

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

WASTE TRANSFER

(No.)

CODE 634

DEFINITION

A system using structures, conduits or equipment to convey byproducts (wastes) from agricultural operations to points of usage.

PURPOSE

To transfer agricultural material associated with production, processing, and/or harvesting through a hopper or reception pit, a pump (if applicable), a conduit, and/or hauling equipment to:

- a storage/treatment facility,
- a loading area, and/or
- agricultural land for final utilization as a resource.

CONDITIONS WHERE PRACTICE APPLIES

The transfer component is a part of a planned waste management or comprehensive nutrient management system.

Material generated by livestock production or agricultural product processing and a conveyance system is necessary to transfer the byproducts from the source to a storage/ treatment facility and/or a loading area, and/or from storage/ treatment to an area for utilization. This includes hauling nutrients from one geographical area with excess nutrients to a geographical area that can utilize the nutrients in an acceptable manner.

CRITERIA

General Criteria Applicable to All Purposes

Laws and Regulations. Waste transfer components must be planned, designed, and constructed to meet all federal, state, and local

laws and regulations, including the Illinois Livestock Management Facilities Act (LMFact, 510 ILCS 77/1 et seq.) and provisions of Title 35E, State of Illinois Rules and Regulations.

Utilities and Permits. The landowner shall be responsible for locating all buried utilities in the project area, including drainage tile and other structural measures.

The landowner shall obtain all necessary permissions from regulatory agencies, including the Illinois Department of Agriculture, US Army Corps of Engineers, US Environmental Protection Agency, Illinois Environmental Protection Agency and Illinois Department of Natural Resources – Office of Water Resources, or document that no permits are required.

Structures. All structures, including those that provide a work area around pumps, shall be designed to withstand the anticipated static and dynamic loading. Structures shall be designed to withstand earth and hydrostatic loading in accordance with practice standard Waste Storage Facility, Code 313. Covers, when needed, shall be designed to support the anticipated dead and live loads.

Reception pits shall be sized to contain a minimum of one full day's production. For reception pits receiving runoff, sufficient storage shall be provided to also contain the volume of runoff from the 25-year, 24-hour storm plus any required freeboard and emergency storage.

Openings to structures to receive material from alley scrape collection shall be a minimum of 9 square feet with one dimension no smaller than 4 feet. The opening shall be equipped with a grate designed to support the anticipated loads.

Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service [State Office](#) or visit the [Field Office Technical Guide](#).

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When curbs are needed in conjunction with structures, they shall be constructed of either concrete or wood. Curbs shall be adequately anchored and shall be of sufficient height to ensure all materials flow into the structure.

Pipelines. Design of pipelines shall be in accordance with sound engineering principles considering the waste material properties, management operations, exposure, etc. The pipe and appurtenances shall be compatible with the type and corrosiveness of material to be transferred. The minimum pipeline capacity from collection facilities to storage/treatment facilities shall be the maximum peak flow anticipated.

The minimum pipeline capacity from storage/treatment facilities to utilization areas shall ensure the storage/treatment facilities can be emptied within the time limits stated in the management plan for nutrient utilization.

Pipelines used for transferring material to a field application system shall meet the requirements of NRCS conservation practice standard, Irrigation Water Conveyance, Pipeline, Code 430.

All pipes shall be designed to convey the required flow without plugging, based on the type and total solids content of the material to be conveyed. To minimize settling of solids in the pipeline, design velocities shall be between 3 to 6 feet per second. Fluid velocities shall not exceed 5 feet per second if pipe is not buried or securely tied down. Design fluid velocity shall not exceed 5 feet per second unless measures are taken to adequately protect the pipeline against surge.

Clean-out access shall be provided for gravity pipelines at a maximum interval of 150 feet unless an alternative design is approved by the design engineer. Gravity pipelines shall not have horizontal curves or bends except minor deflections (less than 10 degrees) in the pipe joints unless special design considerations are used.

