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Coal Combustion Waste Impoundment
Round 7 - Dam Assessment Report (Site #009)

Nearman Creek Power Station

Coal Ash Pond Dike
Kansas City Board of Public Utilities
Kansas City, Kansas

Prepared for:

United States Environmental Protection Agency
Office of Resource Conservation and Recovery

Prepared by:

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INTRODUCTION, SUMMARY CONCLUSIONS AND RECOMMENDATIONS

The release of over five million cubic yards from the Tennessee Valley Authority's Kingston, Tennessee facility in December 2008, which flooded more than 300 acres of land, damaging homes and property, is a wake-up call for diligence on coal combustion waste disposal units. We must marshal our best efforts to prevent such catastrophic failure and damage. A first step toward this goal is to assess the stability and functionality of the ash impoundments and other units, then quickly take any needed corrective measures.

This assessment of the stability and functionality of the Nearman Creek Power Station Ash Pond management unit is based on a review of available documents and on the site assessment conducted by Dewberry personnel on Tuesday, September 21, 2010. We found the supporting documentation lacking critical information (Section 1.1.3), specifically related to the structural stability of the dike. Sections 1.2.1 and 1.2.3 provide a recommendation for providing critical technical documentation regarding the structural stability of the dike, which is required to upgrade the rating of the ash pond dike from POOR to SATISFACTORY. In addition, Sections 1.2.5 and 1.2.6 provide recommendations based on field observations that may help to maintain a safe and trouble-free operation.

In summary, the Nearman Creek Power Station ash management unit is rated POOR due to the lack of information regarding the structural stability of the dike. No other recognized existing or potential management unit safety deficiencies were identified.

PURPOSE AND SCOPE

The U.S. Environmental Protection Agency (EPA) is embarking on an initiative to investigate the potential for catastrophic failure of Coal Combustion Surface Impoundments (i.e., management unit) from occurring at electric utilities in an effort to protect lives and property from the consequences of a dam failure or the improper release of impounded slurry. The EPA initiative is intended to identify conditions that may adversely affect the structural stability and functionality of a management unit and its appurtenant structures (if present); to note the extent of deterioration (if present), status of maintenance and/or a need for immediate repair; to evaluate conformity with current design and construction practices; and to determine the hazard potential classification for units not currently classified by the management unit owner or by a state or federal agency. The initiative will address management units that are classified as having a Less-than-Low, Low, Significant or High Hazard Potential ranking. (For Classification, see pp. 3-8 of the 2004 Federal Guidelines for Dam Safety)

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In February 2009, the EPA sent letters to coal-fired electric utilities seeking information on the safety of surface impoundments and similar facilities that receive liquid-borne material that store or dispose of coal combustion waste. This letter was issued under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104(e), to assist the Agency in assessing the structural stability and functionality of such management units, including which facilities should be visited to perform a safety assessment of the berms, dikes, and dams used in the construction of these impoundments.

EPA requested that utility companies identify all management units including surface impoundments or similar diked or bermed management units or management units designated as landfills that receive liquid-borne material used for the storage or disposal of residuals or by-products from the combustion of coal, including, but not limited to, fly ash, bottom ash, boiler slag, or flue gas emission control residuals. Utility companies provided information on the size, design, age and the amount of material placed in the units. The EPA used the information received from the utilities to determine preliminarily which management units had or potentially could have High Hazard Potential ranking.

The purpose of this report is to evaluate the condition and potential of waste release from the selected High Hazard Potential management units. This evaluation included a site visit. Prior to conducting the site visit, a two-person team reviewed the information submitted to EPA, reviewed any relevant publicly available information from state or federal agencies regarding the unit hazard potential classification (if any) and accepted information provided via telephone communication with the management unit owner.

Factors considered in determining the hazard potential classification of the management units(s) included the age and size of the impoundment, the quantity of coal combustion residuals or by-products that were stored or disposed of in these impoundments, its past operating history, and its geographic location relative to down gradient population centers and/or sensitive environmental systems.

This report presents the opinion of the assessment team as to the potential of catastrophic failure and reports on the condition of the management unit(s).

LIMITATIONS

The assessment of dam safety reported herein is based on field observations and review of readily available information provided by the owner/operator of the subject coal combustion waste management unit(s). Qualified Dewberry engineering personnel performed the field observations and review and made the assessment in conformance with the required scope of work and in accordance with reasonable and acceptable engineering practices. No other warranty, either written or implied, is made with regard to our assessment of dam safety.

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Doc 02: Lutz, Daily & Brain Design Drawing of Ash Pond

Doc 03: Landfill Inspection and Tracking Form

Doc 04: Terracon Report

Doc 05: Construction Specifications for Contract 75A

Doc 06: KDHE NPDES Permit No. 1-MO25-BOO1

Doc 07: KDHE Solid Waste Permit No. 413

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Doc 09: US Army COE Final Envir. Statement—Geology

Doc 10: KCBPU Emergency Response Action Plan (ERAP)

APPENDIX B - PHOTOGRAPHS

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1.0 CONCLUSIONS AND RECOMMENDATIONS

1.1 CONCLUSIONS

Conclusions are based on visual observations from a one-day site visit, conducted on September 21, 2010, and a review of technical documentation provided by Kansas City Board of Public Utilities.

1.1.1 Conclusions Regarding the Structural Soundness of the Management Unit(s)

Dewberry engineers did not observe any significant structural defects on the dike during their site walkover. However, based on a lack of documentation of critical engineering analyses verifying design slope stability, the structural soundness of the management unit is rated POOR.

1.1.2 Conclusions Regarding the Hydrologic/Hydraulic Safety of the Management Unit(s)

The management units at this location are part of a closed loop system fed by a bottom ash slurry from the boiler, decanting to a clear pond, and recycling to the plant boiler. There are no external sources of water other than rainfall on the inner embankments and the ponds themselves. The ponds are located above the 100-year flood level.

1.1.3 Conclusions Regarding the Adequacy of Supporting Technical Documentation

The supporting technical documentation is inadequate. The technical documentation lacks critical engineering analyses of dike slope stability.

1.1.4 Conclusions Regarding the Description of the Management Unit(s)

The description of the management unit provided by the Kansas City Board of Public Utilities was an accurate representation of what Dewberry observed in the field.

1.1.5 Conclusions Regarding the Field Observations

Dewberry staff was provided access to all areas in the vicinity of the management unit required to conduct a thorough field observation. The visible parts of the embankment dikes and outlet structures were observed to have no signs of overstress, significant settlement, shear failure, or other

signs of instability although visual observations were hampered by the presence of thick vegetation in some areas. Embankments appear structurally sound. There are no apparent indications of unsafe conditions or conditions needing remedial action.

Seepage was occurring through the 30” reinforced concrete outlet. This outlet is equipped with both a manual valve system and an inflatable balloon system. The observed leakage raises questions about the overall reliability of these closure mechanisms. See recommendations in Section 1.2.5.

1.1.6 Conclusions Regarding the Adequacy of Maintenance and Methods of Operation

The current maintenance and methods of operation appear to be adequate for the bottom ash management unit. There is a recommendation in Section 1.2.6 that will improve the overall maintenance of the unit. There was no evidence of significant repairs or prior releases observed during the field inspection.

1.1.7 Conclusions Regarding the Adequacy of the Surveillance and Monitoring Program

The surveillance program appears to be adequate. There is a recommendation in Section 1.2.7 that may assist in ensuring regular reviews and identifying potential problems. The management unit dikes are not instrumented. Based on the size of the dikes, the portion of the impoundment currently used to store wet bottom ash, the history of satisfactory performance and current inspection program, installation of a dike monitoring program is not needed at this time.

1.1.8 Classification Regarding Suitability for Continued Safe and Reliable Operation

The facility classification is POOR for continued safe and reliable operation. The classification is due to the lack of critical technical documentation of engineering analyses verifying slope stability safety factors of the management unit dikes.

1.2 RECOMMENDATIONS

1.2.1 Recommendations Regarding the Structural Stability

Although observations made during the site visit do not indicate signs of overstress, significant settlement, shear failure, or other signs of instability, the structural stability cannot be evaluated without reviewing the results of engineering analyses of the slope stability factors of safety under various load conditions. It is recommended that if the original design analyses cannot be located, a new geotechnical engineering evaluation be conducted. The new geotechnical engineering evaluation should be based on current standards, including seismic loading conditions.

1.2.2 Recommendations Regarding the Hydrologic/Hydraulic Safety

No recommendations appear warranted at this time.

1.2.3 Recommendations Regarding the Supporting Technical Documentation

Continued efforts to locate the original slope stability design documentation are recommended. If the original documentation cannot be located within a reasonable period of time, a geotechnical engineering evaluation is recommended to verify the embankment has an acceptable factor of safety for all anticipated loading conditions, including seismic loading.

1.2.4 Recommendations Regarding the Description of the Management Unit(s)

No recommendations appear warranted at this time.

1.2.5 Recommendations Regarding the Field Observations

The seepage through the outlet should be investigated and the 30”pipe should either be removed or an alternate closure mechanism installed on the outlet pipe.

1.2.6 Recommendations Regarding the Maintenance and Methods of Operation

Although the maintenance program appears to be adequate, it is recommended that a vegetation control program be instituted. A regular mowing or spraying program would improve periodic inspections as well as improve the ability to identify animal borrows or other potential problems.

1.2.7 Recommendations Regarding the Surveillance and Monitoring Program

It is recommended that a written Surveillance program of the dike system be developed. Such a system will ensure regular inspections and possibly prevent deterioration of dike conditions.

1.2.8 Recommendations Regarding Continued Safe and Reliable Operation

No recommendations appear warranted at this time.

1.3 Participants and Acknowledgement

1.3.1 List of Participants

Patrick J. Cassidy--- Kansas City Board of Public Utilities
Pat Knefel---Kansas City Board of Public Utilities
Phillip Loun---Kansas City Board of Public Utilities
John Fuentez---Kansas City Board of Public Utilities
Ingrid Setzler---Kansas City Board of Public Utilities
Edward Byrd---Kansas Dept. of Agriculture (State Dam Review)
Stacey Baalman---Kansas Dept. of Health & Environment
Gilbert R. Jones, P.E.---Dewberry
Frank Lockridge, P.E.--- Dewberry

1.3.2 Acknowledgement and Signature

We acknowledge that the management unit referenced herein has been assessed on September 21, 2010.

Gilbert R. Jones, P.E. (KS#18547)	Frank Lockridge, P.E.

2.0 DESCRIPTION OF THE COAL COMBUSTION WASTE MANAGEMENT UNIT(S)

2.1 LOCATION AND GENERAL DESCRIPTION

The Nearman Creek Power Station is in Wyandotte County, Kansas in the Parkville Bend of the Missouri River. Its location on the south bank of the river is highlighted on the USGS Parkville Quadrangle map included in Appendix A as Doc. 01.

The Coal Combustion Waste Management Units were designed by Lutz, Daily & Brain of Shawnee Mission, Kansas and were constructed in 1980. (Appendix A, Doc 02) The units consist of a bottom ash settling pond and a clear water pond. They form a closed loop with the clear water being recycled to the plant operations. The units are enclosed by earthen dikes constructed from on-site clay and clayey silt materials. The dikes have a nominal crest elevation of 763 and the pond has a low point of 741.5, resulting in a maximum height of the dike of 21.5 ft. The crest width varies from 16-24 ft. with the western dike merging into the plant flood protection dike and consequently a much wider section. The side slopes are 3H:1V on both faces. The impoundment is 6.6 acres and has a storage capacity of 200,000 cubic yards.

Table 2.1: Summary of Dike Dimensions and Size[1]

	Nearman Creek Power Station Ash Pond
Dike Height (ft)	21.5
Crest Width (ft)	16-24
Length (ft)	2500 (excluding western boundary)
Side Slopes (upstream) H:V	3:1
Side Slopes (downstream) H:V	3:1

[1] Based on design data on original construction drawings (Appendix A -Doc. 2)

The management unit is divided into two cells by an internal clay berm. The northern cell operates as a primary ash settling basin. The eastern cell operates as a clear water basin. The cells are hydraulically connected by a 24” RCP through the eastern section of the internal dike. Normal pool of water in the primary ash settling cell is approximately 758.8 ft.

This dike is not currently on the Kansas Department of Agriculture list of dams.

2.2 SIZE AND HAZARD CLASSIFICATION

The classification for size, based on the height of the embankment and the impoundment storage capacity is "Small" using the USACE Recommended Guidelines for Safety Inspection of Dams ER 1110-2106 criteria summarized in Table 2.2.a.

Table 2.2a: USACE ER 1110-2-106 Size Classification

	Impoundment	
Category	**Storage (Ac-ft)**	**Height (ft)**
Small	50 and < 1,000	25 and < 40
Intermediate	1,000 and < 50,000	40 and < 100
Large	> 50,000	> 100

Dewberry conducted a qualitative hazard classification based on the Federal Guidelines for Dam Safety, dated April, 2004. The hazard assessment classifications are summarized in Table 2.2.b

Table 2.2b: FEMA Federal Guidelines for Dam Safety Hazard Classification

	Loss of Human Life	**Economic, Environmental, Lifeline Losses**
Low	None Expected	Low and generally limited to owner
Significant	None Expected	Yes
High	Probable. One or more expected	Yes (but not necessary for classification)

There are no residences between the ash pond and the Missouri River. Therefore, loss of human life is not probable in the event of a catastrophic dike failure. Ash released as a result of a catastrophic dike failure is likely to be captured by the operator-owned flood plain between the dike and the river. Therefore, Dewberry evaluated **the ash pond embankment hazard classification as "low."**

2.3 AMOUNT AND TYPE OF RESIDUALS CURRENTLY CONTAINED IN THE UNIT(S) AND MAXIMUM CAPACITY

The ash settling basin receives bottom ash and boiler slag from the plant. In rare instances, fly ash has been discharged to the unit. No other wastewaters from the plant are discharged to the pond. The capacity and elevation of the basin is provided in Table 2.3 below.

Table 2.3: Maximum Capacity of Unit	
Ash Pond Name: Nearman Creek Power Station	
Surface Area (acre)[1]	6.6
Current Storage Capacity (cubic yards)[1]	107,282
Current Storage Capacity (acre-feet)	66.5
Total Storage Capacity (cubic yards)[1]	200,000
Total Storage Capacity (acre-feet)	124
Crest Elevation (feet)	763
Normal Pond Level (feet)	758.8

[1] Based on design data on original construction drawings (Appendix A - Doc. 2)

2.4 PRINCIPAL PROJECT STRUCTURES

2.4.1 Earth Embankment

The approximately 2,500 foot long, ash pond dike is composed of controlled compacted clays and clayey silts. The crest width varies from 16-24 feet with a gravel surface to provide vehicle access. Both up-gradient and down-gradient slopes are 3H:1V. The slopes are protected with medium (8-16”) rip rap.

2.4.2 Outlet Structures

The impoundment primary outlet consists of a 24” reinforced concrete pipe with an invert elevation of 745.5’, which discharges to the clear water basin. The original construction also included a 30-inch diameter reinforced concrete discharge pipe located in the eastern section of the dike. Since the ponds are designed to operate as a completely closed system, the plant management decided to close this discharge pipe and used an inflatable balloon system to do so. This system requires continual inspection and inflation of the balloon using a hydrogen tank located close to the outlet end of the pipe. A recommendation is included in Section 1.2.5 regarding a more permanent closure.

2.5 CRITICAL INFRASTRUCTURE WITHIN FIVE MILES DOWN GRADIENT

A critical infrastructure inventory survey was not provided to Dewberry for review.

Based on available topographic maps, surface drainage in the vicinity of the ash pond is to the north-northeast toward the Missouri River. An eastward flowing bend in the Missouri River intercepts surface runoff approximately 1500 feet north of the impoundment. Nearman Creek is between the impoundment and the river and would receive any release from the impoundment prior to discharge into the

Missouri River. Based on available aerial photographs and a brief driving tour of the area Dewberry did not identify any residences between the plant and the river. Interstate Highway 635 crosses the river approximately 2-3 miles to the east of the plant.

3.0 SUMMARY OF RELEVANT REPORTS, PERMITS, AND INCIDENTS

The Kansas City Board of Public Utilities provided copies of original design drawings of the ash pond, bid specs for their construction, boring locations and other subsurface information, NPDES Permit and Solid Waste Landfill Permit information, and a geotechnical report from Terracon investigating erosion problems on the internal face of the dikes (See Appendix A – Doc 04).

The Terracon report recommended several types of slope protection to prevent erosion of the internal slopes. In response to this report, plant management placed rip rap on both the internal and external slopes.

3.1 SUMMARY OF LOCAL, STATE, AND FEDERAL ENVIRONMENTAL PERMITS.

Discharge from the plant is regulated by the Kansas Department of Health & Environment and has been issued a National Pollutant Discharge Elimination System Permit, Permit No. I-MO25-B001. The NPDES permit was effective October 1, 2006, and expired December 31, 2008. This Permit renewal request has been applied for and is pending approval by the Kansas Dept. of Health and Environment.

The Department of Health & Environment also issued Permit No. 413 for the on-site solid waste landfill that receives fly ash and bottom ash from the plant.

3.2 SUMMARY OF SPILL/RELEASE INCIDENTS

Data reviewed by Dewberry did not indicate any spills, unpermitted releases, or other performance problems with the embankment.

4.0 SUMMARY OF HISTORY OF CONSTRUCTION AND OPERATION

4.1 SUMMARY OF CONSTRUCTION HISTORY

4.1.1 Original Construction

The Nearman Creek ash pond was designed in mid-1979 by Lutz, Daily and Brain Consulting Engineers. The embankment was constructed by H.E. Bohrer Excavating in late 1979 and early 1980. The unit was constructed substantially as shown on the drawings for Contract 75A (See Appendix A – Doc. 02)

4.1.2 Significant Changes/Modifications in Design since Original Construction

The dike has not been significantly changed or modified since the original construction.

4.1.3 Significant Repairs/Rehabilitation since Original Construction

No information was provided regarding major repairs or rehabilitation to the embankment or outlet structures. No evidence of prior releases, failures or patchwork was observed on the earthen dike during Dewberry's visual assessment that indicates prior release or failures have occurred.

4.2 SUMMARY OF OPERATIONAL PROCEDURES

4.2.1 Original Operational Procedures

The impoundment was designed and operated for bottom ash sedimentation and control. Bottom ash is transported by slurry to the west end of the impoundment for primary sedimentation. An internal dike divides the impoundment into two cells; the north cell is the primary settling pond and a smaller southern cell is the clear water pond. Water flows from the north to south sections of the impoundment by gravity via a pipe through the cell divider dike. Water from the clear water cell is recycled back to the plant for reuse. Figure 4.2.1-1 shows the configuration of the pond cells.

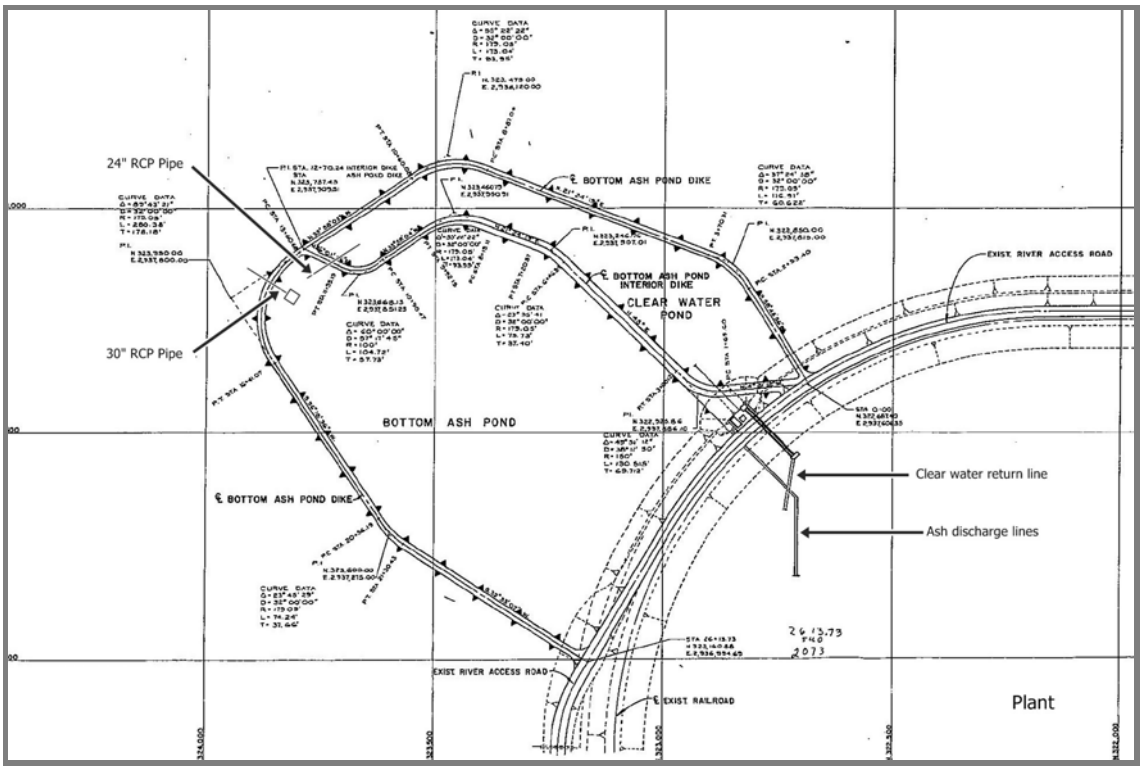


Figure 4.2.1-1: Configuration of the Ash Pond at the KCBPU Nearman Creek Facility

4.2.2 Significant Changes in Operational Procedures and Original Startup

The original design included a 30-inch mid-depth discharge pipe regulated with a mechanical gate. The purpose of this pipe was to permit inflow into the pond in case of flooding to help stabilize the embankments during construction and prior to operational start-up. This pipe has reportedly been closed since construction of the pond was completed. When the mechanical gate started leaking, plant management decided to close this pipe using an inflatable balloon system. However, a small amount of leakage was observed from this pipe during the site visit, raising questions regarding the reliability of these closure mechanisms.

4.2.3 Current Operational Procedures

Current operational procedures include daily observations of the dike system by plant operating staff and a monthly walkover and written report by the Senior Environmental Scientist. See Appendix A – Doc 03. This

form indicates only landfill inspection; however, the inspector said she also inspected the ash pond dike.

4.2.4 Other Notable Events since Original Startup

No additional information was provided to Dewberry of other notable events impacting the operation of the impoundment.

5.0 FIELD OBSERVATIONS

5.1 PROJECT OVERVIEW AND SIGNIFICANT FINDINGS

Dewberry personnel Gilbert Jones, P.E., and Frank Lockridge, P.E., performed a site visit on Tuesday, September 21, 2010, in company with the participants.

The site visit began at 1:00 PM. The weather was warm and partly cloudy. Photographs were taken of conditions observed. Please refer to photographs in Appendix B and the Dam Inspection Checklist in Appendix C. Selected photographs are included here for ease of visual reference. All pictures were taken by Dewberry personnel during the site visit.

Based on the observations during the site visit no significant findings were noted and the embankment appears to be performing in accordance with design expectations.

5.2 EARTH EMBANKMENT

5.2.1 Crest

The crest of the embankment had no signs of significant depressions, tension cracks or other indications of settlement or shear failure. Figure 5.2.1-1 shows the typical crest conditions.

Figure 5.2.1-1: Photograph of Impoundment Dike Crest View

5.2.2 Inside Slope

The inside slope of the embankment has been covered with medium (8-16”) rip rap per the recommendation of Terracon Engineers. There were no observed scarps, sloughs, bulging, cracks, depressions or other indications of slope instability. Figure 5.2.2-1 shows a representative section of the interior slope of the embankment.

Figure 5.2.2-1: Photo of Embankment Inside Slope View – East end of ash pond looking northwest.

5.2.3 Outside Slope and Toe

The outside slope of the embankment is also covered with rip rap. A significant amount of vegetation is present in several areas, particularly along the northern slope. No major scarps, soughs, bulging, cracks, depressions or other indications of slope instability, or signs of uncontrolled seepage were observed. Figure 5.2.3-1 shows a representative section of the outside slope of the embankment.

Figure 5.2.3-1: Photo of Embankment Outside Slope View – North side of ash pond dike looking up the exterior of the dike.

Figure 5.2.3-2: Photo of Embankment Outside Slope View – East side of ash pond dike looking north.

Heavy vegetation along the northern slope made access and visual observation difficult, but there were no obvious areas of seepage or soft soils along the toe of the down-gradient slope.

Figure 5.2.3-3: Photo of Outside Embankment Toe – North side of ash pond dike looking west.

5.2.4 Abutments and Groin Areas

Neither erosion nor uncontrolled seepage was observed along the groins or abutments. Groin slopes and abutments are protected with the same rip rap cover as the adjoining slopes. Figures 5.2.4-1 and 5.2.4-2 show typical conditions observed at the groins and abutments.

Figure 5.2.4-1: Photo of Interior Groin at Northwest Corner of Impoundment. Note that the dike in upper right hand corner also serves as the flood prevention dike for the plant.

Figure 5.2.4-2: Photo of Exterior Groin at Northwest Corner of Impoundment. Note that the dike in upper left hand corner also serves as the flood prevention dike for the plant.

5.3 OUTLET STRUCTURES

5.3.1 Flood Inflow/Outlet Structure

An outflow structure is located in the northeast corner of the impoundment. The structure consists of a 30-inch diameter reinforced concrete pipe regulated with a mechanical gate (see Figure 5.3.1-1) and inflatable balloon, both of which are reported as closed at all times. However, as shown in Figure 5.3.1-2, a small amount of discharge was observed leaking from the outlet at the time of the site visit. The pipe's invert elevation is 751.5ft. The purpose and current condition of this structure is discussed further in Section 4.2.2.

Figure 5.3.1-1: Photo of Mechanical Gate on Discharge Pipe in Interior of Ash Pond

Figure 5.3.2-2: Photo of Drainage at Exterior End of 30” Discharge Pipe

5.3.2 Inlet Conduit

Two 10”ductile iron pipes discharge bottom ash into the south section of the bottom ash settling pond, see Figure 5.3.2-1.

Figure 5.3.2-1: Photo of Bottom Ash Discharging into Ash Pond.

5.3.3 Low Level Outlet

The Nearman Creek Bottom Ash Impoundment does not have a low level outlet.

6.0 HYDROLOGIC/HYDRAULIC SAFETY

6.1 SUPPORTING TECHNICAL DOCUMENTATION

6.1.1 Flood of Record

No documentation has been provided about the flood of record.

6.1.2 Inflow Design Flood

This impoundment does not accept water from any exterior areas.

6.1.3 Spillway Rating

This impoundment does not have a spillway.

6.1.4 Downstream Flood Analysis

No downstream flood analysis data were provided to Dewberry for review.

6.2 ADEQUACY OF SUPPORTING TECHNICAL DOCUMENTATION

Supporting documentation reviewed by Dewberry is adequate to assess the hydrologic/hydraulic safety of the fly ash impoundment.

6.3 ASSESSMENT OF HYDROLOGIC/HYDRAULIC SAFETY

This impoundment does not accept water from any exterior areas. Hence the dike failure by overtopping seems improbable.

7.0 STRUCTURAL STABILITY

7.1 SUPPORTING TECHNICAL DOCUMENTATION

7.1.1 Stability Analyses and Load Cases Analyzed

No stability analyses were provided to Dewberry for review. Dewberry engineers did not observe any significant structural defects on the dike during their site walkover. However, because of the lack of documentation of engineering analyses verifying design slope stability, the structural soundness of the management unit is rated POOR.

7.1.2 Design Parameters and Dam Materials

Construction specifications provided for review (Appendix A –Doc 5) indicate the embankment design is a compacted clay and /or clayey silt fill with a compacted clay core. Construction drawings indicate material for the embankment came from the plant area, and from within the impoundment as needed. The construction drawings are signed and sealed by a registered engineer licensed in the State of Kansas.

7.1.3 Uplift and/or Phreatic Surface Assumptions

No documentation of uplift calculations or phreatic surface assumptions was provided to Dewberry for review.

7.1.4 Factors of Safety and Base Stresses

No documentation of embankment slope stability factors of safety or base stresses was provided to Dewberry for review.

7.1.5 Liquefaction Potential

No documentation of soil liquefaction analyses was provided to Dewberry for review.

7.1.6 Critical Geological Conditions

Documentation provided to Dewberry for review (See Appendix A – Doc 10) indicates the Nearman Creek Power Station ash pond is located within the alluvial and terrace deposits of the Missouri River. The soil types and bedrock contact contours in the Missouri River Valley are generally the result of flow and meander of the river during and after

periods of glaciation. The ash pond embankment is located on a post-glaciation terrace of the upper terrace into which the embankment abuts.

Soils strata in the area generally consist of:

- Approximately 15-20 feet of soft to firm silty clay
- Approximately 20 feet of dense fine and clayey fine sand
- Extending to bedrock is a layer of approximately 80 to 90 feet of dense fine to coarse sand.

7.2 ADEQUACY OF SUPPORTING TECHNICAL DOCUMENTATION

The technical documentation provided to Dewberry lacks critical engineering analyses required to assess the structural stability of the ash pond embankment. If the original slope stability design calculations cannot be located, new geotechnical engineering analyses should be conducted to verify the existing slope stability safety factors meet or exceed acceptable criteria.

7.3 ASSESSMENT OF STRUCTURAL STABILITY

Based on the lack of technical documentation, the structural stability of the pond embankment is rated as POOR.

8.0 ADEQUACY OF MAINTENANCE AND METHODS OF OPERATION

8.1 OPERATING PROCEDURES

The facility is operated for the settlement and storage of wet bottom ash. Coal combustion waste process water discharges into the west side of the north cell, which is separated from the south section by an earthen dike. The north side of the impoundment is the primary sedimentation area. Decant water flows by gravity to the southeast section of the impoundment through a pipe in the dividing dike. Figure 8.1-1 shows the dividing dike.

Figure 8.1-1: Photo of dike dividing ash pond from clear water pond.

8.2 MAINTENANCE OF THE DAM AND PROJECT FACILITIES

The plant Emergency Response Action Plan is attached in Appendix A – Doc 10.

Plant management has instituted several standard practices to validate the condition of the plant dike, impoundment structure, and the solid waste storage areas.

- A senior member of the environmental staff performs monthly checks of the dike and waste areas.

- Plant personnel are required to be aware of the condition of the impoundment dikes as they work on and around them.
- FEMA requires periodic inspection of the plant dike system, which includes a portion of the ash pond dike.

8.3 ASSESSMENT OF MAINTENANCE AND METHODS OF OPERATIONS

8.3.1 Adequacy of Operating Procedures

Based on the assessments of this report, operating procedures appear to be adequate.

8.3.2 Adequacy of Maintenance

Although the maintenance program appears to be adequate, the following recommendation is made to improve the maintenance and help ensure a trouble free operation:

- Increase frequency of mowing dike embankments or institute vegetation control program to improve the effectiveness of daily observations and monthly inspections.

9.0 ADEQUACY OF SURVEILLANCE AND MONITORING PROGRAM

9.1 SURVEILLANCE PROCEDURES

The plant does not have a written program for periodic review of the dike system. It is recommended that a written program be established to assist in early identification of potential problems.

9.2 INSTRUMENTATION MONITORING

The Nearman Creek Power Station fly ash pond embankment does not have an instrumentation monitoring system

9.3 ASSESSMENT OF SURVEILLANCE AND MONITORING PROGRAM

9.3.1 Adequacy of Inspection Program

Based on the data reviewed by Dewberry, including observations during the site visit, the inspection program is adequate.

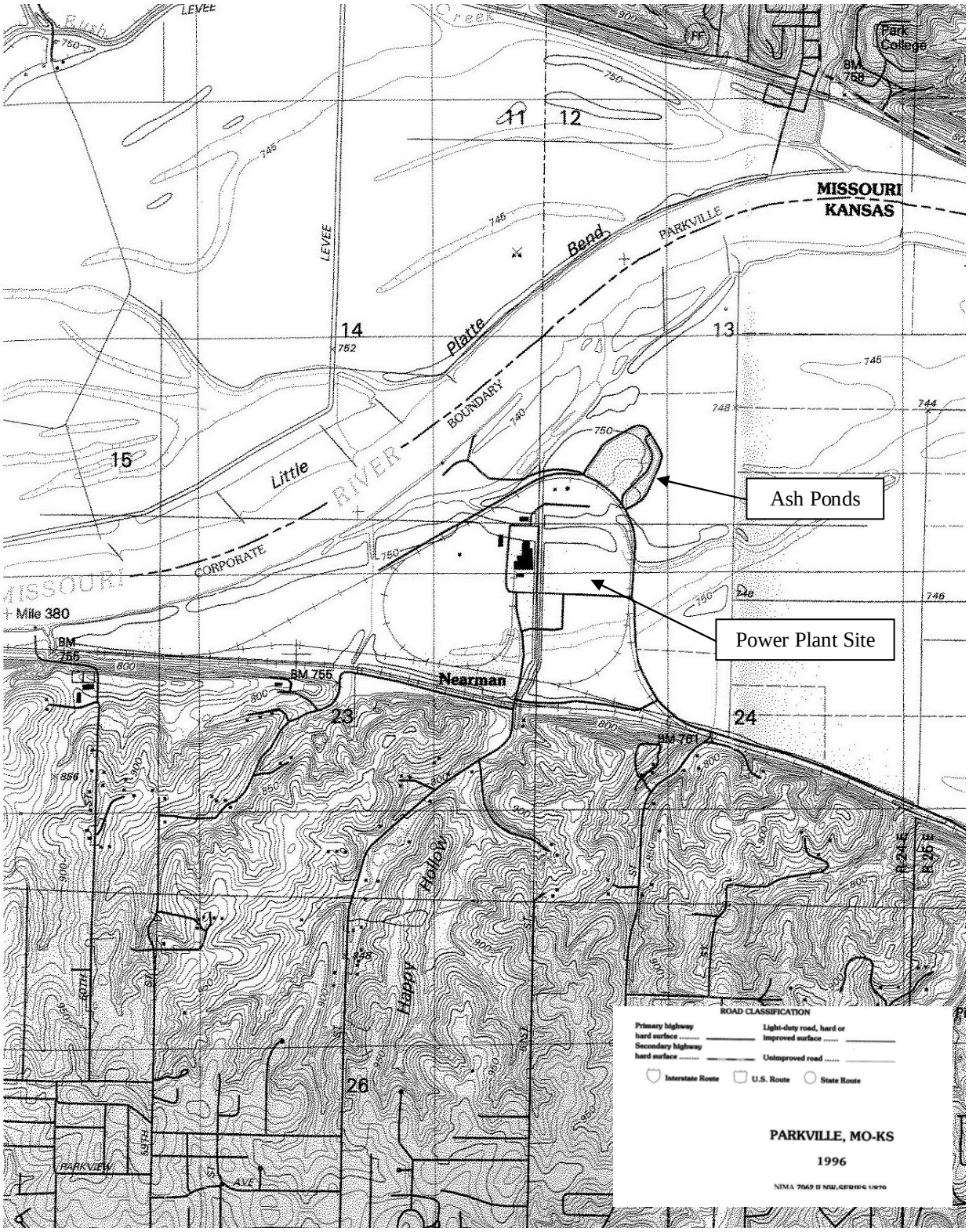
9.3.2 Adequacy of Instrumentation Monitoring Program

Based on the size of the embankment, the current inspection program, and the observations made during this site visit, an embankment monitoring program is not needed at this time.

APPENDIX A

ADDITIONAL INFORMATION

Doc 01: USGS Parkville Quadrangle Map


Ash Ponds
Power Plant Site
MISSOURI
KANSAS
Platte
Bend
PARKVILLE
BOUNDARY
CORPORATE
Little
RIVER
LEVEE
Park College
Nearman
Mile 380
Happy Hollow
PARKVIEW
ROAD CLASSIFICATION
Primary highway hard surface
Light-duty road, hard or improved surface
Secondary highway hard surface
Unimproved road
Interstate Route
U.S. Route
State Route
PARKVILLE, MO-KS
1996

Doc 02: Lutz, Daily & Brain Design Drawing of Ash Pond

NEARMAN CREEK POWER STATION

BOARD OF PUBLIC UTILITIES KANSAS CITY, KANSAS

235,000 KW UNIT NO. 1

1978

INDEX

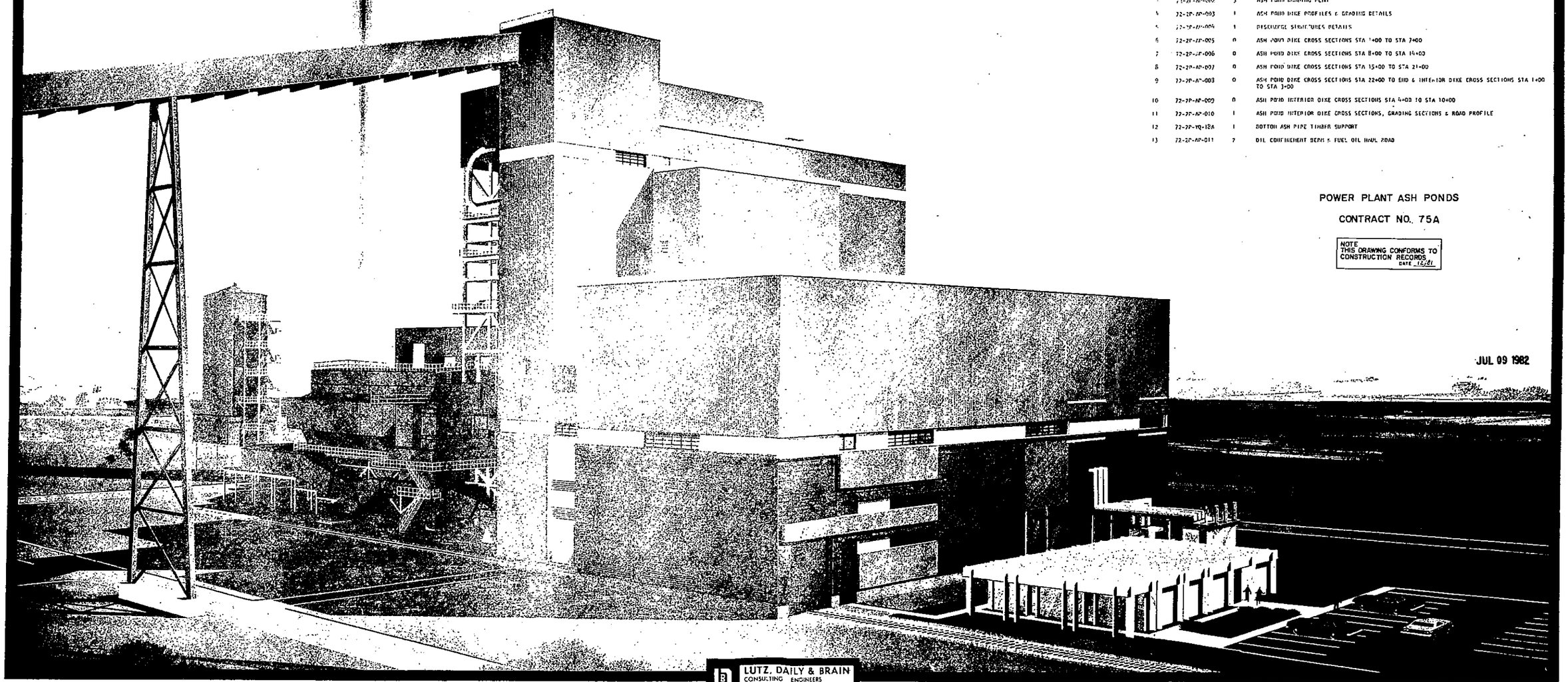
SHEET	DRAWING NUMBER	REV. NO.	DRAWING TITLE
1	72-2P-PP-002	0	SITE LOCATION PLAN
2	72-2P-AP-001	0	ASH POND DIKE ALIGNMENT
3	72-2P-AP-002	3	ASH POND GRADING PLAN
4	72-2P-AP-003	1	ASH POND DIKE PROFILES & GRADING DETAILS
5	72-2P-AP-004	1	DISCHARGE STRUCTURES DETAILS
6	72-2P-AP-005	0	ASH POND DIKE CROSS SECTIONS STA 1+00 TO STA 7+00
7	72-2P-AP-006	0	ASH POND DIKE CROSS SECTIONS STA 8+00 TO STA 14+00
8	72-2P-AP-007	0	ASH POND DIKE CROSS SECTIONS STA 15+00 TO STA 21+00
9	72-2P-AP-008	0	ASH POND DIKE CROSS SECTIONS STA 22+00 TO END & INTERIOR DIKE CROSS SECTIONS STA 1+00 TO STA 3+00
10	72-2P-AP-009	0	ASH POND INTERIOR DIKE CROSS SECTIONS STA 4+00 TO STA 10+00
11	72-2P-AP-010	1	ASH POND INTERIOR DIKE CROSS SECTIONS, GRADING SECTIONS & ROAD PROFILE
12	72-2P-YQ-18A	1	BOTTOM ASH PIPE TIMBER SUPPORT
13	72-2P-AP-011	2	OIL CONFINEMENT BERM & FUEL OIL HAUL ROAD

POWER PLANT ASH PONDS

CONTRACT NO. 75A

NOTE
THIS DRAWING CONFORMS TO CONSTRUCTION RECORDS
DATE 12/81

JUL 09 1982



LUTZ, DAILY & BRAIN
CONSULTING ENGINEERS
SHAWNEE MISSION, KANSAS

75A A5

LEGEND:
REVETMENT
RIVER DIKE
RIVER MILE INDICATOR
RAILROAD MILE INDICATOR
PIEZOMETER
SURVEY CONTROL POINT

SCALE

MISSOURI RIVER
PARKVILLE BEND
POMEROY BEND
LIMIT OF 3000' RIVER FLOOD WAY
1960 CHANNEL LINE
B.P.U. PROPERTY LINE
K.C.K POLICE FIRING RANGE
BORROW AREA
OUTFALL STRUCTURE
INTAKE STRUCTURE
STORM WATER PUMP STATION
SEALING WEIR
BORROW AREA FOR OIL CONFINEMENT BERM
EXISTING FARM LEVEE
FREEBOARD GAGE
NEW LEVEE
BOTTOM ASH POND
FUTURE TANKS
CLEAR WATER POND
FUEL OIL STORAGE TANK
PLANT SERVICE WELL
FUEL OIL HAUL ROAD NOT SHOWN.
SECTION CORNER
MISC. EQUIP STOR. BLDG. FDN.
FLY ASH SILO FDN.
PRECIPITATOR
TRACK HOPPER
WAREHOUSE
TRANSFER HOUSE
COAL TRANSFER HOUSE
COAL CONVEYOR
OFFICE
FUTURE UNITS
PT
RIVER ACCESS ROAD
PC
RELAY HOUSE
SUBSTATION FENCE
RECLAIM STRUCTURE
PLANT LEVEE
COAL STORAGE AREA
PLANT SERVICE SPUR
ACCESS ROAD
NORTHWEST RAILROAD ACCESS
NORTHEAST RAILROAD ACCESS
SOUTHWEST RAILROAD ACCESS
SOUTHEAST RAILROAD ACCESS
ELECTRICAL POWER CORRIDOR
EXISTING CITIES SERVICE 26" Ø GAS LINE
DICKINSON ROAD CONTRACT 73B
DICKINSON ROAD
DICKINSON RD. BRIDGE CONTRACT 73B
NEARMAN CREEK RELOCATION
MOPAC MAIN LINE
MISSOURI PACIFIC RAILROAD
B.P.U. PROPERTY LINE
BREWER DRIVE
NEARMAN DRIVE
SOUTH 55TH STREET
SORTOR DRIVE
55th ST.
49th ST.
47th ST.

NOTE: 55 TH. ST. AND NEARMAN DRIVE ARE THE MAIN ACCESS ROADS TO THE PLANT SITE.

NOTE: COORDINATES SHOWN ARE GROUND CONTROL COORDINATES BASED ON THE KANSAS STATE PLANE COORDINATE SYSTEM AND THE WESTON COORDINATE SYSTEM. WESTON COORDINATE SYSTEM SHOWN IN BRACKETS.

NOTE. THIS PLOT PLAN DRAWING NO. 72-2P-PP-2 IS INTENDED TO BE USED WITH CONTRACT 75A ONLY FOR GENERAL INFORMATION AND NOT CONSTRUCTION.

NOTE
THIS DRAWING CONFORMS TO CONSTRUCTION RECORDS
G.M.M. DATE 12-81

JACK F. DAILY LICENSED 2693 KANSAS PROFESSIONAL ENGINEER

JUL 09 1982

REV.	DESCRIPTION

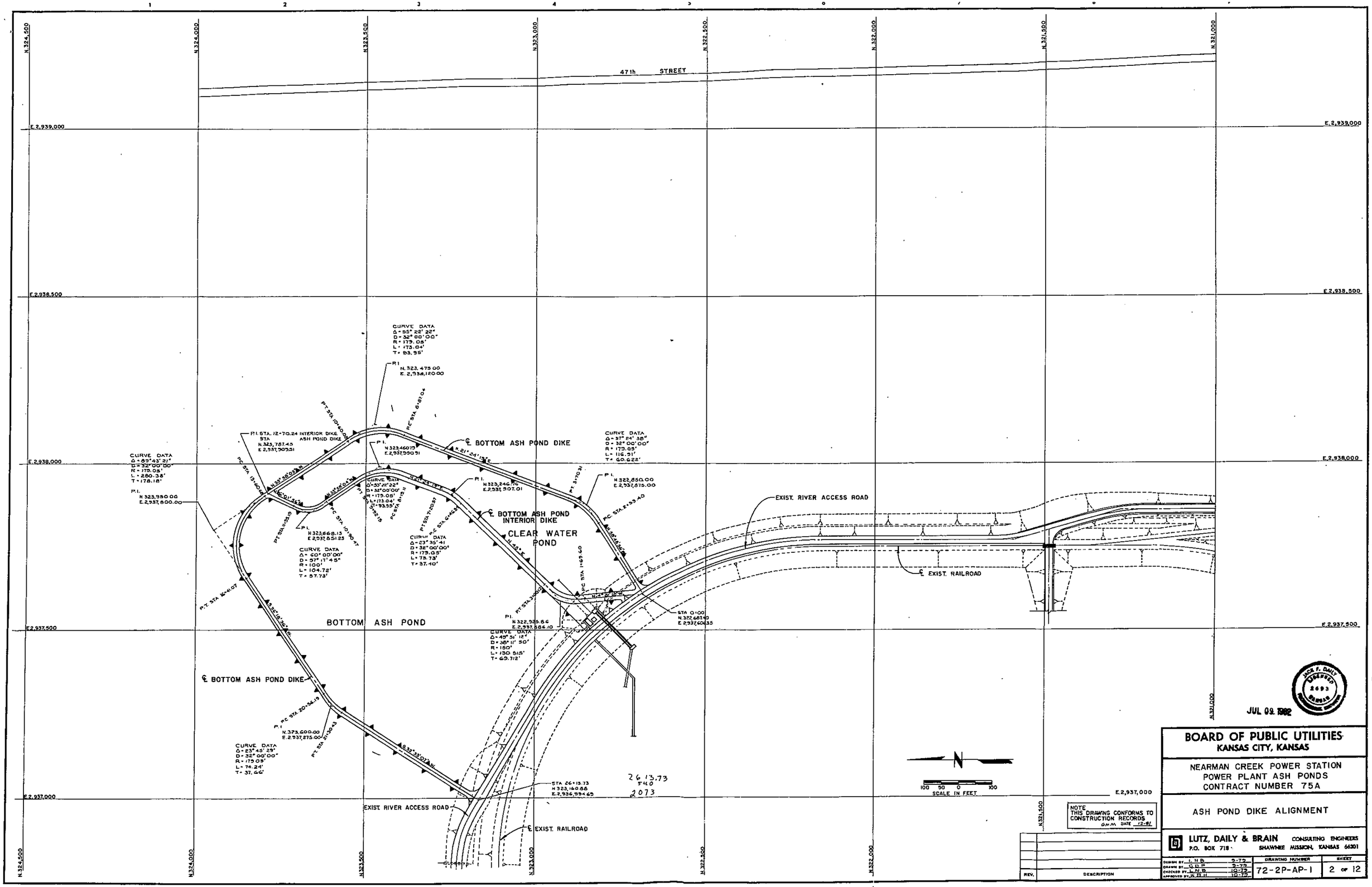
BOARD OF PUBLIC UTILITIES
KANSAS CITY, KANSAS

NEARMAN CREEK POWER STATION
POWER PLANT ASH PONDS
CONTRACT NUMBER 75A

SITE LOCATION PLAN

LUTZ, DAILY & BRAIN CONSULTING ENGINEERS
P.O. BOX 718 SHAWNEE MISSION, KANSAS 66201

			DRAWING NUMBER	SHEET
DESIGN BY	L.N.B.	9-79	72-2P-PP-2	1 OF 12
DRAWN BY	D.D.P.	9-79		
CHECKED BY	L.N.B.	10-79		
APPROVED BY	W.B.H.	10-79		



NOTE
THIS DRAWING CONFORMS TO CONSTRUCTION RECORDS.
G.A.M. DATE 12-81

REV.	DESCRIPTION

BOARD OF PUBLIC UTILITIES
KANSAS CITY, KANSAS

NEARMAN CREEK POWER STATION
POWER PLANT ASH PONDS
CONTRACT NUMBER 75A

ASH POND DIKE ALIGNMENT

LUTZ, DAILY & BRAIN CONSULTING ENGINEERS
P.O. BOX 718 SHAWNEE MISSION, KANSAS 66201

DESIGN BY L.N.B.	5-72	DRAWING NUMBER	SHEET
DRAWN BY G.D.P.	5-72	72-2P-AP-1	2 OF 12
CHECKED BY L.N.B.	10-72		
APPROVED BY N.E.H.	10-72		

47th STREET

℄ BOTTOM ASH POND DIKE

TOE OF SLOPE

℄ BOTTOM ASH POND INTERIOR DIKE

TOE OF SLOPE EL. 742.0

EXIST. RIVER ACCESS ROAD

℄ EXIST. RAILROAD

℄ BOTTOM ASH POND DIKE

EXIST. RIVER ACCESS ROAD

℄ EXIST. RAILROAD

BEGIN PLACEMENT OF RIPRAP AT END OF EXISTING RIPRAP

BEGIN PLACEMENT OF RIPRAP AT END OF EXISTING RIPRAP E 2,935,800±

STA 0+00

LEGEND

(ALL DRAWINGS EXCEPT 72-2P-AP-1)

- LOCATION OF SOIL BORING
- 743 — EXISTING CONTOUR
- 743 — FINISH CONTOUR BY THIS CONTRACT
- TOP OF SLOPE
- TOE OF SLOPE
- EXISTING TOP OF SLOPE (MAY BE DASHED)
- EXISTING TOE OF SLOPE
- RIPRAP BY THIS CONTRACT
- SURFACING BY THIS CONTRACT

close on 1 yr = 1600

N

SCALE IN FEET

100 50 0 100

NOTE
THIS DRAWING CONFORMS TO CONSTRUCTION RECORDS
DATE 12/81

JACK F. DAILY LICENSED 2693 KANSAS PROFESSIONAL ENGINEER

JUL 09 1982

REV.	DESCRIPTION
3	CONFORMED TO CONST. REC. GMM 12-81
2	REVISED AS INDICATED 1-9-80 GLH
1	REVISED PER ADDENDUM #1 10-79 GDP

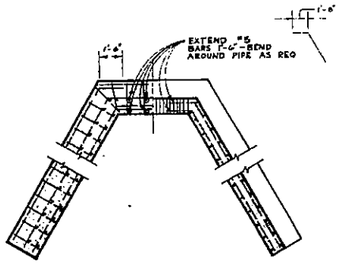
BOARD OF PUBLIC UTILITIES
KANSAS CITY, KANSAS

NEARMAN CREEK POWER STATION
CONTRACT NUMBER 75A
POWER PLANT ASH PONDS

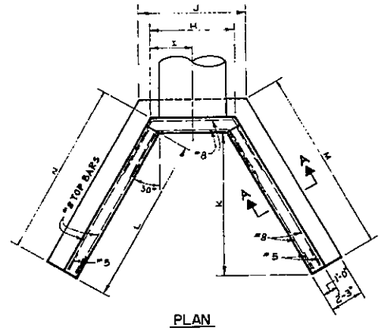
ASH POND GRADING PLAN

LUTZ, DAILY & BRAIN CONSULTING ENGINEERS
P.O. BOX 718 SHAWNEE MISSION, KANSAS 66201

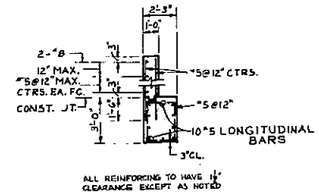
DESIGN BY L.H.B.	9-79	DRAWING NUMBER	SHEET
DRAWN BY G.D.P.	9-79	72-2P-AP-2	3 OF 12
CHECKED BY L.H.B.	10-79		
APPROVED BY N.B.H.	10-79		



SECTION B-B



PLAN



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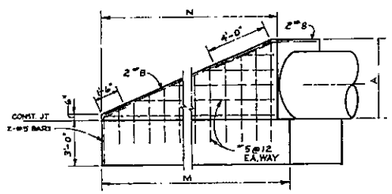
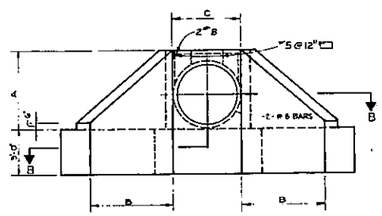
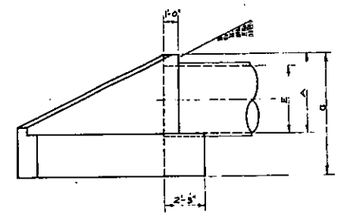


WING ELEVATION

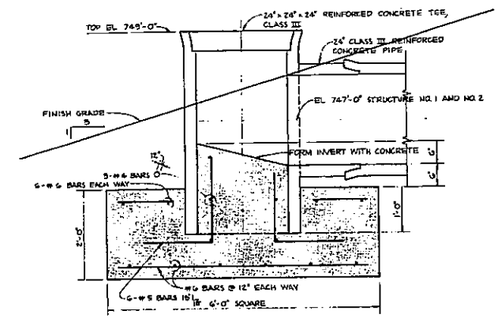


END ELEVATION
SINGLE CULVERT

OUTFALL STRUCTURE
TWO REQUIRED
NO SCALE

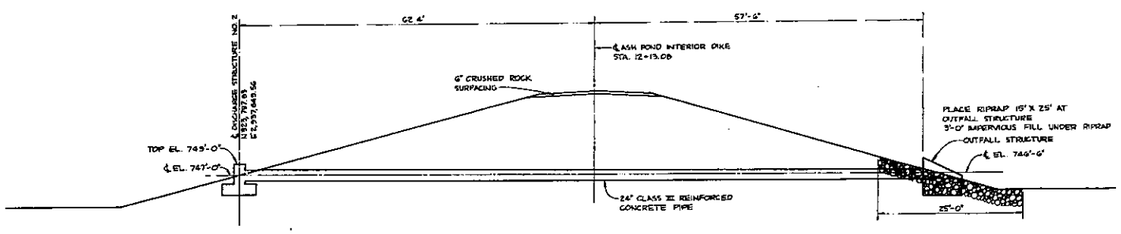


SIDE ELEVATION

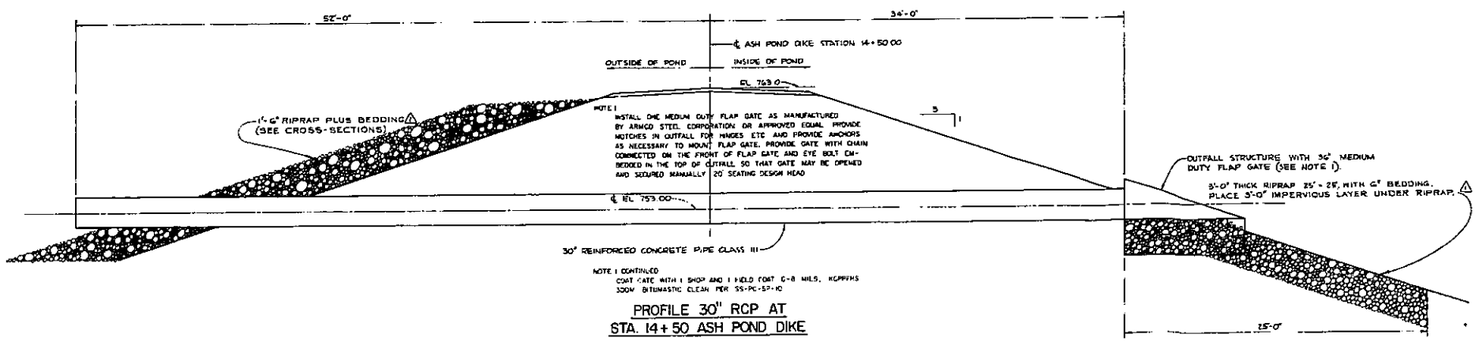


BOTTOM ASH POND DISCHARGE STRUCTURES
TWO REQUIRED
NO SCALE

TABLE FOR DIMENSIONS OF END WALLS			
	24"φ	30"φ	
A	3'-6½"	3'-6½"	
B	3'-2"	3'-2"	
C	2'-6"	4'-0"	
D	--	—	
E	2'-0"	2'-6"	
F	—	—	
G	6'-6½"	6'-6½"	
H	3'-8"	5'-2"	
I	1'-10"	2'-7"	
J	5'-1"	6'-7"	
K	5'-6"	5'-6"	
L	6'-4¼"	6'-4¼"	
M	7'-7¾"	7'-7¾"	
N	6'-11½"	6'-11½"	



PROFILE DISCHARGE LINE
STA. 12+13.08 ASH POND INTERIOR DIKE



NOTE 1 CONTINUED
COAT GATE WITH 1 SHOP AND 1 FIELD COAT 6-8 MILS, KOPPERS 300V BITUMASTIC CLEAN PER SS-PC-SP-10

PROFILE 30" RCP AT
STA. 14+50 ASH POND DIKE

NOTE
THIS DRAWING CONFORMS TO CONSTRUCTION RECORDS
G.M.M. DATE 12-81

REV.	DESCRIPTION	
1	REVISED PER ADDENDUM #1	10-79 G.D.P.

