ADDENDUM NO. 2

PROJECT NAME: **ARDC Waste Management Upgrades**
UNL PROJECT NUMBER: **M975P006**
UNL INVITATION NUMBER: **2168-13-7013**

CONSULTANT: WLA Consulting, Inc.
ADDRESS: 1640 L Street, Suite D, Lincoln, NE 68508

DATE OF ISSUANCE: June 4, 2013
DATE OF BID OPENING: Wednesday, June 12, 2013

The bid documents dated May 15, 2013 for the above referenced project are amended by this addendum.

NOTICE: This Addendum is issued to all interested prospective bidders as an amendment to the project manual or other parts of the bidding (contract) documents for the above named project. Reference to this Addendum must be included in the Bid proposal. The information contained herein shall be fully incorporated into the contract documents as though originally included therein.

QUESTIONS AND MODIFICATIONS TO THE PROJECT MANUAL:

SECTION (LIST IN ORDER) _00 41 13 – BID PROPOSAL FORM___

1. Replace Bid Proposal Form 00 41 13 with revised Bid Proposal Form included in this Addendum # 2.

SECTION (LIST IN ORDER) 01 50 00.1.3 C & D – Temporary Facilities and Controls _

MODIFICATIONS:

1. See revised section attached to replace the original.

SECTION (LIST IN ORDER) 01 73 23. 3.2 J & K – Field Engineering _

MODIFICATIONS:

1. Delete Part 3.2.J from the specification section.
2. Delete Part 3.2.K from the specification section.

SECTION (LIST IN ORDER) 31 23 16.13 - Trenching _

MODIFICATIONS:

1. Delete Part 3.2.B.4 from the specification section.

SECTION (LIST IN ORDER) 32 92 19 - Seeding _

MODIFICATIONS:

1. Modify Part 3.3 of specification section so that bullets are sequential from A-G.

2. Delete the following from the specification section:
   a. Part 1.5.F.
   b. Part 1.8.
   c. Part 3.3.E
   d. Part 3.5.A.
   e. Part 3.6.A through Part 3.6.C.
   f. Part 3.6.E
   g. Part 3.6.I.

SECTION (LIST IN ORDER) 33 47 13 – Pond Liner _

MODIFICATIONS:

1. Delete Part "3.8 Pond Seepage Testing" from the specification section.

QUESTIONS AND MODIFICATIONS TO THE DRAWINGS:

DRAWING NO. G-2 (DAIRY FACILITY) – CONSTRUCTION NOTES & ABBREVIATIONS

MODIFICATIONS:

1. Add to the Construction Notes:

"12. NOT ALL ABOVE AND BELOW SURFACE FEATURES ARE SHOWN. ORIGINAL SURVEY WAS CONDUCTED FOR THE SOLE PURPOSE OF OBTAINING A NDEQ PERMIT, NOT FOR CONSTRUCTION PURPOSES. FIXTURES INSTALLED AFTER THE ORIGINAL SURVEY OR FEATURES NOT KNOWN DURING ORIGINAL SURVEY MAY OR MAY NOT BE SHOWN. CONTRACTORS SHOULD CONTACT UNL PERSONNEL FOR THE LOCATIONS OF ADDITIONAL FEATURES AND DEAL WITH THEM APPROPRIATELY DURING BIDDING/CONSTRUCTION."

DRAWING NO. G-3 (DAIRY FACILITY) – DATA SHEET

MODIFICATIONS:

1. Modify the quantity of Clean Water Diversion Embankment in the Estimated Table of Quantities to 400 LF.

DRAWING NO. C-2 (DAIRY FACILITY) – PROPOSED SITE PLAN

MODIFICATIONS:

1. Add 10 LF of Clean Water Diversion Embankment at the southeast corner of the LWCF Drainage Area Boundary.
2. Modify the Clean Water Diversion Embankment along the north side of the LWCF Drainage Area Boundary.

DRAWING NO. C-3 (DAIRY FACILITY) – HOLDING POND AND SEDIMENT BASIN NO. 1 PARTIAL SITE PLAN

MODIFICATIONS:

1. Modify slope of Sediment Basin No. 1 to 18H:1V.

DRAWING NO. C-4 (DAIRY FACILITY) – CROSS SECTIONS

MODIFICATIONS:

1. Modify slope of Sediment Basin No. 1 to 18H:1V.
2. Add slope callout of 3H:1V to drawing.

DRAWING NO. C-5 (DAIRY FACILITY) – DISCHARGE PIPE DETAIL

MODIFICATIONS:

1. Modify Sheet Keynote No.1 to distinguish that galvanized steel must be used for water elevation markers.
2. Modify vertical spacing of perforations for pond inlet pipe to 6 inches.
3. Modify inlet pipe anchoring to include ½ inch galvanized steel pipe bands for added stability at every joint.

DRAWING NO. G-2 (FEEDLOT FACILITY) – CONSTRUCTION NOTES & ABBREVIATIONS

MODIFICATIONS:

1. Add the following to the Construction Notes:

"12. NOT ALL ABOVE AND BELOW SURFACE FEATURES ARE SHOWN. ORIGINAL SURVEY WAS CONDUCTED FOR THE SOLE PURPOSE OF OBTAINING A NDEQ PERMIT, NOT FOR CONSTRUCTION PURPOSES. FIXTURES INSTALLED AFTER THE ORIGINAL SURVEY OR FEATURES NOT KNOWN DURING ORIGINAL SURVEY MAY OR MAY NOT BE SHOWN. CONTRACTORS SHOULD CONTACT UNL PERSONNEL FOR THE LOCATIONS OF ADDITIONAL FEATURES AND DEAL WITH THEM APPROPRIATELY DURING BIDDING/CONSTRUCTION."

DRAWING NO. G-3 (FEEDLOT FACILITY) – DATA SHEET

MODIFICATIONS:

1. Modify force main pipe to be PVC SDR26.
2. Add lump sum for galvanized steel parts at center pivot connection.
3. Modify quantity of valves.

DRAWING NO. C-2 (FEEDLOT FACILITY) – PROPOSED SITE PLAN

MODIFICATIONS:

1. Modify to clarify that Sediment Basin #5 is existing and no modifications are needed.
2. Modify to note that the center pivot force main is shown on Drawing No. C-2A.

DRAWING NO. C-2A (FEEDLOT FACILITY) – PROPOSED SITE PLAN

MODIFICATIONS:

1. New drawing to clarify the center pivot force main location and connection to the existing center pivot.

DRAWING NO. C-3 (FEEDLOT FACILITY) – EXPANDED SOUTH HOLDING POND PARTIAL PLAN

MODIFICATIONS:

1. Add clarification that existing concrete pump pad must be removed as part of site clearing.

DRAWING NO. C-6 (FEEDLOT FACILITY) – SEDIMENT BASIN NO. 3 PARTIAL PLAN

MODIFICATIONS:

1. Add General Notes stating that contractor will field verify the location of all existing pipes entering the sediment basin prior to excavation. Contractor should notify the Owner and Engineer prior to construction with any issues.

DRAWING NO. C-7 (FEEDLOT FACILITY) – SEDIMENT BASIN NO. 4 & NO. 5 PARTIAL PLAN

MODIFICATIONS:

1. Add General Notes stating that contractor will field verify the location of all existing pipes entering the sediment basin prior to excavation. Contractor should notify the Owner and Engineer prior to construction with any issues.
2. Add field verification of waterer overflow pipe prior to construction. Modify pipe to collect overflow in Sediment Basin No. 5.

DRAWING NO. C-8 (FEEDLOT FACILITY) – COW & CALF SEDIMENT BASIN NO. 6 PARTIAL PLAN

MODIFICATIONS:

1. Modify invert elevation of new underground outlet discharge pipe from the Cow & Calf Basin to the South Holding Pond.

DRAWING NO. C-10 (FEEDLOT FACILITY) – CROSS SECTIONS

MODIFICATIONS:

1. Modify Section B & C to provide updated cross-section information. The previous drawings did not indicate a 10 foot wide top of berm for the entire holding pond.

DRAWING NO. C-16 (FEEDLOT FACILITY) – DETAILS

MODIFICATIONS:

1. Modify Detail 3 to include more information on concrete pump pad.

DRAWING NO. C-17 (FEEDLOT FACILITY) – DETAILS
MODIFICATIONS:

1. New drawing to clarify the center pivot connection.

QUESTIONS AND CLARIFICATIONS FROM THE PRE-BID MEETING (MAY 23, 2013):

QUESTIONS:

1. QUESTION Will the existing holding ponds need dewatered?
   RESPONSE: UNL-ARDC will pump the holding ponds down to 6-12 inches depth prior to start of construction.

2. QUESTION Where does over-excavation go once removed?
   RESPONSE: Sludge (organic) will need trucked to location approximately 1 mile north of the Feedlot Location, via NE Department of Roads, roads.
   Non-organic will be located near the location of cut.

3. QUESTION Where will the fill dirt come from?
   RESPONSE: Within ½ mile of project location, exact locations will be determined by UNL-ARDC during construction.

4. QUESTION Is compaction required on sediment basins?
   RESPONSE: Yes.

5. QUESTION Will AutoCAD files be provided for contractor to use GPS?
   RESPONSE: YES, AutoCAD Provided by WLA upon award.

6. QUESTION Who will remove the fences required?
   RESPONSE: UNL-ARDC will remove required fencing. Existing Swine Unit located north of feed storage area on Feedlot Facility, Sheet C-2 is a Bio-Secure area and will be taped off by UNL-ARDC at the point of restricted access.

7. QUESTION Is stormwater and the Storm Water Pollution Prevention Plan (SWPPP) the responsibility of the contractor?
   RESPONSE: YES.

8. QUESTION Will the contractor furnish the pump from the settling basin to the center pivot?
   RESPONSE: Contractor is responsible for all required dewatering equipment and methods during construction until facility operation certification. UNL will provide access to center pivot irrigation systems for land application of screened water. Contractor may use existing fixed pumping plant equipment as available during construction.

CLARIFICATIONS:

1. CLARIFICATION: NDEQ-NOI Permit Application will be required 7-days prior to breaking ground

2. CLARIFICATION: See attached hand-out provided by Liza Garrett regarding SWPP requirements.
   Also Section 01 50 00 for further clarification.

3. CLARIFICATION: On-site identification is required for both personnel and vehicles. Company identification is required for each while on-site.

END OF ADDENDUM NO. 2

SECTION 00 41 13 - BID PROPOSAL FORM

BID PROPOSAL

TO: THE BOARD OF REGENTS OF THE UNIVERSITY OF NEBRASKA
c/o University of Nebraska-Lincoln
Business Services
Procurement Services Dept.
1700 Y Street
Lincoln, NE 68588-0645

BID PROPOSAL FOR: General

PROJECT: **M975P006, ARDC Waste Management Upgrade**

INVITATION NO.: **2168-13-7013**

☐ **COMPLETE THE FOLLOWING INFORMATION – BIDDERS NAME AND TYPE OF BUSINESS**:
This Bid is offered by _____, hereinafter referred to as the Bidder,
- ☐ a corporation organized and existing under the laws of the State of _____.
- ☐ a limited liability company organized and existing under the laws of the State of _____.
- ☐ a partnership doing business as _____.
- ☐ an individual doing business as _____.

In response to the Bidding Requirements for the construction of the project identified above by name, invitation number, and project number, the Bidder hereby makes the following representations:

Bidder has received the drawings and specifications for the project prepared by WLA Consulting, Inc.

Bidder has examined the Bidding Documents, visited the site, and otherwise familiarized itself with the local conditions affecting the construction of the project.

☐ **COMPLETE THE FOLLOWING INFORMATION – BASE BID**:
Bidder agrees to furnish all labor, materials, tools, equipment, services, transportation, and supervision required to complete the work indicated in the Bidding Documents within the time set forth herein for the lump sum Base Bid amount of

_____dollars($_____).

Base Bid amount above to include all provided (estimated) quantities of work as referenced on sheets G-3 (Dairy Facility) and G-3 (Feedlot Facility) of the project construction documents and referenced below in UNIT PRICE PROPOSALS section of this bid proposal form.

☐ **COMPLETE THE FOLLOWING INFORMATION – ALTERNATE PROPOSALS**:
The Base Bid amount given above may be increased or decreased by the acceptance of any of the Alternate Proposals listed below. The full and complete description of the work to be added to or deleted from the scope of the project by each of the Alternate Proposals is that found in Division 01, Section 01 23 00 - Alternates.

ALTERNATE NO. 1: Provide and install 275 mil, double-sided geocomposite layer beneath the HDPE geomembrane at the South Holding Pond. Refer to Section 33 47 13 - Pond Liner for additional requirements.

ADD / DEDUCT (circle one) the sum of _____ dollars ($_____)

COMPLETE THE FOLLOWING INFORMATION – UNIT PRICE PROPOSALS:

The Contract Sum may be increased or decreased by Change Order through the application of the appropriate unit price to the quantities of work added to or deducted from the original scope of work. The unit prices given below are to be utilized in accordance with the provisions of Section 01 22 00 – Unit Prices to compute the adjustments to the Contract Sum resulting from changes in the quantity of any work for which a unit price proposal is provided.

Unit Price Item:	Unit:	QUANTITY	Cost/Unit:
Dairy Facility Unit Prices			
Excavation	Cubic Yard	1,100	$_____
Earthfill, Class C	Cubic Yard	900	$_____
Clean Water Diversion	Linear Foot	400	$_____
8” Piping, SDR 41	Linear Foot	70	$_____
Seeding	Acre	0.5	$_____
Feedlot Facility Unit Prices			
Excavation	Cubic Yard	41,400	$_____
Earthfill, Class C	Cubic Yard	36,200	$_____
Clean Water Diversion	Linear Foot	4,880	$_____
HDPE Holding Pong Liner	Square Foot	275,000	$_____
Gas Venting Liner (Alternate #1)	Square Foot	275,000	$_____
6” Piping, SDR 41	Linear Foot	800	$_____
8” Piping, SDR 26	Linear Foot	4,280	$_____
8” Piping, SDR 41	Linear Foot	250	$_____
Seeding	Acre	6	$_____

PROVIDE THE FOLLOWING INFORMATION – BID SECURITY:

Included with this Proposal is Bid Security of the type and in the amount required by the Bidding Instructions.

COMPLETE THE FOLLOWING INFORMATION – NUMBER OF ADDENDA RECEIVED:

Bidder has received Addenda Nos. _____, and has included their provisions in this Bid.

COMPLETE THE FOLLOWING INFORMATION – CALENDAR DAYS TO COMPLETE THE WORK:

To substantially complete the work not later than _____ calendar days from the start of construction given in the Notice to Proceed. (Bidder to enter number of days.) Time is of the essence and may be a factor in the award of this Contract.

COMPLY WITH THE FOLLOWING INFORMATION:

In submitting this Bid, Bidder agrees to the following:

1. To hold this Bid open for 60 days following the bid date.
2. To enter into and execute the "University of Nebraska Standard Form Construction Agreement" based upon this Bid, if accepted by Owner.
3. To perform all work required by the Contract Documents.
4. That this Bid has been arrived at without collusion with other Bidders and without any effort or activity which might prevent the University of Nebraska from receiving the lowest possible competitive Bid.
5. To comply with Nebraska Fair Employment Practice Act, understanding that a breach of this provision will be regarded as a material breach of contract.
6. To review and comply with University of Nebraska-Lincoln Standard Terms of Purchase. View at http://www.nebraska.edu/administration/business-and-finance/purchasing/terms-of-purchase.html.
7. To comply with all other applicable policies, procedures and requirements of the Board of Regents of the University of Nebraska with respect to this Bid, the Project, the bid invitation and/or the bidding process.

COMPLETE THE FOLLOWING INFORMATION – SIGNATURE AND CONTACT INFORMATION:

Address: _____

_____

Tele. No.: _____

Fax. No.: _____

Email Address: _____

Signature: _____

Printed Name: _____

Title: _____

Dated this _____ day of _____, 20

SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and other Division-01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection and shall apply to individual Projects as applicable. Temporary utilities required may include but are not limited to:

Water service and distribution.
Temporary electric power and light.
Telephone service.
Storm and sanitary sewer.
Temporary heat.
Field offices and storage sheds.
Temporary roads and paving.
Sanitary facilities, including drinking water.
Dewatering facilities and drains.
Temporary enclosures.
Temporary partitions
Hoists and temporary elevator use.
Temporary Project identification signs and bulletin boards.
Waste disposal services.
Rodent and pest control.
Construction aids and miscellaneous services and facilities.
Erosion, sediment and dust controls
Site-specific Storm Water Pollution Prevention Plans (SWPPP)
NPDES Construction site erosion and sediment control

B. Security and protection facilities required may include but are not limited to:

1. Temporary fire protection.
2. Barricades, warning signs, lights.
3. Sidewalk bridge or enclosure fence for the site.
4. Environmental protection.

1.3 SUBMITTALS

a. Temporary Utilities: Submit reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.

b. Implementation and Termination Schedule: Submit a schedule indicating implementation and termination of each temporary utility within 5 days of the date established for commencement of the Work.

c. ~~Site-specific Storm Water Pollution Prevention Plans (SWPPP)~~National Pollution Dishcarge Elimination System: For construction sites of one (1) acre or more, at least~~,~~ seven days before any dirt is moved, the contractor must first have a site-specfic Storm Water Pollution Prevention Plan written by a qualified person and then submit a NPDES Form CSW-NOI ~~and a site-specific Storm Water Pollution Prevention Plans (SWPPP~~) to the ~~Lower Platte South Natural Resource District (LPSNRD) and must be approved by~~

~~NRD.~~Nebraska Department of Environmental Quality (NDEQ). Copies of all documents must be submitted to UNL-EHS department. Courtesy copies should be sent to the Lower Platte North Natural Resource District. Upon completion of the construction activity, submit the CSW-Transfer~~End~~ form to ~~LPSNRD.~~UNL-EHS department.

d. ~~Form CSW-Start, Form CSW-End: Following approval of the CSW-NOI and SWPPP and upon commencement of the construction activity, submit the CSW-Start to the LPSNRD. Upon completion of the construction activity, submit the CSW-End form to LPSNRD.~~

e. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel, temporary paving and roads, fencing and soil erosion controls.

