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CITY OF YANKTON
416 Walnut Street, PO Box 176
Yankton, South Dakota 57078

November 10, 2005

Attn: Jeffrey W. Weldon - City Manager

Phone 668.5221/Fax 668-5261

Subj: Materials & Structural Evaluation of Pool
Yankton Pool
Yankton, South Dakota

Ref. No. 05F-15005

INTRODUCTION

We have completed an engineering analysis of the existing pool and decks. The analysis included the concrete aprons around the deck, the pool, soil under the pool and the mechanical and electrical systems which are covered under separate reports. The evaluation was authorized by Mr.Jeffrey W. Weldon - City Manager.

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable structural engineers practicing in this or similar localities. No other warranty, express or implied, is made. This report is not a bidding document. Any contractor reviewing this report must draw his own conclusions regarding site conditions and specific construction techniques to be used on this project.

PURPOSE OF REPORTS

The purpose of this report is to determine the existing conditions of the pool and concrete apron area. Based on the current conditions, we were to determine the estimated costs to bring the existing pool up to industry standards. This report does not cover the building, nor the mechanical and electrical engineering reports. The time constraint placed on the completion of this report does not allow to discuss estimates with contractors. For this reason, the estimates could change once the actual estimates are obtained.

HISTORY

Information was received from on site City of Yankton personnel. We were given the following information.

1. The original building complex was built in 1947 with an addition to the south in 1977.
2. The original pool was built in 1947.
3. The pool was renovated in 1977.
4. No other major renovations have been completed after 1977.
5. The renovation in 1977 consisted of placing a new concrete slab over the existing floor in the tapered part of the pool but not in the hopper area. The new floor consisted of about 4 inches of concrete with rebar. The rebar was supported with wood pieces which has caused blow outs and rebar corrosion in small areas.
6. The size of the pool was given as 75' x 165' but using a laser measuring devise, the pool is 82' wide. The actual size of pool and apron and deck should be verified.
7. Voids under the concrete apron area were shown to us for evaluation. The voids are between the pool and building.
8. The gutter system was replaced in 1977 and is stainless steel.
9. The pool leaks, but the exact amount has not been tested.
10. The pool cracks were observed along with the amount of water that comes back into the pool because an exterior drain field and sump system do not exist.
11. At the intersection of the hopper and tapered pool bottom, the joint opens up from frost heave in the winter about 1 inch. The frost goes away and the joint closes but requires repair each year.

OBSERVATIONS/SITE INVESTIGATION

Our observation and study will be limited to the pool concrete, soils and concrete apron. The mechanical and electrical systems to include light poles will be covered in separate reports.

1. The gutter is stainless steel and in relatively good shape with minor pitting from corrosion. The corrosion is caused from contamination in the stainless steel. The gutter requires some welding of joints and replacement of plastic piping and fittings. The dark staining in many areas can be cleaned.

2. The concrete pool has some cracking and joint wear probably from frost heave. The hopper of the pool has a major crack down the middle that follows the drain

inlets. The corner of the hopper has cracks and joints that require repair.

3. The concrete was cored in the hopper, two concrete blow out areas and the east wall. The blow outs are caused by the wood supports for rebar during construction in 1977. The rebar has extensive damage due to corrosion in the area of the blow outs. These areas will require repair by removing the concrete. These areas are small in comparison to the size of the pool.

4. The soil was evaluated through the core holes by using a direct soil shear strength auger and taking soil samples using 3" thin wall samples.

5. Concrete rebound testing was completed at the core sampling areas and at 10 additional locations in the pool and 10 location in the wall of the pool and 10 locations in the concrete deck.

6. The main drain line in the hopper was reviewed using a camera. The camera was inserted into the hopper drain and pushed into the drain line 20'. The steel pipe was observed for corrosion and leaks. The corrosion is present but is limited to the surface. The pipe appeared sound and no leaks were observed.

CONCRETE TESTING AND EVALUATION

1. The hopper was cored with a 4" diamond bit. The concrete was 6.5 inches deep with a #4 rebar going each way at a depth of 4 inches.

2. Cores were taken in 2 blow out areas. The core consisted of 2" grout repair, 2" of concrete added in 1977, and the original 6.2 inch concrete slab. Rebar was found at 2.5" (very corroded) and at mid-height of the origin 6.2" concrete slab. Wood blocking was found below the rebar in the 1977 4 inch floor.

