1901 Gratiot Street
Post Office Box 149
St. Louis, Missouri 63166
314-621-3222

Lary

UNION ELECTRIC

April 24, 1992

Mr. Robert S. P. Eck
Missouri Department of Natural Resources
St. Louis Regional Office
10805 Sunset Office Drive
Suite 100
St. Louis, MO 63127

Dear Mr. Eck:

Re: Labadie Power Plant - NPDES Operating Permit No. MO-0004812, Ash Pond Expansion Project - Construction Permit Application

On December 30, 1991, we submitted a construction permit application for the third and final phase of the ash pond expansion project at our Labadie Power Plant. At that time, we forwarded a construction permit application form A, the fee payment, a preliminary engineering report and drawings.

As we discussed in the engineering report, we were conducting some additional soil investigations as recommended by the DGLS, and were reviewing that and other laboratory data to determine potential alternative liner materials.

Our review is now complete. The results of our investigation as well as our construction schedule make the prudent choice either a synthetic or compacted clay liner meeting a maximum permeability limit of 1x10e-7.

Attached are two copies of the final specification and drawings for a synthetic and alternative compacted clay liner, either of which will meet the permeability limit. This package is being released for bid by qualified contractors. Depending upon the results of the bid process, the most effective option, based upon performance and cost, will be selected.

Your expeditious review of this package is appreciated as the construction contract cannot be awarded without construction permit approval. After the contract is awarded, we will notify you as to which liner material will be used.

Additionally, as you requested, we have included copies of the form C and water balance diagram recently submitted with our operating permit reapplication. As identified in the previously submitted engineering report, the only significant impact of this construction project on the existing ash pond discharge, Outfall 002, is expected to be a reduction in flyash slurry water (approximately 60-80%) and a subsequent reduction in the discharge flow at the outfall of approximately 30-40%.

Also, we have forwarded our soil investigation report and the final specification to DGLS. We have previously submitted our Land Disturbance Permit application for this project in our letter dated February 28, 1992.

As we noted in our December 30, 1991, letter, the construction phase of this project is still being planned for June 1992. We recognize this is a tight timetable. Although we believe the package to be complete, we are prepared to respond promptly to any questions you may have to help expedite the approval process.

If you have any questions or require further information, please contact Mr. Garrett Kramer of my staff at (314) 554-4581.

Thank you for your attention to this matter.

Very truly yours,

T. E. Siedhoff
Manager
Environmental Services

GSK/ems

cc: R. H. Hentges (DNR-HQ)

SPECIFICATION NO. EC-2574

FOR

CONSTRUCTION OF NEW ASH POND

LABADIE PLANT

UNION ELECTRIC COMPANY

Engineering & Construction

Rev. No.	Date	Revisions	By	Approvals	
1	4/23/92	Initial Issue	CWR	CWR	4/23/92

I N D E X

SECTION 1A - SUPPLEMENTAL GENERAL CONDITIONS

1.0 GENERAL

This section of the specification is intended to clarify and supplement the General Conditions of Contract. Specific duties set forth herein are not meant to constitute an exclusive list of requirements but are intended to complement requirements of the General Conditions of Contract. The enumeration of "Contract Documents" in the first paragraph of Section II of the General Conditions of Contract is expanded to include these Supplemental General Conditions.

The work under this Contract shall include the furnishing of all materials, labor, equipment, tools, protection and incidental items necessary to complete in an acceptable manner and ready for use each portion of the work described in the Contract Documents.

2.0 INTENT OF SPECIFICATIONS AND DRAWINGS

The Contract Documents are complementary and any work called for by any part thereof shall be executed as part of the Contract in the same manner as if called for in all parts. Therefore, all work that may be called for in the specifications and not shown on the drawings, or shown on the drawings but not called for in the specifications, shall be executed and furnished by the Contractor as if described in both of these documents. Should any work or materials be required which is not denoted in the drawings, specification, or other Contract Documents either directly or indirectly, but which are necessary for the proper carrying out of the intent thereof, the Contractor is to understand the same to be implied and required, and shall perform all work and furnish all materials as fully as if they were particularly described.