JUL 09 1982

KEVIN F. DAILY LICENSED 2693 KANSAS PROFESSIONAL ENGINEER

BOARD OF PUBLIC UTILITIES
KANSAS CITY, KANSAS

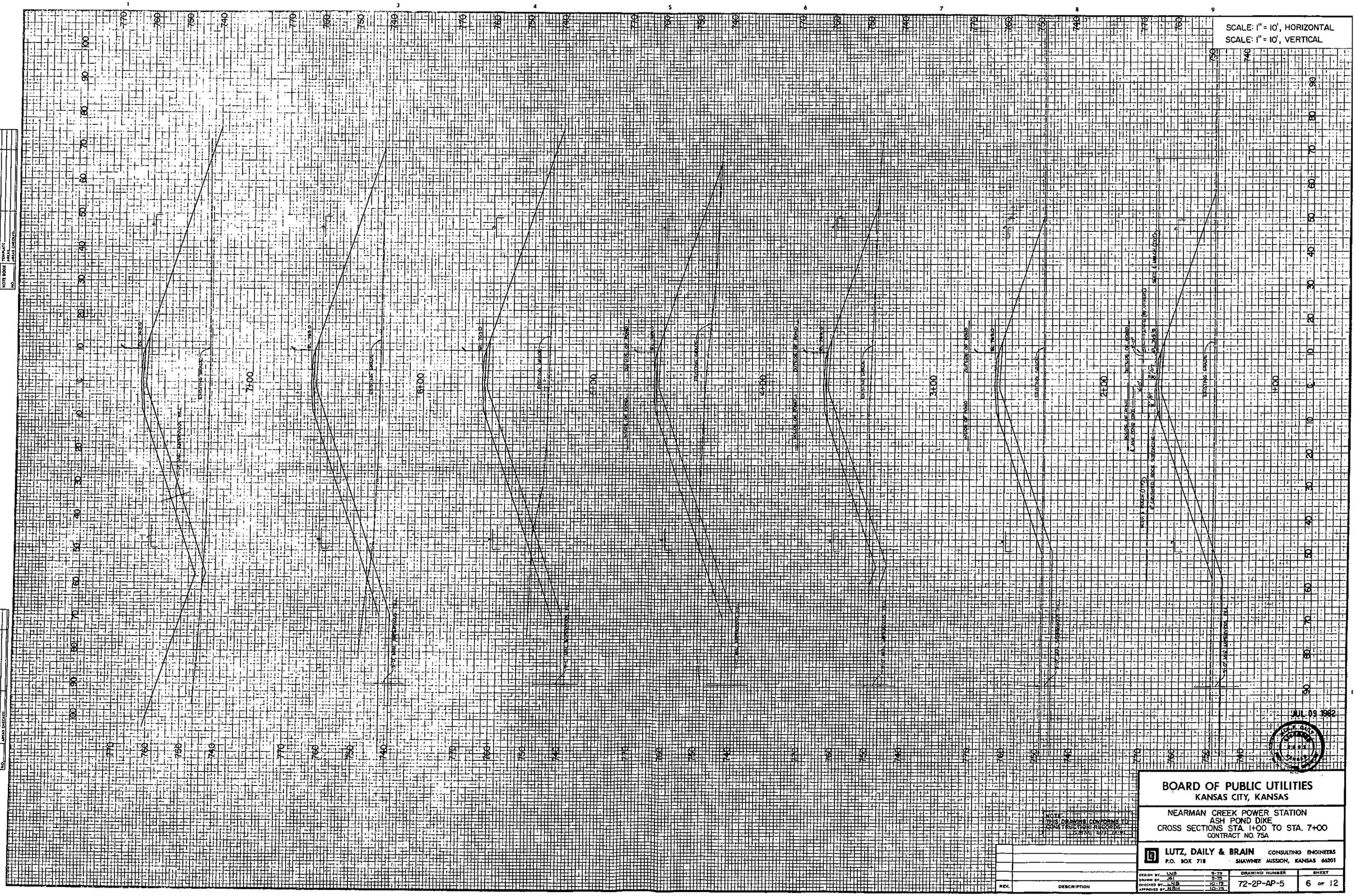
NEARMAN CREEK POWER STATION
CONTRACT NO. 75A

DISCHARGE STRUCTURES DETAILS

LUTZ, DAILY & BRAIN CONSULTING ENGINEERS
P.O. BOX 718 SHAWNEE MISSION, KANSAS 66201

DESIGN BY	LJB	9-79
DRAWN BY	JGI	9-79
CHECKED BY	LNB	10-79
APPROVED BY	RRH	10-79

DRAWING NUMBER	SHEET
72-2P-AP-4	5 OF 12



FINAL SURVEY		BY	DATE
	SURVEYED		
	PLOTTED		
NOTE BOOK	TEMPLATE		
	AREAS		
NO.	AREAS CHECKED		

ORIGINAL SURVEY		BY	DATE
	SURVEYED		
	PLOTTED		
NOTE BOOK	TEMPLATE		
	AREAS		
NO.	AREAS CHECKED		

NOTE:
THIS DRAWING CONFORMS TO CONSTRUCTION RECORDS.
(CERTIFIED AS-BUILT)

REV.	DESCRIPTION

BOARD OF PUBLIC UTILITIES
KANSAS CITY, KANSAS

NEARMAN CREEK POWER STATION
ASH POND DIKE
CROSS SECTIONS STA. 1+00 TO STA. 7+00
CONTRACT NO. 75A

LUTZ, DAILY & BRAIN CONSULTING ENGINEERS
P.O. BOX 718 SHAWNEE MISSION, KANSAS 66201

			DRAWING NUMBER	SHEET
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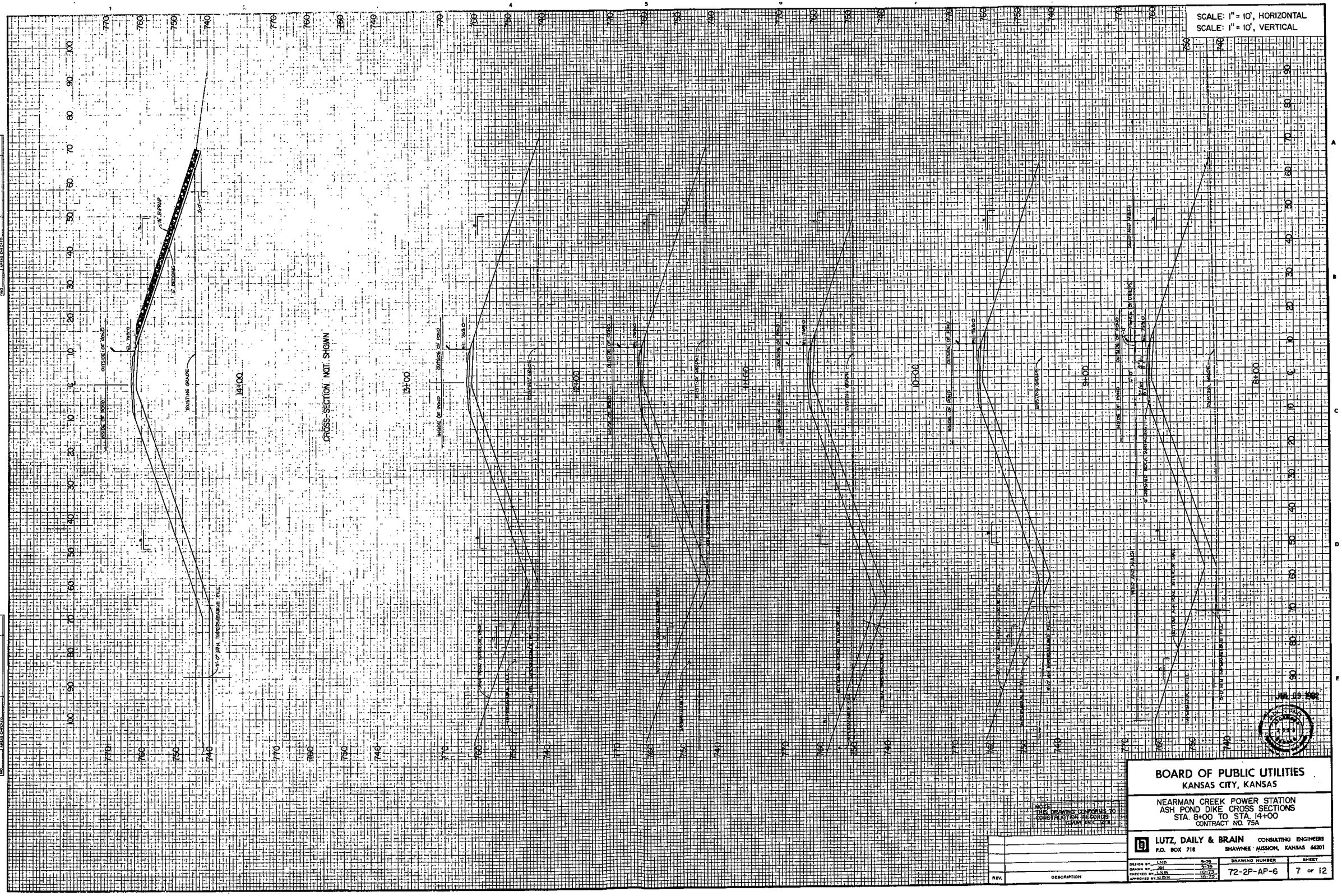
DRAWN BY	JEI	9-79		
CHECKED BY	LNB	10-79		
APPROVED BY	RBH	10-79		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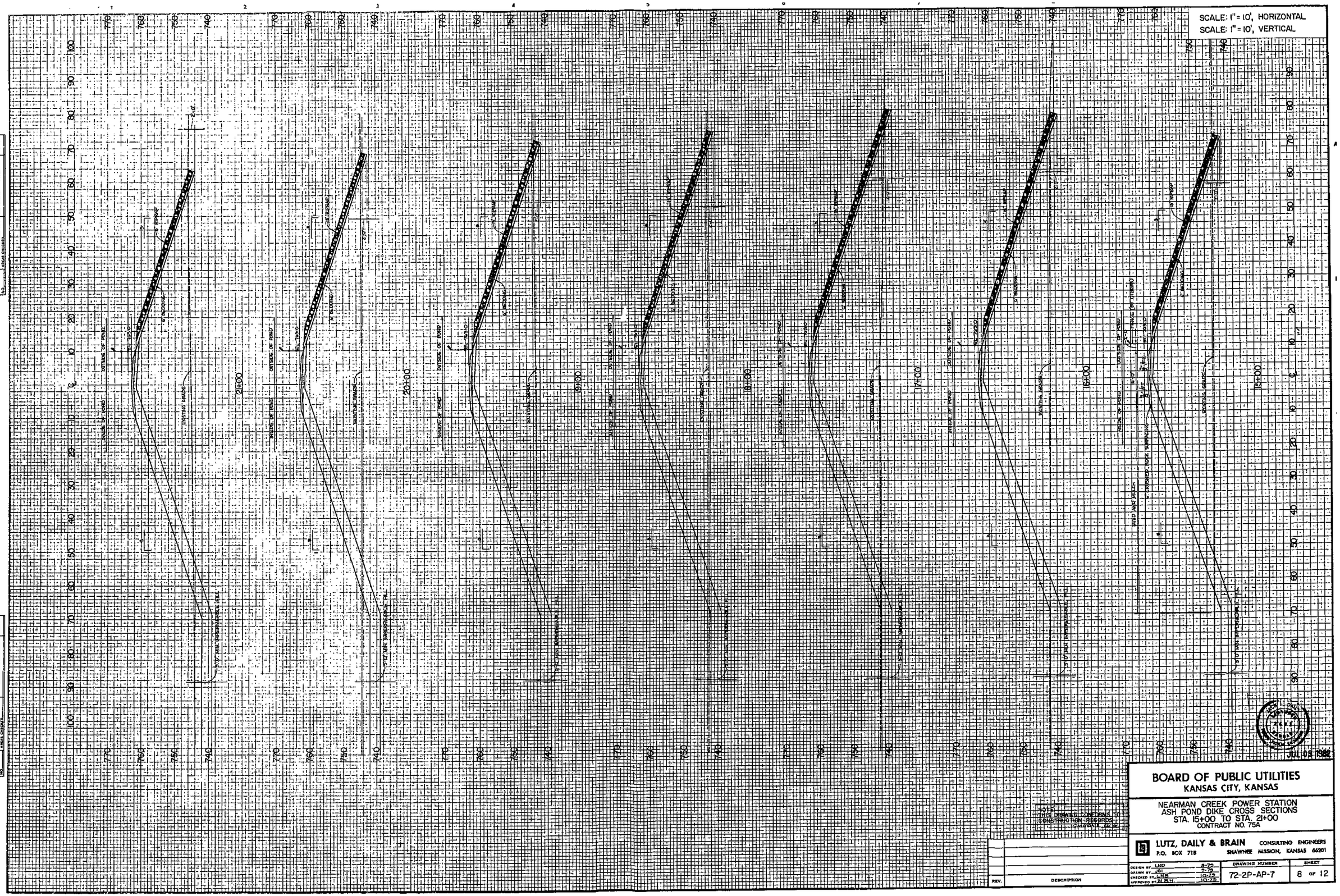
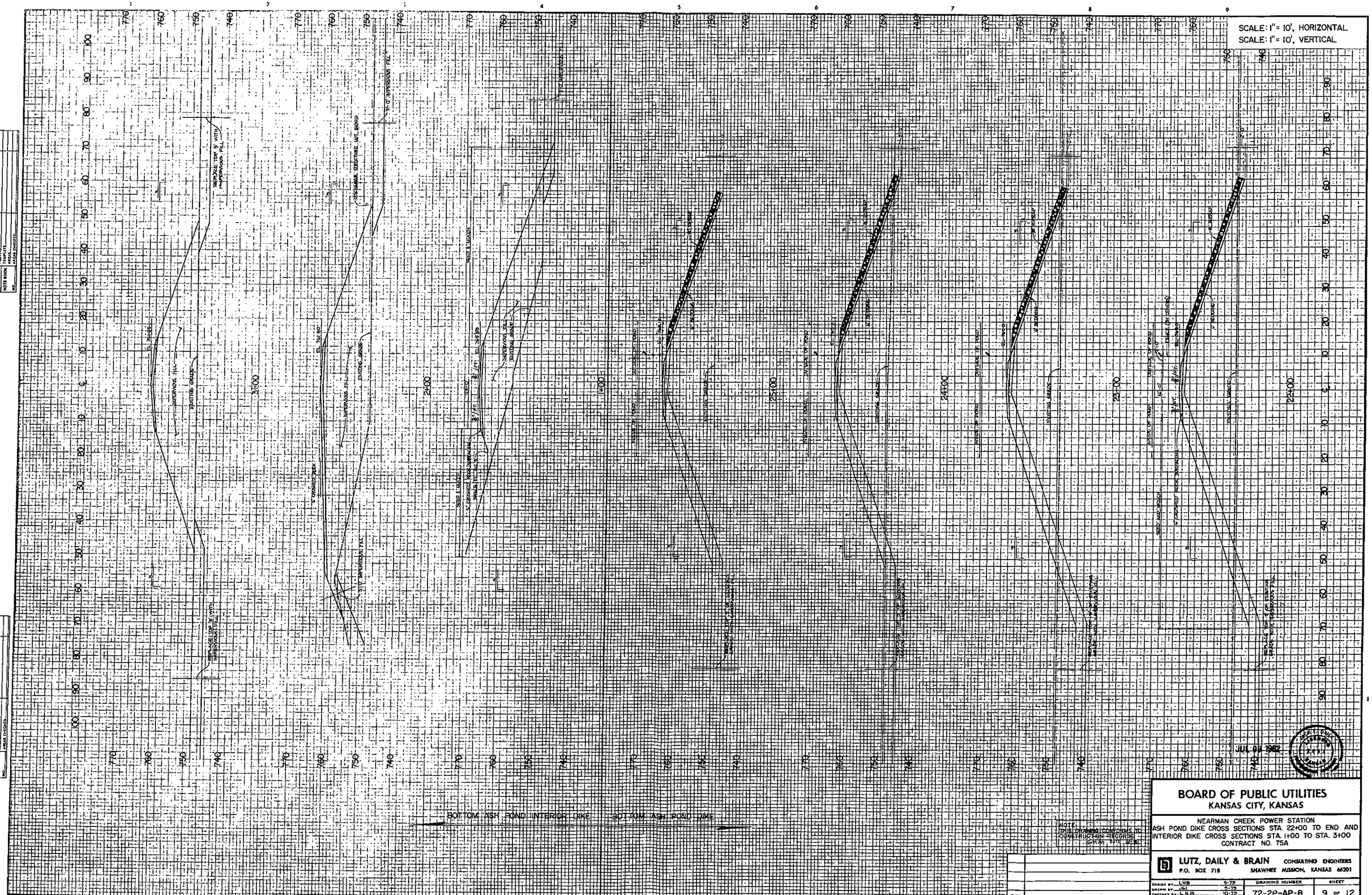
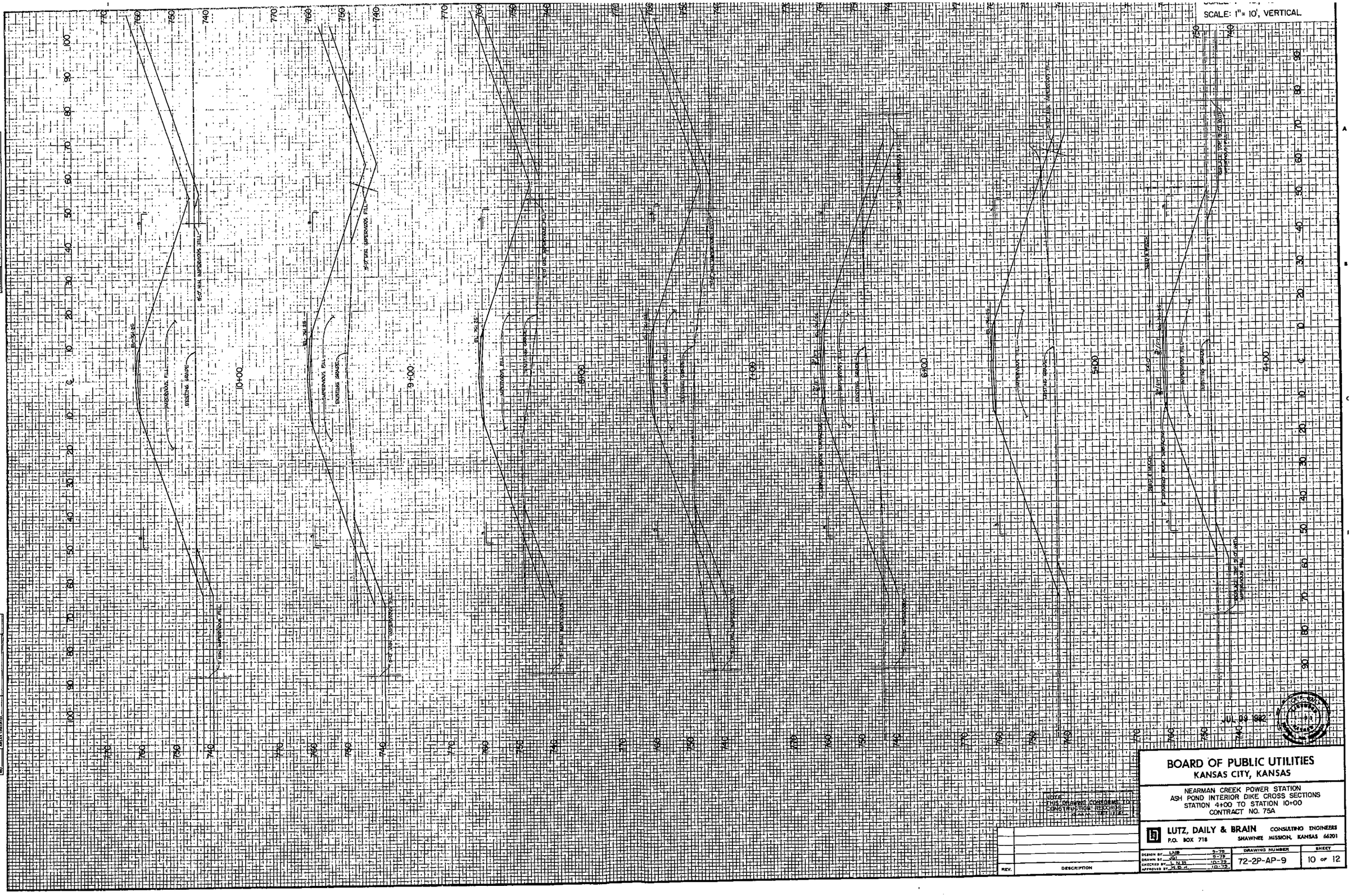
SCALE: 1" = 10', VERTICAL
CROSS-SECTION NOT SHOWN
14+00
13+00
12+00
11+00
10+00
9+00
8+00
EXISTING GRADE
OUTSIDE OF POND
INSIDE OF POND
EDGE OF ROAD
EL. 765.0
16" RIPRAP
6" RECORDS
5'-0" MIN. TOPSOIL
EXISTING PROPERTY
PROPOSED GRADE
EXISTING ROPE
PROPOSED INLET
PROPOSED CREST
CONCRETE BLOCK SURFACING
RECLAIMED SLAG
BOTTOM OF CONCRETE TYPE
SECTION TOPSOIL FILL
UNDISTURBED FILL
ORIGINAL SURVEY
FINAL SURVEY
NOTE BOOK
NO.
BY
DATE
SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
JAN 09 1982
BOARD OF PUBLIC UTILITIES
KANSAS CITY, KANSAS
NEARMAN CREEK POWER STATION
ASH POND DIKE CROSS SECTIONS
STA. 8+00 TO STA. 14+00
CONTRACT NO. 75A
NOTE:
THIS DRAWING CONFORMS TO
CONSTRUCTION RECORDS
(CONT. PAT. 2281)
REV.
DESCRIPTION
LUTZ, DAILY & BRAIN
CONSULTING ENGINEERS
P.O. BOX 718
SHAWNEE MISSION, KANSAS 66201
DESIGN BY LNB 9-72
DRAWN BY JM 9-72
CHECKED BY LNB 10-72
APPROVED BY WBH 10-72
DRAWING NUMBER
72-2P-AP-6
SHEET
7 OF 12


SCALE: 1" = 10', HORIZONTAL
SCALE: 1" = 10', VERTICAL
21+00
20+00
19+00
18+00
17+00
16+00
15+00
EXISTING GRADE
INSIDE OF POND
OUTSIDE OF POND
JUL 09 1982
BOARD OF PUBLIC UTILITIES
KANSAS CITY, KANSAS
NEARMAN CREEK POWER STATION
ASH POND DIKE CROSS SECTIONS
STA. 15+00 TO STA. 21+00
CONTRACT NO. 75A
LUTZ, DAILY & BRAIN
CONSULTING ENGINEERS
P.O. BOX 718
SHAWNEE MISSION, KANSAS 66201
DESIGN BY LJD 2-79
DRAWN BY JG 2-79
CHECKED BY LJD 10-79
APPROVED BY
DRAWING NUMBER
72-2P-AP-7
SHEET
8 OF 12
REV.
DESCRIPTION
FINAL SURVEY
ORIGINAL SURVEY
DATE
BY


SCALE: 1" = 10', HORIZONTAL
SCALE: 1" = 10', VERTICAL
BOTTOM ASH POND INTERIOR DIKE
BOTTOM ASH POND DIKE
EXISTING GRADE
SUPERVISOR FILL
REPLACE TOP 3' WITH IMPERVIOUS FILL
DISCHARGE STRUCTURE NOT SHOWN
3'-0" IMPERVIOUS FILL
SEED AND MULCH
6" CRUSHED ROCK
SEED & MULCH
SEED & MULCH
6" CRUSHED ROCK
SEED & MULCH
6" CRUSHED ROCK
SEED & MULCH
6" CRUSHED ROCK



FINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK TEMPLATE		
AREAS		
NO.	AREAS CHECKED	

ORIGINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK TEMPLATE		
AREAS		
NO.	AREAS CHECKED	

NOTE:
THIS DRAWING CONFORMS TO CONSTRUCTION RECORDS

REV.	DESCRIPTION

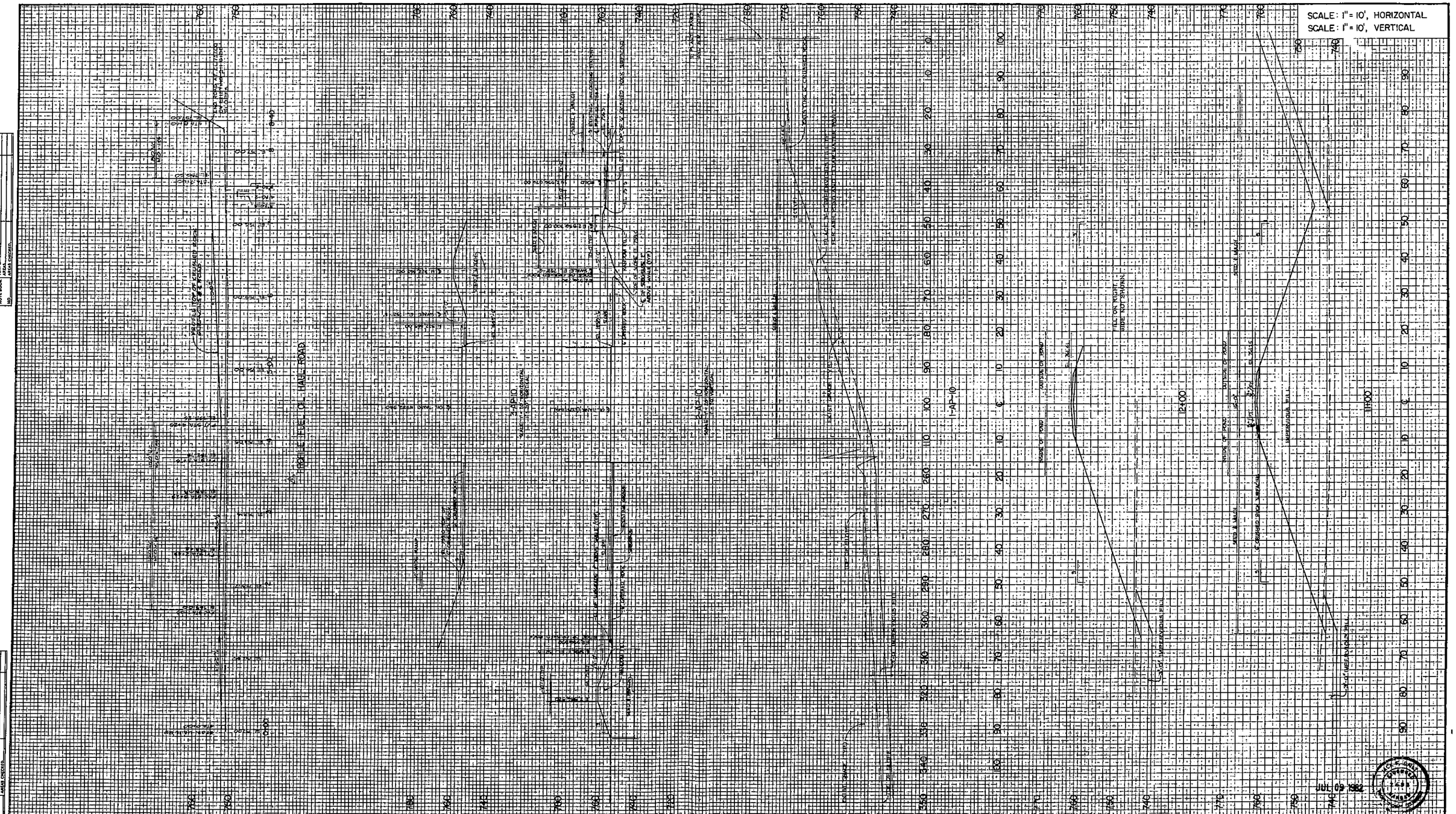
BOARD OF PUBLIC UTILITIES
KANSAS CITY, KANSAS

NEARMAN CREEK POWER STATION
ASH POND INTERIOR DIKE CROSS SECTIONS
STATION 4+00 TO STATION 10+00
CONTRACT NO. 75A

LUTZ, DAILY & BRAIN CONSULTING ENGINEERS
P.O. BOX 718 SHAWNEE MISSION, KANSAS 66201

DESIGN BY	LNB	9-79
DRAWN BY	JGI	9-79
CHECKED BY	L. N. B.	10-79
APPROVED BY	N. B. H.	10-79

DRAWING NUMBER	SHEET
72-2P-AP-9	10 OF 12



NOTE
THIS DRAWING CONFORMS TO CONSTRUCTION RECORDS
GAH 11-6-79

REV.	DESCRIPTION	
1	REVISED GRADES OF FUEL OIL HAUL ROAD	GAH 11-6-79

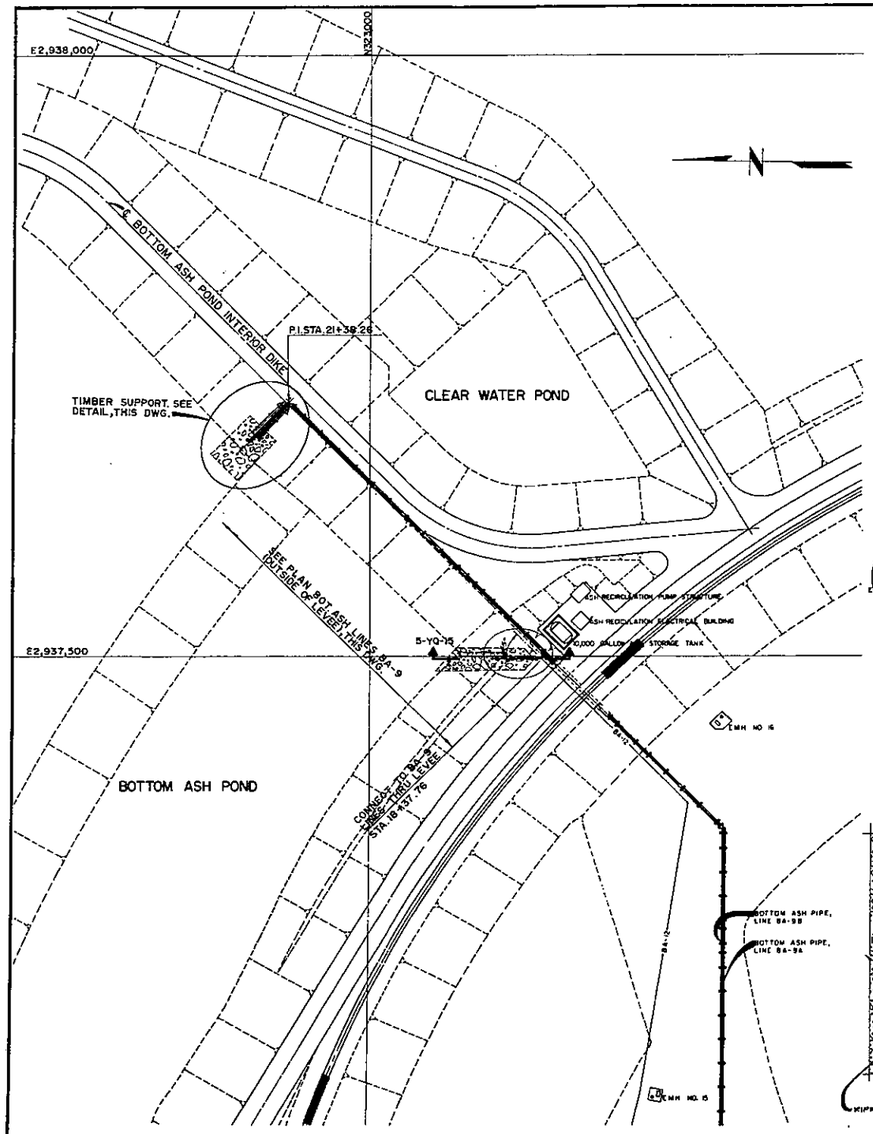
BOARD OF PUBLIC UTILITIES
KANSAS CITY, KANSAS

NEARMAN CREEK POWER STATION
ASH POND INTERIOR DIKE CROSS SECTIONS,
GRADING SECTIONS AND ROAD PROFILE
CONTRACT NO. 75A

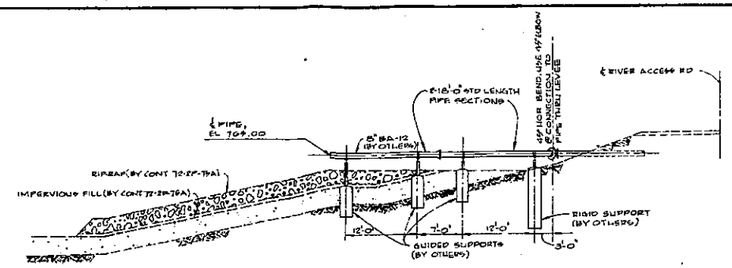
LUTZ, DAILY & BRAIN CONSULTING ENGINEERS
P.O. BOX 718 SHAWNEE MISSION, KANSAS 66201

DESIGN BY LNB	9-79	
DRAWN BY JGL G.D.P.	9-79	
CHECKED BY L.N.B.	10-79	
APPROVED BY M.D.H.	10-79	

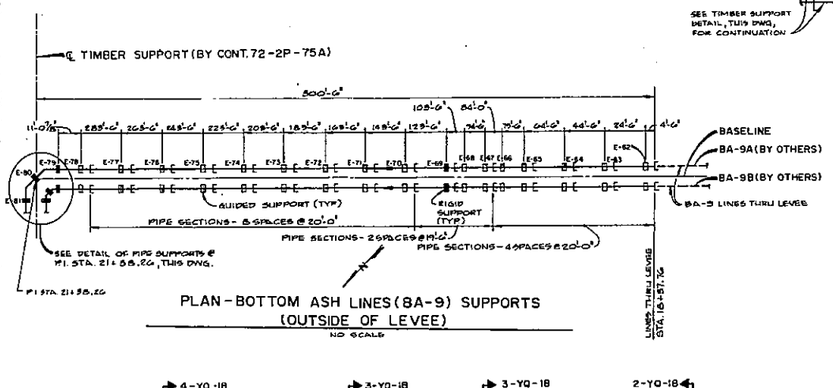
DRAWING NUMBER	SHEET
72-2P-AP-10	11 OF 12



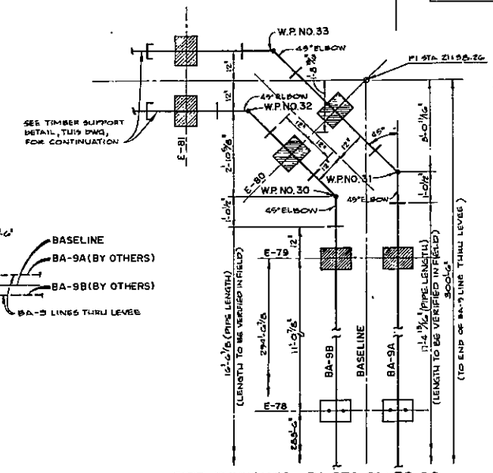
PLAN
SCALE: 1" = 60'-0"



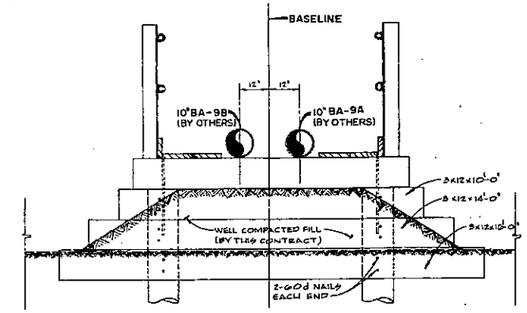
SECTION 5-YQ-18
8" BA-12 LINE DISCHARGE
SCALES: HOR. 1" = 10'-0" VERT. 1" = 10'-0"



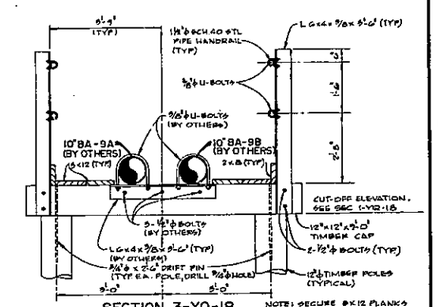
PLAN - BOTTOM ASH LINES (8A-9) SUPPORTS
(OUTSIDE OF LEVEE)
NO SCALE



PIPE SUPPORTS - P.I. STA. 21+38.26
NO SCALE

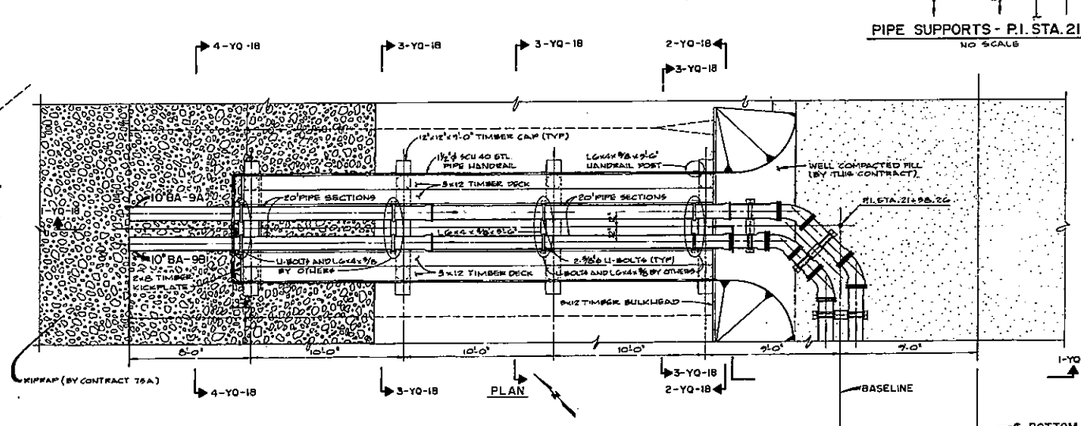


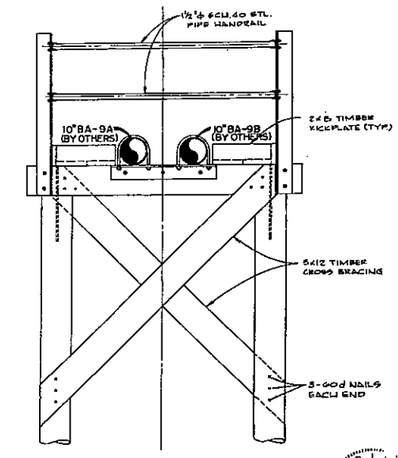
SECTION 2-YQ-18
SCALE: 1/2" = 1'-0"



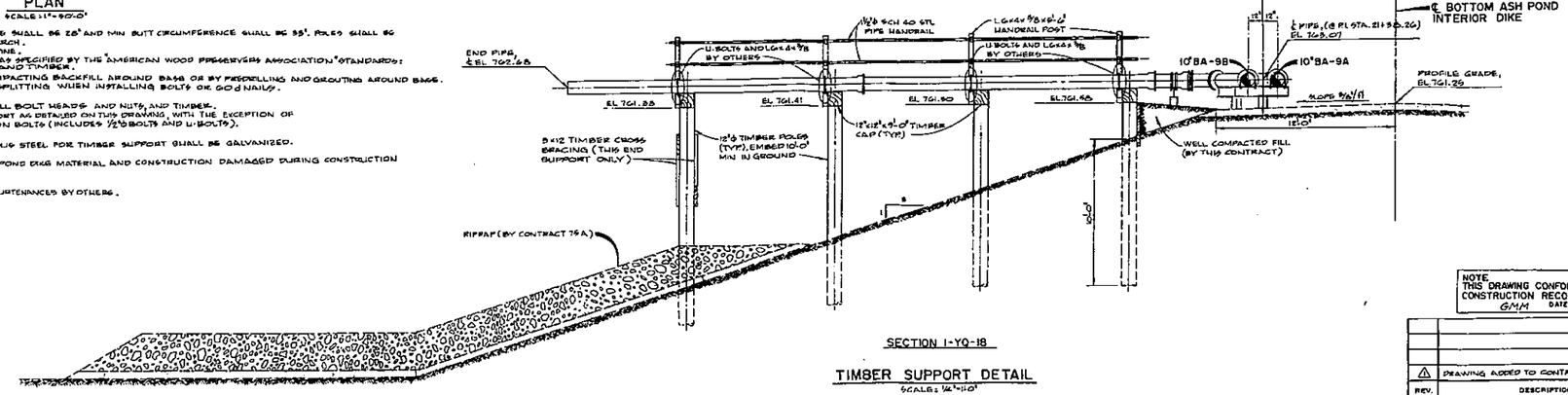
SECTION 3-YQ-18
SCALE: 1/2" = 1'-0"

NOTE: SECURE 8" x 12" PLANKS TO CAP WITH 3-60d NAILS. SPLICE PLANKS @ CAP.





SECTION 4-YQ-18
SCALE: 1/2" = 1'-0"



SECTION 1-YQ-18

TIMBER SUPPORT DETAIL
SCALE: 1/2" = 1'-0"

GENERAL NOTES:

1. POLES SHALL CONFORM TO ASTM D-25, MIN TIP CIRCUMFERENCE SHALL BE 28" AND MIN BUTT CIRCUMFERENCE SHALL BE 35". POLES SHALL BE SOUTHERN PINE, PACIFIC COAST DOUGLAS FIR, OR WESTERN LARCH.
2. LUMBER AND TIMBER SHALL BE DOUGLAS FIR OR SOUTHERN PINE.
3. POLES, LUMBER, AND TIMBER SHALL BE CREOSOTE TREATED AS SPECIFIED BY THE "AMERICAN WOOD PRESERVERS ASSOCIATION" STANDARDS: SECTION C9 FOR POLES, SECTION C2 FOR LUMBER AND TIMBER.
4. POLES MAY BE PLACED BY PREDRILLING AND FIRMLY COMPACTING BACKFILL AROUND BASE OR BY PREDRILLING AND GROUTING AROUND BASE.
5. TIMBERS SHALL BE PREDRILLED AS REQUIRED TO AVOID SPLITTING WHEN INSTALLING BOLTS OR 60d NAILS.
7. MALEABLE IRON WASHERS SHALL BE USED BETWEEN ALL BOLT HEADS AND NUTS, AND TIMBER.
8. THIS CONTRACTOR SHALL CONSTRUCT ONLY THE TIMBER SUPPORT AS DETAILED ON THIS DRAWING, WITH THE EXCEPTION OF OF THE 4 - L6x4x⅜ x 3'-0", AND THE NECESSARY INSTALLATION BOLTS (INCLUDES ½" ϕ BOLTS AND U-BOLTS).
9. PIPE RAILING, HANDRAIL POSTS, BOLTS AND MISCELLANEOUS STEEL FOR TIMBER SUPPORT SHALL BE GALVANIZED.
10. THIS CONTRACTOR SHALL RESTORE ALL LEVEE AND ASH POND DIKE MATERIAL AND CONSTRUCTION DAMAGED DURING CONSTRUCTION OF BOTTOM ASH PIPE TIMBER SUPPORT.
11. BOTTOM ASH PIPES, RIGID AND GUIDED SUPPORTS, AND PIPE APPURTENANCES BY OTHERS.

NOTE
THIS DRAWING CONFORMS TO CONSTRUCTION RECORDS
G/MM DATE 1-82

REV.	DESCRIPTION
1	DRAWING ADDED TO CONTRACT GLH 7-8-80

JUL 09 1982

FRED J. LUTZ LICENSED 6485 KANSAS PROFESSIONAL ENGINEER

BOARD OF PUBLIC UTILITIES
KANSAS CITY, KANSAS

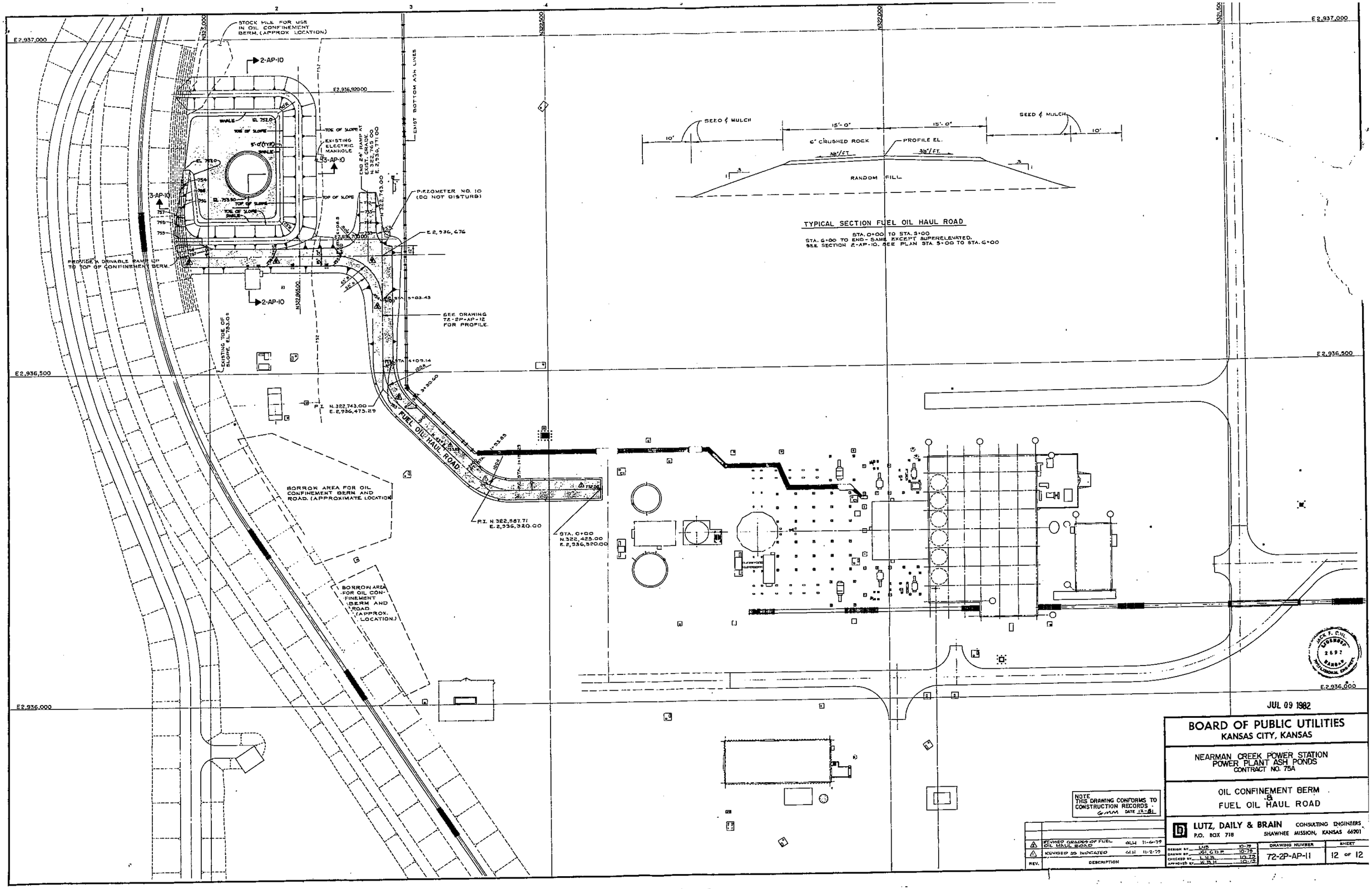
NEARMAN CREEK POWER STATION
POWER PLANT ASH PONDS
CONTRACT NUMBER 75A

BOTTOM ASH PIPE TIMBER SUPPORT

LUTZ, DAILY & BRAIN CONSULTING ENGINEERS
P.O. BOX 718 SHAWNEE MISSION, KANSAS 66201

DESIGN BY	FDF	1-80	
DRAWN BY	GLH	1-80	
CHECKED BY	JAB	1-80	
APPROVED BY		1-80	

DRAWING NUMBER	SHEET
72-2P-YQ-18A	11A of 12


STOCK MILE FOR USE IN OIL CONFINEMENT BERM. (APPROX LOCATION)
2-AP-10
3-AP-10
EXISTING ELECTRIC MANHOLE
END 24" RAMP EXIST. GRADE N 322,765.00 E 2,936,771.00
PIEZOMETER NO. 10 (DO NOT DISTURB)
E 2,936,676
PROVIDE A DRIVABLE RAMP UP TO TOP OF CONFINEMENT BERM.
EXISTING TOE OF SLOPE EL. 752.0±
EXIST. BOTTOM ASH LINES
SEE DRAWING 72-2P-AP-12 FOR PROFILE.
P.I. N 322,743.00 E 2,936,473.29
FUEL OIL HAUL ROAD
BORROW AREA FOR OIL CONFINEMENT BERM AND ROAD. (APPROXIMATE LOCATION)
P.I. N 322,587.71 E 2,936,320.00
STA. 0+00 N 322,425.00 E 2,936,320.00
BORROW AREA FOR OIL CONFINEMENT BERM AND ROAD (APPROX. LOCATION)
E2,937,000
E2,936,500
E2,936,000
SEED & MULCH
6" CRUSHED ROCK
PROFILE EL.
RANDOM FILL
TYPICAL SECTION FUEL OIL HAUL ROAD
STA. 0+00 TO STA. 3+00
STA. 6+00 TO END - SAME EXCEPT SUPERELEVATED.
SEE SECTION E-AP-10. SEE PLAN STA. 3+00 TO STA. 6+00
JACK F. CIVIL
2692
KANSAS
PROFESSIONAL ENGINEER
JUL 09 1982
BOARD OF PUBLIC UTILITIES
KANSAS CITY, KANSAS
NEARMAN CREEK POWER STATION
POWER PLANT ASH PONDS
CONTRACT NO. 75A
OIL CONFINEMENT BERM & FUEL OIL HAUL ROAD
LUTZ, DAILY & BRAIN CONSULTING ENGINEERS
P.O. BOX 718 SHAWNEE MISSION, KANSAS 66201
NOTE THIS DRAWING CONFORMS TO CONSTRUCTION RECORDS
REVISED GRADES OF FUEL OIL HAUL ROAD GLH 11-6-79
REVISED AS INDICATED GLH 11-2-79
REV. DESCRIPTION
DESIGN BY LJB 10-79
DRAWN BY JGL, G.D.P. 10-79
CHECKED BY L.J.B. 10-79
APPROVED BY W.B.H. 10-79
DRAWING NUMBER 72-2P-AP-11
SHEET 12 OF 12

Doc 03: Landfill Inspection and Tracking Form

7.22.10 Route State Inspection
Laura Routh

Kansas City Board of Public Utilities

LANDFILL INSPECTION AND TRACKING FORM

PLEASE CHECK THE APPROPRIATE BOX:

Nearman Creek Power Station 4240 N. 55th Street Kansas City, KS 66104 Bottom Ash and Fly Ash	Maywood 9700 Parallel Parkway Kansas City, KS 66112 Wood Chips Permit No. 533	Quindaro Power Station 3601 N. 12th Street Kansas City, KS 66104 Ash Fill Permit NO. 210
☐	☐	☐

10 AM

INSPECTION CHECKLIST: Please Check the Appropriate Box

	YES	NO	N/A	COMMENTS/ CORRECTIVE ACTIONS
1 Evidence of Runoff?		X		
2 Condition of vegetation ok?	X			
3 Evidence of erosion?		X		
4 Berms or levies in good condition?	X			
5 Other types of waste or trash present?		X		
6 Condition of storm drains?			X	
7 Security gate locked?	X			

ESD PERSONNEL PRINTED NAME	ESD TITLE
INGRID STEZLER	SR. ENV. SCIENTIST
ESD PERSONNEL SIGNATURE	**DATE**
[signature]	7.22.10

- Fly Ash Landfill → Bottom Ash ~~is~~ Being hauled off operations temporarily haulted. Bottom ash in Road - Need to REMOVE bottom ~~ash~~ from Rd

Kansas City Board of Public Utilities

LANDFILL INSPECTION AND TRACKING FORM

File Copy

PLEASE CHECK THE APPROPRIATE BOX:

Nearman Creek Power Station 4240 N. 55th Street Kansas City, KS 66104 Bottom Ash and Fly Ash	Maywood 9700 Parallel Parkway Kansas City, KS 66112 Wood Chips Permit No. 533	Quindaro Power Station 3601 N. 12th Street Kansas City, KS 66104 Ash Fill Permit NO. 210
☒	☐	☐

INSPECTION CHECKLIST: Please Check the Appropriate Box

	YES	NO	N/A	COMMENTS/ CORRECTIVE ACTIONS
1 Evidence of Runoff?		X		
2 Condition of vegetation ok?	X			
3 Evidence of erosion?		X		
4 Berms or levies in good condition?	X			
5 Other types of waste or trash present?		X		Keep debris out of
6 Condition of storm drains?			X	
7 Security gate locked?		X		in use at time.

ESD PERSONNEL PRINTED NAME	ESD TITLE
W. Charles Hoyle II	Staff Scientist
ESD PERSONNEL SIGNATURE	**DATE**
W. Ch Hoyle II	4/29/10

Kansas City Board of Public Utilities

LANDFILL INSPECTION AND TRACKING FORM

PLEASE CHECK THE APPROPRIATE BOX:

Nearman Creek Power Station 4240 N. 55th Street Kansas City, KS 66104 Bottom Ash and Fly Ash	Maywood 9700 Parallel Parkway Kansas City, KS 66112 Wood Chips Permit No. 533	Quindaro Power Station 3601 N. 12th Street Kansas City, KS 66104 Ash Fill Permit NO. 210
☒	☐	☐

INSPECTION CHECKLIST: Please Check the Appropriate Box

	YES	NO	N/A	COMMENTS/ CORRECTIVE ACTIONS
1 Evidence of Runoff?		X		
2 Condition of vegetation ok?	X			
3 Evidence of erosion?		X		
4 Berms or levies in good condition?	X			
5 Other types of waste or trash present?		X		
6 Condition of storm drains?			✓	OK
7 Security gate locked?	X			At plant

ESD PERSONNEL PRINTED NAME	ESD TITLE
INGRID SEFLER	SR. ENV. SCIENTIST
ESD PERSONNEL SIGNATURE	**DATE**
[signature]	8.19.09

Kansas City Board of Public Utilities

LANDFILL INSPECTION AND TRACKING FORM

PLEASE CHECK THE APPROPRIATE BOX:

Nearman Creek Power Station 4240 N. 55th Street Kansas City, KS 66104 Bottom Ash and Fly Ash	Maywood 9700 Parallel Parkway Kansas City, KS 66112 Wood Chips Permit No. 533	Quindaro Power Station 3601 N. 12th Street Kansas City, KS 66104 Ash Fill Permit NO. 210
☒	☐	☐

INSPECTION CHECKLIST: Please Check the Appropriate Box

	YES	NO	N/A	COMMENTS/ CORRECTIVE ACTIONS
1 Evidence of Runoff?		X		
2 Condition of vegetation ok?	X			
3 Evidence of erosion?		X		
4 Berms or levies in good condition?	X			
5 Other types of waste or trash present?		X		
6 Condition of storm drains?	X			
7 Security gate locked?	X			

ESD PERSONNEL PRINTED NAME	ESD TITLE
INGRID SETZLER	SENIOR ENV. SCIENTIST
ESD PERSONNEL SIGNATURE	**DATE**
[signature]	4/7/09

NOTES: performed when KDHE was present

Kansas City Board of Public Utilities

LANDFILL INSPECTION AND TRACKING FORM

PLEASE CHECK THE APPROPRIATE BOX:

Nearman Creek Power Station 4240 N. 55th Street Kansas City, KS 66104 Bottom Ash and Fly Ash	Maywood 9700 Parallel Parkway Kansas City, KS 66112 Wood Chips Permit No. 533	Quindaro Power Station 3601 N. 12th Street Kansas City, KS 66104 Ash Fill Permit NO. 210
☒	☐	☐

INSPECTION CHECKLIST: Please Check the Appropriate Box

	YES (good)	NO	N/A	COMMENTS/ CORRECTIVE ACTIONS
1 Evidence of Runoff?		X		
2 Condition of vegetation ok?	X			
3 Evidence of erosion?		X		some on drive at Fly Ash
4 Berms or levies in good condition?	X			
5 Other types of waste or trash present?		X		
6 Condition of storm drains?	X			OK
7 Security gate locked?	X			

ESD PERSONNEL PRINTED NAME	ESD TITLE
INGRID SETZLER	SR. ENV. SCIENTIST
ESD PERSONNEL SIGNATURE	**DATE**
[signature]	2/10/09

Kansas City Board of Public Utilities

LANDFILL INSPECTION AND TRACKING FORM

PLEASE CHECK THE APPROPRIATE BOX:

Nearman Creek Power Station
4240 N. 55th Street
Kansas City, KS 66104
Bottom Ash and Fly Ash
☐

Maywood
9700 Parallel Parkway
Kansas City, KS 66112
Wood Chips
Permit No. 533
☐

Quindaro Power Station
3601 N. 12th Street
Kansas City, KS 66104
Ash Fill
Permit NO. 210
☐

INSPECTION CHECKLIST: Please Check the Appropriate Box

	YES	NO	N/A	COMMENTS/ CORRECTIVE ACTIONS
1 Evidence of Runoff?		X		
2 Condition of vegetation ok?	X			
3 Evidence of erosion?		X		
4 Berms or levies in good condition?	X			
5 Other types of waste or trash present?		X		
6 Condition of storm drains?	ok		X	
7 Security gate locked?	X			

ESD PERSONNEL PRINTED NAME: JACQUELYN SEGELER	ESD TITLE: SR. ENV. SCIENTIST
ESD PERSONNEL SIGNATURE: [signature]	DATE: 11/13/08

Doc 04: Terracon Report

FILE COPY

GEOTECHNICAL REPORT
EROSION, ASH PONDS DIKE SLOPES
NEARMAN POWER PLANT
KANSAS CITY, KANSAS

PROJECT NO. 02085136
JUNE 20, 2008

Prepared for:

KC BOARD OF PUBLIC UTILITIES
Kansas City, Kansas

Prepared by:

Terracon
Lenexa, Kansas

Terracon

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Letter of Transmittal	i
INTRODUCTION	1
FIELD OBSERVATIONS	1
EROSION	2
WAVE ACTION	3
RIP-RAP	3
Stone Size	3
Erosion Gullies	4
GENERAL COMMENTS	5

APPENDIX A

Figures

APPENDIX B

Manufacturer's Specifications

June 20, 2008

Terracon

Consulting Engineers & Scientists

Terracon Consultants, Inc.
13910 W. 96th Terrace
Lenexa, KS 66215
Phone (913) 492-7777
Fax (913) 492-7443
www.terracon.com

KC Board of Public Utilities
Nearman Power Station
4240 N 55th Street
Kansas City, Kansas 66104

Attention: Mr. Hoang Nguyen, P.E.

Re: Geotechnical Report
Erosion, Ash Ponds Dike Slopes
Nearman Power Plant
Kansas City, Kansas
Project No. 02085136

Gentlemen:

Terracon Consultants, Inc. (Terracon) has completed a desk-top study regarding erosion problems and mitigation for the dike slopes of Ash Ponds at Nearman Power Plant in Kansas City, Kansas. The report is based on our field observations and the available information on the design of the ash pond dikes and the climatic data on prevailing winds. The purpose of this report is to study the erodability characteristics of the dike materials and assess the impact of erosion due to waves and surface water runoff. Suggested remedial measures are also presented in the attached report.

We appreciate the opportunity of providing this service to the Near Power Plant. If we can be of further assistance please contact the undersigned.

Sincerely,
Terracon Consultants, Inc.

LOK M. SHARMA
LICENSED
12448
KANSAS
PROFESSIONAL ENGINEER

Lok M. Sharma, P.E.
Kansas: 12448

per James M. Landrum, P.E.
Kansas: 15074

Enclosures

Copies to: Addressee (3)

GEOTECHNICAL REPORT
EROSION, ASH PONDS DIKE SLOPES
NEARMAN POWER PLANT
KANSAS CITY, KANSAS

PROJECT NO. 02085136
JUNE 20, 2008

INTRODUCTION

At the Nearman Power plant, owned and operated by the Board of Public Utilities in Kansas City, Kansas, the bottom ash from the coal fired plant is hydraulically transported to the ash ponds located adjacent and east of the existing power plant. The layout of the ash pond and other facilities is shown in the attached Figure 1.

The slurried ash is sluiced into the ash pond at one end while the water from the other end of the pond is circulated back to the plant. Adjacent to the ash pond is another pond which stores any excess water. The sluicing of slurry results in solids being dropped near the discharge end of the pipe and the water moving to the low area of the pond. Most of the time, standing water is present in the pond.

The slurry and the deposited ash in the ponds are retained by the perimeter dikes. The inside slopes of the perimeter dikes are subject to erosion due to the wave action in the pond as well as from surface water runoff. The on-going erosion has resulted in high maintenance costs for these ponds.

Terracon was retained to perform a desk top study. This study included evaluating the wave action on the slopes and ensuing erosion and providing recommended remedial measures for the erosion. The following report summarizes the study.

FIELD OBSERVATIONS

The original design drawings indicated the retaining dikes were constructed out of lean to fat clay soils. The design drawings also called for 18 inch thick rip-rap with filter bedding on the upstream slope. Terracon's Lok Sharma, P.E., in company with Mr. Hoang Nguyen of the Nearman plant, made a field visit to observe the conditions. The field observations are noted below:

- The existing dike upstream slope was designed to be at 3H:1V. The existing slope is nearly 3H:1V except in eroded areas.
- The toe of the existing dike at the time of our field trip was under water or buried in ash.
- There were several erosion gullies formed on the slope at various locations.
- Some of the erosion gullies had been previously filled by dumping crushed rock without any filter bedding or geotextile filter fabric underneath.

- Rip-rap was present on the upstream slope of the dikes. The rip-rap was mostly visible in the upper parts of the slope. The erosion gullies in the slope were mostly from surface water runoff.

- At the toe of the upstream slope near the water's edge, there appeared to be more erosion in the north part of the dike. The upstream slope above the water's edge has sporadic vegetation.

- The upstream slope in some places was devoid of any rip-rap and thus had developed erosion gullies.

From our field observations it appears the maintenance and repair methods adopted by the plant personnel is to dump coarse rock fill material in the eroded areas from time to time. Other than erosion, the stability of the dike embankment appears to be adequate.

EROSION

Due to prevailing wind direction, some of the dike slopes have experienced erosion and loss of shoreline from wave action in the pond. At this site, erosion can take place due to several factors:

- Precipitation in the form of rain displaces soil particles. On sloping ground, the particles are transported by over ground flow. On mild slopes, the flow of water on soil is a shallow sheet flow.

- Overland flow enroute to low lying areas creates rills and gullies.

- Moving water exerts erosive forces. In lakes and ponds, the energy of the wave is dissipated along the shoreline resulting in erosion.

- In lakes and ponds, the height and force of the waves are a function of the fetch, the length of the water surface windward. The waves need not be high to be erosive. Small but persistent ripples could also erode the shoreline.

To evaluate the wind action, we studied the available climatic data for the site. The prevailing wind direction and velocities are normally presented in the graphical form of "Wind Rose". The wind rose gives the percentage of time the wind blows in specified direction. A typical wind rose for this area is shown in Figures 2 to 5. This wind rose shows the prevailing wind direction at this site to be from South, Southwest (SSW) direction. Sustained wind velocity is about 12 miles/hour.

WAVE ACTION

Based on the fetch length and wind gusts up to 50 miles/hr we estimated the wave height that could be generated in the pond area. Our estimate shows that wave heights of about 18 inches can develop in these ponds. These waves most of the time are impacting the dike slope in the north-north-east directions. The steady impact of these waves creates erosion at least to the height of the wave plus the wave run up the slope. In order for the dike not to be breached by the wave action, the minimum freeboard above the high water level in the pond should be at least three (3) feet. Because the dikes are already constructed, the water level in these ponds should not be allowed to rise to within three feet of the top of the dike.

RIP-RAP

Stone Size

For a shallow water wave action, the size of rip rap may be computed using the following formula as used by California Department of Transportation:

$$W := \frac{0.0023 H^3 sgr \csc^3(\rho - \alpha)}{\left(\frac{sgr}{sgw} - 1\right)^3}$$

Where
- W = minimum weight in tons of outside stones for no damage
- Sgr = specific gravity of stones
- Sgw = specific gravity of water
- ρ = 70 degrees for randomly placed rubble.
- a = angle of face slope from horizontal
- H = significant wave height

Based on the above formula, we estimate minimum stone size for rip rap to be 8 inches in diameter. The rip-rap should be founded in a toe trench at the base as shown in the attached Figure 6. The rip-rap at this location should be carried up the slope for at least three (3) feet above the high water level. The thickness of the protection should be at least twice the minimum stone size, thus 16 to 18 inches in this case.

The anticipated wave action at this site will be along the north portions of the dike slope. These slopes should have sufficient rip-rap to prevent erosion from waves. The extent of the slopes requiring the heavy riprap is shown in Figure 7. The rip-rap slopes or slopes protected with crushed stone should have a filter backing so that the soils underneath will not be eroded. The filter backing could be graded mineral filter or synthetic geotextile filter fabric. Because of ease of installation, we recommend the following geotextile filter fabric be used underneath rip rap:

Geotextile filter fabric: Non woven synthetic fibers formed into non-woven fabric
Amoco 4553 or equal
Grab tensile strength = 200 lbs (ASTM D-4632)
Grab tensile elongation = 50% (ASTM D-4632)
Puncture =130 lbs (ASTM D-4833)
Apparent Opening size = #100 US Sieve

The geotextile should be covered with 4 inches of granular material such KDOT AB-3 rock to provide a cushion for the rip-rap. The AB-3 layer will also minimize damage to the geotextile during Rip-rap placement.

Erosion Gullies

To repair the existing gullies, we suggest the following procedures:

Areas where erosion gullies have formed are devoid of rip rap materials. The practice of randomly dumping crushed rock in the eroded gullies only provides temporary relief until such time the water undermines the soil below and causes the crushed rock to slide into the pond. The following procedures should be adopted to repair these gullies;

- Clean out any loose material from the gully
- Place a layer of geotextile. Bury the end of geotextile into soil.
- Place coarse 4 to 6 inch thick granular material such AB-3.
- Place coarse rip-rap (6 to 8 inch size) on top of the AB-3 bedding. Bring to grade.
- In non rip-rap areas where gullies are shallow and are primarily formed by surface water, rework the material and fill back with compacted soil. Vegetate with grass and use netting or similar temporary erosion control blankets to establish vegetation.
- This repair technique is shown in the attached Figure 8.

For areas of severe erosion, there are several structural options that can be adopted:

1. Rock-Wire (gabion) mattress

   A Rock-Wire mattress is a flexible wire basket mattress filled with 3-inch size rock. Commonly available mattresses are manufactured by Macaferri Gabions and Reno Gabions. A schematic is shown in the attached Figure 9.

2. Driven PVC sheet piles

   This is a commercially available PVC sheet piling system manufactured by "Shore Guard". The attached Figure 10 shows a schematic of PVC sheet pile for shore protection.

3. Geosynthetic products – "Terracell" or Geoweb"

   A manufactured product such as "Terracell" can be effectively used to check erosion on the slopes. A schematic is shown in Figure 11. The product specifications of some manufacturers are attached. It is a light weight, flexible mat which confines the native soil and prevents it from being transported by the water.

