NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

POND

(No.)

CODE 378

DEFINITION

A water impoundment made by constructing an embankment or by excavating a pit or dugout.

In this standard, ponds constructed by the first method are referred to as embankment ponds, and those constructed by the second method are referred to as excavated ponds. Ponds constructed by both the excavation and the embankment methods are classified as embankment ponds if the depth of water impounded against the embankment at the auxiliary spillway elevation is 3 feet or more.

PURPOSE

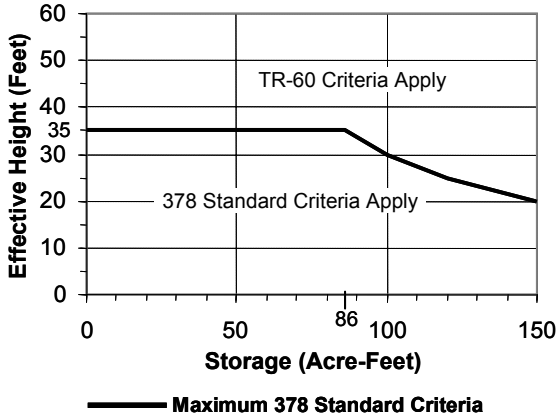
To provide water for livestock, fish and wildlife, recreation, fire control, and other related uses, and to maintain or improve water quality.

CONDITIONS WHERE PRACTICE APPLIES

This standard establishes the minimum acceptable quality for the design and construction of low-hazard ponds where:

1. Failure of the dam will not result in loss of life; damage to homes, commercial or industrial buildings, main highways, or railroads; or in interruption of the use or service of public utilities.
2. The product of the storage times the effective height of the dam is less than 3,000. Storage is the volume, in acre-feet, in the reservoir below the elevation of the crest of the auxiliary spillway. The effective height of the dam is the difference in elevation, in feet, between the auxiliary spillway crest and the lowest point in the cross section taken along the centerline of the dam. If there is no auxiliary spillway, the top of the dam is the upper limit.
3. The effective height of the dam is 35 feet or less.

Figure 1 – Pond (378) Standard Criteria



General Criteria Applicable To All Ponds
All federal, State and local requirements shall be addressed in the design.

A dam shall meet the permitting requirements (Figure 2) of the Louisiana Dam Safety Program (LA-DOTD) when either of the following is met.

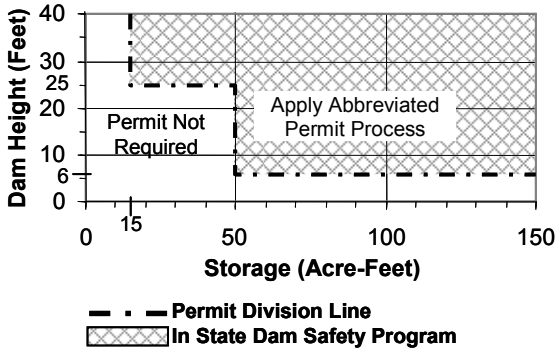
1. the height of the dam is twenty-five feet or more (≥25 ft) in height and has an impounding capacity at maximum storage greater than fifteen acre-feet (>15 ac-ft)
2. the maximum storage capacity is fifty acre-feet) or more (≥50 ac-ft) and is greater than six feet (>6 ft) in height.

LA-DOTD defines the dam height as the height from the lowest elevation of the downstream limit of the dam to the top of the dam. The maximum storage capacity is defined as the volume in the reservoir when the water level in the reservoir is at the top of dam elevation.

The LA-DOTD approval process may be abbreviated if dams meet the requirements of this conservation practice standard and NRCS provides the design, layout and construction inspection of the dam and certifies that the dam meets the requirement of this conservation practice standard.

The landowner is responsible for providing LA-DOTD with a copy of the Pond Data Sheet, a map showing the location of the pond and a letter signed by the owner of the dam (see Exhibit A)

Figure 2 – State Dam Safety Program Dam Permit Requirements



A protective cover of vegetation shall be established on all exposed areas of embankments, spillways and borrow areas as climatic conditions allow, according to the guidelines in conservation practice standard 342, Critical Area Planting.

Site conditions. Site conditions shall be such that runoff from the design storm can be safely passed through (1) a natural or constructed auxiliary spillway, (2) a combination of a principal spillway and an auxiliary spillway, or. (3) a principal spillway without causing erosion, and (4) all discharges shall be back in the original channel at a non erosive velocity prior to leaving the property. If there is concern for erosion, measures shall be employed to prevent erosion.

Drainage area. The drainage area above the pond must be protected against erosion to the extent that expected sedimentation will not shorten the planned effective life of the structure. The drainage area shall be large enough so that surface runoff and groundwater will provide an adequate supply of water for the intended purpose unless an alternate water source exists to serve this purpose. The quality shall be suitable for the water's intended use.

Reservoir area. The topography and geology of the site shall permit storage of water at a depth and volume that will ensure a dependable supply, considering beneficial use, sedimentation, season of use, and evaporation and seepage losses. If surface runoff is the primary source of water for a pond, the soils shall be impervious enough to prevent excessive seepage losses or shall be of a type that sealing is practicable.

