SEWPCC Upgrading/Expansion
Conceptual Design Report

SECTION 20 - Administration Building

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20.0 Administration Building

20.1 PURPOSE OF ADMINISTRATION BUILDING MODIFICATION EVALUATION

The purpose of the Administration Building evaluation was to determine appropriate modifications to be implemented in conjunction with the SEWPCC upgrade and expansion project. The evaluation included:

- Assessment of any significant functional deficiencies.
- Projection of function and space needs for 2012 plant upgrade /expansion.
- Development of preliminary concepts for modifications.

20.2 EVALUATION APPROACH

The evaluation included the following major steps:

- Review of existing plans.
- Review of current and desired functions.
- Tour of the building and discussion of City interests.
- Photographing key features.
- Development of recommendations for modifications.

Stantec personnel including Eric Wiens and Jes Alexant met at the Administration Building on August 6, 2008 with Ron Hahlweg, Chief Operator. Information was exchanged about the City's needs related to the building and photographs were taken.

A Building Envelope / Structure Assessment performed by Stantec in 2006 focused on details of the condition of the building, and were documented in Section 6 of the PDR and in Section 21 of this report. This current evaluation focuses on potential modifications to the building to meet required and desired functions.

A Comprehensive Code Review of the SEWPCC was performed for the City in 2006. That review is summarized in an October 26, 2006 report by CH2MHill. Stantec reviewed that report as part of the evaluation of the Administration Building.

20.3 CODE REVIEW

The 2006 Comprehensive Code Review noted several features of the Administration Building as not meeting current code requirements. Most of the items noted related to dimensional variations in handrails, openings, guards, stair riser height, headroom clearances, and fire separation features. The 2006 review listed the building connection to process areas (by means of the corridor) as an Observed Non-conformance. Some of the items highlighted in the 2006 review relate to items which are “grandfathered,” and as such it is optional whether the City decides to rectify these items or leave them as is, at least until such time as the area is renovated. At the time of renovation The Authority Having Jurisdiction will require that all renovated areas be constructed following current codes. This usually only applies to the specific area being renovated, not adjacent areas. For example, renovation of a washroom would require the washroom be brought up to current code but not the adjacent offices or lunch room. However, this is only a guideline and The Authority Having Jurisdiction is exactly that, they have the authority to require anything they deem to be important to be brought up to code at the time of renovation.

In performing this evaluation of the Administration Building for the SEWPCC Upgrade / Expansion, Stantec has focused on the functional aspects of the building. Stantec has assumed that any new construction or modification construction related to functional features would be designed and constructed following current codes and that all other non-conformance items would remain as is. It is Stantec's understanding that the City has not had any discussions with The Authority Having Jurisdiction regarding the findings of the 2006 Comprehensive Code Review. Stantec recommends that during the detailed design phase for the SEWPCC Upgrade / Expansion project, confirmation be sought from The Authorities Having Jurisdiction regarding exactly how code requirements would be applied to the items noted in the 2006 Code Review, in light of the minor modifications recommended.

The non-conformance items related to the Administration Building noted in the 2006 Comprehensive Code Review are listed below, and the associated sections from the 2006 report are attached in Appendix Q. The City has confirmed that the non-conforming items are being addressed outside the scope of the project. In the table provided below, “MBC” is the Manitoba Building Code; “NFPA” implies National Fire Protection Association, and “CEC” implies the Canadian Electrical Code.

Table 20.1 - Summary of Non-Conforming Items Noted in the October 2006 Comprehensive Code Review for the Administration Area

Item:	Code Reference	
Fire alarm system not provided for building that requires sprinklers	MBC MBC	3.2.4.1 (1) 3.2.4.2 (3)
Standpipe system is not installed in unsprinkled building	MBC	3.2.5.8 (1)(c)
Emergency lighting is missing in many areas	MBC	3.2.7.3 (1)
In many areas exits are not clearly visible	MBC	3.4.2.5 (3)
Lack of exit signs indicating direction of egress	MBC	3.4.5.1 (5)
Smoke detectors not installed in exit stairs	MBC	3.2.4.11 (1)(e)
Entire Administration Area is not Barrier Free	MBC	3.8.1
Stair 116: • Restricted headroom of 1930 mm at the mid landing • Stair riser height of 190 mm • Guard height of 850 mm at stairs • Handrail height of 850 mm at stairs • Penetrations of service lines and vent duct • Non-conforming opening sizes at guards	 MBC MBC MBC MBC MBC MBC	 3.4.3.4 (1) 3.4.6.7 (2) 3.4.6.5 (2) 3.4.6.4 (4) 3.4.4.4 (1) 3.4.6.5 (5)
Stair 115: • Stair riser height of 190 mm • Guard heights of 870 mm at stairs and 1000 mm at landings	 MBC MBC	 3.4.6.7 (2) 3.4.6.5 (2)
All Stairs: • At least one handrail does not extend 300 mm horizontally at top and / or bottom of stair	MBC	3.4.6.4 (7)
Doors: Refer to Door Frame and Hardware Summary	MBC	
Administration area not physically separated from process area	NFPA	1.1.3
…many instances of non-acceptable penetrations though exits – pipes, conduits, electrical wires, ductwork, louvers	NFPA	3.4.4.4 (1)
Administration area – physically connected to process area	NFPA 820	1.1.3 and 3.3.67.2

20.4 EXISTING BUILDING OVERVIEW

The existing Administration Building includes a main floor elevated approximately 1 m above the adjacent grade, and a basement level. The original building was constructed in the early 1970s.