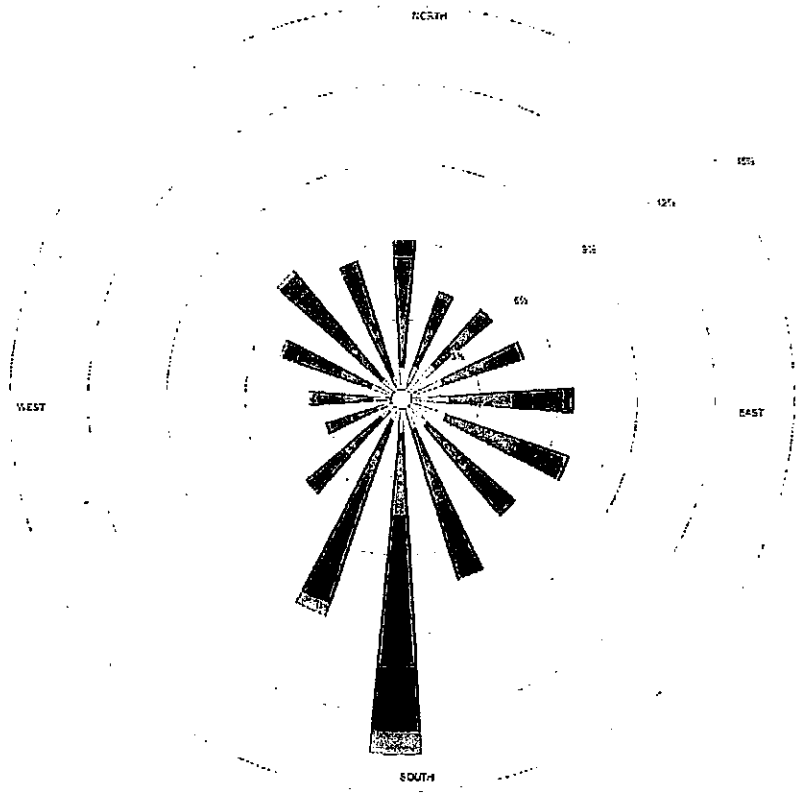
GENERAL COMMENTS

Erosion control does not lend itself to one universal treatment. We have discussed various methods of treating the observed erosion at the site. These methods are easily adoptable. The well tried approach of rip-rap (with filter underneath) should work in most places. However, rip-rap does require regular maintenance. The rip-rap should not be allowed to be undermined by erosion of the underlying soils. The potential for erosion makes the need for filter underneath the rip rap essential. Use of "Terracell" for non rip-rap areas is quite effective; however, establishing vegetation may be a more economical option. Even with the recommended repair options, without proper maintenance, erosion could continue to occur. As such, periodic inspections should be performed to look for signs of erosion. These areas should be repaired as they develop.

This report has been prepared for the exclusive use of our client for the specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made.

Spring

WIND ROSE PLOT
Station #03947 - KANSAS CITY/INT'L ARPT, MO



Wind Speed (m/s)

>11.09	
8.49 - 11.09	
5.40 - 8.49	
3.34 - 5.40	
1.63 - 3.34	
0.51 - 1.63	

MODELER	DATE	COMPANY NAME
Brian O'Neal	6/3/2004	Black_Veatch

DISPLAY	UNIT	COMMENTS
Wind Speed	m/s	

AVG. WIND SPEED	CALM WINDS
5.47 m/s	2.59%

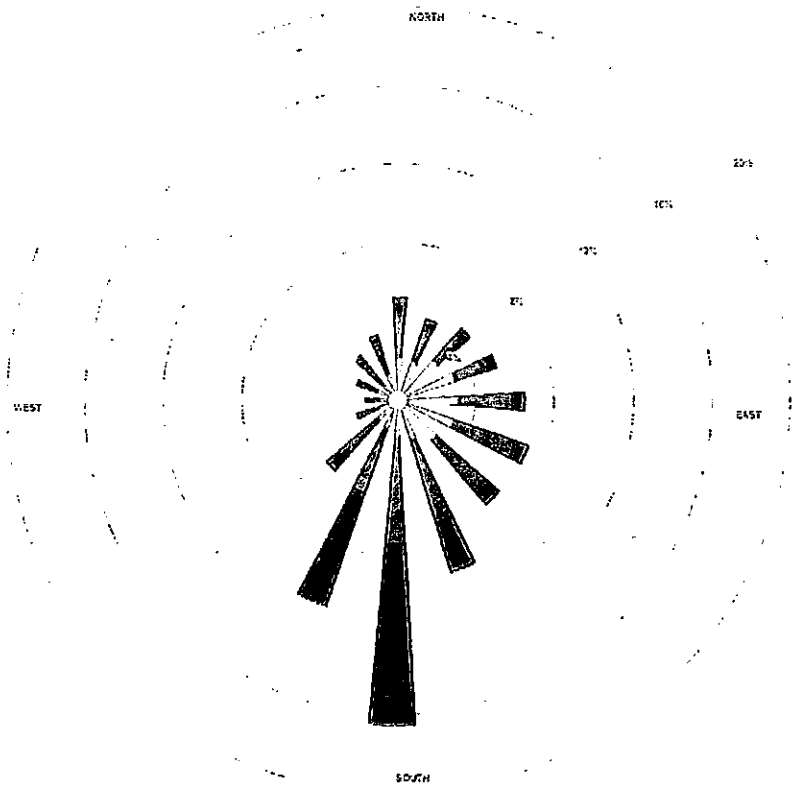
ORIENTATION	PLOT YEAR-DATE-TIME	PROJECT/PLOT NO
Direction (blowing from)	1984 1985 1986 1987 1988 1992 1991 1990 1989 Mar 1 - 31May Midnight - 11 PM	

FIG 2

TERRACON PR. # 02085136
JUNE 2008

Summer

WIND ROSE PLOT
Station #03947 - KANSAS CITY/INT'L ARPT, MO



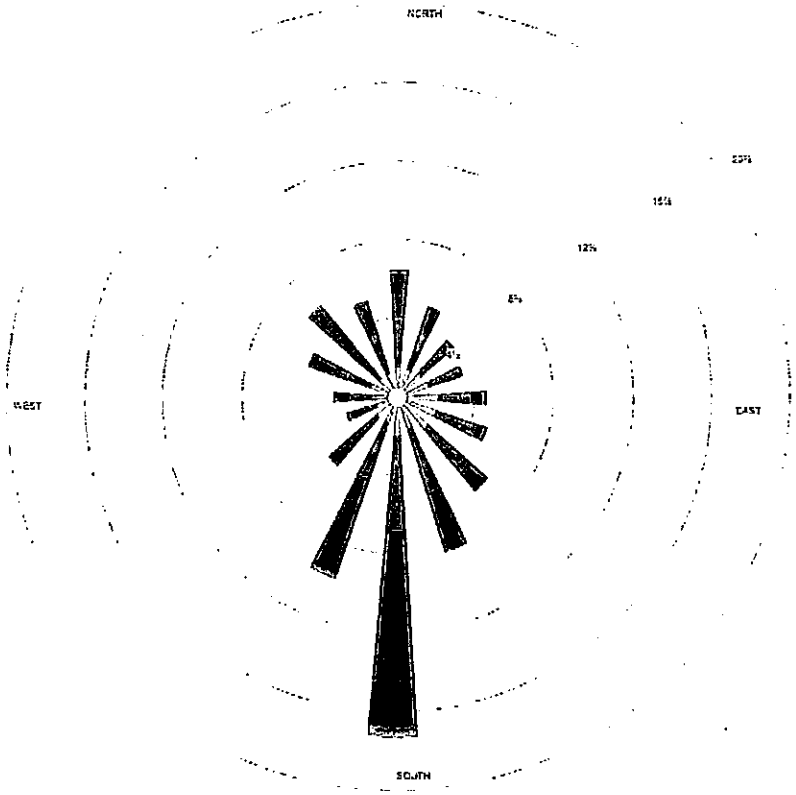
Wind Speed (m/s)	MODELER	DATE	COMPANY NAME
	Brian O'Neal	6/3/2004	Black & Veatch
>11.09	DISPLAY	UNIT	COMMENTS
8.49 - 11.09	Wind Speed	m/s	
5.49 - 8.49	AVG WIND SPEED	CALM WINDS	
3.34 - 5.49	4.53 m/s	4.49%	
1.69 - 3.34	ORIENTATION	PLOT YEAR-DATE-TIME	PROJECT/PLOT NO
0.51 - 1.69	Direction (blowing from)	1984 1985 1986 1987 1988 1992 1991 1990 1989 Jun 1 - 31Aug Midnight - 11 PM	

FIG. 3

TERRACON PR. # 02085136
JUNE 2008

Fall

WIND ROSE PLOT
Station #03947 - KANSAS CITY INT'L ARPT, MO



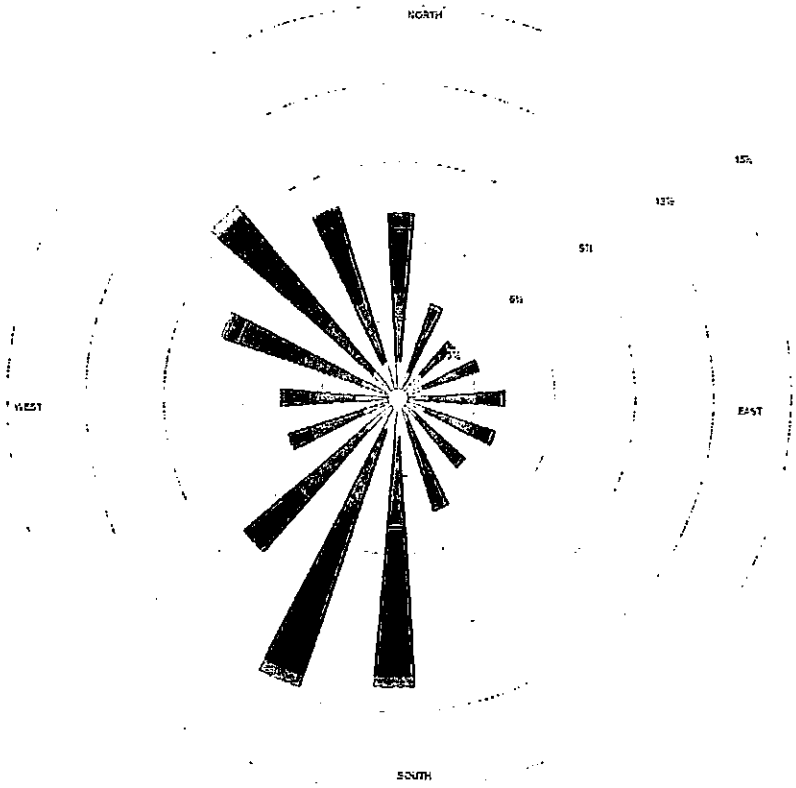
Wind Speed (m/s)	MODELER	DATE	COMPANY NAME
	Brian O'Neal	6/3/2004	Black_Veatch
> 11.05	DISPLAY	UNIT	COMMENTS
8.49 - 11.05	Wind Speed	m/s	
5.40 - 8.49	AVG. WIND SPEED	CALM WINDS	
3.34 - 5.40	5.02 m/s	3.05%	
1.50 - 3.34	ORIENTATION	PLOT YEAR-DATE-TIME	PROJECT-PLOT NO
0.51 - 1.50	Direction (blowing from)	1984 1985 1986 1987 1988 1992 1991 1990 1989 Sep 1 - 30Nov Midnight - 11 PM	

FIG. 4

TERRACON PR # 02085136
JUNE 2008

Winter

WIND ROSE PLOT
Station #03947 - KANSAS CITY/INT'L ARPT, MO



Wind Speed (m/s)
- > 11.05
- 5.49 - 11.05
- 3.60 - 5.49
- 3.34 - 5.60
- 1.60 - 3.34
- 0.51 - 1.60

MODELER	DATE	COMPANY NAME
Brian O'Neal	6/3/2004	Black_Veatch

DISPLAY	UNIT	COMMENTS
Wind Speed	m/s	

AVG WIND SPEED	CALM WINDS
5.31 m/s	2.44%

ORIENTATION	PLOT YEAR-DATE-TIME	PROJECT/PLOT NO
Direction (blowing from)	1984 1985 1986 1987 1988 1992 1991 1990 1989 Check ReportRange Date Midnight - 11 PM	

FIG. 5

TERRACON PR. # 02085136
JUNE 2008

Terracon

PROJECT: _____ Page 1 of 1

JOB NO. #02085136 Date 6-14-08 Comp. By LS CHECKED BY: _____

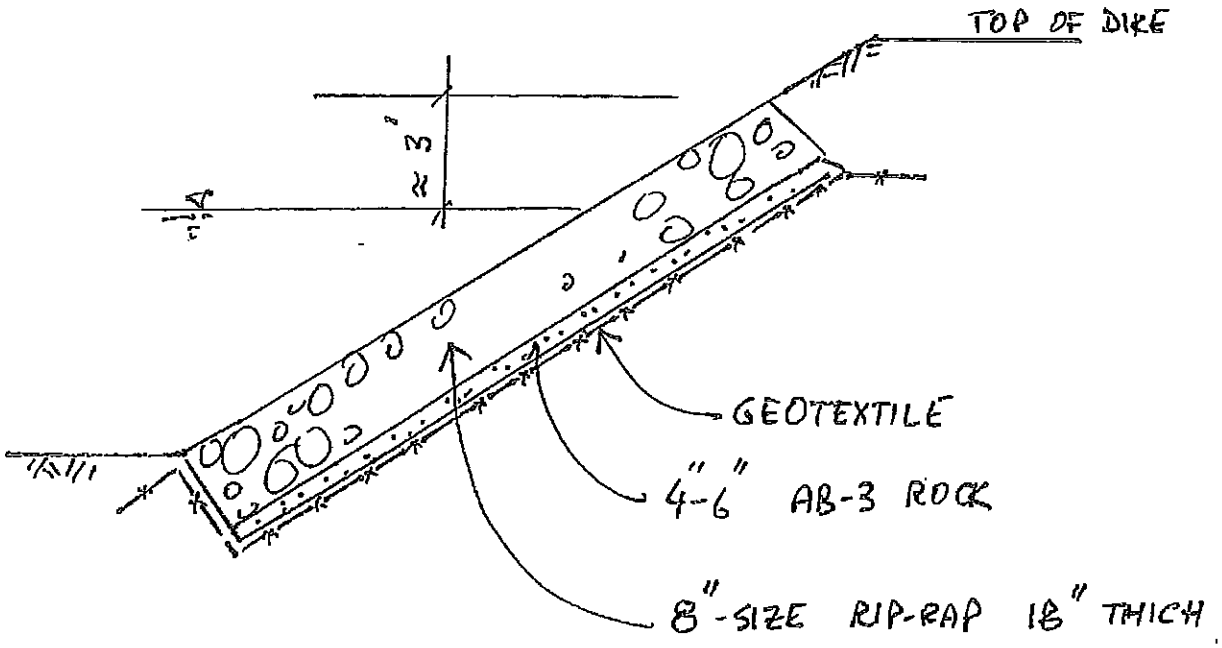


FIG. 6

RIP-RAP SCHEMATIC UPSTREAM SLOPE
ASH PONDS - NEARMAN PLANT

Form 112 5 93

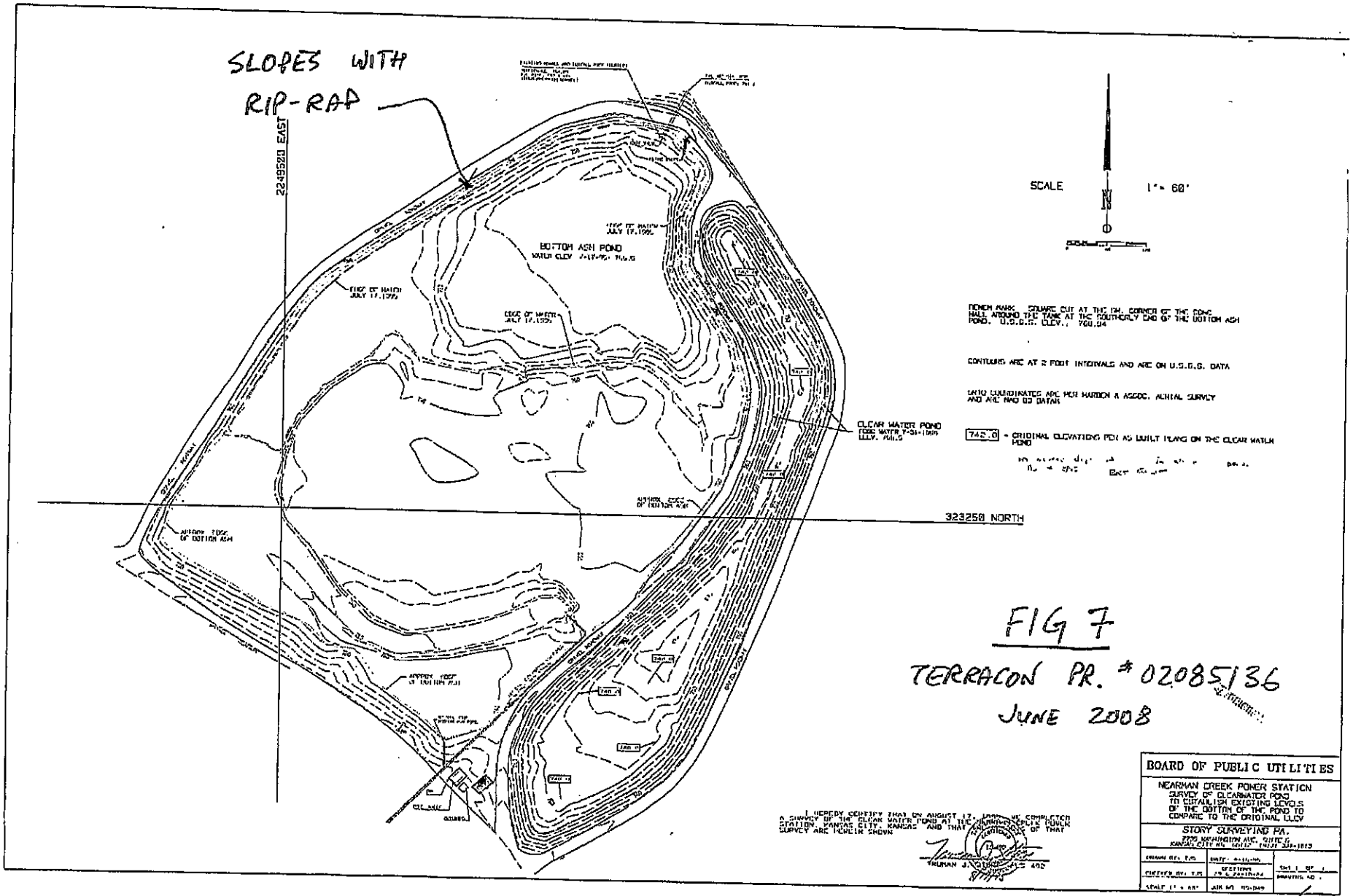


FIG 7

TERRACON PR. # 02085136

JUNE 2008

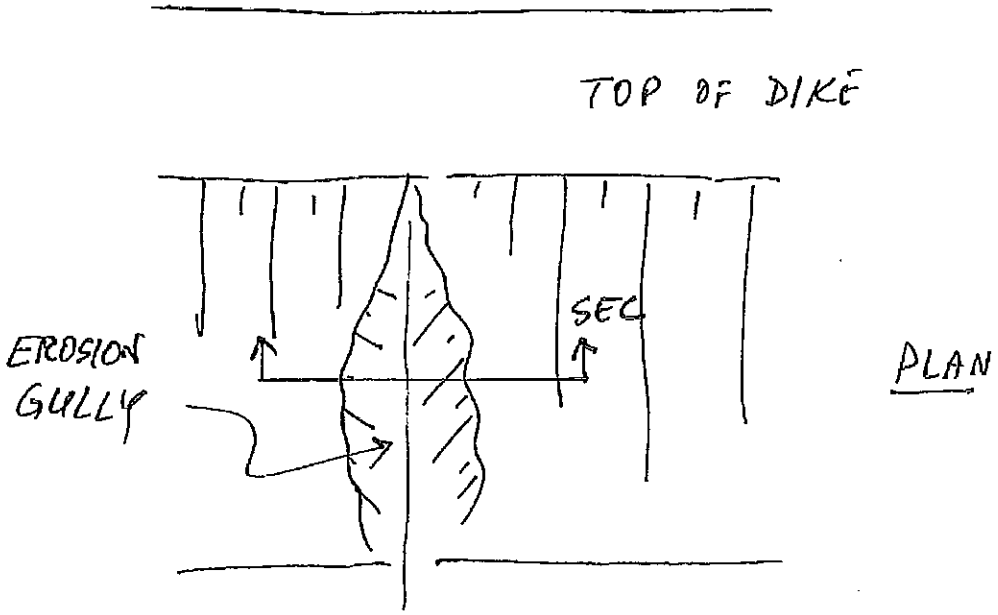
c-version AS

Terracon

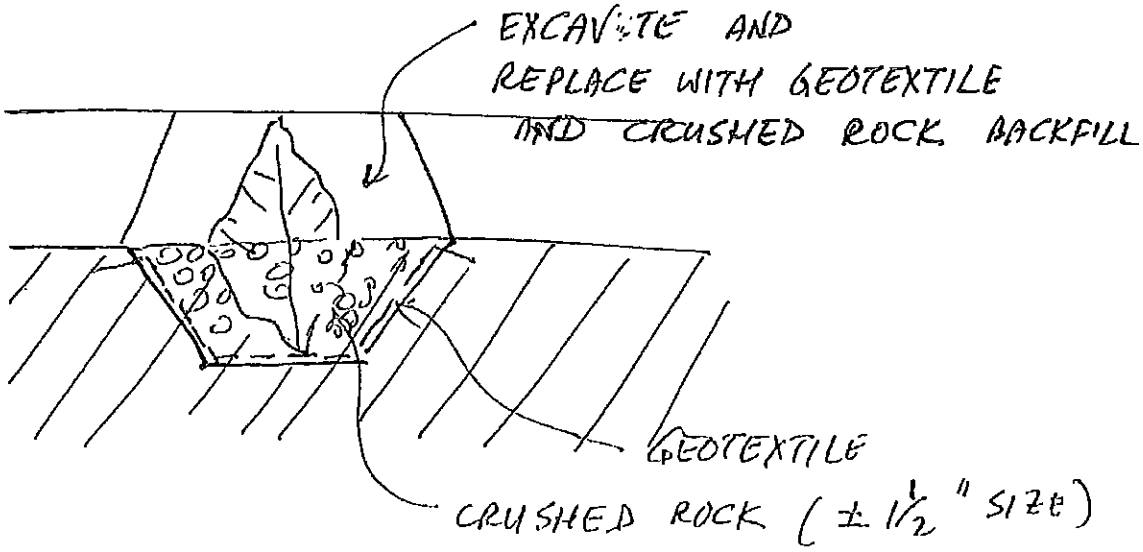
PROJECT: PROPOSED GULLY REPAIR - NEARMAN PLANT Page 1 of 1

JOB NO. 02085136 Date 6-14-08 Comp. By VS CHECKED BY:

FIG. 8



PLAN



SECTION

Form 112—5-93

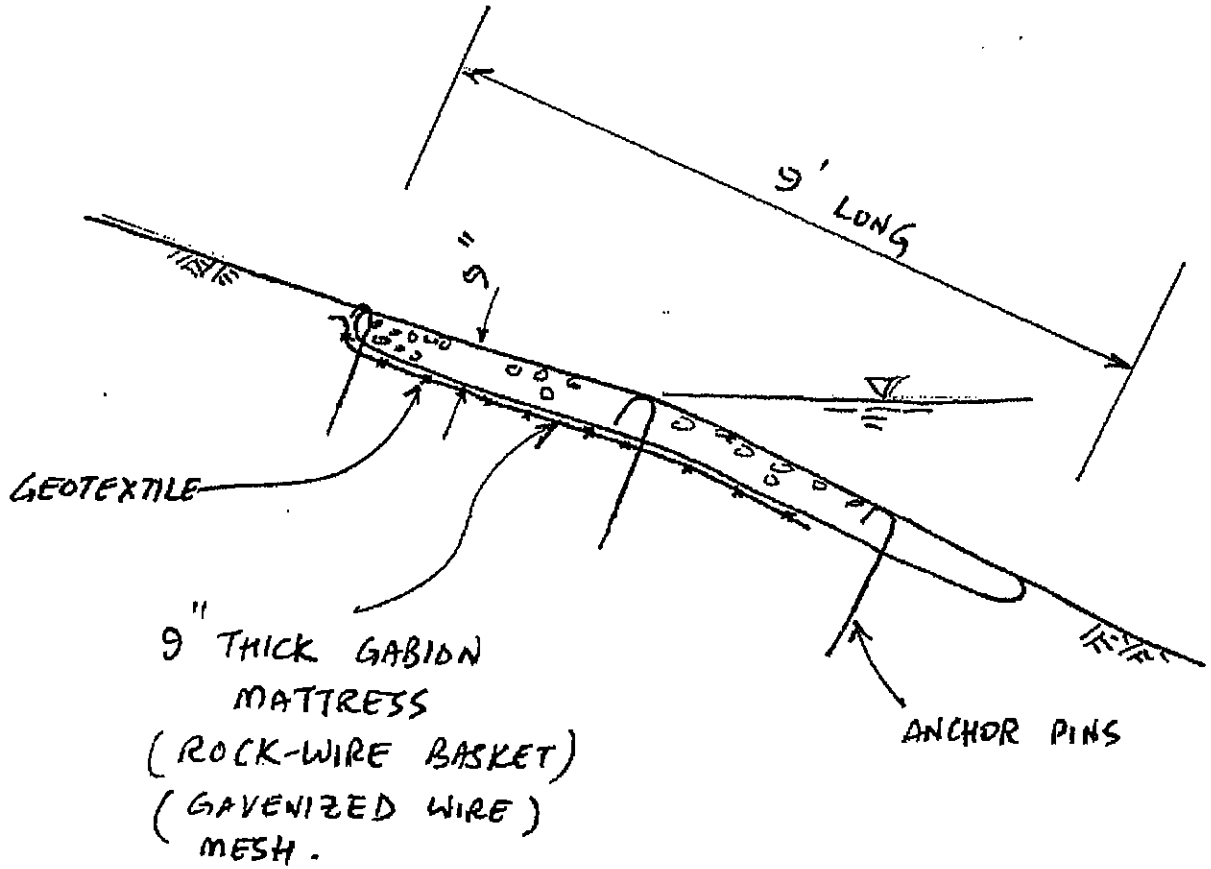
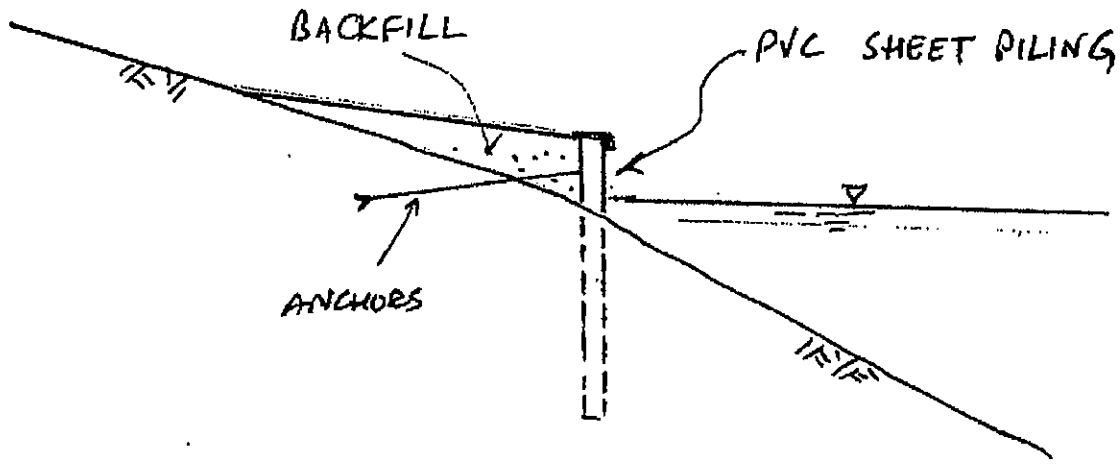


FIG. 9

JUNE 2008 #02085136

Terracon

Form 102—6-85



SHEET PILING (SHORE GUARD)

(NOT TO SCALE)

FIG. 10

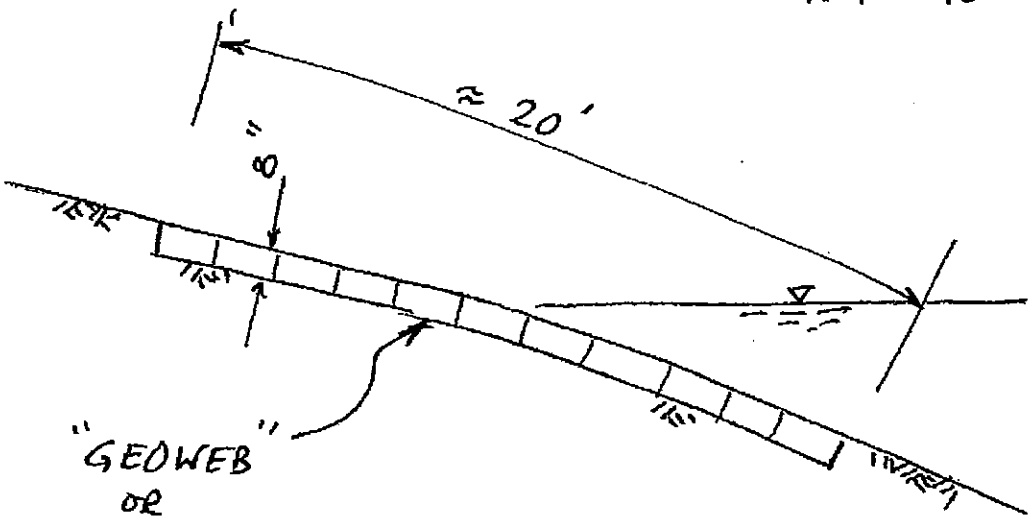
JUNE 2008 #02085136

Terracon

Form 102—6-85

Terracon

NOT TO SCALE



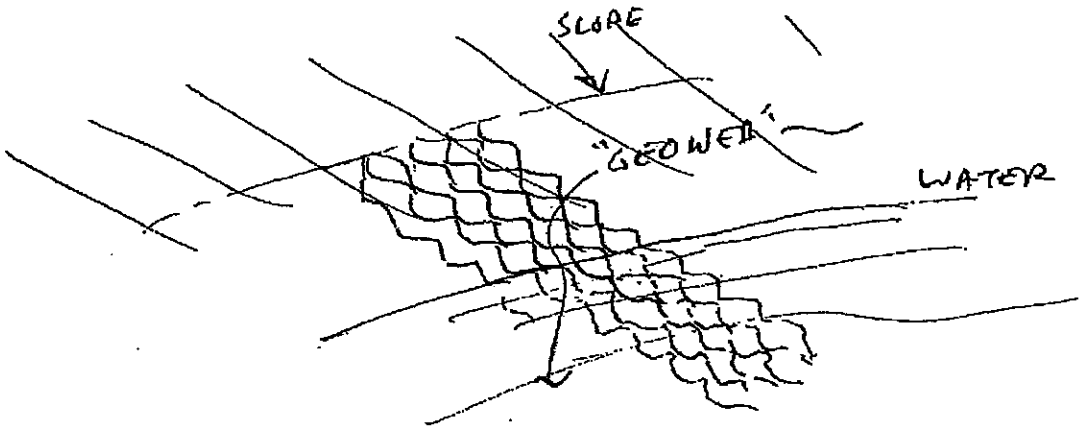


FIG. 11.

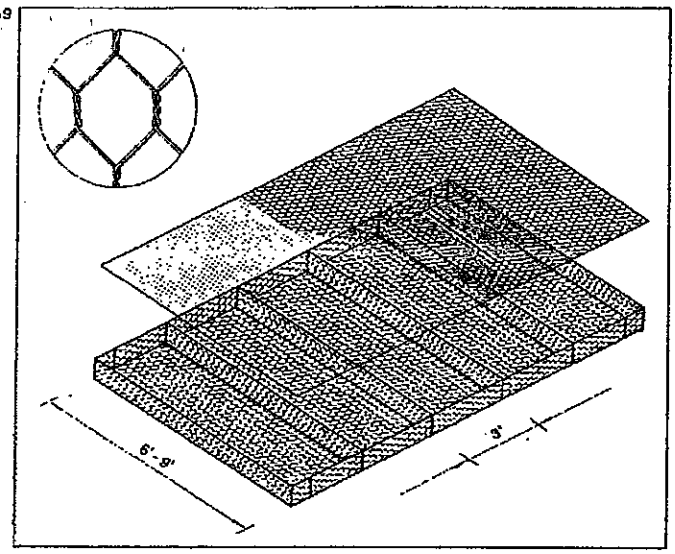
"GEOWEB" OR "TERRACELL"

#02085136 JUNE 2008

Form 103—1-87

Reno® mattress

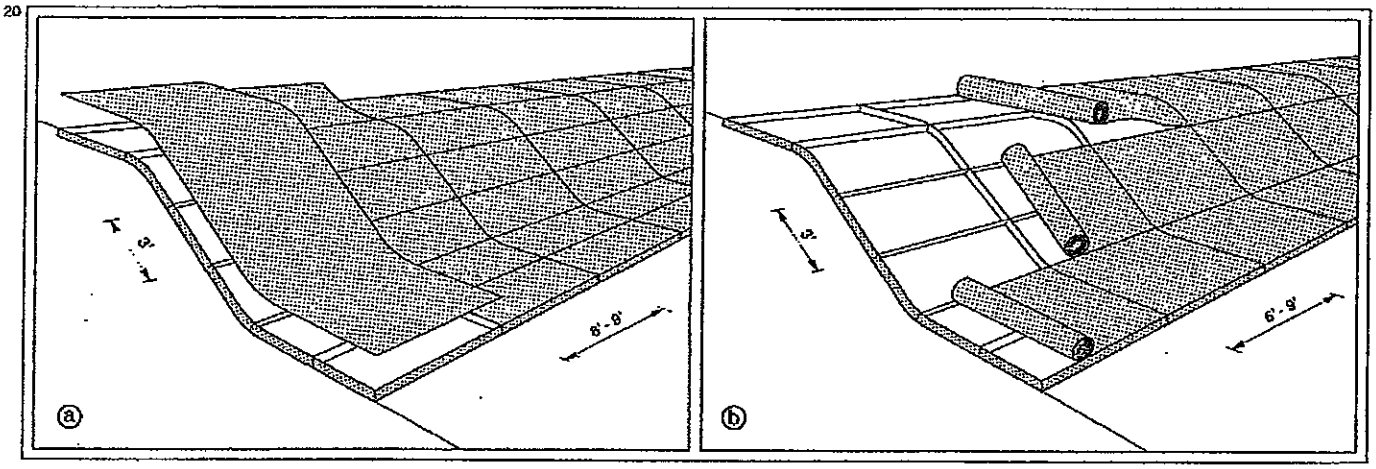
19



Zinc coated Reno® mattress
The Reno® mattress is a special form of gabion with a large surface area/thickness ratio. It is fabricated from a similar but smaller double twist hexagonal mesh to that used to manufacture the gabions. The wire characteristics are the same. Diaphragms are spaced usually at 3' centres, and a continuous panel of mesh forms the base, the side and the end walls of the unit to obtain an open-topped multicell container.
The same mesh is used for the base, diaphragms, and the separate lid (using mesh panels - fig. 20 ⓐ or mesh rolls - fig. 20 ⓑ). All panel edges are selvedged with a wire of a diameter larger than that used for the mesh, so as to strengthen the structure.

Zinc coated Reno® mattress with PVC sleeve
All wires used in the manufacturing of the Reno® mattresses can be coated with PVC in the same manner as that for gabions.

20



Applications

RIVER TRAINING

21

Fig. 21 - U.S.A. - New York
Gabion bank protection near Buffalo.

SOIL CONSERVATION

22

Fig. 22 - ITALY - Tuscany
Drainage channel to stabilize a slope near Florence.

Environmental Impact

Structures built from Reno mattresses and gabions are fundamentally permeable and permit the natural movement and filtration of ground water, indispensable for the life of the surrounding area.
Moreover, thanks to this filtration effect, silt is deposited in the stone fill, promoting the growth of native plants (figs. 15, 16) which not only reinforce the structure binding it into the terrain but will also attract back indigenous fauna, recreating the original eco-system. It is possible to accelerate the vegetation growth by adding soil to the fill during construction (figs. 17,18).

Intégration à l'environnement

Les structures en matelas Reno et en gabions permettent, de par leur caractèristique drainante, d'exercer une action filtrante adaptée à l'alimentation des nappes phréatiques latérales, indispensable à la vie des terrains environnants et à l'autoépuration biologique des eaux.
En outre, ces structures sont en peu de temps recouvertes par la végétation et, grâce aux phénomènes de filtrage et de dépôts limoneux, elles ont tendance à s'amalgamer au terrain avoisinant, en recréant ainsi le paysage préesistante (fig. 15, 16). L'influence se fait non seulement sentir sur les caractèristiques de stabilité de l'ouvrage mais favorise également le développement de la flore et de la faune fluviales, rééquilibrant ainsi l'écosystème. Si l'on désire accélérer le processus naturel d'intégration des revêtements en matelas Reno ou en gabions, on peut envisager de combler les sous-couches en pierre par de la terre végétable et des plantes à croissance rapide (fig. 17, 18).

Adaptación al ambiente

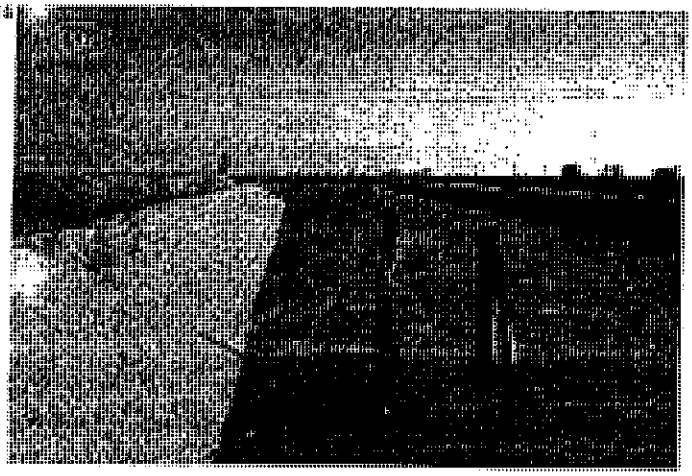
Las estructuras en colchones Reno y gaviones tienen la característica fundamental de ser drenantes, permitiendo el paso del agua que al filtrarse alimenta la capa freática dando vida a los terrenos circunstantes y favorece la depuración del agua.
Después de poco tiempo son cubiertas por la vegetación y por los fenómenos de filtración y sedimentación del transporte limoso, llegan a amalgamarse con el terreno colindante, reconstituyendo el paisaje preexistente (fig. 15, 16). Este aspecto no solo influye sobre las características de resistencia de la obra sino favorece el desarrollo de la flora y de la fauna fluvial, restableciendo el equilibrio del ecosistema.
En caso que se quiera acelerar este proceso natural de integración en un revestimiento de colchones Reno o en una estructura en gaviones, es posible colmatar los huecos del relleno con tierra vegetal y sembrar o plantar especies de crecimiento rápido (fig. 17, 18).

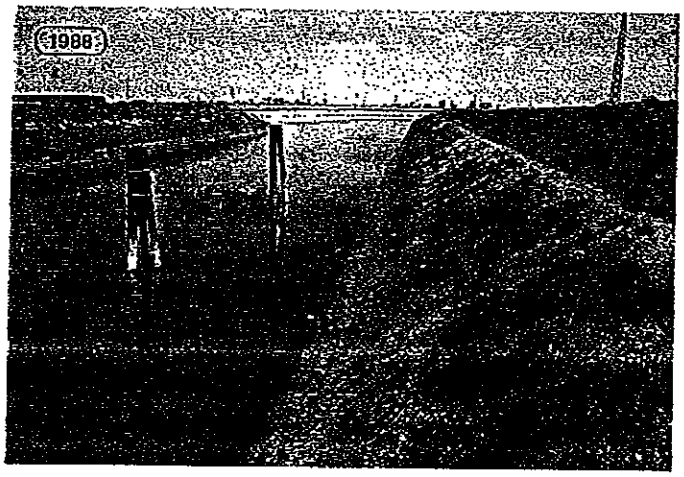
15, 16. ITALY - Veneto
Lining of the channel Fissero - Tartaro - Canalbianco (Verona) using Reno mattresses. After just one year the lining is perfectly integrated into the surrounding environment.

15, 16. ITALIE - Vénitie
Revêtement en matelas Reno du canal Fissero - Tartaro - Canalbianco (Verona) - Après une année l'ouvrage s'intègre parfaitement à l'environnement.

15, 16. ITALIA - Veneto
Revestimiento en colchones Reno del canal Fissero - Tartaro - Canalbianco (Verona). A distancia de un solo año, la obra se presenta perfectamente integrada en el ambiente.

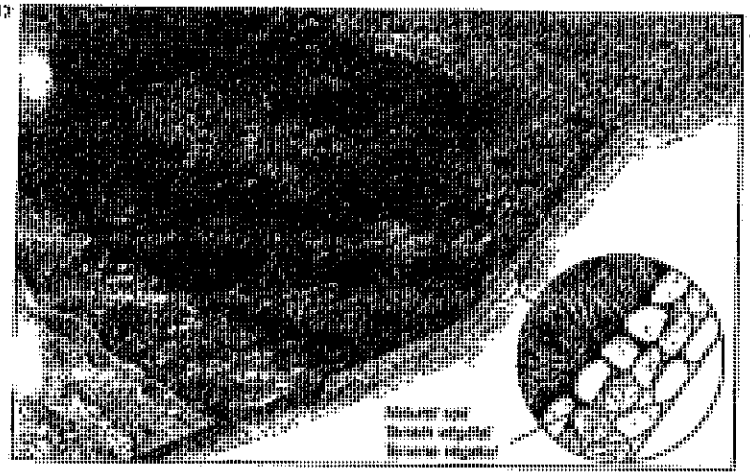
15

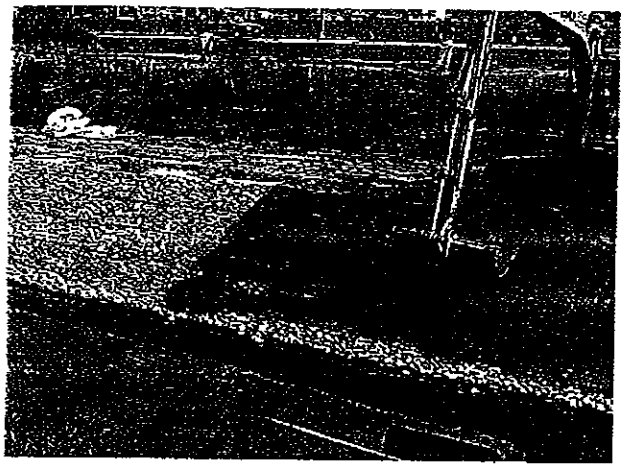




16

17



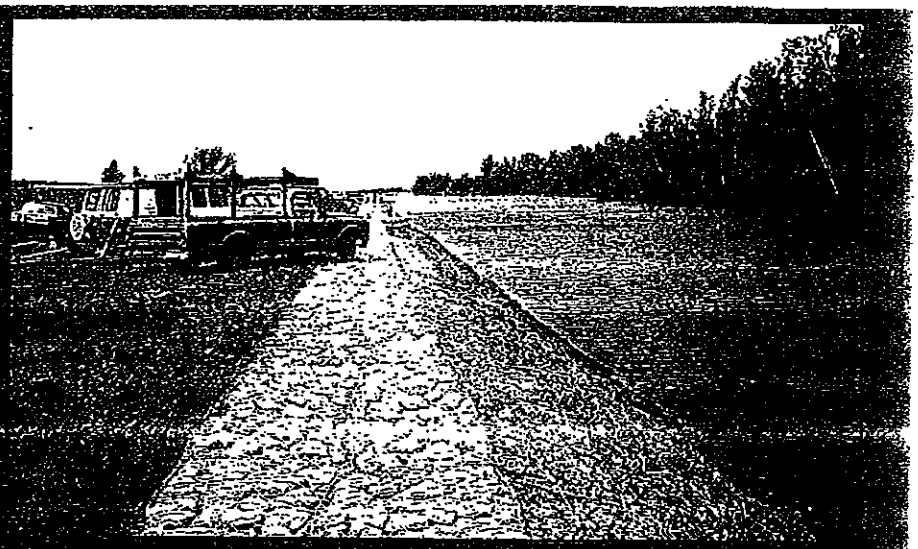


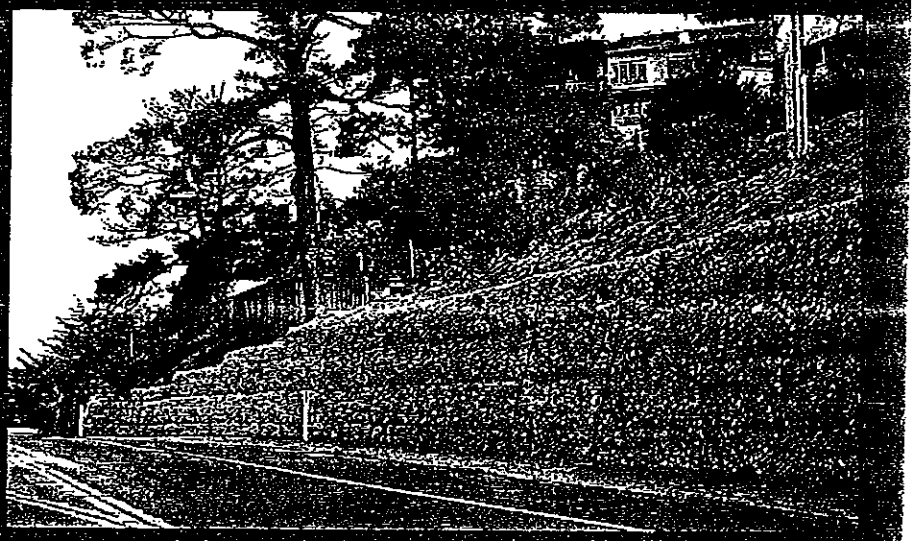
18

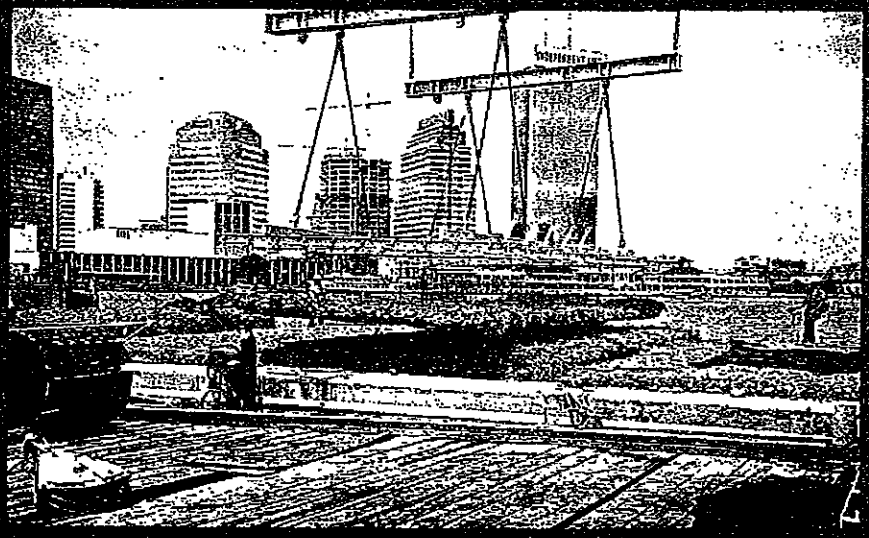
17, 18. ITALY - Veneto
Soil has been introduced into the fill of the Reno mattress revetment to promote vegetation.

17, 18. ITALIE - Vénitie
Pour favoriser la pousse de la végétation sur les revêtements en matelas Reno la structure a été comblée par la terre contenant des essences végétales à croissance rapide.

17,18. ITALIEN - Veneto
Para favorecer el crecimiento de la vegetación en el revestimiento en colchones Reno, ha sido colmatado su relleno con terreno conteniendo especies vegetales de crecimiento rápido.







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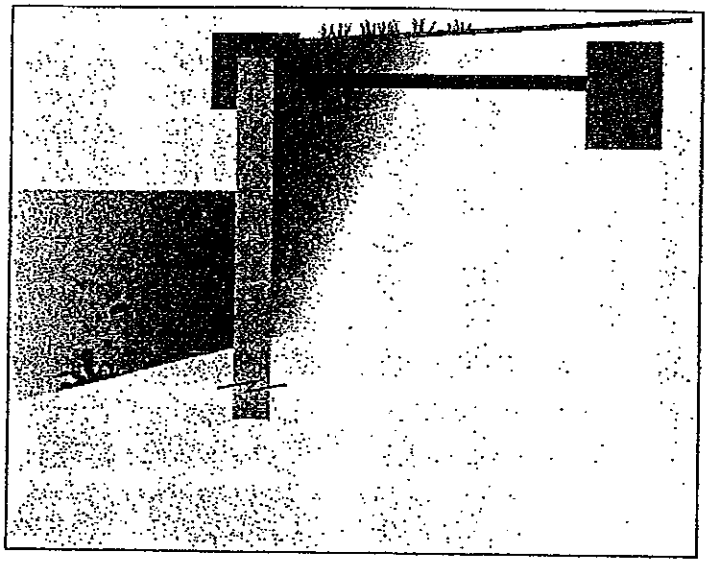
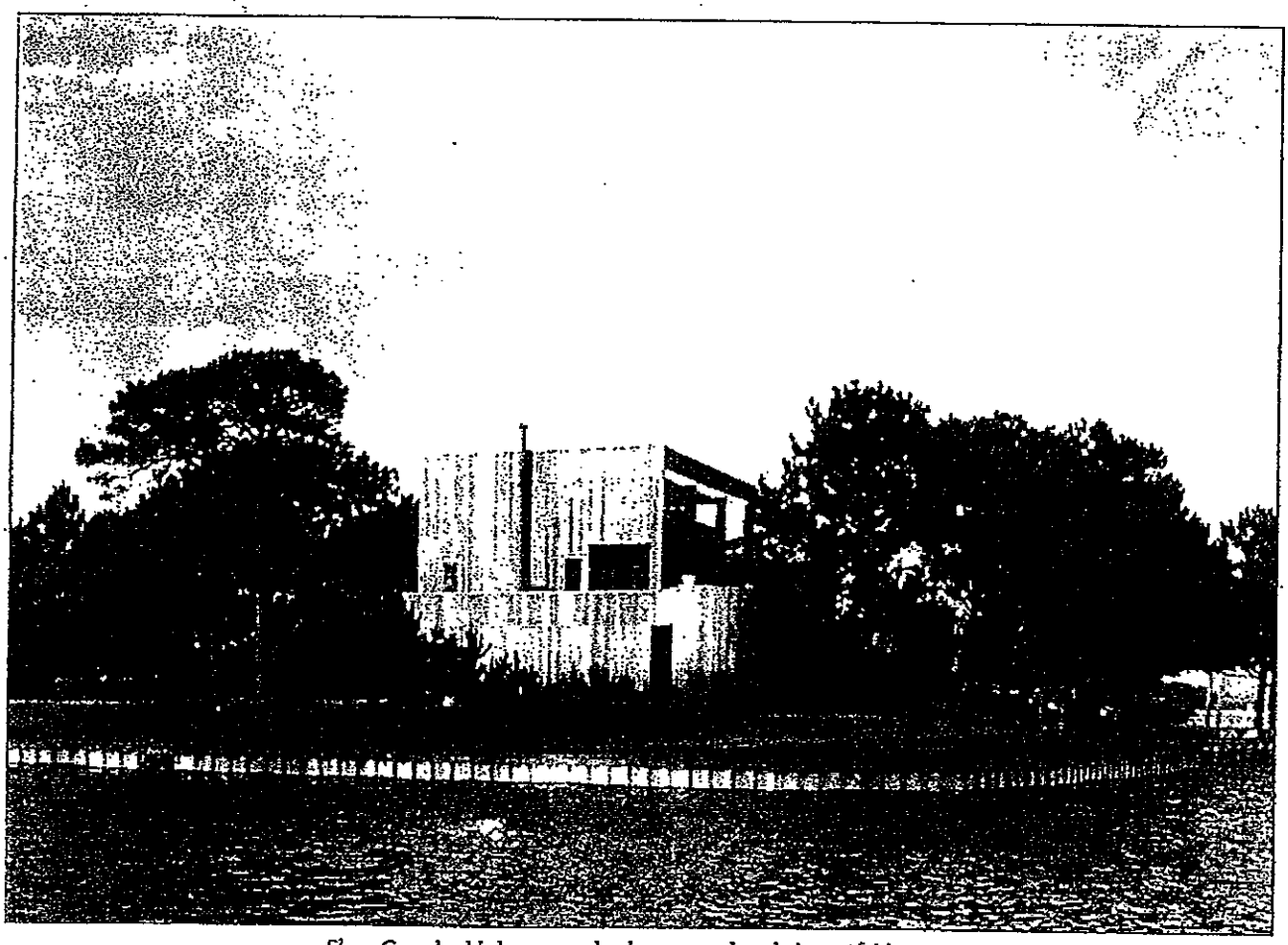
SHOREGUARD ADDS BEAUTY AND VALUE



ShoreGuard® Vinyl Sheet Piling is a patented interlocking sheet piling made of high performance, rigid, weatherable polyvinyl chloride. ShoreGuard offers substantially longer service life than wood, concrete, steel or aluminum in marine environments because it will not be eaten by marine organisms, rust, rot, corrode or be affected by the pH of the soils.

ShoreGuard Vinyl Sheet Piling is used in anchored sheet piling designs. This basic design has been used in seawall construction for centuries and consists of three components:

1. Interlocking ShoreGuard Vinyl Sheet Piling
2. One or more horizontal beams called wales
3. An anchoring system consisting of tie rods and anchors.



ShoreGuard adds beauty and value to an already beautiful home.

A Seawall That Meets Your Budget

This is not a design chart. This is for estimating the material requirements for budgetary purposes. Please rely on your contractor or engineer for design plans.
To assist in **estimating your sheet pile requirements**, follow these simple steps.

1. Measure the "linear footage" of the proposed bulkhead, including return walls.
2. Measure the **"exposed height"** of the proposed bulkhead. That is the measurement from **firm soil** at the base of the wall to the top cap. To find this firm ground and to properly measure the "exposure", you must probe the soil every 5 feet with a rod to ensure that the wall height is accurately measured including "valleys" or soft spots. If a valley is discovered, longer sheets are required, and if the valley is deep enough, another support wale will be needed. **Please measure carefully.**
3. To correctly estimate the specific number of sheets required, compute as follows:
   Series 150 or 250 (10.5 in. wide) Multiply the linear footage by 1.15 (example: 134 lin. ft. wall x 1.15 = 154.1 or 155 sheets)
   Series 300 or 400 (12 in. wide) Number of sheets equals linear feet (example: 134 lin. ft. wall equals 134 sheets)
   Series 500 (12 in. wide) Number of sheets equals linear feet (example: 134 lin. ft. wall equals 134 sheets)
4. Don't forget to order your **Universal Corner Pieces**. Also, it's a good idea to order a few extra sheets, just in case your measurements are not precise. Don't run short and hold up your job waiting for a corner piece or a couple of sheets.

"I have specified and installed ShoreGuard because ShoreGuard is the most cost effective option. I am a believer in the use of plastics in bulkhead design. I believe that ShoreGuard is the best product on the market to provide strong and long-lasting bulkheads."

Engineer, Texas

Single Wale Design

Wall Height	Sheet Piling Series	Sheet Piling Length	Outside Wale	Inside Wale	Tie Rod Length	Distance Between Rods	Backfill
1'-2'	500, 400, 300, 250, 150	4'	1 - 4" x 6"	1 -2" x 6"	12'	7' 16 rods/100'	Sand/Gravel
2.1'-3'	500, 400, 300, 250, 150	6'	1 - 4" x 6"	1 -2" x 6"	12'	6' 18 rods/100'	Sand/Gravel
3.1'-4'	500, 400, 300, 250, 150	8'	1 - 4" x 6"	1 -2" x 6"	15'	5' 21 rods/100'	Sand/Gravel
4.1'-5'	500, 400, 300	10'	1 - 4" x 6"	1 -2" x 6"	15'	5' 21 rods/100'	Sand/Gravel
5.1'-6'	500, 400, 300	12'	1 - 6" x 6"	1 -2" x 6"	20'	5' 21 rods/100'	Sand/Gravel
6.1'-7'	500	14'	1 - 6" x 6"	1 -2" x 6"	20'	5' 21 rods/100'	Sand/Gravel

Multiple Wale Design

Wall Height	Sheet Piling Series	Sheet Piling Length	Outside Wales	Inside Wales	Tie Rod Length	Distance Between Rods	Backfill
4.1'-5'	500, 400, 300,250,150	10'	2 - 4" x 6"	2 -2" x 6"	15'	5' 42 rods/100'	Sand/Gravel
5.1'-6'	500, 400, 300,250,150	12'	2 - 6" x 6"	2 -2" x 6"	20'	5' 42 rods/100'	Sand/Gravel
6.1'-7'	500, 400, 300	14'	2 - 6" x 6"	2 -2" x 6"	20'	5' 42 rods/100'	Sand/Gravel
7.1'-8'	500, 400, 300	16'	2 - 6" x 6"	2 -2" x 6"	20'	5' 42 rods/100'	Sand/Gravel
8.1'-9'	500, 400, 300	18'	2 - 6" x 6"	2 -3" x 6"	20'	5' 42 rods/100'	Sand/Gravel
9.1'-10'	500, 400, 300	20'	2 - 6" x 8"	2 -3" x 6"	20'	5' 42 rods/100'	Sand/Gravel
10.1'-11'	500, 400, 300	22'	3 - 6" x 8"	2 -3" x 6"	20'	5' 63 rods/100'	Sand/Gravel
11.1'-12'	500, 400, 300	24'	3 - 6" x 8"	2 -4" x 6"	20'	5' 63 rods/100'	Sand/Gravel
12.1'-13'	500	26'	3 - 6" x 8"	2 -4" x 6"	20'	5' 63 rods/100'	Sand/Gravel

STOP KNOW YOUR VARIABLES!

IMPORTANT CONSIDERATION FOR ENGINEERS AND DESIGNERS OF SEAWALLS AND RETAINING WALLS: Designing with ShoreGuard Vinyl Sheet Piling is the same as with any material. When developing a seawall or retaining wall design, ensure that the moment generated by the site conditions and your design does not exceed the maximum allowable moment capability of the ShoreGuard series you specify.

SOME VARIABLES TO CONSIDER:

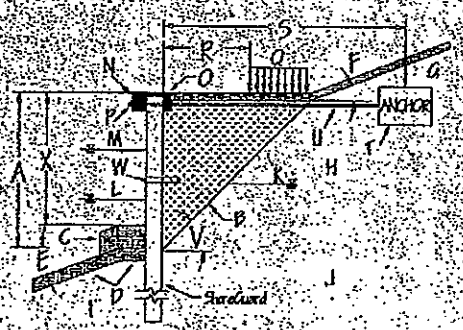
Below are a few site and design considerations that must be addressed for all types of seawall materials: vinyl, steel, aluminum, concrete or wood.

- Soil type (sand, clay, organics, density, porosity)
- Sheet embedment depth
- Water currents, drainage, scour potential
- Slope behind the wall
- Additional loading factors on wall (buildings, roadways, vehicles, boatlifts, etc.)
- Silt and muck deposits at toe (base) of wall
- Installation equipment (see "Know Your Soils and Select the Right Tool", Pg. 3)

FOUR PROBLEMS...THE EFFECTS AND THEIR CAUSES

CAUSE \ PROBLEM	WALL NOT STRAIGHT (ALIGNMENT)	WALL LEANS (AT TOP)	WALL "BELLYING" OUT (MIDDLE OF WALL)	TOE KICKOUT (BASE OF SHEET)
Inadequate embedment			X	
Poor backfill		X	X	
Sheet not driven into firm bottom soil (muck layer)		X	X	
Unusual scour at toe of wall (base)		X	X	
Steep slope or berm behind wall adds loading	X	X	X	X
Building or structure close to wall (surcharge loading)	X	X	X	X
Rapid water drawdown (wind, tide, hurricane)	X		X	
Wall too high without adequate support (wales, piles, both)			X	
Insufficient granular backfill in wedge behind wall	X		X	
Tie rods too small (diameter)	X			
Anchors (deadmen) too small (surface area of anchor is the key)	X	X		
Anchors too close to wall (active soil—see page 4 graph)	X	X		
Dimension of wales too small	X		X	
Insufficient number of tie rods (distance between)	X	X	X	
Driving guide not used during installation	X			
Lack of fasteners when attaching sheets to wales	X		X	
Lack of back wale (front wale only) or sheets not bolted to back wale	X		X	
Unusual drainage conditions (ponding) behind wall		X	X	X

EFFECT \ PROBLEM	WALL NOT STRAIGHT (ALIGNMENT)	WALL LEANS (AT TOP)	WALL "BELLYING" OUT (MIDDLE OF WALL)	TOE KICKOUT (BASE OF SHEET)
Backward rotation of wale / wall	X		X	X
Extreme backfill settlement / loss of fill			X	X
Backfill appears at front toe of wall				X
Sinkhole develops behind wall			X	X
Noticeable "bellying" at middle of wall			X	
Forward rotation of wale / wall	X	X		
Wale curves outward between tie rods	X			
Sheet loses corrugation (flattens)		X	X	



Seawall engineering is a complex analysis of variables.

Please Note: This chart is not inclusive of all the site conditions and influences that may exist in your area. However, it will give you a few to consider before you begin. These problems, causes and effects are the usual consequences of improper construction of **any bulkhead, no matter what material is used for sheeting**. When properly designed and constructed, ShoreGuard Vinyl Sheet Piling will provide superior longevity.

More Tips

Step 7: Proper Backfill, Granular Soils

a. Your choice in backfill influences your wall structure more than any other single factor. Hydrostatic pressure behind a bulkhead causes more failures than any other factor. Use granular, free draining backfill. Contractors refer to it as "cheap insurance" against future problems.

b. Backfill in "lifts" or layers, compacting each as you go. Some contractors will "wash" the sand down behind the wall. This is not only easy but compacts the sand too.

Contractor Tip

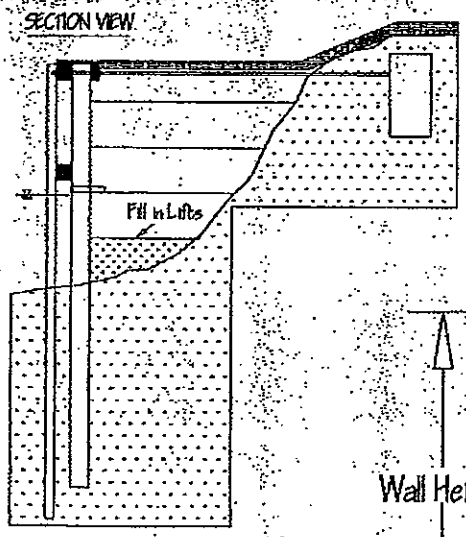
"You are almost finished — it is important not to compromise with cheap backfill. Fill in lifts with a free draining fill such as sand, gravel or shell."