DESIGN CRITERIA FOR EMBANKMENT PONDS

Geological Investigations. Pits, trenches, or borings in accordance with NEM Part 531.03 Requirement for preliminary geologic investigations shall be conducted to characterize materials within the embankment foundation, auxiliary spillway and borrow areas. Soil materials shall be classified using the Unified Soil Classification System.

Foundation cutoff. A cutoff of relatively impervious material shall be provided under the dam if necessary to reduce seepage through the foundation. The cutoff shall be located at or upstream from the centerline of the dam. It shall extend up the abutments as required and be deep enough to extend into a relatively impervious layer or provide for a stable dam when combined with seepage control. The cutoff trench shall have a bottom width adequate to accommodate the equipment used for excavation, backfill, and compaction operations. Side slopes shall not be steeper than one horizontal to one vertical.

Seepage control. Seepage control is to be included if (1) pervious layers are not intercepted by the cutoff, (2) seepage could

create swamping downstream, (3) such control is needed to insure a stable embankment, or (4) special problems require drainage for a stable dam. Seepage may be controlled by (1) foundation, abutment, or embankment filters and drains; (2) reservoir blanketing; or (3) a combination of these measures.

Embankment. The minimum top width for a dam is shown in table 1. If the embankment top is to be used as a public road, the minimum width shall be 16 feet for one-way traffic and 26 feet for two-way traffic. Guardrails or other safety measures shall be used where necessary and shall meet the requirements of the responsible road authority. For dams less than 20 feet in height, maintenance considerations or construction equipment limitations may require increased top widths from the minimum shown in Table 1.

Table 1. Minimum top width for dams

Total height of embankment	Top width
feet	*feet*
Less than 10	6
10 – 14.9	8
15 – 19.9	10
20 – 24.9	12
25 – 34.9	14
35 or more	15

Side Slopes. The combined upstream and downstream side slopes of the settled embankments shall not be less than five horizontal to one vertical, and neither slope shall be steeper than two horizontal to one vertical. All slopes must be designed to be stable, even if flatter side slopes are required. Downstream or upstream berms can be used to help achieve stable embankment sections

Slope Protection. If needed to protect the slopes of the dam from erosion, special measures, such as berms, rock riprap, sand-gravel, soil cement, or special vegetation, shall be provided (Technical Releases 56, "A guide for Design and Layout of Vegetative Wave Protection for Earth Dam Embankments" and 69, "Riprap for Slope Protection Against Wave Action" contain design guidance).

Freeboard. The minimum elevation of the top of the settled embankment shall be 1 foot above the water surface in the reservoir with the auxiliary spillway flowing at design depth. The minimum difference in elevation between the crest of the auxiliary spillway and the settled top of the dam shall be 2 feet for all dams having more than a 20-acre drainage area or more than 20 feet in effective height.

Additional freeboard, as shown in Table 2, shall be added to applicable freeboard specified above in order to contain waves on ponds having longer surface exposure (fetch).

Table 2 - Minimum Additional Freeboard Allowance For Waves in Feet

Design High Water Depth2/	Fetch in Feet				
	1001 to 1250	1251 to 1500	1501 to 1750	1751 to 2000	2001 to 5000
2 Ft.	0.2	0.3	0.4	0.5	1.0
4	0.3	0.4	0.5	0.6	1.2
6	0.3	0.4	0.5	0.7	1.4
8	0.4	0.5	0.6	0.7	1/
10	0.4	0.5	0.7	0.8	
12	0.4	0.6	0.7	0.9	
> 12 to 25	0.5	0.6	0.8	0.9	

1/ Special design required.

2/ Design High Water Depth is defined as the height of water against the dam when the auxiliary spillway is flowing at design depth

Wave Erosion Protection. When the fetch of the pond exceeds 1,000 feet, the upstream face of the dam shall be protected from wave damage by one of the following methods:

1. At least an 8-foot wide berm located approximately 1.0 foot above the planned waterline.
2. A 4-foot bank of structural material such as precast perforated concrete block, riprap or broken concrete extending to an elevation at least 2 feet below and 2 feet above the planned waterline.
3. Increase the width through the dam at the planned waterline at least 4 feet. This increase in width may be obtained by increasing the top width or freeboard, or by flattening the side slopes.

4. Soil cement.
5. Planting vegetation of the right character and height on properly constructed berms (Ref. TR-56).

The assistance and approval of the state office is required when use of soil cement, concrete blocks or vegetation is planned for protection of the upstream face of the dam.

Settlement. The design height of the dam shall be increased by the amount needed to insure that after settlement the height of the dam equals or exceeds the design height. This increase shall not be less than 5 percent of the height of the dam, except where detailed soil testing and laboratory analyses or experience in the area show that a lesser amount is adequate. In the absence of detailed geotechnical information the minimum allowance for settlement shall be as shown in Table 3.

Table 3. Allowance for settlement

Dam Construction Method	Minimum Settlement Allowance in Percent
Compacted Earthfill[1/]	5
Dumped & Shaped[2/]	10

[1/] Compacted Earthfill is defined as fill material that is compacted as specified by the construction specifications by means of a specified number of passes of compaction equipment such as sheepsfoot rollers or fully loaded scrapers or earthmovers.