In a gravity flow pipe system, a minimum head is required, depending upon the consistency of the material: 4 feet for heavily bedded manure, 2 feet for slurry or semi-solid manure, and 1 foot for liquids and liquid manure.

Gravity discharge pipes used for periodically emptying a storage/treatment facility shall have a minimum of two gates or valves, one of which shall be manually operated.

Pipelines shall be installed with appropriate connection devices to prevent contamination of private or public water supply distribution systems and ground water.

Other Conduits. Concrete lined ditches shall be designed in accordance with NRCS conservation practice standard Lined Waterway or Outlet, Code 468. A minimum design velocity of 1.5 feet per second shall be used.

Transport surfaces constructed of concrete and intended to come into contact with livestock wastes shall be constructed or installed to achieve a hydraulic conductivity equal to or less than 1×10^{-6} cm/sec. (510 ILCS 77/1 et seq.)

Pumps. Pumps installed for transfer shall meet the requirements of NRCS conservation practice standard Pumping Plant, Code 533. Pumps shall be sized to transfer material at the required system head and volume. Type of pump shall be based on the consistency of the material and the type of solids. Pumps and appurtenances shall be compatible with the type and corrosiveness of material to be transferred. Requirements for pump installations shall be based on manufacturer's recommendations.

Agitators. Agitators installed to facilitate pumping of liquid or slurry waste for transfer shall be sized to provide agitation of the volume of storage, and shall be compatible with the type and consistency of the material. Requirements for agitator sizing, installation and operation shall be based on manufacturer's recommendations.

Solid/Liquid Waste Separation. A filtration or screening device, settling tank, settling basin, or settling channel used to separate a portion of solids from the manure or liquid waste stream will be designed in accordance with NRCS conservation practice standard Solid/Liquid Waste Separation Facility, Code 632.

Safety. The system design shall consider the safety of humans and animals during construction and operation.

Open structures shall be provided with covers or barriers such as gates, fences, etc. Ventilation

and warning signs shall be provided for transfer systems as necessary to warn of the danger of entry and to reduce the risk of explosion, poisoning, or asphyxiation.

Pipelines from enclosed buildings shall be provided with a water-sealed trap and vent or similar devices where necessary to control gas entry into buildings.

Barriers shall be placed on push-off ramps to prevent tractors or other equipment from slipping into waste collection, storage, or treatment facilities.

Biosecurity. Products from diseased animals shall be handled in accordance with the recommendations of the state veterinarian.

Equipment that has come into contact with materials that could harbor disease (manure, diseased animals, etc) shall be sanitized as appropriate to prevent the spread of disease prior to leaving the farm or fields.

Additional Criteria in Support of Agricultural Land for Final Utilization

Waste utilization. Nutrients shall be applied to the utilization area in amounts, uniformity, rates, and at a time consistent with the requirements of NRCS conservation practice standard Nutrient Management Code 590 or Waste Utilization, Code 633 as appropriate.

Hauling equipment. Equipment used for hauling material from one geographical area to another area shall be capable of hauling the material without spillage, leakage, or wind-blown losses during transport.

CONSIDERATIONS

General

Consider economics (including design life), overall nutrient management system plans, and health and safety factors.

Consider the timing and location of agitation and transfer activities to minimize odor formation and transport and to minimize the breeding of insects within the material.

Agitation may need to continue during pumping to prevent settlement of solids during transfer.

Consider covering and/or minimizing the amount or number of times the material is disturbed to

reduce the likelihood of air emissions of particulate matter, volatile organic compounds, and ammonia air emissions formation and release.

Transfer Operations

In locating structures, utilize existing topography to the greatest extent possible to generate head on structures and reduce pumping requirements.

Consider the operating space requirements of loading and unloading of equipment in the vicinity of the transfer components.

Consider the subsurface conditions, i.e., depth to bedrock, water table, etc., when locating and designing structures.

