

YELLOWKNIFE COURTHOUSE FEASIBILITY STUDY

Prepared for
Department of Public Works and Services
Government of the Northwest Territories

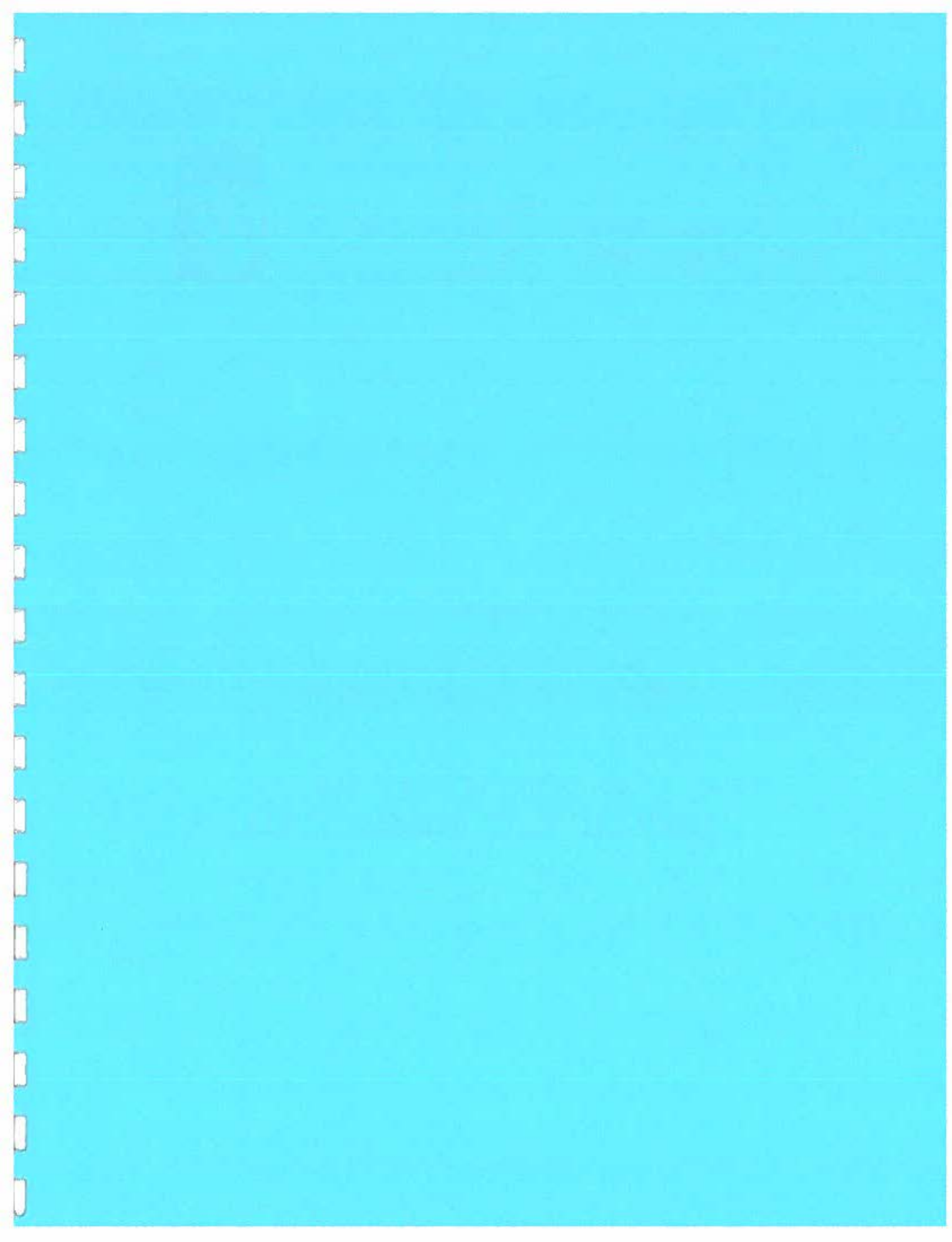
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FEASIBILITY STUDY

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1. EXECUTIVE SUMMARY

1.1 PROJECT FRAMEWORK

The Yellowknife Courts have been located in a leased commercial office building for the past 20 years. The Judiciary and staff have raised concerns about the suitability of the existing building. The Government of the Northwest Territories (GNWT) retained Ferguson Simek Clark and Matrix Planning Associates to determine whether it would be more cost-effective to renovate the existing Yellowknife Courthouse or to construct a new Courthouse.

1.2 PROJECT METHODOLOGY

The Feasibility Study was organized around a series of studies to determine the needs of the Courts, the condition of the existing building, and the implications of redeveloping the existing building versus the construction of a new Courthouse.

- **Needs Analysis**
Obtain historical population and caseload data, and present estimates of future caseloads as the basis for establishing the numbers of courtrooms. Provide preliminary estimates of future facilities requirements based on expectations of caseloads, the complexity of cases, organizational models, operations and personnel.
- **Existing Facilities**
Architectural and Engineering technical assessment of the existing building and its systems, space utilization, and its fit with functional requirements. Functional Assessment of the circulation, security and accommodation in the existing building.
- **Preliminary Facility Programme**
Determine functions and rooms to be accommodated in a new or redeveloped courthouse and the space required.
- **New Courthouse**
Provide an overview of requirements for a new courthouse, including size of site required and a possible building configuration.
- **Redevelopment of Existing Courthouse**
Provide an approach to the redevelopment of the Yellowknife Courthouse to satisfy the Courts' needs.
- **Financial Analysis of Options**
Prepare a detailed financial analysis of the relative costs of continuing the lease and redeveloping the Yellowknife Courthouse or constructing a new Courthouse. (During the study, the third option of purchasing the existing building and redeveloping it was added for financial comparison.)
- **Evaluation of Options**
Provide a summary comparison of the options based on criteria including relative costs, fit with functional program requirements and implementation impacts.
- **Conclusion and Recommendation**
Provide conclusion to study findings and a recommendation for future Yellowknife Courthouse facilities.

1.3 SUMMARY FINDINGS

- **Needs Analysis / Preliminary Building Programme**

The existing Court facilities occupy 3586 m² of the existing building. Two existing courtrooms meet current requirements for ceiling height and security but not for communications and videoconferencing. The third courtroom is inadequate in all above areas. Courtrooms are utilized beyond full capacity, Courts have been forced to be held in rented commercial space, and on occasion Courts do not sit due to lack of available courtroom space.

The population of Yellowknife and the Western NWT is projected to increase, and, in turn, the number of cases will increase. The time required to hear each case is increasing. Future courtroom requirements are projected to increase 20 to 30% in the next ten years. (See Section 3). Personnel required to service this increase are projected to increase 57% in the next ten years.

Based on the above, the Steering Committee decided to plan the new Yellowknife Courthouse for six courtrooms, which should be sufficient to meet anticipated demand for at least ten years, and likely well beyond.

Building requirements are estimated to require a Gross Floor Area of 5261 m².

Due to the uncertainty of projecting population and caseload projections into the future, the Courthouse must be designed to expand beyond the six initial courtrooms. For planning purposes, the financial analysis included a two courtroom addition in Year 10.

Covered secure parking for 13 spaces and outdoor parking for 52 spaces is required.

- **Existing Facilities**

The existing courthouse facility and its systems are in relatively good shape for a twenty year old building.

Major deficiencies for Courthouse uses include: floor to floor heights which are too low for required courtroom ceiling heights; an existing floor plate which impedes efficient layout of the three separate circulation systems required in a Courthouse; a lack of an appropriate image for the courts; a site too small to accommodate required parking; and some required Code upgrades.

1.4 PROPOSED NEW COURTHOUSE

It is proposed that a new six-courtroom courthouse be constructed with a gross floor area of 5261 m². The Net Present Cost of the project over twenty years, including site acquisition, design, financing, operating and maintenance, and a year 10 addition is estimated at \$24,807,669. (For comparison, buying and redeveloping the existing building would be 12% more costly and leasing / redeveloping would be 27% more.)

The proposed facility will conform with all of the requirements of a contemporary courthouse, including:

- Courtrooms and hearing rooms with appropriate room configurations, including floor areas, ceiling heights and seating capacities. Provision would be made to accommodate recent and future technological advances, including facilities for videoconferencing and increased used of computers.
- Separate circulation systems for members of the judiciary, accused in custody and jury members, including a secure entry for the judiciary and jurors, secure parking for the judiciary, and a secure enclosed vehicle sallyport for prisoner transport.
- Substantially improved facilities for regular court users, including interview rooms and witness waiting rooms.
- Sufficient chambers and support space to accommodate members of the judiciary.
- Upgraded public services, including suitable parking accommodation, building waiting areas and public circulation.

1.5 BENEFITS OF A NEW COURTHOUSE

The construction of a new courthouse offers the flexibility to respond to unforeseeable changes in the demand for court services. Additional major benefits include:

- The building would convey an appropriate image for the major courthouse in the Western NWT, reflecting a Court system that is independent of the other two branches of government.
- A separate courthouse would convey to citizens attending, particularly witnesses, parties and accused, that this is a facility in which important business takes place, requiring nothing but the highest standards of integrity and truth.
- A new building has the design flexibility to provide a building symbolic of the Citizens of the Western NWT and Yellowknife.
- A new building would avoid the costly and time-consuming operational and physical disruptions that would be inevitable if the existing Yellowknife Courthouse were to be redeveloped.
- Courthouse security, including the holding and transporting of prisoners, would conform to accepted standards.

1.6 REDEVELOPMENT OF THE EXISTING BUILDING

The feasibility study proposed a redevelopment option for continued use of the existing building.

Net Present Costs for the redevelopment of the existing building including construction costs, temporary rent and relocation costs, and year 10 renovation costs over twenty years is estimated to be \$ 31,525,958.

For comparative purposes, a financial analysis of purchasing the existing building and redeveloping it was prepared. The Net Present Cost of this option over twenty years is estimated to be \$27,896,399. The savings over the lease arrangement above are largely a result of the equity build up in the land and existing building. (Note that the existing building will be over 40 years old at the end of the Study Period.)

Major implications of redeveloping the existing building are:

- The requirement to meet Code and to provide separate, secure circulation systems for Judges and accused would require the insertion of two new elevators and the shaft enlargement and replacement of one existing elevator through all floors.
- Minimum courtroom ceiling height of 3.65 to 4.3 metres is required. This would require the removal of two existing floor assemblies and the insertion of one new floor at an intermediate level.
- It was determined that the disruption of the Courts by the required renovations would be impractical and unacceptable. Redevelopment of the existing building would require moving the courts into temporary accommodations for the renovation period and then moving them back when completed.
- All building systems would require upgrading or replacement as part of its redevelopment.
- The cost of purchasing and developing additional property for required parking has been included in project costs.
- **Although the analysis assumes that alternate accommodations would be available, the reader is cautioned that it is unlikely that such specialized accommodation would in fact be obtainable in Yellowknife. If this alternate accommodation is not available, it would not be possible to redevelop the exiting building under the requirements noted in this study.**

1.7 FINANCIAL ANALYSIS

A table of financial variables was prepared to show the assumptions made underlying financial analysis. It is recommended that the reader review these variables to confirm their validity.

For analysis purposes, project costs were financed over the life of the twenty year planning study, so that at the end of the study period all capital costs had been included.

Retained value is the equity accrued to the GNWT during the study period. Retained value has been calculated and included in the Net Present Cost.

A cost estimate for each option was prepared on a ten year and a twenty year basis.

A Cash Flow Projection was prepared for each option on a ten year and a twenty year basis, and from that the Net Present Cost was calculated.

1.8 EVALUATION OF OPTIONS

| | Lease / Redevelop Existing | Purchase / Redevelop Existing | New Courthouse |
|---|----------------------------|-------------------------------|----------------|
| Functional Fit | | | |
| Compliance with Space Program | Satisfactory | Satisfactory | Optimal |
| Required Functional Relationship | Limited | Limited | Optimal |
| Provide Internal Flexibility | Limited | Limited | Yes |
| Provide Expansion Potential | Limited | Limited | Yes |
| Appropriate Building Image | Unsatisfactory | Unsatisfactory | Optimal |
| Effective Space Utilization | Satisfactory | Satisfactory | Optimal |
| Security | Compromised | Compromised | Optimal |
| Sufficient Public/Staff Parking | Yes | Yes | Yes |
| Implementation | | | |
| Schedule to Completion | 24 months | 24 months | 33 months |
| Disruption to Existing Operations | Significant | Significant | Limited |
| Site Acquisition | For parking | For parking | Required |
| Costs | | | |
| Net Present Cost | \$ 31,525,958 | \$ 27,896,399 | \$ 24,807,669 |
| Net Present Cost Compared to New Building | 127% | 112% | 100% |

1.9 CONCLUSION

The Courthouse Strategy Committee recommends the design and construction of a new standalone Courthouse Facility in Yellowknife as the most cost effective option for addressing the current and future needs of the NWT court system.



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2. INTRODUCTION

2.1 BACKGROUND

In 1977, the GNWT signed a 20-year lease for a new commercial office building being constructed in Yellowknife, which is the judicial centre for the entire jurisdiction. Tenant improvements were made to accommodate the Courts, administrative functions of the Department of Justice, and other government office functions. The Yellowknife Courthouse accommodates all Court of Appeal, Supreme Court, Territorial Court and Justice of the Peace Court functions in Yellowknife.

2.2 PROJECT OBJECTIVES

In May 1998, the Department of Public Works and Services (DPWS), on behalf of the Department of Justice commissioned Ferguson Simek Clark Engineers and Architects (FSC) and Matrix Planning Associates (Matrix) to determine if it would be more cost-effective to redevelop the Yellowknife Courthouse or construct a new courthouse.

The scope of work included:

- Estimating the future demand for court services in Yellowknife, as defined by the numbers and types of courtrooms.
- Developing estimates of space requirements for each court functional component.
- Determining the physical condition of the Yellowknife Courthouse, as well as its fit with functional requirements.
- Assessing the feasibility of accommodating long-term court requirements within the Yellowknife Courthouse.
- Determining the required size of building and site requirements for a new courthouse.
- Evaluating the comparative advantages and disadvantages of redeveloping the Yellowknife Courthouse or constructing a new courthouse.

2.3 PROJECT PARAMETERS

Several planning parameters were established for the project:

- Direction to the consultants was to be provided by a Steering Committee consisting of representatives from the Court of Appeal, Supreme Court and Territorial Court judiciaries, the Department of Justice, and DPWS.
- The project was to be completed by the end of August, to allow time for review and decisions prior to October.
- Consultation was to be limited to individuals directly involved with the operation of the courts. More extensive consultation with court users and the community were to take place as part of subsequent studies.
- The comparison of options was to be based on a 20 year planning horizon.
- In the future, Department of Justice and other GNWT administrative functions will be relocated outside of the Courthouse.

- If redevelopment of the Yellowknife Courthouse for court use does not require the entire building, areas surplus to Courts needs were to be identified.
- Building massing and site layout concepts were to be based on a generic flat site, rather than on an actual location. If a decision were made to construct a new courthouse, a detailed review of potential sites would be required.
- The concept of a Unified Court would not be addressed as part of the study.
- It would be acceptable for all judicial accommodation to share the same floor of the courthouse.
- The Court of Appeal, Supreme Court, Territorial Court and Justice of the Peace Court would share the use of courtrooms on a scheduled basis. The Federal Court of Canada and the Tax Court of Canada will also use the courtrooms on a space available basis.
- Coroner's Inquests, Administrative Tribunals, and other quasi-judicial functions would also use the courtrooms as available.
- All courtrooms excluding smaller meeting and hearing rooms should have secure prisoner access.

2.4 ORGANIZATION OF REPORT

The remainder of the report is divided into six sections:

- **Needs Analysis**
summarizes historical population and caseload data, and presents estimates of future caseloads as the basis for establishing the numbers of courtrooms. It also presents preliminary estimates of future facilities requirements based on expectations regarding caseloads, organizational models, operations and personnel.
- **Existing Facilities**
consists of a description and technical assessment of the Yellowknife Courthouse building and its systems, a description of current space utilization, and a discussion of its fit with functional requirements.
- **New Courthouse**
provides an overview of requirements for a new courthouse, including site size and a possible building configuration.
- **Redevelopment of Existing Courthouse**
presents an approach to the redevelopment of the Yellowknife Courthouse, including a strategy for phased implementation of required upgrading.
- **Financial Analysis of Options**
contains a detailed financial analysis of the relative costs of redeveloping the Yellowknife Courthouse or constructing a new courthouse.
- **Evaluation of Options**
presents a summary comparison of the two options based on criteria including relative costs, fit with functional program requirements and implementation impacts.

There are four appendices, as referenced in the body of the report:

- Technical Status Evaluation
- Functional Assessment
- Space Planning Data
- Costing Information

3. NEEDS ANALYSIS

3.1 APPROACH

Estimating the long-term demand for court services is a daunting task. Not only must we choose a reliable source for population projections as a base for our forecasts, but we must also acknowledge the many other factors that can influence the demand for court services. The list of factors is long and expanding and includes economic conditions, the incidence of crime, new legislation, the numbers of lawyers, and trends towards increasingly complex litigation.

To provide a basis for forecasting, we usually examine past data to identify trends that may continue into the future. Our study of past trends is very limited for the courts in Yellowknife due to the lack of historical data. In fact, we have only four years of complete caseload data. In addition, rudimentary court time data is available for the current year only.

We place great weight on the value of informed opinion to influence the results of our statistical analysis for all of our courts planning projects. For this project, our reliance on the opinions of the Steering Committee was greater than normal due to the lack of adequate historical data as well as the volatility of the local situation.

In the remainder of this section, we describe the results of our analysis. The focus of our work was to estimate the required numbers of courtrooms, the standard measure for the size of court facilities. We proceed from a review of population forecasts to a discussion of caseloads and current courtroom utilization to our conclusions on the required number of courtrooms in 2008.

3.2 POPULATION FORECASTS

Estimating future population for a small population base jurisdiction like the NWT is a difficult task. Yellowknife, in particular, is volatile with the impact of Nunavut as well as unknowns in the mining and tourism sectors. Changing conditions can have significant percentage positive or negative impacts in a small centre such as Yellowknife. Any future modifications to the population forecasts should be examined for the impact on our estimates for court requirements.

Population forecasts for the NWT were obtained from two separate sources — the Territorial Bureau of Statistics, and the Department of Resources, Wildlife and Economic Development (RWED). The Bureau of Statistics has produced forecasts for 1991 to 2006. It is in the process of analyzing 1996 Census data to produce long-range forecasts. The less detailed information obtained from DRWED was used to check assumptions in the Bureau of Statistics estimates.

Figure 1 presents historical population data and forecasts for the NWT for the period from 1981 to 2006. It includes breakdowns for both the Western NWT and area to be included within Nunavut. Figure 2 provides comparable estimates for the period 1994 to 2008 for both the Western NWT and City of Yellowknife. Both sets of figures are based on information provided by the Bureau of Statistics. The totals for the Western NWT and Yellowknife have been extrapolated to 2008 to establish a ten-year planning horizon for establishing the required numbers of courtrooms.

Figure 3 summarizes the projected distribution of age groups in the Western NWT for the period 1991 to 2006. The 15-39 year age group, which is most prone to participation in criminal activities, is expected to increase by 10.5% from 1996 to 2006, from 19,000 to approximately 21,000. However, the most rapid rate of growth will be in the group consisting of those over age 40.

For purposes of our analysis, the Western NWT was taken as the service area for the Supreme Court, while the City of Yellowknife was the service area for the Territorial Court.

Figure 1: Population Forecast for NWT, 1991-2006

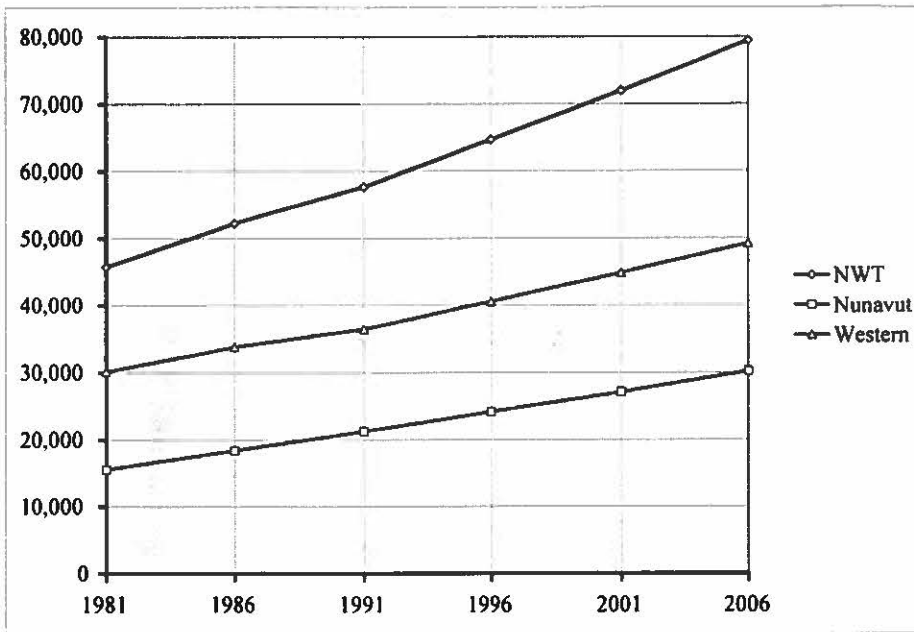


Figure 2: Population in Western NWT and Yellowknife, 1994-2008

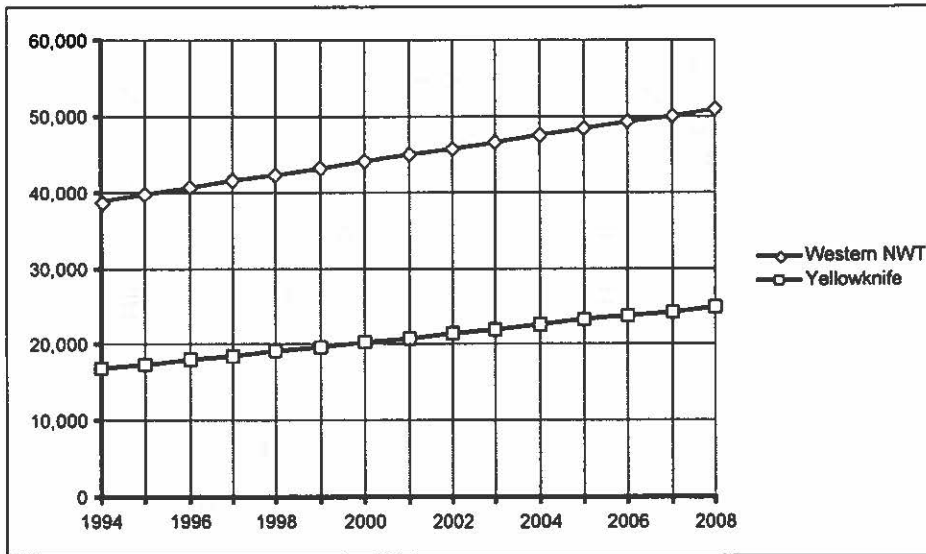
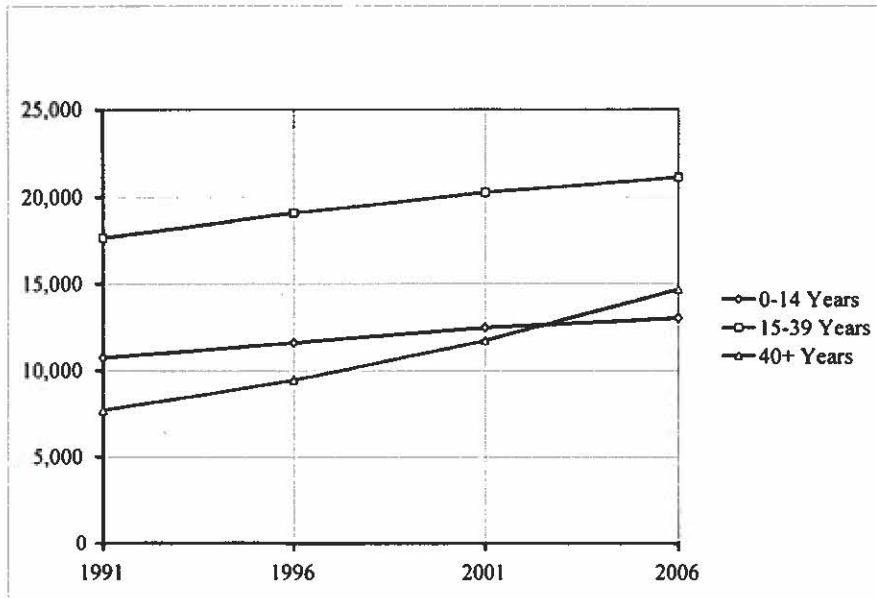


Figure 3: Age Groups in Western NWT, 1991-2006



3.3 CASELOADS

Historical Caseloads

Figure 4 summarizes historical caseloads by case type for the Yellowknife Courthouse for the five-year period from 1993 through 1997. It is based on data provided by the Department of Justice. As indicated, the overwhelming majority of cases involved Territorial Court criminal matters. Note that the data for Territorial Criminal cases was not available for 1993. The figure shown includes Justice of the Peace Traffic Court, as a separate subtotal for these cases is unavailable.

Figure 4: Historical Caseloads, Yellowknife Courthouse, 1993-1997

| Case Type | Year-5 1993 | Year-4 1994 | Year-3 1995 | Year-2 1996 | Year-1 1997 |
|----------------------|----------------|----------------|----------------|----------------|----------------|
| Court of Appeal | 58 | 56 | 88 | 49 | 29 |
| Supreme Criminal | 268 | 218 | 288 | 174 | 99 |
| Divorce | 127 | 119 | 116 | 120 | 78 |
| Estate | 27 | 45 | 28 | 32 | 18 |
| Bankruptcy | 42 | 36 | 42 | 51 | 71 |
| Adoption | 159 | 38 | 27 | 165 | 82 |
| Supreme Other | 250 | 370 | 386 | 242 | 245 |
| Territorial Criminal | n/a | 3,721 | 5,800 | 4,925 | 3,146 |
| Child Welfare | 44 | 44 | 32 | 45 | 22 |
| Maintenance | 118 | 145 | 124 | 142 | 127 |
| Small Claims | 650 | 312 | 363 | 297 | 324 |
| Territorial Other | 0 | 22 | 14 | 32 | 0 |
| Total | 1,743 | 5,126 | 7,308 | 6,274 | 4,241 |

Caseloads have been shrinking over the past three years. The Steering Committee as well as other knowledgeable courts personnel did not think that the downward swing over the past three years constituted a trend that would continue into the future. With only four complete years of data available, we were not able to establish any trends that could be projected into the future.

In addition, the judges and courts personnel felt that the time per case had increased over the past three years such that the actual time in court had remained constant or increased in recent years. Unfortunately, no court time statistics are maintained to quantify these perceptions.

We estimated future caseloads by establishing a base for 1998 and using forecast population growth for specific age groups in the service areas for the Territorial and Supreme Courts. Using this approach our initial forecasts showed, for example, a substantial increase in Territorial Court Criminal caseloads over the ten-year period of just over 30%. Other cases types were shown to increase by approximately 20-30%.

3.4 COURTROOM UTILIZATION

There are three courtrooms at the Yellowknife Courthouse:

- Courtroom 1 on the second floor is a jury courtroom primarily used by the Supreme Court and Court of Appeal.
- Courtroom 2 on the second floor is a remand and trial courtroom primarily used by the Territorial Court, including evening use for Justice of the Peace Traffic Court.
- Courtroom 3 on the third level is used by both the Territorial and Supreme Courts.

In addition, due to the lack of courtroom facilities, the courts have been forced on occasion to book commercial space at local hotels and elsewhere to accommodate certain matters. Holding court in Yellowknife outside of the courthouse is highly undesirable.

On occasion, courts do not sit due to a lack of available court space.

Although there are no statistics available on the number of hours the courtrooms are used, Figure 5 summarizes the data on the number of days the courtrooms were booked.

Figure 5: Analysis of Courtroom Utilization

| Courtroom | Days Booked | | Best Estimate | | Utilization** | |
|----------------------|-------------|------------|---------------|------------|---------------|-------------|
| | 1997 | 1998* | 1997 | 1998 | 1997 | 1998 |
| 1. Supreme Court | 158 | 91 | 158 | 182 | 63% | 73% |
| 2. Territorial Court | 245 | 125 | 245 | 250 | 98% | 100% |
| 3. Shared | 337 | 271 | 169 | 271 | 68% | 108% |
| JP Traffic Court | 76 | 39 | 76 | 78 | 30% | 31% |
| Outside Facilities | 30 | 5 | 30 | 10 | 12% | 4% |
| Total | 846 | 531 | 678 | 791 | 271% | 316% |

* 1998 is for first 6 months ** 100% represents full utilization of 1 courtroom

The two columns labeled 'Days Booked' are the number of days that matters were booked into each of the three courtrooms. Matters booked incorporated all scheduled demands on the Court of Appeal, the Supreme Court and the Territorial Court. The data for 1998 is for the first six months only. The matters booked into the rooms did not necessarily require a full day. This proviso is particularly important for Courtroom 3, the shared courtroom. Matters booked into Courtroom 3, which is a less desirable room without secure prisoner access, are sometimes actually heard in one of the other two courtrooms when they become available.

The two columns labeled 'Best Estimate' modify the Days Booked data in two ways:

- The 1998 data is doubled to approximate the whole year.
- The data for Courtroom 3 is halved to account for the manner in which that space is actually used.

The two columns labeled 'Utilization' calculate the theoretical utilization of the courtroom based on 250 days per year. This calculation is theoretical only since it is based on days booked, not actual use. In addition, we have not taken into account the logistical challenges associated with ensuring the availability of judges and other key personnel, especially with the demand for the circuiting to locations outside Yellowknife.

The result of this analysis indicated that there is current demand for more than three courtrooms. As a result, we concluded that to meet current demand the Yellowknife Courthouse should have four courtrooms. The Steering Committee agreed.

3.5 FUTURE COURTROOM REQUIREMENTS

Beginning with a current requirement of approximately 3.2 courtrooms, we applied the results of our caseload forecasts to yield an initial estimate of demand in 2008 of 4.0 to 4.5 courtrooms. To meet this demand would require a five-courtroom facility.

Next we addressed the various factors that could affect demand with the Steering Committee. During discussion of various factors including the increasing length and complexity of cases, the Steering Committee demonstrated the need to plan the new Yellowknife Courthouse for a total of six courtrooms. A six-courtroom courthouse should be sufficient to meet anticipated demand for at least the next ten years, and likely well beyond.

Due to the lack of population forecasts beyond 2006, we were not able to confidently forecast demand to 2018. Nevertheless, the courthouse should be designed to accommodate expansion beyond the six-courtroom total.

Figure 6 presents a outline of the required mix of courtroom types. This total does not include an additional conference/hearing room to be provided for Alternative Dispute Resolution, pre-trial hearings, settlement conferences, or similar matters. We have assumed that one of the two jury deliberation rooms also could be used for these functions on a scheduled basis.

Figure 6: Mix of Required Courtrooms

| Primary User | Type | Rooms |
|-----------------------|---------------------------|-------|
| Appeal/Supreme Courts | Appeal/Civil Courtroom | 1 |
| | Large Jury Courtroom | 1 |
| | Jury Courtroom | 1 |
| Territorial/JP Courts | Remand (Docket) Courtroom | 1 |
| | Trial Courtroom | 2 |
| Total Courtrooms | | 6 |

No allowance has been made for dedicated facilities for Federal Court, tribunals or similar functions. This conforms with the practice of providing access to courtrooms by these users on a space available basis.

3.6 FACTORS AFFECTING DEMAND

Although the above analysis represents a reasonable estimate of the future demand for court facilities, there are a number of unpredictable factors that could have an impact on the actual demand.

The future population of the NWT is subject to a high level of volatility, based on factors such as:

- The future extent of development of diamond and gold mining and other resource-based activities, which will be dependent in part on world economic conditions.
- The operational model used by these industries — with fly-in work camps, workers may have the option of residing in Yellowknife or Edmonton.
- The impacts of Nunavut on the extent and duration of out-migration of government employees.
- Regional changes, including a trend toward urbanization.

Similarly, there several factors that could affect the extent and nature of future court caseloads, such as:

- A trend toward an increase in the complexity and duration of cases, including those arising from Charter of Rights appeals.
- An increasing trend for people in our society to litigate.
- An increase in organized criminal activity associated with the diamond industry.
- Growth in major drug cases, although to date this has been largely limited to the Eastern NWT.
- Indications that motorcycle gangs may be moving into the NWT.
- The impacts of new gun control legislation, which are expected to result in both increased Territorial Court Criminal caseloads, as well as Charter of Rights challenges.
- Land claims agreements and disputes over traditional hunting and fishing rights for First Nations.
- Proposed changes to the Criminal Code that would give Federal Prosecutors greater discretion to hear cases in Territorial Court, rather than proceeding by indictment. This would limit options for accused to request Supreme Court jury trials.
- A trend toward more process time in the judicial system. This is a major reason why caseloads could be stable or even reducing while workloads are increasing.
- The development of aboriginal justice systems.
- The possibility that there will be more judges resident in communities outside of Yellowknife and, therefore, less circuiting from Yellowknife.
- Videoconferencing may increase centralization of court services.
- The number of Court of Appeal and Supreme Court cases may be reduced by about 25% with the implementation of Nunavut. This reduction likely will occur over the next two or three years.
- A trend toward community-based justice may reduce the number of cases coming to the Territorial and Supreme Courts. However, such an approach may be least effective in a relatively large and heterogeneous city like Yellowknife.

3.7 PERSONNEL ESTIMATES

Personnel estimates have been produced to the year 2008, based on the existing staffing model and numbers, and discussions with Court Administration. The existing and estimated numbers of staff are shown in Figure 7. The estimates presume the privatization or elimination of court reporter positions. They also assume that the Sheriff will be responsible for all courthouse security as well as prisoner handling and transport.

Figure 7: Personnel Estimates for 2008

| Component | Position | 1998 | 2008 | Change |
|-------------------|---------------------|-----------|-----------|-------------|
| Courtrooms | | 3 | 6 | 100% |
| Registry | Manager | 1 | 1 | |
| | Supervisor | 3 | 3 | |
| | Counter Service | 5 | 7 | |
| | Courtroom Service | 6 | 10 | |
| | Information Officer | 0 | 1 | |
| | Total | 15 | 22 | 47% |
| Sheriff | Sheriff | 1 | 1 | |
| | Deputy Sheriff | 1 | 3 | |
| | Prisoner Handling | 1 | 3 | |
| | Clerk | 1 | 1 | |
| | Jury Clerk | 1 | 1 | |
| | Total | 5 | 9 | 80% |
| Judiciary | Resident Judge | 6 | 9 | |
| | JP | 0 | 1 | |
| | Trial Coordinator | 0 | 1 | |
| | Secretary | 4 | 5 | |
| | Law Clerk | 1 | 2 | |
| | Total | 11 | 18 | 64% |
| Library | Librarian | 1 | 1 | |
| | Technician | 1 | 2 | |
| | Total | 2 | 3 | 50% |
| Escort | Prisoner Escort | 4 | 6 | 50% |
| Total | | 37 | 58 | 57% |

3.8 FACILITIES REQUIREMENTS

Estimated Space Requirements

All of these estimates will be subject to review as part of a future programming study. Modifications are likely to include the addition of a dedicated stand-down room for the Court of Appeal. A second dedicated ADR room may also be required. This review would occur at such time as approval is received to proceed with planning and design of one of the two options.

As indicated in Figure 8, the total program area for court facilities is estimated to be 5261 m², including secure enclosed parking for judges and prisoner escort vehicles. A detailed list of space provided within each component is provided in Appendix C.

Figure 8: Summary of Estimated Space Requirements

| Component | Net Area | Assignable | Usable | % Total | |
|---|---------------|-------------|---------------|---------------|---------------|
| 1 Courtrooms | 1089.6 | 1.18 | 1285.7 | 25.2% | |
| 2 Judiciary | 423.9 | 1.23 | 521.4 | 10.2% | |
| 3 Administration | 334.7 | 1.29 | 431.8 | 8.5% | |
| 4 Prisoner Handling | 147.4 | 1.22 | 179.8 | 3.5% | |
| 5 Public Services | 430.4 | 1.20 | 516.5 | 10.1% | |
| 6 Building Services | 145.5 | 1.12 | 163.0 | 3.2% | |
| 7 Program Parking | 181.0 | 1.09 | 197.3 | 3.9% | |
| Total Without Parking | 2571.5 | 1.20 | 3098.2 | 60.7% | |
| Total With Parking | 2752.5 | 1.20 | 3295.5 | 64.5% | |
| Public Circulation | | | 19.0% | 947.4 | 18.0% |
| Private Circulation | | | 3.5% | 174.5 | 3.3% |
| Prisoner Circulation | | | 2.5% | 124.7 | 2.4% |
| Mechanical/Electrical | | | 7.0% | 349.0 | 6.6% |
| Exterior Wall | | | 2.5% | 124.7 | 2.4% |
| Public Washrooms | | | 1.5% | 74.8 | 1.4% |
| Gross Area Without Parking | | | 36.0% | 4986.3 | |
| Gross Area Without Parking per Courtroom | | | | 831.1 | |
| Building Efficiency / Net-to-Gross Ratio | | | | 51.6% | 1.94 |
| Vehicular Circulation | | | 32.0% | 65.0 | 1.2% |
| Exterior Wall for Parking | | | 2.5% | 6.7 | 0.1% |
| Gross Building Area With Parking | | | | 5261.2 | 100.0% |
| Gross Area With Parking per Courtroom | | | | 876.9 | |
| Building Efficiency / Net-to-Gross Ratio | | | | 52.3% | 1.91 |

Definitions

The following are definitions of the terms used in Figure 8:

- Net Area** The floor area required to accommodate the function. In a typical office, for example, this would be the wall-to-wall area within the room.
- Assignable Area** The Net Area plus circulation within identifiable work units (Components in the terminology of this document).
- Usable Area** Defined by BOMAI (Building Owners and Managers Association International) for leasing purposes and includes the Assignable Area plus a Building Factor of 3% to account for structural elements, piers, perimeter HVAC units, and window ledges.
- Gross Area** The floor area of the entire building calculated by adding to the Usable Area factors for major circulation, mechanical/electrical space, exterior walls, janitorial closets, and public washrooms.

All areas are quoted in square metres (m²) unless specifically noted otherwise.

Parking Requirements

There are presently 16 on-site parking stalls provided for the Yellowknife Courthouse. The City of Yellowknife Zoning Department will not require additional parking if the existing building is redeveloped, since the total building occupant load would be lower after renovations. The Committee has determined that an additional 52 parking spaces are required for the proper operation of the courthouse, for a total of 65 spaces.

The City of Yellowknife Zoning Bylaws would require the provision of 65 parking spaces for a new courthouse with the proposed building area.

Secure Enclosed Parking

Requirements for secure parking stalls are summarized in Figure 9. As indicated, a total of 13 stalls would be required. This is slightly less than the 16 stalls currently provided at the Yellowknife Courthouse.

Figure 9: Secure Parking Requirements

| User | Stalls |
|------------------------|-----------|
| Judge | 9 |
| Justice of the Peace | 2 |
| Prisoner Transport Van | 1 |
| Building Services | 1 |
| Total | 13 |

4. EXISTING FACILITIES

4.1 BUILDING STRUCTURE

The Yellowknife Courthouse is a six-storey metal-clad structure, with a covered parking area at grade created by a second floor overhang. Since the building was originally constructed in 1977, it has undergone a series of renovations, both major and minor, to accommodate the Courts and other functions.

Clear Spans and Ceiling Heights

Although the building has adequate clear spans to meet requirements for unobstructed view lines within courtrooms, this is only one consideration in courtroom design. Courtrooms also require ceiling heights appropriate to their size and use for several reasons, including requirements for:

- The judge's bench to be situated on a raised dais.
- Clear sight lines for all participants in the inner court.
- Communicating to those testifying in court the seriousness of the proceedings that are taking place.

Consequently, there is a need to ensure that courtroom size, dimensions and ceiling heights all satisfy physical, structural and perceptual requirements. Floor to ceiling heights for courtrooms typically range from 3.65 to 4.3 metres (12 to 14 feet), dependent upon the size of the courtroom. The Committee regards these as minimum required heights.

Ceiling heights at the Yellowknife Courthouse vary by floor. The highest ceilings, at approximately 3.65 metres (12 feet) are on Level 2. On the other floors, the height to the underside of the suspended ceilings is approximately 2.6 metres (8.5 feet). With the relocation of mechanical systems, a maximum floor to ceiling height of 3.0 metres (10 feet) could possibly be achieved. As a result, any redevelopment of the Yellowknife Courthouse will require the removal of floors where necessary to achieve adequate ceiling heights.

Gross Floor Area

As shown in Figure 10, the gross floor area of the building is approximately 6520 m².

Figure 10: Building Gross Floor Area, Yellowknife Courthouse

| Building Level | Gross Area (m ²) | Ceiling Height (mm) |
|----------------------|------------------------------|---------------------|
| Level 1 | 800 | +/-3000 |
| Level 2 | 1280 | 3650 |
| Level 3 | 850 | 2600 |
| Level 4 | 850 | 2600 |
| Level 5 | 850 | 2600 |
| Level 6 | 850 | 2600 |
| Subtotal | 5480 | |
| Basement | 800 | |
| Mechanical Penthouse | 240 | |
| Total | 6520 | |

4.2 BUILDING IMAGE

There are no special exterior building design features to distinguish the building as a courthouse, and it is unlikely that anything could be done to adequately create such an image. This is typically achieved through the construction of a purpose-built courthouse which has appropriate landscaping, setbacks, a ceremonial front entrance, and public areas which clearly identify the institution housed in the facility as having a special role in the life of the community.

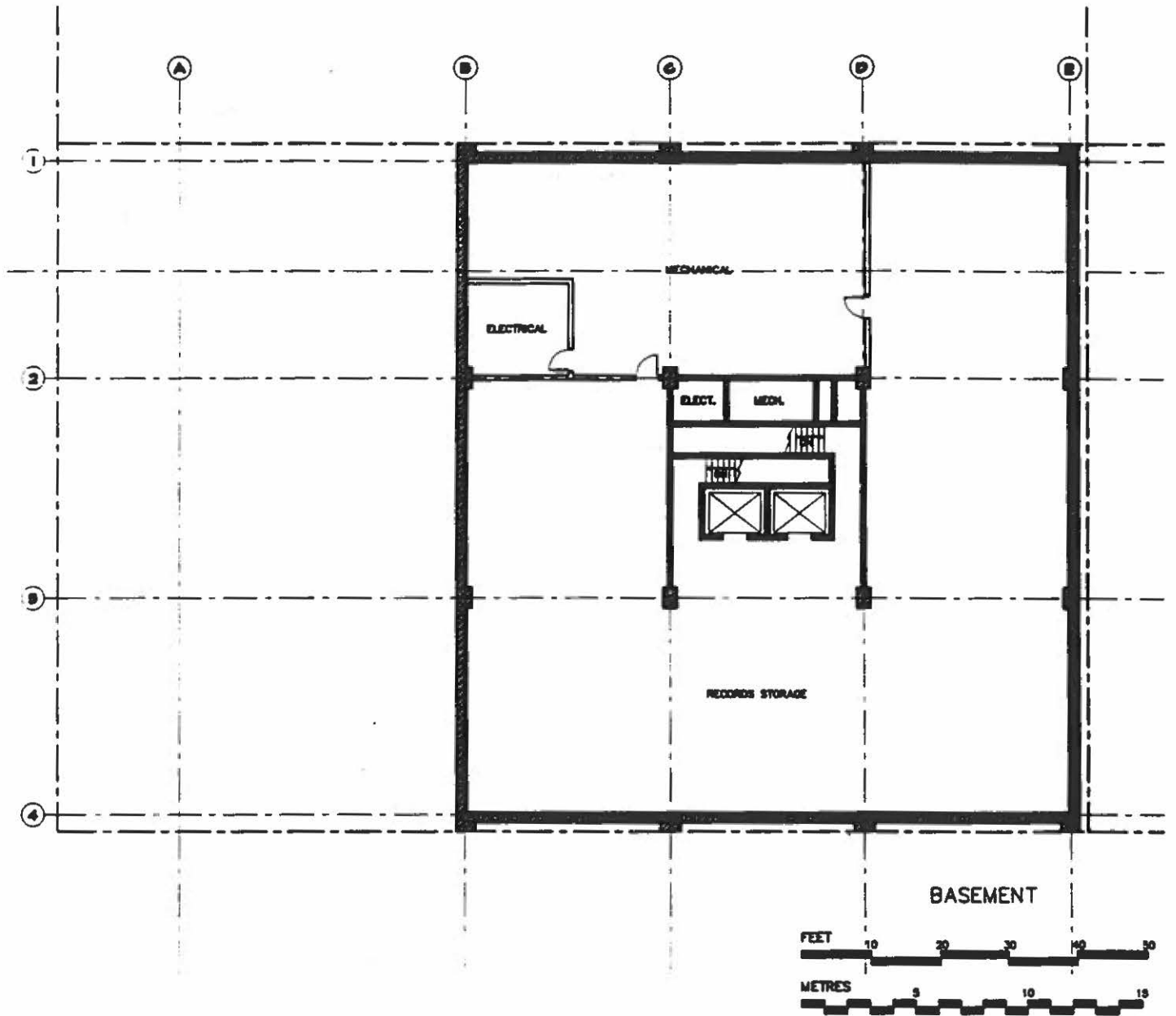
4.3 EXISTING SITE

The building is situated on a site of approximately 15,000 ft² (1,393 m²) bounded by 49th Ave. on the west, a parking lot on the east, a laneway on the north, and 49th St. on the south. The building occupies the entire site. There are no setbacks from the north, south and east lot lines, and 16 parking spaces and limited landscaping have been provided.

4.4 CURRENT BUILDING USE

Schematic floor plans illustrating the layout of each of three building levels being used by the Courts, as well as the basement level, are provided in Figures 11 to 14. The Department of Justice and the Commissioner of the NWT occupy the upper three floors of the building.

Figure 11: Existing Building Use, Basement Level



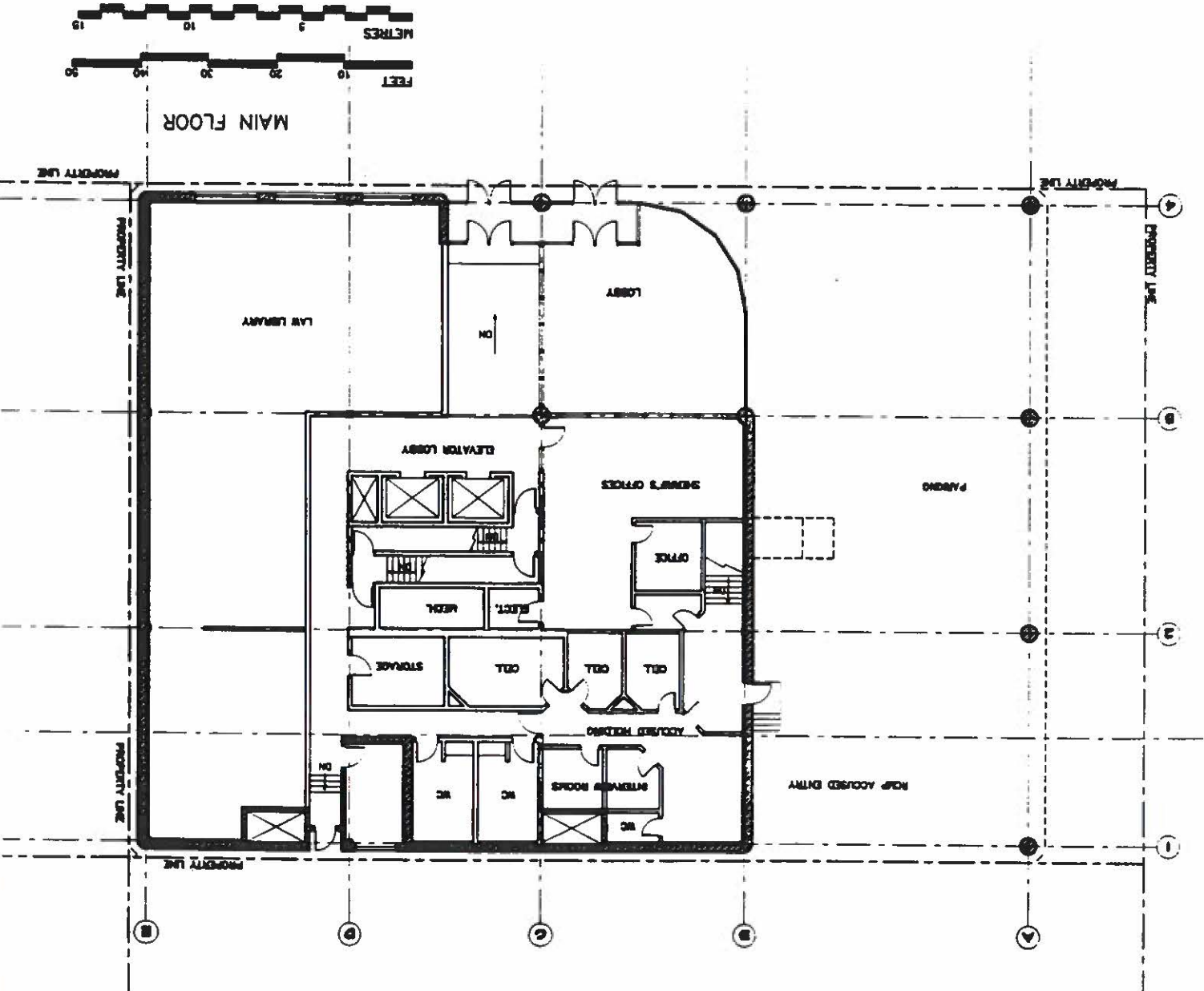


Figure 12: Existing Building Use, Level 1

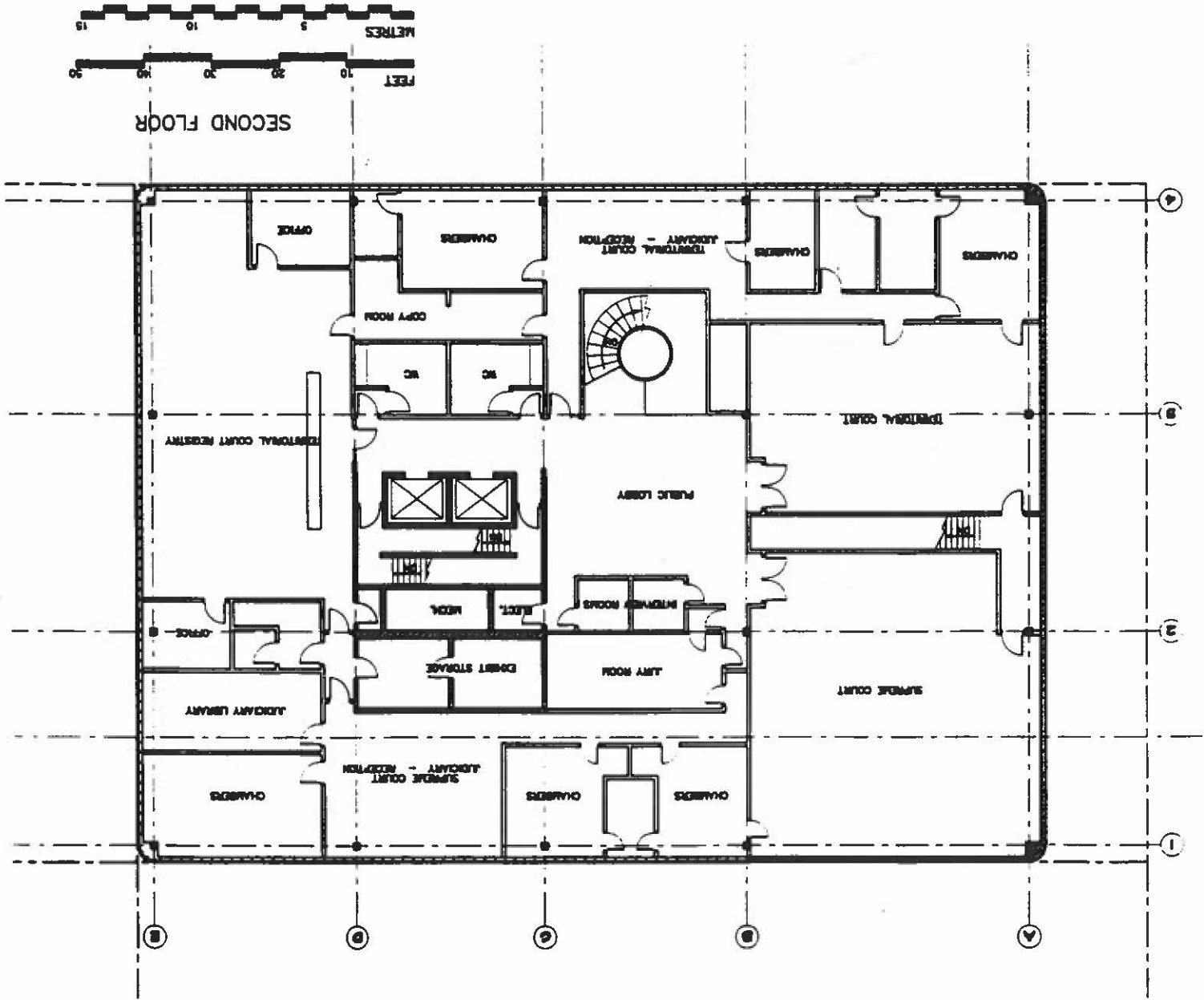
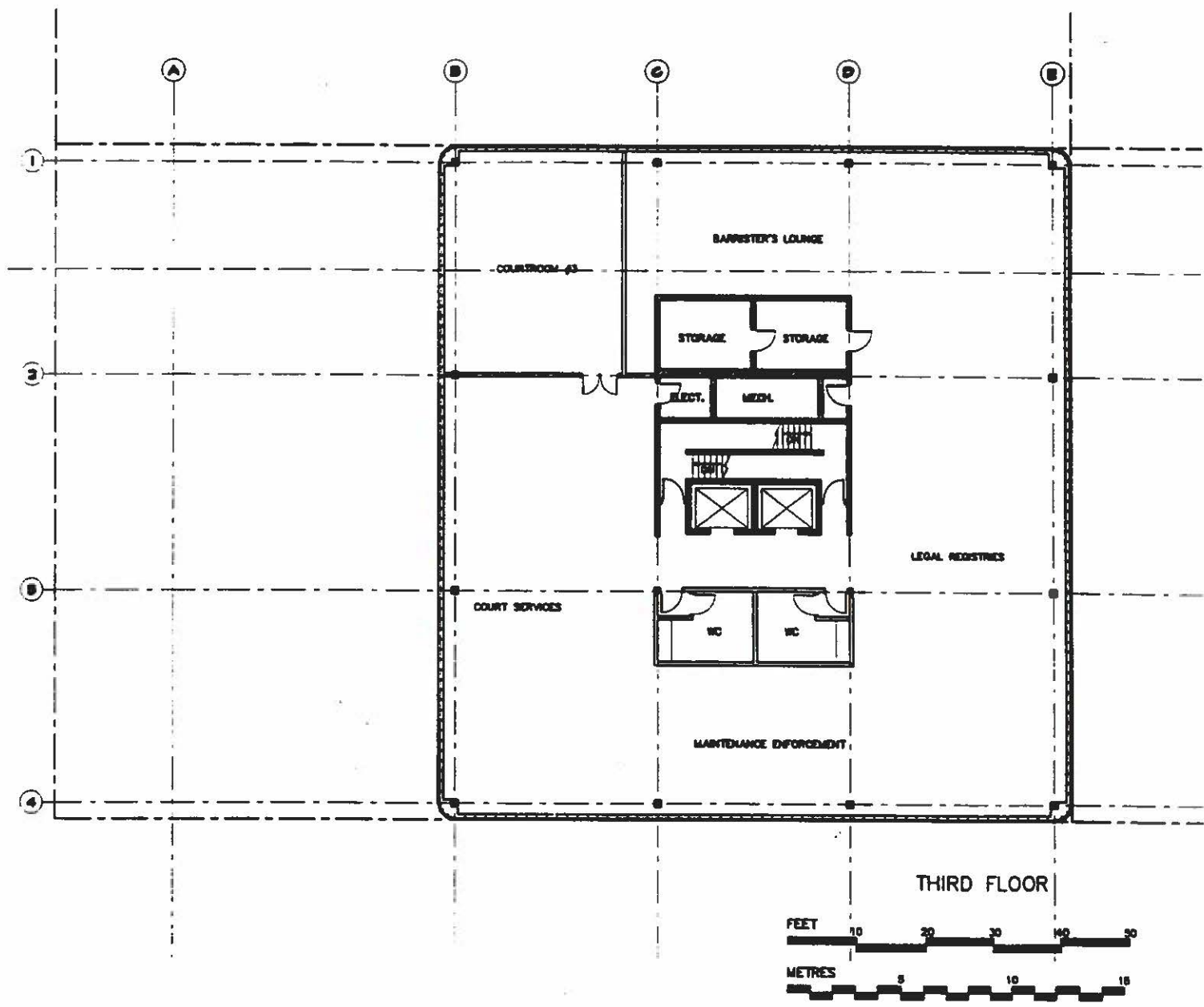


Figure 13: Existing Building Use, Level 2

Figure 14: Existing Building Use, Level 3



4.5 TECHNICAL CONDITION ASSESSMENT

FSC conducted a visual architectural and engineering inspection of the Yellowknife Courthouse and its building systems. The complete technical assessment has been documented separately in Appendix A. The study concludes that, on the whole, the building is in good condition. The following specific items are highlighted:

- Architectural items requiring remedial action consist primarily of Building Code upgrades, including the upgrading of exit stairs and ramps, the installation of fire separation for the circular stairs, and the selective repair and replacement of finishes.
- Mechanical systems typically require, or will soon require, replacement of various equipment items such as pumps, fans and sprinkler heads. The median life span of much of the equipment has been surpassed, in part due to good maintenance practices.
- The structural capacity and floor loading appears to be in accordance with applicable Building Codes in effect when the building was constructed. However, some requirements in the new versions of the Code are more stringent.
- Code requirements for libraries dictate a design "live load" 20% higher than was provided in the original design of the library. If the library is to remain its present location, the capacity of the floor system will require further evaluation.
- The fire alarm system requires minor upgrading for Code compliance.

