APPENDIX G:

HISTORIC FOUNTAIN RESTORATION REPORT

ADDISON POOLS INC.

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B1/C-53 753417

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Los Angeles, CA 90027-5390

Prepared for:

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- Mechanical
- Electrical
- Interior surface

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- Proposed repair or replacement design
- Proposed hydraulic repair/replacement design
- Proposed electrical repair design
- Proposed equipment replacement design
- Proposed interior surface repair and design

Summary

Approximate Replacement Estimate

Approximate Repair Estimate

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Consultants List Required for Replacement/Repair

Historical Consultant
Surveyor
Geologist/Soils Engineer
Structural Engineer
Hydraulic/Mechanical Consultant
Electrical Design Consultant
Landscape Material Consultant
Contractor

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Project Description

Eastern Fountain, Round Terraced

Size

Center section, approximately 18' across a circular shaped vessel

Larger ellipse, encircling the center fountain by 50% and approximately 30" wide

Total water quantity, both vessels; approximately 2,900 gallons

Original Design Intent

Subject to some speculation; ideas to include

- The fountain was to spill from the semi-circle into the round portion
- The entire fountain water level to be at a similar elevation.
- The wall separating the vessels was intended to be a walk-way to view the planting material
- The semi circular area being a place to contain and separate varieties of planted material
- The circular fountain was to flow west, through a meandering stream along the north section of the courtyard and house, flow through the house into the vessel in front of the fireplace and overflow into the large square vessel at the west side of the home, creating an effect of water flowing through the home

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General Condition

The overall condition of the fountain is poor and unable to retain water. It is unfeasible for the fountain to be operational without significant work. The breakdown of condition is as follows;

- Existing Structural Condition

  The fountain has several cracks at, below and above waterline. While the ones at waterline conceivably could be allowed to remain, the ones below the waterline would allow water to escape into the soils below, further exacerbating the damage.

- Mechanical Condition –Piping

  Generally non-existent. A return line appears to feed the basin, perhaps being attached to a submersible pump or a pump housed in a burial vault adjacent to the vessel. There appears to be no provisions for filtration. There currently is a small feed line that was most likely used for fill purposes.

- Mechanical Condition – Electrical

  Generally non-existent.

- Mechanical Condition – Equipment

  Non-existent

- Interior Surface Condition

  Generally poor, painted concrete surface

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Summary of Cause of Condition

- Structural Condition

  Most likely due to inadequate preparation of soils which support the vessel. Proper compaction and certification at the time of construction was not regulated and no guarantee can be made as to what degree of compaction was provided for the soils that support the vessel. Unless designed for unfavorable soils conditions, structures placed in dirt derive a significant amount of their strength from the soils in which they are founded. If there is uneven compaction, or if the vessel is placed on bearing materials of different values, i.e. partially on bedrock and fill, settlement of the supporting soils can occur underneath and around the vessel. With the vessel unevenly supported, unless designed structurally for this, structural cracking can occur. Additionally, without forensic assessment, no guarantee of the materials used to construct the vessel can be made. It is assumed that there is some reinforcement, most likely with a steel or wire fabric, in the concrete and that the concrete the vessel is comprised of has a modicum of strength. It is questionable if the concrete used at the time of construction was designed or tested and if any waterproofing agents were used in conjunction with the concrete mix. Constant saturation of the concrete mix may have caused deterioration of the steel support system, further weakening the structure. The reinforcement, if applicable, most likely has deteriorated in the area of the cracks and has no structural value.

- Mechanical Condition - Piping

  Filtration piping is virtually non-existent. Condition cannot be assessed without forensic assessment; however, I question the value of making that assessment. The piping most likely was never efficient, nor was valued from a proper hydraulic standpoint

  Replenishment water supply – Fill line

  Not suitable for fill, automatic fill device not installed and no backflow prevention device is installed as per current Los Angeles City standards

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Overflow piping – Connection to sewer or storm drainage system cannot be ascertained without investigation. Piping currently appears to be cast-iron which may or may not have been installed at conception. Cast iron typically has a life span which is greatly decreased when chemically treated water is used.