When applicable and compatible, consider the joint use of waste transfer pipelines with irrigation system design requirements.

The pipe pressure rating required may need adjustment based on material temperature.

Consider corrosion resistance and water tightness in the selection of pipe material and joints.

Consider the potential for salt (struvite) deposits in smaller diameter pipes.

Consider the need for appropriate check valves, anti-siphon protection and open air breaks in all pipelines.

Vehicles used to transfer waste material should be sized to reduce the danger of rollover.

Where material is to be spread on land not owned or controlled by the producer, a nutrient management plan is recommended, establishing environmentally acceptable utilization of the material.

PLANS AND SPECIFICATIONS

Plans and specifications for installing waste transfer systems shall be in accordance with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

OPERATION AND MAINTENANCE

An Operation and Maintenance (O&M) Plan must be prepared and reviewed with the

landowner or operator responsible for the application of this practice. The O&M Plan shall provide specific instructions for proper operation and maintenance of each component of this practice and shall detail the level of repairs needed to maintain the effectiveness and useful life of the practice.

The operation and maintenance plan shall describe what actions will be taken to minimize flies and other insects during the transfer of material.

Liquid or slurry material shall be adequately agitated prior to transfer for the purpose of land application both on and off the farm.

Agitation and pumping operations should be protective of the liner in a lined earthen storage facility.

Pipelines used for transferring waste material should be flushed with clean water after use to reduce the risk of gas build up and pipeline explosion.

Provisions should be made for proper ventilation and for extinguishing any ignition sources in a building prior to agitation or pumping of liquid manure in building pits, to reduce the risk of fire.

Ensure that all people and livestock are out of the building prior to agitation or pumping of liquid

manure in building pits, to avoid exposure to lethal gas buildup.

Provisions should be made for removing solids during management operations from conveyance conduits such as concrete lined ditches, etc.

For the hauling of material from one geographical area to another, record keeping by the producer or his/her designated representative will be required and may include such items as:

- the type, nutrient content, and amount of material transferred;
- the solids percentage of the material;
- the date of the transfer;
- the name and address of the source and destination of the material; and
- the condition of the material as left at the destination (spread, stockpiled and covered, etc.).

REFERENCES

Illinois Department of Agriculture, Livestock Management Facilities Act [510 ILCS 77/1 et seq.]

**NATURAL RESOURCES CONSERVATION SERVICE
ILLINOIS CONSTRUCTION SPECIFICATION**

WASTE TRANSFER – PIPELINE

General

Construction operations shall be carried out in a manner and sequence that erosion and air and water pollution are minimized and held within legal limits.

The completed job shall present a workmanlike appearance and shall conform to the line, grades, and elevations shown on the drawings or as staked in the field.

All operations shall be carried out in a safe and skillful manner. Safety and health regulations shall be observed and appropriate safety measures used. Contractor shall be assured that all state laws concerning buried utilities have been met.

All trees, stumps, roots, brush, weeds, and other objectionable materials shall be removed from designated work area.

Minimum Depth of Cover

Pipe shall be installed at sufficient depth below the ground surface to provide protection from hazards imposed by traffic crossing, farming operations, freezing temperatures, or soil cracking. Unless otherwise specified, plastic pipe shall be buried at least 24 inches for ordinary field traffic. When crossing under a road, the pipeline shall be buried deeper or protected from collapsing by placing in a steel or concrete conduit.

Other means of protection must be provided if the depth required for protection is impractical because of shallow soils over rock or for other reasons. Abrupt changes in grade must be avoided to prevent damage to pipe.

Pipelines shall be buried below frost line or otherwise be protected from freezing.

At low places on the ground surface, extra fill may be placed over the pipeline to provide the minimum depth of cover. The top width of the

fill shall then be no less than 10 feet and the side slopes no steeper than 6:1.