The building was expanded and modified in the early 1990s. The older building structure is approximately 12.2 m (40 feet) wide by 24.4 m (80 feet) long, for a site footprint area of approximately 298 m^2. The addition that was constructed in the 1990s to the east of the original building is approximately 13 m by 14 m (43 feet by 46 feet) for a footprint area of 182 m^2. Thus, the site footprint of the entire existing Administration Building is 480 m^2. The building construction includes reinforced concrete perimeter basement walls and floors. The perimeter walls and interior columns are supported by an array of driven precast concrete pilings. The super-structure walls are insulated masonry cavity walls with limestone finish. The building is connected by a corridor to the pump and screen building. There are three interior stairwells. The roof is a flat built-up roof on a steel deck supported by open-web steel joists and beams, supported by the perimeter wall and interior steel columns. The building has its own heating boiler. Simplified floor plans of the main floor and the basement level are shown on Figures 20.1 and 20.2. The 2006 Building Envelope and Structural Assessment review indicated that there were no signs of significant structural distress at that time, but that there were moisture penetration and possible condensation problems in several areas. The building is fully heated and air-conditioned.

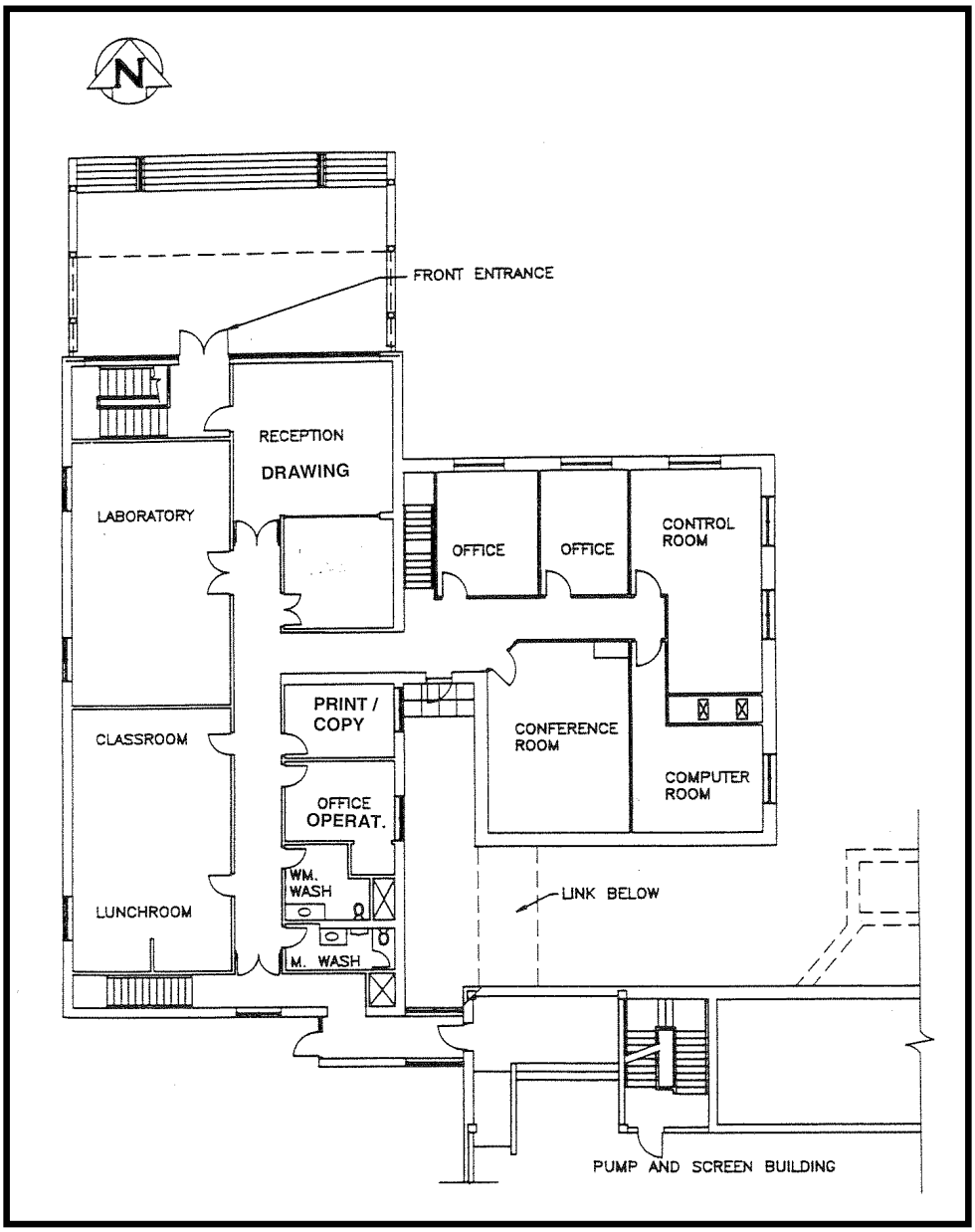

Figure 20.1: Existing Administration Building – Main Floor Layout

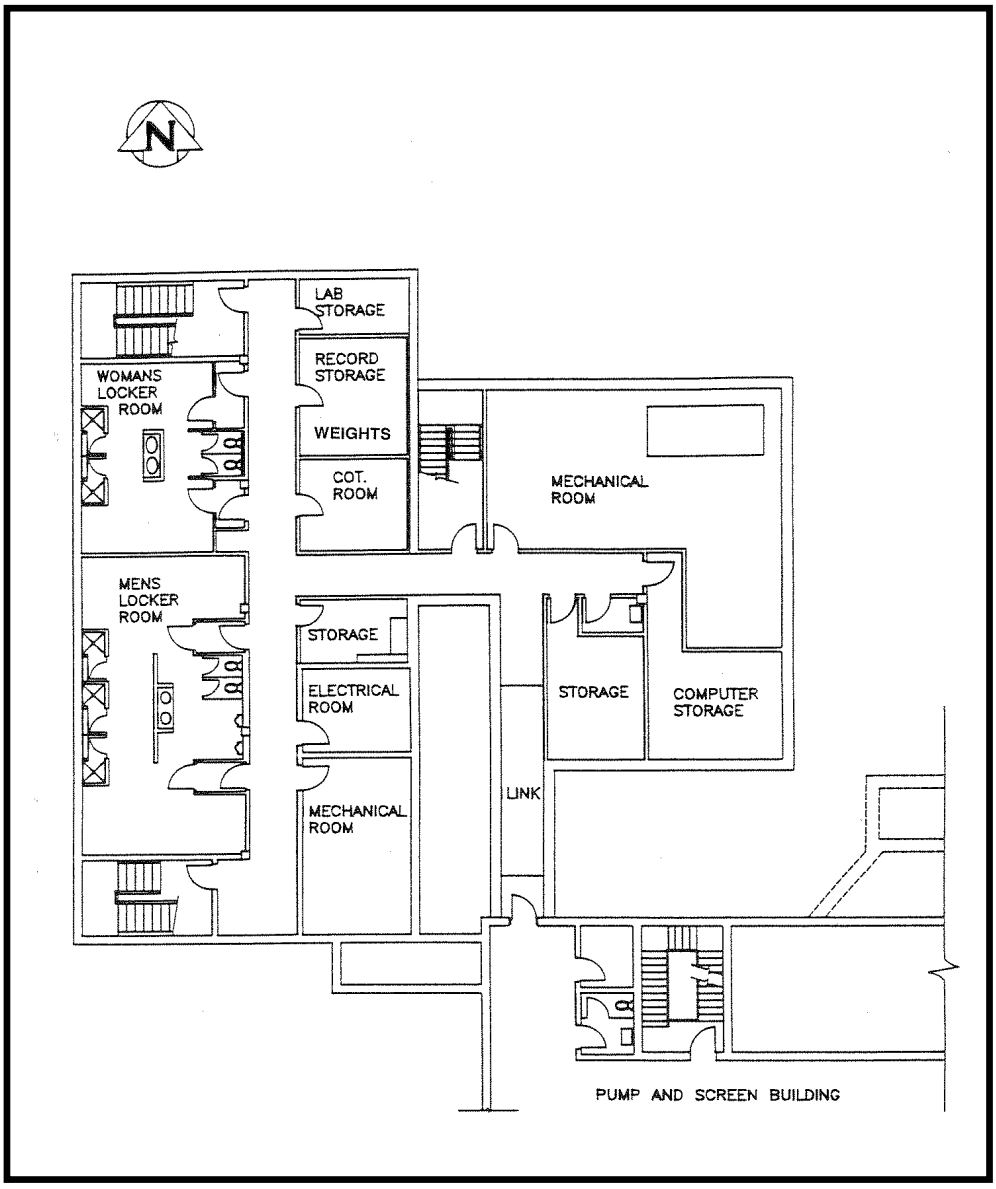

Figure 20.2: Existing Administration Building – Basement Floor Layout

20.5 KEY PREMISES AND FUNCTIONAL ISSUES

20.5.1 Key Premises of the Building Modification Evaluation

Key premises adopted for the evaluation included the following:

- The Admin Building functions were reviewed in the context of the overall 2012 upgrade/expansion, which is currently being designed.
- New treatment processes which will drive the need for additional operating personnel include the biological nutrient removal (BNR) bioreactor system, the primary sludge fermenters, the dissolved air flotation (DAF) dewatering system for the secondary sludge; and to a lesser extent other units.
- The City currently only staffs the SEWPCC one daytime shift per day, and does not intend to extend that time coverage to additional shifts. There is an alarm/monitoring system in place which provides security during the off-shift hours.
- Modifications were considered to meet City operational needs and interests.
- Opportunities exist to enhance appearances in several areas.
- An opportunity exists to enhance potential public visitation and information/education aspects of the plant, with the Administration Building being a key feature.