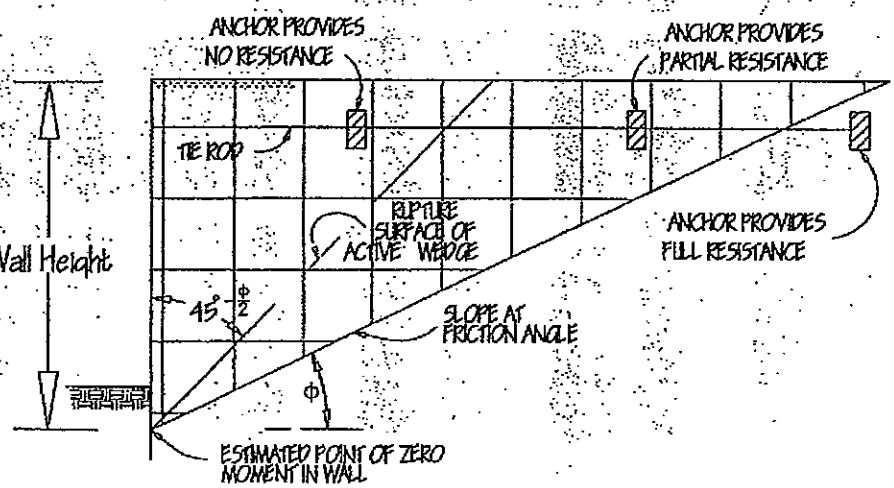
Backfill Soil

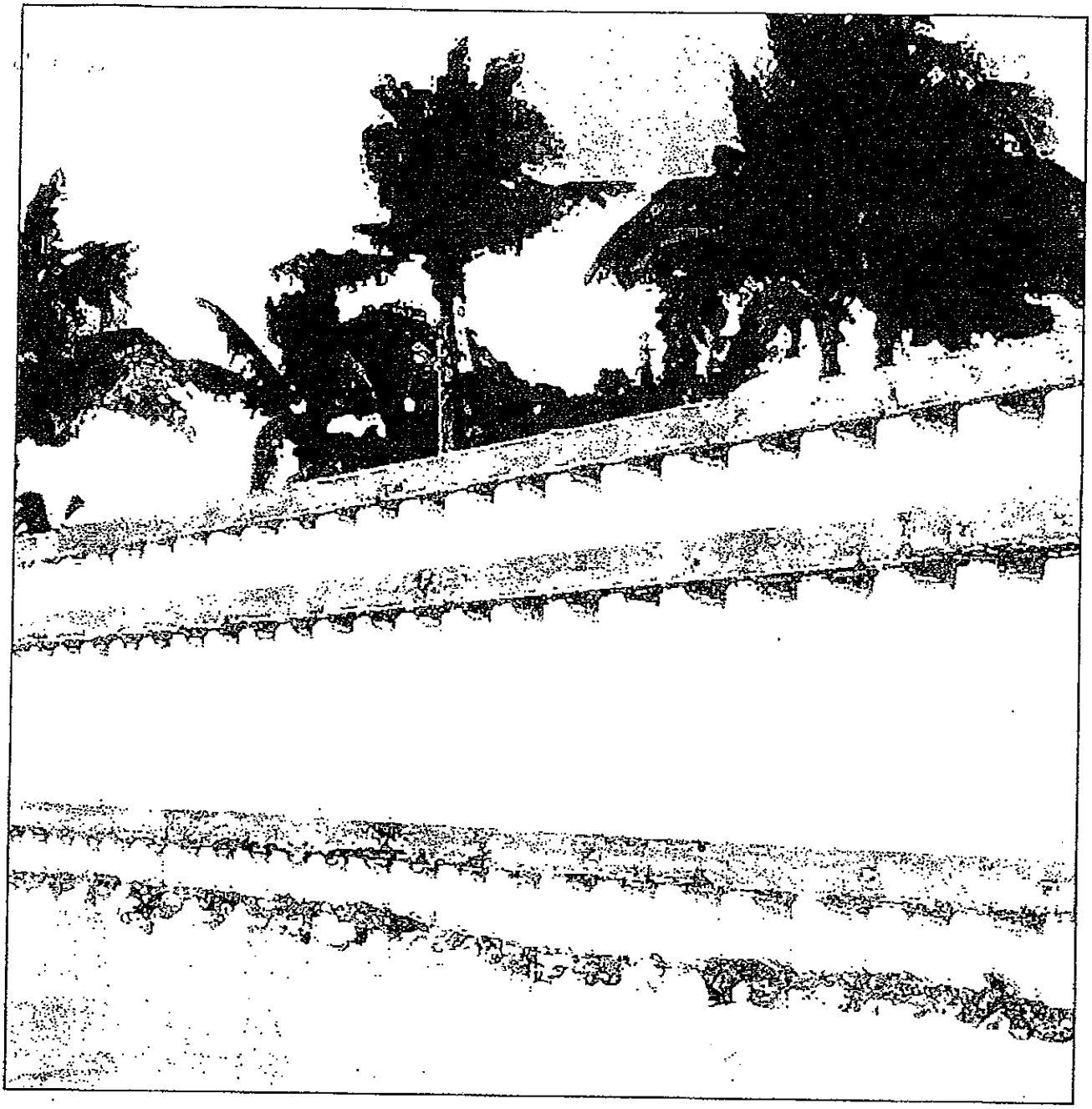
The type of backfill is the single most important variable to be considered during the construction of a bulkhead. The soils dictate the amount of force acting on the wall. The soil must be free draining fill (sand, gravel, shell) compacted in layers or "lifts." Anchors need to be placed well back, outside the "active wedge" of unstable soils.

"ShoreGuard sheet piling is an excellent product. The vinyl material has no reaction with saltwater and the design of your product allows a better toe-hold on walls as well as a much better looking wall for our customers. Every ShoreGuard wall that we install is a silent salesman for years to come (and its wages are cheap)."

Marine Contractor
Oregon







Materials International, Inc.
4501 Circle 75 Parkway, E-5370
Atlanta, Georgia 30339 USA
(800) 256-8857 • (770) 933-8166 • Fax (770) 933-8363
Internet: www.materialsintl.com

Basic design information is provided as an aid to the engineer or architect in developing working plans for specific applications. No warranties of any kind are made as to the suitability for particular applications or the results obtained therefrom.

ShoreGuard® is a registered trademark of Materials International, Inc.
United States Patent Number 5,145,287
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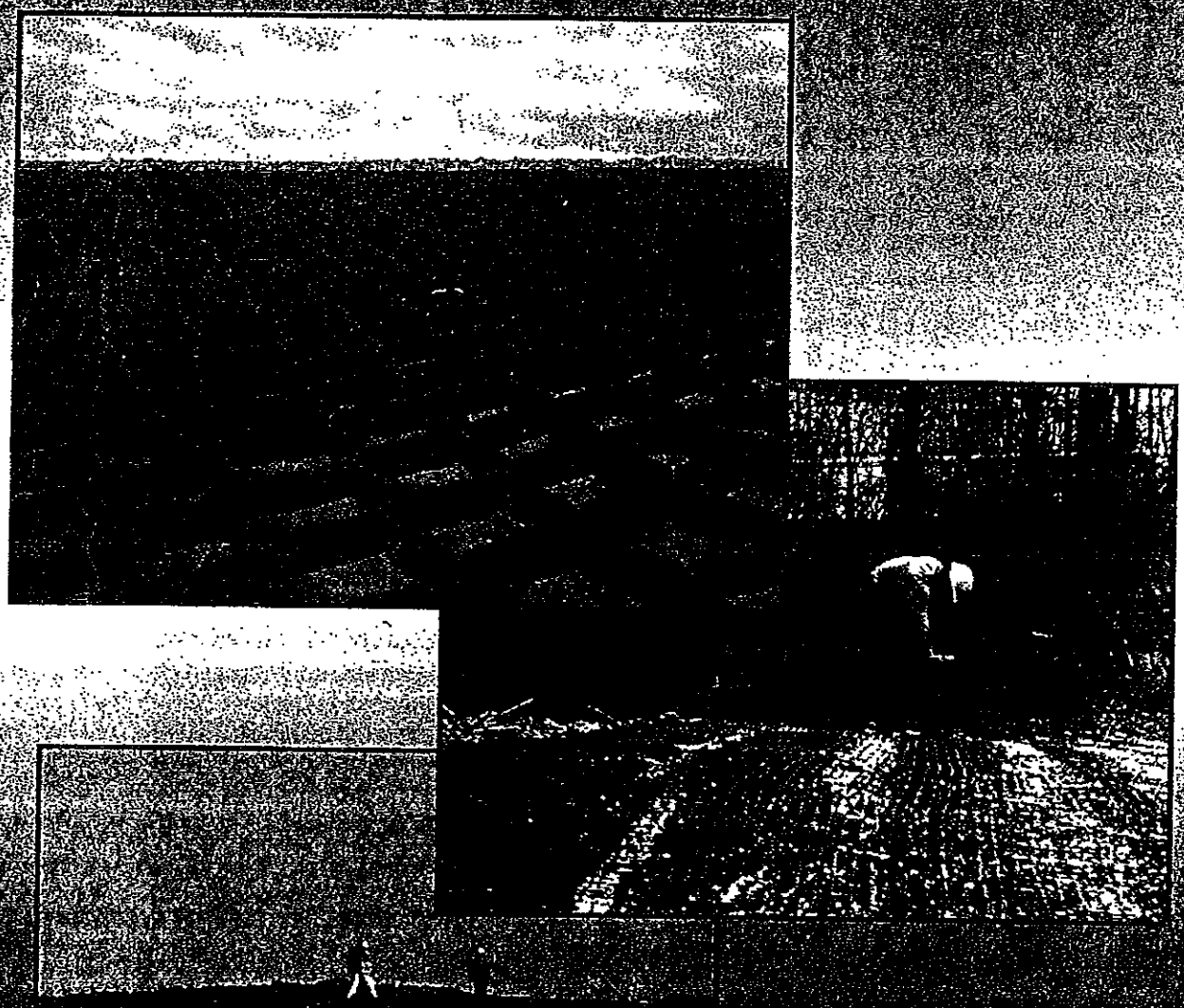
EROSION CONTROL

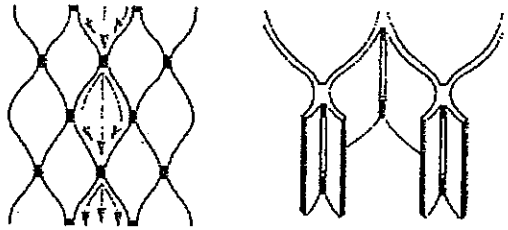


TENAX®

Performance in Plastic Technology™

Cellular Confinement Systems

TENAX TENWEB™ GEOCELLS



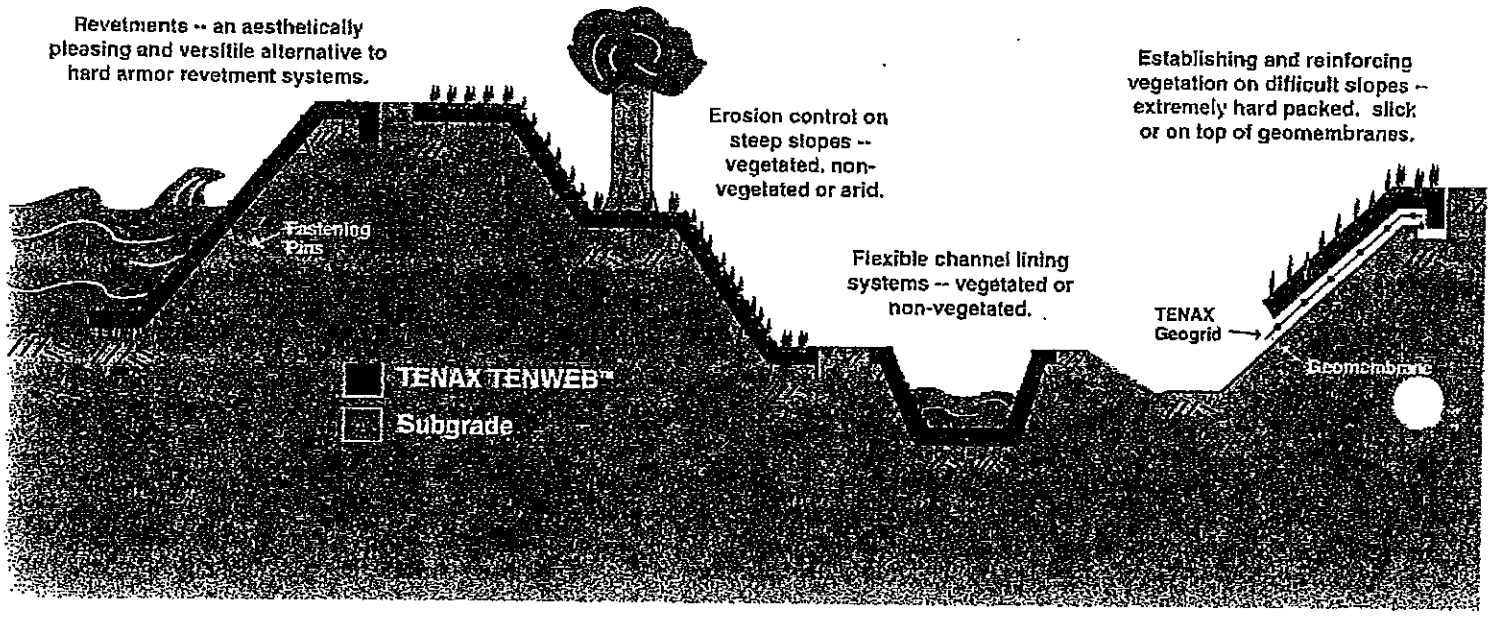
*Each geocell in the expandable TENWEB™ panel is **hydraulically connected** creating a cellular confinement system that is free draining, allowing fluids to flow within the panels from cell to cell. This is critical because it prevents the build-up of excess water within the cells. It also prevents the possibility of failure from excess weight within the cellular confinement system, increasing the factor of safety.*

TENAX TENWEB™ is a three-dimensional cellular confinement system manufactured in a unique continuous extrusion process. This unique extrusion process requires no additional welding or bonding. By continuously forming UV stabilized polyethylene strips and hydraulic junctions (junctions that allow drainage from cell to cell) a strong, durable and flexible honeycomb structure is created.

TENAX TENWEB™ confines the selected infill material and physically prevents mass soil movements. The geocell network also provides a mechanism to distribute and transfer applied loads giving reinforcement to the infill material.

TENAX TENWEB™ is available in a variety of models. By offering cellular confinement systems with two different cell depths (3 and 4 inches), three different cell diameters (4.5, 8, and 12 inches) and innovative hydraulic junctions, Tenax is able to provide project specific cellular confinement solutions. Additionally, Tenax engineers will provide design and installation assistance to assure a successful project.

From our years of experience applying extrusion techniques to solve civil engineering and environmental problems we have developed and designed TENWEB™ specifically for cellular confinement applications such as:

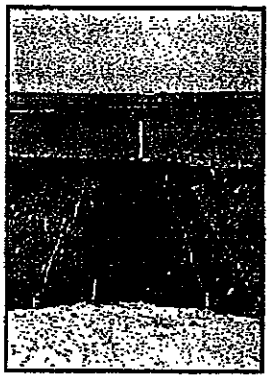


CASE HISTORIES

Tenax Geosynthetics are used from coast to coast to provide slope stabilization, base reinforcement and drainage. Call Tenax for more information about these and other successful projects.

Base Reinforcement and Soft Soil Stabilization

Multi-layered Geogrid
Soft Soil Stabilization
Trinity River Landfill
Grand Prairie, TX



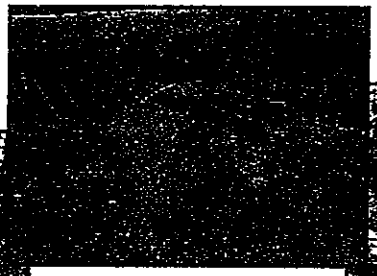
Mulit-layered Geogrid
Soft Soil Stabilization
U.S. Fish & Wildlife
Sanctuary
Atlantic City, NJ

Mulit-layered Geogrid
Drilling Access Road
Equador

Mulit-layered Geogrid
Haul Road over Soft Soils
BFI - Old Dominion Landfill
Richmond, VA

Erosion Control

MULTIMAT™ 100
Permanent Erosion Control
Prince George's County, MD



TENWEB™ 3/300
Slope Protection
TENWEB™ 3/200
Flexible Channel Lining
On-Site Storage Facility
New Mexico

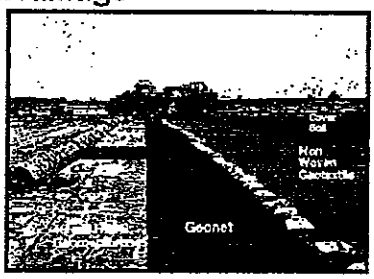
TENWEB™ 3/300
Slope Protection
Depot Road Relocation
Geauga County, OH

Quality

Geosynthetics Testing Laboratory
TENAX®
ISO 9002

Recognized as one of the pioneers in the development of geosynthetics, the Tenax Group manufactures and distributes extruded polymeric products for various geotechnical applications. Tenax extruded polymeric geogrids and three-dimensional structures for civil engineering applications are manufactured in accordance with the requirements of the ISO 9002 Quality Systems.

Drainage

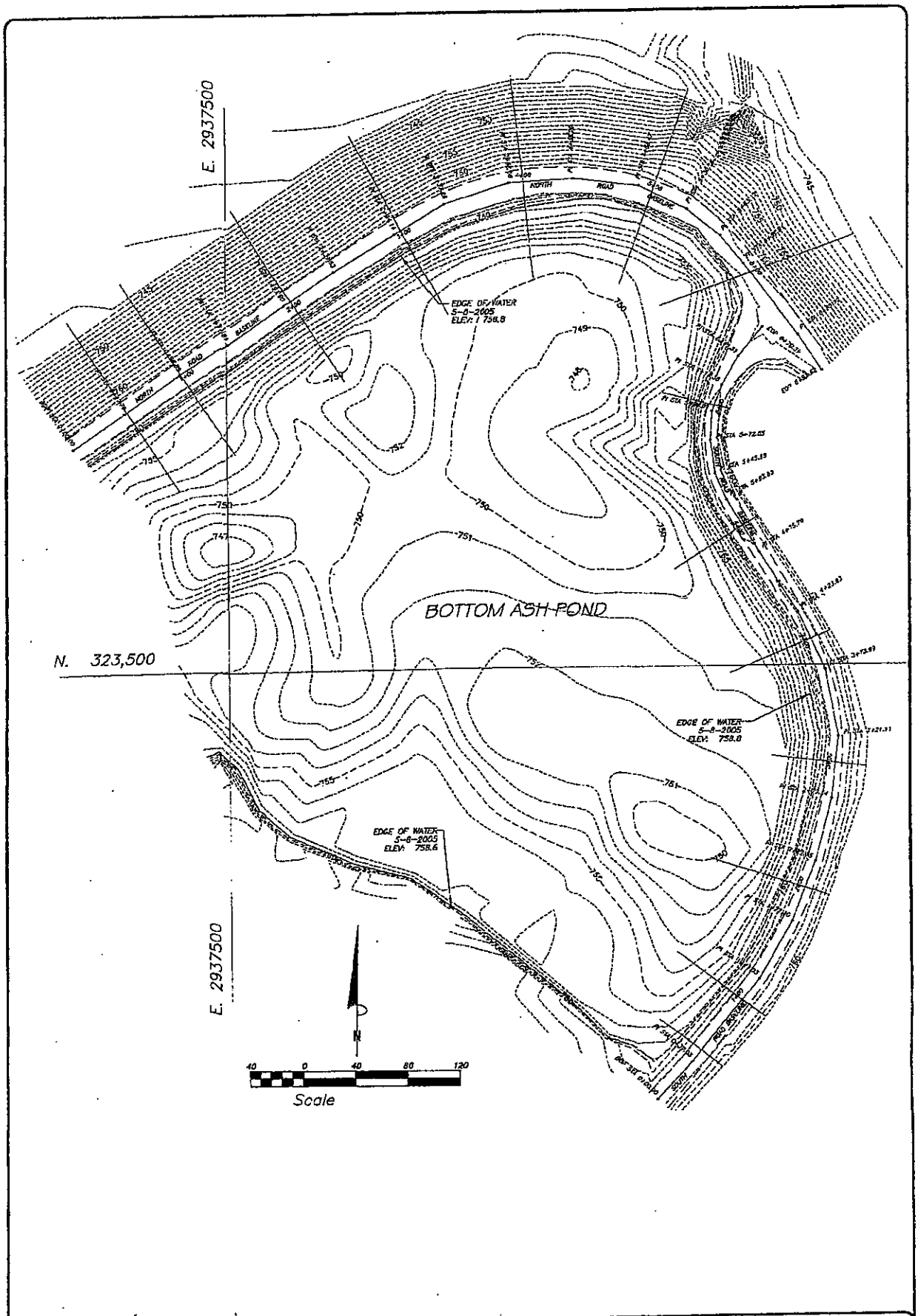


CE™ 3
Landfill Cap Drainage
Steagall Landfill
Galesburg, IL

TNT™ 20505 - Drainage & Gas Venting
TENDRAIN™ - High Flow Drainage
Massachusettes Highway Department
CA/T Project - Materials Disposal System
Spectacle Island Facility, Boston, MA

Tenax also manufacures a complete line of Safety and Snow Fences.

TENAX® Corporation, 4800 East Monument Street, Baltimore, Maryland 21205
Office: (410) 522-7000, Fax: (410) 522-7015, Order Line: (800) 356-8495, Waste Mgt: (800) US-GRIDS



BOTTOM ASH PONDS, NEARMAN POWER PLANT

KANSAS CITY KS

FIG. 1.

Job #	Date	Drawn	Scale
02085136	6-16-08	LS	AS SHOWN

Terracon

Form 149—10-85

Doc 05: Construction Specifications for Contract 75A

H. E. BOHRER EXCAVATING

SUB-DIVISIONS, ROADS and STREETS
3801 NORTH 55th STREET
KANSAS CITY, KANSAS 66104
287-5112

October 26, 1979

Bid Specs
Power Plant
Ash Ponds

Board of Public Utilities
Kansas City, Kansas

RE: Power Plant Ash Ponds
Contract No. 75 A

Gentlemen:

This letter is to verify completion date variation on Contract # 75A Ash Ponds, Nearman Creek Power Station.

We hereby guarantee a place for ash disposal purposes as of May 1, 1980.

This is based on a work week of six days, 9 hours each, for scrapers and two 8 hour daily shifts each week for trucks hauling in dirt from off site.

The date of completion of the oil confinement berm and fuel oil haul road shall be no later than November 16, 1979 as stated in the specifications, page D3.

Very truly yours,

H. E. BOHRER EXCAVATING

Henry E. Bohrer

H. E. BOHRER

LUTZ, DAILY & BRAIN CONSULTING ENGINEERS
CLOVERLEAF 4 BLDG., 6400 GLENWOOD, OVERLAND PARK, KANSAS
TELEPHONE 913 • 831-0833 TWX 910-743-4190

MAILING ADDRESS:
P.O. BOX 718
SHAWNEE MISSION,
KANSAS 66201

October 15, 1979

ADDENDUM NO. 1

TO ALL BIDDERS:

Re: Board of Public Utilities
Kansas City, Kansas
Nearman Creek Power Station No. 1
Power Plant Ash Ponds
Contract No. 75A
Bid Opening Date: October 24, 1979

Gentlemen:

The following changes shall be made to the plans and specifications for the subject contract:

1. Page D-3 of the specifications. Delete the line which reads:

   7. Construct chain link fence and gates.

2. Drawing 72-2P-AP-2; add 18" riprap plus 6" bedding to area bounded by the existing river access road; existing railroad, E2,936,800 and E2,937,100. Match to existing riprap which begins at approximately E2,936,800 and extends westward. Place up to the shoulder elevation.

3. Drawing 72-2P-AP-4, Profile 30" RCP at Sta 14+50 Ash Pond Dike. Revise note which reads:

   3'-0" riprap (see cross-sections) to read 1'-6" riprap plus bedding (see cross-sections).
   Add the words <u>with 6" bedding</u> after 25' X 25', in note at outfall structure.

Four copies of this addendum are enclosed. One copy is to be signed and returned immediately to Lutz, Daily & Brain. Two copies are to be signed and submitted with the Proposal Documents.

LUTZ, DAILY & BRAIN
Consulting Engineers

SIGNATURE:

Name of Firm _____

Signature of Individual _____ Title _____

Address _____

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NOTICE TO BIDDERS

Sealed Proposals, in duplicate, addressed to the Board of Public Utilities, 700 Minnesota Avenue, Kansas City, Kansas, will be received until 7:00 o'clock P.M., on the 24th day of October, 1979, at which time Proposals will be publicly opened and read aloud for:

POWER PLANT ASH PONDS
CONTRACT NO. 75A

Bids received after the above specified time for opening will be returned unopened to the sender.

All equipment, material and labor must be in accordance with the specifications on file with the Board of Public Utilities of Kansas City, Kansas.

Plans and specifications are obtainable at the office of Lutz, Daily & Brain, Consulting Engineers, 6400 Glenwood, Overland Park, Kansas, with a mailing address of P. O. Box 718, Shawnee Mission, Kansas 66201. A non-refundable printing charge of $25.00 will be made for each set of plans.

Each bidder shall submit with his bid a certified check or a cashier's check on a solvent bank, or a bidder's bond, the amount of which is not less than ten percent (10%) of the bid price, and which shall guarantee good faith on the part of the bidder and the entering into Contract within 20 days after notification of acceptance at the price bid.

A Performance Bond and a Statutory Bond in an amount of not less than 100 percent of the Contract Price, conditioned upon faithful performance of the Contract and payment of all persons supplying labor and/or furnishing materials will be required coincident with the execution of the Contract.

Bids will be evaluated by the Purchaser, based on quality, time required for completion, and experience of the Contractor.

The Board of Public Utilities reserves the right to reject any or all bids and to waive irregularities therein, and all bidders must agree that such rejection shall be without liability on the part of the Purchaser or their Engineer for any penalty brought by any bidder because of such rejections, nor shall the bidders seek recourse of any kind against the Purchaser or their Engineer because of such rejections; and the filing of any bid in response to this invitation shall constitute an agreement of the bidder to these conditions.

No bidder may withdraw his bid for a period of sixty (60) days after date of opening bids.

BOARD OF PUBLIC UTILITIES
of Kansas City, Kansas

George E. Bartolac, Purchasing Agent

INSTRUCTIONS TO BIDDERS

EXCEPTIONS TO SPECIFICATIONS: The Purpose of the attached specifications is to give detailed data on work and materials associated with this Contract, scope of Contract, quality of work, materials and equipment required, standards used in determining its acceptability and similar data. Each bidder shall carefully check all requirements herein set forth and shall offer materials and equipment which fully complies with these requirements or shall plainly set forth all points, features, conditions, specifications, etc., wherein his materials and equipment offered does not meet these specifications. Such exceptions as are made shall be listed by page number in the following blanks and shall be marked in ink on the pages of these specifications. Exceptions shall be explained in detail in a letter accompanying the bid. Reference shall not be made to the bidder's Proposal for exceptions and supplementary terms. Failure to outline such exceptions will require the successful bidder to comply with these specifications.

Exceptions to specifications, pages C-5, D-3

SUBMISSION OF BIDS: All Proposals shall be submitted on the Proposal forms hereto attached, which shall remain bound with the complete Contract Documents as originally issued. Copies of addenda, if any, shall be signed and attached to the two bound volumes submitted. Bidders shall furnish all information requested herein by filling in the blanks in the submitted copies of this specification and the transparent sheets supplied by the Engineer.

Each set of bids shall be plainly headed with the name of the bidder and his post office address. The envelope containing the bid shall be sealed and plainly marked "POWER PLANT ASH PONDS - Contract No. 75A."

Bids shall be addressed as follows:

Board of Public Utilities
Kansas City, Kansas
700 Minnesota Avenue
Kansas City, Kansas 66101

If additional information is required from the Engineers, please contact:

Lee N. Bodenheimer, P.E.
P.O. Box 718
Shawnee Mission, Kansas 66201
Telephone - 913-831-0833

If additional information is required from the Board of Public Utilities, please contact:

Ralph Tearney, Jr.
Director of Production Planning
Board of Public Utilities
700 Minnesota Avenue
Kansas City, Kansas 66101
Telephone - 913-281-8246

SITE CONDITIONS: Bidders shall inform themselves of the conditions under which the work is to be performed, concerning the site of the work, the nature of the equipment, the obstacles which may be encountered, the sequence of construction, and all other relevant matters concerning the work to be performed and, if awarded the Contract, shall not be allowed any extra compensation by reason of any matter or thing concerning which such bidder might have fully informed himself, because of his failure to have so informed himself prior to the bidding. The successful Contractor must employ, so far as possible, such methods and means in the carrying out of his work as will not cause any interruption or interference with any other contractors.

INSURANCE COVERAGE: The Contractor shall purchase and maintain at his expense as a minimum insurance coverage of such types and in such amounts as are specified herein to protect Contractor and the interest of Owner and others from claims which may arise out of or result from Contractor's operations under the Contract Documents, whether such operations be by Contractor or by any subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be legally liable. Failure of Contractor to maintain proper insurance coverage shall not relieve him of any contractual responsibility or obligation.

BASE BID: The bidder is expected to base his bids on materials and equipment complying fully with the plans and specifications, and in the event he names in his bid materials or equipment which do not conform, he will be responsible for furnishing materials and equipment which fully conform at no change in his bid price.

ALTERNATE BIDS: It is the desire of the Owner that the bidder base his Proposal price for this project on the written specifications and the prepared plans. If an alternate bid or bids are submitted by a bidder, it is desired that he first submit a Proposal price as above described and then describe his alternate proposal. Failure to do so may be reason for not extending any consideration to alternate proposals.

No exceptions or Alternate Bids will be accepted by the Purchaser concerning the scheduled completion date as specified in the PROPOSAL section of the specifications.

BIDDER QUALIFICATION: Bids will be received only from qualified bidders. Each bidder shall submit with his Proposal a list of jobs erected by him at other locations, as similar as possible to that called for herein. The list should

state the name of the purchaser, location, date of erection, treatment plant capacity, type and other conditions. Such data shall be used to assist the Owner in determining the qualifications of the bidder.

CHECKS OR BID BONDS: Checks or bid bonds of the unsuccessful bidders will be returned when their bids have been rejected, and not to exceed 60 days from the date bids are opened. All bids shall remain in force for this 60-day period. The check or bid bond of the successful bidder will be returned when the Contracts are signed by both parties and necessary bond supplied. Should the Purchaser make an award to a Contractor who refuses to enter into Contract and furnish the required bond, then the bid security which has been deposited with the Purchaser may, at the option of the Purchaser, be forfeited to the Purchaser as liquidated damages, within 20 days after written notice is given.

PERFORMANCE BOND: On award of the Contract, the successful Contractor shall furnish a Performance Bond and Statutory Bond in an amount equal to the full Contract price, guaranteeing faithful compliance with all requirements of the Contract Documents and complete fulfillment of the Contract, and payment of all labor, material and other bills incurred in carrying out this Contract.

STATEMENT OF CONTRACTOR AND AFFIDAVIT: This form must be completed by the Contractor in order to obtain final payment from the Purchaser.

BID DATA: Bidders shall submit bid data as indicated in the Proposal in triplicate by filling in one set of data sheets bound into each of two sets of specifications and one set of transparent data sheets supplied by the Engineer. The transparent sheets will be used to develop tabulation sheets. The transparent sheets shall be filled out legibly in black ink to permit reproduction. All data on these sheets must be contained to the right of the trim markings shown on the sheets.

Bid data which is to be examined or read aloud at the time bids are opened shall be enclosed in a special envelope marked with instructions, which is enclosed with the bidding forms. This envelope shall contain only a cashier's check, certified check, bidder's bond, signed copies of addenda, and a transparent "Summary Sheet" filled out in black ink to permit reproduction. It is important that these sheets be filled out as herein described to aid the Owner in expediting his review of the Proposal.

This special envelope shall be enclosed in a sealed envelope containing the filled out specifications, descriptive information drawings, qualification list and any other bid materials. Bids of an incomplete nature or subject to multiple interpretation may, at the option of the Purchaser, be rejected as being irregular.

REQUEST FOR INTERPRETATION: If any person contemplating submitting a bid for this Contract is in doubt as to the true meaning of any part of the specifications, or other proposed Contract Documents, he may submit to the Engineer a written request for an interpretation thereof. The person submitting the request will be responsible for its prompt delivery. Any interpretation of the proposed documents will be made only by addendum duly issued and/or delivered

to each person receiving a set of such documents. The addenda shall be signed and submitted with the bid and upon closing shall become a part of the Contract. The Engineer will not be responsible for any other explanation or interpretation of the proposed documents.

ADDENDA: Any addendum to the specifications issued during the time allowed for preparation of bids shall be covered in the proposal and upon closing the Contract shall become a part of the specifications. Three copies of each addendum issued before the date of the letting will be mailed to all bidders. One signed copy is to be returned immediately to Lutz, Daily and Brain, Consulting Engineers, as acknowledgement of receipt. Two copies are to be signed and submitted with the proposal.

TIME OF COMPLETION: Time of completion is of the essence of this Contract. The ultimate completion and operation of the entire Power Plant complex is contingent upon the completion of several overlapping contracts. Some contracts can run concurrently and some contracts require completion or partial completion prior to the start of or completion of another contract.

FINANCIAL STATEMENT: The bidder shall furnish upon request a complete financial statement signed by the bidder, if an individual, by all partners if the bidder is a partnership, and by the President or Secretary if the bidder is a corporation.

TAXES: All sales and use taxes on required and approved items to be permanently incorporated in the scope of this Contract, lawfully assessed under the laws and regulations of the State of Kansas or other appropriate taxing authorities shall be paid by the Contractor and/or subcontractors. The Contract price will be adjusted to compensate for any changes in taxes applicable or changes in tax rates which occur subsequent to the bid opening date and prior to completion of Contract in a manner equitable to both parties.

MODIFICATION OF BIDS: Bids may be modified or withdrawn by an appropriate document duly executed in the manner that a bid must be executed, and delivered to the place where bids are to be submitted at any time prior to the final time set for receiving bids.

Bidders may modify or withdraw bids by telegraphic communication at any time prior to the time set for receiving bids provided this instruction is positively identified. Any telegraphed modification should not reveal the amended bid price but should provide only the addition, subtraction or other modification. A duly executed document confirming the telegraphed modification shall be submitted within three days after bids are opened.

PROPOSAL

Dated 24th day of October, 1979

TO: THE BOARD OF PUBLIC UTILITIES
OF KANSAS CITY, KANSAS

Subject: Power Plant Ash Ponds
Contract No. 75A

Gentlemen:

The undersigned, having familiarized himself with the attached Contract Documents, which are as follows: Notice to Bidders, Instructions to Bidders, Proposal, Detailed Specifications, General Specifications, Contract Stipulations, Contract, Performance Bond, Statutory Bond, Statement of Contractor and Affidavit, Appointment of Designated Process Agent, Plans and Additional Drawings, all of which Contract Documents are made a part hereof, hereby proposes, in compliance with said Contract Documents, to furnish all labor, equipment, materials, drayage, tools, supervision, etc., and to construct complete said work at the site of the Nearman Power Station at the following firm prices:

ITEM	PRICE IN WORDS	PRICE IN FIGURES
1.	To furnish, install and construct the Power Plant Ash Ponds as described in these specifications and as shown on the accompanying drawings for the total lump sum of:	
	One Million, Forty-eight Thousand, Eight Hundred Fifty-two and 04/100s Dollars	($ 1,048,852.04)

TAXES: The above prices are inclusive of all applicable taxes in effect as of the date that bids are opened.

The amount of tax included for Item 1	($ 4,599.63)
Total Materials Cost	$ 131,404.00
Total Services Cost (Labor and Incidental Services Rendered)	$ 912,848.41
Total Contract Price	$ 1,048,852.04

Note: The total material cost plus the total services cost plus the total amount of sales tax must equal the amount shown for the total lump sum firm Contract price.

CONTRACT TIME: The undersigned agrees to perform the work covered in this Proposal as follows:

In order for this Contract to move rapidly during construction and to associate its progress relationship to the overall schedule for the entire project as a whole, a definite schedule of construction sequencing shall be followed.

It is the direct intention of the Specifications that the completion dates contained in the TIME OF COMPLETION section of the SPECIAL CONDITIONS be complied with. These completion dates are of the essence for this Contract as well as subsequent contracts and other previously awarded contracts. The undersigned agrees to complete all work contained in the TIME OF COMPLETION section by the time specified.

The completion dates are based on a "Notice to Proceed" given no later than November 1, 1979. If for any reason the "Notice to Proceed" is issued at a later date due only to reasons of the Owner, the completion set forth shall be extended an equal number of days. It is the intention to award the Contract October 31, 1979 and it is required that the successful Contractor shall immediately obtain and submit to the Owner proof of carriage of all required insurance, the signed Contract Documents and the required bonds prior to the "Notice to Proceed" being issued. Failure of the Contractor to expedite the above requirements shall not warrant any extension of time as contained in the PROPOSAL.

The aforementioned Contract Price is based on a 5 day 8 hour work week. * The undersigned understands and agrees that the Owner has the right to require overtime work in excess of the above, if the Owner desires to improve the schedule as indicated above and reimbursement for such overtime will be for the premium portion of the overtime only, excluding such overtime as the Owner may direct, pursuant to the paragraph entitled DELAYS in the Contract Stipulations or overtime required due to the nature of certain tasks.

In addition to the above Item No. 1, bidders shall fill in the following unit adjustment prices. These prices shall be used to adjust the bid price in the event the plans and the specifications are altered by the Purchaser or Engineer due to unforeseen conditions. These unit prices shall be used in conjunction with the paragraph headed EXTRA AND/OR ADDITIONAL WORK AND CHANGES on page F-3 of these specifications under the listing, "(c) on a basis of the unit prices as stated in these specifications where such unit prices apply." These prices are to be used as one of the three means of establishing an addition or deduction from the contract price as defined in this paragraph on page F-3. Any one of the methods (a), (b), or (c) may be used if agreed to in written terms between both parties.

* See H. E. Bohrer Excavating letter of October 26, 1979.

ITEM	PRICE IN WORDS	PRICE IN FIGURES

a. Excavation (per cu yd):

1. Hand excavation

Twelve and No/100s Dollars ($ 12.00)

2. Machine excavation

Seven and No/100s Dollars ($ 7.00)

b. Compacted backfill at structures in place (per cu yd):
Sand -

1. Hand work

Twelve and No/100s Dollars ($ 12.00)

2. Machine work

Seven and No/100s Dollars ($ 7.00)

Earth -

1. Hand work

Twenty-four and No/100s Dollars ($ 24.00)

2. Machine work

Seven and No/100s Dollars ($ 7.00)

c. Compacted embankment in place (per cu yd):

1. Pervious or random material from designated plant site borrow areas

One and 75/100s Dollars ($ 1.75)

2. Impervious material furnished by the Contractor from off site borrow areas

Three and 16/100s Dollars ($ 3.16)

d. Concrete in place for slabs on ground, footings, etc., excluding forms and reinforcing steel (per cu yd)

One Hundred Forty-five and No/100s Dollars ($ 145.00)

ITEM	PRICE IN WORDS	PRICE IN FIGURES

e. Concrete in place for walls, excluding forms and reinforcing steel (per cu yd)

One Hundred Twenty and No/100s Dollars ($ 120.00)

f. Reinforcing steel in place, including ties, chairs, spacers, bending, etc., necessary to install the reinforcement steel (per lb)

None and 65/100s Dollars ($ .65)

g. Furnishing and installing reinforced concrete pipe culverts as hereinafter described in these specifications (per lin ft):

1. 24" diameter C-76 Class III

Twenty and 75/100s Dollars ($ 20.75)

2. 30" diameter C-76 Class III

Twenty-six and 40/100s Dollars ($ 26.40)

3. 36" diameter C-76 Class III

Thirty-three and 20/100s Dollars ($ 33.20)

h. Furnishing stone riprap as hereinafter described in these specifications (per ton):

Eleven and 38/100s Dollars ($ 11.38)

i. Placing stone riprap as hereinafter described in these specifications (per ton):

Eight and 50/100s Dollars ($ 8.50)

j. Furnishing and placing bedding for stone riprap as hereinafter described in these specifications (per ton):

Fifteen and 30/100s Dollars ($ 15.30)

k. Furnishing and placing crushed rock subgrade as hereinafter described in these specifications (per ton):

Twelve and 51/100s Dollars ($ 12.51)

ITEM	PRICE IN WORDS	PRICE IN FIGURES

The undersigned understands and agrees that the Owner has the right to reject any and all bids, to waive informalities or other requirements for its benefit and to accept such Proposal as it deems to its best interest.

GUARANTEE OF GOOD FAITH: If this Proposal is rejected, or if it is accepted and the undersigned shall enter into Contract and furnish necessary bond, then the check or bid bond which has been deposited with this bid shall be returned. However, if the undersigned should refuse to enter into Contract and furnish the necessary bonds within 20 days after notification of acceptance, then the bid security shall be forfeited to the Purchaser as liquidated damages.

SIGNATURE:

Firm H. E. Bohrer Excavating

Individual _____ Title _____

Address 3801 North 55th Street, Kansas City, KS 66104

RETURN CERTIFIED CHECK OR BID BOND TO:

Name George J. Siebers & Company, Inc

Address Two Gateway Center, Suite 231, 4th at State, Kansas City, KS 66101

Completion Date: 30 May 1980 *

 * See H. E. Bohrer Excavating letter dated 26 October 1979

DETAILED SPECIFICATIONS
FOR
POWER PLANT ASH PONDS

SPECIAL CONDITIONS

GENERAL: The Board of Public Utilities of Kansas City, Kansas is strengthening its electrical utility system by constructing a new municipal steam electric generating station called the Nearman Creek Power Station.

A levee structure has been constructed on the site to protect the plant site against flood damage from the Missouri River.

A railroad spur track extending from the mainline of the Missouri Pacific Railroad serves the plant site.

This Power Plant Ash Ponds Contract is one of many contracts that will be a part of the Utility System improvement program. Additional construction and equipment contracts associated with utility system improvements at the Nearman Creek Power Station have been either awarded, are in the process of being bid or will be released for bids in the near future.

LOCATION: The work herein specified will be constructed at the Nearman Creek Power Station site located in the City of Kansas City, Kansas south of the Missouri River near river mile 379, north of the Missouri Pacific Railroad near railroad mile post 293 and just north of the point where Nearman Drive terminates at Dickinson Road. The plant site area is at an approximate elevation of 750 ft above sea level.

INTENT OF SPECIFICATIONS: It is the intent of these specifications to describe in detail the complete construction of the Power Plant Ash Ponds for the Nearman Creek Power Station for the Board of Public Utilities of Kansas City, Kansas. Materials and workmanship which are obviously necessary to complete the project in accordance with the type of construction shown on the accompanying plans but not specifically mentioned in these specifications, shall be furnished complete.

The lump sum price named in these Specifications shall include the furnishing of all labor, material, equipment, transportation costs, equipment rental, storage, etc., necessary to construct the project as herein specified and as shown on the accompanying drawings.

TENTATIVE SCHEDULE OF CONSTRUCTION: The following is a tentative schedule of construction for delivery of equipment and of construction by contractors tabulated to the best knowledge of the Engineer at the present time and is listed only to give this Contractor some indication of when the associated parts of the project will be delivered or completed. Deviations by other contractors from this schedule shall not be reason for additional compensation to the Contractor.

During the duration of this construction Contract a close overlapping of work under this Contract and that of other construction contracts will prevail. It is required that excellent cooperation between all contractors associated with this utility system improvement program be exercised to expedite and produce a first-class job in every respect.

Some previously awarded major contracts and contracts to be awarded that will be doing work on the project site during the duration of this Contract are as follows:

a. Power Plant Coal Handling System, Contract 70A, awarded to Mid-West Conveyor Company. Contract 70A will be erecting steel and setting equipment on foundations constructed by Miscellaneous Foundations Contract 85.

b. Power Plant Building Superstructure and Office Building, Contract 81, V. S. DiCarlo General Contractors - Contract is in the construction stage at the job site.

c. Steam Generating Unit, Contract 61, Riley Stoker Corporation - Contract is in the construction stage at job site.

d. Electrostatic Precipitator, Contract 82, Belco Pollution Control Corporation - Contract is in the construction stage at job site.

e. Power Plant Miscellaneous Foundations, Contract 85, Sharp Brothers Contracting Company - Contract is in the construction stage at the job site.

f. Power Plant Power Piping, Contract 86A, Natkin and Company - Contract is in the construction stage at the job site.

g. Power Plant Mechanical and Electrical Yard Construction, Contract 86B, Sanders Company - Contract is in the construction stage at the job site.

h. Power Plant Wiring and Lighting, Contract 88, Sachs Electric - Commonwealth Electric - Contract is in the construction stage at the job site.

i. Power Plant Service Well, Contract 72C, Layne Western Company, Inc. - Contract will be in the construction stage at the job site.

j. Wastewater Treatment Plant and Piping, Contract 77D - Contract will be awarded and in the construction stage at the job site.

k. Power Plant Intake, Outfall and Sealing Weir, Contract 77A - Contract is in the construction stage at the job site.

l. The power plant substation which is being built by the Board of Public Utilities is in the construction stage at the job site.

m. Roadway Subgrade and Paving, Drainage and Railroad Track Materials and Installation, Contract 76B - Contract is in the construction stage at the job site.

SCOPE OF CONTRACT: This Contract shall include furnishing all materials, transportation costs, storage, equipment, labor and tools necessary to complete the work as described in these specifications and shown on the accompanying plans.

SEQUENCE OF CONSTRUCTION: On award of the Contract, the successful Contractor will be given a "Notice to Proceed."

The following description, while not intended to cover all finite details, outlines the major items of work to be accomplished under this Contract:

1. Clear and grub the area within the limits of the ash ponds and the oil confinement berm.

2. Strip the top 12" of topsoil from areas to receive embankment fill and clay blanket and stockpile for utilization as the top surface on the ungraveled areas of embankment and area fills.

3. Construct embankment, roadway subgrades and drainage structures.

4. Construct crushed rock surfacing and place topsoil on embankments and fills.

5. Mulch, fertilize and seed designated embankment slopes.

6. Place riprap and bedding on designated areas.

7. Construct chain link fence and gates. **

8. Final clean-up of area.

In addition to the above mentioned items, this Contract shall include minor items not specifically mentioned herein but shown on the accompanying drawings or obviously necessary to provide a complete job.

TIME OF COMPLETION: The time of completion is of the essence for this Contract No. 75A. The earliest completion time for this Contract is imperative based upon Contracts already awarded and their associated delivery of equipment and materials as well as subsequent equipment contracts scheduled for bidding after the award of this Contract No. 75A.

The date of completion of the oil confinement berm and fuel oil haul road shall be no later than November 16, 1979. *

The date of completion of the remainder of this Power Plant Ash Ponds Contract 75A shall be no later than December 31, 1979. *

* See H. E. Bohrer Excavating letter dated 26 October 1979.
** See Addendum No. 1.

DRAWINGS: The drawings accompanying these specifications show in detail the extent of the work to be performed and are made an integral part hereof. The drawings are as follows:

Sheet No.	Drawing No.	Title
1 of 12	72-2P-PP-2	Site Location Plan
2 of 12	72-2P-AP-1	Ash Pond Dike Alignment
3 of 12	72-2P-AP-2	Ash Pond Grading Plan
4 of 12	72-2P-AP-3	Ash Pond Dike Profiles and Grading Details
5 of 12	72-2P-AP-4	Discharge Structures Details
6 of 12	72-2P-AP-5	Ash Pond Dike Cross Sections Sta 1+00 to Sta 7+00
7 of 12	72-2P-AP-6	Ash Pond Dike Cross Sections Sta 8+00 to Sta 14+00
8 of 12	72-2P-AP-7	Ash Pond Dike Cross Sections Sta 15+00 to Sta 21+00
9 of 12	72-2P-AP-8	Ash Pond Dike Cross Sections Sta 22+00 to End and Interior Dike Cross Sections Sta 1+00 to Sta 3+00
10 of 12	72-2P-AP-9	Ash Pond Interior Dike Cross Sections Sta 4+00 to Sta 10+00
11 of 12	72-2P-AP-10	Ash Pond Interior Dike Cross Sections, Grading Sections and Road Profile
12 of 12	72-2P-AP-11	Oil Confinement Berm and Fuel Oil Haul Road

The accompanying drawings indicate the size, location and general arrangement of the proposed construction. Dimensions lacking, but required shall not be scaled, but shall be referred to the Engineer in writing for the correct interpretation. Any inconsistencies or discrepancies which require correction or consideration shall also be referred to the Engineer in writing.

EXISTING FACILITIES: Overhead communication and signal lines exist on the site and on the Missouri Pacific Railroad right-of-way. These communication and signal lines are in service and this service must not be interrupted. This Contractor shall use extreme care in working around these lines. In the event that one of these lines should be damaged this Contractor shall immediately notify

Mr. K. D. Hestes, General Manager
Missouri Pacific Railroad Company
Phone 816-483-0525

Cost of repair to these communication and signal lines required as a result of damage by this Contractor will be borne by this Contractor.

There is an existing 26" diameter Cities Service natural gas line which is north and roughly parallel to the Missouri Pacific Railroad right-of-way. The location of this gas line is shown on the accompanying plans. It is imperative that this gas line stay in service and not be damaged by work associated with this Contract. This Contractor will be moving materials and equipment over this pipe line.

CONTROLLED ACCESS: Existing road crossings of the Missouri Pacific tracks and over the existing 26" diameter Cities Service gasline have been established and constructed by others. This Contractor is prohibited from crossing the Missouri Pacific tracks or the Cities Service gasline with vehicles or equipment of any kind or character except at the existing crossings.

RESPONSIBILITY TO RAILROAD: Whenever the term "Railroad" is used herein it shall mean the Missouri Pacific Railroad Company, 210 North 13th Street, St. Louis, Missouri 63103, represented by Mr. E. T. Franzen, Chief Engineer-Design and Construction, or his duly authorized agent, who will be acting for the Missouri Pacific Railroad Company.

If the Contractor or his subcontractors while crossing railroad property shall function thereon contrary to the specifications, or if such Contractor while crossing railroad property in a manner deemed hazardous by the railroad to its property and facilities or the safe and expeditious movement of its traffic, the railroad shall have the right to restrict crossing railroad property until the acts or omissions of such Contractor have been fully rectified to the satisfaction of the railroad.

If the railroad exercises their right to restrict crossing of railroad property for reasons that the Contractor is not complying with specified conditions, then the Contractor will not be permitted an extension of construction time. If the railroad requests restrictions for reasons that were not stated in the specifications or by separate letter, the Owner will consider a time extension.

Before commencing work involving crossing of railroad property, the Contractor shall be required to give written notice to Missouri Pacific Railroad, at least ten days in advance of the date on which the Contractor expects to begin work involving crossing of railroad property.

All correspondence to the Missouri Pacific Railroad shall be sent to:

Mr. K. D. Hestes, General Manager
Missouri Pacific Railroad Company
6400 Martin Avenue
Kansas City, Missouri 64120

and a copy shall be sent to:

1. Mr. Ralph E. Tearney, Jr.
   Director of Production Planning
   Board of Public Utilities

2. Resident Engineer

3. Lutz, Daily & Brain
   Consulting Engineers

The Contractor shall be required to use the utmost care in protecting railroad property and in avoiding accident. All railroad tracks and grade shall be kept free, by Contractor, of construction materials, debris and any other obstructions, so as to permit safe and expeditious movement of rail traffic. All work shall be performed without interference with tracks, facilities, or the operations of the railroad or its tenants except under specific arrangements affected between the Contractor and the Railroad.

The Contractor shall provide a flagman at the authorized railroad crossing at such times as required to properly safeguard operations over crossing by workmen, vehicles and subcontractors associated with this Contract.

Contractor shall require the person in charge of each vehicle operating onto and over the tracks of the railroad via the crossing to first bring such vehicle to a full stop at a safe distance from the tracks of the railroad before operating thereover, and (2nd) receive a proceed sign from the flagman stationed at the intersection of said roadway and said tracks before attempting to operate said vehicle across the tracks.

If the Contractor shall operate over crossing when there is no flagman at the crossing, the Contractor shall require the person in charge of each vehicle operating onto and over the tracks of the railroad via the crossing to first bring said vehicle to a full stop and determine that there is no train approaching on railroad tracks so near as to strike him or any property in his custody before attempting to operate thereover.

Contractor shall promptly report to Railroad's representative any accident or casualty happening in or incident to the exercise by Contractor of the grant herein contained.

Contractor shall keep any snow, ice, earth, rock or other and different obstructions removed from about said crossing, as well as keep the tracks of railroad free and clear of earth, rock or other and different obstructions at said intersection by reason of Contractor's operations on or in the vicinity of said crossing.

This Contractor shall and will, and does hereby agree to, assume and discharge, and indemnify and save harmless the Missouri Pacific Railroad, its successors and assigns, from and against, any and all liability, loss, cost or expense for or on account of injuries or fatalities to all persons, or damage to or loss or destruction of any property, caused by, arising out of or incident to the provision, maintenance, operation, use, existence or removal of crossing on premises and regardless of whether any such injury, death, damage, loss or destruction shall have been caused or contributed to by any act or omission, negligent or otherwise, of the railroad or of railroad's officers, agents, servants or employees.

LIMITS OF CONTRACT: This Contract 75A shall include all installations shown on the accompanying plans and as described in these specifications.

SITE VISIT: It is required that the Contractor visit the site of the project before submitting his proposal for this work so that he might be fully informed of the existing field conditions and the obstacles he might encounter.

SITE ACCESS: It is intended that the Contractor and his employees use established crossings and roadways whenever it is possible in the execution of all work associated with this Contract.

BASELINES AND BENCHMARKS: The Engineer has established baselines and benchmark locations and elevations. From the baselines and benchmarks established by the Engineer, the Contractor shall complete the layout of the work and shall be responsible for all measurements that may be required for the execution of the work to the lines and grades prescribed in the specifications or on the plans, and to such modifications as the Engineer may require as a result of necessary modifications to the Contract work. All field notes and data used by the Contractor for purposes of layout of the work shall be available for review by the Engineer. Such review will not relieve the Contractor of the responsibility for constructing the improvements to the lines and grades prescribed in the specifications or shown on the plans. The Contractor shall furnish, at his own expense, all labor, materials and equipment as may be required in laying out any part of the work from the baselines and benchmarks established by the Engineer. It shall be the responsibility of the Contractor to maintain and preserve all stakes and other marks established by the Engineer. If such marks are destroyed by the Contractor, without authorization by the Engineer, the marks may be replaced by the Engineer at the expense of the Contractor.

TESTING: Testing of materials in embankment and excavated areas for classification and compaction, stone riprap and bedding, shall be made by an independent testing laboratory selected and paid for by the Owner.

Stockpiled material and every operation of construction shall be subject to inspection by the Engineer and his representatives and they shall have free access to all operations and all parts of the work at all times, whether at, or away from the site.

WATER ELEVATIONS: The following are approximate elevations determined from the best data available to the Engineers, for the Missouri River at milepost 379 at the site of the proposed construction:

Low Water Elevation	727.2 MSL	(1-30-66)
Low Water Elevation	727.4 MSL	(Jan 1937)
Minimum Service Navigation Elevation	734.5	
Full Service Navigation Elevation	735.4	
Ordinary High Water Elevation	741.6	
High Water Elevation	755	(July 1951)
High Water Elevation	758	(April 1952)
High Water Elevation	756	(Oct 1973)

The above data was obtained in discussions with the Kansas City District Corps of Engineers and is the best information available to the Engineers.

WATER DAMAGE: Any damage to partially or completed work of this Contractor due to high or flowing water shall be repaired to the final condition shown on these plans and described in these specifications by this Contractor as his sole responsibility and at no additional expense to the Owner until such time as all of the work included in this Contract is completed by the Contractor and accepted by the Owner.

SUBSURFACE EXPLORATION

GENERAL: The logs of the most recent borings of test holes in the borrow area and in the embankment fill areas are included in the back of these specifications for the information of the Contractor. The logs represent the soils only at the particular location at which each of the test holes were drilled. Any interpretation of soil conditions between test holes shall be the responsibility of the Contractor.

In addition to this information, reports of the soil conditions for the Nearman site were made in December 1975, March 1976, September 1976, October 1977, and additional borings were taken in May 1978 by Layne-Western Company, Inc., of Kansas City, Missouri. A report was made in November 1975 by R. J. Spiegel, Consulting Engineers, Kansas City, Missouri in regard to the flood protection system at the Nearman Power Plant which incorporates 106 borings made on the site and borrow areas by Layne-Western. All of the above reports are available for review at the office of the Owner or the Engineer.

This boring data is included and made available in order to give the Contractor all available information. The Owner does not guarantee the information to be factual. If the Contractor desires he may do additional subsurface exploration at his own expense.

Data included is as follows:

Summary of Soil Tests
Boring Logs

D-3-74	47-75	52-75	57-75
D-4-74	48-75	53-75	88-75
11-75	49-75	54-75	90-75
12-75	50-75	55-75	92-75
46-75	51-75	56-75	95-75

Locations of the above test holes are shown on Drawing 72-2P-AP-2.

CLEARING AND GRUBBING

SCOPE OF WORK: The work covered by this section consists of furnishing all labor, equipment, tools and materials and performing all operations necessary for clearing and grubbing the areas specified herein or indicated on the Drawings and for the removal or disposal of all cleared and grubbed materials as specified herein.

ORDER OF WORK: All clearing and grubbing shall be completed at least 300 feet in advance of embankment or fill construction, required excavation, road relocation and/or fill construction and ditch excavation, all areas where structures are to be located or other required construction. In locations where work on existing or proposed structures is performed or must be performed prior to the construction of the roadway embankment fills, drainage structures, ditch excavation or other work under this Contract, clearing and grubbing shall be completed in advance for at least 50 feet in all directions. Borrow areas shall be cleared in advance of their required use but only when it is apparent that their use will be required.

CLEARING: Clearing shall consist of the complete removal to the ground surface of trees, brush, trash, slash, stone, metal, stumps, down timber, structures and other obstructions. Clearing shall also consist of the removal of abandoned foundations, buildings, bridges, debris, and other materials which remain after buildings or other structures have been salvaged or removed by others. Trees shall be felled in such a manner as to avoid damage to trees to be left standing, to the existing structures and installations, or those under construction, as well as to safeguard employees and others.

Construction areas for roads, embankments and structures shall be cleared within the limits of the fill for this work, together with strips five feet wide, beyond and contiguous thereto.

Existing channels, ditches, and depressions to be filled shall be cleared within the limits of the proposed fills.

Construction areas for channels, ditches, and riprap shall be cleared within the excavation limits of 5 feet beyond and contiguous to the area of construction.

Borrow areas, including ditch excavation areas and other areas or embankments that are to be used as a source of borrow material, shall be cleared to the extent necessary to provide material meeting the specified requirements for fill materials. Vegetation on borrow area traverses, the strip of land along the river bank which is to be left unexcavated shall be left undisturbed to the maximum extent practicable and consistent with excavating for borrow and providing access for construction equipment.

GRUBBING: Grubbing shall consist of the removal of all stumps, roots, buried logs, pipes, debris, metal, existing structures of any kind that have been abandoned or are to be abandoned, and other objectionable matter below the ground surface.

Construction area for structures shall be thoroughly grubbed within the limits of the structure.

Borrow areas, including existing levees and fills or other embankments that are to be used as borrow shall be grubbed to the extent necessary to provide borrow materials acceptable to the Resident Engineer.

DISPOSAL: Except as hereinafter specified, all logs, brush, slash, trash, and other combustible debris, which are the products of the clearing and grubbing operation, may be disposed of by burning in an air-curtain type destructor upon permission obtained in writing by this Contractor from the Kansas City-Wyandotte County Department of Health. Air curtain open pit destructor shall be in strict accordance with the above agency's requirements. If burning is not permitted or desirable, all material shall be disposed of by the Contractor at offsite landfills approved by the governing agency. Open burning will not be permitted. The Contractor shall be responsible for compliance with all Federal, State, County and City laws and regulations relative to the disposal of combustibles by burning.

STREAM FLOW: The products of clearing and grubbing operation shall be placed in areas where they will not be carried away by stream flow.

Stumps or debris which, in the opinion of the Engineer, are impractical to burn and stones, broken concrete, metal, and other similar solid objects, which are the products of removal of structures and foundations, wire fencing metal fence-posts, and pipes to be removed, shall be disposed of by the Contractor at off-site landfills acceptable to the governing agency.

Disposal of riprap where removed shall be as follows. Riprap which meets the requirements of section RIPRAP, shall be stockpiled and reused.

FILLING OF DEPRESSIONS AND HOLES: The filling of depressions and holes excavated below the original ground surface as a result of clearing and grubbing operations is specified in section EMBANKMENT.

EMBANKMENT

SCOPE OF WORK: The work covered by this section consists of furnishing all plant, equipment, tools, labor and materials and performing all operations necessary for constructing all required fills, road embankment fills and any other required fill as shown on the drawings and/or as specified herein.

The natural and existing ground surfaces as shown on the drawings are approximate only. Embankments and fills shall be constructed to the net grade and cross section shown and except as otherwise specified without additional allowance for shrinkage of the fill.

MATERIALS: Embankment materials shall be obtained from designated borrow areas on the plant site, off-site borrow areas furnished by the Contractor or from required excavation as shown on the drawings. Material shall be free of roots, stone, debris, or similar objects larger than two inches in diameter.

Pervious materials shall be free-draining sand or gravelly sand consisting of sound durable particles and shall contain not over 10% passing the U.S. standard No. 200 sieve.

Impervious materials shall be fine-grained materials of low permeability consisting of clays, clay silts, or silts, and shall be free of plant growth, roots, and humus. In general, the particle size of impervious material shall be such that a minimum of 90 percent of the soil particles shall pass a U.S. Standard No. 200 screen and shall be material classified as CL on the plasticity chart of the Unified Soil Classification Chart and have a minimum P.I. of 12 and a maximum liquid limit of 45.

This impervious material is not available in borrow areas on the plant site and shall be provided by the Contractor.

Random materials shall consist of pervious materials, impervious materials or any combination thereof.

Natural blanket soils (or materials) refers to the natural deposit of fine-grained soils ranging from silts and sandy silts to clay and varying in thickness from being absent (i.e. sand occurs from the ground surface down to bedrock) to upwards of 25 feet. These soils are typically stratified having been water-deposited and reworked many times. The natural moisture of these materials varies generally with the season of the year and stage of the river.