3. Core #3 was taken in a blow out area. The core consisted of 1" grout repair, 3" of concrete added in 1977, and the original 6.0 inch concrete slab. Rebar was found at 2.5" (very corroded) and at 3 inches from bottom of concrete of the origin 6.2" concrete slab. Wood blocking was found below the rebar in the 1977 4 inch floor.

4. Concrete was cored to a 7" depth for strength evaluation and over all quality.

The concrete was evaluated using a microscope to view air entrapment and entrainment. The overall quality of the concrete is good. Blow out areas were caused by the wood blocking which allowed the rebar to corrode. When steel corrodes, the rust expands popping the concrete apart.

Core#	Description/Location	In-place strength	Code Strength
1.	4" dia.x 1947 concrete Hopper 11 N & 26' E from SW corner	Fc = 4400 psi	3000 psi
2.	4" dia.x 1977 concrete 4" dia x 1947 concrete Sloped floor 38' E & 101 S from NW corner	Fc = 5200 psi Fc = 4100 psi	3000 psi 3000 psi
3.	4" dia.x 1977 concrete 4" dia x 1947 concrete Sloped Floor 68' S & 10' W from NE corner	Fc = 3600 psi Fc = 4600 psi	3000 psi 3000 psi
4.	4" dia. Wall 62' S of NE corner	Fc = 4800 psi	3000 psi

* Core location in a blow out area. Concrete deteriorated from rebar corrosion expansion. Concrete strength outside the cracked and deteriorated area. Deteriorated area could not be tested. Repair required in the blow out area.

REBOUND HAMMER TESTING

Rebound hammer testing was completed on the concrete in the pool area. Ten areas in a relatively uniform spacing around the perimeter of the pool walls and 10 areas in the floor were completed to check the uniformity of the concrete. The rebound readings in all areas varied from 3400 to 5400 psi. The rebound hammer was correlated to the concrete cores. The over all quality of concrete is adequate for renovation.

EXTERIOR GRADE AROUND POOL DECK

The exterior grade around the pool deck was observed. The rain water in the north east side now runs towards the deck as well as the east side. The pool deck areas and 25' away from the deck should have elevations completed. The soil should slope down and away from the deck a minimum of 1' for 15' away from the deck. This will form a drainage ditch to divert water away from the deck.

SOIL EVALUATION IN CORE AREAS

Core #1: Located in the hopper about 10' north and 40' east from the southwest corner of the pool.

Depth	Soil type	shear strength	Density	Remarks
0-1'	Sand	1500 psf	NA	Ground water flowing into hopper area impossible to get thin wall samples in clean sand with flowing water
1'-2'	Sand	3000	NA	
2'-3'	Sand	4000	NA	
3'-4'	Sand	4500	NA	
4'		Obstruction probably a large rock		

Core #2: Located in the sloped bottom of the hopper about 40' east and 100' south from the northwest corner of the pool.

Depth	Soil type	shear strength	Density	Remarks
0-1'	Silty Clay	500 psf	96.9 pcf	91% compaction probably frost heave damage to the soil Proctor 106.5 pcf
1'-2'	Silty clay	1500	99.1 pcf	93% compaction
2'-3'	Silty clay	2200	101 pcf	95
3'-4'	Silty clay	3500	102 pcf	96

Core #3: Located in the sloped bottom of the hopper about 75' east and 85' south from the northwest corner of the pool.

Depth	Soil type	Shear strength	Density	Remarks
0-1'	Silty Clay	600 psf	94.8 pcf	89% compaction probably frost heave damage to the soil Proctor 106.5 pcf
1'-2'	Silty clay	1700	99.1 pcf	93% compaction
2'-3'	Silty clay	1900	101 pcf	95
3'-4'	Silty clay	2800	101 pcf	96

DRAIN FIELD WITH SUMP SYSTEM

The present conditions are that all water leaking out of the pool or running down the hill to the deck simply saturates the soil and probably causes a water table down stream that must be pumped by the neighbors probably to the southwest of the pool. The ground water tries to leak back into the pool when drained. The saturated soil will frost heave in the winter which stresses the pool. This means that the cracks are enlarged and the caulked joints and cracks are pulled apart. The hopper area appears to have been cracked in the middle from frost heave. To reduce the damage from frost heave, the amount of water under the pool must be reduced with a sump and drain field. The drain must be about 15' deep south of the hopper area and on the east should taper upward but be at least 3 feet deeper than the bottom of the pool. The north drain should be tapered up for proper drainage but the drain should be on the north, east and south sides always draining into a deep 18' sump with a pump. This continuous draining will reduce the water content in the soil. The sump will keep the ground water on the property. The water should then be pumped into a storm drain in the street.