[2/] Dumped & Shaped is defined as fill material hauled from off-site dumped and shaped or scraped on-site and shaped with blade type equipment such as bulldozers, motor graders, or scrapers

Actual allowance for settlement (in excess of the minimum listed) shall be determined by the designer for the individual site based on soil type, moisture conditions, contractor and experience in the area.

Hydrologic Design. The minimum hydrologic design for dams meeting the requirements of the State Dam Safety Program shall be as follows.

Principal Spillway Storm* – 2.5 to 3.0 inches of rainfall per 24 hr. (See Figure 3).

Auxiliary Spillway Storm – 50 year 24 hour frequency (See Figure 4).

Freeboard Storm – 100 year 24 hour frequency (See Figure 5).

*Principal spillway criteria do not apply to ponds whose drainage area is essentially the same as the surface area (e.g. commercial fish ponds).

Principal spillway. A pipe conduit, with needed appurtenances, shall be placed under or through the dam, except where rock, concrete, or other types of lined spillways are used, or where the rate and duration of flow can be safely handled by a vegetated or earth spillway.

A principle spillway (trickle tube) shall be required for all ponds with a drainage area greater than 5 acres. The minimum trickle tube size for a pond is shown in Table 4. All trickle tubes shall have a trash guard to prevent the conduit from clogging.

For dams with a drainage area of 20 acres or less, the principal spillway crest elevation shall not be less than 0.5 feet below the auxiliary spillway crest elevation. For dams with a drainage area over 20 acres, this difference shall not be less than 1.0 feet. Dams constructed primarily for game fish production shall have the principal spillway crest elevation set a minimum of 1.0 foot below the auxiliary spillway crest elevation for drainage areas of 20 acres or less and 1.5 feet below the auxiliary spillway crest elevation for drainage areas greater than 20 acres.

Where ponds are to be constructed primarily for game fish production, they shall be located so that the drainage area will produce adequate runoff; however, peak outflow shall be small enough to limit the design auxiliary spillway flow to 6 inches in depth. Design auxiliary spillway flow depth may be increased when a trickle tube is used. The trickle tubes shall be sized to decrease the use of the auxiliary spillway. The landowner should be informed that fish stock may be lost during storms causing high auxiliary spillway flow depth. Trickle tubes should remove water from the bottom and not the surface of the pond storage area.

When design discharge of the principal spillway is considered in calculating peak outflow through the auxiliary spillway, the crest elevation of the inlet shall be such that the design discharge will be generated in the

conduit before there is discharge through the auxiliary spillway.

Pipe conduits designed for pressure flow must have adequate anti-vortex devices. The inlets and outlets shall be designed to function satisfactorily for the full range of flow and hydraulic head anticipated.

The capacity of the pipe conduit shall be the minimum size shown in Table 4 for dams not in the state dam safety program or sized according to the criteria detailed above under Hydrologic Design. The diameter of the principal spillway pipe shall not be less than 4 inches. Pipe conduits used solely as a supply pipe through the dam for watering troughs and other appurtenances shall not be less than 1-1/4 inches in diameter.

If the pipe conduit diameter is 10 inches or greater, its design discharge may be considered when calculating the peak outflow rate through the auxiliary spillway.

Table 4 – Minimum trickle tube size*

Drainage Area	Siphon	Drop Inlet**	
	SSP & PVC	PVC & SSP	CMP
Acres	Inches	Inches	Inches
5 – 10	4	8 x 6	10 x 8
5 – 10	4	8 x 6	10 x 8
11 – 20	4	8 x 6	10 x 8
21 – 50	6	8 x 6	12 x 8
51 – 100	8	10 x 8	15 x 10
101 – 175	10	15 x 10	18 x 12
176 – 300	12	18 x 12	21 x 15

* Applies to dams not in state dam safety program (see Figure 2)

** Riser diameter X barrel diameter.

Pipe conduits shall be ductile iron, welded steel, corrugated steel, corrugated aluminum, reinforced concrete (pre-cast or site-cast), or plastic. Pipe conduits through dams of less than 20 feet total height may also be cast iron or unreinforced concrete.

Pipe conduits shall be designed and installed to withstand all external and internal loads without yielding, buckling, or cracking. Rigid pipe shall be designed for a positive projecting condition. Flexible pipe shall be designed for a maximum deflection of 5 percent. The modulus of elasticity for PVC pipe shall be assumed as one-third of the amount designated by the compound cell classification to account for long-term reduction in modulus of elasticity. Different reductions in modulus may be appropriate for other plastic pipe materials.

The minimum thickness of flexible pipe shall be as shown in the Engineering Field Handbook (EFH), Chapter 6, Structures, LA Supplement, Figure S-6-48, Table of Minimum Wall Thickness and Fill Height For Pipe as appropriate for the particular pipe size and material. Connections of flexible pipe to rigid pipe or other structures shall be designed to

All pipe conduits shall be designed and installed to be water tight by means of couplings, gaskets, caulking, waterstops, or welding. Joints shall be designed to remain watertight under all internal and external loading including pipe elongation due to foundation settlement.

Pipe conduits shall have a concrete cradle or bedding if needed to provide improved support for the pipe to reduce or limit structural loading on pipe to allowable levels.