3.0 ALTERNATE MATERIAL

These Contract Documents may contain items of material for which a certain manufacturer or type is specifically designated. The Contractor's proposal shall be based on furnishing only that specified type or manufacturer for that item of material. Consideration will be given to other manufacturer's material items only if included in the Contractor's original proposal as an alternate to the specification together with the corresponding increase or decrease in the Contractor's base price.

The Company reserves the right to accept or reject any such alternate items of material which may be offered. Approval or rejection of such items of material will be given within a reasonable period of time after award of the Contract and submittal of necessary details.

4.0 STANDARDS

The quality of workmanship, clearances, protection of workers, etc.,shall be governed by applicable laws, ordinances and regulations of authorities having jurisdiction as well as applicable sections of standards as set up by the following organizations:

American Concrete Institute (ACI)
American Institute of Steel Construction (AISC)
American National Standards Institute (ANSI)
American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRE)
American Society of Mechanical Engineers (ASME)
American Society for Testing & Materials (ASTM)
Institute of Electrical and Electronic Engineers (IEEE)
National Electrical Code (NEC)
National Electrical Manufacturer's Association (NEMA)
National Electrical Safety Code (NESC)
National Fire Protection Association (NFPA)
Occupational Safety and Health Administration (OSHA)

5.0 PERMITS

The Company will be responsible for any building permits required by duly constituted authorities. The Contractor shall be responsible for obtaining all other permits, including any necessary for moving equipment over the city or county streets and state highways.

The Contractor shall comply with all laws, ordinances, rules and regulations of governmental authorities affecting the conduct of the proposed work. Before the completion of the contract, the Contractor shall furnish to the Company any and all certificates of approval resulting from required inspections.

6.0 BENCH MARKS

One bench mark with its assigned elevation will be furnished on the site by the Company. The Contractor shall furnish all field layouts and shall be responsible for the use of proper field dimensions and elevations. All such work shall be subject to approval by the Construction Supervisor at his discretion.

7.0 INSPECTION OF SITE

Before submitting a proposal, the Contractor should visit the site and become thoroughly familiar with existing conditions to which his work is in any way related and become fully informed as to the extent and character of the work required.

No consideration will be granted for any misunderstanding of the materials to be furnished or the work to be done, it being understood that the submission of a proposal is an agreement to all conditions referred to in the Contract Documents including those indicated on the drawings and specifications.

8.0 DRAWINGS, DETAILS & INSTRUCTIONS PROVIDED BY CONTRACTOR

The Contractor shall submit to the Company, with such promptness as to cause no delay in the performance of the work, copies of shop drawings, equipment details, installation, operating, and maintenance instructions, wiring diagrams, parts lists, etc., as required below. No purchasing, fabrication, erection processing or shipping of the aforementioned material or equipment may begin until the drawings or details have been reviewed by the Engineer.

The Contractor shall submit five (5) copies of the above information, four (4) of which the Company will retain for its permanent file. One copy will be returned.

These submittals will be reviewed and approved for general design features only. Approval will not relieve the Contractor of responsibility for proper dimensions, quantities, accuracy, fit, adequacy of details, and coordination with other trades. Deviations from Contract Documents are not approved unless specifically requested in writing by Contractor and approved in writing by the Company.

Should field changes be required, such changes shall be promptly documented by the Contractor and submitted to the Company in the form of as-built drawings as required above.

9.0 TESTING OF MATERIALS, ETC.

The Contractor shall furnish free of charge any samples necessary for testing. The Company will pay for routine tests performed on concrete or masonry. The Contractor will pay for all others.

The Contractor, when called upon, will furnish to the Company three (3) copies of test reports, literature, etc., pertaining to material used or to be used by him or his subcontractor in this work.

10.0 LABOR CONDITIONS

Contractor shall comply with and shall cooperate with the Company in enforcing jobsite conditions which directly affect the performance of the work including but not limited to starting and quitting time, smoking regulations, check-in and check-out procedures, job safety regulations and daily clean-up. Contractor shall enforce the following work rules:

A. Workmen shall be at their place of work at the starting time and shall remain at their place of work until the quitting time.