1.4 **QUALITY ASSURANCE**

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:

1. Building Code requirements.
2. Health and safety regulations.
3. Utility company regulations.
4. Police, Fire Department and Rescue Squad rules.
5. Environmental protection regulations.

B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities."

C. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.

D. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).

E. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.5 **PROJECT CONDITIONS**

A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of the permanent service.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

PART 2 – PRODUCTS

2.1 MATERIALS

A. TARPAULINS: Provide waterproof, fire resistant, UL labeled tarpaulins with flame spread rating of 15 or less. For temporary enclosures provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.

B. WATER: Provide potable water approved by local health authorities.

C. OPEN-MESH FENCING: Provide 11-gage, galvanized 2-inch, chain link fabric fencing 6-feet high with galvanized steel pipe posts, 1½" I.D. for line posts and 2½" I.D. for corner posts. Provide mesh privacy screen panels with edge binding, grommets, and half-moon shaped wind vents. Privacy screen fabric color: Red (colorfast). Fence screen is not to have any graphics or signage on it unless approved by UNL. All mesh needs to be submitted for approval by UNL prior to installation.

2.2 EQUIPMENT

A. Provide new equipment; if acceptable to the Architect, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.

B. WATER HOSES: Provide ¾" heavy-duty, abrasion-resistant, flexible rubber hoses 100 ft. long, with pressure rating greater than the maximum pressure of the water distribution system; provide adjustable shut-off nozzles at hose discharge.

C. ELECTRICAL OUTLETS: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.

D. ELECTRICAL POWER CORDS: Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.

E. LAMPS AND LIGHT FIXTURES: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.

F. HEATING UNITS: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the type of fuel being consumed.

G. TEMPORARY OFFICES: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows and serviceable finishes. Provide heated and air- conditioned units on foundations adequate for normal loading.

H. TEMPORARY TOILET UNITS: Provide self-contained single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material.

I. FIRST AID SUPPLIES: Comply with governing regulations.

J. FIRE EXTINGUISHERS: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.

1. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. UTILITY SHUTDOWNS - See Section 01 10 00 Summary of Work, 1.3 Work Restrictions, for Owner notification requirements for utility shutdowns.

1. Unless otherwise specified, the Contractor shall determine the locations and availability of water and electrical power within the work area. The Contractor shall make all the necessary connections to make water and electric power available for construction purposes. The Contractor shall be responsible for any damage done to water or electrical connection devices.

B. Provide adequate utility capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.

C. Obtain easements to bring temporary utilities to the site, where the Owner's easements cannot be used for that purpose.

D. Water Service: Install water service and distribution piping of sizes and pressures adequate for construction until permanent water service is in use.

E. Sterilization: Sterilize temporary water piping prior to use.

F. Temporary Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include transformers, overload protected disconnects, automatic ground-fault interrupters and main distribution switch gear. Arrange with Owner 14 days in advance to arrange for time when service can be interrupted.

1. Except where overhead service must be used, install electric power service underground.

G. Power Distribution System: Install wiring overhead, and rise vertically where least exposed to damage. Where permitted, wiring circuits not exceeding 125 Volts, AC 20 ampere rating, and lighting circuits may be nonmetallic sheathed cable where overhead and exposed for surveillance.

H. Temporary Lighting: Whenever overhead floor or roof deck has been installed, provide temporary lighting with local switching. Install and operate temporary lighting that will fulfill security and protection requirements, without operating the entire system, and will provide adequate illumination for construction operations and traffic conditions.

I. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off the site in a lawful manner.

1. Filter out excessive amounts of soil, construction debris, chemicals, oils and similar contaminants that might clog sewers or pollute waterways before discharge.

2. Connect temporary sewers to the municipal system as directed by the sewer department officials.

3. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly.

3.3 EROSION, SEDIMENT AND DUST CONTROL

A. In accordance with all applicable rules, law and standards and in accordance with UNL Environmental Health and Safety Safe Operating Procedures, the contractor shall develop, implement and maintain effective erosion, sediment and dust control plans throughout the project site for the duration of the project. See UNL Environmental Health & Safety Safe Operating Procedures for “Erosion, Sediment, and Dust Control during land disturbing activities: for common erosion/sediment/dust control measures.

B. The contractor is bound by the terms of the Owner’s Small Municipal Separate Sewer Systems (SMS4) NPDES Permit (NE0133892). See UNL Environmental Health & Safety Safe Operating Procedures for “NPDES Construction Site Erosion and Sediment Control”.

C. On all sites the Contractor shall: 1) Plan for, implement and maintain reasonable measures to prevent storm water pollution resulting from construction activities, 2) Report to the owner in writing, any release of any quantity of hazardous material at the construction site, 3) Maintain good house-keeping at the construction site, 4) Take corrective action to rectify concerns expressed by the Owner’s representatives or the Authority having jurisdiction, related to storm water pollution prevention controls.

D. In addition, on all sites of one (1) acre of more the contractor shall: 1) Apply for, obtain and comply with the requirements of a General NPDES Permit Authorizing Storm Water Discharges from Construction Sites to waters of the State of Nebraska (General NPDES permit number NER100000), 2) Maintain on site copies of the Storm Water Pollution Prevention Plan (SWPPP) with current site plan, Notice of intent (NOI), Notice of Construction Start (CSW-Start), weekly routine inspection reports, and post-precipitation

inspection records, 3) File Notice to End/Terminate (NOT or CSW-End) and provide copies to the Owner's representatives.

E. Provide earthen embankments and similar barriers in and around excavations and sub-grade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.

3.4 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

A. Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities for easy access
    1. Maintain temporary construction and support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.

B. Provide incombustible construction for offices, shops and sheds located within the construction area, or within 30 feet of building lines. Comply with requirements of NFPA 241.

C. Temporary Heat: Provide temporary heat required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.

D. Heating Facilities: Except where use of the permanent system is authorized, provide vented self contained LP gas or fuel oil heaters with individual space thermostatic control.

    1. Use of gasoline burning space heaters, open flame, or salamander type heating units is prohibited.

E. Field Offices: Provide insulated, weather-tight temporary offices of sufficient size to accommodate required office personnel at the Project site. Keep the office clean and orderly for use for small progress meetings. Furnish and equip offices as follows:

    1. Furnish with a desk and chairs, a 4-drawer file cabinet, plan table and plan rack and a 6-shelf bookcase.

F. Storage and Fabrication Sheds: Install storage and fabrication sheds, sized, furnished and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on the site.

G. Provide necessary toilet facilities to comply with regulations and health codes.

H. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.
    1. Provide safety showers, eye-wash fountains and similar facilities for convenience, safety and sanitation of personnel.

I. Drinking Water Facilities: Provide containerized tap-dispenser bottled-water type drinking water units, including paper supply

J. Dewatering Facilities and Drains: For temporary drainage and dewatering facilities and operations not directly associated with construction activities included under individual Sections, comply with dewatering requirements of applicable Sections. Where feasible, utilize the same facilities. Maintain the site, excavations and construction free of water.

K. Temporary Enclosures: Provide temporary enclosure for protection of construction in progress and completed, from exposure, foul weather, other construction operations and similar activities.

1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.

2. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 square feet or less with plywood or similar materials.

3. Close openings through floor or roof decks and horizontal surfaces with load-bearing wood-framed construction.

4. Where temporary wood or plywood enclosure exceeds 100 square feet in area, use UL-labeled fire-retardant treated material for framing and main sheathing.

L. Temporary Lifts and Hoists: Provide facilities for hoisting materials and employees. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

M. Project Identification and Temporary Signs: Prepare project identification and other signs of the size indicated; install signs where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative treated wood or steel. Do not permit installation of unauthorized signs.

1. Project Identification Signs: Engage an experienced sign painter to apply graphics. Comply with details indicated.

2. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.

N. Temporary Exterior Lighting: Install exterior yard and sign lights so that signs are visible when Work is being performed.

O. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F (27 deg C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.

P. Rodent and Pest Control: Before deep foundation Work has been completed, retain a local exterminator or pest control company to recommend practices to minimize attraction and harboring of rodents, roaches and other pests. Employ this service to perform extermination and control procedures at regular intervals so the Project will be relatively free of pests and their residues at Substantial Completion. Perform control operations in a lawful manner using environmentally safe materials.

Q. Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate. Cover finished permanent stairs with a protective covering of plywood or similar material so finishes will be undamaged at the time of acceptance.

R. Temporary Partitions: Provide floor-to-ceiling temporary partitions to limit dust and dirt migration and to separate areas occupied by the Owner from fumes and noise as specified for the Project. Provide fire rated temporary partitions at locations and as specified in the construction documents.

1. Provide walk-off mats at each entrance through temporary partition.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer as requested by the Architect.

B. Temporary Fire Protection: Until fire protection needs are supplied by permanent facilities, install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations."

1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.

2. Store combustible materials in containers in fire-safe locations.

3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.

4. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.

C. Permanent Fire Protection: At the earliest feasible date in each area of the Project, complete installation of the permanent fire protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.

D. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed provide lighting, including flashing red or amber lights.

E. Enclosure Fence: When excavation begins, install an enclosure fence with lockable entrance gates. Locate where indicated, or enclose the entire site or the portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs and other animals from easily entering the site, except by the entrance gates.

1. Provide open-mesh, chain-link fencing with posts set in a compacted mixture of gravel and earth.

2. Provide plywood fence, 8-feet high, framed with four 2" x 4" rails, and preservative treated wood posts spaced not more than 8-feet apart.

F. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security.

G. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.

H. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion. Coordinate with UNL Landscape Services.

3.6 OPERATION, TERMINATION AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

C. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.

D. Protection: Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

E. Termination and Removal: Unless the Architect or Owner requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired

F. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of Project identification signs.

G. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:

1. Replace air filters and clean inside of ductwork and housings.

2. Replace significantly worn parts and parts that have been subject to unusual operating conditions.

3. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

END OF SECTION

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SECTION 01 71 23 - FIELD ENGINEERING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for field engineering services, including, but not necessarily limited to, the following:

1. Land survey Work.
2. Civil engineering services.
3. Structural engineering services.

1.3 SUBMITTALS

A. CERTIFICATES: Submit a certificate signed by the Land Surveyor or Professional Engineer certifying that the location and elevation of improvements comply with the Contract Documents.

B. Final Property Survey: Submit 10 copies of the final property survey.

C. Project Record Documents: Submit a record of Work performed and record survey data as required under provisions of Sections "Submittals" and "Project Closeout".

1.4 QUALITY ASSURANCE

A. Surveyor: Engage a Registered Land Surveyor registered in the State where the project is located, to perform land surveying services required.

B. Engineer: Engage a Professional Engineer of the discipline required, registered in the state in which the Project is located, to perform required engineering services.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 EXAMINATION

A. The Owner will identify existing control points and property line corner stakes.

B. Verify layout information shown on the Drawings, in relation to the property survey and existing benchmarks before proceeding to layout the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.

C. Do not change or relocate benchmarks or control points without prior written approval. Promptly report lost or destroyed reference points, or requirements to relocate reference points because of necessary changes in grades or locations.

D. Promptly replace lost or destroyed project control points. Base replacements on the original survey control points.

E. Establish and maintain a minimum of two permanent benchmarks on the site, referenced to data established by survey control points.

F. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

G. Existing utilities and equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction.

H. Prior to construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer and water service piping.

3.2 PERFORMANCE

A. Working from lines and levels established by the property survey, establish benchmarks and markers to set lines and levels at each story of construction and elsewhere as needed to properly locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.

B. Advise entities engaged in construction activities, of marked lines and levels provided for their use.

C. As construction proceeds, check every major element for line, level and plumb.

D. Surveyor's Log: Maintain a surveyor's log of control and other survey Work. Make this log available for reference.

E. Record deviations from required lines and levels, and advise the Architect when deviations that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record deviations that are accepted and not corrected.

F. On completion of foundation walls, major site improvements, and other Work requiring field engineering services, prepare a certified survey showing dimensions, locations, angles and elevations of construction and sitework.

G. Site Improvements: Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes and invert elevations by instrumentation and similar appropriate means.

H. BUILDING LINES AND LEVELS: Locate and lay out batter boards for structures, building foundations, column grids and locations, floor levels and control lines and levels required for mechanical and electrical Work.

I. EXISTING UTILITIES: Furnish information necessary to adjust, move or relocate existing structures, utility poles, lines, services or other appurtenances located in, or affected by construction. Coordinate with local authorities having jurisdiction.

~~J. FINAL PROPERTY SURVEY: Before Substantial Completion, prepare a final property survey showing significant features (real property) for the Project. Include on the survey a certification, signed by the Surveyor, to the effect that principal metes, bounds, lines and levels of the Project are accurately positioned as shown on the survey.~~

~~K. RECORDING: At Substantial Completion, have the final property survey recorded by or with local governing authorities as the official "property survey".~~

END OF SECTION

SECTION 31 23 16.13 – Trenching

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:

1. Trench excavation
2. Trench backfill
3. Trench wall stabilization
4. Dewatering
5. Testing

B. Work included in project consists of, but is not limited to, installation methods of following:

1. Process piping
2. Water piping (plant, process transmission, distribution and non-potable)
3. Relocation of existing piping
4. Chemical feed piping
5. Surface drainage conduits and piping
6. Electrical conduits and direct burial cables
7. All related utility and process appurtenances
8. Anchor trenches
9. Sanitary sewer piping

C. Definitions:

1. Excavation: All excavation will be defined as unclassified. No separate payments will be made for rock excavation or removal of unsuitable materials.

D. Related Sections:

1. Section 31 10 00 Site Clearing
2. Section 31 22 19 Finish Grading
3. Section 31 23 00 Excavation and Fill

PART 2 PRODUCTS

2.1 SEE SECTION 31 23 00

PART 3 – EXECUTION

3.1 GENERAL

A. Excavate trench, backfill, and compact for all underground utility lines, structures, bases, and appurtenances.

3.2 EXCAVATION

A. Excavation for Appurtenances:

1. Excavate for appurtenant structures to provide at least 12 inches (minimum) clear distance between outer surface and embankment and in full observation to Safety Rules.
2. See Section 31 23 00 for applicable requirements of excavation, filling, backfilling and finish grading.

B. Trench Excavation:

1. Unless indicated or given permission to do otherwise, excavate trenches by open cut method to depth shown on drawings and necessary to accommodate work. Permission may be granted for tunnel work for crossing under existing utility lines; however, such tunnels are limited to 10 feet in length.
2. Open trench widths outside buildings, units, and structures shall be no more than 50 lineal feet. Trenching limitations may be field adjusted as weather conditions dictate.
3. Do not open greater length of trench than can be effectively utilized under existing conditions. Schedule work and order materials so trenches are not left open longer than reasonably necessary. Any trench or portion of trench, which is opened and remains idle for seven calendar days, or longer, as determined by Owner, may be directed to be immediately refilled, without completion of work, at no additional cost to Owner. Said trench may not be reopened until Owner is satisfied that work associated with trench will be prosecuted with dispatch.
4. ~~Observe following trenching criteria:~~
   a. ~~Trench size. Excavate only sufficient width to accommodate free working space. In no case shall trench width at top of pipe or conduit exceed outside diameter of utility service by following dimensions:~~

~~Overall Diameter of Utility Service~~	~~Excess Dimension~~
~~33 inches and less~~	~~16 inches~~
~~36 inches and greater~~	~~24 inches~~

   b. Cut trench walls vertically from bottom of trench to one foot above top of pipe, conduit, or utility service.
   c. Keep trenches free of water. Include cost of dewatering in original proposal.
   d. Brace and sheet trenches as soil conditions dictate and in full observation of OSHA requirements. Do not remove sheeting until backfilling has progressed to stage that no damage to piping, utility service, or conduit will result due to removal.
   e. Brace trenches running near walls or columns, to prevent any settlement or other disturbance of walls or columns, to make trench excavation that runs parallel to footing bottom with maximum slope of one to one.

C. Trenching for Electrical Installations:

1. Observe Part 3.2.B “Trench Excavation” with the following modifications for electrical installations:
   a. Do not open more than 600 lineal feet of trench in exterior locations for trenches more than 12 inches, but not more than 30 inches wide.
   b. Any length trench may be opened in exterior locations for trenches which are 12 inches wide or less.
   c. Do not over excavate.
   d. Trenching depths for electrical work are not stated on Drawings. Cut trenches for electrical runs with minimum 30 inches cover, unless otherwise specified.

D. Blasting with any type of explosive is prohibited.

3.3 PREPARATION OF FOUNDATION FOR PIPE LAYING

A. If over-excavation occurs, backfill and compact to 95 percent of maximum dry density per ASTM D698 or backfill with granular bedding material.

B. In case of rock excavation, carry excavation a minimum of 12 inches below established grade and backfill to grade with suitable earth or granular material. Use material free of rocks, roots, sod or organic matter and compact per paragraph A. Form bell holes in trench such that only barrel of pipe is supported by bedding material.

C. Subgrade Stabilization. Provide subgrade stabilization when directed in accordance with these specifications and details when shown. Observe following requirements when unstable trench bottom materials are encountered.

1. Notify Owner when unstable materials are encountered and define by drawing station locations and limits.
2. Remove unstable trench bottom caused by Contractor operations. Replace with subgrade stabilization with no additional compensation.