Cantilever outlet sections, if used, shall be designed to withstand the cantilever load. Pipe supports shall be provided when needed. Other suitable devices such as a Saint Anthony Falls (SAF) stilling basin or an impact basin may be used to provide a safe outlet.

All steel pipe and couplings shall have protective coatings in areas that have traditionally experienced pipe corrosion, or in embankments with saturated soil resistivity less than 4000 ohms-cm or soil pH less than 5. Protective coatings shall be asphalt, polymer over galvanizing, aluminized coating or coal tar enamel as appropriate for the pipe type. Plastic pipe that will be exposed to direct sunlight shall be ultraviolet-resistant and protected with a coating or shielding, or provisions provided for replacement as necessary

Cathodic Protection. Cathodic protection is to be provided for coated welded steel and galvanized corrugated metal pipe where soil and resistivity studies indicate that the pipe needs a protective coating, and where the

need and importance of the structure warrant additional protection and longevity. If cathodic protection is not provided for in the original design and installation, electrical continuity in the form of joint-bridging straps should be considered on pipes that have protective coatings. Cathodic protection should be added later if monitoring indicates the need.

Seepage Control. Seepage control along a pipe conduit spillway shall be provided if any of the following conditions exist:

1. The effective height of dam is greater than 15 feet.
2. The conduit is of smooth pipe larger than 8 inches in diameter.
3. The conduit is of corrugated pipe larger than 12 inches in diameter.

Seepage along pipes extending through the embankment shall be controlled by use of a drainage diaphragm

Drainage Diaphragm. The drainage diaphragm shall function both as a filter for adjacent base soils and a drain for seepage that it intercepts. The drainage diaphragm shall consist of sand meeting the requirements of ASTM C-33, for fine aggregate. If unusual soil conditions exist such that this material may not meet the required filter or capacity requirements, a special design analysis shall be made.

The drainage diaphragm shall be a minimum of 2 feet thick and extend vertically upward and horizontally at least three times the outside pipe diameter, and vertically downward at least 18 inches beneath the conduit invert. The drainage diaphragm shall be located immediately downstream of the cutoff trench, but downstream of the centerline of the dam if the cutoff is upstream of the centerline.

The drainage diaphragm shall be outletted at the embankment downstream toe using a drain backfill envelope continuously along the pipe to where it exits the embankment. Drain fill shall be protected from surface erosion.

Trash Guard. To prevent clogging of the conduit, an appropriate trash guard shall be installed at the inlet or riser unless the watershed does not contain trash or debris that could clog the conduit.

Other Outlets. A pipe with a suitable valve shall be provided to drain the pool area if needed for proper pond management or if required by State law. The principal spillway conduit may be used as a pond drain if it is located where it can perform this function.

Auxiliary spillways. Auxiliary spillways convey large flood flows safely past earth embankments and have historically been referred to as “Emergency Spillways”.

An auxiliary spillway must be provided for each dam, unless the principal spillway is large enough to pass the peak discharge from the routed design hydrograph and the trash that comes to it without overtopping the dam. The following are minimum criteria for acceptable use of a closed conduit principal spillway without an auxiliary spillway: a conduit with a cross-sectional area of 3 ft^2 or more, an inlet that will not clog, and an elbow designed to facilitate the passage of trash.

The minimum capacity of a natural or constructed auxiliary spillway shall be that required to pass the peak flow expected from a design storm of the frequency and duration shown in Table 5, less any reduction creditable to conduit discharge and detention storage.

Table 5. Minimum auxiliary spillway capacity

Drainage area (Ac.)	Effective height of dam[1] (Ft.)	Storage (Ac-Ft)	Minimum design storm[2]	
			Frequency (Years)	Minimum duration (Hours)
20 or less	20 or less	< than 50	10	24
20 or less	> than 20	< than 50	25	24
> than 20		< than 50	25	24
All others			50	24

1. As defined under “Conditions where Practice Applies”.
2. Select rain distribution based on climatological region.

The auxiliary spillway shall safely pass the peak flow, or the storm runoff shall be routed through the reservoir. The routing shall start either with the water surface at the elevation of the crest of the principal spillway or at the water surface after 10 days’ drawdown, whichever is higher. The 10-day drawdown shall be computed from the crest of the

auxiliary spillway or from the elevation that would be attained if the entire design storm were impounded, whichever is lower. Auxiliary spillways shall provide for passing the design flow at a safe velocity to a point downstream where the dam will not be endangered.

Constructed auxiliary spillways are open channels that usually consist of an inlet channel, a control section, and an exit channel. They shall be trapezoidal and shall be located in undisturbed or compacted earth or in-situ rock. The side slopes shall be stable for the material in which the spillway is to be constructed. For dams having an effective height exceeding 20 feet, the auxiliary spillway shall have a bottom width of not less than 10 feet.

Upstream from the control section, the inlet channel shall be level for the distance needed to protect and maintain the crest elevation of the spillway. The inlet channel may be curved to fit existing topography. The grade of the exit channel of a constructed auxiliary spillway shall fall within the range established by discharge requirements and permissible velocities.

