MEMORANDUM

State of Alaska
Department of Transportation & Public Facilities
Statewide Public Facilities

TO: File

DATE: September 26, 2007

FILE NO:
TELEPHONE NO: 907-269-0869
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FROM: Matt Desalernos P.E.
Project Manager

SUBJECT: Nome State Office Building
Project Number TBD

The Nome State Office Building was constructed in 1973-74 Problems with the building began almost immediately. A major storm event in the fall of 1974 caused significant damage to the south wall of the building The repairs made after the 1974 storm have been largely ineffective at protecting the building from the infiltration of corrosive salt water spray from the Bering Sea which sits only a few feet away. Over the years significant corrosion to steel framing members and to steel structural members has now developed into a serious problem that must be addressed soon if the building is to remain in service An engineers report dated 2001 indicated that corrosion has reduced the cross section of some columns by as much as 15% Undoubtedly the situation has continued to worsen in the years since that report was written

The structural problems with the building are well documented through a series of engineer's reports dating back to Jan 1994 (see attached summary). Each subsequent report has noted additional and progressive damage to the steel framing and the structural components of the building. Another severe storm event such as the one in that occurred in 1974 could easily cave in the entire south wall of the crawl space, allowing storm waves to wreak havoc within that area of the building causing extensive damage to the building HVAC system. Such damage could easily cause the entire building to be unfit for occupancy for a significant amount of time

The exterior cladding system on those portions of the building not damaged by the 1974 flood has been at a point of failure for some time. A significant amount of the cladding system is made of steel that has now rusted away to the point where it no longer serving as an effective moisture barrier. In addition, the original cladding system relied heavily on a number of caulked joints to maintain the integrity of the moisture barrier. Such systems are difficult or impossible to maintain, particularly in a severe environment. As a result many if not all of the original caulked joints are now at a point of failure. The end result of the rusted out steel panels and failed caulked joints is that the likelihood of additional corrosion damage to interior steel framing members in other areas of the building is very high.

Subsequent storm events in 2004 and 2005 have caused additional damage to the south wall During these events significant flooding resulted in the crawl space. The flood water infiltrated the buildings HVAC system, creating the potential for possibly hazardous contaminants (dust and mold) to have been introduced into the buildings ventilation system. While these contaminates have been removed, the probability is high that future storm events will cause more flooding in the crawl space and the cleanup will need to be repeated If the building is to remain in service, it would be prudent and sensible to look at reconfiguring the buildings HVAC system so that mechanical equipment is removed from this area completely or at a minimum housed or sealed in such a way as to be protected from damaging effects of the almost certain future flooding of the crawl space

The mechanical systems in the building are all original equipment and have exceeded their useful life expectancy New boilers and direct digital control systems are needed to replace the existing 30+ year old systems.

Other significant life safety issues need to be corrected if the building is to remain in service Existing corridors were identified in 1994 as not meeting the current fire rating (1hour), it is doubtful that the fire marshal will allow this deficiency to remain if other major upgrades to the building are undertaken Other life safety issues such as adding a fire alarm system, adding code required smoke dampers to the ducting system and adding code compliant emergency exit lighting should also be addressed

The original roof was replaced in 1993, so it is now 14 years old Nome maintenance personnel have not mentioned problems with the roof Typically roofs of this kind can be expected to last 20 yrs or more. Accordingly, a new roof is probably going to be needed in the next 5-10 years.

ROM Cost estimate (not including costs for temporary relocation of current occupants):

Structural Repair and new siding 2.5 million

- Demo old siding including haz mat for asbestos impregnated siding: $250,000
- Demo damaged framing members exposing corroded steel structural members and joints: $150,000
- Repair of corroded structural members $1,000,000
- Replacement of damaged wall framing $500,000
- Install new siding system: $500,000

HVAC System Renovations 2 0 million

Life Safety upgrades: 1 5 million

Following is an extract of findings from existing architectural and engineering reports on file for the building:

USKH Jan 1994. This report is separated into three volumes as follows:

- Vol A Exterior Envelope Corrosion Study
- Corrosion damage to the south wall of the structure was the primary focus of the report. The report documented damage that occurred as a result of a major storm even that occurred in November of 1974 The report identified that an inadequate repair of that damages resulted in poor protection from the elements which had resulted
- USKH recommended removal of the existing cladding system to expose the framing members such that the extent of corrosion damage could be determined and removed.
- After repair of the damaged framing, a new cladding system Exterior Insulation and Finish System (EIFS) was recommended This system would utilize a synthetic plaster system such as Dryvit, R-Wall, Pleko, Finestone or Thorowall These types of systems are considered to have excellent resistance to harsh and/or corrosive environments.

- Vol B Heating and Ventilation controls Study Volume B focused solely on the HVAC control system

- Pneumatic Heating and Ventilation System controls are original and nearing the end of their useful life. Lifespan is typically 20-30yrs building was 20 yrs old in 1993

- USKH recommended upgrading the system to DDC

- Other suggested improvements were to balance all the air and hydronic systems in the facility and insulate heating system piping in the basement.