3.4 BACKFILLING

A. Do not backfill until tests to be performed on system show system is in full compliance to specified requirements.

B. Methods: Provide backfill and compaction methods in accordance with the following:

1. Place backfill in lift thicknesses capable of being compacted to densities specified.
2. Observe specific pipe or conduit manufacturer's recommendations regarding methods of backfilling and compaction.
3. Exercise extreme care in backfilling operations to avoid displacing joints and appurtenances or causing any horizontal or vertical misalignment, separation, or distortion. Repair damages, distortions or misalignments to full satisfaction of Engineer.

C. Water flushing for consolidation is not permitted.

D. Backfilling methods for electrical installations are same as mentioned in this section. Observe notes and details on electrical drawings for fill in immediate vicinity of direct burial cables.

3.5 DEWATERING

A. Where ground water is encountered during excavation, install dewatering system to prevent softening and disturbance of material below and on side of trenches to allow piping and utilities to be placed dry and to maintain stable excavation side slope. Employ dewatering specialist for selecting and operating dewatering system. Keep system in operation until trench is completely backfilled and compaction requirements are verified. Dispose of ground water at location shown on drawings. Transport and discharge water so it will not interfere with construction operations, damage existing construction or cause any damage to off-site properties. Conform to all local, state and federal government rules and regulations in discharge of dewatering wells. Shut off dewatering system at rate to prevent quick upsurge of water that might weaken subgrade. Assume all costs associated with dewatering.

3.6 FIELD QUALITY CONTROL

A. Backfill compaction tests. Perform in-place moisture density tests beginning 1.0 foot above top of pipe of utility service and perform test at 3.0-foot intervals to finish grade. Test to be at approximately 500-foot intervals as directed. Obtain required proctor curves at no additional cost to Owner.

END OF SECTION

SECTION 32 92 19 – SEEDING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fertilizing.
2. Seeding.
3. Hydroseeding.
4. Mulching.
5. Maintenance.

B. Related Sections:

1. Section 31 23 00 – Excavation and Fill.

1.2 REFERENCES

A. ASTM International:

1. ASTM C602 - Standard Specification for Agricultural Liming Materials.

B. See Section 01 42 00 Reference Standards.

1.3 DEFINITIONS

A. Weeds: Vegetative species other than specified species to be established in given area.

1.4 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures

B. Product Data: Submit data for seed mix, fertilizer, mulch, and other accessories.

C. Test Reports: Indicate topsoil nutrient and pH levels with recommended soil supplements and application rates.

D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

E. Invoices or proof of purchase to verify quantities specified.

~~F. Operation and Maintenance Data: Include maintenance instructions, cutting method and maximum grass height; and, types, application frequency, and recommended coverage of fertilizer.~~

1.5 QUALITY ASSURANCE

A. Contract seeding work to a single firm specializing in seeding turf and/or wildflower mixes. Firm shall have satisfactory record of performance on completed projects of comparable size and quality.

B. The Owner may inspect sod, seed or plugs at site before planting, for compliance with requirements for genus, species, variety, size and quality. The Owner may reject unsatisfactory or defective material at any time during progress of work. Rejected materials shall be immediately removed from project site.

1.6 QUALIFICATIONS

A. Seed Supplier: Company specializing in manufacturing products specified in this Section with minimum 3 years documented experience.

B. Installer: Company specializing in performing work of this Section with minimum 5 years documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Deliver grass seed mixture in sealed containers showing percentage of seed mix, germination, inert matter and weeds; year of production; net weight; date of packaging; and location of packaging. Seed in damaged packaging is not acceptable.

C. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

~~1.8 MAINTENANCE SERVICE~~

~~A. Maintain seeded areas immediately after placement until grass is well established and exhibits vigorous growing condition for minimum of three cuttings.~~

PART 2 – PRODUCTS

2.1 TOPSOIL MATERIALS

A. Conform to Section 32 91 19. Topsoil: Original surface soil typical of the area, which is capable of supporting native plant growth; free of large stones, roots, waste, debris, contamination, or other unsuitable material, which may be detrimental to plant growth; pH value of 5.4 to 7.0.

2.2 SEED MIXTURE

A. Furnish seeding materials:

1. City/County/NRD Rural Mixture
   a. Contains: Smooth Bromegrass, Oats, Perennial Ryegrass, and Tall Fescue
   b. Packaged: 1/2 acre bag (50 lbs)
   c. Use: Provides for excellent ground cover and erosion control

2.3 ACCESSORIES

A. Mulching Material: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable.

B. Fertilizer: Commercial grade; recommended for grass; of proportion necessary to eliminate deficiencies of topsoil, as indicated in analysis. When test is not available, use 10-10-10 mixture of Nitrogen, phosphoric acid, and soluble potash.

C. Lime: ASTM C602, Class T or Class O agricultural limestone containing a minimum 80 percent calcium carbonate equivalent.

D. Water: Clean, fresh and free of substances or matter capable of inhibiting vigorous growth of grass.

E. Erosion Fabric: Jute matting, open weave.

F. Herbicide: As required to combat type of weeds encountered.

G. Stakes: Softwood lumber, chisel pointed.

H. String: Inorganic fiber.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Administrative Requirements: Verification of existing conditions before starting Work.

B. Verify prepared soil base and topsoil are ready to receive the Work of this Section.

3.2 FERTILIZING

A. Apply lime at application rate recommended by soil analysis. Work lime into top 6 inches of soil.

B. Apply fertilizer at application rate recommended by soil analysis.

C. Apply after smooth raking of topsoil and prior to roller compaction.

D. Do not apply fertilizer at same time or with same machine used to apply seed.

E. Mix fertilizer thoroughly into upper 2 inches of topsoil.

F. Lightly water soil to aid dissipation of fertilizer. Irrigate top level of soil uniformly.

3.3 SEEDING

A. Apply seed evenly in two intersecting directions at the rates shown above. Rake in lightly.

B. Do not seed areas in excess of that which can be mulched on same day.

C. Planting Season:

1. Fall: August 15 – September 15.
2. Late Winter: February 15 – March 21.

D. Do not sow immediately following rain, when ground is too dry, or when winds are over 12 mph.

~~E. Roll seeded area with roller not exceeding 112 lbs/linear foot.~~

F. Immediately following seeding and rolling, apply mulch to thickness of 1/8 inch. Maintain clear of shrubs and trees.

G. Apply water with fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.

3.4 HYDROSEEDING

A. Apply fertilizer, mulch and seeded slurry with hydraulic seeder at rate of 6 lbs per 1,000 square feet evenly in one pass.

B. Apply water with fine spray immediately after each area has been hydroseeded. Saturate to 4 inches of soil and maintain moisture levels two to four inches.

3.5 SEED PROTECTION

~~A. Identify seeded areas with stakes and string around area periphery. Set string height to 12 inches. Space stakes at 5 feet on center.~~

B. Cover seeded slopes where grade is greater than 3 H:1 V with erosion fabric. Roll fabric onto slopes without stretching or pulling.

C. Lay fabric smoothly on surface, bury top end of each section in 6 inch deep excavated topsoil trench. Overlap edges and ends of adjacent rolls minimum 12 inches. Backfill trench and rake smooth, level with adjacent soil.

D. Secure outside edges and overlaps at 36 inch intervals with stakes.

E. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.

F. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges minimum 6 inches.

3.6 MAINTENANCE

~~A. Mow grass at regular intervals to maintain at maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at each mowing. Perform first mowing when seedlings are 40 percent higher than desired height.~~

~~B. Neatly trim edges and hand clip where necessary.~~

~~C. Immediately remove clippings after mowing and trimming. Do not let clippings lay in clumps.~~

D. Water to prevent grass and soil from drying out.

~~E. Roll surface to remove minor depressions or irregularities.~~

F. Control growth of weeds. Apply herbicides. Remedy damage resulting from improper use of herbicides.

G. Immediately reseed areas showing bare spots.

H. Repair washouts or gullies.

~~I. Protect seeded areas with warning signs during maintenance period.~~

END OF SECTION

SECTION 33 47 13 – POND LINER

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Geomembrane liner for livestock lagoon application.
2. Geocomposite liner for gas venting layer in livestock lagoon application.

B. Related Sections:

1. Section 31 23 00 Excavation and Fill.
2. Section 33 31 00 Sanitary Piping.

1.2 REFERENCES

A. ASTM International:

1. ASTM D413 - Standard Test Methods for Rubber Property - Adhesion to Flexible Substrate.
2. ASTM D570 - Standard Test Method for Water Absorption of Plastics.
3. ASTM D638 - Standard Test Method for Tensile Properties of Plastics.
4. ASTM D751 - Standard Test Methods for Coated Fabrics.
5. ASTM D1004 - Standard Test Method for Initial Tear Resistance of Plastic Film and Sheeting.
6. ASTM D1204 - Standard Test Method for Linear Dimensional Changes of Non-rigid Thermoplastic Sheeting or Film at Elevated Temperature.
7. ASTM D1505 - Standard Test Method for Density of Plastics by the Density-Gradient Technique.
8. ASTM D3083 - Standard Specification for Flexible Poly (Vinyl Chloride) Plastic Sheeting for Pond, Canal, and Reservoir Lining.
9. ASTM D4833 - Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.
10. ASTM D5199 - Test Method for Measuring Nominal Thickness of Geotextiles and Geomembrane
11. ASTM D5994 - Test Method for Measuring the Core Thickness of Textured Geomembranes.
12. ASTM D6693 - Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Submittals

1. Submit a list of five similar completed projects in which the manufactured material has been successfully used along with references.
2. Submit evidence that the manufacturer of the liner is listed by the National Sanitation Foundation as having met Standard 54 for flexible membrane liners, and has at least five years of continuous experience in the manufacture of HDPE membranes or experience totaling ten million square feet (10,000,000 ft^2) of manufactured HDPE liners.
3. Warranty: Warrant to the Owner the entire lining installed under the Contract to be free of defects in materials and workmanship for a period of five (5) years following the date of acceptance of the Work by the Owner, in accordance with the Maintenance and Guarantee provisions of the General Conditions. The liner manufacturer shall warrant

the materials against defect or failure due to contact with leachate or due to exposure to weather. This warranty shall be submitted prior to the contract award and shall state all conditions and exclusions.

4. Submit evidence that the proposed installer is approved by the manufacturer and has successfully installed, in waste lagoons or containment ponds, at least two million square feet (2,000,000 ft^2) of HDPE liner.

C. Submit for the Engineer's approval, shop drawings showing lining sheet layout with proposed size, number, position and sequence of placing of all sheets and indicating the location and the direction of all field joints. Show complete details and/or methods for anchoring the lining at the top of the slope, making field joints, seals at structures, etc.

D. Prior to the installation, submit the following information supplied by the geomembrane liner manufacturer:

1. The origin (resin supplier's name and resin production plant), identification (brand name and number) and production date of the resin.
2. A copy of the quality control certificates issued by the resin supplier noting results of the density.
3. Reports on the tests conducted by the manufacturer to verify the quality (specific gravity, etc.) of the resin used to manufacture the geomembrane liner rolls assigned to this project.

1.4 QUALITY ASSURANCE

A. Install the liner using either a manufacturer approved installer or an approved manufacturer/installer of the liner systems. The selected installer shall have fabricated and supervised the installation of not less than two million square feet (2,000,000 ft^2) of HDPE liners. The liner superintendent shall have a minimum of one million square feet (1,000,000 ft^2) of similar installation experience.

B. Submit for approval a "Field Quality Control Manual" from a manufacturer approved installer or an approved manufacturer/installer prior to the start of the construction. The manual shall, at a minimum, provide the installer's "Daily Log" form, detailed installation procedures, including equipment and methodology and quality control testing protocol, including materials and seam testing. The Engineer shall have the right to require changes in the "Field Quality Control Manual".

C. Provide a Quality Control Certificate for each roll of geomembrane liner signed by a responsible party of the manufacturer. Include in the quality control certificate:

1. Roll numbers and identification.
2. Results of quality control tests. At a minimum, give results for thickness (ASTM D751), tensile strength (ASTM D638), and tear resistance (ASTM D1004 Die C).

D. All personnel performing seaming operations must be trained in the operation of the specific seaming equipment being used and must qualify by successfully welding a test seam. The Contractor's foreman shall provide direct supervision of the seaming operations.

1.5 DELIVERY, STORAGE AND HANDLING

A. Store rolls at the site on a prepared, smooth surface (no wooden pallets permitted).

B. Stack rolls no more than three rolls high, or as recommended by the manufacturer.

C. The installer and Engineer shall inspect each individual roll of the geomembrane lining material prior to installation. Any roll with defects or surface blemishes will be rejected. Engineer shall be the sole judge of what constitutes a defect or blemish.

PART 2 - PRODUCTS

2.1 GEOMEMBRANE LINER

A. The geomembrane liner shall be manufactured of High Density Polyethylene (HDPE) or Linear Low Density Polyethylene (LLDPE) and shall be a new, first quality product designed and manufactured specifically for wastewater pond liners and shall have satisfactorily demonstrated by prior use to be suitable and durable for such purposes. This material shall meet or exceed the following specifications (all values are minimum unless otherwise specified).

1. Smooth HDPE/LLPDE Liner: Designed specifically for the flexible geomembrane applications, **to be installed on cell floor and side slopes**, shall be smooth on both sides.

Property	Test	Specification
Average Thickness	ASTM D5199	40 mil
Minimum Thickness	ASTM D5199	36 mil
Density	ASTM D1505	0.94 g/cc
Dimensional Stability	ASTM D1204	+/- 2%
Tensile Properties		
– Strength at Break	ASTM D6693	152 lb/in width
– Strength at Yield	ASTM D6693	84 lb/in width
– Elongation at Break (2.5" gauge length)	ASTM D6693	700%
– Elongation at Yield (1.3" gauge length)	ASTM D6693	12%
Tear Resistance	ASTM D1004	28 lbs
Puncture Resistance	ASTM D4833	72 lbs
Permeability to Water	ASTM E96	1×10^{-12} cm/sec, max
Carbon Black Content	ASTM D1603	2.0-3.0%

2. Textured HDPE/LLDPE Liner: Designed specifically for the flexible geomembrane applications, **2 panels in each pond to be installed on side slopes** shall be textured on both sides, for the purpose of egress/escape.

Property	Test	Specification
Average Thickness	ASTM D5994	40 mil
Minimum Thickness	ASTM D5994	36 mil
Density	ASTM D1505	0.94 g/cc
Dimensional Stability	ASTM D1204	+/- 2%
Tensile Properties		
– Strength at Break	ASTM D6693	60 lb/in width
– Strength at Yield	ASTM D6693	84 lb/in width
– Elongation at Break (2.5" gauge length)	ASTM D6693	100%
– Elongation at Yield (1.3" gauge length)	ASTM D6693	12%
Tear Resistance	ASTM D1004	28 lbs
Puncture Resistance	ASTM D4833	60 lbs
Permeability to Water	ASTM E96	1×10^{-12} cm/sec, max
Carbon Black Content	ASTM D1603	2.0-3.0%

B. Meet or exceed the manufacturer's published specification and property requirements according to the specification sheet for the type and size of the geomembrane liner required. The geomembrane liner shall be free of holes, blisters, undispersed raw materials or any sign of contamination by foreign matter. There shall be no factory seams.

C. The geomembrane liner shall be manufactured by the extrusion process and shall be uniform in color, thickness, size and surface texture. The geomembrane liner shall be a flexible, durable, watertight product free of holes, blisters, undispersed raw materials and contaminants. Repair any defects using the extrusion fusion welding techniques in accordance with the manufacturer's recommendations.

D. The geomembrane liner material shall be manufactured as a continuous sheet with no factory seams and in rolls with a minimum width of 20 feet. The roll length shall be maximized to provide the largest manageable sheet for the fewest field seams. Labels on the roll shall identify the thickness, length, width and manufacturer's mark number. Packaged factory sheets of the geomembrane liner material which have been delivered to the project site, shall be stored in accordance with the manufacturer's recommendations.

E. Resin used for extrusion welding with extrudate of lining sheets and for repairs, shall be high density polyethylene produced from the same product as the sheet resin. Physical properties shall be same as the lining sheets.

F. Vents and pipe boots: Vents and pipe boots shall be made of the same material as the liner. The boots shall be welded and clamped to pipes of the same material as the liner. Boots shall be clamped to other types of pipes as recommended by the liner manufacturer to provide a leak-free attachment.

G. Liner appurtenances:

1. The liner shall be mechanically attached to pipe, concrete, or steel structures as shown in the drawings and according to liner manufacturer's recommendations.
2. Gasket materials shall be neoprene, closed-cell medium, 0.25-inch thick, with adhesive on one side, or other gasket material as approved by the liner manufacturer.
3. Metal battens shall be 0.25-inch thick by 2-inch wide stainless steel. Battens shall be installed according to the liner manufacturer's recommendations.
4. Clamps shall be 0.5-inch wide stainless steel.
5. Bolts shall be stainless steel.

H. Placement of Concrete:

1. Concrete placement for ramps, splash pads, and other appurtenances shall be in accordance with the drawings and as specified in the concrete specification and drawings.
2. All reinforcing steel shall be placed on flat-footed plastic rebar chairs. All rebar splices shall be fully tied.
3. On slopes, concrete shall be placed from the bottom of the slope to the top and have a slump as specified in the concrete specification.
4. Internal vibrators shall be used to consolidate concrete. Metal shovels and rodding shall not be used to consolidate or place the concrete.
5. Concrete forms shall be held in place by methods that avoid damaging the liner.