Structural auxiliary spillways. If chutes or drops are used for principal spillways or auxiliary spillways, they shall be designed according to the principles set forth in the Part 650, Engineering Field Handbook and the National Engineering Handbook, Section 5, Hydraulics; Section 11, Drop Spillways; and Section 14, Chute Spillways. The minimum capacity of a structural spillway shall be that required to pass the peak flow expected from a design storm of the frequency and duration shown in table 2, less any reduction creditable to conduit discharge and detention storage.

CRITERIA FOR EXCAVATED PONDS

Minimum Size. The minimum size excavated pond shall have 2,400 square feet of surface area, with a minimum top width of 40 feet. It is desirable that twenty percent of the surface area shall be 6 feet deep. However, a minimum of 16 percent of the surface area shall be 6 feet deep, except where the depth is limited to less than 6 feet by a permeable stratum and no other source of water is practicable. See conservation practice standard 399, Fishpond Management, Land Management Guide, Biology Job Sheets and Technical Notes on fisheries for biological recommendations.

Runoff. Provisions shall be made for a pipe and auxiliary spillway, if needed, that will meet the capacity requirements of Table 2. Runoff flow patterns shall be considered when locating the excavated pond and placing the spoil.

Side slopes. Side slopes of excavated ponds shall be stable and shall not be steeper than one horizontal to one vertical. If livestock will water directly from the pond, a watering ramp (i.e. water access point) of ample width shall be provided. The ramp shall extend to the anticipated low water elevation at a slope no steeper than three horizontal to one vertical. Water access points shall conform to conservation practice standard 561, Heavy Use Area Protection or 578, Stream Crossing.

Inlet protection. If surface water enters the pond in a natural or excavated channel, the side slope of the pond shall be protected against erosion.

Excavated material. The material excavated from the pond shall be placed so that its weight will not endanger the stability of the pond side slopes and it will not be washed back into the pond by rainfall. It shall be disposed of in one of the following ways:

1. Uniformly spread to a height that does not exceed 3 feet, with the top graded to a continuous slope away from the pond.
2. Uniformly placed or shaped reasonably well, with side slopes assuming a natural angle of repose. The excavated material will be placed at a distance equal to the depth of the pond but not less than 12 feet from the edge of the pond.
3. Shaped to a designed form that blends visually with the landscape.
4. Used for low embankment construction and leveling of surrounding landscape.
5. Hauled away.

DESIGN CRITERIA FOR SMALL PONDS IN SERIES

The criteria contained herein shall be used to design small ponds in series. These criteria may be used in lieu of a rigorous TR-60 routing analysis of the ponds in series subject to the following limitations and conditions.

Limitations:

1. The dams are less than inventory size. A dam is inventory size when the height of the dam is 25 feet or more ($\geq$ 25 ft) and has an impounding capacity at maximum storage greater than 15 acre-feet (>15 ac-ft) or having an impounding capacity at maximum storage of 50 acre-feet ($\geq$50 ac-ft) or more and is greater than six feet (>6 ft) in height.
2. Both or all dams are low hazard (Class A)
3. The downstream dam shall not be overtopped.
4. Surface area of the upstream pond or ponds shall not exceed 1.0 acre each.
5. The effective height of the dam shall be limited to not greater than 12 feet. Effective height is the difference in elevation, in feet, between the auxiliary spillway crest and the lowest point in the cross section taken along the centerline of the dam.
6. Both the downstream and the upstream pond shall have an auxiliary spillway of adequate design to handle the peak flow from the design storm required by Pond Standard (378) based on the drainage area of the original design.
7. The new pond shall meet all other applicable provisions of this standard.

Upstream Pond-New. The size of the new upstream pond is dependent on the storage capacity of the existing downstream pond. The storage volume of the new structure shall not exceed the difference in the freeboard storage capacity of the existing downstream pond less the storage capacity of the downstream pond when pool stage of the existing downstream pond is at the crest elevation of the principal spillway.

Downstream Pond-New. The new downstream pond shall be designed to contain the storage volume of the existing upstream pond. This storage volume shall be contained in the new downstream pond between the crest of the principal spillway and the top of the dam in the event of a breach of the upstream dam.

CONSIDERATIONS

Visual resource design. The visual design of ponds should be carefully considered in areas of high public visibility and those associated with recreation. The underlying criterion for all visual design is appropriateness. The shape and form of ponds, excavated material, and plantings are to relate visually to their surroundings and to their function.

The embankment may be shaped to blend with the natural topography. The edge of the pond may be shaped so that it is generally curvilinear rather than rectangular. Excavated material can be shaped so that the final form is smooth, flowing, and fitting to the adjacent landscape rather than angular geometric mounds. If feasible, islands may be added for visual interest and to attract wildlife.

Use Exclusion. Consideration should be given to limiting the use of the pond for livestock watering to specific water access points. Water access points should conform to conservation practice standards 561, Heavy Use Area Protection or 578, Stream Crossing.

Cultural Resources. Consider existence of cultural resources in the project area and any project impacts on such resources. Consider conservation and stabilization of archeological, historic, structural, and traditional cultural properties when appropriate.

Fish and Wildlife. Project location and construction should minimize the impacts to existing fish and wildlife habitat.

