tributary stream flows into the 100-year floodplain of Mississippi River or the Illinois River must arrange for the project site to be investigated by a qualified botanist or environmental scientist for the occurrence of the Federally threatened plant species. Written documentation, provided by the botanist or environmental scientist, must be provided to the Corps of Engineers for consultation with the U.S. Fish and Wildlife Service to ensure compliance with the Endangered Species Act of 1973 as amended (16 U.S.C. 1531 et seq.).

(13) Projects in environmentally sensitive areas (wetlands, endangered species, etc.) shall be excluded from processing under this regional permit. Also, if in the opinion of the Corps of Engineers, the project may not be in the public interest due to any unique circumstances, the Corps may require an individual permit on a case-by-case basis.

(14) This regional permit does not authorize the discharge of fill into wetland areas.

(15) If, at any future date, the Illinois Department of Natural Resources, Office of Water Resources, (IDNR/OWR) or the Corps of Engineers determines that the bank stabilization obstructs or impairs navigation, or in any way infringes on the rights or interests of the public or any individual party, the permittee agrees to make necessary modifications as determined by the IDNR/OWR or the Corps of Engineers, or the Corps of Engineers may require an individual permit on a case-by-case basis.

(16) If, in the opinion of the Corps of Engineers, the bank stabilization may constitute an undue hazard, obstruction to navigation, or if it is deemed that the project may not be in the general public interest, the Corps of Engineers may require an individual permit on a case-by-case basis.

(17) The project proponent must notify the appropriate public or private utility in advance of any work within 250 feet of an underground utility so that the utility is not damaged during construction activities.

(18) Individual projects to be authorized under the regional permit must not be located in the proximity of property listed in the National Register of Historic Places nor in the vicinity of properties listed in the Federal Register as eligible for inclusion in the National Register of Historic Places unless, after coordination with the State Historic Preservation Officer of the State of Illinois and the Advisory Council on Historic Preservation, a determination of "no effect" or "no adverse effect" is made in accordance with criteria established by 36 CFR 800.4.

(19) Individual projects to be authorized under the regional permit must not be located within sites included in the National Register of National Landmarks or any other areas named in Acts of Congress or Presidential proclamations as National Rivers, National Wilderness Areas, National Recreational Areas, National Lakeshores, National Parks, National Monuments, National Wild and Scenic River Systems, National Wild Life Refuge System, and such areas as may be established under Federal Law for similar and related purposes unless the activity is specifically authorized by the appropriate Federal agency.

(20) Parties proposing to undertake work under the provisions of this regional permit must provide prior notification to the appropriate Corps of Engineers District. Information submitted by the proponent must clearly determine whether or not the proposed work complies with the conditions and limitations of the regional permit. The proponent will be notified within 15 workdays if the project is in compliance with the conditions of the regional permit and whether project construction may proceed. However, this will not alleviate the need of the proponent to obtain other applicable state or local authorization.

(21) The Corps of Engineers will determine on a case by case basis if a particular project proposal will fall under the auspices of this regional permit.

(22) Applicable general and special conditions from the standard individual Department of the Army permit will also be included as conditions of this regional permit.

(23) Any conditions imposed by water quality certification issued by the Illinois Environmental Protection Agency are considered to be part of this permit.

b. **Design Considerations.** The Corps of Engineers may add additional special conditions as deemed appropriate to protect the aquatic environment on a case-by-case basis for any activity authorized under this regional permit.

(1) Blanket riprap.

(a) Bank shoreline protection must be less than 1,000 feet in length and must contain less than two cubic yards of fill material per running foot below the ordinary high water mark.

(b) For projects involving continuous placement of riprap along the bank, toe of the bank, or other similar applications, the cross sectional area of the natural channel shall not be reduced by more than 10 percent nor the volume of material exceed 2 cubic yards per lineal foot of stream bank or shoreline. The bank may be graded to obtain a flatter slope and to lessen the quantity of material required.

(c) A well distributed mix of stones weighing from 20 to 200 pounds should be used.

(d) The riprap should be from 12 inches to 18 inches thick. Portions of the riprap layer under water should be increased to 18 inches to 30 inches thick.

(e) Riprap materials shall not be placed at a steeper slope than 2:1 (2 horizontal to 1 vertical) for dumped riprap and 1.5:1 for hand-placed riprap. A bedding layer of either six inches of gravel or filter material must be used if required to prevent loss of fines through the riprap material. The riprap must be sized to withstand the anticipated forces from flood flows or wave action.

(f) A riprap trench or apron should be provided at the base of the protected bank for stability.

(g) Both ends of the project should be tied into the bank, with the most common method being to excavate a trench in the bank and fill it with riprap. Additionally the project should be tied into the bank at regular intervals of between 100 feet and 200 feet.

(2) Seawalls and Gabions. Seawalls and gabions shall be constructed at or landward of the water line as determined by the normal pool elevation unless:

- It is constructed in alignment with any existing seawall(s) or gabion structure(s).
- The volume of material placed, including the structure, will not exceed 2 cubic yards per lineal foot.
- The cross sectional area of the natural channel shall not be reduced by more than 10 percent nor the volume of material exceed 2 cubic yards per lineal foot of stream bank or shoreline. The bank may be graded to obtain a flatter slope and to lessen the quantity of material required.