4.6 FUNCTIONAL EVALUATION

Matrix conducted a functional evaluation of the building based on a tour of the building, discussions with building users and a review of previous studies. An interim report was produced dated June 19, 1998 entitled Revised Working Paper, Functional Assessment, Yellowknife Courthouse. The report, provided in Appendix B, documents the detailed findings of the evaluation.

The building has operated as a functioning courthouse for the past 20 years, although caseloads have on occasion exceeded the building's capacity. Courtrooms are accessible to the public via elevators and stairs, and dedicated internal stairs provide secure prisoner access to the two courtrooms on Level 2.

Deficiencies

There are, however, a number of serious functional deficiencies, including:

- The lack of total separation among the building circulation systems used by members of the judiciary, prisoners, jurors, other court staff and the general public. There is no secure prisoner access to the courtroom on Level 3.
- Inadequate security measures, as evidenced by the lack of adequate control of public access to the building, control of internal movement, video surveillance and alarm systems. The current mix of building tenants exacerbates the problem.
- A need for additional courtroom and conference/hearing rooms to accommodate current and projected workloads and case management. A courtroom with a higher seating capacity than existing is needed for jury panels, high profile trials and ceremonial events. There is a specific need for a smaller conference/hearing room for Alternative Dispute Resolution, pre-trial hearings, routine liaison between the judiciary and both Crown and defense counsel, and settlement conferences. Requests from the Federal Courts and other tribunals to use courtroom space often cannot be accommodated due to scheduling conflicts.
- Insufficient capacity to respond to peak loads in the prisoner holding area. There is also a need for a secure enclosed vehicle sallyport for prisoner transfers.

- The lack of any offices for the Court of Appeal, which now sits regularly in Yellowknife, coupled with an insufficient number of chambers for visiting members of the judiciary hearing cases in Yellowknife.
- The lack of a retiring room for the Court of Appeal adjacent to the courtroom, to which the panel (usually three) can retire to consider and reach decisions as the day's cases are heard. This must be in a secure area with no public access.
- A lack of secure parking for both judges' and prisoner transfer vehicles.
- A shortage of courtroom support facilities including adequately sized interview rooms, dedicated witness waiting rooms, and adequately sized public waiting areas.
- A need for upgraded jury deliberation facilities including sufficient space, appropriately located washrooms, and an environment conducive to deliberations, including appropriate lighting, adequate air circulation, and localized temperature controls.
- A lack of on-site parking for staff and members of the public.

5. NEW COURTHOUSE

5.1 PLANNING PRINCIPLES

There are a number of considerations which must be addressed as part of planning for a new courthouse. They include:

- The provision of separate secure circulation systems for members of the judiciary, jurors and prisoners, in addition to public circulation.
- The zoning of the building for public, staff and restricted access.
- Provision for extended hours access, primarily for members of the judiciary and for the courthouse library.
- Use of an integrated building security system involving a combination of both dynamic supervision in the form of security staff supervision, supplemented by static measures involving the facility design supplemented by equipment such as screening devices, surveillance cameras, alarms and card access control.
- Explicit provision for future building expansion.

5.2 PRELIMINARY BUILDING CONCEPT

The design of a new Yellowknife Courthouse will be contingent in part on the opportunities and constraints afforded by the selected site. One possible concept would involve the construction of a low-rise multi-storey structure:

- High use areas such as the registry, prisoner holding area, remand (docket) court and possibly the courts library would be located on the main floor.
- Other courtrooms and conference/hearing rooms would be located on upper levels, in part to limit the amount of public movement.
- Dedicated stairs would be used to provide secure prisoner access from holding areas to the courtrooms.
- Judicial chambers would be located either along secure corridors adjacent to the courtrooms, or on an upper level with elevators and secure corridors to provide courtroom access.

A relatively compact design for the facility would minimize the amount of horizontal circulation, limit site area requirements, and potentially limit building costs by limiting roof areas. A key objective would be to use building and site features to clearly identify the facility as a courthouse.

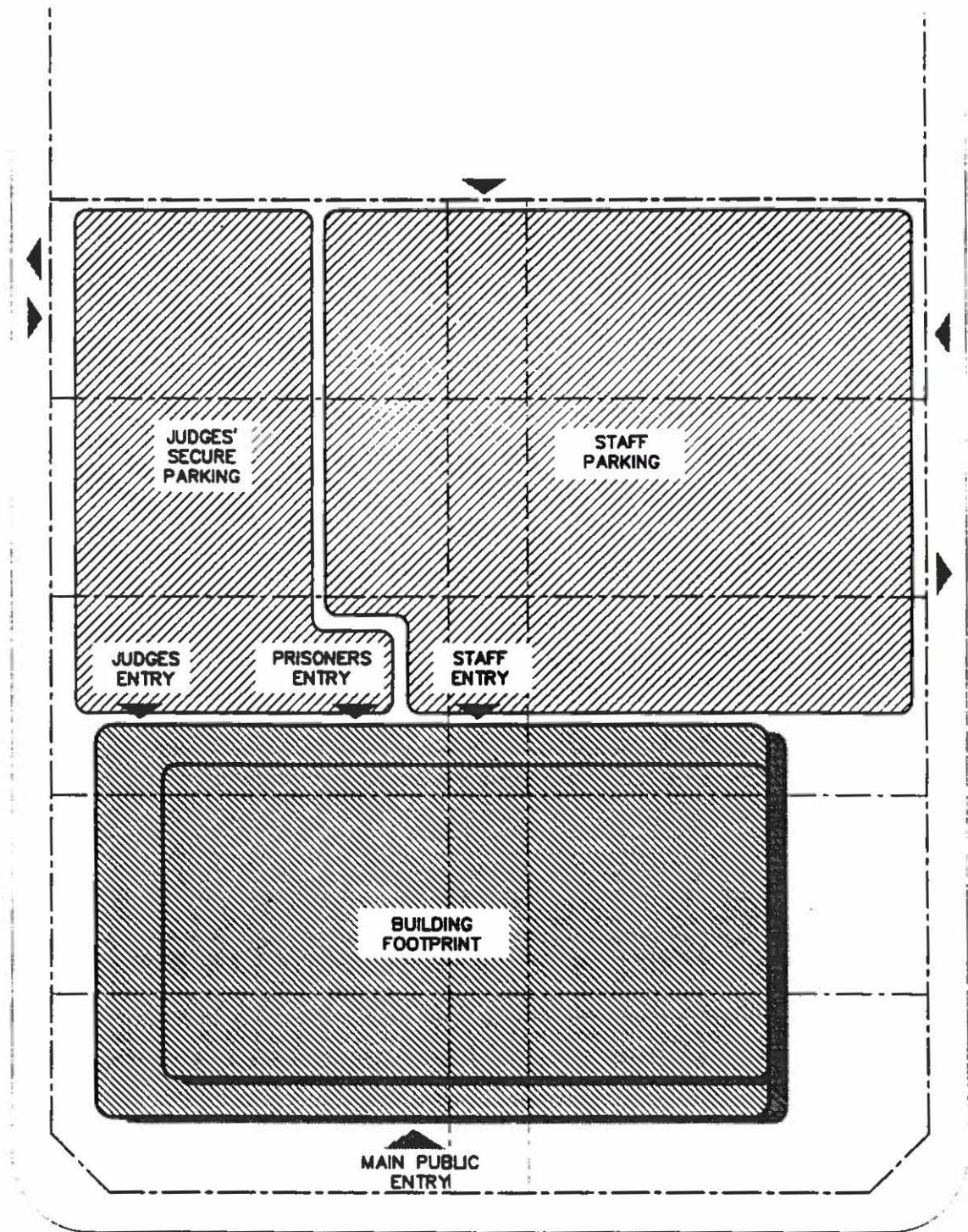
Site Development Concept

In order to develop preliminary estimates of land costs land requirements for a central core site have been analyzed, based on a four-storey structure, assuming no basement (in case bedrock is encountered). A level site equivalent in size to ten city lots with a central lane is assumed.

As illustrated in Figure 15:

- Sufficient staff and public parking would be provided to comply with municipal bylaws.
- There would be a secure, enclosed parking area for judges' vehicles, with a dedicated building entrance.
- A separate prisoner entry would include a secure enclosed vehicle sallyport.

Figure 16: Preliminary Site Development Concept



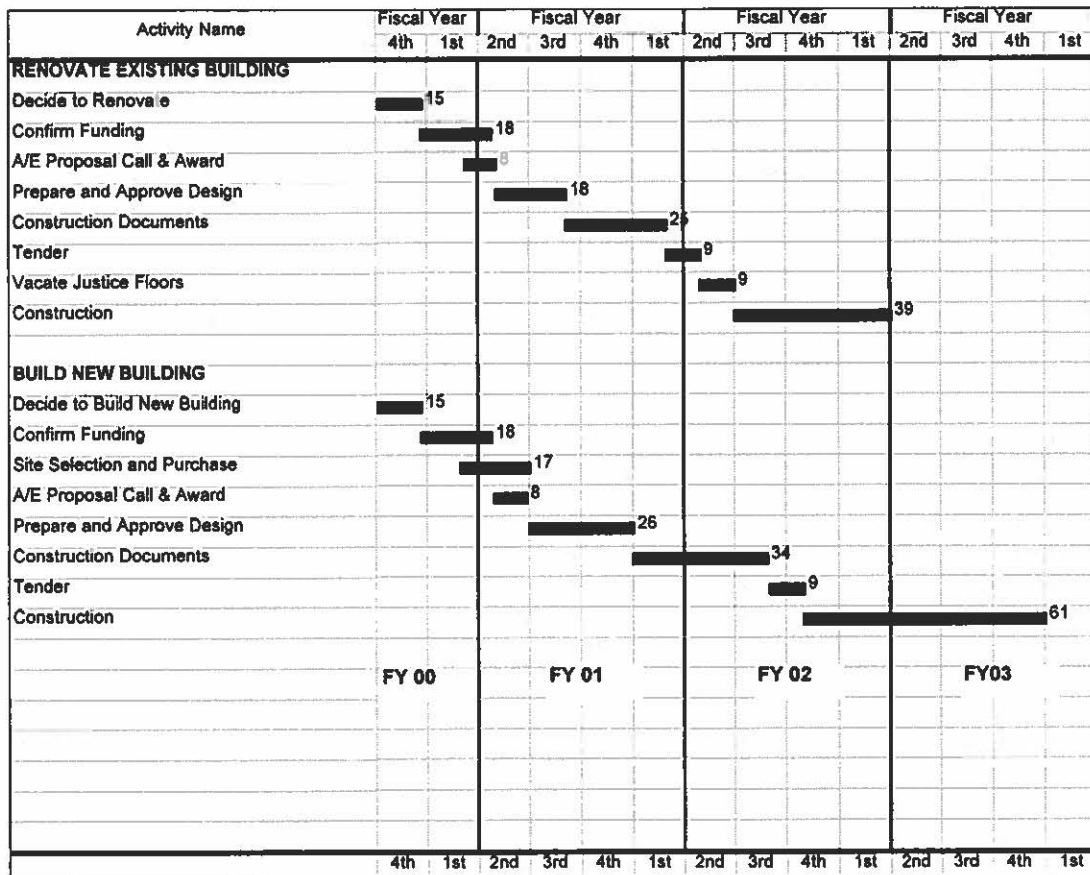
5.3 IMPLEMENTATION SCHEDULE

For the purposes of this study, the fiscal year in which approval to proceed with the project has been called Year 1. The bar chart below (Figure 17) illustrates the shortest practical implementation schedule for both building options:

It is estimated that it will take approximately 33 months from the time that approval is received to proceed with the building of a new courthouse until building occupancy. This includes:

- 00 months for approval of project and funding (precedes Year 1)
- 00 months for detailed facility programming. (precedes Year 1)
- 03 months for site selection, surveys and geotechnical studies
- 06 months for schematic design and review
- 08 months for design development and preparation of construction documents and review
- 02 months for tendering and award of the construction contract.
- 14 months for construction, commissioning, and occupancy.

Figure 17: Implementation Schedule



6. REDEVELOPMENT OF EXISTING COURTHOUSE

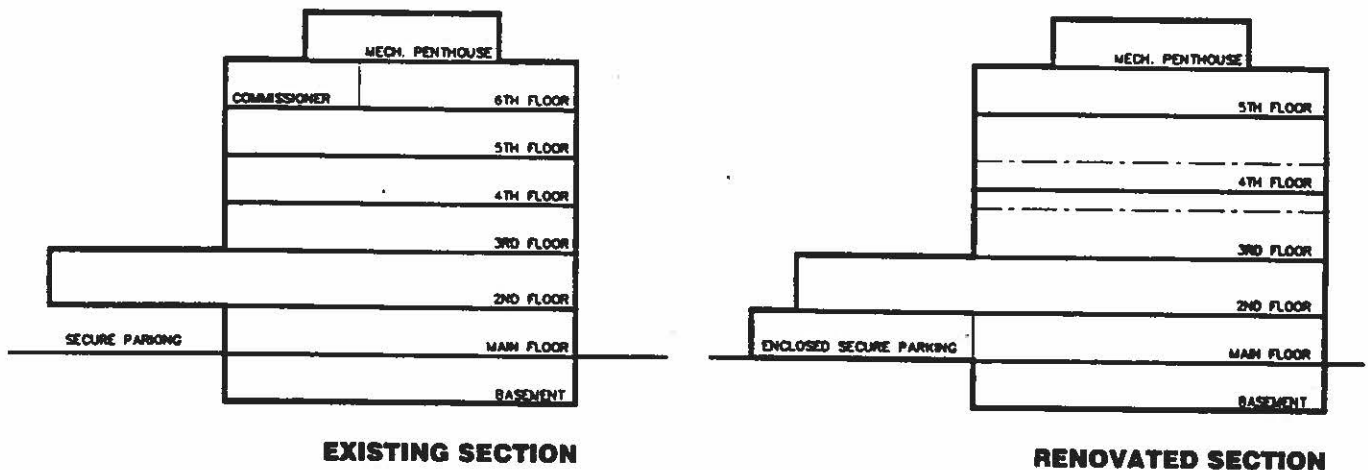
6.1 INTRODUCTION

Conceptual plans were prepared to illustrate how functional requirements could be accommodated within the existing building envelope of the Yellowknife Courthouse. An assessment of the feasibility of expanding the existing building to the east indicated that this would result in a less desirable functional layout and higher costs.

Two major sets of structural changes to the existing building would be required. The first is the construction of a new interior elevator shaft with two secure elevators—one dedicated for use by the judiciary, and the other for prisoner movement between the central holding area and upper level courtrooms.

The second would involve the removal of the existing floorplates on existing Levels 4 and 5, and insertion of one floor in their place. This reconfiguration of the building would allow for the creation of increased ceiling heights for courtrooms on two floors of the building. This is illustrated graphically in Figure 18, which provides a comparison of the existing and proposed building floor levels.

Figure 18: Comparison of Existing and Proposed Building Floor Configurations



6.2 POTENTIAL BUILDING LAYOUT

One potential approach to the redevelopment of the Yellowknife Courthouse is described below. It has been developed primarily to provide a basis for order of magnitude cost estimates, as well as to assess the likelihood of accommodating facility program requirements within the existing building. A discussion of how the work might be phased is presented in Section 6.4. If a decision were made to proceed with this option, the concept presented here would be re-examined during the programming and detailed design phases.

Basement Level

Figure 19 illustrates one possible approach to the redevelopment of the Basement Level. Existing mechanical rooms and storage space would be retained, an expanded area would be provided for building services, and the Courthouse Library would be relocated from Level 1. Separate elevators would provide access to the Library for judges and lawyers.

Level 1

Figure 20 shows the potential layout of the main floor. A new entry lobby would be created and the existing prisoner holding area would be expanded. Dedicated internal stairs, in addition to a secure elevator, would connect the holding area with courtrooms on Level 2. The existing outdoor covered parking area would be enclosed to provide 13 to 16 secure parking stalls for the judiciary, as well as for prisoner transport vehicles. A secure enclosed vehicle sallyport would also be constructed. A card reader would limit access to the parking area, which would also be monitored by video surveillance cameras. As indicated, a portion of the floor would be unassigned, and could be used by another tenant. Provision of a separate "storefront" entrance would limit access to the remainder of the building.

Level 2

Figure 21 illustrates the potential use of Level 2. It would include:

- An expanded remand (docket) courtroom.
- A large jury courtroom, and associated jury deliberation room.
- Courtroom support functions and public services.
- The sheriff's office, court registry and public counters.

Level 3

Figure 22 shows a possible layout for Level 3. It would contain two trial courtrooms and ancillary spaces and a portion of court administration. Adjusting the level of the floor above would increase the ceiling heights of the two courtrooms.

Level 4

Figure 23 illustrates the potential reconfiguration of Level 4. As illustrated, the existing floorplate would be removed to create increased ceiling heights for an Appeal/Civil courtroom and a second smaller jury courtroom. Courtroom ancillary spaces including a second jury deliberation room, a smaller conference/hearing rooms and public services would also be provided.

Level 5

Figure 24 shows the reconfiguration of Level 5. In fact, this level would be removed to allow greater ceiling heights on levels 3 and 4. No usable space would remain.

Level 6

The top floor of the building, as illustrated in Figure 25, would be redeveloped to provide all judicial accommodations. A dedicated elevator would provide direct access to all courtrooms, the conference/hearing room on Level 4, and secure judicial parking. Part of this floor is currently occupied by the Commissioner's Suite. This area would be very costly to replicate elsewhere, to allow for the use of this space by the courts.

BASEMENT

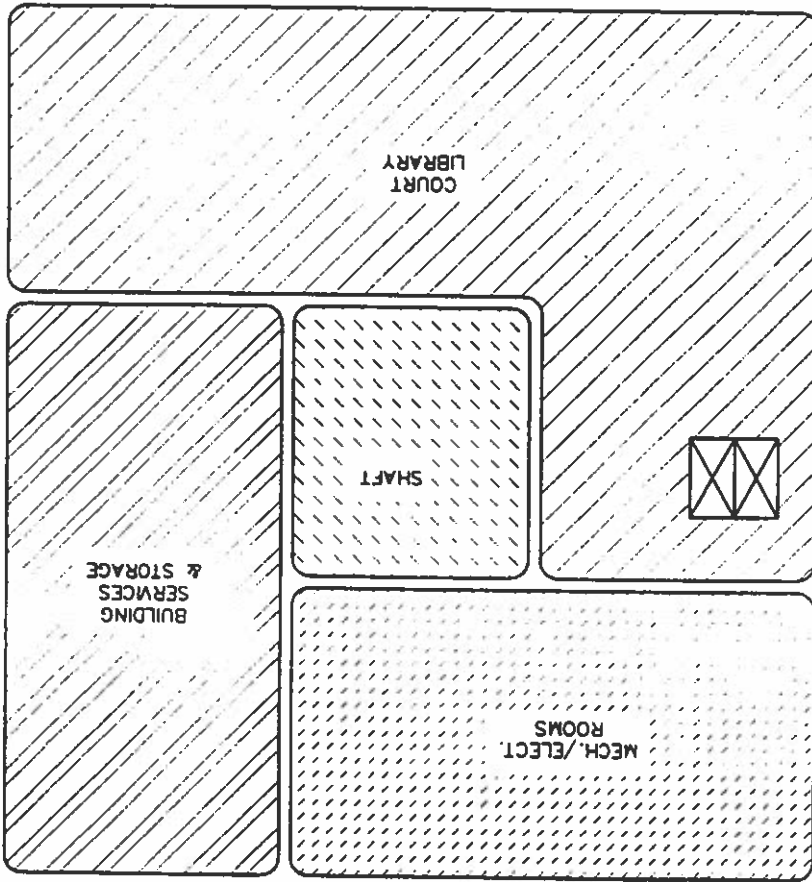


Figure 19: Possible Redevelopment of Basement Level

MAIN FLOOR

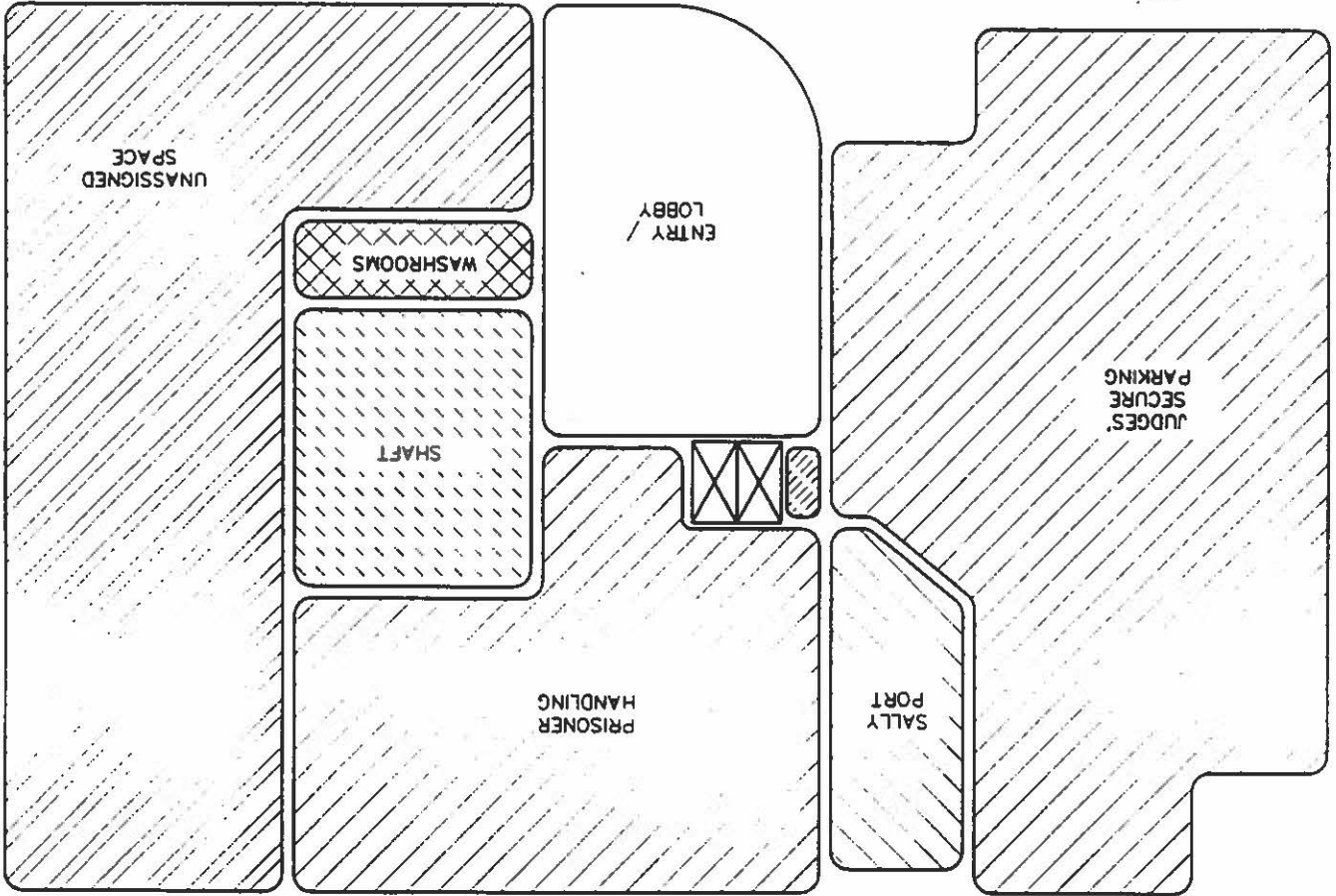
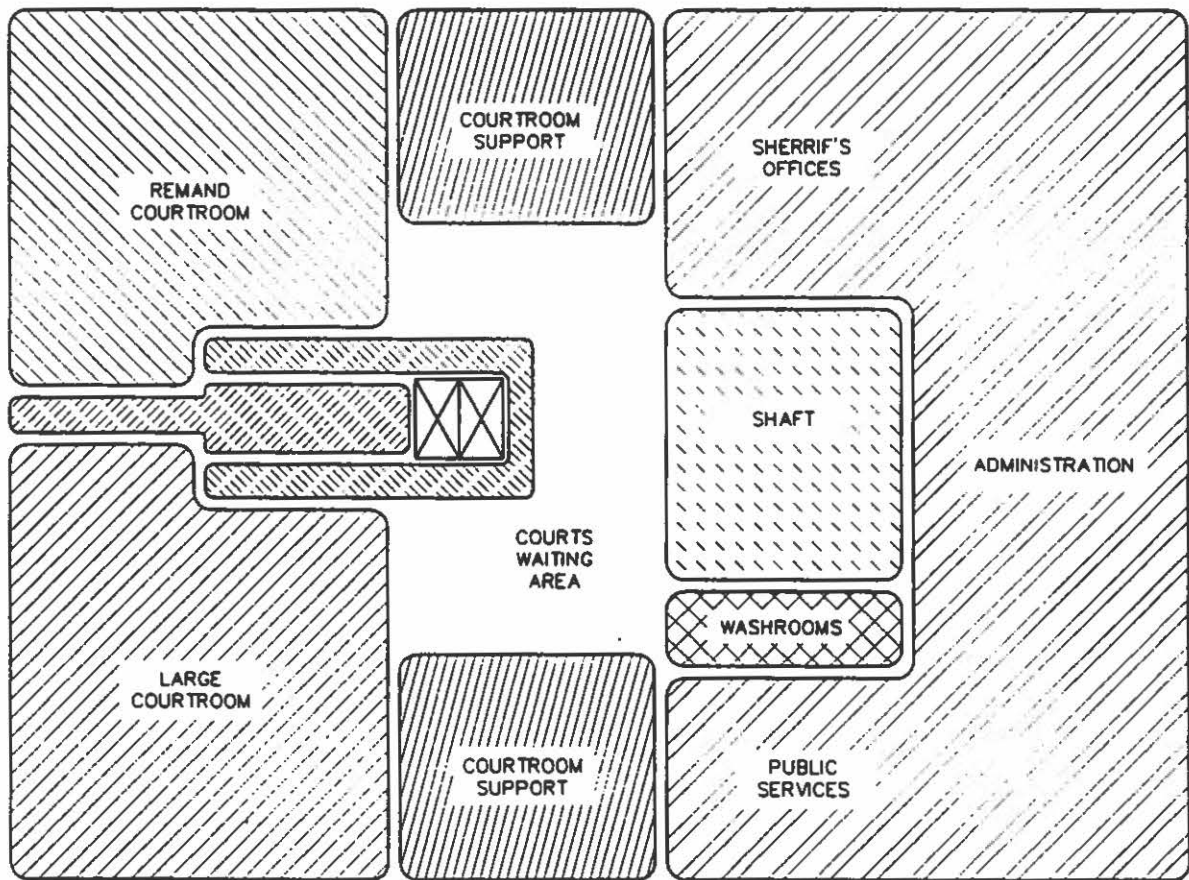


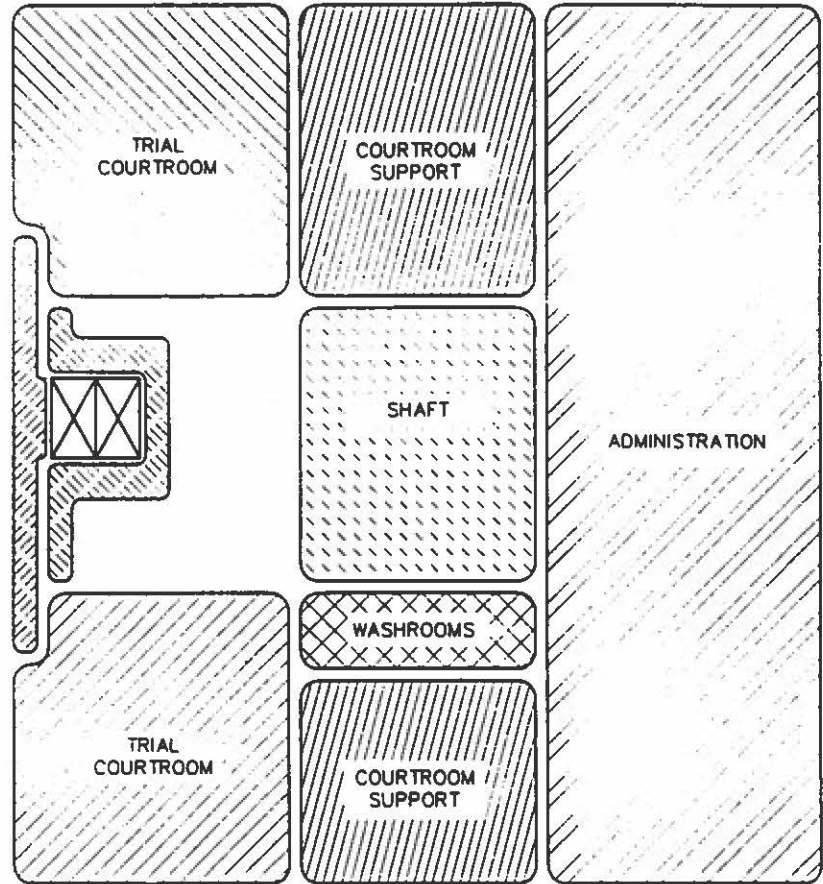
Figure 20: Possible Redevelopment of Level 1

Figure 21: Possible Redevelopment of Level 2



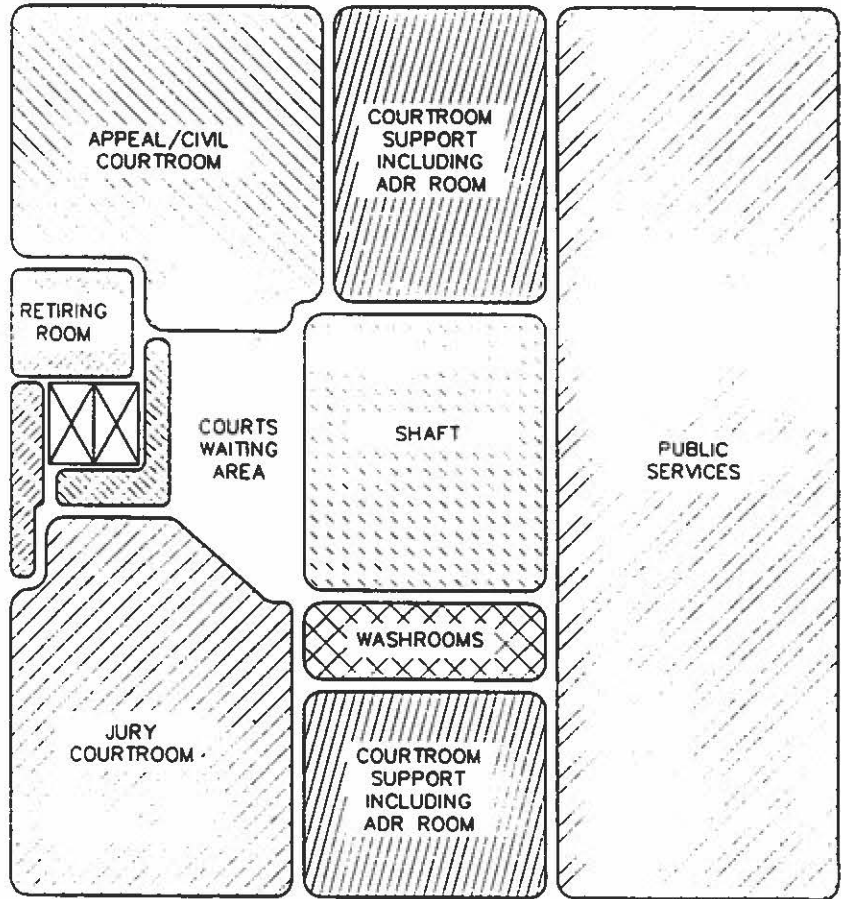
SECOND FLOOR

Figure 22: Possible Redevelopment of Level 3



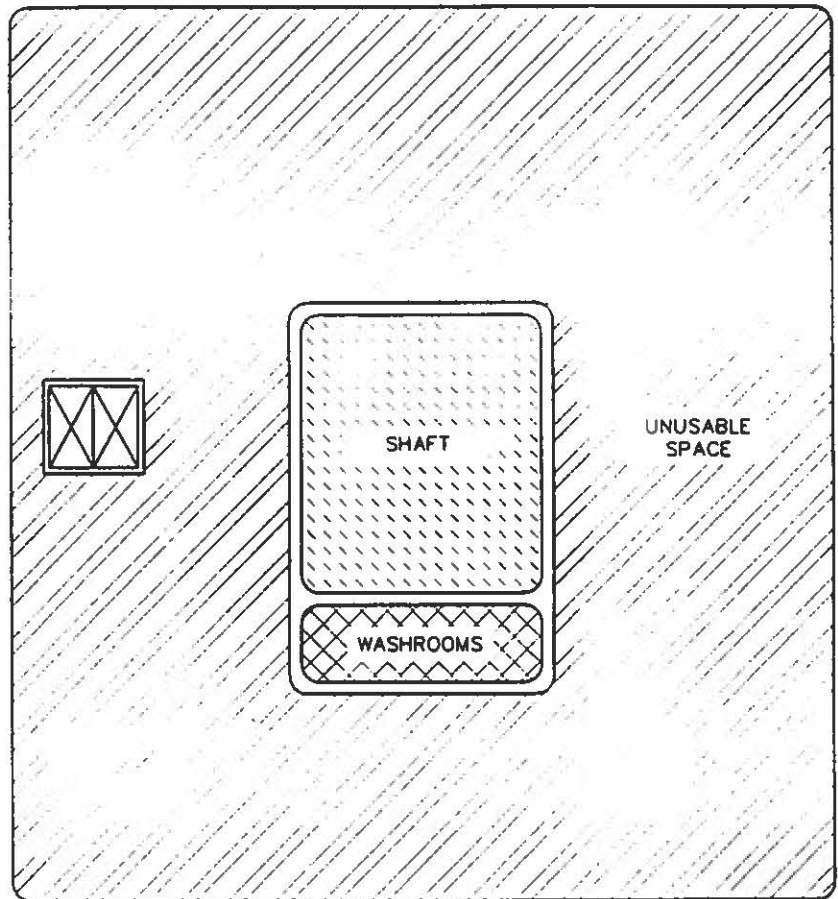
THIRD FLOOR

Figure 23: Possible Redevelopment of Level 4



FOURTH FLOOR

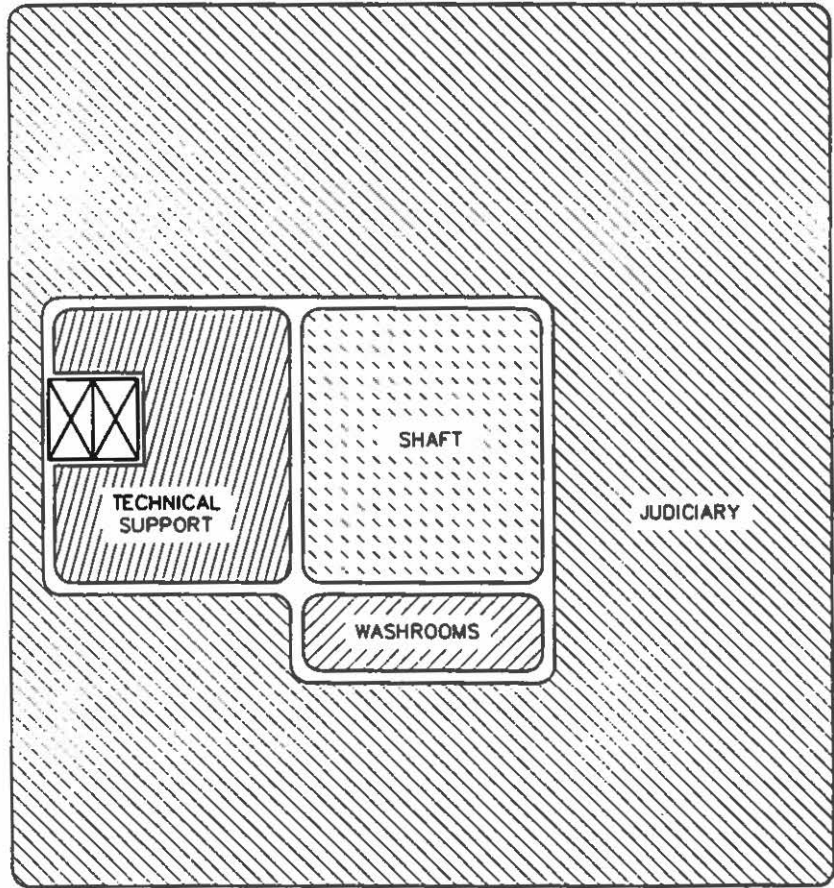
Figure 24: Possible Redevelopment of Level 5



**FIFTH
FLOOR**

STRUCTURAL
RENOVATIONS
ELIMINATE
THIS FLOOR

Figure 25: Possible Redevelopment of Level 6



SIXTH FLOOR

6.3 BUILDING AREA ANALYSIS

If the building were to be redeveloped as illustrated above, it would be almost totally utilized by the Courts. Less than 10% of the total floor area, on Level 1, would be vacant. There would be little or no room for future expansion of court operations, including the provision of additional courtrooms. Future courtrooms would be limited to the 3rd or 4th floor (displacing some administrative and public services to the main floor). Any future courtrooms would be limited in size, and it would be difficult to provide them with secure access.

6.4 IMPLEMENTATION CONCEPT

The courts would be moved to a temporary location during the renovation period, since the extent of the redevelopment will cause significant disruption to court operations.

Costs for renovations to the existing building include the relocation of the Courts to temporary accommodation. Before this option is chosen, further study is recommended to determine if suitable accommodations exist in Yellowknife and the resultant cost. If relocating the Courts is not practical further study is recommended to determine the feasibility of renovating the courthouse while occupied.

6.5 IMPLEMENTATION SCHEDULE

For the purposes of this study, the fiscal year in which approval to proceed with the project has been called Year 1. The bar chart below (Figure 26) illustrates the shortest practical implementation schedule for both building options:

It is estimated that it take approximately 24 months from the time that approval is received to proceed with the redevelopment of the Yellowknife Courthouse until building occupancy. This includes:

- 00 months for approval of project and funding (precedes Year 1).
- 00 months for detailed facility programming (precedes Year 1).
- 05 months for schematic design and review of renovations and temporary accommodations.
- 06 months for design development and preparation of construction documents for renovations and temporary accommodations.
- 02 months for tendering and award of the construction contract.
- 11 months for relocating the courts, construction, commissioning, and occupancy.

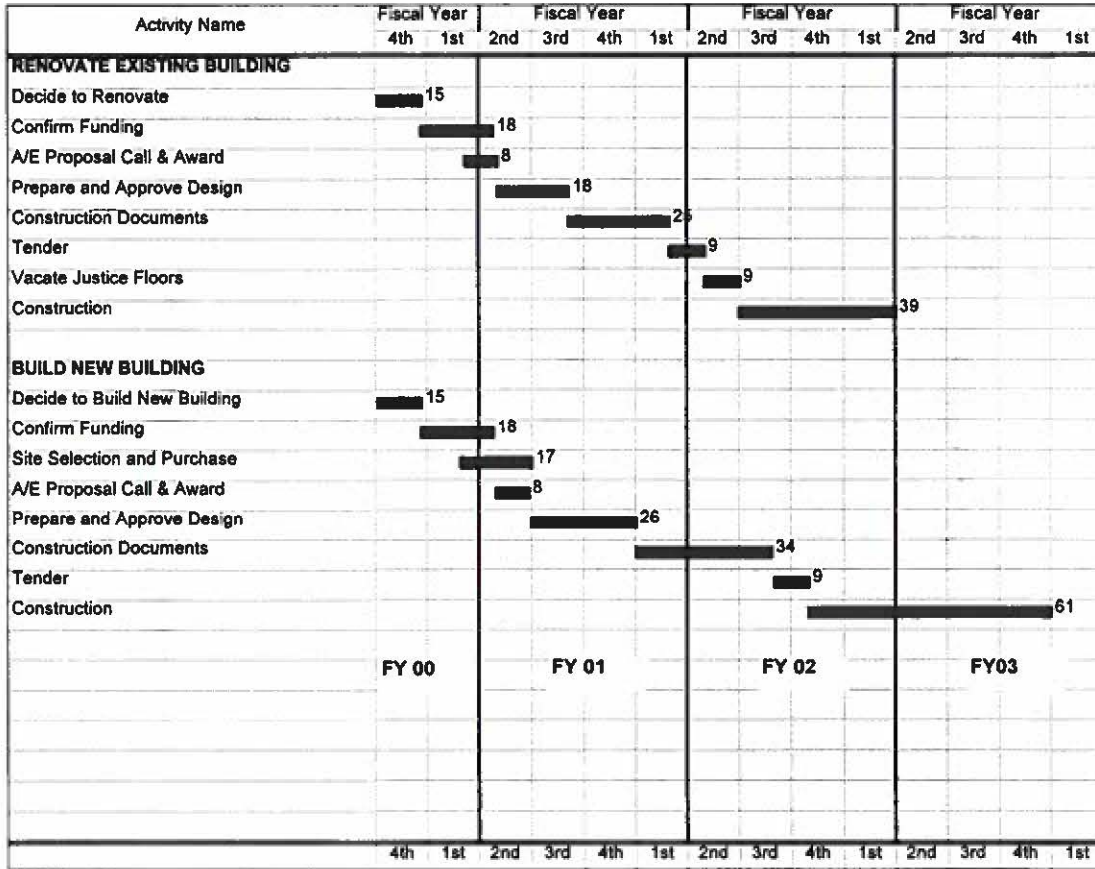
6.6 FEASIBILITY

The analysis for continuing Court use of the existing building is based on moving the courts into temporary accommodations during a renovation period. Significant structural changes on two floors, and a double-loaded secure elevator shaft servicing all floors would be required, making continued occupancy during renovations impractical.

Although the analysis assumes that alternate accommodations would be available, the reader is cautioned that it is unlikely that such specialized accommodation would in fact be obtainable, making the option to renovate unrealizable.

Future expansion of court services in the existing building is quite limited. It is anticipated that only one additional courtroom could be provided in the future. Due to the necessarily vertical nature of the circulation systems, this additional courtroom would not have secure and separate access by prisoners and the judiciary.

Figure 26: Implementation Schedule



7. FINANCIAL ANALYSIS OF OPTIONS

7.1 ANALYSIS ASSUMPTIONS

The relative costs of the options of redeveloping Yellowknife Courthouse or constructing a new Courthouse have been evaluated using the following financial assumptions: (See Appendix D for Financial Variables and detailed financial analysis.)

- Costs have been analyzed over the twenty year planning term of the study.
- Costs have been included for increased growth in Year Ten.
- Base lease costs for the existing building are based on the rate of \$14.00 per square foot per year, the figure used by the GNWT for planning purposes.
- When the Courts occupy only part of the existing building, such as at present, the lease costs have been pro-rated to that portion of the building.
- Where the Courts will occupy over 90% of the existing building, the entire lease costs have been allocated to the Courts.
- The purchase price of land for a new building or parking has been calculated at a current market rate of \$43.00 per square foot, for adjacent, assembled properties.
- The site for a new building could be a GNWT owned property. The market value cost of land for a new building has been included for a fair comparison with the existing privately owned building. If land for a new courthouse is assigned at no cost, the new courthouse option could be significantly less expensive, but servicing costs for the land could offset this saving.
- Costs for land for additional parking have been calculated on a purchase basis with repayment over twenty years. Further study should analyze the relative market costs of purchasing parking lots vs. leasing them from private developers.
- After twenty years it takes approximately 60% of the cost of new construction to retrofit a building to current standards, therefore the value of the building structure after twenty years has been calculated at the remaining 40%. The total value is the building value plus the value of its land.
- The value of a 40 year old building has been calculated at 20% of the cost of new construction.
- Repayment of capital expenditures has been calculated over a 20 year planning term, so the total amount of the principal is paid at the end of 20 years. For expenditures occurring after Year one, the term of repayment has been adjusted to end at Year Twenty.
- The loan rate used is 6.00%, which is the current cost of small government 30 year money.
- New construction is based on a cost of \$3,000 per m².
- The operating costs for the existing building are \$600,000 per annum. (historical data from DPWS). O&M costs for the new building have been calculated at 5% less (a more efficient building) pro-rated by building area.
- Operating and Maintenance amounts do not include staff or programme costs.
- Design fees and expenses are based on the Alberta Association of Architects Schedule of Recommended Fees.

- GNWT project overhead costs are calculated at the DPWS historical cost of 4.30%.
- No allowance has been made for increasing costs due to inflation, except for a 10% increase in lease rates for the existing building for the second 10 year period of the study.
- For GNWT owned property, grants in lieu of property taxes have been included, based on the current formula.

7.2 ANALYSIS OPTIONS

Three cost scenarios were analyzed. (See Appendix D):

1. Build a new courthouse on a purchased site. Build an addition to the building after 10 years to satisfy increased growth. At the end of twenty years, the GNWT would have paid back the capital cost and retained the value of the land and the current worth of the building.
2. Renew the lease in the existing building and make major renovations to suit the Courts' needs. Purchase additional land to provide increased parking needs. After 10 years, provide for additional growth through major renovations within the building envelope. At the end of twenty years, the GNWT would have paid back the capital cost and retained the value of the land purchased for parking.
3. Purchase the existing building and make major renovations to suit the Courts' needs. Purchase additional land to provide increased parking needs. After 10 years, provide for additional growth through major renovations within the building envelope. At the end of twenty years, the GNWT would have paid back the capital cost and retained the value of the land and the current worth of the (then forty year old) building.

7.3 COST ANALYSIS AND COMPARISON

Construction of a new courthouse is the most economical option.

Net Present Value for the design, construction and operation of the courthouse options are:

- Build New Courthouse \$ 24,807,669
- Lease Existing and Renovate \$ 31,525,958
- Purchase Existing and Renovate \$ 27,896,399
- Compared to a new Courthouse, purchasing / renovating the existing building has a 12% higher net present value. Leasing / renovating the existing building has a 27% higher net present value.
- The option of purchasing the existing building and renovating it is shown as less costly than leasing and renovating. The reader is cautioned that this is the result of retained value in a 40 year old building.

7.4 NOTES TO COSTING ANALYSIS

- Costs estimates are preliminary and are based on the assumptions noted.
- Land costs for a new building have been based on 10 adjacent city lots. A future site selection study will be required to determine if suitable lots can be obtained, or if a location outside the downtown core is acceptable.
- The total project costs for a new courthouse can be significantly lowered if land purchase is not required or if grants in lieu of taxes are not required. These have been included for the purposes of fair comparison. Their deletion is beyond the scope of this study.

- Costs for renovations to the existing building include the relocation of the Courts to temporary accommodation. Before this option is chosen, further study is recommended to determine if suitable accommodations exist in Yellowknife and the resultant cost. The provision of suitable, economical temporary accommodations for the Courts during renovations may not be possible, which would make the continued use of the existing building unfeasible.

8. EVALUATION OF OPTIONS

8.1 INTRODUCTION

The two options of redeveloping the Yellowknife Courthouse or constructing a new building have been evaluated based on three sets of criteria:

- Anticipated fit with functional requirements.
- Implementation Impacts.
- Projected capital and operating costs.

8.2 SUMMARY COMPARISON OF OPTIONS

Figure 27 presents a summary comparison of the two options of redeveloping the Yellowknife Courthouse or building a new courthouse.

Figure 27: Summary Comparison of Options

| | Lease / Redevelop Existing | Purchase / Redevelop Existing | New Courthouse |
|---|----------------------------|-------------------------------|----------------|
| Functional Fit | | | |
| Compliance with Space Program | Satisfactory | Satisfactory | Optimal |
| Required Functional Relationship | Limited | Limited | Optimal |
| Provide Internal Flexibility | Limited | Limited | Yes |
| Provide Expansion Potential | Limited | Limited | Yes |
| Appropriate Building Image | Unsatisfactory | Unsatisfactory | Optimal |
| Effective Space Utilization | Satisfactory | Satisfactory | Optimal |
| Security | Compromised | Compromised | Optimal |
| Sufficient Public/Staff Parking | Yes | Yes | Yes |
| Implementation | | | |
| Schedule to Completion | 24 months | 24 months | 33 months |
| Disruption to Existing Operations | Significant | Significant | Limited |
| Site Acquisition | For parking | For parking | Required |
| Costs | | | |
| Net Present Cost | \$ 31,525,958 | \$ 27,896,399 | \$ 24,807,669 |
| Net Present Cost Compared to New Building | 127% | 112% | 100% |

8.3 FUNCTIONAL FIT

The two options are likely to differ significantly in the extent to which they comply with functional and operational requirements. Redevelopment of the Yellowknife Courthouse will be constrained by aspects of the existing building envelope, while construction of a new courthouse will be constrained primarily by the capital budget and possible site limitations. The following discussion, while not necessarily completely comprehensive, highlights the key differences between the options.

Compliance with Space Program

Both options should provide sufficient space to accommodate facilities program space requirements, as well as meeting requirements to provide:

- Separate and distinct building circulation systems for the judiciary, prisoners, jurors and the public.
- The required number of courtrooms.
- Secure prisoner access to all courtrooms.
- Minimal travel time between courtrooms and judicial accommodation.