When feasible, structure should be retained, such as trees in the upper reaches of the pond and stumps in the pool area. Upper reaches of the pond can be shaped to provide shallow areas and wetland habitat.

If fish are to be stocked, consider criteria and guidance in conservation practice standard 399, Fishpond Management.

Shallow water edges should be deepened to provide an 18 to 36 inch water depth. See Standards and Specifications – 399 (Fishpond Management), Land Management Guide, Biology Job Sheets and Technical Notes on fisheries for biological recommendations, and Landscape Architecture Note 4.

Vegetation. Stockpiling topsoil for placement on disturbed areas can facilitate revegetation.

Consider placement and selection of vegetation to improve fish and wildlife habitat and species diversity.

Water Quantity. Consider effects upon components of the water budget, especially:

1. Effects on volumes and rates of runoff, infiltration, evaporation, transpiration, deep percolation, and ground water recharge.
2. Variability of effects caused by seasonal or climatic changes.
3. Effects on downstream flows and impacts to environment such as wetlands, aquifers, and; social and economic impacts to downstream uses or users.
4. Potential for multiple purposes.

Water Quality

1. Consider effects on erosion and the movement of sediment, pathogens, and soluble and sediment-attached substances that are carried by runoff.
2. Effects on the visual quality of onsite and downstream water resources.
3. Short-term and construction-related effects of this practice on the quality of downstream water courses.
4. Effects of water level control on the temperatures of downstream water to prevent undesired effects on aquatic and wildlife communities.
5. Effects on wetlands and water-related wildlife habitats.
6. Effects of water levels on soil nutrient processes such as plant nitrogen use or denitrification.
7. Effects of soil water level control on the salinity of soils, soil water, or downstream water.
8. Potential for earth moving to uncover or redistribute toxic materials such as saline soils.

PLANS AND SPECIFICATIONS

Plans and specifications for installing ponds shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

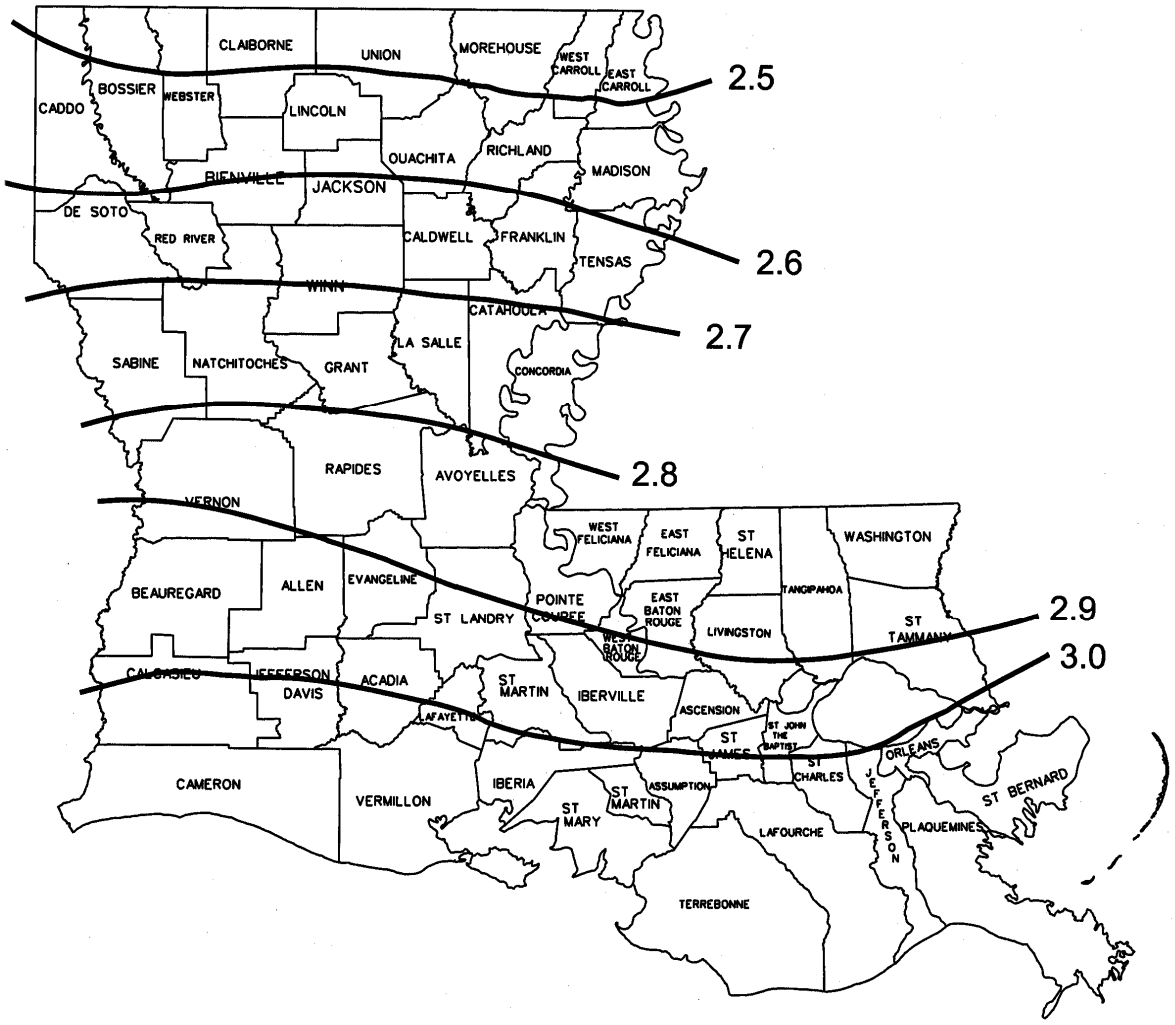
An operation and maintenance plan applicable to this practice that includes but is not limited to the items listed below will be developed with the landowner or individual responsible for operation and maintenance.

