



## MEMO

**Date:** April 7, 2010

**To:** File *DOE*

**From:** Tenneson Engineering Corporation

**Re:** Ted Walker Memorial Pool – April 2009 Pre-Use Inspection

I inspected the Mechanical Room of the pool facility on April 7, 2010. Present was Scott Green and the pool operator. At this time, there was very little concrete rubble located within the Mechanical and Bowler Room areas. I would estimate that the amount of spalled concrete would amount to less than 1/10 of a cubic foot. It did not appear that there was any new cracking within the concrete beams or wall sections. At this time, the Parks District had placed three steel tube supports under three concrete beams and provided adequate jacking and cribbing to support the loads. I recommended to the Parks District to clean up the rubble and to conduct daily monitoring of the concrete within the Mechanical Room during the summer use period. Any amounts of rubble that occurred on a daily basis of approximately a handful or more, should be immediately reported to me and allow an inspection to occur. All rubble is to be left in place until I had witnessed it, whether during the summer operating season or at the end of the season, after the Labor Day closure. At this time, it was also noted that the Parks District had attempted to gain access to the gallery on the south side of the pool. Access had been obtained utilizing a rotohammer drill through the concrete bulkhead. This bulkhead was determined to be approximately 8" to 10" thick based upon the hole that was drilled approximately half-way up from the bottom of the bulkhead. This bulkhead area had been filled with sand and other rubble material. At this time, I also mentioned to the Parks District that continued use of this facility would probably only last another year or two unless a substantial remediation project was undertaken. They mentioned they would be going out for a bond issue this fall to possibly construct a new aquatics center that would replace this pool, hopefully by the 2012 operating season.



May 4, 2009

Mr. Scott Green, Executive Director  
Northern Wasco County Parks & Recreation District  
414 Washington Street, Suite 1D  
The Dalles, Oregon 97058

Reference: Spring 2009 Ted Walker Memorial Pool Inspection

Dear Scott:

At your request, Tenneson Engineering Corporation conducted a cursory visual inspection of the Mechanical Room within the Ted Walker Memorial Pool. This inspection was done by Darrin O. Eckman, Oregon Registered Professional Engineer No. 51430, on April 29, 2009, in your presence. The purpose of this inspection was to evaluate the extent of additional damage that may have occurred since the last inspection done in May 2008. During these previous inspections, it was noted that there were numerous areas within the ceiling of the Mechanical Rooms where the concrete was spalling away from the reinforcing steel. This spalling, once again, occurred both within the flat slab ceiling and also within the drop grade beams and columns, particularly those located adjacent to the pool structure. During the most recent inspection, it was noted that there was very little debris that appeared to have spalled from the ceiling. Our office had directed your organization to not clean up any fallen material to give Tenneson an opportunity to evaluate, once again, the extent of the ongoing damage.

At this time, there does not appear to be significant additional damage that has occurred on this structure and, therefore, I feel that the structural adequacy of the overall structure has not been compromised at this point. As noted in previous correspondence, it is difficult to predict the timing of failure in a system such as this. Once again, we would estimate that extreme structural distress would be somewhere in the period of three to five years. At this time, I would recommend the following action items.

- District staff to clean the entire mechanical room area of all concrete and reinforcing steel debris. This area should be checked by yourself upon completion to verify that all materials from in between, under, and surrounding any other structures within this room be completely removed to better insure that our next inspection establishes any possible additional debris.
- This Mechanical Room area should be inspected daily during operation by staff. Any large amounts of debris (those that displace a cumulative amount of material more than say a 6" square area) should be immediately reported to yourself and Tenneson Engineering contacted for additional inspection and evaluation.
- The debris during this operational year should not be cleaned unless directed to do so by my office. Once again, this is to allow us a better opportunity to evaluate the extent and rate of deterioration that is occurring within this area.
- As discussed, based upon our inspection at this time, Tenneson Engineering will pursue structural calculations of the existing flat slab decks and drop grade beams. The purpose of this evaluation is to establish the working stress within these members. Due to placement of the additional steel columns, at approximately the midspans of the drop beams, this greatly reduces the stress that these beams may

be carrying and thus could prolong the lifespan of these members. In addition, with the second pool deck poured atop the first deck, this, once again, would also further provide evidence of adequate structural strength to withstand the anticipated loads. We would appreciate it if you could forward our office any drawings, both from the original pool construction and also from the pool retrofit that was done, as we understand it, approximately 20 years ago.