2.2 GEOCOMPOSITE LINER

A. Designed specifically for the transfer of gas under geomembrane liners.

Property	Test	Specification
Mass per Unit Area	ASTM D5199	8 oz/yd^2
Grab Tensile	ASTM D4632	220 lbs
Puncture Strength	ASTM D4833	120 lbs
AOS	ASTM D4571	80 US sieve
Permittivity	ASTM D4491	1.3 sec^{-1}
Flow Rate	ASTM D4491	95 gpm/ft^2
UV Resistance	ASTM D4355	70% retained
Core Parameters		
– Transmissivity	ASTM D4716	29 gal/min/ft^2
– Density	ASTM D1505	0.94 g/cm^3
– Tensile Strength	ASTM D5035	65 lb/in
– Carbon Black Content	ASTM D1603	2.0%
– Thickness	ASTM D5199	275 mil
Geocomposite Exterior		
– Transmissivity	ASTM D4716	3.4 gal/min/ft^2
– Ply Adhesion	ASTM D7005	1.0 lb/in

2.3 APPROVED MANUFACTURERS

A. Approved Manufacturers:

1. Poly-Flex, Inc.; Tel: 888-765-9359, www.poly-flex.com
2. GSE Lining Technology; 800-435-2008; www.gseworld.com
3. Colorado Lining Technology; 800-524-8672; www.coloradolining.com
4. Approved equal. Approval shall be by the Engineer's review of a responsive submittal as provided in this section.

PART 3 – EXECUTION

3.1 GEOMEMBRANE LINER INSTALLATION

A. Prior to the installation, the manufacturer/installer shall inspect the surface of the liner subgrade to confirm that it is in accordance with the provisions of Section 31 23 00, is suitable for installation of the geomembrane liner, and provide written acceptance of the subsurface.

B. Panel Placement

1. Submit a panel layout drawing prior to the placement which minimizes field jointing and horizontal field seams on the slopes. Any subsequent changes to the panel layout drawing must be approved by the Engineer.
2. Record information relating to the panel placement including date and time, panel number and panel dimensions on a Panel Placement Form supplied by the Contractor. If a portion of a roll is set aside to be used at another time, write the roll number on the remainder of the roll in at least three places.
3. To all extent possible, coordinate the installation of the geomembrane liner with the installation of the underlying geosynthetic clay liner to minimize prolonged exposure of the geosynthetic clay liner.
4. Deploy the panels so as to avoid damaging the geomembrane and the underlying geosynthetic clay liner. Do not drag sandbags, equipment or other items across the geomembrane liner. Do not allow workers to slide down the slopes atop the

geomembrane liner. Require workers working on the geomembrane to wear smooth-soled shoes. Do not allow shoes with patterns on the sole that can pick up rocks and trash. Do not allow vehicular traffic or smoking over the geomembrane liner.

5. Adjust panels so that seams are aligned with the fewest possible wrinkles and "fishmouths".
6. In each pond, two side slope panels shall be textured. These panels shall be placed on opposite sides of pond.

C. Do not place the geomembrane liner when air temperature, at a point six (6) inches above the membrane, is less than 40°F or greater than 104°F, or when the humidity is more than 80 percent (80%), or when it is raining, snowing, hailing, or when there is frost on the ground, or when there are high winds. Do not place in an area of standing water or in the presence of excessive moisture (i.e. fog, dew).

D. Liner Restraint During Installation

1. Weight the geomembrane with sandbags or equivalent to hold in position during installation.
2. Sandbags shall be:
   a. Sufficiently close-knit to preclude fines from working through the bag material or seams of the bags.
   b. Contain not less than 40 nor more than 60 pounds of sand having 100 percent passing for a number 8 screen.
   c. Tied closed after filling.
   d. Bags that are split, torn or otherwise losing their contents shall be immediately removed from the construction area and any spills immediately cleaned up.

3.2 GEOCOMPOSITE LINER INSTALLATION

A. Prior to the installation, the manufacturer/installer shall inspect the surface of the liner subgrade to confirm that it is in accordance with the provisions of Section 31 23 00, is suitable for installation of the geomembrane liner, and provide written acceptance of the subsurface.

B. Liner Restraint During Installation – Refer to Part 3.1.D.

3.3 WELDING

A. General

1. All seams shall be welded by double-track fusion welding. For fusion welding, overlap panels four to six inches.
2. Clean the seam area and remove moisture, dust and debris.
3. Record the seaming information to include seam number, welder identification, machine number, temperature setting and weather conditions.
4. Periodically check the machine's operating temperature and speed. Record the information directly on the geomembrane liner.
5. Extend the seams to the outside edge of the panels to be placed in the anchor trench.
6. At "fishmouths" or wrinkles which cannot be welded through, cut along the ridge to achieve a flat overlap. Patch with an oval patch extending three inches beyond the cut in all directions.
7. Weld the butt seams during the coolest time of the day to allow for contraction of the geomembrane liner.
8. Trim six inches from the ends of the panels being butt welded and at the "T" joints. Grind three inches, minimum, back from the joint and the extrusion weld in all of the areas prepared by the grinding.

3.4 TRIAL WELDS

A. Conduct trial welds prior to each seaming period, every five (5) hours, as weather conditions dictate, or if welding problems are suspected. Conduct trial welds under the same conditions as will be encountered during the actual seaming. Once qualified by a passing trial weld, welding technicians will not change the parameters (temperature, speed, etc.) without performing another trial weld.

B. Make trial welds by joining two (2) pieces of the geomembrane liner, at least six inches in width. Make trial welds for double-track fusion welds a minimum of five feet long.

C. Cut a minimum of three, one-inch wide specimens, one from the middle of the seam and one from near each end. Specimens will be obtained using a one-inch die cutter. The specimens will then be tested in peel using a field tensiometer.

D. In order for a trial weld to be considered acceptable, three specimens must meet the following criteria:

1. Exhibit Film Tearing Bond (FTB). Meet or exceed the minimum peel strength of 90 pounds per inch for fusion welds. If any specimens are in non-conformance, the entire procedure will be repeated. In the case of double-track fusion welded seams, both welds must pass in order to be considered acceptable.

E. If repeat tests utilizing reasonable sets of welding parameters also fail, the seaming apparatus will not be accepted and will not be used for seaming until the deficiencies are corrected and a passing test seam is achieved.

F. The Engineer, or Engineer's representative, will be present during the peel testing. The Contractor will record the date, time, operator, machine number, ambient and operating temperatures, speed setting, peel values and pass/fail designation.

3.5 LINER TESTING

A. Non-destructive Seam Testing

1. Test seams by the air pressure test in accordance with ASTM D5820. The air pressure test equipment and procedures shall conform to this specification and the liner manufacturer's recommendations. Test all seams over 100 percent of their length. Pressurize the air channel to an initial pressure of 25 to 30 psi. The maximum allowable drop after 5 minutes will be 4 psi. The location of all defective seams shall be marked and repaired.

B. Liner Leakage Testing

1. Test liner by an electrical leak path detection test per ASTM D7002. Test shall be performed at a minimum of one time per roll of liner material.
2. A report of electrical leak path detection test results shall be submitted to Engineer for approval.

3.6 SEAMING DOCUMENTATION

A. Document Seaming Operations. Mark on the geomembrane liner, with permanent markers at the start of all seams, information regarding the date, time, welding technician's ID, machine number, and machine operating temperature and speed.

B. Welding technicians should periodically check the operating temperature and speed and mark the information along the seam.

C. Record results of the field seam test strips.

D. Provide the Engineer with "As-Built" drawings reflecting general panel placement and seaming information.

E. All acceptable seams must be bound by two locations from which passing tests have been taken.

3.7 REPAIRS

A. Any portion of the geomembrane liner or geomembrane seam showing a flaw or having a destructive or non-destructive test in non-compliance will be repaired and non-destructively tested.

B. Repair holes larger than one-quarter of an inch with a patch. Repair smaller holes by extrusion cap welding.

C. Grind and clean the surface to be patched, no more than one hour prior to the patching. Remove no more than 10 percent (10%) of the thickness.

D. Patches shall be round or oval in shape, made of the same geomembrane liner and extend to a minimum of 6 inches beyond the edge of the defects. All patches shall be of the same compound and thickness as the geomembrane liner specified. All patches shall have their top edge beveled with an angle grinder prior to placement on the geomembrane. Patches shall be applied using approved methods only.

E. Each repair shall be non-destructively tested, except when the Engineer requires a destructive seam sample obtained from a repaired seam. Repairs that pass the non-destructive test shall be taken as an indication of an adequate repair. Failed tests indicate that the repair shall be repeated and retested until passing test results are achieved.

F. All acceptable seams shall be bounded by two locations from which passing tests have been taken.

~~3.8 POND SEEPAGE TESTING~~

~~A. A Pond Seepage Testing Plan shall be prepared and submitted to the Engineer for approval. The Contractor shall engage the services of a professional engineer with an independent firm to prepare the seepage testing plan, oversee the installation and operation of the monitoring equipment, review collected data, and calculate seepage rates.~~

~~B. Upon approval on the Pond Seepage Testing Plan, each pond cell shall be pre-filled with water to a depth of 2 feet.~~

~~C. The pond cell shall be given 2 weeks to allow for initial saturation and stabilization.~~

~~D. After the initial saturation period, each pond shall be re-filled with water to a minimum depth of 2 feet.~~

~~E. The following monitoring equipment shall be provided and installed:~~

~~1. Precipitation gauge and data logger, with accuracy to 0.01 inches.~~
~~2. Temperature recorder and data logger. Temperature readings will be recorded hourly.~~
~~3. Class A evaporation pan and pan stilling well with evaporation gauge and data logger.~~

4. ~~Three 6-inch diameter PVC pipe pond stilling wells with automatic depth gauges and data loggers. One pond depth recorder for each pond.~~

F. ~~The pond water depth and meteorological data will be monitored for a minimum of 21 days.~~

G. ~~Maximum water level drop of 1/64-inch per day average over the duration of the seepage test indicates a passing test.~~

H. ~~If the liner fails the seepage test requirements, the liner shall be repaired and re-tested prior to start-up.~~

I. ~~All measurement data from the data loggers, seepage calculations and summary report will be submitted to Engineer for review and approval.~~

J. ~~Engineer will submit tests results to the NDEQ.~~

END OF SECTION

CONSTRUCTION NOTES:

1. THE CONTRACTOR WILL INSPECT THE CONSTRUCTION AREA FOR THE PRESENCE OF UTILITY FACILITIES BOTH SURFACE AND SUBSURFACE, AND WILL NOTIFY THE NEBRASKA ONE CALL SYSTEM (HTTP://NE-DIGGERS.COM) BEFORE CONSTRUCTION ACTIVITIES WILL BEGIN. THE CONTRACTOR WILL USE EXTRA SAFETY PRECAUTIONS WHEN WORKING NEAR OR AROUND PIPELINES, POWER LINES, POWER POLES, UNDERGROUND CABLES, OR OTHER UTILITY INSTALLATIONS.
   DIGGERS HOTLINE: 1-800-331-5666
2. CLEARING AREAS, CLEARING AND GRUBBING AREAS, AND CONSTRUCTION WORK LIMITS ARE GENERALLY BOUNDED BY THE TOES OF THE EMBANKMENT AND BORROW AREAS AS SHOWN ON THE DRAWINGS.
3. TREES WITHIN THE WORK LIMITS WILL BE DISPOSED OF IN AN AREA DESIGNATED BY THE LAND OWNER AT THE TIME OF CONSTRUCTION.
4. EXCAVATED MATERIAL NOT SUITABLE FOR EARTHFILL WILL BE SPREAD AND SHAPED TO BLEND INTO THE SURROUNDING LANDSCAPE. EXACT LIMITS OF THE EXCAVATION WASTE DISPOSAL AND/OR STOCKPILE AREAS WILL BE DESIGNATED BY THE LAND OWNER AT TIME OF CONSTRUCTION.
5. MATERIAL WHICH IS NOT SUITABLE FOR EARTHFILL AND WHICH CAN NOT BE SPREAD IN ADJACENT FIELDS (STUMPS, TREES, FENCE MATERIALS, CONCRETE BLOCKS, RUBBLE, ETC.) WILL BE DISPOSED AT THE LANDFILL IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS.
6. CERTIFICATION FOR PAYMENT FOR EARTHWORK QUANTITIES WILL BE BASED ON NEAT-LINE MEASUREMENTS. ADDITIONAL BORROW NEEDED TO COMPLETE EARTH FILLS WILL NOT BE INCLUDED AS A PAYMENT ITEM. WHEN STRUCTURAL EXCAVATED QUANTITIES EXCEED BORROW REQUIREMENTS FOR EMBANKMENT, PAYMENT WILL BE MADE ONLY FOR EXCAVATION. WHEN ADDITIONAL BORROW IS NEEDED TO COMPLETE EARTHFILL, PAYMENT WILL BE MADE ON THE EARTHFILL QUANTITY NEEDED TO COMPLETE THE EMBANKMENT TO DESIGNATED NEAT-LINES.
7. FENCES WITHIN THE CONSTRUCTION WORK LIMITS WILL BE REMOVED BY OTHERS BEFORE CONSTRUCTION BEGINS.
8. ALL SURFACES BENEATH EARTHFILL AND BORROW AREAS WILL BE STRIPPED TO A DEPTH OF 0.5 FEET. STRIPPINGS WILL BE STOCKPILED AND USED AS TOPSOIL ON FINISHED EMBANKMENTS AND BORROW AREAS.
9. PLACEMENT OF PIPES AND LINER MATERIAL WILL TAKE PLACE IN THE PRESENCE OF THE ENGINEER OR ENGINEER'S REPRESENTATIVE.
10. ALL DISTURBED AREAS WILL BE SEEDED ACCORDING TO THE CONSTRUCTION SPECIFICATIONS.
11. ALL PVC PLASTIC PIPE SHALL CONFORM TO ASTM STANDARD D-2241. ALL POLYETHYLENE (PE) PIPE SHALL CONFORM TO ASTM STANDARDS F-405 AND/OR F-667.
12. NOT ALL ABOVE AND BELOW SURFACE FEATURES ARE SHOWN. ORIGINAL SURVEY WAS CONDUCTED FOR THE SOLE PURPOSE OF OBTAINING A NDEQ PERMIT, NOT FOR CONSTRUCTION PURPOSES. FIXTURES INSTALLED AFTER THE ORIGINAL SURVEY OR FEATURES NOT KNOWN DURING ORIGINAL SURVEY MAY OR MAY NOT BE SHOWN. CONTRACTORS SHOULD CONTACT UNL PERSONNEL FOR THE LOCATIONS OF ADDITIONAL FEATURES AND DEAL WITH THEM APPROPRIATELY DURING BIDDING/CONSTRUCTION.

2

ABBREVIATIONS:

AC	=	ACRE
AU	=	ANIMAL UNITS
BM	=	BENCH MARK
CWD	=	CLEAN WATER DIVERSION
CL	=	CENTERLINE
CP	=	CONTROL POINT FOR SURVEY LAYOUT
CY	=	CUBIC YARDS
DIP	=	DUCTILE IRON PIPE
D/S	=	DOWNSTREAM
ELEV	=	ELEVATION (FEET)
FL	=	FLOWLINE
GPM	=	GALLONS PER MINUTE
LB	=	POUNDS
LF	=	LINEAR FEET
LS	=	LUMP SUM
MOL	=	MAXIMUM OPERATING LEVEL (MUST PUMP LEVEL)
TBM	=	TEMPORARY BENCH MARK
TDH	=	TOTAL DYNAMIC HEAD (FEET)
TOB	=	TOP OF BERM
UGO	=	UNDERGROUND OUTLET

Diggers Hotline Of Nebraska

Statewide 811

Call Before You Dig... Its The Law

PROFESSIONAL CHEMICAL ENGINEER
FERDINANDO T. SCARPELLO
E-8052
STATE OF NEBRASKA

5/30/13

REVISION TRACKING		
DATE	DESCRIPTION	REVISION
02/18/2011	ORIGINAL DRAWINGS	0
05/17/2012	DAIRY CHANGES	1
05/29/2013	ADDENDUM NO. 2	2

UNL - ARDC (M975P006)
DAIRY FACILITY
SAUNDERS COUNTY, NEBRASKA

CONSTRUCTION NOTES & ABBREVIATIONS

PROJECT NUMBER: 117-011
DESIGNED: DAJ / FTS
DRAWN: SLK
CHECKED: FTS

1640 "L" STREET, SUITE D
LINCOLN, NE 68508
TEL (402) 475-8588
FAX (402) 477-1956
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WLA Consulting, Inc.
Engineers & Scientists
WaterLandAir

DRAWING NUMBER G-2

FILE: 117011G2(5)DAIRY

ESTIMATED TABLE OF QUANTITIES

ITEM	UNIT	QUANTITY	AS-BUILT
EXCAVATION			
STRIPPING, BENEATH EMBANKMENT	CY	300	
SEDIMENT BASIN #1 EXCAVATION	CY	800	
TOTAL EXCAVATION	CY	1,100	
EARTHFILL, CLASS C			
STRIPPING BACKFILL	CY	300	
SEDIMENT BASIN #1 EMBANKMENT	CY	600	
TOTAL EARTHFILL, CLASS C	CY	900	
CLEAN WATER DIVERSION EMBANKMENT	LF	400	
PLASTIC PIPE			
8" Ø PVC, SDR 41	LF	70	
6" Ø PE RISER	EA	1	
SEEDING	AC	0.5	

NOTE: EARTHFILL NOT ADJUSTED FOR COMPACTION.