1. The lifespan of the practice shall be stated.
2. Maintenance:
   a. The dam shall be maintained in a manner that retains the specified vegetation on both the dam and auxiliary spillway. Mechanical or chemical controls of woody and invasive plant species will be required. Fertilization will be applied as necessary to maintain a vigorous permanent vegetative cover.
   b. Holes created by burrowing animals shall be backfilled and compacted.
   c. Any rills that develop on the dam slopes shall be immediately backfilled and compacted and permanent vegetation re-established.

3. Inspection:

a. As a minimum an annual inspection of the dam, principal and auxiliary spillways shall be made by the owner.

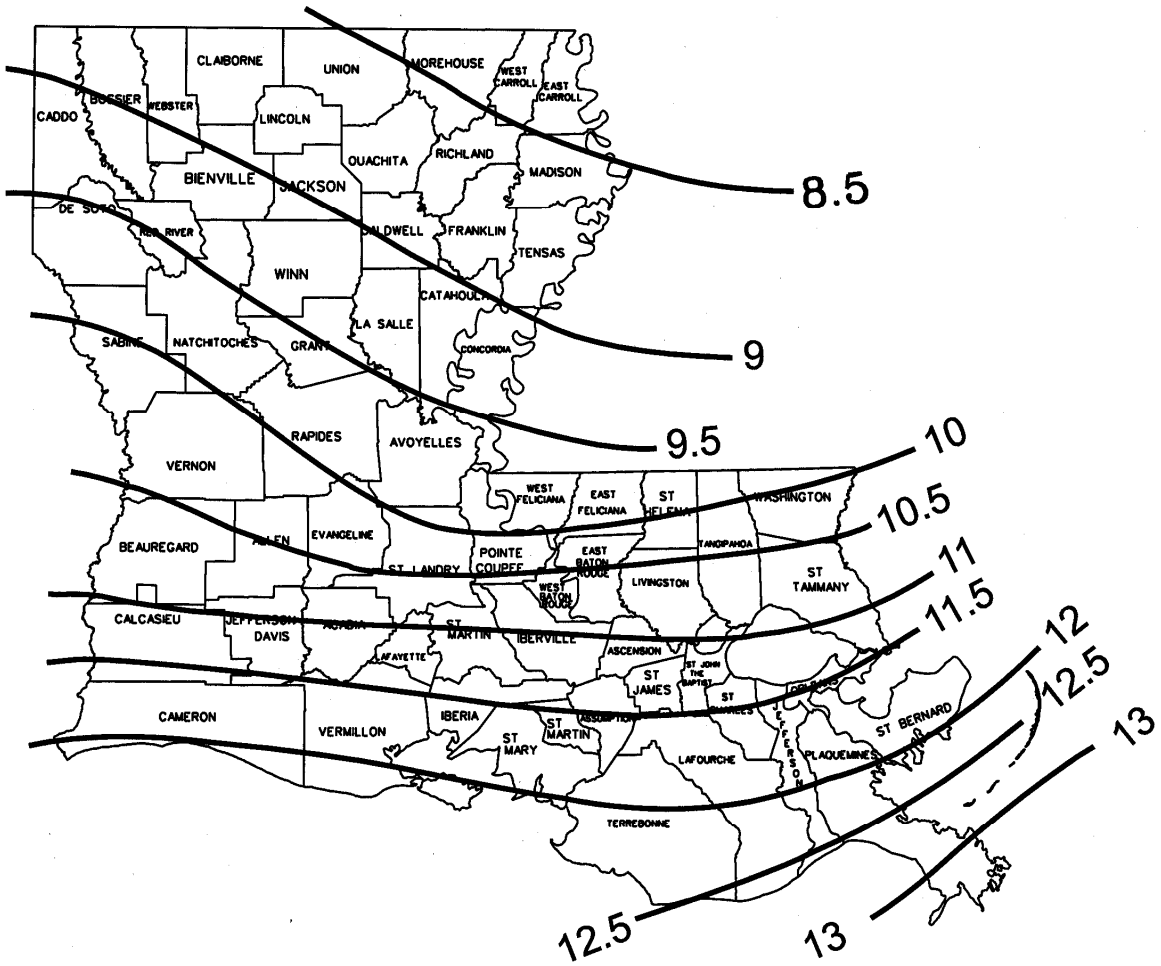
FIGURE 3. PRINCIPAL SPILLWAY DESIGN RAINFALL (INCHES)