Waste fill is any existing sanitary and trash landfill excavated. The waste fill shall be removed to an off site licensed sanitary landfill.

The degree of compaction for materials expressed hereinafter as a percentage of maximum density refers to a maximum density at optimum moisture, determined in accordance with test procedures presented in ASTM D-698 (Standard Proctor).

FOUNDATION PREPARATION: After stripping, horizontal surfaces to receive fill shall be thoroughly scarified to a depth of six inches immediately prior to compaction and compacted as specified. If, for any reason, the surface to receive fill becomes compacted in such a manner or growth of vegetation develops to such an extent that in the opinion of the Engineer, a plane, seepage, or weakness might be induced, the surface shall again be thoroughly scarified. Where embankments are constructed against an existing slope (either a natural or excavated slope or that of a previously placed portion of the embankment), the existing slope shall be cut or notched through any loose or dried material on the surface, and the compaction equipment shall work on both the existing material and the new fill to bond them together. Excavation for removal of objectionable material for embankment and drainage ditches, depressions and holes resulting from clearing and grubbing operations and voids caused by the removal or part removal of old foundations and structures or any other excavation required for removal of materials considered objectionable by the Engineer shall be backfilled and compacted to original grade or to the excavation shown on the applicable drawings, with impervious material compacted to at least 95 percent of maximum density and pervious material compacted to at least 80 percent of relative density.

GROUND WATER CONTROL: Where excavation is to be performed below ground water level and placement of compacted fill is required, placement of fill shall be conducted in the dry. If seepage occurs and results in any loosening of the foundation soils, or if, in the opinion of the Engineer, there is reason to believe loosening of the foundation soils will occur, the Contractor shall install a suitable dewatering system which will nullify the excess seepage gradient. Any loosened foundation material shall be compacted to at least 95 percent of maximum density. The water level shall be allowed to rise only after sufficient fill has been placed to offset the uplift pressure of the water. Methods for care of water and controlling the ground water level and seepage gradients shall be subject to review by the Engineer.

PLACEMENT AND COMPACTION REQUIREMENTS: The embankment and fills shall be constructed of compacted earth fill zones as indicated. Except on top of impervious fill material, the top six inches of material placed on ramps, turnaround, road and embankment fills and the top 12 inches of area fills shall consist of topping material consisting of friable clay silts possessing characteristics of representative soils in the vicinity which produce a heavy growth of vegetation. The material shall be free from stones or similar objects larger than two inches in diameter, stumps, roots, and any toxic substance or substances which may be harmful to plant growth or be a hindrance to grading, planting and maintenance operations. The fill areas shall be graded to drain and shall be left in a reasonably smooth condition that will not result in the ponding of water.

EQUIPMENT: Tamper-type rollers shall consist of a heavy-duty, double drum unit with a drum diameter not less than 60 inches and an individual drum length of not less than 60 inches. The drums shall be liquid, or sand and liquid ballasted during use. Each drum shall have staggered feet uniformly spaced over the cylindrical surface such as to provide approximately three tamping feet for each two feet of drum surface. The tamper feet shall be seven to nine and a half inches in clear projection from the cylindrical surface of the roller and

shall have a face area of not less than six or more than 10 square inches. The rolling units of multiple-type tamping rollers shall be pivoted on the main frame in a manner which will permit the units to adapt themselves to uneven ground surfaces and to rotate independently. The roller shall be equipped with cleaner bars, designed and attached to prevent the accumulation of material between the tamping feet; and these cleaner bars shall be maintained at their full length throughout the period of roller use. The weight of the roller shall be between 1000 pounds and 1500 pounds per linear foot of drum length empty and be capable of being ballasted to at least 2000 pounds per foot of linear drum length. The design and operation of the tamping roller shall be acceptable to the Engineer. At any time during prosecution of the work, repairs to the tamping feet, minor alterations in the rollers, and variations in the weight as may be found necessary to secure optimum compaction of the earth fill materials shall be performed. Rollers shall be self-propelled or drawn by a crawler-type tractor. Self-propelled rollers exceeding the empty weight requirement may be used provided that by the substitution of tamping feet having a face area not exceeding 14 square inches, the nominal foot pressure on the tamping feet of the self-propelled roller can be adjusted to approximate the nominal foot pressure of the towed roller for the particular working con-dition required for the towed rollers. If the self-propelled rollers cause shearing of the fill or laminations in the fill, the Engineer may direct that the self-propelled rollers be removed from the fill and that tractor-drawn tamping rollers be used. For self-propelled rollers, in which steering is accomplished through the use of rubber-tired wheels, the tire pressure shall not exceed 40 pounds per square inch. Rollers shall be operated at a speed not to exceed 3.5 miles per hour.

Crawler-type tractors used for compaction shall weigh not less than 40,000 pounds.

Power tampers will be acceptable subject to obtaining densities comparable to that specified for the material and zone of the embankment being compacted.

Sprinkling equipment shall consist of pressure distributors designed to apply water in controlled quantities to variable widths of surface. Sprinkling equipment depending solely on gravity flow for dispensing water to the fill will not be permitted.

COVERAGE:

a. Tamping Rollers. A complete pass shall consist of complete coverage of the area to be compacted with each trip of the roller overlapping the adjacent trip by not less than one foot.

b. Crawler Tractor. One pass shall consist of complete coverage by the tractor with sufficient overlap of successive tread paths to ensure complete coverage.

c. Power Tampers. Surfaces to be compacted in confined areas inaccessible for rolling shall be tamped uniformly with power tampers to obtain densities equal to that obtained by rollers or crawler tractors as applicable.

PLACEMENT AND COMPACTION: Layers shall be started full width out to the slope stakes and shall be carried substantially horizontal with sufficient slope to provide satisfactory drainage during construction. Portions of the fill, which are inaccessible to rolling, shall be compacted in three inch uncompacted lifts with power tampers. Hauling equipment shall be operated to avoid tracking insofar as practicable. When ruts appear in the surface of any layer of material to be rolled, the surface shall be scarified so that all ridges and bridging between ruts are broken down and the surface of the layer regraded and made uniform before compaction. Where the surface of any layer in the impervious fill or random fill has been made too smooth to bond properly with the succeeding layer, it shall be loosened by scarifying and recompacted. If the work is stopped for 24 hours or more, or if rainfall is imminent and is anticipated in sufficient amounts to cause temporary shutdown of operations, the impervious or random zones (except where the random fill is pervious material) shall be smooth bladed to drain and sealed with rubber-tired rollers, or other acceptable equipment as required to inhibit absorption of rainfall. Embankment and fills shall be scarified and recompacted after becoming unduly wet or after freezing before additional fill material is placed. Finished slopes shall present a uniform appearance without pronounced irregularities.

An overbuild of 0.5 foot above the prescribed grades will be permitted in the final dressing, provided any excess material is so distributed that there are no abrupt humps or depressions in the surfaces or bulges in the width of the crown. The above grade tolerance may be modified at locations where such modifications will not impair the design or appearance of the embankment. Fill material shall not be placed upon frozen surfaces nor shall frozen earth, snow, or ice be placed in the fill.

Impervious materials shall be placed in approximately horizontal layers not exceeding eight inches in thickness. Each layer shall be compacted to at least 95 percent of maximum density at optimum moisture. Before rolling is started, each layer shall be dried by aeration or have moisture added as necessary to obtain a uniform moisture content within the limits of three percent above and three percent below the optimum moisture for maximum density.

When fill consists of pervious material it shall be placed in maximum 12 inch uncompacted lifts. Each lift of pervious material when placed as fill shall be wetted as directed to facilitate compaction by not less than three passes of a crawler type tractor or vibrating roller acceptable to the Engineer. Pervious material shall be compacted to at least 100 percent maximum density. When the fill is a combination of pervious and impervious material and there is a question as to which method of compaction should be used, the method of compaction shall be determined by the Engineer.

After each layer of material is finished, it shall be inspected by the Engineer or his representative before beginning a new layer. If the material fails to meet the density specified, the course shall be reworked as necessary to obtain the specified compaction, and the compaction method or subsequent work shall be altered to obtain the specified density. Such procedure shall be determined by the Engineer.

Materials placed in area fill shall meet the requirements for embankment fill.

Materials placed in the required area fill shall be placed and compacted as described for rolled fill.

ACCESS ROADS, HAUL ROADS AND RAMPS: At locations where access roads to fields or buildings are destroyed because of the work required under this Contract, the Contractor shall provide temporary access roads during the construction period. Such facilities shall be removed to the extent required by the Engineer. Excavated materials or stockpiles of supplies shall not be placed, nor shall equipment be stored or operated in such manner as to preclude ingress to or egress from the fields and buildings.

Haulroads and ramps constructed for the prosecution of the work shall be to such line, grade, and width as to fulfill the requirements for safe and efficient hauling operations. Construction of ramps by excavation into the side slopes of the new or existing embankments will not be permitted. Subsequent to the completion of the work prior to acceptance by the Owner, the Contractor shall, where so directed by the Engineer, remove temporary construction ramps, and plow, scarify or otherwise loosen all haul roads, the areas occupied by ramps, and the access way (other than existing roads) to a minimum depth of six inches and the surface left in a reasonably smooth condition.

TOPSOIL: Contractor shall place 6" topsoil on all side slopes except riprap areas prior to seeding.

EXCAVATION

SCOPE OF WORK: The work covered by this section consists of furnishing all labor, equipment, tools and materials, and the performing of all operations necessary for stripping, stockpiling materials, and excavation of borrow areas, drainage ditches, removal of objectionable material from embankment foundation and anywhere else within the project limits, and any and all other excavation incidental to the construction of appurtenant fills, all as shown on the drawings or as described herein. For the definitions of certain terms used herein refer to section EMBANKMENT.

EQUIPMENT AND OPERATIONS: The Contractor shall submit to the Engineer for review and acceptance a list of his excavating and hauling equipment, and plan of operations, prior to starting excavation and embankment construction. As the work progresses, the plan shall be modified as required to meet field conditions and shall be acceptable to the Engineer. The plan shall provide that excavation and disposal of materials is coordinated with the use of temporary stockpiles to provide the various required materials at the appropriate time for incorporation into the embankment. The plan shall indicate the proposed haul road pattern. In the event that public roads are used as haul roads, they shall be kept free of dirt, mud, rock or other material spilled or dropped from hauling equipment. The Contractor shall plan his operations to prevent interference with existing power, communications and underground utility lines, bridges, highways and railroads which cross the construction right-of-way. The plan shall also be modified to provide for coordinating this work with work of other contractors on facilities crossing or adjacent to this work. The Contractor shall also plan his operations to prevent interference with and operations on any railroad right-of-way without prior clearance from such railroads all as acceptable to the Engineer.

SHEETING AND BRACING: Sheeting and bracing shall be installed where required for the protection of existing facilities or for the safety of the workmen; however, sheeting and bracing will not be permitted in lieu of required excavation slopes. The sheeting and bracing shall be adequately designed and properly installed to withstand anticipated loads. The Contractor shall be fully responsible for the design of the sheeting and bracing which will not only prevent failure of the existing embankment but will also prevent the formation of cracks in the undisturbed soil. If any evidence of soil movement occurs, the Contractor shall make physical changes in the sheeting and bracing to check the soil movement. Sheeting and bracing shall be removed as backfill operations progress.

SURFACE AND GROUND WATER: Normal drainage in drainage channels and structures shall be provided. Where excavation extends below the ground water level and work on structures or placement of compacted fill is required in that location, the work shall be conducted in accordance with the applicable provisions of section EMBANKMENT.

MIXING OF MATERIALS: When materials in borrow areas and required excavations are considerably stratified or when the natural moisture content varies considerably from the optimum value for proper placement and obtaining maximum density in compacted fill, the Engineer may require that excavation be done in a manner to provide mixing during excavation to obtain a more homogenous material and with a more desirable moisture content after required manipulation of the fill.

LINES AND GRADES: The natural and existing ground surfaces shown on the drawings are approximate only. Material shall be excavated at the locations as specified and to the lines and grades as shown on the drawings. Any excessive excavation, including borrow excavation, shall be backfilled as specified herein.

COMMON EXCAVATION: Common excavation includes all excavation except borrow excavation. Excavation of road embankments and any required area fills shall be included as common excavation. Excavation outside the above limits or the limits of excavation shown on the drawings shall be considered as borrow excavation.

The Contractor should study the existing borings and visit the site so that he will be fully informed of the existing field conditions and obstacles which he might encounter. He may take additional borings if he so desires prior to submitting his proposal.

OBJECTIONABLE MATERIAL: In areas to be occupied by the embankment and related fills, any material designated as objectionable material by the Engineer, such as soft, low shear strength clays, muck, trash and excessively wet foundation soils or material determined to be objectionable because of high permeability, stability or is otherwise unsuitable as a foundation for compacted fill, shall be removed to the limits shown on the drawings, or as directed by the Engineer within reasonable limits.

Excavation for placement of riprap and bedding shall be performed at the locations and to the cross sections and grades shown.

STRUCTURES: Excavation for structures as shown on the drawings shall be "Common Excavation."

PLANT SITE BORROW AREAS: The borrow areas are foreshore borrow area and excess material from excavations for structures within the plant site all as shown on the drawings. Certain conditions apply to each area as delineated. The limits of this borrow are shown on the drawings. Construction haul roads and access ways along traverses and adjacent to borrow areas shall be maintained and left in a smooth and reasonably level condition. Upon completion of the embankments and berms, and prior to acceptance, all disturbed area surrounding excavated borrow areas and the borrow areas themselves shall be graded smooth and left in a clean, neat, and workmanlike condition. Drainage of the borrow areas shall be the Contractor's responsibility during his operations in the borrow area. The borrow areas are shown on the drawings and the types of borrow operations permissible in each of the borrow areas are described as follows:

EXCAVATED MATERIALS FROM ASH PONDS, DITCHES AND OTHER REQUIRED EXCAVATIONS: Materials obtained from these sources may be used in the embankments and required fills insofar as the materials meet the requirements of section EMBANKMENT.

FORESHORE BORROW: Material for fill may be obtained from the foreshore borrow area. The limits of this borrow pit and other details are shown on the drawings. In general, all borrow from the foreshore pit will be by land operated equipment.

STRIPPING: Vegetation shall be stripped from all areas to receive compacted fill to a depth sufficient to remove topsoil containing humus, grass, and grass roots. Stripping of borrow areas will be required insofar as it is necessary to provide suitable material for required fills. Stripped topsoil shall be stockpiled separately to be used later.

DISPOSITION OF MATERIALS: Excavated earth materials, except materials considered unsuitable, shall be utilized in the construction of fill areas provided they meet the requirements for these materials set forth in section EMBANKMENT.

Material unsuitable for use in the embankments or related fills shall be wasted back into the foreshore borrow areas at locations as directed by the Engineer.

SLOPE FINISHING: Finished slopes in the excavated areas shall present a uniform appearance without pronounced irregularities. The acceptability of any undercuts (material remaining above lines and grades shown on the drawings) will be determined by the Engineer on the basis of the relation of the undercut to the performance and appearance of the completed work.

SLIDES: In case of slides in any part of the required excavation prior to final acceptance of the work, the Contractor may be required to remove and/or replace materials with compacted fill, as directed. Remedial measures will be at the expense of the Owner unless the slide is due to the failure of the Contractor to comply with stipulated restrictions on surcharging or over steepening slopes or to take reasonable precautions or exercise sound engineering and construction practices in the conduct of his work.

SLOPES AND SURCHARGES: During the construction period, temporary slopes for any channel, structure excavation, or other required excavation shall not be steeper than the indicated finished slope or the construction slope, if specified. With the review and acceptance of the Engineer, temporary slopes may be constructed by benching so that the average slope is not steeper than the finished slope or specified construction slope. In addition, no temporary, permanent, or construction slopes shall be surcharged with stockpiles of excavated or other materials or with heavy construction equipment which would have the same effect as the surcharge material. The toe of the slope of such stockpiled material will be maintained a distance back from the top of the finished slope (actual or theoretical) equal to the full depth of the excavation or channel. Any slide or adverse condition caused by failure of the Contractor to maintain these requirements shall be corrected by the Contractor at no additional cost to the Owner.

BEDDING

SCOPE OF WORK: This section of the specifications covers all plant, labor, equipment and materials to furnish and completely install the bedding under the riprap as required by the drawings and as herein specified.

The bedding material shall consist of crushed limestone or natural gravel materials of the thickness indicated at the option of the Contractor.

MATERIALS: The materials shall conform to the following requirements. Bedding shall be sound, durable limestone, free from cracks, seams, shale partings, and soil or shall be natural gravel composed of hard, tough and durable particles free from adherent coatings. Bedding larger than one inch standard sieve size shall be reasonably free from flat elongated particles. Bedding material shall be reasonably well graded within the limits specified:

Sieve Size	Per Cent Passing by Weight
3 inch	Maximum Allowable Size
1-1/2 inch	75-95
1/2 inch	40-60
No. 4	5-25

PLACEMENT: Bedding shall be spread uniformly to the lines and grades indicated. Placement shall be by methods which will minimize segregation. Any damage to underlying surface during placing of the bedding shall be repaired before proceeding with the work. Compaction of the bedding layer will not be required, however, the bedding surface shall be reasonably smooth.

RIPRAP

SCOPE OF WORK: This section of the specifications covers the furnishing of all plant, labor, materials and equipment for constructing the riprap of the lines and grades shown on the drawings and as herein specified.

MATERIALS: Stone for riprap shall be sound durable limestone, free from cracks, seams, shale partings, and overburden spoil. Stone shall be approximately rectangular in cross section free from these slabby pieces having an elongation ratio greater than four and the quantity of stone having an elongation ratio greater than three shall not exceed 20 per cent by weight.

Deleterious substances such as shale and clay balls (in material retained on the 1/2 inch sieve) shall not exceed seven per cent by weight.

GRADATION: Stone shall be reasonably uniformly graded within the following limits:

Weight in Pounds	Percent of Total Weight Lighter Than
300	Maximum Allowable Size
200	85-95
50	30-50
10	0-15

PLACEMENT: Riprap shall be placed to full layer thickness in one operation in such a manner as to minimize segregation and avoid displacing the underlying material. Stone for riprap shall be placed, beginning at the bottom of the section, in a manner that will produce a well-keyed and stable mass of rock with a finished surface corresponding to the lines and grades shown on the drawings. Distribution shall be obtained by selective loading at the source of excavation, as applicable together with controlled dumping at the site, or by other acceptable methods. Hauling over bedding or riprap after placement will not be permitted. Stone shall be placed by direct dumping in place by means of truck, skip box, clam, rock bucket, or orange peel. The larger stones shall be well-distributed and the finished stone protection shall be free from pockets of small stones and clusters of large stones. Final finishing of the slope shall be done as material is being placed. Dumping of stone at the top of the slopes and rolling into place will not be permitted. Moving stone by drifting and manipulating stone by means of dozers or whole blade equipment will not be permitted. A tolerance of plus 0.5 feet from the thickness shown on the drawings will be allowed in the finished surface of the riprap. When necessary, the Contractor shall hand place riprap to the extent necessary to secure the results specified herein.

MAINTENANCE: The Contractor shall maintain the riprap until the project is completed and any material displaced by any cause shall be repaired to the lines and grades shown on the drawings.

EARTHWORK FOR STRUCTURES

SCOPE OF WORK: The Contractor shall furnish all materials, machinery, equipment, and labor necessary to do all excavation work, backfilling and grading indicated on the drawings or herein stipulated. This work shall include necessary preparation of the area around the structure, removal and disposal of all debris, the handling, storage, transportation and disposal of all excavated material, all necessary sheeting, shoring and protection work, preparation of subgrades, and final grading and dressing of the area around the structure to the grades and elevations shown on the drawings or called for in these specifications.

This Contract shall include excavation for all foundations or any other construction which shall require excavation to construct the project as shown on the accompanying plans.

This work shall be done so as to conform with all local and state ordinances and laws with respect to safety and excavation including safety provisions of the Williams-Steiger Occupational Safety and Health Act of 1970 and its latest revisions and regulations.

INSPECTION AND SOIL TESTS: The opened excavation shall be examined and approved by the Engineer before concrete or footings are poured. The Engineer may then order the surfaces to be placed in better condition or may order a test of the bearing capacity. Cost of such test would be borne by the Owner and shall not be a part of this Contract.

CLASSIFICATION OF EXCAVATION: There will be no classification of excavated materials, and the term "excavation" shall include all materials excavated or removed on the site or sites of the work regardless of the type, character, composition or condition of the materials so excavated, and shall further include all debris, junk, broken concrete, brick, stone, pipe, logs, stumps, roots and all other materials encountered within the specified excavation limits.

STRUCTURE EXCAVATION: Excavation shall be done carefully to lines and elevations shown on the drawings, and shall provide proper room for all construction operations. Work shall be done so that the premises shall be as free as possible from all obstructions and from interference with transportation, storage or handling of materials. Care shall be taken at all times to conduct the work safely, with all precautions against hazards of any kind. Before placing the concrete or other foundations upon any subgrade, all loose material shall be removed so that the structure will rest on solid, undisturbed ground.

Concrete forms will be required for wall and footings of any kind; therefore, the excavation shall provide adequate clearance for their installation and removal. In no case shall excavation faces be undercut to provide for extended footings.

SHEETING AND SHORING: The Contractor, as his subsidiary obligation, shall provide and construct all sheeting and shoring required to protect and maintain the stability of existing banks or sides of excavation, and to prevent caving, sliding or any movement of such banks into the excavated area. Sheeting, bracing and shoring shall be adequate in design and construction to withstand all loads that might be caused by earth movement or pressure, and it shall be rigid, maintaining its shape and position under all circumstances.

UNAUTHORIZED EXCAVATION: All material excavated below the bottoms of concrete walls, footings and foundations shall be replaced, by and at the expense of the Contractor, with concrete placed at the same time and monolithic with the concrete above.

REMOVAL OF WATER: The Contractor shall provide and maintain proper and adequate dewatering equipment for the removal and disposal of all surface and ground water entering excavations or other parts of the work, and shall keep each such excavation dry until the structure to be built therein is completed to the extent that no damage from hydrostatic pressure, flotation or otherwise will result from contact with such water. No reinforcement steel shall be placed in water, and no water shall be permitted to rise over such steel before the concrete has been deposited. Surface water shall be diverted or otherwise prevented from entering excavated areas or trenches, to the greatest extent practicable without causing damage to adjacent property.

SUBSOIL STABILIZATION: Subgrade soil for all concrete structures, regardless of type or location, shall be firm, dense, and thoroughly compacted and consolidated, shall be free from mud and muck, and shall be sufficiently stable to remain firm and intact under the feet of the workmen engaged in subgrade surfacing or laying reinforcement steel, and depositing concrete thereon.

Subsoil which is otherwise solid, but which becomes mucky on top due to construction operations, shall be reinforced with one or more layers of crushed stone or gravel as directed by the Engineer. The Contractor will be allowed the actual delivered cost of such granular material used, with no allowance for labor in placing or for profit.

EARTH BACKFILL: Well compacted backfill shall be placed around the exterior of all walls and footings and foundations to the elevations shown on the drawings accompanying these specifications.

Backfill shall be placed in layers not to exceed six inches in depth, well tamped and compacted to 95% of maximum density at optimum moisture content. All backfill shall be made from approved material. Each layer of backfill shall be thoroughly compacted by rolling or by mechanical or hand tamp as conditions may warrant.

EXCESS MATERIAL: All stumps, roots, rock or other debris uncovered in the excavation shall be disposed of beyond the site or as directed by the Engineer.

PIPE CULVERTS: Pipe culverts shall be of reinforced concrete of the size and type called for on the drawings and as described in these specifications.

Trenches for pipe culverts shall be cut along lines and to grades shown on the plans and/or established by the Engineer. Grades shown on the plans are flow line grades. Trenches shall be of sufficient width to provide free working space for satisfactory bedding and jointing and thorough tamping of the backfill and bedding material under and around the pipe.

Pipe culverts shall be bedded in an earth foundation of uniform density, carefully shaped by means of a template, at the grade established, to fit the lower part of the pipe exterior for at least 10 percent of its over-all height.

Backfill where required under pipes shall be placed and compacted as described for embankment fill to an elevation which is at least 10 percent of the overall height of the pipe above the bottom of the pipe elevation and then shaped as described above.

Proper facilities shall be provided for hoisting and lowering the sections of pipe into the trench without damaging the pipe or disturbing the prepared foundation and side of the trench. Unless otherwise authorized by the Engineer, the laying of pipes shall be started at the outlet end and proceed upstream. Outside laps of circumferential joints shall point upstream with longitudinal laps on the side. Multiple installations of pipe shall be laid with the center lines of individual barrels parallel. Clear distances between pipes shall be as shown on the plans.

Selected embankment material, free from large lumps, clods, or rock, shall be placed alongside the pipe in layers not exceeding six inches in depth and thoroughly compacted so that on each side of the pipe there shall be a berm of thoroughly compacted or undisturbed earth at least as wide as the external diameter of the pipe. Each layer, if dry, shall be moistened and then compacted by rolling, tamping with mechanical rammers, or by hand tamping with heavy iron tampers having a tamping face of not more than 25 square inches. Special care must be taken to thoroughly compact the fill under the haunches of the pipe. The above method of filling and compacting shall be continued until the embankment is level with the top of the pipe. The fill above the top of pipe shall be completed in the usual manner as specified under earthwork.

This item shall include the furnishing and construction of such joints, and such connections to endwalls, etc., as may be required to complete the work as shown on the plans.

All reinforced concrete pipe shall conform with serial designation C76 "Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe."

CRUSHED ROCK ROAD SURFACING AND BASE COURSE

SCOPE OF WORK: The work covered under this section consists of furnishing all plant, labor, supplies, equipment and materials, and performing all operations in connection with the preparation of subgrade and the construction of a crushed stone surface course for the top of the roads, as specified herein and shown on the drawings.

Hauling of surfacing materials will not be permitted on the subgrade or the finished surface when the road crown conditions are such that hauling operations will cause rutting of the surfaces.

MATERIALS: Crushed rock for surfacing shall be hard durable limestone. The material shall conform to the requirements of ASTM D1241. Soil-aggregate shall conform to the requirements of Section 3 for Type I, Gradation C.

SAMPLING AND TESTING: The source of the materials shall be designated, and suitably processed samples representative of the material proposed for use in the work shall be obtained by the Contractor. All tests necessary to determine the suitability of materials to conform to the requirements of these specifications will be performed by the Contractor at no expense to the Owner. The samples shall be delivered to a point designated at least 30 days in advance of the time when the need therefore arises, and all materials shall be reviewed prior to delivery to the site of the work. Material may be sampled periodically during the work for compliance with specification requirements.

SUBGRADE PREPARATION: The areas to be surfaced shall be shaped to line, grade, and cross section, and shall be compacted as specified below. This operation shall include any reshaping required along with the rolling of the subgrade to obtain compaction. When completed and ready for surfacing, the areas to be surfaced shall be reasonably smooth and uniform with irregularities bladed out or rolled down.

Compaction shall be accomplished with four passes of an acceptable smooth-drum roller weighing not less than 150 pounds per lineal inch of drum, or four passes of a crawler-type tractor weighing not less than 10,000 pounds or other acceptable roller.

COVERAGE: One pass is defined as one complete coverage of the entire surface with the roller or tractor treads.

PLACEMENT OF MATERIALS: Surfacing material shall be distributed evenly over the previously prepared subgrade in sufficient quantity to obtain the compacted depth shown on the drawings, and then spread to a reasonably smooth and uniform surface of proper crown and section. The material shall be placed and spread in such a manner that will cause a minimum of segregation. The material shall then be compacted with three passes of a smooth-drum roller as specified above. The rolling shall begin at the outside edge and shall progress to the center of the surfaced area, parallel with the road centerline, uniformly overlapping each preceding pass.

MAINTENANCE: Surfacing material shall be maintained until final acceptance and any material displaced by any cause shall be replaced at no additional cost to the Owner and to the lines, grades, and section shown.

MISCELLANEOUS STEEL

SCOPE OF WORK: This Contract shall include all labor, materials and equipment for the complete furnishing, fabrication and installation of all miscellaneous steel work as herein specified and/or shown on the accompanying plans.

DESIGN, FABRICATION AND ERECTION: The "Standard Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings," and the "Code of Standard Practice" of the American Institute of Steel Construction, including latest amendments, shall apply to all work included under this Contract.

MATERIALS AND WORKMANSHIP: Workmanship and finish shall be equal to the best practice in modern structural shops. All material shall have clean surfaces before being worked, and fabricated members shall be free from twists, bends or open joints. Shearing and clipping shall be neatly done and all work which will be exposed to view shall be neatly finished.

DELIVERY AND STORAGE: All miscellaneous steel is to be carefully handled at all times, in transit, delivery and storage. It shall not be dropped off cars or trucks and while stored at the site, it shall be set on blocking which will prevent distortion or contact with the ground. Any abrasions shall be touched up after erection, and before assembling, all contact surfaces shall be thoroughly cleaned.

REINFORCING STEEL: Reinforcing steel for concrete work is not a part of this section of the Contract but is furnished and installed under the PLAIN AND REINFORCED CONCRETE section of the specifications.

GALVANIZED MATERIAL: All material shown on the accompanying drawings as being galvanized shall be hot dipped galvanized after fabrication in accordance with the latest revision of ASTM Specification A525 (G210 min).

SHOP DRAWINGS: Shop drawings shall be furnished as specified under GENERAL SPECIFICATIONS. Each member shall be piece marked and an erection diagram shall be furnished with erection marks thereon.

PLAIN AND REINFORCED CONCRETE

SCOPE OF WORK: All concrete work shall conform to the requirements of these specifications and the Contract Drawings. This Contract shall include furnishing all materials, transportation costs, equipment, labor and tools necessary to complete the work as described in these specifications and as shown on the accompanying drawings. This work shall include all slabs, walls, structure foundations, and all other items shown on the accompanying plans to be constructed of plain and reinforced concrete.

INTENT OF SPECIFICATIONS: These specifications are intended to specify the mixing, placing, curing and finishing of all concrete included in this Contract. In case of conflict between specific published specifications referred to herein and the requirements which follow herein, the latter shall govern.

SHOP DRAWINGS: Shop drawings shall be furnished as specified under GENERAL SPECIFICATIONS. Predetermined construction joints have been shown on the engineering drawings for special reasons and the bar splices shall be detailed accordingly.

ACI STANDARD: It is intended to include herein by this reference ACI Standard 301-72 (revised 1975), Specifications for Structural Concrete for Buildings. This is the standard adopted by the American Concrete Institute in May, 1972. It is an industry standard and copies are available from the American Concrete Institute, P.O. Box 19150, Redford Station, Detroit, Michigan 48219. One copy of this standard shall be obtained by the Contractor prior to beginning construction and shall be kept in the field office of the Contractor for the duration of this project. Any difference between this standard and the requirements of this specification will be herein defined in detail and/or shown on the accompanying plans.

MATERIALS: Materials shall be as follows:

Cement - Portland cement shall conform to all applicable provisions of the latest revision of ASTM Standard Specification C-150, Type I. The same brand of cement shall be used for all exposed concrete so that the concrete will have the same appearance throughout the structure.

Air Entraining Agent - All concrete shall have an air entraining agent added when the materials are placed in the mixer at the batch plant.

Air entraining agent shall meet the requirements of ASTM Standard Specifications C-260. Air entraining agent shall be rigidly controlled by proper testing to provide a minimum of 4.0% and a maximum of 6.0% entrained air.

Aggregate - Concrete aggregates shall conform to all applicable provisions of the latest revision of ASTM Standard Specification C-33. Fine aggregate shall consist of clean, well graded river sand having a fine-

ness modulus not smaller than 2.60 nor larger than 2.90 and shall be free from injurious amounts of dust, clay, loam, or other deleterious matter. In case of conflict between the Specification C-33 and the requirements which follow herein, the latter shall govern. All aggregates shall come from one source of supply. Coarse aggregate shall be crushed limestone with maximum size not to exceed 3/4 inch.

PROPORTIONING: This specification is intended to describe a concrete that will have both structural strength and durability of exposure to the elements of weather. Proportioning shall be as designated by Section 3.8.2 and 3.8.2.1 Method 1 on Page 9 of ACI Specification 301-72 (Revised 1975).

Each cubic yard of concrete shall contain a minimum of six sacks of cement and a maximum of six gallons of water per sack. In lieu of the specified cement content as stated above, the Contractor may use 5-1/2 bags of cement per cu yd plus an approved water reducing agent conforming to all applicable provisions of the latest revision of ASTM Standard Specification C-494 Type A, or approved equal. The use of a water reducing agent shall reduce the water requirements at least 10% when compared to a reference non-air entrained mix. When the water is reduced by 10% the same or greater workability shall be obtained as that of the referenced mix. The specified strength shall be maintained at all ages.

The water reducing agent used shall be of a type and amount as recommended by the manufacturer based on the temperatures encountered at the time of placing the concrete.

Before a water reducing agent is used, trial batches shall be made as hereinbefore described by a qualified independent testing laboratory to insure that the mix will meet all of the strength, workability, consistency and other requirements of this specification.

Water Content: Only sufficient water to produce concrete of the required consistency and workability shall be used. All free water contained in the aggregates shall be taken into consideration in determining the amount of water to be added to each batch of concrete. The slump of the concrete produced shall be kept within 20%, plus or minus, of the slump obtained by tests made on the final approved trial batch.

If, in the opinion of the Engineer, any batch of concrete has too much water, it shall be discarded as waste material.

Workability: This term is used to describe the ease or difficulty which may be encountered in placing concrete in its final location in such a manner that the forms will be entirely filled and the surfaces will be smooth and free from honeycombs. It is apparent that the requirements of workability will vary in different parts of the structures and this fact must be recognized and met by proper adjustments in the proportioning of the aggregates. Workability will be the basis for determining the acceptability of concrete, provided of course the water-cement ratio has been adhered to. Since the total amount of aggregates which may be used depends upon the gradation of the aggre-

gates, it is to the Contractor's interest to provide well graded aggregates.

Consistency: Consistency is a term describing, or relating to, the state of fluidity of the concrete. In general, all concrete placed in forms and around reinforcement shall be of such consistency that all aggregates will float uniformly throughout the mass without segregation, the concrete will flow sluggishly when tamped or spaded, and can be readily puddled into corners and angles of forms. The consistency shall be checked by means of the standard slump tests.

Concrete slump for any one concrete mix shall be kept uniform regardless of variations in moisture content of the aggregate used and in no case shall the slump of any batch exceed that authorized for the concrete being mixed by more than 20%. The slump of any batch of concrete which exceeds this limit shall be rejected and wasted unless, by consent and approval of the Engineer, it is possible for the Contractor to add additional regular batch proportions to correct the water-cement ratio without exceeding the mixing time allowed.

The concrete shall contain a minimum of 4% and a maximum of 6% entrained air, the same as specified above under MATERIALS. The entrained air may be obtained through the addition of an approved neutralized Vinsol resin in the amount necessary to obtain the specified amount of air.

Strength - All concrete used throughout this Contract shall develop a minimum compressive strength of 4000 psi in 28 days.

Weight - Normal weight concrete shall be used throughout this Contract.

Slump - Slump requirements shall be four inches or less.

Admixtures - Admixtures shall be as previously specified. <u>Calcium Chloride shall not be used</u>.

FORMWORK: Metal wall forms shall not be used without written permission of the Engineer. Showing or exposed faces of concrete shall be constructed by placing them against a smooth plywood surface properly coated to prevent bond or some similar smooth flat type of form lining.

Foundations shall have a 3/4" chamfer on all exposed corners, excepting edges having steel angles embedded.

Earth cuts shall not be used as forms.

Shop drawings are not required for formwork.

REINFORCING STEEL: All reinforcing bars furnished by this Contractor shall be deformed bars of intermediate grade billet steel conforming to the requirements of ASTM Standard Specification A615 with a minimum yield point of 60,000 psi.

Within 30 days after the Contract is awarded, the Contractor shall have bending diagrams and lists of reinforcing bars prepared and submitted as specified under SHOP DRAWINGS in the GENERAL SPECIFICATIONS to the Engineer for checking and approval. Approval of any drawing shall not relieve the Contractor from furnishing any or all materials required by the plans or specifications.

Details of the fabrication of reinforcing steel shall, unless expressly shown otherwise on the drawings or specified herein, comply with the current standards of the American Concrete Institute. Such standards include the "Manual of Standard Practice for Detailing Reinforced Concrete Structures ACI 315," and also "Building Code Requirements for Reinforced Concrete ACI 318-77," or the latest revision thereof. In case of conflict, the Building Code ACI 318-77 shall govern.

Metal reinforcement shall be accurately formed to the dimensions indicated on the plans and by shop drawings and bending details approved by the Engineer. All bars shall be bent cold. Ties and stirrups shall be bent around a pin twice the bar diameter, and other bars around a pin at least six times the bar diameter. Bars with kinks or bends not called for in the details shall not be used. Heating and rebending of bars will not be permitted. Bars shall be cut either by shearing or sawing. Flame cutting will not be permitted.

After fabrication the bars shall be labeled with waterproof tags and stored in such a sequence that rehandling will be avoided. Reinforcing steel delivered to the job site shall be stored on cribbing off of the ground.

All reinforcement, before being placed, shall be thoroughly cleaned of mill and rust scale, oil, or any coating that would destroy or reduce the bond and shall be kept in this condition until the concrete is poured.

All reinforcing steel shall be accurately placed and secured in position by using 16 gauge annealed wire ties at intersections and shall be supported by metal spacers and chairs in accordance with the recommendations of the Concrete Reinforcing Steel Institute.

Reinforcing in slabs and footings resting on the ground shall be supported above the subgrade by hanging or tying to steel dowels driven into the subgrade or on suitable precast concrete supports or chairs if a thin concrete mat is poured for a working surface.

Welding of reinforcing steel or to reinforcing steel is prohibited.

CONSTRUCTION JOINTS: Construction joints have been predetermined and are shown on the drawings. Keyways shall be as shown for all construction joints.

Joints not shown on the plans shall not be made without the written approval of the Resident Engineer.

Where a joint is to be made, the surface of the concrete shall be thoroughly cleaned and all laitance removed.

EMBEDDED ITEMS: Items to be embedded in concrete shall be plumb and securely held in place by wiring to reinforcing steel while the concrete is being placed. The Contractor shall support these items adequately so that any movement of persons or equipment on adjacent bar steel will not create movement of the embedded item.

All frames for manhole openings shall be set in the position shown on the plans. Manhole steps shall be set in the position shown on the plans, aligned straight and set at 12 inch maximum spacing.

PRODUCTION OF CONCRETE: Ready-mixed concrete shall be used throughout this project except as hereinafter specified. Ready-mixed concrete shall conform to requirements set forth in ACI 301-72, Section 7.1.

MIXING: The mixing of concrete shall be done in a batch mixer of a type and construction which will insure uniform distribution of all ingredients throughout the entire mass of each batch. The mixer shall be equipped with a mechanically operated timing and signaling device which will indicate and insure the completion of the required mixing period. Mixer shall not be loaded in excess of its rated capacity.

The ingredients of each batch of concrete shall be mixed for a period of 1-1/2 minutes after all ingredients are in the mixer, during which period the mixer shall rotate at a peripheral speed of approximately 200 ft per minute. Water shall be measured and added to produce concrete of uniform consistency and slump regardless of fluctuations in moisture content of the aggregates used. Each batch shall be completely discharged before recharging the mixer.

Ready-mixed and transit-mixed concrete meeting the above specified requirements, that is, mixed and delivered in accordance with the requirements set forth in the ASTM C-94 "Standard Specifications for Ready Mixed Concrete," may be used. Non-agitating equipment shall not be used to transport concrete to the job.

All concrete mixing and transporting equipment shall be acceptable to and approved by the Resident Engineer prior to use on or for the Contract work and, after approval, shall be maintained in proper and acceptable condition and repair.

Hand mixed concrete shall not be made in batches exceeding one sack of cement.

Any and all concrete or mortar that has stiffened or hardened to the extent that it is no longer plastic and workable shall be wasted as directed by the Resident Engineer. In no case shall such material be retempered or otherwise reconditioned and used on this project.

BATCHING CONCRETE: Aggregate and bulk cement shall be measured to within one percent by weight. Cement in standard sacks need not be weighed. Water shall be measured by volume or weight to within one percent.

The complete batching and mixing shall be approved by the Resident Engineer and shall conform to the following requirements: ready adjustment of aggregate

weights for varying moisture content; proportion of water to cement accurately controlled and easily checked; accurate control of all materials with positive shutoff; facilities for prompt removal of excess materials in hoppers; visible dial or balance indicators; each specified size of aggregate measured separately on a separate beam scale; each unit of weighing shall be provided with an underweight indicator which shall indicate the filling of the last 100 lb of the batch, and an overweight indicator which will indicate at least 25 lb of overweight; bulk cement dropped through canvas drop chute or telescopic flexible hose tremie, ten 50 lb test weights provided. When checked in increments of 500 lb, the weighing apparatus shall be accurate to within 0.4% to and including the heaviest batch weight expected.

Batching plant equipment shall be so arranged that the operator may conveniently observe and inspect the operation of the bin gates and the materials in each weighing hopper. The under- and overweight indicators and the water measuring device shall be in full view of the operator when he is at the controls. All concrete batching equipment shall be acceptable to and approved by the Owner.

WEATHER CONDITIONS: Weather conditions for production of concrete shall be in accordance with ACI 301-72, Section 7.6, ACI 305 and ACI 306. One copy of these standards shall be obtained by the Contractor and shall be kept in the field office of the Contractor during the duration of the project.

NOTIFICATION: Twenty-four hours advanced notice of the intent to place concrete shall be given to the Resident Engineer by the Contractor indicating that all formwork, embedments, and reinforcing steel are ready for inspection. Notification nor inspection shall not relieve the Contractor of sole responsibility for the work performed.

PLACING: No concreting underwater will be allowed. Reinforcing steel shall always be placed in the dry. Trunks or pipe shall be used to restrict the free fall of concrete to a maximum of six feet.

Before any concrete is placed, all ice, snow, and frost should be completely removed and the temperature of all surfaces to be in contact with the new concrete should be raised to as close as may be practical to the temperatures of the new concrete that is to be placed thereon. No concrete should be placed on a frozen subgrade or on one that contains frozen materials. Where concrete is to be placed over permanently frozen ground, subgrade material must be thawed deep enough to insure that it will not freeze back up to the concrete during the required period of protection.

Arrangements for covering, insulating or housing newly-placed concrete should be made in advance of placement and should be adequate to maintian, in all parts of the concrete, the temperature and moisture conditions recommended herein for winter curing temperatures and methods.

If the Contractor elects to do so, he may place a thin layer (approximately two or three inches in thickness) of lean concrete at no cost to the Owner below the bottom of structural foundations to serve as a working platform and an aid to supporting the bar steel, etc. This concrete should have at least 3-1/2

sacks of cement to the yard and be a uniform reasonably well graded mix, screeded to a reasonably level surface. This is not a requirement and if the Contractor chooses to do so, this working slab shall be below and not a part of the structural foundation thickness as shown on the plans.

BONDING: Surfaces of unformed construction shall be cleaned of laitance and slightly roughened after initial and prior to final set wherever possible. Hardened surfaces and existing surfaces over which new concrete is to be placed shall be cleaned of all laitance, surface film, loose material, oil and other deleterious substances, and shall be roughened to provide aggregate exposure over the entire surface. Before the new concrete is placed the existing surface shall be saturated with clean water for at least 24 hours.

FINISHING OF FORMED SURFACES: All surfaces exposed to view which have been in contact with the forms shall receive a smooth rubbed finish in accordance with Section 10.3.1 of ACI 301-72 after the surfaces have been prepared as specified in Chapter 9 of ACI 301-72 excluding Section 9.4. All air bubbles shall be filled with a bonding grout and rubbed down with sacks before final rubbing as specified above. This shall include all exposed edges of foundations and walls.

FINISHING OF RELATED UNFORMED SURFACES: The top surface of the junction box shall receive a stiff broom finish. All other surfaces shall receive a tight wood troweled finish.

CONCRETE FILL: Where concrete fill is required, it shall be plain concrete as herein specified. Concrete fill shall be used in the junction box from the top of the base to the invert of the connecting pipes except for thicknesses of less than three inches, in which case plain grout consisting of one part normal cement, three parts sand and water to produce a zero slump, shall be used. Concrete fill on the sides of the junction box for the direction of channel flow shall be of plain concrete placed by use of forms except for heights of less than 12 inches, in which case plain grout may be used.

CURING AND PROTECTION: Curing and protection of all concrete work done in late fall, winter and early spring shall be in accordance with ACI 301-72 Sections 12.1, 12.2.1, 12.2.1.5, 12.3.1 and 12.2.3 (excluding the alternative). Preservation of moisture and cold weather protection shall be considered a simultaneous protective concern by this Contractor. Cold weather protection shall also include the applicable requirements of ACI 306, "Recommended Practice for Cold Weather Concreting." Protective measures proposed shall be submitted to the Engineer for review well in advance of the placing of any concrete in this Contract.

Curing and protection of all concrete work done in the late spring, summer and early fall shall be in accordance with ACI 301-72 Sections 12.1, 12.2.1.1 or 12.2.1.2, 12.2.2, 12.2.3 (excluding the alternative). Hot weather protection shall also include the applicable requirements of ACI 305-72 "Recommended Practice for Hot Weather Concreting."

SAMPLES AND TESTING: Obtaining samples and testing shall be in accordance with Chapter 16 of ACI 301-72 (Revised 1975). The testing agency will be determined by the Owner after the award of the Contract.

All specified slump tests, concrete tests of aggregates batched on the job, and the taking of concrete test specimens shall be done by the Contractor in the presence of the Resident Engineer.

The following items of testing shall be done and paid for by the Contractor:

1. Cement: All cement shall be mill tested before delivery to the site and mill test reports shall be submitted in triplicate to the Engineer for approval.

2. Concrete Aggregate: Concrete aggregates shall be tested in accordance with the "Standard Specifications for Concrete Aggregates," Serial Designation C33 of the ASTM. One such test shall be made for each 200 cu yd of fine aggregate and for each 400 cu yd of coarse aggregate. Test reports shall be submitted in triplicate to the Engineer.

3. Reinforcing Steel: All reinforcing steel shall be mill tested before delivery to the site, and mill test reports shall be submitted in triplicate to the Engineer for approval.

4. Trial Batches: After approval of the concrete materials to be used, the Contractor shall submit to the Owner for approval a tentative concrete mix for each slump and mix which he intends to use on the work. The design, batching and testing of each tentative concrete mix shall be performed by a qualified independent testing laboratory for this Contractor. When approved, each mix shall be subject to field adjustments by the Resident Engineer whenever necessary to produce concrete of proper workability, uniform consistency, and acceptable density and strength.

   Each tentative concrete mix submitted by the Contractor for approval shall be based on the following:

   Consistency - on which mix design is used.

   Total water - per cu yd of freshly mixed concrete required to provide the design consistency with the aggregate used.

   Cement factor - sacks per cubic yard.

   Specific gravity and gradation - of each aggregate used.

   Ratio - of fine to total aggregate.

   Weight (surface dry) - of each aggregate per cu yd of freshly mixed concrete used, gallons of total water, and pounds of each aggregate.

Batch proportions - Expressed in sacks of cement (pounds if bulk cement is used), gallons of total water, and pounds of each aggregate.

Slump (in inches) - produced by the proposed concrete proportions.

Air content - percentage of air in proposed concrete mix.

In addition to the required design data and batch proportions, each concrete mix design submitted for approval shall be accompanied by laboratory test reports of compression test of specimens made from such mix as hereinafter specified.

The following procedure shall be followed with the Contractor providing the costs for services of field preparing the concrete compression test specimens and field storing, protecting and curing the specimens. Transportation of test specimens to the lab and testing of specimens shall be by the testing agency designated by the Owner at no cost to the Contractor.

Concrete: During the progress of the work, compression tests of the concrete used shall be made in accordance with the Standard Method of Making and Storing Compression Test Specimens of Concrete in the Field, Serial Designation C31, and Method of Sampling Fresh Concrete Serial Designation C172 of the ASTM, and tested in accordance with the Standard Method of Test for Compressive Strength of Molded Concrete Cylinders, ASTM Designation C39. In addition to the report outlined in C39, the WEIGHT, the SLUMP and LOCATION of the pour of the test cylinder is to be noted. Not less than three test cylinders shall be made for each test and not less than one test for each 100 cu yd of concrete, and not less than one test for each day's pour under 100 cu yd of concrete. Test cylinders shall be tested for compressive strength at the following age sequence:

One at seven days
Two at twenty-eight days

Slump tests shall be made for each 50 cu yd or less (as may be required) of concrete used in order that the consistency shall be kept uniform for each concrete mix.

The testing agency shall submit to the Engineer, Resident Engineer, Owner and the Contractor a report of all compression tests as described above.

SURFACE PROTECTION: All concrete surfaces shall be protected from injury by construction activities, until acceptance of the work by the Owner.

APPROVAL OF MATERIAL: All materials that will be incorporated in the structure shall be submitted to the Engineer for approval prior to installation.

SEEDING

SCOPE OF WORK: The work covered by this section consists of furnishing all materials and performing all work required for mulching, fertilizing and seeding the unprotected finish slopes of the Ash Pond levee roads, oil confinement berm and surrounding areas within limits shown on the accompanying drawings.

MATERIALS:

Fertilizer: Fertilizer of 12-12-12 grade, uniform in composition, free-flowing, and suitable for application with acceptable equipment, shall be provided. The fertilizer shall be delivered to the site in bags or other convenient containers, each fully labeled, conforming to the applicable State fertilizer laws, and bearing the name, trade name or trademark, and warranty of the producer.

Mulch: Mulch shall be straw of cereal grain such as oats, wheat or grass hay on flat or gentle sloping areas and wood fiber on extreme cuts and slopes. Materials that contain objectionable weed seeds as listed by the Kansas State Department of Agriculture or other species that might be detrimental to the planting being established or to adjacent farmland will not be acceptable.

Seed: Seed shall be labeled in accordance with the latest U. S. Department of Agriculture Rules and Regulations under the Federal Seed Act. Seed shall be furnished in sealed, standard containers unless otherwise acceptable to the Engineer. Seed that is wet or moldy or that has been otherwise damaged in transit or storage will not be acceptable. The pure live grass seed mixture and application rate to be used shall be as follows:

1. On slopes which are three feet horizontal to one foot vertical, or steeper:

Kind of Seed	Pounds per Acre
Perennial Rye	10
K-31 Fescue	35
Smooth Brome	15
Crown Vetch	20
Total	80

2. On slopes which are less than three feet horizontal to one foot vertical:

Kind of Seed	Pounds per Acre
Perennial Rye	10
K-31 Fescue	30
Smooth Brome	15
Total	55

Weed Seed: Weed seed shall not exceed 0.5 percent by weight of the total of pure live seed and other material in the mixture.

Pure Live Seed: The following formula shall be used to determine the amount of commercial seed required in pounds to provide in each kind of seed the specified quantities of pure live seed:

$$\frac{\text{Pounds Pure Live Seed} \times 100 \times 100}{\text{Purity (\%)} \times \text{Germination (\%)}} = \text{Pounds Commercial Seed Required}$$

Soil for Repairs: Soil for repairs shall be of at least equal quality to that which exists in areas adjacent to the area to be repaired. Soil shall be used that is free from roots, stones and other materials that hinder grading, planting and maintenance operations and that is reasonably free from objectionable week seeds and toxic substances.

Water: Water shall be free from oil, acid, alkali, salt and other substances harmful to the growth of grass, and shall be from a source reviewed by the Engineer prior to use.

INSPECTION AND TESTS:

Fertilizer: The Engineer shall be furnished with duplicate copies of invoices for all fertilizer used on the project. Invoices for fertilizer shall show the grade furnished. Each lot of fertilizer shall be subject to sampling and testing at the discretion of the Engineer. Sampling and testing will be in accordance with the official methods of the Association of Official Agricultural Chemists. Upon completion of the project, a final check of the total quantities of fertilizer used will be made against the total area treated, and if the minimum rates of application have not been met, the Engineer may require the distribution of additional quantities of fertilizer to make up the minimum rates of application specified.

Seed: The Engineer shall be furnished signed copies of a statement from the vendor, certifying that each container of seed delivered complies with the specified requirements and is labeled in accordance with the Federal Seed Act. This certification shall be obtained from the vendor and shall be furnished on or with all copies of seed invoices. Each lot of seed will be subject to testing by the Owner in accordance with the latest Rules and Regulations under the Federal Seed Act.

PREPARATION OF SEEDBED: Equipment necessary for the proper preparation of the ground surface and for handling and placing all required materials shall be on hand, in good condition, and shall be reviewed before the work is started. The Contractor shall demonstrate to the Engineer before starting work that the application of the materials required will be made at the specified rates.

Clearing: Prior to grading and tillage operations, vegetation on the site that might interfere with grading, tillage or seeding operations shall be mowed, grubbed, raked and removed from the site and the ground surface cleared of

stones, roots, cable, wire, grade stakes, and any other materials that might hinder proper grading, tillage and seeding.

Grading: Previously established grades shall be maintained on the areas to be treated in a true and even condition; necessary repairs shall be made by adding soil as necessary to previously graded areas. Where grades have not been established, the areas shall be graded as shown, and all surfaces shall be left in an even and properly compacted condition to prevent formation of depressions.

Tillage: After the areas required to be treated have been brought to the grades shown, the areas shall be thoroughly tilled to a depth of at least three inches by plowing, disking, harrowing, or other accepted methods until the condition of the soil is acceptable. Tilling of slopes shall be in a direction at right angles to the slope. The work shall be performed only during periods where beneficial results are likely to be obtained. When conditions are such, by reason of drought, excessive moisture, or other factors, that satisfactory results are not likely to be obtained, the work will be stopped and shall be resumed only when directed. Undulations or irregularities in the surface that would interfere with further construction operations or maintenance shall be leveled before the next specified operation.

Fertilizer: Fertilizer shall be distributed uniformly at a rate of 400 pounds per acre over areas to be seeded, and shall be incorporated into the soil to a depth of at least two inches by disking, harrowing, or other acceptable methods. Incorporation of fertilizer may be part of the tillage operation.

Leveling: Surface irregularities resulting from tillage, fertilizing or other operations, before seeding, shall be leveled.

Cleanup: After completion of the above operations, the surface shall be cleared of stones or other objects larger than two inches in thickness or diameter, and of roots, brush, wire, grade stakes and other objects that might be a hindrance to mai n tenance operations.

PLANTING SEED: A satisfactory method of sowing which distributes the seed uniformly at the specified rate shall be employed, using acceptable mechanical powerdrawn drills or seeders, mechanical hand-seeders, hydro-seeders, or other acceptable methods. Equipment shall be provided with markers or other means to insure that the successive seeded strips will overlap or be separated by a space no greater than eight inches or equipment row spacing, whichever is less. When delays in operations extend the work beyond the most favorable planting season for species designated or when conditions are such by reason of drought, high winds, excessive moisture, or other factors that satisfactory results are not likely to be obtained, work shall be halted as directed and resumed only when conditions are favorable or when acceptable alternate or corrective measures and procedures have been effected. If during or after seeding operations a show of green indicates that strips wider than the space indicated above have been left unplanted, or other areas skipped, additional seed shall be sown if so directed.

APPLYING AND ANCHORING MULCH: Mulch shall be spread uniformly in a continuous blanket, using two tons per acre. Mulch shall be spread by hand or by a manure spreader, a modified grain combine with straw-spreader attachment, a blower type mulch spreader or other suitable equipment. Mulching shall be started at the windward side of relatively flat areas, or at the upper part of a steep slope, and continued uniformly until the area is covered. The mulch shall not be bunched. Immediately following spreading, the mulch shall be anchored to the soil by a V-type wheel land packer, a scalloped disc land packer designed to force mulch into the soil, surface, or other suitable equipment. The number of passes required will be determined by the Engineer, but shall not exceed three.

REPAIRING AND RESEEDING: The Contractor is not required to guarantee a cover crop; however, the Contractor shall be fully responsible for any damage or lack of cover caused by elements under his control. The Engineer may direct that areas that do not attain the required cover or areas that become damaged shall be repaired and reseeded to specification requirements.

TOPSOIL: Contractor shall place 6" topsoil on all side slopes except riprap areas prior to seeding.

GENERAL SPECIFICATIONS

MATERIAL AND WORKMANSHIP: All materials shall be new materials of high quality which shall give long life and reliable operation. Parts subjected to high temperatures shall be of such design that serious deformations shall not occur within the normal life of the equipment. All equipment shall be modern in design and shall not have been in prior service except as required by factory tests. The workmanship shall be of high quality in every detail.

STATUS OF THE ENGINEER: The Engineer will make periodic visits to the site to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents. He will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of work nor will he be responsible for the construction means, methods, techniques, sequences or procedures, or the safety precautions incidental thereto. His efforts will be directed toward providing assurance for the Owner that the completed Project will conform to the requirements of the Contract Documents, but he will not be responsible for the Contractor's failure to perform the Work in accordance with the Contract Documents. On the basis of his on-site observations as an experienced and qualified design professional, he will keep the Owner informed of the progress of the Work and will endeavor to guard the Owner against defects and deficiencies in the Work of Contractors.

The Engineer will not be responsible for the time it takes for this or any other contractor to complete any phase of this or other contractor's work. The Engineer will provide general information that is available as to the best estimate of schedule of construction as furnished to him by the contractors involved.

The Engineer will make an initial interpretation of the terms and conditions of the Contract Documents. In his capacity as interpreter he will exercise his best efforts to insure faithful performance of the Contract. He shall not be liable for the result of any interpretation or decision rendered in good faith.

Neither Engineer's authority to act under these provisions nor any decision made by him in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of Engineer to Contractor, any subcontractor, supplier or manufacturer, any of their agents or employees, or any other person performing any of the work.

The duties and responsibilities and the limitations of authority of Engineer as Owner's consultant as set forth herein shall not be extended without written consent of the Owner and the Engineer.

ELECTRICAL EQUIPMENT: All electrical equipment furnished under these Specifications shall be of the best of their respective kinds. All equipment shall be designed, constructed and rated in accordance with the Standard of the IEEE, ANSI, IPCEA, ASTM, EEI; and shall pass temperature and voltage tests as recommended therein. In selecting capacities of equipment and machines, it shall be assumed that the equipment or driven machine will be operated continuously at

conditions of maximum stress and power requirements, unless otherwise stated. Under these conditions of maximum stress and power requirements, deleterious effects shall not exceed those permitted by the most stringent of the above applicable standards.

STRUCTURAL MATERIAL: All structural steel shall meet the minimum requirements of the American Institute of Steel Construction's "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings," including the "Code of Standard Practice for Steel Buildings and Bridges."

All concrete, both plain and reinforced, shall meet the minimum requirements of the American Concrete Institute, both as to standards of design and material.

LABOR AND TOOLS: Work which should properly be done with skilled labor shall not be attempted with common laborers. The Contractor shall have on the job at all times, ample equipment to carry on the work properly, including such tools as may be necessary to meet emergency requirements. He shall furnish necessary scaffolding, blocking, ladders, hoists, temporary lighting and other special equipment necessary to complete the projects in the time set forth. Such special tools and materials not required in the permanent installation shall remain the property of the Contractor and shall be removed by him on completion of the work.

SPECIAL TOOLS AND ACCESSORIES: The manufacturer will furnish one complete set of all special maintenance tools and all usual accessories, lubricating devices, gauges, etc., as required for safe and reliable operation. Tools will be shipped in a container marked to identify the use of the tools contained. These tools shall not be used by the Contractor for erection of the unit. This Contractor shall unload tools and place in storage as directed by the Resident Engineer.

PACKING AND SHIPMENT: All machines and equipment shall be carefully packed to prevent damage in shipment. The Contractor shall be responsible for the safe arrival of the equipment and shall replace or repair at his own expense any equipment lost or damaged prior to its delivery at the point of destination specified in this Contract. The Contractor's representative shall be responsible for receiving all material and equipment, paying demurrage, making arrangements for unloading and making all claims to the transportation company.

Covers and other means shall be used to prevent corrosion, moisture damage, mechanical damage and accumulation of dirt and dust in electrical equipment and machinery. Suitable rust-preventive compounds shall be applied to all exposed machined surfaces and unpainted iron and steel. All bearings and similar items shall be grease packed or oil lubricated prior to shipment.

Each item of equipment and material shall be tagged or marked as identified in the delivery schedule or on shop drawing and complete packing lists and bills of material shall be included with each shipment. Each piece of every item need not be marked separately provided that all pieces of each item are packed or bundled together and the packages or bundles are properly tagged or marked.

Bills of material and packing lists shall accompany all shipments. Bills of material and packing lists shall also be mailed to each of the following, two weeks in advance of equipment arrival at the job site:

Purchaser's Director of Production Planning
Receiving Contractor (if applicable)
The office of the Engineer

Bills of material shall contain the following information:

Contract number
Contract name
Complete list of items with tag numbers

ERECTION: The erection of materials and equipment by the Contractor shall be done in a first-class workmanlike manner and in accordance with the best engineering practice. Equipment shall be carefully handled to prevent damage during erection. All damage shall be repaired by the Contractor to the satisfaction of the Engineer. All equipment requiring foundations and foundation bolts shall be securely mounted in a level position by grouting with an approved grout.

COOPERATION: This Contractor shall cooperate with the Purchaser, Engineer and other contractors in performing the work involved in the entire Project. Fairness shall prevail as regards use of access roads, storage space, space for temporary office, utility services, work areas, and other facilities. In any arrangement as to the proportion of facilities between contractors, the decision of the Owner shall be final.

USE OF COMPLETED PORTIONS: The Purchaser shall have the right to use all completed portions of the work whether accepted or not and such use shall not relieve the Contractor from complying with any requirements herein outlined.

CONTROL LINES: The Contractor shall locate and lay out his work from the baselines as established on the accompanying plans. The Engineer will furnish the Contractor with field location of these baselines. The Engineer will also furnish the Contractor with a benchmark within one hundred feet of the Project. This elevation shall be used as a reference for all construction.

LINES, ELEVATIONS AND MEASUREMENTS: The Contractor shall verify the lines, levels and dimensions at the site as given on the plans before ordering any of the materials or doing any of the work. He alone shall be responsible for the correctness of same. Any real or apparent discrepancies are to be reported to the Engineer immediately for correction or interpretation.

PROTECTION DURING CONSTRUCTION: During the progress of construction, the Contractor shall protect all existing and new work from injury or defacement and particular care must be taken of all finished parts. All projections and other work subject to damage or liable to cause injury during construction shall be properly protected with boards, casing, planks, etc. This shall include pits, trenches and sumps. He shall be responsible for any and all damage done to the

streets, railroads, utilities, communication lines, buildings, or property near and about the site by reason of any work included in this Contract.

PROTECTION OF PERSONS: The Contractor shall take all necessary steps to protect his own men, other workers, the Board and their agents and the public from danger and hazards during the prosecution of his work. Danger signs, warning signs, flares, lanterns, railings, barriers, etc., shall be erected to prevent accidents from temporary construction, falling objects, rotating machinery, electric lines and other conditions which might present hazard.