2

PROFESSIONAL CHEMICAL ENGINEER
FERDINANDO T. SCARPELLO
E-8052
STATE OF NEBRASKA

5/30/13

REVISION TRACKING		
DATE	DESCRIPTION	REVISION
02/18/2011	ORIGINAL DRAWINGS	0
05/17/2012	DAIRY CHANGES	1
05/29/2013	ADDENDUM NO. 2	2

UNL - ARDC (M975P006)
DAIRY FACILITY
SAUNDERS COUNTY, NEBRASKA

DATA SHEET

PROJECT NUMBER: 117-011
DESIGNED: DAJ / FTS
DRAWN: SLK
CHECKED: FTS

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DRAWING NUMBER G-3

FILE: 117011G2(5)DAIRY

CLEAN WATER DIVERSION

CLEAN WATER DIVERSION 2

PROPOSED SEDIMENT BASIN NO.1

EXISTING N. SICK BARN

LWCF DRAINAGE AREA BOUNDARY

EXISTING LAGOON

EXISTING HOOP BARN

EXISTING HOOP BARN

EXISTING SHOP

CLEAN WATER DIVERSION 2

EXISTING HOSPITAL BARN

EXISTING NUT. BARN

EXISTING PARLOR

CP# 2057

EXISTING LOAF BARN

EXISTING LOAF BARN

EXISTING FEED BUNKER

EXISTING FEED STORAGE

EXISTING CALF BARN

SITE DESCRIPTION
SECTION 23, T14N, R8E,
SAUNDERS COUNTY, NEBRASKA

PROFESSIONAL CHEMICAL ENGINEER
FERDINANDO T. SCARPELLO
E-8052
STATE OF NEBRASKA

5/30/13

LEGEND

- FENCE LINE
- ROAD CENTERLINE
- CWD — CLEAN WATER DIVERSION
- SAN — SANITARY LINE
- CONTROL POINT

N

0 100' 200'

REVISION TRACKING		
DATE	DESCRIPTION	REVISION
02/18/2011	ORIGINAL DRAWINGS	0
05/17/2012	DAIRY CHANGES	1
05/29/2013	ADDENDUM NO. 2	2

UNL - ARDC (M975P006)
DAIRY FACILITY
SAUNDERS COUNTY, NEBRASKA

PROPOSED SITE PLAN

PROJECT NUMBER: 117-011
DESIGNED: DAJ / FTS
DRAWN: SLK
CHECKED: FTS

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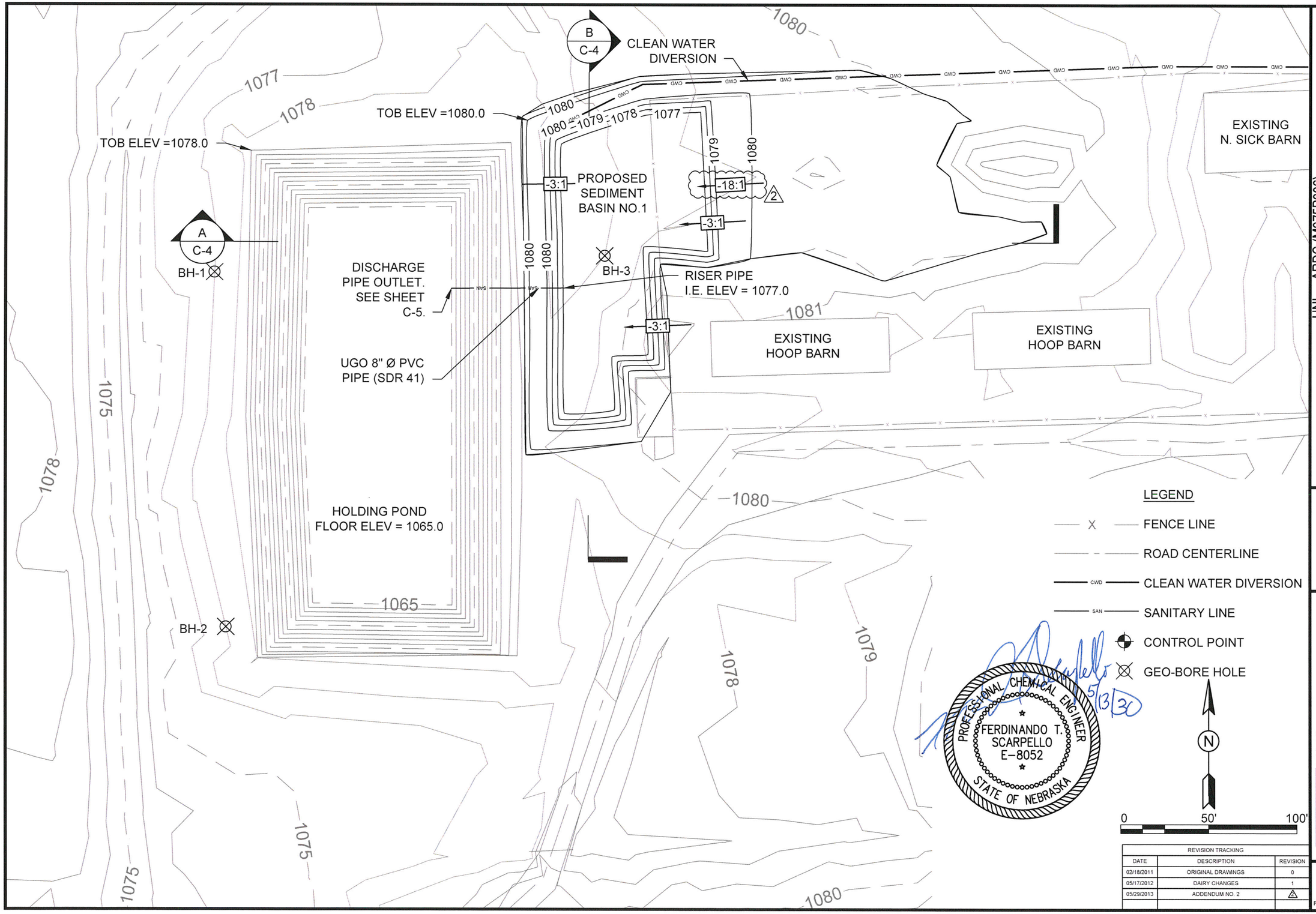
DRAWING NUMBER C-2

FILE: 117011C1(5)DAIRY



LEGEND

- FENCE LINE
- ROAD CENTERLINE
- CWD — CLEAN WATER DIVERSION
- SAN — SANITARY LINE
- CONTROL POINT
- GEO-BORE HOLE

PROFESSIONAL CHEMICAL ENGINEER
FERDINANDO T. SCARPELLO
E-8052
STATE OF NEBRASKA

5/13/30

N

0 50' 100'

REVISION TRACKING		
DATE	DESCRIPTION	REVISION
02/18/2011	ORIGINAL DRAWINGS	0
05/17/2012	DAIRY CHANGES	1
05/29/2013	ADDENDUM NO. 2	2

UNL - ARDC (M975P006)
DAIRY FACILITY
SAUNDERS COUNTY, NEBRASKA

HOLDING POND AND SEDIMENT BASIN NO. 1 PARTIAL SITE PLAN

PROJECT NUMBER: 117-011
DESIGNED: DAJ / FTS
DRAWN: SLK
CHECKED: FTS

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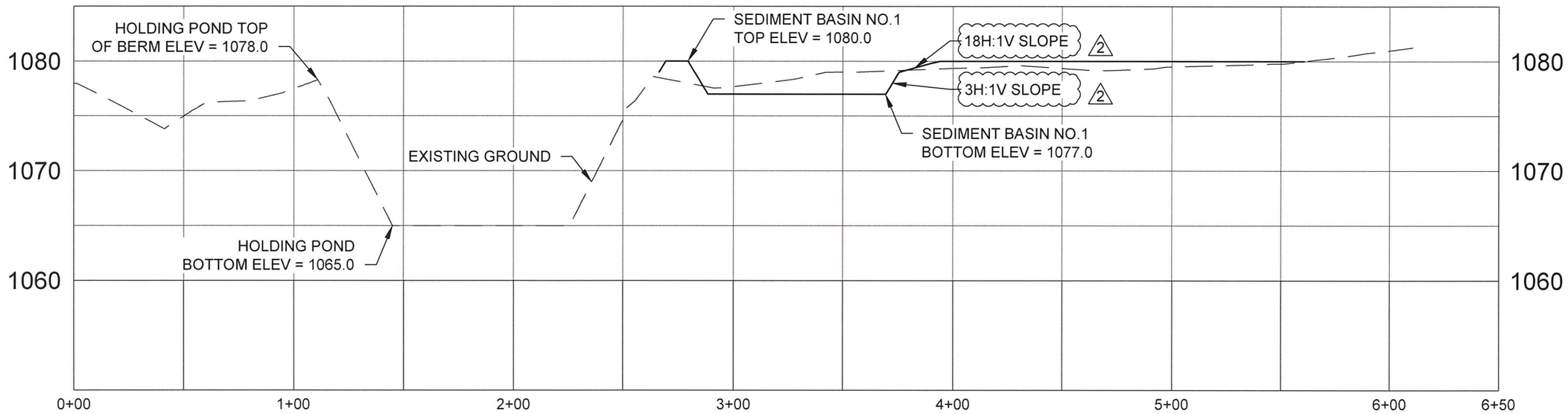
DRAWING NUMBER C-3

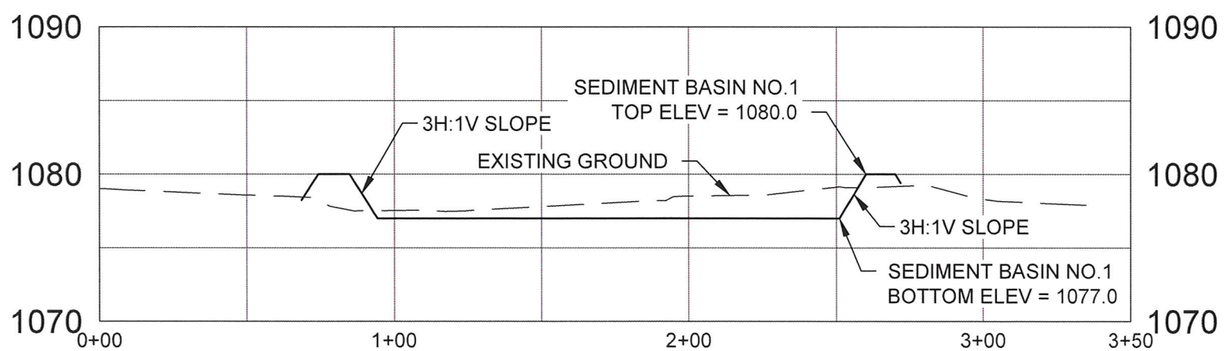
FILE: 117011C1(5)DAIRY



A HOLDING POND & SEDIMENT BASIN NO. 1 CROSS SECTION

HORIZ: 1" = 50'
VERT: 1" = 10'

0 50' 100'
0 10' 20'



B SEDIMENT BASIN NO. 1 CROSS SECTION

HORIZ: 1" = 50'
VERT: 1" = 10'

0 50' 100'
0 10' 20'

PROFESSIONAL CHEMICAL ENGINEER
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5/30/13

REVISION TRACKING		
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02/18/2011	ORIGINAL DRAWINGS	0
05/17/2012	DAIRY CHANGES	1
05/29/2013	ADDENDUM NO. 2	2

UNL - ARDC (M975P006)
DAIRY FACILITY
SAUNDERS COUNTY, NEBRASKA

CROSS SECTIONS

PROJECT NUMBER: 117-011
DESIGNED: DAJ / FTS
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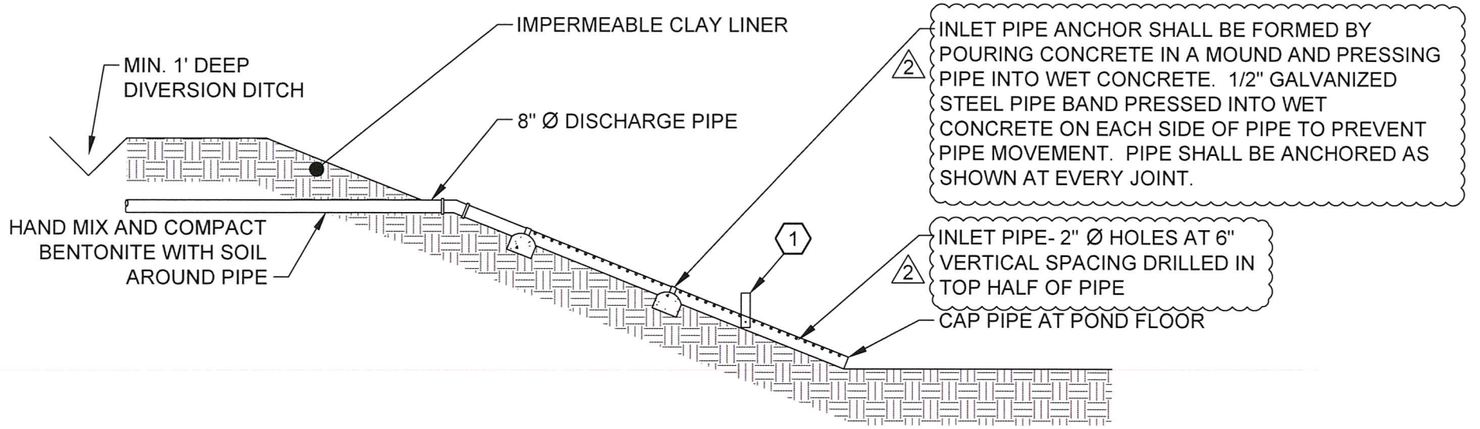
DRAWING NUMBER C-4

FILE: 117011C1(5)DAIRY



1 DISCHARGE PIPE DETAIL

NO SCALE

SHEET KEYNOTES

1. 1/4" GALVANIZED STEEL ANGLE IRON BOLTED TO SIDE OF PIPE WITH ANCHOR BOLTS. CUT ANGLE IRON TO REQUIRED ELEVATION. CRITICAL ELEVATIONS NEEDING MARKERS ARE: PRE-WINTER LEVEL, MUST-PUMP LEVEL, AND THE 25-YR, 24-HR STORM LEVEL.

2

CRITICAL ELEVATION SCHEDULE	
DESCRIPTION	ELEV (FT)
BOTTOM POND	1065.0
PRE-WINTER LEVEL	1067.5
MUST PUMP LEVEL	1075.0
25-YR, 24-HR STORM	1076.5
PIPE PENETRATION I.E.	1074.0

REVISION TRACKING		
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05/17/2012	DAIRY CHANGES	1
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UNL - ARDC (M975P006)
DAIRY FACILITY
SAUNDERS COUNTY, NEBRASKA

DISCHARGE PIPE DETAIL

PROJECT NUMBER: 117-011
DESIGNED: DAJ / FTS
DRAWN: SLK
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DRAWING NUMBER C-5

FILE: 117011C5(6)DAIRY

CONSTRUCTION NOTES:

1. THE CONTRACTOR WILL INSPECT THE CONSTRUCTION AREA FOR THE PRESENCE OF UTILITY FACILITIES BOTH SURFACE AND SUBSURFACE, AND WILL NOTIFY THE NEBRASKA ONE CALL SYSTEM (HTTP://NE-DIGGERS.COM) BEFORE CONSTRUCTION ACTIVITIES WILL BEGIN. THE CONTRACTOR WILL USE EXTRA SAFETY PRECAUTIONS WHEN WORKING NEAR OR AROUND PIPELINES, POWER LINES, POWER POLES, UNDERGROUND CABLES, OR OTHER UTILITY INSTALLATIONS.
   DIGGERS HOTLINE: 1-800-331-5666
2. CLEARING AREAS, CLEARING AND GRUBBING AREAS, AND CONSTRUCTION WORK LIMITS ARE GENERALLY BOUNDED BY THE TOES OF THE EMBANKMENT AND BORROW AREAS AS SHOWN ON THE DRAWINGS.
3. TREES WITHIN THE WORK LIMITS WILL BE DISPOSED OF IN AN AREA DESIGNATED BY THE LAND OWNER AT THE TIME OF CONSTRUCTION.
4. EXCAVATED MATERIAL NOT SUITABLE FOR EARTHFILL WILL BE SPREAD AND SHAPED TO BLEND INTO THE SURROUNDING LANDSCAPE. EXACT LIMITS OF THE EXCAVATION WASTE DISPOSAL AND/OR STOCKPILE AREAS WILL BE DESIGNATED BY THE LAND OWNER AT TIME OF CONSTRUCTION.
5. MATERIAL WHICH IS NOT SUITABLE FOR EARTHFILL AND WHICH CAN NOT BE SPREAD IN ADJACENT FIELDS (STUMPS, TREES, FENCE MATERIALS, CONCRETE BLOCKS, RUBBLE, ETC.) WILL BE DISPOSED AT THE LANDFILL IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS.
6. CERTIFICATION FOR PAYMENT FOR EARTHWORK QUANTITIES WILL BE BASED ON NEAT-LINE MEASUREMENTS. ADDITIONAL BORROW NEEDED TO COMPLETE EARTH FILLS WILL NOT BE INCLUDED AS A PAYMENT ITEM. WHEN STRUCTURAL EXCAVATED QUANTITIES EXCEED BORROW REQUIREMENTS FOR EMBANKMENT, PAYMENT WILL BE MADE ONLY FOR EXCAVATION. WHEN ADDITIONAL BORROW IS NEEDED TO COMPLETE EARTHFILL, PAYMENT WILL BE MADE ON THE EARTHFILL QUANTITY NEEDED TO COMPLETE THE EMBANKMENT TO DESIGNATED NEAT-LINES.
7. FENCES WITHIN THE CONSTRUCTION WORK LIMITS WILL BE REMOVED BY OTHERS BEFORE CONSTRUCTION BEGINS.
8. ALL SURFACES BENEATH EARTHFILL AND BORROW AREAS WILL BE STRIPPED TO A DEPTH OF 0.5 FEET. STRIPPINGS WILL BE STOCKPILED AND USED AS TOPSOIL ON FINISHED EMBANKMENTS AND BORROW AREAS.
9. PLACEMENT OF PIPES AND LINER MATERIAL WILL TAKE PLACE IN THE PRESENCE OF THE ENGINEER OR ENGINEER'S REPRESENTATIVE.
10. ALL DISTURBED AREAS WILL BE SEEDED ACCORDING TO THE CONSTRUCTION SPECIFICATIONS.
11. ALL PVC PLASTIC PIPE SHALL CONFORM TO ASTM STANDARD D-2241. ALL POLYETHYLENE (PE) PIPE SHALL CONFORM TO ASTM STANDARDS F-405 AND/OR F-667.
12. NOT ALL ABOVE AND BELOW SURFACE FEATURES ARE SHOWN. ORIGINAL SURVEY WAS CONDUCTED FOR THE SOLE PURPOSE OF OBTAINING A NDEQ PERMIT, NOT FOR CONSTRUCTION PURPOSES. FIXTURES INSTALLED AFTER THE ORIGINAL SURVEY OR FEATURES NOT KNOWN DURING ORIGINAL SURVEY MAY OR MAY NOT BE SHOWN. CONTRACTORS SHOULD CONTACT UNL PERSONNEL FOR THE LOCATIONS OF ADDITIONAL FEATURES AND DEAL WITH THEM APPROPRIATELY DURING BIDDING/CONSTRUCTION.