Redevelopment of the Yellowknife Courthouse may be subject to the following limitations, dependent on detailed design:

- Courtroom configurations, including litigation area widths and the depth of public galleries.
- An inability to consolidate functions such as Courts Administration in a single location. This is likely to result in operational inefficiencies.
- The potential need to locate functions such as the Courthouse Library in a less than ideal location. The ability to provide adequate working environments for staff may be compromised. While the courthouse library could be retained in its existing location on Level 1, this would eliminate the possibility of expanding other court functions in this location.
- Less than optimal space utilization, due to design inefficiencies associated with fitting program requirements into an existing building envelope.
- A lack of future expansion potential, especially for the provision of additional courtrooms. One future courtroom could be provided, but adequate access from separate and distinct circulation systems is not likely to be possible.
- A similar lack of internal flexibility to respond to future changes in program requirements, due to the constraints of the building envelope, including the lack of standardized floor to ceiling heights and the location of fixed elements such as the main public elevator shaft.
- Limitations on floor loading, which will limit opportunities for space efficiencies through the use of high density file storage systems.
- Reduced flexibility to provide the cabling, wiring, conduit, outlets, and other similar features which should be provided to facilitate the installation of equipment such as videoconferencing, computers, local area networks, paging, sound enhancement, emergency buzzers, metal detection, video security, and alarms for the exhibit and cash vaults.

Building Security

In contrast with the redevelopment of the Yellowknife Courthouse, a new courthouse would be designed to facilitate the provision of a security system that has the capability of:

- Preventing undesirable incidents.

- Detecting potential security problems.
- Confining an incident to the affected area and preventing it from spreading.
- Enabling a quick, effective response to overcome the incident.

This could include:

- The provision of a single access point for the screening of visitors.
- The zoning of building functions to facilitate extended hour access to areas such as judicial accommodation and the courthouse library without compromising building security.
- A building layout which maximizes visual supervision of public areas where required.
- The design of site circulation to provide a clear separation between prisoner transport and other vehicles.

8.4 FUTURE EXPANSION

Planning for all except the smallest courthouse includes a requirement that explicit provision be made for future facility expansion, defined as the provision of some number of additional courtrooms. Implicit in this requirement is the assumption that other support facilities also will need to expand accordingly.

Provision of a new courthouse would facilitate:

- Identification of the specific locations to be designated for the construction of any additional courtrooms.
- The general approach to be taken in providing the required additional floor areas for other components, recognizing that some internal reorganization of space also may be required.
- The approach to be taken in extending the existing building circulation systems to provide access to the new areas.
- Possible approaches to implementing the expansion program in a manner that would minimize the disruption of ongoing court operations.

8.5 STAFF AND PUBLIC PARKING

There are no opportunities to provide staff and public parking on the existing Yellowknife Courthouse site, unless additional adjacent property can be purchased to expand the site boundaries. The alternative included in the analysis is for the GNWT to purchase an alternate site in the downtown core area to be developed for surface parking. Site selection criteria for a new courthouse would include sufficient site area for required on-site parking.

8.6 BUILDING IMAGE

Construction of a new courthouse should provide the opportunity to create a building and site image appropriate for the major courthouse in the NWT, reflecting a Court system that is independent of the other two branches of government. It would also convey a message to the citizens attending court, including witnesses, parties and the accused, that this is a setting for important business requiring nothing less than the highest standards of integrity and truth.

A new courthouse would be designed so as to be clearly identifiable as a separate physical and operational entity. It would project an image of dignity. This implies recognition of tradition and a conservative, yet elegant approach to the building's appearance without appearing grandiose or ostentatious. At the same time, the building would project an open, inviting image and appear approachable to the general public. Development of the courthouse grounds should have the appearance of being publicly accessible.

Site Development

Site development would include a suitable level of landscaping, setbacks from public and vehicular circulation, and the provision of entry plazas and other public amenities. In particular, the public entrance would be readily identifiable.

Building Exterior and Form

Exterior building features would focus on the design of the main building entry and the use of building materials that present an image of permanence. The form of the building, while not being overpowering or intimidating, would convey a message that the building houses important functions requiring the highest levels of respect.

Building Interior

The design of interior spaces would include the provision of adequate public gathering spaces and the use of appropriate materials and finishes. The overall layout would be readily comprehensible. Visitors and staff would be able to easily determine where they need to go for specific purposes without the need for complex signage and directions. The facilities would project an image of orderliness and efficiency, especially in areas of high staff use and contact with the public, such as Court Administration.

Limitations of the Yellowknife Courthouse

In contrast, redevelopment of the Yellowknife Courthouse would be severely constrained by the design of the existing building and limited site area. Creating an appropriate building entrance would require extensive and costly renovations, as well as the possible need for the acquisition of additional property. Opportunities for the creation of formal public entrances, plazas and other public amenities would similarly be extremely limited.

8.7 IMPLEMENTATION

Project Schedules

It is estimated that the time from project approval to occupancy of a new courthouse would be approximately 33 months. In contrast, redevelopment of the Yellowknife Courthouse would likely require 24 months.

Disruption to Existing Operations

The Courts operate on a rigid schedule, with the need for communications and activities to occur in a timely manner. Confusion among participants regarding the location of court functions or the misdirection of documents could result in significant delays in court operations, as well as potentially jeopardizing the quality of justice resulting from non-appearances by witnesses and other parties. Significant financial and social costs will result if there are delayed or interrupted court sessions, mistrials, procedural delays through an inability to schedule Court sessions.

The redevelopment of the existing building for continued use for court facilities would require their temporary relocation, with all the operational difficulties and disruptions this would entail. Further complicating this option is the improbability of finding adequate accommodations.

An alternative discussed with the committee was the possibility of continuing the operation of the courts in place during renovations. Even greater disruption of court operations is likely in this case. There would inevitably be construction noise, dust, and related impacts associated with redeveloping the existing building while still occupied and in use. In addition to these factors is the difficulty of maintaining continuous security of the facility during construction. These impacts could be mitigated to a limited degree by requiring that construction take place outside of court sitting hours, primarily in the evenings and on weekends. However, in addition to involving a substantial cost premium, experience elsewhere has shown that this is unlikely to be a practical

solution. Judicial chambers and the courthouse library will both be in use during extended hours. As well, it is difficult to match the demands of the construction process with court schedules.

In contrast, construction of a new courthouse should avoid all of the potential disruption associated with the redevelopment of the Yellowknife Courthouse. The new courthouse would be constructed on an alternate site and occupied on completion.

Relocation Impacts

The primary disruption to court activities with the construction of a new courthouse would be associated with the move to the new facility. This will be dependent in part on the extent to which existing furniture and equipment is reused in the new facility, and the associated extent of the commissioning process prior to occupancy.

There will be both moving costs per se, as well as lost staff time associated with packing, unpacking and re-establishing courts operations in a new location.

Site Acquisition

In contrast with the construction of a new facility, redevelopment of the Yellowknife Courthouse will avoid the need for acquisition of a new site. The construction of a new courthouse will require the assessment of alternate sites, and a detailed site selection process. If a decision is made to construct the facility on privately held land, there could also be a need for land assembly, public consultation and rezoning. Identification of a suitable GNWT site could serve to mitigate these latter impacts.

Relocation of Existing Tenants

If a decision is made to proceed with the construction of a new courthouse, it is possible that the Department of Justice and other current courthouse tenants could remain in the existing leased building. This would be of particular benefit in the case of the office of the Commissioner of the NWT. Replacing the existing facilities in an alternate location would require a significant capital outlay.

8.8 PROJECT COSTS

Project Costs

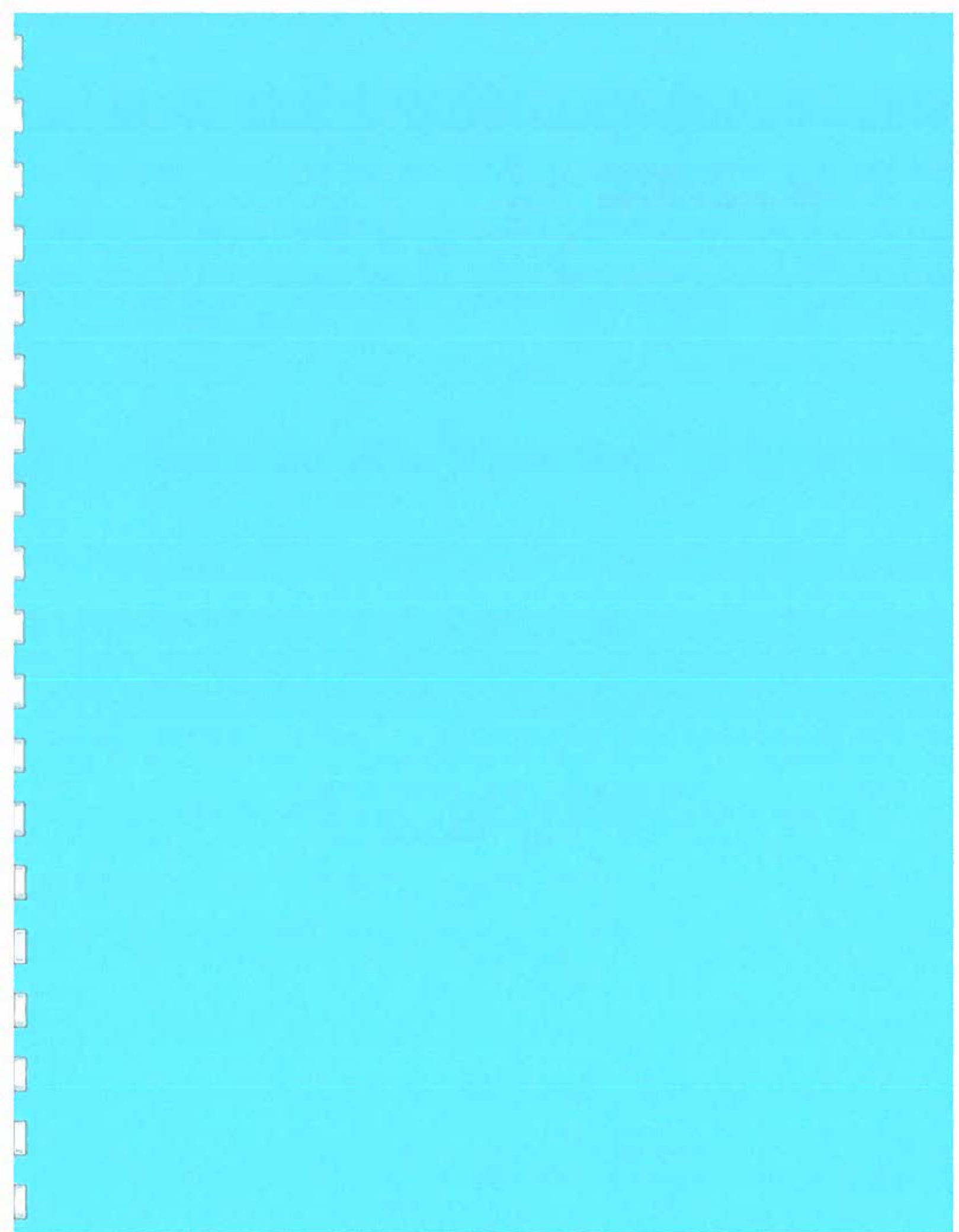
As indicated in Figure 27, the Net Present Cost of a new courthouse is approximately \$24,800,000.

In comparison, purchasing / renovating the existing building has a 12% higher net present value, and leasing / renovating the existing building has a 27% higher net present value.

**APPENDIX A
TECHNICAL EVALUATION**



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS





FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

**Yellowknife Courthouse
Yellowknife, NT**

Technical Status Evaluation Report

Prepared By

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**Yellowknife Courthouse
Yellowknife, NT**

Technical Status Evaluation Report

Report Dates:

| | |
|----------------------|------------------|
| Building Inspection: | May 25, 29, 1998 |
| Report Compilation: | June, 1998 |
| Final Report: | Sept. 11, 1998 |

Technical Evaluation Staff:

| | |
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Executive Summary

This evaluation of the existing condition of the Yellowknife Courthouse building, was prepared for the Department of Public Works & Services, GNWT. The report evaluates the technical status of architectural, structural, mechanical and electrical systems within the building, and was conducted to assist in the development of a feasibility study for the delivery of court services in the future. The report is not intended to identify programming or functional concerns.

Architectural / Structural

The courthouse building was originally constructed in 1977-78, and has been leased by the GNWT since. This six story steel-framed structure contains a stud-framed central core within which a lateral bracing system has been provided. Overall, the building structure is in very good condition. Several of the finishes in the building require selective repair or replacement. Of note are various minor cracks in drywall at exterior walls, ceilings in certain locations, and flooring in public lobbies. The entry lobbies on the main floor require redesign to meet current codes. One elevator in the building will require retrofitting to meet current codes.

The structural capacity the floors have been designed for have been determined from the original construction plans and compared with current building code requirements. The main floor library is underdesigned for current floor loading requirements for this occupancy. Some areas of the office spaces are being used for centralized file storage. The original plans indicate these areas to be designed for office use only. Filing storage and equipment on some floors should be relocated to more evenly distribute weight over the floor areas. If the filing layout is to be maintained an up to date mapping and analysis of each floor is recommended, and structural reinforcement may be necessary.

Costing

The cost of upgrading the existing building will vary significantly based on the extent of the upgrades, the proposed new use of the building, the inclusion or exclusion of upgrade work in a construction contract for the new facility, etc. Costing of renovations has not been included as part of the technical review but is included as a component of the feasibility study, based on a comprehensive scope of work including redevelopment requirements.

Mechanical

The majority of the mechanical equipment is located within the basement. There also is a roof top fan mezzanine which houses ventilation/ cooling equipment. Most of the equipment is original and has been very well maintained. Some components are reaching or have reached the end of their *median service life* according to ASHRAE guidelines. The level and

degree of regular maintenance has permitted this equipment to exceed the expected life spans. A further life span of 5 years can be anticipated on most equipment. The 13630L buried fuel oil tank will require replacement within the next three years due to the requirements of the *Environmental Code of Practice for Underground Storage Tank Systems Containing Petroleum Products (1989)*.

Electrical

In general the electrical systems in the building are in very good condition. The building electrical systems appear to be well maintained. There is a code deficiency with the fire alarm - more heat and smoke detectors are required in some areas due to past renovations that may not have included updating the alarm system. This will require rectification as part of any renovations proposed.

Introduction

Ferguson Simek Clark Engineers & Architects was commissioned to prepare a feasibility study to provide the GNWT with direction on whether to renovate the existing courthouse building or to provide a new facility. One part of this study is a technical status evaluation of the existing courthouse building. The inspection of the existing building was carried out over several days in late May and early June, 1998 by Ferdinand Regier, M.Arch, Phil Nolan, P.Eng., Doug Cargill, P. Eng., and Neal Bourassa, P.Eng.

The technical status evaluation considered a number of issues including: existing condition of systems and components; remaining service life of systems and components; and operational and maintenance concerns.

Information found in this report was collected from the following sources:

- Visual site inspections of the existing courthouse building (non-destructive testing)
- Review of record drawings (provided by DPWS)
- Review of O&M information (available from Polar Panda Developments, Inc.)
- Discussion with occupants and maintenance staff (Polar Panda Developments, Inc.)

The formatting of this report (including the itemized system / component reviews), as well as many of the definitions are based on a technical evaluation report format originally developed by the Department of Public Works, Technical Services Division, and refined by Ferguson Simek Clark.

This report has been prepared for the Department of Public Works & Services, and is intended to: provide a summary of the existing systems and components in the building and recommendations for its continued operation and/or renovation.

ARCHITECTURAL / STRUCTURAL

Existing Systems and Descriptions

1.1 General

The architectural and structural systems at the *Yellowknife Courthouse* in Yellowknife, N.W.T. were reviewed during site visits on the 29th of May and 9th of June, 1998. The following report outlines the findings of this evaluation.

The purpose of the review was to assess: (1) the building for any violations of the applicable governing codes and standards; and (2) the existing components for remaining life and for possible replacement; and (3) the building's suitability for continued use as a courthouse.

The applicable codes and standards include:

- *National Building Code of Canada* (1995)

1.1 Architectural

The courthouse building was originally constructed in 1977-78, and has been leased by the GNWT since. This six story steel-framed structure contains a stud-framed central core within which a lateral bracing system has been provided. The building houses both court services (main through 3rd floors), as well as general office space (fourth through sixth floors).

Floor areas are as follows:

| | |
|--|--------------------|
| -Basement and 1 st floors are approximately | 800m ² |
| -Second floor area is approximately | 1280m ² |
| -Floors 3 through 6 are typically | 850 m ² |
| -Mechanical penthouse is approximately | 240m ² |
| Gross Floor Area (all floors) | 6520m ² |

Exterior walls are typically 125mm steel studs, framed between floor plates, containing batt insulation. Roofs are insulated with 65mm rigid insulation and covered with modified bituminous membrane roofing. Double-glazed aluminum-framed windows and aluminum cladding complete the envelope.

A pair of elevators and two sets of 'scissor' exit stairs are contained in the central core. The elevator shaft and stairs are enclosed with a stud wall system maintaining a 2 hr separation.

Overall, the building is in good condition. Following are some areas that require action (a more comprehensive description of systems and recommendations can be found in the 'Detailed Comments', appendix B):

Code-related Items:

- Storage in basement corridors- In several locations in the basement corridors were found to be used for storage. No storage is allowed in corridors.
- Ramp at main floor entry- The ramp currently has a slope of approximately 1:9. Current code requires a maximum of 1:12 slope.
- Stair opening at entry lobby- Walls separating the lobby from all other areas require a 1hr. fire rating.

- Exit stairs- Much of the slip-resistant tape on the stairs has worn off. New slip resistant tape or tread covers should be provided.
- Fire rated doors- A number of doors to storage and other rooms do not close and / or latch properly. All rated doors must be self-closing.
- Elevators- Both elevators have clear interior dimensions less than required by the current building code. One of the elevators will require upgrading to meet code.

Other Items:

- Interior finishes at exterior walls show cracks and damage.
- Sound insulation at courtrooms is required to minimize noise transmission from defendant corridor.
- Ceiling tile ties should be provided for all ceiling mounted fixtures (at acoustical tile ceilings only). Many tiles currently show deformation due to the weight of fixtures.
- Floor finishes in public areas, especially the courtroom lobby show wear. Some consideration should be given to replacing more public area floors with hard surface products (ceramic tile, quarry tile, etc.)
- The penthouse roof is the only one not yet replaced (from original). It should be replaced in the near future.
- Parking area- The pavement in the parking area has settled relative to the concrete grade beams under parts of it. This area should be compacted and repaved. Bollards should be installed to protect the defendants stair enclosure.

The courthouse building was fairly well designed and constructed based on typical construction methods of the day. Subsequent to initial construction, tenant improvements and good maintenance practices have kept the systems and components in the building current and in good overall condition.

1.2 Structural

The courthouse is a steel-framed building on steel piles. A notable exception is the basement level where walls and floors are cast in place concrete. The steel structure supports 76mm concrete floors, poured over steel 'pan'. Structural bays vary between 8.5m and 12.7m, with perimeter I-beams, depth varying between 400 to 610mm. Between beams, 510mm deep open-web steel joists (765 to 915mm spacing) are typical. Joists above and below courtrooms are typically 915mm deep with 890mm spacing due to the greater spans. Floor to floor heights are 3.25m (basement), 4.24m (1st and 2nd), 3.8m (3rd to 6th), and 4.4m (penthouse).

The structural capacity the floors have been designed for have been determined from the original construction plans and compared with current building code requirements. The main floor library is underdesigned for current floor loading requirements for this occupancy. Some areas of the office spaces are being used for centralized file storage. The original plans indicate these areas to be designed for office use only. Filing storage and equipment on some floors should be relocated to more evenly distribute weight over the floor areas. If the filing layout is to be maintained an up to date mapping and analysis of each floor is recommended, and structural reinforcement may be necessary.

MECHANICAL

Existing Systems and Descriptions

1.1 General

The mechanical systems at the *Yellowknife Courthouse* in Yellowknife, N.W.T. were reviewed during a site visit during the 29th of May, 1998. The systems evaluated include the heating, the ventilation, the chilled water, the fire protection, the plumbing and drainage, and the control systems. The following report outlines the findings of this evaluation.

The purpose of the review was to (1) assess the building for any violations of the applicable governing codes and standards; (2) to assess the existing equipment for remaining life and for possible replacement and; (3) the building's suitability for continued use as a courthouse.

The applicable codes and standards include:

- *National Building Code of Canada* (1995);
- *CAN/CSA B139-M91, Installation Code for Oil Burning Equipment;*
- *National Plumbing Code* (1995);
- *NFPA 10-1994, Portable Fire Extinguishers;*
- *NFPA 13-1996, Installation of Sprinkler Systems;*
- Applicable ASHRAE standards;
- Applicable ASPE standards; and
- Applicable SMACNA Design and Construction Guidelines.

The building was constructed in one phase and was completed in 1978. The majority of the mechanical equipment is located within the basement area of the building. There also is a roof top fan mezzanine which houses ventilation/ cooling equipment. Most of the equipment is original and has been very well maintained. Some components are reaching or have reached the end of their Median Service Life according to the guidelines provided by the ASHRAE Technical Committee 1.8: *Equipment Service Life Table*. However, the level and degree of regular maintenance has permitted this equipment to exceed the expected life spans. A further life span of 5 years can be anticipated on most equipment.

The following describes the general systems provided in the existing building.

1.2 Existing Building Service / Plumbing and Drainage

The existing water service to the *Yellowknife Courthouse* is a 200mm diameter main from an existing 150mm diameter city main located underneath the rear alleyway. The building service was installed during the original construction. After the main enters into the building, it tees off into a 75mm diameter domestic water main and a 150mm diameter fire protection main.

The condition of the existing buried water service is unknown at this time. Maintenance personnel have not reported any difficulties with the existing system. The service is complete with a 25mm diameter recirculation main and bronze body, GRUNDFOS UP 15-18BF

recirculation pump. The pump is approximately 5 years old. The pump motor was observed to be overheating. The pump is beginning to fail and should be replaced.

Domestic hot water is provided through single walled tankless heaters located within the boilers. The water is then passed through a GSW Model 5ET1758C, 175L electric domestic water heater/ storage tank. During the summer months when the boilers are shut down, the electric DHW heater provides DHW to the building. During the winter months it acts as a storage tank. The DHW and the tankless heaters are new and are suitable for continued use.

The domestic hot water recirculation (DHWR) pump operates continuously and circulates the DHW through the building and back to the DHW heat exchanger/ DHW tank. This ensures that a DHW supply is always available throughout the building. The DHWR pump is a new GRUNDFOS UP-15-18SF pump and appears to be in good condition.

Domestic water is distributed throughout the building by DCW and DHW mains. These mains are routed through the main building vertical service shaft. Branch distribution piping is located within the ceiling space of each floor area. The condition of the piping was not verified. Sampling of the pipe in order to determine its remaining life is recommended.

Due to the height of the building, a DW pressure booster pump has been provided. The base mounted pump is a EBARA Model 65x50FS2G. The guard on the pump shaft has been removed and should be reinstalled. Also, the pump is exhibiting signs of corrosion. As outlined within the ASHRAE Technical Committee 1.8: *Equipment Service Life Table*, the median life of a base mounted pump is 20 years. Therefore, as the pump has exceeded this life span by one year it should be replaced.

The washroom fixtures are a mixture of enameled steel and porcelain. The existing CRANE water closets are elongated bowl styles complete with flush tanks or valves. They are in good condition. All of the domestic water supplies and trim appeared to be in good condition.

The flush valve, wall mounted urinals are also manufactured by CRANE. They are generally in good condition.

The CRANE lavatories are a combination of enameled steel and porcelain. Enamel steel fixtures are contrary to the Public Works and Services *Design Standards & Guidelines for New Public Buildings*. Generally the p-traps and the screwdriver domestic water supplies are in good condition. The lavatory faucets should be upgraded to provide tempered at all barrier free accessible lavatories to fully comply with the requirements of the NBC (1995).

The drinking fountains are deck mounted bubblers mounted adjacent to a lavatory within each washroom area. They appeared to be in good condition. It is recommended that refrigerated drinking fountains be provided to cut down on DW usage.

Sanitary service of the existing *Yellowknife Courthouse* is a 150mm diameter main to an existing 200mm diameter city main located underneath the rear alleyway. The building service was installed during the original construction.

The condition of the existing buried sanitary service is unknown at this time. Maintenance personnel have not reported any difficulties with the existing system.

Some hangers were noted to be missing or damaged and should be added or replaced to the requirements of the *National Plumbing Code of Canada* (1995).

1.3 Fuel Oil

Fuel for heating and indirect domestic hot water production is supplied by a buried 13630L ULC Listed, fuel oil tank. The existing buried fuel oil tank was installed in 1976. The tank does not have secondary containment nor does it have cathodic protection. As per the requirements of the *Environmental Code of Practice for Underground Storage Tank Systems Containing Petroleum Products* (1989) and the *Office of the N.W.T. Fire Marshal*, any tank that does not have cathodic protection and is over 25 years in age must be replaced. Therefore, the existing tank will be required to be removed within the next three years.

From the exterior fuel oil storage tank, fuel oil is transferred by a BENNENT & EMMOTT Model F180 gear pump to an interior, non-ULC listed, 1136L-day tank located within the basement Mechanical Room. Fuel oil to the two boilers and the generator is fed by gravity. The transfer pumps are original and have exceeded their median service life by one year. As per the requirements of Section 6.1.1.1. of *CAN/CSA-B139-M91 Installation Code for Oil Burning Equipment*, all fuel oil storage tanks must be ULC listed. Therefore, the interior day tank should be replaced.

1.4 Fire Protection

Mechanical fire protection within the *Yellowknife Courthouse* is good. The building is provided with handheld ANSUL and GRINNELL Type "ABC" fire extinguishers, fire hose cabinets, FLAG pump tank fire extinguishers and an automatic sprinkler system. The cabinets are complete with a 38mm diameter fire fighter's valve.

The coverage of the existing handheld extinguishers is good with numerous Type "C" fire extinguishers located throughout the building. As per the *Public Works and Services Design Standards & Guidelines for New Public Buildings*, Type "ABC" fire extinguishers are required. If *GNWT Design Guidelines* are to be followed the existing Type "C" fire extinguishers should be replaced.

The existing sprinkler system is a wet pipe system complete with standard response sprinkler heads. As per the requirements of *Technical Bulletin FM-004-88*, issued by the *Office of the N.W.T. Fire Marshal*, all sprinkler heads within a fire protection system are required to be "quick response". Therefore, the existing sprinkler heads should be replaced.

1.5 Heating

Heat is produced within the *Yellowknife Courthouse* by two ULC listed, BURNHAM V-1110 cast iron boilers. The gross I-B-R rated output per boiler is 569kW for a total gross output of 1137 kW. Both boilers are provided with BECKETT MODEL MODEL CF2300A burners. The heating system is arranged in a primary–secondary configuration.

The typical heating load for an office building is approximately 0.15kW/m². Utilizing this value, the existing heating plant is capable of heating a future building area of up to approximately 7580m². Presently the gross building area is approximately 6520m². Therefore, the existing heating plant appears to be suitable for continued use, including limited room for expansion.

The median life expectancy of a cast iron sectional boiler is 15 years. As the boilers were installed in approximately 1996, one could expect the boilers to reach their median life in the year 2011. However, as the water treatment appears to be good, one could expect a longer than normal boiler lifespan.

The existing boiler chimneys were noted to have some corrosion and pitting. Cleaning of these chimneys is required. Replacement will likely be required within the next 5 years.

The existing heating system expansion tank is an “open type” of expansion tank. Typically, an “open” tank is the major source of air infiltration within a heating system. Therefore, this tank should be replaced with a diaphragm tank as per current industry practices.

Perimeter radiation elements, where present, are in good condition.

The existing cabinet unit heaters and unit heaters are approaching the end of their useful lives. As per *ASHRAE*, the median life expectancy is 20 years. Therefore, all terminal units should be replaced during a major renovation.

Heating water is circulated from the primary HW circuit to each secondary HW circuit by two base mounted pumps. These base mounted, EBARA Model 40LPD6.75 pumps operate in parallel on a lead/ lag basis to serve this HW circuit. At the time of inspection, the pump casing seal was noted to have been leaking. As outlined within the *ASHRAE T.C. 1.8. Equipment Service Life Table*, the median service life of a base mounted pump is 20 years. As this pump appears to have been from the original construction, the pumps have exceeded their median life as indicated by *ASHRAE*. Replacement of these pumps is recommended.

Heating water is circulated to the building unit heaters and the building perimeter radiation elements by an individual, secondary heating water circuit. Two ARMSTRONG Model 4380 -2x2x8 in-line centrifugal pump operate in parallel on a lead/ lag basis to serve this HW circuit. The pumps are in good shape and are suitable for continued use.

Heating water is circulated to the building AHU heating coils by an individual, secondary heating water circuit. Two EBARA Model 40LPD6.75 in-line centrifugal pumps operate in parallel on a lead/ lag basis to serve this HW circuit. These pumps are extremely noisy and exhibit signs of fluid leakage. They should be replaced.

Heating water is circulated at each building air handling unit heating coil by a tertiary heating water circuit. An ARMSTRONG Model S34AB in-line centrifugal pump continuously

circulates HW through the AHU heating coil. At the time of inspection, the pump casing seal was noted to have leaked in the past. As outlined within the *ASHRAE T.C. 1.8. Equipment Service Life Table*, the median service life of a pipe mounted pump is 10 years. As this pump appears to have been from the original construction, the pump has exceeded its median life by 11 years. These pumps should be replaced.

Distribution piping throughout the building is primarily steel. It appears to be in good condition, however, some recent leakage was observed at fittings, air vents, and valve stems. Laboratory testing of the piping in order to assess its remaining life is recommended.

Insulation was noted to be damaged or missing within occupied areas and mechanical spaces. This represents a hazard to the building occupants and maintenance personnel and results in a decreased thermal efficiency of the heating system. The insulation should be replaced in these areas.

Most of the piping is not identified. Identification is recommended to increase maintenance efficiency.

1.6 Chilled Water

Cooling is provided within the *Yellowknife Courthouse* by a CARRIER Model 30HS160B4 Chiller/ Compressor and two remote CARRIER Model 09DE084400 air cooled condensers. The approximate cooling capacity of this system is 632kW.

The typical cooling load for an office building is approximately 9.5m²/kW. Utilizing this value, the existing cooling plant is capable of cooling a future building area of up to approximately 6004m². Presently the gross building area requiring cooling is approximately 6280m². Therefore, the existing chilled water plant appears to be suitable for continued use, barring any unforeseen building loads.

The median life expectancy of a chiller and a remote condensing unit is 20 years. Therefore, these items have exceeded their median life expectancy and should be reviewed further in order to determine their remaining life and suitability for continued use (i.e. the Montreal Protocol).

The existing chilled system expansion tank is an "open type" of expansion tank. Typically, an "open" tank is the major source of air infiltration within a chilled water system. Therefore, this tank should be replaced with a diaphragm tank as per current industry practices.

Chilled water is circulated from the primary CHW circuit to each secondary CHW coil by two base mounted pumps. These base mounted, EBARA Model 4042 pumps operate in parallel on a lead/ lag basis to serve this CHW circuit. At the time of inspection, the pump casing seal was noted to have been leaking and there was excessive corrosion on the pump body. As outlined within the *ASHRAE T.C. 1.8. Equipment Service Life Table*, the median service life of a base mounted pump is 20 years. As this pump appears to have been from the original construction, the pump has exceeded its median life as indicated by *ASHRAE*. It is recommended that these pumps be replaced.

Distribution piping throughout the building is primarily steel. It appears to be in poor condition and some recent leakage and corrosion was observed at fittings, air vents, and valve stems. Laboratory testing of the piping in order to assess its remaining life is recommended.

Insulation was noted to be damaged or missing within occupied areas and mechanical spaces. This results in a decreased thermal efficiency of the cooling system. The insulation should be replaced in these areas.

Most of the piping is not identified. Identification is recommended to increase maintenance efficiency.

1.7 Ventilation

Mechanical ventilation is provided to the *Yellowknife Courthouse* by four ventilation systems located within the two fan rooms. One is located within the basement and the other is located within the penthouse.

Air Handling Units #1 and #2 are built-up air handling units. They are comprised of a variable volume centrifugal supply air fans, variable volume vaneaxial relief air fans, a filter section, heating coils, and chilled water cooling coils. The total specified supply and return air capacity for each of these units is as follows:

Air Handling Unit (AS-1)

- CANADIAN BLOWER Size 85 Centrifugal Supply Fan (F-1): 15010 L/s
- CANADIAN BLOWER Size 32 Type B Vaneaxial Return Fan (F-2): 13510 L/s (Approximate only);

Air Handling Unit (AS-2)

- CANADIAN BLOWER Size 730 Centrifugal Supply Fan (F-5): 8710 L/s
- CANADIAN BLOWER Size 32 Type B Vaneaxial Return Fan (F-6): 7840 L/s (Approximate only);

Generally, the air handling units appear to be good operating condition. The heating coils do not show signs of leaks. The filters consist of are a mixture of replaceable bag types (AS-1) and a disposable, low arresstance media (AS-2).

The heating coil is controlled by a duct mounted modulating minimum supply air temperature controller. The outdoor air, return air, and the exhaust air ducts are operated in parallel to maintain a mixed air temperature. Freeze protection of the heating coils is provided by a "manual " reset low temperature controller. Heating coil control is provided by a three way mixing control valve with an individual in-line circulation pump.

Janitor rooms and Washrooms are provided with an central exhaust air system located within the penthouse area. The fan appears to be in good condition.

Supply air is distributed throughout the building by medium velocity, variable volume ductwork and boxes. Space air diffusion is by a combination of ceiling diffusers and wall

mounted linear grilles (court rooms). Return air is routed through a plenum and collected at a central point.

A review of the existing ventilation rates confirms that the ventilation supply air volumes are adequate on the main and second floors. However, the ventilation rates on the third through the sixth floors are slightly less than is the current practice. This may lead to occupant discomfort.

A review of the existing heating coil sizes indicate that the existing ventilation system may be incapable of providing outdoor air as outlined by *ASHRAE 62-1989 "Ventilation for Acceptable Indoor Air Quality"*. Therefore, as per the requirements of the *National Building Code of Canada (1995)* the outdoor air volumes must be increased.

1.8 Controls

The existing control system within the *Yellowknife Courthouse* is primarily a JOHNSON CONTROLS pneumatic system. There are some assorted PENN line voltage thermostats which control the unit heaters and the cabinet unit heaters. As per the tables in ASHRAE, a Pneumatic control system has a median life span of 20 years. It was noted during the evaluation that some components have already failed and have been replaced (i.e. perimeter radiation zone valves and thermostats). It is recommended that a complete control review by a JOHNSON CONTROLS representative should be performed in order to bring the control system back to the original design intent. This would also permit any damaged or failed controls or components to be replaced and/or updated.

1.9 Calculations

Various calculations sheets have been provided for reference within the Appendix.

ELECTRICAL

Existing Systems and Descriptions

1.1 General

The electrical systems at the *Yellowknife Courthouse* in Yellowknife, N.W.T. were reviewed during a site visit during the 29th of May, 1998. The systems evaluated include the service & distribution, stand-by power, lighting, fire alarm and communications systems. The following report outlines the findings of this evaluation.

The purpose of the review was to (1) assess the building for any violations of the applicable governing codes and standards; (2) to assess the existing equipment for remaining life and for possible replacement and; (3) the building's suitability for continued use as a courthouse.

1.2 Service & Distribution

A 120/208 volt 1600 Amps three-phase underground utility service is brought into the building from an exterior pad mounted utility transformer. The main service and distribution equipment utilize breakers disconnects. All building wiring, including incoming feeders, are copper. The main service feeds CDP and EDP panels. A Westinghouse Robonics Type RO transfer switch feeds the EDP panels with a stand-by connection to a genset.

1.3 Stand-by Power Generation

There is a 110 kW, three phase, diesel stand-by generator and transfer switch located in the mechanical room. The transfer switch is an automatic type which signals start-up and shut-down to the generator during utility power disturbances or failures. The unit is fueled from the main fuel-oil tank.

1.4 Lighting

The lighting in the building utilizes mainly T12 lamps and magnetic ballasts. There is some incandescent lighting in selected areas of the building, mainly as accent lighting. The lighting in the courtrooms is done with pot lamps that have been retrofitted with PL lamps. The light levels in the court rooms are somewhat low and should be redesigned.

1.5 Branch Circuit Power

Branch circuit wiring is done with RW90 xlink in conduit for the majority of the building. There are an adequate number of receptacles in most locations.

1.6 Emergency Lighting

Emergency lighting is provided by battery packs with attached heads and remote heads located at various locations throughout the building. The battery packs are in good condition. Maintenance personnel stated that they check all the battery packs twice a year and replace those that do not meet code requirements

1.7 Fire Alarm System

The fire alarm system in the building is a Simplex 4002 located in the electrical room. There is a remote annunciator panel located by the main door.

The fire alarm system is monitored by Arctic alarms.

It appears as though the fire alarm system complied with all the codes at the time of installation. Over the years some spaces have changed uses. Some heat and smoke detectors would have to be added to the system to bring it up to present day codes.

1.8 Data Communications

The data communications system consists of category 5 cabling run through cable tray to computer closets. These are located on each floor of the building. The Local Area Network (LAN) cabling system is adequate for present day uses.



**Technical Status Evaluation
Yellowknife Courthouse
Yellowknife, NT**



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

SUMMARY

Rating Action Priority Remaining Service Life

A ARCHITECTURAL SYSTEMS / COMPONENTS

A1.0 BASEMENT LEVEL

| | | | | |
|------|------------------------------------|--------------|-----------------|----------------|
| A1.1 | BASEMENT FLOOR | Good | Code Compliance | Over 15 years |
| A1.2 | BASEMENT EXTERIOR WALLS | Good | None | Over 15 years |
| A1.3 | BASEMENT INTERIOR PARTITIONS | Satisfactory | None | 10 to 15 years |
| A1.4 | BASEMENT FINISHES | Satisfactory | None | 10 to 15 years |
| A1.5 | BASEMENT DOORS / FRAMES / HARDWARE | Satisfactory | None | 5 to 10 years |

A2.0 COURTHOUSE (MAIN TO 3RD FLOOR)

| | | | | |
|------|------------------------------------|----------------|-----------------|----------------|
| A2.1 | EXTERIOR WALLS | Satisfactory | Varies | 10 to 15 years |
| A2.2 | INTERIOR PARTITIONS | Varies | Desirable | 5 to 10 years |
| A2.3 | FLOOR FINISHES | Varies | Desirable | 0 to 5 years |
| A2.4 | CEILING FINISHES | Good | Suggested | 5 to 10 years |
| A2.5 | INTERIOR DOORS / FRAMES / HARDWARE | Satisfactory | None | 10 to 15 years |
| A2.6 | MAIN STAIR / RAMP / HANDRAILS | Unsatisfactory | Code Compliance | 10 to 15 years |
| A2.7 | ENTRANCE DOORS / GLAZING | Good | None | 10 to 15 years |
| A2.8 | ELEVATORS | Good | Code Compliance | Over 15 years |

A3.0 OFFICES (UPPER FLOORS)

| | | | | |
|------|------------------------------------|----------------|-----------------|----------------|
| A3.1 | FLOOR FINISHES | Satisfactory | Suggested | 0 to 5 years |
| A3.2 | EXTERIOR WALLS | Unsatisfactory | Varies | 10 to 15 years |
| A3.3 | INTERIOR PARTITIONS | Good | None | 5 to 10 years |
| A3.4 | CEILING FINISHES | Good | None | 5 to 10 years |
| A3.5 | INTERIOR DOORS / FRAMES / HARDWARE | Satisfactory | Code Compliance | Varies |

A4.0 MECHANICAL PENTHOUSE

| | | | | |
|------|----------------------|------|------|----------------|
| A4.0 | MECHANICAL PENTHOUSE | Good | None | 10 to 15 years |
|------|----------------------|------|------|----------------|

A5.0 OVERALL

**Technical Status Evaluation
Yellowknife Courthouse
Yellowknife, NT**



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

| SUMMARY | | Rating | Action Priority | Remaining Service Life |
|---------|-------------------------------------|----------------|-----------------|------------------------|
| A5.1 | EXIT STAIRS / HANDRAILS | Unsatisfactory | Code Compliance | 10 to 15 years |
| A5.2 | EXTERIOR CLADDING AND SOFFIT | Satisfactory | None | 10 to 15 years |
| A5.3 | EXTERIOR LOUVRES, GRILLES, FLASHING | Satisfactory | Desirable | 10 to 15 years |
| A5.4 | EXTERIOR WINDOWS | Satisfactory | None | 10 to 15 years |
| A5.5 | ROOF ASSEMBLIES | Varies | Monitor | Varies |
| A5.6 | THERMAL INSULATION | Satisfactory | None | Over 15 years |
| A5.7 | ENVELOPE INTEGRITY | Satisfactory | None | Undetermined |
| A5.8 | FIRE RESISTANCE RATINGS | Satisfactory | Code Compliance | Not Applicable |
| A5.9 | PARKING | Unsatisfactory | Desirable | 0 to 5 years |
| A6.0 | DOCUMENTATION | Satisfactory | None | Not Applicable |

SUMMARY

Rating Action Priority Remaining Service Life

S STRUCTURAL SYSTEMS / COMPONENTS

| | | | | |
|------|------------------------------|----------------|--------------|---------------|
| S1.0 | STRUCTURAL GENERAL | Very Good | None | Over 15 years |
| S2.0 | BASEMENT | Very Good | None | Over 15 years |
| S3.0 | MAIN FLOOR | Not Determined | Code Upgrade | Over 15 years |
| S4.0 | 2nd FLOOR | Good | Desirable | Over 15 years |
| S5.0 | 3rd FLOOR/ COURTHOUSE ROOF | Good | Varies | Over 15 years |
| S6.0 | 4th TO 6th FLOOR | Good | Varies | Over 15 years |
| S7.0 | PENTHOUSE FLOOR/ UPPER ROOF | Very Good | None | Over 15 years |
| S8.0 | ELEVATOR/ MECH. MACHINE ROOM | Very Good | None | Over 15 years |
| S9.0 | PENTHOUSE ROOF | Very Good | None | Over 15 years |

**Technical Status Evaluation
Yellowknife Courthouse
Yellowknife, NT**



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

| SUMMARY | | Rating | Action Priority | Remaining Service Life |
|----------|--|----------------|-----------------|------------------------|
| M | MECHANICAL SYSTEMS / COMPONENTS | | | |
| M1.0 | DOMESTIC WATER SYSTEMS - GENERAL | Satisfactory | Varies | 5 to 10 years |
| M1.1 | PLUMBING FIXTURES | Good | Varies | 5 to 10 years |
| M1.2 | DOMESTIC WATER SUPPLY PIPING | Satisfactory | Varies | Varies |
| M1.3 | DOMESTIC WATER SUPPLY EQUIPMENT | Satisfactory | Suggested | 0 to 5 years |
| M1.4 | SANITARY WASTE SYSTEM | Satisfactory | None | 5 to 10 years |
| M2.0 | FIRE PROTECTION SYSTEMS - GENERAL | Satisfactory | Code Compliance | 5 to 10 years |
| M2.1 | FIRE WATER EQUIPMENT | Satisfactory | Desirable | 0 to 5 years |
| M2.3 | FIRE HOSE CABINETS | Satisfactory | None | 5 to 10 years |
| M2.4 | FIRE EXTINGUISHERS | Satisfactory | Suggested | 5 to 10 years |
| M2.5 | FIRE PROTECTION PIPING | Satisfactory | Code Compliance | 5 to 10 years |
| M3.0 | FUEL SYSTEMS - GENERAL | Satisfactory | Code Upgrade | 0 to 5 years |
| M3.1 | FUEL OIL TANKS | Unsatisfactory | Code Upgrade | 0 to 5 years |
| M3.2 | FUEL OIL PIPING AND TRIM | Satisfactory | Suggested | 0 to 5 years |
| M4.0 | HEATING - GENERAL | Satisfactory | Suggested | 10 to 15 years |
| M4.1 | HEATING EQUIPMENT | Good | Suggested | 10 to 15 years |
| M5.0 | CHILLED WATER EQUIPMENT | Satisfactory | Suggested | 5 to 10 years |
| M6.0 | VENTILATION - GENERAL | Unsatisfactory | Code Compliance | 5 to 10 years |
| M6.1 | VENTILATION EQUIPMENT | Unsatisfactory | Code Compliance | 0 to 5 years |
| M6.2 | VENTILATION DISTRIBUTION | Satisfactory | None | 5 to 10 years |
| M6.3 | FUEL FIRED APPLIANCE VENTING | Satisfactory | Test | 5 to 10 years |
| M7.0 | CONTROLS | Satisfactory | Test | 5 to 10 years |

**Technical Status Evaluation
Yellowknife Courthouse
Yellowknife, NT**



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

SUMMARY

Rating Action Priority Remaining Service Life

E ELECTRICAL SYSTEMS / COMPONENTS

| | | | | |
|-------------|----------------------------------|-----------|--------------|----------------|
| E1.0 | ELECTRICAL GENERAL | Very Good | None | Over 15 years |
| E1.1 | SERVICE AND DISTRIBUTION | Very Good | None | Over 15 years |
| E1.2 | STAND-BY POWER GENERATION | Good | None | 10 to 15 years |
| E1.3 | BRANCH CIRCUIT POWER | Good | Suggested | Over 15 years |
| E2.1 | LIGHTING | Very Good | Varies | Varies |
| E2.2 | EMERGENCY LIGHTING | Very Good | None | Over 15 years |
| E3.1 | FIRE ALARM SYSTEM | Very Good | Code Upgrade | Over 15 years |
| E4.1 | DATA COMMUNICATIONS | Very Good | None | Over 15 years |



Appendix 'A'

Definitions



Definitions

Remaining Service Life refers to the remaining cost effective service life of the system or component being considered.

- **Over 15 years-** Under normal operating conditions and receiving proper maintenance, the system or component is expected to remain economically in service for over 15 years. The system may be in new or like-new condition.
- **10 to 15 years-** Under normal operating conditions and receiving proper maintenance, the system or component is expected to remain in service for 10 to 15 years.
- **5 to 10 years-** Under normal operating conditions and receiving proper maintenance, the system or component is expected to remain in service for 5 to 10 years.
- **0 to 5 years-** The effective economic service life of the system or component has been reached. Plans to replace or renovate the component or system should proceed.
- **Immediate-** The system or component is still in service, however, its effective economic service life has been reached and it could fail at any time.
- **Not operational-** The system or component is not in service as intended.
- **Not applicable-** A service life rating for the system or component is not applicable or appropriate.
- **Varies-** The service life rating for components or subsystems within the system being described varies.

Performance Rating refers to the degree to which the observed condition of the component or system conforms to the technical performance requirements or standards called for in codes, standards and guidelines for design and construction quality, and current operating and maintenance standards.

- **Very good-** The performance of the system or component meets and exceeds the specified quality standard.
- **Good-** The performance of the system or component conforms to the specified quality standard.
- **Satisfactory-** The performance of the system or component generally conforms to the specified standard with some shortcomings.
- **Unsatisfactory-** The performance of the system or component fails to meet the specified standard.
- **Not determined-** Sufficient information could not be gathered to assign a performance rating.
- **Varies-** The performance rating for components or subsystems within the system being described varies.

Recommended Action Priority refers to the urgency of the recommended action. The urgency reflects the importance of the recommended action to either the safety, cost-efficient operation or conservation of the system or component.

- **Mandatory-** The action noted is an obligation arising from the requirement of a code, regulation, or referenced standard and involves life safety concerns. This action should be addressed immediately.
- **High priority-** The action noted is an obligation arising from the requirement of a code, regulation, or referenced standard that is not necessarily a life safety concern. This action should be addressed at the earliest reasonable opportunity.
- **Desirable-** The action noted will substantially improve the safety, cost-effectiveness, or extend the service life of the system or component.
- **Suggested-** The action noted will have some benefit to the operation or longevity of the building. These are discretionary items.
- **Code upgrade-** The system or component does not meet current code requirements, standards or regulations. These items should be addressed as part of any significant renovations or additions to the building.
- **Code compliance-** The system or component may conform to code requirements and standards, though the use of the components by the staff violates code-related design intentions. The staff and maintainers of the building should be made aware of these items.
- **Monitor-** An observed problem with the system or component requires further monitoring before a conclusion can be drawn.
- **Varies-** The action noted for components or subsystems within the system being described varies.
- **None-** No action is recommended..

Appendix 'B'

Detailed Comments



CONDITION / STATUS

RECOMMENDATIONS

A ARCHITECTURAL SYSTEMS /

Remaining Service Life
 Action Priority
 Rating
 Photo Reference #

A1.0 BASEMENT LEVEL

Remaining Service Life
 Action Priority
 Rating
 Photo Reference #

A1.1 BASEMENT FLOOR

Most of the basement floor is painted concrete. The basement floors are one-way concrete slabs.

Some painted plywood ramps are also present.

Storage of paper products and electronic equipment was noted in several areas in basement corridors. This is a code violation.

Remaining Service Life **Over 15 years**
 Action Priority **Code Compliance**
 Rating **Good**
 Photo Reference # **1.27**

Material being stored in corridors must be relocated. Staff should be made aware that storage in these areas conflicts with the intent of the building code.

A1.2 BASEMENT EXTERIOR WALLS

The exterior walls at the basement level are all cast-in-place concrete. Insulated stud walls with drywall finish line the inside face of the concrete structure.

Remaining Service Life **Over 15 years**
 Action Priority **None**
 Rating **Good**
 Photo Reference #

A1.3 BASEMENT INTERIOR PARTITIONS

Interior basement partitions are of two types:

Drywall / stud walls are typically unfinished, except in elevator lobby. They are taped and joints have been 'mudded', and run from floor to ceiling. All are in reasonable condition relative to their use in storage areas.

Many of the interior partitions in the basement are studs with fencing material separating storage areas. The condition of these 'walls' is also reasonable.

Remaining Service Life **10 to 15 years**
 Action Priority **None**
 Rating **Satisfactory**
 Photo Reference # **1.27**

| CONDITION / STATUS | RECOMMENDATIONS |
|--------------------|-----------------|
|--------------------|-----------------|

A1.4 BASEMENT FINISHES

As outlined in interior partitions, many of the basement surfaces are unfinished. The elevator lobby (an exception) has the usual markings and abrasions associated with service and storage uses.

Exterior wall finishes are covered elsewhere.

There are no ceiling finishes, as the structure and floor above are all exposed.

Floor finishes are covered elsewhere.

| | |
|------------------------|----------------|
| Remaining Service Life | 10 to 15 years |
| Action Priority | None |
| Rating | Satisfactory |
| Photo Reference # | 1.27 |

A1.5 BASEMENT DOORS / FRAMES / HARDWARE

Doors and frames in the basement are typically 1 1/2hr rated steel assemblies. They separate mechanical, corridor, and storage uses. These doors have held up fairly well considering their use in service and storage areas.

| | |
|------------------------|---------------|
| Remaining Service Life | 5 to 10 years |
| Action Priority | None |
| Rating | Satisfactory |
| Photo Reference # | |

A2.0 COURTHOUSE (MAIN TO 3RD FLOOR)

| | |
|------------------------|--|
| Remaining Service Life | |
| Action Priority | |
| Rating | |
| Photo Reference # | |

A2.1 EXTERIOR WALLS

Main floor exterior walls are cast-in-place architectural concrete, metal stud walls, batt insulation, vapour barrier, and a painted drywall finish.

Above the main floor the construction is as follows: 76mm deep aluminum cladding (horizontal); 25mm metal furring strips; bitumen impregnated fibreboard; stud wall with batt insulation; vapour barrier; and a painted drywall finish.

None of the exterior walls showed signs of moisture or air infiltration.

Some evidence of differential movement was observed (thin cracks in the finish). Occupants advised that cracks had not changed significantly over a number of years.

| | |
|------------------------|---------------------|
| Remaining Service Life | 10 to 15 years |
| Action Priority | Varies |
| Rating | Satisfactory |
| Photo Reference # | 1.10,1.21,1.22,1.26 |

Repair cracks in walls, monitor for further differential movement. See also structural notes.

CONDITION / STATUS

RECOMMENDATIONS

A2.2 INTERIOR PARTITIONS

Many of the interior partitions in the building have been part of subsequent tenant improvements. As such they are newer and were generally in good condition. Finishes varied, but are typically painted drywall or vinyl covered drywall.

One deficiency noted was at the courtrooms, where sound transmission between the inmate access corridor and the courtrooms is unacceptably high.

Remaining Service Life 5 to 10 years
 Action Priority Desirable
 Rating Varies
 Photo Reference # 1.23

Sound transmission in walls adjoining courtrooms and inmate corridor should be reduced.

A2.3 FLOOR FINISHES

Main entry floor entry finishes are ceramic tile, generally in good condition.

Most of the public and office floors are carpeted. Wear on these carpets varies. The second floor lobby carpet was replaced during a renovation in 1992. This carpet shows wear and should be replaced.

Consideration should be given to installing a hard floor surface in this area.

Remaining Service Life 0 to 5 years
 Action Priority Desirable
 Rating Varies
 Photo Reference #

A number of areas require re-carpeting. Consider installing a hard-surface floor in second floor lobby.

A2.4 CEILING FINISHES

Courtroom ceilings are 300mm acoustical tile fixed in place. Several valances and ventilation bulkheads are present and in courtrooms, clad in plastic laminate and stainless steel.

