CHIPPEWA/LUCE/MACKINAC CONSERVATION DISTRICT
2847 ASHMUN STREET SAULT STE. MARIE, MI 49783
906-635-1278 CLMCD@MACD.ORG WWW.CLMCD.ORG
"Our mission is to assist with land use and management through education, community projects and services."

Request for Bids
Chippewa/Luce/Mackinac Conservation District (CLMCD)
Waishkey River Watershed Farmland Runoff Reduction Project
Bid Period Open: January 19th, 2026 to February 13th, 2026
Bid Opening: February 13th, 2026 at 9:01am

Waishkey River Watershed Farmland Runoff Reduction Project Site #2 – Bridge, Manure Storage Facility & Gutters

CLMCD invites qualified contractors to provide bids for Site #2 for an early summer 2026 installation.

1. SUMMARY

Professional contractors with experience and expertise in barn gutters, livestock bridge crossing, and small cement work using standards from the Natural Resources Conservation Service (NRCS) are invited to submit a competitive bid for work associated with Waishkey River Watershed Farmland Runoff Reduction Project. The project site is located on South Maple Road, less than three miles from I-75 Exit 386. Contractors will need to comply fully with NRCS standards. This project includes the installation of the following;

- 200 ft of gutters for barn roof
- 25 ft x 6 ft livestock stream crossing (timber bridge)
- 20 ft x 20 ft manure storage bin

Installers will need to have a high degree of flexibility and communication. Installers will need to have the ability to meet with CLMCD to complete the project and be able to provide itemized invoices. The Request for Bids does not constitute a contract for services performed or to be performed. Following the selection of the successful contractor, CLMCD and the contractor will negotiate a contract including a full scope of services. If there are any questions, contact Mrs. Madeline Drent CLMCD Watershed Technician at 906-748-0837 madeline.drent@macd.org.

The contractors' services will consist of providing all necessary labor, equipment and materials for the completion of this project in accordance with the anticipated scope of service specifications in Section 2.

2. ANTICIPATED SCOPE

Four horses and one mini-pony reside on this property. The owner overwinters the animals in the 17,500 ft² paddock. Within the paddock, a 20'x20' concrete bottom with 4-inch curb manure storage bin will need to be constructed in the southeast corner. The manure storage bin will have 3 walls made of pressure treated wood with a metal roof structure diverting water way from the paddock and manure storage bin. No manure storage system exists on this property currently. Gutters (approx..200') will be added to redirect clean water from the roof and towards the stream

through a French drain system (approx. 250ft). A 25'x 6' livestock stream crossing will be added to allow access to pasture across the stream. Timber fabrication must meet NRCS standards. The crossing must be installed using EGLE standards and specifications outlined in the permit for the bridge crossing. CLMCD will apply for and hold the permit for the bridge crossing.

3. SCHEDULE FOR COMPLETION

CLMCD is expecting to have the project completed by July 2026. *Pending EGLE permit*.

- Contractors should purchase materials and begin installation as soon as permitted. *If the contractor is not able to meet the timelines, the contractor bid should provide a timeline of their own to be considered.*
    - **Pre-construction meeting is required with CLMCD and landowner.**
- March - July 2026 – Contractor should complete the given project to NRCS standards provided by CLMCD. Finished project will be inspected for quality and quantity upon completion by CLMCD. Invoice should be submitted to CLMCD itemized by project within 30 days of completion.

Any bidder will be given the option to see the project area with CLMCD project staff before the bidding period ends. Bidders can request a to see the project area by contacting Madeline Drent, Watersheds Technician at 906-748-0837 or by email at madeline.drent@macd.org. **Site visits are highly recommended to fully understand the project.**

4. SUBMITTAL REQUIREMENTS

Please submit one electronic copy of your bid in .PDF format no later than **9:00 AM EST on February 13th, 2026** to Mr. Mike McCarthy at clmcd@macd.org

In the interest of fairness to all bidders and to facilitate timely review, any bids received after the scheduled receipt time stated above will be rejected and not reviewed. All bids received on time become the property of the CLMCD and will not be returned.

In compliance with CLMCD policy, all bids will be opened on **9:01 AM EST** on **February 13th, 2026**. The bid will be opened by a CLMCD Staff member, analyzed and brought to the CLMCD Board for approval. All contractors may be present for the bid opening.

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5. What to Submit

To facilitate review of the bids, the bidders are requested to organize the bid package as follows:

- 1-2 page 8.5" x 11" letter sized paper with company's name, address, telephone number, and email.
- Brief paragraph providing experience for the type of project being bid on and using 3rd party standards, specifically NRCS standards.
- Bid price for the project with a breakdown showing the price of each component. See below for an example
- A timeline of when the project will be complete
- Date bid was submitted
- Signature of bidder.

Itemized List Example

Values shown here are fictional and not expectations for real pricings.

Item	Quantity	Price	Cost
Fence Posts	200	$12	$2400.00
Labor - hours	45	$32	$1440.00
High Tensile Wire	2	$200	$400.00
Strainer	10	$5	$50.00
		Total Cost	$4290.00

Attached: Map of Project Area, NRCS Timber Fabrication Standards, NRCS Waste Storage Facility Standards, NRCS Runoff Structure Standards, EGLE Small Bridge Stream Crossing Standards, Bridge Permit Cross Section Drawing *(Submitted with EGLE permit application for bridge crossing)*

This request for bid does not commit CLMCD to enter into agreement, to pay any costs incurred in the preparation of a proposal in response to this request or in subsequent negotiations, or to procure a contract for the project. CLMCD will require the selected bidder, if any, to participate in negotiations and to absorb such cost, technical and/or other revisions to the proposals as may result from negotiations. CLMCD reserves the right to perform all or some of the scope items listed herein with its own work force.

Construction Specification
MI-174 Timber Fabrication and Installation

1. SCOPE

The work shall consist of the construction of timber structures and timber portions of composite structures.

2. MATERIALS

Structural timber and lumber shall conform to the requirements shown on the drawings. Unless otherwise specified on the drawings, timber and lumber shall be treated with:

1. Chromated copper arsenate (CCA) with a minimum net retention of 0.6 pounds per cubic foot for placement in contact with concrete or for building poles and and 0.4 pounds per cubic foot for other uses.
2. Alkaline Copper Quat (ACQ-C) with a minimum net retention of 0.6 pounds per cubic foot for placement in contact with concrete or for building poles and and 0.4 pounds per cubic foot for other uses.

Hardware for CCA treated wood, except cast iron and stainless steel, shall be galvanized or cadmium plated. Hardware for ACQ except cast iron and stainless steel, shall be hot dipped galvanized. Unless otherwise specified, structural steel shapes, plates and rods shall not be galvanized. Driftbolts, dowels and screws shall be either wrought iron or medium steel. Nuts, washers and bolts on a single structure shall all be of the same material and have the same coatings.