Trench Construction

The trench at any point below the top of the pipe shall be only wide enough to permit the pipe to be easily placed and joined and to allow the initial backfill material to be uniformly placed under the haunches (lower half of the pipe) and along the sides of the pipe. The maximum trench width shall be 36 inches. If the trench is precision excavated and has a semicircular bottom that closely fits the pipe, the width shall not exceed the outside diameter of the pipe by more than 10%.

The trench bottom shall be uniform so that the pipe lies on the bottom without bridging. Clods, rocks and uneven spots that can damage the pipe or cause non-uniform support shall be removed.

If rocks, boulders, or any other material that can damage the pipe are encountered, the trench bottom shall be undercut a minimum of 4 inches below final grade and filled with bedding material consisting of sand or compacted fine-grained soils.

Provisions shall be made to ensure safe working conditions where unstable soil, trench depth, or other conditions can be hazardous to personnel working in the trench.

Placement

Care shall be taken to prevent permanent distortion and damage when handling the pipe during unusually warm or cold weather. The pipe shall be allowed to come within a few degrees of the temperature it will have after it is completely covered before placing the backfill, other than that needed for shading, or before connecting the pipe to other facilities. The pipe shall be uniformly and continuously supported over its entire length on firm stable

material. Blocking or mounding shall not be used to bring the pipe to final grade.

For pipe with bell joints, bell holes shall be excavated in the bedding material, as needed, to allow for unobstructed assembly of the joint and to permit the body of the pipe to be in contact with the bedding material throughout its length.

Materials

The compound used in manufacturing the pipe shall meet the requirements of one of the following materials:

1. Polyvinyl chloride (PVC) as specified in ASTM D 1784.

Material	Classification
Type I, Grade 1	12454-B
Type I, Grade 2	12454-C
Type II, Grade 1	14333-D

2. Acrylonitrile-butadiene-styrene (ABS) as specified in ASTM D 3965.

Material	Classification
Type I, Grade 2	5-2-2
Type 1, Grade 3	3-5-5
Type II Grade 1	4-4-5

3. Polyethylene (PE) as specified in ASTM D 1248.

Material	Classification
Grade P14, Class C	IC-P14
Grade P23, Class C	IIC-P23
Grade P33, Class C	IIIC-P33
Grade P34, Class C	IVC-P34

The pipe shall be homogeneous throughout and free from visible cracks, holes, foreign matter, or other defects. The pipe shall be as uniform in color, opacity, density, and other physical properties as is commercially practicable.

All pipe installed under this standard shall be pressure rated for water.

Iron pipe size (IPS) (outside diameter same as that for iron pipe sizes) and I.D. controlled PE pipe manufactured, tested, and marked to meet one of the following ASTM specifications shall be acceptable under this standard.

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ASTM Standard Specification for Pipe

D 1785	PVC, Schedules 40, 80 and 120
D 2241	PVC, SDR-PR
D 2672	Bell-End PVC
D 2740	PVC Plastic Tubing
D 1527	ABS, Schedules 40 and 80
D 2282	ABS, SDR-PR
D 2239	PE, SDR-PR
D 2447	PE, Schedules 40 and 80, O.D.
D 2737	PE Plastic Tubing
D 3035	PE, SDR-PR, O.D.
F 771	PE Irrigation Pipeline Systems

Plastic irrigation pipe (PIP) shall meet the requirements of ASTM D 2241.

Joints and Connections

All joints and connections shall be designed and constructed to withstand the design maximum working pressure for the pipeline without leakage and to leave the inside of the line free of any obstruction that may tend to reduce its capacity below design requirements.

All fittings, such as couplings, reducers, bends, tees, and crosses, shall be installed according to the recommendations of the pipe manufacturer.

All fittings and couplers shall meet or exceed the same strength requirements as those of the pipe and shall be made of material that is recommended for use with the pipe. Listed below are the ASTM standard specifications for fittings covered by this standard.