20.5.2 Key Functional Issues

Key functions that the Administration Building houses include the following:

- Support for SEWPCC plant operations only – no dispatching.
- Data compilation and record-keeping activities.
- Showers and washrooms for plant operational personnel.
- Lunchroom / “classroom”.
- Previous analytical laboratory testing.
- Some limited parts storage.
- Plant entry for public visitors.
- Activities on two levels, with three interior stairwells.

From the review of plans, plant upgrade operational needs, and discussions with the City personnel, the following were derived as key features of the building and its functional features:

- In 2008, there are 5 operators plus a similar number of trade specialists. There are 2 primary treatment operators, 2 secondary treatment operators, and 1 senior operator.
- The staff level projected for the pending expanded plant are for 7 operators plus specialists, for a total of 15 staff based in the Administration Building.
- Additional locker facilities represent one of the most critical needs.
- The existing plant smoke/fire alarm is a combination of several systems – the Admin Building is on a separate alarm system from other areas of the treatment plant.
- No major chronic moisture problems exist. Periodically a leak has occurred at the lower corridor doorway.
- There is sufficient room for conferences.
- There is sufficient room for building controls equipment.
- There is a pending contract for roof replacement at the entry.

This study developed several recommended actions which should be coordinated with Risk and Criticality review recommendations developed for the City by other consultants.

20.6 BUILDING FRONT ENTRY RECEPTION ROOM

The Building Front Entry Reception Room is a well-lit, simple and attractive room immediately inside the front entrance. It is not currently intensely used. The 1971 plans showing an arrangement of waiting room chairs in this room suggest that the original intention was to have a staff person stationed in this room who could serve at least in part as a receptionist. On those 1971 plans, the room immediately beyond the reception room was a Control Room. Several photographic views of the Front Entry Reception Room are shown in Figures 20.3 and 20.4. Currently, no City personnel are permanently assigned to provide reception functions in this room. There is not a receptionist's desk or chair in this room. The City has indicated that there is not a need for an assigned receptionist in this building.

The existing entry reception room offers an opportunity to provide educational information to the visiting public about the treatment plant. Based on review of the room and discussions with the City personnel, Stantec recommends that the City provide a display model of the SEWPCC in this room. A rectangular table should be provided for the model display, replacing the existing small round table. Several of the existing chairs would be displaced. Stantec also recommends

that several photographs or drawings of the treatment plant be mounted on the two walls opposite from the windows and the entry doorway. These could include diagrams of the treatment process of cross-sectional elevation drawings or schematics. A model of the existing plant currently exists in storage. That model might serve as a base for the expanded plant model.

Discussions with City personnel indicate that there is not a need for additional “mud room” features such as footwear cleaners, or hot closets for outerwear at the building front entry area.

Figure 20.3: Front Entry Reception Room Window View

Figure 20.4: Front Entry Reception Room Interior Wall View

20.7 CLERICAL / DRAWING FILES ROOM

The room that was labeled on earlier plans as the Control Room and subsequently as Clerk's Office is located immediately inside the building beyond the Front Entry Reception Room. This room is currently used for drawing files and as a common clerical area.

Figure 20.5: Clerical / Drawing Files Room - Files

Figure 20.6: Clerical / Drawing Files Room - Window to Front Entry Room

This room appears to serve its desired function well as a drawing file and shared clerical office. No recommendations are made to modify the function or layout of this room.

Review of documents and discussion with City personnel indicate that there is currently no formal visitor entry advisement system such as a building-wide buzzer or bell for the front entry area of the building. A formal and simple visitor advisory system should be installed. This could simply consist of a visitor pushbutton located in the reception room, linked to a phone or pager system or a buzzer audible in key areas of the plant which are staffed. There would need to be a response feature, such as an intercom speaker in the visitor reception room, advising the visitor that a staff person would attend shortly. Conceivably, the visitor advisory system might be linked to the plant SCADA system and possibly security camera system. For Conceptual Design purposes, Stantec has assumed that a simple visitor advisory system will be developed, similar to a pushbutton station with a zone annunciator and acknowledgement function. The design would be coordinated with any security system enhancement design that may be developed as part of the Facility Upgrade.

20.8 LUNCH ROOM / CLASSROOM

This room is located in the southwest corner of the original building on the main floor. It is 6.1 m (20 feet) wide by 9.6 m long (31 feet 7 inches) long. Kitchen equipment on the southern end of the room includes a stove with range, three microwave ovens, a sink, counters, and cabinets. The southern wall behind the kitchen appliances is tile-covered. The northern end includes a wall-mounted blackboard and other items. There are three rows of long tables with chairs in the middle of the room. The room is well lit by ceiling flush fluorescent fixtures, with a double window on the western exterior wall near the kitchen end. There is a simultaneous seating capacity for approximately 24 people for meal breaks, and for several more persons in classroom learning mode. The learning mode is for periodic staff seminars oriented toward the SEWPCC facility. The floor is linoleum tile. Surfaces in the room are materials which are easily cleanable, which is an important feature for a lunchroom in a wastewater treatment plant.

