ADDENDUM NO. 3

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 7, 2013
DATE OF BID OPENING (REVISED): 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:

MODIFICATIONS:
SECTION (LIST IN ORDER) _01 50 00 – TEMPORARY FACILITIES___

3.4 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION
1 Modify section J.
2 SEE REVISED SECTION TO REPLACE EXISTING.

SECTION (LIST IN ORDER) _31 23 00 – EXCAVATION AND FILL___

3.6 SURFACE WATER CONTROL
1. Modify section A.
2. SEE REVISED SECTION TO REPLACE EXISTING.

3.7 DEWATERING
1. Modify section E.
2. SEE REVISED SECTION TO REPLACE EXISTING.

SECTION (LIST IN ORDER) _31 23 16 – TRENCHING___

3.5 DEWATERING
1. Modify section A.
2. SEE REVISED SECTION TO REPLACE EXISTING.

END OF ADDENDUM NO. 3

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 and conform to all local, state, federal government rules and regulations including the owner's existing nutrient management plan. 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

SECTION 31 23 00 – EXCAVATION AND FILL

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavating topsoil.
2. Excavating subsoil for buildings, pavements, and landscape.
3. Backfilling building perimeter to subgrade elevations.
4. Backfilling site structures to subgrade elevations.
5. Filling under pavements or slabs-on-grade.
6. Undercutting and filling over-excavation.
7. Disposal of excess material.

B. Related Sections:

1. Section 31 10 00 - Site Clearing.
2. Section 32 92 19 – Seeding.

1.2 REFERENCES

A. ASTM International:

1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
2. ASTM D1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method.
3. ASTM D1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (6,000 ft-lbf/ft3 (2,700 kN-m/m3)).
4. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
5. ASTM D2419 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
6. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
7. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
8. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.3 SUBMITTALS

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

B. Excavation Protection Plan: Describe sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property; include structural calculations to support plan.

C. Dewatering Plan: Describe dewatering methods to be used to keep excavations dry if required.

D. Samples: Submit, in air-tight containers, 10-pound sample of each type of fill to testing laboratory.

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

1.4 CLOSEOUT SUBMITTALS

A. Section 01 77 00 - Closeout Procedures: Requirements for submittals.

B. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

PART 2 PRODUCTS

2.1 MATERIALS

A. Topsoil: Original surface soil typical of the area which is capable of supporting native plant growth. It shall be free of large stones, roots, waste, debris, contamination, or other unsuitable material which might hinder plant growth.

B. Subsoil: Clean lean clay with a plasticity index of 20 or less and has a liquid limit of 45 or less, that is free of clay, rock, or gravel lumps larger than 2 inches in any dimension, debris, waste, frozen material, and any other deleterious material that might cause settlement. Suitable material excavated from the site may be used as subsoil fill under optimum moisture conditions.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Division 1 General Requirements: Verification of existing conditions before starting work.

B. Verify survey bench mark and intended elevations for the Work are as indicated on Drawings.

3.2 PREPARATION FOR EXCAVATION

A. Call Local Utility Line Information service as indicated on Drawings not less than three working days before performing Work.

1. Request underground utilities to be located and marked within and surrounding construction areas.

B. Protect utilities indicated to remain from damage.

C. Protect plant life, lawns, rock outcropping, and other features remaining as portion of final landscaping.

D. Protect bench marks, survey control point, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

E. Protect and maintain erosion and sedimentation controls during excavation and fill operations.

3.3 TOPSOIL EXCAVATION

A. Excavate topsoil from areas to be further excavated, re-landscaped, or regraded without mixing with foreign materials for use in finish grading.

B. Do not excavate wet topsoil.

C. Stockpile in area designated on site and protect from erosion.

D. Remove from site excess topsoil not intended for reuse.

3.4 EXCAVATION

A. Excavate only as necessary for structure removal and demolition.

B. Removal of obstructions and undesirable materials includes, but is not necessarily limited to, removal of foundations, existing structures, unsuitable sub-grade soils, expansive type soils and any other material which may be concealed beneath present grade.

C. Excavated material which is free of unsatisfactory material shall remain on-site for backfill.

D. Grade top perimeter of excavation to prevent surface water from draining into excavation.

E. Notify Engineer and testing agency of unexpected subsurface conditions.

F. Remove excess and unsuitable material from site.

G. Repair or replace items indicated to remain damaged by excavation.

H. Do not excavate wet subsoil or excavate and process wet material to obtain optimum moisture content.

I. Stability: Replace damaged or displaced subsoil as specified for fill.

3.5 SHEETING AND SHORING

A. Sheet, shore, and brace excavations to prevent danger to persons, structures, and adjacent properties and to prevent caving, erosion, and loss of surrounding subsoil.

B. Support excavations more than 5 feet deep excavated through unstable, loose, or soft material. Provide sheeting, shoring, bracing, or other protection to maintain stability of excavation.