(3) Bank shaping with appropriate biotechnical streambank protection techniques. Minimal grading and bank shaping activities for state-of-the-art natural vegetative stabilization methods, such as the willow post method, will be authorized under this regional permit. No material produced as a result of grading and bank shaping shall be deposited into any water of the US, including wetland areas. Material produced by grading and bank shaping shall be pulled back from the water's edge.

(4) Hard points. Hard points are short rock intrusions extending only a short distance from the bank. Jetties, which extend from the bank further than hard points, are specifically excluded from this regional permit. Hard points may be used if they are keyed into the bank and if they do not extend from the bank more than the minimum necessary to achieve adequate erosion protection. The Corps of Engineers will determine on a case by case basis whether the proposed hard point is acceptable for the stream.

(5) Longitudinal peaked stone riprap. Longitudinal peaked stone riprap is a continuous stone dike placed along the toe of the bank. Riprap with a gradation from maximum stone size of 400 pounds to 50 to 70 percent smaller than a 90 pound stone size is placed in a pyramid or triangular shaped cross section at the toe of an eroding bank without shaping the banks. The riprap should be tied into the bank at both the upstream and downstream ends. Additionally, short riprap dikes should be tied into the bank at regular intervals of between 100 feet and 200 feet. The construction of longitudinal peaked stone riprap is not authorized under this regional permit on the Mississippi River or on the Illinois River.

(6) Bendway weirs. A bendway weir is a low-level rock sill located in the channel of a bend angled 0 degrees to 25 degrees upstream into the stream flow. The structures are spaced approximately 50 feet to 150 feet apart. The weirs should be attached (keyed into) the outer bank of the stream bend. The weirs should be built of well-graded stone with an upper weight limit of 650 pounds to 1000 pounds. Typically, the weirs are 2 feet high at the stream end and rise to 4 feet high at the bank end. Bendway weirs act to redirect the flow away from the eroding bank as flow over the weir is redirected at right angles to the downstream face of the weir. Bendway weirs may extend into the channel a maximum of 50% of stream width. Bendway weirs should be constructed based on engineering/design principles developed by the U. S. Army Corps of Engineers. The construction of bendway weirs are not be authorized under this regional permit on the Mississippi River or on the Illinois River.

(7) Stream barbs. A stream barb is a rock structure which projects out from the bank on a sharp upstream angle of 20 to 30 degrees, measured from bank tangent line. Stream barbs are designed to direct the stream current away from the eroding bank to the center of the channel. The barbs will be built of well-graded stone with an upper weight limit of 650 pounds to 1000 pounds. At the bank, the top of the barbs will be constructed to the design height, typically 4 to 8 feet above the streambed. The top of the barbs will incline from the bank end to streambed level at the streamward end. The incline will be according to design, typically 10% (10 horizontal to 1 vertical). On silt-bottom streams, the barbs will be keyed into the streambed by excavating a core trench for the full length of the barb and backfilling with riprap rock. The barbs will be keyed into the outer bank. The bank key trench will be excavated perpendicular to the streambank from streambed to top-of-bank, and backfilled with riprap rock. Stream barbs are designed to extend into the channel a maximum of 35% of stream width. Stream barbs should be constructed on engineering/design principles developed by the U.S. Army Corps of Engineers and the U.S. Department of Agriculture, Natural Resources Conservation Service. The construction of stream barbs is not to be authorized under this regional permit on the Mississippi River or on the Illinois River. [NOTE: This is a new item under this regional permit.]

(8) Rock Riffles. Rock riffle structures are low-head weir structures constructed over the streambed from bank-to-bank. Constructed rock riffles are used to stabilize the streambed where downcutting erosion is occurring. Rock riffles will be built of well-graded riprap rock with an upper weight limit of 650 pounds to 1000 pounds. The largest individual stones will be sorted from the stockpiled rock to be placed as emergent boulders and crest stone. The crest of the riffle will be "V" shaped on the centerline of the structure. From the crest, the downstream slope will be no steeper than 20H:1V, and the upstream slope will be no steeper than 4H:1V. Riffle structures will be keyed into the streambed and bank using riprap rock. Bed keys will be constructed from bank-to-bank with a minimum depth of 2 feet and minimum width of 4 feet. Bank keys will be constructed, into both banks, with a minimum depth of 5 feet and a minimum width of 4 feet, extending upward on a 1.5h to 1v slope toward the top-of-bank. Rock riffles shall be constructed to design standards of the U.S. Department of Agriculture, Natural Resources Conservation Service. The construction of rock riffles is not to be authorized under this regional permit on the Mississippi River or on the Illinois River.

[NOTE: This is a new item under this regional permit.]

4. Agency Review and Where to Reply.

a. Department of the Army, Corps of Engineers. The regional permit is being processed under the provisions of Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) and Section 404 of the Clean Water Act (33 U.S.C. 1344).

b. State of Illinois.