- For continued inspections, we recommend that the District reestablish access into the two corridors on either side of the pool. These accessways were, at one point, concreted in. It would be preferable that the District provide a 24" square access hole into these corridors for further inspection of the deterioration that may be occurring in these areas. The extent of deterioration in these areas is unknown since they cannot be visually inspected at this time. These access holes can be established utilizing a concrete cutting chainsaw or other such method. You may wish to contact local contractors or rental stores for such a device. One contractor to note would be Schuepbach Concrete Construction of Hood River. I believe that they do have access to this type of equipment. After access is obtained, then proper confined space entry measures should be followed and an inspection of these access tunnels should be done to establish the extent of deterioration, if any, that has occurred in these areas.

I understand that the Parks and Recreation District is currently working on a master plan that may involve a new pool structure somewhere in the next three to five years. I believe that this the best way for the District to proceed, once again noting that renovation of the existing damaged structure may tend to be quite costly and the fact that unless all portions of the structure are thoroughly evaluated, there still may be substantial areas of oxidation and deterioration that are occurring that may affect the renovated structure in the future.

Please feel free to contact me should you have any questions concerning this evaluation and also we will schedule an evaluation in the fall of 2009, assuming that no further deterioration occurs during the course of operation.

Sincerely yours,

TENNESON ENGINEERING CORPORATION

  
Darrin O. Eckman, P.E.

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**TENNESON**  
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May 21, 2008

Via Mail & Fax 296-1239

Scott Green  
Northern Wasco County Parks and Recreation District  
414 Washington Street, Suite 1D  
The Dalles, Oregon 97058

Reference: Ted Walker Memorial Pool

Dear Scott:

At your request, Tenneson Engineering Corporation is hereby providing you with the limited opinion regarding the structural adequacy of the existing concrete structure supporting the Ted Walker Memorial Pool in The Dalles, Oregon. As you are well aware, I visited the facility, in your presence, during the summer of 2007. During this visit, it was noted that there were numerous areas within the ceiling of the Mechanical Room where concrete was spalling away from the reinforcing steel. This spalling was occurring within both the flat-slab ceiling and also within the drop-grade beams and columns, particularly those located adjacent to the pool structure. We were unable to access all of the locations during that time period, however, we also inspected the concrete deck surrounding the pool. It is my opinion that the pool deck drainage system has somehow been compromised and allows water to be in close contact with the reinforcing steel. This has caused the reinforcing steel to oxidize and as the reinforcing steel is oxidized, or rusts, it has essentially grown in size and cracked the concrete surrounding it. It is my opinion that this is a dangerous condition for two reasons. The primary reason being that the flexural strength of the concrete has been compromised by the reduced strength of the reinforcing steel. In addition, the entire concrete structure strength has been compromised due to the cracking and spalling of the concrete, both surrounding the reinforcing steel and in the other areas inspected. It is extremely difficult to predict timing of failure in a system such as this. It could be a matter of months or years. However, my estimate would be extreme structural distress somewhere in the period of 3-5 years. The oxidation of the rebar will not get better with time and as the rebar is further oxidized and more spalling of the concrete occurs along the length of the drop beams and within the flat pan of the ceiling, this will further weaken the structure. While there are methods of remediation of the damaged rebar and concrete, it is my opinion that based upon the extensive nature of the situation and the fact that the primary cause of the initial oxidation, that being of a clogged or a non-functioning drainage system, has not been corrected then the situation will reappear at a later date.

We certainly look forward to working with the Northern Wasco County Parks and Recreation District on resolving this problem and possible coming up with a better designed system with some of the new products that are available now. Please do not hesitate to contact me should you have any questions concerning this opinion.

Sincerely,

Darrin O. Eckman, P.E.

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<prosp.956>