B. There shall be no limit on production by workmen nor restrictions on the full use of tools or equipment. There shall be no restriction, other than may be required by safety regulations, on the number of men assigned to any crew or to any service.

C. Slowdowns, standby crews and featherbedding practices will not be tolerated.

D. If a steward is included in the labor force, he shall be a qualified workman performing work on his craft and shall exercise no supervisory functions. There shall be no non-working stewards.

E. There shall be no illegal strikes, work stoppages or lockouts.

F. When a local union does not furnish qualified workmen within 48 hours (Saturdays, Sundays and holidays excluded), the Contractor shall be free to obtain workmen from any source.

G. It is agreed that overtime is undesirable and not in the best interests of the industry or the craftsmen. Therefore, except in unusual circumstances, overtime will not be worked. Where unusual circumstances demand overtime, such overtime will be kept to a minimum. Under no circumstances will regularly scheduled overtime (5 ten hour days, etc.) be considered.

The Contractor shall assure that its Subcontractors of all tiers shall comply with the provisions herein set forth.

11.0 SUPERINTENDENCE

The Contractor shall keep on the work at all times during its progress, a competent superintendent and any necessary assistants.

The Contractor shall employ craft foremen who have passed a qualified foremen's training program when such training is offered by the foreman's respective craft. Contractor shall provide certificates of completion of said training to the Construction Supervisor before foreman starts on job.

12.0 PERFORMANCE REQUIREMENTS

The Work shall be performed by Contractor at the times stated and in accordance with the provisions of these Contract Documents.

All overtime worked at the discretion of the Contractor must be approved in writing by the Company and all costs will accrue to Contractor's account. The Company reserves the right to require Contractor to perform overtime work at Company's written direction.

13.0 WORK LIMITATIONS

Care must be exercised at all times to maintain safe clearance and safe working practices, both for equipment and personnel, in order to avoid injury or service interruption. All job personnel must be made thoroughly acquainted with hazards involved. It shall be the Contractor's responsibility, working with the Construction Supervisor, to make this condition clear to all Contractor's personnel.

The Contractor shall at all times perform his work to conform with the Company's safety practices and operating procedures. Should an outage of Company equipment be required during the course of the work, the Contractor shall obtain all outages and releases in accordance with the Company's Workman's Protection Assurance Procedures. The appropriate procedure, based on the Operating Manual for the Union Electric System, is included as an appendix to this specification.

High voltage may be present on circuits or equipment at the site during construction period. The Contractor shall at all times perform his work to conform with the Company's safety practices and operating procedures as mentioned above.

No explosives may be used without written permission from the Company.

Any additional work limitations are set forth in an appendix and become a part of this specification.

14.0 DELIVERY AND STORAGE

The Contractor shall provide suitable facilities and shall store all materials supplied by him. Storage of the material and equipment on the jobsite areas shall be as designated by the Construction Supervisor and so located that it will not interfere with the Company's personnel or operations.

Materials provided by the Company will be stored in a suitable location by the Company if received prior to the Contractor's presence at the site. Any materials received thereafter will be unloaded and stored by the Contractor. The Contractor shall be responsible for inspecting and hauling all materials from point of storage to the job site unless otherwise stated in specification.

It shall be the Contractor's responsibility to perform inventory and ascertain that all materials are on hand as required. He shall notify the Company's Construction Supervisor at once of any material shortages or damage to allow replacement without delaying the progress of the work. After acceptance of equipment or material, Contractor will be responsible for loss or damage.

After completion of the work the Contractor shall inventory and haul all excess material, furnished by the Company, to designated Company storage location(s), and shall restore all construction storage areas to a reasonably satisfactory condition as directed by the Construction Supervisor.

15.0 PROTECTION OF WORK AND PROPERTY

The Contractor shall:

A. Be responsible for repairing any damage to any building, walkway, etc., arising in connection with the work performed. For damage due to causes beyond the reasonable control of the Contractor, any of the subcontractors or any of the Contractor's or subcontractor's officers, agents, servants, or employees, the Company will reimburse the Contractor for such expense of repairing the damage.