1

ABBREVIATIONS:

AC	=	ACRE
AU	=	ANIMAL UNITS
BM	=	BENCH MARK
CWD	=	CLEAN WATER DIVERSION
CL	=	CENTERLINE
CP	=	CONTROL POINT FOR SURVEY LAYOUT
CY	=	CUBIC YARDS
DIP	=	DUCTILE IRON PIPE
D/S	=	DOWNSTREAM
ELEV	=	ELEVATION (FEET)
FL	=	FLOWLINE
GPM	=	GALLONS PER MINUTE
LB	=	POUNDS
LF	=	LINEAR FEET
LS	=	LUMP SUM
MOL	=	MAXIMUM OPERATING LEVEL (MUST PUMP LEVEL)
TBM	=	TEMPORARY BENCH MARK
TDH	=	TOTAL DYNAMIC HEAD (FEET)
TOB	=	TOP OF BERM
UGO	=	UNDERGROUND OUTLET

Diggers Hotline Of Nebraska

Statewide 811

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PROFESSIONAL CHEMICAL ENGINEER
FERDINANDO T. SCARPELLO
E-8052
STATE OF NEBRASKA

5/30/13

REVISION TRACKING		
DATE	DESCRIPTION	REVISION
02/18/2011	ORIGINAL DRAWINGS	0
05/29/2013	ADDENDUM NO. 2	1

UNL - ARDC (M975P006)
OLD FEEDLOT
SAUNDERS COUNTY, NEBRASKA

CONSTRUCTION NOTES & ABBREVIATIONS

PROJECT NUMBER: 117-011
DESIGNED: DAJ/FTS
DRAWN: SLK
CHECKED: FTS

1640 "L" STREET, SUITE D
LINCOLN, NE 68508
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DRAWING NUMBER G-2

FILE: 117011G2(3)FEEDLOT

ESTIMATED TABLE OF QUANTITIES			
ITEM	UNIT	QUANTITY	AS-BUILT
EXCAVATION			
STRIPPING, BENEATH EMBANKMENT	CY	3,100	
EXCAVATION FOR SOUTH HOLDING POND	CY	22,500	
SEDIMENT BASIN #3 EXCAVATION	CY	5,700	
SEDIMENT BASIN #4 EXCAVATION	CY	3,100	
COW / CALF BASIN EXCAVATION	CY	800	
FEED STORAGE BASIN EXCAVATION	CY	6,200	
TOTAL EXCAVATION	CY	41,400	
EARTHFILL, CLASS C			
STRIPPING BACKFILL	CY	3,100	
HOLDING POND EMBANKMENT	CY	31,600	
SEDIMENT BASIN #3 EMBANKMENT	CY	100	
SEDIMENT BASIN #4 EMBANKMENT	CY	100	
COW / CALF BASIN EMBANKMENT	CY	1,100	
FEED STORAGE BASIN EMBANKMENT	CY	200	
TOTAL EARTHFILL, CLASS C	CY	36,200	
CLEAN WATER DIVERSION EMBANKMENT	LF	4,880	
HOLDING POND LINER			
HDPE LINER	SF	275,000	
GAS VENTING LAYER (ALTERNATE BID ITEM)	SF	275,000	
PLASTIC PIPE			
6" Ø PVC, SDR 41	LF	800	
8" Ø PVC, SDR 26	LF	4,280	
8" Ø PVC, SDR 41	LF	250	
8" Ø PE RISER	EA	4	
6" Ø PE RISER	EA	1	
VALVES			
8" Ø BURIED GALVANIZED STEEL BUTTERFLY VALVE W/ ACTUATOR	EA	3	
8" Ø GALVANIZED STEEL GATE VALVE	EA	2	
SEEDING	AC	6	
DEWATERING PUMP RELOCATION	LS	1	
GALVANIZED STEEL VALVE, TEE, AND AIR/VACUUM RELEASE FOR CENTER PIVOT CONNECTION	LS	1	

NOTE: EARTHFILL NOT ADJUSTED FOR COMPACTION.

<u>DESIGN CAPACITIES</u>

SEDIMENT BASIN #1: CONVERT EXISTING NORTH HOLDING POND, 254,800 CF (163%)
SEDIMENT BASIN #2: CONVERT EXISTING MIDDLE HOLDING POND, 183,200 CF (105%)
SEDIMENT BASIN #3: 210,000 CF (113%), DRAINS INTO SOUTH HOLDING POND
SEDIMENT BASIN #4: 151,000 CF (115%) INCLUDES SEDIMENT BASIN NO. 5 STORAGE VOLUME, DRAINS INTO SOUTH HOLDING POND
SEDIMENT BASIN #5: COLLECTION POOLS FOR ANALYSIS, DRAINS INTO SEDIMENT BASIN NO. 4
COW/CALF BASIN: 29,600 CF (138%), DRAINS INTO SOUTH HOLDING POND
SWINE AREA & FEED STORAGE BASIN: 189,900 CF (113%), DRAINS INTO SOUTH HOLDING POND

ENLARGED SOUTH HOLDING POND: TOTAL CAPACITY = 2,671,500 CF (INCLUDES FREEBOARD AND 175% CAPACITY)

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05/29/2013	ADDENDUM NO. 2	1

UNL - ARDC (M975P006)
OLD FEEDLOT
SAUNDERS COUNTY, NEBRASKA

DATA SHEET

PROJECT NUMBER: 117-011
DESIGNED: DAJ / FTS
DRAWN: SLK
CHECKED: FTS

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DRAWING NUMBER G-3

FILE: 117011G2(3)FEEDLOT

EXISTING SWINE LAGOONS

FUTURE DEEP-PIT SWINE BARNS
NOT IN CONTRACT

EXISTING SWINE UNITS

CP# 51347

FEED STORAGE AREA

1 NEW FORCE MAIN DISCHARGE LINE TO PIVOT. CONTINUED ON SHEET C-2A.

NEW FEED STORAGE BASIN SEE SHEET C-9

NEW COW & CALF BASIN SEE SHEET C-8

NEW ACCESS ROAD

1 EXISTING SEDIMENT BASIN #5 SEE SHEET C-7

EXISTING CATTLE PENS

EXISTING CATTLE PENS

EXISTING CATTLE PENS

NEW SEDIMENT BASIN #4 SEE SHEET C-4

EXPANDED SOUTH HOLDING POND (TO BE LINED) SEE SHEET C-3

SEDIMENT BASIN #1
EXISTING NORTH HOLDING POND
(UNCHANGED)
SEE SHEET C-4

CP# 50004

WELLS

SEDIMENT BASIN #2
EXISTING MIDDLE HOLDING POND
(UNCHANGED)
SEE SHEET C-5

CP# 50003

NEW SEDIMENT BASIN #3 SEE SHEET C-6

EXISTING SOUTH HOLDING POND

LEGEND

- FENCE LINE
- ROAD CENTERLINE
- CLEAN WATER DIVERSION
- SANITARY LINE
- CONTROL POINT
- WELL
- FLOW DIRECTION

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E-8052
STATE OF NEBRASKA

5/30/13

N

0 300' 600'

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05/29/2013	ADDENDUM NO. 2	1

UNL - ARDC (M975P006)
OLD FEEDLOT
SAUNDERS COUNTY, NEBRASKA

PROPOSED SITE PLAN

PROJECT NUMBER: 117-011
DESIGNED: DAJ / FTS
DRAWN: SLK
CHECKED: FTS

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DRAWING NUMBER C-2

FILE: 117011C1(4)FEEDLOT

LEGEND

X FENCE LINE	CONTROL POINT
— — ROAD CENTERLINE	WELL
CWD CLEAN WATER DIVERSION	FLOW FLOW DIRECTION
SAN SANITARY LINE	

CONNECT TO EXISTING CENTER PIVOT PIPING. SEE DETAIL: 1 / C-17

BURY FORCE MAIN A MINIMUM OF 3' BELOW EXISTING GRADE

NEW FORCE MAIN DISCHARGE LINE TO PIVOT

EXISTING SWINE LAGOONS

FUTURE DEEP-PIT SWINE BARNS *NOT IN CONTRACT*

EXISTING SWINE UNITS

CP# 51347

FEED STORAGE AREA

NEW FEED STORAGE BASIN

CWD

SAN

N

0 300' 600'

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E-8052
STATE OF NEBRASKA

5/30/13

REVISION TRACKING		
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UNL - ARDC (M975P006)
OLD FEEDLOT
SAUNDERS COUNTY, NEBRASKA

PROPOSED SITE PLAN

PROJECT NUMBER: 117-011
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DRAWING NUMBER C-2A

FILE: 117011C1(4)FEEDLOT

EXISTING CATTLE PENS

NEW DISCHARGE PIPE SEE PROFILE: A C-14

1 FIELD VERIFY LOCATION AND PROTECT EXISTING CULVERT AND DISCHARGE PIPE

C C-10

EXISTING CATTLE PENS

EXISTING CATTLE PENS

SEDIMENT BASIN NO. 5

NEW UGO DISCHARGE PIPE

NEW UGO DISCHARGE PIPE

NEW SEDIMENT BASIN NO. 4

B C-10

EXISTING CATTLE PENS

NEW SEDIMENT BASIN NO. 3

NEW UGO DISCHARGE PIPE

BH-1

REMOVE EXISTING DISCHARGE PIPE

BH-4

BH-5

BH-3

EXPANDED SOUTH HOLDING POND (TO BE LINED) TOB = 970.0 BOTTOM = 958.0

REMOVE EXISTING DISCHARGE PIPE

1 FORCEMAIN TO EXISTING DEWATERING PUMP LOCATION. BURY 3' BELOW GRADE.

RELOCATE DEWATERING PUMP. SEE DETAIL: 3 C-16

BH-2

A C-10

EXISTING UGO DISCHARGE PIPE REMOVE & REPLACE AS NECESSARY

1 REMOVE EXISTING CONCRETE PUMP PAD

CONNECT TO EXISTING FORCEMAIN (FIELD VERIFY)

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STATE OF NEBRASKA
5/30/13

GROUNDWATER DATA		
BORE ID	GROUND ELEV	GROUNDWATER ELEV
BH-1	963.42	951.8
BH-2	954.23	942.7*
BH-3	959.10	949.1
BH-4	967.59	948.9
BH-5	960.34	945.9

*NOTE: BH-2 HAD OBSERVED GW ELEV = 953.65 ONE MONTH AFTER DRILLING.

LEGEND

- FENCE LINE
- ROAD CENTERLINE
- CWD — CLEAN WATER DIVERSION
- SAN — SANITARY LINE
- CONTROL POINT
- GEO BORE HOLE
- FLOW DIRECTION

N

0 100' 200'

REVISION TRACKING		
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05/29/2013	ADDENDUM NO. 2	1

UNL - ARDC (M975P006)
OLD FEEDLOT
SAUNDERS COUNTY, NEBRASKA

EXPANDED SOUTH HOLDING POND PARTIAL PLAN

PROJECT NUMBER: 117-011
DESIGNED: DAJ / FTS
DRAWN: SLK
CHECKED: FTS

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DRAWING NUMBER C-3

FILE: 117011C1(4)FEEDLOT

EXISTING CATTLE PENS

EXISTING CATTLE PENS

EXISTING CATTLE PENS

PROPOSED SEDIMENT BASIN NO. 4

NEW SEDIMENT BASIN NO. 4

NEW SEDIMENT BASIN NO. 3

EXPANDED SOUTH HOLDING POND

PROPOSED SEDIMENT BASIN NO. 3

ACCESS ROAD

B
C-10

NEW 8" Ø RISER PIPE, 5' TALL, WITH 1" Ø HOLES, 5 PER ROW, 12 VERTICAL INCHES BETWEEN ROWS

NEW 8" Ø PVC UGO DISCHARGE PIPE
INVERT ELEV = 968.0
DISCHARGE ELEV = 967.0

REMOVE EXISTING DISCHARGE PIPE

BH-1

A
C-10

A
C-11

LEGEND

- FENCE LINE
- ROAD CENTERLINE
- CLEAN WATER DIVERSION
- SANITARY LINE
- CONTROL POINT
- WELL
- FLOW DIRECTION

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E-8052
STATE OF NEBRASKA

5/30/13

1

GENERAL NOTES

1. FIELD VERIFY LOCATION OF ALL PIPES ENTERING SEDIMENT BASIN PRIOR TO EXCAVATION.
2. NOTIFY ENGINEER AND OWNER OF ANY UNMARKED PIPES THAT ARE IN CONFLICT WITH BASIN CONSTRUCTION.

N

0 80' 160'

REVISION TRACKING		
DATE	DESCRIPTION	REVISION
02/18/2011	ORIGINAL DRAWINGS	0
05/29/2013	ADDENDUM NO. 2	1

UNL - ARDC (M975P006)
OLD FEEDLOT
SAUNDERS COUNTY, NEBRASKA

SEDIMENT BASIN NO. 3 PARTIAL PLAN

PROJECT NUMBER: 117-011
DESIGNED: DAJ / FTS
DRAWN: SLK
CHECKED: FTS

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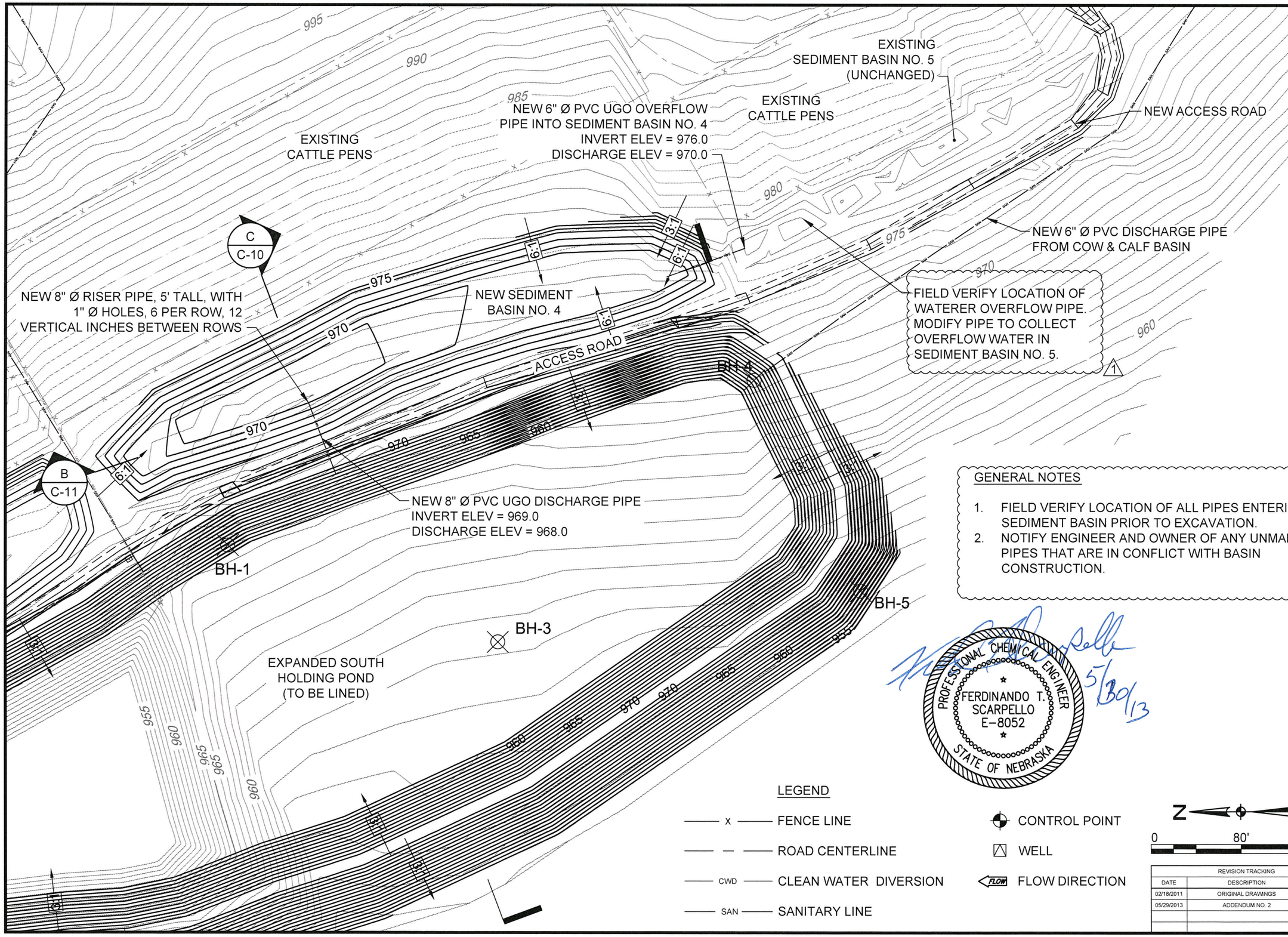
DRAWING NUMBER C-6

FILE: 117011C1(4)FEEDLOT



GENERAL NOTES

1. FIELD VERIFY LOCATION OF ALL PIPES ENTERING SEDIMENT BASIN PRIOR TO EXCAVATION.
2. NOTIFY ENGINEER AND OWNER OF ANY UNMARKED PIPES THAT ARE IN CONFLICT WITH BASIN CONSTRUCTION.