- Mechanical Condition – Electrical Power and Bonding

  Non-existent – no assessment can be made towards the power supply and without demolishing the vessel, no assessment can be made as to whether the pool has been properly bonded

- Interior Surface Condition

  Painted surface. Paint can be an aesthetic covering which provides a measure of waterproofing as well as a clean smooth and appealing effect. Paint is under duress from chemicals, water, and sunlight and once installed becomes a maintenance factor in that it must be replaced on a regular basis; yearly is not uncommon. The surface may have initially been a smooth coat of concrete or plaster type of surface which we are unable to determine without some destructive investigation.

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Repair/Replacement Design Work Required

- Proposed replacement/repair design

  Initial thought would be to remove the entire structure, after thoroughly documenting size, shape and elevation landmarks, and replace with a similar structure using modern construction techniques.

  Common practices would include

  Aesthetic evaluation, discussion and direction as to intent of original design and direction of how to proceed

  Geological assessment of soils conditions and proper recommendations towards repair

  Evaluation of geological conditions by a licensed structural engineer and a recommendation and plan be provided as to structural design

  Design factors would include

  Concrete mix

  Concrete thickness

  Concrete additives, waterproofing additives

  Structural steel design

- Proposed hydraulic design

  Design factors would include

  Providing proper filtration,

  Fill/make up water

  Backflow prevention

  Overflow and waste water provisions

- Proposed electrical design

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Design factors would include

Power requirements

Hook-up of equipment and proper time cycles

Electrical bonding requirements

Lighting (if desired)

- Equipment design

  Factors to include ultimate design intent of fountain, whether it is to be a filtered, clear water system or to be a planted water garden

  Equipment location

  Pump sizes and efficiency

  Filtration types and efficiency

  Lighting aesthetics (if chosen)

- Interior finish and waterproofing design

  Design factors to include

  Plaster versus paint versus cementitious products to provide waterproofing

  Aesthetics of chosen material

An alternate to entirely replacing the structure is to perform a structural repair of the cracked areas only. This would include partial demolition of the damaged area, enough to provide a structural splice to the existing steel, and replacement of the concrete in that area. As mentioned previously, the damage has likely occurred due to poor soils conditions and this repair will not address those concerns. It may or may not work. Additionally, this repair will show signs of a

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"cold-joint", or the distinction between the concrete pours which may or may not influence the aesthetics of the vessel. If the vessel is repainted, the appearance of the joint would be minimal.

An additional alternative to replacing the vessel is to fill the cracks with an epoxy material to attempt to "glue" the vessel together and then to coat the vessel with a fiberglass liner. The fiberglass liner is a flexible membrane that is applied on the existing structure. Because fiberglass is somewhat flexible, it would bridge the cracks and bend rather than crack, maintaining the watertight integrity of the vessel. I question the aesthetic value of a modern product like fiberglass in this application.

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Summary

Although repair of existing structure is mentioned above, I truly feel the best definitive method of repair is to remove and replace the structure. All of the advances in construction techniques could be utilized while maintaining the essence of the original architecture. If we use proper cements such as a Colton or High-Early cement with a "washed" finish, we can ensure the look of the replacement is that of an "aged" vessel. While reconstructing the vessel, we can ensure that we are founded on proper bearing material and that the vessel is structurally designed to prevent cracking. We would provide a proper filtration system, most likely in an unobtrusive subterranean vault at a satellite location. If plant material is to be used, we would design for a biological system to promote a natural filtration in addition to a mechanical device. Proper fill and overflow devices would be installed to minimize saturation of the surrounding soils. Additionally, we could contemplate lighting as an enhancement to the vessel.