CONTRACTOR'S SUPERVISION: The Contractor shall perform the work of this Contract as an independent contractor, at his sole risk. The Contractor shall employ all persons to perform the work, such persons to be his sole employees and subject to his direction and control and not the employees of the Purchaser or subject to its direction or control. The Contractor shall determine the manner and method in which the work shall be performed to accomplish the results required by the Contract. The Contractor or his agents and employees shall not become the agents or employees of the Purchaser.

The Contractor shall give his personal attention to the work at all times, and shall have a duly authorized representative on the site of the work continuously during working hours, prior to the arrival of any materials at the job site and throughout the progress of the work, to receive directions or instructions. Any instructions or directions given to the representative of the Contractor shall be considered the same as though given to a principal of the Contractor. The Contractor shall supervise and direct the work efficiently and with his best skill and attention. He shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction used. In case the construction work should stop, through no fault of the Contractor, for a period of ten days or longer, then the Superintendent may be removed from the job and returned when active work starts. All expense as a result of the removal and return of the Superintendent shall be borne by the Contractor. The Superintendent shall not be relieved except with the consent of the Owner, unless he proves to be unsatisfactory to the Contractor or Owner or ceases to be in the Contractor's employ. The Superintendent shall be a competent field engineer and shall have had previous experience of a similar nature and shall be thoroughly familiar with the requirements of the project. In the event that the Superintendent is not satisfactory to the Purchaser, the Superintendent shall be replaced with a Superintendent of proper qualifications. When the Superintendent is on vacation or otherwise absent a substitute against whom the Owner or the Engineer have no reasonable objection shall be provided. The Contractor's supervision shall be such as to produce a first-class job in every respect, including materials and workmanship.

The Contractor's Supervisor shall submit daily progress reports to the Resident Engineer. These reports shall also be required of all subcontractors. Report forms will be supplied by the Resident Engineer. The Contractor's Superintendent shall also be required to attend weekly Contractor's meetings as scheduled by the Resident Engineer.

CONTRACTOR'S CONSTRUCTION SCHEDULE: The Contractor shall furnish the Engineer with a proposed schedule of his construction before starting any construction work. It shall be the Contractor's responsibility to make all necessary allowances in the schedule for the work of other contractors. Schedule shall receive the approval of the Engineer before being used. After schedule has been approved and work has commenced, the Contractor shall revise the schedule at monthly intervals to show the work actually done and to reflect the anticipated sequence of events. Distribution of monthly revised schedules shall be one copy to the Purchaser, one copy to the Resident Engineer and six copies to the office of the Engineer. The schedule shall be in the form of a critical path method, man loaded Gantt chart and shall include shop drawings and all items mentioned in the DETAILED SPECIFICATIONS. Submission of the schedule revisions shall be a prerequisite for the approval of payments. A Daily Contractor's Report showing number of men and work accomplished shall be filled out and submitted to the Resident Engineer daily on a form as provided by the Resident Engineer.

SECURITY: The Contractor shall be responsible for provision of security for equipment, materials, tools, etc., in his care.

VARIATIONS FROM REQUIREMENTS AND SPECIFICATIONS: No change, variation, or deviation from the drawings or specifications shall be made, except by written order of the Engineer. Should the Contractor find, at any time during the progress of the work that in his opinion existing conditions demand, make desirable, or beneficial, a modification in requirements covering any particular item or items, he shall promptly report such matters in writing to the Engineer for his decision and instruction.

UTILITIES: The Purchaser will furnish temporary power for construction purposes at one metered location at the nearest available source on the construction site in accordance with the Purchaser's service policy. If there is an existing source on the construction site, it will determine the location of the temporary service. If temporary service is required at any other location or at more than one location, the Contractor will pay to the Purchaser all costs incurred in installing and removing all facilities required for such services.

For services of 200 amperes and less, the Purchaser will furnish a meter base and meter for installation by the Contractor. The Contractor shall furnish and install a disconnect switch, secondary protection, weatherhead, conduit and fittings, and the conductor required to connect the load to the secondary of the transformer. The Contractor shall wire all the required equipment and provide three feet of conductor length extending from the weatherhead for connection by the Purchaser.

Information as to what items are required for services greater than 200 ampere capacity can be obtained from the Purchaser's Metering Department.

The following 60 Hertz, alternating current nominal secondary voltages are available; the voltage or voltages supplied shall be selected by the Purchaser:

a. 1 phase, 120/240 V, 3-wire
b. 3 phase, 240 V, 3-wire

c. 3 phase, 480 V, 3-wire
d. 3 phase, 120/208 V, 4-wire
e. 3 phase, 277/480 V, 4-wire

The Contractor will pay to the Purchaser the regular charge for electric energy consumed under the applicable published rate structure.

Water will be furnished in reasonable quantities to the Contractor, free of charge, at the nearest available source of supply. Any reservoirs, tanks etc., required by the Contractor for storage shall be furnished by the Contractor. The Contractor shall furnish and install necessary temporary piping for conveying water to the point of usage and shall remove such piping upon completion of the job.

Compressed air will not be available to the Contractor at the project site but shall be furnished as required by the Contractor.

TELEPHONE SERVICE: The Contractor shall maintain a telephone for use of those connected with the work and furnish free service for local calls. Charges for long distance messages shall be paid for by the person making them.

TEMPORARY BUILDINGS: The Contractor shall construct and maintain temporary trailers and/or frame buildings near the building site where directed by the Resident Engineer for the Contractor's office and storage of materials. The building shall be well constructed, shall have wood floors, a watertight roof and sides covered with matched boards. All materials subject to weather damage shall be kept in protected storage until immediately before use. The Contractor shall be responsible for the proper care and protection of his materials, equipment, etc., delivered to and stored at the site and materials and equipment that may be furnished to him by the Owner for installation under these specifications until the project is accepted.

TOILETS: This Contractor shall provide chemical toilet facilities for his workmen and they shall be removed by this Contractor upon completion of this Contract. The chemical toilet shall be kept in a clean and sanitary condition at all times. Location of toilet shall be determined by the Resident Engineer. (There shall be as many toilets provided, depending upon the number of workmen, as is required by code or union stipulations).

STANDARDS: Reference is made through these specifications to ASTM (American Society for Testing and Materials), ANSI (American National Standards Institute), AISC (American Institute of Steel Construction), ASME (American Society of Mechanical Engineers), IEEE (Institute of Electrical and Electronic Engineers), and other similar standards. In all such cases, the materials shall comply in all respects to the latest revised specifications quoted and such standards are as much a part of these specifications as if quoted verbatim herein.

CLEANING: The Contractor shall at all times keep the premises free from all debris, dirt, condemned materials, blocking, scaffolding, etc., as soon as possible after accumulation and after it has served its useful purpose. In case of dispute, the Owner may remove the rubbish and surplus materials and charge

the cost to the several contractors in a proportion as shall be determined to be just. After the job is completed, all floors, equipment, etc., shall be given a thorough cleaning prior to acceptance.

INTERFERENCE WITH EXISTING UTILITIES: All work scheduled by the Contractor shall be planned with the consent of the Resident Engineer and shall not in any way interfere with the Plant service unless consent is given by the authorized representatives of the Purchaser.

Damage to existing utilities caused by this Contractor shall be repaired promptly in a manner as directed by the Purchaser. The cost of such repairs shall be borne by the Contractor. The Contractor will be allowed extra compensation for such repair only if in the judgment of the Resident Engineer such damage was not caused through any negligence on his part.

COST BREAKDOWN: The Contractor shall furnish the Engineer, within 30 days after award of Contract, a cost breakdown of the project covering the labor and materials included in the lump sum price under each item of the Proposal. The Engineer must approve this estimate before the first monthly invoice is submitted for payment.

The breakdown shall itemize the cost of each of the special appurtenances and equipment, complete with quantities, unit prices, labor, bond, etc. The Contractor shall use care in determining that the various items listed in the cost breakdown are realistic. If the Engineer feels the information on the breakdown is inadequate or insufficient in detail, the Contractor shall supply the requested additional information.

EQUIPMENT DRAWINGS: Preliminary drawings showing principal dimensions of the equipment shall be submitted with the bidder's Proposal at the time bids are opened. All drawings submitted shall be identified with the following data: Purchaser's name, plant and unit designation, Contract number, specification item number if applicable, Contractor's name and Contractor's job reference number. Six folded copies of each drawing required to show detailed arrangements of equipment, foundation plans, foundation bolt locations, pipe connection locations, principal dimensions and wiring shall be submitted by the Contractor to the Engineer for approval as soon as possible after the Contract is awarded. One copy of all drawings shall be sent directly to the Purchaser. If the drawings are approved by the Engineer, five folded copies of each drawing will be kept for construction purposes and one copy bearing the Engineer's approval will be returned to the Contractor. If the drawings are not approved, one copy showing the reasons for disapproval will be returned to the Contractor, who shall make corrections as required and shall then submit six copies of the corrected drawings to the Engineer and one copy to the Purchaser. After the drawings have been approved, four additional copies of the drawings and one duPont photographic washoff, reproducible mylar #1HR4 shall be provided for final distribution. Approval of all detailed drawings must be accomplished in the time agreed to in the Proposal and before shipment of any material from the factory. Failure of the Contractor to have the necessary drawings approved within this time will be construed as a guarantee by the Contractor that the drawings submitted with his Proposal are correct and may be used for construc-

tion purposes. In the event that increased construction costs are incurred through the use of approved drawings, or drawings submitted with the Contractor's Proposal, if the drawings for approval are not submitted as outlined above, and failure of equipment furnished to match such drawings; such costs shall be borne by the Contractor and deducted from his final payment. Drawings other than schematics shall be made to scale. All drawings necessary for design, installation and operation shall be submitted as above outlined.

Approval of any drawings by the Engineer will not relieve the Contractor of responsibility for the accuracy and correctness of his work or for the construction and successful performance of the equipment furnished by him. Upon request, the Engineer will submit copies of his drawings for the installation of equipment to the manufacturer for his comments and suggestions.

SHOP DRAWINGS: The Contractor shall prepare in a neat and workmanlike manner, placement drawings and shop details for all material and equipment furnished under this Contract. All drawings submitted shall be identified with the following data: Purchaser's name, plant and unit designation, Contract number, specification item number if applicable, Contractor's name and Contractor's job reference number. These drawings shall be CHECKED by the Contractor before being submitted to the Engineer. After being checked, these drawings shall be folded and then submitted to xhe Engineer in triplicate for his approval in an expeditious manner after the Contract is awarded. One print will be returned to the Contractor either approved, approved as noted, or returned for correction. When corrections or changes on returned prints are required to be made by the Contractor, the corrected sets shall again be submitted to the Engineer for final approval. Upon approval, the Contractor shall furnish eight copies of the approved prints to the Engineer. Approval of any drawings by the Engineer will not release the Contractor of responsibility for the accuracy and correctness of his work.

SPECIFICATIONS AND DRAWINGS: The Contractor shall keep at the job site a copy of the drawings and specifications and shall at all times give the Purchaser and the Engineer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of differences between drawings and specifications, the specifications shall govern. In any case of discrepancy, either in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Engineer, who shall promptly make a determination in writing. Any adjustment by the Contractor without this determination shall be at his own risk and expense. The Engineer shall furnish from time to time such detail drawings and other information as he may consider necessary, unless otherwise provided.

REPAIR AND/OR REPLACEMENT OF DEFECTIVE PORTIONS: The Contractor shall be responsible for a period of one year from and after the date of acceptance by the Purchaser of the work covered by this Contract, for any repairs or replacements caused by defective materials, workmanship or equipment which in the judgment of the Engineer shall become necessary during such period. If certain portions are shown to be defective within the original warranty period, then the warranty period on those portions shall be extended one year from and after such time

that all defects are corrected. The Contractor shall undertake with due diligence to make the aforesaid repairs and/or replacements within ten days after receiving written notice that such repairs or replacements are necessary. If the Contractor should fail to begin such repairs or replacements within this period or in case of emergency, where in the judgment of the Engineer delay would cause serious loss or damage, the repairs and/or replacements may be made by the Purchaser and charged to the Contractor.

The Contractor warrants to the Purchaser that the work of this Contract will be free from defects in material, workmanship and title and will meet the specifications contained in the Contract of Sale.

LABORATORY TESTS: Upon request the Contractor shall make available samples of material furnished under this Contract for testing in a laboratory to be selected and paid for by the Owner.

TEMPORARY FIRE PROTECTION: This Contractor shall furnish temporary portable fire protection equipment for his own work during the progress of construction.

ORDINANCES: The Contractor shall conduct his work to conform to all municipal, state and national regulations affecting his work. All requirements affecting drayage, loading, hoisting, etc., shall be strictly adhered to.

CONTRACTOR'S ESTIMATED PAYMENT SCHEDULE: In order to provide the Purchaser with an accurate cash flow requirement for the total project, this Contractor shall submit an estimate of the payments which will become due in each month for the work which has been specified herein. The first schedule shall be submitted within 30 days after the date of contract award. In the event of any anticipated change in payments, the Contractor will be required to update the Payment Schedule on a monthly basis on forms provided by the Engineer. One copy shall be submitted to the office of the Engineer, one copy to the Resident Engineer and two copies shall be submitted to the Purchaser.

ACCESS ROADS: This Contractor shall use designated roads for access to the construction site. Employees of the Contractor shall park in areas assigned by the Resident Engineer. This Contractor shall not disturb any existing vegetation without the permission of the Resident Engineer.

CORRESPONDENCE: The Contractor shall send one copy of all correspondence with the Engineer to the Purchaser's Director of Production Planning and to the Resident Engineer. The Engineer is to receive two copies and Resident Engineer is to receive one copy each of all correspondence sent to the Purchaser by the Contractor. The Contractor shall submit in duplicate all correspondence addressed to the Engineer.

The Contractor warrants to the Purchaser that the work of this Contract will be free from defects in material, workmanship and title and will meet the specifications contained in the Contract of Sale.

STORAGE OF MATERIALS: The Contractor shall be responsible for the proper care and protection of his materials, equipment, etc., delivered to and stored at the site and materials and equipment that may be furnished to him by the Owner for installation under these specifications until the project is accepted. Materials and equipment furnished by the Owner shall be clear of all construction operations, except during the installation period. All material shall be protected from damage by weather or other possible damage. All material which is to be used in the construction shall be in first-class condition when placed or it will not be acceptable.

CONTRACT STIPULATIONS

GENERAL: The following provisions are agreed to by and between the Contractor and the Purchaser.

DEFINITIONS: "Purchaser," "Owner," "Party of the First Part," or "Board" shall mean the Board of Public Utilities of the City of Kansas City, Kansas, acting through its duly authorized representatives.

"Contractor" or "Party of the Second Part" shall mean the party having entered into Contract to perform the work herein specified.

"Engineer" shall mean the firm of Lutz, Daily & Brain, Consulting Engineers, P.O. Box 718, Shawnee Mission, Kansas 66201.

"Subcontractor" shall mean only those having a direct contract with the Contractor and it includes one who furnishes material worked to a special design according to the plans and specifications for this work, but does not include one who merely furnishes material not so worked.

"Work" of the Contractor or subcontractor includes labor, materials, supplies, equipment and services to be furnished under the Contract and the carrying out of all obligations imposed by the Contract Documents.

"As directed," "as ordered," "as required," "as permitted," "as allowed," "acceptable to," and words or phrases of like import shall mean that the direction, requirement, allowance or permission of the Owner or Engineer is intended only to the extent of judging compliance of the terms of the contract; none of these terms shall imply the Owner or the Engineer has any authority or responsibility for supervision of the Contractor's forces or construction operations, such supervision and the sole responsibility therefore being strictly reserved for the Contractor.

"Approved," "reasonable," "acceptable," "satisfactory," "proper," "suitable," and words or phrases of like import shall mean approved, reasonable, acceptable, satisfactory or suitable in the judgment of the Owner or Engineer to the extent provided in the paragraph immediately above.

"Or equal," is not intended to impose limitations preventing the free exercise of the Contractor's skill or to exclude products which are satisfactory. Materials and workmanship shall be of the best of their respective kinds. Trade or manufacturer's names where used in these specifications are intended to fix the standards of workmanship and materials. Any article or material equaling the standards fixed may be used in place of that mentioned by the specifications provided that the material or article proposed is submitted to and approved by the Engineer. No substitution shall be made unless this definite approval has been obtained.

"Contract Time" shall mean the number of days or the date stated in the Proposal for the completion of the work.

2. For all materials, tools, and other expendable equipment to the extent of 90 percent of the cost thereof, not later than the 20th day of the calendar month following that in which such materials, tools and equipment are delivered at the site of the project, and the balance of the cost thereof not later than the 30th day following the completion of that part of the work in or on which such materials, tools and equipment are incorporated or used.

3. To each of his subcontractors, not later than the fifth day following each payment to the Contractor, the respective amounts allowed the Contractor on account of the work performed by his subcontractor, to the extent of each subcontractor's interest therein.

Acceptance by the Contractor of the final payment shall be a release to the Purchaser and every agent thereof, from all claims and liability hereunder for anything done or furnished for, or relating to the work, or for any act or neglect of the Purchaser or of any person relating to or affecting the work. The STATEMENT OF CONTRACTOR AND AFFIDAVIT form enclosed in this specification must be completed by the Contractor and attached to the final payment request.

EXTRA AND/OR ADDITIONAL WORK AND CHANGES: If any extra and/or additional work is to be done or any change in the plans and specifications is deemed necessary, the Purchaser may instruct the Engineer to issue to the Contractor a written change order directing that such extra and/or additional work be done or that such change be made, and the Contract shall be modified accordingly. Compensation to the Contractor will be calculated as an addition to or deduction from the Contract Price, based upon such written terms as may be established between the parties, either (a) by an acceptable lump sum proposal of the Contractor, or (b) on a cost-plus limited basis not to exceed a specified limit, or (c) on a basis of the unit prices as stated in these specifications where such unit prices apply. In the event that none of the foregoing methods are agreed upon with the Contractor, the Purchaser may perform the work. The Purchaser shall be the sole judge of such action and procedure. Determination of cost-plus work shall be based upon actual cost of labor and material plus a maximum of 20% of actual Contractor cost for overhead, profit, contingencies, etc. When a price addition involves a Subcontractor's work the total combined overhead, profit, contingencies, etc., of the Contractor and his Subcontractor shall not exceed 30% of the base estimated cost. This breaks down to a maximum of 20% for the Subcontractor and 10% for the Contractor. The determination of price deduction to the Contract as listed under subheading (a) shall be based on the estimated cost plus 10% for profit.

PURCHASER'S RIGHT TO WITHHOLD PAYMENT: The Purchaser shall have the right to withhold from payments due to the Contractor, in addition to the retained percentages herein elsewhere provided for on account of any of the following:

(a) Claims filed or reasonable evidence indicating probable filing of claims against the Contractor for labor and services rendered and materials furnished in and about the work covered by this Contract.

"Date of Contract" shall mean the date set forth at the beginning of the Contract.

"Notice of Award" shall mean the written notice by Owner to the bidder that he is the successful bidder and that upon compliance with the conditions precedent to be filled by the bidder within the time specified, Owner will execute and deliver an agreement or contract to him.

"Notice to Proceed" shall mean the written notice by Owner stipulating the date on which Contractor may begin the work and which marks the start of counting Contract Time stated in the Proposal.

"Resident Engineer" shall mean the authorized representative of the Engineer who is assigned to the construction site and project.

"Date of Acceptance" shall mean date on which Engineer concludes that the work of this Contract has been completed and demonstrated to be in compliance with the Contract and recommends acceptance thereof in writing.

PAYMENTS:

(a) Not later than the 25th day of each calendar month, the Contractor shall submit a duly certified statement of the cost of materials delivered to the site and work performed at the site during that calendar month. Not later than the 25th day of the following calendar month, the Purchaser will make partial payment to the Contractor on the basis of a duly certified approved statement of the cost of materials delivered to the site and work performed at the site during the preceding calendar month by the Contractor, but the Purchaser will retain 10% of the amount of each such statement. Payment shall not constitute acceptance of the work. Prior to presenting final invoice for payment, the Contractor shall file with the Purchaser a sworn statement that all items of labor, materials and parts comprising the specified work have been paid for after all work has been performed, payment of the final invoice less 10% retainage shall be made to the Contractor. Acceptance of the Contract and payment of the 10% retainage will be made after construction has been completed, but will not be withheld more than 90 days after acceptance of the final invoice. The Contractor shall furnish, before the work starts, a breakdown of his estimated costs and estimated payment schedule, in sufficient detail to assist in preparing these monthly statements. Payment requests shall be submitted to the Purchaser, the Resident Engineer and the office of the Engineer.

(b) The Contractor shall pay:

1. For all transportation and utility services not later than the 20th day of the calendar month following that in which the services are rendered.

(b) Damage to another contractor or to the Purchaser.

(c) Work that is defective or guarantees that have not been met and that remain uncorrected.

(d) Failure of the Contractor to submit a cost breakdown, schedules, reports and other information as required under the Contract.

(e) Failure of the Contractor to diligently prosecute the work and maintain progress to assure completion within the Contract time.

(f) A reasonable doubt that the work of the Contract can be completed for the balance then unpaid.

(g) Any other material breach by the Contractor of his duties and obligations under the Contract.

The Purchaser is by this Contract authorized to apply such retained amounts to the payment of such just claims.

PATENTS: The Contractor shall defend any suit or proceeding brought against the Purchaser and hold Purchaser harmless so far as based on a claim that any materials, methods, equipment, or any part thereof, furnished under this Contract constitutes an infringement of any patent. The Contractor shall pay all damages and costs awarded therein against the Purchaser. In case said material or equipment or any part thereof, is in such suit held to constitute infringement and the use of said equipment or part is enjoined, the Contractor shall, at his own expense, either procure for the Purchaser the right to continue using said material, equipment or part; or replace same with noninfringing equipment, or modify it so it becomes noninfringing.

DISCHARGE OF EMPLOYEES: Any employee of the Contractor who is connected with the work and should prove to be quarrelsome, dishonest, incompetent or inexperienced or does not work for the good of the job shall upon written notice from the Purchaser be removed by the Contractor and replaced by an employee with proper qualifications.

EQUAL EMPLOYMENT OPPORTUNITY: During the performance of this Contract, the Contractor agrees as follows:

1. The Contractor, in accordance with the policy of the Board of Public Utilities to assure equal opportunities to every citizen, will not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin.

2. The Contractor and his subcontractors shall agree:

   a. To post in a conspicuous place notices summarizing the provisions of non-discrimination;

b. In all solicitations or advertisements for employees placed by or on behalf of the Contractor and subcontractors, to state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin;

c. Pursuant to Executive Order 11246, EEO, section 202, Article A, Sections 1 through 7, as amended, and Article B, Sections 1 and 2 are hereby included by reference and the Contractor represents that he does not maintain or provide any segregated facilities for his employees;

d. To notify each subcontractor or labor union of these commitments, with the provision that in the event of non-compliance with the nondiscrimination clauses of the contract by any contractor or subcontractor, the Contract may be cancelled, terminated or suspended in whole or in part.

3. The Contractor agrees that in the event of Contractor's non-compliance herewith, the Contract may be cancelled, terminated or suspended in whole or in part.

SUBCONTRACTING: No part of the work covered by this Contract shall be sublet by the Contractor without the prior written approval of the Purchaser. The Contractor shall file with the Engineer a complete list of subcontractors together with a list of kind of material used. This list is to be submitted in writing as soon as subcontracts are made and approved by the Purchaser.

ASSIGNMENT OF CONTRACT: No assignment by the Contractor of any principal construction contract or any part thereof or of the funds to be received thereunder by the Contractor, will be recognized unless such assignment has had the approval of the Purchaser and the Surety has been given due notice of such assignment in writing. The consent of surety, together with copy of assignment, shall be filed with the Purchaser.

In addition to the usual recitals in assignment contracts, the following language must be set forth:

> It is agreed that the funds to be paid to the assignee under this assignment are subject to a prior lien for services rendered or materials supplied for the performance of the work called for in said contract in favor of all persons, firms or corporations rendering such services or supplying such materials.

The Contractor shall not be relieved of his obligations under this Contract by subletting or assignment even with Purchaser's approval. The Purchaser may terminate assignments and subcontracts should they fail to perform the work in accordance with the requirements of the specifications.

The Contractor shall file with the Engineer a complete list of proposed subcontractors together with the scope of each subcontract and a list of kind of material used. This list is to be submitted in writing.

SAFETY AND PROTECTION: The Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work. He shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

All employees on the work and other persons who may be affected thereby, and

All the work and the materials and equipment to be incorporated therein, whether in storage on or off the site.

The design features and configuration of all equipment and facilities provided under this contract shall fully conform with all applicable safety and/or health statutes.

The Contractor must promptly report to the Purchaser, in writing, all accidents whatsoever arising out of, or in connection with, the performance of the work, whether on or adjacent to the site, which caused death, personal injury, or property damage, giving full details and statements of witnesses. In addition, if death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to the Engineer.

If any claim is made by anyone against the Contractor or any subcontractor on account of any accident, the Contractor shall promptly report the facts in writing, giving full details of the claim.

The Contractor shall comply with the Department of Labor Safety and Health Regulations for Construction promulgated under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54; 40 U.S.C. 333) and under the Williams-Steiger Occupational Safety and Health Act of 1970 (PL 91-596; 29 U.S.C. 655, 657); and with any Federal, State or Municipal safety laws or building codes which supplement or extend said regulations. Machinery, equipment, and all hazards shall be guarded or eliminated in accordance with the safety provisions of the "Manual of Accident Prevention in Construction," published by the Associated General Contractors of America, to the extent that such provisions are not in contravention of applicable laws.

The Contractor shall designate a responsible member of his organization on the site whose duty shall be the enforcement of safety and health regulations. The name of such tindividual shall be posted in a conspicious place.

The Contractor's attention is called to existing energized electric power lines in the work area of this Contract. It shall be this Contractor's sole responsibility to keep all personnel and equipment clear of these and any other power lines such that neither personal safety nor continuity of electric service is jeopardized.

LEGAL REQUIREMENTS: The Contractor shall do all work in such a manner as to comply with all City ordinances, and laws of the City, County, State and Nation as apply to the work herein outlined. He shall also obtain all necessary licenses and permits and keep necessary records as required.

In accordance with Kansas Statute 16-113 when a nonresident Contractor enters into agreement with the Owner to construct a building, bridge, sewer, etc., or other such improvements, he shall appoint a resident of Wyandotte County as his Designated Process Agent, and such appointment must be made in writing and filed with the Clerk of the District Court.

In case of a civil action which may arise wherein the Owner may be a plaintiff, the Designated Process Agent will be served. Also, before any payments (progress payments) are made to the Contractor, the appointment of the Process Agent must be executed on the form given on page L-1 of this specification and filed.

The Contractor shall register an executed copy of the Statutory Bond with the clerk of the District Court who is located in the Wyandotte County Courthouse. There is a filing fee of $5.00 for the registration of the executed Statutory Bond.

The Contractor shall obtain a receipt from the Clerk of the District Court indicating that the Statutory Bond and the Designated Process Agent, if required, have been registered. This receipt shall be promptly forwarded to the Owner for their records.

BONDS: The Contractor shall furnish a Performance and a Statutory Bond with a company having the approval of the Purchaser, in an amount of 100 percent of the Contract price guaranteeing complete and faithful performance of the Contract, payment of all bills of whatever nature which could become a lien against the property, and guaranteeing replacement of defective materials and workmanship for a period of one year after completion of the Contract. At any time during the continuance of the Contract that the surety on any bond becomes unacceptable to Owner for financial reasons, Owner shall have the right to require additional and sufficient sureties which Contractor shall furnish to the satisfaction of Owner within ten days after notice to do so.

CONTRACT DOCUMENTS: Eight copies of Contract Documents shall be made, executed and distributed as follows:

4 copies to Purchaser	1 copy to Bonding Company
2 copies to Contractor	1 copy to Engineer

The following documents are a part of the Contract:

Notice to Bidders
Instructions to Bidders
Proposal
Detailed Specifications
General Specifications
Contract Stipulations

Contract
Performance Bond
Statutory Bond
Statement of Contractor and Affidavit
Appointment of Designated Process Agent
Additional drawings as required
Addenda as may be issued

CONTRACTOR'S INSURANCE: The Contractor shall not commence work under this Contract until he has obtained all insurance required under this Contract and such insurance has been approved by the Purchaser, nor shall the Contractor allow any subcontractor to commence work on his subcontract until all similar insurance required of subcontractor has been so obtained and approved. All policies shall be in amounts, form and companies satisfactory to the Purchaser.

Any insured loss under the policies of property insurance is to be adjusted with Owner and made payable to Owner as trustee for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage.

Owner and Contractor waive all rights against each other for damages caused by fire or other perils to the extent covered by property insurance, except such rights as they may have to the proceeds of such insurance held by Owner as trustee. Contractor shall require similar waivers by subcontractors. Owner as trustee will have the power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within five days after the occurrence of loss to Owner's exercise of this power.

The Owner may accept insurance covering a subcontractor in character and amounts less than the standard requirements set forth herein where such standard requirements appear excessive because of the character or extent of the work to be performed by such subcontractor.

Compensation Insurance: The Contractor shall take out and maintain during the life of this Contract, Employee's Liability and Workmen's Compensation insurance for all of his employees employed at the site of the project, and in case any work is sublet, the Contractor shall require the subcontractor similarly to provide Workmen's Compensation Insurance for all the latter's employees unless such employees are covered by the protection afforded by the Contractor. In case any class of employees engaged in hazardous work under this Contract at the site of the project is not protected under the Workmen's Compensation Statute, the Contractor shall provide and shall cause each subcontractor to provide Employee's Liability Insurance for the protection of his employees not otherwise protected. This insurance shall protect Contractor against any and all claims brought under the Workmen's Compensation Law. It shall also protect Contractor against claims for injury to, disease, or death of workmen engaged in the work which, for any reason, may not fall within the provisions of the Workmen's Compensation Act. This policy shall include an "All States" endorsement. Limits of coverage shall be not less than the following:

(1) Workmen's Compensation - Statutory
(2) Employer's Liability - $250,000 each person

Comprehensive Automobile Insurance: This insurance, to be on comprehensive form, shall protect Contractor against any and all claims for injuries to members of the public and damage to property of others arising from the use of automobiles and trucks in connection with the performance of the work, shall cover the operation on or off the site of the work of all motor vehicles licensed for highway use whether they are owned, non-owned or hired.

Liability limits shall be not less than the following:

(1) Bodily injury - $250,000 each person
$500,000 each occurrence

(2) Property Damage - $200,000 each occurrence

Comprehensive General Liability Insurance: This insurance, to be on comprehensive form, shall protect Contractor against any and all claims in connection with or resulting therefrom, arising in whole or in part out of any act of commission or act of omission of Contractor, his agents or subcontractors, or anyone directly or indirectly employed by any of them or for whose acts any of them may be legally liable.

In addition, this general liability insurance policy shall be endorsed to provide blanket contractual liability insurance.

The property damage liability coverage under this policy shall contain no exclusion (commonly referred to as XC&U exclusion) relative to blasting, explosion, collapse of buildings, or damage to underground property.

Liability limits shall be not less than the following:

(1) Bodily Injury - $250,000 each person
$500,000 each occurrence
(2) Property Damage - $250,000 each occurrence
$500,000 aggregate

This policy shall be extended to include Independent Contractors Protective Liability insurance to protect against bodily injury or property damage claims traceable to negligence of independent contractors, while excluding liability arising out of supervisory, inspection or engineering services, opinions, reports, surveys, designs or specifications.

This policy shall include products and completed operations covering for limits as specified above.

This policy shall include personal injury liability insurance for limits of not less than $250,000 each claim and $500,000 annual aggregate.

This policy shall provide "Broad Form Property Damage" Insurance.

Umbrella Policy: At the option of the Contractor, evidence of coverage and limits as required in the above paragraphs covering Compensation, Comprehensive

Automobile and Comprehensive General Liability insurance, may be furnished by certificate of so called "Umbrella" liability policy, in addition to certificate required for comprehensive general liability policy, comprehensive automobile liability policy and workmen's compensation policy.

Owner's Protective Liability Insurance: This insurance shall be in the name of the Owner, maintained in force for the duration of the Contract, by Contractor. Policy shall be for the same limits of liability as the Comprehensive General Liability Insurance and shall protect Owner against any and all claims, and liabilities for injury to or death of persons, or damage to property caused in whole or in part by, or alleged to have been caused in whole or in part by, the negligent acts or omissions of Contractor, his agents, employees, or subcontractors, in connection with or resulting from the operations performed under the terms of the Agreement. The Contractor shall furnish the Owner the original policy, however, to avoid delays in the start of construction, a Binder may be issued and will be acceptable proof of intent while the policy is being prepared.

Proof of Carriage of Insurance: The Contractor shall furnish the Owner with satisfactory proof of carriage of the insurance required. All certificates of insurance shall state that thirty days written notice will be given to the Purchaser before the policy is cancelled or changed. For the Owner's Protective Liability Insurance, the Contractor shall provide either a temporary binder or the original policy in lieu of a Certificate of Insurance.

Each certificate of insurance shall state the type coverage certified and shall be identified as one of the following:

Insurance Coverage	Limits
A. Workmen's Compensation	Statutory
B. Employer's Liability	$250,000 each person
C. Comprehensive Automobile	
Bodily Injury	$250,000 each person $500,000 each occurrence
Property Damage	$200,000 each occurrence
D. Comprehensive General Liability	
Bodily Injury	$250,000 each person $500,000 each occurrence
Property Damage	$250,000 each occurrence $500,000 aggregate
E. Independent Contractor's Protective Liability	
Personal Injury	$250,000 each claim $500,000 annual aggregate
F. Broad Form Property Damage	

Insurance Coverage	Limits
G. Umbrella Policy	
H. Owner's Protective Liability Insurance	
Bodily Injury	$250,000 each person
	$500,000 each occurrence
Property Damage	$1,000,000 each occurrence
	$1,000,000 aggregate

OWNER'S INSURANCE: Installation Floater Insurance: The Owner will provide Installation Floater Insurance. This Insurance shall insure and protect Owner from all insurable risks of physical loss or damage to materials or equipment, including labor expended, in warehouse or storage areas, during transit from point of origin to the site of installation or erection, during installation or erection, and after the work is completed of any acceptance or use of portions of the work prior to completion of the Contract. Materials and supplies of Contractors which are destined to become a part of the completed work while on the job site awaiting and during erection or installation will be insured by the Owner for all risks of direct physical loss or damage. However, the insurance will not apply to Contractors' or subcontractors' equipment, tools, vehicles, plans, blueprints, specifications or any other contractors' property which is not destined to become a part of the completed work.

Coverage will be for an amount not less than the value of the work at completion, excluding excavations, railroad spur lines, etc.

The value shall include the aggregate value of the equipment and materials furnished by Contractor plus items furnished by Owner or others under separate contract which are in the care and custody or to be erected or to be installed by Contractor, and not otherwise insured under Builder's Risk Insurance.

Installation Floater Insurance will also provide for losses, if any, to be adjusted with and made payable to Owner for distribution to Owner and others as their interest may appear.

INDEMNIFICATION: The Contractor agrees to indemnify and hold harmless the Owner, the Engineer, or any employee, director or agent of either of them, from and against all claims, damages, losses and expenses including attorneys' fees arising from deaths or accidents or destruction of tangible property (other than the work itself) including the loss of use resulting therefrom, attributable to the Contractor, or its subcontractors, in the work contemplated and done under this Contract, and to indemnify and hold harmless the Owner, the Engineer, or any employee, director or agent of either of them, from and against all claims, damages, losses and expenses including attorneys' fees, decrees or judgments whatsoever arising from any and all injuries, including death or damages or destruction of property resulting to any third person or persons, corporations, partnerships or associations caused by any act, omission, failure or neglect of the Contractor, its subcontractors or agents, servants and employees, or other persons under its supervision or direction in the performance of any work under the terms of this Contract.

This indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable for or by the Contractor or any subcontractor, manufacturer or supplier under Workmen's Compensation Acts, disability benefit acts, or other employee benefit acts.

INTENT OF THE CONTRACT DOCUMENTS: It is the intent of the Contract Documents as set forth to provide for the proper and complete performance of the work to be accomplished; and the Contract Documents shall comprise the entire agreement between the Owner and the Contractor. No oral agreement or conversation with any officer, representative, agent, or employee of Owner or Engineer, either before or after the execution of the General Contract, shall affect or modify the terms or obligations therein contained. The Contract Documents may be modified only as provided in the Contract Stipulations. The several provisions of the Contract Documents are complementary and what is called for by any one shall be as binding as if called for by all. The precedence of the Contract Documents and its several provisions, is in the following sequence:

a. Addenda or modifications of any nature;

b. The specifications where, if there be a conflict, Engineer will determine which stipulation best meets the intent of the design;

c. The drawings, where the precedence shall be drawings of larger scale over those of smaller, figured dimensions and noted equipment and materials over graphic indications;

d. Conflicts between drawings or specifications and applicable codes and standards shall be referred to Engineer for a decision thereon.

The captions used in the Contract Documents are for convenience only and shall not control or affect the meaning or construction of any of the provisions thereof.

OWNERSHIP OF DOCUMENTS: All specifications, drawings and copies thereof furnished by Engineer shall remain his property. They shall not be used on any extension of this project or on another project and, with the exception of those sets which have been signed in connection with the execution of the Agreement, shall be returned to him on request upon completion of the work.

DELAYS: The Contractor agrees that the Board of Public Utilities shall not be liable for any delays caused by strikes, floods, fire, explosion, Acts of God, mob violence or any other cause beyond the control of said parties to this Contract.

The Contractor having expertise in this specific field of endeavor recognizes and subsequently hereby agrees that in undertaking to complete the work within the herein fixed time, he has taken into consideration and made allowances for all of the ordinary delays and hinderances incident to such work, whether growing out of delays in securing materials or workmen, or otherwise.

Cause for delay in the completion of the work shall only be from causes beyond Contractor's control, which are the following:

1. Abandonment of the work by the men engaged thereon through no fault of the Contractor.

2. Delays caused by court proceedings.

3. Additions or omissions ordered in writing by the Board which cause a change in the project that create a legitimate delay in the Contractor's completion time.

4. Abnormal weather conditions, other than normal seasonal changes.

It is expressly understood and agreed between the Contractor and the Purchaser that the Contractor is not entitled to and shall not have any claim whatsoever, for damages or additional compensation for any delay, interruption or cessation of work to be performed by the Contractor under the several provisions of this Contract. However, the Contractor shall receive and be entitled to certain extensions of time or periods of time specified in the Contract for the completion of any work therein provided, if the Purchaser in his discretion shall grant, in writing to the Contractor, after being notified in writing, of such actual or anticipatory delays by the Contractor. Notification of such delay shall be made by the Contractor to the Purchaser in writing, not later than one (1) week from the time when any such cause for delay shall occur or be anticipated by the Contractor. No extension of time will be made for delay ending more than seven (7) days before claim therefor is made in writing to the Purchaser.

If at any time during the performance of the work, the Contractor's progress on any phase of the work shall fall behind that necessary to enable the Contractor to complete it in accordance with the date or calendar days set out in the Proposal and the dates established by schedules submitted in accordance with the Contract Documents, (as adjusted for the extensions of time, if any, to which the Contractor is entitled under the provisions hereof), or the work, tools, plant or equipment of the Contractor appears to be or is insufficient, inefficient or inappropriate to secure the quality of the work required, the Contractor, at no extra expense to the Purchaser shall take such action as necessary to meet those completion dates, including but not limited to, working additional or longer shifts and employing more labor and equipment and/or to increase the efficiency of, improve the character of, augment the number of or to substitute new tools, plant or equipment of the Contractor as the case might be so as to secure the quality of work required.

RIGHT OF PURCHASER TO TERMINATE CONTRACT: Should the Contractor abandon the work to be performed under this Contract; or if the Contractor's progress in the performance of any phase of the work shall fall behind that established under the Contract; or if the Contractor is adjudged bankrupt or insolvent; or if the Contractor goes into receivership; or if he should make a general assignment for the benefit of his creditors; in the event of a breach of this Contract by the Contractor, then the Purchaser may serve written notice upon the Contractor and the Surety of its intention to terminate the right of Con-

tractor to perform the Contract. Unless within ten days after the serving of such notice upon the Contractor such violation shall cease and satisfactory arrangement for correction be made, the Purchaser may terminate the right of the Contractor to perform the Contract on 24 hours notice. Twenty-four hours after giving such termination notice, the right of the Contractor to perform the Contract shall cease and terminate. In the event of any such termination, the Purchaser shall immediately serve notice thereof upon the Surety and the Contractor, and the Surety shall have the right to take over and perform the Contract, provided, however, that if the Surety does not evidence intention in writing to Purchaser to commence performance thereof within seven days from the date of the mailing to such Surety of notice of termination, the Purchaser may itself take over the work and prosecute the same to completion by contract or otherwise for the account and at the expense of the Contractor. The Surety shall commence performance within 15 days following the notification to the Purchaser of its intentions to proceed pursuant to the terms of the Contract. If the Surety does not commence performance within said term, the Purchaser shall have the right, at its option, to take possession of and utilize such materials and appliances as may be suitable for the work, and to supplement them as necessary to complete the Contract work. The Contractor and his surety shall be liable to the Purchaser for any excess cost occasioned thereby to the Purchaser. Such rights of the Purchaser shall not be exclusive of any other right or remedy at law or equity the Purchaser may have on account of the Contractor's breach. Or the Purchaser, in the event of any such default on the part of the Contractor, may terminate this Contract, but such termination shall not relieve the Contractor from liability for any loss, costs or expenses, including attorney fees resulting to the Purchaser by reason of said default.

RIGHT OF CONTRACTOR TO TERMINATE CONTRACT: If the work should be stopped for a continuous period of three calendar months or more by competent order of any court or other public authority validly exercising jurisdiction through no act or fault of the Contractor or of anyone employed by him, or should the Purchaser fail to pay the Contractor within forty-five days any sum due in accordance with the terms of the Contract provided there is no error in any such payment invoice or that Contractor is not in default in any particular under the terms of this Contract, the Contractor may stop performance or terminate this Contract, upon fifteen days notice in writing unless the Purchaser, during such time, has removed such conditions. Upon any such termination, the Purchaser shall pay the Contractor reasonable and proper charges for termination.

CONTRACT DRAWINGS AND SPECIFICATIONS: The successful Contractor will be furnished ten sets of full size Contract Drawings and 10 sets of specifications without charge. Any additional sets requested by the Contractor will be furnished at the cost of reproduction and mailing.

In addition this Contractor will receive one copy of each manufacturing shop drawing furnished by others and installed by this Contractor. Any additional prints requested by the Contractor will be furnished at the cost of reproduction and mailing.

CONTRACT AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____, 19___, by and between the BOARD OF PUBLIC UTILITIES of the CITY OF KANSAS CITY, KANSAS, as Party of the First Part and hereinafter termed the "Purchaser" and

_____

a _____ of (town) _____ in the State

of _____, Party of the Second Part and hereinafter termed the "Contractor,"

WITNESSETH:

THAT WHEREAS: The Purchaser has caused to be prepared specifications and other contract documents for the material herein described, and has approved and adopted said contract documents and has caused to be published an advertisement inviting sealed proposals for

Power Plant Ash Ponds, Contract No. 75A

_____

specified herein, for the Board of Public Utilities of the City of Kansas City, Kansas, in accordance with the terms of this Contract; and

WHEREAS, the said Contractor, in response to such advertisement, has submitted to the Purchaser, in the manner and at the time specified, a sealed Proposal in accordance with the terms of said advertisement; and

WHEREAS, the Purchaser has publicly opened, examined, and canvassed the Proposals submitted in response to the published invitation therefor and, as a result of said canvass has determined and declared the aforesaid Contractor to be the lowest and/or best bidder for the furnishing of

Power Plant Ash Ponds, Contract No. 75A

and has duly awarded to the said Contractor a contract therefor, as stated more in detail in the Contract Documents, to-wit: Notice to Bidders, Instructions to Bidders, Proposal, Detailed Specifications, General Specifications, Contract Stipulations, Performance Bond, Statutory Bond, Statement of Contractor and Affidavit, Appointment of Designated Process Agent, and Plans and Additional Drawings, all of which documents are attached hereto and made a part of this Contract, for the prices and amounts hereinafter set forth.

NOW THEREFORE: In consideration of the compensation to be paid by the Purchaser to the Contractor, and of the mutual agreements herein contained, the Parties of these presents have agreed and hereby agree, the Purchaser for itself and its successors and the Contractor for itself, himself, or themselves, or its, his or their successors and assigns, or its, his or their executors and administrators as follows:

ARTICLE I: That the Contractor shall (a) furnish all tools, equipment, supplies, superintendence, transportation, and other accessories, services and facilities; (b) furnish all materials, supplies and equipment specified; (c) provide and

perform all necessary labor; and (d) in good substantial and workmanlike manner and in accordance with the provisions of this Contract Document, execute and complete all work included in and covered by the Purchaser's official award of this Contract to the said Contractor, such award being based on the acceptance by the Purchaser of Items and Subitems of the Proposal as follows:

Power Plant Ash Ponds, Contract No. 75A

ARTICLE II: That the Purchaser shall pay to the Contractor for the performance of the work embraced in this Contract, and the Contractor will accept as full compensation therefor, the sum of
One Million, Forty-eight Thousand,
Eight Hundred Fifty-two and 04/100s ---------- Dollars ($1,048,852.04)

for all work and materials covered by and included in the Contract award and designated in the foregoing Article I; payment thereof to be made in the manner provided in the Contract Stipulations hereto attached.

ARTICLE III: That the Contractor will start work, furnish the necessary drawings and complete the work, all in the number of days set forth in the Proposal.

IN WITNESS WHEREOF: The Parties hereto have affixed their signatures and seals:

PURCHASER

Executed this ____ day of _____, 19___.

BOARD OF PUBLIC UTILITIES OF THE
CITY OF KANSAS CITY, KANSAS

By _____
President

Attest: _____
Secretary,
Board of Public Utilities

CONTRACTOR

Executed this ____ day of _____, 19___.

_____

By _____

Title _____

Attest: _____

Title _____

Approved as to form:

_____
Attorney for the Board of Public Utilities

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That we, the undersigned

_____ of _____
hereinafter referred to as "Contractor," and

_____, a corporation organized under the laws of the State of _____, and authorized to transact business in the State of Kansas, as Surety, are held and firmly bound unto the Board of Public Utilities of the City of Kansas City, Kansas, hereinafter referred to as "Purchaser," in the penal sum of

One Million, Forty-eight Thousand, Eight Hundred Fifty-two and 04/100s Dollars($1,048,852.04) lawful money of the United States of America, for the payment of which sum, well and truly to be made, we bind ourselves and our heirs, executors, administrators, successors and assigns, jointly and severally by these presents:

THE CONDITIONS OF THE FOREGOING OBLIGATION ARE SUCH THAT:

WHEREAS, the above bounden Principal has heretobefore on the _____ day of _____, 19____, entered into a certain Contract with the Board of Public Utilities of the City of Kansas City, Kansas, a quasi-municipal corporation, a copy of which Contract together with its terms, covenants, conditions and stipulations is incorporated herein and made a part hereof, as fully and amply as if the said Contract were recited at length herein.

NOW THEREFORE, if the above bounden Principal shall well, truly and faithfully perform said Contract and comply with all terms and provisions thereof and satisfy all of the obligations of said Principal arising thereunder (including the matter of infringement, if any, of patents and covenant for replacement of defective materials and workmanship for a period of one year after the completion of the Contract) and comply with all the covenants therein contained and contained in the specifications and other documents constituting a part of said Contract required to be performed by said Principal in the manner and within the time provided in said Contract, and shall fully indemnify and save harmless said Board of Public Utilities of the City of Kansas City, Kansas, from all costs and damages which said Purchaser may suffer by reason of failure so to do, and shall reimburse and repay said Purchaser all outlay and expense which said Purchaser may incur in making good any such default and shall pay all persons who have contracts directly with the Principal for labor and materials, if any, included in said Contract, then this obligation to be null and void; otherwise to remain in full force and effect.

PROVIDED FURTHER, that if the said Contractor fails to duly pay for any labor, materials, sustenance, provisions, provender, or any other supplies or materials used or consumed by such Contractor or his, their, or its subcontractors, in performance of the work contracted to be done, the Surety will pay the same in any amount not exceeding the amount of this obligation, together with interest as provided by law:

PROVIDED FURTHER, that the said Surety, for value received, hereby stipulates and agrees that the bonds shall be automatically increased in amount and extended in time without formal and separate amendments to cover full and faithful performance of the Contract in the event of Change Orders regardless of the amount of time or money involved. It shall be the Contractor's responsibility to notify his surety of any changes affecting the general scope of the work or change in the Contract Price.

IN TESTIMONY WHEREOF, the said Contractor has hereunto set his hand, and the said Surety has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its attorney-in-fact duly authorized thereunto so to do, at _____ on this the _____ day of _____, 19___.

_____
Contractor

By_____(Seal)

Attest: _____

_____
Surety Company

By _____
Attorney-In-Fact

(Accompany this Bond with Attorney-in-fact's authority from the Surety Company certified to include the date of the Bond.)

Countersigned:

_____
Resident Kansas Agent

Approved as to form:

_____
Attorney for the
Board of Public Utilities

STATUTORY BOND

KNOW ALL MEN BY THESE PRESENTS: _____

as Principal, and _____, a _____

organized under the laws of the State of _____ and authorized to transact business in the State of Kansas, as Surety are held firmly bound unto the State of Kansas in the penal sum of
One Million, Forty-eight Thousand,
Eight Hundred Fifty-two and 04/100s Dollars ($ 1,048,852.04)
lawful money of the United States, for the payment of which sum, well and truly to be made, said Principal and Surety bind themselves, their heirs, administrators, executors, successors and assigns, jointly and severally by these presents.

Signed, sealed and delivered at _____, this _____ day of

_____, 19___.

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH THAT WHEREAS, said Principal has entered into a written Contract with the Board of Public Utilities of the City of Kansas City, Kansas (hereinafter called the "Purchaser") dated

_____, 19___, for the furnishing of the following described improvements:
Power Plant Ash Ponds, Contract No. 75A

NOW THEREFORE, IF THE SAID Principal or the subcontractors of said Principal shall pay all indebtedness incurred for equipment, supplies, materials or labor furnished, used or consumed in connection with, in or about the construction or making of the above described improvements, including gasoline, lubricating oils, fuel oils, greases and similar items used or consumed directly in furtherance of such improvements and shall save the State of Kansas harmless from all demands, judgments, claims and suits of any kind and character for damages or injury to persons or property occasioned by the negligence of said Contractor or his agents, servants or employees, this obligation shall be void; otherwise it shall remain in full force and effect.

The said Surety, for value received, hereby stipulates and agrees that the bonds shall be automatically increased in amount and extended in time without formal and separate amendments to cover full and faithful performance of the Contract in the event of Change Orders regardless of the amount of time or money involved. It shall be Contractor's responsibility to notify his Surety of any changes affecting the general scope of the work or change in the Contract price.

_____
Contractor

Countersigned:

By _____(Seal)

_____
Resident Kansas Agent

Attest_____

Approved as to form:

_____
Surety Company

By_____
Attorney-in-Fact

_____
Attorney for the
Board of Public Utilities

(Accompany this Bond with Attorney-in-fact's authority from the Surety Company certified to include the date of the bond.)

N 321,270
E 2,937,800

TEST BORING LOG

Project: Board of Public Utilities
Nearman Site
Address: 55th Street and Missouri River
City & State: Kansas City, Kansas

Boring No.: D-3 Sheet 1 of 4
Surface Elevation: 743.81 Offset:
Date Started: 10-16-74 Completed: 10-18-74
Driller: J. Kelly Rig: FA

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETROMETER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	1'0"	WB				Topsoil
1'0"	2'6"	ST1			1'0"	Brown silty clay, stiff
2'6"	3'6"	WB				Same
3'6"	5'0"	ST2			1'0"	Brown very fine to fine sand
5'0"	6'0"	WB				Same
6'0"	7'6"	SS3		3-1-1	1'0"	Same
7'6"	8'0"	WB				Same
8'0"	8'6"	WB				Gray sandy clay, soft
8'6"	10'0"	SS4		1-1-3	1'0"	Same
10'0"	10'6"	WB				Same
10'6"	11'0"	WB				Brown fine to very fine sand
11'0"	12'6"	SS5		4-6-6	1'2"	Same
12'6"	13'6"	WB				Same
13'6"	15'0"	SS6		6-7-10	1'0"	Same
15'0"	16'0"	WB				Same
16'0"	17'6"	SS7		7-10-13	11"	Same

REMARKS: (Casing, Water Loss, Etc.) Water Level Time Date

(Completion)

N 321,270
E 2,937,800

TEST BORING LOG

Project: Board of Public Utilities
Nearman Site
Address: 55th Street and Missouri River
City & State: Kansas City, Kansas

Boring No. D- 3 Sheet 2 of 4
Surface Elevation 743.81 Offset
Date Started 10-16-74 Completed 10-18-74
Driller J. Kelly Rig FA

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
17'6"	18'6"	WB				Brown fine to very fine sand
18'6"	20'0"	SS8		8-11-19	1'0"	Same
20'0"	21'0"	WB				Same
21'0"	22'6"	SS9		8-6-8		Gray fine to very fine sand
22'6"	23'6"	WB				Same
23'6"	25'0"	SS10		4-7-8	1'1''	Gray brown fine to medium sand
25'0"	26'0"	WB				Gray brown medium to fine sand, w/tr. coarse sand
26'0"	27'6"	SS11		4-3-5	1'0"	Same
27'6"	28'6"	WB				Gray medium to coarse sand w/tr. fine sand, w/lignite
28'6"	30'0"	SS12		3-4-3	1'0"	Brown medium to fine sand w/tr. coarse sand, w/lignite
30'0"	31'0"	WB				Same
31'0"	32'6"	SS13		4-7-8	1'6"	Same
32'6"	33'6"	WB				Same
33'6"	35'0"	SS14		4-4-4	11"	Brown coarse to medium sand w/tr. fine sand
35'0"	36'0"	WB				Same
36'0"	37'6"	SS15		4-5-7	1'0"	Same

REMARKS: (Casing, Water Loss, Etc.) Water Level Time Date

(Completion)

N 321,270
E 2,937,800

TEST BORING LOG

Project: Board of Public Utilities
Nearman Site
Address: 55th Street and Missouri River
City & State: Kansas City, Kansas

Boring No.: D- 3 Sheet 3 of 4
Surface Elevation: 743.81 Offset:
Date Started: 10-16-74 Completed: 10-18-74
Driller: J. Kelly Rig: FA

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
37'6"	38'6"	WB				Brown coarse to medium sand, w/tr. fine sand
38'6"	40'0"	SS16		4-5-5	1'0"	Same
40'0"	41'0"	WB				Same
41'0"	42'6"	SS17		5-4-6	1'0"	Same
42'6"	43'6"	WB				Same
43'6"	45'0"	SS18		4-5-5	8"	Same
45'0"	46'0"	WB				Same
46'0"	47'6"	SS19		7-9-12	1'1"	Brown fine to medium sand w/lignite
47'6"	48'6"	WB				Same
48'6"	50'0"	SS20		8-8-11	7"	Same
50'0"	51'0"	WB				Brown coarse to medium sand w/tr. fine sand, w/gravel and lignite
51'0"	52'6"	SS21		5-8-14	1'6"	Same
52'6"	53'6"	WB				Same
53'6"	55'0"	SS22		6-8-13		Same
55'0"	56'0"	WB				Same
56'0"	57'6"	SS23		8-10-12	1'6"	Brown medium to fine sand, w/tr. coarse sand

REMARKS: (Casing, Water Loss, Etc.) Water Level Time Date

(Completion)

N 321,270
E 2,937,800

TEST BORING LOG

Project: Board of Public Utilities
Nearman Site
Address: 55th Street and Missouri River
City & State: Kansas City, Kansas

Boring No. D- 3 Sheet 4 of 4
Surface Elevation 743.81 Offset
Date Started 10-16-74 Completed 10-18-74
Driller J. Kelly Rig FA

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
57'6"	58'6"	WB				Brown medium to fine sand w/some coarse sand
58'6"	60'0"	SS24		8-9-9	1'2"	Same
60'0"	61'0"	WB				Same
61'0"	63'0"	WB				Gray medium to coarse sand w/tr. of fine sand, w/some lignite
63'0"	70'0"	WB				Gray coarse to medium sand w/tr. of fine sand, w/clay, gravel boulders
70'0"	71'6"	SS25		25-40-60	1'6"	Gray fine to very fine sand
71'6"	80'0"	WB				Same
80'0"	81'6"	SS26		17-12-25	1'6"	Gray medium to fine sand w/some coarse sand, w/lignite, gravel and boulders
81'6"	83'0"	WB				Same
83'0"	90'0"	WB				Gray coarse to medium sand, w/gravel boulders
90'0"	91'6"	SS27		10-15-20	8"	Same
91'6"	100'0"	WB				Same
100'0"	101'6"	SS28		18-20-20	1'6"	Same
101'6"	104'0"	WB				Same
104'0"	114'0"	WB				Gray shale, medium hard
114'0"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.) Water Level Time Date

(Completion)

TEST BORING LOG

N 321,270
E 2,939,187

Project Board of Public Utilities — Boring No. D-4 — Sheet 1 of 4

Nearman Site — Surface Elevation 747.00 — Offset

Address 55th Street and Missouri River — Date Started 10-4-74 — Completed 10-16-74

City & State Kansas City, Kansas — Driller E. Conner — Rig CME

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETROMETER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	2'0"	WB				Light brown sandy silt, w/tr of clay, dry to moist, soft
2'0"	3'6"	ST1	1.5		15"	Light brown sandy silt w/tr. of clay, moist, soft
3'6"	4'6"	WB				Same
4'6"	6'0"	ST2	0.75		14"	Same
6'0"	7'0"	WB				Same
7'0"	8'6"	ST3	0.5		16"	Same
8'6"	9'6"	WB				Same
9'6"	11'0"	ST4	1.0		18"	Gray and brown sandy silt w/clay, moist, soft
11'0"	12'0"	WB				Same
12'0"	13'6"	ST5	1.25		18"	Same
13'6"	14'6"	WB				Same
14'6"	16'0"	ST6	0.5		18"	Gray silty clay (very little silt) moist, soft
16'0"	17'0"	WB				Same
17'0"	18'6"	ST7	0.5		18"	Gray silty clay, moist, soft
18'6"	19'6"	WB				Same
19'6"	21'0"	ST8	0.5		17"	Gray silty fine sand, wet, loose

REMARKS: (Casing, Water Loss, Etc.) — Water Level — Time — Date

(Completion)

N 321,270
E 2,939,187

TEST BORING LOG

Project: Board of Public Utilities
Nearman Site
Address: 55th Street and Missouri River
City & State: Kansas City, Kansas

Boring No. D-4 Sheet 2 of 4
Surface Elevation 747.00 Offset
Date Started 10-4-74 Completed 10-16-74
Driller E. Conner Rig CME

Abbreviations: A.O. — Auger Only; H.A. — Hollow Auger; W.B. — Wash Bore; R.B. — Rock Bit; S.S. — Split Spoon; S.T. — Shelby Tube; C.W. — Core Water; C.A. — Core Air; F.B. — Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR—MATERIAL—MOISTURE—CLAY CONSISTENCY SAND DENSITY
21'0"	24'6"	WB				Gray silty fine sand wet, loose
24'6"	26'0"	SS1		4-5-7	18"	Gray silty fine sand (very little silt) wet, loose
26'0"	29'6"	WB				Same
29'6"	31'0"	SS2		6-7-9	18"	Gray fine sand w/tr. of silt, wet, medium dense
31'0"	34'6"	WB				Same
1'6"	36'0"	SS3		17-19-5	6"	Gray fine sand, wet, medium dense
36'0"	39'6"	WB				Same
39'6"	41'0"	SS4		5-6-4	18"	Same
41'0"	44'6"	WB				Same
44'6"	46'0"	SS5		19-17-12	18"	Gray medium to very coarse sand, wet, dense
46'0"	49'6"	WB				Same
49'6"	51'0"	SS6		18-17-16	18"	Same
51'0"	54'6"	WB				Same
54'6"	56'0"	SS7		18-16-15	18"	Same
56'0"	59'6"	WB				Same
59'6"	61'0"	SS8		8-6-6	18"	Gray medium to very coarse sand, wet, medium dense

REMARKS: (Casing, Water Loss, Etc.) Water Level Time Date (Completion)

TEST BORING LOG

N 321,270
E 2,939,187

Project: Board of Public Utilities
Nearman Site
Address: 55th Street and Missouri River
City & State: Kansas City, Kansas

Boring No.: D-4 Sheet 3 of 4
Surface Elevation: 747.00 Offset:
Date Started: 10-4-74 Completed: 10-16-74
Driller: E. Conner Rig: CME

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
61'0"	64'6"	WB				Gray medium to coarse sand w/boulders, wet, dense
64'6"	66'0"	SS9		8-7-6	18"	Same
66'0"	69'6"	WB				Same
69'6"	71'0"	SS10		12-11-12	18"	Gray medium to coarse sand, wet, dense
71'0"	74'6"	WB				Same
74'6"	76'0"	SS11		8-15-14	18"	Gray fine to medium sand, wet, dense
76'0"	79'6"	WB				Same
79'6"	81'0"	SS12		8-12-14	18"	Gray fine sand w/lignite, wet, dense
81'0"	84'6"	WB				Same
84'6"	86'0"	SS13		10-11-13	16"	Same
86'0"	89'6"	WB				Gray fine sand w/boulders, wet, dense
89'6"	91'0"	SS14		10-12-14	17"	Gray fine sand, wet, dense
91'0"	94'6"	WB				Same
94'6"	96'0"	SS15		11-14-13	18"	Same
96'0"	99'6"	WB				Same
99'6"	101'0"	SS16		12-13-14	16"	Gray fine to medium sand, wet, dense

REMARKS: (Casing, Water Loss, Etc.) Water Level Time Date

(Completion)

N 321,270
E 2,939,187

TEST BORING LOG

Project: Board of Public Utilities
Nearman Site
Address: 55th Street and Missouri River
City & State: Kansas City, Kansas

Boring No. D-4 Sheet 4 of 4
Surface Elevation 747.00 Offset
Date Started 10-4-74 Completed 10-16-74
Driller E. Conner Rig CME

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETROMETER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
101'0"	109'6"	WB				Gray fine to medium sand, wet, med. dense
109'6"	111'0"	SS17		12-11-10	10"	Same
111'0"	118'0"	WB				Same
118'0"	120'0"	WB				Gray and brown medium to coarse sand, w/tr. of gravel, wet, very dense
120'0"	121'6"	SS18		7-9-11		Gray & brown coarse sand, wet, med. dense
121'6"	126'4"	WB				Same
126'4"	137'0"	WB				Blue gray shale, dry, hard
137'0"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

	Water Level	Time	Date
Set 60'0" of 2" PVC Pipe.	10'3"	3:15	10-18-74 (Completion)

N 322,150
E 2,937.750

TEST BORING LOG

Project: Board of Public Utilities
Nearman Plant Site - Main Plant
Address: 55th and Missouri River
City & State: Kansas City, Kansas

Boring No. 11 Sheet 1 of 1
Surface Elevation 748.93' Offset
Date Started 1-9-75 Completed 1-9-75
Driller J. Rau Rig CME

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	1'6"	HA				Topsoil
1'6"	2'0"	HA				Light brown and gray sandy clayey silt, moist, medium stiff
2'0"	3'6"	ST1	1.25		16"	Same
3'6"	4'6"	HA				Same
4'6"	6'0"	ST2	2.0		18"	Light brown and gray sandy clayey silt, moist, stiff
6'0"	7'0"	HA				Same
7'0"	8'6"	ST3	1.0		10"	Light brown and gray sandy clayey silt, moist, soft
8'6"	9'6"	HA				Same
9'6"	11'0"	ST4	1.5		18"	Light brown and gray sandy clayey silt, moist, medium stiff
11'0"	14'6"	HA				Same
14'6"	16'0"	SS1		8-8-11		Light brown silty fine sand, moist, medium dense
16'0"	19'6"	HA				Same
19'6"	21'0"	SS2		4-4-3		Light brown fine to medium sand, wet, loose
21'0"	24'6"	HA				Same
24'6"	26'0"	SS3		7-9-11		Same
26'0"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

Water Level	Time	Date	
14'5"	10:15	1-9-75	(Completion)

Layne-Western Company, Inc. 1010 WEST 39th STREET, KANSAS CITY, MISSOURI 64111

LW-59A 75A

N 321,700
E 2,937,750

TEST BORING LOG

Project: Board of Public Utilities
Nearman Plant Site - Main Plant
Address: 55th and Missouri River
City & State: Kansas City, Kansas

Boring No. 12 Sheet 1 of 1
Surface Elevation 747.73' Offset
Date Started 1-6-75 Completed 1-6-75
Driller J. Rau Rig A.T.V.