Ceilings in office areas are typically metal channels and acoustical tile. The ceilings are generally in good condition. Many ceiling fixtures, however, are not adequately tied to structure above, resulting in bowing of the acoustical tile being visible.

Remaining Service Life 5 to 10 years
 Action Priority Suggested
 Rating Good
 Photo Reference # 1.23,1.24,1.25,1.28

Provide sufficient ties for lighting and ventilation fixtures in ceilings, replace tiles as required.

A2.5 INTERIOR DOORS / FRAMES / HARDWARE

Generally the doors, frames and hardware are in good operating condition. A few instances of loose closers, scratched finishes, and poor fit were observed.

Doors to all service, storage, and other rooms requiring a fire rating should be checked for proper operation (at least one storage room door did not appear to close properly).

Remaining Service Life 10 to 15 years
 Action Priority None
 Rating Satisfactory
 Photo Reference #

Ensure that all rated door closers and hardware operate properly, ie.- doors should close and latch on their own.

CONDITION / STATUS

RECOMMENDATIONS

A2.6 MAIN STAIR / RAMP / HANDRAILS

The main floor entry ramp to the elevators was built to approximately 1:9 slope. This ramp would require redesign to 1:12 for full code compliance in the event of a substantial renovation to the building.

The circular stair in the main floor is supported from a central column. Treads are steel pan, with concrete fill and ceramic tile surfacing. The stair appears to be in good condition, though some fire rating issues require action (see fire ratings).

Remaining Service Life 10 to 15 years
 Action Priority Code Compliance
 Rating Unsatisfactory
 Photo Reference # 1.20

A2.7 ENTRANCE DOORS / GLAZING

Main floor entry doors and glazing is a double glazed system in thermally broken aluminum frames. Doors open to a common vestibule with access to both entry lobbies (stairs and elevators). The glazed wall between the two lobbies is of the same aluminum system, though not thermally broken or double glazed.

Remaining Service Life 10 to 15 years
 Action Priority None
 Rating Good
 Photo Reference # 1.10

A2.8 ELEVATORS

There are two elevators in the Yellowknife Courthouse. Both serve the basement through sixth floor and measure 2006mm X 1250mm (interior clear dimensions), and have centre door openings approx. 1060mm wide.

NBC(95) requires that one elevator (serving all storeys) be able to accommodate a 2010mm X 610mm stretcher in the prone position. Neither of the elevators meets this requirement. Minimum dimensions required are 2032mm X 1295mm, with an access door offset to either end of the 2032mm dimension

Remaining Service Life Over 15 years
 Action Priority Code Compliance
 Rating Good
 Photo Reference #

In the event of a significant renovation, one of the elevators would have to be retrofitted to meet code requirements. The dimensional difference between what is required and what is existing is not great, so it may be possible to replace the elevator car with a car with offset access doors, and renovate elevator lobbies accordingly. Alternatively, an additional elevator meeting code requirements, serving all storeys, may be considered.

A3.0 OFFICES (UPPER FLOORS)

Remaining Service Life
 Action Priority
 Rating
 Photo Reference #

CONDITION / STATUS

RECOMMENDATIONS

A3.1 FLOOR FINISHES

Most of the public and office floors are carpeted. Wear on these carpets varies.

Remaining Service Life 0 to 5 years
 Action Priority Suggested
 Rating Satisfactory
 Photo Reference #

Selective re-carpeting should be considered.

A3.2 EXTERIOR WALLS

Exterior wall construction for floors two through six is typical, as follows: 75mm aluminum cladding (horizontal); 25mm metal furring strips; bitumen impregnated fibreboard; stud wall with batt insulation; vapour barrier; and a painted drywall finish.

None of the exterior walls showed signs of moisture or air infiltration.

Some evidence of differential movement was observed (thin cracks in the finish). Occupants advised that cracks had not changed significantly over a number of years.

Remaining Service Life 10 to 15 years
 Action Priority Varies
 Rating Unsatisfactory
 Photo Reference # 1.10-1.13,1.21

Repair cracks in finishes, monitor differential movement. See also structural notes.

A3.3 INTERIOR PARTITIONS

Interior partitions in the building have typically been part of subsequent tenant improvements. As such they are newer and were generally in good condition. Finishes varied, but are typically painted drywall or vinyl covered wallboard.

Remaining Service Life 5 to 10 years
 Action Priority None
 Rating Good
 Photo Reference #

A3.4 CEILING FINISHES

Ceilings on these floors are typically metal channels and acoustical tile. The ceilings are generally in good condition.

Most ceiling fixtures, however, are not adequately tied to structure above, resulting in bowing of the acoustical tile being visible.

Remaining Service Life 5 to 10 years
 Action Priority None
 Rating Good
 Photo Reference # 1.28

Tie fixtures to structure above, replace tiles as required.

CONDITION / STATUS

RECOMMENDATIONS

A3.5 INTERIOR DOORS / FRAMES / HARDWARE

Interior doors and frames are part of tenant improvements within the building. As a result they are not documented on original drawings.

Doors and frames within the building vary from standard wood doors in metal frames all the way to frameless glass door systems. Generally the doors, frames and hardware are in good operating condition. A few instances of loose closers, scratched finishes, and poor fit were observed.

Doors to all service, storage, and other rooms requiring a fire rating should be checked for proper operation (at least one storage room door did not appear to close properly).

Remaining Service Life **Varies**
 Action Priority **Code Compliance**
 Rating **Satisfactory**
 Photo Reference #

Ensure that all rated door closers and hardware operate properly, ie.- doors should close and latch on their own.

A4.0 MECHANICAL PENTHOUSE

The mechanical penthouse walls are drywall, taped and plastered (unfinished). Floors are painted concrete. Ceiling is exposed structure. All components are generally in good condition.

Remaining Service Life **10 to 15 years**
 Action Priority **None**
 Rating **Good**
 Photo Reference #

A5.0 OVERALL

This section covers systems not specific to main floor, courthouse, or office sections noted elsewhere.

Remaining Service Life
 Action Priority
 Rating
 Photo Reference #

A5.1 EXIT STAIRS / HANDRAILS

Most of the stairs in the building are concrete on steel pan. Slip-resistant tape was applied to all treads but has been worn off on most stairs.

The tread, riser and nosing dimensions do not meet current code requirements. In the event of a significant renovation these items could require upgrading to meet current codes and would represent substantial cost and difficulty.

Handrails are steel pipe type, approximately 50mm diameter, and appear to meet code and be in good condition.

Remaining Service Life **10 to 15 years**
 Action Priority **Code Compliance**
 Rating **Unsatisfactory**
 Photo Reference # **1.29**

The authority having jurisdiction may require stairs to be brought to code compliance. This would require replacement of the 'scissor' stairs. Alternatively, the authority may not require full compliance, and accept partial measures including the re-application of slip-resistant tape or a rubber tread covering with non-slip nosing to all treads.

CONDITION / STATUS

RECOMMENDATIONS

A5.2 EXTERIOR CLADDING AND SOFFIT

All cladding on the courthouse is aluminum, 76mm deep horizontal siding, fastened to 25mm metal furring over bitumen impregnated fibreboard. The furring allows for drainage (additional 6mm spacers at bottom edge of cladding).

Soffits above the parking area, as well as at the main/second floor perimeter are typically a shallower profile aluminum cladding (similar material and finish as wall cladding). Soffits are in good condition.

Cosmetic damage to some of the cladding is evident (dents from vehicles, pedestrians, etc.)

A few unsealed penetrations were observed on the main roof.

Remaining Service Life 10 to 15 years
Action Priority None
Rating Satisfactory
Photo Reference # 1.10-1.13,1.30-1.34

Repair of cosmetic damage should be considered discretionary, as these dents do not appear to effect the technical performance of the envelope.

Seal penetrations.

A5.3 EXTERIOR LOUVRES, GRILLES, FLASHING

Louvres and grilles on the exterior appear to be in satisfactory condition, though the paint finish on many of them show signs of wear and deterioration.

Remaining Service Life 10 to 15 years
Action Priority Desirable
Rating Satisfactory
Photo Reference # 1.12, 1.32,1.33

Grilles should be repainted to match aluminum cladding.

A5.4 EXTERIOR WINDOWS

Exterior windows are typically aluminum units, with the exception of the main floor library windows.

Main floor windows:

The main floor windows are irregularly-shaped double-glazed, sealed units mounted on the inside face of exterior concrete wall openings (also irregular). It is unknown whether any of these units have been replaced. They appear to be operating well, as no signs of moisture or air infiltration were apparent.

Aluminum windows:

These windows (approx. 1000 - 600x900mm double-glazed units) appear to be in relatively good condition. The glazing gasket in many of the windows has crept significantly. Some of these units may require reglazing.

Remaining Service Life 10 to 15 years
Action Priority None
Rating Satisfactory
Photo Reference # 1.10,1.21

CONDITION / STATUS

RECOMMENDATIONS

A5.5 ROOF ASSEMBLIES

There are three separate roofs on this building: above the courtrooms; above the penthouse; and the main roof over the rest of the building.

Construction drawings indicate that 65mm of rigid insulation was installed directly over steel deck. Roll roofing was applied over the rigid insulation.

The lower and main roofs have both been upgraded to modern MBM roofing in the last 7 years, while the penthouse roof is believed to be original.

No evidence of leaks was found, and roofs appeared to all be performing adequately. Roofs of the type currently on the main and lower roofs can perform well for 15 to 20 years.

Remaining Service Life

Varies

Action Priority

Monitor

Rating

Varies

Photo Reference #

1.40,1.41

Periodic monitoring of the roofs should be done. The penthouse roof is likely to require upgrading in the next five years or less.

A few drain caps were not fastened or present during the inspection. This should be remedied.

A5.6 THERMAL INSULATION

Thermal Insulation by assembly:

- Basement floor: none
- Basement walls: 89mm batt insulation
(interior) with 52mm rigid
insulation to 1200mm from grade (exterior)
- First Floor walls: 89mm batt insulation (interior)
- 2nd-6th Floor walls: 125mm batt insulation (in studs)
- Penthouse walls: 89mm batt insulation (in studs)
- All roofs: 65mm rigid insulation

Remaining Service Life

Over 15 years

Action Priority

None

Rating

Satisfactory

Photo Reference #

CONDITION / STATUS

RECOMMENDATIONS

A5.7 ENVELOPE INTEGRITY

Vapour barriers in the building are typically the polyethylene type, installed on the inside face of the insulated stud walls. Having been installed on the warm side of the insulation, and protected from penetrations by drywall finishes, they appear to be performing well.

No moisture problems were encountered on our site visits or expressed by maintenance staff.

Note that the actual condition of the vapour barriers was not verifiable without destructive investigation, so the observations made in this section are based on visual inspection of finishes and discussion with maintenance staff.

A major source of air movement through envelopes is often at the junction of materials, ie: windows and vapour barriers, wall and roof assemblies, etc. No unusual air infiltration was observed.

| | |
|-------------------------------|---------------------|
| Remaining Service Life | Undetermined |
| Action Priority | None |
| Rating | Satisfactory |
| Photo Reference # | |

A5.8 FIRE RESISTANCE RATINGS

Original drawings for the building appear to show all required ratings for the building as drawn. These drawings do not include tenant improvements, though, so some conflicts may have arisen due to changes since construction. Note that all service and storage rooms require fire rating, including rated doors, frames, and hardware.

The main floor circular stair presents a path of travel for fire. The main floor enclosure (between the stair lobby and adjacent spaces) does not appear to be constructed as a rated assembly. This area would require remedial design work in the event of a substantial renovation.

Fire resistance ratings in building (from original building drawings):

| | |
|-------------------------------------|------------|
| Elevator, stair and service shafts: | 2hr rating |
| Mechanical and electrical rooms: | 2hr rating |

| | |
|-------------------------------|------------------------|
| Remaining Service Life | Not Applicable |
| Action Priority | Code Compliance |
| Rating | Satisfactory |
| Photo Reference # | 1.20 |

Ensure that all service and storage room doors operate properly. (see also doors, frames and hardware)

The circular stair enclosure on the (main floor) may require fire rating from adjacent spaces.

CONDITION / STATUS

RECOMMENDATIONS

A5.9 PARKING

Sixteen parking spaces have been provided on site, located beneath the courthouse soffit. Two of these spaces, however, are generally required for inmate transfer to the adjacent holding cells.

No physical security measures are in place to protect vehicles or their passengers.

A stairwell enclosure currently conflicts with the parking area in one location, and shows signs of having been struck by vehicular traffic.

The paving in some locations is heaving as a result of differential settlement, ie: paving is damaged where grade beams below are not allowing settlement to the same degree as other areas.

Remaining Service Life 0 to 5 years
Action Priority Desirable
Rating Unsatisfactory
Photo Reference #

The paving below the building should be replaced, with care given to maximize compaction of substrate material.
 Bollards should be installed to protect the stair enclosure.

A6.0 DOCUMENTATION

Project Record Documents for this building are available from the DPWS Library. These drawings include a complete set of original construction drawings, as well as drawings from numerous subsequent renovations.

Operations and Maintenance material is available from the offices of Polar Panda Development, Ltd.

Remaining Service Life Not Applicable
Action Priority None
Rating Satisfactory
Photo Reference #

Ensure all future work is well recorded and filed with DPWS / Polar Panda Development Ltd.

S STRUCTURAL SYSTEMS / COMPONENTS

Remaining Service Life
Action Priority
Rating
Photo Reference #

CONDITION / STATUS

RECOMMENDATIONS

S1.0 STRUCTURAL GENERAL

The building is supported on cast in place concrete pile caps of various arrangements. The pile caps are connected in the core area with cast in place concrete tie beams.

The plans indicate the piles to be 12" diameter.

The notes on the plans indicate the piles to be designed for a load of 100 kips (450 kN). They are not clear whether they are founded on bedrock or develop their resistance through friction.

A cast in place concrete wall is located around the perimeter of the building to retain backfill. This wall and basement columns are supported on one-way concrete slabs and band beams.

An oil storage tank area is located in the southwest corner of the building footprint (beneath the parking). This area has been framed using concrete grade beams.

A central core area within the building has been used to accommodate a lateral bracing system. The lateral bracing system consists of steel angles arranged in a simple 'X' pattern typically. One bay at the base of the building uses an inverted 'Vee' type bracing arrangement to accommodate architectural requirements.

Each level or platform above the basement is framed using metal 'pan' (concrete filled) which is in turn supported with open web steel joists, steel channels and steel beams. Steel girder beams in turn frame into steel column lines.

Floor areas above the main floor are cantilevered around the perimeter of the building using extensions to the top chord of the open web steel joists along grid line 1 and grid line 4.

Stub beams are framed onto the perimeter steel columns along grid line B and grid line E. A single open web steel joist is then framed between the stub beams to support the extended area of the floor.

Remaining Service Life

Over 15 years

Action Priority

None

Rating

Very Good

Photo Reference #

| CONDITION / STATUS | RECOMMENDATIONS |
|--------------------|-----------------|
|--------------------|-----------------|

S2.0 BASEMENT

The basement area structural system employs a series of cast in place concrete band beams, which support a 150mm one way structural slab.

Remaining Service Life **Over 15 years**
 Action Priority **None**
 Rating **Very Good**
 Photo Reference #

S3.0 MAIN FLOOR

The main floor is supported on a combination of one way cast in place structural slabs and concrete filled metal 'pan'.

Remaining Service Life **Over 15 years**
 Action Priority **Code Upgrade**
 Rating **Not Determined**
 Photo Reference #

In turn, these areas are supported with a combination of open web steel joists, wide flange steel beams and steel channels. Openings for building services are indicated on the plans.

The Library is located on this floor area. Current code requirements list a minimum live load of 150 psf to be applied to this use and occupancy.

The perimeter of the building at this level is supported on a series of cast in place concrete beams and the cast in place concrete foundation wall.

We would recommend the floor systems in this part of the building be evaluated further to determine the adequacy of the floor system for current live load requirements.

A section of the main floor is sloped to accommodate handicapped access. The slope of the ramp is 1:9. Current code requirements dictate a maximum slope of 1:12.

Within the core area of this level, the floor system is supported on a combination of reinforced concrete walls, wide flange beams and steel channels.

Openings for the stairwell and mechanical services are indicated on the plans.

The design live load for this level is 125 psf (pounds per square foot) while the dead load is 60 psf

CONDITION / STATUS

RECOMMENDATIONS

S4.0 2nd FLOOR

The second floor is supported on a combination of one way concrete structural slabs and concrete filled metal 'pan'.

In turn, these areas are supported with a combination of open web steel joists, wide flange steel beams and steel channels. Openings for access and circulation are indicated on the plans.

The perimeter of the building at this level is supported wide flange steel beams, which are in turn supported on steel columns.

Openings for the stairwell and mechanical services are indicated on the plans.

Extensions to the top chord of the open web steel joists are provided along grid lines 1 and 4. Stub beams are connected to the columns along grid lines A and E, from which a supplemental open web steel joist is supported.

The typical design live load for this level is 70 psf (pounds per square foot) while the dead load is 50 psf. There are exceptions to the typical floor loading indicated on the plan.

Remaining Service Life

Over 15 years

Action Priority

Desirable

Rating

Good

Photo Reference #

Some cracking of the drywall surfaces on the perimeter walls was noted in previous site visits.

The locations of these drywall cracks should be indicated on the plans or on photos. We suspect a construction detail may be the cause of this distress.

From this information, the cause of the distress to the drywall may be better determined and appropriate action is taken.

CONDITION / STATUS

RECOMMENDATIONS

S5.0 3rd FLOOR/ COURTHOUSE ROOF

The third floor/ courthouse roof is supported on a combination of one-way concrete slabs over metal 'pan'.

In turn, these areas are supported with a combination of open web steel joists, wide flange steel beams and steel channels. Openings for access, circulation and mechanical services are indicated on the plans.

The wide flange beams along grid lines C and grid line D, between grid 2 and grid 3 are fitted with steel shear studs and are an integral part of the lateral load resisting scheme.

The perimeter of the building at this level is supported wide flange steel beams, which are in turn supported on steel columns.

Extensions to the top chord of the open web steel joists are provided along grid lines 1 and 4. Stub beams are connected to the columns along grid lines A and E, from which a supplemental open web steel joist is supported.

The typical design live load for this level is 70 psf (pounds per square foot) while the dead load is 50 psf within the building space. There are exceptions to the typical floor loading indicated on the plan.

An accumulation of drifting snow on the courthouse roof has also been accounted for and shown on the plans.

We observed point loading due to the proximity of numerous filing cabinets to each other.

Remaining Service Life

Over 15 years

Action Priority

Varies

Rating

Good

Photo Reference #

Some cracking of the drywall surfaces on the perimeter walls was noted in previous site visits.

The locations of these drywall cracks should be indicated on the plans or on photos. We suspect a construction detail may be the cause of this distress.

File cabinets and other heavy objects should be arranged to minimize point loading.

CONDITION / STATUS

RECOMMENDATIONS

S6.0 4th TO 6th FLOOR

The fourth to sixth floors are supported on a combination of one-way concrete slabs over metal 'pan'.

In turn, these areas are supported with a combination of open web steel joists, wide flange steel beams and steel channels. Openings for access, circulation and mechanical services are indicated on the plans.

The wide flange beams along grid lines C and grid line D, between grid 2 and grid 3 are fitted with steel shear studs and are an integral part of the lateral load resisting scheme.

The perimeter of the building at this level is supported wide flange steel beams, which are in turn supported on steel columns.

Extensions to the top chord of the open web steel joists are provided along grid lines 1 and 4. Stub beams are connected to the columns along grid lines A and E, from which a supplemental open web steel joist is supported.

The typical design live load for this level is 70 psf (pounds per square foot) while the dead load is 50 psf within the building space. There are exceptions to the typical floor loading indicated on the plan.

We observed point loading due to the proximity of numerous filing cabinets to each other.

Remaining Service Life

Over 15 years

Action Priority

Varies

Rating

Good

Photo Reference #

Some cracking of the drywall sufeaces on the perimeter walls was noted in previous site visits.

The locations of these drywall cracks should be indicated on the plans.

File cabinets and other heavy objects should be arranged to minimize point loading.

CONDITION / STATUS

RECOMMENDATIONS

S7.0 PENTHOUSE FLOOR/ UPPER ROOF

The penthouse floor and upper roof level are supported on concrete filled metal decking. There is a 250mm deep concrete slab within the limits of the penthouse. A concrete curb has also been shown on the plans, which outlines this area.

In turn, these areas are supported with a combination of open web steel joists, wide flange steel beams and steel channels. Openings for access, circulation and mechanical services are indicated on the plans.

The wide flange beams along grid lines C and grid line D, between grid 2 and grid 3 are fitted with steel shear studs

The perimeter of the building at this level is supported wide flange steel beams, which are in turn supported on steel columns.

Extensions to the top chord of the open web steel joists are provided along grid lines 1 and 4. Stub beams are connected to the columns along grid lines A and E, from which a supplemental open web steel joist is supported.

The live load for the penthouse is not indicated on the plans. The dead load varies, depending on location. We estimate the 10" thick penthouse area has a dead load of 140 psf.

Remaining Service Life

Over 15 years

Action Priority

None

Rating

Very Good

Photo Reference #

CONDITION / STATUS

RECOMMENDATIONS

S8.0 ELEVATOR/ MECH. MACHINE ROOM

The elevator/ mechanical machine levels are supported on one way reinforced concrete slabs.

In turn, these areas are supported with a combination of wide flange steel beams and steel channels.

Access to this level is provided by a stairwell leading from the penthouse floor level.

All beams at this level are equipped with steel shear studs, which act as collectors for lateral loads.

The design load for this level is not indicated on the plans.

We did not observe any structural problems within this area.

Remaining Service Life

Over 15 years

Action Priority

None

Rating

Very Good

Photo Reference #

S9.0 PENTHOUSE ROOF

The penthouse roofs supported on concrete filled metal pan.

In turn, these areas are supported with a combination of open web steel joists and wide flange steel beams.

The typical design live load for this level is 45 psf (pounds per square foot) while the dead load is 35 psf .

A series of point loads is also shown on the drawings, which support mechanical equipment.

Remaining Service Life

Over 15 years

Action Priority

None

Rating

Very Good

Photo Reference #

M MECHANICAL SYSTEMS / COMPONENTS

Remaining Service Life

Action Priority

Rating

Photo Reference #

CONDITION / STATUS

RECOMMENDATIONS

M1.0 DOMESTIC WATER SYSTEMS - GENERAL

The existing domestic water system is approximately 21 years of age. Piping, valves, and fittings are beginning to show signs of wear. Minor upgrades will be required to the system to maintain useability.

Remaining Service Life 5 to 10 years
 Action Priority Varies
 Rating Satisfactory
 Photo Reference #

Deficiencies noted include maintenance and some code related items.

M1.1 PLUMBING FIXTURES

Generally, the washroom fixtures are a mixture of enameled steel and porcelain. The existing CRANE water closets are elongated bowl styles complete with flush tanks or valves. They are in good condition. All of the domestic water supplies and trim appear to be in good condition.

Remaining Service Life 5 to 10 years
 Action Priority Varies
 Rating Good
 Photo Reference # 2.10, 2.11, 2.12, 2.13

Replace fixtures as damage occurs.

The flush valve, wall mounted urinals are also manufactured by CRANE. They are generally in good condition.

Refrigerated drinking fountains throughout building are recommended.

The CRANE lavatories are a combination of enameled steel and porcelain. Some fixtures are chipped. Generally the p-traps and the screwdriver domestic water supplies are in good condition. The faucets must be upgraded to provide tempered at all barrier free accessible lavatories.

Provide new fixtures to suit building programme requirements.

The drinking fountains are sink mounted bubblers located within each washroom area. They appeared to be in good condition. The use of refrigerated drinking fountains is recommended.

The lavatory faucets should be upgraded to provide tempered water at all barrier free accessible lavatories as per the requirements of the NBC (1995).

CONDITION / STATUS

RECOMMENDATIONS

M1.2 DOMESTIC WATER SUPPLY PIPING

The existing water service to the Yellowknife Courthouse is provided through a 200mm diameter main from an existing 150mm diameter city main located underneath the rear alleyway. Once the main enters into the building, it tees off into a 75mm diameter domestic water main and a 150mm diameter fire protection main.

The condition of the existing buried water service is unknown at this time. Maintenance personnel, however, have not reported any difficulties with the existing system. The service is complete with a 25mm diameter recirculation main and bronze body, GRUNDFOS UP 15-18BF recirculation pump. The pump is approximately 5 years old. The pump motor was observed to be overheating. Therefore, the pump is beginning to fail and should be replaced.

Domestic water is distributed throughout the building by DCW and DHW mains. These mains are routed through the main building vertical service shaft. The branch distribution piping is located within the ceiling space of each floor area. The condition of the piping was not verified. The existing piping is copper c/w sweat fittings. Only DCW piping is insulated. Sampling of the pipe in order to determine its remaining life is recommended.

Remaining Service Life

Varies

Action Priority

Varies

Rating

Satisfactory

Photo Reference #

2.44, 2.45

Replace DW recirc. pump.

Review the remaining life of the piping.

The insulation of the DHW and the DHWR piping is recommended in order to reduce DHW system standby losses.

| CONDITION / STATUS | RECOMMENDATIONS |
|--------------------|-----------------|
|--------------------|-----------------|

M1.3 DOMESTIC WATER SUPPLY EQUIPMENT

Domestic hot water is provided through single walled tankless heaters located within the boilers. The water is then passed through a GSW Model 5ET1758C, 175L electric domestic water heater/ storage tank. The DHW and the tankless heaters are new and are suitable for continued use.

The domestic hot water recirculation (DHWR) pump operates continuously and circulates the DHW through the building and back to the DHW heat exchanger/ DHW tank. The DHWR pump is a new GRUNDFOS UP-15-18SF pump and appears to be in good condition.

Due to the height of the building, a DW pressure booster pump has been provided. The base mounted pump is a EBARA Model 65x50FS2G. The guard on the pump shaft has been removed and should be reinstalled. Also, the pump is exhibiting signs of corrosion. Therefore, the pump should be replaced.

| | |
|------------------------|--------------|
| Remaining Service Life | 0 to 5 years |
| Action Priority | Suggested |
| Rating | Satisfactory |
| Photo Reference # | 2.34, 2.32 |

Replace DW booster pump.

M1.4 SANITARY WASTE SYSTEM

Sanitary service of the existing Yellowknife Courthouse is routed through a 150mm diameter main to an existing 200mm diameter city main located underneath of the rear alleyway.

The condition of the existing buried sanitary service is unknown at this time. Maintenance personnel, however, have not reported any difficulties with the existing system.

| | |
|------------------------|---------------|
| Remaining Service Life | 5 to 10 years |
| Action Priority | None |
| Rating | Satisfactory |
| Photo Reference # | |

M2.0 FIRE PROTECTION SYSTEMS - GENERAL

Mechanical fire protection within the Yellowknife Courthouse is good. The building is provided with handheld ANSUL and GRINNELL Type "ABC" fire extinguishers, fire hose cabinets, FLAG pump tank fire extinguishers and an automatic sprinkler system. The cabinets are complete with a 38mm diameter fire fighter's valve.

| | |
|------------------------|--------------------------|
| Remaining Service Life | 5 to 10 years |
| Action Priority | Code Compliance |
| Rating | Satisfactory |
| Photo Reference # | 2.20, , 2.21, 2.23, 2.24 |

Existing standard response sprinkler heads should be replaced with quick response heads.

| CONDITION / STATUS | RECOMMENDATIONS |
|--------------------|-----------------|
|--------------------|-----------------|

M2.1 FIRE WATER EQUIPMENT

The existing fire pump is an Aurora No. 77-66566 end suction pump capable of producing 1893L/min. The pump casing was noted to be leaking.

| | |
|------------------------|--------------|
| Remaining Service Life | 0 to 5 years |
| Action Priority | Desirable |
| Rating | Satisfactory |
| Photo Reference # | 2.46 |

Repair leaking fire pump casing.

M2.3 FIRE HOSE CABINETS

Class 2 FHC with 38mm diameter valve are provided in the occupied spaces.

| | |
|------------------------|---------------|
| Remaining Service Life | 5 to 10 years |
| Action Priority | None |
| Rating | Satisfactory |
| Photo Reference # | 2.25, 2.22 |

M2.4 FIRE EXTINGUISHERS

The building is provided with handheld ANSUL and GRINNELL Type "ABC" fire extinguishers, fire hose cabinets, FLAG pump tank fire extinguishers.

The coverage of the existing handheld extinguishers is good with numerous Type "C" fire extinguishers located throughout the building. As per the Public Works and Services Design Standards & Guidelines for New Public Buildings, Type "ABC" fire extinguishers are required. If GNWT Design Guidelines are to be followed, the existing Type "C" fire extinguishers should be replaced.

| | |
|------------------------|---------------|
| Remaining Service Life | 5 to 10 years |
| Action Priority | Suggested |
| Rating | Satisfactory |
| Photo Reference # | |

Consider replacing type C fire extinguishers with dry chemical ABC type.

M2.5 FIRE PROTECTION PIPING

The existing sprinkler system is a wet pipe system complete with standard response sprinkler heads. As per the requirements of Technical Bulletin FM-004-88, issued by the Office of the N.W.T. Fire Marshal, all sprinkler heads within a fire protection system are required to be "quick response". Therefore, the existing sprinkler heads should be replaced.

| | |
|------------------------|-----------------|
| Remaining Service Life | 5 to 10 years |
| Action Priority | Code Compliance |
| Rating | Satisfactory |
| Photo Reference # | 1.28, 2.43 |

Existing standard response sprinkler heads should be replaced with quick response heads.

CONDITION / STATUS

RECOMMENDATIONS

M3.0 FUEL SYSTEMS - GENERAL

Fuel for heating and in-direct DHW production is supplied by a buried 13630L ULC Listed, fuel oil tank. Fuel oil to the two boilers and the generator is gravity fed.

Remaining Service Life 0 to 5 years
 Action Priority Code Upgrade
 Rating Satisfactory
 Photo Reference #

The system requires upgrading to meet current codes.

M3.1 FUEL OIL TANKS

Fuel for heating and in-direct DHW production is supplied by a buried 13630L ULC Listed, fuel oil tank. The existing buried fuel oil tank was installed in 1976. The tank does not have secondary containment nor does it have cathodic protection. As per the requirements of the Environmental Code of Practice for Underground Storage Tank Systems Containing Petroleum Products (1989) and the Office of the N.W.T. Fire Marshal, any tank that does not have cathodic protection and is over 25 years in age must be replaced. Therefore, the existing tank will be required to be removed within the next three years.

Remaining Service Life 0 to 5 years
 Action Priority Code Upgrade
 Rating Unsatisfactory
 Photo Reference # 2.33, 2.52

Remove existing buried fuel tank. Replace with new above ground tank.

Replace existing 1136L Non-ULC listed day tank.

From the exterior fuel oil storage tank, fuel oil is transferred by a gear pump to an interior, non-ULC listed, 1136L-day tank located within the basement Mechanical Room. As per the requirements of Section 6.1.1.1. of CAN/CSA-B139-M91 Installation Code for Oil Burning Equipment, all fuel oil storage tanks must be ULC listed. Therefore, the interior day tank must be replaced.

M3.2 FUEL OIL PIPING AND TRIM

From the exterior fuel oil storage tank, fuel oil is transferred by a BENNETT & EMMOTT Model F180 gear pump to an interior, non-ULC listed, 1136L-day tank located within the basement Mechanical Room. The transfer pumps are original and have exceeded their median service life by one year.

Remaining Service Life 0 to 5 years
 Action Priority Suggested
 Rating Satisfactory
 Photo Reference # 2.51

Replace fuel oil transfer pumps as required.



CONDITION / STATUS

RECOMMENDATIONS

M4.0 HEATING - GENERAL

Heat is produced within the Yellowknife Courthouse by two ULC listed, BURNHAM V-1110 cast iron boilers. The heating system is arranged in a primary-secondary configuration.

Remaining Service Life

10 to 15 years

Action Priority

Suggested

Rating

Satisfactory

Photo Reference #

2.30

CONDITION / STATUS

RECOMMENDATIONS

M4.1 HEATING EQUIPMENT

Heat is produced within the Yellowknife Courthouse by two ULC listed, BURNHAM V-1110 cast iron boilers. Both boilers are provided with BECKETT MODEL MODEL CF2300A burners. The heating system is arranged in a primary-secondary configuration. The median life expectancy of a cast iron sectional boiler is 15 years. As the boilers were installed in approximately 1996, one could expect the boilers to reach their median life in the year 2011. However, as the water treatment appears to be good, one could expect a longer than normal boiler lifespan. The existing boiler chimneys, however, were noted to have some corrosion and pitting. Therefore, the chimneys and breaching should be evaluated in order to ascertain their remaining life. The existing heating system expansion tank is an "open type" of expansion tank. Typically, an "open" tank is the major source of air infiltration within a heating system. Therefore, this tank should be replaced with a diaphragm tank as per current industry practices. Perimeter radiation elements, where present, are in good condition. The existing cabinet unit heaters and unit heaters are approaching the end of their useful lives. As per ASHRAE, the median life expectancy is 20 years. Therefore, all terminal units should be replaced during a major renovation. Heating water is circulated from the primary HW circuit to each secondary HW circuit by two base mounted pumps. These base mounted, EBARA Model 40LPD6.75 pumps operate in parallel on a lead/ lag basis to serve this HW circuit. At the time of inspection, the pump casing seal was noted to have been leaking. These pumps should be replaced. Heating water is circulated to the building unit heaters and the building perimeter radiation elements by an individual, secondary heating water circuit. Two ARMSTRONG Model 4380 -2x2x8 in-line centrifugal pump operate in parallel on a lead/ lag basis to serve this HW circuit. The pumps are in good shape and are suitable for continued use. Heating water is circulated to the building AHU heating coils by an individual, secondary heating water circuit. Two EBARA Model 40LPD6.75 in-line centrifugal

see bottom half of recommendations for continuation.

Remaining Service Life 10 to 15 years
Action Priority Suggested
Rating Good
Photo Reference # 2.47, 2.40, 2.30., 2.31, 2.41, 2.42, 2.48, 2.53, 2.54, 2.61, 2.62
 Review/ replace boiler chimney.
 Replace HW expansion tank.
 Replace CUH/ UH.
 Replace Primary HW pumps.
 Replace AHU Secondary HW circ. pumps.
 Replace AHU heating coil circ. pumps.
 Review HW piping for remaining life.
 Insulate HW piping to eliminate standby losses.
 Identify HW piping.

pumps operate in parallel on a lead/ lag basis to serve this HW circuit. These pumps are extremely noisy and exhibit signs of fluid leakage. Therefore they should be replaced. Heating water is circulated at each building air handling unit heating coil by a tertiary heating water circuit. An ARMSTRONG Model S34AB in-line centrifugal pump continuously circulates HW through the AHU heating coil. At the time of inspection, the pump casing seal was noted to have been leaking in the past. These pumps should be replaced. Distribution piping throughout the building is primarily steel. It appears to be in good condition, however, some recent leakage was observed at fittings, air vents, and valve stems. Laboratory testing of the piping in order to assess its remaining life is recommended. Insulation was noted to be damaged or missing within occupied areas and mechanical spaces. This represents a hazard to the building occupants and maintenance personnel and results in a decreased thermal efficiency of the heating system. The insulation should be replaced in these areas. Most of the piping is not identified. Identification is recommended to increase maintenance efficiency.

CONDITION / STATUS

RECOMMENDATIONS

M5.0 CHILLED WATER EQUIPMENT

Cooling is provided within the Yellowknife Courthouse by a CARRIER Model 30HS160B4 Chiller/ Compressor and two remote CARRIER Model 09DE084400 air cooled condensers.

The median life expectancy of a chiller and a remote condensing unit is 20 years. Therefore, these items have exceeded their median life expectancy and should be reviewed further in order to determine their remaining life and suitability for continued use (i.e. the Montreal Protocol).

The existing chilled system expansion tank is an "open type" of expansion tank. Typically, an "open" tank is the major source of air infiltration within a chilled water system. Therefore, this tank should be replaced with a diaphragm tank as per current industry practices.

Chilled water is circulated from the primary CHW circuit to each secondary CHW coil by two base mounted pumps. These base mounted, EBARA Model 4042 pumps operate in parallel on a lead/ lag basis to serve this CHW circuit. At the time of inspection, the pump casing seal was noted to have been leaking and there was excessive corrosion on the pump body. As outlined within the ASHRAE T.C. 1.8. Equipment Service Life Table, the median service life of a base mounted pump is 20 years. As this pump appears to have been from the original construction, the pump has exceeded its median life as indicated by ASHRAE. Therefore, these pumps should be replaced.

Distribution piping throughout the building is primarily steel. It appears to be in poor condition and some recent leakage and corrosion was observed at fittings, air vents, and valve stems. Laboratory testing of the piping in order to assess its remaining life is recommended.

Insulation was noted to be damaged or missing within occupied areas and mechanical spaces. This results in a decreased thermal efficiency of the cooling system. The insulation should be replaced in these areas.

Most of the piping is not identified. Identification is recommended to increase maintenance efficiency.

efficiency.

Remaining Service Life 5 to 10 years

Action Priority Suggested

Rating Satisfactory

Photo Reference # 2.38, 2.39., 2.35, 2.50.,2.65

- Review/ replace chiller/ RCUs.
- Replace HW expansion tank.
- Replace Primary CHW pumps.
- Review CHW piping for remaining life.
- Identify HW piping.
- Repair damaged insulation.



CONDITION / STATUS

RECOMMENDATIONS

M6.0 VENTILATION - GENERAL

Mechanical ventilation is provided to the Yellowknife Courthouse by four ventilation systems located within the two fan rooms. One is located within the basement and the other is located within the penthouse.

| | |
|--|-----------------|
| Remaining Service Life | 5 to 10 years |
| Action Priority | Code Compliance |
| Rating | Unsatisfactory |
| Photo Reference # | |
| Upgrade O/A to meet the requirements of the NBC (1995) and ASHRAE 62-89. | |

CONDITION / STATUS

RECOMMENDATIONS

M6.1. VENTILATION EQUIPMENT

Mechanical ventilation is provided to the Yellowknife Courthouse by four ventilation systems located within the two fan rooms. One is located within the basement and the other is located within the penthouse.

Air Handling Units #1 and #2 are built-up air handling units. They are comprised of a variable volume centrifugal supply air fans, variable volume vaneaxial relief air fans, a filter section, heating coils, and chilled water cooling coils. The total specified supply and return air capacity for each of these units is as follows:

Generally, the air handling units appear to be good operating condition. The heating coils do not show any signs of leaks. The filters consist of are a mixture of replaceable bag types (AS-1) and a disposable, low arrestance media (AS-2).

Janitor rooms and Washrooms are provided with an central exhaust air system located within the penthouse area. The fan appears to be in good condition.

Supply air is distributed throughout the building by medium velocity, variable volume ductwork and boxes. Space air diffusion is by a combination of ceiling diffusers and wall mounted linear grilles (court rooms). Return air is routed through a plenum and collected at a central point.

A review of the existing ventilation rates confirms that the ventilation supply air volumes are adequate on the main and second floors. However, the ventilation rates on the third through the sixth floors are slightly less than is the current practice. This may lead to occupant discomfort.

A review of the existing heating coil sizes indicate that the existing ventilation system may be incapable of providing outdoor air as outlined by ASHRAE 62-1989 "Ventilation for Acceptable Indoor Air Quality". Therefore, as per the requirements of the National Building Code of Canada (1995) the outdoor air volumes must be increased.

| | |
|-------------------------------|---|
| Remaining Service Life | 0 to 5 years |
| Action Priority | Code Compliance |
| Rating | Unsatisfactory |
| Photo Reference # | 2.37,1.32,1.33,1.28,2.60 2.63,2.64,2.66,2.67 |

Upgrade O/A to meet the requirements of the NBC (1995) and ASHRAE 62-89.

CONDITION / STATUS

RECOMMENDATIONS

M6.2. VENTILATION DISTRIBUTION

Supply air is distributed throughout the building by medium velocity, variable volume ductwork and boxes. Space air diffusion is by a combination of ceiling diffusers and wall mounted linear grilles (court rooms). Return air is routed through a plenum and collected at a central point.

Remaining Service Life 5 to 10 years
 Action Priority None
 Rating Satisfactory
 Photo Reference #

M6.3 FUEL FIRED APPLIANCE VENTING

The existing boiler chimneys, however, were noted to have some corrosion and pitting. Therefore, the chimneys and breaching should be cleaned and evaluated in order to ascertain their remaining life.

Remaining Service Life 5 to 10 years
 Action Priority Test
 Rating Satisfactory
 Photo Reference # 1.31

Review boiler chimney for remaining life.
 Replace as required.

M7.0 CONTROLS

The existing control system within the Yellowknife Courthouse is primarily a JOHNSON CONTROLS pneumatic system. The system is in good shape. Many of the components are new.

Remaining Service Life 5 to 10 years
 Action Priority Test
 Rating Satisfactory
 Photo Reference # 2.36

It is recommended that a complete control review by a JOHNSON CONTROLS representative should be performed in order to bring the control system back to the original design intent. This would also permit any damaged or failed controls or components to be replaced and/or updated.

E ELECTRICAL SYSTEMS / COMPONENTS

Remaining Service Life
 Action Priority
 Rating
 Photo Reference #

| CONDITION / STATUS | RECOMMENDATIONS |
|--------------------|-----------------|
|--------------------|-----------------|

E1.0 ELECTRICAL GENERAL

In general the building is in very good condition and well maintained. There are a few code items relating to the fire alarm system which will have to be upgraded to bring the building up to present standards (see fire alarm section).

| | |
|------------------------|---------------|
| Remaining Service Life | Over 15 years |
| Action Priority | None |
| Rating | Very Good |
| Photo Reference # | |

E1.1 SERVICE AND DISTRIBUTION

The main service into the building feeds into a main breaker from there into a CDP panel and a EDP which in turn feeds sub panels located throughout the building. The EDP panel is also fed from the stand-by generator which feeds the EDP section of the main switchgear. Lighting loads, heating loads and some receptacles are picked up by the stand-by generator.

Motor loads are fed from two MCC's one located in the mechanical room and another located in the penthouse.

The main breaker for the building is 120/208 (1600 Amps).

All of the main switchgear is Square D. All of the sub panels are also Square D

The main switchgear is in good condition.

| | |
|------------------------|----------------|
| Remaining Service Life | Over 15 years |
| Action Priority | None |
| Rating | Very Good |
| Photo Reference # | 3.10,3.12,3.13 |

E1.2 STAND-BY POWER GENERATION

The existing genset is a Katolight 110 watt unit with 562 hours on it. It appears to be well maintained and in good condition with very few hours on it. The generator is connected to a Robonics Type RO transfer switch rated at 400 Amps. It is fed from the main fuel-oil tank.

The generator picks up various lighting loads, heating loads and a few receptacles in the building.

| | |
|------------------------|----------------|
| Remaining Service Life | 10 to 15 years |
| Action Priority | None |
| Rating | Good |
| Photo Reference # | 3.11 |



| CONDITION / STATUS | RECOMMENDATIONS |
|--------------------|-----------------|
|--------------------|-----------------|

E1.3 BRANCH CIRCUIT POWER

Branch circuit wiring is good throughout the building. There are a few locations where a high concentration of computers and printers could benefit from additional receptacles.

Remaining Service Life Over 15 years
 Action Priority Suggested
 Rating Good
 Photo Reference #

Add more receptacles in selected locations.

E2.1 LIGHTING

Lighting in the building is done mainly with recessed fluorescent fixtures in the building. The fluorescent fixtures have T12 lamps and magnetic ballasts. Most are used as diffusers for mechanical air handling units.

Remaining Service Life Varies
 Action Priority Varies
 Rating Very Good
 Photo Reference # 1.23-1.25

The fluorescent lighting throughout the building is in good condition and no action is required.

Light levels in the court rooms should be reviewed and changed to give adequate light levels.

Ballasts and wiring were spot checked throughout the building. None of the ballasts checked had PCB's in them. All wiring to the light fixtures checked was done with BX with a grounding wire connected to the light fixture.

In the court rooms lighting is done with pot lights that have been retrofitted with PL lamps. The light levels in the court rooms is on the low side.

E2.2 EMERGENCY LIGHTING

Emergency lighting is done with battery packs with attached heads and remote heads located at various locations throughout the building. The battery packs are in good condition. Maintenance personnel stated that they check all the battery packs twice a year and replace those which do not meet code requirements.

Remaining Service Life Over 15 years
 Action Priority None
 Rating Very Good
 Photo Reference #

E3.1 FIRE ALARM SYSTEM

The fire alarm system in the building is a Simplex 4002 located in the electrical room. There is a remote annunciator panel located by the main door.

Remaining Service Life Over 15 years
 Action Priority Code Upgrade
 Rating Very Good
 Photo Reference # 3.21

The fire alarm system is monitored by Arctic alarms.

Add heat and smoke detectors to bring system up to present day codes.

It appears as though the fire alarm system complied with all the codes at the time of installation. Over the years some spaces have changed uses. Some heat and smoke detectors would have to be added to the system to bring it up to present day codes.



CONDITION / STATUS

RECOMMENDATIONS

E4.1 DATA COMMUNICATIONS

The data communications system consists of category 5 cabling run through cable tray to computer closets. These are located on each floor of the building. The Local Area Network (LAN) cabling system is adequate for present day uses.

Remaining Service Life

Over 15 years

Action Priority

None

Rating

Very Good

Photo Reference #

3.20



Appendix 'C'

Photographs



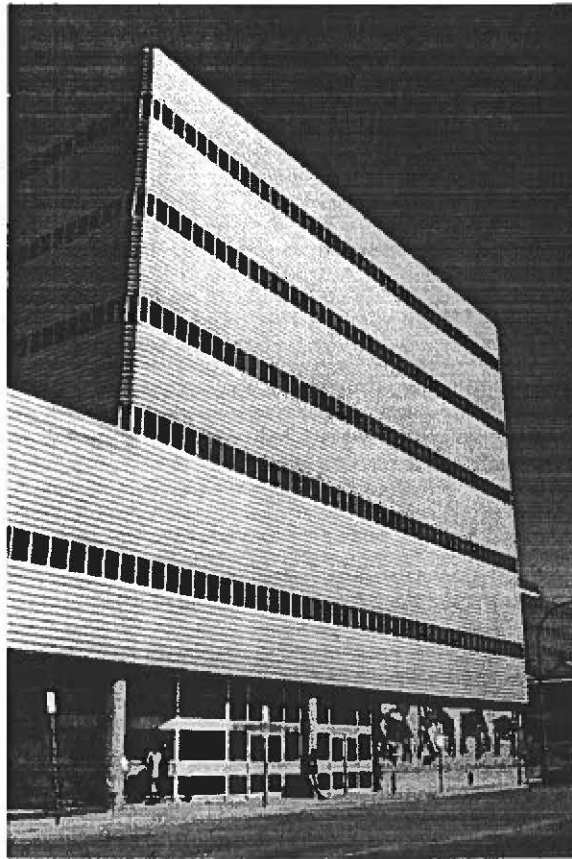
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

Reference # 1.10

Exterior view from
49th Street and 49th
Ave.



Reference # 1.11

Exterior view from
49th street.



Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

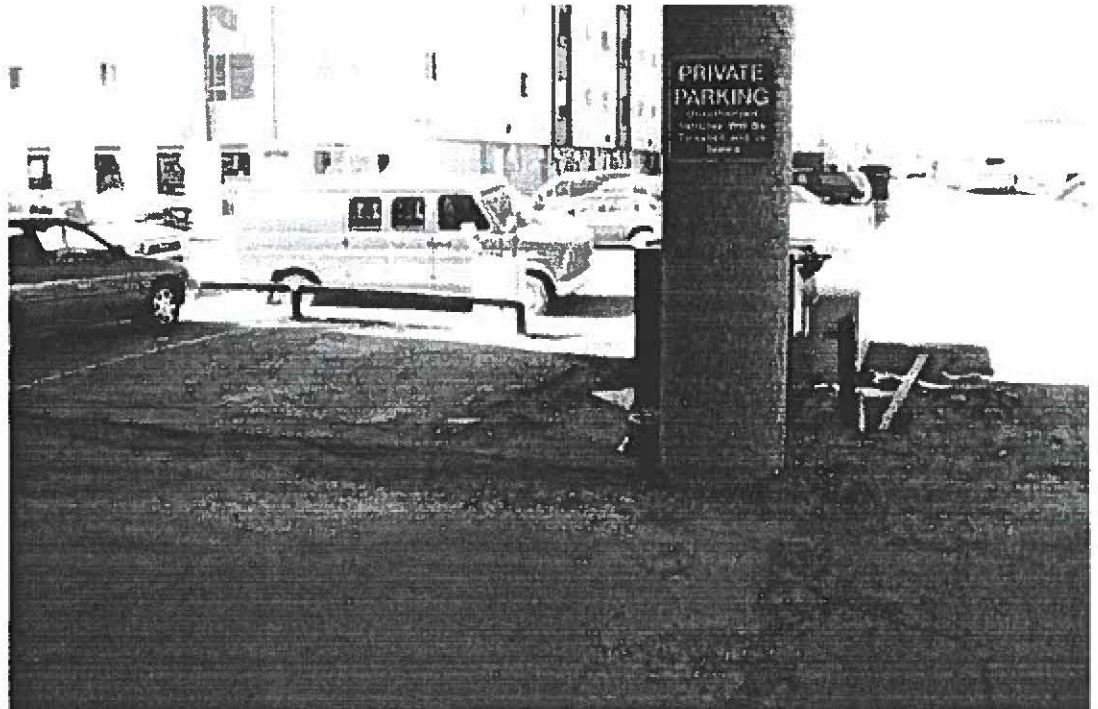
Reference # 1.12

Exterior view from alley.



Reference # 1.13

Asphalt damage at grade beams in covered parking area.



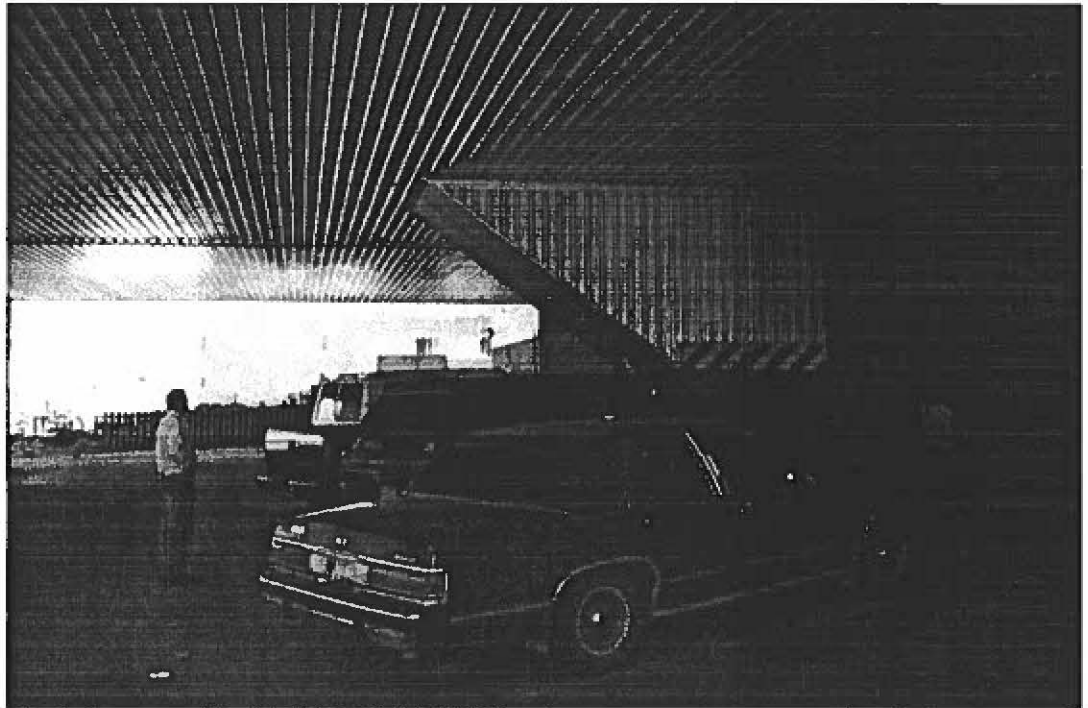
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

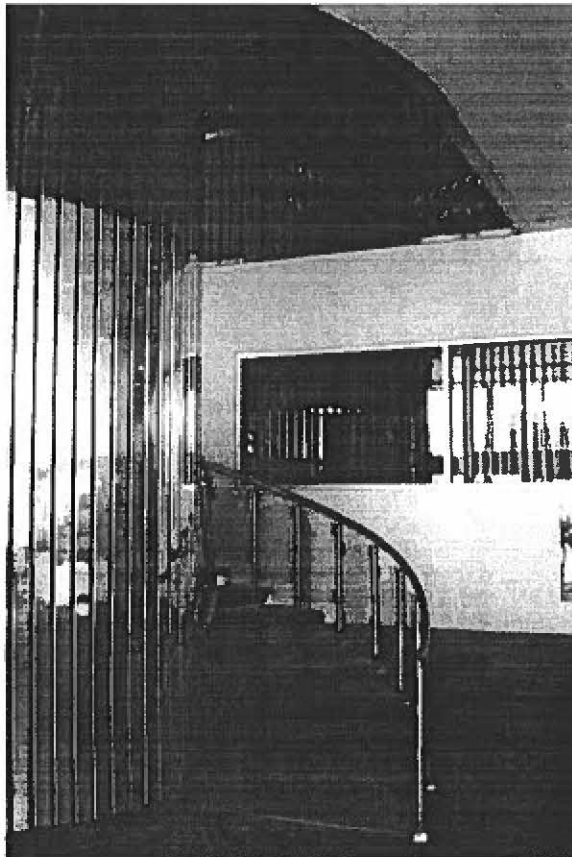
Reference # 1.14

Covered parking area.