DECK EVALUATION

The deck around the pool was evaluated. At first we prepared to core the concrete to obtain the strength. Observations of the deck between the pool and bath house indicated extensive voids under the concrete slabs. During the coring of the pool, we obtained concrete rebound hammer testing at each core location. We used these correlations to determine the concrete strength in the deck. Around the deck we chose 10 locations for testing. The strength of concrete where tested varied from 3,600 psi to 5,100 psi concrete. Based on this testing, the strength of concrete was deemed acceptable based on strength.

The soil under the slab between the pool and bath house has settled or has been transported out of the area by drain leaks. The amount of voids under the slabs are very extensive, where observed. We could look under the slabs from a hole in the concrete steps which leads to the basement. The hole should be filled with concrete to seal the area. The concrete deck voids must be filled with grout. Usually, the voids under the concrete slabs are filled by using mud jacking.

Mud Jacking - This underpinning system utilizes a somewhat proprietary service that is provided by only a few companies that are considered experts in their field. The system involves drilling holes into the concrete on a 3' to 4' grid. The drilling should start in the void area and extend out until the voids are filled. The contractor will then sound the concrete apron using a 1" diameter shaft about 3' to 4' long. If a void area is indicated, the area is drilled. A grout mixture of cement or lime, sand and water is then

forced through a pipe into the numerous voids. By closely monitoring the pressure needed to force the mixture through the pipe into the soil, the necessary amount of grout to fill the voids is determined and controlled. The grout fills the voids and slightly lifts the concrete back into place. This process is continued until the entire depth of material below the affected concrete slab is filled. Upon completion, the existing concrete slabs will be continuously supported by stabilized soil. This system should provide resistance to both horizontal and vertical movement of the concrete slabs around the pool.

A potential problem with this system is that underground utilities in the grouted areas will become encased in the grout. This condition could create difficulties if repairs or replacement of the utilities are necessary at some future date. Another potential problem is that the system does not allow the owner, or his consultant, very much control in determining whether the work is being properly completed. The owner must rely on the expertise of the specialty contractor hired to do the work under the observation of a geotechnical engineer. The only grouting contractor in the area is Burd Contracting in Canton, South Dakota. Grouting can not be completed when the temperature drops below freezing. Therefore the holes could be started to determine the amount voids present. At some point, it may be less expensive to remove the concrete apron and fill the voids with sand.

The extent of voids observed indicates the potential for the concrete deck to fail and fall into the void area. For this reason the pool must not be used this next summer until the deck voids are filled. We believe the best course of action is to proceed with repairs immediately. To delay repairs and allow the concrete slabs to possibly fail this winter would potentially disrupt the concrete slab drains. The amount of voids is impossible to determine at this time. In addition, some concrete slabs have moved around because of inadequate surface drainage around the pool deck area. Elevations of the deck should be completed and then the lower concrete deck areas can be lifted.

After these repairs are complete all underground water and drain lines should be pressure tested or viewed with a camera to determine if any leaks or breaks are present. If any leaks or breaks are found, they should be repaired.

The concrete apron, after the voids have been filled can be used but to update the facility, the cracks in the concrete slabs can be repaired by grinding out the crack in a V shape and filling with the appropriate adhesive.

The concrete aprons can be prepared by grinding, sand blasting or by using a scabbler to make them rough. Place a deck coating as determined by the product manufacturer.