This room meets its intended functions well, and serves an important functional space for communication among staff personnel and for periodic rest breaks. Stantec recommends that the City upgrade the ceiling and wall treatment with light-colored paint or covering, except for the southern tile-covered wall which is currently satisfactory. Consideration should be given to installing wiring and a ceiling-mounted projector for classroom purposes.

Figure 20.7: Lunch Room / Classroom – Looking at the South Wall

Figure 20.8: Lunch Room / Classroom - Kitchen Appliances

Figure 20.9: Lunch Room / Classroom - Ceiling Panels and Lighting

20.9 ANALYTICAL LABORATORY FUNCTIONS

The former analytical laboratory room which is on the main floor of the Administration Building is no longer used for any significant laboratory functions. The room is 9.70 m (31 feet 10 inches) long by 5.74 m (18 feet 10 inches) wide; inside clear dimensions. The room area is 55.7 m^2 (599 ft^2). Photos showing the existing laboratory room are provided on Figures 20.10, 20.11, and 20.12. The space provided by the existing room far exceeds that currently needed for operable laboratory equipment. The room is presently used largely for storage of miscellaneous items. The existing lab room has a fume hood, gas lines, sinks, water, and counters in place. There is a muffle furnace in place, but the exact operational condition is unknown.

All regulatory sampling and analysis is currently undertaken by the City's Environmental Standards Division. The City has indicated that this approach will be followed in the foreseeable future. Operational testing at the SEWPCC is currently undertaken by the operators on site at the location of the treatment units, using portable instruments or kits.

Figure 20.10: Laboratory Room View Toward Fume Hood

Figure 20.11: Laboratory Room Storage on Tables

Figure 20.12: Room Fixtures and Laboratory Room Cleaners

Stantec has projected the testing that would be required for operation of the expanded plant, and has recommended online instrumentation components that will be installed in the expanded plant. Review of that information indicates the following:

- A fume hood will not be needed in the future.
- The planned plant upgrade currently being designed will involve several items of fixed online instruments for pH, D.O., and sludge density.
- The upgraded plant multi-source operational testing should include D.O., ORP, pH, conductivity, UV Transmissivity, SVI, MLVSS, and MLVSS.
- Portable instruments should include D.O., ORP, pH, conductivity.
- Equipment should be maintained on site somewhere at the SEWPCC for:
    - MLSS and MLVSS (filter apparatus, scale, and drying oven/muffle furnace – rehabilitated or new).
    - SVI (settling cone).

- UV Transmissivity meter; and,
- A microscope for microbiological examination.

- A sink and some lab counter space (approximately 5 m^2) should be provided in the expanded plant.

The MLVSS measurement (indicating the volatile fraction of the MLSS) is an important measurement useful in calculating the viable mean cell residence time (MCRT, or sludge age) through time, particularly through periods of varying characteristics of influent wastewater or when there has been a change in the biomass. Normally, it is desired to have the volatile fraction of the MLSS should remain constant to within a fairly narrow target range. However, the actual ratio may vary somewhat periodically due to several factors. Having accurate ongoing current knowledge of the MLVSS/MLSS ratio is useful in making the appropriate process operational modifications to bring the ratio back into the desired range for optimum bioreactor performance. For this reason, Stantec recommends that the City maintain a muffle furnace on site at the SEWPCC along with several other basic items of laboratory equipment. A microscope with effective power up to 500x will be an important tool for periodic examination of samples of ML biomass, secondary clarifier liquor and sludge, and fermenter liquid.

Stantec also recommends maintaining a desk-top jar test apparatus on site for periodic quick chemical coagulation optimization tests – 4 or 6 gang mixers with 1 or 2 litre beakers.

The items recommended above could fit in a space less than half the size of the present laboratory room. It is estimated that an area of approximately 20 m^2 would suffice for the future limited laboratory functions. Relocating the laboratory functions to another location outside the Administration Building would free up space for other purposes in this building. Stantec's discussions with City personnel have indicated that maintaining the laboratory equipment closer to the bioreactors would be more efficient. One potential new location for the future limited laboratory equipment is the present compressor building, which currently serves the high purity oxygen system. Based on the Conceptual Design concepts, there will be sufficient room in that building for a relocated laboratory space. Such relocation would require some minor architectural and plumbing work in the existing HPO compressor room.

Relocating the laboratory functions outside of the Administration Building would provide an opportunity to convert all or part of the existing laboratory room into space for other functions, including women's locker room space, discussed in the next section.

20.10 LOCKER ROOMS

There are two locker rooms on the lower level: one for men and one for women. The width of each room is 5.8 m. The length of the men's locker room is 9.8 m; for an area of 56.8 m2. The length of the women's locker room is 6.5 m; for an area of 37.7 m2. Each room has two doors

providing one-way traffic – dirty and clean sides. This concept works well for the staff. The men's locker room has three shower stalls, two sinks, two toilets and two urinals. The women's locker room has two shower stalls, two sinks, and two toilets. Lockers are located on the north and south walls.