Reference # 1.20

Spiral stair from main floor to courts lobby on second floor.



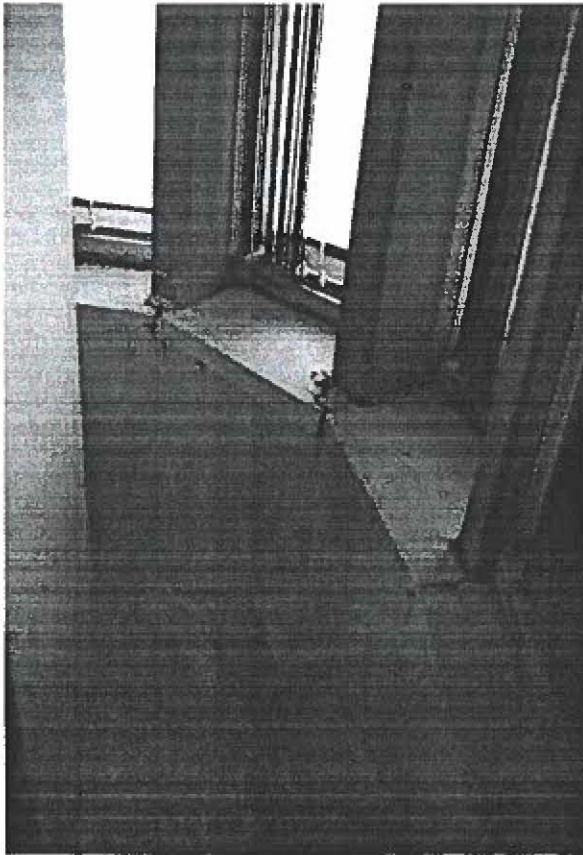
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

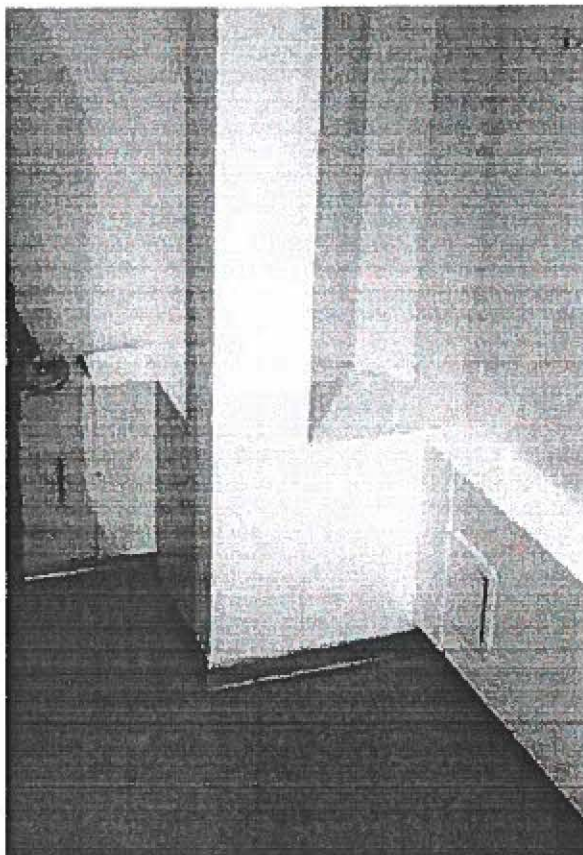
Reference # 1.21

Finish damage at exterior wall (office).



Reference # 1.22

Finish damage at exterior wall (courtroom).



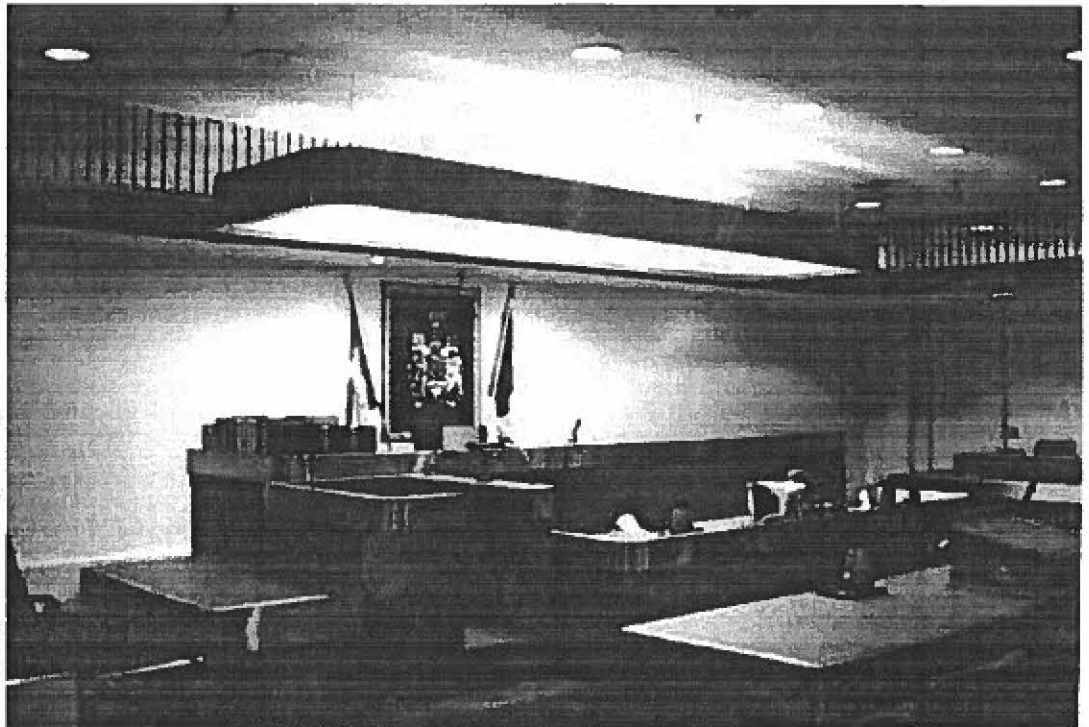
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

Reference # 1.23

Courtroom.



Reference # 1.24

Courtroom ceiling.



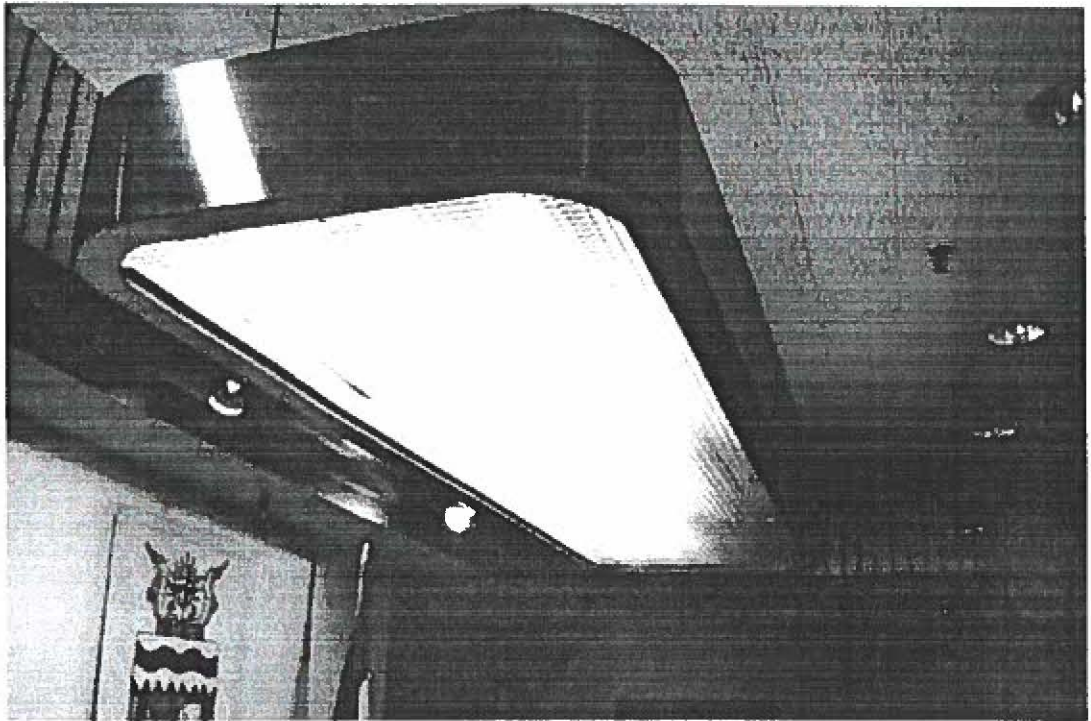
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

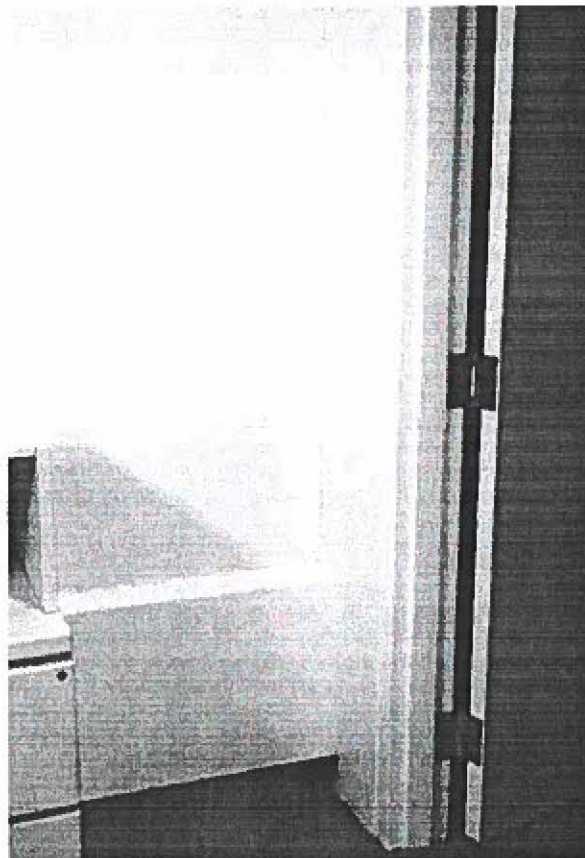
Reference # 1.25

Light valance
(courtroom).



Reference # 1.26

Damage at exterior
wall (sheriff's offices).



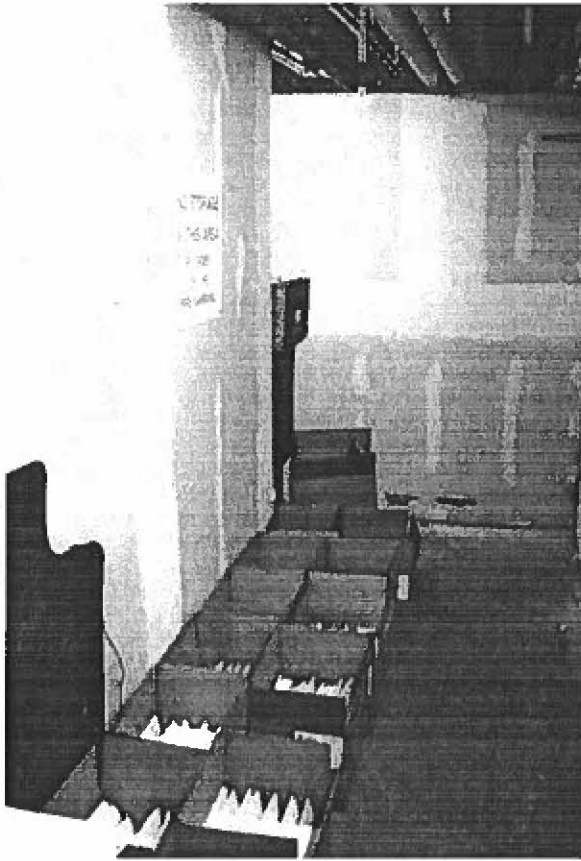
Reference Photographs



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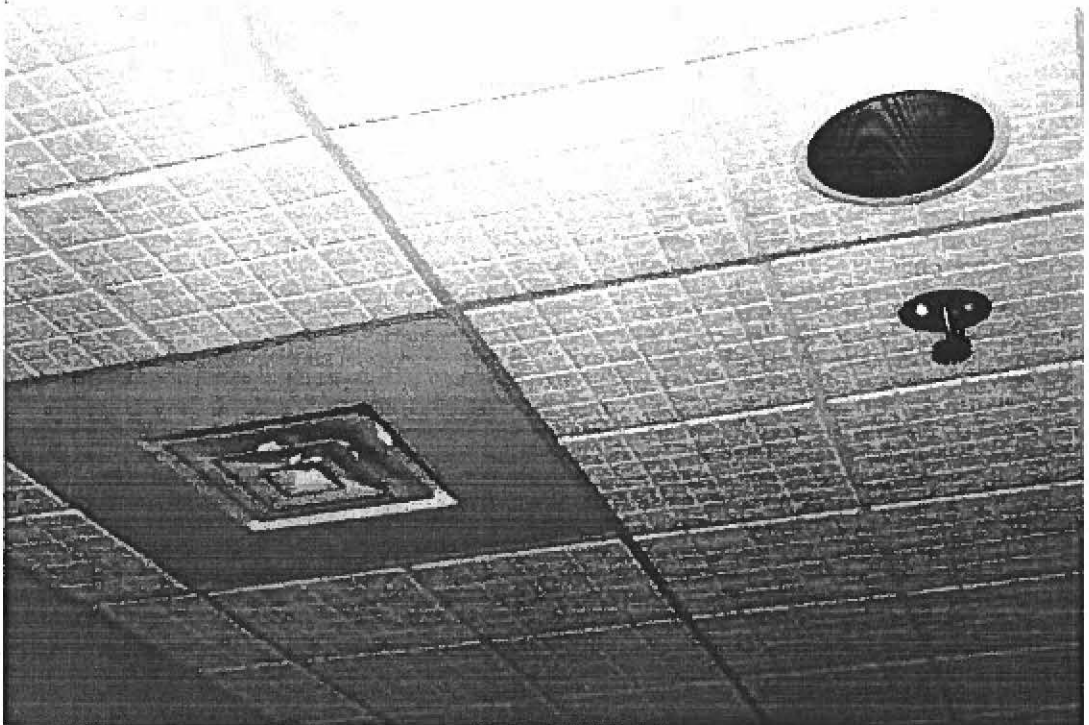
Reference # 1.27

Basement corridor.
Note storage items.



Reference # 1.28

Photo showing an
existing supply air
diffuser and one of the
standard response
sprinkler heads.



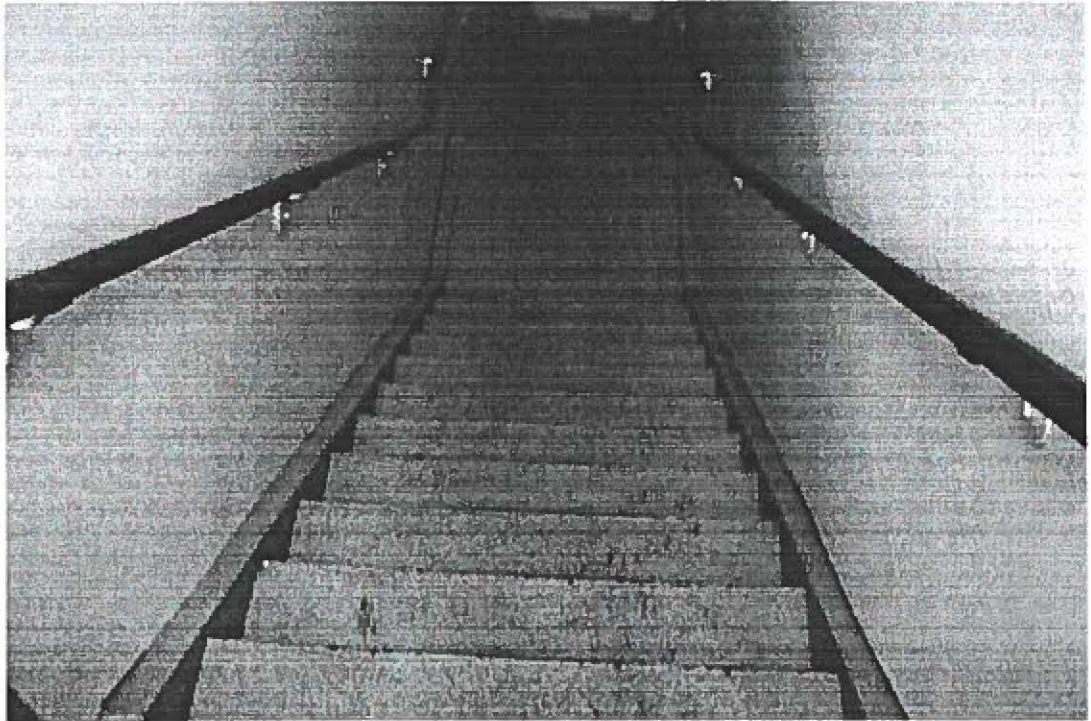
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

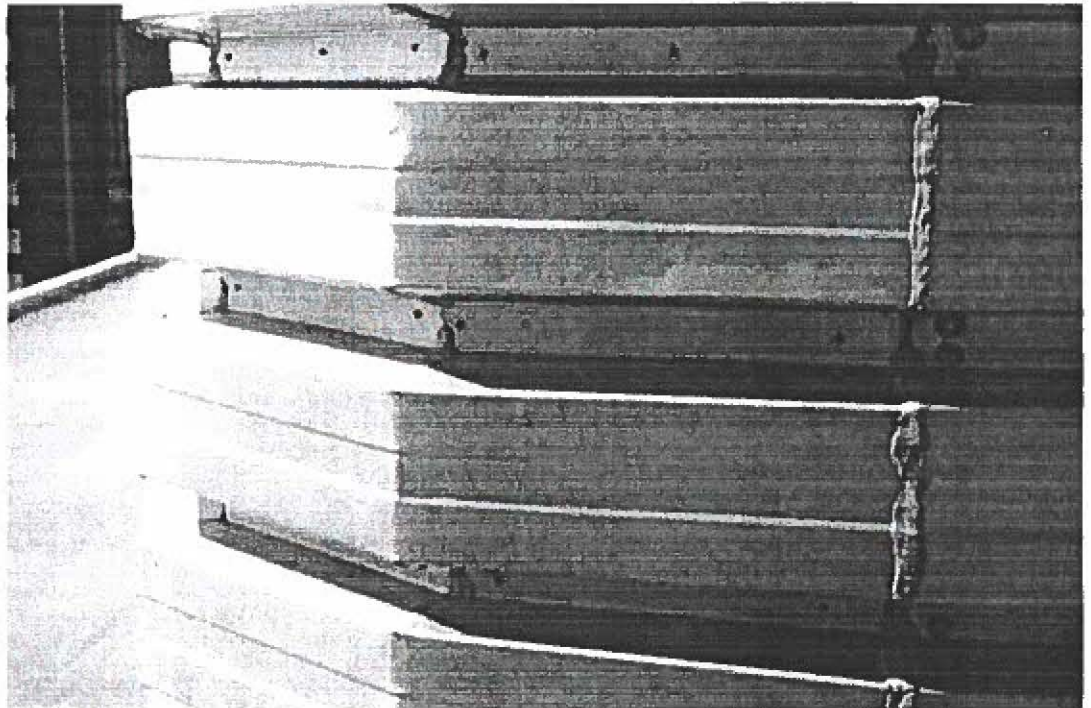
Reference # 1.29

Exterior view from
49th street.



Reference # 1.30

Cladding at corner, on
main roof. (typical).



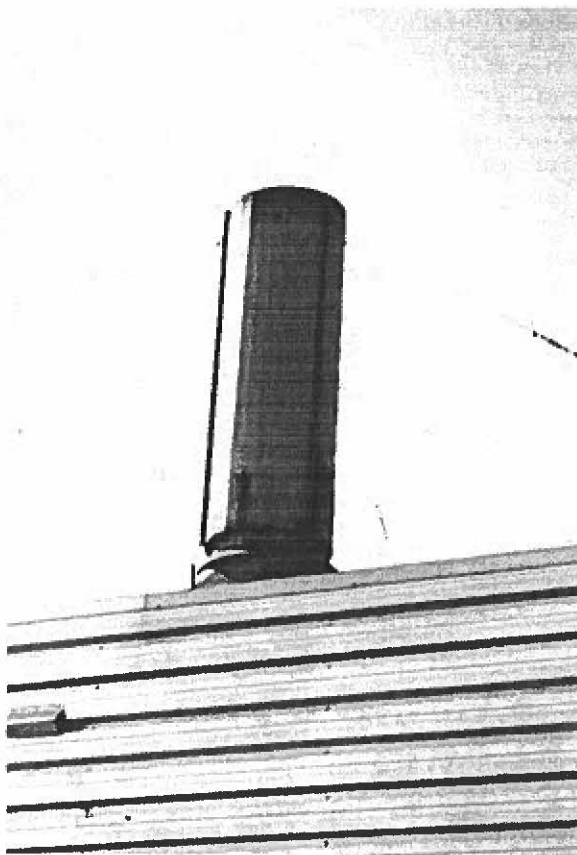
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

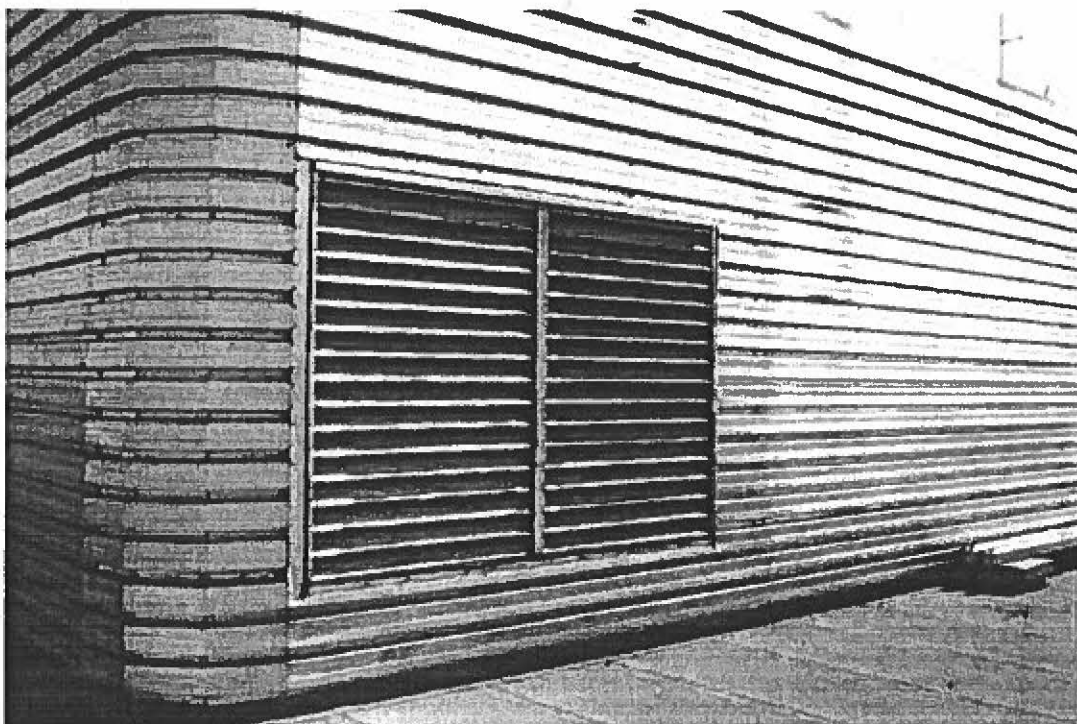
Reference # 1.31

This is a photograph of the boiler chimney. Note that the rain cap is missing and surface corrosion is present.



Reference # 1.32

This is a photograph of air handling unit AH-1 relief air louver.



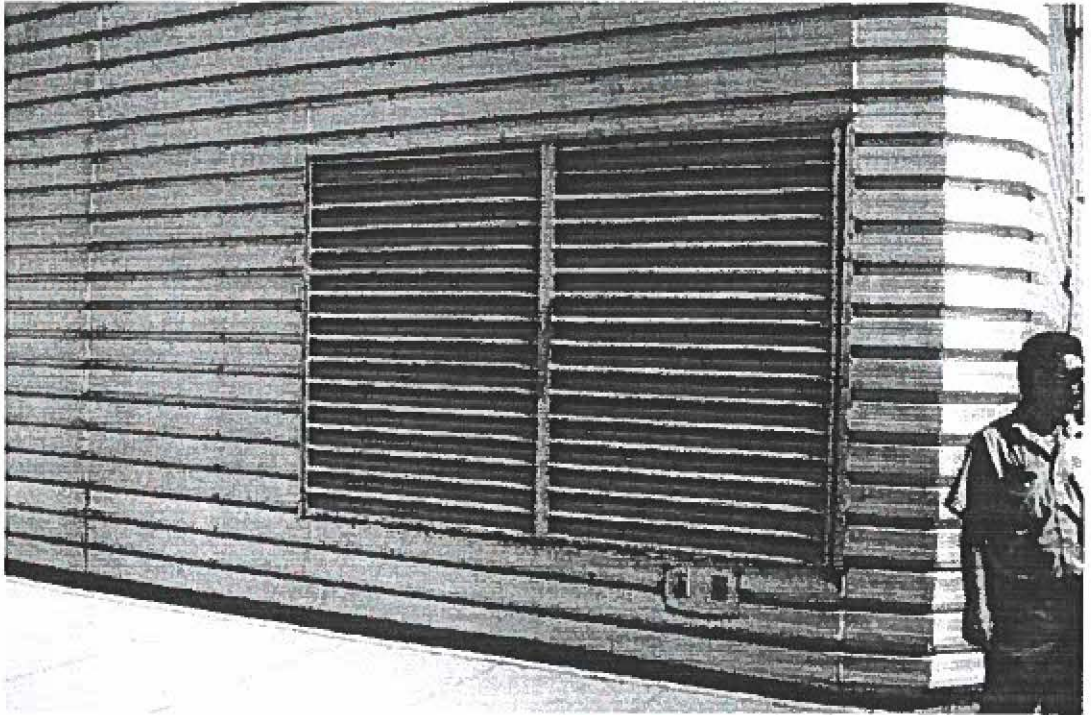
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

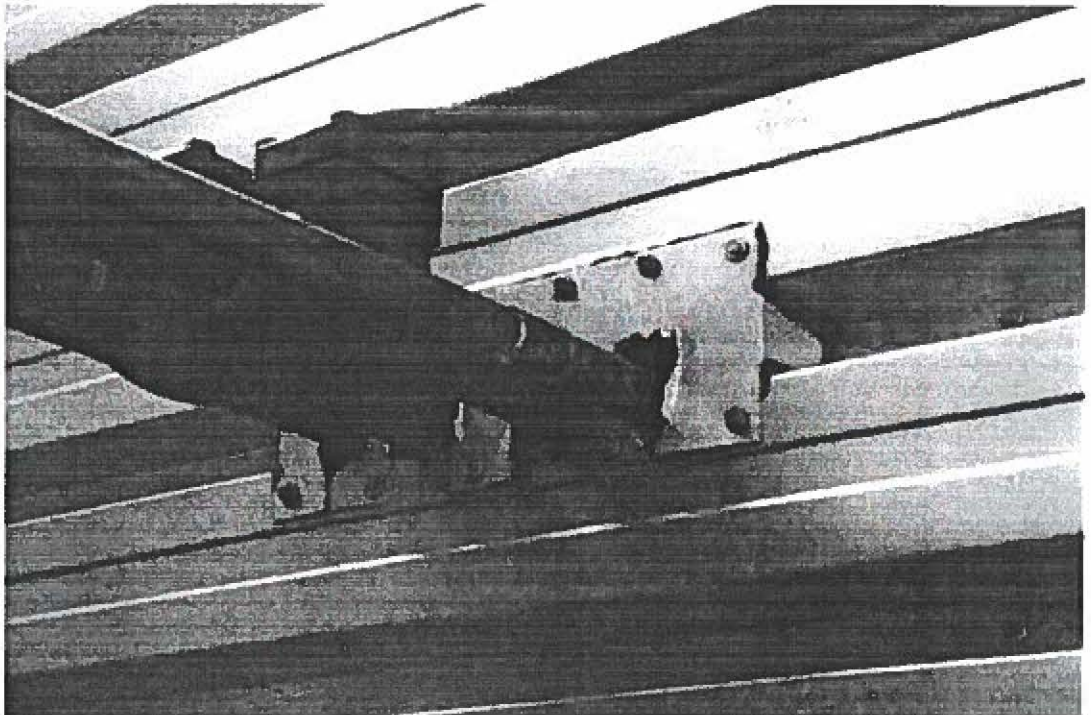
Reference # 1.33

This is a photograph of air handling unit AH-1 outside air louver.



Reference # 1.34

Cladding penetrations.



Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

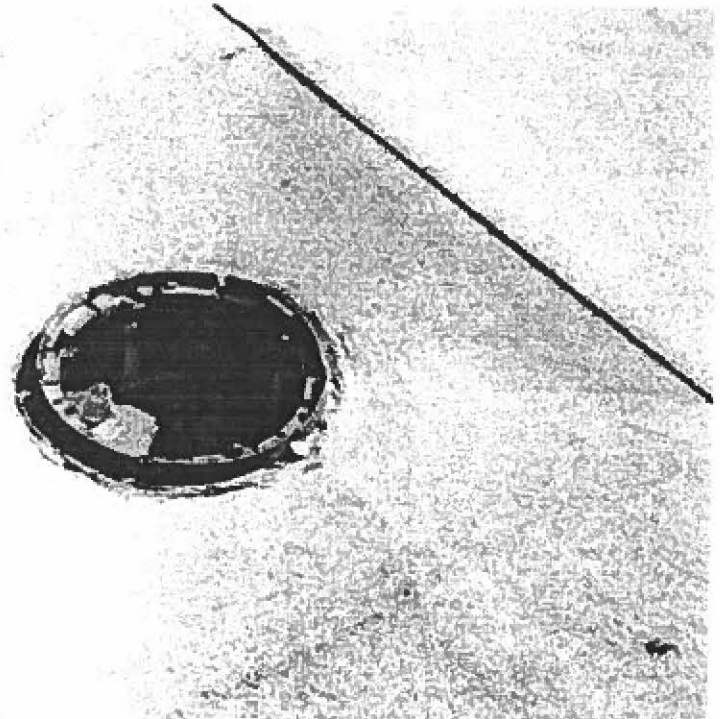
Reference # 1.40

This is a photograph of a roof drain.



Reference # 1.41

This is a photograph of a roof drain that is missing the dome cover.



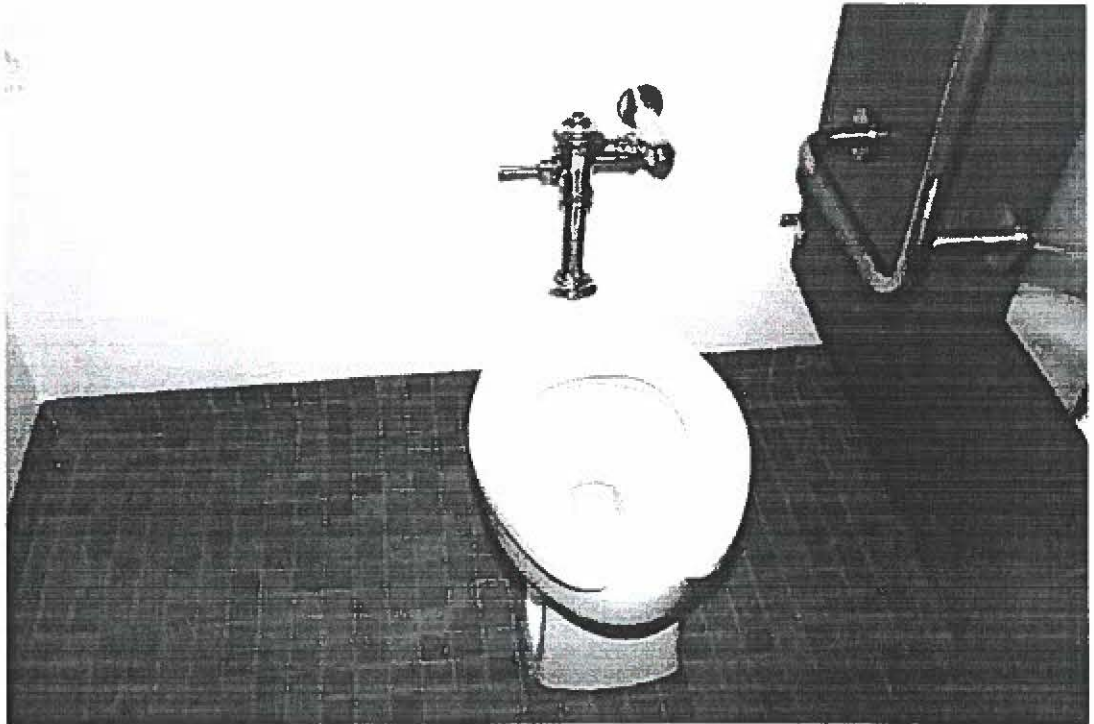
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

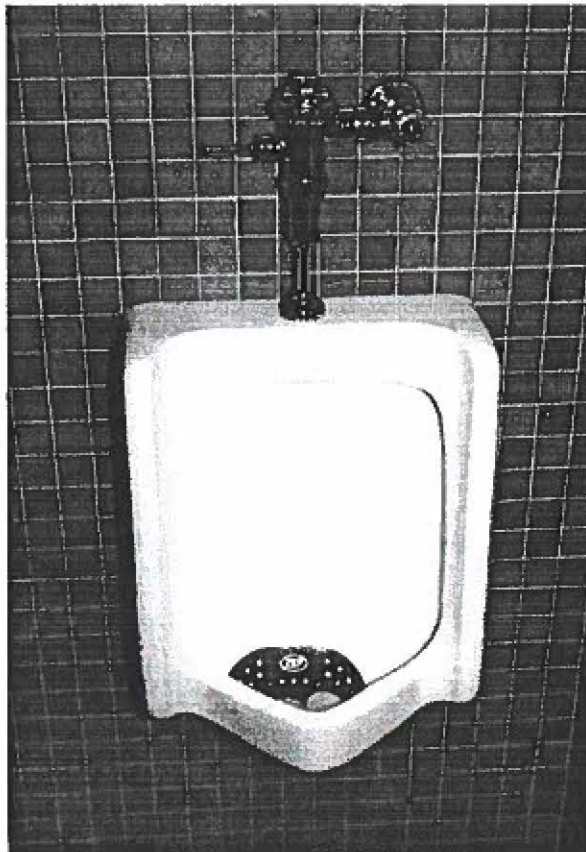
Reference # 2.10

This is a photograph of a CRANE water closet c/w flush valve.



Reference # 2.11

This is a photograph of a CRANE urinal c/w flush valve.



Reference Photographs

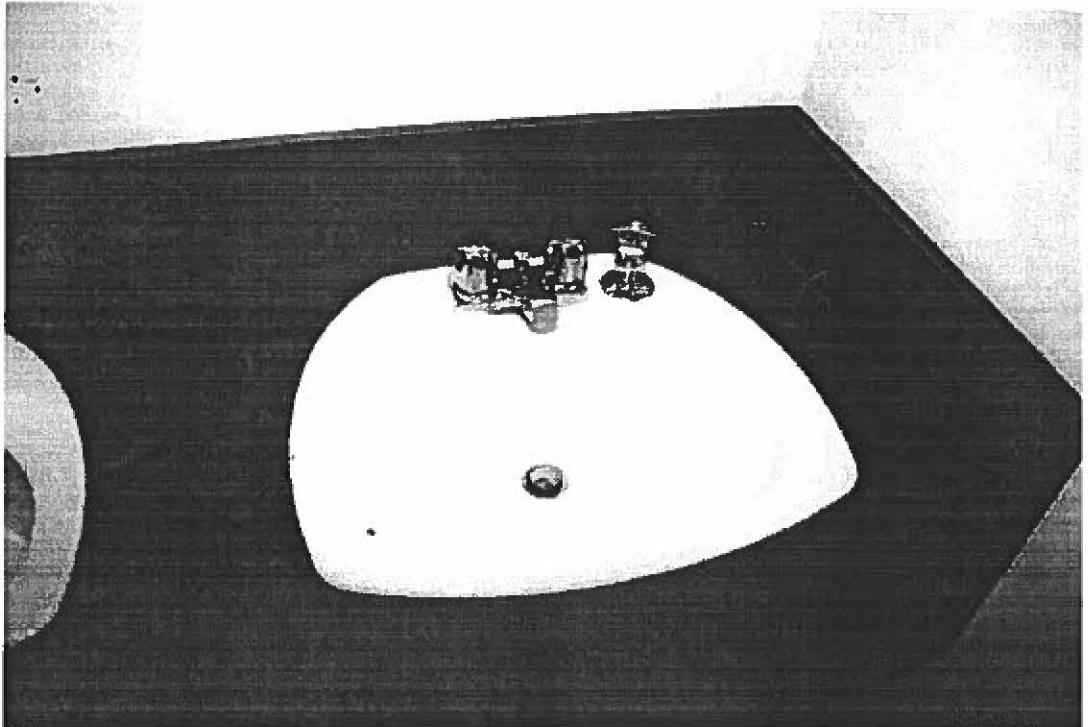
Reference # **2.12**

This is a photograph of a vandal proof combination water closet and lavatory.



Reference # **2.13**

This is a photograph of a CRANE enamelled steel lavatory c/w with EMCO faucet and sink mounted drinking fountain.



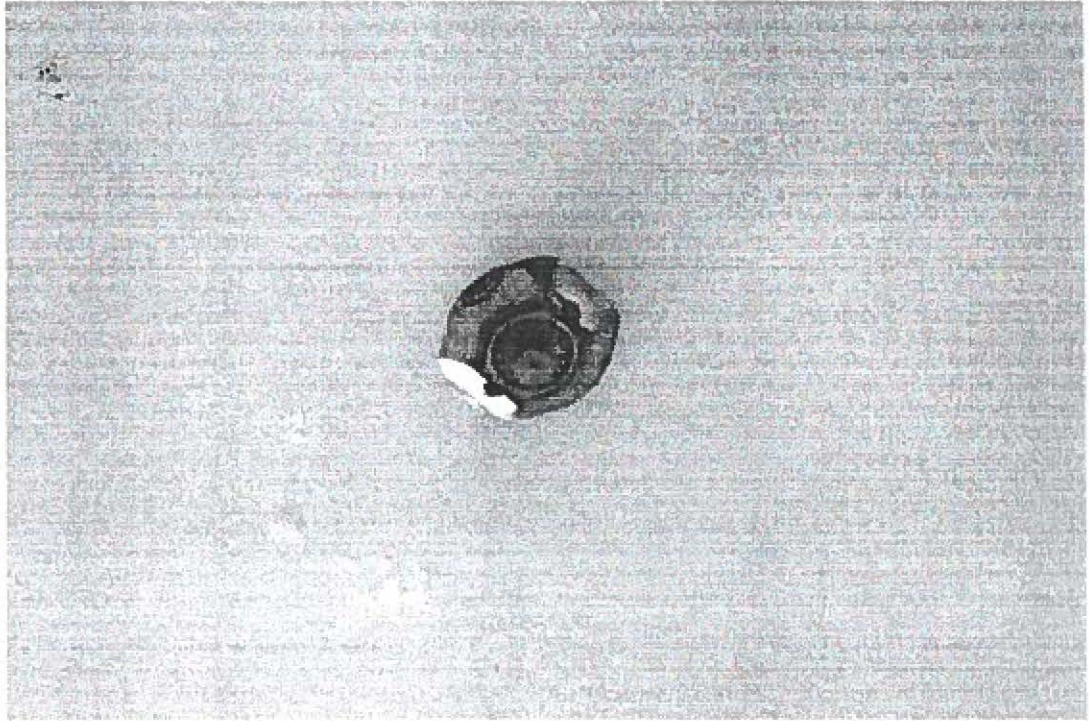
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

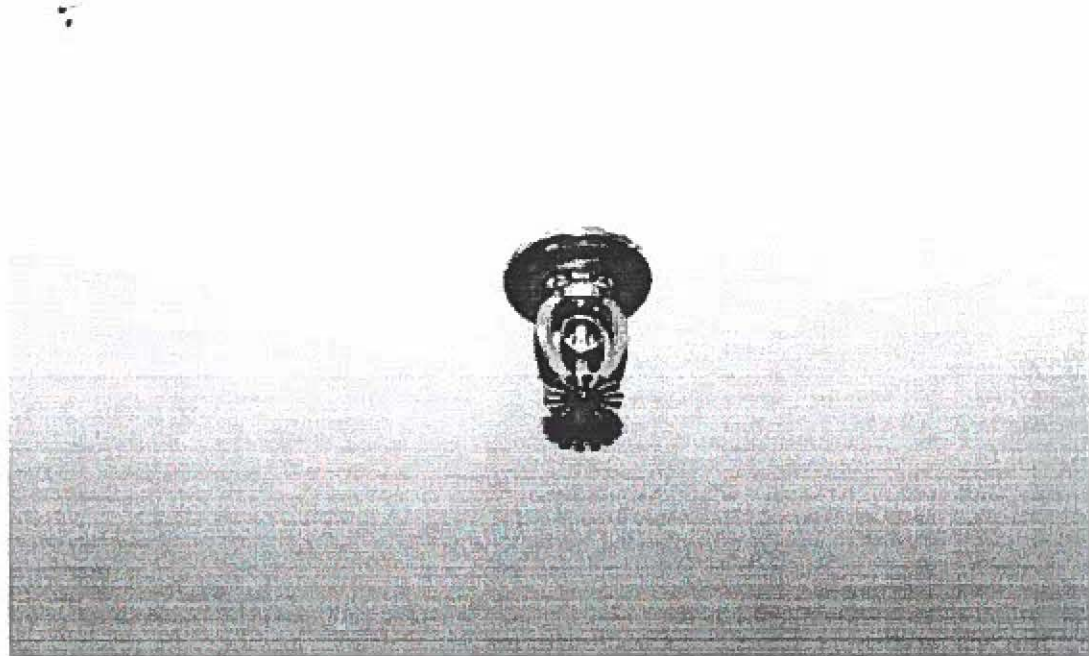
Reference # **2.20**

This is a photograph of a vandal proof sprinkler head.



Reference # **2.21**

This is a photograph of a standard response sprinkler head.



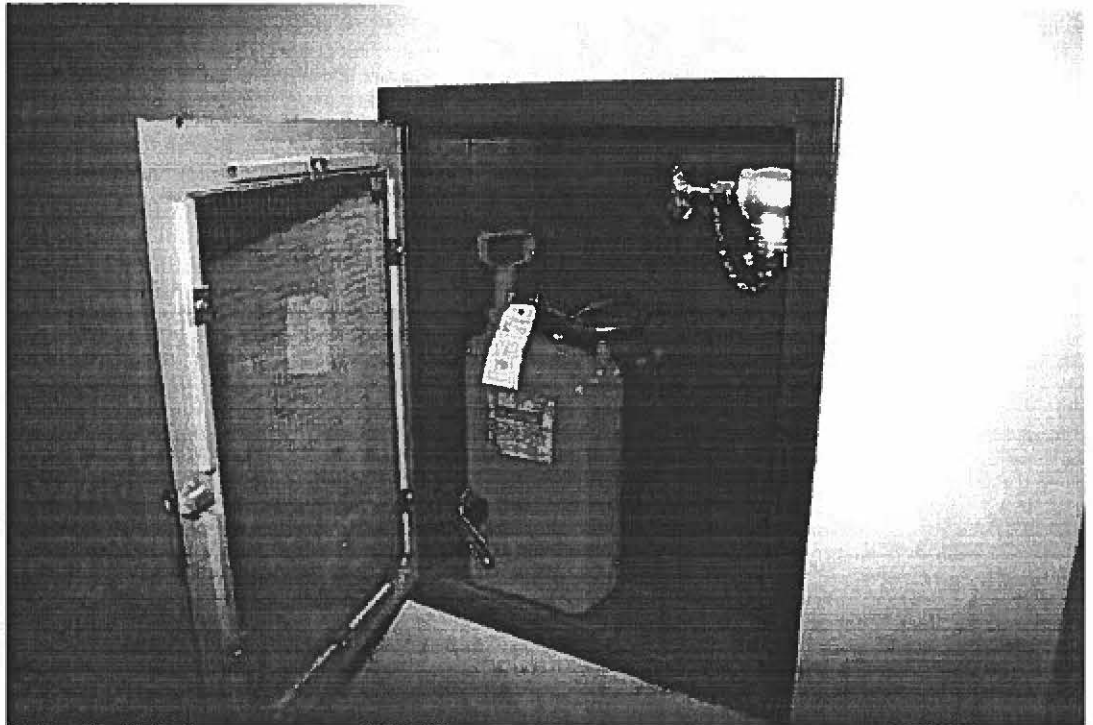
Reference Photographs



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ENGINEERS AND ARCHITECTS

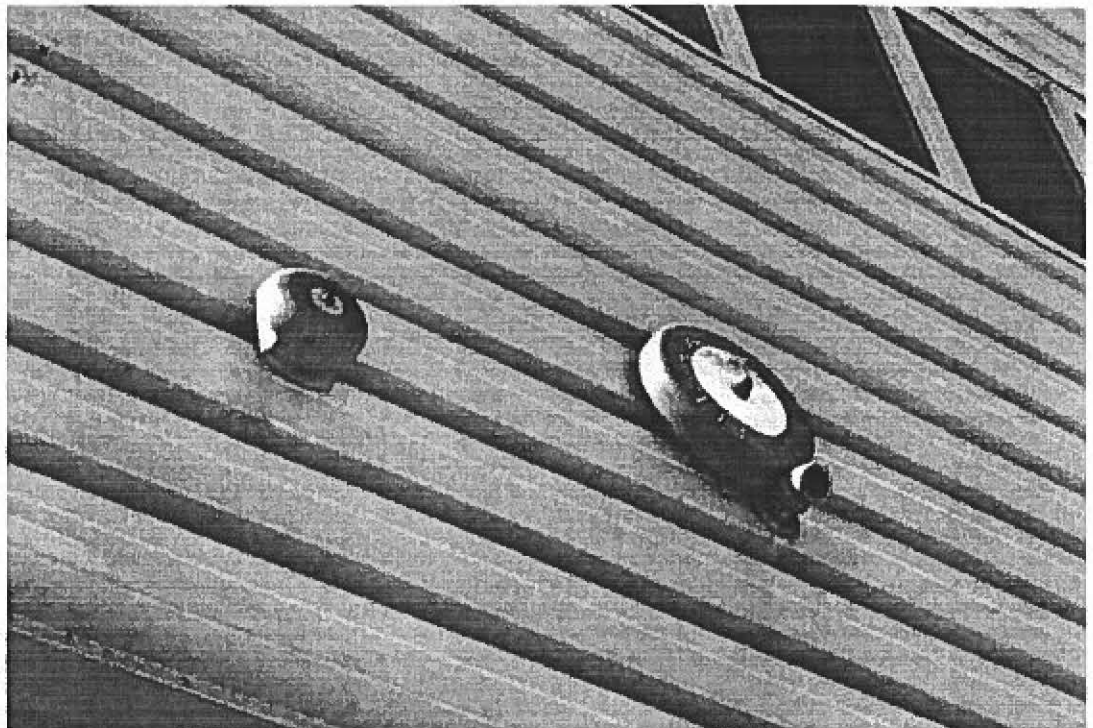
Reference # 2.22

This is a photograph of a 38mm diameter fire hose valve c/w a Hand Pump fire extinguisher.



Reference # 2.23

This is a photograph of the sprinkler system water gong and electric fire alarm bell.



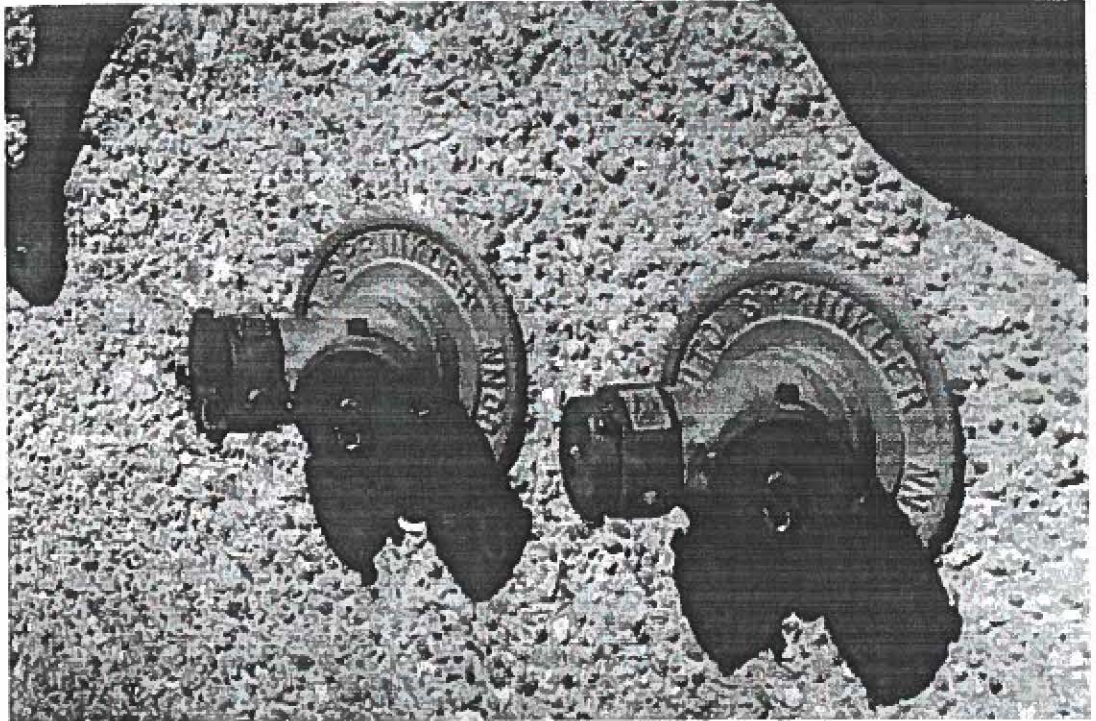
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

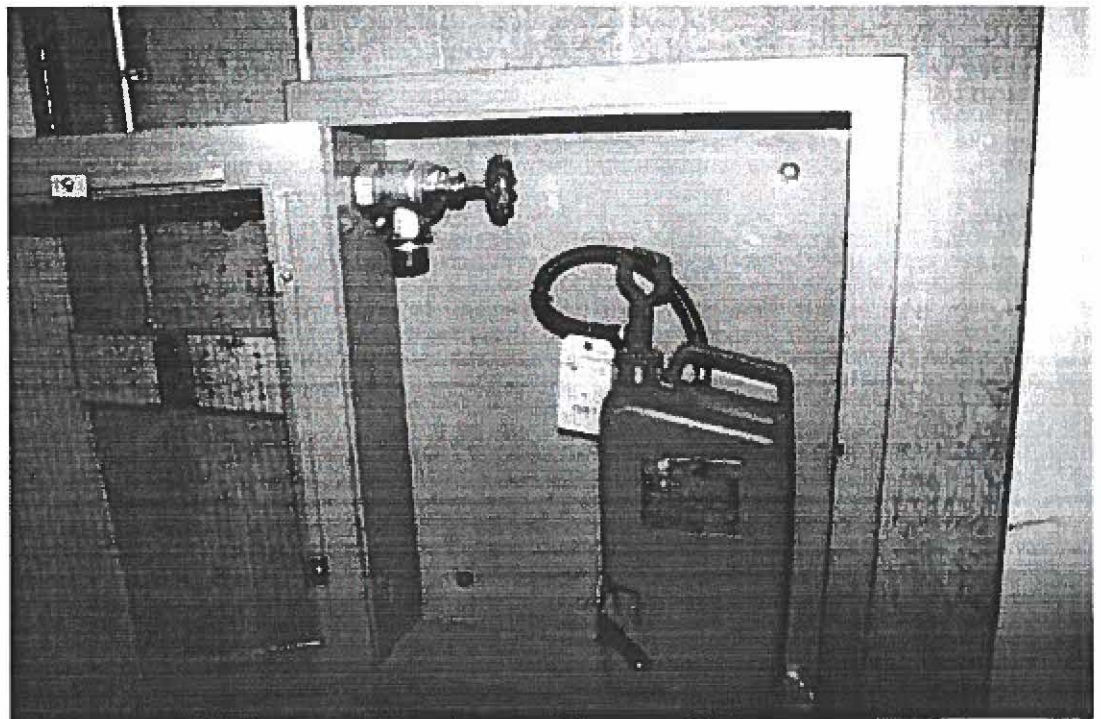
Reference # 2.24

This is a photograph of the exterior fire department connections.



Reference # 2.25

This is another photograph of the fire hose cabinet c/w 38mm diameter hose valve and hand pump fire extinguisher.