ASTM Standard Specification for Fittings

D 2466	Socket-type PVC, Schedule 40
D 2467	Socket-type PVC, Schedule 80
D 2609	PE Plastic Insert Fittings
D 2683	Socket-type PE, SDR 11.0
D 3139	Flexible Elastomeric Seals
D 3261	PE Butt Heat Fusion Fittings

Plastic irrigation pipe (PIP) shall have belled ends or separate couplers and fittings that are suitable for joining the pipe and appurtenances by solvent cement, rubber gaskets, or other

methods recommended by the pipe manufacturer. Such fittings and joints shall be capable of withstanding a working pressure equal to or greater than that for the pipe.

Solvent for solvent cement joints shall conform to ASTM Specification D 2564 for PVC pipe and fittings and to D 2235 for ABS pipe and fittings. Solvent cement joints shall be used and constructed according to the recommendations of the pipe manufacturer.

Rubber gasket joints shall conform to ASTM Specification D 3139.

Thrust Blocks

Thrust blocks must be formed against a solid hand-excavated trench wall undamaged by mechanical equipment. They shall be constructed of concrete, and the space between the pipe and trench wall shall be filled to the height of the outside diameter of the pipe or as specified in the design plan.

Testing

The pipeline shall be tested for pressure strength, leakage, and proper functioning. The tests may be performed before backfilling or anytime after the pipeline is ready for service.

Tests for pressure strength and leaks shall be accomplished by inspecting the pipeline and appurtenances while the maximum working pressure is maintained and all joints and connections are uncovered, or by observing normal operation of the pipeline after it is put into service. Partial backfills needed to hold the pipe in place during testing shall be placed as specified in "Initial Backfill." Any leaks shall be repaired and the system retested.

The pipeline shall be tested to ensure that it functions properly at design capacity. At or below design capacity there shall be no objectionable flow conditions. Objectionable flow conditions shall include water hammer, continuing unsteady delivery of waste, damage to the pipeline, pipe blockage, or detrimental discharge from control valves.

Initial Backfill

Hand or mechanical backfill methods may be used.

The initial backfill material shall be soil or sand that is free from rocks or stones larger than 1 inch in diameter. At the time of placement, the moisture content of the material shall be such that the required degree of compaction can be obtained with the backfill method to be used. The initial backfill material shall be placed so that the pipe will not be displaced, excessively deformed, or damaged.

If backfilling is done by hand or mechanical means, the initial fill shall be compacted firmly around and above the pipe as required to provide adequate lateral support to the pipe.

Final Backfill

Final backfill material shall be free of large rocks, frozen clods, and other debris greater than 3 inches in diameter. The material shall be placed and spread in approximately uniform layers so that there will be no unfilled spaces in the backfill and the backfill will be level with the natural ground or at the design grade required to provide the minimum depth of cover after settlement. Rolling equipment shall not be used to consolidate the final backfill until the specified minimum depth of cover has been placed.

Mound soil over pipe to allow for settlement. Provisions shall be provided for stabilizing disturbed areas and controlling erosion, as necessary.

All special backfilling requirements of the pipe manufacturer shall be met.

Vegetation

Topsoil shall be added, if needed to establish vegetation. Refer to Conservation Practice Standard 342, Critical Area Planting, for seeding and mulching recommendations or equivalent.

Utilities

The landowner shall be responsible for locating all buried utilities in the project area, including drainage tile and other structural measures.

**NATURAL RESOURCES CONSERVATION SERVICE
ILLINOIS CONSTRUCTION SPECIFICATION**

WASTE TRANSFER – CONCRETE STRUCTURES

General

Construction operations shall be carried out in a manner and sequence that erosion and air and water pollution are minimized and held within legal limits.

The completed job shall present a workmanlike appearance and shall conform to the line, grades, and elevations shown on the drawings or as staked in the field.

All operations shall be carried out in a safe and skillful manner. Safety and health regulations shall be observed and appropriate safety measures used. Contractor shall be assured that all state laws concerning buried utilities have been met.