3. WORKMANSHIP

All framing shall be true and exact. Timber and lumber shall be accurately cut and assembled to a close fit and shall have even bearing over the entire contact surfaces. No open or shimmed joints will be accepted. Nails and spikes shall be driven with just sufficient force to set the heads flush with the surface of the wood. Deep hammer marks in wood surfaces shall be considered evidence of poor workmanship and sufficient cause for rejection of the work.

Holes for round driftpins and dowels shall be bored with a bit 1/16 inch (1.5 mm) smaller in diameter than that of the driftpin or dowel to be used. The diameter of holes for square driftpins or dowels shall be equal to one side of the driftpin or dowel. Holes for machine bolts and rods shall be bored with a bit of the same diameter as that of the bolt. Holes for lag screws shall be bored with a bit not larger than the body of the screw at the base of the thread.

Washers shall be used in contact with all bolt heads and nuts that would otherwise be in contact with wood. Where public access is anticipated, all nuts shall be checked or burred after final tightening to effectively prevent removal.

Surfacing, cutting and boring of timber and lumber shall be kept to the practical minimum where cutting of treated timber and lumber is required. All cuts and abrasions shall be carefully trimmed and coated with not less than three brush coats of a commercially available wood preservative or sealer.

All recesses and holes cut or bored in treated timber and lumber shall be swabbed with not less than three coats of a commercially available wood preservative or sealer. After field treatment any unfilled holes shall be plugged with tightly fitting wooden plugs treated with a commercially available wood preservative or sealer.

4. HANDLING AND STORING MATERIALS

All timber and lumber stored at the site of the work shall be neatly stacked on supports above the ground surface and protected from the weather by suitable covering. Timber and lumber shall be close-stacked. The ground underneath and in the vicinity of all stacks shall be cleared of weeds and rubbish. The use of cant hooks, peavies or other pointed tools, except end hooks, will not be permitted in the handling of structural timber or lumber. Timber and lumber shall be handled with rope slings or other methods that will prevent the breaking or bruising of outer fibers, or penetration of the surface in any manner.

Specific Site Requirements

United States Department of Agriculture

Natural Resources

Conservation Service

CONSERVATION PRACTICE

STANDARD WASTE

STORAGE FACILITY

CODE 313

(no)

DEFINITION

An agricultural waste storage impoundment or containment structure.

PURPOSE

This practice is used to accomplish one or more of the following purposes–

- Minimize or eliminate the impacts on surface water.
- Minimize or eliminate the impacts on groundwater resources.
- Minimize emissions such as greenhouse gases to improve air quality.

CONDITIONS WHERE PRACTICE APPLIES

Use where storage is needed for wastes generated by agricultural production or processing and where soils, geology, and topography are suitable for construction of the facility. For reception pits, use NRCS Conservation Practice Standard (CPS) Waste Transfer (Code 634).

For liquid waste storage facilities with an embankment, this practice applies only to low hazard structures. A low hazard structure is defined as a dam in a rural or agricultural area where failure may damage farm building, agricultural land, or township and country roads (Title 210, National Engineering Manual (NEM), Part 520, Section 520.21,"Definition and Classes").

This practice does not apply to the storage of human waste or to a facility used exclusively for routine animal mortality. Use NRCS CPS Animal Mortality Facility (Code 316), for routine animal mortality.

CRITERIA

NRCS, MI
October 2024

General Criteria Applicable to All Purposes

Laws and Regulations

Plan, design, and construct the waste storage facility to meet all Federal, Tribal, State and local laws and regulations.

Location

Locate the waste storage facility outside the 100-year floodplain, unless site restrictions require locating it within the floodplain. Protect the facility from inundation from a 25-year flood event and structural damage from the 100-year flood event, if located within the floodplain. Additionally, follow the policy found in Title 190 General Manual, Ecological Sciences, Part 410, Subpart B, Section 410.25 Flood Plain Management, which may require additional protection, planning, or operating measures.

All existing field tile (subsurface drains) within 50 feet of a waste storage are to be removed and capped or re-routed around the waste storage facility.

Required distances per 1976 PA399, Michigan Safe Drinking Water Act between waste storage facilities and public drinking water wells may be reduced where the conditions described in the Well Isolation Distance Worksheet apply.

Foundation

Perform surface and subsurface investigations for all waste storage facilities sufficient in detail and analysis to support the design in accordance with Title 210, National Engineering Manual (NEM), Part 531, Geology, (210-NEM-531). Document the soil material encountered, the location of any seeps, the depth to water table, the depth to bedrock, the presence of sink holes, karst topography, the description and location to nearest water well(s), and other conditions that might affect the suitability of the site.
Additional foundation criteria are listed specific to Criteria for Liquid Waste Storage Impoundments and Additional Criteria for Fabricated Structures.

Sensitive Environmental Settings

Where liquid-storage is to be provided in sensitive environmental settings, such as tanks in areas with shallow wells in surface aquifers, ecologically vital water supply, high-risk karst topography, or other site- specific concerns, design the storage structure with enhanced or dual liners. For fabricated structures, design as a reinforced concrete hydraulic or environmental structure according to NRCS, Title 210-NEM, Part 536, Structural Engineering. Alternatively, use a flexible liner membrane, designed and constructed in accordance with standard engineering and industry practice, to provide secondary liquid containment for structures constructed with other methods described in NRCS, Title 210-NEM, Part 536, Structural Engineering.

Storage Period

The storage period is the maximum length of time anticipated between emptying events. Base the storage period on the timing required for environmentally safe utilization considering climate, crops, soils, and equipment.

For livestock operations that are NOT a Concentrated Animal Feeding Operation (CAFO) as defined by the Michigan Department of Environment, Greak Lakes & Energy (EGLE) and are NOT subject to a National Pollutant Discharge Elimination System (NPDES) permit, the minimum storage period will be:

- 6 months, or
- 6 months less the time period equivalent to the volume of manure spread on land suitable for winter application based on the Manure Application Risk Index (MARI) analysis for each field where winter application of manure is planned, or

- If livestock are in confinement less than 6 months, the duration of confinement may be used in lieu of 6 months in the minimum storage period criteria above.

For livestock operations defined as a CAFO by the EGLE, the minimum storage period must be 6 months or what is required by the operations EGLE-CAFO permit.

Design Storage Volume
Size the facility to store the following volumes:

Operational Volume

- Manure, wastewater, bedding, and other wastes accumulated during the storage period.
- Include normal monthly precipitation less evaporation, during the storage period for liquid or slurry storage facilities subject to precipitation.
- Normal runoff from the facility's drainage area during the storage period.
- Planned maximum residual solids. Provide a minimum of 6 inches for residual solids in tanks unless provisions that allow for complete emptying are included.
- Additional storage to meet management goals or regulatory requirements.

Emergency Volume (liquid storages only)

- 25-year, 24-hour precipitation on the surface of the liquid or slurry storage facility at the maximum level of the required design storage or more as identified by the operations EGLE-CAFO permit criteria.
- 25-year, 24-hour runoff from the facility's drainage area or more as identified by the operations EGLE-CAFO permit criteria.