- None of this work was ever funded

- Vol C Condition Survey and Deficiencies Report
  Life Safety issues are as follows:
- 1 hour corridor system: Current corridors now on extend from floor to drop ceiling. Corridors should be replaced with floor to hard ceiling on hour fire rated walls and 20 minute fire rated metal framed doors
- Stair Railings need to be brought up to current codes
- Fire alarm system: Building wide addressable fire alarm system is recommended
- Other fire separations. Additional smoke dampers in the ventilation system are required to meet current codes.
- Inadequate ventilation for fume hood and kettle exhaust fan
- Emergency Lighting system upgrade
  Other items noted include provisions for lessening the maintenance cost of the build, energy conservation and ADA compliance

Loftus Engineering Associates 10/13/97

- Exterior Envelope Corrosion Study Review
  This report was made as a follow up (second opinion) report to Volume A of the initial USKH report. Report confirms the initial USKH diagnosis and recommendation for

repair. Report indicates that the condition of the south wall is "an unacceptable condition by any standard of performance"

Recommended repairs to the wall system include:
1. Removal of all of the existing siding on the building to expose the underlying sheet rock for inspection.
2. Removal and replacement of all the studs in the crawl space, includes the entire wall section.
3. Additional 15% of wall areas (first floor primarily) are expected to require similar removal and replacement. Areas requiring removal shall be determined by inspection after removal of cladding and areas of sheetrock.
4. All removed walls to be reconstructed. Entire building clad with half inch ply covered with building paper. EPS insulation will be fastened to the ply and then covered with an EIFS cladding system as identified in the USKH report

Corrosion in the steel columns is first identified in this report. Report indicates the condition as "serious" and indicates that repairs should be made by stripping up to 2 feet of the concrete cladding over the existing columns and cleaning and reapplying corrosion inhibitors.

None of these repairs were undertaken

PDC Inc Consulting Engineers12/20/2001

- Engineers Report Nome State Office Building

This report focuses primarily on corrosion to the structural elements of the building. Notes indicate corrosion has reduced the cross section of some structural elements to have reduced column cross sections by as much as 15%. Failure of the exterior cladding is identified as the source of the leakage for wind driven salt spray from the Bering Sea. Corrosion also noted in steel floor decking on the east wall. Beam to column and beam to girder bolted connections show corrosion as well.

Recommended fix is to expose all structural elements suspected to be subject to corrosion. Sandblast and recoat them with corrosion inhibitors. All connections should be sandblasted, inspected and repaired. Additional lateral supports may be required to correct structural deficiencies. Replace all metal studs along the south wall of the crawl space and the first floor of the structure. Exterior cladding should be completely removed and replaced with a new system more resistant to the corrosive elements particular to the building location

None of the recommended repairs have been made

BBFM Engineers Inc. 10/22/2004

- Nome State Office Building Inspection

Inspection was made immediately subsequent to a storm event which caused flooding in the basement of the Nome State Office Building and caused up to three feet of gravel deposited along the south wall of the building. Report references a previous report by PDC that identifies concrete spalling and sever corrosion of structural columns on the south wall of the building. Recommends repair of this problem as indicated in the PDC Report.

DOTPF Northern Region Safety Officer Letter Regarding Mold/Fungus 5/17/2006

- Letter documents Northern Region M&O cleanup and testing to demonstrate that mold and fungus were not present in the building