All trees, stumps, roots, brush, weeds, and other objectionable materials shall be removed from designated work area.

Concrete

Concrete shall have a minimum design strength of 3500 psi at 28 days with a maximum net water content of 6 gallons/bag.

Portland cement shall be Type I or II. Air-entraining admixture shall be used to provide an air content of 4 to 7 percent of the volume of concrete.

Coarse aggregate shall be hard; be free from dirt and organic materials; and consist of well-graded gravel, crushed stone, or other suitable materials larger than 3/8 inch. Maximum size shall be 1 inch.

Fine aggregate shall consist of well-graded natural or manufactured sand with particle gradation ranging from coarse (3/8 inch) to fine (#200 sieve).

Mixing water shall be clean and free from oil, alkali, or acid.

The proportions of the aggregates shall be such to produce a concrete mixture that will work readily into the corners and angles of the forms and around steel reinforcement when consolidated. The slump at the time of placing shall be 3 to 5 inches.

Forms shall be wood, plywood, steel, or other approved materials and shall be mortar-tight. The forms shall be unyielding and shall be constructed so the finished concrete conforms to the specified dimensions and contours.

Prior to placement of concrete, the forms and subgrade shall be free of chips, sawdust, debris, water, ice, snow, extraneous oil, mortar, or other harmful substances or coatings. Any oil on the reinforcing steel or other surfaces required to be bonded to the concrete shall be removed. All surfaces shall be firm and damp prior to placing concrete. Placement of concrete on mud, dried earth, uncompacted fill, or frozen subgrade will not be permitted.

Inspection and approval of the forms and steel placement by designated personnel shall be made prior to the placement of concrete. Copies of the concrete delivery tickets shall also be furnished to verify proper concrete was delivered and placed.

Concrete shall be conveyed from the mixer to the forms as rapidly as practical by methods that will prevent segregation of the aggregates and loss of mortar. Concrete shall not be dropped more than 5 feet vertically except where suitable equipment is used to prevent segregation.

Immediately after the concrete is placed in the forms, it shall be consolidated by spading, hand tamping, or vibration as necessary to ensure smooth surfaces and dense concrete. All exposed surfaces of the concrete shall be accurately screeded to grade and then wood-floated.

Concrete shall not be mixed nor placed when the atmospheric temperature is less than 40° F or more than 90° F unless facilities are provided to prevent freezing or for cooling as required.

Bedding Material

Bedding material shall be used to level the foundation excavation to finished grade, allowing for the placement of concrete. Use of moist (not saturated) bedding material will facilitate screeding, leveling, and finishing operations.

Bedding material shall be placed to a thickness of 3 to 6 inches, as necessary, over the entire area to be covered by concrete.

Bedding material shall consist of clean sand, gravel and/or crushed rock which ranges in size from concrete sand (ASTM C 33) to gravel or crushed rock no larger than 3/8 inch. Final grade of the material shall be uniform.

Reinforcing Steel

Grade 40 or 60 reinforcing steel shall be standard, deformed reinforcing bars of the size indicated in the plans.

Before reinforcement is placed, the surface of the bars and any metal supports shall be cleaned to remove any rust, mill scale, oil, grease, or other coatings and shall be maintained in such a condition until it is completely embedded in concrete.

Reinforcement steel shall be accurately placed and supported in such a manner that will prevent its displacement during the placement of the concrete. Tack welding of bars will not be permitted. Metal chairs, metal hangers, metal spacers, and concrete chairs may be used to support the reinforcement. Such hangers, spacers, and ties shall be placed in such a manner that they will not be exposed in any concrete surface. Precast concrete chairs shall be moist at the time concrete is placed.

Welded wire fabric shall conform to the requirements of American Society for Testing and Materials (ASTM) A 185. All joints are to be double reinforced by laps of 15 inches or more.