Currently, the SEWPCC staff includes one woman operations person. As noted above, it is estimated that the expanded plant will require a total operational staff of 15 persons. The premise is that the expanded plant would be actively staffed only during the daytime shift, as is the current practice. Any time consumed by staff waiting at the end of a shift for an available shower stall represents time lost from operational work. Based on recent historical staffing trends, it is estimated that for the expanded plant there will be a need for two more men's shower stalls. Consideration should also be given to providing one additional sink, toilet, and urinal for the men's locker room.

Figure 20.13: Men's Locker Room - Clothing Hangers

Figure 20.14: Men's Locker Room - Lockers

Figure 20.15: Men's Locker Room - Sinks

Figure 20.16: Women's Locker Room - Lockers

Stantec examined the existing locker rooms to assess whether the required additional shower stalls and other fixtures could be added into the existing men's locker room space by rearranging items. Stantec has concluded that this is not feasible. The existing men's shower room is already crowded.

Based on those constraints, Stantec considered several potential solutions for providing the required additional men's locker room capacity, including the following:

- Moving the existing partition wall 2 m into the women's locker room, resulting in a reduction in the size of the women's locker room; or
- Relocating the women's locker room upstairs to the existing Laboratory Room, and develop a new small Lab Room in the building which currently houses the compressors for the high purity oxygen (HPO) system; or at another location outside of the Administration Building.

A review of dimensions indicated that Alternative A would significantly limit the capacity of the women's locker room, to an effective limit of two persons (assuming the same shift). This was considered to be an undesirable limitation. An initial review of the changes needed in the former Laboratory Room for conversion indicated that while there would be a cost associated with plumbing and other items, the alternative could be implemented feasibly because there is no longer a need to maintain laboratory facilities in the Administration Building. Therefore, Stantec recommends that the City implement Alternative B outlined above. This would involve the following:

- Construction of a new small laboratory space in the existing HPO compressor room;
- Conversion of 42 m^2 of the existing Laboratory Room to be the new Women's Locker Room on the main floor; and
- Conversion of the existing 37.7 m^2 Women's Locker Room to be an expansion of the Men's Locker Room.

This program would increase the Women's Locker Room space by about 11 percent over the current space. It would expand the Men's Locker Room space by 67 percent. It would also leave 13.7 m^2 of space from the old Laboratory Room for use for other purposes.

To create the new Women's Locker Room, it will be necessary to install new plumbing fixtures and associated water supply, drainage, and plumbing vent lines, which would be plumbed from the main floor. The HVAC ductwork would have to be modified. The new Women's Locker Room would include three shower stalls, two sinks, and two toilets; with space and plumbing provision to add a third sink and a third toilet as staffing developed over time. Lockers sufficient for four people should be installed. Two doors should be installed from the main floor corridor,

providing the same clean side/dirty side concept that is currently used. One of the two existing exterior wall windows would be removed, with the opening blocked and finished with consistent building exterior treatment. A preliminary drawing outlining the potential layout for the new Women's Locker Room is provided in a subsequent section of this memo.

The expansion of the Men's Locker Room space could be accomplished through either of two approaches:

- By converting the existing Women's Locker Room to serve as a second Men's Locker Room with its own separate doorways (existing) to the basement corridor, to minimize new construction; or alternately,

- By cutting an opening in the existing partition wall which currently separates the Men's Locker Room from the Women's Locker Room, moving some of the existing men's lockers, and installing additional fixtures and lockers. With this alternative, two of the four doors which currently serve the existing Men's Locker Room and Women's Locker Room could be closed off, freeing up wall space. The clean side/dirty side concept would be maintained, with the flow-through traffic being handled by the two remaining doors.

Alternative 1 would result in having two Men's Locker Rooms side by side with separate doorways. Alternative 2 would eventually result in more efficient use of space, but would require more construction than Alternative 1 in terms of doorway modifications and locker relocations.

To avoid having two Men's Locker Rooms, Stantec recommends that the City implement Alternative 2. To minimize construction costs, it is recommended that the existing shower, sink and toilet locations be maintained. Some of the fixtures would be modified slightly, but no plumbing construction would be required in the basement floor concrete, with the exception of new urinals. This will result in one Men's Locker Room space which has two sets of showers, toilets and sinks. While this is not an ideal layout concept, it is felt that the lower construction cost justifies the approach.

20.11 MAIN FLOOR WASHROOMS

Initial input provided during a project presentation and review meeting on August 20, 2008 indicated that the City is interested in having additional washroom capacity on the Main Floor. There is currently on the Main Floor a Women's Washroom and a Men's Washroom, both located in the southeast area of the old building. Both rooms are small, with the Men's Room being smaller than the Women's Room. The Women's Room has one sink and one unenclosed toilet with handicap support bars. The Men's Room has one sink, one urinal, and one enclosed toilet. Photos showing these rooms are provided in Figures 20.17 and 20.18. The 1971 plans for the original building construction showed a Men's Room farther to the south, with a Women's Room just north of the Men's Room, and a Coat Closet Room just north of the Men's Room.

Based on review of later plans and the August 2008 site visit, it appears that sometime prior to 1994, the southernmost room was re-designed to be the Men's Room, and the room just north of that was converted to be the Women's Room. The former coat closet room space was added to the new Women's Room, and the previous coat closet room door became the sole doorway entry into the new Women's Room.