Freeboard Volume (for liquid or slurry waste storage)

- Minimum of 6 inches for vertical walled facilities not subject to precipitation.
- Minimum of 12 inches for all other facilities and under-floor storages that require pit ventilation.

Freeboard Volume (for solid stacking facilities)

- Solid stacking implies that the manure has a consistency that does not flow but stays in place even during the wettest time of the storage period. The design volume for solid stacking fabricated structures may exceed the height of the structure walls, however the maximum height of manure stored along the wall must be a minimum of 6 inches from the top of the wall. The anticipated stacking angle of the manure must be considered in determining the required wall height and design loads.

Exclude non-polluted runoff from the structure where practical except where inclusion is advantageous to the operation of the facility.

Inlet Structures
Design inlet to resist corrosion, plugging, freeze damage, and ultraviolet deterioration. Design must incorporate erosion protection. For inlet structures, use NRCS CPS Waste Transfer (Code 634).

Waste Removal Components
Design components for removing waste such as gates, pipes, docks, wet wells, pumping platforms, retaining walls, or ramps in accordance with the applicable CPS, including but not limited to NRCS CPS Heavy Use Area (Code 561), Pumping Plant (Code 533) or Waste

Transfer (Code 634). Account for all items that will influence the performance of the component including loading, durability, serviceability, material properties, and construction quality. Incorporate features to protect against erosion, tampering, and accidental release of stored waste. Design ramp slopes to accommodate anticipated equipment and traction. Components must be compatible with the land application methods specified in the nutrient management plan, NRCS CPS Nutrient Management (Code 590).

Accumulated Solids Removal
Preserve storage volume by including a provision for periodic removal of accumulated solids. Design the facility to accommodate the anticipated method of removing accumulated solids. This is important for determining the configuration of impoundments and the liner to be used.

Maximum Operating Level
The maximum operating level for liquid storage structures is the level that provides the operational volume.

Staff Gauge
Locate and specify the requirements for a staff gauge or other permanent marker in the liquid storage facility to clearly indicate the following elevations:

- Maximum operating level (top of the operational volume).
- Top of Emergency level (top of the design storage volume).
- Top of required freeboard volume.

Identify the method for the operator to measure the depth of accumulated waste in the Operation and Maintenance Plan, for facilities where the contents are not visible and a staff gauge would not be visible, such as below a slatted floor.

Under-barn storages may be measured with a dip-stick or similar device. For solid stackable waste storage, freeboard level must be permanently marked on the sidewalls.

Safety
Include appropriate safety features to minimize the hazards of the facility and confined space entry (refer to American Society of Agricultural Engineers (ASAE) Standard EP470, Manure Storage Safety for guidance, as needed).

Provide appropriate warning signs, ladders, ropes bars, rails, and other safety devices. Include type, number, location, and details for installation of required safety features.

Use warning signs to identify the potential for explosion, poisoning, or asphyxiation.

Design covers and gratings over openings such that livestock or humans cannot accidentally displace them and fall into the facility. Design covers and gratings to handle expected operation loads.

Design pipelines with a water-sealed trap and vent, or similar device, if there is a potential for gases from the pipe to accumulate in confined spaces.

A fence is required around impoundments, excavated ponds, and uncovered tanks that have exposed walls less than 5 feet above the ground surface. Use NRCS CPS Fence (Code 382) to design a fence that will prevent accidental entry by people or animals. Post universal warning signs to prevent entry into liquid waste storage structures.

Roofs and Covers

Use NRCS CPS Roofs and Covers (Code 367) to design waste storage facility covers or roofs, as needed.

Treated Wood
Use criteria from NRCS CPS Roof and Covers (Code 367) for treated wood and fasteners.

Additional Criteria for Liquid Waste Storage Impoundments
A liquid waste storage impoundment is a waste storage facility where the stored material does not consistently stack and is either a natural topographic depression, manmade excavation, or diked area formed primarily of earthen materials (although the facility may be lined with manmade materials).

Foundation
Locate the impoundment in soils with a permeability that meets all applicable regulations or line the impoundment with suitable material. Use liners which meet or exceed NRCS CPS Pond Sealing or Lining, Compacted Soil Treatment (Code 520), Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner (Code 521), or Pond Sealing or Lining, Concrete (Code 522). Install an engineered pond liner or ensure foundation materials meet the maximum specific discharge rate as recommended by NRCS in Title 210-National Engineering Handbook (NEH), Part 651, Agricultural Wast Management Field Handbook (AWMFH), Appendix 10D.

Include an evaluation in the liner design of all buoyant uplift forces on the liner for sites located in a floodplain or where there is potential for uplift. Limit projected uplift head under clay liners to a gradient of less than 0.5 ft/ft in the clay liner. The gradient is determined as the difference in total head between the top and the bottom of a clay liner when buoyant forces exist (such as when the floodplain is flooded) divided by the thickness of the clay liner.

The maximum specific discharge for waste storage impoundments is 0.0153 ft^3/ft^2/day (5.411 x 10^{-6} cm^3/cm^2/sec).

In Situ Soils
This is a natural clay base that must meet the Unified Soil Classification System (USCS) of CL, CH, MH, SC, or GC for the entire depth of the waste storage impoundment. Two options are available under this criteria:

- 10-Foot Option. Subsurface investigations demonstrates and documents that suitable natural soil material exist continuously from the freeboard elevation to a depth of at least 10 feet below the design bottom elevation of the waste storage impoundment
- 2-Foot Option. Subsurface investigations demonstrates and documents that suitable natural soil materials exists continuously from the freeboard elevation to a depth of at least 2 feet below the design bottom elevation of the pond. Results of laboratory permeability tests of undisturbed samples or field permeability tests are to be used.
    - The permeability test are representative of the soils throughout the 2-foot depth and must be representative of the soils observed within the storage facility surface area including the side slopes.
    - Side slopes must be 2:1 or flatter
    - Soils that have a blocky structure or desiccation cracks are to be disked to a minimum depth of 6 inches and recompacted.

Design Bottom Elevation
Locate the bottom elevation a minimum of 2 feet above the seasonal high-water table, to protect the integrity of the liner, unless special design features are incorporated that address buoyant forces, impoundment seepage rate and non-encroachment of the water table by

contaminants. The water table may be lowered by use of engineered designed artificial drainage to meet this requirement.

To lower the water table with artificial drainage all of the following conditions must be met:

-
-
-

Outlet

An observation point (typically a catch basin) must be included in the design of the waste storage facility artificial drainage system as close to the storage facility as possible. The site specific Operation and Maintenance Plan outlines visual indicates when liquid observed in the observation point must be pumped back into the waste storage facility

Must incorporate the ability to disable (such as a gate valve) the outlet at the observation point should contaminants be observed in the waste storage facilities artificial drainage system.

The artificial drainage system of the waste storage facility may be part of an existing artificial or field tile drainage system past the observation point only if: the outlet is observable, the outlet is shown on the construction drawings, and the existing field tile drainage system is analyzed to handle the total capacity needs with the design documentation.

