Section IX

Facility Load and Other Design Criteria

SECTION IX - FACILITY LOAD AND OTHER DESIGN CRITERIA

9-01. SITING

a. Consideration of Seasonal Fluctuations. All proposed structures, except boat launching ramps and beaches, will be located above the flood control pool, elevation 626.5 NGVD, and site selection will be based on soil types, erosion potential, and present shoreline erosion problems.

b. Universal Accessibility (UA). All new and updated facilities and environments shall be designed to be universally accessible. The target is for 100 percent of facilities such as campsites and picnic sites to be universally accessible. The standard that must be met is that the minimum number of universally accessible facilities such as campsites and picnic sites comply with current UA guidance. Existing facilities will be retrofitted to become universally accessible as funding allows.

c. Buildings. Areas around buildings are landscaped with appropriate vegetation to provide the recreational user with isolation and screening from other uses or activities, while also providing an aesthetically pleasing area.

d. Utilization of Pre-fabricated Facilities. If any facilities are constructed such as, but not limited to shower buildings, comfort stations, and any type of group shelter, the option of using a pre-fabricated facility will be considered when determining the most cost effective approach.

e. Feasibility of Utilities. The feasibility of connecting to existing electricity, water, and/or sewer utilities will be considered when determining the best location for proposed facilities.

f. Utilities Placement. Power and communication lines inside recreation areas should be placed underground. If overhead power lines are absolutely necessary they shall be placed where they will not become a safety hazard and in accordance with ER 1110-2-4401, “Engineering and Design – Clearances for Electric Power Supply Lines and Communication Lines Over Reservoirs.”

g. Topography. The topography of the area will be utilized to the best possible advantage by placement of buildings to provide the user with a scenic view, and to accommodate people with disabilities.

h. Trails. The placement of trails was determined by the locations that would provide the best water and nature orientation, while considering the needs of the user to get from one location to another. Trails are generally located below 626.5 flood pool elevation. To maintain the trails, operational

vehicles will have access to some areas of the trails. Various types of trails have been developed at Lake Shelbyville: hiking, nature, interpretive, equestrian, snowmobile, cross-country skiing, and multi-purpose, which includes bicycle.

The General Dacey Trail Plan is a multi-partnered regional initiative centered on Lake Shelbyville. This is more than a simple trail project. Upon completion, the proposed General Dacey Trail will provide almost one hundred and seventy miles of recreational opportunities. A further description of the General Dacey Trail Plan can be found in Section 10-10.

EM 1110-2-410, “Design of Recreation Areas – Access and Circulation, “contains detailed specifications for trails.

i. Roads. Recreation area road placement was limited to level areas located away from extensive tree cover where possible.

j. Campgrounds. Required, recommended, and optional considerations concerning new construction or renovation of campgrounds can be found in EM 1110-1-400 Recreation Facilities and Customer Services Standards.

9-02. SIGNS

All new signs are to be installed, as required, under the direction of project personnel and conform to the Corps of Engineers Sign Standard Manual, EP 310-1-6a & b and the Graphic Standards Manual, EP 310-1-6.

9-03. MISCELLANEOUS

If any of the following facilities are constructed, the Corps of Engineers Recreation Facilities and Customer Services Standards, EM 1110-1-400, will be utilized.

a. Fish Cleaning Stations.

b. Sanitary Dump Stations.

c. Support Items. Picnic tables, fire rings and grills, lantern hangers, water hydrants, benches, and self-pay stations.

d. Comfort Station and Shower House Buildings. Comfort stations shall be provided within campgrounds and day use areas. Shower houses shall be provided at campgrounds and at beaches when feasible.

Specific building features for all comfort stations and shower houses within a campground where water and sewage treatment are available include:

Recommended:

1) Provide a minimum of one restroom fixture per gender for each 25 campsites.
2) One sink per each 25 campsites per gender.
3) Provide a minimum of one showerhead per gender for each 25 campsites.

Required:

1) One electric hand dryer or paper towel dispenser per every two sinks.
2) Shelf for toiletries in shower stall, shelving above sinks, and clothing hooks nearby.
3) Vandal proof mirror above every sink.
4) Drinking fountain.
5) Provide a minimum of one fully equipped unisex shower unit at each campground.
6) An individual dressing area for each shower stall.

e. Campsite. Campgrounds may be developed with a range of campsite types from fairly primitive tent-only sites to highly developed multipurpose sites that will accommodate modern recreational vehicles. Campgrounds may also include group and multi-unit campsites. This provides a diversity of camping opportunities to accommodate different user types and groups. Campsites may also be more efficiently sited within a campground by utilizing a range of campsite types with differing spatial and spacing requirements.

