Hal Moe Pool Building

Structural Assessment

405 Third St.
Snohomish, WA 98290

CG Project No.: 14206.10

November 2014

11/3/14

250 4th Ave. South
Suite 200
Edmonds, WA 98020

Phone: 425.778.8500
Fax: 425.778.5536
www.cgengineering.com

Executive Summary

The Hal Moe Pool was built in the 1960's and later remodeled and enclosed in 1989. The facility was closed in 2007 and has remained vacant since that time. The building has not been maintained for several years, and has areas of damage due to water intrusion from the exterior, and a humid pool environment from the inside.

Different options are being explored for the site. These options include refurbishing the existing building for a new public use, demolishing the building and constructing a new public facility, or demolishing the building for more open space. Considerations will need to be made for each option.

Option 1: Refurbish the Existing Building

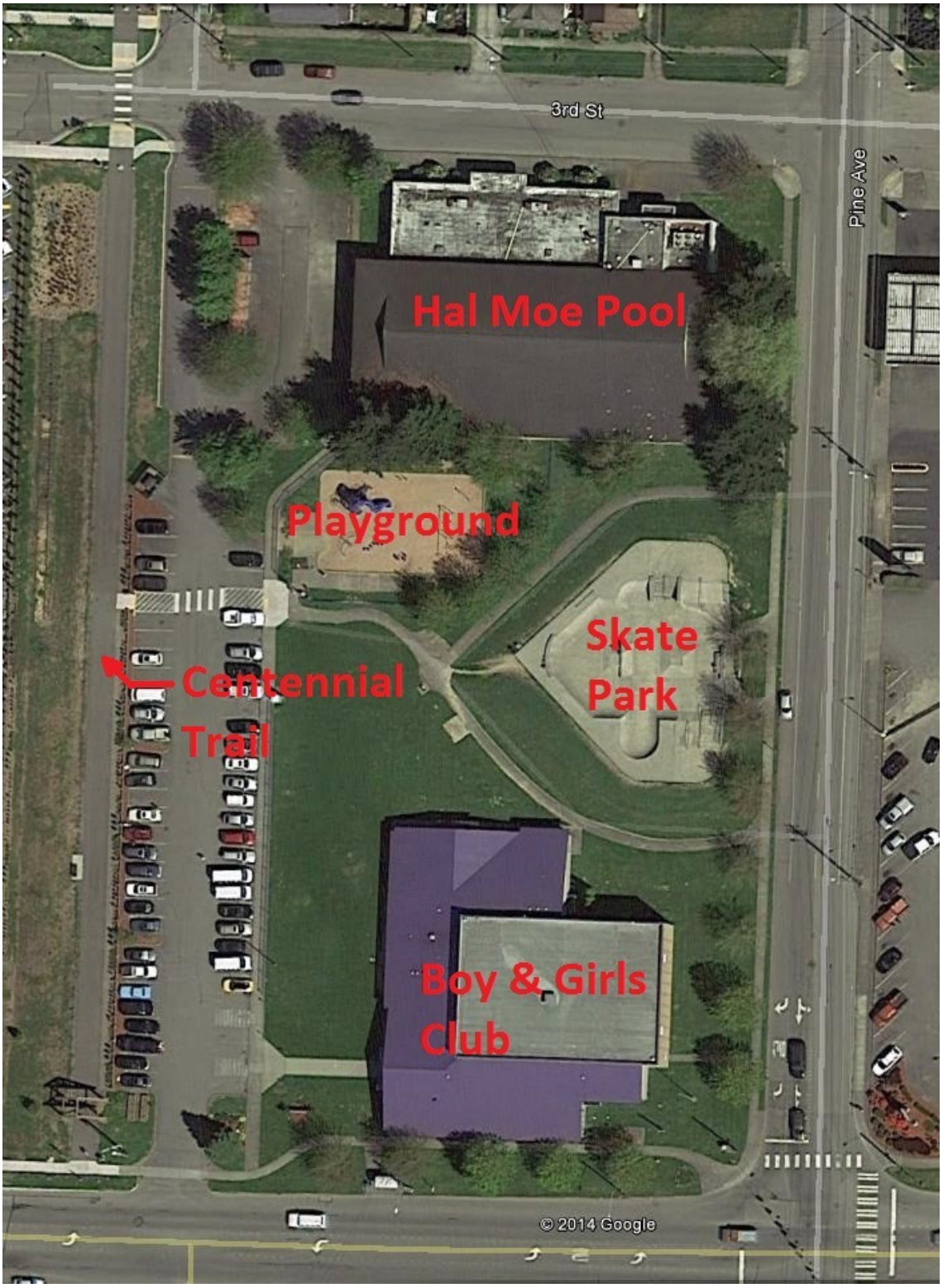
- The existing superstructure can remain and be used for a building of similar or smaller size and shape
- The roofing, roof sheathing, and roof joists should be replaced
- The existing locker rooms and lobby should be demolished
- The existing walls should be replaced with new stud walls
- Site improvements would be minimal
- Refurbishing the existing building could provide an open 14,000 sf facility for substantially less cost than constructing a new facility.
- Replacing the roof and walls will allow for a re-design and re-styling of the facility
- The City could retain a building that has been part of the community for 25 years.