(1) The re-issuance of the regional permit is being coordinated with Illinois Environmental Protection Agency (IEPA) for water quality certification, or waiver thereof, for the proposed activity in accordance with Section 401 of the Clean Water Act. Certification or waiver indicates that IEPA believes the activity will not violate applicable water quality standards. The review by the IEPA is conducted in accordance with the Illinois water quality standards under 35 Illinois Administrative Code Subtitle C. The water quality standards provide for the IEPA to review individual projects by providing an antidegradation assessment, which includes an evaluation of alternatives to any proposed increase in pollutant loading that may result from this activity. The "Fact Sheet" containing the antidegradation assessment for this proposed project may be found on the IEPA's web site, at www.epa.state.il.us/public-notices/. In the event that the IEPA is unable to publish the "Fact Sheet" corresponding to the timeframe of this Joint Public Notice, a separate public notice and "Fact Sheet" will be published by the IEPA at the web site identified above. You may also obtain a copy of the "Fact Sheet" by contacting the IEPA at the address or telephone number shown below. Written comments specifically concerning possible impacts to water quality should be addressed to: Illinois Environmental Protection Agency, Bureau of Water, Watershed Management Section, 1021 N. Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276. A copy of the written comments should be provided to the Corps of Engineers. If you have any questions, please contact IEPA at (217) 782-3362.

(2) The re-issuance of the regional permit is being coordinated with the Illinois Department of Natural Resources, Office of Water Resources (IDNR/OWR), pursuant to an Act in Relation to the Regulation of the Rivers, Lakes and Streams of the State of Illinois, Chapter 615, ILCS 5 (Illinois Compiled Statutes (1994)). Comments concerning the IDNR/OWR permit should be addressed to the Illinois Department of Natural Resources, Office of Water Resources, One Natural Resources Way, Springfield, Illinois 62702-1271, with a copy provided to the Corps of Engineers (see paragraph 11. of this public notice for address). Mr. Mike Diedrichsen, IDNR/OWR (217/782-3863), may be contacted for additional information.

5. **Historical/Archaeological.** Under this regional permit, the Rock Island District of the U.S. Army Corps of Engineers authorizes the permittee to initiate consultation with State Historic Preservation Officers and Tribal Historic Preservation Officers (SHPO/THPO) and other consulting parties as provided for at 36 CFR 800.2(c)(5) in the Advisory Council on Historic Preservation regulations for the *Protection of Historic Properties; Recommended Approach for Consultation on Recovery of Significant Information from Archaeological Sites; Final Rule and Notice* (Federal Register Vol. 64, No. 95, pp. 27071-27087, May 18, 1999).

All findings and determinations resulting from the consultation shall be provided to the Corps of Engineers which shall remain legally responsible for all findings and determinations once agreed to by the Corps and formalized through the process provided for in 36 CFR 800. If, during construction, the permittee uncovers an item or items that may be of historic or archaeological interest or if important new historic data comes to light in the project area, the District Engineer shall be notified immediately and the work will be delayed a sufficient time to carry out the requirements for post-review discoveries as set out at 36 CFR 800.13 (b-d) and/or the requirements of the Illinois Human Skeletal Remains Protection Act (20 ILCS 3440/), as applicable.

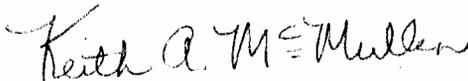
6. **Dredge/Fill Material Guidelines.** The evaluation of the impact of the proposed activity on the public interest will also include application of the guidelines promulgated by the Administrator of the United States Environmental Protection Agency under authority of Section 404(b) of the Clean Water Act (40 CFR Part 230).

7. **Public Interest Review.** The decision whether to re-issue the regional permit will be based on an evaluation of the probable impact including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food production and, in general, the needs and welfare of the people.

8. **Who Should Reply.** The Corps of Engineers is soliciting comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed regional permit. Any comments received will be considered by the Corps of Engineers to determine whether to re-issue, modify, condition or deny this regional permit. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity. These statements should be submitted on or before the expiration date specified at the top of page 1. These statements should bear upon the adequacy of plans and suitability of locations and should, if appropriate, suggest any changes considered desirable.

9. **Public Hearing Requests.** Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this regional permit. Requests for public hearings shall state, with particularity, the reasons for holding a public hearing. A request may be denied if substantive reasons for holding a hearing are not provided.

10. **Reply to the Corps of Engineers.** Comments concerning the regional permit should be addressed to the District Engineer, U. S. Army Corps of Engineers, St. Louis Island District, ATTN: OD-F (Keith A. McMullen), 1222 Spruce, St. Louis, Missouri 63103-2833. Mr. Keith A. McMullen (314-331-8582) may be contacted for additional information.



Keith A. McMullen
Lead Project Manager/Assistant Chief
Regulatory Branch

Attachment

NOTICE TO POSTMASTERS:

It is requested that this notice be conspicuously and continually placed for 21 days from the date of this issuance of this notice .