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STATE OF NEBRASKA

5/30/13

LEGEND

- FENCE LINE
- ROAD CENTERLINE
- CLEAN WATER DIVERSION
- SANITARY LINE
- CONTROL POINT
- WELL
- FLOW DIRECTION

N

0 80' 160'

REVISION TRACKING		
DATE	DESCRIPTION	REVISION
02/18/2011	ORIGINAL DRAWINGS	0
05/29/2013	ADDENDUM NO. 2	1

UNL - ARDC (M975P006)
OLD FEEDLOT
SAUNDERS COUNTY, NEBRASKA

SEDIMENT BASIN NO. 4 & NO. 5 PARTIAL PLAN

PROJECT NUMBER: 117-011
DESIGNED: DAJ / FTS
DRAWN: SLK
CHECKED: FTS

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DRAWING NUMBER C-7

FILE: 117011C1(4)FEEDLOT

EXISTING BUILDING

CLEAN WATER DIVERSION SEE DETAIL 2 / C-15

CWD

FLOW

EXISTING CATTLE PENS

995

990

985

980

975

1 NEW 6" Ø PVC UGO DISCHARGE PIPE, INVERT ELEV = 978.0 DISCHARGE ELEV = 968.0 SEE PROFILE: A / C-13

NEW COW & CALF BASIN

6:1

3:1

C / C-13

B / C-13

NEW 8" Ø RISER PIPE, 5' TALL, WITH 1" Ø HOLES, 2 PER ROW, 12 VERTICAL INCHES BETWEEN ROWS

LEGEND

- FENCE LINE
- ROAD CENTERLINE
- CWD — CLEAN WATER DIVERSION
- SAN — SANITARY LINE
- CONTROL POINT
- GEO BORE HOLE
- FLOW DIRECTION

N

0 50' 100'

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STATE OF NEBRASKA
5/30/13

REVISION TRACKING		
DATE	DESCRIPTION	REVISION
02/18/2011	ORIGINAL DRAWINGS	0
05/29/2013	ADDENDUM NO. 2	1

UNL - ARDC (M975P006)
OLD FEEDLOT
SAUNDERS COUNTY, NEBRASKA

COW & CALF SEDIMENT BASIN NO. 6 PARTIAL PLAN

PROJECT NUMBER: 117-011
DESIGNED: DAJ / FTS
DRAWN: SLK
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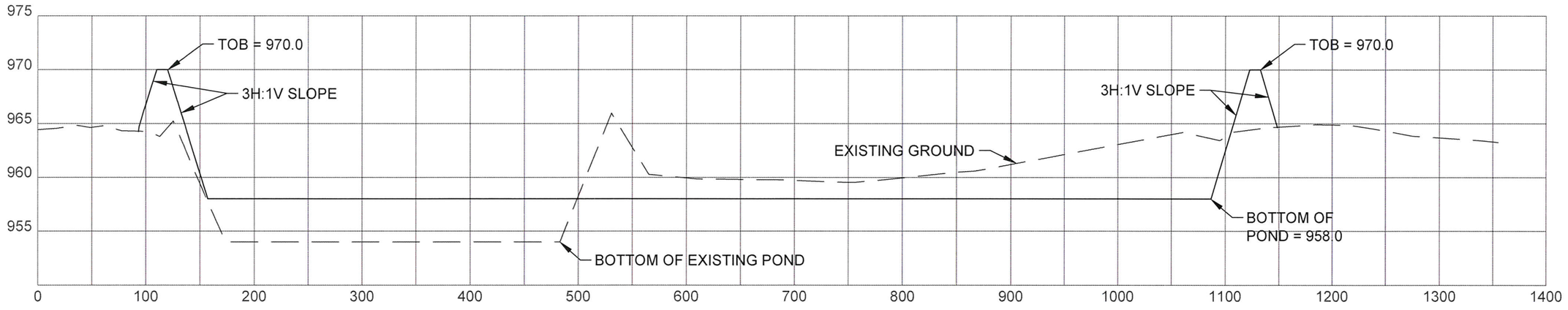
DRAWING NUMBER C-8

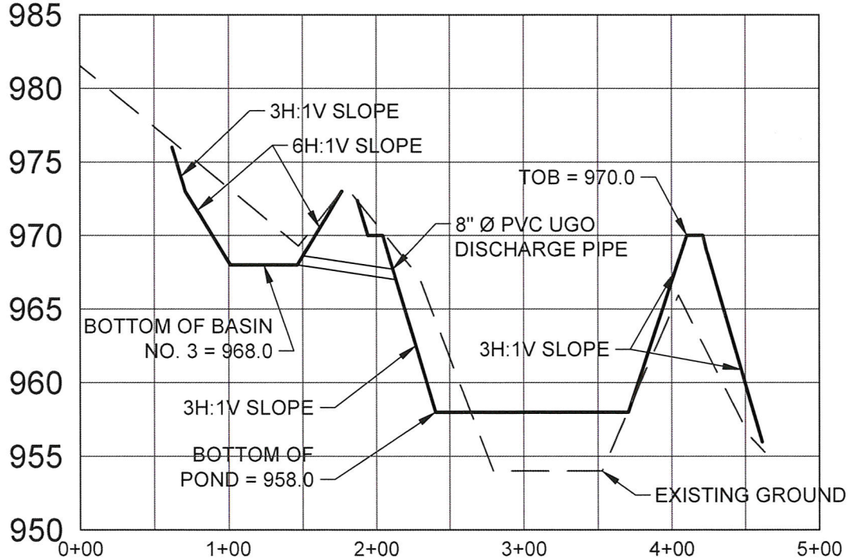
FILE: 117011C1(4)FEEDLOT



A EXPANDED SOUTH HOLDING POND CROSS SECTION

H: 1" = 100'
V: 1" = 10'

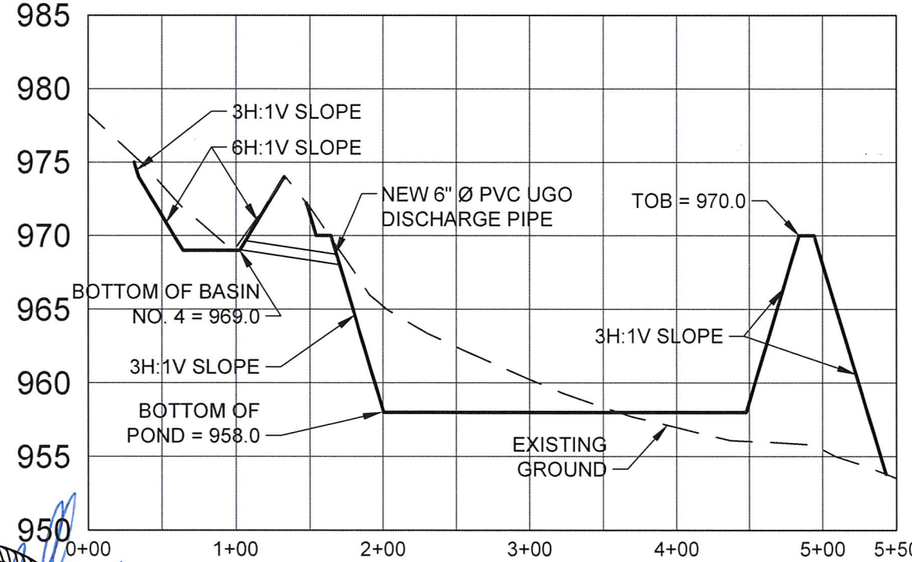
0 100' 200'
0 10' 20'



B EXPANDED SOUTH HOLDING POND
& SEDIMENT BASIN NO. 3 CROSS SECTION

H: 1" = 100'
V: 1" = 10'

0 100' 200'
0 10' 20'



C EXPANDED SOUTH HOLDING POND
& SEDIMENT BASIN NO. 4 CROSS SECTION

H: 1" = 100'
V: 1" = 10'

0 100' 200'
0 10' 20'

PROFESSIONAL CHEMICAL ENGINEER
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E-8052
STATE OF NEBRASKA
5/30/13

REVISION TRACKING		
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UNL - ARDC (M975P006)
OLD FEEDLOT
SAUNDERS COUNTY, NEBRASKA

CROSS SECTIONS

PROJECT NUMBER: 117-011
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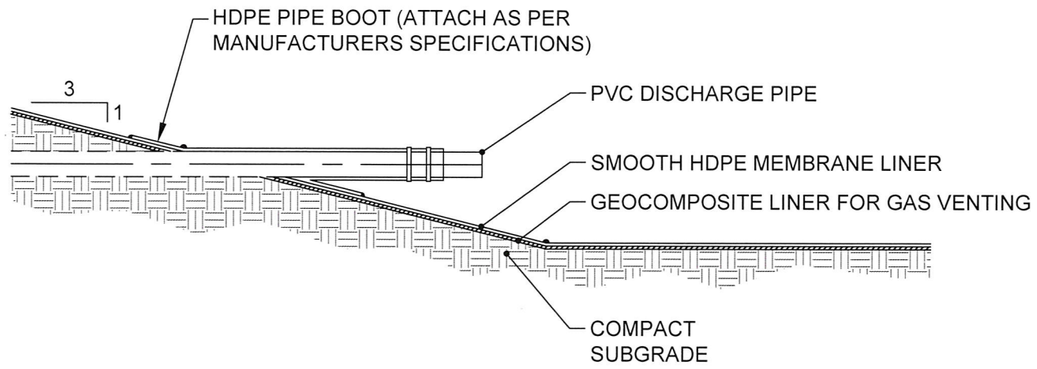
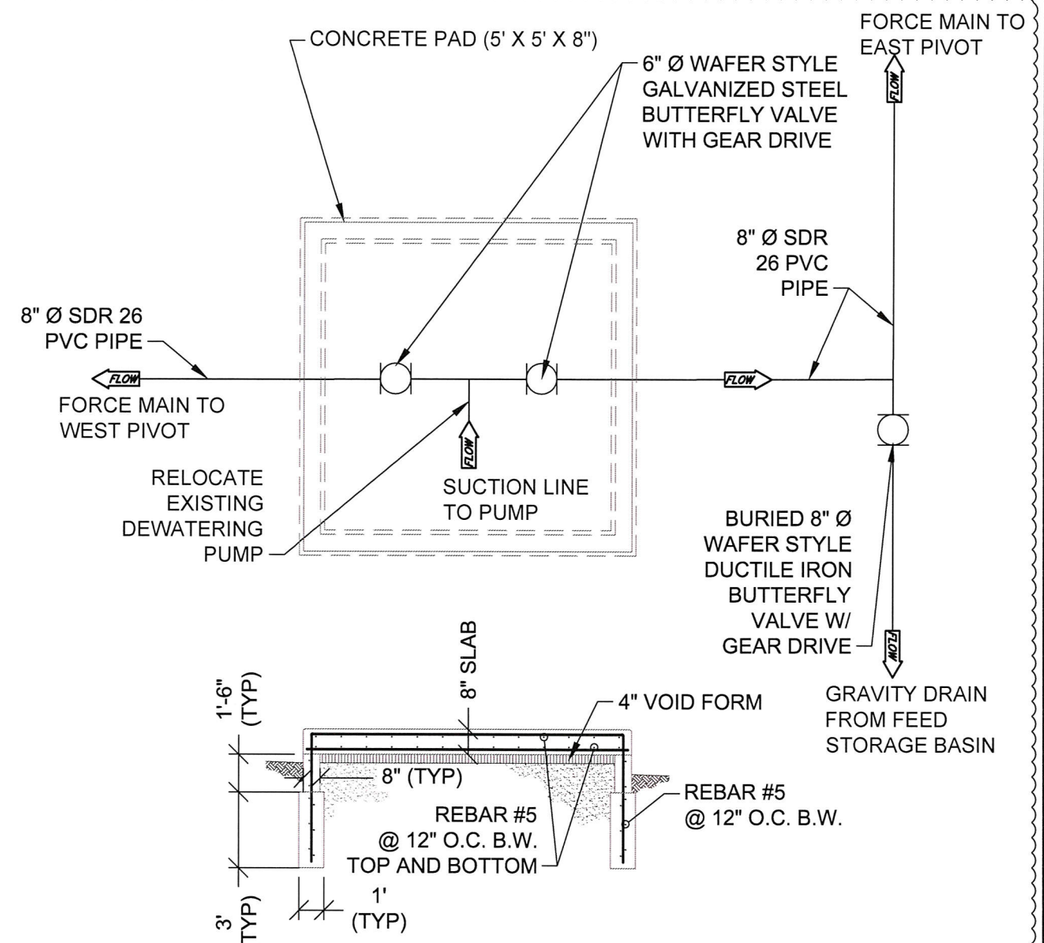
DRAWING NUMBER C-10

FILE: 117011C1(4)FEEDLOT



1 TYPICAL PIPE PENETRATION LINER DETAIL

NOT TO SCALE



3 DEWATERING PUMP PLAN AND SECTION DETAIL

NOT TO SCALE

NOTES:
1. CONTRACTOR TO CONNECT PUMP TO EXISTING 3-PHASE, 480V LINE.
2. CONTRACTOR TO PROVIDE ALL FITTINGS NOT SPECIFICALLY SHOWN IN THE ABOVE DETAIL.
3. ALL ABOVE GROUND PIPING AND FITTINGS SHALL BE GALVANIZED STEEL.

NOTES:

1. ALL LINE MARKINGS ARE TO BE WHITE AND MADE AT 1' INTERVALS FROM LAGOON BOTTOM.
2. ALL NUMBERS SHALL BE AT LEAST 6" TALL.
3. NUMBERS AND MARKINGS ARE TO BE WHITE EXTRUSION WELDED DIRECTLY TO BASE BLACK HDPE LINER.
4. THE LOCATION OF THE LAGOON STAFF GAUGE IS SHOWN ON SHEET C-3.
5. CONTRACTOR SHALL SURVEY THE EXACT LOCATIONS OF THE LINE MARKINGS AFTER LINER INSTALLATION.
6. STAFF GAUGE WILL IDENTIFY CRITICAL ELEVATIONS:

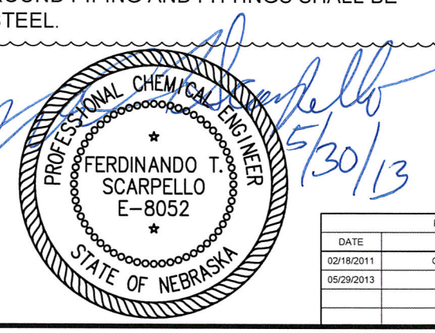
CRITICAL ELEVATIONS		
TOP OF BERM ELEV	TOB	970.0
MAX. WATER LEVEL ELEV	MWL	968.0
MUST PUMP LEVEL ELEV	MPL	964.5
PRE-WINTER LEVEL ELEV	PWL	963.0

2 TYPICAL HOLDING POND STAFF GAUGE DETAIL

NO SCALE

TYPICAL GAUGE LAYOUT

NOT TO SCALE



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DATE	DESCRIPTION	REVISION
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05/29/2013	ADDENDUM NO. 2	1

UNL - ARDC (M975P006)
OLD FEEDLOT
SAUNDERS COUNTY, NEBRASKA

DETAILS

PROJECT NUMBER: 117-011
DESIGNED: DAJ / FTS
DRAWN: SLK
CHECKED: FTS

1640 "L" STREET, SUITE D
LINCOLN, NE 68508
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www.WLA-consulting.com
WL Consulting, Inc.
Engineers & Scientists
WaterLand

DRAWING NUMBER C-16

FILE: 117011C1(4)FEEDLOT

PROVIDE GALVANIZED STEEL AIR/VACCUUM RELIEF VALVE

PROVIDE WAFER STYLE GALVANIZED STEEL BUTTERFLY VALVE WITH GEAR DRIVE

REMOVE AND REPLACE EXISTING TEE WITH GALVANIZED STEEL 4-WAY TEE

1 CENTER PIVOT CONNECTION DETAIL

NOT TO SCALE

NOTES:

1. ALL PIPING SHOWN ABOVE SHALL REMAIN WITH THE EXCEPTION OF THE 3-WAY TEE.
2. ALL ABOVE GROUND FITTINGS SHALL BE GALVANIZED STEEL UNLESS OTHERWISE NOTED.
3. ALL PIPING IS 8" Ø UNLESS OTHERWISE NOTED.
4. CONTRACTOR SHALL PROVIDE ALL ADDITIONAL FITTINGS NOT SPECIFICALLY LISTED TO COMPLETE THIS CONNECTION.

PROFESSIONAL CHEMICAL ENGINEER
FERDINANDO T. SCARPELLO
E-8052
STATE OF NEBRASKA

5/30/13

REVISION TRACKING		
DATE	DESCRIPTION	REVISION
05/29/2013	ADDENDUM NO. 2	1

UNL - ARDC (M975P006)
OLD FEEDLOT
SAUNDERS COUNTY, NEBRASKA

DETAILS

PROJECT NUMBER: 117-011
DESIGNED: DAJ / FTS
DRAWN: SLK
CHECKED: FTS

1640 "L" STREET, SUITE D
LINCOLN, NE 68508
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DRAWING NUMBER C-17

FILE: 117011C1(4)FEEDLOT

Stormwater and the Construction Industry

Protect Natural Features

Bad

Good

- Minimize clearing.
- Minimize the amount of exposed soil.
- Identify and protect areas where existing vegetation, such as trees, will not be disturbed by construction activity.
- Protect streams, stream buffers, wild woodlands, wetlands, or other sensitive areas from any disturbance or construction activity by fencing or otherwise clearly marking these areas.