Figure 20.17: Existing Women's Washroom - Main Floor

Figure 20.18: Existing Men's Washroom - Main Floor

The existing Men's Washroom is 1.52 m (5 feet) wide, and has an area of 6.0 m^2 (64 ft^2). The existing Women's Washroom has an area of 7.4 m^2 (80 ft^2).

To provide the additional washroom space desired, several alternatives were considered:

- Expansion of the existing Women's Washroom into the current footprint of the existing Men's Washroom, and conversion of other space in the building to become a new larger Men's Washroom.

- Redesignation of the existing Women's Washroom to be a Unisex Washroom suitable for one person at a time, and conversion of other building space into a new larger Women's Washroom.

Alternative 2 would involve less construction and is recommended for implementation. It is recommended that the remaining portion of the previous Laboratory Room space available after conversion for the new Women's Locker Room (13.7 m^2 remaining) be used to construct a new Women's Washroom. Implementing Alternative 2 would result in the following:

- Designated Men's Washroom space: 6.0 m^2
- Designated Women's Washroom space: 13.7 m^2
- Unisex Washroom space: 7.4 m^2

At times when the demand for Men's Washroom space was high, the Unisex Washroom would fill that need. Handicapped support rails and clearance would be included in both the new designated Women's Washroom and in the Unisex Washroom, but not in the designated Men's Washroom. The partition and plumbing construction for the new Women's Washroom would be done in conjunction with the adjacent new Women's Locker Room in the old Laboratory space. The construction work required to convert the present Women's Washroom to be the new Unisex Washroom would be relatively minimal, primarily involving decorative features such as wall coverings. Appropriate signage would be placed on the doors for all of the washrooms indicating which ones incorporated handicapped access design.

A simplified layout for the proposed Main Floor Washroom conversions is provided in a subsequent section of this memo.

20.12 MECHANICAL ROOMS

There are mechanical rooms in both the old and new sections of the Administration Building, both containing air handling units. The mechanical room in the old section contains hot water booster pumps for the heating system. This room is located on the basement level in the southeast corner of the old building. These pumps receive hot water that is pumped from the

plant boilers located in the Service Building, and boost it through the heat exchangers that serve the Administration Building. The heat exchanger unit draws cool air in and heats that air using the hot water heat source. The heat exchange unit and related piping is insulated. A view of the heat exchanger is provided in Figure 20.19.

The second mechanical room in the Administration is located in the northeast corner of the new building. This room houses the AC air handling units which serve to cool the Administration Building (M651 AHU and M652 AHU) as well as condensate pumps, smaller heat exchangers, piping and ductwork.

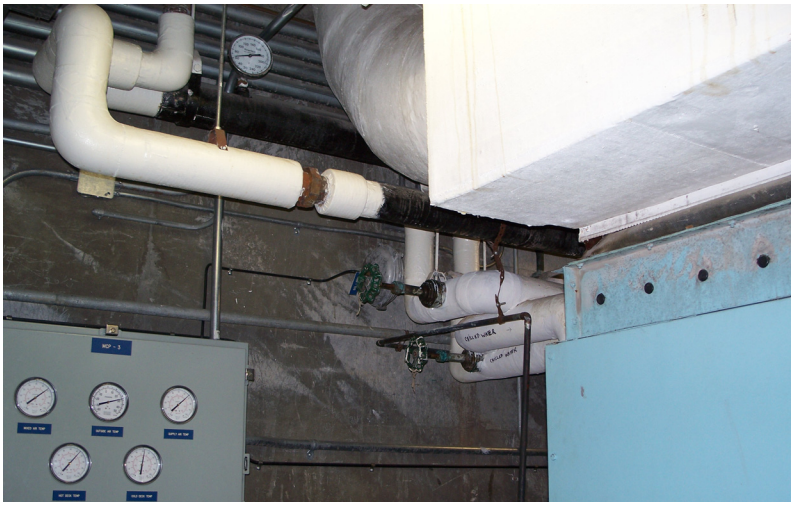

Figure 20.19: Air Handling Heat Exchanger and Piping

The review of the Administration area did not reveal a need for upgrade or expansion of the pumps, heat exchanger or heating or cooling systems; nor for replacement of piping in this area. Heat exchanger and pipe insulating materials that potentially consist of asbestos containing materials are addressed in Section 22. To the extent possible, any disturbance to this material should be avoided or minimized.

Hot water for the Administration Building is provided from a hot water heating tank located in the Service Building. It is not anticipated that the addition of three showers in the new Women's Locker Room will result in a need for an expansion of that hot water heating capacity. All of the new showers would be equipped with efficient water-saving and heat-saving shower heads, and the existing showers would be retrofitted with the same conservation shower heads. Detailed calculations will be done during the Detailed Design to confirm the projected hot water demands and associated heating loads.

20.13 UNINTERRUPTIBLE POWER SUPPLY (UPS)

A Toshiba 4000 Series uninterruptible Power Source (UPS) device is located in the computer room which is in the southeast corner of the new Administration Building, on the Main Floor level, and is shown in Figure 20.20. During the site tour on August 6, 2008, that UPS unit was not working, and had not been working for several months. Information conveyed during the August 20, 2008 presentation and review meeting indicated that the City is in the process of addressing that deficiency.

