



**Notes:**

- Contractor shall remove existing sludge to elevation 1329.5 in each cell. Sludge shall be disposed of per KDHE regulations and requirements. Reference Sludge Removal Notes this sheet.
- Owner shall lower the water level in Cell #3 to within a few feet of the bottom of the lagoon. Contractor shall remove remaining water and haul to Owner's Wastewater Treatment Plant #2 (located at 57th Street South and Hydraulic) for disposal. Contractor is responsible for all pumping and transport of water and coordination with the Owner for disposal. Work shall be conducted per schedule and requirements of Owner. All costs associated with removal and hauling shall be included in the bid; no additional payment will be made for work associated with this item.
- Contractor to clean interior of all transfer piping between lagoon cells prior to putting cell back into service. Pipes to be cleaned with high pressure hot water.
- Install new turtle screens on all inlet and transfer piping in lagoons. Turtle screens shall be per details on Sheet C7. Reference plan for 6 locations (#).
- Install new depth gauge in each lagoon cell per detail on sheet C6. Locations to be determined by Owner.

**Construction Sequence Notes:**

- The wastewater collection and treatment system shall be operational at all times during construction. At no time shall the system be incapable of receiving or treating wastewater flow.
- One cell shall be taken out of service at a time for the noted rehabilitation work, and cell returned to full function and service prior to next cell being taken out of service.
- Sequence shall be Cell #2, Cell #1, Cell #3.
- A detailed construction sequence including draining, bypass pumping plan, planned time out of service, and sequence of work items shall be provided by the Contractor to the Engineer for review prior to any work being done at the project site.
- Each Cell of the Wastewater Treatment Ponds shall be tested in accordance with KDHE Standards.

**Testing of Wastewater Treatment Ponds**  
 After soil sterilization completed, the first pond to be put into use shall be filled to the minimum operational level using a suitable water source. The transfer gate valves and/or stop planks of the outlet structures shall be closed and sealed before filling. Beginning not less than 7 days after filling is completed, the tests shall be performed to determine the water loss through the bottom and embankments of the pond. The calculations for the water loss value must consider the influences of the precipitation and evaporation during the test period.

If the water loss through the pond embankments and bottoms exceeds 1/4 inch per day, the ponds shall be drained and reworked in accordance with the requirements of this chapter and tested again. The procedure shall be repeated until the water loss through the pond embankments and bottoms is 1/4 inch per day or less. Because water loss through the soil is proportional to the depth of water, this must be considered in computing the water loss where the minimum operating level varies from the one specified in the original derivation of the water loss figure.

Seepage testing shall be incidental to the Increase Berm Height bid item and shall include all labor and equipment necessary for completion of a whole pond seepage test using the overnight balance method for each lagoon cell.

Approved seepage testing service providers include:  
 KLA Environmental Service, Inc.

The Contractor shall develop and submit a Seepage Testing Plan to the Engineer for review. The plan shall include the following:  
 An outline of the tasks required to complete the testing.  
 Proposed dates and times when testing equipment will be set up and removed from the site.  
 Proposed equipment installation locations.

The lagoon cell shall not be filled for testing until written authorization has been provided by the Engineer. Contractor shall be responsible to notify Engineer when each cell is ready for inspection to verify it is ready to be filled for testing. Contractor shall begin filling the cell within 3 calendar days of Engineer's authorization. Water for filling shall be obtained from the secondary cell still in service.

The seepage test shall be conducted in accordance with the guidelines provided by Ham and DeSutter (2003) and Ham and Baum (2009).

Liquid level change in each cell shall be measured with two pressure transducers in order to ensure accuracy. Each sensor shall be placed in a separate stilling well and attached to a metal post. The metal post required to support the stilling well shall be placed into the soil liner as deep as practical. Upon the completion of testing period, the metal posts shall remain embedded into the soil liner.