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Replacement Estimate

Approximate cost to replace structure with current prevailing wage standards and excluding consultant fees – $125,000.00 - $150,000.00 +-

Repair Estimate

Approximate cost to repair existing structure with current prevailing wage standards and excluding consultant fees - $75,000.00 - $100,000.00 +-

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Western Fountain, Square Terraced

Size

Overall size approximately 25' x 25'

Center section, approximately 16'

Upper terraced section, approximately 5' at 75% of the vessel

Total water quantity, both vessels; approximately 7,000 gallons

Original Design Intent

Subject to some speculation; ideas to include

- The fountain was to spill from the upper terraced sections into the larger center area
- The entire fountain water level to be at a similar elevation.
- The wall separating the vessels was intended to be a walk-way to view the planting material
- The upper terraced area being a place to contain and separate varieties of planted material
- The circular fountain was to flow west, through a meandering stream along the north section of the courtyard and house, flow through the house into the vessel in front of the fireplace and overflow into the large square vessel at the west side of the home, creating an idea of water flowing through the home

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General Condition

The overall condition of the fountain is poor and unable to retain water. It is unfeasible for the fountain to be operational without significant work. The breakdown of condition is as follows;

- Existing Structural Condition

  The fountain has several cracks at, below and above waterline. While the ones at waterline conceivably could be allowed to remain, the ones below the waterline would allow water to escape into the soils below, further exacerbating the damage. Additionally, the fountain has cracked and tipped at the south west corner significantly and is unable to retain water for any length of time.

- Mechanical Condition –Piping

  Generally non-existent. There is an overflow line existing from the center of the planter at the east, possibly to accommodate the concept of the interior pond flowing into this vessel. Additionally there is an antiquated float type of automatic fill device covered by a modern stainless steel housing that is not operational at this time, nor is it connected to a backflow prevention device. There appears to be a drain pipe in the center of the vessel that is unable to be assessed without mechanical investigation.

- Mechanical Condition – Electrical

  Generally non-existent.

- Mechanical Condition – Equipment

  Non-existent

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- Interior Surface Condition

  Generally poor, painted concrete surface

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Summary of Cause of Condition

- Structural Condition

  Most likely due to inadequate preparation of soils which support the vessel. Proper compaction and certification at the time of construction was not regulated and no guarantee can be made as to what degree of compaction was provided for the soils that support the vessel. Unless designed for unfavorable soils conditions, structures placed in dirt derive a significant amount of their strength from the soils in which they are founded. If there is uneven compaction, or if the vessel is placed on bearing materials of different values, i.e partially on bedrock and fill, settlement of the supporting soils can occur underneath and around the vessel. With the vessel unevenly supported, unless designed structurally for this, structural cracking can occur. Additionally, without forensic assessment, no guarantee of the materials used to construct the vessel can be made. It is assumed that there is some reinforcement, most likely with a steel or wire fabric, in the concrete and that the concrete that the vessel is comprised of has a modicum of strength. It is questionable if the concrete used at the time of construction was designed or tested and if any waterproofing agents were used in conjunction with the concrete mix. Constant saturation of the concrete mix may have caused deterioration of the steel support system, further weakening the structure.

- Mechanical Condition - Piping

  Filtration piping is virtually non-existent. Condition cannot be assessed without forensic assessment; however, I question the value of making that assessment. The piping most likely was never efficient, nor was valued from a proper hydraulic standpoint

  Replenishment water supply – Fill line

  Not suitable for fill, automatic fill device not operational and no backflow prevention device is installed as per current Los Angeles City standards

  Overflow piping – Connection to sewer or storm drainage system cannot be ascertained without investigation. Piping currently appears to be cast-iron which may or may not have been installed at conception. Cast

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iron typically has a life span which is greatly decreased when chemically treated water is used.

- Mechanical Condition – Electrical Power and Bonding

  Non-existent – no assessment can be made towards the power supply and without demolishing the vessel, no assessment can be made as to whether the pool has been properly bonded

- Interior Surface Condition

  Painted surface. Paint can be an aesthetic covering which provides a measure of waterproofing as well as a clean smooth and appealing effect. Paint is under duress from chemicals, water, and sunlight and once installed becomes a maintenance factor in that it must be replaced on a regular basis; yearly is not uncommon. The surface may have initially been a smooth coat of concrete or plaster type of surface which we are unable to determine without some destructive investigation.