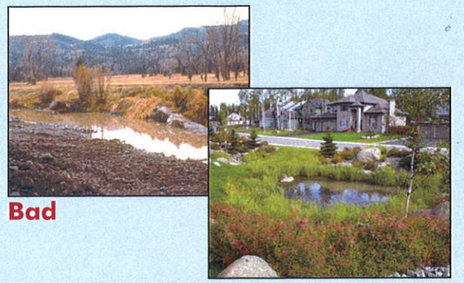
Construction Phasing

Bad

Good

- Sequence construction activities so that the soil is not exposed for long periods of time.
- Schedule or limit grading to small areas.
- Install key sediment control practices before site grading begins.
- Schedule site stabilization activities, such as landscaping, to be completed immediately after the land has been graded to its final contour.

Vegetative Buffers

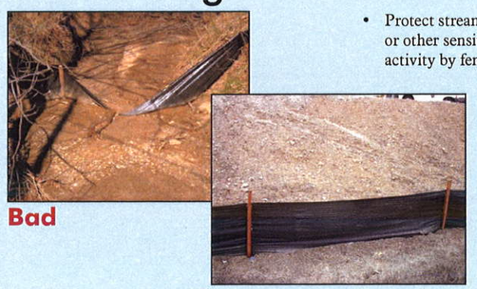


Bad

Good

- Protect and install vegetative buffers along waterbodies to slow and filter stormwater runoff.
- Maintain buffers by mowing or replanting periodically to ensure their effectiveness.

Silt Fencing



Bad

Good

- Inspect and maintain silt fences after each rainstorm.
- Make sure the bottom of the silt fence is buried in the ground.
- Securely attach the material to the stakes.
- Don't place silt fences in the middle of a waterway or use them as a check dam.
- Make sure stormwater is not flowing around the silt fence.

Maintain your BMPs!

www.epa.gov/npdes/menuofbmps

Site Stabilization

Bad

Good

- Vegetate, mulch, or otherwise stabilize all exposed areas as soon as land alterations have been completed.

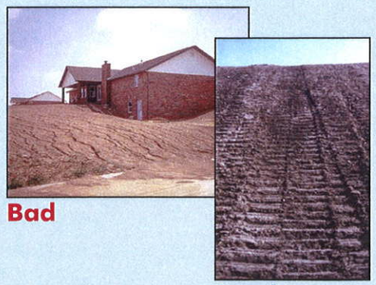
Construction Entrances

Bad

Good

- Remove mud and dirt from the tires of construction vehicles before they enter a paved roadway.
- Properly size entrance BMPs for all anticipated vehicles.
- Make sure that the construction entrance does not become

Slopes



Bad

Good

- Rough grade or terrace slopes.

Dirt Stockpiles

Bad

Storm Drain Inlet Protection

Bad

Good

- Use rock or other appropriate material to cover the storm drain inlet to filter out trash and debris.
- Make sure the rock size is appropriate (usually 1 to 2 inches in diameter).
- If you use inlet filters, maintain them regularly.

Stormwater and the Construction Industry

Planning and Implementing Erosion and Sediment Control Practices

The construction industry is a critical participant in the nation's efforts to protect streams, rivers, lakes, wetlands, and oceans. Through the use of best management practices (BMPs), construction site operators are the key defense against erosion and sedimentation.

As stormwater flows over a construction site, it picks up pollutants like sediment, debris, and chemicals. High volumes of stormwater can also cause stream bank erosion, and destroy downstream aquatic habitat. Preventing soil erosion and sedimentation is an important responsibility at all construction sites.

In addition to the environmental impact, uncontrolled erosion can have a significant financial impact on a construction project. It costs money and time to repair gullies, replace vegetation, clean sediment-clogged storm drains, replace poorly installed BMPs, and mitigate damage to other people's property or to natural resources.

Best Management Practice (BMP)
A BMP is a method used to prevent or control stormwater runoff and the discharge of pollutants, including sediment, into local waterbodies. Silt fences, inlet protection, and site-stabilization techniques are typical BMPs on a construction site.

Operator
An operator is someone who has control over and the ability to modify construction plans and specifications (e.g. owner, general contractor)

or

Someone who has control over the day-to-day operations at a site (e.g., owner, general contractor) that are necessary to ensure compliance with the permit requirements. It is the responsibility of a construction site owner or operator to contain stormwater runoff and prevent erosion during **all** stages of a project.

There may be more than one person at a site who meets these definitions and must apply for permit coverage. (States may have different definitions of the term "operator.")

So what's being done about polluted runoff?

The Clean Water Act includes the National Pollutant Discharge Elimination System (NPDES) permitting program. As of January 2003, 44 states and territories are authorized to issue NPDES stormwater permits. If your state isn't authorized to operate the NPDES stormwater permit program, EPA issues the permits. Permits vary from state to state, so contact your state or EPA for specific information. Your permitting authority has specific information on your state's NPDES stormwater permit program. In general, construction permits require construction operators to do all of the following:

- Develop and implement a stormwater pollution prevention plan
- Submit a permit application or notice of intent (NOI)
- Comply with the permit, including maintaining BMPs and inspecting the site

Under the NPDES program, construction activities that disturb 1 or more acres are required to obtain stormwater permit coverage. States have different names for the plans that construction operators must develop, such as

- Stormwater pollution prevention plan
- Erosion and sediment control plan
- Erosion control and stormwater management plan
- Stormwater management plan
- Water pollution control plan
- Pollution prevention plan

This document uses the term "*Plan*."

I think I need a permit... Where do I start?

All land-disturbing activities, including clearing, grading, and excavation, that disturb **1 or more acres** are required to be covered under a state or EPA-issued NPDES construction stormwater permit **prior to land disturbance**. Permit requirements vary by state. Begin by researching the specific requirements in your state. You might already be subject to local erosion and sediment control requirements, but that doesn't release you from the requirements of the NPDES program at the state or EPA level. Although you must comply with both sets of requirements, in most cases they have been designed to be complementary. Contact your permitting authority to find out exactly what you need to do. A good place to start your search is the Construction Industry Compliance Assistance web site at http://www.envcap.org/cica.

The NPDES permit requirements include small construction activities that are part of a larger common plan of development or sale, such as a single lot within a larger subdivision. For developments with multiple operators, all operators must have permit coverage for their individual parts of the larger development, no matter how large or small each operation happens to be. When there are multiple operators at one site, they're encouraged to develop and share one comprehensive Plan and obtain permit coverage as co-permitees.

The **owner or operator** of the construction site is responsible for complying with the requirements of the permit. Responsibilities include developing a Plan, obtaining permit coverage, implementing BMPs, and stabilizing the site at the end of the construction activity.

Construction sites that discharge unpermitted stormwater are in violation of the Clean Water Act and may be subject to fines of up to $27,500 a day per violation.

Determine your eligibility

All construction activity that disturbs 1 or more acres of land, as well as activity that disturbs less than 1 acre but is part of a larger common plan of development, must obtain permit coverage.

Read and understand your stormwater permit requirements

Get a copy of the permit for construction activities and a permit application (or notice of intent form) from your state or EPA permitting authority.

Develop a Plan

Most states do not require you to submit your Plan. However, you do need to keep the Plan on site. If that's impractical, you may post a notice that tells where the Plan is kept so it can be accessed by the permitting authority and other interested parties.

You'll need to post a copy of your completed application on site. Put it in a place where the public can see it so they'll know your site is covered by an NPDES permit!

Apply for permit coverage

Once you understand your permit requirements and have developed a Plan, you can submit a stormwater permit application (or notice of intent) to your permitting authority. This must be done before beginning any land

Developing and Implementing a Plan

You must have a Plan that includes erosion and sediment control and pollution prevention BMPs. These Plans require

- Advance planning and training to ensure proper implementation of the BMPs
- Erosion and sediment control BMPs in place until the area is permanently stabilized
- Pollution prevention BMPs to keep the construction site "clean"
- Regular inspection of the construction site to ensure proper installation and maintenance of BMPs

Fortunately, the practices and measures that must be included in your Plan are already part of the standard operating procedures at many construction sites.

Six steps are associated with developing and implementing a stormwater Plan. There's a wealth of information available on developing pollution prevention plans. Please contact your permitting authority for help in finding additional guidance materials, or visit www.epa.gov/npdes/stormwater. A sample construction plan is available at www.epa.gov/npdes/pubs/sample_swppp.pdf.

1. Site Evaluation and Design Development

- **Collect site information**
- **Develop site plan design**
- **Prepare pollution prevention site map**

The first step in preparing a Plan is to define the characteristics of the site and the type of construction that will occur. This involves collecting site information, identifying natural features that should be protected, developing a site plan design, describing the nature of the construction activity, and preparing a pollution prevention site map.

2. Assessment

- **Measure the site area**
- **Determine the drainage areas**
- **Calculate the runoff coefficient**

The next step is assessing the impact the project will have on stormwater runoff. Determine the drainage areas and estimate the runoff amounts and velocities. For more information on calculating the runoff coefficient, go to www.epa.gov/npdes/pubs/chap02_conguide.pdf, page 11.

3. Control Selection and Plan Design

- **Review and incorporate state or local requirements**
- **Select erosion and sediment controls**
- **Select other controls**
- **Select stormwater management controls**
- **Indicate the location of controls on the site map**
- **Prepare an inspection and maintenance plan**
- **Coordinate controls with construction activity**
- **Prepare sequence of major activities**

In the third step you'll actually document your procedures to prevent and control polluted stormwater runoff. You must delineate areas that will not be disturbed, including critical natural areas like streamside areas, floodplains, and trees. You must also identify the measures (or BMPs) you'll use to protect these areas.

Phasing your project to minimize the amount of exposed soil at any given time is a highly effective way to prevent erosion. Erosion control measures designed to prevent soil from being mobilized include diversions to route stormwater away from exposed soils and stabilization with vegetation, mulch, and geotextiles. Sedimentation control measures designed to remove sediment from stormwater or prevent it from leaving the site include silt fences, sediment traps, and diversions.

You'll need to select erosion and sediment controls—including stabilization measures for protecting disturbed areas and structural controls for diverting runoff and removing sediment—that are appropriate for your particular site. The appropriateness of the control measures will depend on several factors, but will be influenced most directly by the site characteristics. Some stabilization measures you might consider are temporary seeding, permanent seeding, and mulching. Structural control measures include earth dikes, silt fences, and sediment traps. No single BMP will meet all of the erosion and sedimentation control needs of a construction site. A combination of BMPs is necessary. For more information on the types of BMPs appropriate for your construction site, see the BMP fact sheet series available at www.epa.gov/npdes/menuofbmps.

Soil erosion control tips...

- Design the site to infiltrate stormwater into the ground and to keep it out of storm drains. Eliminate or minimize the use of stormwater collection and conveyance systems while maximizing the use of stormwater infiltration and bioretention techniques.
- Minimize the amount of exposed soil on site.
  - To the extent possible, plan the project in stages to minimize the amount of area that is bare and subject to erosion. The less soil exposed, the easier and cheaper it will be to control erosion.
  - Vegetate disturbed areas with permanent or temporary seeding immediately upon reaching final grade.
  - Vegetate or cover stockpiles that will not be used immediately.
- Reduce the velocity of stormwater both onto and away from the project area.
  - Interceptors, diversions, vegetated buffers, and check dams are a few of the BMPs that can be used to slow down stormwater as it travels across and away from the project site.
  - Diversion measures can also be used to direct flow away from exposed areas toward stable portions of the site.
  - Silt fences and other types of perimeter filters should never be used to reduce the velocity of runoff.
- Protect defined channels immediately with measures adequate to handle the storm flows expected.
  - Sod, geotextile, natural fiber, riprap, or other stabilization measures should be used to allow the channels to carry water without causing erosion. Use softer measures like geotextile or vegetation where possible to prevent downstream impacts.
- Keep sediment on site.
  - Place aggregate or stone at construction site vehicle exits to accommodate at least two tire revolutions of large construction vehicles. Much of the dirt on the tires will fall off before the vehicle gets to the street.
  - Regular street sweeping at the construction entrance will prevent dirt from entering storm drains. Do not hose paved areas.
  - Sediment traps and basins are temporary structures and should be used in conjunction with other measures to reduce the amount of erosion.
- Maintaining all BMPs is critical to ensure their effectiveness during the life of the project.
  - Regularly remove collected sediment from silt fences, berms, traps, and other BMPs.
  - Ensure that geotextiles and mulch remain in place until vegetation is well established.
  - Maintain fences that protect sensitive areas, silt fences, diversion structures, and other BMPs.

Other BMPs and Activities to Control Polluted Runoff

You'll need to select other controls to address potential pollutant sources on your site. Construction materials, debris, trash, fuel, paint, and stockpiles become pollution sources when it rains. Basic pollution prevention practices can significantly reduce the amount of pollution leaving construction sites. The following are some simple practices that should be included in the Plan and implemented on site:

- Keep potential sources of pollution out of the rain as practicable (e.g., inside a building, covered with plastic or tarps, or sealed tightly in a leak-proof container).
- Clearly identify a protected, lined area for concrete truck washouts. This area should be located away from streams, storm drain inlets, or ditches and should be cleaned out periodically.
- Park, refuel, and maintain vehicles and equipment in one area of the site to minimize the area exposed to possible spills and fuel storage. This area should be well away from streams, storm drain inlets, or ditches. Keep spill kits close by and clean up any spills or leaks immediately, including spills on pavement or earthen surfaces.
- Practice good housekeeping. Keep the construction site free of litter, construction debris, and leaking containers. Keep all waste in one area to minimize cleaning.

4. Certification and Notification

- **Certify the Plan**
- **Submit permit application or notice of intent**

Once the Plan has been developed, an authorized representative must sign it. Now is the time to submit the permit application or notice of intent. Your permit might require that the Plan be kept on site, so be sure to keep it available for the staff implementing the Plan.

Erosion and sedimentation control practices are only as good as their installation and maintenance.

5. Implementing and Maintaining a Plan

- **Implement controls**
- **Inspect and maintain controls**
- **Update/change the Plan**
- **Report releases of hazardous materials**

A Plan describes the practices and activities you'll use to prevent stormwater contamination and meet the NPDES permit requirements. Make sure that the Plan is implemented and that the Plan is updated as necessary to reflect changes on the site.

Erosion and sedimentation control practices are only as good as their installation and maintenance. Train the contractors that will install the BMPs and inspect immediately to ensure that the BMPs have been installed correctly.

Regularly inspect the BMPs (especially before and after rain events) and perform any necessary repairs or maintenance immediately. Many BMPs are designed to handle a limited amount of sediment. If not maintained, they'll become ineffective and a source of sediment pollution.

It's also important to keep records of BMP installation, implementation, and maintenance. Keep track of major grading activities that occur on the site, when construction activities cease (temporarily or permanently), and when a site is temporarily or permanently stabilized.

If construction plans change at any time, or if more appropriate BMPs are chosen for the site, update the Plan accordingly.

6. Completing the Project: Final Stabilization and Termination of the Permit

- **Final stabilization**
- **Notice of Termination**
- **Record retention**

Many states and EPA require a Notice of Termination (NOT) or other notification signifying that the construction activity is completed. An NOT is required when

- Final stabilization has been achieved on all portions of the site for which the permittee is responsible.
- Another operator has assumed control over all areas of the site that have not been finally stabilized. That operator would need to submit a new permit application to the permitting authority.
- For residential construction only, temporary stabilization of a lot has been completed prior to transference of ownership to the homeowner, with the homeowner being made aware of the need to perform final stabilization.

Permittees must keep a copy of their permit application and their Plan for at least 3 years following final stabilization. This period may be longer depending on state and local requirements.

Preconstruction Checklist

- A site description, including
  - Nature of the activity
  - Intended sequence of major construction activities
  - Total area of the site
  - Existing soil type and rainfall runoff data
  - A site map with:
    - Drainage patterns
    - Approximate slopes after major grading
    - Area of soil disturbance
    - Outline of areas which will not be disturbed
    - Location of major structural and nonstructural soil erosion controls
    - Areas where stabilization practices are expected to occur
    - Surface waters
    - Stormwater discharge locations
  - Name of the receiving water(s)
- A description of controls:
  - Erosion and sediment controls, including
    - Stabilization practices for all areas disturbed by construction
    - Structural practices for all drainage/discharge locations
  - Stormwater management controls, including
    - Measures used to control pollutants occurring in stormwater discharges after construction activities are complete
    - Velocity dissipation devices to provide nonerosive flow conditions from the discharge point along the length of any outfall channel
  - Other controls, including
    - Waste disposal practices that prevent discharge of solid materials
    - Measures to minimize offset tracking of sediments by construction vehicles
    - Measures to ensure compliance with state or local waste disposal, sanitary sewer, or septic system regulations
  - Description of the timing during the construction when measures will be implemented
- State or local requirements incorporated into the Plan
- Inspection and maintenance procedures for control measures identified in the Plan
- Contractor certification and Plan certification

Implementation Checklist

- Maintain records of construction activities, including
  - Dates when major grading activities occur
  - Dates when construction activities temporarily cease on the site or a portion of the site
  - Dates when construction activities permanently cease on the site or a portion of the site
  - Dates when stabilization measures are completed on the site
- Prepare inspection reports summarizing
  - Name of person conducting BMP inspections
  - Qualifications of person conducting BMP inspections
  - BMPs/areas inspected
  - Observed conditions
  - Necessary changes to the Plan
- Report releases of reportable quantities of oil or hazardous materials
  - Notify the National Response Center at 800-424-8802 immediately
  - Report releases to your permitting authority immediately, or as specified in your permit. You must also provide a written report within 14 days.
  - Modify the Plan to include
    - The date of release
    - Circumstances leading to the release
    - Steps taken to prevent reoccurrence of the release
- Modify Plan as necessary
  - Incorporate requests of the permitting authority to bring the Plan into compliance
  - Address changes in design, construction operation, or maintenance that affect the potential for discharge of pollutants

An ounce of prevention is worth a pound of cure! It's far more efficient and cost-effective to prevent pollution than it is to try to correct problems later. Installing and maintaining simple BMPs and pollution prevention techniques on site can greatly reduce the potential for stormwater pollution and can also save you money!