Landowner _____

Stream _____

Location _____

NOT TO SCALE

Sheet 1 of 2

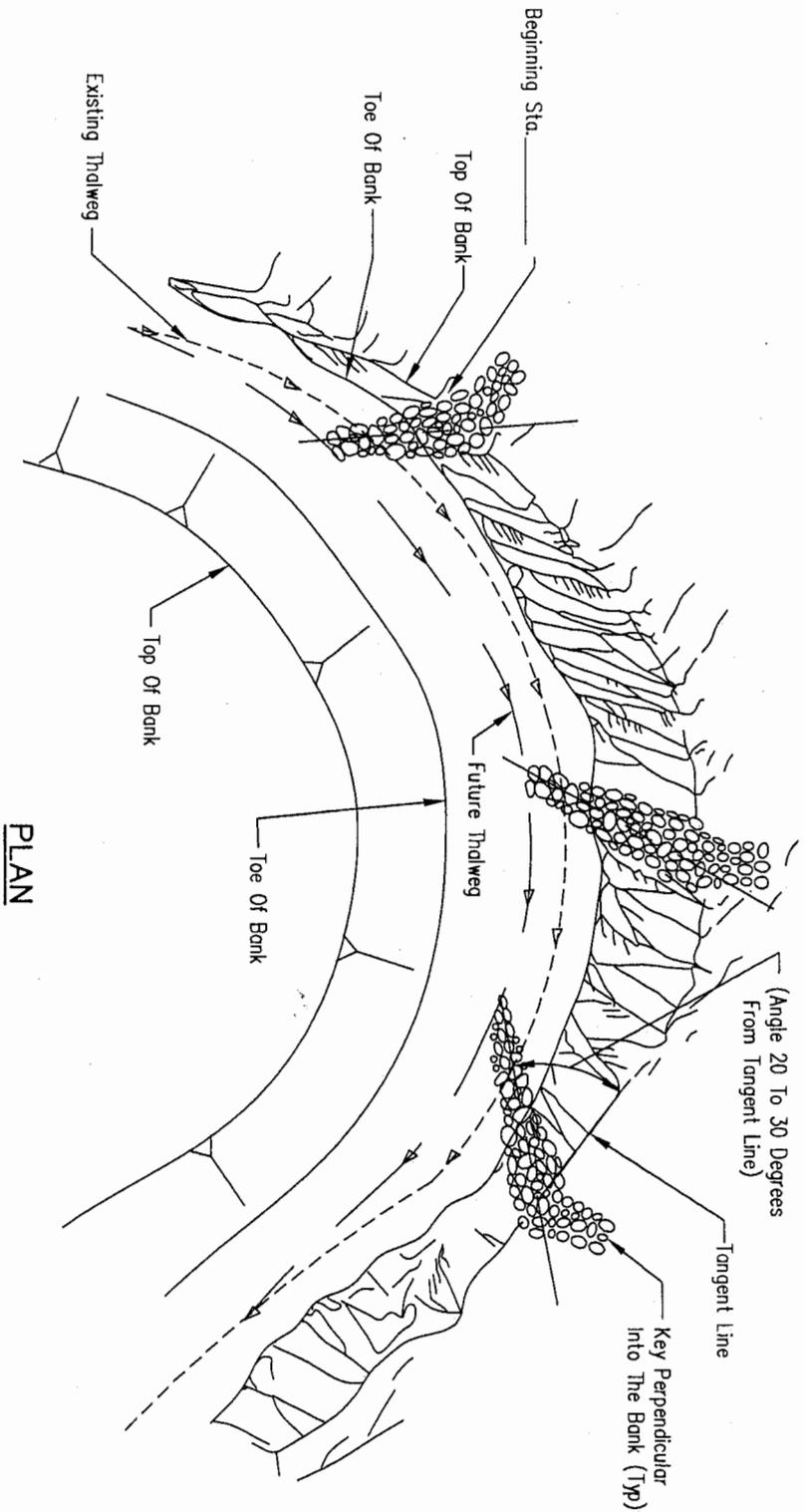
File No. IL-ENG-167
 Drawing No. _____



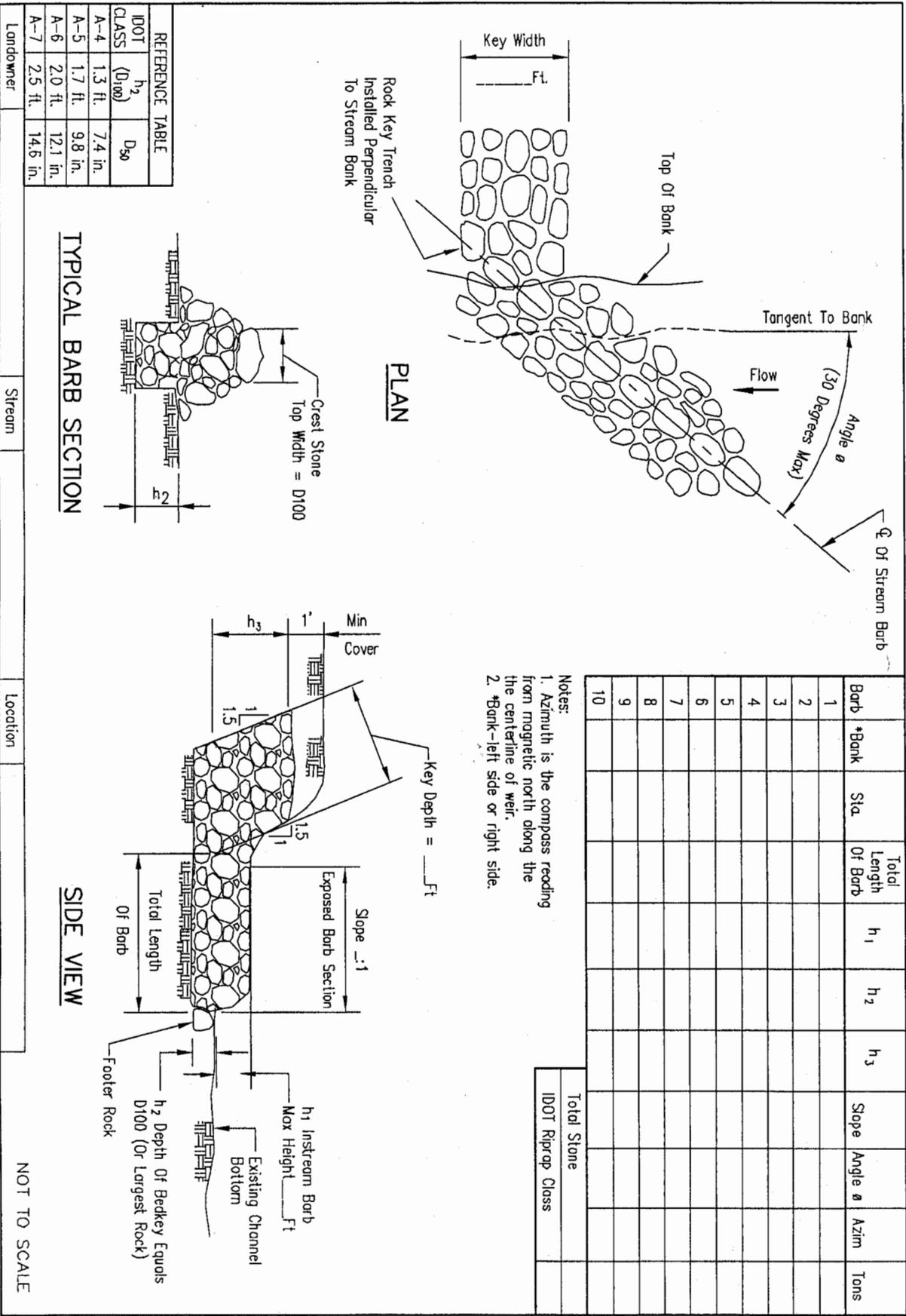
STREAM BANK STABILIZATION STREAM BARB

Date _____
 Designed _____
 Drawn M. QUINONES 3/20/02
 Checked _____
 Approved _____

Beginning Sta. Description _____



PLAN



REFERENCE TABLE

DOT CLASS	h_2 (D ₁₀₀)	D ₅₀
A-4	1.3 ft.	7.4 in.
A-5	1.7 ft.	9.8 in.
A-6	2.0 ft.	12.1 in.
A-7	2.5 ft.	14.6 in.

TYPICAL BARB SECTION

SIDE VIEW

NOT TO SCALE

Landowner _____ Stream _____ Location _____

- Notes:
1. Azimuth is the compass reading from magnetic north along the centerline of weir.
 2. *Bank—left side or right side.

Barb	*Bank	Sta	Total Length Of Barb	h_1	h_2	h_3	Slope	Angle θ	Azimuth	Tons
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

Total Stone	
DOT Riprap Class	



STREAM BANK STABILIZATION
STREAM BARB

Date _____
 Designed _____
 Drawn M. QUINONES 9/03
 Checked _____
 Approved _____

Landowner

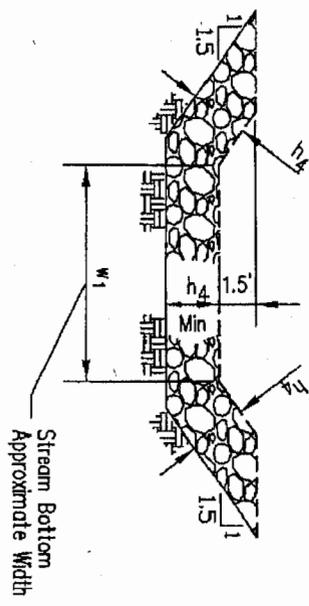
0 Stream

0 Location

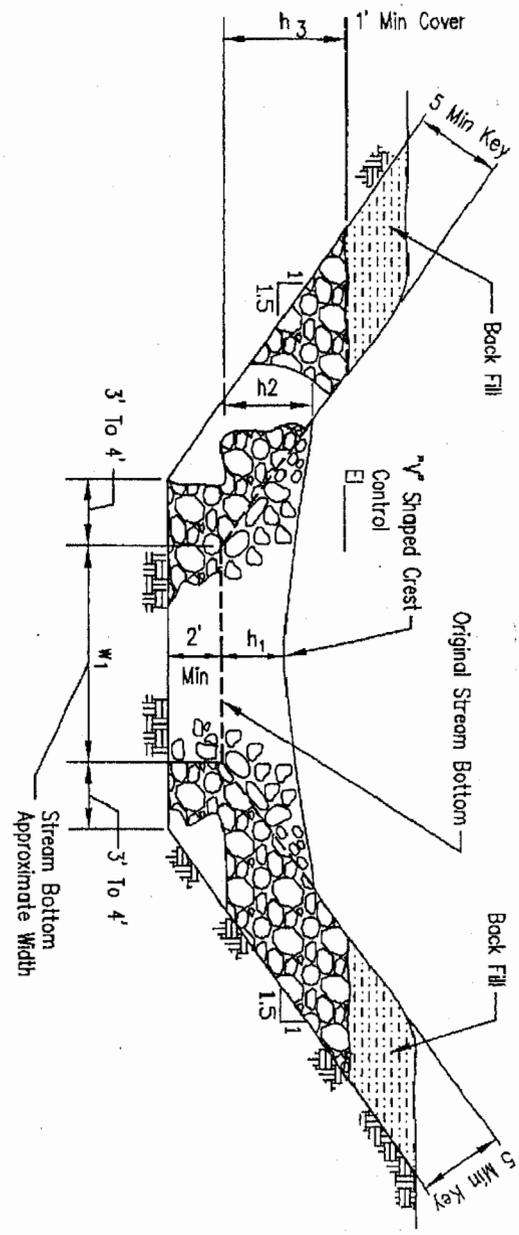
Adams County, Illinois

NOT TO SCALE

SECTION C-C



SECTION B-B



**STREAM BANK STABILIZATION
ROCK RIFFLE DETAILS**



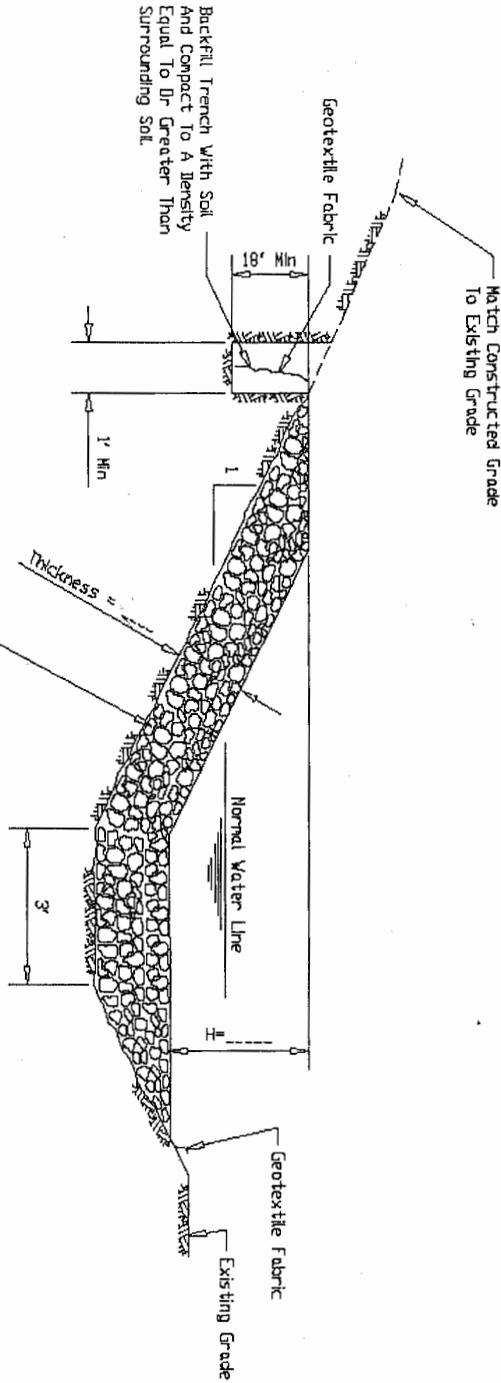
File No. IL-ENG-1698
Drawing No.

Designed _____ Date 8/2/2005
 Drawn M. QUINONES 11/02
 Checked _____
 Approved _____

This drawing was derived from Standard
Drawing IL-640 in the Illinois Urban Manual.

SECTION

Rock Riprap Shall Be Gradation No. _____
Quality Designation "A" As Per
IDOT Standard Specification.

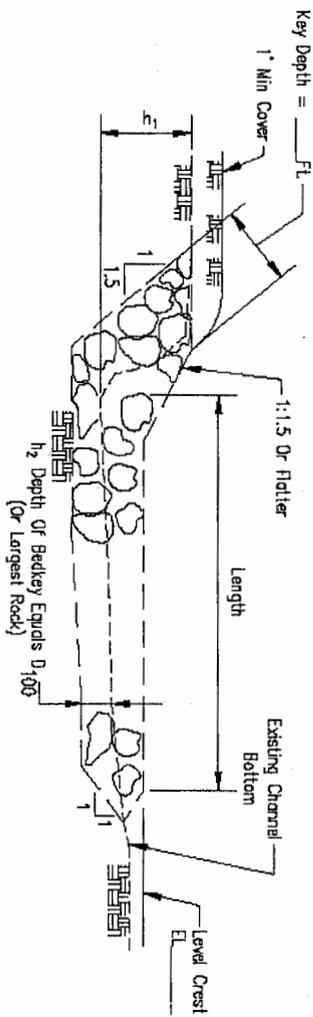
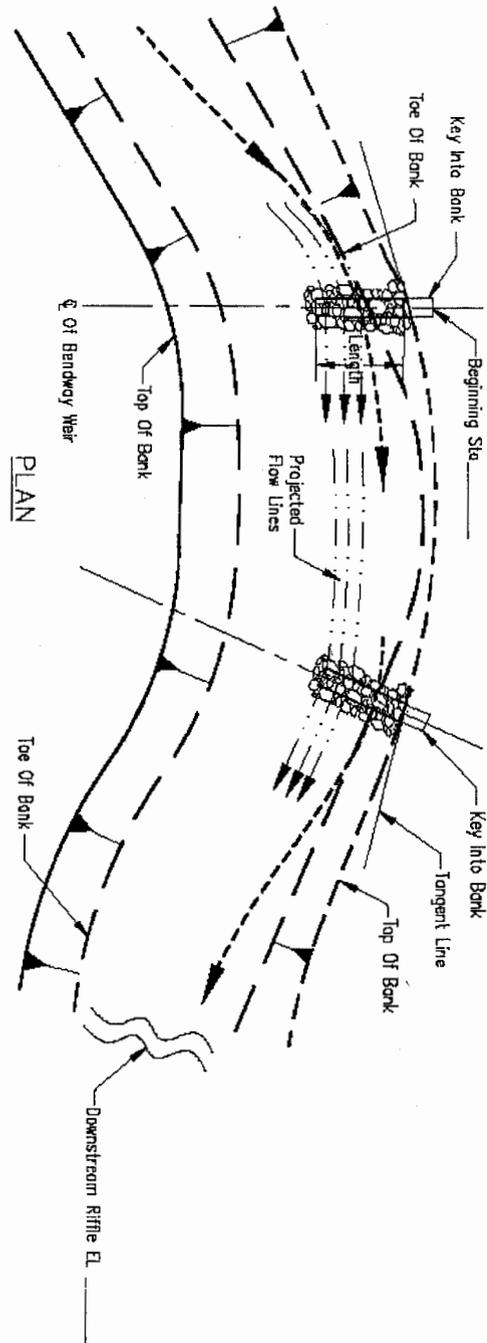


- Notes:
1. The filter fabric shall meet the requirement in material specification 592 GEOTEXTILE table 1 or 2, Class 1
 2. The riprap shall be placed according to construction specification 61 LOOSE ROCK RIPRAP. The rock may be equipment placed.



ROCK RIPRAP STREAMBANK
PROTECTION DETAIL

Date	
Designed _____	_____
Drawn M. QUINDRES	2/00
Checked _____	_____
Approved _____	_____



TYPICAL PROFILE, CENTERLINE OF BENDWAY WEIR

Benchmark EL _____
 Description _____
 Beginning Sta. Description _____

Landowner _____

Stream _____

Location _____

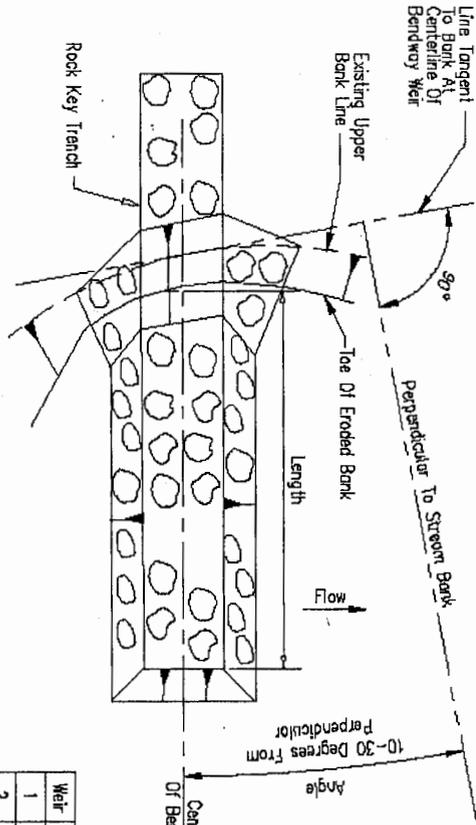
NOT TO SCALE

Sheet 1 of 2



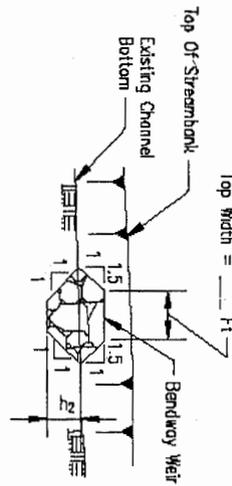
BENDWAY WEIRS

Designated	Date
Drawn: M. QUINN	3/26/02
Checked:	
Approved:	



PLAN VIEW OF BENDWAY WEIR

- Notes:
1. Azimuth is the compass reading from magnetic north along the centerline of weir.
 2. *Bank-left side or right side.