Grouting of concrete aprons (complete guess-make soundings and drill holes to determine the extent and estimated cost of repair by grout contractor). Estimated cost	$ 15,000.00
Clean up and a deck coating	$ 60,000.00
Deck -replace extensively broken slabs 300 ft2@ $ 25.00/ft^2	$ 7,500.00
Repair cracks in pool and deck	$ 30,000.00
Remove bleachers and fill basement with compacted soil, foundation to remain but to be remove 2' below grade. Does not include dump fees	$ 30,000.00
Install sump and drain field	$ 40,000.00
Deck blow out areas caused by wood and rebar corrosion 12 areas @ about 30 ft2 each, cut the areas out, replace rebar, dowel into sound concrete, replace concrete	$ 20,000.00
Soil grading around pool deck	$ 30,000.00
Cleaning welding and parts for gutter	$ 10,000.00
Remove existing coatings-pool replace with epoxy coatings	$ 100,000.00
Caulk pool	$ 10,000.00
Engineering and design drawings	$ 20,000.00
Contingency for unknown conditions	$ 50,000.00
Estimated Cost of pool renovation	$ 422,500.00

City of Yankton
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OPTIONS BEYOND POOL REPAIR

Diamond brite finish for pool walls and bottom optional	$ 240,000.00
Epoxy coating not required	$ 100,000.00
Additional money for Diamond Brite	$ 140,000.00
Black ceramic tile racing lanes and targets	$ 30,000.00
New diving boards and frames	$ 30,000.00
Diving boards only	$ 12,000.00
140' water slide	$ 130,000.00
New main drain good for 60 years (existing should last 30 years more)	$ 30,000.00

These estimates can be refined and be more accurate by obtaining actual estimates from contractors. During our typical study of a pool we are given about 30 working days to obtain accurate estimates. Because of time constraints, we made estimates based on previous projects that could affect the real costs of repairs.

If you have any questions, please call me.

Sincerely,
American Technical Services, Inc.

Michael J. Ollerich, P.E.
President

PREMIER engineering inc.
Electrical / Mechanical Consultants
Specializing in Power, Lighting, Low Voltage, HVAC, & Plumbing Design

Memo

To: Michael Ollerich, PE - American Technical Services

From: Mark W. Joffer, PE; Bill Ollerich, PE

Date: 11/4/2005

Premier #: 30-5301

Re: Yankton Pool Study

The purpose of this report is to provide an overview of the mechanical and electrical systems at the above referenced facility.

The information contained herewith has been prepared to assist the City of Yankton in making objective decisions with regard to the future of the local aquatic facility. This review was for the main pool area and does not include the wading pool. It is important to note that only non-invasive methods of field investigation were utilized. Additional unforeseen conditions may arise which might compound a deficiency identified or conceal it altogether, as well as impact any budgetary estimates established in this report.

Electrical Observations

Electric Service

1. This facility is served by a pad mount 112.5 KVA transformer. This transformer sits on the front side of the building. The voltage rating of this transformer is 12,470Y/7200, to 208Y/120 volt, 3 phase. [Picture E1]

2. A single 3 inch conduit runs between the secondary of this transformer and a 400 amp 240 volt, 3 phase fusible main service disconnect located in the Mechanical Room immediately adjacent to the transformer. [Picture E2]

3. Within this the main service disconnect are 3 fuses. Phase A and Phase C are fused at 400 amps. Phase B is fused at 200 amps.

4. Wiring coming into the line side of this disconnect appears to have 500 MCM aluminum feeding Phase A and Phase C. It would appear that Phase B is fed with #4/0 aluminum.

5. Wiring off from the load side of the fuses is as follows. Phase A and Phase C have a #4/0 aluminum coming off from the load side of each of these. These conductors go on to feed a

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200 amp, single phase Square D panel board located immediately to the right of the main service disconnect. Also coming up from the load side of Phase A and C appear to be #1 copper conductors that go into the 100 amp, 3 pole fusible disconnect located immediately to the left of the main service disconnect.

6. There is only one (1) wire on the load side of Phase B and that is a #1 copper running to the 100 amp, 3 pole disconnect located immediately to the left of the main service disconnect.

7. The 100 amp, 3 pole disconnect mentioned above is fused at 100 amps and is use to feed power to the pool pump motors.

8. In addition to the electric gear noted above there is a small load center located in the main entry check in area that is a Square D 24 pole load center. Approximately 1/2 of these spaces (poles) are empty.

9. It would appear that the conductors on the load side of Phase A and Phase C are too small for the fuse size serving them. This is also true for the conductors on the load side of Phase B. This is a code violation.

10. The 400 amp main service disconnect and the single phase panel board located immediately to the right of it are showing pitting and other signs of corrosion. This corrosion could cause failure of this equipment.