Do not use an outlet that can automatically release stored material except for septic tanks that feed a treatment system such as a vegetated treatment area or leaching field, or outlets leading to another storage facility with adequate capacity. Design a permanent outlet that will resist corrosion and plugging. Provide a backflow prevention measure for an outlet that pumps wastewater to secondary storage located at a higher elevation.

Embankments

Design embankments to withstand loads associated with the waste storage structure. Increase embankment height by a minimum of 5% to allow for settling. Stabilize all embankments to prevent erosion or deterioration. Raise the embankment height to the calculated wave height where wave action may be a concern and protect the slope from wave action. Wave action may be a concern when the surface area is greater than one acre.

- Top width: Design minimum embankment top widths according to table 1.
- Side slopes: Design the combined side slopes of the settled embankment no steeper than 5-to-1. Design both side slopes no steeper than a 2-to-1 ratio, unless provisions are made for stability.

- Effective height (total embankment height): The difference in elevation between the settled top of the embankment and the lowest point in the profile taken along the centerline of the embankment.

Table 1. Minimum Top Widths

Total embankment height (ft)	Top width, (ft)
Less than 15	8
15–19.9	10
20–24.9	12
25–34.9	14
35 or more	15

When effective height exceeds 20 feet, provide embankment protection by raising the embankment above the design storage volume an additional emergency volume of the 25-year, 24-hour storm runoff from the facility drainage plus the 25-year, 24-hour precipitation volume on the surface of the liquid or slurry storage facility or one foot of freeboard whichever is greater.

Excavations
Specify excavated side slopes to meet the requirements of the type of liner selected, see NRCS CPS Pond Sealing or Lining, Compacted Soil Treatment (Code 520), Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner (Code 521) or Pond Sealing or Lining, Concrete (Code 522).

Additional Criteria for Fabricated Structures Foundation
Provide a foundation for fabricated waste storage structures to safely support all superimposed loads without excessive movement or settlement, based on the subsurface investigation (210-NEM-531).

Calculate settlement based upon site-specific soil test data, where a nonuniform foundation cannot be avoided or where applied loads may create highly variable foundation loads. Index tests of site soil may allow correlation with similar soils for which test data is available. Use presumptive bearing strength values for assessing actual bearing pressures obtained from table 2 or another nationally recognized building code when site-specific soil test data is not available. Provide adequate detailing and articulation to avoid distressing movements in the structure when using presumptive bearing values.

Table 2. Presumptive Allowable Foundation and Lateral Pressure[1]

Class of Materials	Vertical Foundation Pressure (psf)	Lateral Bearing Pressure (psf/ft below natural grade)	Coefficient of Friction[a]	Cohesion (psf)[b]
Crystalline bedrock	12,000	1,200	0.70	-
Sedimentary and foliated rock	4,000	400	0.35	-

Class of Materials	Vertical Foundation Pressure (psf)	Lateral Bearing Pressure (psf/ft below natural grade)	Coefficient of Friction[a]	Cohesion (psf)[b]
Sandy gravel or gravel (GW and GP)	3,000	200	0.35	-
Sand, silty sand, clayey sand, silty gravel, clayey gravel (SW, SP, SM, SC, GM and GC)	2,000	150	0.25	-

Clay, sandy clay, silty clay, clayey silt, silt and sandy silt (CL, ML, MH and CH)	1,500	100	-	130

[1] International Building Code (IBC), 2018, International Code Council (ICC)

[a] Coefficient to be multiplied by the dead load.

[b] Cohesion value to be multiplied by the contact area, as limited by Section 1806.3.2 Lateral sliding resistance limit. For clay, sandy clay, silty clay, clayey silt, silt and sandy silt, the lateral sliding resistance shall not exceed one-half the dead load.

For bedrock foundations or where bedrock joints, fractures, or solution channels exist, separate the floor slab and the bedrock by:

- A minimum of 2 feet of soil or,
- A liner that meets or exceeds NRCS CPS Pond Sealing or Lining, Compacted Soil Treatment (Code 520), Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner (Code 521), or Pond Sealing or Lining, Concrete (Code 522) or,
- Other appropriate method or alternative that achieves equal protection.

Design Bottom Elevation
Locate the fabricated structure bottom elevation no lower than the seasonal high water table unless it is a perched water table lowered with an engineered artificial drainage designed system that incorporates an observation point, outflow disable mechanism and site specific Operation and Maintenance Plan.

Structural Loadings
Design the waste storage structure to withstand all anticipated loads in accordance with the requirements in Title 210, NEM, Part 536, Structural Design (210-NEM-536), including, as applicable, internal and external loads, hydrostatic uplift pressure, concentrated surface and impact loads, and water pressure due to seasonal high-water table, frost or ice.

Calculate loading from lateral earth pressures using soil strength values determined from the results of appropriate soil tests and procedures described in Technical Release 210-74, “Lateral Earth Pressures”. ASCE or ACI criteria may be used where appropriate. Table 3 provides minimum lateral earth pressure

values when soil strength tests are not available. Use an additional soil surcharge or an additional internal lateral pressure in the wall analysis when equipment will operate near the wall.

Use a minimum internal lateral pressure of 65 lb/ft^2/ft of depth for stored waste that is not protected from precipitation. Use a minimum internal lateral pressure of 60 lb/ft^2/ft of depth for stored waste protected from precipitation and not likely to become saturated. Use a minimum internal lateral pressure of 72 lb/ft^2/ft of depth for sand-laden manure storage if the percentage of sand exceeds 20%. Designers may use lesser values if supported by measurement of actual pressures of the waste to be stored.

Table 3. Minimum Lateral Earth Pressure Values[1]

Description of Backfill Material [c]	Unified Soil Classification	Design Lateral Soil Load (lb/ft^2/ft of depth) [a]	
		Active pressure	At-rest pressure
Well-graded, clean gravels; gravel-sand mixes	GW	30	60
Poorly graded clean gravels; gravel-sand mixes	GP	30	60
Silty gravels, poorly graded gravel-sand mixes	GM	40	60
Clayey gravels, poorly graded gravel-sand mixes	GC	45	60
Well-graded, clean sands; gravely sand mixes	SW	30	60
Poorly graded clean sands; sand-gravel mixes	SP	30	60
Silty sands, poorly graded sand-silt mixes	SM	45	60
Sand-silt clay mix with plastic fines	SM-SC	45	100
Clayey sands, poorly graded sand-clay mixes	SC	60	100
Inorganic silts and clayey silts	ML	45	100
Mixture of inorganic silt and clay	ML-CL	60	100
Inorganic clays of low to medium plasticity	CL	60	100
Organic silts and silt clays, low plasticity	OL	Note [b]	Note [b]
Inorganic clayey silts, elastic silts	MH	Note [b]	Note [b]
Inorganic clays of high plasticity	CH	Note [b]	Note [b]
Organic clays and silty clays	OH	Note [b]	Note [b]

Description of Backfill Material [c]	Unified Soil Classification	Design Lateral Soil Load (lb/ft^2/ft of depth) [a]	
		Active pressure	At-rest pressure

[1] Table 1610.1, Lateral Soil Load, International Building Code (IBC), 2018, International Code Council (ICC).