After placement of the reinforcement, concrete shall not be placed until the reinforcement has been inspected and approved by NRCS.

Joints

Steel tying and form construction adjacent to new concrete shall not be started until concrete has cured at least 12 hours.

Concrete joints shall be of the type and at the locations shown on the drawings.

Expansion joints shall be made only at locations shown on the drawings. Expansion joint filler shall be held firmly in the correct position as the concrete is placed.

Expansion joint filler shall conform to the requirements of ASTM Specification D 1752, Type I, Type II, or Type III.

Waterstops shall be either metallic or nonmetallic, as specified on the drawings. Metallic waterstops shall be fabricated from sheets of copper or galvanized steel. Nonmetallic waterstops shall be made of natural or synthetic rubber or vinyl chloride polymer or copolymer. Rubber, polymer and copolymer waterstops shall have ribbed or bulb-type anchor flanges and a hollow tubular center bulb, unless otherwise shown on the drawings. All waterstops shall be of the sizes shown on the drawings.

Splices in metal waterstops shall be brazed, welded or overlapped and bolted. Splices in nonmetallic waterstops shall be cemented or joined as recommended by the manufacturer.

Form Removal and Finishing

Forms shall be removed in such a way to prevent damage to the concrete.

The minimum period from completion of the concrete placement to the removal of the forms shall be 12 hours.

Immediately after removal of the forms, concrete which is honey combed, damaged or otherwise defective shall be repaired or replaced. All cavities or depressions resulting from form tie removal shall be patched with a non-shrink grout, mortar mix or epoxy-type

sealer. Non-shrink grout consists of 1 part cement and 2-1/2 parts sand that will pass a No. 16 sieve. Only enough water shall be added to produce a filling which is at the point of becoming rubbery when the material is solidly packed.

Concrete shall be prevented from drying for a curing period of at least 7 days after it is placed. Exposed surfaces shall be kept continuously moist for the entire period or until curing compound is applied.

If concrete is placed when temperatures may fall below 40° F during the curing period, it will be insulated or heated to maintain a temperature of 50° F for the first 3 days of the curing period.

Backfilling

Backfilling may begin when the curing period has ended. Backfill against the structure will

be placed in no more than 4-inch layers and compacted by hand tamping or with manually directed power tampers or plate vibrators. Layers compacted in this manner shall extend not less than 2 feet from any part of the concrete structure.

Vegetation

Topsoil shall be added, if needed to establish vegetation. Refer to Conservation Practice Standard 342, Critical Area Planting, for seeding and mulching recommendations or equivalent.

Utilities

The landowner shall be responsible for locating all buried utilities in the project area, including drainage tile and other structural measures.

NATURAL RESOURCES CONSERVATION SERVICE

ILLINOIS OPERATION AND MAINTENANCE

WASTE TRANSFER – PIPELINE

Follow the operation and maintenance plan below to keep your waste transfer system functioning as intended:

- Pipeline shall be operated at a maximum of _____ gallons per minute. Monitor delivery rate using flow meter on application device or as described below.
- The maximum operating pressure for the waste transfer system is _____ psi. Maintain all pressure relief valves installed as a part of the system at the design pressure setting.
 System relief valve: Located at pump, Pressure setting _____ psi
 Supplementary relief valve: Location _____, Pressure setting _____ psi
 Supplementary relief valve: Location _____, Pressure setting _____ psi
 Supplementary relief valve: Location _____, Pressure setting _____ psi
- Frequent operation of the pressure relief valve indicates potential system problems. If the relief valves show sign of frequent use, inspect mechanical components of pipeline, clean out the pipeline, and/or reduce the operating flow delivery rate.
- Perform routine maintenance of all mechanical components in accordance with manufacturer's recommendations. Inspect and test valves, pressure regulators, pumps, agitators, switches, and other appurtenances.
- Inspect after significant storm events and at least annually to identify repair and maintenance needs. Check for leaks and improper operation. Check for debris, minerals, algae, and other materials that may restrict system flow. Repair any damage as soon as possible after being noted.
- Slowly open and close valves to prevent excessive water hammer.
- When quick connects are used, ensure proper operation and adequate designed delivery rate.
- Drain and/or provide for cold weather operation of the system.
- Pipelines used for transferring waste material should be flushed with clean water after use to reduce the risk of gas build up and pipeline explosion.
- Protect pipeline from damage by farm equipment, vehicles, and livestock. Mark pipeline locations in areas where potential damage could occur.
- Repair any eroded areas that are hazardous to the pipeline. Reestablish vegetative cover immediately where erosion has occurred.
- Record on a map the location of the pipeline and approximate depth.