11. There is an electric gear that served the original building that is located in the basement of the facility this gear had been abandoned. This gear had been severally corroded and had deteriorated. [Picture E2]

Lighting

Interior lighting

1. Most all interior lighting throughout the facility is done utilizing incandescent light fixtures. This type of lighting, although relatively inexpensive, is high maintenance. [Picture E3]

2. Light fixtures in the Men and Women's Shower areas are open type fixtures with no lens.

3. Light fixtures in the Mechanical Room are the lensed type. However, the lenses are missing on several of the fixtures.

4. Light fixtures that have been painted do not show signs of corrosion on the painted portion of the fixture. However, any unpainted portions of the fixtures are showing signs of corrosion. [Picture E4]

5. Lighting in the basement of the facility is done with a mixture of different types of incandescent lighting. This is in very poor condition.

6. Lighting levels within the building are inadequate.

Exterior Lighting

1. There are some recessed incandescent light fixtures located at the main entrance to the facility.

2. One of these fixtures at the main entrance to the facility has had the glass lens broken. [Picture E5]

3. In looking within the recessed light fixtures at the main entrance of the facility they are showing severe signs of corrosion. [Picture E5]

4. There does not appear to be any other building mounted light on the front and sides of the building.

5. There is one (1) building mounted light stem located on the poolside of the building. However, it appears to have been abandoned and is just an open socket. This is a potential safety hazard.

6. Lighting for the pool area is done utilizing 25 to 50 foot tall steel poles around the perimeter of the pool. There are a total of 8 of these fixtures. [Picture E6]

7. It appears that the fixtures located at the top of the poles are high wattage quartz floodlights. [Picture E7]

8. The poles are showing signs of corrosion through out their entire length. It appears as if they have been painted at least once in the past. However, rust is showing through. [Picture E8}

9. There are no Wet Niche light fixtures within the pool itself.

10. It appears that the amount of exterior lighting is the pool is not sufficient to meet code requirement if the pool is used at night.

11. Another concern of exterior lighting is that the lack of lighting within the pool. Especially in the deep end of the pool. At night it would probably be quite difficult to adequately see down to the bottom depths of the pool.

12. The light poles serving the pool are located a distance anywhere from 6 feet to 15 feet off from the pool water. It is not clear whether these poles are tied into the grounding grid required for the pool. It is also not clear as to whether these pole light fixtures are served by ground fault circuit interrupter breakers.

13. There is an abandoned light fixture near the Women's Locker Room. It is presently broken and is simply an open socket. This poses a potential safety hazard.

14. Presently there does not appear to be any lighting in the small wading pool area located immediately to the South of the main pool. [Picture E9][

Pool Electrical Equipment

1. There appear to be two (2) electric motors being utilized as pumps for the pool.

2. Each of the pump motors is rated at 15 horsepower. The South pump motor appears to be newer than the North pump motor. However, it is not readily apparent exactly what age the motors are.

3. The flexible conduits serving the pump motors are in very poor condition. The flex serving the North pump motor has broken and left wires exposed.

4. The motor starters for the North and South pump are showing signs of pitting, rusting, and corrosion.

Miscellaneous Electrical Observations

1. Much of the conduit in the facility is showing signs of corrosion depending upon its location. This corrosion ranges from moderate to very severe. [Picture E10]

2. In light of the corrosion shown on the conduit and electrical gear, it is likely that this same corrosion exists within electrical devices such as switches and receptacles. It is likely that their operation is degrading due to the high moisture levels.

3. Based on the corrosive effects seen on conduit, lighting, and electrical devices it is highly likely that the same corrosion exists on exposed portions of wiring in the facility. Exposed wiring may be present at any junction boxes, electrical device connections, etc.

4. There appears to be a lack of adequate convenience receptacles in this facility. The receptacles that are there do not all appear to be GFI protected as is required by the code.

5. There do not appear to be any GFI protected convenience receptacles located at the pool deck area as is required by the National Electric Code.

6. There is a metal j-box with broken PVC conduit running up into the bottom of it at the pool deck. This situation is exposed to the general public and provides a potential risk of shock. [Picture E11]

7. It is not known whether the code required grounding grid exists around the pool at this point. I was unable to locate an area within pool building were the ground wire may have come up. This may indeed exist. However, it would be difficult to determine whether or not it is installed with out jack hammering out the concrete.