Option 2: Demolish Existing Building and Construct a New Building

- A new building could be built that would not be constrained to the exact location or shape of the existing building.
- The existing glulam beams and columns could be salvaged and sold as reclaimed lumber.
- Constructing a new building would require new site development which could include new utilities, and a drainage system.
- Construction of a new building of similar size would be substantially more costly than refurbishing the existing building.

Option 3: Demolish Existing Building and Leave as Open Space

- The existing glulam beams and columns could be salvaged and sold as reclaimed lumber.
- Minor site development would be required.



Aerial View of Hal Moe Pool Building

(Courtesy of Google Earth)

INTRODUCTION

CG Engineering was retained by the City of Snohomish to assess the condition of the Hal Moe Pool building and explore possible options for the site. The site consists of an existing covered pool structure and parking lot. It is adjacent to several other public facilities including a playground, Snohomish Skate park, The Boys and Girls Club, and The Centennial Trail. Refer to photos 6-8.

The pool building was closed in 2007 and has remained vacant since that time. The building includes a 14,000sf covered pool structure, and an attached 4,500sf locker room and lobby. The pool and changing rooms were constructed in the late 1960's and the covered pool structure was added in 1989. The locker rooms were constructed with masonry walls and a wood framed roof. Refer to photos 1-5.

The covered pool structure was constructed with large glulam columns and beams which span the width of the building, creating an unobstructed open area approximately 70ft wide x 180ft long and 26ft high at the center. The columns are inset slightly from the exterior walls. The exterior walls around the pool structure are wood framed, and supported by a masonry wall on a conventional concrete foundation. The interior of the pool building includes a diving pool, large lap pool, smaller training pool, and small therapy pool. Refer to Appendix A. At the time of our observation all pools were dry and appeared to have been drained several years ago. The interior floor was concrete and was sloped to drains around the pools.

OBSERVATIONS

A visual inspection of the structure was performed to observe the roof framing, glulam roof beams, columns, and wall framing. The roof framing and glulam beams were observed with the use of a mechanical lift at accessible locations. The wall framing and column bases were observed at ground level and at accessible mechanical lift locations. Portions of interior finishes had fallen down or were removed allowing access to the roof, wall, and column base framing. Areas suspected of rot were visually observed, then examined with a small probe to determine the extent of the rot.

Exterior

An inspection of the exterior walls for the pool structure was completed. Each wall was observed from the outside, and inspected for water damage and rot through the use of field techniques.

The exterior walls consisted of sheathed wood studs on top of masonry stem walls. Refer to photo 9. The masonry wall ran around the perimeter of the main pool structure. The exterior of the masonry was furred out with wood panel siding. Where side rooms were located off the main structure, the exterior walls consist only of wood studs and plywood sheathing. At several locations it was observed that the exterior siding was severely rotted. Refer to photos 10 and 11. While this condition was common around the perimeter, it seemed especially prevalent at locations where the roof gutter pipes were missing.