- Follow your Comprehensive Nutrient Management Plan (CNMP) for scheduling and amount of land application of waste material.
- Liquid or slurry material shall be adequately agitated prior to transfer for the purpose of land application both on and off the farm. For agitation in a lined holding pond, ensure that the agitator does not damage the liner. For agitation in an enclosed storage pit, turn off all potential sources of ignition, provide adequate ventilation, and ensure all people are out of the building.
- Minimize flies and other insects and odors during the transfer of material.

Additional Details:

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NATURAL RESOURCES CONSERVATION SERVICE

ILLINOIS OPERATION AND MAINTENANCE

WASTE TRANSFER – CONCRETE STRUCTURES

Follow the operation and maintenance plan below to keep your waste transfer system functioning as intended:

- Follow your Comprehensive Nutrient Management Plan (CNMP).
- Remove solids from alleys and reception pits during management operations.
- Minimize flies and other insects and odors during the transfer of material.
- Do not dispose of dead animals, greases, syringes, or other wastes in the waste transfer facility.
- Inspect after significant storm events and at least twice a year to identify repair and maintenance needs. Inspect concrete sumps, reception pits, curbs, ramps, and alleys for separations and/or cracks, which would indicate potential failure. Repairs should be made immediately.
- Check backfill areas around concrete structures for unusual settlement. Determine if settlement is caused by backfill consolidation or failure of concrete walls. Repair walls or fill, as appropriate.
- Perform routine maintenance of all mechanical components in accordance with manufacturer's recommendations. Inspect and test pipes, pumps, valves, gates, and other appurtenances. Repair as needed.
- Check for leaks and improper operation. Check for debris, minerals, algae, and other materials that may restrict system flow. Repair any damage as soon as possible after being noted.
- Maintain a good vegetative cover of recommended species on backfill around structures. If the vegetative cover is damaged, it should be reestablished as soon as possible. The vegetative cover should be mowed twice a year to stimulate a vigorous plant growth.

Additional Details:

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NATURAL RESOURCES CONSERVATION SERVICE

ILLINOIS OPERATION AND MAINTENANCE

WASTE TRANSFER – AGITATOR / PUMP

Follow the operation and maintenance plan below to keep your waste transfer system functioning as intended:

- Follow all operation and maintenance instructions provided by the manufacturer.
- Operate the agitator/pump at or below the specified maximum power rating for the system.
- Liquid or slurry material shall be adequately agitated prior to transfer for the purpose of land application both on and off the farm. For agitation in a lined holding pond, ensure that the agitator does not damage the liner.
- Manure agitation can produce toxic gases in buildings built above the pit. Toxic gases can also emanate in buildings situated by the pit and/or connected to the pit by an evacuation line. For agitation in an enclosed storage pit, turn off all potential sources of ignition, provide adequate ventilation, and ensure all people are out of the building.
- Do not enter into a manure pit at any time.
- Make sure that no person is in close proximity to any moving parts before engaging the drive.
- Drain and/or provide for cold weather operation of the system.
- Follow your Comprehensive Nutrient Management Plan (CNMP) for scheduling and amount of land application of waste material.
- Minimize flies and other insects and odors during the transfer of material.

Additional Details:

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