8. There is a junction box cover not installed located at the bottom of one of the light poles that serves the pool area. Presently it would be possible for any one of the general public to reach in to the pole and grab electrical wires. This is exposing the general public to a potential electrical shock hazard. [Picture E8]

9. There is not a fire alarm present in the building.

10. The phone service to the building appears to come in on the North side of the building.

11. Electrical conduit support devices all appear to be metal. These supports show varying degrees of corrosion from moderate to severe. [Picture E10]

Opinion of Probable Cost for required Electrical Improvements = **$100,000.00**

Mechanical Observations

Pool Equipment:

Only the main pool is addressed. The existing pool recirculation and filtration system consists of two (2) pumps, two (2) sand filters and a chemical feed system.

The pumps were new in the 1970's and are too small to provide the required water exchanges per day and are recommended to be replaced. (Per 10 state code) Some of the piping associated with the pumps is degraded, full of scale and at least one (1) valve does not operate and is therefore recommended to be replaced. [Pictures M1 & M2].

The sand filters show rust on the outside [Picture M3] but one option is to renovate them.

The interior condition at the filters are unknown. Opinion of probable cost of replacing the pool circulation pumps, related piping, renovating the filters, and replacing chemical feed system is $70,000.00.

Our opinion of probable cost to provide new filters including building wall removal and replacement for filter change out is $100,000.00.

The return line from equipment to gutter is thought to be able to remain in service. However, if it were to be replaced our opinion of probable cost would be $20,000.00.

As an option a gas fired pool heater could be added. Our opinion of probable cost including gas piping would be $45,000.00.

Plumbing System & Fixtures:

Replacement of plumbing fixtures in this report **assumes the number of fixtures remain the same**. The code requires more fixtures than exists. Preliminary observations indicated that to install the proper number of fixtures major rearrangement of Shower Rooms would be required as a minimum and **quite possibly building enlargement might be required.** The cost for this building enlargement is not included in any of the mechanical costs listed.

Public Toilets

The water was turned off, therefore, no plumbing fixture operation could be observed.

While the public toilets work, they are unsightly and do not meet ADA. The water closet has proper height to meet ADA, however, the space is insufficient. The lavatory is the wrong height and the faucet configuration is incorrect to meet ADA. [Picture M4]

Showers

The condition of these rooms is similar to the Public Toilets in that they reportably function to a degree but are unsightly and do not meet ADA. There are three (3) water closets in the Women's Shower and two (2) in the Men's Shower. They are too low to meet ADA.

There are three (3) urinals in the Men's Shower. Two (2) mounted at 26" and one (1) at 21". These fixtures are reported to function acceptably. However, the flush valves and related piping have considerable deterioration.

There are two (2) lavatories in the Women's Shower and one (1) in the Men's Shower. They are at the wrong height to meet ADA. The faucets are at an incorrect configuration to meet ADA. [Picture M5]

There are four (4) showerheads in each of the Men and Women's Shower Room. They appear to have worked acceptably. The piping is surface mounted. [Picture M6]

There is one (1) drinking fountain in each of the Men and Women's Shower Room. It is unsightly degraded and does not meet ADA. [Picture M7]

There is a single natural gas fired water heater serving the showers. While it appears to have been is service for some years it is thought that it has some life left. The hot water mixing valve does not meet requirement, in that it does not prevent too high of temperature of hot water. Opinion of probable cost of proper valve $5,000.00. The only natural gas used in the building is for the water heater. This piping appears in good condition.

The water service to the facility is 4" and is in the lower level. It shows considerable rust but is reported to function and can be reused.

The waste and vent piping serving the showers was installed in the 1940's and is therefore, assumed to be in very poor condition and should be replaced. Our opinion of probable cost to replace the plumbing fixtures in the Public Toilet and Shower Rooms including fixtures as well as water, waste, and vent piping and cutting and patching the floor would be $125,000.00.

Ventilation

Public Toilet Rooms

No ventilation exists for the Toilet Rooms, exhaust for these rooms may be added. Opinion of probable cost $5,000.00,

Showers

The existing ventilation for these rooms consists of a single gravity vent through the roof and has severe damage and does not operate. Exhaust for both showers are recommended to be replaced. Opinion of probable cost $5,000.00.