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	1'6"	HA				Topsoil
1'6"	2'0"	HA				Light brown silty clayey sand, moist, stiff
2'0"	3'6"	ST1	1.25		18"	Same
3'6"	4'6"	HA				Same
4'6"	6'0"	ST2	1.25		18"	Light brown silty fine sand, moist, medium dense
6'0"	7'0"	HA				Same
7'0"	8'6"	SS1		3-4-4		Dark brown silty fine sand w/tr. of clay, wet, loose
8'6"	9'6"	HA				Same
9'6"	11'0"	SS2		5-6-4		Light brown fine sand, moist, med. dense
11'0"	14'6"	HA				Same
14'6"	16'0"	SS3		7-8-12		Light gray fine sand, wet, dense
16'0"	19'6"	HA				Same
19'6"	21'0"	SS4		8-12-14		Same
21'0"	24'6"	HA				Same
24'6"	26'0"	SS5		11-11-10		Same
26'0"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

	Water Level	Time	Date	
Caved @	7'1"	3:00	1-6-75	(Completion)

Layne-Western Company, Inc. 1010 WEST 39th STREET, KANSAS CITY, MISSOURI 64111

75A

LW-59A

N 321,350
E 2,938,250

TEST BORING LOG

Project: Board of Public Utilities
Nearman Plant Site - Main Plant
Address: 55th and Missouri River
City & State: Kansas City, Kansas

Boring No. 46 Sheet 1 of 1
Surface Elevation 743.53' Offset
Date Started 1-9-75 Completed 1-9-75
Driller J. Rau Rig A.T.V.

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	2'0"	HA				Dark gray brown sandy silt, wet, very soft
2'0"	3'6"	ST1	0.0		18"	Same
3'6"	4'6"	HA				Same
4'6"	6'0"	ST2	1.5		18"	Light brown and gray sandy silty clay, moist, stiff
6'0"	7'0"	HA				Same
7'0"	8'6"	ST3	0.5		18"	Dark brown sandy silty clay, wet, soft
8'6"	9'6"	HA				Same
9'6"	11'0"	SS1		3-3-2		Light brown medium sand, wet, loose
11'0"	14'6"	HA				Same
14'6"	16'0"	SS2		8-13-14		Light gray and brown fine sand, wet, dense
16'0"	19'6"	HA				Same
19'6"	21'0"	SS3		7-7-7		Light brown silty fine sand, wet, med. dense
21'0"	24'6"	HA				Same
24'6"	26'0"	SS4		5-4-7		Same
26'0"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

Water Level	Time	Date	
11'11"	2:30	1-9-75	(Completion)

N 321,350
E 2,939,000

TEST BORING LOG

Project: Board of Public Utilities
Nearman Plant Site - Main Plant
Address: 55th and Missouri River
City & State: Kansas City, Kansas

Boring No. 47 Sheet 1 of 1
Surface Elevation 747.99' Offset
Date Started 1-7-75 Completed 1-7-75
Driller J. Rau Rig A.T.V.

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	1'6"	HA				Topsoil
1'6"	2'0"	HA				Light brown silty clay, moist, stiff
2'0"	3'6"	ST1	2.0		18"	Same
3'6"	4'6"	HA				Same
4'6"	6'0"	ST2	2.0		18"	Same
6'0"	7'0"	HA				Same
7'0"	8'6"	ST3	1.0		12"	Light brown silty fine sand, very moist, medium dense
8'6"	9'6"	HA				Same
9'6"	11'0"	SS1		2-2-2		Light brown silty fine sand, very moist, loose
11'0"	14'6"	HA				Same
14'6"	16'0"	ST4	1.5		18"	Light brown and gray sandy silty clay, very moist, medium stiff
16'0"	19'6"	HA				Same
19'6"	21'0"	SS2		8-8-8		Light gray silty fine sand, wet, medium dense
21'0"	24'6"	HA				Same
24'6"	26'0"	SS3		7-2-8		Light brown silty fine sand w/thin clay seams, wet, medium dense
26'0"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

Water Level	Time	Date	
17'4"	3:45	1-7-75	(Completion)

N 322,150
E 2,938,250

TEST BORING LOG

Project: Board of Public Utilities
Nearman Plant Site - Main Plant
Address: 55th and Missouri River
City & State: Kansas City, Kansas

Boring No. 48 Sheet 1 of 1
Surface Elevation 747.93' Offset
Date Started 1-9-75 Completed 1-9-75
Driller J. Rau Rig A.T.V.

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	1'0"	HA				Topsoil
1'0"	2'0"	HA				Light brown and gray sandy clayey silt, wet, soft
2'0"	3'6"	ST1	0.5		10"	Same
3'6"	4'6"	HA				Same
4'6"	6'0"	ST2	0.75		18"	Same
6'0"	7'0"	HA				Same
7'0"	8'6"	ST3	2.0		18"	Light brown silty fine sand, wet, dense
8'6"	9'6"	HA				Same
9'6"	11'0"	ST4	1.5		10"	Light brown and gray sandy clay w/silt, wet, stiff
11'0"	12'6"	SS1		5-4-7		Light brown and gray silty fine sand, wet, medium dense
12'6"	14'6"	HA				Same
14'6"	16'0"	SS2		8-10-13		Light brown medium sand, wet, dense
16'0"	19'6"	HA				Same
19'6"	21'0"	SS3		3-3-4		Dark brown and gray medium sand, wet, loose
21'0"	24'6"	HA				Same
24'6"	26'0"	SS4		8-12-9		Dark brown and gray medium sand, wet, dense
26'0"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

	Water Level	Time	Date	
Caved	10'3"	1:40	1-9-75	(Completion)

Layne-Western Company, Inc. 1010 WEST 39th STREET, KANSAS CITY, MISSOURI 64111

LW-59A 75A

N 322,150
E 2,939,000

TEST BORING LOG

Project: Board of Public Utilities
Nearman Plant Site - Main Plant
Address: 55th and Missouri River
City & State: Kansas City, Kansas

Boring No. 49 Sheet 1 of 1
Surface Elevation 747.17' Offset
Date Started 1-6-75 Completed 1-6-75
Driller J. Rau Rig A.T.V.

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	1'6"	HA				Topsoil
1'6"	2'0"	HA				Light brown silty fine sand, moist, med. stiff
2'0"	3'6"	ST1	1.5		18"	Same
3'6"	4'6"	HA				Same
4'6"	6'0"	ST2	1.5		18"	Dark brown silty clay, moist, medium stiff
6'0"	7'0"	HA				Same
7'0"	8'6"	ST3	NT		18"	Light brown silty fine sand, moist, med.dense
8'6"	9'6"	HA				Same
9'6"	11'0"	SS1		2-4-4		Dark brown sandy clayey silt, wet, medium stiff
11'0"	14'6"	HA				Same
14'6"	16'0"	SS2		5-6-5		Light brown clayey med. sand, moist, med.dense
16'0"	19'6"	HA				Same
19'6"	21'0"	SS3		4-5-6		Same
21'0"	24'6"	HA				Same
24'6"	26'0"	SS4		11-8-9		Same
26'0"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

Water Level	Time	Date	
13'6"	11:50	1-6-75	(Completion)

Layne-Western Company, Inc. 1010 WEST 39th STREET, KANSAS CITY, MISSOURI 64111

75A

LW-59A

TEST BORING LOG

N 322,900
E 2,938,000

Project Board of Public Utilities — Boring No. 50 — Sheet 1 of 1

Nearman Plant Site — Surface Elevation _____ Offset _____

Address 55th and Missouri River — Date Started 2-19-75 Completed 2-19-75

City & State Kansas City, Kansas — Driller J. Rau — Rig A.T.V.

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	1'0"	HA				Topsoil
1'0"	2'0"	HA				Dark brown silty clay, very moist, med.stiff
2'0"	3'6"	ST1	1.25		18"	Same
3'6"	4'6"	HA				Same
4'6"	6'0"	ST2	0.75		18"	Dark brown sandy clayey silt, wet, soft
6'0"	7'0"	HA				Same
7'0"	8'6"	ST3	1.5		18"	Light brown sandy silt, moist, stiff
8'6"	9'6"	HA				Same
9'6"	11'0"	SS1		3-4-6		Light brown silty fine sand, moist, medium dense
11'0"	14'6"	HA				Same
14'6"	16'0"	SS2		3-5-5		Light gray and brown medium sand, moist, medium dense
16'0"	19'6"	HA				Same
19'6"	21'0"	SS3		3-4-4		Light gray and brown medium sand, wet, loose
21'0"	24'6"	HA				Same
24'6"	26'0"	SS4		5-7-6		Light gray and brown medium sand, wet, medium loose
26'0"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

Water Level	Time	Date
15'3"	1:50	2-19-75 (Completion)

Layne-Western Company, Inc. 1010 WEST 39th STREET, KANSAS CITY, MISSOURI 64111

75A

LW-59A

N 322,900
E 2,938,650

TEST BORING LOG

Project: Board of Public Utilities
Nearman Plant Site - Main Plant
Address: 55th and Missouri River
City & State: Kansas City, Kansas

Boring No. 51 Sheet 1 of 1
Surface Elevation 746.27' Offset
Date Started 1-8-75 Completed 1-8-75
Driller J. Rau Rig A.T.V.

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	1'0"	HA				Topsoil
1'0"	2'0"	HA				Dark brown silty clay, wet, soft
2'0"	3'6"	ST1	0.75		18"	Same
3'6"	4'6"	HA				Same
4'6"	6'0"	ST2	0.75		18"	Dark brown sandy clayey silt, wet, soft
6'0"	7'0"	HA				Same
7'0"	8'6"	ST3	NT		18"	Light brown silty fine sand, moist, medium dense
8'6"	9'6"	HA				Same
9'6"	11'0"	SS1		4-6-9		Same
11'0"	14'6"	HA				Same
14'6"	16'0"	SS2		8-8-7		Light brown fine to medium sand, wet, medium dense
16'0"	19'6"	HA				Same
19'6"	21'0"	SS3		3-2-1		Same
21'0"	24'6"	HA				Same
24'6"	26'0"	SS4		5-4-6		Same
26'0"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

	Water Level	Time	Date	
Caved	11'1"	4:00	1-9-75	(Completion)

N 323,850
E 2,938,500

TEST BORING LOG

Project: Board of Public Utilities
Nearman Plant Site - Main Plant
Address: 55th and Missouri River
City & State: Kansas City, Kansas

Boring No. 52 Sheet 1 of 1
Surface Elevation 747.66' Offset
Date Started 1-8-75 Completed 1-8-75
Driller J. Rau Rig A.T.V.

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	1'6"	HA				Topsoil
1'6"	2'0"	HA				Dark brown silty clay, very moist, med. stiff
2'0"	3'6"	ST1	1.25		12"	Same
3'6"	4'6"	HA				Same
4'6"	6'0"	ST2	1.0		14"	Dark brown sandy clayey silt, very moist, medium stiff
6'0"	7'0"	HA				Same
7'0"	8'6"	ST3	0.75		14"	Dark brown sandy clayey silt, wet, soft
8'6"	9'6"	HA				Same
9'6"	11'0"	ST4	NT		18"	Light brown silty fine sand, moist, medium dense
11'0"	12'6"	SS1		7-7-8		Same
12'6"	14'6"	HA				Same
14'6"	16'0"	SS2		7-8-9		Light brown fine to medium sand, wet, medium dense
16'0"	19'6"	HA				Same
19'6"	21'0"	SS3		8-4-4		Light gray and brown fine to medium sand, wet, medium dense
21'0"	24'6"	HA				Same
24'6"	26'0"	SS4		8-7-13		Light gray and brown fine to medium sand, wet, dense

26'0" Total Depth

REMARKS: (Casing, Water Loss, Etc.)

Set 21'0" of 2" PVC pipe. Slotted 10'0".

Water Level	Time	Date	
14'8"	3:00	1-8-75	(Completion)

Layne-Western Company, Inc. 1010 WEST 39th STREET, KANSAS CITY, MISSOURI 64111

LW-59A 75A

N 324,850
E 2,939,000

TEST BORING LOG

Project: Board of Public Utilities
Nearman Plant Site - Main Plant
Address: 55th and Missouri River
City & State: Kansas City, Kansas

Boring No. 53 Sheet 1 of 1
Surface Elevation 746.63' Offset
Date Started 1-8-75 Completed 1-8-75
Driller J. Rau Rig A.T.V.

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	1'0"	HA				Topsoil
1'0"	2'0"	HA				Light brown sandy silty clay, moist, soft
2'0"	3'6"	ST1	1.0		9"	Same
3'6"	4'6"	HA				Same
4'6"	6'0"	ST2	1.0		18"	Light brown sandy silt, moist, soft
6'0"	7'0"	HA				Same
7'0"	8'6"	ST3	NT		14"	Light brown fine sand, moist, medium dense
8'6"	9'6"	HA				Same
9'6"	11'0"	SS1		4-4-7		Same
11'0"	14'6"	HA				Same
14'6"	16'0"	SS2		2-2-2		Dark gray fine sand, wet, loose
16'0"	19'6"	HA				Same
19'6"	21'0"	SS3		7-9-6		Dark gray fine to medium sand w/tr. of lignite, wet, medium dense
21'0"	24'6"	HA				Same
24'6"	26'0"	SS4		11-9-12		Same
26'0"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

Water Level	Time	Date	
19'1"	10:30	1-8-75	(Completion)

Layne-Western Company, Inc. 1010 WEST 39th STREET, KANSAS CITY, MISSOURI 64111

LW-59A 75A

N 324,500
E 2,938,500

TEST BORING LOG

Project: Board of Public Utilities
Nearman Plant Site - Main Plant
Address: 55th and Missouri River
City & State: Kansas City, Kansas

Boring No. 54 Sheet 1 of 1
Surface Elevation 748.63' Offset
Date Started 1-8-75 Completed 1-8-75
Driller J. Rau Rig A.T.V.

Abbreviations: A.O. — Auger Only; H.A. — Hollow Auger; W.B. — Wash Bore; R.B. — Rock Bit; S.S. — Split Spoon; S.T. — Shelby Tube; C.W. — Core Water; C.A. — Core Air; F.B. — Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR—MATERIAL—MOISTURE—CLAY CONSISTENCY SAND DENSITY
0'0"	1'6"	HA				Topsoil
1'6"	2'0"	HA				Dark brown very silty clay, wet, soft
2'0"	3'6"	ST1	0.5		15"	Same
3'6"	4'6"	HA				Same
4'6"	6'0"	ST2	1.5		18"	Light brown and gray sandy silt w/tr. of clay, moist, stiff
6'0"	7'0"	HA				Same
7'0"	8'6"	ST3	0.25		6"	Dark brown very sandy silty clay, wet, very soft
8'6"	9'6"	HA				Same
9'6"	11'0"	SS1		3-2-5		Light brown silty fine sand, moist, medium dense
11'0"	14'6"	HA				Same
14'6"	16'0"	SS2		7-8-8		Light brown fine to medium sand, moist, dense
16'0"	19'6"	HA				Same
19'6"	21'0"	SS3		7-10-16		Dark gray fine to medium sand, moist, dense
21'0"	24'6"	HA				Same
24'6"	26'0"	SS4		10-14-15		Gray and brown fine to medium sand, moist, dense
26'0"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

Water Level	Time	Date	
20'3"	11:30	1-8-75	(Completion)

TEST BORING LOG

N 324,200
E 2,938,000

Project Board of Public Utilities

Nearman Plant Site - Main Plant

Address 55th and Missouri River

City & State Kansas City, Kansas

Boring No. 55 Sheet 1 of 1

Surface Elevation 748.16' Offset

Date Started 1-9-75 Completed 1-9-75

Driller J. Rau Rig A.T.V.

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	1'6"	HA				Topsoil
1'6"	2'0"	HA				Dark brown silty clay, moist, stiff
2'0"	3'6"	ST1	2.0		16"	Same
3'6"	4'6"	HA				Same
4'6"	6'0"	ST2	1.5		18"	Light brown sandy clayey silt, moist, stiff
6'0"	7'0"	HA				Same
7'0"	8'6"	ST3	2.25		15"	Same
8'6"	9'6"	HA				Same
9'6"	11'0"	SS1		5-7-10		Light brown fine sand, moist, medium dense
11'0"	14'6"	HA				Same
14'6"	16'0"	SS2		2-2-2		Dark gray silty fine sand, wet, loose
16'0"	19'6"	HA				Same
19'6"	21'0"	SS3		5-4-5		Dark gray medium sand, wet, medium dense
21'0"	24'6"	HA				Same
24'6"	26'0"	SS4		8-10-6		Same
26'0"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

	Water Level	Time	Date	
Caved @	8'6"	1:20	1-9-75	(Completion)

N 323,850
E 2,937,500

TEST BORING LOG

Project Board of Public Utilities
Nearman Plant Site - Main Plant
Address 55th and Missouri River
City & State Kansas City, Kansas

Boring No. 56 Sheet 1 of 1
Surface Elevation 746.77' Offset
Date Started 1-9-75 Completed 1-9-75
Driller J. Rau Rig A.T.V.

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	1'6'	HA				Topsoil
1'6"	2'0"	HA				Light brown sandy silt, moist, medium stiff
2'0"	3'6"	ST1	1.5		18"	Same
3'6"	4'6"	HA				Same
4'6"	6'0"	ST2	1.0		18"	Light brown silty fine sand, moist, loose
6'0"	7'0"	HA				Same
7'0"	8'6"	SS1		7-9-13		Light brown fine sand, moist, dense
8'6"	9'6"	HA				Same
9'6"	11'0"	SS2		8-6-4		Light brown fine sand, moist, medium dense
11'0"	14'6"	HA				Same
14'6"	16'0"	SS3		5-5-4		Light brown fine sand, wet, medium dense
16'0"	19'6"	HA				Same
19'6"	21'0"	SS4		10-12-10		Dark gray medium sand, wet, dense
21'0"	24'6"	HA				Same
24'6"	26'0"	SS5		15-12-12		Same
26'0"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

	Water Level	Time	Date	
Caved	12'0"	4:00	1-9-75	(Completion)

Layne-Western Company, Inc. 1010 WEST 39th STREET, KANSAS CITY, MISSOURI 64111

LW-59A 75A

N 323,500
E 2,937,000

TEST BORING LOG

Project: Board of Public Utilities
Nearman Plant Site - Main Plant
Address: 55th and Missouri River
City & State: Kansas City, Kansas

Boring No. 57 Sheet 1 of 1
Surface Elevation 748.14' Offset
Date Started 1-3-75 Completed 1-3-75
Driller J. Rau Rig A.T.V.

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	1'6"	HA				Topsoil
1'6"	2'0"	HA				Dark brown sandy silt, very moist, soft
2'0"	3'6"	ST1	0.25		18"	Same
3'6"	4'6"	HA				Same
4'6"	6'0"	ST2	1.5		18"	Dark brown and gray silty clay, moist, stiff
6'0"	7'0"	HA				Same
7'0"	8'6"	ST3	1.0		18"	Light brown silty fine sand, moist, loose
8'6"	9'6"	HA				Same
9'6"	11'0"	SS1		3-4-3		Same
11'0"	14'6"	HA				Same
14'6"	16'0"	SS2		6-2-3		Light gray silty fine sand, wet, medium dense
16'0"	19'6"	HA				Same
19'6"	21'0"	SS3		5-4-5		Brown and gray medium to coarse sand, wet, medium dense
21'0"	24'6"	HA				Same
24'6"	26'0"	SS4		8-8-11		Same
26'0"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

	Water Level	Time	Date	
Caved	6'0"	4:30	1-3-75	(Completion)

N 324,050
E 2,937,000

TEST BORING LOG

Project: Board of Public Utilities
Nearman Plant Site - Borrow Area
Address: 55th and Missouri River
City & State: Kansas City, Kansas

Boring No. 88 Sheet 1 of 1
Surface Elevation 742.67' Offset
Date Started 1-13-75 Completed 1-13-75
Driller J. Rau Rig A.T.V.

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	4'6"	HA				Dark gray brown silty clay, wet, very soft
4'6"	6'0"	SS1		1-1-1		Same
6'0"	9'6"	HA				Same
9'6"	11'0"	SS2		2-1-1		Dark gray sandy silty clay, wet, very soft
11'0"	12'0"	HA				Same
12'0"	14'6"	HA				Light brown and gray silty fine sand, wet, medium dense
14'6"	16'0"	SS3		4-5-5		Same
16'0"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

	Water Level	Time	Date
Took Proctor sample 0'0" to 12'0"	1'0"	11:30	1-13-75 (Completion)

Layne-Western Company, Inc. 1010 WEST 39th STREET, KANSAS CITY, MISSOURI 64111

LW-59A 75A

N 324,750
E 2,937,500

TEST BORING LOG

Project: Board of Public Utilities
Nearman Plant Site - Borrow Area
Address: 55th and Missouri River
City & State: Kansas City, Kansas

Boring No. 90 Sheet 1 of 1
Surface Elevation 742.37' Offset 20'0" East
Date Started 1-13-75 Completed 1-13-75
Driller J. Rau Rig A.T.V.

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	4'6"	HA				Light brown silty clay, wet, very soft
4'6"	6'0"	SS1		1-1-1		Same
6'0"	7'0"	HA				Same
7'0"	9'6"	HA				Light brown silty fine sand, wet, med. dense
9'6"	11'0"	SS2		4-5-6		Same
11'0"	14'6"	HA				Same
14'6"	16'0"	SS3		8-9-8		Light brown fine to medium sand, wet, medium dense
16'0"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

Took Proctor sample 0'0" to 9'6".

Water Level	Time	Date
5'3"	12:30	1-13-75 (Completion)

N 324,500
E 2,937,800

TEST BORING LOG

Project: Board of Public Utilities
Nearman Plant Site - Borrow Area
Address: 55th and Missouri River
City & State: Kansas City, Kansas

Boring No. 92 Sheet 1 of 1
Surface Elevation 747.17' Offset
Date Started 1-8-75 Completed 1-8-75
Driller J. Rau Rig A.T.V.

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	1'6"	HA				Topsoil
1'6"	2'0"	HA				Dark gray sandy silty clay, wet, soft
2'0"	3'6"	ST1	0.75		13"	Same
3'6"	4'6"	HA				Dark gray silty fine sand, wet, loose
4'6"	6'0"	ST2	1.0		12"	Same
6'0"	9'6"	HA				Same
9'6"	11'0"	SS1		2-2-2		Dark brown sandy silty clay, wet, soft
11'0"	14'6"	HA				Same
14'6"	16'0"	SS2		1-2-1		Dark gray silty fine sand, wet, very loose
16'0"	18'0"	HA				Same
18'0"	24'6"	HA				Dark brown and gray fine to medium sand, wet, medium dense
24'6"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

Took Proctor sample 1'6" to 14'6". Set 20'0" of PVC pipe, slotted 10'0".

Water Level	Time	Date	
14'2"	12:30	1-8-75	(Completion)

Layne-Western Company, Inc. 1010 WEST 39th STREET, KANSAS CITY, MISSOURI 64111

LW-59A 75A

N 325,000
E 2,938,650

TEST BORING LOG

Project: Board of Public Utilities
Nearman Plant Site - Borrow Area
Address: 55th and Missouri River
City & State: Kansas City, Kansas

Boring No. 95 Sheet 1 of 1
Surface Elevation 749.03' Offset
Date Started 1-8-75 Completed 1-8-75
Driller J. Rau Rig A.T.V.

Abbreviations: A.O. – Auger Only; H.A. – Hollow Auger; W.B. – Wash Bore; R.B. – Rock Bit; S.S. – Split Spoon; S.T. – Shelby Tube; C.W. – Core Water; C.A. – Core Air; F.B. – Finger Bit

DEPTH FROM	DEPTH TO	METHOD	PENETRATION RECORD: POCKET PENETRO-METER	PENETRATION RECORD: NO. OF BLOWS	CORE RECOVERY	SAMPLE DESCRIPTION: COLOR–MATERIAL–MOISTURE–CLAY CONSISTENCY SAND DENSITY
0'0"	1'0"	HA				Topsoil
1'0"	4'6"	HA				Light brown very silty clay, very moist, medium stiff
4'6"	6'0"	SS1		4-3-3		Same
6'0"	8'0"	HA				Same
8'0"	9'6"	HA				Light brown silty fine sand, very moist, medium dense
9'6"	11'0"	SS2		4-6-7		Same
11'0"	14'6"	HA				Same
14'6"	16'0"	SS3		10-10-8		Same
16'0"	Total Depth					

REMARKS: (Casing, Water Loss, Etc.)

Took Proctor sample 1'0" to 8'0".

Water Level	Time	Date	
Caved 14'4"	1:30	1-8-75	(Completion)

STATEMENT OF CONTRACTOR
AND
AFFIDAVIT

STATE OF_____, COUNTY OF_____, SS:

_____, of lawful age, being first duly sworn on oath, deposes and states he is the

_____of_____, which company did on the _____day of _____, 19____, enter into a written contract with the Board of Public Utilities of the City of Kansas City, Kansas for the performance of the following work:

_____

_____

_____

Affiant further states that all work to be performed by the Contractor under said contract has been fully performed; that all bills and charges for labor, services, material and equipment for which a lien could be filed, and that all payrolls, material and equipment bills and other indebtedness connected with the work for which the Board of Public Utilities or the City of Kansas City, Kansas, or its property might in any way be responsible, have been paid or otherwise satisfied.

_____
(SIGNATURE)

(CORPORATE SEAL)

WITNESSETH:

BE IT REMEMBERED that on this _____ day of _____, 19____, before me, the undersigned, a Notary Public in and for the County and State aforesaid, came _____ who_____personally known to me to be the same person(s) who executed the foregoing Certificate of Contractor and Affidavit, and duly acknowledge the execution of the same.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal the day and year last above written.

_____
Notary Public

My Commission Expires:

_____

APPOINTMENT OF DESIGNATED PROCESS AGENT

In the event that the Contractor is not a resident of Wyandotte County, Kansas an appointment of a Designated Process Agent shall be made in accordance with Kansas Statute 16-113 and as specified herein. The name, address and signature of the Designated Process Agent shall be provided by the Contractor in the space given below.

Name and Address:

_____

_____

_____

_____

_____
Signature of Designated Process Agent

Contractor _____

Individual _____ Title _____

Address _____

_____

Doc 06: KDHE NPDES Permit No. 1-MO25-BOO1

D. Darsey cc
J. Fuentez Quindaro
S. Cenelli NWTP
Rhonda Brown N. Creek

FILE COPY

KANSAS

RODERICK L. BREMBY, SECRETARY

KATHLEEN SEBELIUS, GOVERNOR

DEPARTMENT OF HEALTH AND ENVIRONMENT

September 15, 2006

Kansas City Board of Public Utilities
540 Minnesota Avenue
Kansas City, KS 66101

RE: Kansas Water Pollution Control
Permit No. I-MO25-BO01
Nearman Creek Power Station

Dear Permittee:

You have fulfilled all the filing requirements for a Kansas Water Pollution Control Permit and Authorization to Discharge under the National Pollutant Discharge Elimination System (NPDES). We are pleased to forward your new permit. While it is permissible to make as many copies as needed for monitoring and reporting purposes, you need to retain the original permit for your files.

We suggest you carefully read the terms and conditions of your permit and understand these terms and conditions are enforceable under both State and Federal law.

Please notice the reporting paragraph on page 2 of your permit, where all reports are due by the 28th day of the schedule noted. Please submit reports to the Kansas Department of Health and Environment, Bureau of Water-TSS, 1000 SW Jackson St., Suite 420, Topeka, Kansas 66612-1367.

If you have any questions concerning this permit, contact Ed Dillingham at (785) 296-5513.

Sincerely,

Karl Mueldener

Karl Mueldener, P.E.

Director, Bureau of Water

pc: NE - District Office
OA - Permit File

DIVISION OF ENVIRONMENT
Bureau of Water
CURTIS STATE OFFICE BUILDING, 1000 SW JACKSON ST., STE. 420, TOPEKA, KS 66612-1367
Voice 785-296-5500 Fax 785-296.0086 http://www.kdhe.state.ks.us/

Kansas Permit No.: I-M025-BO01

Federal Permit No.: KS0119075

KANSAS WATER POLLUTION CONTROL PERMIT AND AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

Pursuant to the Provisions of Kansas Statutes Annotated 65-164 and 65-165, the Federal Water Pollution Control Act as amended, (33 U.S.C. 1251 et seq; the "Act"),

Owner:	Kansas City Board of Public Utilities
Owner's Address:	540 Minnesota Avenue Kansas City, Kansas 66101
Facility Name:	Nearman Creek Power Station
Facility Location:	4240 N. 55th Street P.O. Box 4088 Kansas City, Kansas 66104
Legal Description:	SW 1/4 of Section 13, Township 10S, Range 24E, Wyandotte County, Kansas
Receiving Stream:	Missouri River, Missouri River Basin

is authorized to discharge from the wastewater treatment facility described herein, in accordance with effluent limitations and monitoring requirements as set forth herein.

This permit is effective October 1, 2006, supercedes the previously issued Water Pollution Control Permit No. I-MO25-BO01 and expires December 31, 2008.

FACILITY DESCRIPTION:

This facility generates electric power with high pressure steam produced by fossil fuel. The recent facility modifications include the installation of a combustion turbine (#4) with about 50 gpm discharge during operation and an 8-cell cooling tower. The cooling system will be operated in two modes: once-through cooling using river water or the cooling tower using city water as make-up water. The average daily discharge excluding storm water run-off, consists of the following outfalls, and is about 181 million gallons during summer and 148 mgd during winter months during once-through cooling operation and 1.56 mgd when the newly installed cooling towers are operating.

Secretary, Kansas Department of Health and Environment

September 13, 2006
Date

FACILITY DESCRIPTION: Continued

001A1 Once through condenser and auxiliary equipment cooling river water, 180 mgd summer / 97.9 mgd winter to Missouri River; no treatment.
001A2 Cooling tower blowdown including discharge from plant area runoff to Missouri River; 1.56 mgd (dechlorination).
002A1 Intake screen wash water, 0.072 mgd to Missouri River; no treatment.
003A1 Johnson County Water District intake ice control (up to 2.8 mgd flow) and Power Plant Intakes Ice Control during winter months, maximum flow for both discharges 49.1 mgd (diverted from 001A1) to Missouri River; no treatment.
004A1 Sanitary sewage treatment plant effluent, 0.0072 mgd to outfall 004X1 or 004X2; aerobic digestion.
004B1 Demineralizer regeneration wastewater, boiler sample water, 0.0144 mgd to outfall 004X combined; neutralization with sulfuric acid. No monitoring required.
004C1 Boiler blowdown quenched with river water during once through cooling operation 0.7085 mgd to outfall 004X.
004C2 Boiler blowdown quenched with the city drinking water supply during cooling tower operation; 0.7085 mgd to outfall 004X. (Dechlorination)
004D1 Combustion turbine-4 (CT-4) evaporate air cooling with distilled water during occasional operation of CT-4 to 004X; (no treatment), 50 gpm
004X1 Discharge from outfalls 004A1, 004B1, 004C1, & 004D1 and plant area runoff to Missouri River during once through cooling operation; 0.76 mgd
004X2 Discharge from outfalls 004A1, 004B1, 004C2, & 004D1 and plant area runoff to Missouri River During Cooling Tower Operation; 0.76 mgd
005A1 Overflow from bottom ash pond to Missouri River, containing: fuel oil storage area runoff, coal storage runoff retention pond overflow, bottom ash sluice floor drains, equipment cleaning wastewater, small pump bearing cooling water.
008A1 Missouri River Intake (required only if TSS net allocation option for 004X1 is being used).

Boiler fireside (preheater) wash water and/or boiler cleaning waste are collected separately to be injected into the boiler fire for evaporation or shipped off-site for treatment and disposal.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in this permit. The effluent limitations shall become effective on the dates specified herein. Such discharges shall be controlled, limited, and monitored by the permittee as specified. There shall be no discharge of floating solids or visible foam in other than trace amounts.

The monitoring reports shall be submitted on or before the 28th day of the following month. In the event no discharge occurs, written notification is still required.

A. **EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS** (continued)

Effective Date Outfall Number and Effluent Parameter(s) Units	EFFLUENT LIMITATIONS Final Upon Issuance Daily Average	 Daily Maximum	MONITORING REQUIREMENTS Measurement Frequency	 Sample Type
001A1 - Once Through Condenser and Auxiliary Equipment Cooling Discharge to Missouri River				
Flow - MGD	Monitor	Monitor	Daily	Pump Logs
Total Residual Oxidant - mg/l		0.2	Twice/Monthly	grab
pH - Standard Units	between the range of 6.0 to 9.0		Twice/Monthly	grab
Temperature - ° F			Daily	Continuous Recorder
January	106	170		
February & December	108	167		
March	112	159		
April	101	148		
May	107	158		
June	117	133		
July, August	118	118		
September	113	141		
October	103	172		
November	97	158		
001A2 - Cooling Tower Blowdown Discharge				
Flow - MGD	Monitor	Monitor	Daily	Recorder
* Free Available Oxidant - mg/l	0.2	0.5	Daily	Continuous recorder *
Temperature - °F	Monitor	Monitor	Twice Monthly	grab
pH - Standard Units	within the range of 6.0 to 9.0		Twice Monthly	grab
Priority Pollutant Scan			See Supplemental Condition #2	
004A1 - Sewage Treatment Plant Discharge Prior to Commingling with Other Flows				
Flow - MGD	Monitor	Monitor	Twice/Monthly	Estimate
BOD_5 -mg/l	30	45	Twice/Monthly	grab
Total Suspended Solids -mg/l	30	45	Twice/Monthly	grab
pH - Standard Units	between the range of 6.0 to 9.0		Twice/Monthly	grab
004x1 - Discharge from Outfalls 004A1, 004B1, 004C1, & 004D1 and Plant Area Runoff to Missouri River During Once Through Cooling Operation (1)				
Flow - MGD	Monitor	Monitor	Daily	Estimate
Total Suspended Solids (2) - mg/l	30	100	Twice/Monthly	grab
Oil and Grease - mg/l	10	15	Twice/Monthly	grab
pH - Standard Units	between the range of 6.0 to 9.0		Twice/Monthly	grab

A. **EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS** (continued)

Effective Date Outfall Number and Effluent Parameter(s) Units	EFFLUENT LIMITATIONS Final Upon Issuance Daily Average	 Daily Maximum	MONITORING REQUIREMENTS Measurement Frequency	 Sample Type
004X2 - Discharge from Outfalls 004A1, 004B1, 004C2, & 004D1 and Plant Area Runoff to Missouri River During Cooling Tower Operation (1)				
Flow - MGD	Monitor	Monitor	Daily	Estimate
Total Suspended Solids - mg/l	30	100	Twice/Monthly	grab
Oil and Grease - mg/l	10	15	Twice/Monthly	grab
Total Residual Oxidant - mg/l	Monitor	Monitor	Twice/Monthly	grab
pH - Standard Units	between the range of 6.0 to 9.0		Twice/Monthly	grab
005A1 - Overflow From Bottom Ash Pond To Missouri River				
Flow - MGD	Monitor	Monitor	Weekly (3)	Estimate
Total Suspended Solids -mg/l	30	100	Weekly (3)	grab
Oil and Grease - mg/l	10	15	Weekly (3)	grab
pH - Standard Units	between the range of 6.0 to 9.0		Weekly (3)	grab
008A1 - Missouri River Water Intake, required only if net TSS allocation option is being used				
Total Suspended Solids - mg/l	Monitor	Monitor	Twice/Monthly (2)	grab

(1) Outfall 004X1 and 004X2 shall be sampled only during dry weather conditions since stormwater runof would significantly alter the sample characteristics.

(2) A Total Suspended Solids (TSS) net allocation may be claimed for outfall 004X1 when the river water intake is sampled concurrently with outfall 004X1. The TSS net allocation is to be determined by subtracting the river water intake value(s) from the outfall value(s). The monitoring report(s) shall contain TSS (river water intake, outfall and net allocation) values (river water intake and outfall) value(s). Monitoring is required only if net allocation is claimed.

(3) A sample shall be analyzed the first day a discharge occurs and weekly thereafter.

002A1	Intake Screen Wash Water to Missouri River, and
003A1	Johnson County Water District and Power Plant Intakes Ice Control During Winter Months to Missouri River, and
004B1	Demineralizer Regeneration Wastewater & Boiler Sample Water, to Outfall 004X1, and
004C1	Boiler Blowdown to Outfall 004X1 During Once Through Cooling Operation, and
004C2	Boiler Blowdown to Outfall 004X2 During Cooling Tower Operation, and
004D1	Combustion Turbine-4 (Ct-4) Discharge During Occasional Operation of CT-4

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

The permittee is authorized to discharge from the above named outfall(s) in accordance with the conditions as specified herein:

The discharge shall not cause a violation of Kansas Surface Water Quality Standards, K.A.R. 28-16-28b through 28-16-28e. The permittee shall not discharge the following:

a. oil or grease in concentrations which cause any visible film or sheen to form upon the surface of the receiving water;

b. oil or grease which causes a sludge or emulsion to be deposited beneath the surface of the receiving water, upon submerged substrate, or upon adjoining shorelines;

c. turbidity or color producing substances causing any change in the natural appearance of the stream or water body;

d. substances in the wastewater which cause objectionable odors in the vicinity of the receiving water;

e. floating debris, scum, foam, froth, or other floating material in other than trace amounts; or

f. materials which create deposits of sludge or fine solids causing aesthetic or environmental concerns downstream of the outfall.

The permittee shall periodically inspect the outfall(s) and receiving stream(s) to ensure compliance with the above Water Quality Standards. The permittee shall maintain a log documenting the results of any monitoring or inspections performed and shall provide the log to KDHE staff for review upon request.

Any violation of the above general Water Quality Standards shall be reported within 24 hours of discovery, to either the Kansas Department of Health and Environment, Division of Environment at (785) 296-5517 or the appropriate KDHE District Office followed by a letter, within 5 days of discovery, explaining the cause of the water quality violation, the actions taken to correct the violation, and actions taken to prevent recurrence.

B. STANDARD CONDITIONS

In addition to the specified conditions stated herein, the permittee shall comply with the attached Standard Conditions dated August 1, 1996.

C. SCHEDULE OF COMPLIANCE

1. Within 30 days after the effective date of this permit permittee shall submit documentation on Supplemental Condition No. 5 of this permit.

2. Within 6 months of the effective date of this permit, permittee shall submit a report on

SCHEDULE OF COMPLIANCE Continued

the feasibility of connecting the cooling tower make up water supply at a location upstream of the drinking water chlorination system.

3. If considered feasible, the report shall include a KDHE acceptable schedule to change the cooling tower source water diversion point.

D. **SUPPLEMENTAL CONDITIONS**

1. There shall be no discharge of polychlorinated biphenyl compounds.

2. Priority Pollutant Scan:

   Within 90 days of permit effective date and after any change in chemicals added for cooling tower maintenance, permittee shall either monitor the cooling tower blowdown for the 126 priority pollutants listed in Attachment B or provide an engineering evaluation demonstrating that the pollutants listed in Attachment B, which are contained in chemicals added for cooling tower maintenance, are not detectable in the final cooling tower discharge by the analytical methods in 40 CFR part 136. Effluent limits for the monitored priority pollutants contained in chemicals added for cooling tower maintenance shall be non-detect using analytical methods in 40 CFR part 136, except for total chromium at 0.2 mg/l and total zinc at 1.0 mg/l.

3. All samples and flow measurements required for permit monitoring shall be taken on the same day except for miscellaneous discharges related to stormwater runoff.

4. Miscellaneous discharges related to runoff are regulated by Water Quality Criteria. Runoff contained in the oil storage dike area(s) shall be visually inspected to determine if removal of oil and grease is necessary prior to discharge.

5. Neither free available oxidant nor total residual oxidant may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual oxidant at any one time unless the utility can demonstrate to the Director that the units in a particular location cannot operate at or below this level of oxidant concentration.

6. Permittee shall develop and implement an oxidation schedule indicating the time, dosage and duration of applications for each unit. The records shall be maintained and made available for review upon KDHE or EPA request.

7. This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Section 301 (b)(2), (C), and (D), 304 (b)(2), and 307 (a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:

   a. Contains different conditions or is otherwise more stringent than any effluent limitation in the permit, or

D. **SUPPLEMENTAL CONDITIONS** (Continued)

b. Controls any pollutant not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

8. Changes in Discharges of Toxic Substances

The permittee shall notify the Director as soon as it knows or has reason to believe:

a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

(1) One hundred micrograms per liter (100 μg/l);

(2) Two hundred micrograms per liter (200 μg/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 μg/l) for 2,4-dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony;

(3) Five (5) times the maximum concentration value reported for that pollutant in the permit application.

b. That any activity has occurred or will occur which result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following notification levels":

(1) Five hundred micrograms per liter (500 μg/l);

(2) One milligram per liter (1 mg/l) for antimony;

(3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application.

9. In the event the Environmental Protection Agency amends or promulgates the BPT, BAT, and/or BCT effluent guideline limitations for a specific Point Source Category or any of the subcategories covering your industry, this permit will be revoked and reissued to incorporate the new limitation(s).

10. The capacity of the coal pile runoff pond exceeds the capacity that is necessary to treat coal pile runoff resulting from a 10-year 24-hour precipitation event (5.3 inches). Any untreated overflow from the coal pile runoff pond associated with a 10 year 24 hour or greater precipitation event is exempt from the total suspended solids limits. The following conditions apply to this containment facility:

a. Only stormwater runoff from the coal pile area shall be directed to the coal pile runoff pond.

D. **SUPPLEMENTAL CONDITIONS** (Continued)

b. The pond shall be operated to maximize the settling of coal fines so as to minimize the amount of suspended solids released in the discharge.

c. The coal pile runoff pond shall be operated in a manner to treat the flow from a 10-year 24-hour precipitation event.

d Precipitation data shall be recorded and reported. The date and amount of precipitation shall be recorded and kept on file at the facility.

11. The use of earthen lagoons for the handling and treatment of certain types of industrial wastes is currently being reevaluated by the Kansas Department of Health and Environment. This is an ongoing effort resulting from increased emphasis, at both the state and federal level, in addressing source control as a mechanism for eliminating or minimizing the potential for groundwater contamination. The facility addressed by this permit has yet to be fully evaluated. As such, the Department may require the installation of groundwater monitoring wells or other necessary improvements to the wastewater handling and disposal system. The permittee will be notified and consulted concerning any monitoring well installation requirements or possible lagoon system modifications at a later time. The installation of any monitoring wells or any modifications to the wastewater system requires prior approval by the Department.

12. Toxic Substances - Water Treatment Additives. If the permittee utilizes or changes water treatment additives:

a. After the mixing zone provided by Kansas Water Quality Standards, the discharge of water treatment additives shall not be harmful to human, animal or plant life uses in the receiving water.

b. The permittee shall keep an ongoing log of the water treatment chemicals used, their potential concentration in the facility discharge, and the associated toxicity data for each chemical. A sample chemical additives evaluation log can be obtained from KDHE.

c. The permittee shall provide KDHE, upon request, toxicity tests and/or a chemical additives evaluation log the permittee uses to determine if the requirements in the paragraphs above are being achieved. In the event the data indicate the requirements in the paragraphs above are not achieved, KDHE reserves the right to amend the facility's NPDES permit to specify additional terms and conditions for toxic substances.

13. Discharge of industrial stormwater (as defined in 40 CFR part 122.26 (b)(14)) from the facility, except for stormwater associated with construction activity disturbing 1 acre or more of soil, is authorized under this permit. Such discharges shall be in compliance with the Kansas Surface Water Quality Standards (KAR 28-16-28) and in conformance with the facility stormwater pollution prevention plan developed in accordance with **ATTACHMENT A**.

D. **SUPPLEMENTAL CONDITIONS** (Continued)

14. The permittee shall maintain, modify and implement the existing storm water pollution prevention plan (SWP3) in accordance with the **ATTACHMENT A**. A copy of the SWP3 shall be kept on site and be available for KDHE or EPA inspection upon request.

15. Information required by the 316(b) Phase II regulations, 40 CFR Part 125.95 et seq., shall be submitted to KDHE - Bureau of Water in accordance with the dates indicated in the Phase II regulations.

16. Chemicals primarily added for mussel control shall not be utilized until a mussel control program is approved by KDHE - Bureau of Water.

ATTACHMENT A

STORMWATER POLLUTION PREVENTION PLAN REQUIREMENTS AND GUIDELINES

The Stormwater Pollution Prevention plan (SWP2 plan) shall be specific to the industrial activities and site characteristics occurring at the location described in this permit. The permittee shall fully implement the provisions of the SWP2 plan required under this permit as a condition of this permit.

The purpose of the SWP2 plan is to ensure the design, implementation, management, and maintenance of Best Management Practices (BMPs) in order to reduce the amount of pollutants in storm water discharges associated with the industrial activities at the facility. The SWP2 plan shall employ, as appropriate, BMPs from each of three major classes: managerial/administrative; structural controls and non-structural controls.

As guidance, the permittee shall evaluate, select, install, utilize, operate and maintain the BMPs in accordance with or equivalent to the concepts and methods described in Environmental Protection Agency (EPA) document number EPA 832-R-92-006, entitled ***Stormwater Management for Industrial Activities*** - *Developing Pollution Prevention Plans and Best Management Practices*, published in September, 1992[1]; and the U.S. Environmental Protection Agency's *Final NPDES Storm Water Multi-Sector General Permit for Industrial Activities*; Notice dated Sept. 29, 1995, and subsequent modifications.

The SWP2 plan and any amendments shall be developed by an individual knowledgeable in stormwater management and control and familiar with the site characteristics of the facility. Due to technical and site specific requirements in developing a SWP2 plan, KDHE highly encourages and recommends that the SWP2 plan and any amendments be prepared by, or under the supervision of a Kansas licensed professional engineer. The SWP2 plan shall be reviewed and re-certified for compliance with accepted standards for stormwater pollution prevention at least once every five years. If KDHE determines the SWP2 Plan to be inadequate, KDHE reserves the right to require the permittee to obtain the services of a qualified consultant to correct any deficiencies in the SWP2 Plan. The plan shall contain, at a minimum, the following items:

1. Pollution Prevention Team - Specific individuals or positions shall be identified within the facility organization as members of a Stormwater Pollution Prevention Team who are responsible for developing, implementing, maintaining and revising the plan. Each member's responsibilities shall be clearly identified in the plan. The activities and responsibilities of the team shall address all aspects of the facility's stormwater pollution prevention plan.

2. Description of potential pollutant sources - pollutant sources which may reasonably be expected to add significant pollutants to the stormwater discharge shall be described. The description shall include, at a minimum:

    a. Site Map - a site map identifying: the outlined drainage areas of each stormwater outfall; the location of significant materials exposed to precipitation or runoff; storage tanks; scrap yards and general refuse areas; fuel storage and distribution areas; vehicle and equipment maintenance and storage areas; loading/unloading areas; waste treatment, storage or disposal areas; short and long term material storage areas (including but not limited to: supplies, construction materials, plant equipment, oils, fuels, used and unused solvents, cleaning materials, paint, water treatment chemicals, fertilizers, and pesticides); landfills; construction sites; stock piles; major spills or leaks; surface water bodies and existing structural control measures to reduce pollutants in stormwater runoff (such as bermed areas, grassy swales, etc.).

    b. Inventory of Exposed Materials - a narrative description of significant materials handled, treated, stored, leaked, spilled or disposed of in a manner which would allow exposure to stormwater within the period

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[1] The EPA Manual entitled *Storm water Management for Industrial Activities - Developing Pollution Prevention Plans and Best Management Practices*, and the *Final Reissuance of NPDES Storm Water Multi-Sector General Permit for Industrial Activities*; Notice dated October 30, 2000 are available online at: http://cfpub.epa.gov/npdes/stormwater/swppp-msgp.cfm#swppp, through the EPA Water Resources Center, at (202) 260-7786 or (800) 832-7828, e-mail waterpubs@epamail.epa.gov or through the National Technical Information Services (NTIS). The NTIS publication number is PB92-235969. The NTIS order desk phone number is (800) 553-6847.

starting three years prior to the date of this permit; existing managerial/administrative, structural and nonstructural control measures to reduce pollutants in stormwater runoff; and any treatment the storm water receives. A list of significant spills and leaks of toxic / hazardous materials in exposed areas shall be maintained and kept updated.

c. Sampling Data - a summary of existing sampling data, if available.

d. Risk Identification and Summary of Potential Pollutant Sources - A narrative description of the potential pollutant sources and pollutant parameter of concern shall be identified.

3. Measures and Controls - A description of stormwater management controls appropriate for the facility which addresses the following minimum components, including a schedule for implementing such controls to the extent practical:

a. Good housekeeping requiring the maintenance of areas in a clean, orderly manner including handling, process, and storage areas (exposed to precipitation) for raw metals, scrap metals, fuels, paints, etc.

b. Preventive Maintenance - Including timely inspection and maintenance of stormwater management controls, like oil water separators, catch basins etc.

c. Spill Prevention and Response Procedures - Appropriate material handling procedure, storage requirements, use of equipment such as diversion valves, and procedures for cleaning up spills should be identified. Availability of the necessary equipment to implement a clean-up should be addressed. The following areas should be addressed:

(1) Metal fabrication and finishing areas - include measures for maintaining clean, dry, orderly conditions and use of dry clean-up techniques;
(2) Receiving, Unloading and Storage Areas and Raw Material Storage Areas - include measures to prevent spills & leaks; easy access for spill clean-up; quick and correct identification of materials; and training employees on clean-up techniques.
(3) Storage of Equipment - include procedures for proper clean-up and/or covering of equipment before storing outdoors.
(4) Storage of Metal Working Fluids - measures to identify proper controls.
(5) Cleaners and Rinse Water - Include measures to control spills, build-up and disbursement of sand from sand blasting, and use of less toxic cleaners.
(6) Lubricating Oils and Hydraulic Fluids - include procedures for using detecting and control devices to reduce, prevent, and contain leaks and overflows.
(7) Chemical Storage Areas - include a program to inspect containers, and identify proper disposal and spill controls to prevent stormwater contamination.

d. Inspections: Identification of qualified facility personnel to inspect at appropriate intervals designated equipment and storage areas for raw metal, finished product, materials and chemicals, recycling, equipment, paint, fueling and maintenance; and loading, unloading, and waste management areas. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections shall be maintained on-site for at least three years after the date of the inspection.

e. Employee Training: Employee training programs to inform personnel responsible for implementing activities identified in the SWP2 plan or otherwise responsible for stormwater management, at all levels of responsibility, of the components and goals of the SWP2 plan. The SWP2 plan shall provide for training existing and new staff.

f. Record keeping and Internal Reporting Procedures: A log to document a description of incidents (such as spills, or other discharges), along with other information which may impact the quality and quantity

of stormwater discharges needs to be developed and maintained. Reporting procedures, inspections and maintenance activities shall be developed and included in the SWP2 plan.

g. Non-storm water Discharges - The SWP2 plan must identify all non-stormwater (dry weather) discharges directed to surface or groundwater. The SWP2 plan shall ensure the implementation of appropriate pollution prevention measures for the dry weather discharges. The following common non-stormwater discharges are authorized by this permit only if the permittee evaluates and implements, where practical, Best Management Practices (BMPs) to minimize pollutants in these discharges:

(1) potable water sources including flushing of water hydrants and potable water lines;

(2) air conditioner and compressor condensate;

(3) foundation and footing drains if overlaying soils and groundwater are uncontaminated and other sources of uncontaminated dewatering discharges;

(4) washing of buildings and streets or pavement where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) with potable water that does not use solvents, cleansers, detergents, or other additives;

(5) uncontaminated irrigation water used to establish or maintain vegetation;

(6) incidental cooling tower mist, provided minimization of toxicity of water treatment chemicals is implemented as a Best Management Practice (BMP);

(7) stormwater discharges commingled with other discharges authorized by this NPDES permit, provided the operator complies with the permitting, monitoring and pollution prevention requirements of the discharge;

(8) potable water used without solvents, cleansers, detergents, or other additives as a BMP for external vehicle washing or for dust control;

(9) non-stormwater discharges that are identified and covered by this permit, and

(10) other miscellaneous uncontaminated similar types of discharges authorized by KDHE.

All other non-stormwater discharges are unauthorized and are not covered by this permit. KDHE shall be notified of all unauthorized non-stormwater discharges within 30 days of discovery.

h. Sediment and Erosion Control: Measures to minimize erosion in areas which, due to topography, activities, or other factors, have a high potential for significant soil erosion. At a minimum consider structural, vegetative, and/or stabilization measures to limit erosion. Must include measures to minimize erosion related to the high volume of vehicle traffic and heavy equipment operating at the facility on a daily basis such as forklifts, cranes etc.

i. Management of Runoff: Describe existing and/or proposed stormwater management practices (practices other than those which control the generation or source(s) of pollutants) to divert, infiltrate, reuse or otherwise manage stormwater runoff in a manner that reduces pollutants in stormwater discharges from the site. The pollutant sources at the facility identified in Item 2 above, Description of Potential Pollutant Sources, with potential to contribute pollutants to stormwater discharges associated with industrial activity shall be considered when determining reasonable and appropriate measures to implement.

4. Comprehensive Site Compliance Evaluation - Qualified personnel shall conduct site compliance evaluations at least once a year. Such evaluations shall provide for:

a. Visual inspection of areas contributing to a stormwater discharge associated with industrial activity for evidence of, or the potential for, pollutants entering the drainage system. Evaluation of measures to reduce pollutant loadings to determine whether they are adequate and properly implemented in accordance with the terms of the permit or whether additional control measures are needed. A visual evaluation of equipment needed to implement the plan, such as spill response equipment and containment drums, shall be made to determine it is functioning properly and drums are not corroded.

b. A report summarizing the scope of the evaluation, personnel making the evaluation, the date(s) of the evaluation, major observations relating to the implementation of the stormwater pollution prevention plan, and any actions taken shall be made and retained as part of the stormwater pollution prevention plan.

c. The report shall include resolution to any incident of non-compliance determined from the comprehensive site evaluation within 90 days.

If the comprehensive site evaluation does not identify any incidents of non-compliance, the report shall include a statement that the facility is in compliance with the SWP2 plan and the conditions of this permit.

5. Monitoring and Record Keeping Requirements.

a. Visual Examination of Stormwater Quality: The permittee shall periodically perform and document a visual examination of a stormwater discharge associated with industrial activity from each identified stormwater outfall. Visual examination reports shall be maintained onsite and be made available for KDHE & EPA inspection upon request. Each report shall include the date and time, name of the person performing examination, nature of discharge (runoff or snow melt), visual quality of the discharge (i.e., color, odor, clarity, floating solids, suspended solids, foam, oil sheen, and other indicators of stormwater pollution) and probable sources of any observed contamination.

b. Records of all stormwater monitoring data[2], unless otherwise indicated in this permit, shall be kept on file.

6. The SWP2 plan shall be re-evaluated and modified in a timely manner, but in no case more than 90 days after:

a. a change in design, construction, operation or maintenance that has a significant effect on the potential for the discharge of pollutants to the waters of the State, or

b. the permittee's inspections (including the regular comprehensive site compliance evaluation required herein) indicate deficiencies in the SWP2 plan or any BMP; or

c. a visual inspection of contributing areas or a visual inspection of the storm water discharges or monitoring of the stormwater discharges indicate the plan appears to be ineffective in eliminating or significantly minimizing pollutants from sources identified in the plan.

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[2] For sampling methods and procedures please refer to NPDES Storm Water Sampling Guidance Document, EPA 833-B-92-001, available online at: http://www.epa.gov/npdes/pubs/owm0093, through the EPA Water Resources Center at (202) 566-1729 or (800) 832-7828, by e-mail waterpubs@epamail.epa.gov or by calling the National Technical Information Service (NTIS) at (800) 553-6847.

ATTACHMENT B

40 CFR 423 Appendix A: Pollutant concentration in the cooling tower discharge for the chemicals added for cooling tower maintenance shall be non-detectable except for total chromium 0.2 mg/l and total zinc 1.0 mg/l.

Base/Neutral (mg/l)
001 Acenaphthene
002 Acrolein
003 Acrylonitrile
004 Benzene
005 Benzidine
006 Carbon tetrachloride (tetrachloromethane)

Acid Compounds (mg/l)
007 Chlorobenzene
008 1,2,4-trichlorobenzene
009 Hexachlorobenzene
010 1,2-dichloroethane
011 1,1,1-trichloreothane
012 Hexachloroethane
013 1,1-dichloroethane
014 1,1,2-trichloroethane
015 1,1,2,2-tetrachloroethane
016 Chloroethane
017 Bis(2-chloroethyl) ether
018 2-chloroethyl vinyl ether (mixed)
019 2-chloronaphthalene
020 2,4, 6-trichlorophenol
021 Parachlorometa cresol
022 Chloroform (trichloromethane)
023 2-chlorophenol
024 1,2-dichlorobenzene
025 1,3-dichlorobenzene
026 1,4-dichlorobenzene
027 3,3-dichlorobenzidine
028 1,1-dichloroethylene
029 1,2-trans-dichloroethylene
030 2,4-dichlorophenol
031 1,2-dichloropropane
032 1,2-dichloropropylene (1,3-dichloropropene)
033 2,4-dimethylphenol
034 2,4-dinitrotoluene
035 2,6-dinitrotoluene
036 1,2-diphenylhydrazine
037 Ethylbenzene
038 Fluoranthene
039 4-chlorophenyl phenyl ether
040 4-bromophenyl phenyl ether
041 Bis(2-chloroisopropyl) ether
042 Bis(2-chloroethoxy) methane
043 Methylene chloride (dichloromethane)
044 Methyl chloride (dichloromethane)
045 Methyl bromide (bromomethane)
046 Bromoform (tribromomethane)
047 Dichlorobromomethane
048 Chlorodibromomethane
049 Hexachlorobutadiene
050 Hexachloromyclopentadiene
051 Isophorone

Volatiles (mg/l)
052 Naphthalene
053 Nitrobenzene
054 2-nitrophenol
055 4-nitrophenol
056 2,4-dinitrophenol
057 4,6-dinitro-o-cresol
058 N-nitrosodimethylamine
059 N-nitrosodiphenylamine
060 N-nitrosodi-n-propylamin
061 Pentachlorophenol
062 Phenol
063 Bis(2-ethylhexyl) phthalate
064 Butyl benzyl phthalate
065 Di-N-Butyl Phthalate
066 Di-n-octyl phthalate
067 Diethyl Phthalate
068 Dimethyl phthalate
069 1,2-benzanthracene (benzo (a)anthracene)
070 Benzo(a)pyrene (3,4-benzo-pyrene)
071 3,4-Benzofluoranthene (benzo(b) fluoranthene)
072 11,12-benzofluoranthene (benzo(k) fluoranthene)
073 Chrysene
074 Acenaphthylene
075 Anthracene
076 1,12-benzoperylene (benzo(ghi) perylene)
077 Fluorene
078 Phenanthrene
079 1,2,5,6-dibenzanthracene (dibenzo(,h) anthracene)
080 Indeno (1,2,3-cd) pyrene (2,3-o-pheynylene pyrene)
081 Pyrene
082 Tetrachloroethylene
083 Toluene
084 Trichloroethylene
085 Vinyl chloride (chloroethylene)

Pesticides (mg/l)
086 Aldrin
087 Dieldrin
088 Chlordane (technical mixture and metabolites)
089 4,4-DDT
090 4,4-DDE (p,p-DDX)
091 4,4-DDD (p,p-TDE)
092 Alpha-endosulfan
093 Beta-endosulfan
094 Endosulfan sulfate
095 Endrin
096 Endrin aldehyde
097 Heptachlor
098 Heptachlor epoxied (BHC-hexachlorocyclohexane)

Polychlorinated Biphenyls
099 Alpha-BHC
100 Beta-BHC
101 Gamma-BHC (lindane)
102 Delta-BHC (PCB- poly chlorinated biphenyls)
103 PCB-1242 (Arochlor 1242)
104 PCB-1254 (Arochlor 1254)
105 PCB-1221 (Arochlor 1221)
106 PCB-1232 (Arochlor 1232)
107 PCB-1248 (Arochlor 1248)
108 PCB-1260 (Arochlor 1260)
109 PCB-1016 (Arochlor 1016)
110 Toxaphene

Metals (ug/l)
111 Antimony
112 Arsenic
113 Asbestos
114 Beryllium
115 Cadmium
116 Chromium
117 Copper
118 Cyanide, Total
119 Lead
120 Mercury
121 Nickel
122 Selenium
123 Silver
124 Thallium
125 Silver
126 Zinc
127 2,3,7,8-tetrachloro -dibenzo -p-dioxin (TCDD)

STANDARD CONDITIONS FOR
KANSAS WATER POLLUTION CONTROL AND
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT

1. Representative Sampling:

   A. Samples and measurements taken as required herein shall be representative of the nature and volume of the monitored discharge. All samples shall be taken at the location designated in this permit, and unless specified, at the outfall(s) before the effluent joins or is diluted by any other water or substance.