B. Bear the responsibility for repairing and/or replacing any equipment or materials damaged by the Contractor.

C. Maintain adequate protection for his work and materials at all times to prevent damage from Company operating activities.

D. Post warning signs adjacent to all work areas indicating the hazards created by the construction in progress.

E. Provide necessary temporary lighting, wiring, globes, guard lights, barricades or any other items required by regulations, standards or laws established for public protection and safety or to facilitate the work.

The adequacy of all safeguards is the responsibility of the Contractor. The Construction Supervisor may order additional safeguards, signs, coverings, etc., when he deems it necessary.

16.0 SECURITY

The Contractor shall be responsible for providing a level of security that will ensure control, accountability, and protection to the work area, tools, materials and equipment involved in the execution of this contract.

17.0 REMOVALS AND PREPARATORY WORK

The Contractor shall cooperate with the Construction Supervisor in scheduling removal work so as to cause a minimum disruption to Company's personnel or operations.

The Contractor shall provide protective enclosures, covers, water stops, etc., necessary to prevent water damage to existing building areas during construction.

Materials removed from existing facilities become the property of the Contractor unless otherwise specified elsewhere in the Specification or on the drawings and shall be promptly removed from the site. The Construction Supervisor will designate areas where the removed items retained by the Company shall be stored. All retained materials shall be neatly stored and protected from the elements as necessary to prevent damage.

18.0 CUTTING, PATCHING, ETC.

The Contractor shall do all cutting, fitting, or patching that may be necessary to make the several parts come together properly and fit to receive the work of other Contractors.

19.0 TEMPORARY HEAT

The Contractor shall provide temporary heat as necessary to protect all work materials against damage from dampness and cold to the satisfaction of the Construction Supervisor.

20.0 CLEAN-UP

The Contractor shall maintain good housekeeping while performing the work. Upon completion of the work, the Contractor shall remove all excess material and debris and leave the area in a condition satisfactory to the Construction Supervisor.

21.0 OWNER APPROVAL OF PROCEDURE, ETC.

The procedures, methods, and materials agreed to in the Contract Documents shall not be deviated from without consent of the Company.

The Company reserves the right of approval over all procedures, methods, and materials to be employed by the Contractor for this work.

22.0 INSPECTION, REJECTION OF MATERIALS AND WORKMANSHIP

The Contractor shall, at its own expense, provide safe and necessary facilities and all samples, documents, drawings and lists necessary for complete inspection of the work. If Contractor covers all or any portion of the work prior to any required inspection or test by the Company, the cost of any necessary uncovering and replacing shall be borne by Contractor. Neither the failure to make such inspection nor to discover defective workmanship, materials or equipment nor approval of or payment to Contractor for such work, materials or equipment shall prejudice the rights of the Company thereafter to correct or reject the same as hereinafter provided.

23.0 EXTENSION OF TIME-CONTRACTOR'S WAIVER OF DAMAGES FOR DELAY

If Contractor's performance of the Work be delayed by any condition beyond the control and without the fault or negligence of Contractor and which was not foreseeable by Contractor at the time this contract was entered into, Contractor shall, within seven (7) days of the commencement of any such delay give to the Company written notice thereof and of the anticipated results thereof. Within seven (7) days of the termination of any such delay, Contractor shall file a written notice with the Company specifying the actual duration of the delay. Failure to give either of the above notices shall be sufficient ground for denial of an extension of time. If the Company determines that the delay was beyond the control and without the fault or negligence of Contractor and not foreseeable by Contractor at the time this contract was entered into, the Company shall determine the duration of the delay and shall extend the time of performance of this contract thereby.

Contractor shall not be entitled to, and hereby expressly waives recovery of any damages suffered by reason of the delays contemplated by this Paragraph 23 and extension of time shall constitute Contractor's sole remedy for such delays.

24.0 ACCOUNTING

The Contractor shall furnish complete accounting information and cooperate with the Company's accounting practice.