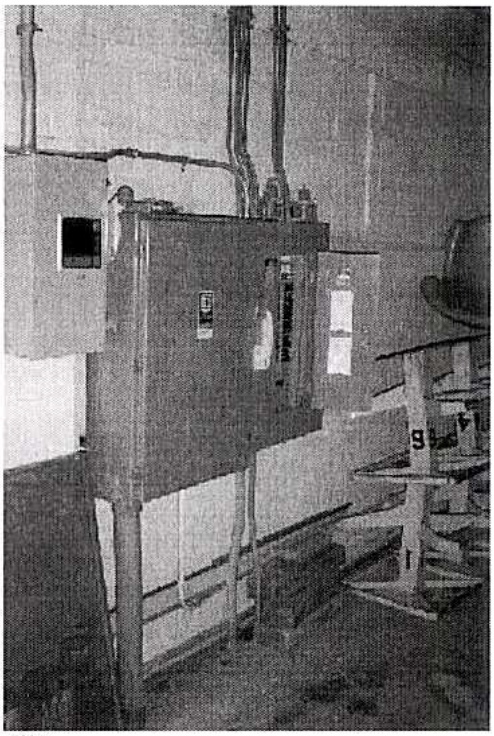
Mechanical Room

No ventilation exists for this area. Exhaust through the roof and intake air through the wall is recommended. Opinion of probable cost $10,000.00.

Opinion of Probable Cost for all suggested mechanical improvements = **$385,000.00**

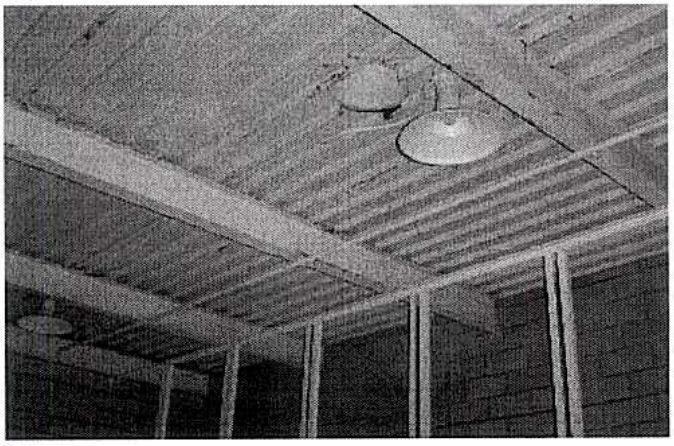
30-5301 Yankton Pool Study Electrical Pictures