The wall cavities were opened during the assessment and observed. A vapor barrier was located on both the interior and exterior face of the studs. At the location opened, the wall cavity was damp and mold was observed. Rot was also present in the studs. Refer to photos 12 and 13. When a vapor barrier is applied to both the interior and exterior of a wall, it is common to have significant water damage without continual maintenance. The interior vapor barrier was likely required to protect the framing from the humid air caused by the pool. When the vapor barrier was punctured the water vapor in the air was allowed to enter the wall cavity, and then was not

able to escape causing the water to remain inside the wall cavity. It is likely that over the life of the building, small punctures occurred in the vapor barrier resulting in increased moisture inside the wall cavity.

Roof Framing
The roof structure consisted of roof sheathing nailed to flat 2x4 sleepers that were supported at intermediate, and end locations by roof rafters. The roof rafters spanned between glulam roof beams. The glulam beams were supported by glulam columns on the interior side of the exterior walls. Refer to photo 14.

In many areas, the interior ceiling finish had fallen away exposing the roof framing and insulation. An interior and exterior vapor barrier was also installed on the roof. In many areas, the interior vapor barrier was exposed and the insulation was visible. In each of these locations mold was visible, and it appeared that water was trapped in the roof cavity. Refer to photo 15

The roof sheathing was observed from the underside with a man lift. All locations that were observed showed signs of heavy water staining. Areas of rot were also observed in the roof sheathing.

The roof joists were 2x12s spaced at 2'-0" on-center, and were observed from below where the interior ceiling finishes had fallen away. The locations observed showed signs of heavy water staining, mold, and minor rot. Refer to photo 16. The joists were supported at each end by a glulam beam, and were constructed with blocking between roof joists above the glulam beam.

Glulam Beams and Columns
The glulam roof beams (10 ¾ x 36 north side spanning 35'-0", 10 ¾ x 48 south side spanning 47'-0") follow the slope of the roof, and were connected at the ridge by a bolted knife plate. There was also a steel collar tie connecting the glulam beams. At the time of the observation the glulam roof beams appeared to be in good condition, and there was no observable water damage or rot present. Refer to photos 17-21.

The glulam beams were supported by columns, which were supported on concrete foundation plinths with steel knife plates. Several column bases were exposed during the observation, and no water damage or rot was present. Refer to photos 22 and 23.

The glulam beams and columns all appeared to be in good condition with no observable structural damage. Most beams were water stained from years of service in a humid environment.

Lobby and Locker Rooms
The lobby and locker rooms were constructed with masonry walls and a wood framed roof. The masonry walls were constructed with stacked bond (the masonry blocks were stacked vertically instead of staggering the masonry joints). Refer to photo 24. In each of the locker rooms, there was a distinct odor of mold and much of the debris on the ground was covered in mold. This is likely due to the building being vacant and unheated for several years.

The original construction drawings were reviewed for this area. Since the original construction of the pool building, the building codes have changed based on how standard construction practices have performed over time. The construction of the existing masonry walls no longer meets the requirements of the building code because they are prone to failure in a seismic event.

CONCLUSIONS

Depending on the desired use of the property, different options could be pursued for this site. The pool structure is located in a community area with an adjacent playground, Snohomish Skatepark, The Boys and Girls Club, and The Centennial Trail. An additional public facility would be well suited for the area, but the property could have other uses. To repurpose the site, the existing building will have to be addressed. The following options provide recommendations for the site based on the desired use.

Repair and Repurpose the Existing Structure

Despite the appearance from the exterior, the super structure of the building is in good condition, and could be left in place and reused. The main support structure of the building consists of glulam beams and columns spaced at 18ft on center. No damage was observed to any of the glulam beams or columns during the observation. The current framing system provides a completely open building that could have several different uses.

The exterior of the building was constructed from a combination of wood and masonry walls. In the observation of the exterior, several locations of water damage and rot were found. The entire exterior wall system will need to be demolished and reconstructed. Typically, the exterior walls also support roof load and reconstruction of the exterior walls would require temporary shoring of the roof structure, causing additional labor during construction. In the case of this building, the roof structure is entirely supported by the glulam beams, alleviating the need for temporary shoring and allowing easier construction. Reframing the exterior walls would also allow for the opportunity to add doors and windows to the exterior. With the height of the roof framing, large roll up doors could be installed on either end of the building.

The lateral force resisting system of the building currently uses a combination of plywood shear walls and masonry walls. With any remodel, the building would need to meet the requirements of the current building code. The masonry walls do not meet the requirements of the building code. It would likely be more cost effective to demolish the exterior masonry walls and replace them with wood shear walls then to upgrade them. Some additional foundation work would also be required.

The roof sheathing was damaged in several areas. Given the amount of damage, it is recommended that all of the roof sheathing and roofing be replaced. Almost all of the joists observed were affected by mold and some were also rotted. While the extent of the rot was minor, the amount of mold was extensive. Structurally, many of the joists are adequate, but it is recommended that any budget for remodeling include complete replacement of the joists. Given the cost of cleaning the mold and selective replacement, it will likely be more cost effective to replace all of the joists.

The existing pools will need to be filled to create a level floor. The existing floor of the building was exposed concrete and was sloped to drains around the pools. It may be possible to re-use some of the existing concrete floor, but much of it will need to be removed and replaced. Considering that a new concrete slab will be required in the pool areas, and some of the existing surrounding concrete will have to be replaced, it is recommended that the entire concrete slab be replaced.

The existing locker rooms and lobby were constructed with stacked bond masonry which does not meet the requirements of the current building code. Mold was prevalent throughout the locker

rooms. Given the type of construction, upgrading or remodeling this area of the building may not be possible or would likely be cost prohibitive. Demolition of the locker rooms and lobby is recommended.

The existing roof is framed with a hip style roof at each end. Since the glulam beams are spaced at 18ft and independently support the roof structure, it would be possible to remove the two end bays and the hip look of the roof. This would reduce the overall length of the building by 36ft, 18ft on each end but would provide a gable roof appearance. Also if a shorter building is desired, the building length could be reduced in 18ft increments at the glulam beam bays.

The City of Lynnwood recently completed a similar project in which they remodeled an existing pool structure. The construction was similar, with a glulam beam roof structure. The super structure was left in place and the remaining walls and roof were remodeled. The glulam beams were refinished and left exposed. Refer to photos 25 and 26 showing the before and after photos of the building.

Demolish Existing Building

The existing building could be completely demolished, and either the site could be left as open space, or a new building could be built in its place. The site is relatively flat, and several different types of buildings could be built in this location. Demolishing the building would require removing the existing structure, foundation, and concrete slab. The pools would also have to be filled.

The existing glulam beams and columns are not damaged and could be sold as reclaimed lumber. Several reclaimed lumber suppliers were contacted to research a possible value. The glulams were manufactured and erected specifically for the configuration of this building and have significantly more value in their current use than they would for another use. It may be difficult to find a reclaimed lumber supplier to purchase these glulams unless someone was constructing a building with similar dimensions. A minimal value of salvage could be applied to the glulams.

Site work would also be required for either a new building or open space. Considerations would need to be made for the drainage system with any redevelopment. Restoring the site with a new field or park likely would not require any additional drainage design, but if a new building was constructed, it would be required to follow the current drainage requirements. Depending on the size of the new building, a storm water detention system may be required.

Construction Costs & Salvage Value

To help compare the different options, construction costs have been reviewed for different conditions. The costs should be considered approximate since the scope of work for the site is mostly unknown. Actual construction costs will vary depending on the exact scope of work and type of finishes desired.

- **Repair Existing Building**
  The existing building is in need of repair. The value below represents the approximate minimum cost to repair the building to a state where it could be occupied. This would include replacing the roof framing, roofing, exterior stud walls and demolition of the locker rooms and lobby. No additional costs have been added for possible improvements to the building such as removal of the pool and concrete or tenant improvement upgrades.
  Minimum Repair Costs = $180,000

- **Value of Existing Superstructure**
  The existing superstructure was framed with heavy glulam beams with a clear span to 70-82ft, and a ceiling height of 26ft at the center. The beams and collar ties were specifically made for this building. The construction to erect the glulam frames would have been labor intensive. The value below represents only the construction for the glulam columns, beams, and footings. When comparing the savings to constructing a new building, additional savings would be realized in reduced site development.
  Cost of Constructing Existing Superstructure Today = $250,000
  (Additional costs would also be incurred for site work)

- **Cost to Demolish Existing Building**
  The cost to demolish the existing building would depend on the method used, and how much of the existing building would be salvaged. Any materials to be salvaged will take additional labor and effort to demolish without damaging. Existing construction plans for the pools were not available, but typically they are heavily reinforced and difficult to demolish. Depending on the future use of the site, it may be possible to leave the pool structure in place and fill them to grade. The values provided include the complete demolition and removal of all material.
  Building Demolition and Disposal = $120,000
  Pool and Concrete Slab Demolition and Disposal = $180,000

- **Salvage Value of Existing Beams**
  The existing glulam beams could be salvaged if the structure was demolished. The value of salvaged lumber is substantially higher for sawn lumber than it is for glulams. It is partially dependent on demand at the time of demolition. Since most of the existing beams are larger than are typically used in standard construction, the market for these beams will be less than smaller beams.
  Glulam salvage Value = $7,000-$12,000

- **Cost to Construct New Building**
  The construction costs of a new building can vary widely depending on size, complexity, intended use, and finishes. At this time it is not possible to assign a value for a new building.

RECOMMENDATIONS

Option 1: Refurbish the Existing Building
The desired future use of this site should be the primary factor in determining the best option to follow. The super structure of the existing building is suitable to be re-used and remodeled and reduced in size if desired but the location and shape of the any new facility will be roughly limited to the existing building. If the desired use for the site is a similar public building, it would be substantially less costly to repair and remodel the existing building than demolish it and construct a new building. The existing building also has historical value to the community. Remodeling the existing building would help preserve that history.

Items required to refurbish the existing building:
- Replace roofing and roof sheathing
- Replace damaged roof rafters
- Remove existing masonry and stud walls and replace with new stud walls
- Demolish existing lobby and locker rooms
- Infill pools and replace concrete floor
- Upgrade existing foundation

Option 2: Demolish Existing Building and Construct New building
Demolishing the existing building and constructing a new building would allow the option to construct a new building without any constraints to the existing building size and shape. Substantial site development would be required. It would be more costly than remodeling the existing building but could be tailored to a specific use.

Items required to demolish the existing building and construct a new building:
- Demolish and dispose of existing structure
- Salvage existing glulam beams and columns and sell as reclaimed lumber
- Construct new building
- Extensive site development will be required

Option 3: Demolish Existing Building and Leave as Open Space
Demolishing the existing building and leaving it as an open field or park would allow the City to maintain public open space with less maintenance. Open space would require less maintenance but a revenue vs expense analysis should be considered.