[a] Design loads based on moist conditions for the specified soils at optimum density. Actual field conditions govern. Submerged or saturated soil pressures include the weight of the buoyant soil plus hydrostatic loads.

[b] Unsuitable as backfill material.

[c] The definition and classification of soil materials shall be in accordance with ASTM D2487.

Structural Design
Design structures with reinforced concrete, steel, wood, or masonry materials in accordance with 210- NEM-536, Structural Engineering. Account for all items that will influence the performance of the structure, including loading assumptions, durability, serviceability, material properties and construction quality.
Ensure that the material used for a fabricated structure is compatible with the waste product to be stored.

Tanks may be designed with or without a cover. Design openings in a covered tank to accommodate equipment for loading, agitating, and emptying. Equip these openings with fencing, grills or secure covers for safety, and for odor and vector control as necessary.

Slabs on Grade
Slab design must consider the required performance and the critical applied loads along with both the subgrade material and material resistance of the concrete slab.

Additional Criteria for Stacking Facilities
A stacking facility may be open, covered, or roofed and is used for wastes which behave primarily as solid. Determine the wall height using the anticipated stacking angle of repose of the waste material and any clearance height needed for containment of the stacked material. Construct a stacking facility of durable materials. Design the stacking facility with adequate safety factors to prevent failure due to internal or external pressures, including hydrostatic uplift pressure and imposed surface loads such as equipment which may be used within, on, or adjacent to the structure.

Design Bottom Elevation
Locate the fabricated structure bottom elevation no lower than the seasonal high water table unless it is a perched water table lowered with an engineered artificial drainage designed system that incorporates an observation point, outflow disable mechanism and site specific Operation and Maintenance Plan.

Seepage and Internal Drainage
Use the appropriate NRCS CPS Pond Sealing or Lining, Compacted Soil Treatment (Code 520), Geomembrane or Geosynthetic Clay Liner (Code 521), or Concrete (Code 522) to reduce the potential for groundwater contamination.

Collect and utilize leachate in a safe manner to prevent pollution of surface or groundwater. Prevent influent seepage or surface runoff from infringing on the designed storage capacity or on the suitability of the waste being stacked and stored. Leachate control may not be needed on sites that have a roof, or waste material with little seepage potential.

Make provisions for drainage of leachate, including rainfall from the stacking area (especially those without a roof). Collect leachate and transfer to a tank, waste storage impoundment, treatment lagoon, or vegetated treatment area.

Poultry Litter Stacking Facility
For wood walled facilities, design the height of the litter stack not to exceed 7 feet, with litter to wood contact limited to 5 feet to reduce the potential for spontaneous combustion damage.

CONSIDERATIONS

General Considerations
Consider the use of textured liners or addition of features such as tire ladders, that would allow for escape from the waste storage structures, when using exposed liners such as HDPE or similar materials that are slippery when wet.

Solid/liquid separation of runoff or wastewater entering impoundments to minimize the frequency of accumulated solids removal and to facilitate pumping and application of the stored waste.

When using organic bedding consider omitting evaporation losses when determining design storage volumes for liquid or slurry systems as evaporation will likely be impeded where a crust could form on the storage surface.

Where a flexible membrane liner and concrete (reinforced or non-reinforced) liners are being used. Consider the durability of connections between the different liners. For longevity of the storage it may be more cost effective to line the entire facility with a geomembrane liner than to try to establish a leak-proof connection between the different liner types.

Consider environmental concerns, economics, the overall waste management system plan, and safety and health factors.

Provide the operator with the cost to close the facility since the economics and risks associated with waste storage facilities are quite high. Cost should include removal of the planned sludge accumulation volume and the waste stored at the maximum operating volume.

Considerations for Siting
Consider the following factors in selecting a site:

- Proximity to the source of waste.
- Access to other facilities.
- Ease of loading and unloading waste.
- Compatibility with the existing landforms, vegetation, and prevailing winds, including building arrangement to minimize odors and adverse impacts on visual resources.
- Adequate maneuvering space for operating, loading, and unloading equipment.
- Distance to surface water, wells, non-farm residence(s), and property lines.
    - To maintain Right-to-Farm protection, follow distance criteria from non-farm residence(s) and property lines in the Michigan Department of Agriculture & Rural Development, Generally Accepted Agriculture and Management Practices (GAAMPs) for Site Selection and Odor Control for New and Expanding Livestock Facilities, Section VI, Manure Storage Structure Changes or Installations at Existing Livestock Facilities.
- Avoid locating waste storage facilities upwind of areas where heavy gasses may accumulate.

Considerations for Minimizing Impacts of Sudden Breach of Embankment or Accidental Release from the Waste Storage

Consider features, safeguards, and management measures to minimize the risk of failure or accidental release, or to minimize or mitigate impact of this type of failure when any of the categories listed below might be significantly affected.

Potential impact categories from breach of embankment or accidental release include:

- Downstream drinking water sources.
- Surface water bodies—perennial streams, lakes, wetlands, and estuaries.
- Critical habitat for threatened and endangered species.
- Riparian areas.
- Farmstead, or other areas of habitation.
- Off-farm property.
- Historical and archaeological sites or structures that meet the eligibility criteria for listing in the National Register of Historical Places.

Consider the following either individually or in combination to minimize the potential of or the consequences of sudden breach of embankments:

- Additional emergency volume.
- Additional freeboard.
- Storage for wet year rather than normal year precipitation.
- Reinforced embankment— such as, additional top width, flattened and/or armored downstream side slopes.
- Secondary containment.
- Dual liner.

Consider the following options to minimize the potential for accidental release from the waste storage facility through gravity outlets.

- Outlet gate locks or locked gate housing.
- Secondary containment.
- Addition of an electronic water elevation monitoring device or alarm system.
- Another non-gravity means of emptying the waste storage facility.

Considerations for Minimizing the Potential of Storage Pond Liner Failure

Avoid sensitive environmental sites unless no reasonable alternative exists.

Consider providing a leak detection system in conjunction with the planned liner to provide an additional measure of safety for a site with one or more of these site conditions.

Considerations for Stacking Facilities

Leachate collection within a stacking facility can be accomplished by use of a timber wall with the boards installed vertically, leaving 3/4-inch cracks. The timber wall drainage section may be included in a concrete or masonry block wall. Use the design criteria for timber walls.

Considerations for Organic Operations

Use rot-resistant or treated lumber that meets the requirements for organic production for any

facility that is an organic producer or that sells manure to organic producers. The producer should consult with the organic certifier as to the use and acceptability of treated lumber for waste storage.

Considerations for Health and Safety

Consider the following options to minimize health and safety issues:

- Include adequate ventilation, especially when agitating stored manure.
- Add emergency equipment such as multi-gas monitor, buoys and self-contained breathing apparatus.
- Remove potential sources of sparks.