25.0 FINAL ACCEPTANCE BY OWNER

As soon as practicable after completion of all the work, full inspection and/or tests will be made by the Company. When such inspection and/or tests have proved that the work is in accordance with the requirements of this contract, the Manager of Construction shall notify Contractor in writing of final acceptance of the work. Use of the work by the Company and/or another contractor does not constitute acceptance.

SECTION 1B - SUMMARY OF WORK

1.0 INTRODUCTION

The intent of this specification is to provide the services of a Contractor and certain items of material necessary to construct a new ash pond complete with a liner at the Labadie power plant located outside of Labadie, Missouri.

This Contractor will work in close harmony with other Contractors or Union Electric personnel who may be employed at this site. In the event of differences of opinion regarding scheduling of work, the decision of the company will be final and binding.

2.0 DESCRIPTION OF WORK

The scope of work shall consist of procuring, delivering, receiving, unloading at the worksite, storing, and installing all materials and other items necessary to perform the work as described below:

A. Site Clearing: Clear the pond area and fill areas of all trees, plants, debris, and other items as required to permit grading of the site as detailed on the drawings. Cleared vegetation and debris shall be in disposed of accordance with Section 02200 of the specification.

B. Grading:

* Remove approximately the top 6" of topsoil, vegetation, etc. Stockpile topsoil and stockpile.

* Excavate the soil from within pond basin, construct the new ash pond 27'-6 high dikes (south and west side of the pond) and the 3'-0 high berms (north side of the pond) by placing and compacting the excavated material in accordance with Section 02200 of the specification. The elevation of the top of the liner in the southwest corner adjacent to the pumping station shall be 460.0.

* The cleared existing slopes on the north and west side of the pond shall receive 6" of compacted clean soil to cover all rocks, tree roots, grass, etc. This soil shall be compacted with a drum

roller to provide a smooth surface for placement of synthetic liner.

* Finish grade the pond bottom to provide a constant slope from all parts of the pond down to the pumping station (elev 460.0). Final compaction of the pond bottom shall be performed with a drum type roller to provide a smooth surface for placement of synthetic liner.

* Spread and compact the stockpiled topsoil over the top and outside face of the new dikes and on all surfaces of the new 3'-0 high berms.

C. Erosion Protection: Provide and install a continuous line of straw bales along property lines and other erosion prone areas, if required for erosion control during construction.

D. Pumping Structure: Construct the pumping structure as detailed in the drawings. This structure will house submersible pumps which will be used to pump excess water from the new pond to the existing pond.

E. Liner Installation: Provide and install a 40 mil High Density Polyethylene (HDPE) pond liner over the entire pond bottom and a 60 mil HDPE liner over the inside face of all surrounding dikes. The liner shall be installed in accordance to the manufacturers specifications including quality control testing as specified in the approved manufacturer's QC manual.

F. Seeding: Preparation of the seed bed, fertilization, seeding, and mulching of the top and outside face of the new dikes and all surfaces of the 3'-0 high berms. Water and maintain seeded areas for six weeks from date of seeding.

3.0 COMPANY AND MANUFACTURER'S DRAWINGS

3.1 Provided By Union Electric

The following drawings are intended to indicate the scope of the work to be done and details necessary for the installation of items set forth in this specification, and are part of this specification. These drawings in general are to scale, but figures shall always be followed and drawings are not to be scaled. In case of errors or

discrepancies, the Engineer shall be consulted for the adjustment of all complication arising therefrom. The Engineer's decisions shall be final.

The Contractor shall field verify the dimensions as noted and shall give due consideration to the areas where field fitting and adjustments will be required in congested areas as noted on the drawings.