   B. Monitoring results shall be recorded and reported on forms acceptable to the Division and postmarked no later than the 28th day of the month following the completed reporting period. Signed and certified copies of these, prepared in accordance with KAR 28-16-59 and all other reports required herein, shall be submitted to:

      Kansas Department of Health & Environment
      Bureau of Water-Technical Services Section
      1000 SW Jackson Street, Suite 420
      Topeka, KS 66612-1367

2. Schedule of Compliance: No later than 14 calendar days following each date identified in the "Schedule of Compliance," the permittee shall submit to the above address, either a report of progress or, in the case of specific action being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements, or, if there are no more scheduled requirements, when such noncompliance will be corrected.

3. Definitions:

   A. The "daily average" discharge means either the total discharge by weight during a calendar month divided by the number of days in the month that the facility was operating or the average concentration for the month. The daily average discharge shall be determined by the summation of all measured daily discharges by weight divided by the number of days during the calendar month when the measurements were made, or by the summation of all concentrations determined during the calendar month divided by the number of samples collected and analyzed.

   B. The "daily maximum" discharge means the total discharge by weight or average concentration during a 24 hour period.

   C. The "monthly average", other than for fecal coliform bacteria, is the arithmetic mean of the value of effluent samples collected in a period of 30 consecutive days. The monthly average for fecal coliform bacteria is the geometric mean of the value of the effluent samples collected in a period of 30 consecutive days.

   D. The "weekly average", other than for fecal coliform bacteria, is the arithmetic mean of the value of effluent samples collected in a period of 7 consecutive days. The weekly average for fecal coliform bacteria is the geometric mean of the value of effluent samples collected in a period of 7 consecutive days.

   E. A "grab sample" is an individual sample collected in less than 15 minutes.

F. A "composite sample" is a combination of individual samples in which the volume of each individual sample is proportional to the discharge flow, the sample frequency is proportioned to the flow rate over the sample period, or the sample frequency is proportional to time.

G. The "act" means the Clean Water Act, 30 USC Section 1251 et seq.

H. The terms "Director", "Division", and "Department" refer to the Director, Division of Environment, Kansas Department of Health and Environment, respectively.

I. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

J. "Bypass" means any diversion of waste streams from any portion of a treatment facility or collection system.

4. Test Procedures: All analysis required by this permit shall conform to the requirements of 33 USC Section 1314(h), and shall be conducted in a laboratory certified by this Department. For each measurement or sample, the permittee shall record the exact place, date, and time of sampling; the date of the analyses, the analytical techniques or methods used, and the individual(s) who performed the sampling and analysis and, the results. If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved procedures, the results shall be included in the Discharge Monitoring Report form required in 1.B. above. Such increased frequencies shall also be indicated.

5. Records Retention: All records and information resulting from the monitoring activities required by this permit, including all records of analyses and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation, shall be retained for a minimum of 3 years, or longer if requested by the Division.

6. Change in Discharge: All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant not authorized by this permit or of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of this permit. Any anticipated facility expansions, productions or flow increases, or process modifications which result in a new, different, or increased discharge of pollutants shall be reported to the Division at least one hundred eighty (180) days before such change.

7. Noncompliance Notifications: If for any reason, the permittee does not comply with, or will be unable to comply with any daily maximum or weekly average effluent limitations specified in this permit, the permittee shall provide the Department with the following information in writing within five days of becoming aware of such condition:

   A. A description of the discharge and cause of noncompliance, and

   B. the period of noncompliance including exact dates and times or if not corrected, the anticipated time the noncompliance is expected to continue and steps taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

   The above information shall be provided with the submittal of the regular Discharge Monitoring Report form for violations of daily average or monthly average effluent limitations.

8. Facilities Operation: The permittee shall at all times maintain in good working order and efficiently

and effectively operate all treatment, collection, control systems or facilities, to achieve compliance with the terms of this permit. Such proper operation and maintenance procedures shall also include adequate laboratory controls and appropriate quality assurance procedures. Maintenance of treatment facilities which results in degradation of effluent quality, even though not causing violations of effluent limitations shall be scheduled during noncritical water quality periods and shall be carried out in a manner approved in advance by the Division. The permittee shall take all necessary steps to minimize or prevent any adverse impact to waters of the State resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge. When necessary to maintain compliance with the permit conditions, the permittee shall halt or reduce those activities under its control which generate wastewater routed to this facility.

9. Immediate Reporting Required: Any diversion from, or bypass of facilities necessary to maintain compliance with the permit is prohibited, except: where no feasible alternatives to the bypass exist and 1) where necessary to prevent loss of human life, personal injury or severe property damage; or 2) where excessive stormwater inflow or infiltration would damage any facilities necessary to comply with this permit or 3) where the permittee notifies the Director seven days in advance of an anticipated bypass. The Director or Director's designee may approve a bypass, after considering its adverse effects, if any of the three conditions listed above are met. The permittee shall immediately notify the Division by telephone [(913) 296-5517 or the appropriate KDHE District Office] of each bypass and shall confirm the telephone notification with a letter explaining what caused this spill or bypass and what actions have been taken to prevent recurrence. Written notification shall be provided to the Director within five days of the permittee becoming aware of the bypass. The Director or Director's designee may waive the written report on a case-by-case basis.

10. Removed Substances: Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in a manner acceptable to the Division.

11. Power Failures: The permittee shall provide an alternative power source sufficient to operate the wastewater control facilities or otherwise control pollution and all discharges upon the loss of the primary source of power to the wastewater control facilities.

12. Right of Entry: The permittee shall allow authorized representatives of the Division of Environment or the Environmental Protection Agency upon the presentation of credentials, to enter upon the permittee's premises where an effluent source is located, or in which are located any records required by this permit, and at reasonable times, to have access to and copy any records required by this permit, to inspect any monitoring equipment or monitoring method required in this permit, and to sample any influents to, discharges from or materials in the wastewater facilities.

13. Transfer of Ownership: The permittee shall notify the succeeding owner or controlling person of the existence of this permit by certified letter, a copy of which shall be forwarded to the Division. The succeeding owner shall secure a new permit. The permit is not transferable to any person except after notice and approval by the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary.

14. Availability of Records: Except for data determined to be confidential under 33 USC Section 1318, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department. Effluent data shall not be considered confidential. Knowingly making any false statement on any such report or tampering with equipment to falsify data may result in the imposition of criminal penalties as provided for in 33 USC Section 1319 and KSA 65-170c.

15. Permit Modifications and Terminations: As provided by KAR 28-16-62, after notice and opportunity for a hearing, this permit may be modified, suspended or revoked or terminated in whole or in part during its term for cause as provided, but not limited to those set forth in KAR 28-16-62 and KAR 28-16-28b through f. The permittee shall furnish to the Director, within a reasonable amount of time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish upon request, copies of all records required to be kept by this permit.

16. Toxic Pollutants: Notwithstanding paragraph 15 above, if a toxic effluent standard or prohibition (including any schedule of compliance specified at such effluent standards) is established under 33 USC Section 1317(a) for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be revised or modified in accordance with the toxic effluent standard or prohibition. Nothing in this permit relieves the permittee from complying with federal toxic effluent standards as promulgated pursuant to 33 USC Section 1317.

17. Civil and Criminal Liability: Except as authorized in paragraph 9 above, nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance as provided for in KSA 65-170d, KSA 65-167, and 33 USC Section 1319.

18. Oil and Hazardous Substance Liability: Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities or penalties to which the permittee is or may be subject to under 33 USC Section 1321 or KSA 65-164 et seq. The municipal permittee shall promptly notify the Division by telephone upon discovering crude oil or any petroleum derivative in its sewer system or wastewater treatment facilities.

19. Industrial Users: The municipal permittee shall require any industrial user of the treatment works to comply with 33 USC Section 1317, 1318 and any industrial user of storm sewers to comply with 33 USC Section 1308.

20. Property Rights: The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights nor any infringements of or violation of federal, state or local laws or regulations.

21. Operator Certification: The permittee shall ensure the wastewater facilities are under the supervision of an operator certified by the Department. If the permittee does not have a certified operator or loses its certified operator, appropriate steps shall be taken to obtain a certified operator as required by KAR 28-16-30 et seq.

22. Severability: The provisions of this permit are severable. If any provision of this permit or any circumstance is held invalid, the application of such provision to other circumstances and the remainder of the permit shall not be affected thereby.

23. Removal from Service: The permittee shall inform the Division at least three months before a pumping station, treatment unit, or any other part of the treatment facility permitted by this permit is to be removed from service and shall make arrangements acceptable to the Division to decommission the facility or part of the facility being removed from service such that the public health and waters of the state are protected.

24. Duty to Reapply: A permit holder wishing to continue any activity regulated by this permit after the expiration date, must apply for a new permit at least 180 days prior to expiration of the permit.

Doc 07: KDHE Solid Waste Permit No. 413

State of Kansas . . . John Carlin, Governor

DEPARTMENT OF HEALTH AND ENVIRONMENT

Joseph F. Harkins, Secretary

Forbes Field
Topeka, Kansas 66620
913-862-9360

FILE COPY

February 25, 1982

Mr. Clyde Noren, P.E.
Senior Mechanical Engineer
Kansas City Board of Public Utilities
700 Minnesota Avenue
Kansas City, Kansas 66101

KS Permit No: 413

Dear Mr. Noren:

Enclosed is Solid Waste Permit No. 413 for fly and bottom ash disposal areas at the Nearman Creek Power Station. Please note the attached Special Conditions which were discussed during our meeting on February 4, 1982.

The closure plans should include grading and contouring of the final cover material to ensure adequate surface water runoff. Please contact us for review of the proposed ground water and surface water monitoring plans. Our Bureau of Environmental Geology Section will review the placement and depth of the monitoring wells.

If you have any questions, please feel free to contact us.

Sincerely yours,

Division of Environment

Joseph E. Cronin

Joseph E. Cronin, P.E.
Engineering and Sanitation Section
Bureau of Environmental Sanitation

mw
Enclosure

C Wendel Holmes
Bonner Springs District Office

STATE OF KANSAS

DEPARTMENT OF HEALTH AND ENVIRONMENT
DIVISION OF ENVIRONMENT

PERMIT

No. 413

For Operating A Processing Facility Or A Solid Waste Disposal Area

In accordance with the provisions of Kansas Statutes Annotated 65-3407

PERMISSION IS HEREBY GRANTED

to NEARMAN CREEK POWER STATION
KANSAS CITY, KANSAS BOARD OF PUBLIC UTILITIES

NAME OF MUNICIPALITY, INSTITUTION, DISTRICT, CORPORATION OR PERSON

to operate a BOTTOM ASH AND FLY ASH LANDFILL

location SEC. 13 & 24, T 10S, R 24E, WYANDOTTE COUNTY

in conformity with plans and specifications approved by the Department of Health and Environment, and the following-named conditions and requirements to wit:

THOSE CONDITIONS LISTED ON THE REVERSE SIDE
AND THOSE CONDITIONS TO PERMIT NUMBER 413
ATTACHED TO THIS PERMIT.

KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT 1974

Done at Topeka, this 11TH day of FEBRUARY 1982

James F. Lee, Jr.
DEPARTMENT OF HEALTH AND ENVIRONMENT

38-2464-3-9-49 12-75-300

KANSAS CITY, KANSAS BOARD OF PUBLIC UTILITIES
NEARMAN CREEK POWER STATION

Special Conditions to Permit Number 413

1. This permit applies to the following areas:

   a. Fly ash storage pond.

   b. Bottom ash pond.

2. Board of Public Utilities shall prepare:

   a. Closure plan for fly ash storage pond. Plan shall be submitted to Kansas Department of Health and Environment by July 1, 1982.

   b. Closure plan for bottom ash pond when the mean elevation of the ash reaches elevation 755 feet.

3. Board of Public Utilities shall prepare a ground water and surface water monitoring plan. The plan shall be submitted to Kansas Department of Health and Environment by July 1, 1982.

4. The project shall be constructed and operated in accordance with the plans for Nearman Creek Power Plant Ash Ponds as prepared by Lutz, Daily, and Brain and as approved by the Department.

Done at Topeka, this 11th day of February 1982

James F. Lebsack

Department of Health and Environment

Doc 08: KDHE Solid Waste Permit No. 413 Renewal

K A N S A S

RODERICK L. BREMBY, SECRETARY — DEPARTMENT OF HEALTH AND ENVIRONMENT — MARK PARKINSON, GOVERNOR

June 15, 2010

Patrick Cassidy
BPU-Nearman Creek
300 N 65th Street
Kansas City, KS 66102

FILE COPY

cc. P. CASSIDY
J. FUENTES

RE: Permit Renewal for Permit No. 0413, for the following types of permits: Industrial; Wyandotte County

Dear Mr. Cassidy:

The Department of Health and Environment is in receipt of your updated liability insurance certificate and financial assurance documentation for your solid waste facility as required by K.S.A. 65-3407.

This letter will serve as the permit renewal for the period of July 1, 2010 through June 30, 2011.

All conditions, requirements and conformity with plans and specifications referred to and shown on permit 0413 remain in effect. Your continuing cooperation with the solid waste management program is appreciated.

Sincerely,

Dennis A. Degner

Dennis A. Degner, Ph.D., P.E.
Chief, Solid Waste Permits Section

c Wyandotte County Commissioners

DIVISION OF ENVIRONMENT
Bureau of Waste Management
CURTIS STATE OFFICE BUILDING,1000 SW JACKSON ST., STE.320, TOPEKA, KS 66612-1366
Voice 785-296-1600 Fax 785-296-1592 http://www.kdhe.state.ks.us/waste

Kansas City,
Board of Public Utilities 540 MINNESOTA AVENUE • KANSAS CITY, KANSAS 66101 • (913) 573-9000

FILE COPY

May 28, 2010

Mr. Ken Powell
Kansas Department of Health & Environment
Bureau of Waste Management, Permits Section
1000 SW Jackson, Ste. 320
Topeka, Kansas 66612-1366

Subject: **BPU Industrial Landfill 2010 Permit Renewals:**
No. 210 - Quindaro Ash
No. 413 - Nearman Bottom Ash and Fly Ash
No. 533 - Maywood (Wood Chips)

Dear Mr. Powell:
Please accept the enclosed closure/post-closure cost estimates for BPU's Quindaro, Nearman, and Maywood Industrial Landfills. Included is an updated insurance certificate from our insurance agency, fulfilling BPU's landfill operating permit conditions and KAR 28-29-84. BPU is a municipally owned utility and, as such, falls under the financial assurance of the Unified Government of Wyandotte County.

Thank you for your assistance. If you have any questions, please feel free to call me at 913.573.9806.

Sincerely,

Ingrid Setzler
Environmental Services Department

IAS/ias
Enclosures
c: L. Austin, D. Dorsey, J. Fuentez, B. Kamm, M. Kline, W. Johnson
EnvironmentalRecords/landfills/2009 landfill renewals
X:\Waste\Landfills\Permit Renewals\2010\2010 KDHE Ltr Renewal.doc

Form B (Additional Insured)

Certificate Number: 088137

ASSOCIATED ELECTRIC & GAS INSURANCE SERVICES LIMITED

Hamilton, Bermuda

cc. J. Fuentes
M. Wolf

CERTIFICATE OF INSURANCE

(Excess Liability)

This Certificate is furnished to the Certificate Holder named below as a matter of information only. Neither this Certificate nor the issuance hereof modifies the policy of insurance identified below (the "Policy") in any manner. The Policy terms are solely as stated in the Policy or in any endorsement thereto. Any amendment, change or extension of the Policy can only be effected by a specific endorsement issued by the Company and attached to the Policy.

The undersigned hereby certifies that the Policy has been issued by Associated Electric & Gas Insurance Services Limited (the "Company") to the Named Insured identified below for the coverage described and for the policy period specified.

Notwithstanding any requirements, terms or conditions of any contract or other document with respect to which this Certificate may be issued or to which it may pertain, the insurance afforded by the Policy is subject to all of the terms of the Policy.

NAME OF INSURED: BOARD OF PUBLIC UTILITIES OF KANSAS CITY KANSAS

PRINCIPAL ADDRESS: 540 MINNESOTA K.C.K. 66101

POLICY NUMBER: X0308A1A09

POLICY PERIOD: From: 12/31/09 To: 12/31/10

RETROACTIVE DATE: 5/22/1986

DESCRIPTION OF COVERAGE: Claims-First-Made Excess Liability Policy covering claims for Bodily Injury, Property Damage and Personal Injury arising from the operations described below. The production and distribution of water and electricity to a designated area.

LIMIT OF LIABILITY: $35,000,000 per occurrence and in the aggregate, where applicable.

ADDITIONAL INSURED: The Certificate Holder is an additional Insured under the Policy but only (i) to such extent and for such Limits of Liability (subject always to the terms and Limits of Liability of the Policy) as the Named Insured has agreed to provide insurance for the Certificate Holder under the following contract:

and (ii) with respect to the following operations:
Landfills located at the Quindaro Power, Nearman Power and Maywood Chip Landfills.

Should the Policy be cancelled, assigned or changed in a manner that is materially adverse to the Insured(s) under the Policy, the undersigned will endeavor to give days advance written notice thereof to the Certificate Holder, but failure to give such notice will impose no obligation or liability of any kind upon the Company, the undersigned or any agent or representative of either.

DATE: 5/26/10

ISSUED TO: Ingrid Setzler
ADDRESS: Enviromental Services
300 N. 65th St.
K.C.K. 66102

("Certificate Holder")

AEGIS INSURANCE SERVICES, INC.

BY: Sandra A. Johnson

At Jersey City, New Jersey

9002 (8/87)

Copies: White—Certificate Holder; Canary—Aegis Insurance Services, Inc.; Pink—Insured; Goldenrod—Broker

CLOSURE COST ESTIMATE WORKSHEET FOR INDUSTRIAL LANDFILL

template: BPU/closurewk4

OWNER: Board of Public Utilities, Kansas City, Kansas
CURRENT PERMIT RENEWAL YEAR: 2010
TOTAL PERMITTED AREA: 14.64 Acres
AREA CURRENTLY OPEN: 14.64 Acres
LARGEST AREA TO EVER BE OPEN AT ANY TIME: 14.64 Acres
(use this area for estimating closure costs)

PERMIT NO.: 413
NAME: Nearman Bottom Ash
CONV. FACTOR: 4840.02 SQYDS./ACRE
CONV. FACTOR : 0.3333 YDS./FT.

Note: Industrial landfills which have waste containment systems and appurtenances with planned maintenance schedules, environmental monitoring systems with planned maintenance schedules and periodic sampling and analysis requirements, or requirements to maintain insurance coverage during the long-term care period must complete the "Post-Closure Cost Estimate for Industrial Landfill" worksheet, page 4.

ITEM	QUANTITY	UNITS	UNIT COST	COST	SUBTOTALS
Low Permeability Soil Layer					
Preparation of landfill to receive cover (final grading)	14.64	ACRE	$53.75	$786.90	
Soil--compacted, off-site (@18 inches = 0.5 yards)	47,239	CU. YD.	$5.63	$265,955.57	
Soil--compacted, on-site	0	CU. YD.	$2.20	$0.00	
Low Permeability Soil Layer Subtotal					**$266,742.47**
Vegetative Soil Layer					
Vegetative soil--off-site (@ 12 in = 0.334 yards)(12 in as per KDHE)	23,619	CU. YD.	$5.20	$122,818.80	
Vegetative soil--on-site	0	CU. YD.	$1.77	$0.00	
Seeding and mulching	14.64	ACRE	$1,500.00	$21,960.00	
Vegetative Soil Layer Subtotal					**$144,778.80**
Erosion Control					
**Misc. fill to create slope (From: Engineer's Estimate 7-17-95)	20,900	CU. YD.	$6.00	$125,400.00	
**Outflow structure and misc. (From: Engineer's Estimate 7-17-95)	1	Lin. FT.	$0.00	$15,000.00	
Riprap ditching/channels	0	Lin. FT.	$13.00	$0.00	
Erosion Control Subtotal					**$140,400.00**
Professional Services					
** Contingencies, Legal, Administrative, and Engineering (From: Engineer's Estimate, 7-17-95)		Lump Sum		$114,180.00	
Topographic and boundary survey		Lump Sum		$0.00	
Engineering (construction oversight)		Lump Sum		$0.00	
Professional Services Subtotal					**$114,180.00**
Estimated Closure Cost	(sum of all subtotals above)				**$666,101.27**
Administration and Contingency					
Administration and contingency (Estimated Closure Cost x 10%)				$66,610.13	
Administration and Contingency Subtotal					**$66,610.13**
Total Current Closure Costs					**$732,711.40**

(Instructions and explanations of bid items and sources of unit costs are provided on the back of this page.)

Contact Person/Cost Estimate Prepared By: Patrick J. Cassidy/Burns & McDonnell
Phone Number: 913.573.9856

The minimum final cover requirements for an industrial landfill include a landfill cap consisting of a minimum of 18 inches of compacted soil overlaid by a minimum of 6 inches of soil capable of supporting vegetation. Closure is complete when the cap has been seeded and vegetation is fully established. All estimates submitted must be consistent with the KDHE-approved closure plan.

Last edit date: May, 2010

POST-CLOSURE COST ESTIMATE WORKSHEET FOR INDUSTRIAL LANDFILL

OWNER: Board of Public Utilities, Kansas City, Kansas
CURRENT PERMIT RENEWAL YEAR: 2010
TOTAL PERMITTED AREA: 14.64 Acres
(use this area for estimating closure costs)

PERMIT NO.: 413
NAME: Nearman Bottom Ash
CONV. FACTOR: 4840.02 sqyds/acre
CONV. FACTOR : 0.3333 YDS./FT.

Note: Industrial landfills which have waste containment systems and appurtenances with planned maintenance schedules, environmental monitoring systems with planned maintenance schedules and periodic sampling and analysis requirements, or requirements to maintain insurance coverage during the long-term care period must complete the "Post-Closure Cost Estimate for Industrial Landfill" worksheet, page 4.

ITEM	QUANTITY	UNITS	UNIT COST	COST	SUBTOTALS
Cover Repair for 5% of the Landfill Area					
5% of the landfill area: 0.73 acres (.05 x 14.64 acres = 0.73 acres)					
Soil--off -site (assume 24-inch depth for repair)	2,357	CU. YD.	$5.20	$12,256.40	
Soil--on-site		CU. YD.	$1.77		
Cover Repair Subtotal					**$12,256.40**
Seeding(Reseed 5% of the Landfill Area)					
5% of the landfill area: 0.73 acres (.05 x 14.64 acres)					
Seeding and mulching	0.73	ACRE	$1,500.00	$1,095.00	
Seeding Subtotal					**$1,095.00**
Groundwater Monitoring					
Number of monitoring wells including background wells in group: 5 wells	Sampling Rate: twice per year				
Groundwater sampling personnel labor	48	hr.	$35.00	$1,680.00	
Groundwater sampling event mobilization.	600	mile	$0.40	$240.00	
Groundwater analytical cost (1 background+4 wells+3 QC + 8 samples/event)	16	sample	$331.00	$5,296.00	
Groundwater monitoring well maintenance	4	well	$13.00	$52.00	
Groundwater monitoring well replacement (240 total lin.ft.all wells)	240	total well footage	$0.20	$48.00	
Groundwater Monitoring Subtotal					**$7,316.00**
Inspections and Recordkeeping					
Inspections and Recordkeeping	1	Lump Sum		$1,000.00	
Inspections and Recordkeeping Subtotal					**$1,000.00**
Estimated Annual Post-Closure Cost	(sum of all subtotals above)				**$21,667.40**
Administration and Contingency					
Administration and contingency (Estimated Closure Cost x 10%)				$2,166.74	
Administration and Contingency Subtotal					**$2,166.74**
Total Estimated Annual Post-Closure Cost					**$23,834.14**
ESTIMATED 30-YEAR POST-CLOSURE COST	**(Total Annual Post-Closure Cost x 30)**				**$715,024.200**

(Instructions and explanations of bid items and sources of unit costs are provided on the back of this page.)

Contact Person/Cost Estimate Prepared By: Patrick J. Cassidy/Burns & McDonnell
Phone Number: 913.573.9856

Closure is complete when the cap has been seeded and vegetation is fully established. The 30-year post closure period begins when the landfill is no longer receiving waste and final closure has been completed for the entire site. All estimates submitted must be consistent with the KDHE-approved post-closure plan.

Last edit date: May, 2010

CLOSURE COST ESTIMATE WORKSHEET FOR INDUSTRIAL LANDFILL

template: BPU/closurewk4

OWNER: Board of Public Utilities, Kansas City, Kansas
CURRENT PERMIT RENEWAL YEAR: 2010
TOTAL PERMITTED AREA: 6.6 Acres
AREA CURRENTLY OPEN: 6.6 Acres
LARGEST AREA TO EVER BE OPEN AT ANY TIME: 6.6 Acres
(use this area for estimating closure costs)

PERMIT NO.: 413
NAME: Nearman Fly Ash
CONV. FACTOR: 4840.02 SQYDS./ACRE
CONV. FACTOR : 0.3333 YDS./FT

Note: Industrial landfills which have waste containment systems and appurtenances with planned maintenance schedules, environmental monitoring systems with planned maintenance schedules and periodic sampling and analysis requirements, or requirements to maintain insurance coverage during the long-term care period must complete the "Post-Closure Cost Estimate for Industrial Landfill" worksheet, page 4.

ITEM	QUANTITY	UNITS	UNIT COST	COST	SUBTOTALS
Low Permeability Soil Layer					
Preparation of landfill to receive cover (final grading)	6.6	ACRE	$53.75	$354.75	
Soil--compacted, off-site (24 inches as per permit)	21,307	CU. YD.	$5.63	$119,958.41	
Soil--compacted, on-site	0	CU. YD.	$2.20	$0.00	
Low Permeability Soil Layer Subtotal					**$120,313.16**
Vegetative Soil Layer					
Vegetative soil--off-site (12 inches as per KDHE)	10,670	CU. YD.	$5.20	$55,484.00	
Vegetative soil--on-site	0	CU. YD.	$1.77	$0.00	
Seeding and mulching	6.6	ACRE	$1,500.00	$9,900.00	
Vegetative Soil Layer Subtotal					**$65,384.00**
Erosion Control					
**Misc. fill to create slope (From: Engineer's Estimate 7-17-95)	10,700	CU. YD.	$6.00	$64,200.00	
**Outflow structure and misc. (From: Engineer's Estimate 7-17-95)	1	Lump Sum	$0.00	$15,000.00	
Riprap ditching/channels	0	Lin. FT.	$13.00	$0.00	
Erosion Control Subtotal					**$79,200.00**
Professional Services					
** Contingencies, Legal, Administrative, and Engineering (From: Engineer's Estimate, 7-17-95)		Lump Sum		$0.00	
Topographic and boundary survey	1	Lump Sum		$0.00	
Engineering (construction oversight)	1	Lump Sum		$0.00	
Professional Services Subtotal					**$59,880.00**
Estimated Closure Cost	sum of all subtotals above)				**$324,777.16**
Administration and Contingency					
Administration and contingency (Estimated Closure Cost x 10%)				$32,477.72	
Administration and Contingency Subtotal					**$32,477.72**
Total Current Closure Costs					**$357,254.88**

(Instructions and explanations of bid items and sources of unit costs are provided on the back of this page.)

Contact Person/Cost Estimate Prepared By: Patrick J. Cassidy/Burns & McDonnell
Phone Number: 913.573.9856

The minimum final cover requirements for an industrial landfill include a landfill cap consisting of a minimum of 18 inches of compacted soil overlaid by a minimum of 6 inches of soil capable of supporting vegetation. Closure is complete when the cap has been seeded and vegetation is fully established. All estimates submitted must be consistent with the KDHE-approved closure plan.

Last edit date: May, 2010

POST-CLOSURE COST ESTIMATE WORKSHEET FOR INDUSTRIAL LANDFILL

OWNER: Board of Public Utilities, Kansas City, Kansas
CURRENT PERMIT RENEWAL YEAR: 2010
TOTAL PERMITTED AREA: 6.6 Acres
(use this area for estimating closure costs)

PERMIT NO.: 413
NAME: Nearman Fly Ash
CONV. FACTOR: 4840.02 SQYDS./ACRE
CONV. FACTOR : 0.3333 YDS./FT.

Note: Industrial landfills which have waste containment systems and appurtenances with planned maintenance schedules, environmental monitoring systems with planned maintenance schedules and periodic sampling and analysis requirements, or requirements to maintain insurance coverage during the long-term care period must complete the "Post-Closure Cost Estimate for Industrial Landfill" worksheet, page 4.

ITEM	QUANTITY	UNITS	UNIT COST	COST	SUBTOTALS
Cover Repair for 5% of the Landfill Area					
5% of the landfill area: 0.33 acres (.05 x 6.6 acres = 0.33 acres)					
Soil--off -site (assume 24-inch depth for repair)	1,065	CU. YD.	$5.20	$5,538.00	
Soil--on-site		CU. YD.	$1.77		
Cover Repair Subtotal					**$5,538.00**
Seeding (Reseed 5% of the Landfill Area)					
5% of the landfill area: 0.33 acres (.05 x 6.6 acres)					
Seeding and mulching	0.33	ACRE	$1,500.00	$495.00	
Seeding Subtotal					**$495.00**
Groundwater Monitoring					
Number of monitoring wells including background wells in group: 4 wells Sampling Rate: twice/yr					
Groundwater sampling personnel labor	48	hr.	$35.00	$1,680.00	
Groundwater sampling event mobilization	600	mile	$0.40	$240.00	
Groundwater analytical cost (1background+3 wells+3QC=7samples/event)	14	sample	$331.00	$4,634.00	
Groundwater monitoring well maintenance	4	well	$13.00	$52.00	
Groundwater monitoring well replacement (120 total lin.ft.of all wells)	120	total well footage	$0.20	$24.00	
Groundwater Monitoring Subtotal					**$6,630.00**
Inspections and Recordkeeping					
Inspections and Recordkeeping	1	Lump Sum		$1,000.00	
Inspections and Recordkeeping Subtotal					**$1,000.00**
Estimated Annual Post-Closure Cost	(sum of all subtotals above)				**$13,663.00**
Administration and Contingency					
Administration and contingency (Estimated Closure Cost x 10%)				$1,366.30	
Administration and Contingency Subtotal					**$1,366.30**
Total Estimated Annual Post-Closure Cost					**$15,029.30**
ESTIMATED 30-YEAR POST-CLOSURE COST	**(Total Annual Post-Closure Cost x 30)**				**$450,879.000**

(Instructions and explanations of bid items and sources of unit costs are provided on the back of this page.)

Contact Person/Cost Estimate Prepared By: Patrick J. Cassidy/Burns & McDonnell
Phone Number: 913.573.9856

Closure is complete when the cap has been seeded and vegetation is fully established. The 30-year post closure period begins when the landfill is no longer receiving waste and final closure has been completed for the entire site. All estimates submitted must be consistent with the KDHE-approved post-closure plan.

Last edit date: May, 2010

K A N S A S

RODERICK L. BREMBY, SECRETARY

MARK PARKINSON, GOVERNOR

DEPARTMENT OF HEALTH AND ENVIRONMENT

May 03, 2010

Patrick Cassidy
BPU-Nearman Creek
300 N 65th Street
Kansas City, KS 66102

RE: Permit Renewal for Permit No. 0413, for the following types of permits: Industrial; Wyandotte County

Dear Mr. Cassidy:

This is to notify you that the permit type(s) listed above on Permit Number 0413, must be renewed by July 1, 2010, as required by the general permit conditions and Kansas Administrative Regulations 28-29-84. **In order to renew the permit, the following information must be sent to the Bureau of Waste Management thirty days prior to July 1, 2010:**

1. A copy of the certificate of general liability insurance as required by K.A.R. 28-29-2201. This should be an updated copy with proof of insurability for the next year.

2. Updated cost estimates for closure and if applicable, post closure.

Please forward the necessary information to the Bureau of Waste Management at least 30 days prior to the permit anniversary date of July 1, 2010. **Failure to provide the requested information by the renewal date will result in 1) suspension of your permit and 2) an order to immediately cease taking waste and close the facility in accordance with your approved facility closure plan.**

Enclosed with this letter are the Closure Cost Estimate Worksheets necessary for renewal of your permit. Use the proper worksheet for each individual permit type and total the amounts to give a clear and precise estimate of closure costs. Please direct questions regarding permit renewal to me at (785) 296-1121, Fax (785) 296-1592.

Ken Powell
Solid Waste Permits Section

c Wyandotte County Commissioners

DIVISION OF ENVIRONMENT
Bureau of Waste Management
CURTIS STATE OFFICE BUILDING,1000 SW JACKSON ST., STE.320, TOPEKA, KS 66612-1366
Voice 785-296-1600 Fax 785-296-1592 http://www.kdhe.state.ks.us/waste

K A N S A S

RODERICK L. BREMBY, SECRETARY

DEPARTMENT OF HEALTH AND ENVIRONMENT

MARK PARKINSON, GOVERNOR

May 3, 2010

BPU-Nearman Creek
Patrick Cassidy
300 N 65th Street
Kansas City, KS 66102

Permit #: 0413

Dear Mr. Cassidy:

Please help us update our records. Review the information regarding your permit listed below and make any necessary corrections. Changes may be submitted by phone to Jamie Packard, (785) 296-1602, or faxed to (785) 296-1592, or mailed to the following address:

Kansas Department of Health & Environment
Bureau of Waste Management
1000 SW Jackson, Suite 320
Topeka, KS 66612-1366

Thank you for your cooperation.

Facility phone:	913-573-9856
Hours of operation:	8am-4:30pm
Directions to the facility:	
Contact person:	Patrick Cassidy
Address:	300 N 65th Street Kansas City, KS 66102
Phone:	913-573-9856
Fax:	913-573-9838
Email:	

Doc 09: US Army COE Final Envir. Statement—Geology

Kansas

FILE COPY

RECEIVED
LUTZ, DAILY & BRAIN
OCT 14 1976
ANSWERED

FINAL ENVIRONMENTAL STATEMENT

REGARDING
APPLICATION FOR A DEPARTMENT OF THE ARMY PERMIT BY

THE BOARD OF PUBLIC UTILITIES
OF
KANSAS CITY, KANSAS

NEARMAN CREEK STEAM-ELECTRIC GENERATING STATION

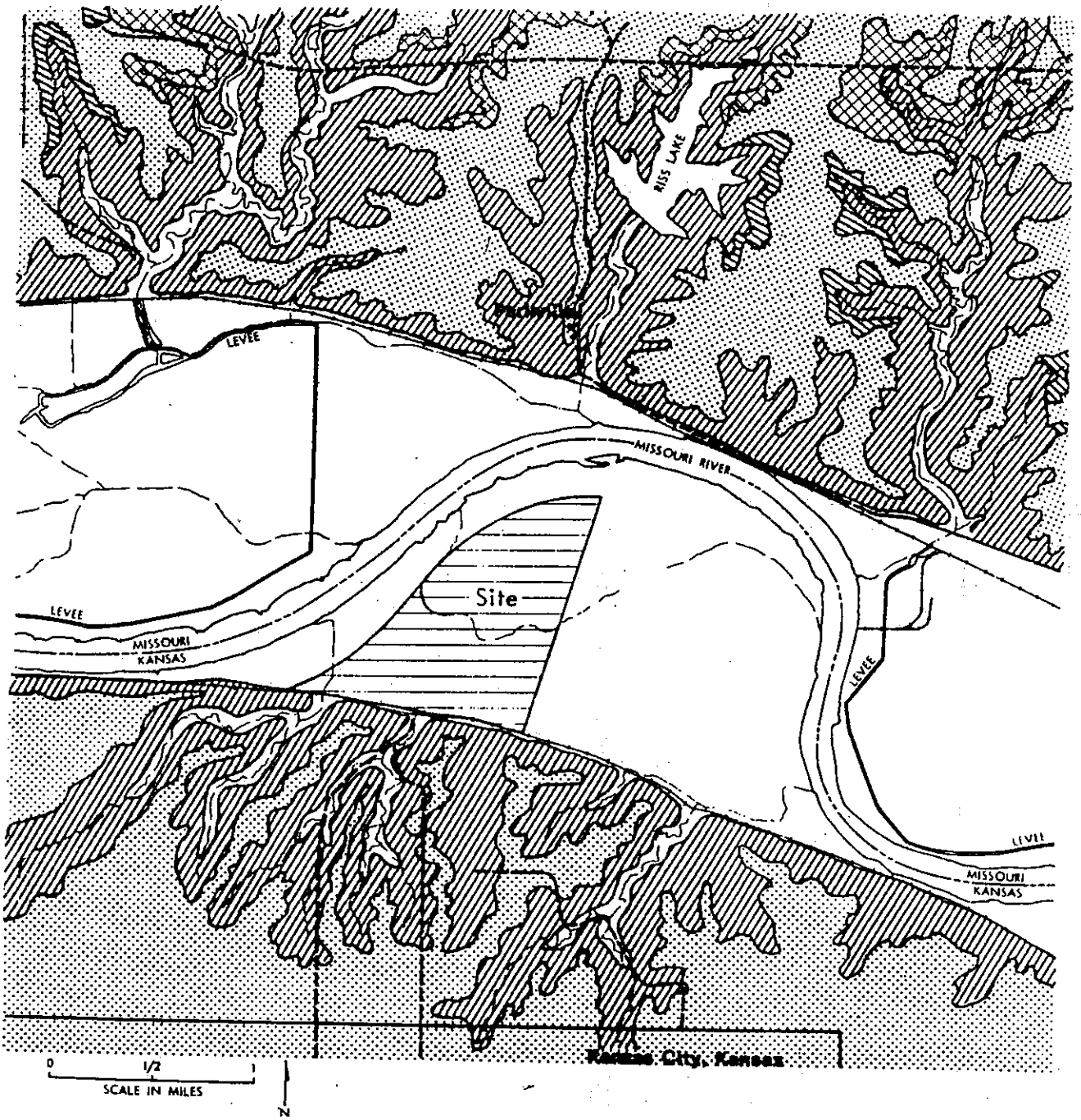
WYANDOTTE COUNTY, KANSAS

PREPARED BY

U. S. ARMY ENGINEER DISTRICT
KANSAS CITY, MISSOURI

AUGUST 1976

GEOLOGY

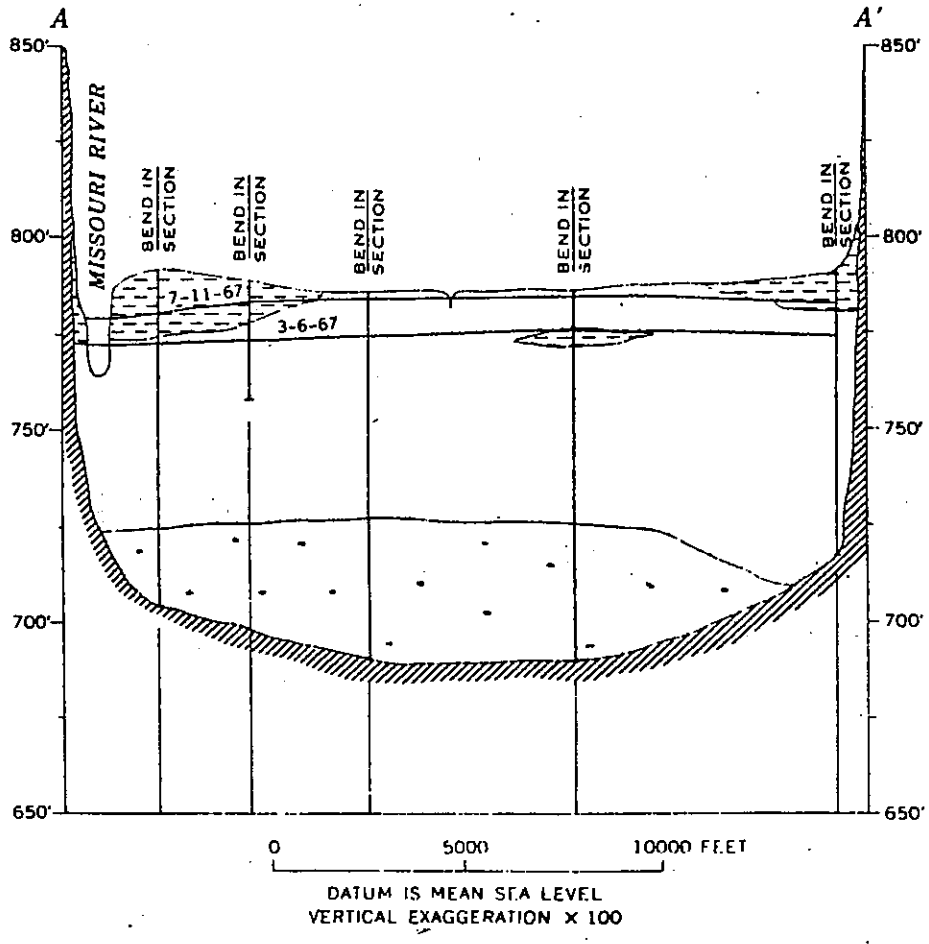


LEGEND

- Alluvium and Terrace Deposits
- Glacial Deposits
- Loess
- Lansing Group
- Kansas City Group

Source: Kansas Geological Survey Field Notes
S.N. Davis, 1955

Figure 2-4 - Geologic Map of Area Surrounding the Site



Source: Emmett, L. F., and Jeffery, H. G., (1969).

Figure 2-5 - Geologic Section

Geology.

2.20 Soils. The alluvial soils beneath the site are grouped into the Eudora-Onawa Association (635 acres), and are composed of silty loams occurring on gentle slopes. Along the valley walls are soils of the Knox-Sharpsburg-Sogn Association (120 acres). These are silty clay soils which occur on steep to rolling slopes. The Eudora-Onawa soils are highly productive with plentiful rainfall. However, the productivity of the Knox-Sharpsburg-Sogn soils is severely limited near the site because of factors such as steepness of the surface slope, shallowness of bedrock, and erodibility of the soil. Table 2-7 summarizes selected physical characteristics of these soil types (USDA, 1974).

2.21 Site geology. The geologic strata beneath the site consist of stream alluvium, glacial deposits, sedimentary rocks, and a deep basement of granitic rock. The sedimentary rocks exposed in the valley walls and underlying flood plain are of Pennsylvanian Age. Pre-Pennsylvanian rocks do not crop out in the area and can only be studied from information collected from exploratory testholes. Rocks of Cambrian, Ordovician, Devonian, and Mississippian Age are known to be present. The total thickness of the sedimentary rocks beneath the site is approximately 2,500 feet, beneath which, is Pre-Cambrian granite of undetermined thickness.

2.22 Figure 2-4 shows the distribution of exposed geologic formations near the site. The age relationship of these formations is summarized by Table 2-8. The Missouri River Valley alluvial deposits are discussed in greater detail than the other geologic formations because of their greater potential as a ground water aquifer, which is discussed in a following section.

2.23 The valley fill near the site is about 100 feet thick. It is generally composed of surface soil and clay deposits approximately 10 feet thick. Beneath the clay is a sequence of sand and gravel layers. Although the sand and gravel may be intermixed, there is a general increase in size of fragments with depth. At the base of the sequence, cobble-size fragments occur. The alluvium is underlain by Pennsylvanian aged bedrock. Figure 2-5 shows a typical geologic section of the valley. This section is drawn across the valley upstream from the site, but is typical of conditions at the site.

2.24 Local structural geology. The rocks near the site occur in a sequence of alternating layers of limestone and shale with minor amounts of sandstone. These layers tilt toward the west-northwest at approximately 15 feet/mile (Davis, 1955). Locally, small folds and an occasional small fault interrupt the normal dip of the rocks and extensive jointing is present. The bedrock surface is marked by recently formed stream valleys as well as former valleys which are currently buried by glacial deposits. No buried valleys are known in the immediate vicinity of the site, but they are prevalent throughtout the region.

2.25 Several small anticlines and synclines have been described in Platte and surrounding counties (Ward, 1973). The Farley, Prairie Point, Belgium Bottoms (Lakeside), and Parkville structures are the largest, and occur in the southern portion of Platte County. These are generally subsurface anticlinal and domal structures which are apparent only from testhole data. Similar types of structures probably occur in Wyandotte County, Kansas, and have been described in Johnson County, Kansas (O'Connor, 1971). Locally, small folds occur in the exposed rocks, but are of very limited extent and often are the result of local slumping of the underlying formations.

2.26 No major faults are known to occur in the immediate vicinity of the site. However, jointing is prevalent in both the limestone and shale formations, but is more apparent in the limestones.

2.27 Mineral resources. Naturally occurring minerals near the site which have the greatest potential value include oil and gas, limestone, and sand and gravel. In addition, coal production has been of some importance in past years northwest of the site at Leavenworth and lightweight aggregate is produced from shale aggregate elsewhere in the region. No metallic minerals are known to exist near the site.

2.28 The production of oil and gas has been limited to rocks of Pennsylvanian Age in this area. Production has been generally limited to the small anticlines and domes previously mentioned, and has been relatively small. Production has declined in recent years.

2.29 The principal limestone resource of the area is the Wyandotte Limestone. The limestone is crushed and used primarily as aggregate, road building material, and as riprap material for dike and levee construction along the Missouri River. Many quarries exist along the Missouri River bluffs from which limestone has been quarried extensively.

Doc 10: KCBPU Emergency Response Action Plan (ERAP)

EMERGENCY RESPONSE ACTION PLAN (ERAP)

NEARMAN POWER STATION
KANSAS CITY BOARD OF PUBLIC UTILITIES
4240 NORTH 55th STREET
KANSAS CITY, KANSAS 66104

Prepared by:
Environmental Services Department
Kansas City Board of Public Utilities

December 2009

1.1 EMERGENCY RESPONSE ACTION PLAN (ERAP)

NEARMAN POWER STATION
4240 NORTH 55TH STREET
KANSAS CITY, KANSAS 66104

1.0 PRIMARY EMERGENCY CONTACT

Patrick J. Cassidy, Director of Environmental Services Department
Office (913) 573-9856
Cella (913) 645-1657

24-Hour BPU Environmental Emergency Phone: (913) 573-9888

Mr. Cassidy has full authority, including contracting authority, to implement remedial and/or removal actions or any other action deemed necessary in an emergency situation.

2.0 EMERGENCY CONTACTS

2.1 BPU Environmental Services Department Contacts:

Ingrid Setzler	Office	(913) 573-9806
	Cell	(913) 645-1691
Maxann Flynn	Office	(913) 573-9868
	Cell	(913) 645-1672
Tammy Miller	Office	(913) 573-9802
	Cell	(913) 645-1412

24-Hour BPU Environmental Emergency Phone: (913) 573-9888

2.2 BPU Emergency Response Coordinator

John Fuentez	Office	(913) 573-9786 - Nearman
	Cell	(913) 645-1486
Darrell Dorsey	Cell	(913) 645-1484

2.3 BPU Public Affairs Officier

David Mehlhaff	Office	(913) 573-9173
	Cell	(913) 645-1473

The above-listed individuals are candidates to be contacted in the event of a discharge so that immediate communications between the primary emergency contact and the appropriate federal officials and the persons providing response personnel and equipment can be ensured. Following is a list of federal agencies and organizations:

- National Response Center (NRC) (800) 424-8802

- U.S. Environmental Protection Agency (913) 281-0991
  Regional Response Center (RRC)
  24-Hour Spill Number
- Federal Emergency Management Agency (FEMA) (816) 283-7063
- Haz-Mat Response, Inc. (HRI) – (Olathe) 800-229-5252
- State Emergency Response Commission (SERC) (785) 296-3176
  (Spill Notification)
- Kansas Emergency Response Commission (913) 296-1690
- Kansas Division of Emergency Management (KDEM) (785) 274-1409
- Kansas State Fire Marshall (785) 296-3401
- Kansas Department of Health and Environment (KDHE) Northeast Office
  Business Hours (785) 296-1679
  After Business Hours (785) 296-0614
- Local Emergency Planning Committee (LEPC) (913) 573-6300
  Wyandotte County Emergency Planning Agency
- Kansas City, Kansas Water Pollution Control (913) 371-4240
- Wyandotte County Health Department (913) 321-4803
- Kansas City, Kansas Fire Department (913) 573- 5550
- Kansas City, Kansas Police Department (913) 573- 6000
- KU Medical Center (Burn Center) (913) 588-6540
- Providence Health Center (913) 596-4180
- National Weather Service (816) 540-5147
- Kansas City, Missouri Water Department Drinking Water
  Intake Dispatch: (816) 5130209
  Director: (816) 513-7051
  Cell: (816) 803-0888
  Control Room: (816) 513-7050
- US Missouri Water Company (Lexington) Drinking Water
  Intake (660) 259-2912

- KCP&L Utility Intakes (River Mile Markers 365.7 and 358.3)
  Control Room (816)242-3561
  Supervisor (816)242-2451

- Utilicorp Utility Intake (Sibley) (816) 737-5600

- Union Pacific Railroad (913) 621-1575

- Kansas City Gas Service (800) 794-4780

- Associated Press (816) 421-4844

- Kansas City Kansan (913) 387-3434

- Kansas City Star (816) 234-7745

- KCTV-5 Television Station (913) 677-7211
  (913) 677-5555

- KMBC TV-9 Television Station (816) 760-9335
  (816) 221-9999

- WDAF TV-4 Television Station (816) 932-9201
  (816) 753-4567

- KSHB-41 Television Station (816) 932-4141

- ENTERCOM Radio Stations (913) 677-8998
  (KYYS, KMBZ, KKGM, WDAF, KUDL, KQRL, KCIY, KXTR)

- KMBZ News Radio (913) 744-3600
  (913) 563-4042

- KCMO Radio (913) 514-3000
  (816) 576-7710

- KCFX Radio Station (913) 514-3000

APPENDIX B

PHOTOGRAPHS

Photo Log
Site Visit – KCBPU Nearman Creek Coal Ash Pond, Kansas City, KS
September 21, 2010

1. Outfall Gate – East Side of Pond

2. Interior of dike – Taken from east end of pond, looking northwest

3. Interior of dike – Taken from east end of pond, looking south

4. Outfall pipe – small amount of discharge observed

5. Standing water at foot of dike below outfall pipe

6. Same as 4.

7. Same as 4.

8. Same as 4.

9. Exterior of dike – Taken from east end of pond looking south. Heavy vegetation at base and on dike.

10. Exterior of dike – Taken from east end of pond looking north. Heavy vegetation at base and on dike.

11. Exterior of dike – Taken from north side of pond looking west. Heavy vegetation at base and on dike.

12. Exterior of dike – Taken from north side of pond looking east. Heavy vegetation at base and on dike.

13. Exterior of dike – Taken from north side of pond looking northeast down side of dike. Heavy vegetation at base and on dike.

14. Exterior of dike – Taken from north side of pond looking southwest up side of dike. Heavy vegetation at base and on dike.

15. Exterior of dike – Taken from north side of pond looking southeast up side of dike. Heavy vegetation at base and on dike.

16. Exterior of dike – Taken from north side of pond looking southwest/west. Heavy vegetation at base and on dike.

17. Interior of dike – Taken from north side of pond looking east.

18. Interior of dike – Taken from north side of pond looking west.

19. Exterior of dike – Taken from north side of pond looking west. Heavy vegetation at base and on dike.

20. Exterior of dike – Taken from north side of pond looking east. Heavy vegetation at base and on dike.

21. Exterior of dike, groin at northwest corner.

22. Interior of dike, groin at northwest corner.

23. Exterior of dike (plant ring berm) – Taken from west side of pond looking north.

24. Exterior of dike (plant ring berm) – Taken from west side of pond looking south.

25. Discharge from plant at southeast corner of pond.

26. Interior of dike – Taken from west end of pond looking north.

27. Discharge from plant at southeast corner of pond.

28. Stillwater pond and interior dike, from west end looking east.

29. Same as 28.

30. Interior separation dike – Clearwater side, taken from separation dike looking east.

31. Discharge from plant on south side of ash pond, taken from interior berm between ash pond and clear water pond.

32. Interior of separation dike – Ash pond side, taken from separation dike looking west.

33. Interior of separation dike – Ash pond side, taken from separation dike looking east.

34. Interior of separation dike – Ash pond side, taken from separation dike looking north across pond.

35. Tie-in of interior separation dike at east end – clearwater pond side.

36. Tie-in of interior separation dike at east end – ash pond side.

APPENDIX C

DAM INSPECTION CHECK LIST

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name:	KCBPU - Nearman Crk.	Date:	9/21/2010
Unit Name:	Ash Pond	Operator's Name:	KCBPU
Unit I.D.:		Hazard Potential Classification:	High ☐ Significant ☐ Low ☒
	Inspector's Name:	GIB JONES, FRANK LOCKRIDGE	

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Variable		18. Sloughing or bulging on slopes?		X
2. Pool elevation (operator records)?	≈ 758		19. Major erosion or slope deterioration?		X
3. Decant inlet elevation (operator records)?	≈ 758'		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	N/A		Is water entering inlet, but not exiting outlet?		X
5. Lowest dam crest elevation (operator records)?	763'		Is water exiting outlet, but not entering inlet?		X
6. If instrumentation is present, are readings recorded (operator records)?		X	Is water exiting outlet flowing clear?	X	
7. Is the embankment currently under construction?		X	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?	X - was Specified		From underdrain?	X	
9. Trees growing on embankment? (If so, indicate largest diameter below)		X	At isolated points on embankment slopes?		X
10. Cracks or scarps on crest?		X	At natural hillside in the embankment area?	N/A	
11. Is there significant settlement along the crest?		X	Over widespread areas?		X
12. Are decant trashracks clear and in place?			From downstream foundation area?		X
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?	N/A		"Boils" beneath stream or ponded water?	X	
14. Clogged spillways, groin or diversion ditches?	N/A		Around the outside of the decant pipe?		
15. Are spillway or ditch linings deteriorated?	N/A		22. Surface movements in valley bottom or on hillside?		X
16. Are outlets of decant or underdrains blocked?		X	23. Water against downstream toe?		X
17. Cracks or scarps on slopes?		X	24. Were Photos taken during the dam inspection?	X	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Issue #	Comments
1.	Bless & Veatch annual insp. of dike around plant (not bottom ash pond) See Comments
2.	Difficult to assess slope condition due to rip rap & vegetation, but slopes are uniform & no apparent problems
3	Original "mid point" (ht. of dike) drain is leaking. Plant has attempted to block off drain using a hydrogen inflated balloon & closing the in-pond valve.
4.	Operator does have daily plant staff on/around the dike, periodically ride the dike, a trapper under contract to capture burrowing animals, and quarterly walk overs by staff environmental personnel. When problems are noted, a consultant is retained to deal w/ the problem.

Coal Combustion Waste (CCW)

Impoundment Inspection

Impoundment NPDES Permit 1-M025-B001 INSPECTOR GIB JONES/FRANK LOCKRIDGE

Date 9/21/10

Impoundment Name Nearman Creek Power Station Ash Pond

Impoundment Company KCBPU

EPA Region 7

State Agency Kansas Dept. of Agriculture

(Field Office) Address 109 SW 9th St. 2nd Flr. Topeka, KS 66612-1283

Name of Impoundment Edward E. Byrd, P.E.

(Report each impoundment on a separate form under the same Impaundment NPDES Permit number)

New ☒ Update ☐

	Yes	No
Is impoundment currently under construction?	☐	☒
Is water or ccw currently being pumped into the impoundment?	☒	☐

IMPOUNDMENT FUNCTION: Bottom ash sluice impoundment & settlement.

Nearest Downstream Town Name: Kansas City, KS

Distance from the impoundment: Approx. 5 miles

Location:

Latitude	39	Degrees	10	Minutes	27.17	Seconds	N
Longitude	94	Degrees	41	Minutes	33.06	Seconds	W

State KANSAS County WYANDOTTE

	Yes	No
Does a state agency regulate this impoundment? Not impoundment, but solid waste landfill	☑ Kansas Dept. of Health and Environment	☐

If So Which State Agency? Kansas Dept. of Agriculture, which regulates dams in the state has not rated or considered this structure a regulated dam. Since accompanying Dewberry on this visit, they are considering regulating it.

HAZARD POTENTIAL *(In the event the impoundment should fail, the following would occur):*

- [ ] **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

- [x] **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

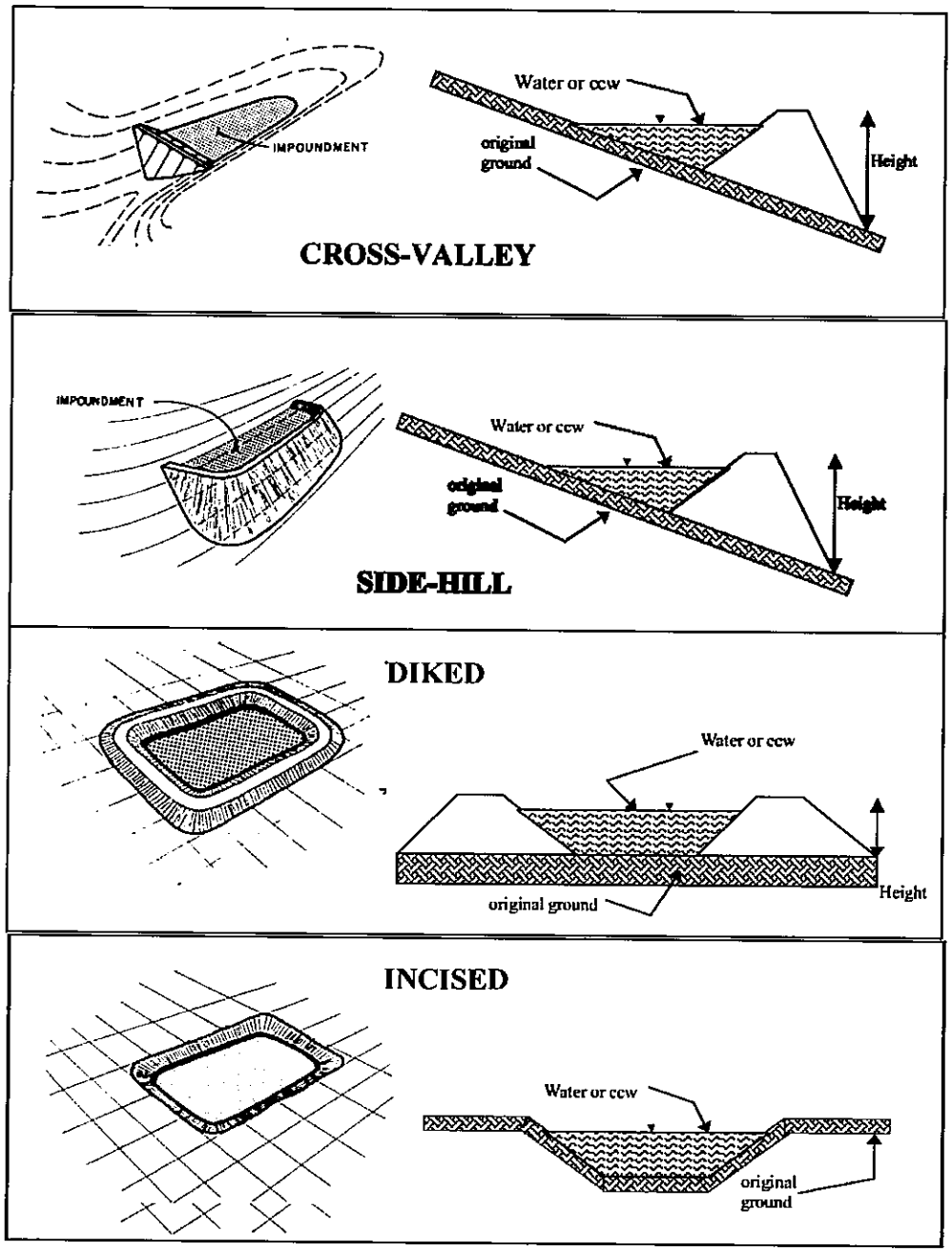
- [ ] **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

- [ ] **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

Pond is a bottom ash and boiler slag pond with no occupied housing within 5 miles downgradient. Retained volume of material in the pond is maintained at approx. 50% of capacity or 100,000 yd^3. This quantity would easily be captured by the adjacent on-site wetland area prior to reaching the river.

CONFIGURATION:



☐ Cross-Valley ☐ Side-Hill ☒ Diked

☐ Incised (form completion optional) ☐ Combination Incised/Diked

Embankment Height (ft) ~21'

Pool Area (ac) ~6.6 ac

Current Freeboard (ft) ~5'

Embankment Material EARTH

Liner CLAY

Liner Permeability

TYPE OF OUTLET (Mark all that apply)

☐ **Open Channel Spillway** NA

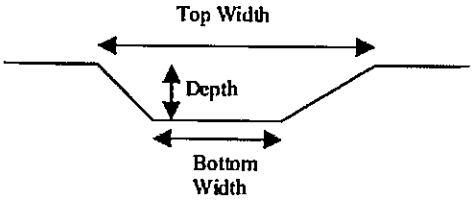
- ☐ Trapezoidal
- ☐ Triangular
- ☐ Rectangular
- ☐ Irregular

depth (ft)

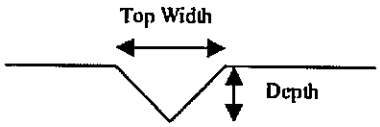
average bottom width (ft)

top width (ft)

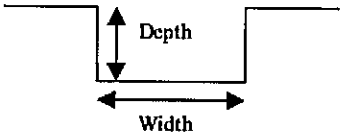
TRAPEZOIDAL



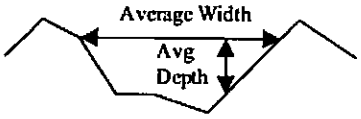
TRIANGULAR



RECTANGULAR

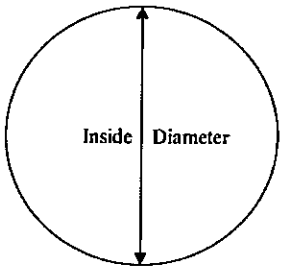


IRREGULAR



☒ **Outlet**

30 ~~48~~" inside diameter
~~(SDR 17 – smooth lined – 19.5" OD)~~



Material

- ☐ corrugated metal
- ☐ welded steel
- ☒ concrete
- ☐ plastic (hdpe, pvc, etc.)
- ☐ other (specify):

	Yes *	No
Is water flowing through the outlet?	☒	☐

*SMALL AMT. DUE TO LEAK IN CLOSURE DEVICE

☐ **No Outlet**

☐ **Other Type of Outlet** (specify):

The Impoundment was Designed By AEP ~~in house personnel~~

	Yes	No
Has there ever been a failure at this site?	☐	☒

If So When? [illegible]

If So Please Describe : '93 flood did inundate the pond. However, dike has never been breached.

	Yes	No
Has there ever been significant seepages at this site?	☐	☒
If So When?		

If So Please Describe :

	Yes	No
Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site?	☐	☒
If so, which method (e.g., piezometers, gw pumping,...)?		

If So Please Describe :

ADDITIONAL INSPECTION QUESTIONS

Concerning the embankment foundation, was the embankment construction built over wet ash, slag, or other unsuitable materials? If there is no information just note that. No Information is from design specifications and knowledge of plant personnel present at the time of construction.

Did the dam assessor meet with, or have documentation from, the design Engineer-of-Record concerning the foundation preparation?

We were given a copy of the original design drawings

From the site visit or from photographic documentation, was there evidence of prior releases, failures, or patchwork on the dikes? No