The duration of each test period shall be equal to or greater than eight hours. At least two tests shall be conducted on consecutive or near-consecutive nights. The depth measurements at start and end of each test period shall be taken when the wind speed is less than 3 m/s at 1 m above the liquid surface. Scum, crust or debris shall cover not more than 5% of the liquid surface of the pond before the testing period begins.

The final report shall be complete and delivered to the Engineer within 10 days from the completion of the testing period. The final seepage testing report and any included drawings and calculations shall bear the certification of a Professional Engineer licensed in the State of Kansas.

The results of all on site testing and the appropriate water balance calculations shall be submitted to the Engineer upon completion of the tests. The cell shall not be put into service until Engineer and KDHE have approved the test results.

- Concrete Repair (Refer to Sikacrete 211 SCC Plus instructions)**
- Remove loose concrete around grate frame perimeter. Remove 1/2" concrete around exposed reinforcement.
  - Clean reinforcement and grate frame to bright metal finish with wire brush.
  - Drill and adhere #3 vertical bar dowels into top of existing wall at 18" around perimeter of grate (3" embedment). Maintain 1" minimum concrete cover over reinforcement.
  - Install #3 horizontal bars with ACI hooks or #3 horiz. ties around perimeter of grate (1" below the top of grate). Hook horizontal reinforcement at corners if straight bars are used. Maintain 1" minimum concrete cover over reinforcement.
  - Form perimeter of vault.
  - Prime reinforcement and grate frame with Armatec 110 EpoCem.
  - Mix and pour Sikacrete 211 SCC Plus into form. Chamfer or radius (3/4") exposed outside edge.
  - Remove form after sufficient cure time.
  - Remove grate, sandblast and repaint, or replace (match existing).
  - Paint grate frame and repaired concrete top.
  - Seal concrete joint to grate frame.

- Sludge Removal Notes:**
- Removal of sludge from the lagoon cells shall be completed by means of dredging or by dewatering each lagoon and removing sludge through the use of pumps.
  - Lagoons shall be cleaned in accordance with the Construction Sequence.
  - Contractor is responsible for all preparation of necessary plans, reports, and documentation for removal and disposal as required by the Kansas Dept. of Health and Environment (KDHE) and the Environmental Protection Agency (EPA).
  - Contractor shall be responsible for any permitting or approvals required from KDHE or EPA for the work.
  - Disposal of all removed sludge and sludge materials shall be by the Contractor in accordance with local, state, and federal requirements. The Contractor is required to acquire land for application of the sludge and sludge materials.
  - Contractor shall be responsible for all preparation of land application reports and documentation required by EPA. Such documents shall be provided complete to the City for submission to the EPA.
  - Contractor shall be responsible for preparation of and adherence to a Sludge Management Plan per KDHE and EPA requirements.
  - KDHE has approved disposal of sludge by transporting to Wichita WWTP #2. If the volume to be disposed of is greater than 2 dry tons/acre, sampling will have to be completed to verify the sludge meets the regulatory requirements for disposal including metals criteria, agronomic rates, etc. before it can be land applied at the City's site. No disposal fees will be assessed for the sludge disposed of at Wichita WWTP #2 for the project. Costs associated with any testing required will be the responsibility of the Contractor.

**Structure Coating Note:**  
 Coat interior and top of Distribution Box per City of Wichita Standard Specification for manholes with a pipe size greater than or equal to 15". Surface preparation and coating application shall be per Manufacturer recommendations and requirements. Contractor shall divert and/or plug flow as required for completion of coating work. Reinstall existing grating.

Ref. Sht. C6 for Grading Plan  
 Ref. Sht. C7 and C8 for Typical Sections



No.	Revision	By	Date
FAIRWAY MEADOWS ADDITION			
<b>SITE PLAN</b>			
SANITARY SEWER LAGOON REHABILITATION			
<b>PEC</b>		PROFESSIONAL ENGINEERING CONSULTANTS, P.A. 303 SOUTH TOPEKA WICHITA, KS 67202 316-262-2691 www.pec1.com	
Designed by	SCU	Job No.	187043-003
Drawn by	TDS	Date	July 2019
			Sht. C5 of 14