C. Design sheeting and shoring to be removed at completion of excavation work.

D. Repair damage caused by failure of the sheeting, shoring, or bracing and for settlement of filled excavations or adjacent soil.

E. Repair damage to new and existing Work from settlement, water, or earth pressure or other causes resulting from inadequate sheeting, shoring, or bracing.

3.6 SURFACE WATER CONTROL

A. Control and remove unanticipated **storm** water ~~seepage~~ into excavation **and conform to all local, state and federal government rule and regulations in the SWPPP in dewatering discharges including specifying practices and controls**.

B. Provide ditches, berms, and other devices to divert and drain surface water from excavation area.

C. Divert surface water and seepage water within excavation areas into sumps or settling basins prior to pumping water into drainage channels and storm drains.

3.7 DEWATERING

A. Design and provide dewatering system to permit Work to be completed on dry and stable subgrade.

B. Operate dewatering system continuously until backfill is minimum 2 feet above normal ground water table elevation.

C. When dewatering system cannot control water within excavation, notify Engineer and stop excavation work.

1. Supplement or modify dewatering system and provide other remedial measures to control water within excavation.
2. Demonstrate dewatering system operation complies with performance requirements before resuming excavation operations.

D. Modify dewatering systems when operation causes or threatens to cause damage to new construction, existing site improvements, adjacent property, or adjacent water wells.

E. Discharge ground water ~~and seepage water~~ within excavation areas into sumps or settling basins prior to pumping water into drainage channels and storm drains. **Conform to all local, state, and federal government rules and regulations, including obtaining and conforming to a NPDES Dewatering Permit.**

F. Remove dewatering and surface water control systems after dewatering operations are discontinued.

3.8 PROOF ROLLING

A. Proof roll areas to receive fill, pavement and building slabs to identify areas of soft yielding soils.

1. Use loaded tandem-axle pneumatic tired dump truck or large smooth drum roller.
2. Load equipment to maximum 50 tons gross weight and make a minimum of four passes with two passes perpendicular to the others.

B. Undercut such areas to firm soil, backfill with granular fill, and compact to density equal to or greater than requirements for subsequent fill material.

C. Do not proof roll or undercut until soil has been dewatered.

3.9 BACKFILLING

A. Scarify subgrade surface to depth of 4 inches.

B. Compact subgrade to density equal to or greater than the requirements of the compaction schedule.

C. Backfill areas to contours and elevations with unfrozen materials to an elevation so that final grade can be met in accordance with aggregate surfacing requirements.

D. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.

E. Place fill material in continuous layers and compact in accordance with Schedule at end of this Section.

F. Employ placement method that does not disturb or damage other work.

G. Maintain optimum moisture content of backfill materials to attain required compaction density.

H. Support foundation walls and structures prior to backfilling.

I. Remove surplus backfill materials from site in accordance with Section 02 42 00.

3.10 PROTECTION

A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.

B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

C. Protect structures, utilities, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth operations.

D. Repair or replace items indicated to remain damaged by excavation or filling.

3.11 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Independent laboratory, field inspecting, testing, adjusting, and balancing.

B. Testing Agency: Testing of backfill material and compaction will be conducted by and independent third party. UNL will coordinate and pay for testing services. Contractor shall provide sufficient notification to UNL for scheduling testing.

C. Allow testing agency to inspect and test subgrades and each backfill layer. Proceed with subsequent backfill only after test results for previously completed work comply with requirements.

D. Laboratory Material Tests: In accordance with ASTM D1557 or AASHTO T180.

E. In-Place Compaction Tests: In accordance with the following:

1. Density Tests: ASTM D1556, ASTM D2167, or ASTM D2922.
2. Moisture Tests: ASTM D3017.

F. Frequency of Tests: Building and Pavement Areas: Minimum of four tests per lift and no less than one test per 250 cubic yards of backfill.

G. In the event of a failed compaction or moisture test, scarify and moisten or aerate, or remove and replace soil materials to depth required. Then recompact and retest until specified requirements are achieved.

3.12 SCHEDULES

A. Backfill Compaction:

1. Place backfill and fill soil materials in 6” loose lift layers.
2. Compact material to a minimum of 95 percent of maximum density (ASTM D-698 Method A), except the top 12 inches.
3. Compact top 12 inches to a minimum of 98 percent of maximum density (ASTM D-698 Method A).
4. Moisture content: The minimum moisture allowable shall be between ± 3% of optimum moisture content.

B. Sub-grade Compaction:

1. Scarify subgrade surface to depth of 4 inches.
2. Compact material to a minimum of 95 percent of maximum density (ASTM D-698 Method A).
3. Moisture content: The minimum moisture allowable shall be between ± 3% of optimum moisture content.

C. Seeded Areas Compaction

1. Maximum 8-inch compacted depth.
2. Compact material to a minimum of 90 percent of maximum density (ASTM D-698 Method A).
3. Moisture content: The minimum moisture allowable shall be between ± 3% of optimum moisture content.

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***, including obtaining and conforming to a NPDES Dewatering Permit.*** ~~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