U.E. Drawing No.	Rev. No.	Drawing Title/Description
8500-X-126563	2	Property - Plan New Ash Pond
8500-X-124893	0	Property - Plan Proposed Ash Pond
8500-X-124136	1	Property Plan New Roadway & Ash Pond
8500-X-124829	0	Ash Silo/Truck Loop Site And Grading Plan
8500-X-124830	0	Ash Silo/Truck Loop Profile And Details

3.2 Provided by the Contractor

The contractor shall submit to the Company, with such promptness as to cause no delay in the performance of the work, 5 copies of shop drawing, product data sheets, etc., as required by this specification. No purchasing, fabrication, erection, processing, or shipping of the aforementioned materials may begin until the required documentation has been reviewed by the Engineer.

Samples and data required to be submitted to Union Electric shall be forwarded to :

Union Electric Company
J. W. Rinke - Manager, Construction
P.O. Box 149, Mail Code 450
St. Louis, MO 63166

Approval samples and data sheets shall be reviewed and returned to the Contractor within ten working days after receipt. Approval is for general design features only and will not relieve the Contractor of responsibility for proper quantities, adequacy of details, and coordination with other

trades. Deviation from contract Documents are not approved unless specifically requested in writing by the Contractor and approved in writing by the Company.

Should field changes be required, such changes shall be promptly documented by the Contractor and submitted to the Company in the form of as-built drawings.

4.0 MATERIALS AND EQUIPMENT SUPPLIED BY THE COMPANY

The materials and equipment that are to be furnished by the Company are listed in the schedule below:

NONE

5.0 MATERIALS AND EQUIPMENT FURNISHED BY THE CONTRACTOR

All materials, equipment, tools, and any incidental items (except those specifically stated above) necessary to complete each portion of the work described herein and/or shown on the drawings shall be furnished by the Contractor.

6.0 UTILITIES, FACILITIES, AND MISCELLANEOUS

The following utilities, facilities, etc., shall be provided as indicated.

	Item	Provided By
A.	Telephone Service for Use of Construction Forces	Contractor
B.	Sanitary Facilities	Contractor
C.	Drinking Water	Contractor
D.	Construction Water	Contractor
E.	Electric Service	Contractor

7.0 SCHEDULE

The Contractor shall be required to furnish the Company with a complete schedule of the Work to be performed under this contract broken down by activity. The schedule shall include a listing of the Contractor's estimate of mandays required for each activity by craft. The schedule shall be included as part of bid package presented by the Contractor.

The schedule shall comply with the dates and guidelines listed below:

A. The required finish date of this contract is **November 1, 1992.**

D. The level of detail in each schedule shall be sufficient to permit the Company to monitor the Contractor's performance relative to the specified guidelines. The activities should be depicted in such a manner that precedent relationships between activities are shown.

E. The Contractor shall furnish update reports at two (2) week intervals until the work is completed. These reports shall indicate by activity the scheduled % of completion as shown on the original schedule, the actual % completion as of the date of the report, and the number of mandays expended on the project to date.

If at any time during this Contract, when the Contractor's actual progress, in the opinion of the Company, is such that the completion dates of the work will not be met, the Contractor shall participate in a re-evaluation of the remaining work.

If, as a result of this re-evaluation of the remaining work, it is determined by the Company that the completion date will not be met, the Company retains the right to direct the Contractor to accelerate the construction program. It shall be the responsibility of the Contractor to initiate and comply with such corrective action as required or directed.

At the time of the award of this contract, scheduling requirements will be discussed in detail by all interested parties.

SECTION 02200

SITE PREPARATION AND EARTHWORK

PART 1 - GENERAL

A. SUMMARY

This Section includes all excavating, trenching, filling, embankment construction, backfilling, compacting, grading and all related items necessary to complete the work indicated or specified.

B. REFERENCES

1. Applicable Standards

a. American Society For Testing and Materials (ASTM):

(1) C88 - Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.

(2) D698 - Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5-Pound (2.49 kg) Rammer and 12-Inch (304.8 mm) Drop.

(3) D1241 - Materials for Soil-Aggregate Subbase, Base and Surface Courses.

(4) D4253 - Maximum Index Density of Soils Using a Vibratory Table.

(5) D4254 - Minimum Index Density of Soils and Calculation of Relative Density.

b. Occupational Safety and Health Administration (OSHA):

(1) Part 1926 - Safety and Health Regulations for Construction.