I. Background

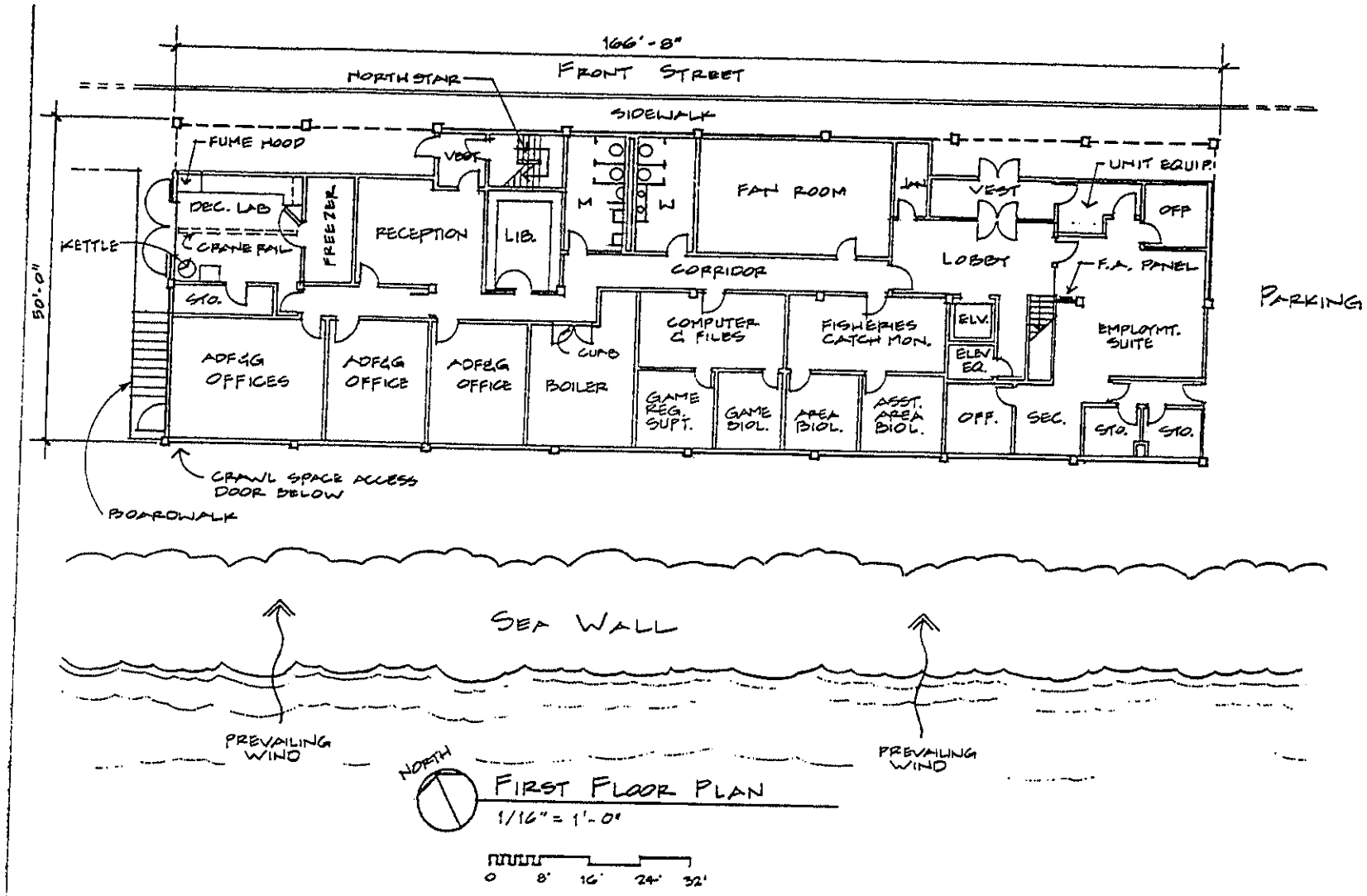
The Nome State Office Building is a 15,980 square-foot, two-story structure, located on Front Street in Nome, adjacent to the sea wall on the Norton Sound of the Bering Sea. The facility houses various state agencies, including:

Department of Corrections
Department of Environmental Conservation
Department of Fish and Game
Department of Health and Social Services
Department of Labor
Elections
Attorney General
Governor's Office
Legislative Affairs

On November 17, 1993, at the request of DOT&PF, the facility was inspected by Scott Bell, P.E., a mechanical engineer with USKH. The purpose of the inspection was to determine the condition of the existing HVAC controls system, list deficiencies, and provide recommendations and budgetary cost estimates for correction of the identified deficiencies. The wide difference in room temperatures throughout the facility is the primary impetus for this study of the HVAC control system. As part of this investigation, Mr. Bell met with the Honeywell, Inc. representative in Anchorage and reviewed this building's control system with them.

The existing controls system is a pneumatic system consisting primarily of Honeywell components and is in average condition for a 20-year old system (control systems have a useful life of from 20 to 30 years). Several of the control sequences can be improved upon by the addition of control components. Given the remaining useful life of the control system the State should consider switching to a direct digital control (DDC) for the mechanical rooms and main controllers.

Upgrades to the building's air heating system are also discussed, but are not recommended at this time due to their high estimated construction cost.



FIRST FLOOR PLAN
1/16" = 1'-0"

USKH
Architecture • Engineering
Land Surveying • Planning

STATE of ALASKA
DEPARTMENT of TRANSPORTATION & PUBLIC FACILITIES
NOME STATE OFFICE BUILDING UPGRADE
Project No. 66060

DATE 1/12/94
DRAWN JRN
CHECKED GHP

DWG. NO.
1

BBFM Engineers Inc.

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MEMORANDUM

Date: October 22, 2004
To: Mike Szewc, State of Alaska
From: Troy J. Feller, PE
Re: Nome State Office Building

204153

The purpose and scope of site visit was to identify and assess any storm damage or distress to the Nome State Office Building on Front Street. The recommendations from this assessment are in my Site Observation Report dated October 22, 2004. Although not storm related, during my observations I did note the on-going corrosion of steel columns below 1st floor along south side of building. This corrosion is becoming severe and is starting to diminish the building's structural integrity. Most of the cracked and spalled concrete observed around perimeter of building and in the crawl space is being caused by the steel column corrosion. The outer layer of steel expands as it oxidizes which results in prying forces to the un-reinforced concrete encasement resulting in the cracking and spalling. Once the concrete encasement is loose it tends to trap moisture against steel columns which exacerbates the problem. This situation needs to be addressed as described in the December 2001 report by PDC Engineers.