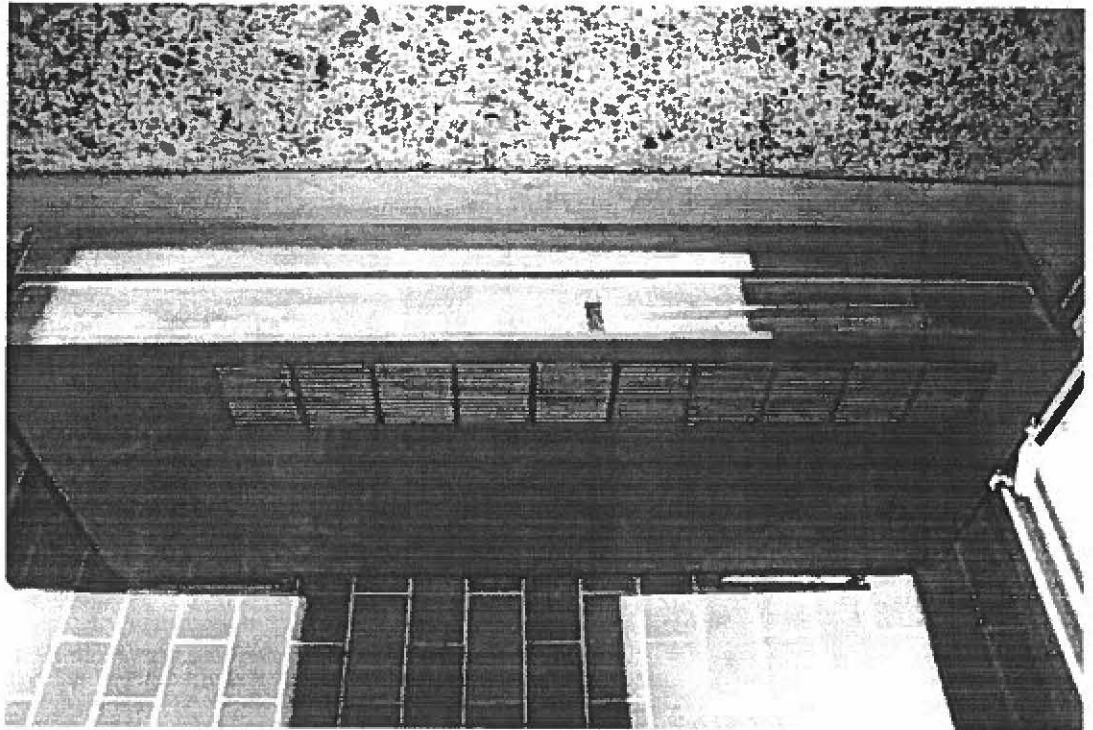
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

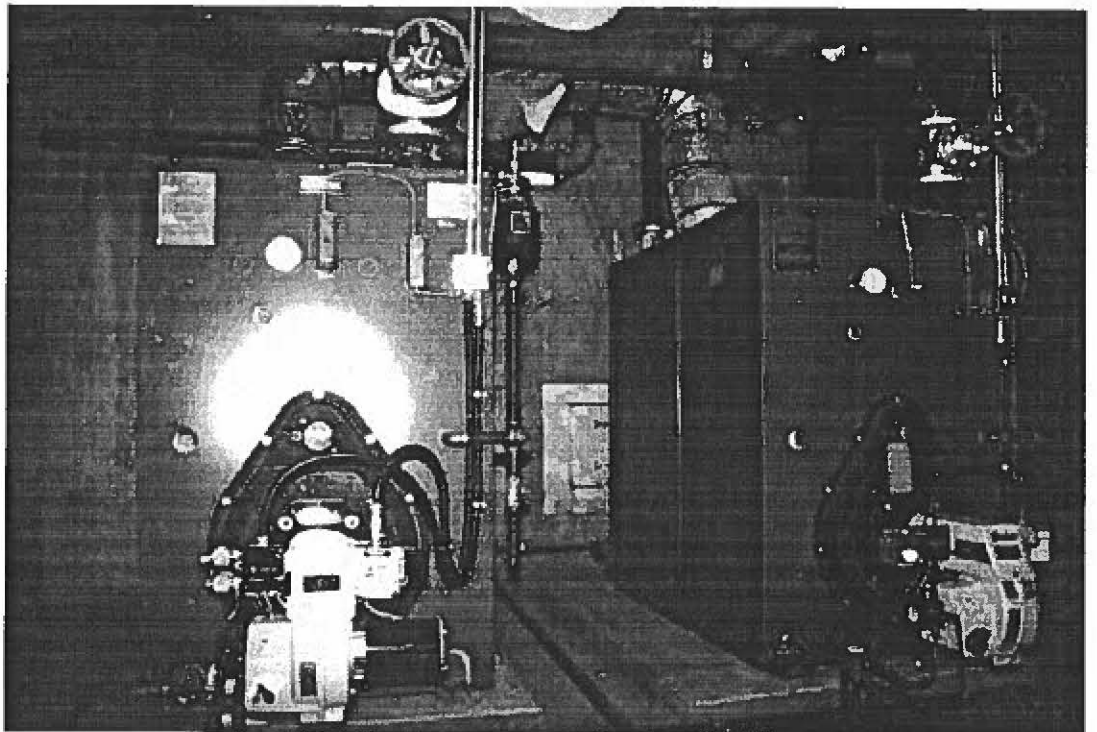
Reference # 2.30

This is a photograph of the Main vestibule cabinet unit heater.



Reference # 2.31

This is a photograph of the two BURNHAM boilers.



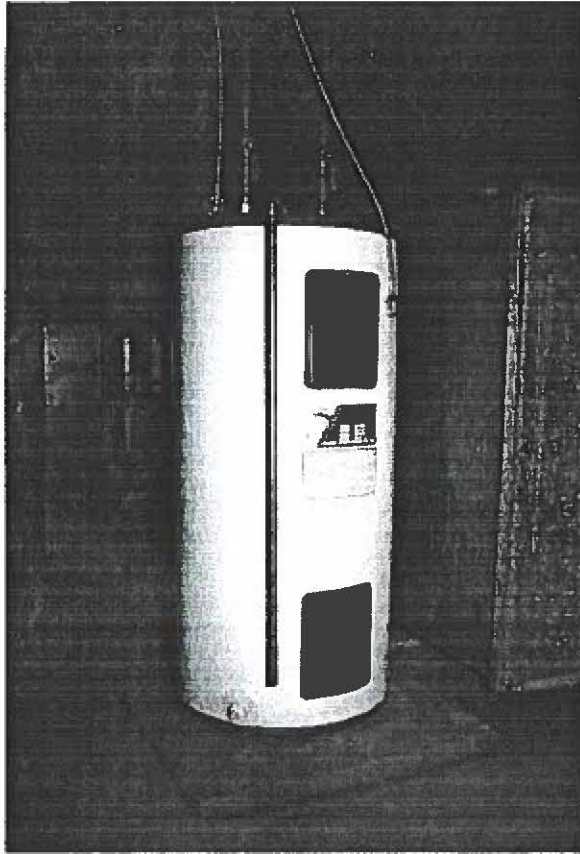
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

Reference # 2.32

This is a photograph of the GSW electric DHW heater.



Reference # 2.33

This is a photograph of the buried fuel oil tank fill and vent.



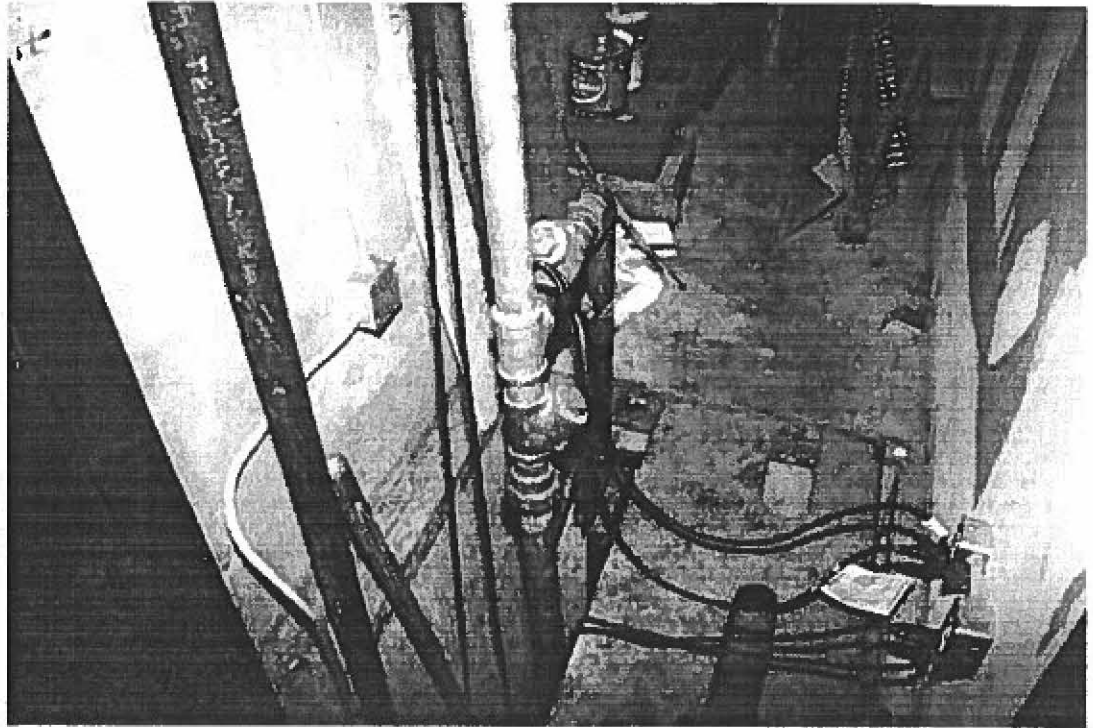
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

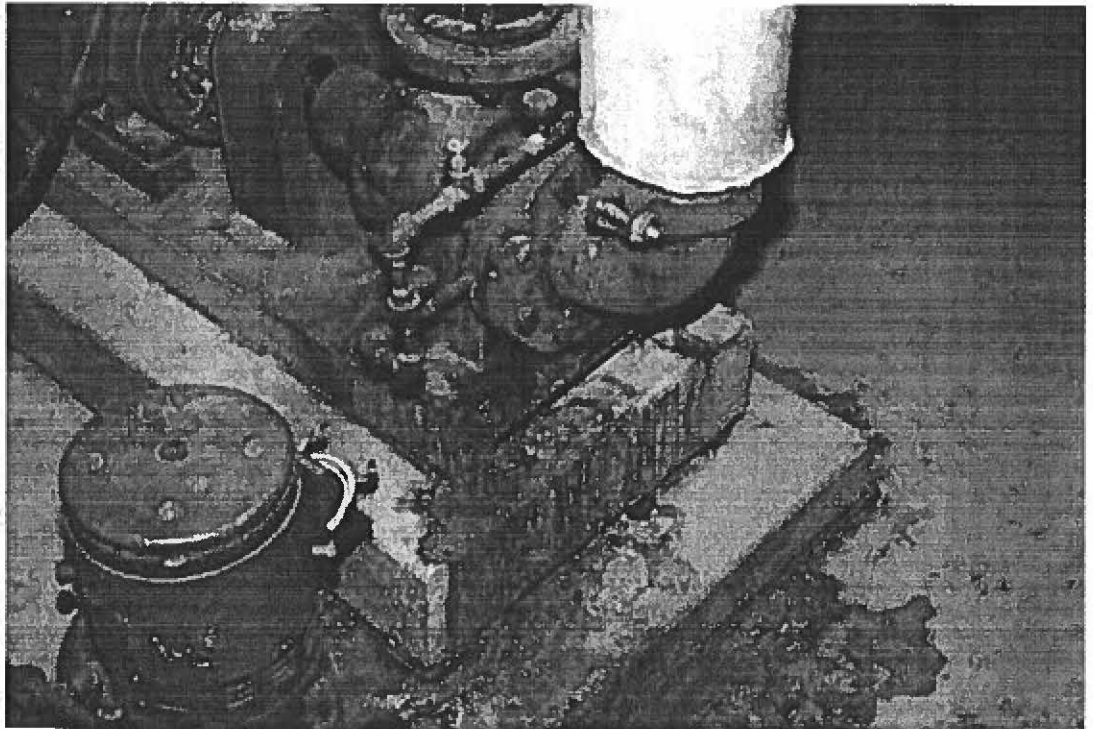
Reference # 2.34

This is a photograph of a ground water sump pump.



Reference # 2.35

This is a photograph of the excessive corrosion present at the chilled water pumps.



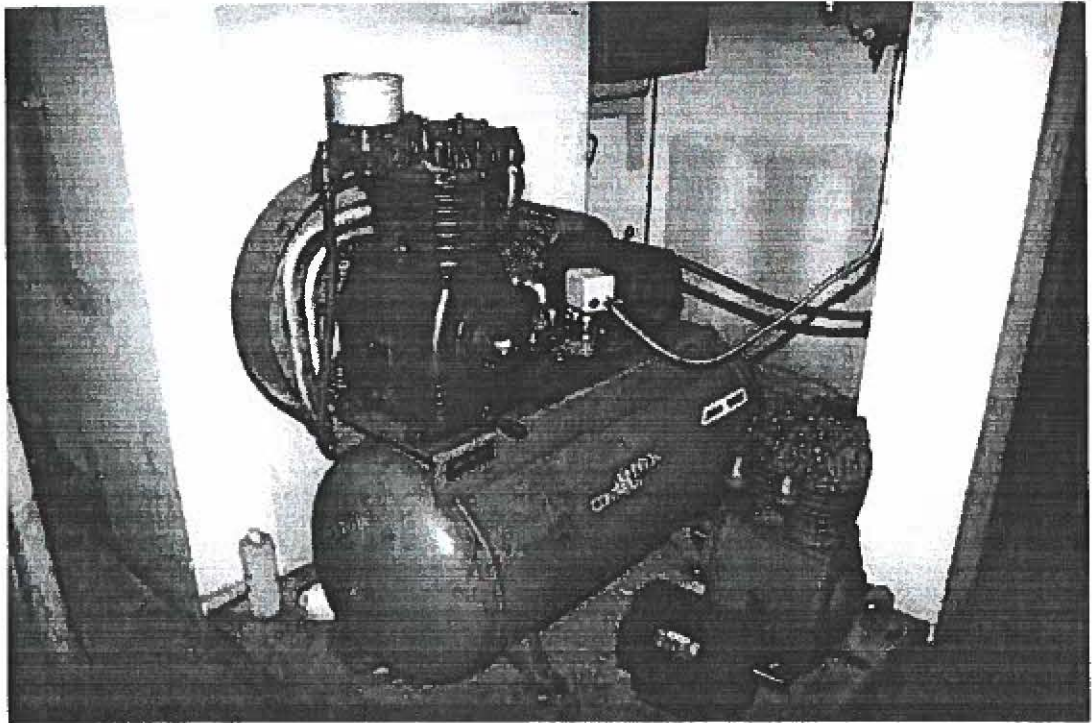
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

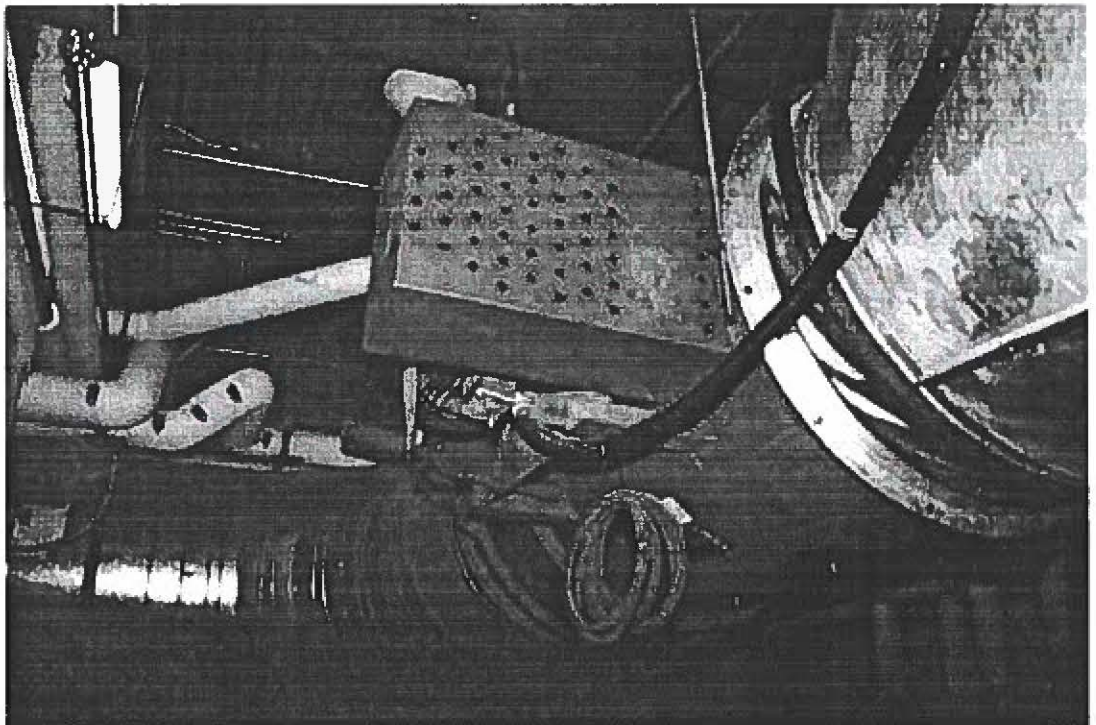
Reference # 2.36

This is a photograph of the Controls air compressor.



Reference # 2.37

This is a photograph of return fan F-6.



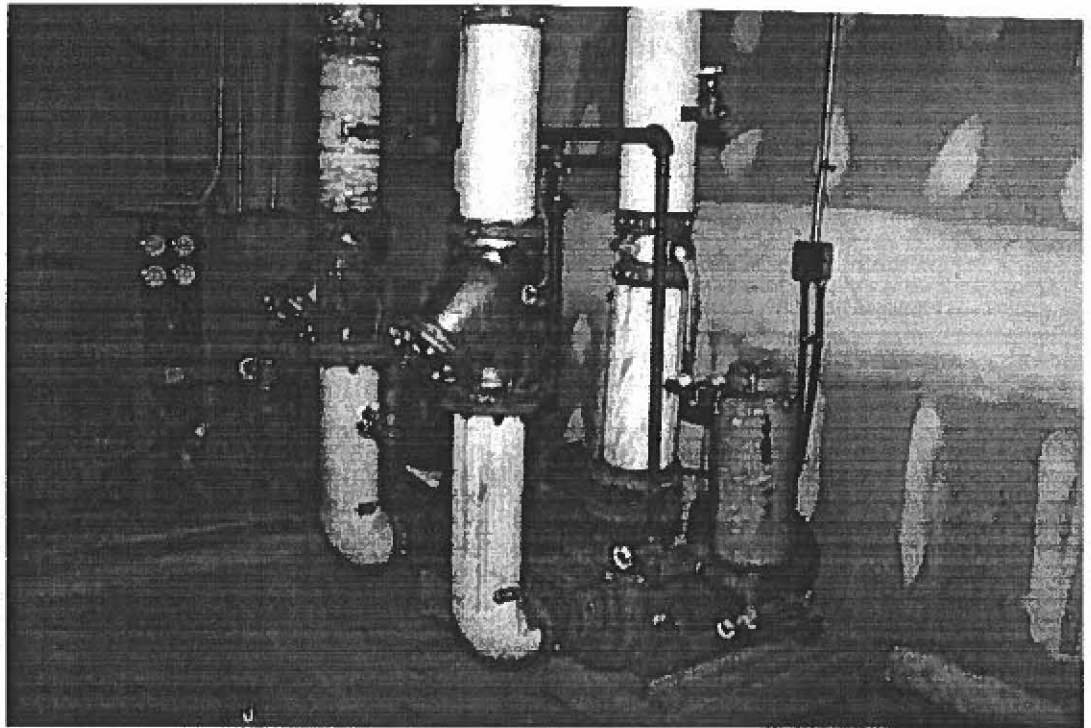
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

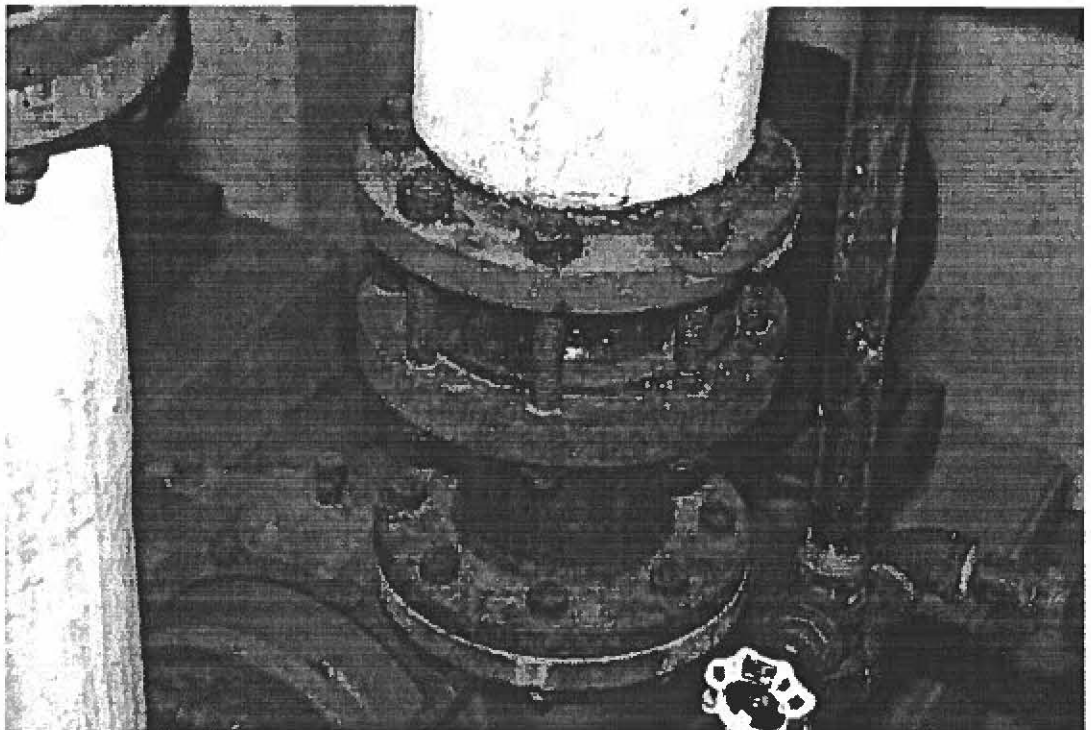
Reference # 2.38

This is a photograph of the chilled water pumps.



Reference # 2.39

This is a photograph of the corrossions at a chilled water pump flange.



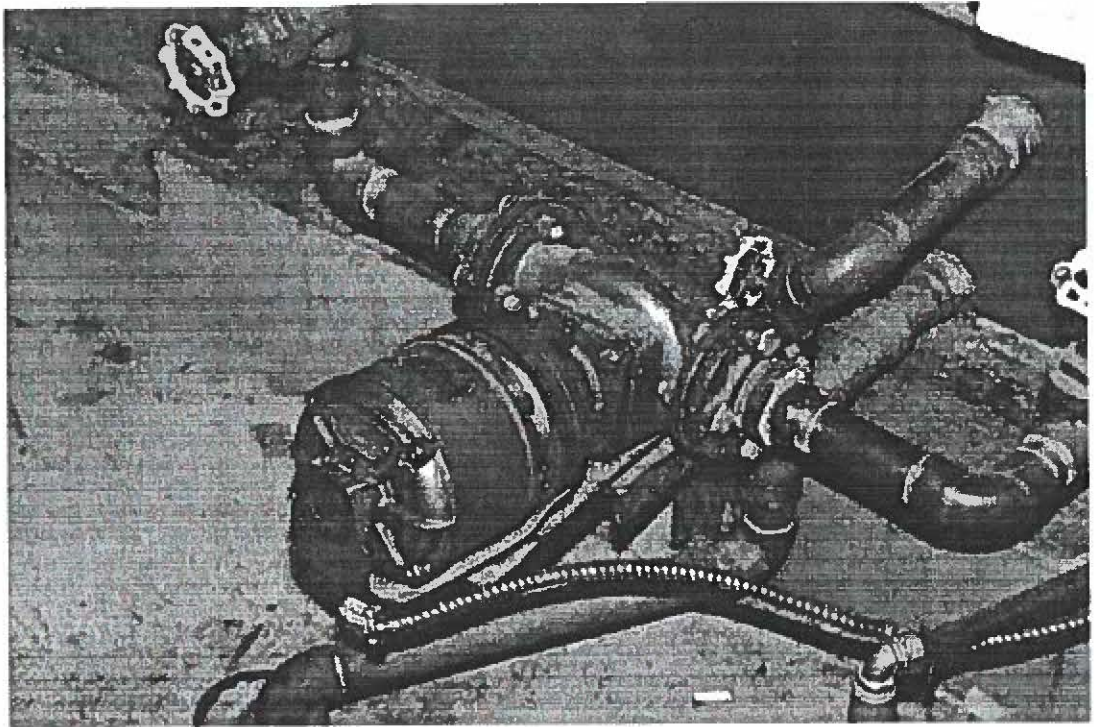
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

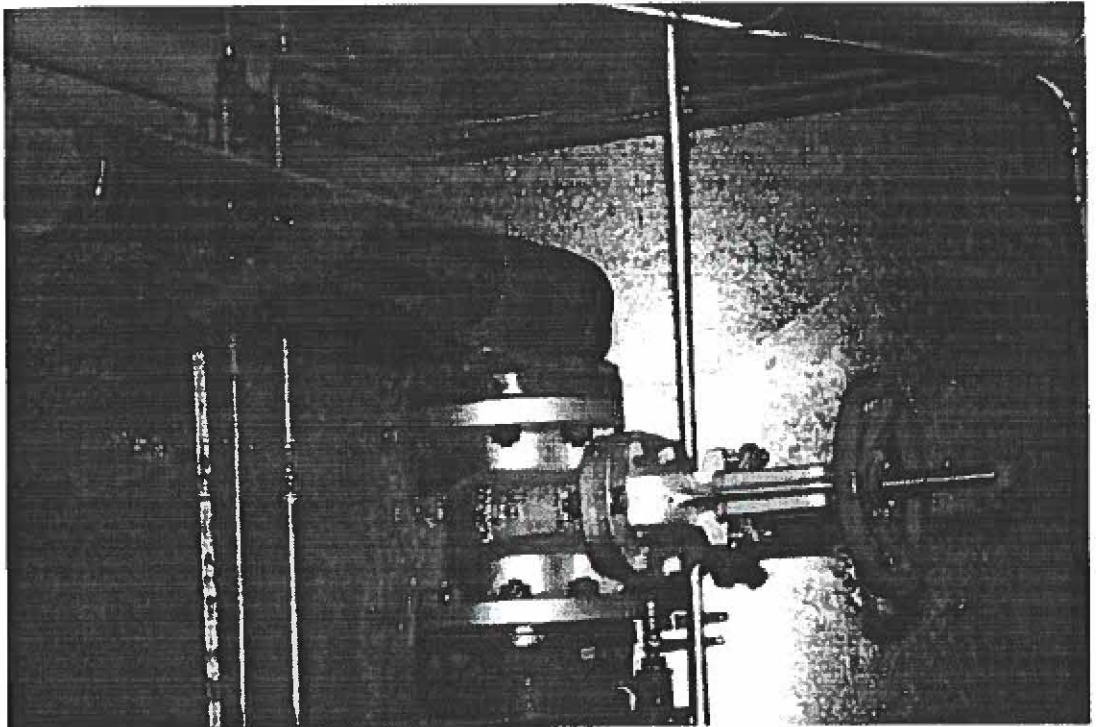
Reference # 2.40

This is a photograph of the AH-1 heating coil circ. pump.



Reference # 2.41

This is a photograph of the uninsulated HW piping.



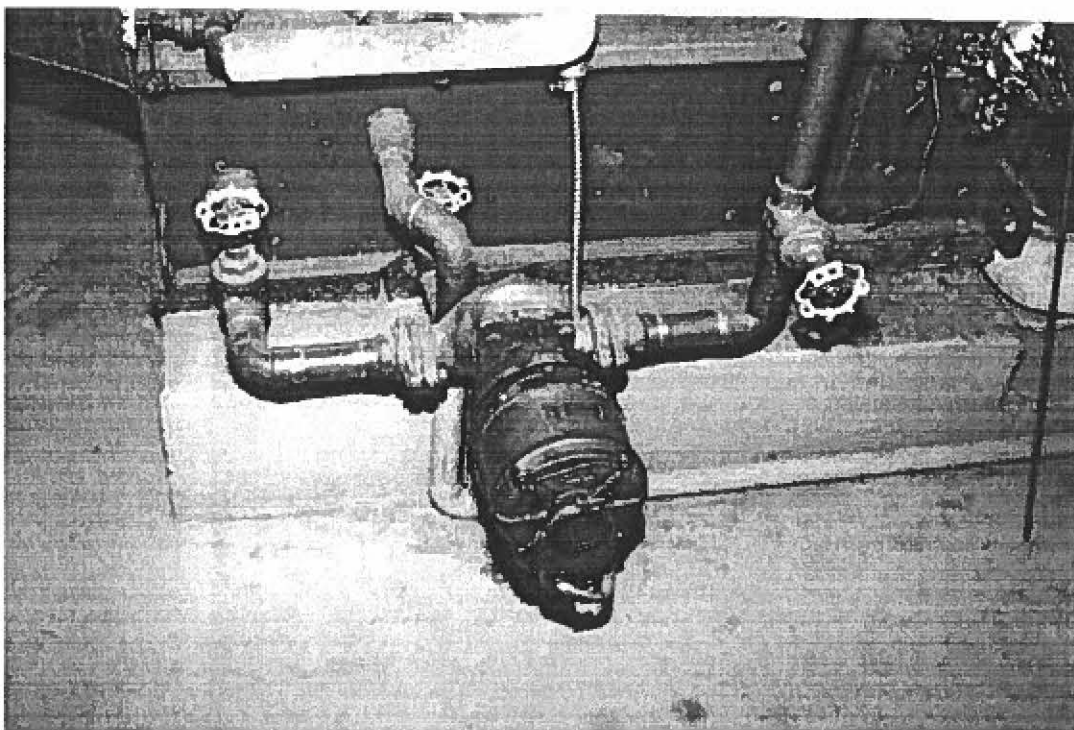
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

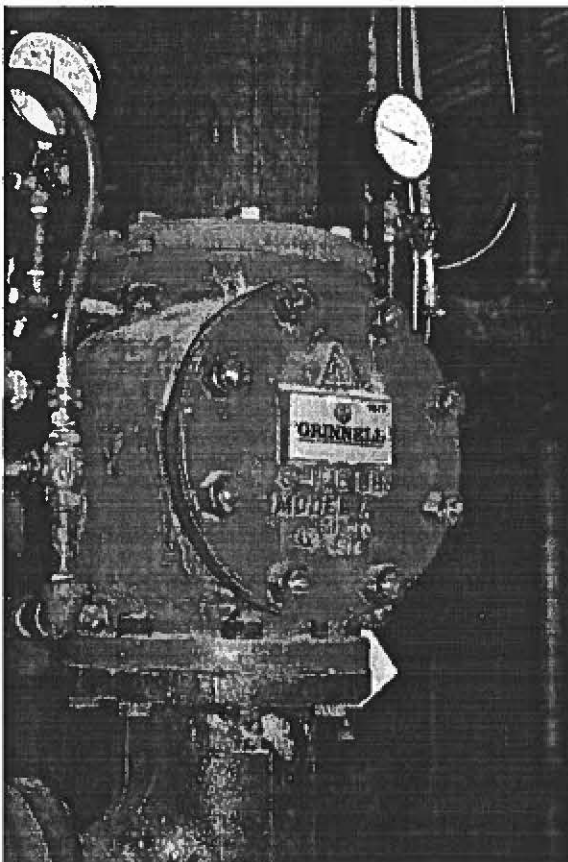
Reference # 2.42

This is a photograph of AH-2 heating coil circ. pump.



Reference # 2.43

This is a photograph of the wet pipe sprinkler system alarm valve.



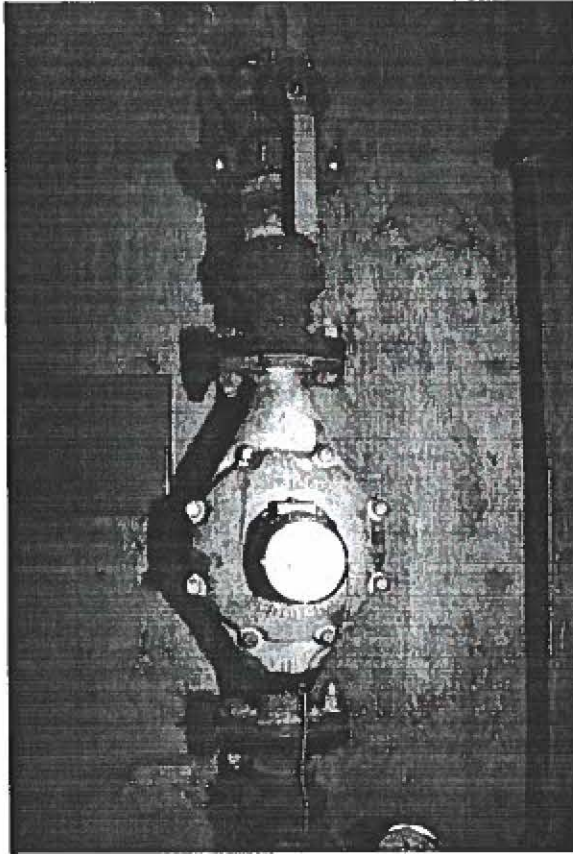
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

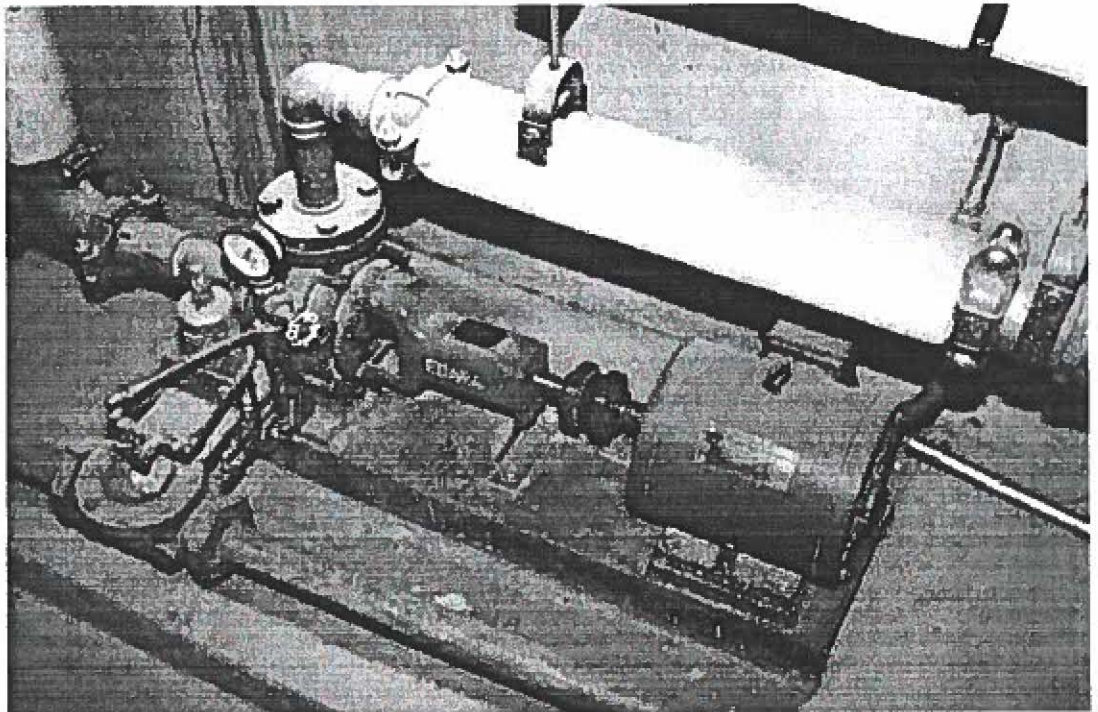
Reference # 2.44

This is a photograph of the surface corrosion that is present on the DW piping.



Reference # 2.45

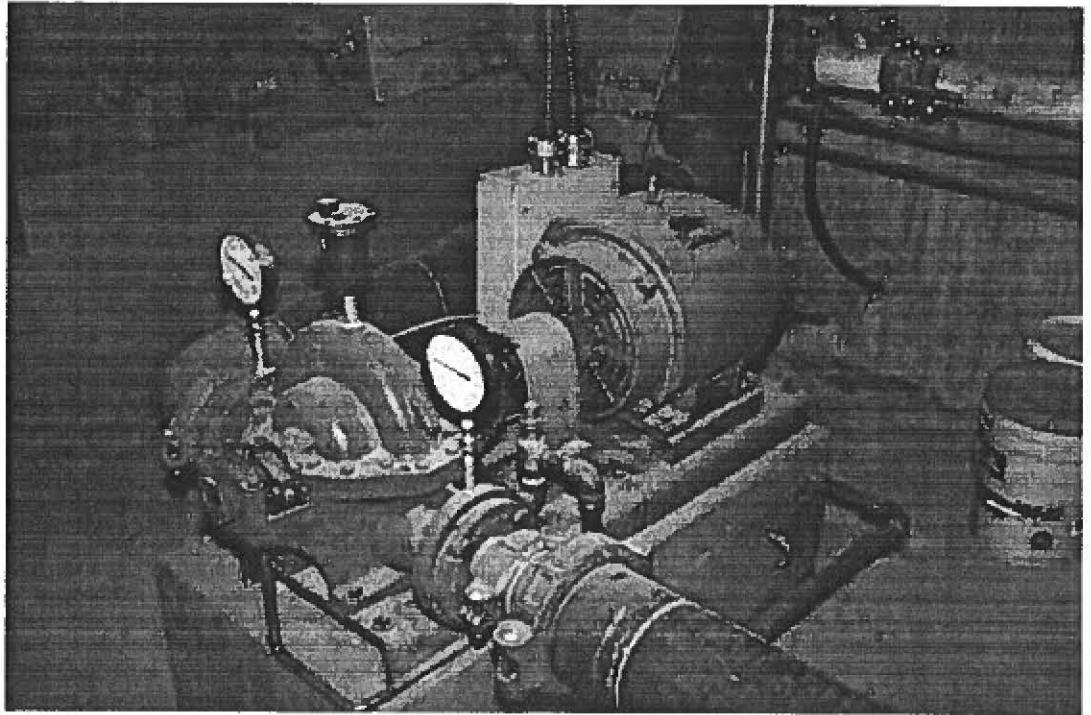
This is a photograph of the DW booster pump.



Reference Photographs

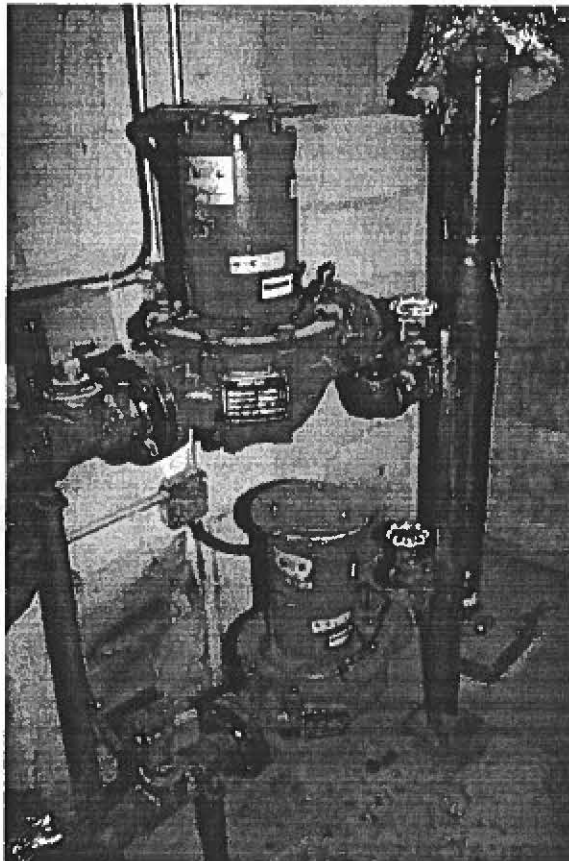
Reference # 2.46

This is a photograph of the fire pump.



Reference # 2.47

This is a photograph of the Radiation Loop HW circ. pumps P-3 and P-4.



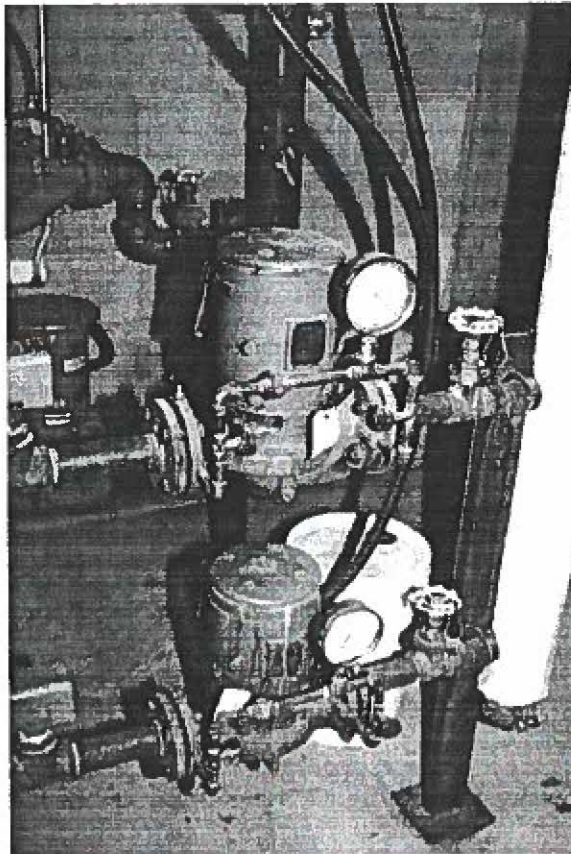
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

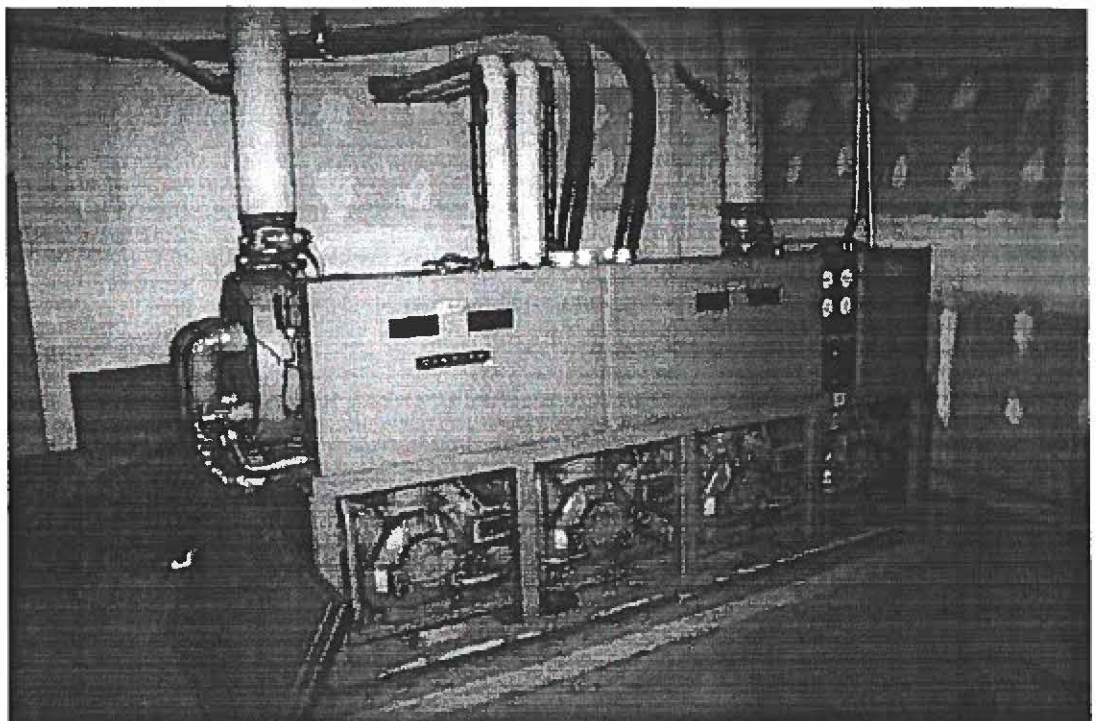
Reference # 2.48

This is a photograph of the Heating Coil Loop pumps P-5 and P-6.



Reference # 2.50

This is a photograph of the CARRIER chiller.



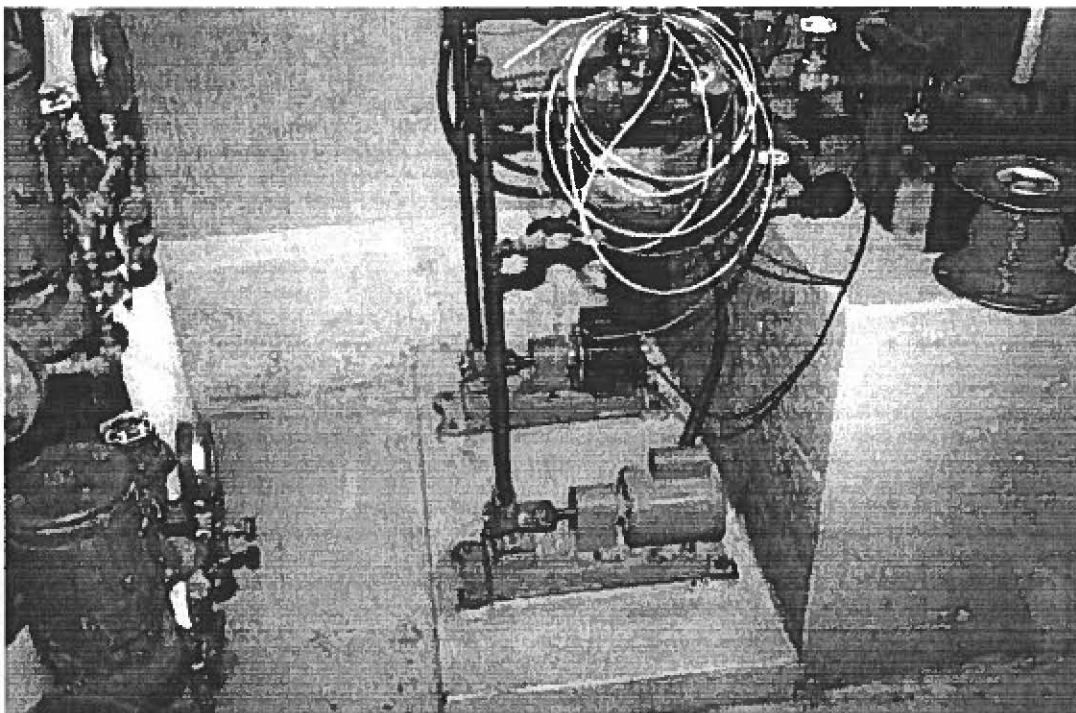
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

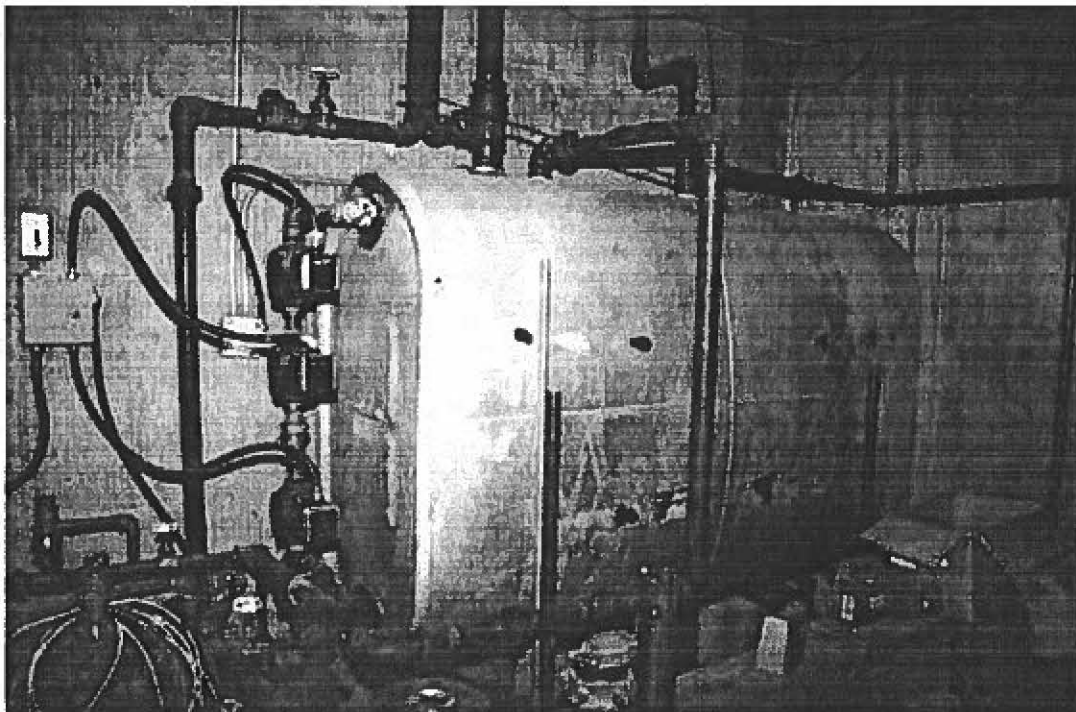
Reference # 2.51

This is a photograph of the fuel oil transfer pumps.



Reference # 2.52

This is a photograph of the non-ULC listed, interior fuel oil daytank.



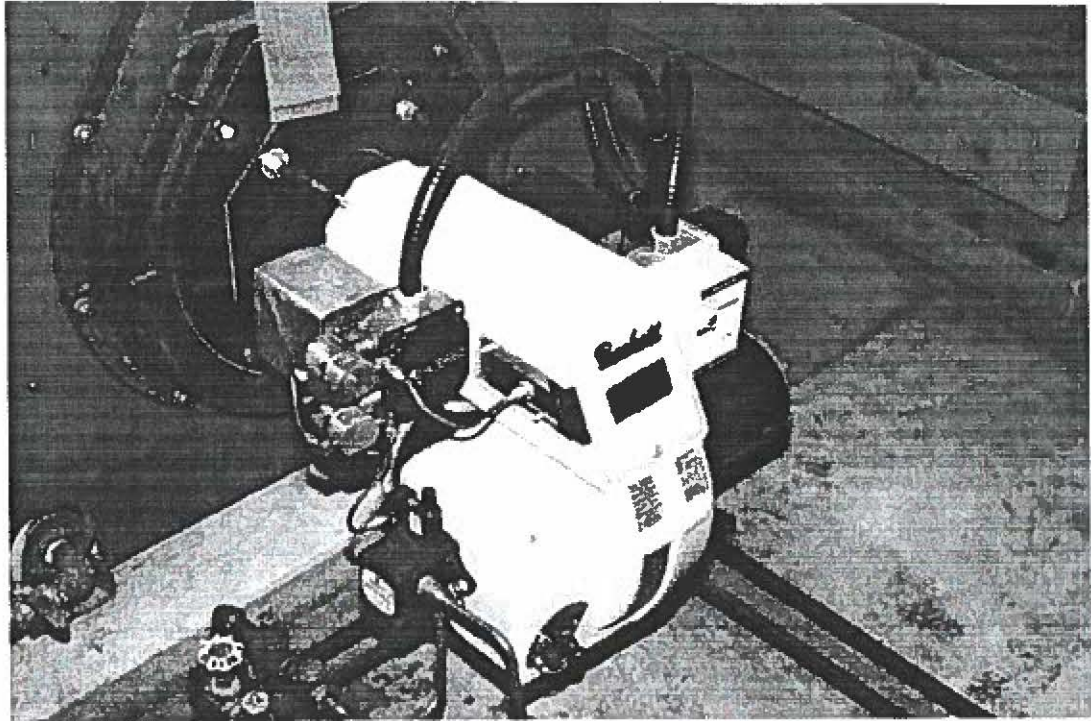
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

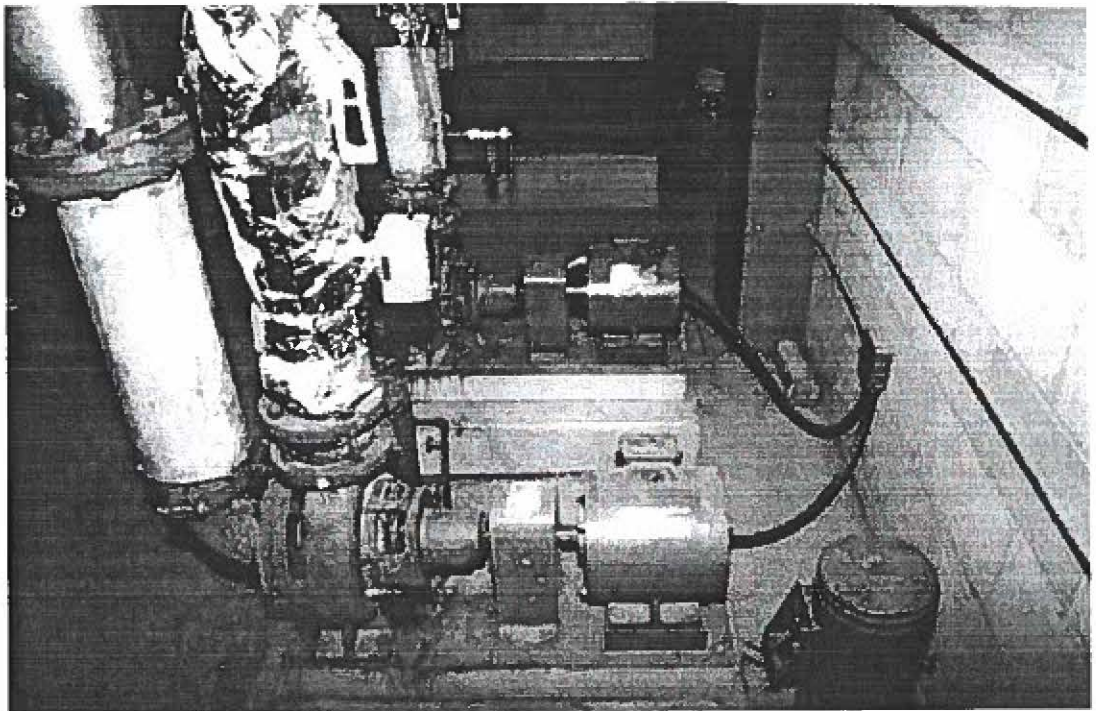
Reference # 2.53

This is a photograph of the boiler oil burner.