NRCS, LA

October 2009

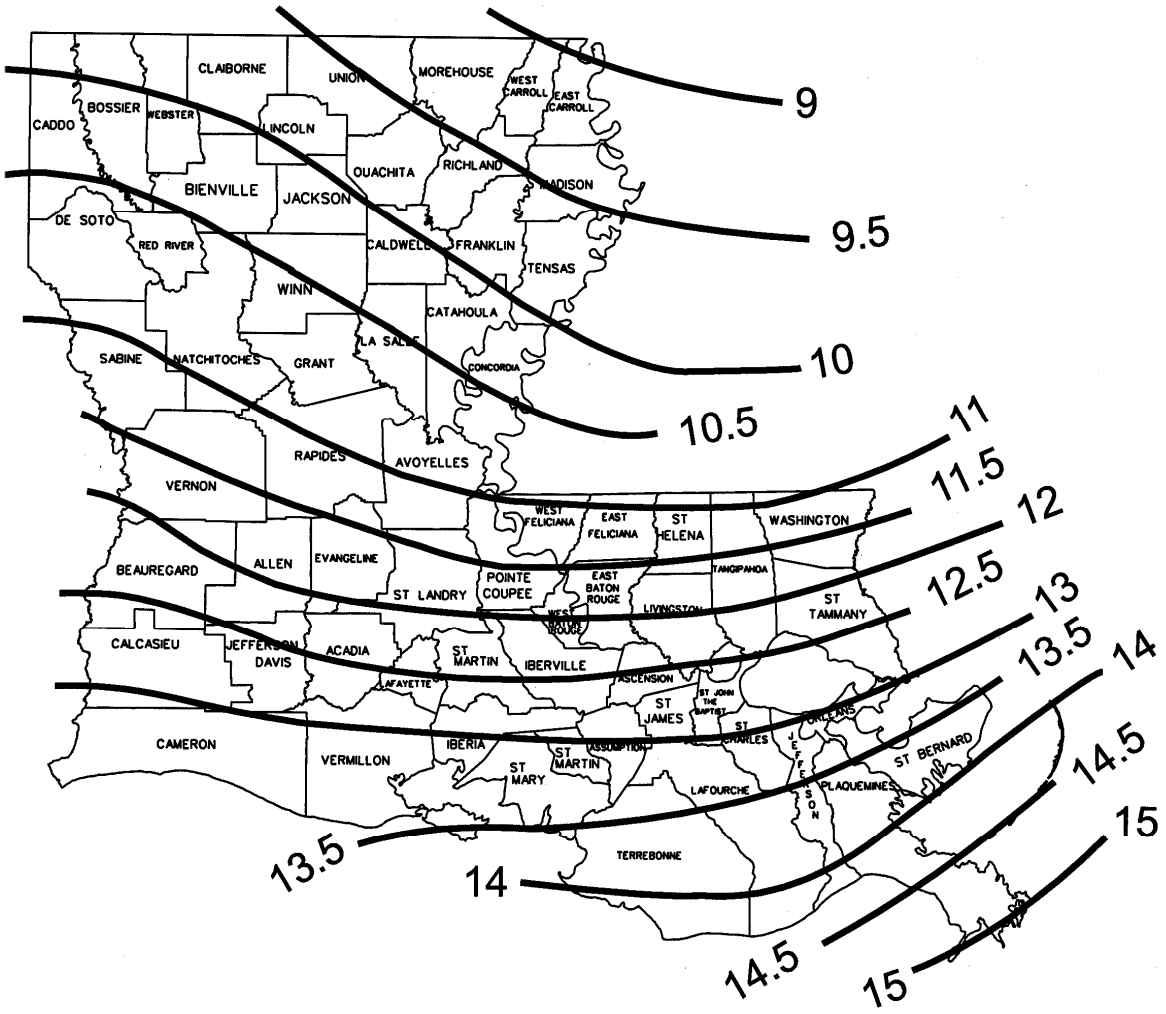
FIGURE 4. RAINFALL MAXIMUM 24-HOUR RAINFALL 50 YEAR FREQUENCY (INCHES)



NRCS, LA

October 2009

FIGURE 5. RAINFALL MAXIMUM 24-HOUR RAINFALL 100 YEAR FREQUENCY (INCHES)



NRCS, LA

October 2009

DATE: _____

Dam Safety Administrator
Louisiana DOTD
P. O. Box 94245, Capitol Station
Baton Rouge, Louisiana 70804

RE: POND CONSTRUCTION

I am aware that the design, construction, and operation of all dams within Louisiana are regulated by the Rules and Regulation for Dam Safety Program as developed by the State of Louisiana, Department of Transportation and Development. I am also aware of the liability that is associated with owning a dam.

Since I am receiving design and construction assistance from the Natural Resources Conservation Service, the dam described below is excluded from the approval process outlined in the Dam Safety Regulations. However, if for some reason (such as land use change) the dam no longer comes within the criteria of the Natural Resources Conservation Service National Handbook for Conservation Practice – Standard 378, Pond, I agree to modify the structure if necessary to comply with the requirements of the dam Safety Regulations. I also agree to allow access for inspection of this structure.

Sincerely,

_____
OWNER

DAM LOCATION: