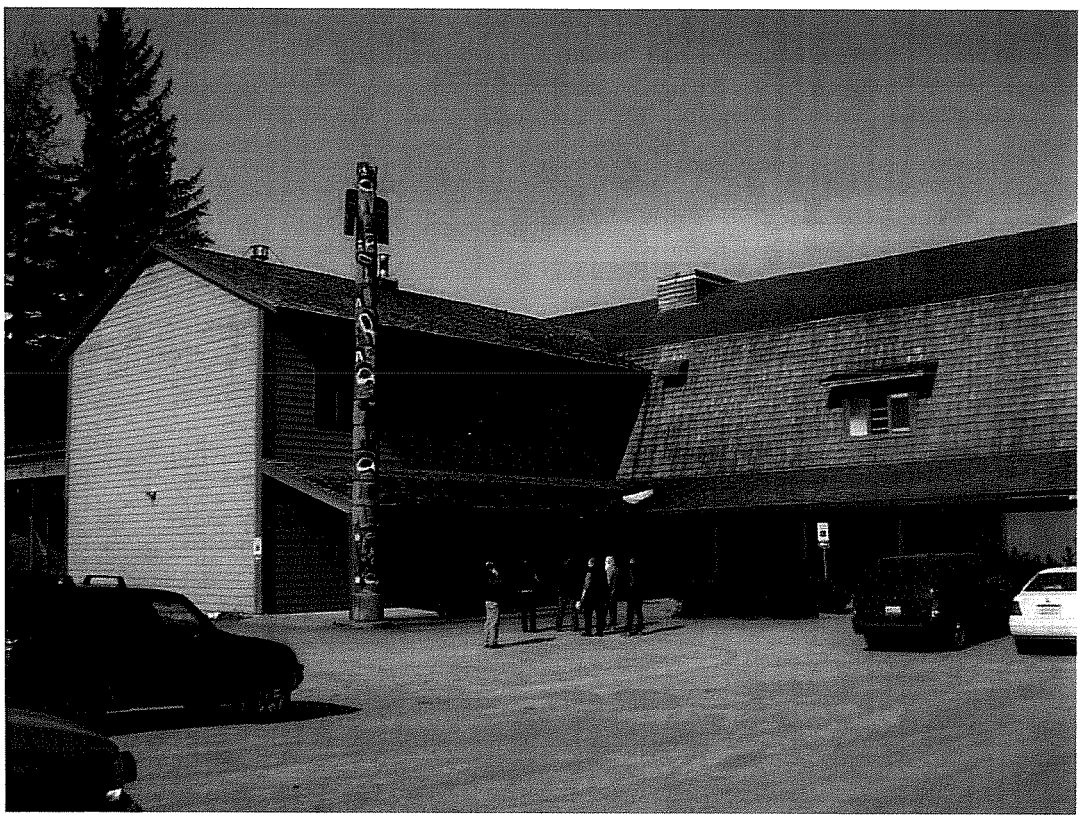
Condition Survey of

Chilkat Center for the Arts



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EXECUTIVE SUMMARY

The Haines Borough retained a team of consultants to inspect and assess the condition of the Chilkat Center for the Arts. The team included and architect from Jensen, Yorba, Lott Architects, a structural engineer from PND Engineers, a mechanical engineer from Murray and Associates, PC, and an electrical engineer from Haight and Associates. The report that follows lists the deficiencies we encountered and suggests a budget for improvements.

Architectural Summary: The Chilkat Center is an important community cultural, social and economic resource for the Haines community. The day the consulting team visited it was hosting a conference that drew numerous Canadian tourism and marketing providers, that included meal service, provided space for aerobics classes, broadcast studio and offices for the public radio station, while church services are periodically held in the basement.

However, the building was last renovated in the late 70's to early 80's. Many interior and exterior finishes and components are past their useful life and should be replaced. Without significant capital upgrades the building will become more and more difficult to maintain, and likely affect the health of the organizations the rely on it.

There are several key general areas of concern. First, the low slope roof and gambrel roofs do not properly ventilate nor include proper insulation. As a result, ice dams cause leaks and other problems that re-occur each winter. Secondly, the building was designed prior to ADA becoming law. Significant changes are needed to better serve this population. Finally, the general wear and tear that has occurred over the years reduce the attractiveness of the building, increase operating costs and limit the marketability of the facility.

Structural Systems Summary: Although the structural system is in fair to good condition, there are many deficiencies that need attention. Roof rafters and beams are overstressed when subjected to code prescribed snow loads. The valley beam at the low roof canopy is rotten and has been overloaded. The lateral load resisting diaphragms and shear walls do not have the capacity to resist code prescribed loads from seismic forces. These deficiencies should be corrected.

Mechanical Systems Summary: The ventilation systems have reached the end of their service life and need major replacement and renovation to meet current building code and comfort requirements. The heating system is inefficient, of poor design and construction, and will need major replacement and renovation soon. The building environmental controls are not functioning and even if operational would be outdated and inefficient. The plumbing systems are old but operational but need minor repair and renovation particularly for ADA required fixtures and spaces. The sprinkler system needs major renovation to combine the numerous drains and to revise the sprinkler coverage for protected areas as constructed. The dry sprinkler system has been a source of problems with trapped condensate freezing causing water damage in the past.

Electrical Systems Summary :

The power service entrance and distribution system is in good condition, but requires some upgrade to better facilitate the current facility uses. The branch circuit panels have reached their service life, requiring replacement. Part of the branch circuiting is in good condition, but part is in only fair condition, requiring renovation of most of it.

The lighting system is in fair condition and may be retained for a short time. As spaces are renovated, new luminaires with improved energy conserving characteristics should be employed. Additionally, controls should be modified with space renovations to take advantage of the use of occupancy sensors as much as possible. Some luminaires and/or lamps may be replaced immediately, along with some control modifications to reduce energy consumption.

Executive Summary (continued)

The telephone system is minimal and network system is nonexistent. TV Cable serves the building, but there is no distribution system. These systems should be upgraded to better facilitate the users and visitors.

There is no fire alarm system. One should be installed with an interface to the sprinkler system.

There is no access control system, intrusion detection system, or camera surveillance system. These may be considered based on need.

Repair and Improvement Costs

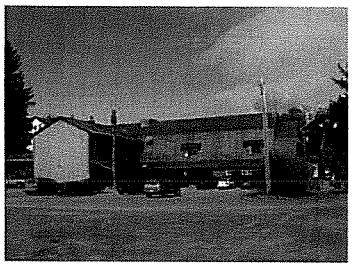
The estimated construction cost to make the recommended repairs and improvements to the facility is $3.34 million and the total project cost is estimated to be $4.08 million. The construction budget contains a contingency of 20 percent. Project costs include construction, design and preparation of construction documents, construction administration and construction inspection costs. A summary of the costs is in the appendix.

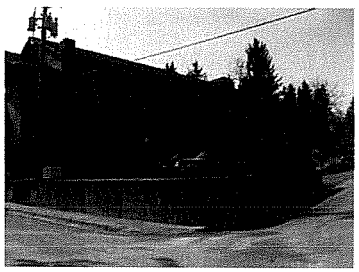
Replacement Costs:

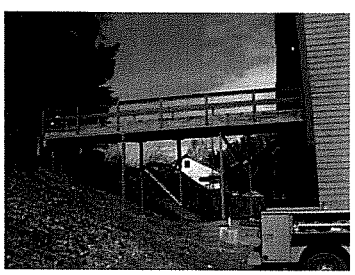
The Chilkat center is an extremely valuable asset to the community. Replacement of the facility would result in a significant economic burden to the community and likely cost far more than the list of budget items included in this report. To establish a budget for a replacement building we utilized the Department of Education and Early Development Program Demand Cost Model, 11th Edition. The cost model is a very powerful tool developed to assist school districts in predicting future cost of new facilities. The model is ideal for estimating complex facilities such as this. Assumed a program of the following, which closely approximates the existing program:

Multi-purpose room:	1,500 sf
Theatre:	5,166 sf
Locker/dressing room:	2,712 sf
Office/meeting rooms:	10,150
Food Service:	200 sf
Toilets:	500 sf

Including project costs and escalation to the year 2010, the project budget should be approximately $11,000,000. The cost model is included in the appendix.







INTRODUCTION

The Chilkat Center is a multi use cultural center and community resource building located in the Fort William Seward National Historic Area. It includes the following primary functions:

- 275 seat theatre with full stage, rigged backstage with shops, dressing rooms scenery rooms and other spaces for full theatric production.
- Food service, meeting rooms and lobby areas necessary for small conventions.
- Community radio station studio, production and office space
- Multi use community room suitable for meetings, community fitness classes and other uses.

The building was originally built reportedly from a relocated former cannery building. Evidence of the old structure is present in the attic, including very old rough sawn timbers and remnants of enamel socket and exposed wire electrical system. Significant renovation and additions were accomplished in the late 1970's and early 80's, apparently from drawings prepared for the Juneau based engineering and development firm of EMPS, under the direction of architect Thomas Huntington. However, no record drawings or complete construction drawings appear to exist.

The building is located on an east facing sloping site. The driveway is paved, but the parking area is gravel and surrounded by a steep embankment on the west, undeveloped area to the north and west, and the building to the east. A parking analysis is beyond the scope of this project, but it appears to lack sufficient space when the facility is at capacity. The site experiences severe northeast winds in winter, and southeast winds at other times, with the accompanying heavy snow and wind. Configuration of the building on the site results in extremely heavy snow drifting in winter- drifts up to the underside of the roof at the covered walkway on the south and east side of the building are not uncommon.

The sloping site was graded to produce the flat pad for the building and parking area. However an approximately 12 foot high embankment results on the west (high) side of the site, with the foot of the slope terminating approximately 14 feet from the rear wall of the building. As a result, street access is provided to the north and south of the building. The embankment limits access to the west, although the change of grade provides bridge access from grade to the second floor, which partly offsets any lack of elevator access between floors. Loading to the stage area is provided directly from the street on the west side, and a concrete loading dock provides access to the scene shop area backstage.

The building consists of concrete foundations and elevated wood framed floor structures. The additions are conventional wood framing. The original portion which includes the theatre is an unconventional truss system with ceilings and other structures supported from indirect wood framing systems retrofitted to the original large trusses. The existing configuration includes a very large cold attic space, with up to 12 inches of fiberglass batt insulation laid on the flat ceiling, and separated with two large plywood attic draft stops. The wall system includes complex and indeterminate wall assemblies including 2x4 studs at 32 inches on center, spaced board with old shingles concealed within furred wall space and gambrel walls superimposed around the original structure. There do not appear to be fire stops in the wall framing that we could observe. The covered walks on the north and east are also conventional wood framing.

Exterior finishes include cedar shake roofing and gambrel wall covering, cedar horizontal siding. Windows are a mix of 1970's era Pella brand wood windows with integral blinds and newer vinyl replacement windows. Exterior doors are a mix of painted steel and wood doors and frames.

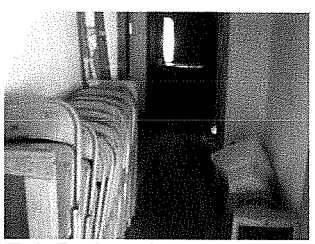
ANALYSIS

Building Code:

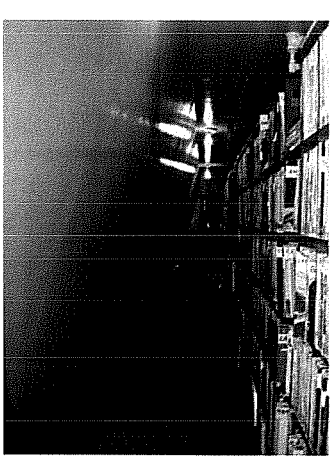
It is not certain under what code the original building was justified. We evaluated it using the 2003 International Building Code. The following are our comments on the applicable architectural elements of the code:

No outstanding violations are reported by the State Fire Marshal.

We evaluated the building for basic area and occupancy requirements. It can be favorably evaluated using the non separate uses method which allows non fire rated separations between the various primary occupancies (A1 theatre; B office/work areas; A3 assembly). We made the following assumptions: type V-N non rated construction; most restrictive occupancy (A1) used as basis of analysis; sprinkler system meeting NFPA 13; separation from other buildings of at least 50 feet. Based on these assumptions, the three primary occupancies do not need fire rated separations, the area of the building is allowable, and the two story plus basement arrangement is acceptable.


Exit Path at Second Floor Bridge

The drawings do not indicate a two hour rated separation between the theater house and the stage. The stage is less than 50 feet high, and is equipped with a smoke vent at the roof. Thus configured, it does not appear to need a two hour proscenium wall, nor a self closing, fire barrier stage curtain. One hour separation of stage and other support spaces is required, and it is shown as such on the drawings, and some doors we observed do have fire rating labels on them, although most lack closers and other required hardware, including the large door between the stage and scene shop. The stage loading door to the exterior is required to have vestibule doors and none are provided.



The stage includes a house curtain and several scene curtains. None are provided with labels indicating that they have been treated with a flame retardant.

We noted what we assume were plywood draft stops were installed in the attic space, including the large, cold attic above the theatre and radio station spaces. Since the building is sprinkled, the draft stops are no longer required.

Exit widths and locations as shown on the drawings appear to be code compliant in the basement, theater, stage and second story office/community room areas. Only one exit is provided to the radio station studio area. With an occupant load of approximately 20 persons, this appears allowable. However the record storage area (a long narrow space between the north gambrel roof and a vertical wall shared with the theatre space) exceeds the allowable common egress path.

There is a significant exit deficiency that should be corrected as soon as possible. A required second floor exit from the south wing discharges to grade via a bridge. The bridge is severely deteriorated, and not safe to use. Without it, the large meeting space in this wing should not be used.

Exit stairs have insufficient headroom at the basement stair. The stair connecting the scene shop to the south wing second floor is over 12 feet of continuous vertical rise. It may not be possible to correct these conditions without significant building reconfiguration.

Ventilation of the attic spaces is insufficient. The area of the large attic space is approximately 7,800 sf, and requires a total ventilation area of 1/150 sf, or approximately 52 square feet. There are only two small gable end vents provided with a total area of approximately 9 square feet. A similar condition occurs over the 1980's addition. While there are some eave vents provided in the newer wing (a 2" diameter hole every 16 inches) attic ventilation is seriously undersized, which is the primary reason for ice dams and subsequent leaks. The Gambrel roof sections are also significantly under ventilated, with virtually no ventilation provided in the bay windows, nor the sloped walls to approximately 8 feet above the second floor- all areas where ice damming has been reported.

A complete code analysis report is attached to this conditions survey as an appendix item.

ADA Issues:
The building was designed prior to the enactment of accessibility regulations. Further, the design of the 1970's era remodel included numerous changes in elevation and circulation space. As a result, the building significantly under-achieves compliance with the Americans with Disabilities Act Guidelines. There is a significant civil liability to the community because of the potential for discrimination to disabled employees or visitors.

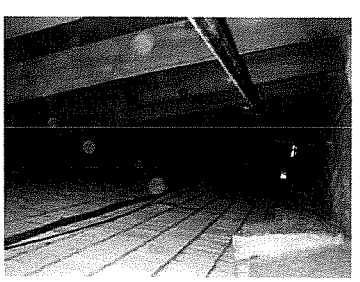
Site: The main parking area has a designated accessible or van accessible parking area. At least one van and two vehicle stalls should be provided.

Access routes: No accessible route is provided from the main entry to the theatre. Secondary exit doors are accessible, but require bypassing the ticket area. There is no accessible route from the theatre to the stage. The stage door is served with a ramp, but it is too steep and does not meet ADAG requirements, nor are the required rails provided.

There is no accessible route to the radio station studios or station offices. A possible route to the studios exists if the second floor bridge was safe, except that one must pass through the second floor meeting room in order to get to the studio area. The radio station offices are blocked by a short stairway.

The second floor meeting room would be accessible if the bridge were safe.

No accessible route is provided to the basement area dressing rooms or basement area large meeting room.



Accessible facilities: There are no accessible toilet facilities in the building. They are all blocked by inaccessible doorways, stairways, insufficient turn-around space or other obstructions. Sinks do not provide the necessary clearance, toilets are not the required height or have the required clearances or grab bars.
The warming kitchen/serving area is not accessible. There is not an accessible sink, turn around space is insufficient and there is no accessible counter space.

Doorways: There are numerous doorways that do not provide sufficient maneuvering space. Any attempt to improve access via installation of an elevator should consider reconfiguring of interior doorways to complete the accessible route.

ARCHITECTURAL CONDITION SURVEY

Exterior

Site parking area is not paved and does not appear to drain properly. The present scheme with all site runoff leading to a single catch basin has been subject to ice build up and flooding. Sidewalks where provided appear in fair condition, but the stairs leading to the street from the main entry are heaving and at the end of their useful life. The wood ramp and loading dock at the stage door should also be replaced or reconfigured (see comments below).

The roof assembly has failed due to faulty design and configuration. The insufficient ventilation and problems with insulation cause chronic problems with ice dams and subsequent water infiltration into the building. This occurs both at the high, low slope roof and at the gambrel roof areas. In addition, the configuration of the roof should be modified or other measures taken to ensure that snow drifts do not damage the building. The gambrel roof should be ventilated, or replaced with a conventional vertical wall surface. As part of this work, the wall, gambrel roof and attic insulation should be corrected to provide consistent insulation of at least R-30 (roof) and R-19 (walls)

The exterior siding appears in satisfactory condition and should continue to provide adequate service as long as it is maintained, and other problems discussed are addressed.

Windows: The existing "Pella" wood windows have failed due to age, ice and water damage and should be replaced. As part of this work, the bay windows should be reconfigured to improve wall ventilation and eliminate the ice damming that occurs over them.

Doors: The existing exterior doors and frames are in poor condition, at the end of their useful life and should be replaced. The stage door area ramp and dock is constructed of wood exposed to the weather and will likely serve no longer than 8 to 10 years. The area is fully exposed to the weather and is difficult to use due to rain and wind into the stage area. While the code required vestibule will partly correct this problem, the exposed dock should be corrected with a roof structure in conjunction with reconfiguring the ramp. The bridge to the second floor should also be replaced.

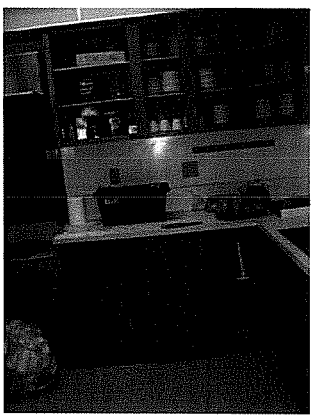
Interior:

All interior floor finishes are past their useful life. Carpet is worn and delaminating, causing a tripping hazard. Toilet room floors are likely asbestos containing sheet vinyl, some of which is delaminating due to water leakage. Vinyl composition tiles are loose and, in rooms with plumbing fixtures, unsanitary. They should all be replaced.

The stage floor does appear to be in fair condition and should remain viable.

Interior doors are of mixed ratings, missing hardware, show various levels of damage and in some cases are not properly configured (see ADA comments). Virtually all doors should be replaced. The door between the scene shop and stage should be made self closing or replaced.

The record storage area (see code comments) should no longer be used for this purpose, and returned to use as access to theatre equipment only.



The kitchen area does not serve properly to support food service or concessions to activities at the center. It is well past its useful life, not sanitary, not ADA compliant and poorly configured. It should be completely reconfigured, with all appliances and furnishings replaced.

Toilet room finishes and equipment should be replaced. If possible, they should be made ADA compliant, or an accessible toilet room provided at each major area.

Fire ratings: integrity of the one hour rated wall assemblies should be confirmed. There appear to be holes in drywall in furnace area ceilings and other areas that could reduce the required rating.

CORRECTIVE MEASURES

A) Re-grade the existing site, including additional fill and D-1 paving as required to re-direct surface runoff from the existing catch basin to sheet flow to the south of the site. If required, collect runoff in this area in new catch basin where freezing will not negatively affect the existing parking lot.

Budget $15,000 for grading and fill; $5,000 for new catch basin and underdrain to existing catch basis.

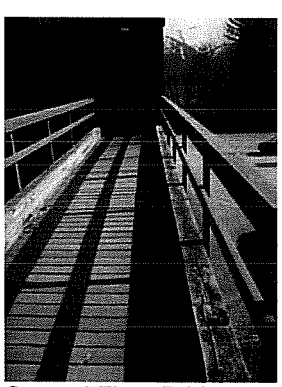
Existing Concrete Stairs East End of Site

B) Replace or repair existing concrete stairs at east end of site, including installation of railings.

Budget: $8,000

C) Replace loading dock and ramp, including installation of roof overhang at stage door and north theatre door area.

Budget: $15,000



Second Floor Bridge

D) Replace existing second floor bridge. Provide additional structure within building, foundation improvements, railings, decking and other measures as required to make bridge fully ADA accessible. Bridge structure should be covered, unless galvanized steel beams, decking, railings and connections are used.

Budget: $40,000

E) Replace low slope roof assembly (walkway roof covering, high area roofing over north and south wings): Remove existing shingles and prepare existing plywood deck for new roofing, including replacement of any dryrot. Install two layers of self adhering asphalt underlayment, then new cedar shake roofing to match existing. (Ventilation improvements in other category)

Budget: (assume $25/sf) $300,000

F) Replace gambrel roof surface and improve ventilation in gambrel roof: remove existing shingles down to bare, prepared plywood substrate; install treated wood furring and treated plywood over the existing sloped roof to create a ventilation space between the insulated interior and the roof assembly. Install two layers of self adhering asphalt underlayment, then new cedar shake roofing to match existing. Provide space between insulation and add ventilation at eave over bay window roof assembly

Budget: (assume $40/sf) 116,000

G) Install additional attic insulation (r-19). Where feasible, add insulation to gambrel roof/wall. Install additional eave vents, gable vents, and baffled attic vents

Budget: $35,000

H) Replace wood windows with insulated vinyl windows. Provide sliding window function, rather than casement type.

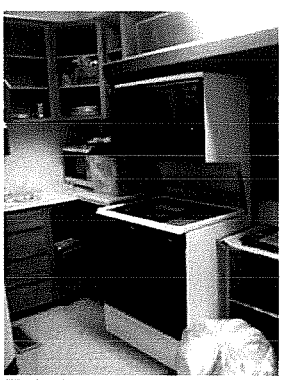
Budget: $30,000

I) Replace exterior doors, frames and hardware, 13 door leafs total.

Budget: $26,000

J) Replace floors in kitchen, toilet rooms, janitor rooms and similar areas.

Budget: $25,000


Existing Kitchen Appliances

K) Replace carpets.

Budget: $20,000

L) Replace kitchen area with new appliances, counters, wall surfaces, serving area. Reconfigure to improve serving and preparation area efficiency.

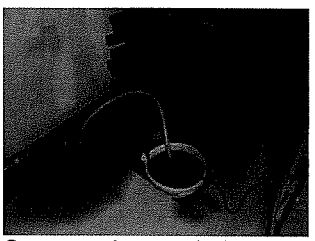
Budget: $75,000

M) Refurbish all toilet rooms

Budget: $100,000

N) Add an accessible toilet at the second floor

Budget: 10,000


Sump and pump in basement

O) Provide elevator access to both floors plus basement.

Budget: $350,000

P) Provide lift at stair between radio station offices and other functions on this floor.

Budget: $50,000

Q) Replace sliding, fire rated metal door between stage and scene shop

Budget: $30,000

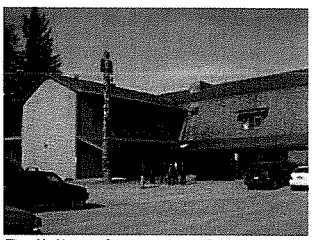
R) Miscellaneous wall reconfiguration, patching and painting to repair fire rating and to reconfigure doorways

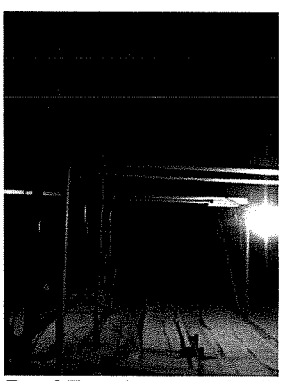
Budget: $20,000

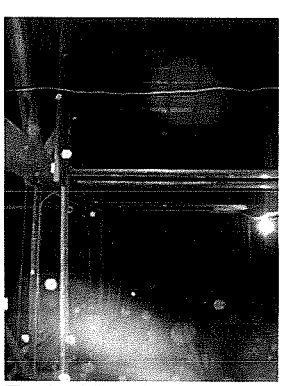
S) Correct basement floor leak with permanent sump pump.

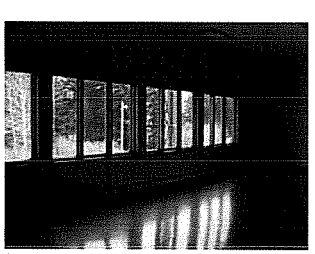
Budget: $20,000

CIVIL/STRUCTURAL CONDITION SURVEY


Building from the Southeast, South Wing on Left


Roof Framing over Auditorium, Stage and Radio Offices


Typical Roof Framing


East Wall of South Wing

BACKGROUND

The structural system of the Chilkat Center for the Arts consists of a conventional reinforced-concrete, spread footing foundation supporting primarily timber framed floors, walls and roof framing with steel floor framing at the stage. A partial basement has reinforced concrete retaining walls and a slab on grade floor.

Roof framing over the theater, stage, and radio station consists of 44'-0" long roof trusses at approximately 9 feet on center, supporting flat 4x6 beams that are approximately 13 feet from the end support of the trusses. The beams support 2x6 rafters at 2 feet on center that run from the central ridge to the haunch point. There is no ridge beam. The rafters are approximately 25 feet long and support straight 1x sheathing which in-turn support the roofing. A 2x4 framed ceiling over the radio station offices, the auditorium seating and stage is suspended from the roof trusses.

Roof trusses are supported 8x8 posts and appear to also support beams which support the second floor passageways on the north and south sides of the auditorium. The floor framing for these passageways is not shown on the available plans. Above the passageways sloping 2x6 studs at 2'-0" on center serve as roof joists in an un-vented roof.

The second floor framing at the projection room and the radio station consists of 2x joists spanning between the east exterior wall and an interior steel beam approximately 7 feet from the east wall and then to sawn timber beams 5 feet from the steel beam and additional beams at periodic intervals parallel to the east wall. The framing in this area is not clearly depicted on available plans.

According to available plans floor framing under the lobby and the auditorium consists of 10 x 10 timber beams, spanning approximately 10 feet and spaced between 6 and 8 feet on-center, supporting 2x floor joists which in-turn support floor sheathing. Available plans do not identify the framing under the sloped floor of the auditorium.

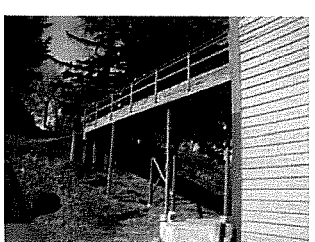
There is a lighting catwalk parallel to the main roof trusses. It is accessed by a ship ladder on the north end of the catwalk. The catwalk floor is framed with 2x6 joists.

Stage floor framing consists of 3x tongue and groove decking supported by open-web steel joists which are supported by 14 inch deep wide flange, steel beams. The steel beams are supported on the west retaining wall of the basement a steel pipe column approximately 21 feet from the west wall and a steel pipe column approximately 42 feet from the west basement wall.

The structural system at the 1980 southern wing consists of a reinforced-concrete basement walls supporting pre-engineered wood floor trusses at the first and second floors, floor plywood and 2x6


Trusses above South Wing. Note Gable End Vent


Low Roof Canopy


2nd Floor Bridge Access and Loading Dock Below


No blocking between floor joists


Low Roof Canopy Valley Framing

exterior walls. An interior wall also supports first and second floor trusses. The walls support pre-engineered wood roof trusses and the plywood roof deck. Roof trusses appear to be site-constructed with plywood gussets.

There is an exterior low roof canopy on the east side of the southern wing and the sough side of the main building. The canopy is above an exterior concrete sidewalk. Timber columns at the edge of the sidewalk support timber beams which with the exterior wall of the building support sloping 2x10 joists spaced at 16 inches on-center.

There is an elevated concrete apron on the south end of the west side of the building that serves as a loading dock for the back stage area.

Above the loading dock is a timber-framed bridge that connects the second floor of the south wing to the adjacent parking area on a hillside above the loading dock. It consists of timber beams supporting timber decking and side rails.

The lateral load resisting system consists of the roof and floor diaphragms supported by wood sheathed shear walls.

Available plans for the building do not completely depict the framing system for the building.

Inspection and Observations

The structural inspection consisted of visual observations, probing with a flat tipped screw driver and sounding with a hammer. Attic spaces, all rooms, and the crawl spaces under the auditorium were accessed.

Observations made during the inspection include:

1) There is no blocking between floor joists at the first floor beams in the crawl space. This is a code violation.

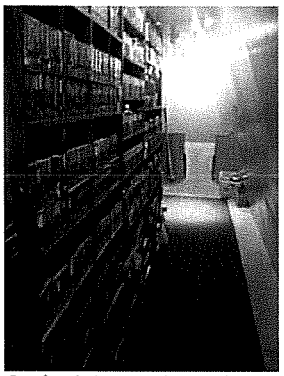
2) One post in crawl space does not have solid bearing but is supported only be connector bolts. The connector bolts do not have the capacity to support the full load that the post is designed to carry

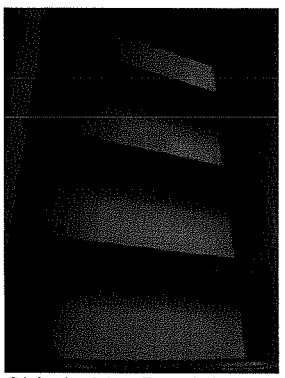
3). The valley beam at the low roof canopy is rotten and has been overloaded.

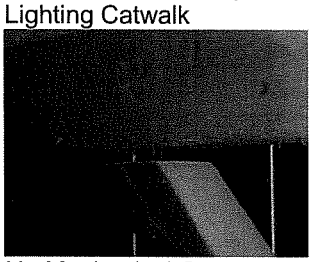
4) The attic space should have additional vents. There are vents without screens on each gable end of the main wing of the structure.

5) The roof diaphragm is very weak is not capable of resisting code pre-scribed lateral loads from earthquakes.

6) Shear walls at the original building likely do not have the capacity to resist Code prescribed lateral forces from Wind and earthquakes.


Stored Records and CDs in Passageway


Ship ladder Providing Access to Lighting Catwalk


No Mechanical Connectors at Truss Member Joints


Rot in Bridge Framing

7) The walls on the east side of the south wing, at the second floor, does not appear to have adequate resistance to resist lateral forces from wind and earthquakes.

8) Heavy stacks of vinyl records and compact discs are on the second-floor passageway north of the auditorium. The weight of these materials likely overloads the framing.

9) The ship ladder providing access to the lighting catwalk does not have hand rails that meet code requirements.

10) Roof trusses over the main auditorium consist of members that are minimally connected with nails. Some diagonal web members have no mechanical connection to the bottom chords.

11) Rafters over the auditorium and radio station have very long spans and are overstressed when subjected to code prescribed snow loads.

12) Roof beams at truss haunches are overstressed when subject to code prescribed snow loads.

13) The bridge on the west side of the building has rotten beams and floor framing. The bridge rails do not meet code safety requirements.

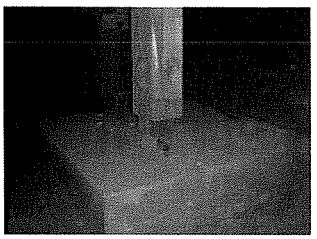
14) The sidewalk at the main entry is uneven and pitted.

15) Concrete at the loading dock west of the south wind deteriorates when simply abraded by hand.

16) A sump in a storage room in the basement is constantly intercepting groundwater and requires a pump to remove the water. This requires a considerable amount of maintenance and power. Consideration should be given to intercepting the water outside the building and delivering the water to the storm drain system using gravity rather than using a pumped system.

17) The condition of framing at the attic and crawl spaces was generally found to be fair to good with little signs of deterioration or distress, except as noted above.

STRUCTURAL CORRECTIVE MEASURES


Post in crawl space without full bearing

A) Install blocking between floor joists.

Budget: $20,000

B) Add solid blocking under post that does not have full bearing

Budget: $200

C) Remove and replace rotten beam at low roof canopy valley

Budget: $6,000

D) Install an ridge vent, eave vents and screen gable end vents

Budget: See architectural corrective measures

E) Replace roof sheathing over auditorium, stage and radio offices (Demolition costs included)

Budget: $60,000

F) Perform detailed lateral analysis of entire building. Likely install new sheathing on sidewalls at second floor at auditorium, stage and radio offices.

Budget: $7,500

G) Verify sheathing at south wing second floor walls has adequate capacity to resist code prescribed lateral loads. Likely remove one bay of windows and sheath with plywood.

Budget: $2,500

H) Remove stored materials in passageways. Move to basement.

Budget: Not a construction cost

I) Replace ship ladder with conventional stair with code approved handrails.

Budget: $2,500

J) Connect members of trusses over auditorium, stage and radio offices to each other using metal side plates and bolts.

Budget: $105,000

K) Replace rafters over auditorium with 2x12 rafters at 16 inches on center.

Budget: $30,000

L) Replace purlin beam with new 3.125 x 10.5 glu lam beams.

Budget: $6,500

M) Replace bridge that provides second floor access. See Architectural corrective measures

Budget: See architectural corrective measures

N) Replace damaged sidewalk

Budget: $4,500

O) Replace concrete loading dock.

Budget: See architectural corrective measures

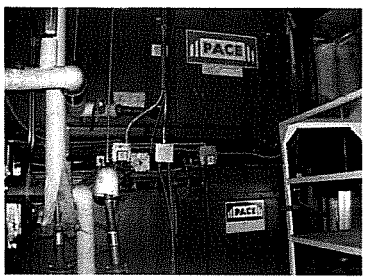
P) Install perimeter drain that intercepts ground water passing under the building. Route drain to storm sewer.

Budget: $20,000

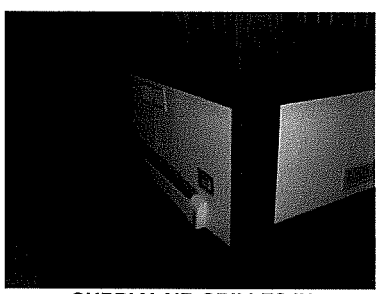
MECHANICAL SYSTEMS

VENTILATION SYSTEMS

HV-1 and HV-2: Two ventilation units are located in the lower level Mechanical Room. HV-1 supplies ventilation air to the three floors of the building addition and HV-2 supplies air to the Auditorium and the basement level below the stage area. The two ventilation systems share outside air and relief/return air plenum systems constructed mainly of gypsum lined surfaces. The building appears to experience easy transfer of air and have high infiltration/exfiltration construction so relief air will move to adjacent areas and to the outside fairly easily. HV-1 ventilation air is supplied through floor grilles for the upper floors and side wall grilles on exposed ductwork throughout the lower basement floor. The auditorium HV-2 ventilation air is delivered to the space through floor grilles with the return air grille located high up on the south wall. About half of the exposed ductwork was of a non metal fiber board type. No duct access doors were found for maintenance and inspection. No record of the balancing log was found and it does not appear that the ventilation systems were ever adjusted.



VENTILATION UNITS HV-1 & HV-2



SUPPLY AIR GRILLES IN AUDITORIUM

Several occupied areas of the ventilation zones did not have grilles so ventilation was not supplied. Outside air is obtained from louvers at the first floor level above a man door facing the parking lot. Return air for HV-1 is obtained generally from the basement level in the meeting room. Return air for HV-2 is obtained from return grilles located high up in the Auditorium and routed through non metal ducts to the vertical gypsum lined return/relief air shaft on the south side of the auditorium. The relief air path out of building is from this return/relief air shaft to a weather hood located high on the south side of the building. Return air for HV-2 is obtained from return grilles on the south side of the Auditorium and routed through non metal ducts to the vertical gypsum lined return/relief air shaft. The relief air path out of building is from this return/relief air shaft through a relief air damper in the attic and then to a weather hood located high on the south side of the building.

VENTILATION UNIT HV-3

HV-3: HV-3 ventilation unit is located in a separate basement area, northern corner of the building, under the kitchen area off of the main auditorium lobby. HV-3 supplies air to the auditorium lobby area through floor grilles and to the second floor radio studios through ceiling diffusers. The outside air for HV-3 was obtained from Fan Room entry exterior stairs space but the stairs were enclosed after original construction and the outside air louver pathway blocked. The heating coil was reported to have been repaired from a burst during a frozen condition several years ago.

All of the fans were reported to be operated manually when needed. The outside and return air damper controls were not functioning and the fan inlet doors were all observed open effectively negating outside air intake and drawing return air into the fans through the mechanical room space. The outside and return air damper controls were not functioning; actuator linkage removed, dampers non-operational, and the linkage was fixed in place with wood. A supply air duct from HV-1 is open in the boiler room. HV-1, HV-2, and HV-3 fan systems are 25 years old and have 0-10 years left of useable life.

CORRECTIVE MEASURES, OPTIONS AND COSTS

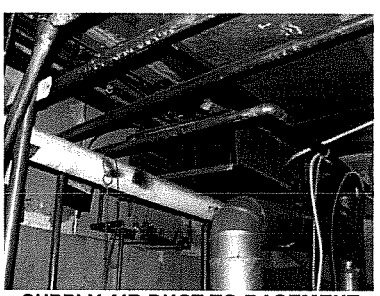
Category: Code Compliance, Repairs/Renovation Needed, Energy Efficiency, Occupant Comfort

ATTIC DUCTS MADE OF FIBERGLASS ONLY

The HV Ventilation systems need to be operated continuously whenever the building is occupied as required by Building codes. Not only do the building occupants experience inadequate ventilation and heating when the HV ventilation units are not operated but the limited number and placement of supply grilles and return grilles result in poor indoor air quality when operating. Some occupied areas of the building do not have any ventilation currently including the Stage, several basement areas, the office and workshop/set area, and several second floor offices and storage areas. Most other basement and first floor areas have side wall supply grilles while the second floor Radio area has ceiling grilles. Infrequent HV filter changes will result in the interior of the ductwork to be dirty. Temporary relief exhaust fans have been set up in the upper areas of the auditorium to help with overheating, but these fans are not very effectual.

SUPPLY AIR DUCTS OFF OF HV-1 & HV-2 MADE OF FIBERGLASS ONLY

HV fan systems are all single supply fans with no return fan. Typically single fan systems can serve large areas such as the auditorium, with few air pressure problems but the smaller offices and other areas may experience pressure problems; such as doors propped open and especially could if the exterior envelope is tightened up with insulation addition or newer walls in future renovations. Therefore new fan systems should consider a return fan to help the supply fan better control pressure problems and for great efficiency of the system.



SUPPLY AIR DUCT TO BASEMENT AREAS DISCONNECTED IN BOILER ROOM

Item: Ventilation Systems Renovation for HV-1, HV-2, and HV-3. For the short term, 0-5 years, in order to make these fan systems operational the control functions need to be restored for the heating coil/pump and mixing air damper abilities, some ductwork needs repairing and replacement and the interior of the units needs cleaning and maintenance. Fan systems need to be adjusted for design volumes and new motor sheaves installed if necessary. The controls refurbishment cost is not included below, see Building Heating and Ventilation Controls later in the in this report.

For the long term, greater than 5 years, the fan systems should be further renovated with replacement with new fans, ductwork enlarged and air volumes modified to cover actual layout of occupied areas.

Cost:

Short Term Cost; Reuse existing fan systems with immediate refurbishment: $40,000.

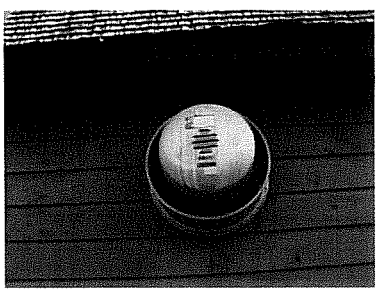
Long Term Cost; Replace and revise ventilation systems: $200,000.

Total cost; Ventilation System Renovation: *$240,000.*

KITCHEN EXHAUST SYSTEMS

KITCHEN HOOD

A wall mounted fan, located on the north side of the building, exhausts air from a back shelf design Type 1 exhaust hood system that covers the propane range in the kitchen plus an additional 18 inches to the side of the range. It appears that the cooking range was replaced sometime in the past with a smaller one so the hood covers a larger area that it should. The hood has grease filters but they appear to be a fabricated older type that is not very effective. The hood does not have chemical fire suppression system and the range propane system is not connected for interoperability with the exhaust air system; both serious code violations. The original plans called for an interlock of the exhaust fan with HV-3 and increased OSA damper positioning, but this feature was not functioning. The controls for HV-3 are non-functioning and there is no makeup air source for the exhaust hood other than the ventilation air supplied by HV-3 to the lobby area adjacent to the auditorium. The exhaust fan is wall mounted exhausting under a roof overhang. The fan is old and does not meet current code requirements for grease duty.



KITCHEN HOOD EXHAUST FAN

CORRECTIVE MEASURES, OPTIONS AND COSTS

Category: Code Compliance, Repairs/Renovation Needed

The kitchen hood exhaust system is not code compliant on several issues and needs to be replaced.

A make-up air system should be installed or renovate the HV-3 controls to operate whenever the hood exhaust systems operates.

Item: Renovate Kitchen Exhaust System. Replace the kitchen hood and exhaust fan with a modern hood with fire suppression system. Revise fuel system for interconnection.

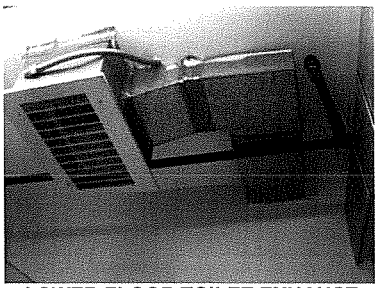
Cost: *$22,000.*

Item: Install Make-up Air System for Exhaust Hood: Install a make-up air fan with filtered and tempered (heating coil) supply air system.

Cost: *$15,000.*

EXHAUST SYSTEMS

Each toilet room has an individual ceiling mounted exhaust fan either controlled by the respective light switch or separate switch. The lower floor toilet room exhaust fans exhaust out the south end of the lower floor just above grade. The auditorium lobby toilet rooms discharge directly to their respective outside wall through wall caps. The second floor toilets in the addition each have ceiling exhaust fans with flexible ductwork in the attic above. A ceiling mounted exhaust fan in the second floor workout room exhausts air out through a roof cap. The adjacent second floor offices also have a ceiling mounted exhaust fan that discharges through the attic to a common roof cap. The radio offices have a small toilet room with exhaust



LOWER FLOOR TOILET EXHAUST FAN

fan. All exhaust fans when operated appeared to be insufficient volume.

The exhaust ducts in the addition attic are generally long lengths of flexible duct (20 feet) with no supports that connect into a common vertical sheet metal duct to a roof cap. Long lengths of flexible duct add considerable static pressure to the exhaust system reducing the exhaust air volume the fan will produce.

Recommend replacing the flexible ductwork with sheet metal for increased exhaust air volume and efficiency.

TOILET ROOM EXHAUST FAN

CORRECTIVE MEASURES, OPTIONS AND COSTS

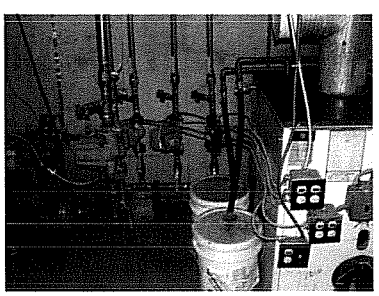
Category: Repairs/Renovation Needed, Energy Efficiency, Occupant Comfort

The exhaust fans should be replaced as they have reached their life expectancy. The flexible exhaust ductwork should be replaced to reduce overall energy usage and improve indoor air quality.

Item: Replace all Exhaust Fans (10 total), replace flexible ductwork, and route several discharge ducts to an exterior wall;

Cost: *$12,000.*

HEATING PLANT - ULTIMATE NATURAL DRAFT BOILERS



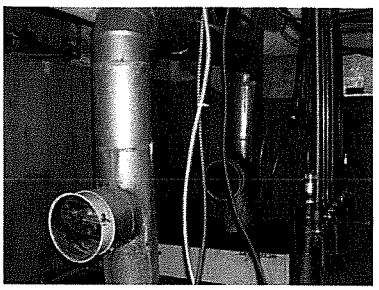
HEATING CIRCULATION PUMPS

HEATING SYSTEM

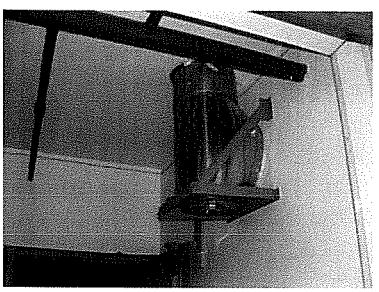
Two boilers (Ultimate Boiler PFO 9), cast-iron sectional, were installed approximately 8 years ago during a mechanical renovation. The boilers advertise a high efficiency rating in the mid 8-0% range. It was not known or evident when the burners were last adjusted for maximum efficiency. Approximately six heating zones, each with a unitized pump at the heating plan, supplies heating water to a heating loop. Each HV fan unit also has a circulating pump within its own heating coil loop to assist with water flow. Many of the heating loops experience air blockage due to piping not pitched correctly and lack off air vent valves. Some of the heating piping is insulated, roughly 50%.

The two natural draft boilers combustion combines in the mechanical room prior to entering the main vertical chimney. At the connection point the chimney size is not enlarged until after the tee. The chimney is double wall construction but is exposed through the two floor levels before exiting through the roof. Both of the natural draft dampers are old and appear to be partially stuck, not able to operate freely. The chimney does show evidence of past leakage with stains on the outside shell. The interior of the chimney was not investigated. The boiler model is no longer manufactured but should last 5-10 years as well as the natural draft double wall chimney.

The oil tank is located underground on the west side of the building. The tank was reported to be single wall with no monitoring or leak detection.



CHIMNEY BREECHING



CHIMNEY EXPOSED IN BUILDING

CORRECTIVE MEASURES, OPTIONS AND COSTS

Category: Code Compliance, Repairs/Renovation Needed, Energy Efficiency

Recommend renovation of heating plant for longer life. The present boilers will probably last 5-10 years more with increasingly more maintenance and replacement of parts required. The boiler manufacturer recommended replacing the burner assembly with a more efficient model in 2003. The underground storage tank is single wall and should be replaced with a double wall underground tank with leak detection/monitoring ability, or an aboveground tank.

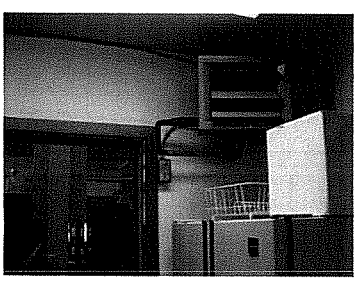
The chimney breeching needs to enlarge at the point of the two branches and should be enclosed throughout the building in a fire rated shaft.

The heating plant is approaching its service life and troublesome with multiple pumps, un-insulated piping, and lack of controls. Recommend replacing most of the unitized circulating pumps with a variable speed pumping system for better efficiency and actual response to heating loads. Recommend to replace the heating plant with two oil-fired boilers, replace the entire chimney, replace the underground storage tank, insulate all heating piping and replace the many unitized pumps with a lead-lag variable speed pumping system.

Item: Replace Heating Plant, Chimney, and Oil Delivery System.

Cost: *$100,000*

HEATING CIRCULATION AND DELIVERY SYSTEM



UNIT HEATER IN KITCHEN

Several areas including the main auditorium lobby meeting place has had its heating units removed and/or disconnected. Several complaints were made of lack of heating in the auditorium lobby meeting areas. Most of the baseboard heating units are of low quality residential type with many covers missing and most with damaged fins. Most sections of baseboard have individual non electric integral thermostat radiator valves for basic individual control. The integral heating valve-thermostat control of the heating units is a poor control and results in uneven temperature environment. Unit heaters are located in the kitchen and in the back stage area that operate manually. It was reported that the ventilation unit HV-3 was operated only for supplemental heating when this area got cold.

BASEBOARD HEATING UNIT

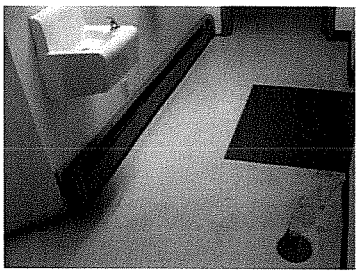
CORRECTIVE MEASURES, OPTIONS AND COSTS

Category: Code Compliance, Repairs/Renovation Needed, Energy Efficiency, Occupant Comfort

Recommend replacing all heating units with light commercial style heating units and installing wall mounted thermostats for better response of the environment temperature. Recommend replacing about a third of the heating piping for better efficiency in routing and response. Recommend insulating all heating piping and installing pump controls.

Item: Replace Heating Units and Controls. Replace all heating units with modern commercial units with automatic valves, air vents, drain valves, and wall mounted thermostats. Revise some heating piping for better zone heating and control.

Cost: *$50,000*



DRINKING FOUNTAIN, BASEBOARD HEATING UNIT

Note: Floor drain with continual ground water drain on right

PLUMBING SYSTEM

The plumbing fixtures are old but functional. None of the fixtures are ADA compliant. Bottom floor toilet rooms have floor drains. A ground water source leak is continually draining into several basement areas and is currently funneled to one of the floor drains. The plumbing piping is copper and what could be seen was Type L copper. Much of the above ground sanitary waste piping is plastic PVC and ABS. The piping appears to be generally in fair condition.

The domestic hot water tank is heated indirectly off the boiler heating plant with its own unitized heating water pump. A tempering valve (Watts brand) is located on the discharge of the hot water tank for anti-scald protection. A unitized hot water recirculation pump is located at the tank.

Kitchen Plumbing: A triple pot sink and vegetable prep sink are located in the kitchen. Both sinks are small and are directly connected into the drainage system. A hand wash sink is located immediately outside the kitchen area.

PLUMBING FIXTURES 1

PLUMBING FIXTURES 2
Radio Offices Toilet Room

PLUMBING FIXTURES 3

CORRECTIVE MEASURES, OPTIONS AND COSTS

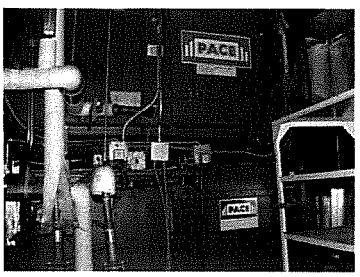
Category: Code Compliance, Repairs/Renovation Needed, Energy Efficiency

The kitchen vegetable prep sink does have an air gap to the sanitary system for prevention of cross contamination and is a code violation. The plumbing fixtures are old and not a water saving type. None of the plumbing fixtures meets ADA requirements. The plumbing piping needs to be insulated for efficiency.

Item: Replace All Plumbing Fixtures. Replace the hot water tank tempering valve. Revise kitchen plumbing with new floor sink and indirect drainage of vegetable prep sink. Modify plumbing systems for ADA configuration (costs below only include the fixtures not the space renovation). Insulate all domestic water piping.

Cost: *$40,000.*

BUILDING HEATING AND VENTILATION CONTROLS



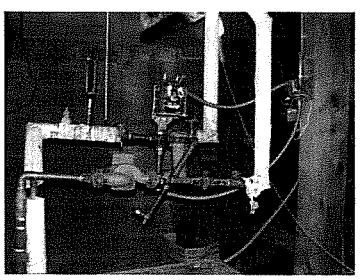
HV-1 & HV-2 CONTROLS

Each fan has a wall mounted thermostat that controls the supply air temperature delivered to each respective area. HV-1 thermostat is located in the lower floor meeting room. HV-2 thermostat is located in the auditorium. HV-3 thermostat is located in the Auditorium Lobby.

The fan outside and return air damper controls were not functioning and All the fan inlet doors were also observed open effectively negating outside air intake and drawing return air into the fans through the mechanical room space.

The outside and return air damper controls were not functioning; actuator linkage removed, dampers non-operational, and the linkage was fixed in place with wood.

CORRECTIVE MEASURES, OPTIONS AND COSTS



HV-3 CONTROLS

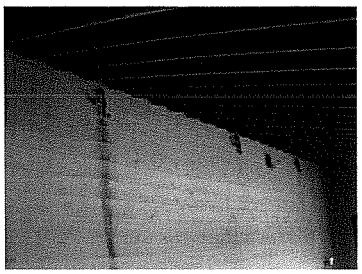
Category: Code Compliance, Repairs/Renovation Needed, Energy Efficiency, Occupant Comfort

Recommend Renovation of the building heating and ventilation controls with modern Direct Digital Controls. Modern DDC type controls will be able to more efficiently operate the heating and ventilation systems and allow the user the schedule, monitor operation, and trend the building heating and ventilation systems. Therefore even though the systems when operating correctly will be heating more outside air (as required by code) these systems should be more efficient due to the DDC systems. The DDC controls should be tied into the heating circulation pump controls and possibly the boiler operating controls. The heating units should also be connected to the DDC system for monitoring and scheduling purposes.

Item: Renovate the control system.

Cost: *$80,000*

FIRE PROTECTION SPRINKLER SYSTEM



SPRINKLER EXTERIOR DRAINS

The building is served by a dry pipe sprinkler system comprised of steel pipe with compressed air inside and sprinkler heads located through the building including attic spaces. Many of the sprinkler heads in the top floors are served by dry pendent heads off of sprinkler piping in the attic. The sprinkler system was last certified in 2004 according to tags on the sprinkler header.

The piping has many drains, approximately 25, located around the building. These drains need to be accessed regularly for condensate draining as part of the regular maintenance of dry pipe sprinkler systems. Because of the numerous drains this probably has not done in the past. Recent problems with burst piping occurred, causing water damage, most likely a result of condensate collecting in pipe sections and without frequent drainage when the pipe is subjected to a cold spell it then freezes and breaks.

SPRINKLER HEAD IN ATTIC SPACE

The stage area has a center roof hatch smoke relief that reportedly was installed for fire purposes. The stage area does not meet current code requirements for sprinkler protection. The stage area should be protected with a deluge system controlled by heat and smoke detectors.

CORRECTIVE MEASURES, OPTIONS AND COSTS

Category: Code Compliance, Repairs/Renovation Needed

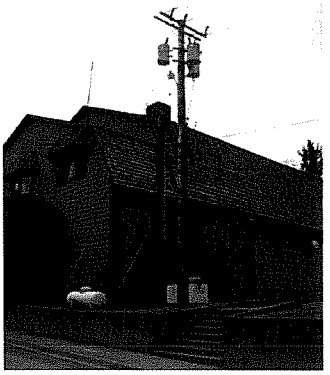
STAGE SMOKE RELIEF VENT (LOOKING UP)

The Stage area does not meet current code requirements and should have a deluge type sprinkler system installed at the main curtain. The dry system drains should be ganged together as much as possible for ease of maintenance. Providing easily accessible drains and maintaining them on a regular basis will help prevent the frequent problems with the sprinkler piping breaking and leaking.

Item: Install stage sprinkler system and revise the dry sprinkler system for central easily accessible drains.

Cost: *$12,000*

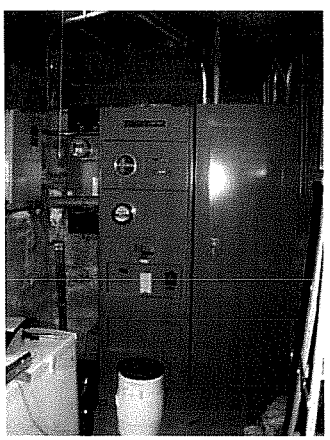
ELECTRICAL CONDITION SURVEY



The power service to the building is composed of a 400 ampere rated circuit routed from a bank of pole transformers (3 each rated at 25 KVA) located at the NE corner of the building on a utility pole. The circuit is routed underground in conduit to the main switchboard located in the basement at that corner of the building.

The service switchboard is rated for 400 amperes at 208Y/120 volts, three phase. It includes main meter instrument transformers and a main circuit breaker for the building. It also includes a single phase meter (five jaw) and 100 ampere circuit breaker for the public radio station. The meter for the building is located on an enclosure adjacent to the switchboard. The switchboard was manufactured by Square D, and the components appear to be currently available. The switchboard is in good condition.

The feeder for the radio station is configured with conductors in conduit to a transfer switch located on the left side of the main switchboard. Additionally, conductors in conduit are routed from a pad mounted generator located just outside the building to this same transfer switch. The load side of the transfer switch feeds a panel for the radio station with conductors in conduit. This panel was not found.



The feeder for the building is configured with conductors to a separate distribution panel located on the right side of the switchboard. This panel includes circuit breakers for panels located in the Boiler room, the Shop, and the Kitchen. Another large feeder is routed to the stage lighting panel. The remaining circuit breakers serve small, undefined loads. This panel was manufactured by Square D and the components are still manufactured. The front of the panel exposes live terminals and bus when opened. It appears to be the wrong cover for this panel and needs to be replaced for safety purposes. Access to the front of the panel is required to operate the circuit breakers. Otherwise, the panel is in good condition.

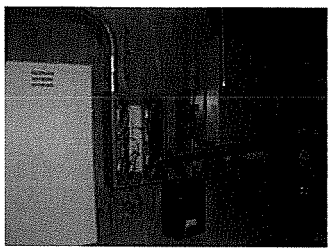
There appears to be no earth ground system for the service. No grounding electrodes were found, and no bond to the water service was apparent. A grounding system needs to be installed.

The generator and transfer switch appear to belong to the radio station. Their condition was not assessed, although from appearances, they are in good condition.

Branch Circuit System

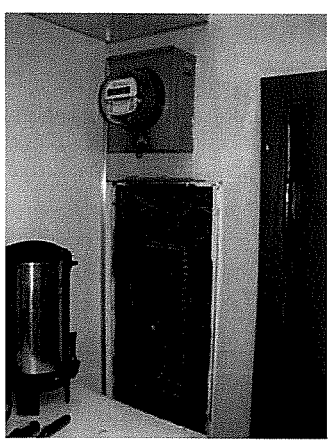
The branch circuit panels consist of six load centers. One is located in the Boiler Room, one in the Shop, one in the Auditorium Control

Booth, and two in the Kitchen. The supposed sixth one designated for the radio station was not found.



The load centers located in the Shop, Boiler Room, and Control Booth are all in fair condition with 2 to 5 years of remaining service life. The load centers in the Kitchen are in poor condition with one lacking adequate working clearances.

The branch circuiting primarily consists of single conductors in raceway. Most of the raceway is Electrical Metallic Tubing, EMT. There is some circuiting consisting of type NM cable (Romex type). The circuiting is in fair condition. In numerous locations, the raceway lacks adequate support, or connections have separated, compromising proper grounding paths. Many junction boxes are open with conductor terminations protruding beyond the edge of the box. Many circuits have been modified or added since the original construction. The circuit loading was not analyzed. Ground Fault Circuit Interrupters are not installed for all circuits powering receptacles in wet locations (ex. Kitchens and Restrooms) as required for safety. With renovation of spaces, the circuiting should be replaced. In some cases, it may be appropriate to retain some circuiting, however, it will require a careful survey of such circuits to define repairs and modifications if necessary. If the spaces are not renovated within two years, effort should be made to survey all of the circuits and make modifications or repairs necessary to ensure safety, as well as conformance to code.

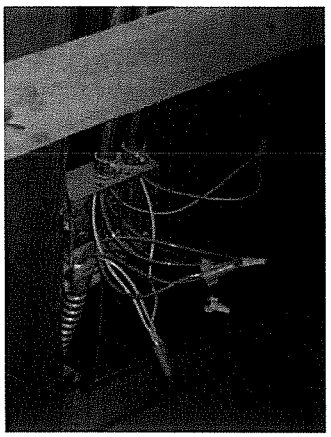


Convenience receptacles are scattered throughout the facility in accordance to needs when the facility was last renovated. However, since that time, technology has presented us with numerous pieces of equipment requiring electrical power, ex., computers, printers, copiers, and presentation equipment. Additionally, the use of the facility has changed over time with space renovated to facilitate needs requiring greater use of receptacles. Overall, there is a lack of receptacles in desirable locations. And the present receptacles, although in fair condition, have exceeded their service life. The existing receptacles should be replaced within two years, and receptacles added as spaces are renovated.

Disconnects and motor starters for the heating and ventilation equipment all appear to be in good condition. Most of this equipment has a remaining service life exceeding five years. However, as the heating and ventilation system is upgraded or modified, this equipment should be replaced accordingly.

Lighting Systems

The exterior lighting system consists of some wall mounted luminaires at the access points to the building. Additionally, some area lighting illuminates part of the parking area. The illumination of



some of the building access areas and some of the parking area is inadequate to ensure safety. Many of the luminaires are in fair to poor condition. The lighting control was not reviewed, but suspected to operate with photocells. This lighting should be replaced in the near future utilizing new pole mounted luminaires in the parking area and driveway and wall mounted luminaires at the building access points. The light sources considered should include LEDs, compact fluorescent, and High Pressure Sodium. The controls should include photocell, motion sensor, and time schedule.

The interior lighting system consists of luminaires with fluorescent lamps in the public and tenant spaces. Much of the utility space including attics, storage rooms, heating/ventilation spaces, and electrical spaces are illuminated with porcelain fixtures with incandescent lamps. Most of these areas appear to be controlled with manually operated, wall mounted switches. The illumination of most of the spaces appeared to be adequate and the fixtures in fair condition with approximately five years of service life remaining. In fact, the illumination of all spaces, including the utility spaces was surprisingly well maintained with operating lamps in most locations. In view of the current trend toward energy conservation, all of the lighting should be upgraded. Incandescent lighting in the utility spaces should be replaced with fluorescent – this should be done immediately by replacing the lamps with the newly marketed helical, medium base type fluorescent, allowing direct replacement of lamps, only.

The display lighting in the public areas consists of old track type flood lighting with incandescent lamps. The fixtures have reached their service life and should be replaced.

All of the public areas include emergency powered luminaires and illuminated exit signs in conformance to the codes. All appeared to be recently installed and in good condition. These should be replaced or relocated as needed when the spaces are renovated.

As noted above, energy conservation is a more prominent issue now. As spaces are renovated and lighting upgraded, the following illumination criteria should be considered:

- Utilize high efficiency luminaires as much as possible (Fixtures with T5 lamps are more efficient that those with T12 and T8 lamps).
- Utilize high efficacy lamps as much as possible (LED, Fluorescent, & HID).
- Shift the dominance of illumination from ambient to task lighting. (Provide only the minimum amount of ambient illumination necessary. Provide task illumination of specific areas where more illumination is needed).
- Control as much lighting as possible with Occupancy Sensors (this typically saves 15 to 25 percent of the energy currently

used for lighting).

Communications and Data Systems

The building is served with telephone and TV cable service from the same utility pole as that used for the power service. The service is routed to a terminal board mounted to the wall to the left of the main power switchboard and radio station transfer switch. The TV cable is not connected. It appears there are six telephone circuits and one DSL circuit (for the radio station) in use. The service equipment appears to be in fair condition. This equipment may be upgraded or modified as needs increase.

Telephone circuits routed from the terminal board to the individual terminals and telephone based equipment utilize telephone cables routed through the building without raceways. All are old and in fair condition. Note will support network data communications. These cables should be replaced as spaces are renovated.

There is no network system in this building. Given the use of the building and apparent desire to increase marketing for conventions, it appears necessary to install a network that will allow use of internet access with hardwired and wireless ports. Additionally, it may be useful to provide network circuiting to allow more progressive presentations in the auditorium with interactive projectors, etc. And, a need for printing and scanning via the network will probably be desirable. The network should consist of a single distribution point in a clean & dry location with some security from unauthorized users. The equipment should be a rack with patch panels, switch, internet server, UPS, and cable modem (maybe). The circuits to the terminals should be Category 5e or 6 cables routed in conduit or supported on hooks in the attics or above suspended ceilings. Wireless modems should be installed in strategic locations throughout the building to allow system use by more mobile equipment, (ex. laptops and projectors).

The telephone system should be configured in a manner similar to that employed for the data network with the cables to the terminals also routed from the same distribution rack and a separately designated patch panel. This will allow reallocation or relocation of lines & terminals utilizing patch cables when the needs arise.

Fire Alarm System

There is no fire alarm system for this facility. As a minimum, a system providing safety to the occupants in compliance with the codes should be installed. This includes manual pull stations at all exits and at the top of stairs, as well as in some utility spaces. It may also require automatic detection in the auditorium and lobby areas.

The sprinkler system needs to be connected. And all of the public spaces require notification devices with horns and strobes. The alarm system must be connected to call a Central Alarm agency when alarm conditions exist to facilitate calls to the fire department.

Access Control, Intrusion Detection, & Surveillance Camera Systems

No system exists in this facility to provide access control into the building or designated spaces. And there is no intrusion detection and alarming system or surveillance camera system. These are not mandatory to the operation of this facility, however, they may be considered. If these systems are considered, the following criteria should be evaluated and incorporated as desired:

- Maintain simplicity as much as possible to minimize operating and maintenance time.
- Employ network type systems. Allow for occupancy scheduling and manual disarming/arming control for all of the systems.
- Integrate the lighting occupancy sensors into the intrusion detection system to reduce the number of detection devices and increase coverage.
- Utilize proven equipment for door access controls.
- Utilize web based cameras with network connection to allow monitoring from authorized computers outside the building.
- Integrate the surveillance cameras with the intrusion detection system to alarm unauthorized intrusions.

Corrective Measures Costs

It is estimated that the costs to make repairs and improvements to the electrical system are:

Site Lighting	$ 25,000
Power Service and Distribution (20,228 square feet x $3.30/SF)	$ 67,000
Branch Circuiting (20,228 square feet x $3.00/SF)	$ 60,000
Lighting (20,228 square feet x $15.20/SF)	$307,500
Communications/Networks/Alarms (20,228 square feet x $10.00/SF)	$202,300

Appendix A

Summary of the Cost for Repairs

Chilkat Center for the Arts
Condition Survey, May 2008

Summary of Costs of Corrective Measures

Description	Budget	
Architectural		
Re-grade site, new catcfh basin	$20,000	
Replace existing concrete stairs at east end of site	$8,000	
Replace loading dock and ramp	$15,000	
Replace existing second level bridge	$40,000	
Replace Low Slope Roof Assembly	$300,000	
Replace gambrel roof	$116,000	
Install attic insulation and vents	$35,000	
Replace wood windows	$30,000	
Replace exterior doors	$26,000	
Replace floors in kitchen, toilet rooms, janitor rooms	$25,000	
Replace carpets	$20,000	
Replace kitchen appliences, counters, wall surfaces and serving area	$75,000	
Refurbish toilet rooms	$100,000	
Add accessible toilet room	$10,000	
Provide elevator access to both floors and basement	$350,000	
Provide lift at stair between radio station offices and other functions on this floor	$50,000	
Replace siding, fire tated metal door between stage and scene shop	$30,000	
Misc. wall reconfiguration, patching and painting	$20,000	
Correct basement floor leak with permanent sump pump and piping	$20,000	
Structural		
Blocking at floor joists	$20,000	
Block at foundation post	$200	
Replace roof sheathing at auditotium, stage and radio offices	$60,000	
New sheathing at second floor walls at auditorium, stage and radio offices	$7,500	
Shouth wing shear walls	$2,500	
Lighting catwalk ship ladder replacement	$2,500	
Truss connections	$105,000	
Replace rafters	$30,000	
Replace purlin beams	$6,500	
Replace damaged sidewalk	$4,500	
New perimeter drain	$20,000	
Mechanical		
Short term HVAC fan refurbishment	$40,000	
HVAC replacement	$200,000	
Renovate kitchen exhaust	$22,000	
Install make-up air for kitchen exhaust hood	$15,000	
Toilet exhaust fan replacement	$12,000	
Replace heating plant chimney and oil delivery system	$100,000	
Replace heating units and controls	$50,000	
Replace plumbing fixtures	$40,000	
Renovate heating control system	$80,000	
Install stage sprinkler system and revise sprinkler system	$12,000	
Electrical		
Site Lighting	$25,000	
Power Service and Distribution	$67,000	
Branch Circuiting	$60,000	
Lighting	$307,500	
Communication/Netweorks/Alarms	$202,300	
Construction Subtotal	$2,781,500	
Contingency (20 percent)	$556,300	
Construction Budget	$3,337,800	$3,337,800
Design of Improvements (12 percent)		$401,000
Construction Administration and Inspection (10 percent of Construction)		$334,000
Estimated Project Budget		$4,072,800

PND Engineers, Inc.
9360 Glacier Highway, Suite 100
Juneau, Alaska 99801
P (907) 586-2093
F (907) 586-2099

May 30, 2008

Appendix B

Cost Model for Building Replacement

Alaska Department of Education Early Development

Program Demand Cost Model for Alaskan Schools, 11th Edition

New Construction and Renovation Work

SCHOOL DISTRICT: (Name of School District) DATE OF ESTIMATE: (Date)

PROJECT: Chilkat Center
LOCATION: (Location of School)

PROJECT SUMMARY

	NEW CONSTRUCTION	RENOVATION	TOTAL
Project Size	20,228 SF	0 SF	20,228 SF
Construction Cost	$10,602,042	$0	$ 10,602,042
Construction Cost/SF	$524.13/SF		$524.13/SF
Construction Management (by Consultant)	$ 0	$ 0	$ 0
Land Purchase Costs	$ 0	$ 0	$ 0
Site Investigation	$ 0	$ 0	$ 0
Design Services Costs	$ 0	$ 0	$ 0
Equipment Costs	$ 0	$ 0	$ 0
Direct Administrative Overhead	$ 0	$ 0	$ 0
Art	$ 0	$ 0	$ 0
Project Contingency	$ 530,102	$ 0	$ 530,102
Total Project Cost	**$11,132,145**	**$0**	**$11,132,145**

NOTES:

[1] The square foot area for renovation needs to be inserted.

Alaska Department of Education Early Development

Program Demand Cost Model for Alaskan Schools, 11th Edition

New Construction and Renovation Work

SCHOOL DISTRICT: (Name of School District) DATE OF ESTIMATE: (Date)

PROJECT: Chilkat Center
LOCATION: (Location of School)

		AREA	$/SF	COST
1.00	**INSTRUCTIONAL RESOURCE/SUPPORT TEACHING AREAS**			
1.01	Standard Classroom[1]	0 SF	$ 171.36	$ 0
1.02	Kindergarten/Primary Classroom[2]	0 SF	208.44	0
1.03	Damp Classroom/Laboratory[3]	0 SF	191.72	0
1.04	Gymnasium[4]	0 SF	246.16	0
1.05	Instructional Media Center (IMC)	0 SF	180.19	0
1.06	Music Room	0 SF	188.99	0
1.07	Home Economics	0 SF	194.12	0
1.08	Industrial Arts[5]	0 SF	195.67	0
1.09	Other[6]	0 SF	0.00	0
1.10	Other[6]	0 SF	0.00	0
1.11	**SUBTOTALS (Lines 1.01 thru 1.10):**	**0 SF**		**$ 0**

NOTES:

[1] Includes general educational space as well as special instructional areas to include: business, driver's education, typing, language laboratory, and special education.
Cost for computer outlets included in classrooms.

[2] Includes a toilet.

[3] Includes art, sciences, craft and cosmetology.

[4] Physical education (dressing rooms and health classrooms).

[5] Includes wood/metal shop, automotive shop and agriculture.

[6] See Table 4, Categories A and B, for other types of instructional resource/support teaching spaces.

Alaska Department of Education Early Development

Program Demand Cost Model for Alaskan Schools, 11th Edition

New Construction and Renovation Work

SCHOOL DISTRICT: (Name of School District) DATE OF ESTIMATE: (Date)

PROJECT: Chilkat Center
LOCATION: (Location of School)

	AREA	$/SF	COST
SUBTOTAL CARRIED FORWARD (Line 1.11):	0 SF		$ 0
2.00 GENERAL SUPPORT/SUPPLEMENTARY AREAS			
2.01 Multipurpose Room[1]	1,500 SF	$ 178.46	$ 267,690
2.02 Auditorium[2]	5,166 SF	217.59	1,124,070
2.03 Lockers and Showers	2,712 SF	263.84	715,534
2.04 Administration[3]	10,150 SF	206.27	2,093,641
2.05 Cafeteria/Food Preparation[4]	200 SF	481.84	96,368
2.06 Storage	0 SF	156.16	0
2.07 Toilets	500 SF	317.91	158,955
2.08 Circulation	0 SF	177.43	0
2.09 Mechanical/Electrical[5]	0 SF	156.16	0
2.10 Other[6]	0 SF	0.00	0
2.11 Other[6]	0 SF	0.00	0
2.12 SUBTOTALS (Lines 1.11 + 2.01 thru 2.11):	**20,228 SF[7]**		**$ 4,456,258**

NOTES:

[1] Lunch rooms, etc.

[2] Includes stage and support area square footage.

[3] Includes space for counselor's area, clinic areas and administrative areas.

[4] Includes kitchen and serving areas (Dining in 2.01 - Multipurpose Room).

[5] Does not include equipment or systems, just space.

[6] See Table 4, Categories C and D, for other types of general support/supplementary space.

[7] The total square foot area arrived at from Sections 1.00 and 2.00 is the gross floor area of the building.

Alaska Department of Education Early Development

Program Demand Cost Model for Alaskan Schools, 11th Edition

New Construction and Renovation Work

SCHOOL DISTRICT: (Name of School District) DATE OF ESTIMATE: (Date)

PROJECT: Chilkat Center
LOCATION: (Location of School)

				COST
SUBTOTAL CARRIED FORWARD (Line 2.12):				$ 4,456,258
3.00 SPECIAL REQUIREMENTS				
3.01 Emergency Generator (Standby Included)	0	KW	1,009.72	$ 0
3.02 Fuel Oil 1,000 Gallon Storage for Generator	0	GAL	10.21	0
3.03 Fire Protection - Pump	0	EA	30,186	0
3.04 Fire Protection - Water Storage	0	GAL	3.05	0
3.05 Add for Crawlspace[1]	0	SF	40.42	0
3.06 Add for Pile Foundation[2]	0	SF	64.25	0
3.07 Add for Thermopile Foundation[3]	0	SF	69.62	0
3.08 Demolition of Existing Building	20,000	SF	20.87	417,400
3.09 Abatement of Existing Building	3,000	SF	8.24	24,720
3.10 Other Special Requirements[4]	0	LS	0	0
3.11 SUBTOTAL (Lines 2.12 + 3.01 thru 3.10):				**$ 4,898,378**

NOTES:

[1] Enter SF of building footprint that will be constructed using standard concrete foundations and a crawl space.

[2] Enter SF of building footprint that will be constructed using standard pile foundation system.

[3] Enter SF of building footprint that will be constructed using thermopile foundation system.

[4] Special Requirements may include required infrastructure for prime power generation, water treatment, and sewage treatment.

Alaska Department of Education Early Development

Program Demand Cost Model for Alaskan Schools, 11th Edition

New Construction and Renovation Work

SCHOOL DISTRICT: (Name of School District) DATE OF ESTIMATE: (Date)

PROJECT: Chilkat Center
LOCATION: (Location of School)

			COST
SUBTOTAL CARRIED FORWARD (BUILDING COSTS) (Line 4.09):			$ 4,998,378
5.00 CONSTRUCTION GENERAL REQUIREMENTS			
5.01 Mobilization, General Operating Costs and Office Overhead	Line 4.09 x	13.25%	662,285
5.02 Contactor's Mark-Up, Risk and Profit	Lines 4.09 + 5.01 x	8.50%	481,156
5.03 Bonds and Insurances	Lines 4.09, 5.01, 5.02 x	2.45%	150,475
5.04 BASE TOTAL (Line 4.09 + 5.01 thru 5.03):			**$ 6,292,293**

Alaska Department of Education Early Development

Program Demand Cost Model for Alaskan Schools, 11th Edition

New Construction and Renovation Work

SCHOOL DISTRICT: (Name of School District) DATE OF ESTIMATE: (Date)

PROJECT: Chilkat Center
LOCATION: (Location of School)

			COST
SUBTOTAL CARRIED FORWARD (BASE TOTAL) (Line 5.04):			$ 6,292,293
6.00 GEOGRAPHIC AREA COST FACTOR			
6.01 Place Geographic Area Here (Refer to Table No. 1 for percentage addition)	Line 5.04 x	11.40%	717,321
6.02 SUBTOTAL (Lines 5.04 + 6.01):			**$ 7,009,615**

Alaska Department of Education Early Development

Program Demand Cost Model for Alaskan Schools, 11th Edition

New Construction and Renovation Work

SCHOOL DISTRICT: (Name of School District) DATE OF ESTIMATE: (Date)

PROJECT: Chilkat Center
LOCATION: (Location of School)

		COST
SUBTOTAL CARRIED FORWARD (Line 6.02):		$ 7,009,615

7.00 SIZE FACTOR

NOTE: This section is automatically calculated by the program. However, refer to Table No. 2 for details on how the size adjustment factor is arrived at.

7.01	Size Adjustment Factor	Line 6.02 x 1.02	0
7.02	**SUBTOTAL:**		**$ 7,009,615**

FORMULA:

Proposed School Size / Base School Size	20,228 SF / 25,000 SF	=	0.81

NOTE:

1) If the proposed new school exceeds 25,000 SF, this calculation is disregarded.

2) For additions included with remodel work that has a value equal to or greater than $ 6,000,000 at Line 6.02, this calculation is also disregarded.

Alaska Department of Education Early Development

Program Demand Cost Model for Alaskan Schools, 11th Edition

New Construction and Renovation Work

SCHOOL DISTRICT: (Name of School District) DATE OF ESTIMATE: (Date)

PROJECT: Chilkat Center
LOCATION: (Location of School)

			COST
SUBTOTAL CARRIED FORWARD (Line 7.02):			$ 7,009,615
8.00 CONTINGENCIES			
8.01 GENERAL For construction unknowns and the unanticipated, on site and design criteria	Line 7.02 x	10.00%	700,961
8.02 SUBTOTAL (Line 7.02 + 8.01):			$ 7,710,576
8.03 ESCALATION Escalation is to be added for future cost estimates. Please put the year you anticipate the project to be escalated to. Escalation has been ***estimated*** only up to the year ***2010***.	Line 8.02 x	2010 ↓ 37.50%	2,891,466
8.04 TOTAL ESTIMATED CONSTRUCTION VALUE (Line 8.02 + 8.03):			**$ 10,602,042**

Alaska Department of Education Early Development

Program Demand Cost Model for Alaskan Schools, 11th Edition

New Construction and Renovation Work

SCHOOL DISTRICT: (Name of School District) DATE OF ESTIMATE: (Date)

PROJECT: Chilkat Center
LOCATION: (Location of School)

				COST	See Below for Suggested EED Ranges
SUBTOTAL CARRIED FORWARD (CONSTRUCTION VALUE) (Line 8.04):				$ 10,602,042	
9.00 PROJECT OVERHEAD AND OTHER COSTS					
9.01	Construction Management (by Consultant)[1]	Line 8.04 x	0.00%	0	2% to 4%
9.02	Land Purchase Costs[2]	1 LS	--	0	--
9.03	Site Investigation[2]	1 LS	--	0	--
9.04	Design Services Costs	Line 8.04 x	0.00%	0	6% to 10%
9.05	Equipment Costs[2, 4]	Line 8.04 x	0.00%	0	0% to 10%
9.06	District Administrative Overhead[3]	Line 8.04 x	0.00%	0	2% to 9%
9.07	Art[5]	Line 8.04 x	0.00%	0	0.5% to 1%
9.08	Project Contingency	Line 8.04 x	5.00%	530,102	
9.09	**PROJECT TOTAL COST (Lines 8.04 + 9.01 thru 9.08):**			**$ 11,132,145**	

NOTES:

[1] Percentage is established by AS 14.11.020(c) for consultant contracts.
[2] Include only if necessary for completion of this project.
[3] Includes district/municipal/borough administrative costs.
[4] See the department's publication, Guidelines for School Equipment Purchases. Technology is included with Equipment.
[5] Required for all renovation and construction projects over $250,000 (AS 35.27.020(d)).

Appendix C

Architectural Code Analysis

Jensen Yorba Lott, Inc.
522 West 10th Street
Juneau, Alaska 99801
ph 907-586-1070, fax 907-586-3959

Plan analysis based on
the 2003 International Building Code

Project Number:
Project Name: chikat center
Address:

Date: May 27, 2008

Occupancy: B,A-1,A-3
Construction: V-B

Contractor:
Architect:
Engineer:
Report By: Scott Henriksen

NOTE: The code items listed in this report are not intended to be a complete listing of all possible code requirements in the 2003 IBC. It is a guide to selected sections of the code.

Report created using Plan Analyst software by IHS Global 800-854-7179

SPRINKLER SYSTEM:
NFPA 13 sprinkler system throughout the building
Sprinkler system used to increase the allowable area and height.
-- Sec. 504.2 and 506.3

FRONTAGE INCREASE:
Perimeter of the entire building = 510 feet.
Perimeter which fronts a public way or accessible open space = 510 feet.
Minimum width of public way or accessible open space = 50
Allowable area increased 75.0% for frontage increase.
-- Sec. 506.2 NOTE: Limit in Section 506.2.1 used.

FL	NAME	OCC	MAX FLR	AREA	ALLOWED	RATIO	STATUS
2	Office	B	ok	2000	20625	0.1	ok
2	Office	B	ok	3220	20625	0.16	ok
TOTAL FOR FLOOR				5220	20625	0.25	ok
1	Theater	A-1	ok	5166	20625	0.25	ok
1	Office	B	ok	5000	20625	0.24	ok
TOTAL FOR FLOOR				10166	20625	0.49	ok
B1	Church Worship Area	A-3	ok	1500	20625	0.07	ok
B1	Locker Room	B	ok	2712	20625	0.13	ok
TOTAL FOR FLOOR				4212	20625	0.2	ok
BUILDING TOTAL				15386	41250	0.37	ok

-- Sec. 503, 504, 506 and Table 503

Code review for:
Project Id.: chikat center
Address:

Allowable area and height calculations are based on the most restrictive use. Different uses are not separated by fire barriers. -- Sec. 302.3.1
Basement area not included in the total when checking allowable area. -- Sec. 503.1.1

The actual height of this building is 45.0 feet.
The maximum height of this building is 60.0 feet. -- Table 503 and Sec. 504.2

PROPERTY DESCRIPTION:
North Side has a property line. - Distance to property line = 100.0
East Side has a public way. - Distance to public way = 60.0 ,width = 24.0
Exterior wall rating based on distance to center line of public way. -- Sec. 702.1 FIRE SEPARATION DISTANCE
South Side has a property line. - Distance to property line = 50.0
West Side has a property line. - Distance to property line = 40.0

EXTERIOR WALL FIRE RATINGS AND OPENING PROTECTION
Sec. 602, Tables 601 and 602, and Sec. 704

	NORTH			EAST			SOUTH			WEST		
OCC	BRG WALL	NON BRG	OPNG% UP/PR	BRG WALL	NON BRG	OPNG% UP/PR	BRG WALL	NON BRG	OPNG% UP/PR	BRG WALL	NON BRG	OPNG% UP/PR
B	0-hr	0-hr	NL/NL	0-hr	0-hr	NL/NL	0-hr	0-hr	NL/NL	0-hr	0-hr	NL/NL
A-1	0-hr	0-hr	NL/NL	0-hr	0-hr	NL/NL	0-hr	0-hr	NL/NL	0-hr	0-hr	NL/NL
A-3	0-hr	0-hr	NL/NL	0-hr	0-hr	NL/NL	0-hr	0-hr	NL/NL	0-hr	0-hr	NL/NL

The exterior walls may be of COMBUSTIBLE material. -- Sec. 602.5
Exterior walls are required to be fire-rated for exposure to fire:
1. From Both sides when fire separation is 5 feet or less.
2. On the interior side only when separation is greater than 5 feet. -- Sec. 704.5

Then maximum percent of area of unprotected opening has been adjusted for an automatic sprinkler system. -- Sec. 704.8.1

Code review for:
Project Id.: chikat center
Address:

up/pr = Maximum percent of openings in the exterior wall.
-- Table 704.8
up - The maximum percent if all openings are unprotected.
pr - The maximum percent if all openings are protected.
If some are protected and some are not, then use formula in Sec. 704.8
Openings in 1hr walls are required to be protected with 3/4 hour assemblies. -- Sec. 704.12 and Sec. 715.4
Openings in walls required to be greater than 1hr are required protected with 1 1/2 hour assemblies. -- Sec. 715.4
NL = No fire protection requirements for openings.
NP = Openings are not permitted in this wall.

Note: Unlimited unprotected openings are allowed in walls not required to fire-resistant. -- Table 704.8, Note: g.
* = These walls may be required to have a parapet wall 30 inches above the roofing. The parapet wall is required to have the same fire rating as the wall and shall have noncombustible faces for the uppermost 18 inches. -- Sec. 704.11
Exception 1: A parapet wall is not required when the wall is not required to be fire-resistive.

FIRE RESISTANCE RATINGS FOR BUILDING ELEMENTS -- Table 601

ELEMENT	MATERIAL	RATING	NOTES
Structural Frame	Any	0 hour	
Interior Bearing wall	Any	0 hour	
Interior nonbrg wall	Any	0 hour	
Shaft Enclosure	Any	1 hour	Note 1
Floor/Ceiling Assembly	Any	0 hour	
Roof/Ceiling Assembly	Any	0 hour	
Stairs	Any	None	

NOTES:
1. Fire resistance rating for shafts based on Section 707.4
NOTE: See Section 707.2 for shaft enclosure exceptions.

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DUCTS AND AIR TRANSFER OPENINGS -- Sec. 716
Dampers shall be accessible for inspection and servicing. 716.4
Where required. -- Sec. 716.5
1. Fire walls. -- Sec. 716.5.1
2. Fire barriers -- Sec. 716.5.2 See exceptions
3. Shaft enclosures -- Sec. 716.5.3 See exceptions
4. Fire partitions -- Sec. 715.5.4 See exceptions
5. Smoke barriers -- Sec. 715.5.5 (smoke damper) See exceptions

DRAFTSTOPPING:
Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with NFPA 13. -- Sec. 717.3.3 Exception (floor) and Sec. 717.4.3, Exception (attic)
Opening in the partitions shall be protected by self-closing doors with automatic latches constructed as required for the partitions. -- Sec. 717.4.1.1

OCCUPANCY SEPARATIONS -- Sec. 302.3.2 and Table 302.3.2
Uses are not separated by fire barriers. The construction of the building is based on the most restrictive use. -- Sec. 302.3.1

SEPARATION OF INCIDENTAL USE AREAS -- Table 302.1.1
Furnace rooms where any piece of equipment is over 400,000 BTU per hour input -- Smoke barrier -- Sec. 302.1.1.1
Rooms with any boiler over 15 psi and 10 horsepower -- Smoke barrier -- Sec. 302.1.1.1
Refrigerant machinery rooms -- Smoke barrier -- Sec. 302.1.1.1
Incinerator rooms -- 2 hours and an automatic sprinkler system
Storage rooms over 100 square feet -- Smoke barrier -- Sec. 302.1.1.1
Note: This list covers only the most common uses. See Table 302.1.1 for a complete list.

EXIT REQUIREMENTS:

FL	NAME	NUMB OCC	MIN EXITS	MIN WIDTH	PANIC HDWR	CORRIDOR RATING	DOOR SWING	NOTES
2	Office	20	1	3.0	No	N/A	N/R	
2	Office	32	1	4.8	No	N/A	N/R	
TOTAL FOR FLOOR		52	2	10.4	No	N/A	Out	

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1	Theater	275	2	41.3	Yes	N/A	Out	1 12
1	Office	50	1	7.5	No	N/A	Out	
TOTAL FOR FLOOR		325	2	48.8	Yes	N/A	Out	11 12
B1	Church Worship Area	214	2	32.1	Yes	N/A	Out	1 12
B1	Locker Room	54	2	8.1	No	N/A	Out	1
TOTAL FOR FLOOR		268	2	53.6	Yes	N/A	Out	12

FOOTNOTES:
1. Two exits are required from this area since the occupant load exceeds allowable in Table 1014.1
11. Note: If 2nd floor and basement exit through the first floor, exiting on the first floor is to be based on egress convergence. Base exiting requirements on the 1st floor using the sum of the occupants on the 2nd floor and in the basement. -- Sec. 1004.5
12. Panic hardware is required when the occupant load is 100 or more. -- Sec. 1008.1.9

NOTES FOR EXIT TABLE
Door swing is based on Section 1008.1.2
Occupant load is based on Section 1004 and Table 1004.1.2
Exit width is in inches and based on Section 1005.1 & Table 1005.1
Width shown for all areas is based on other egress components.
Width shown for 1st floor is based on other egress components.
Width shown for other floors & basements is based on stairways.
For the minimum width of doors, see Section 1008.1.1.
For the minimum width of corridors, see Section 1016.2.
For the minimum width of stairways, see Section 1009.1.
Exits shall be continuous from the point of entry into the exit to the exit discharge. -- Sec. 1003.6

EXIT SEPARATION
In areas where 2 exits are required, the minimum separation is 1/3 of the maximum diagonal of the area or floor measured in a straight line between exits or exit access doorways.-- Sec. 1014.2.1, Exception 2
Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity by more than 50 percent. -- Sec. 1005.1