- Impacts of low berms around manure storage structures that can trap heavy gases and allow gases to collect above manure storages.

Considerations for Improving Air Quality

Liquid manure storage may result in emissions of volatile organic compounds, ammonia, hydrogen sulfide, methane, nitrous oxide, and carbon dioxide. Solid manure storage may result in emissions of particulate matter, volatile organic compounds, ammonia, carbon dioxide, and nitrous oxide. Consider minimizing liquid storage time to reduce emissions.

Reduce emissions of greenhouse gases, ammonia, volatile organic compounds, particulate matter and odor, by adding other NRCS CPSs Anaerobic Digester (Code 366), Roofs and Covers (Code 367), Waste Treatment (Code 629), Amendments for Treatment of Agricultural Waste (Code 591), Composting Facility (Code 317), and Air Filtration and Scrubbing (Code 371) to the waste management system.

Some fabric and organic covers have been shown to be effective in reducing odors.

Maintain appropriate manure moisture content for solid manure storage facilities. Excessive moisture will increase the potential for air emissions of volatile organic compounds, ammonia, and nitrous oxide, and may lead to anaerobic conditions, which will increase the potential for emissions of methane and hydrogen sulfide. Too little moisture will increase the potential for dust and other particulate matter emissions.

PLANS AND SPECIFICATIONS

Prepare plans and specifications that describe the requirements for applying the practice to achieve its intended use. As a minimum, include the following in the engineering plans and specifications:

- Plan view of system layout with relevant benchmark elevation and descriptions.
- Setbacks from wells, property line(s) and non-farm residence(s).
- Structural details of all components, including reinforcing steel, type of materials, and thickness.
- Locations, sizes, and type of pipelines and appurtenances.
- Requirements for foundation preparation and treatment.
- Backfill requirements: lift thickness, method of compaction, material type, material size and moisture content.
- Safety features.
- Material quantities.

- Approximate location of utilities and notification requirements.
- Vegetative requirements.

OPERATION AND MAINTENANCE

Develop an operation and maintenance plan that is consistent with the purposes of the practice, its intended life, safety requirements, and the criteria for its design. At a minimum, the plan will contain the following information where appropriate:

- Operational requirements for emptying the storage facility and the expected storage period. Begin removal of the liquid storage facility as soon as practical before the maximum operating level has been reached. Include the requirement that waste be removed from storage and utilized at locations, times, rates, and volume in accordance with NRCS CPS Nutrient Management (Code 590).
- Explanation of the staff gauge or other permanent marker to indicate the maximum operating level, for impoundments and other liquid storages. Identify the method for the operator to measure the

  depth of accumulated waste, for storages where the contents are not visible and a staff gauge would not be visible, such as below a slatted floor.
- Provisions for emergency removal and disposition of liquid waste in the event of an unusual storm event that may cause the waste storage structure to fill to capacity prematurely.
- Instructions, as needed, for ventilating confined spaces according to ASABE standard S607, Ventilating Manure Storages to Reduce Entry Risk.
- Develop an emergency action plan for waste storage facilities where there is a potential for significant impact from breach or accidental release. Include site-specific provisions for emergency actions that will minimize these impacts.
- Describe the routine maintenance needed for each component of the facility. Include provisions for maintenance that may be needed as a result of waste removal or material deterioration.

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Natural Resources Conservation Service

CONSERVATION PRACTICE STANDARD

ROOF RUNOFF STRUCTURE

CODE 558

(no)

DEFINITION

A structure or system of structures to collect, control, and convey precipitation runoff from a roof.

PURPOSE

This practice may be applied to achieve one or more of the following purposes:

- Protect surface water quality by excluding roof runoff from contaminated areas
- Prevent erosion from roof runoff
- Increase infiltration of roof runoff
- Capture roof runoff for onfarm use

CONDITIONS WHERE PRACTICE APPLIES

Where roof runoff from precipitation needs to be—

- Diverted away from a contaminated area.
- Collected and conveyed to a stable outlet or infiltration area.
- Collected and captured for other uses such as evaporative cooling systems, livestock water, or irrigation.

CRITERIA

General Criteria Applicable to All Purposes

Plan, design, and construct the roof runoff structure to comply with all Federal, State, and local laws and regulations. Notify landowner and/or contractor of their responsibility to locate all buried utilities in the project area, including drainage tile and other structural measures. The landowner is also required to obtain all necessary permits for project installation prior to construction.

Evaluate the condition of the existing roof structure prior to installation of a gutter. Install new fascia boards as needed to support gutters and downspouts for the practice life span. Mount gutters on plumb fascia boards. If the building does not have a fascia board, mount to the rafter ends, adding any necessary appurtenances to ensure the gutters are securely attached and positioned to collect runoff from the roof.

Ensure that the gutter support system will withstand the anticipated loading from precipitation including loads from snow and ice, where applicable. Where snow and ice are expected, install roof gutters below the projection of the roof line. If this is not possible with the existing roof, install rigid supports or wraparound straps. If structural supports are missing or insufficient, design the required supports for the gutter.

Protect the downspouts, laterals, and cross-pipe pipelines from damage by livestock or equipment with heavy-walled pipe, fencing, or other protective measures to exclude livestock and equipment.

Gutter design capacity
To exclude roof runoff from manure contamination, design roof runoff structures to convey the peak flow from a 25-year, 5-minute rainfall event. (Refer to NRCS National Engineering Handbook (Title 210), Part 651, Agricultural Waste Management Field Handbook, Chapter 10, Appendix 10B.)

For other applications, design roof runoff structures to convey the peak flow from a 10-year, 5-minute rainfall event.

Downspout
Design downspouts, collector pipes, lateral downspouts, or cross-pipes with a capacity that equals or exceeds the designed roof gutter flow rate. If downspouts drain directly onto the ground, use an elbow and energy dissipation device at the outlet to provide erosion protection and direct water away from the foundation of the structure by ensuring that ground slopes away from the building.

Ground gutter
If roof gutters are not feasible, ground gutters may be used in some instances. Ground gutters may not be practical for livestock housing where the purpose is to exclude roof runoff from contaminated areas.

Use ground gutters only on buildings with eaves that extend 12 inches or more horizontally from the building. Where runoff from the roof eave drops onto the ground surface, provide a gutter with the same capacity as required for roof gutters. Ground gutters must convey runoff away from the building to a stable outlet without erosion.

Ground gutters can be rock-lined channels, rock-filled trenches with subsurface drains, or concrete channels.

Outlet
Roof runoff can empty into a subsurface drain, underground outlet, a storage tank, a dry well, or onto an energy dissipation device as described above in section “Downspout.”

Size outlets to handle the design flow from the gutter system. Provide accessible cleanouts for subsurface drains, underground outlets, and storage tanks that are used as outlets.

Use NRCS Conservation Practice Standard (CPS) Subsurface Drain (Code 606) to design subsurface drains if necessary to dewater ground gutters or infiltration ditches.