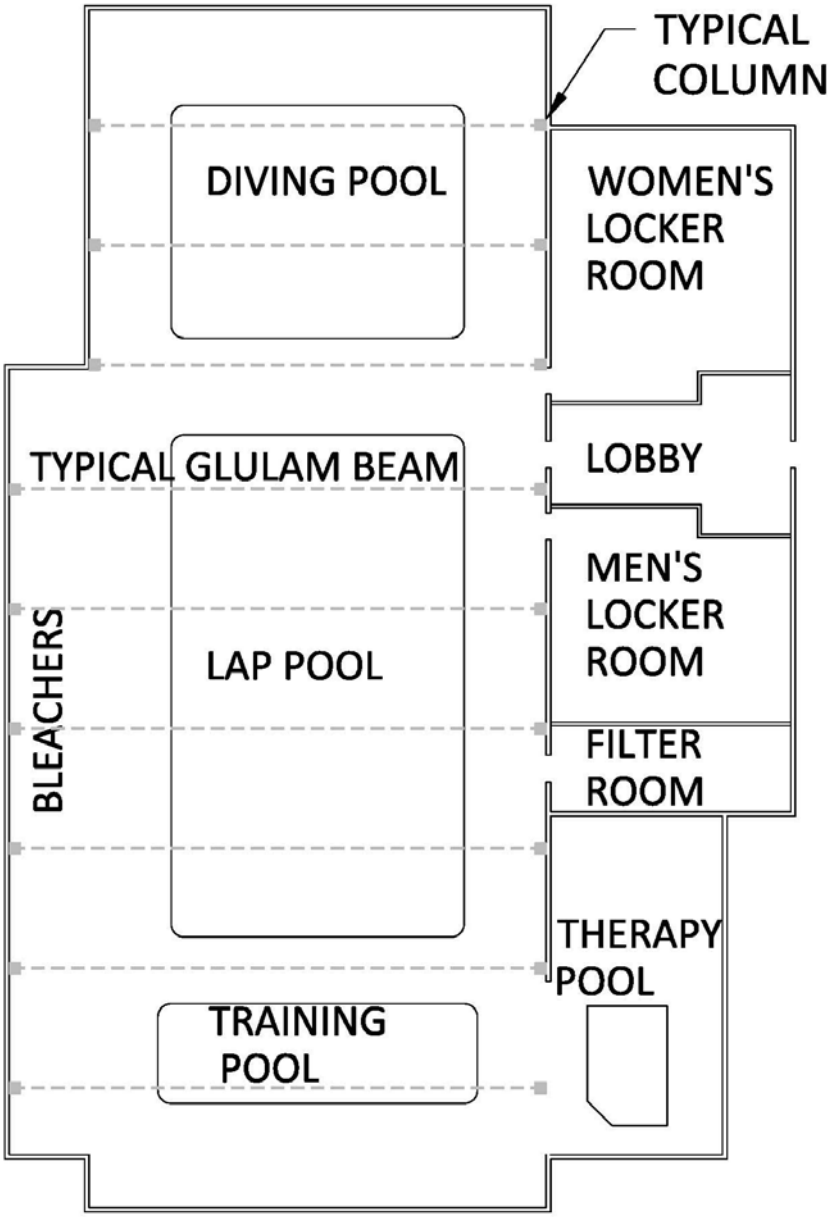
Items required to demolish existing building and create open space
- Demolish and dispose of existing structure
- Salvage existing glulam beams and columns and sell as reclaimed lumber
- Re-grade and plant site as desired
- Minor site development will be required

Appendices

Appendix A: Existing Floor Plan

Appendix B: Photos

Appendix A: Existing Floor Plan



1 FLOOR PLAN
SCALE: NOT TO SCALE

Appendix B: Photos

Photo 1: Hal Moe Pool Entry North Elevation

Photo 2: Hal Moe Pool East Elevation

Photo 3: Hal Moe Pool South Elevation

Photo 4: Hal Moe Pool West Elevation

Photo 5: Pool Structure Interior

Photo 6: Play Structure at South of Building

Photo 7: Skate Park at South of Building

Photo 8: Boys & Girls Club Nearby

Photo 9: Lower CMU Wall with Stud Wall Above

Photo 10: Exterior Siding Rot

Photo 11: Exterior Siding Rot

Photo 12: Sill Plate Damp and Moldy

Photo 13: Mold in Stud Cavity

Photo 14: Typical Pool Structure Framing

Photo 15: Mold in Ceiling Cavity

Photo 16: Typical Roof Framing

Photo 17: Typical Roof Beam

Photo 18: Typical Steel Collar Tie

Photo 19: Typical Steel Collar Tie

Photo 20: Typical Glulam Column

Photo 21: Typical Glulam Post-to-Beam Connection

Photo 22: Typical Post Base (Stained not Moldy)

Photo 23: Post Base in Good Condition (Stained not Moldy)

Photo 24: Locker Room with Stacked Bond Masonry

Photo 25: Lynnwood Pool Prior to Remodel (Courtesy of City of Lynnwood Public Works)

Photo 26: Lynnwood Pool After Remodel (Courtesy of City of Lynnwood Public Works)