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Repair/Replacement Design Work Required

- Proposed replacement/repair design

Due to the significant damage from settlement, it is mandatory that any attempt at restoration includes addressing the soils conditions beneath. The vessel is significantly cracked and is completely out of level. Any attempts at patching or repair from structural standpoint would be temporary as cracking would probably occur during the first heavy rain from settlement, expansion or movement of the soils. Fiberglass lining would not work unless significant effort was put into leveling and stabilizing the vessel but I question the aesthetics of the fiberglass. The proper repair would include removing the entire structure, after thoroughly documenting size, shape and elevation landmarks, and replacing it with an identical structure using modern construction techniques. It is expected that the repair would require deep footings founded on competent bearing materials to ensure further settlement does not occur. An alternative to this may be to over excavate and re-compact in the area of the fountain prior to reconstruction and construct the new fountain as a "floating" structure which requires no support from the soils for strength. This not a desirable method of repair as further settlement may continue and "tipping" of the new shell may occur. There could be further discussion of excavation under the existing structure and providing additional structural support to the vessel by underpinning, but without knowledge of where suitable bearing materials are, it could be an open ended proposition of repair. Additionally, extensive remedial concrete work would need to be done at the surface to ensure further leaking does not occur and the cracks are properly filled. Again, an undesirable method of definitive repair.

Common construction practices would include-

Aesthetic evaluation, discussion and direction as to intent of original design and direction of how to proceed

Geological assessment of soils conditions and proper recommendations towards repair

Evaluation of geological conditions by a licensed structural engineer and a recommendation and plan be provided as to structural design

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Design factors would include

Concrete mix

Concrete thickness

Concrete additives, waterproofing additives

Structural steel design

- Hydraulic design

  Design factors would include

  Providing proper filtration,

  Fill/make up water

  Backflow prevention

  Overflow and waste water provisions

- Electrical design

  Design factors would include

  Power requirements

  Hook-up of equipment and proper time cycles

  Electrical bonding requirements

  Lighting (if desired)

- Equipment design

  Factors to include ultimate design intent of fountain, whether it is to be a filtered, clear water system or to be a planted water garden

  Equipment location

  Pump sizes and efficiency

  Filtration types and efficiency

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Lighting aesthetics (if chosen)

- Interior finish and waterproofing design

  Design factors to include

  Plaster versus paint versus cementitious products to provide waterproofing

  Aesthetics of chosen material

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Summary of Repair

Although repair of existing structure is mentioned above, I truly feel the best definitive method of repair is to remove and replace the structure. All of the advances in construction techniques could be utilized while maintaining the essence of the original architecture. If we use proper cements such as a Colton or High-Early cement with a "washed" finish, we can ensure the look of the replacement is that of an "aged" vessel. While reconstructing the vessel, we can ensure that we have a proper bearing material and that the vessel is structurally designed to prevent cracking. We would provide a proper filtration system, most likely in an unobtrusive subterranean vault at a satellite location. If plant material is to be used, we would design for a biological system to promote a natural filtration in addition to a mechanical device. Proper fill and overflow devices would be installed to minimize saturation of the surrounding soils. Additionally, we could contemplate lighting as an enhancement to the vessel.

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Replacement Estimate

Approximate cost to replace structure with current prevailing wage standards and excluding consultant fees; pending review of soils conditions – $175,000.00 - $200,000.00 +-

Repair Estimate

Approximate cost to repair existing structure with current prevailing wage standards and excluding consultant fees - $100,000.00 - $150,000.00 +-

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Consultant List and Description of Services

- Historical expert

  To ensure the replacement design intent is historically accurate

- Surveyor

  To accurately document the existing structure size, elevation and location

- Geologist/Soils Engineer

  To ensure the repair/replacement is founded on compenat soils with a bearing value that will support the new structure or ensure that the repair is feasible from a geological standpoint. Work that is required would include test-pits, assessment of compaction, recommendation of support system

- Structural Engineer

  To ensure the replacement/repair is mathematically calculated for design strength and to collaborate with the geological consultant to ensure further damage does not occur

- Hydraulic/Mechanical Consultant

  To provide flow design, equipment location, code required freshwater connection requirements and overflow connections

- Electrical Consultant

  To provide proper load requirements, proper bonding plan and code required connections. Additionally may be required for lighting design

- Landscape Architect or Designer

  To provide planting schedule for plant replacement

- Contractor

  To execute the plan