C. SUBMITTALS

1. Submit as specified in DIVISION 1.

2. Where selecting an option for excavations, trenching and shoring design from "OSHA Part 1926," which requires design by a Registered Professional Engineer, submit (for information only and not for Engineer approval) copies of design calculations and notes for sloping, benching, support systems, shield systems, and other protective systems approved by the Registered Professional Engineer obtained by Contractor.

PART 2 - PRODUCTS

A. MATERIALS ENCOUNTERED

1. Materials suitable for use in embankment and fill include material that is free of debris, roots, organic matter, frozen matter and which is free of stone having any dimension greater than 2 inches in areas requiring a high degree of compaction, or 4 inches in other embankment and fill areas.

   a. Cohesionless materials include gravels, gravel-sand mixtures, sands, and gravelly sands generally exclusive of clayey and silty material--materials which are free-draining and for which impact compaction will not produce a well-defined moisture-density relationship curve and for which the maximum density by impact methods will generally be less than by vibratory methods.

   b. Cohesive materials include silts and clays generally exclusive of sands and gravel--materials for which impact compaction will produce a well-defined moisture-density relationship curve.

2. Materials unsuitable for use in embankment and fill include all material that contains debris, roots, organic matter, frozen matter, stone (with any dimension greater than 2 inches in areas requiring a high degree of compaction or 4 inches in other embankment and fill areas), or other materials that are determined by Engineer as too wet or otherwise unsuitable for providing a stable subgrade or stable foundation for structures.

3. All materials encountered, regardless of type, character, composition and condition thereof shall be unclassified. Rock encountered shall be handled at no additional cost to Owner.

4. Waste material includes excess usable materials and materials unsuitable for use in the Work.

5. Borrow materials shall be obtained from areas shown on the plans.

B. GRANULAR MATERIAL

1. Granular bedding material except for use with High Molecular Weight -High Density Polyethylene (HDPE) pipe shall be crushed stone or gravel indicating a loss of not more than 15 percent after 5 cycles when tested for soundness with sodium sulfate as described in ASTM C88. Granular bedding material shall conform to ISSRBC SECTION 704 -"COURSE AGGREGATE," gradation No. CA 11.

Percent Passing	Sieve Size
100	3/4-inch
60-100	1/2-inch
0-5	No. 4

2. Granular bedding material for HDPE pipe shall be clean natural sand conforming to ISSRBC SECTION 703 - "FINE AGGREGATES."

C. EMBANKMENT AND FILL MATERIAL

1. Material shall be free of roots or other organic matter, refuse, ashes, cinders, frozen earth or other unsuitable material.

2. Use for embankment suitable material sufficiently friable to provide a dense mass free of voids and capable of satisfactory compaction.

3. Do not use material containing gravel, stones, or shale particles greater in dimension than one-half the depth of the layer to be compacted.

4. Moisture content shall be that required to obtain specified compaction of the soil.

5. Perform any wetting or drying of the material as required to (obtain the specified density when compacted.

D. TRENCH STABILIZATION MATERIAL

Granular material as specified or conform to ASTM D1241, Gradation A or B, well-graded, with not more than 10 percent passing No. 200 sieve.

PART 3 - EXECUTION

A. SITE PREPARATION

1. Clearing, Grubbing and Demolition

   a. Perform only in areas where earthwork or other construction operations are to be performed.

   b. Protect tops, trunks, and roots of existing trees which are to remain on the site.

   c. Clear areas and dispose of other trees, brush and vegetation before starting construction.

   d. Remove tree stumps and roots larger than 3 inches in diameter and backfill resulting excavations with approved material.

   e. Remove existing construction to limits indicated or as required to accommodate new construction.

   f. Dispose of debris by burning on the site as directed and in a manner acceptable to Construction Supervisor.