Reference # 2.54

This is a photograph of the Primary HW circ. pumps P-1 and P-2.



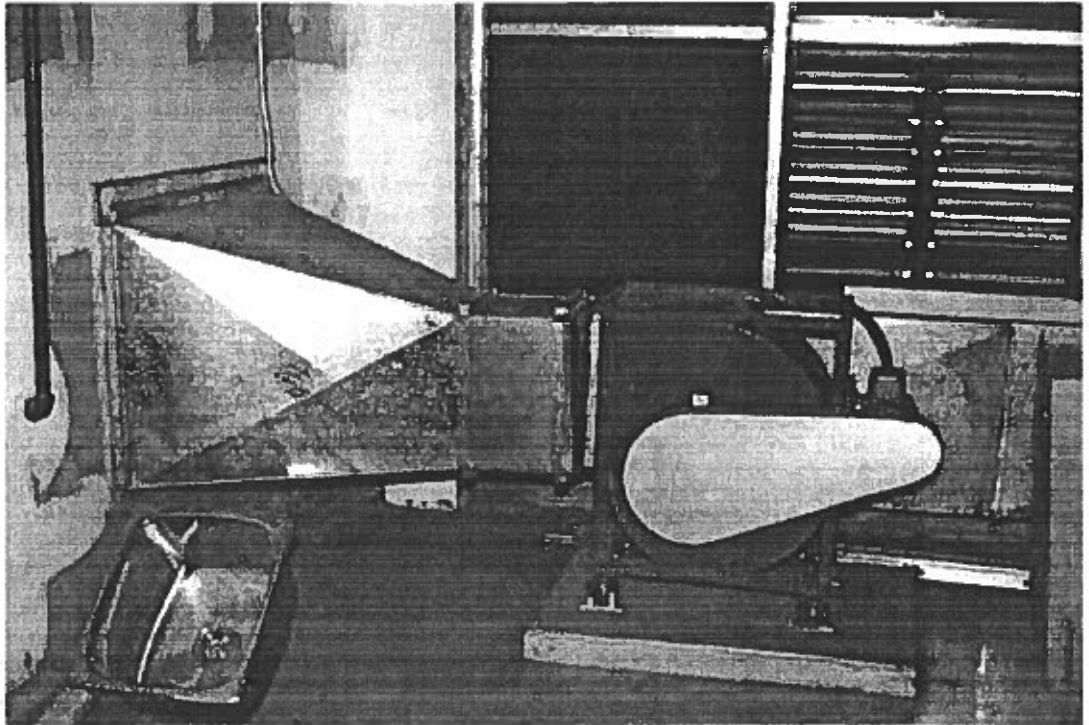
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

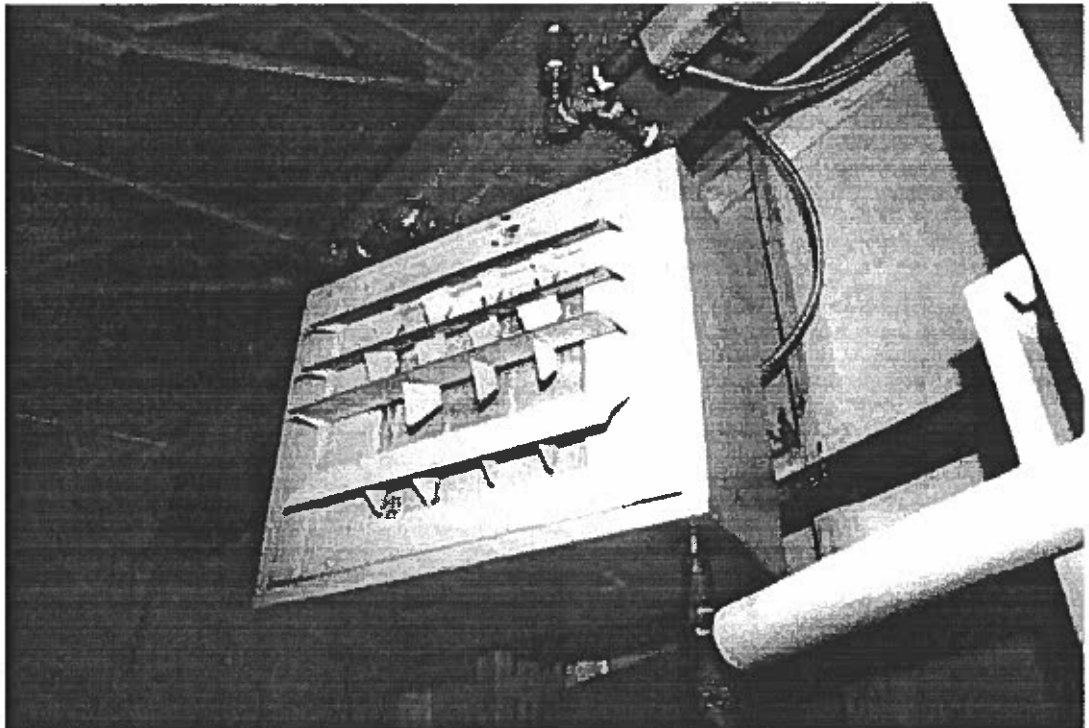
Reference # 2.60

This is a photograph of
exhaust fan F-3.



Reference # 2.61

This is a photograph of
a unit heater.



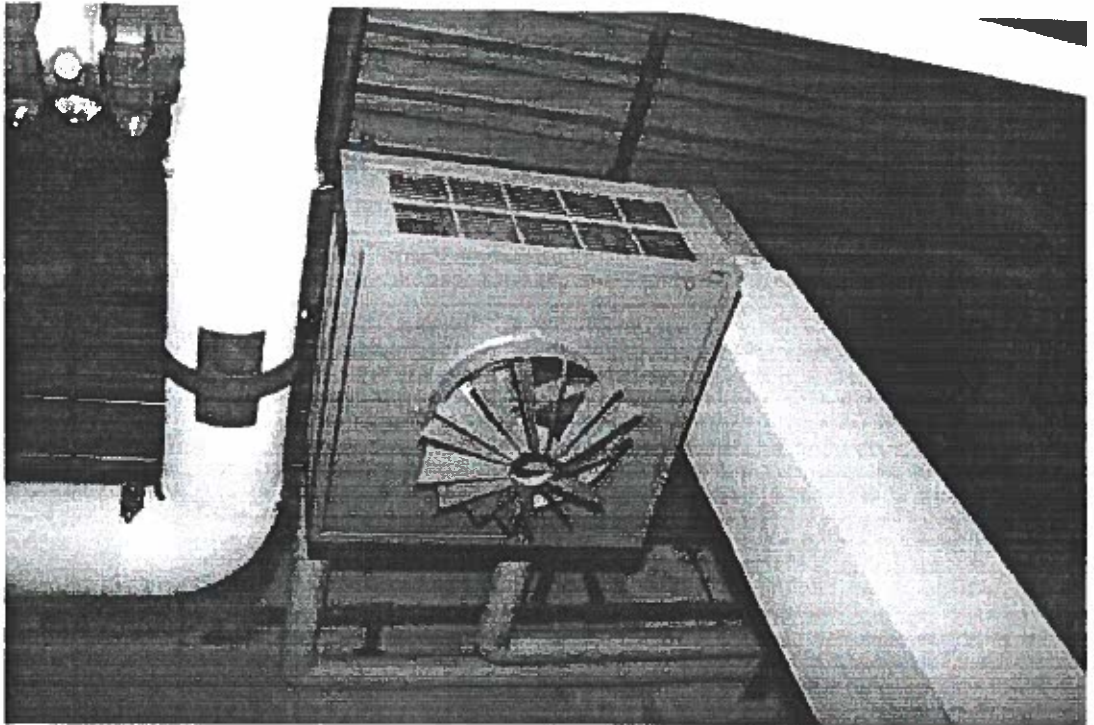
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

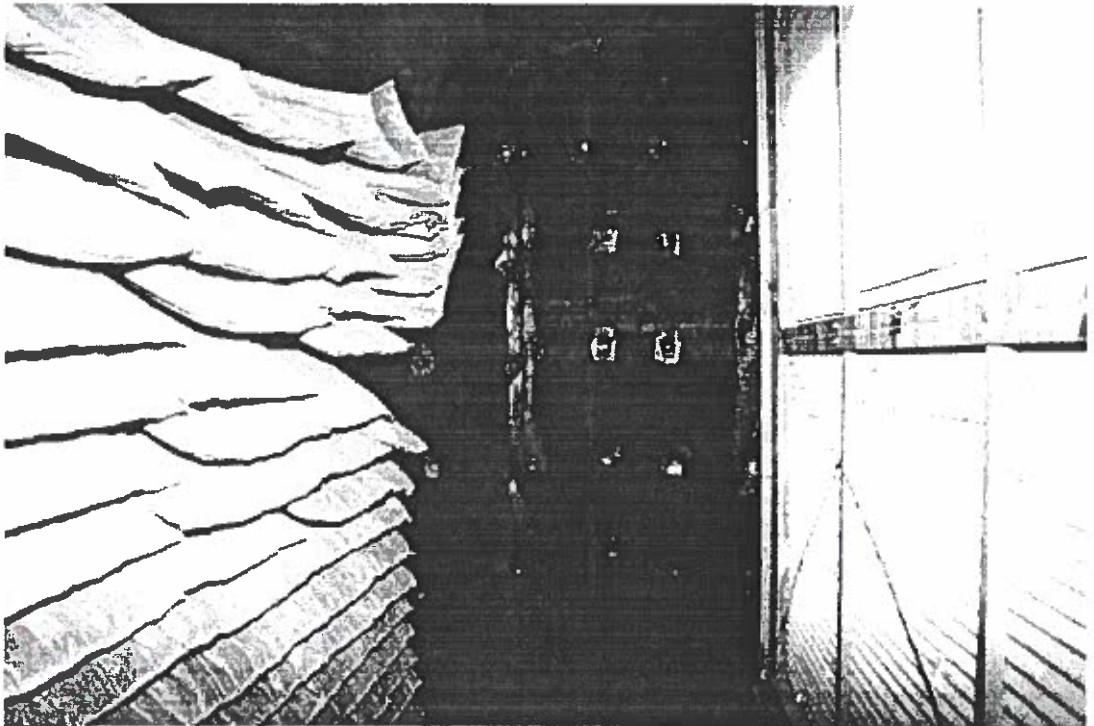
Reference # 2.62

This is a photograph of
a unit heater
(Penthouse area)



Reference # 2.63

This is a photograph of
the bag filter on AH-1.



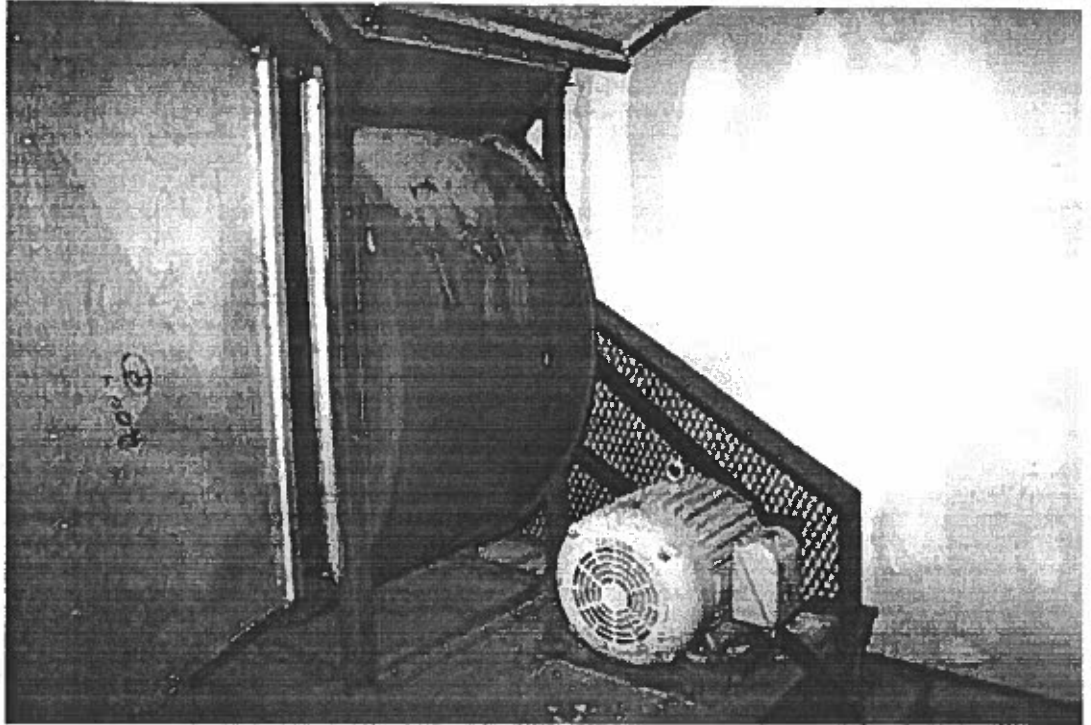
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

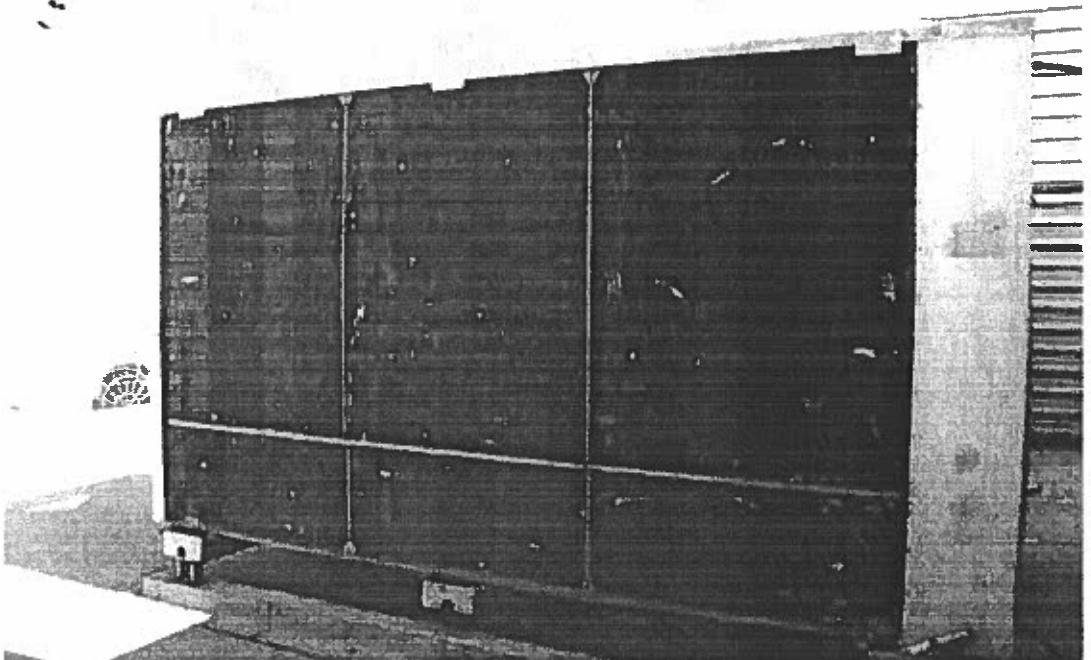
Reference # 2.64

This is a photograph of
Supply Fan F-1.



Reference # 2.65

This is a photograph of
a remote air cooled
condenser.



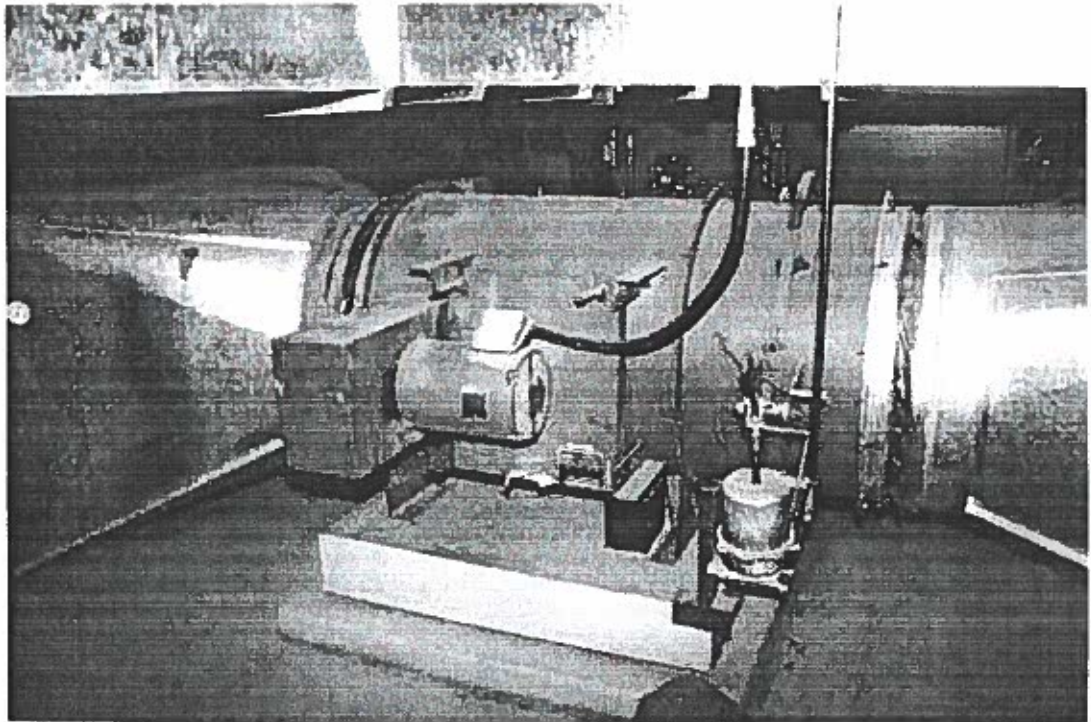
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

Reference # 2.66

This is a photograph of Return Fan F-6.



Reference # 2.67

This is rotated view of the filters in AH-2.



Reference Photographs

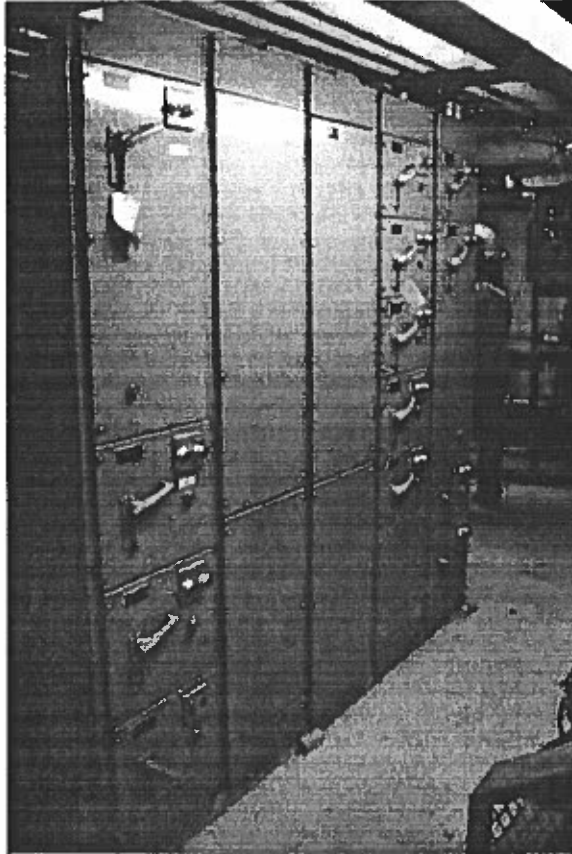


FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

Reference # 3.10

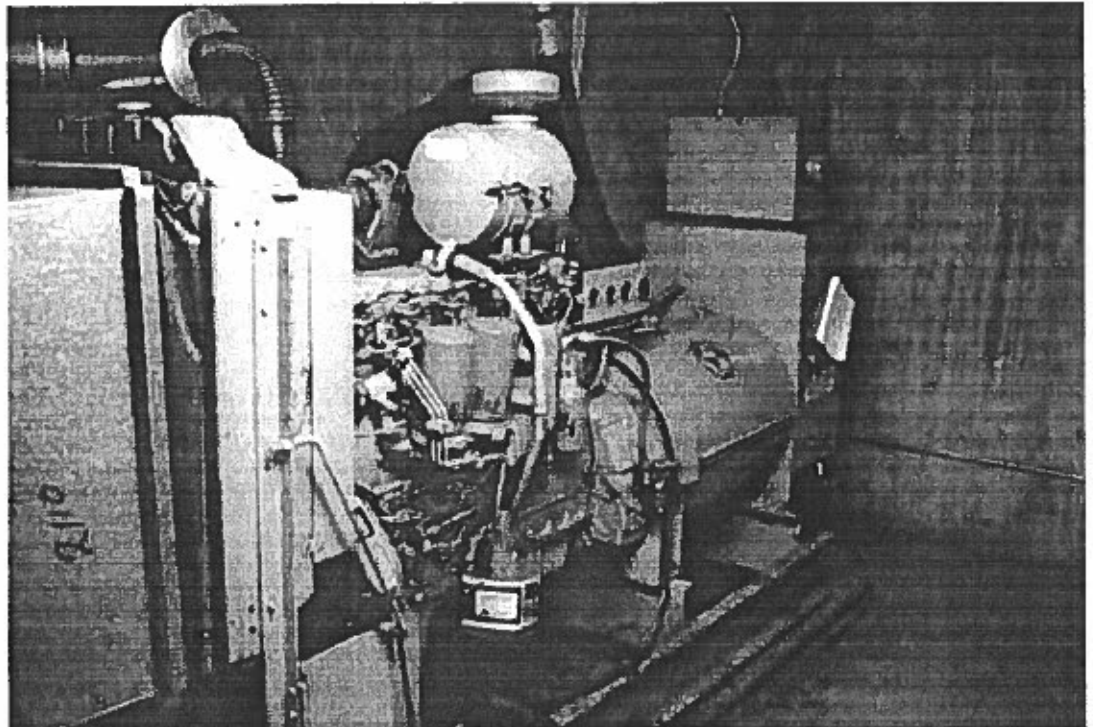
MCC#1

(Motor control centre)



Reference # 3.11

Stand-by generator.

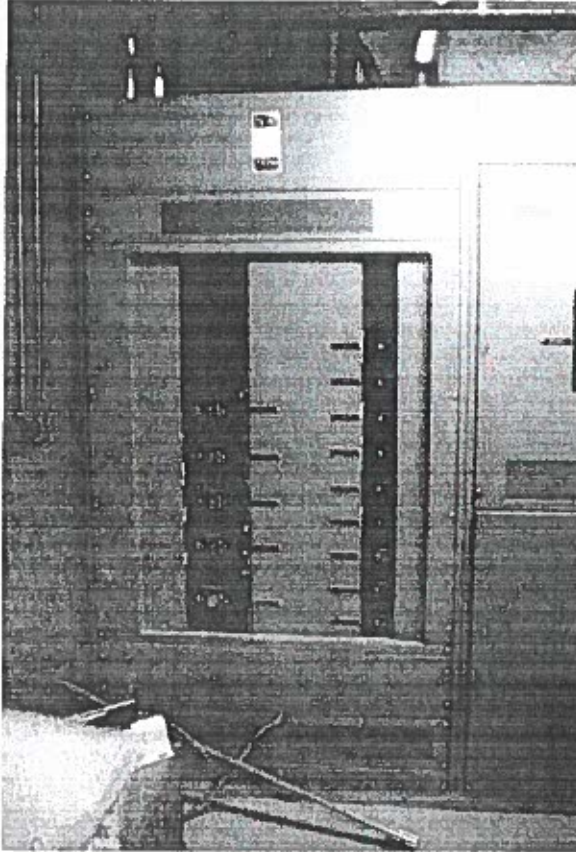


Reference Photographs



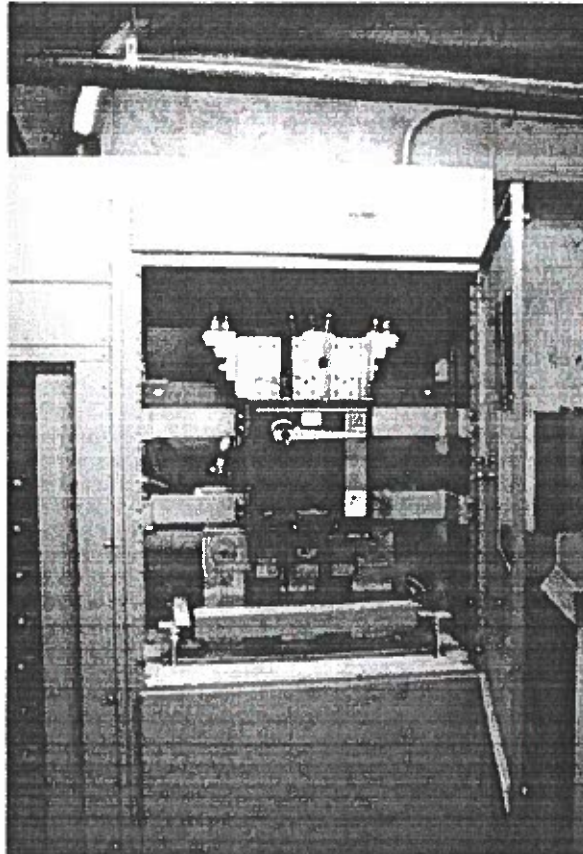
Reference # 3.12

Main central
distribution panel.



Reference # 3.13

Main distribution
panel.



Reference Photographs

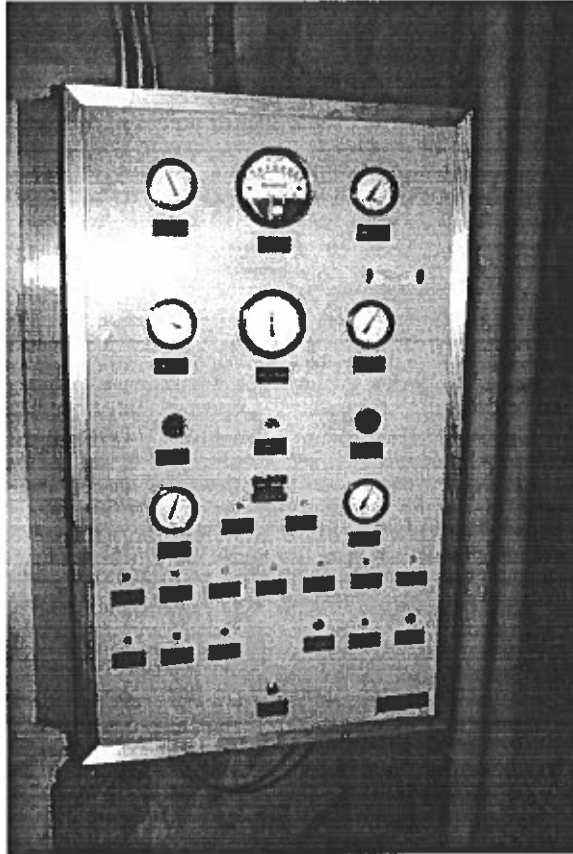


FERGUSON SIMEK CLARK

ENGINEERS AND ARCHITECTS

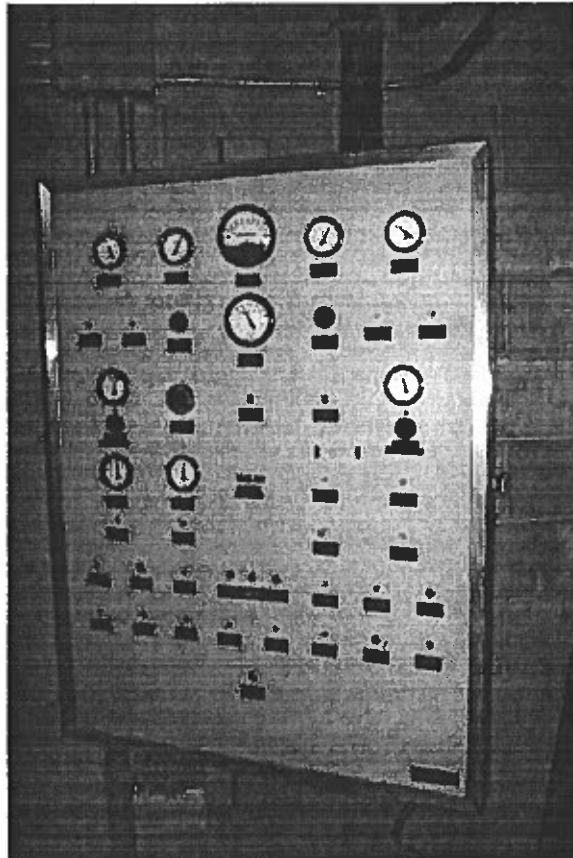
Reference # 3.14

This is a photograph of a control panel located within the penthouse.



Reference # 3.15

This is a photograph of the control panel located within the Basement Mechanical room.



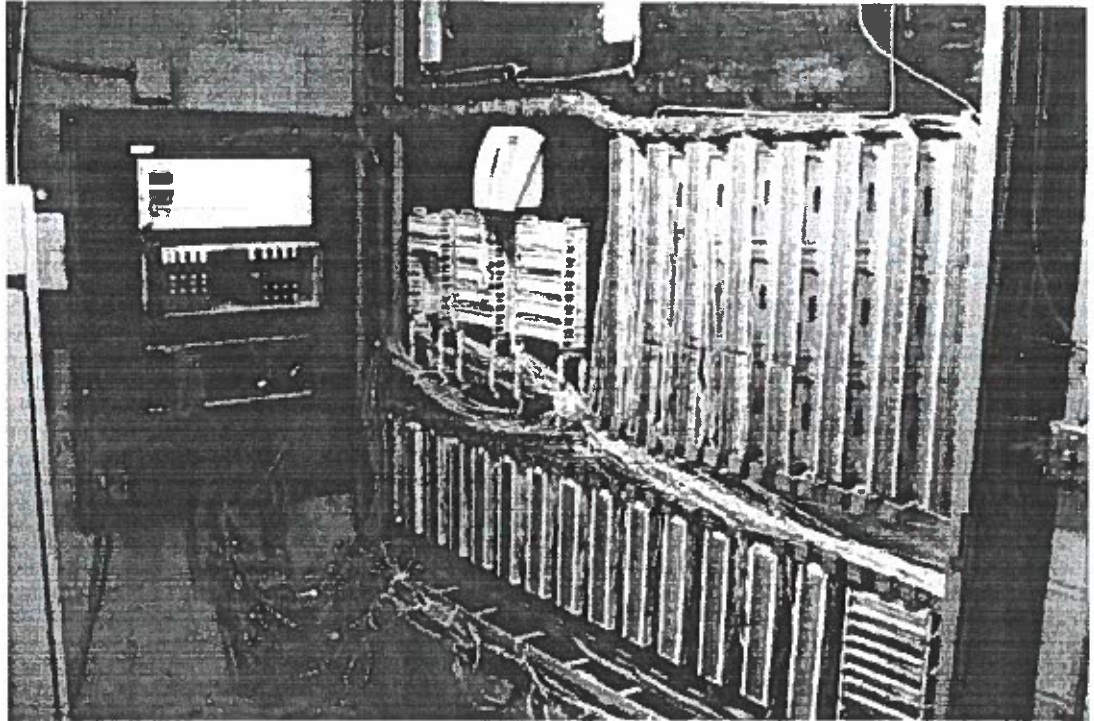
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

Reference # 3.20

Communications board.



Reference # 3.21

Fire alarm panel.



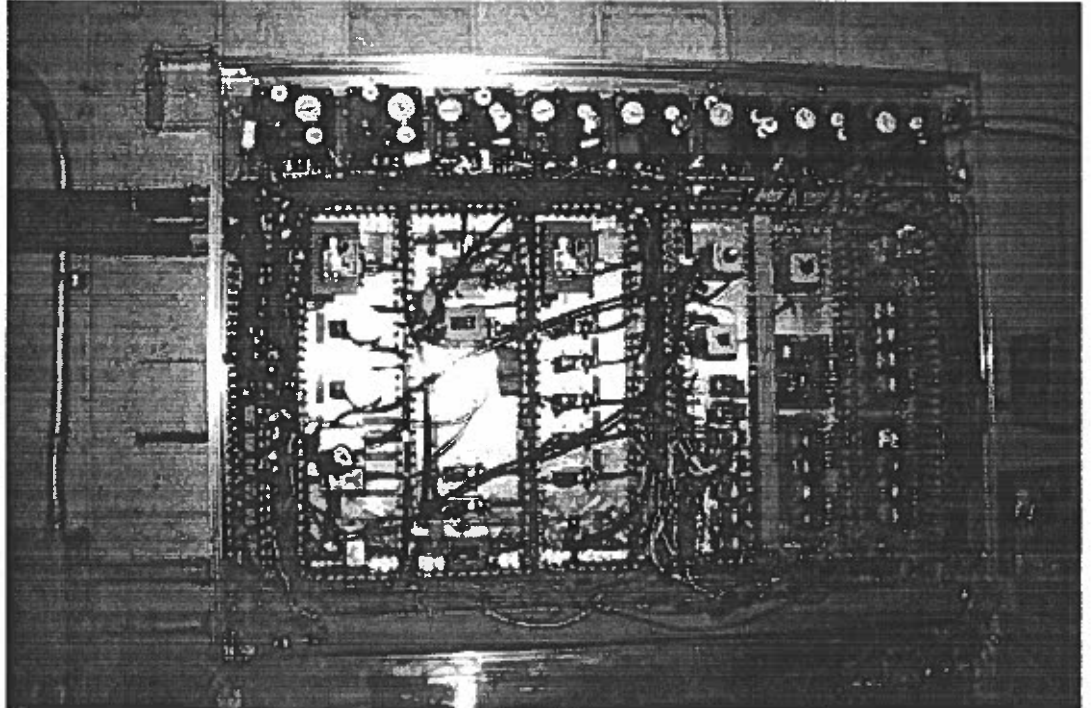
Reference Photographs



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS

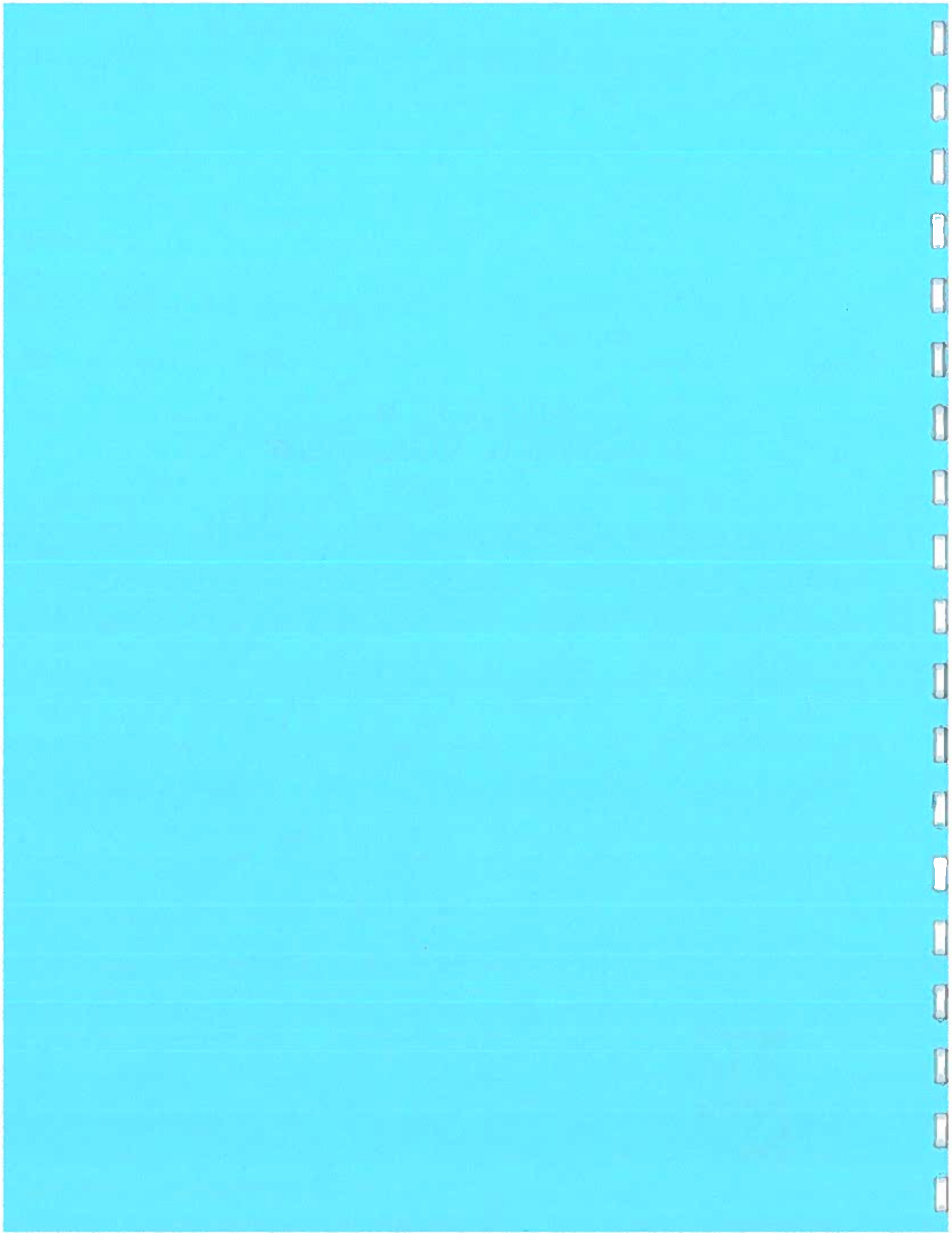
Reference # 3.22

This is a rotated,
interior, view of the
Basement control
panel.



APPENDIX B
FUNCTIONAL ASSESSMENT







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PLANNING
ASSOCIATES**

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WORKING PAPER

FUNCTIONAL ASSESSMENT

YELLOWKNIFE COURTHOUSE

June 15, 1998

1. INTRODUCTION

1.1 BACKGROUND

Ferguson Simek Clark and Matrix Planning Associates have been retained by the Departments of Justice and Public Works and Services to conduct an assessment of options for the accommodation of court services in Yellowknife. The study is addressing two specific alternatives:

- Constructing a new courthouse.
- Continuing to use the existing courthouse.

The latter includes the probable redevelopment of the existing building to provide a better fit with requirements for the Court of Appeal, Supreme Court and Territorial Court of the N.W.T.

1.2 PURPOSE OF WORKING PAPER

As part of the project, Ferguson Simek Clark will be conducting a detailed technical analysis of the existing courthouse, including structural, mechanical, electrical and architectural systems. This work will identify any required upgrading of building systems, as well as associated costs.

At the same time, Matrix will be addressing functional deficiencies which affect the operation of the Courts. The purpose of this Working Paper is to present the key initial results of our analysis. This information is intended for review and comment by members of the Strategy Committee. Any comments will be reviewed as part of the agenda for Meeting 3, Needs Assessment, on July 6.

This Working Paper does not address the fit between the existing building and long-term space requirements. These will be identified as part of our Needs Assessment work. It similarly does not discuss specific design details such as courtroom layouts or the provision of locks or card readers in specific locations.

In conjunction with both the technical assessment and a review of future court requirements, it will provide the basis for the production of alternative redevelopment concepts for the existing courthouse.

1.3 SOURCES OF INFORMATION

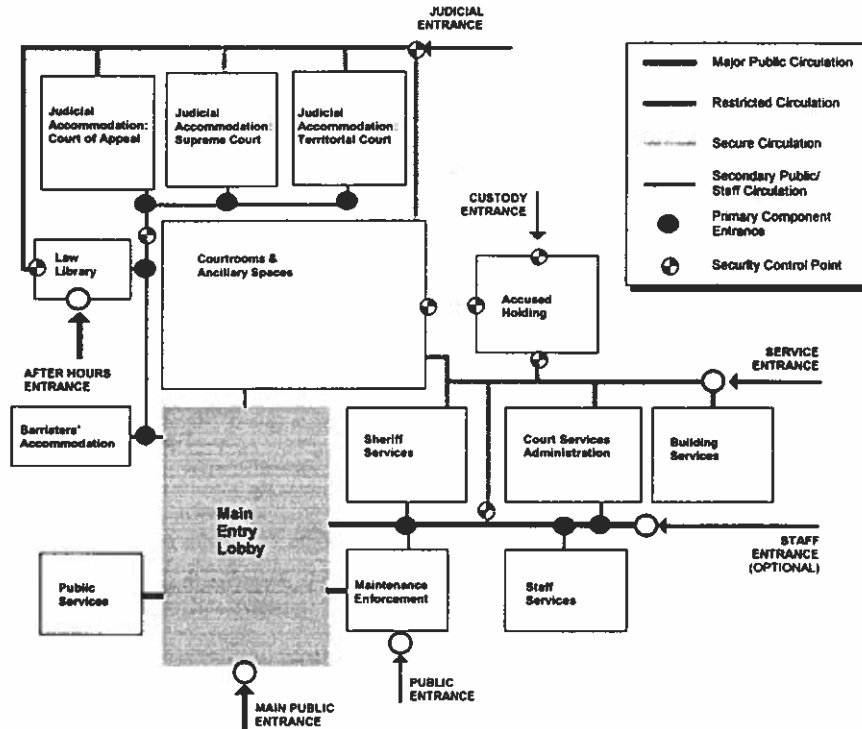
The information presented in this Working Paper is based on a number of sources, including:

- Issues raised at Meeting 1 of the project Strategy Committee.
- Subsequent interviews with the Chief Justice of the Court of Appeal, the Chief Justice of the Supreme Court, and the Chief Judge of the Territorial Court.
- Meetings with the Director and Acting Director of Court Services, as well as the Court Sheriff.
- A May 1998 tour of the courthouse.
- A review of a Security Audit of the building conducted for the government by an outside consultant.
- A previously produced MPA report entitled Guidelines for the Planning and Design of Law Court Facilities in British Columbia.

It is anticipated that additional interviews will be held with other knowledgeable individuals, including members of the RCMP, federal prosecutors, Court Reporters, and members of the Defense Bar whose area of practice includes Civil, Criminal and Family law.

2. ASSESSMENT FRAMEWORK

The diagram below illustrates the generic layout of components in a typical new courthouse. It indicates the relative location of functional components, as well as circulation systems and major access control points, primarily between building zones. It is intended for illustrative purposes only, and does not necessarily indicate how the court facilities in Yellowknife would be organized.



A primary requirement for courthouse facilities is the provision of separate circulation systems for members of the Judiciary, persons in custody, and the general public. The latter group includes court participants such as victims, witnesses, jury members, parties in civil and family matters, and gallery spectators, as well as others such as individuals using Court Registry services.

Key items illustrated above include:

- The provision of secure parking and secure access to judicial chambers, as well as dedicated secure access between chambers and courtrooms.
- Secure prisoner access between holding areas and courtrooms. The docket courtroom is normally located as close to the main holding area as feasible due to the high volume of movement.
- Separate after hours access to the courthouse library.
- The organization of the building into judicial, staff, public and prisoner zones.

Several items may require clarification:

- Jury deliberation rooms are included within the Courtrooms and Ancillary Spaces component. There must be secure access between courtrooms and jury rooms. A secure circulation route to an enclosed parking area is also desirable for transporting sequestered juries to and from the courthouse.
- All courtroom entrances would be locked when not in use, including dedicated judicial entrances from chambers areas.
- A separate staff entrance is optional, dependent in part on the location of staff parking areas. A semi-secure fenced compound for staff parking would be desirable.
- If Maintenance Enforcement remains in the courthouse, it may be desirable to locate it on the main floor with both a dedicated public “storefront” entrance and a separate staff entrance into the building.
- Building Services refers to central building mechanical and maintenance areas. A dedicated service entrance is desirable for deliveries of items such as furniture and equipment and office supplies.

2.1 APPROACHES TO BUILDING CIRCULATION

There are two general approaches that are normally taken to meeting courthouse circulation requirements.

Low Rise Building

In a low rise building, judicial chambers are located along a secure corridor in back of a row of adjacent courtrooms. This provides private judicial access to the courtrooms. Dedicated elevator access is also provided between a secure underground parking area and judicial chambers. The public enters courtrooms from public lobbies and waiting areas, while staff use public and/or judicial corridors. Prisoner holding areas are normally located above or below the level of the courtrooms, with dedicated stairwells allowing for secure movement between holding areas and courtrooms.

High Rise Building

High rise courthouse buildings must rely more heavily on elevators for much of the movement within the building. Dedicated elevators are likely to be required for the judiciary; the public and staff; and prisoners.

High traffic areas, such as the Registry and docket courtroom are located on the main floor where possible. Other courtrooms are located on upper levels. In high use courthouses, escalators may be used to transport the public to courtrooms on a second level.

The building is normally zoned so that the highest use areas are closest to the ground level, while less heavily used facilities are located on upper levels. In the case of a high rise building, judicial chambers would typically be located on upper levels, with elevator access to secure vestibules located adjacent to courtrooms.

3. EXISTING COURTHOUSE

3.1 OVERVIEW

The existing Yellowknife Courthouse is a six-story structure built in 1978 for use as a leased office building. The Department of Justice, as well as the Courts, were the initial tenants, and have occupied the facility for the past twenty years. Leasehold improvement were initially made to accommodate court requirements, and there have been interim renovations to improve the functionality of the facility.

3.2 BUILDING LAYOUT

We are attempting to obtain an accurate set of drawings illustrating current building use. Based on our tour of the facility and reference to rough floor plans, our understanding is that the building is organized as follows.

Main Floor

The main floor houses the courthouse library, the sheriff's office and prisoner holding cells. There is also a main entry lobby that has been subdivided to control public movement within the building. One side of the lobby accesses a pair of elevators that service all six floors. The other side provides access to a circular stair which links the first and second floors.

A corridor entered from the elevator lobby allows lawyers to enter the prisoner holding area to interview clients. A card reader has been installed to provide after hours access from the lobby to the courthouse library.

There is exterior parking at grade level adjacent to the building, as well as a dedicated entrance to the prisoner holding area.

Second Floor

The majority of court facilities are located on the second floor. This includes:

- One courtroom which is used primarily by the Court of Appeal and Supreme Court, and a second which is used primarily by the Territorial Court. The latter is used by a Justice of the Peace for evening court sittings.
- Three chambers and clerical and support space for the Supreme Court.
- Four Territorial Court chambers for Judges and Justices of the Peace, as well as clerical and support space.
- An integrated Court Registry area, including exhibit storage.
- A jury deliberation room.
- Two interview rooms.
- A public waiting area and washrooms.

Third Floor

The remainder of the court facilities are located on the third floor. This includes:

- A third courtroom, which is normally used by the Territorial court.
- A barristers' lounge and robing areas.
- Legal Registries, including Land Titles.
- Office space for court reporters.
- Offices for the Maintenance Enforcement Program.
- A public waiting area and washrooms.

Other Floors

The three upper floors of the building are used for Department of Justice administrative functions. The sixth floor holds the offices of the Commissioner of the Northwest Territories.

4. FUNCTIONAL DEFICIENCIES

4.1 OVERVIEW

Many of the functional deficiencies associated with the existing court facilities reflect the inappropriate use of space, as well as a lack of attention to providing the required separate circulation systems. This is due in part to the fact that the building was originally designed to accommodate general-purpose office space, rather than specialized court facilities.

A more fundamental problem is the mix of uses in the building, which includes court functions, administrative office space, and other functions requiring public access. This has resulted in significant problems in controlling public movement within the building.

The remainder of this Working Paper summarizes major building deficiencies in relation to the ideal models discussed in Section 2. It is organized by functional component.

4.2 COURTROOMS AND ANCILLARY SPACES

Courtroom Numbers and Sizes

The number of courtrooms is insufficient to meet current demands. The Territorial Court would prefer to have a Justice of the Peace hearing cases both during the day and in the evening, but the courtroom on the third floor is often needed to hear other Territorial Court matters.

The Court of Appeal sits periodically in Yellowknife, and arrangements normally are made to schedule Supreme Court cases around these periods.

The size of the Supreme Court courtrooms on Level Two is adequate for most courtroom functions. On docket days the Territorial Court is often too small, as there may be as many as 60-70 accused. The courtroom on Level Three is smaller than desirable and has no formal dais for use by Territorial Court judges.

There is currently a need for one larger courtroom seating up to 200 people to accommodate entire jury panels, high profile trials, and ceremonial events.

Courtroom Access

While both of the courtrooms on Level Two have direct and secure prisoner access by stairwells from the holding area, there is no secure access to the courtroom on Level Three. This limits its usefulness for hearing criminal cases.

Judicial access to the Court of Appeal/Supreme Court courtroom is extremely awkward. The only entry not requiring crossing public waiting areas is accessed through one of the Supreme Court Justice's chambers.

While access to the Territorial courtroom appears to be adequate, there is no secure access for members of the judiciary to the courtroom on Level Three. Moving to and from the courtroom requires passing through public waiting areas.

Courtroom Storage

Provision should be made for storage space both within and adjacent to the courtrooms. This could include storage areas for portable furniture and equipment, as well as lockable cupboards within the courtrooms for storage of large volumes of case documents for use by legal counsel and members of the judiciary.

Hearing Rooms

With an increased emphasis on Alternative Dispute Resolution, and Judicial Dispute Resolution, including pre-trial conferences and mediation, there is an increasing need for smaller less formal settings for members of the Judiciary to meet with others around a table, rather than in a courtroom setting.

Jury Deliberation Room

The single jury room has no daylighting and is not a comfortable setting for extended jury deliberations. Secure access from this area to an enclosed parking area is required. Shared use of a judicial elevator (on a scheduled basis) is acceptable. However, jurors should not have to pass through chambers areas.

Counsel Day Rooms

It is desirable to have private space where members of the prosecution and defense bar can meet during brief trial adjournments to meet to resolve issues. This could be a boardroom that could also be used for other court functions. The room should have video-conferencing facilities.

Retiring Room, Court of Appeal

The lack of a retiring room for the Court of Appeal adjacent to the courtroom, to which the panel (usually three) can retire to consider and reach decisions as the day's cases are heard. This must be in a secure area with no public access.

Stand Down Rooms

Dependent upon the location of judicial chambers in relation to courtrooms, stand down rooms may be required for members of the Judiciary.

Interview Rooms

There is an insufficient number of interview rooms, and the existing rooms are too small. There should be at least two per courtroom, adequately sized to accommodate private meetings between lawyers and their clients. It would also be desirable to have a sufficient number of rooms to allow space to be dedicated for use for the storage of documents during lengthy and complex civil trials.

Translation Booths

There are eight official languages in the NWT. At least one Supreme Court courtroom and one Territorial Court courtroom should be provided with soundproofed booths equipped for simultaneous translation.

Each booth should be capable of accommodating two translators, and should ideally be located within the line of sight of the Bench. There is an occasional need for translation into a third language. The use of a portable booth might be a viable solution.

Witness Waiting Rooms

There is a need for dedicated waiting rooms for witnesses. These are required for:

- The safety and comfort of victims and some other witnesses.
- The separation of parties in some family matters.
- Possible use for remote testimony by child witnesses.

A separate waiting area is required for members of the RCMP attending court as witnesses in criminal matters.

Waiting Areas

Public waiting areas are too small to provide opportunities for the separation of incompatible individuals and groups.

Courtroom Technology

There is currently a need to incorporate new and emerging technologies into courtrooms to expedite the justice process and limit system costs. This is a particular concern in the NWT, where travel time and costs can be substantial. Anticipated changes include increased use of computers in the courtroom by members of the judiciary, lawyers, and court clerks.

The capability for video-conferencing is also required for:

- Testimony by expert witnesses.
- First appearances by accused in custody in an alternative location.
- Warrants and bail applications in remote communities.
- The briefing by the Judiciary of individuals in remote locations on their rights and obligations prior to appearing for appeals or other matters.
- The possible participation in court of judges in remote locations.
- The display of evidence to members of the gallery.

Video-conferencing facilities are also expected to be provided in all communities throughout the Territory. Facilities and data transmission must be secure.

Space and staff will be required to monitor and control electronic equipment required for simultaneous translation, video-conferencing, and other functions. This could take the form of a designated audiovisual control room.

4.3 JUDICIAL ACCOMMODATION

Facilities for judicial accommodation are currently considered to be inadequate, and requirements are expected to increase in the future.

Judicial Chambers

There is a lack of office space to accommodate visiting members of the Court of the Appeal of the NWT, as well as visiting Deputy Judges from other locations. These individuals are currently sharing the use of other judicial chambers, or using available space such as the jury room.

A minimum of three visiting chambers are required, primarily for use by the Court of Appeal and Supreme Court. These chambers should have access to washrooms and robing areas.

A single visiting chamber is also required for the Territorial Court. This could double as chambers space for a Justice of the Peace.

Dedicated chambers should be provided for the Chief Justices of the Court of Appeal and Supreme Court, as well as the Chief Judge of the Territorial Court.

Court of Appeal

Under existing arrangements, the Chief Justice resides in Edmonton as part of a joint appointment as Chief Justice of the Alberta Court of Appeal. Justices from the NWT, Alberta and Yukon hear cases on a rotating basis.

It is possible that future workloads will dictate the establishment of a resident Court of Appeal for the Territory. If this occurs provision will need to be made for resident chambers, as well as workstations for administrative staff and other support functions.

Secure Parking Area

As discussed in Section 2, a secure enclosed parking area is required for members of the judiciary, with dedicated access to judicial chambers.