E1



E2

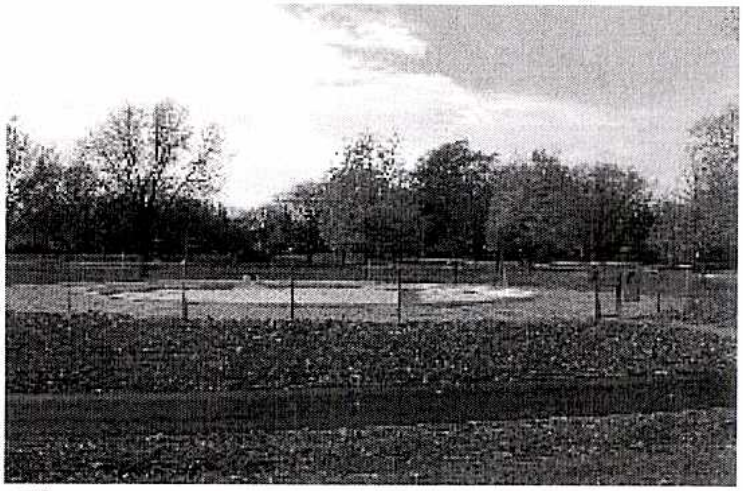
E3



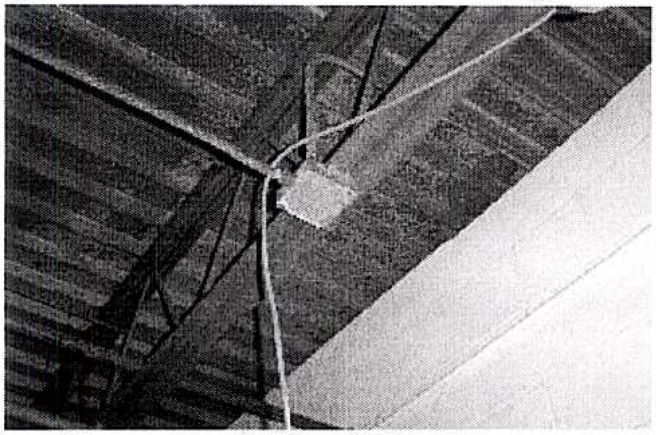
E4

30-5301 Yankton Pool Study Electrical Pictures

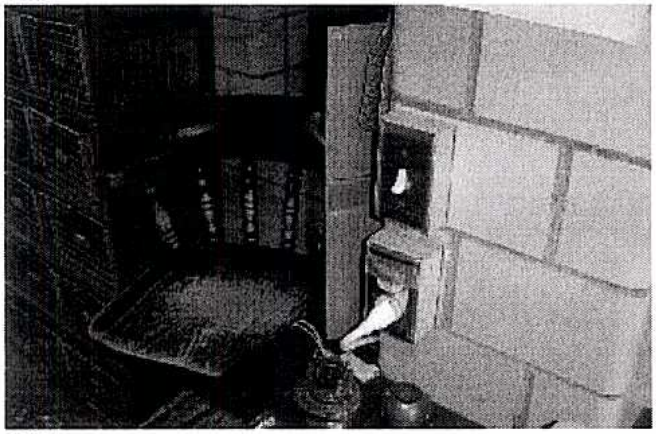
E8



E9



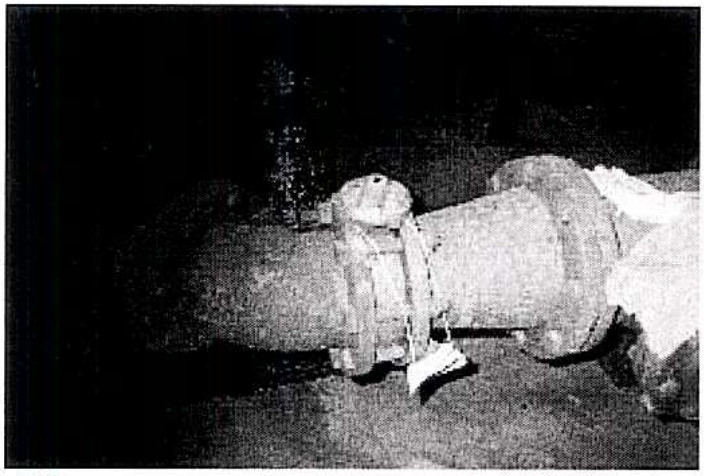
E10



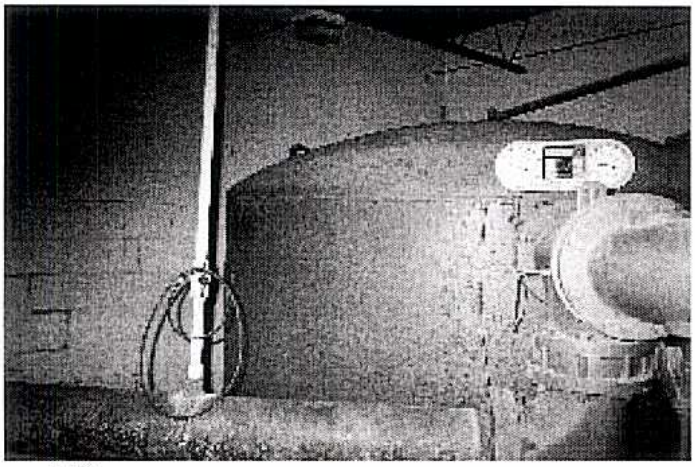
E11

30-5301 Yankton Pool Study Mechanical Pictures

M1



M2



M3

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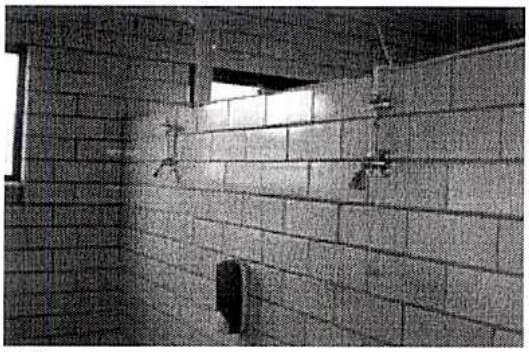
M4

M5



M6

M7