2. Stripping: Remove topsoil from areas within limits of excavation, trenching and borrow and areas designated to receive embankment, and compacted fill as follows:

   a. Scrape areas clean of all brush, grass weeds, roots and other material.

   b. Strip to depth of approximately 6 inches or to a sufficient depth to remove excessive roots in heavy vegetation or brush areas and as required to segregate topsoil.

   c. Stockpile topsoil in areas where it will not interfere with construction operations or existing facilities. Stockpiled topsoil shall be reasonably free of subsoil, debris and stones larger than 2 inches in diameter.

   d. Remove waste from the site or dispose of on site as directed by Engineer.

B. EXCAVATION AND TRENCHING

1. Sheeting and Bracing:

   a. Use when required by the specifications or drawings and where resulting slopes from excavation or trenching might endanger in-place structures or utilities.

b. Provide materials on site prior to start of excavation. Adjust spacing and arrangement as required by conditions encountered.

c. Remove sheeting and bracing as backfill progresses. Fill voids left after withdrawal with sand or other approved material.

2. Explosives: Blasting will not be permitted.

3. Excavation for Structures:

a. Excavate area adequate to permit efficient erection and removal of forms.

b. Trim to neat lines where details call for concrete to be deposited against earth.

c. Excavate by hand in areas where space and access will not permit use of machines.

d. Notify Engineer immediately when excavation has reached the depth indicated.

e. Restore bottom of excavation to proper elevation with concrete or compacted granular material in areas overexcavated.

4. Trenching for Underground Utilities:

a. Side Walls:

(1) Make vertical or sloped within specified trench width limitations below a plane 12 inches above top of pipe.

(2) Make vertical or sloped (stepped) as required for stability, above a plane 12 inches above top of pipe.

(3) Excavate without undercutting.

b. Trench Depth:

(1) Excavate to depth sufficient to provide the minimum bedding requirements for the pipe being placed.

(2) Do not exceed that indicated where conditions of bottom are satisfactory.

(3) Increase depth as necessary to remove unsuitable supporting materials.

c. Trench Bottom:

(1) Protect and maintain when suitable natural materials are encountered.

(2) Remove rock fragments and materials disturbed during excavation or raveled from trench walls.

(3) Restore to proper subgrade with trench stabilization material when overexcavated. Payment shall conform to the unit price stipulated in the BID FORM for authorized replacement of unsuitable materials. Correct at no additional cost to Owner when trench is overexcavated without authority or to stabilize bottom rendered unsuitable through negligence or improper operations.

d. Trench Width:

(1) Excavate trench to a width which will permit satisfactory jointing of the pipe and thorough tamping of bedding.

(2) Do not exceed following trench widths:

(a) Below a plane 12 inches above top of pipe.

Nominal Pipe Size	Trench Width	
	Minimum	Maximum
Less than 24 inches	Pipe od + 1 foot	Pipe od + 2 feet 24
inches and larger	Pipe od + 2 feet	Pipe od + 3 feet

(b) Above plane defined in (a), no maximum limit.

(c) Maximum trench width limitations shall apply in all areas more than 3 feet from manhole or structure walls.

(d) Maximum width shall be as near the minimum specified as can be controlled by construction equipment and methods utilized.

e. Fill and Embankment Areas: Perform trenching only after compacted fill or embankments has reached an elevation of not less than one foot above the top of the pipe.

5. Dewatering:

a. Control grading around excavations to prevent surface water from flowing into excavation areas.

b. Drain or pump as required to continuously maintain all excavations and trenches free of water or mud from any source and discharge to approved drains or drainage channels. Commence when water first appears and continue until Work is complete to the extent that no damage will result from hydrostatic pressure, flotation, or other causes.

c. Remove subgrade material rendered unsuitable by excessive wetting and replace with approved backfill material.

6. Waste Materials:

a. Remove unsuitable materials from work area as excavated.

b. Deposit such materials in locations and within areas indicated or designated by Engineer.

c. Grade waste areas and leave free draining with an orderly, neat appearance.

7. Existing Groundwater Monitoring Well Closure

a. The existing groundwater monitoring wells located within the new ash pond or in the area that will be covered by the new ash pond dikes shall be sealed to preclude the introduction of contaminants into the groundwater.

1. All materials, debris and obstructions that may interfere with sealing operations shall be removed from the well.