Use NRCS CPS Underground Outlet (Code 620) to design underground outlets to convey roof runoff to a stable outlet. In cold climates, ensure underground outlets are deep enough to avoid freezing or include a method to bypass the outlet without damage to the downspout.

Materials
Roof gutters and downspouts may be made of aluminum, galvanized steel, plastic, or wood. Aluminum gutters must have a minimum nominal thickness of 0.027 inches. Aluminum downspouts of 3 inches by 4 inches must have a minimum nominal thickness of 0.019 inches. Aluminum downspouts larger than 3 inches by 4 inches must have a minimum nominal thickness of 0.024 inches. Galvanized steel gutters and downspouts must be a minimum of 28 gauge. Plastics must contain ultraviolet stabilizers. Wood gutters must be made of rot-resistant wood free of knots.

To prevent corrosion, avoid contact between components of dissimilar metals.

To improve infiltration for rock-filled trenches and dry wells, use poorly graded gravel.

Where traffic, climatic, or other conditions necessitate the use of reinforced concrete for channels, pads, and slabs, refer to NRCS National Engineering Manual (NEM) (Title 210), Part 536, Section 536.20, “Design Criteria for Reinforced Concrete,” for design and installation of reinforced concrete.

Where nonreinforced concrete is acceptable, refer to NRCS 210-NEM-536, Section 536.22, “Design Criteria for Concrete Slabs-on-Ground,” for design and installation of nonreinforced concrete.

Additional Criteria to Increase Infiltration

Increase runoff infiltration by directing flow to existing vegetation or infiltration features (e.g., lawns, mass planting areas, existing natural areas, infiltration trenches, dry wells, rain gardens, or natural areas). Ensure these areas have the capacity to infiltrate the runoff without flowing directly to surface or ground water, causing excessive erosion, or adversely affecting the desired plant species.

Additional Criteria to Capture Water for Other Uses

Roof runoff can be contaminated with environmental pollutants that have settled on the roof between runoff events. This may make the captured runoff unsuitable for uses such as drinking water for livestock without treatment. The operator is responsible for ensuring that the quality of the runoff is suitable for the intended purpose.

If runoff water is to be stored, determine the tank size based on the planned use of the captured water. Select tank materials that have adequate strength and durability to hold water for the intended purpose and length of time required. Use materials that will not degrade the quality of the stored water for its intended use. Include a drain to allow maintenance of the tank and to protect from damage from freezing.

Install the storage tank on a firm, level foundation that will not settle differentially. Examples of suitable foundation materials are bedrock, concrete, compacted gravel, and stable well-compacted soils. Where necessary, prepare the foundation by removal and disposal of materials that are not adequate to support the design loads. Anchor or brace aboveground tanks as needed to prevent overturning or sliding by wind and animals.

Use NRCS design procedures or manufacturer’s guidelines to ensure that buried tanks will withstand all earth and vehicle loads anticipated for the site.

Include provisions for access to the tank for maintenance and repairs. However, ensure that access points will limit unintended or unauthorized access.

Design tanks connected directly to gutters and downspouts to bypass runoff events that exceed the design capacity of the tank. Include provisions to convey overflows to a stable outlet without excessive erosion.

CONSIDERATIONS

Gutter size can be decreased by increasing the number of downspouts. When designing a gutter and downspout system consider the balance between gutter size and the spacing and sizing of downspouts to optimize the design.

If roof runoff will be used for livestock drinking water, the runoff should be treated before being consumed by livestock. This might include bypassing the first flush of runoff which often contains the majority of pollutants. Depending on the use of the runoff, additional actions may be necessary, such as settling and filtration to remove suspended particles and treatment of pathogens with ultraviolet light or chlorination. See International Code Council, CSA/ICC 805-2018, “Rainwater Harvesting Systems,” for information on water quality treatment options for different end uses of the collected water.

Discharging roof runoff outlets near wells and sinkholes or directly into drainage ditches, streams, or ponds can be a point source of pollution. Consider the use of vegetative filter areas, such as raingardens, at outlets to minimize the pollution potential from roof runoff.

Consider the use of wraparound straps in lieu of rigid supports on steep roofs where the outer edge of the gutter cannot be placed below the projected roof line.

On roofs subject to snow and ice slides, consider additional supports even if the gutter is installed below the projected roof line.

PLANS AND SPECIFICATIONS

Provide plans and specifications that describe the requirements for applying this practice to achieve its intended purpose. As a minimum, include—

- A plan view showing the layout of gutters, downspouts, and outlets.
- Details of gutter installation, including necessary cross sections and slope of gutters.
- Details on the protection of downspouts from damage.
- Details on outlets, storage tanks, or infiltration areas as appropriate.
- Any other site-specific detail drawings necessary for the installation of the practice.
- Requirements for stabilization of any areas disturbed by the installation of the practice.
- Construction specifications describing the installation of the practice, materials, and quantities.

OPERATION AND MAINTENANCE

Prepare an operation and maintenance plan and review it with the operator. Describe the actions that must be taken to ensure that the facility functions properly for its design life. As a minimum, include—

- A schedule for regularly checking the gutters and downspouts for removal of any accumulated debris, damage from weather events, livestock, and equipment. Additional checks should be made after significant weather events (rain, snow, ice, extended cold periods, or high winds).
- Ensuring that the outlets are freely operating and not causing erosion.
- Ensuring roof runoff structures are clean, operating properly, and overflows are not causing erosion.
- Promptly repairing or replacing any damaged components.

