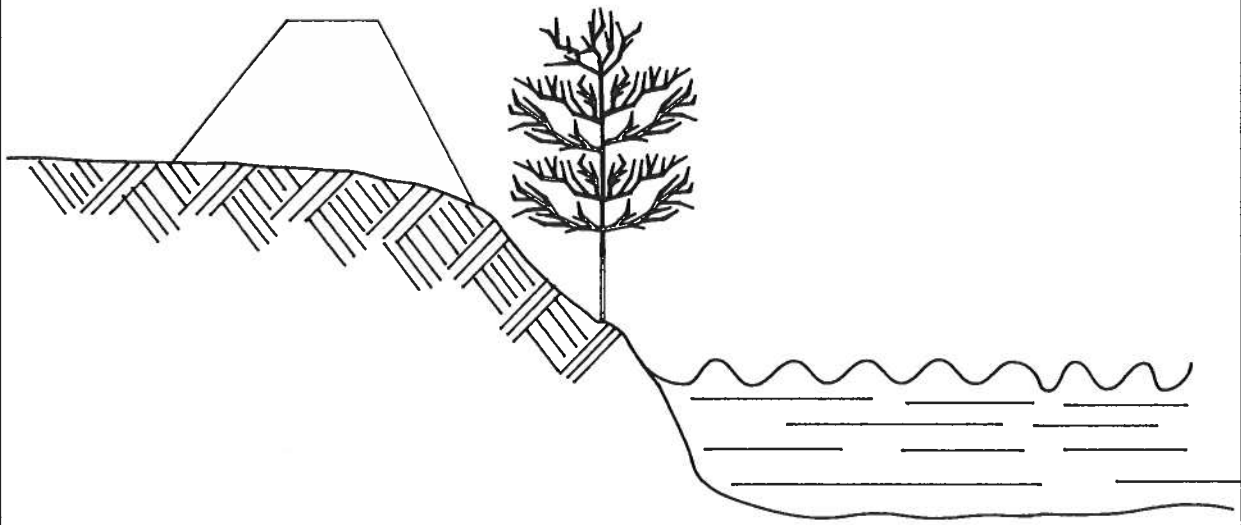


DYKE CREEK WATERSHED

ALLEGANY COUNTY, NEW YORK



DESIGN REPORT

SCS SYRACUSE, NEW YORK

DESIGN REPORT

DYKE CREEK WATERSHED

FLOOD CONTROL DIKES

**U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE**

DYKE CREEK WATERSHED
FLOOD CONTROL DIKES
NY-4705

DESIGN REPORT

The Dyke Creek Watershed is located in Allegany and Steuben Counties, New York. Watershed planning was completed in 1985. The only structural element contained in the selected plan is a Class I dike system along the Dyke Creek channel at the outskirts of the Village of Wellsville. Sheet 5 of this report along with the Wellsville North and Wellsville South, New York, U.S. Geological Survey 7.5 minute quadrangles may be used to define location of the work.

A summary of pertinent design information is given on Sheet 4 of this report. Job Class VII approval is required for this work.

The dike system will protect the damage area from the 100 year frequency storm. The minimum top of dike was set at an elevation two feet above the design storm water surface in accordance with a variance from Practice Standard 356, Dike, granted by the Director of Engineering, March 11, 1983. In order to support revision of existing Flood Insurance Rate Maps, the top of dike elevation was also checked against criteria in F.E.M.A. Interim Levee Policy and found to meet those criteria. It was subsequently learned that F.E.M.A. will also accept the criteria and procedures of other agencies in support of such map revisions. For these reasons the hydraulic analysis contained in this report is adequate for both design and FIRM revision.

The manual closures planned at both ends of the Route 417 bridge over Dyke Creek were not included in the design. This bridge is scheduled for replacement within a year of the dike construction and will be raised to an elevation at least equal to the top of dike. Since the closures would be needed only to meet freeboard requirements, the risk of flood damage during this interval is minimal.

Flap gated conduits through the base of the dikes at four locations will remove the internal damage from the dike system. A manually operated shear gate is also provided for each conduit in the event of flap-gate malfunction during flood conditions. Temporary ponding of internal drainage water will occur behind the dike at the conduit locations, but will be limited to elevations that will not cause damage to buildings or dwellings.

At the downstream end of the main dike (approximate station 83+00), backwater flooding from the Dyke Creek channel around the open-ended dike was found to be greater than anticipated, and resulted in remaining structural damages. The option of closing the dike and providing a flap-gated conduit results in temporary ponding of interior drainage water, but at a lower elevation than the backwater flooding and without remaining damages. The sponsors requested that this option be exercised and the dike was designed as a closed system.

The Dyke Creek channel itself is marginally stable. Recent gravel movement and incipient bank erosion are evident at several locations. Channel velocities up to 8.5 feet per second exist in the design reach. The dike foundation is protected from erosion by locating the dike so that the projected side slope, including a 15 ft. berm, does not encroach on the existing channel bottom width. Provisions are made in the Operation and Maintenance Plan to repair or protect the channel banks should future erosion threaten the dike foundation.

Severe erosion of the left bank is presently occurring at the upstream end of the main dike. This bank will be reconstructed and protected with rock rip rap.

Serious erosion also exists on the left bank between sta. 61+00 and sta. 65+00. In this location, an earth dike faced with rock rip rap would adequately protected against erosion, but would seriously impair the ability of vehicles to service commercial establishments. A sheet pile dike with rock protection at the toe offers the same protection against flood waters and erosive velocities with minimal encroachment on traffic patterns and at comparable cost. Based on these considerations, the sponsors requested that this portion of the dike be constructed of steel sheet piles.

The dike, borrow area, and other disturbed areas will be vegetated as part of the construction project.

DYKE CREEK WATERSHED
FLOOD CONTROL DIKES
DESIGN REPORT SUMMARY

- I. Watershed Data
- A. Drainage Area 46,348 Acres
72.42 Sq. Mi.
 - B. Dike Class I
- II. Earth Fill Dike
- A. Height (varies) 0-12 Ft.
 - B. Top Width 10 Ft.
 - C. Approximate Length
 - Main Dike 4660 Ft.
 - Auxiliary Dike 2310 Ft.
 - D. Volume
 - Main Dike 50,987 C.Y.
 - Auxiliary Dike 15,572 C.Y.
 - E. Compaction Class A
- III. Sheet Pile Dike
- A. Length 990 Ft.
 - B. Section Modules 18 in³/ft.
 - C. Pile Length 21 Ft.
- IV. Structure Data
- A. Auxiliary Dike sta. 29+80
 - 1. type concrete pipe
 - 2. length 46 Ft.
 - 3. diameter 18 in.
 - B. Main Dike sta. 58+65
 - 1. type concrete pipe
 - 2. length 35 Ft.
 - 3. diameter 18 in.
 - C. Main Dike sta. 65+00
 - 1. type iron pipe
 - 2. length 2 Ft.
 - 3. diameter 18 in.
 - D. Main Dike sta. 83+00
 - 1. type concrete pipe
 - 2. length 35 Ft.
 - 3. diameter 18 in.

DESIGN SECTION, SYRACUSE, NY

WELLSVILLE NORTH, NY

7.5 MIN QUAD

77° 57' 30"

AUXILIARY
DIKE

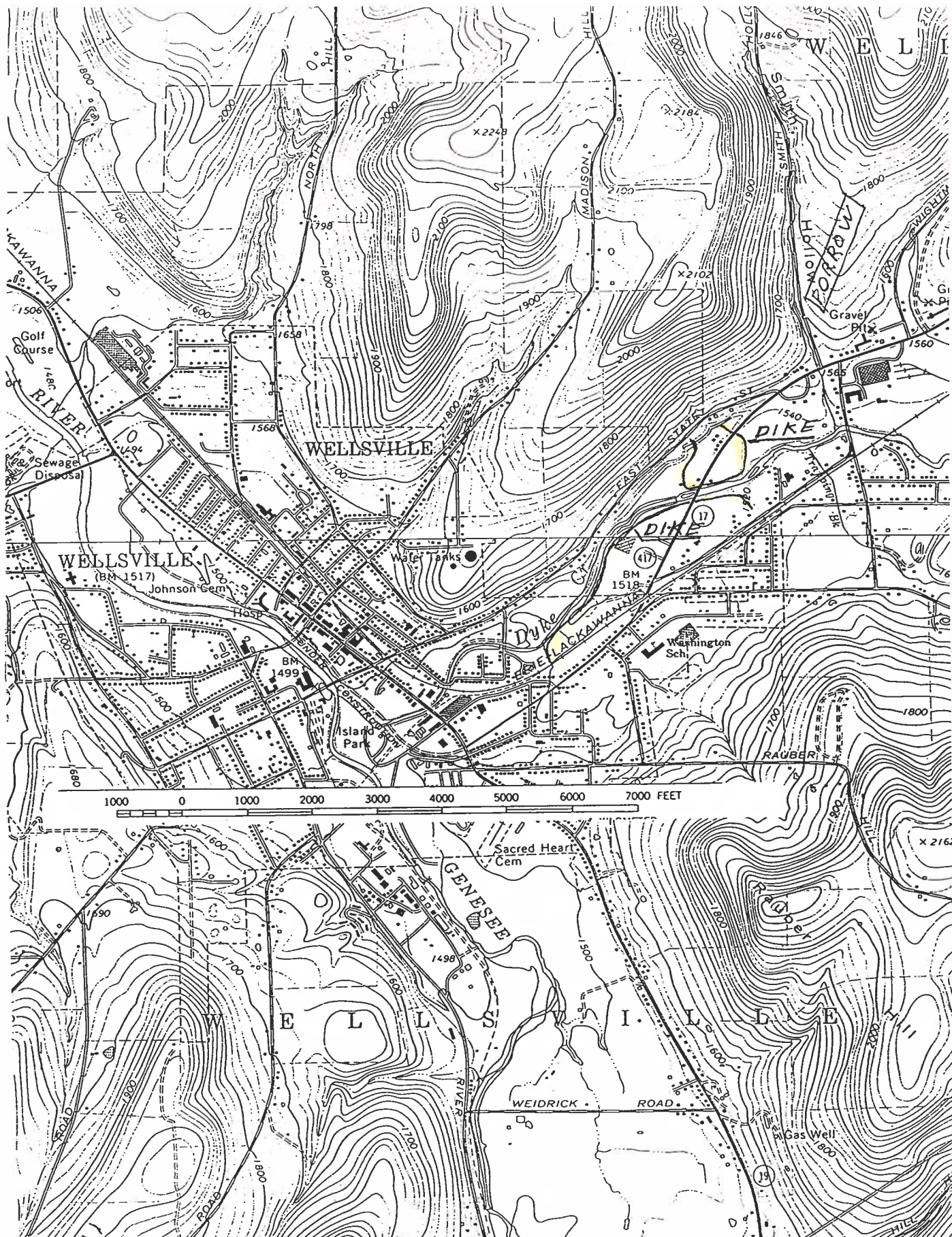
42° 07' 30"

MAIN
DIKE

WELLSVILLE SOUTH, NY

7.5 MIN. QUAD

77° 57' 30"



WELLSVILLE NORTH AND
WELLSVILLE SOUTH QUADS

Criteria and procedures used in this design are given in the following publications:

National Handbook of Conservation Practices, Standard 356 - Dike

National Engineering Handbook, Section 4 - Hydrology

National Engineering Handbook, Section 5 - Hydraulics

National Engineering Handbook, Section 6 - Structures

Technical Release No. 25 - Design of Open Channels

U.S. Weather Bureau Technical Paper No. 40 and 49

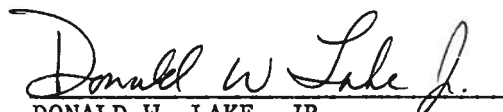
U.S. Army Corps. of Engineers, HEC-2 Water Surface Profiles - Generalized
Computer Program

Federal Highway Administration, Hydraulic Design Series No. 5

United States Steel, Steel Sheet Piling Design Manual



ANDRAS S. FEHER
State Design Engineer



DONALD W. LAKE, JR.
State Conservation Engineer