Judicial Dining Area

It may be desirable to have an area that could be used by members of the judiciary for eating meals. This would allow for more efficient use of members' time, as well as promoting collegiality. In a small community such as Yellowknife, it is difficult for members of the judiciary to eat in public restaurants without being recognized.

A dedicated dining room is not necessarily required, as use of a boardroom might be adequate. Similarly, while it would be difficult to justify the cost of on-site food preparation, a catering arrangement might be feasible. This will require further discussion.

Law Students Workspace

There is no workspace available for use by law students who conduct research and otherwise assist the members of the Judiciary.

Waiting Areas

There is a need for expanded waiting areas for visitors within the judicial chambers area.

4.4 COURT ADMINISTRATION

Court Registry

If operational funding is available, it would be desirable to have a staffed information booth in the main entry lobby while the courts are in session. This would avoid the need for Court Registry staff to respond to inquiries from the public regarding matters such as daily dockets, as well as directional information.

As discussed in Section 2, it may be desirable to have a separate staff entrance, dependent in part on the location of staff parking areas. If a decision is made to provide a separate staff entrance, it should be properly located with controlled access. There are currently problems associated with staff use of a separate exit door.

Legal Registry

The Legal Registries are located on the third floor of the building. Given their limited linkages to court operations, as well as the relatively high traffic volumes associated with functions such as land title searches, this is not an appropriate location.

Plans have already been made to relocate this function to the Stuart Hodgson Building in January 1999.

Exhibit Storage

The existing exhibit storage area is considered to be inadequate. A secure exhibit storage room with a specialized security vault is required. Storage of sealed documents and warrant authorizations are a particular concern. The room should be alarmed and monitored (see Section 4.7).

Records Storage

Current arrangements for storing inactive records in basement storage areas, as well as in off-site locations, has created problems for file retrieval. The building structure may limit options for solutions such as high-density file storage systems, due to requirements to accommodate higher than normal floor loads

4.5 SHERIFF SERVICES

There do not appear to be any particular problems with the location of the Sheriff's office. Direct access is provided to the holding cells. There could be some economies gained by having the Sheriff's office and Court Registry share the use of a common information counter, as well as office equipment. This would also allow for improved coverage during staff breaks.

4.6 ACCUSED HOLDING

Accused holding consists of three holding cells with varying capacities, as well as support spaces. There is no formal booking area. RCMP members, who also serve as escort officers, normally book persons in custody at the Yellowknife Correctional Centre. Prisoners bring bag lunches with them from the YCC.

Capacity

Staff have indicated that to date there has generally been adequate capacity to meet the demand. There have been occasions when interview rooms have had to be used inappropriately as holding space. Additional capacity is expected to be needed in the future.

Separation Requirements

Although there are no cells designated for specific groups, it has been possible to comply with requirements for the separate of male and females adults in custody, as well as adults and Young Offenders.

This may become more problematic in the future if criminal caseloads increase significantly, or there is a greater need to separate specific groups of individuals, such as members of rival gangs.

Layout of Holding Cells

All of the holding cells are equipped with one piece security sinks and toilets. Given that they are often used for group holding, the provision of secure modesty panels for toilets would be appropriate.

Visiting Areas

Provision has been made for two open interview rooms for lawyers and clients, as well as separate access for lawyers to the area. Consideration should be given to the provision of at least one secure interview booth. A secure polycarbonate panel with a pass-through for documents would separate lawyers and clients. This may require discussion with members of the Law Society.

Entry Sallyport

Provision should be made for a secure enclosed vehicle sallyport to transport persons in custody to and from the courthouse. There is currently only a designated entry door accessed from an outdoor parking area. Video surveillance of the area should be provided.

Staff Lockers and Training Area

Commissionaires under the supervision of the RCMP currently supervise the holding area. If a decision is made to assign this responsibility to the Sheriff's office, as well as to increase the number of Deputy Sheriffs, consideration should be given to providing a staff locker/change room and possibly a small fitness/training area.

Secure Storage

The Sheriff's office has responsibility for seizures in connection with court cases. There is a need for a secure unfinished (basement) storage area for seized items.

4.7 COURTHOUSE SECURITY

The lack of adequate security Courthouse security is the most prevalent deficiency of the existing building. It is a major issue that must be addressed as part of either the redevelopment of the existing facility or the construction of a new facility.

Courthouse security is currently a joint responsibility of the Sheriff's office, the RCMP, and a private firm that provides contracted after hour building security services.

Many of the existing deficiencies in courthouse security relate to operational issues and procedures. Consideration has been given to expanding the role of the Sheriff's office in having primary responsibility for building security.

In recent years, there has been some upgrading of building security, including the installation of card access control systems and door alarms.

Security Control Centre

The primary facility need is for an integrated security control centre with responsibility for all aspects of building security while the courts are in operation.

This would include monitoring of all alarm systems, including emergency alarm buttons, which should be provided:

- In all courtrooms at the Judge's bench, court clerk's desk, and at a Deputy Sheriff's station, if provided.
- In judicial chambers areas
- In Registry areas where there are cashier functions.

Video surveillance cameras would also be monitored from the security centre. Probable locations for cameras include the prisoner building entry, the visitors' entrance to the holding area, main holding area corridors and stairwells, the entrance to exhibit storage areas, and possibly public waiting areas.

Any other building alarm systems, such as door contact switches on exhibit storage areas, would also be monitored from this area. The control centre would have the capacity to communicate directly with the RCMP when emergency support is required.

Screening of Users

The acceptability of screening members of the public for contraband has been debated in several jurisdictions. It appears to be the consensus of the three levels of the Judiciary of the NWT that the use of an unobtrusive walkthrough metal detector at the courthouse entrance would be acceptable.

This would respond to increasingly frequent incidents taking place outside of the courtroom, such as domestic assaults in public waiting areas. It may also be desirable to consider the designation of the largest jury courtroom as a high security courtroom, with provision for additional screening, a private search area, and dedicated washrooms within a secure "suite."

Building Tenants

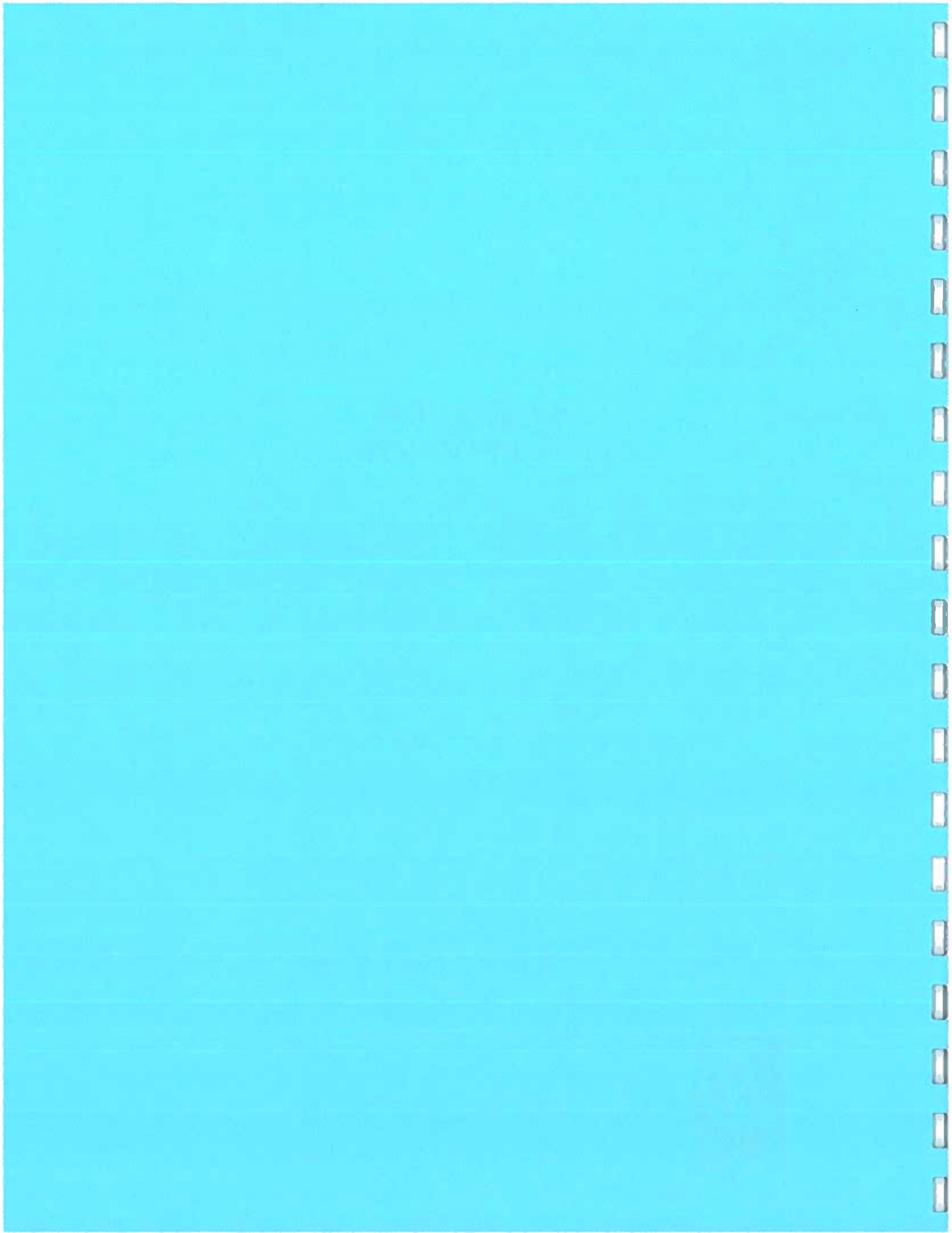
As noted previously, one of the major causes of building security problems is the mix of incompatible tenants. A decision has tentatively been made that in the long term Department of Justice administrative functions will not be co-tenants with the courts.

However, if a decision is made to redevelop the existing courthouse, it is possible that some space may not be required, at least in the short term, for court functions. Careful attention will need to be given to ensure that the selection of other tenants does not compromise court security. Selection criteria should include limited contact with the general public.

It will also be essential to ensure that after hours use by other tenants can be accommodated through the use of card readers or other means to limit access to court areas.

APPENDIX C
SPACE PROGRAMME





Accommodation Schedule, Yellowknife Courthouse

| Component | Space | Unit Area | Units | Area | Notes |
|--------------------|---|-----------|-------|--------|--|
| 1 Courtrooms | Courtroom, Remand | 145.0 | 1 | 145.0 | 80-90 in public gallery |
| | Courtroom, Large Jury | 170.0 | 1 | 170.0 | about 100 in public gallery |
| | Courtroom, Jury | 105.0 | 1 | 105.0 | |
| | Courtroom, Appeal/Civil | 90.0 | 1 | 90.0 | |
| | Courtroom, Trial | 80.0 | 2 | 160.0 | |
| | Meeting Room, Pre-Trial/ADR | 24.0 | 1 | 24.0 | |
| | Retiring Room, Court of Appeal | | | | Not currently in totals |
| | Breakout Room | 9.0 | 2 | 18.0 | |
| | Jury Room | 37.0 | 2 | 74.0 | also for ADR and pre-trial conferences |
| | Washroom, Private | 4.2 | 2 | 8.4 | primarily for juries |
| | Interview/Witness Waiting Room | 9.0 | 12 | 108.0 | can be witness waiting and other similar functions |
| | Furniture and Equipment Room | 12.0 | 1 | 12.0 | audio visual equipment, extra chairs |
| | Communications Equipment Room | 6.0 | 3 | 18.0 | |
| | Courtroom Waiting Area | 25.0 | 6 | 150.0 | |
| | Public Telephone | 0.9 | 8 | 7.2 | |
| Component Subtotal | | | | 1089.6 | |
| 2 Judiciary | Chambers, Resident Judge | 26.0 | 9 | 234.0 | includes washroom and robing area |
| | Chambers, Visiting Judge | 26.0 | 3 | 78.0 | includes washroom and robing area |
| | Office, Presiding JP | 10.8 | 1 | 10.8 | |
| | Office, Coordinator | 9.0 | 1 | 9.0 | |
| | Workstation, Secretary | 5.6 | 5 | 28.0 | |
| | Workstation, Law Clerk | 5.6 | 2 | 11.2 | |
| | Visitor Waiting Area | 6.0 | 1 | 6.0 | |
| | Filing Area | 0.5 | 13 | 6.5 | filing allocation for Registry and Sheriff |
| | Closet, Personal Belongings | 1.4 | 1 | 1.4 | |
| | Supplies/Communications Room | 9.0 | 1 | 9.0 | |
| | Judicial Meeting Room/Reference Library | 30.0 | 1 | 30.0 | capacity for 10 |
| | Component Subtotal | | | | 423.9 |

Accommodation Schedule, Yellowknife Courthouse

| Component | Space | Unit Area | Units | Area | Notes |
|---------------------|------------------------------------|-----------|-------|-------|----------------|
| 3 Administration | Office, Manager | 10.8 | 1 | 10.8 | |
| | Workstation, Supervisor | 9.0 | 3 | 27.0 | |
| | Workstation, Counter Clerk | 5.6 | 7 | 39.2 | |
| | Workstation, Courtroom Clerk | 4.7 | 10 | 47.0 | |
| | Office, Sheriff | 10.8 | 1 | 10.8 | |
| | Workstation, Deputy Sheriff | 4.7 | 3 | 14.1 | |
| | Workstation, Sheriff Counter Clerk | 5.6 | 1 | 5.6 | |
| | Meeting Room | 18.0 | 1 | 18.0 | capacity for 8 |
| | Visitor Waiting Area | 7.8 | 1 | 7.8 | |
| | Filing Area | 19.5 | 1 | 19.5 | |
| | Closet, Personal Belongings | 4.8 | 1 | 4.8 | |
| | Secure Exhibit Storage Room | 21.0 | 1 | 21.0 | |
| | Supply/Copier/Mail Room | 14.0 | 1 | 14.0 | |
| | Computer Communications Room | 9.0 | 1 | 9.0 | |
| | Form Filling Area | 6.8 | 1 | 6.8 | |
| | Counter Station | 4.5 | 3 | 13.5 | |
| | JP Hearing Room | 11.0 | 1 | 11.0 | |
| | Staff Lunchroom | 18.0 | 1 | 18.0 | |
| | Staff Washroom, Women | 11.4 | 1 | 11.4 | |
| | Staff Washroom, Men | 8.4 | 1 | 8.4 | |
| Robing Room | 8.0 | 1 | 8.0 | | |
| First Aid/Rest Room | 9.0 | 1 | 9.0 | | |
| Component Subtotal | | | | 334.7 | |

Accommodation Schedule, Yellowknife Courthouse

| Component | Space | Unit Area | Units | Area | Notes |
|---------------------|-------------------------------------|-----------|-------|------|---------------------------------|
| 4 Prisoner Handling | Security Control/Booking Room | 13.0 | 1 | 13.0 | |
| | Storage Room | 5.0 | 1 | 5.0 | |
| | Sallyport | 37.0 | 1 | 37.0 | |
| | Large Group Holding Cell, Men | 18.0 | 1 | 18.0 | holds up to 12; includes toilet |
| | Small Group Holding Cell, Men | 7.0 | 1 | 7.0 | holds up to 4; includes toilet |
| | Small Group Holding Cell, Women | 7.0 | 1 | 7.0 | holds up to 4; includes toilet |
| | Small Group Holding Cell, Boys | 7.0 | 1 | 7.0 | holds up to 4; includes toilet |
| | Single Holding Cell | 4.4 | 5 | 22.0 | includes toilet |
| | Lawyer/Prisoner Consulting Cubicle | 2.9 | 3 | 8.7 | |
| | Lawyer Waiting Area | 2.0 | 1 | 2.0 | |
| | Emergency Shower | 2.5 | 1 | 2.5 | |
| | Locker Room, Prisoner Escort, Men | 8.0 | 1 | 8.0 | |
| | Staff Washroom | 4.2 | 1 | 4.2 | |
| | Locker Room, Prisoner Escort, Women | 6.0 | 1 | 6.0 | |
| | Component Subtotal | | | | 147.4 |

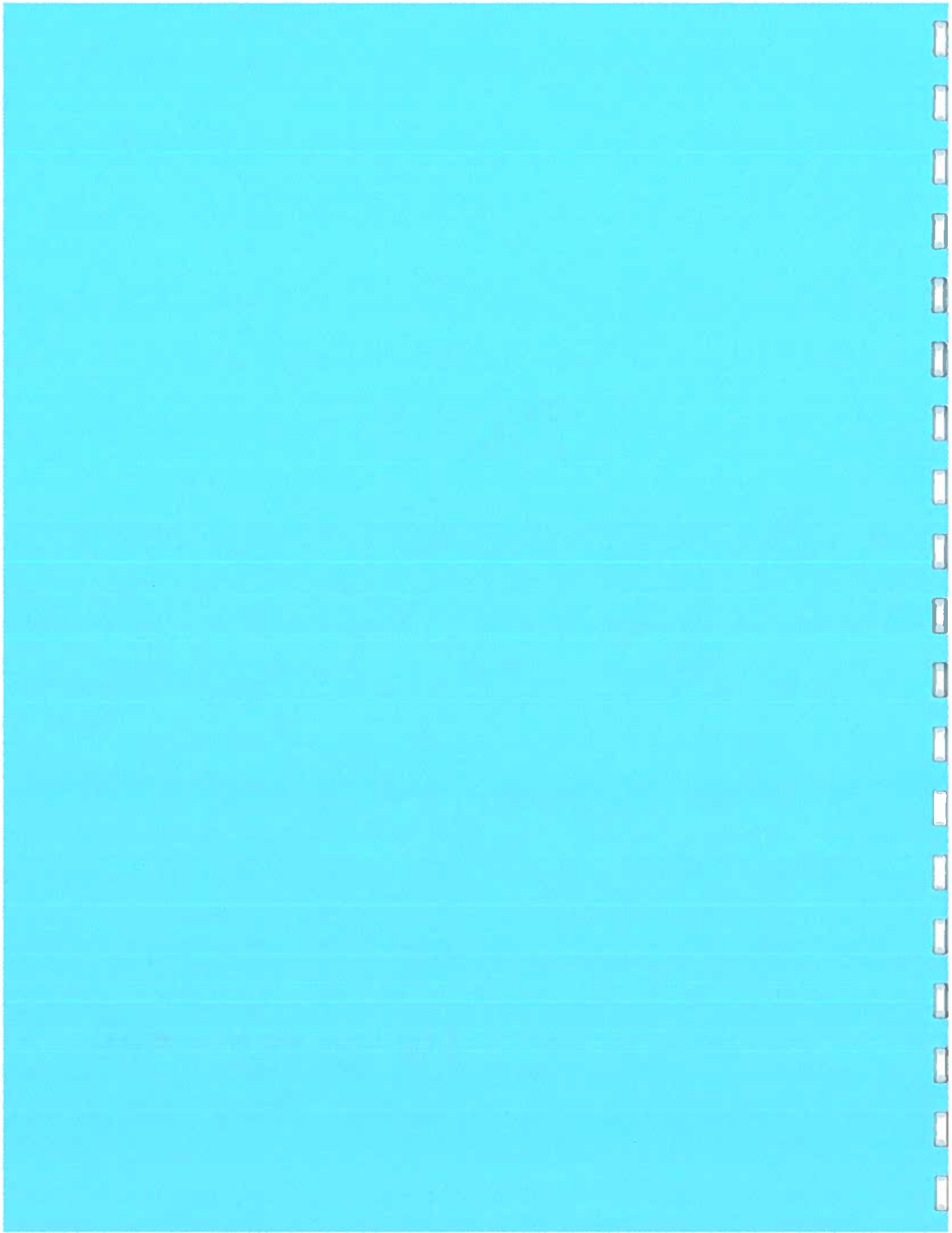
Accommodation Schedule, Yellowknife Courthouse

| Component | Space | Unit Area | Units | Area | Notes |
|---------------------|---------------------------------|-----------|-------|-------|--|
| 5 Public Services | Information Kiosk | 8.0 | 1 | 8.0 | |
| | Public Telephone | 0.9 | 2 | 1.8 | |
| | Security Screening | 5.0 | 2 | 10.0 | |
| | Building Security Office | 8.0 | 1 | 8.0 | |
| | Food Outlet | 6.0 | 1 | 6.0 | possibly vending machines |
| | Food Seating Area | 18.0 | 1 | 18.0 | capacity for 18 |
| | Counsel Lounge | 12.0 | 1 | 12.0 | capacity for 6 |
| | Washroom, Counsel | 4.2 | 1 | 4.2 | |
| | Robing Room | 7.0 | 2 | 14.0 | |
| | Court Library Work Area | 50.0 | 1 | 50.0 | |
| | Court Library | 200.0 | 1 | 200.0 | |
| | Office, Agency | 9.0 | 9 | 81.0 | Crown Counsel, Legal Aid, Social Agencies, Probation |
| | Visitor Waiting Area | 9.0 | 1 | 9.0 | Visitors to Agency Offices |
| | Washroom, Agencies | 4.2 | 2 | 8.4 | |
| Component Subtotal | | | | 430.4 | |
| 6 Building Services | Building Systems Control Room | 15.0 | 1 | 15.0 | |
| | Communications Room | 13.5 | 1 | 13.5 | |
| | Housekeeping Storage Room | 10.0 | 1 | 10.0 | |
| | Program Storage Area | 60.0 | 1 | 60.0 | inactive records, enforcement, exhibits, etc. |
| | Building Storage Area | 20.0 | 1 | 20.0 | |
| | Shipping/Receiving/Holding Area | 15.0 | 1 | 15.0 | |
| | Garbage Disposal Area | 12.0 | 1 | 12.0 | |
| Component Subtotal | | | | 145.5 | |
| 7 Program Parking | Judge's Stall | 13.0 | 9 | 117.0 | |
| | JP's Stall | 13.0 | 2 | 26.0 | |
| | Prisoner Transport Van Stall | 19.0 | 1 | 19.0 | |
| | Building Services Stall | 19.0 | 1 | 19.0 | |
| | Component Subtotal | | | | 181.0 |

APPENDIX D
COST ANALYSIS



FERGUSON SIMEK CLARK
ENGINEERS AND ARCHITECTS



**YELLOWKNIFE COURTHOUSE FEASIBILITY STUDY
FINANCIAL VARIABLES**

| ITEM | UNIT | COST/UNIT | NOTES |
|---|-------------------|-------------|--|
| Gross Floor Area of Existing Building | m ² | 6,520 | |
| Lease Entire Existing Building | m ² | \$151 | \$14 per sf per year base lease - amount used for DPWS office planning |
| Total Leasable Area in existing building | m ² | 5,199 | |
| Lease 100 % of existing building (per Year) | new base lease | \$783,489 | for entire building |
| Lease 55% (per year) | 55% of base lease | \$430,919 | lease for 55% of existing building (portion presently occupied by Courts) |
| New Courthouse Gross Floor Area | m ² | 5,261 | |
| Addition to new Courthouse in year 10 | m ² | 1,000 | |
| New Courthouse Gross Floor Area - After Addition | m ² | 6,261 | |
| Purchase New Property | m ² | \$462 | estimate based on lot cost of \$215,000/lot |
| Purchase New Property | lot | \$ 257,519 | 50 ft x 100 ft. lot + 1/2 lane 557.4 m ² |
| Pave new property for Parking | lot | \$ 45,000 | 50 ft x 100 ft. lot |
| Buy Existing Building | | | |
| value of property | 3 | \$ 257,519 | \$ 772,556 |
| value of 40 % construction | \$ 19,560,000 | 40% | \$ 7,824,000 |
| Calculated Purchase Price | | | \$ 8,596,556 |
| value of 20% new construction | \$ 19,560,000 | 20% | \$ 3,912,000 |
| Calculated Value after 20 years | | | \$ 4,684,556 |
| Mortgage Rate | p.a. | 6.00% | |
| Mortgage Term | years | 20 | based on Gov. of Newfoundland 30 yr. Bond rate planning term for study |
| New Construction Cost | m ² | \$ 3,000 | Conservative Construction Cost Estimate |
| Major Renovations 75% of new cost | m ² | \$ 2,250 | |
| Minor Renovations 50% of new cost | m ² | \$ 1,500 | |
| Operating and Maintenance Costs Exist. Building | p. a. | \$ 600,000 | from DPWS historical data |
| Operating and Maintenance Costs for 55 % of Existing Building | p. a. | \$ 330,000 | |
| Operating and Maintenance Costs New Courthouse | p. a. | \$ 392,000 | 5% less than existing, adjusted to gross floor area |
| Operating and Maintenance Costs New Courthouse after Addition | p. a. | \$ 490,000 | 5% less than existing, adjusted to gross floor area |
| Project Overheads | | | |
| Renovation - Fees & Expenses DPWS | 12.70% | | |
| Renovation Total Percentage | 4.30% | 17.00% | |
| New Construction - Fees & Expenses DPWS | 10.20% | | |
| New Construction Total Percentage | 4.30% | 14.50% | |
| Relocate Courts | \$ 20.00 | \$ 141,300 | cost per sm for 2860 m ² plus \$100 per person for phones + 3 days lost time per person per move |
| Temporary Rent | \$ 30.00 | \$ 85,800 | temporary rental for 2860 m ² at monthly rate indicated |
| Lost Time Program and Incidental Costs | \$ 60.00 | \$ 1,350.00 | \$ per hour per person x 3 days x 7.5 hrs. per day No allowance has been included for public information, new letterhead, lost time except for direct moving costs, program costs, or other incidental costs. |
| Grant In Lieu of Taxes | | 0.0206 | value of building and land x mill rate (14.6 municipal plus 6.0 school) / 1000 |

YELLOWKNIFE COURTHOUSE FEASIBILITY STUDY
BUILD NEW COURTHOUSE

| Description | Notes | Units | Cost/unit (\$) | \$ PROJECT | \$ COST |
|---|--|--------|----------------|----------------------|----------------------|
| Year 1 to 10 | | | | | |
| YEAR 1 PROJECT COSTS | | | | | |
| Relocation Costs | relocating Court to new building | 1 | \$ | 141,300 | |
| Property Acquisition | 50 x 100 city lots | 10 | \$ 257,519 | \$ 2,575,188 | |
| Site Development | allowance | LS | \$ 250,000 | \$ 250,000 | |
| Renovation Costs | N/A | 0 | \$ 2,250 | \$ - | |
| New Construction Costs | new 4 storey courthouse m ² | 5261 | \$ 3,000 | \$ 15,783,000 | |
| Project Overhead | construction | 14.50% | \$ 16,033,000 | \$ 2,324,785 | |
| | | | | \$ 21,074,273 | |
| YEAR 1 PROJECT \$ TO BE FINANCED | | | | | |
| YEAR 1 TO 10 COSTS | | | | | |
| Lease Costs (55% of Bldg) | 2.5 years until new building is ready | 2.5 | \$ 430,919 | \$ | 1,077,298 |
| Grant in Lieu of Taxes | for 8 years | 8 | 378,178.67 | \$ | 3,025,429 |
| Year 1 \$ Financing Costs Years 3 to 10 | yr. | 6.00% | \$ 21,074,273 | \$ | 8,821,786 |
| Year 1 \$ Principal Payments Years 3 to 10 | yr. | 6.00% | \$ 21,074,273 | \$ | 6,748,990 |
| O&M Costs Years 1 to 2.5 | 55% exist. building for 2.5 years | 2.5 | \$ 330,000 | \$ | 825,000 |
| O&M Costs Years 2.5 to 10 | new building for 7.5 years | 7.5 | \$ 392,000 | \$ | 2,940,000 |
| | | | | Year 1 to 10 | \$ 23,438,503 |
| YEAR 11 PROJECT COSTS | | | | | |
| Addition Costs Year 10 | m ² for 2 medium or 3 small court rooms | 1,000 | \$ 3,000 | \$ 3,000,000 | |
| Selective Renovation | to accommodate new court rooms | 200 | \$ 1,500 | \$ 300,000 | |
| Project Overhead Addition | | 14.50% | \$ 3,000,000 | \$ 435,000 | |
| Project Overhead Renovation | | 17.00% | \$ 300,000 | \$ 51,000 | |
| | | | | \$ 3,786,000 | |
| YEAR 11 PROJECT \$ TO BE FINANCED | | | | | |
| Grant in Lieu of Taxes | for 10 years | 10 | 378,178.67 | \$ | 3,781,787 |
| Year 1 \$ Financing Costs for Years 11 to 20 | interest on 17 year term | 6.00% | \$ 21,074,273 | \$ | 5,138,187 |
| Year 1 \$ Principal Payments for Years 11 to 20 | principal on 17 year term | 6.00% | \$ 21,074,273 | \$ | 14,325,283 |
| Year 10 \$ Financing Costs for Years 11 to 20 | interest on 10 year term | 6.00% | \$ 3,786,000 | \$ | 1,357,961 |
| Year 10 \$ Principal Payments Years 11 to 20 | principal on 10 year term | 6.00% | \$ 3,786,000 | \$ | 3,786,000 |
| O&M Costs Year 11 to 20 | | 10 | \$ 490,000 | \$ | 4,900,000 |
| | | | | \$ 24,860,273 | \$ 33,289,217 |
| 20 YEAR TOTAL COST PROJECTION | | | | | |
| Residual Value | Year 1 Construction + 60% Year 10 Construction | | | \$ | 56,727,720 |
| | | | | | 11,118,388 |
| | | | | | \$ 45,609,332 |

YELLOWKNIFE COURTHOUSE FEASIBILITY STUDY
LEASE AND RENOVATE EXISTING BUILDING

| Description | Notes | Units | Cost/unit (\$) | \$ PROJECT | \$ COST |
|---|--|--------|----------------|----------------------|----------------------|
| Years 1 to 10 | | | | | |
| YEAR 1 PROJECT COSTS | | | | | |
| Temporary Fitup Costs for relocated courts | allowance | LS | | 300,000 | |
| Buy Property for Parking (52 extra spaces) | 50 ft. x 100 ft. city lots | 3.25 | \$ 257,519 | \$ 836,936 | |
| Site Development | pavement | 3.25 | \$ 45,000 | \$ 146,250 | |
| Major Renovations Costs | at 75% of new construction cost | 3500 | \$ 2,250 | \$ 7,875,000 | |
| Structural Renovations for Ceiling Height | allowance | LS | | 1,000,000 | |
| Selective Renovations Costs | at 50% of new construction cost | 1800 | \$ 1,500 | \$ 2,700,000 | |
| New Construction Costs | N/A | 0 | \$ 3,000 | | |
| Project Overhead | on site develop. & renovations | 17.00% | \$ 12,021,250 | | |
| | | | | \$ 14,901,799 | |
| YEAR 1 PROJECT \$ TO BE FINANCED | | | | | |
| YEAR 1 TO 10 COSTS | | | | | |
| Lease Costs (55 % of Building) | 1 year (during design and tender) | 1 | \$ 430,919 | | \$ 430,919 |
| Lease Costs (100 % of Building) | 9 year | 9 | \$ 783,489 | | \$ 7,051,404 |
| Relocation Costs | accommodation | 2 | \$ 141,300 | | \$ 282,600 |
| Temporary Rent Costs | (months) | 8 | \$ 85,800 | | \$ 686,400 |
| Year 1 \$ Financing Costs for Year 1 to 10 | interest on 20 year term | 6.00% | \$ 14,901,799 | | \$ 7,652,543 |
| Year 1 \$ Principal Payments for Year 11 to 20 | principal for property, renov. & fees | 6.00% | \$ 14,901,799 | | \$ 5,339,524 |
| O&M Costs Year 1 | 55% existing building for first year | 1 | \$ 330,000 | | \$ 330,000 |
| O&M Costs Year 2 to 10 | remainder | 9 | \$ 600,000 | | \$ 5,400,000 |
| | | | | Year 1 to 10 | \$ 27,173,390 |
| 10 YEAR TOTAL COST | | | | | |
| Years 11 to 20 | | | | | |
| YEAR 11 PROJECT COSTS | | | | | |
| Renovation Costs Year 10 | infill one courtrooms | 300 | \$ 2,250 | 675,000 | |
| Selective Renovation | minor circulation revisions | 200 | \$ 1,500 | 300,000 | |
| Project Overhead Addition | N/A | 14.50% | | | |
| Project Overhead Renovation | | 17.00% | \$ 975,000 | \$ 165,750 | |
| | | | | \$ 1,140,750 | |
| YEAR 11 PROJECT \$ TO BE FINANCED | | | | | |
| YEAR 11 TO 20 COSTS | | | | | |
| Lease Costs (100% of building) | lease increased 10% | 10 | \$ 861,838 | | \$ 8,618,382 |
| Year 1 \$ Financing Costs for Years 11 to 20 | interest on 20 year term | 6.00% | \$ 14,901,799 | | \$ 3,429,793 |
| Year 1 \$ Principal Payments for Years 11 to 20 | principal on 20 year term | 6.00% | \$ 14,901,799 | | \$ 9,562,274 |
| Year 10 \$ Financing Costs for Years 11 to 20 | term | 6.00% | \$ 1,140,750 | | \$ 409,164 |
| Year 10 \$ Principal Payments for Year 11 to 20 | term | 6.00% | \$ 1,140,750 | | \$ 1,140,750 |
| O&M Costs Year 11 to 20 | 100 % of existing building | 10 | \$ 600,000 | | \$ 6,000,000 |
| | | | | 16,042,549 | \$ 29,160,363 |
| YEAR 11 TO 20 TOTAL COST | | | | | |
| 20 YEAR TOTAL COST PROJECTION | | | | | |
| Residual Value | Land purchased for parking and pavement (no tenant improvements) | | | | \$ 56,333,753 |
| | | | | | 983,186 |
| | | | | | \$ 55,350,567 |

**YELLOWKNIFE COURTHOUSE FEASIBILITY STUDY
PURCHASE AND RENOVATE EXISTING BUILDING**

| Description | Notes | Units | Cost/unit (\$) | \$ PROJECT | \$ COSTS |
|---|---|--------|----------------|-----------------|---------------|
| Year 1 to 10 | | | | | |
| YEAR 1 PROJECT COSTS | | | | | |
| Temporary Fitup Costs for Relocated Courts | allowance property + 40% of new construction value | LS | \$ | 300,000 | |
| Purchase Existing Building | 50 ft. x 100 ft. city lots pavement | LS | \$ 257,519 | \$ 8,596,556 | |
| Buy Property For Parking (52 extra spaces) | | 3.25 | \$ 45,000 | \$ 146,250 | |
| Site Development | | 3500 | \$ 2,250 | \$ 7,875,000 | |
| Major Renovations Costs | allowance | LS | \$ | 1,000,000 | |
| Structural Renovations for Ceiling Height | | 1800 | \$ 1,500 | \$ 2,700,000 | |
| Selective Renovations Costs | N/A | 0 | \$ 3,000 | \$ - | |
| New Construction Costs | on site develop. & renovations | 17.00% | \$ 12,021,250 | \$ 2,043,612.50 | |
| Project Overhead | | | | \$ 23,498,355 | |
| YEAR 1 PROJECT \$ TO BE FINANCED | | | | | |
| YEAR 1 TO 10 COSTS | | | | | |
| Lease Costs (55 % of Building) | lease terminates at start of year 1 | 0 | \$ 430,919 | \$ | \$ 282,600 |
| Relocation Costs | accommodation | 2 | \$ 141,300 | \$ | \$ 686,400 |
| Temporary Rent Costs | (months) | 8 | \$ 85,800 | \$ | \$ 3,393,141 |
| Grant in Lieu of Taxes | for ten years | 10 | \$ 339,314.06 | \$ | \$ 12,067,145 |
| Year 1\$ Financing Costs Years 1 to 10 | fees | 6.00% | \$ 23,498,355 | \$ | \$ 8,419,791 |
| Year 1\$ Principal Payments Years 1 to 10 | principal for property, renov. & fees | 6.00% | \$ 23,498,355 | \$ | \$ 6,000,000 |
| O&M Costs Year 1 to 10 | 100 % of existing building | 10 | \$ 600,000 | \$ | \$ 30,649,077 |
| 10 YEAR TOTAL COST | | | | | |
| Year 11 to 20 | | | | | |
| YEAR 11 PROJECT COSTS | | | | | |
| Renovation Costs Year 11 | infill one courtroom | 300 | \$ 2,250 | \$ 675,000 | |
| Selective Renovation | minor circulation revisions | 200 | \$ 2,250 | \$ 450,000 | |
| Project Overhead Addition | N/A | 14.50% | \$ - | \$ - | |
| Project Overhead Renovation | | 17.00% | \$ 1,125,000 | \$ 191,250 | |
| YEAR 11 PROJECT COSTS | | | | | |
| YEAR 11 TO 20 COSTS | | | | | |
| Lease Costs (100% of building) | no lease costs | 0 | \$ 783,489 | \$ | \$ 3,393,141 |
| Grant in Lieu of Taxes | for ten years | 10 | \$ 339,314.06 | \$ | \$ 5,408,373 |
| Year 1\$ Financing Costs for Years 11 to 20 | term | 6.00% | \$ 23,498,355 | \$ | \$ 15,078,564 |
| Year 1\$ Principal Payments for Year 11 to 20 | term | 6.00% | \$ 23,498,355 | \$ | \$ 472,112 |
| Financing Costs for Year 10 Costs Year 11 to 20 | interest for project costs 10 year term | 6.00% | \$ 1,316,250 | \$ | \$ 1,316,250 |
| Year 11\$ Principal Payments for Years 11 to 20 | principal for project costs 10 year term | 6.00% | \$ 1,316,250 | \$ | \$ 6,000,000 |
| O&M Costs Year 11 to 20 | 100 % of existing building | 10 | \$ 600,000 | \$ | \$ 31,668,439 |
| YEAR 11 TO 20 TOTAL COST | | | | | |
| 20 YEAR TOTAL COST PROJECTION | | | | | |
| Residual Value | Property + 40% Year 1 Construction + 60% Year 10 Construction | | | \$ 62,517,517 | \$ 8,007,497 |
| 20 YEAR TOTAL COST | | | | | |
| \$ 54,510,019 | | | | | |

YELLOWKNIFE COURTHOUSE FEASIBILITY STUDY
TEN YEAR CASH FLOW PROJECTION

| ITEM | Year 01 | Year 02 | Year 03 | Year 04 | Year 05 | Year 06 | Year 07 | Year 08 | Year 09 | Year 10 | 10Year Total |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|
| LEASE & RENOVATE EXISTING BUILDING | | | | | | | | | | | |
| Lease Costs | \$ 430,919 | \$ 783,489 | \$ 783,489 | \$ 783,489 | \$ 783,489 | \$ 783,489 | \$ 783,489 | \$ 783,489 | \$ 783,489 | \$ 783,489 | \$ 7,482,323 |
| Payments for Renov. Principal (20 year term) | \$ 405,099 | \$ 429,405 | \$ 455,169 | \$ 482,479 | \$ 511,428 | \$ 542,114 | \$ 574,640 | \$ 609,119 | \$ 645,666 | \$ 684,406 | \$ 5,339,524 |
| Payments for Renov. Interest (20 year term) | \$ 894,108 | \$ 869,802 | \$ 844,038 | \$ 816,728 | \$ 787,779 | \$ 757,093 | \$ 724,566 | \$ 690,088 | \$ 653,541 | \$ 614,801 | \$ 7,652,543 |
| Retained Value | \$ (26,727) | \$ (28,331) | \$ (30,031) | \$ (31,833) | \$ (33,743) | \$ (35,767) | \$ (37,913) | \$ (40,188) | \$ (42,600) | \$ (45,156) | \$ (352,289) |
| Temporary Rent and Relocation | \$ 484,500 | \$ 484,500 | \$ 484,500 | \$ 484,500 | \$ 484,500 | \$ 484,500 | \$ 484,500 | \$ 484,500 | \$ 484,500 | \$ 484,500 | \$ 4,845,000 |
| Operating & Maintenance Costs | \$ 330,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 6,000,000 |
| TOTALS | \$ 2,517,898 | \$ 3,138,865 | \$ 2,652,665 | \$ 2,650,863 | \$ 2,648,963 | \$ 2,646,929 | \$ 2,644,783 | \$ 2,642,508 | \$ 2,640,096 | \$ 2,637,540 | \$ 26,821,100 |
| NET PRESENT VALUE YEAR ONE | | | | | | | | | | | \$ 19,799,679 |
| PURCHASE & RENOVATE EXISTING BUILDING | | | | | | | | | | | |
| Lease Costs | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| Payments for Renov. Principal (20 year term) | \$ 638,792 | \$ 677,120 | \$ 717,747 | \$ 760,812 | \$ 806,461 | \$ 854,848 | \$ 906,139 | \$ 960,508 | \$ 1,018,138 | \$ 1,079,226 | \$ 8,419,791 |
| Payments for Renov. Interest (20 year term) | \$ 1,409,901 | \$ 1,371,574 | \$ 1,330,947 | \$ 1,287,802 | \$ 1,242,233 | \$ 1,193,845 | \$ 1,142,554 | \$ 1,088,186 | \$ 1,030,556 | \$ 969,467 | \$ 12,067,145 |
| Retained Value | \$ (217,680) | \$ (230,741) | \$ (244,586) | \$ (259,261) | \$ (274,816) | \$ (291,305) | \$ (308,784) | \$ (327,311) | \$ (346,949) | \$ (367,766) | \$ (2,869,199) |
| Temporary Rent and Relocation | \$ 484,500 | \$ 484,500 | \$ 484,500 | \$ 484,500 | \$ 484,500 | \$ 484,500 | \$ 484,500 | \$ 484,500 | \$ 484,500 | \$ 484,500 | \$ 4,845,000 |
| Operating & Maintenance Costs | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 6,000,000 |
| TOTALS | \$ 2,915,513 | \$ 2,902,453 | \$ 2,404,108 | \$ 2,389,433 | \$ 2,373,877 | \$ 2,357,388 | \$ 2,339,910 | \$ 2,321,383 | \$ 2,301,744 | \$ 2,280,927 | \$ 24,586,738 |
| NET PRESENT VALUE YEAR ONE | | | | | | | | | | | \$ 18,329,307 |
| BUILD NEW BUILDING | | | | | | | | | | | |
| Lease Costs in Exist. Building | \$ 430,919 | \$ 430,919 | \$ 215,460 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 1,077,298 |
| Grants in lieu of Taxes | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 3,025,429 |
| Payments for Renov. Principal (18 year term) | \$ 681,891 | \$ 766,172 | \$ 812,143 | \$ 860,871 | \$ 912,523 | \$ 967,275 | \$ 1,025,311 | \$ 1,085,476 | \$ 1,146,228 | \$ 1,211,036 | \$ 6,748,990 |
| Payments for Renov. Interest (18 year term) | \$ 1,264,456 | \$ 1,223,543 | \$ 1,180,175 | \$ 1,134,204 | \$ 1,085,476 | \$ 1,033,824 | \$ 979,072 | \$ 921,036 | \$ 860,936 | \$ 801,786 | \$ 8,821,786 |
| Retained Value | \$ (359,753) | \$ (381,338) | \$ (404,218) | \$ (428,471) | \$ (454,179) | \$ (481,430) | \$ (510,316) | \$ (540,936) | \$ (573,408) | \$ (606,840) | \$ (3,560,640) |
| Relocation to New Courthouse (in project cost) | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| O & M Costs Existing Building | \$ 330,000 | \$ 330,000 | \$ 165,000 | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ 825,000 |
| O & M Costs New Building | \$ 760,919 | \$ 760,919 | \$ 2,541,233 | \$ 2,335,188 | \$ 2,312,308 | \$ 2,288,055 | \$ 2,262,346 | \$ 2,235,096 | \$ 2,206,210 | \$ 2,175,591 | \$ 2,940,000 |
| TOTALS | \$ 760,919 | \$ 760,919 | \$ 2,541,233 | \$ 2,335,188 | \$ 2,312,308 | \$ 2,288,055 | \$ 2,262,346 | \$ 2,235,096 | \$ 2,206,210 | \$ 2,175,591 | \$ 19,877,843 |
| NET PRESENT VALUE YEAR ONE | | | | | | | | | | | \$ 14,146,905 |

NOTES:

Courts currently occupy 55% of existing building. After renovations 100% of building would be required. 100% of lease costs attributed to Courts.

Payments are based on a 18 year term at 6.0% interest. Principal paid at end of term.

Payments for cost of purchasing existing building and renovating if or building new building through a capital programme considered the same as a capital lease funding mechanism.

Cash Flow based on most optimistic schedule for renovations or construction and assumes approval for project 1 April starting Year 01.

**YELLOWKNIFE COURTHOUSE FEASIBILITY STUDY
ELEVEN TO TWENTY YEAR CASH FLOW PROJECTION AND TOTALS**

| ITEM | Year 11 | Year 12 | Year 13 | Year 14 | Year 15 | Year 16 | Year 17 | Year 18 | Year 19 | Year 20 | 11 to 20 Year Total | 0 to 10 Year Total | 0 to 20 Year Totals |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------------|--------------------|---------------------|
| LEASE & RENOVATE EXISTING BUILDING | | | | | | | | | | | | | |
| Lease Costs | \$ 861,838 | \$ 861,838 | \$ 861,838 | \$ 861,838 | \$ 861,838 | \$ 861,838 | \$ 861,838 | \$ 861,838 | \$ 861,838 | \$ 861,838 | \$ 8,618,382 | \$ 7,482,323 | |
| Payments for Renov. Principal (20 year term) | \$ 725,470 | \$ 768,998 | \$ 815,138 | \$ 864,047 | \$ 915,899 | \$ 970,843 | \$ 1,029,093 | \$ 1,090,839 | \$ 1,156,289 | \$ 1,225,667 | \$ 9,562,274 | \$ 5,339,524 | |
| Payments for Renov. Interest (20 year term) | \$ 573,736 | \$ 530,208 | \$ 484,068 | \$ 435,160 | \$ 383,317 | \$ 328,364 | \$ 270,113 | \$ 208,368 | \$ 142,917 | \$ 73,540 | \$ 3,429,793 | \$ 7,652,543 | |
| Payments for Year 10 Renov. Principal (10 year term) | \$ 86,546 | \$ 91,739 | \$ 97,244 | \$ 103,078 | \$ 109,263 | \$ 115,819 | \$ 122,768 | \$ 130,134 | \$ 137,942 | \$ 146,218 | \$ 1,140,750 | \$ 409,164 | |
| Payments for Year 10 Renov. Interest (10 year term) | \$ 68,445 | \$ 63,252 | \$ 57,748 | \$ 51,913 | \$ 45,729 | \$ 39,173 | \$ 32,224 | \$ 24,858 | \$ 17,050 | \$ 8,773 | \$ 630,897 | \$ (983,186) | |
| Retained Value | \$ (47,845) | \$ (50,737) | \$ (53,781) | \$ (57,008) | \$ (60,428) | \$ (64,054) | \$ (67,897) | \$ (71,971) | \$ (76,289) | \$ (80,867) | \$ (630,897) | \$ 949,000 | |
| Temporary Rent and Relocation | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 6,000,000 | \$ 5,730,000 | |
| Operating & Maintenance Costs | \$ 2,868,171 | \$ 2,865,300 | \$ 2,862,265 | \$ 2,859,029 | \$ 2,855,606 | \$ 2,851,982 | \$ 2,848,139 | \$ 2,844,065 | \$ 2,839,747 | \$ 2,835,170 | \$ 28,829,466 | \$ 26,821,100 | \$ 55,350,547 |
| TOTALS | | | | | | | | | | | \$ 11,732,288 | \$ 19,794,879 | \$ 31,855,948 |
| NET PRESENT VALUE YEAR ONE | | | | | | | | | | | \$ 11,732,288 | \$ 19,794,879 | \$ 31,855,948 |
| PURCHASE & RENOVATE EXISTING BUILDING | | | | | | | | | | | | | |
| Lease Costs | \$ 1,143,980 | \$ 1,212,619 | \$ 1,285,376 | \$ 1,362,498 | \$ 1,444,248 | \$ 1,530,903 | \$ 1,622,757 | \$ 1,720,123 | \$ 1,823,330 | \$ 1,932,730 | \$ 15,078,544 | \$ 8,419,791 | |
| Payments for Renov. Principal (20 year term) | \$ 904,714 | \$ 836,075 | \$ 763,318 | \$ 686,195 | \$ 604,445 | \$ 517,791 | \$ 425,936 | \$ 328,571 | \$ 225,344 | \$ 115,964 | \$ 5,408,373 | \$ 12,067,145 | |
| Payments for Renov. Interest (20 year term) | \$ 99,861 | \$ 105,853 | \$ 112,208 | \$ 118,936 | \$ 126,072 | \$ 133,637 | \$ 141,655 | \$ 150,154 | \$ 159,164 | \$ 168,713 | \$ 1,316,250 | \$ 4,721,112 | |
| Payments for Year 10 Renov. Principal (10 year term) | \$ 78,975 | \$ 72,983 | \$ 66,632 | \$ 59,900 | \$ 52,764 | \$ 45,199 | \$ 37,181 | \$ 28,682 | \$ 19,673 | \$ 10,123 | \$ 472,112 | \$ (2,869,199) | |
| Payments for Year 10 Renov. Interest (10 year term) | \$ (389,832) | \$ (413,222) | \$ (438,015) | \$ (464,296) | \$ (492,154) | \$ (521,683) | \$ (552,984) | \$ (586,164) | \$ (621,333) | \$ (658,613) | \$ (5,138,298) | \$ 969,000 | |
| Retained Value | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 600,000 | \$ 6,000,000 | \$ 6,000,000 | |
| Temporary Rent and Relocation | \$ 2,437,698 | \$ 2,414,308 | \$ 2,389,514 | \$ 2,363,233 | \$ 2,335,376 | \$ 2,305,846 | \$ 2,274,545 | \$ 2,241,366 | \$ 2,206,197 | \$ 2,168,917 | \$ 23,137,800 | \$ 24,884,736 | \$ 47,723,738 |
| Operating & Maintenance Costs | | | | | | | | | | | \$ 9,667,891 | \$ 18,329,302 | \$ 27,893,399 |
| TOTALS | | | | | | | | | | | \$ 23,137,800 | \$ 24,884,736 | \$ 47,723,738 |
| NET PRESENT VALUE YEAR ONE | | | | | | | | | | | \$ 23,137,800 | \$ 24,884,736 | \$ 47,723,738 |
| BUILD NEW BUILDING | | | | | | | | | | | | | |
| Lease Costs in Etist. Building | \$ 378,179 | \$ 378,179 | \$ 378,179 | \$ 378,179 | \$ 378,179 | \$ 378,179 | \$ 378,179 | \$ 378,179 | \$ 378,179 | \$ 378,179 | \$ 3,781,787 | \$ 1,077,298 | |
| Grants in lieu of Taxes | \$ 1,086,830 | \$ 1,152,040 | \$ 1,221,162 | \$ 1,294,432 | \$ 1,372,098 | \$ 1,454,424 | \$ 1,541,699 | \$ 1,634,190 | \$ 1,732,242 | \$ 1,836,176 | \$ 14,325,283 | \$ 6,748,990 | |
| Payments for Renov. Principal (18 year term) | \$ 859,517 | \$ 794,307 | \$ 725,185 | \$ 651,915 | \$ 574,249 | \$ 491,923 | \$ 404,658 | \$ 312,167 | \$ 214,105 | \$ 110,171 | \$ 5,138,187 | \$ 8,821,786 | |
| Payments for Renov. Interest (18 year term) | \$ 287,236 | \$ 304,470 | \$ 322,738 | \$ 342,103 | \$ 362,629 | \$ 384,387 | \$ 407,450 | \$ 431,897 | \$ 457,811 | \$ 485,279 | \$ 3,786,000 | \$ 3,786,000 | |
| Payments for Year 10 Renov. Principal (10 year term) | \$ 227,160 | \$ 209,926 | \$ 191,658 | \$ 172,293 | \$ 151,767 | \$ 130,009 | \$ 106,946 | \$ 82,499 | \$ 56,585 | \$ 29,117 | \$ 1,357,961 | \$ (3,560,440) | |
| Payments for Year 10 Renov. Interest (10 year term) | \$ (573,391) | \$ (607,794) | \$ (644,262) | \$ (682,918) | \$ (723,893) | \$ (767,326) | \$ (813,366) | \$ (862,168) | \$ (913,898) | \$ (968,732) | \$ (7,557,748) | \$ (11,118,388) | |
| Retained Value | | | | | | | | | | | \$ 6,000,000 | \$ 6,000,000 | |
| Relocation to New Courthouse (in project cost) | | | | | | | | | | | \$ 825,000 | \$ 825,000 | |
| O & M Costs Existing Building | \$ 490,000 | \$ 490,000 | \$ 490,000 | \$ 490,000 | \$ 490,000 | \$ 490,000 | \$ 490,000 | \$ 490,000 | \$ 490,000 | \$ 490,000 | \$ 4,900,000 | \$ 2,940,000 | |
| O & M Costs New Building | \$ 2,755,531 | \$ 2,721,127 | \$ 2,684,640 | \$ 2,646,004 | \$ 2,606,029 | \$ 2,561,595 | \$ 2,515,556 | \$ 2,466,754 | \$ 2,415,024 | \$ 2,360,190 | \$ 25,731,469 | \$ 19,877,848 | \$ 45,609,332 |
| TOTALS | | | | | | | | | | | \$ 10,660,764 | \$ 14,146,906 | \$ 24,807,459 |
| NET PRESENT VALUE YEAR ONE | | | | | | | | | | | \$ 10,660,764 | \$ 14,146,906 | \$ 24,807,459 |

NOTES:

Courts currently occupy 55% of existing building. After renovations 100% of building would be required. 100% of lease costs attributed to Court.
 Payments for new courthouse are based on a 18 year term at 6.0% interest. Principal paid at end of term.
 Payments for cost of purchasing existing building and renovating it or building new building through a capital programme considered the same as a capital lease funding mechanism.
 Cash Flow based on most optimistic schedule for renovations or construction and assumes approval for project 1 April starting Year 01