Specific building features for campsites include:

Required:

1) A hardened living area, 400 to 625 square feet, with a fine crushed stone or other hard surface, picnic table, fire ring/grill, and lantern hanger provided for each campsite.
2) Living area bordered by concrete curbing, plastic or wooden timbers, or other approved materials.
3) As a minimum, one water spigot shall be provided per four campsites. Individual campsite water hookup required at administrative sites and recommended at multi-purpose sites.
4) Have 50-, 30-, and 20-amp electrical hookups located at the campsite pedestal. This is optional for tent-only campsites.
5) Individual campsite sewage hookup required at administrative sites and optional at multi-purpose sites where demand exists and local factors allow for installation.

f. Boat launching ramp. Boat launch ramps shall provide convenient and safe public access to the water.

g. Courtesy Docks. Courtesy docks shall be provided at launch ramps for short-term docking, loading of gear, and passenger safety and convenience. Docks shall have a minimum width of six feet and minimum length of twenty feet. Docks should be located to avoid boat traffic congestion and ensure continued use of the ramp. Portable facilities such as floating docks, cable-guided docks, and push-pull docks are recommended if the water fluctuation difference is more than three feet.

h. Playgrounds. Playgrounds should be integrated within the site with access to parking and safe pedestrian access routes that provide separation from vehicular traffic. Playgrounds should be located in close proximity to other high-use activities such as group use facilities. The shape or limits of playgrounds are influenced by the existing conditions of the site and the play components that are provided. The playground area may be defined to allow the placement of desirable trees within the limits of the playground to provide shade.

i. Entrance Stations. Entrance stations are buildings located at park area entrances and designed for purposes such as fee collection, security, and dispensing customer information.

j. Group Shelters. Group shelters can range from small shade structures covering one or two picnic tables, to large screened or enclosed structures. The character and size of the structure should be consistent with the design theme and typical group sizes that use the park. Related amenities should be considered to serve large groups and extended family gatherings. Consideration should be given to the use of pre-manufactured shelters for durability, ease of construction, and ease of maintenance.

9-04. INTERPRETIVE DEVICES

Interpretive devices provided include, but are not limited to, the following: trails, signs, visual aids, programs, events, brochures, and displays. All activities under the Interpretive Services and Outreach Program (ISOP) shall be designed to accomplish one or more of the goals listed in ER 1130-2-550, Chapter 4, 15 November 1996.

a. Visitor Center. Visitor Center operation is necessary and integral part of total project management. The primary purpose of the Visitor Center program is to provide interpretive information to the visiting public about the Corps, its mission, the project and its facilities, visitor safety and geographic area where the project is located. Visitor Center provides the information necessary to visitors for safe and enjoyable use of Corps facilities. Exhibits and

other interpretive communications should be designed to stimulate interest and convey information. Chapter 5 of ER 1130-2-550 and EP 1130-2-550 “Visitor Center Program” establishes guidance governing planning, development, management, and operation of USACE Visitor Center facilities at civil works water resource projects.

b. Amphitheaters. Amphitheater facilities should be constructed of materials that are indigenous to the site or reminiscent of a local character and style so that the structure blends with the natural environment of the park. Durable construction materials that can withstand exposure to weather and the year-round impacts of users should be used. Table 5.17 of EM 1110-1-400 contains amphitheater design guidelines.

9-05. WASTE AND DISPOSAL

Trash, refuse collection, and disposal services are contracted out to private industry. Section 4.8 and Table 4.5 of EM 1110-1-400 contains guidance for trash service support items.

9-06. WATER AND SEWER DESIGN CRITERIA

a. Waste Water Collection and Treatment. Sewer design is in accordance with the requirements of the Federal Environmental Protection Agency, Illinois Environmental Protection Agency and Corps of Engineers Memorandum EM 1110-1-400: Planning and Design Criteria, and other standards and conditions as required by the Corps of Engineers. Septic systems are not permitted.

(1) Generally, sewers are located to obtain maximum use of gravity flow mains by following contours. Lift stations and force mains are provided as necessary to transfer flow from locations having low ground elevations relative to elevations downstream. Where possible, gravity sewers from several buildings are grouped to intersect at a common lift station. For planning purposes, gravity sewers are based upon 8-inch diameter PVC mains and 4-inch PVC service laterals.

(2) Lift station sizing is based upon all sewage being pumped within an 18 hour day with a peak flow factor of 2.5 times and average 30 gallons per day (GPD) per person for campers and 5 GPD per person for picnickers using waterborne toilets. Minimum size for force mains is 4-inch diameter. Minimum discharge from the lift stations is based upon 100 GPM for flooded suction pumps.