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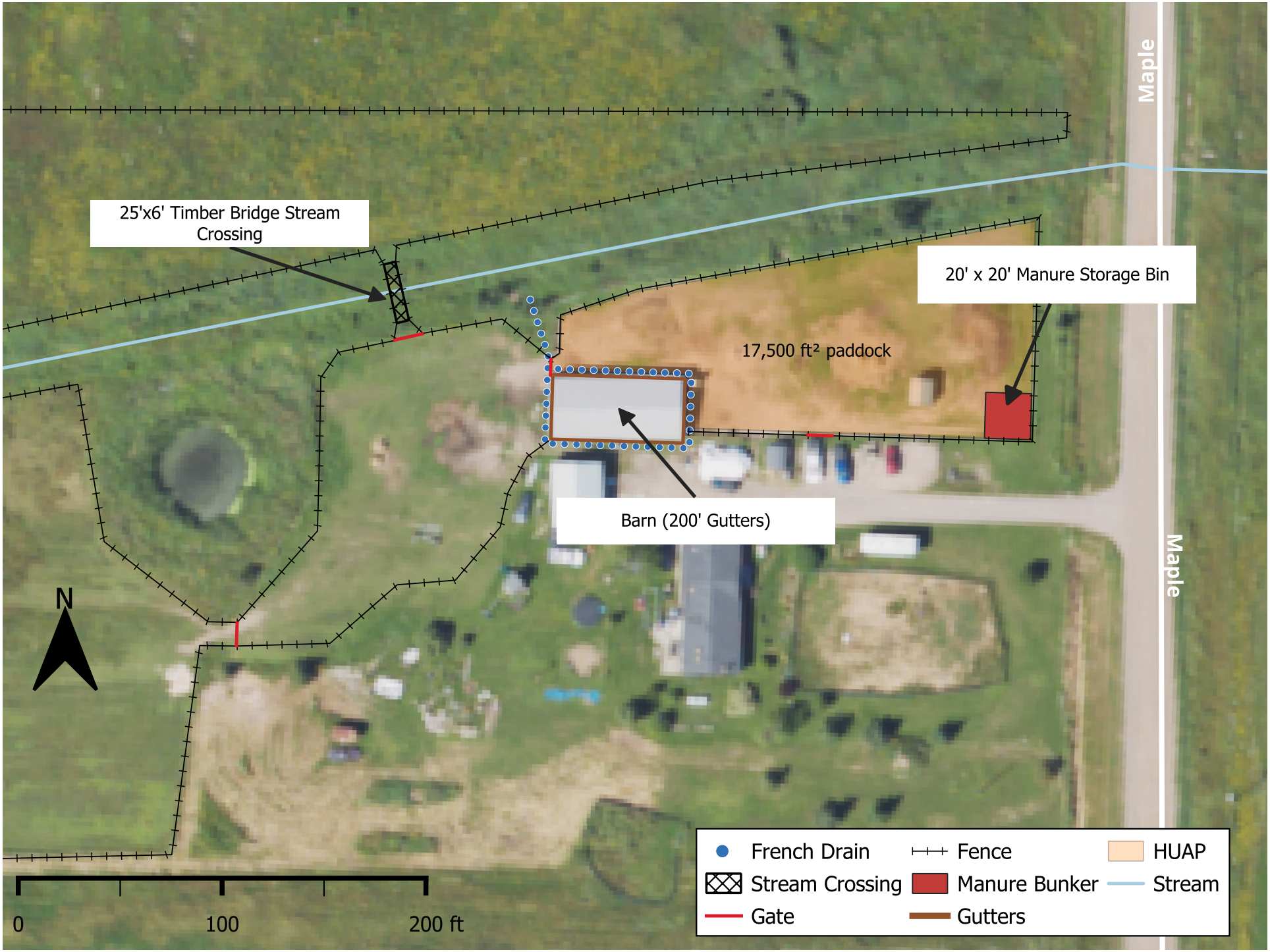
25'x6' Timber Bridge Stream Crossing
20' x 20' Manure Storage Bin
17,500 ft² paddock
Barn (200' Gutters)
Maple
Maple
N
0
100
200 ft
French Drain
Fence
HUAP
Stream Crossing
Manure Bunker
Stream
Gate
Gutters

G. Culverts and Bridges - Small

Category applies to: ☒ *Part 31, Floodplain Regulatory Authority*
☒ *Part 301, Inland Lakes and Streams*
☐ *Part 303, Wetlands Protection*
☐ *Part 325, Great Lakes Submerged Lands*

New or replacement culvert and bridgestructures that are 6 feet or less in span and 30 feet or less in length that meet all of the following:

- The structure must be bottomless (3-sided), or if the structure has a bottom then the invert elevation must be buried below the stream bottom 1/6 of the bankfull width up to a maximum buried depth of 1-foot. For streams with a bankfull width of 3 feet or less, EGLE may determine that burial is not required in non-alluvial channels (e.g., bedrock substrate).
- The structure spans a minimum of bankfull width. Only a single structure at each crossing is allowed under this category (i.e., multiple culverts at a crossing are not included in this category).
- The structure is aligned with the centerline of the stream at both the inlet and outlet ends. Meanders upstream or downstream of the structure shall not be eliminated.
- For replacements, the existing culvert cannot be perched (i.e., a culvert with an outlet invert elevated above the downstream water surface, allowing a freefall condition).
- The structure must be placed at a flat slope, unless a steeper slope is approved by EGLE, or for legally established drains, at an approved design slope. For stream crossings with an approximate slope of 3% or greater, as determined by EGLE, the structure must be bottomless (or a clear span bridge) to be included in this GP category.
- The placement of riprap shall be limited to the minimum necessary to ensure proper stabilization of the side slopes and fill in the immediate vicinity of the structure. Riprap shall not extend upstream or downstream of the structure more than 25 feet on each end. Riprap shall be properly sized based on velocity and consist of natural field stone or rock (broken concrete is not allowed). Natural field stone or rock includes crushed quarry rock. Broken concrete, free of protruding metal, contaminants, and other foreign material, may be allowed in legally established drains, except those constituting mainstream portions of certain natural watercourses identified in rule. Riprap shall not extend waterward of the existing banks up or downstream to avoid obstructing flood flows.

Bankfull is the width of the stream that corresponds to the depth where water fills a main channel to the point of overflowing. In instances where the applicant is unsure of the bankfull width, it is recommended that the applicant contact EGLE staff and request a preapplication site review. In legally established drains (except those constituting mainstream portions of certain natural watercourses identified in rule), if bankfull indicators are not present, the structure span may be determined by calculating the 1.5-year stream width at the 1.5-year flow that is based on a stable stream width and depth or by applying the regional reference curves in the 2015 report “Revised Bankfull Discharge for Selected Michigan Rivers and Regional Hydraulic Geometry Curves for

Estimating Bankfull Characteristics in Southern Michigan Rivers" or other EGLE approved report.

In addition, for stream crossing locations where the drainage area is 2 square miles or greater, the crossing must meet one of the following:

1. For replacement structures, there is no decrease in end area opening and the structure meets all of the following:

   - Equal or shorter culvert length or bridge width.
   - Equal or greater auxiliary waterway openings and road overflow areas are below the 1% annual chance flood.
   - Same or improved roughness coefficient.
   - Same or improved entrance conditions.
   - Same or improved slope.
   - Same road grade, unless the existing road is above the 100-year floodplain elevation.

   A culvert or bridge replacement may be extended or widened up to 24 feet if bullets 2 through 6 above are met.

2. For replacement culverts:

   - The applicant must submit, and receive EGLE approval of, a certification by the owner or by the owner's engineering consultant, that the replacement is designed with an equal or greater hydraulic capacity, that the existing bridge or culvert and its approaches do not cause harmful interference, and that deletion of existing auxiliary openings and road overflow areas is not planned.

3. For new culverts:

   - A culvert has an effective waterway opening that equals or exceeds the cross-sectional area of the channel, has fill over the culvert that is not more than 1.5 feet, and has approach fill that slopes to natural ground elevations within 10 feet on either side of the culvert.

H. Culverts - Wetland Equalizer

Category applies to: ☐ *Part 31, Floodplain Regulatory Authority*
☐ *Part 301, Inland Lakes and Streams*
☒ *Part 303, Wetlands Protection*
☐ *Part 325, Great Lakes Submerged Lands*

The installation of equalization culverts in wetlands that meet all of the following:

- The culvert is a minimum diameter of 18 inches.
- The culvert is installed at the proper elevation for the purpose of water level equalization and must be buried 20% of the culvert diameter.