END VIEW

REFERENCE TABLE		
DOT CLASS	h_2 (ft)	D_{50} (in.)
A-4	1.5 ft.	7.4 in.
A-5	1.7 ft.	9.8 in.
A-6	2.0 ft.	12.1 in.
A-7	2.5 ft.	14.6 in.

Weir	*Bank	Sta	Length	Dist Elev	h_1	h_2	Angle	Azim	Tons
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									

Total Stone
IDOT Riprap Class

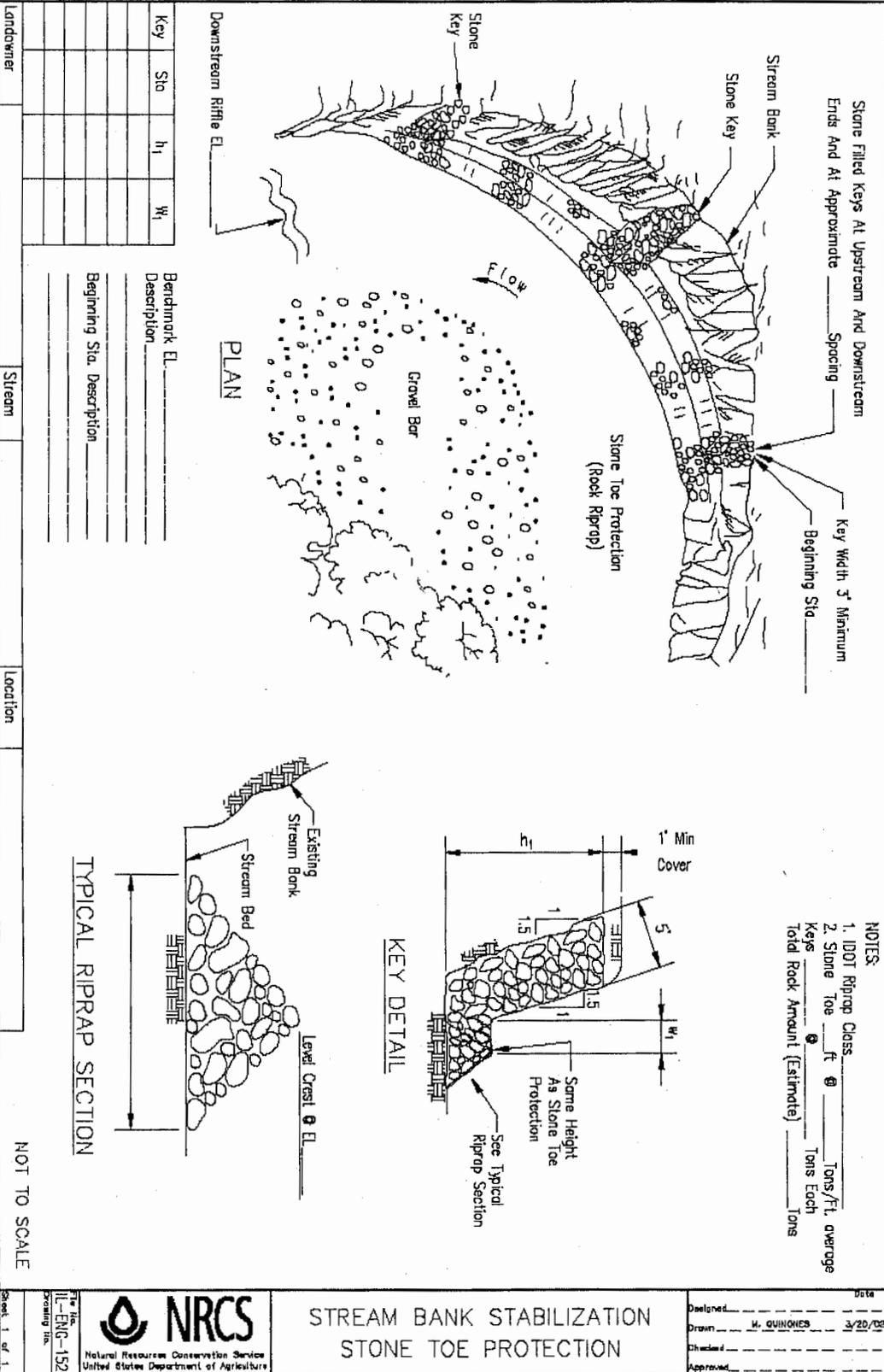
NOT TO SCALE

Landowner: _____ Stream: _____ Location: _____



BENDWAY WEIRS

Date: 3/26/02
 Designed: M. QUINONES
 Drawn: _____
 Checked: _____
 Approved: _____



- NOTES:
1. DOT Riprap Class _____ Tons/Ft. coverage
 2. Stone Toe _____ ft @ _____ Tons Each
- Keys _____ Tons Each
 Total Rock Amount (Estimate) _____ Tons

Key	Sta	h ₁	W ₁

Benchmark El. _____
 Description _____
 Beginning Sta. Description _____

Landowner _____ Stream _____ Location _____

NOT TO SCALE