(3) Equalization tanks are anticipated to regulate flow to treatment plants where lift stations occur. Sizing of flow equalization tanks for planning purposes is based upon storage equal to one-half the capacity of the sewage

treatment plant. Sewage treatment is in accordance with the requirements of the Federal Environmental Protection Agency, Illinois Environmental Protection Agency and Corps of Engineers Memorandum EM 1110-1-400 "Planning and Design Criteria" and other standards and conditions as required by the Corps of Engineers. Facility loading is based upon all camping spaces fully occupied on a weekend day without any additional overflows permitted to occur during seasonal or holiday peaks. Peak population is based upon eight person per day for each campsite, and four persons per day for picnic tables. For planning purposes, facility sizing is based upon 20 pounds Biochemical Oxygen Demand (BOD) or less per 1,000 cubic feet for an extended aeration package treatment plant. At campsites, the BOD per capita day is assumed at .08 pounds and at picnic areas the BOD per capita day is assumed at .02 pounds. For treatment plants of 40,000 GPD and above, dual aeration tanks are assumed. Tertiary treatment is required based upon use of gravity filter type treatment.

(4) Currently, one extended aeration sewage treatment plant and three land treatment systems are operated in the recreation areas.

(5) The treatment plant outlet is assumed at elevation 620 feet NGVD for planning purposes based upon a 50-year frequency elevation of 618 feet NGVD for the lake. The discharge elevation is assumed at five feet below normal pool for dispersion into the lake. It is assumed that the outfall line and headsail will be constructed without dewatering when the lake level submerges the outlet.

(6) The Corps of Engineers is currently negotiating with the Cities of Shelbyville and Sullivan to connect facilities to a regional sewer system maintained by the responsible municipality. Connecting to the cities would eliminate the need for the Corps of Engineers to operate and maintain the sewage treatment plant (STP) and the three land treatment systems. Replacement of the STP at Wilborn Creek Recreation Area is a priority because the system is beyond its design life and does not meet current Illinois Environmental Protection Agency (IEPA) requirements for discharge. All work concerning the regional sewer system will be done in accordance with the appropriate permits from the IEPA.

b. Water System. Water systems design is in accordance with the requirements of the Corps of Engineers Memorandum EM 1110-1-400, "Planning and Design Criteria," and other standards and conditions as required by the Corps of Engineers.

(1) For planning purposes, the source of water supply for domestic purposes for each site is based upon 50 GPM at a pressure of 50 psi available at the connection to the main of the water district from the city of Shelbyville system or Moultrie Water District. The present water supply agreement with the

water district does not provide adequate flows to meet fire protection demands. Provisions for fire protection are outlined in Section 12-03.

(2) For planning purposes, storage at each site is based upon a minimum supply of 50 GPM available from the water district. The total storage required is assumed as that necessary to provide for peak daily usage based upon 2.5 times the average daily consumption.

(3) Domestic water demand is based upon 30 GPD average per person assuming that all water consumed in one day is used within 18 hours. The maximum hourly rate of demand is based upon a peak factor of 2.5 times average flow.

(4) Main sizing is based upon peak domestic rate of flow. Looping of water lines has not been provided as a basis for planning. Sizing of service lines to buildings is based upon fixture units flow requirements in accordance with the National Plumbing Code.

(5) Water mains are considered to be adequately sized at peak flows to maintain required residual pressures for flush tanks.

9-07. POLICIES AND PROCEDURES PUBLICATIONS

a. General policies and procedures for planning, design, operation, and maintenance of recreation facilities at USACE Civil Works projects are given in Engineer Manuals (EM), Engineer Regulations (ER), and Engineer Pamphlets (EP) referenced below:

EM 1110-1-400 Recreation Planning and Design Criteria

This Engineer Manual is located on the Natural Resources Management Gateway web page; http://corpslakes.usace.army.mil under the Policy and Procedures in the Recreation Facilities Standards Section. This manual includes required, recommended, and optional criteria for all new or renovated facilities on Corps of Engineers land.

ER 1110-2-400	Design of Recreation Sites, Areas, and Facilities
EP 1130-2-550	Chapter 3: Project Master Plans and Operational Management Plans
ADAAG	ADA Accessibility Guidelines
UFAS	Uniform Federal Accessibility Standards
EP 1130-2-540	Chapter 2:Recreation Management
ER 1165-2-400	Recreational Planning, Development, and Management Policies
EP 310-1-6	Graphic Standards Manual
EP 310-1-6 a & b	Sign Standards Manual
EM 385-1-1	Safety and Health Requirements Manual

b. These publications guide the development of recreational facilities to assure they are of the highest quality while serving the health, safety, and enjoyment of the visiting public.