Figure 20.20: UPS - Not working as of August 2008

20.14 CONTROL ROOM AND WORK STATIONS

The Control Room is located in the northeast corner of the new Administration Building annex, on the Main Floor. This room and nearby rooms on the Main Floor contain a number of computer workstations. These serve as vital components in the existing INFI 90 Distributed Control System for the treatment plant, which is currently based on an array of Bailey Multi-Function Processor (MFP) modules. The workstations in the Administration Building are linked by communication cabling to all of the Process Control Units (PCUs) throughout the plant. Work stations in the Administration Building include several central work stations and an expert system work station in the Control Room itself, the Supervisor's work station in the nearby Supervisor's Office, an Engineering work station in the adjacent Computer Room, and a QNX cable hub in the Control Room. Also located in the Control Room is PCU-SH which serves Control Area M, the Administration Building and the Liquid Waste Disposal Facility.

There are a number of other PCUs and work stations located throughout the plant, in key treatment process areas. The configuration design concept of the future control system for the expanded and upgrade treatment plant is currently in development. However, it is projected that whatever system is selected, it will continue to include localized control interface devices linked

to a common communication network. It is also projected that while it might involve modification of the human machine interface (HMI) devices and communication conduits, the future system will not require physical expansion of the existing Control Room, Computer Room, or Supervisor's Office, which are in the Administration Building.

20.15 MOTOR CONTROL CENTER

The Electrical Room for the Administration Building is located in the southeastern area of the old building, on the basement level. This room contains the Motor Control Center (MCC) for the Administration Building, MCC-1M. This is not a master MCC for all plant power items; there are a number of other MCCs throughout the plant which serve the various treatment process equipment and support areas. Figure 20.21 shows this MCC. Several lighting panels, local control panel CDP-10A, and a transformer are also located in this Electrical Room.

This Electrical Room and MCC-1M have some limited space for additional circuits, but not for any additional major equipment or transformers. Because the major equipment that will be added in the plant upgrade/expansion will be served through MCCs local to each equipment area, it is not anticipated that there will be a need to add significant circuits, loads, or panels in the Administration Building to MCC-1M or other stacks. If as the plant design develops it becomes necessary to add further MCC, transformer, or panel devices, these could be added by converting some of the non-critical rooms which are near this Electrical Room, such as the adjacent Storage Room, the nearby Storage Room in the new building section, and possibly a nearby room which is used as a Cot Room.

Figure 20.21: MCC-1M in the Admin Building Electrical Room

20.16 OTHER FUNCTIONAL ROOMS

All rooms and aspects of the Administration Building were reviewed. In addition to the rooms noted in preceding sections, the building includes several offices, storage rooms, and other function rooms. There is an exercise room located in the eastern section of the basement level, shown in Figure 20.22. This is an asset to the facility and the staff, and used judiciously will help maintain staff physical fitness and reduce the risk of workplace injuries.

Figure 20.22: Exercise Room

There are several other offices, storage rooms, and a conference room in the Administration Building. The plant administration has confirmed that these rooms are adequate for current and future needs. It is not projected that the pending plant upgrade and expansion will create a need for expansion of these functions such that additional space would be required in the Administration Building.

20.17 BUILDING MOISTURE CONTROL

The August 6, 2008 site visit indicated that there have been several leaks in the building in the past. In the past a leak dropped water from the ceiling in the computer parts storage room onto several boxes of computer and telecommunication equipment parts. That leak was subsequently repaired, although the root cause of the leak was not conveyed during this review. The leak location is shown in Figure 20.23.

Figure 20.23: Computer Supplies Storage - Past Ceiling Leak

Water has in the past leaked through the wall where plant piping penetrates the lintel over the doorway entering the link corridor, shown in Figure 20.24. This leak into the interior of the Administration Building has been repaired by injecting polymer material.

Figure 20.24: Leak Site at Corridor Portal

The 2006 Building Envelope/Structure Assessment noted several apparent leaks in the building roof membranes, and recommended corrective actions. The City has within the past several years addressed a number of leak problems. A contract for repair and replacement of roofing material has been developed. At the time of writing this report there were no apparent major deficiencies related to leaks that would have a significant impact on the design of the plant upgrade/expansion related to the Administration Building.

20.18 EXTERIOR FEATURES

The Administration Building has sufficient parking and access. The concrete on the front entry patio and on the steps is spalling in several areas, resulting in an increased potential for someone tripping on a rough spot. It is Stantec's understanding that the City is planning to refinish this area in the near future.

Figure 20.25 shows the north side of the building, looking at the new addition section. This view indicates that there are ornamental trees and shrubs growing immediately against the building exterior wall surface.

Figure 20.25: Exterior - North Side of New Addition

Trees and shrubs located near a building can sometimes contribute to a windbreak effect, saving building heat loss in the winter. However, having trees and shrubs with leaves against the surface of the building increases the risk of trapping moisture on the exterior wall surface. This could promote mildew and possibly micro-scale frost fracturing, which could lead to crumbling. This is particularly applicable for the north-facing building walls that receive no direct sunlight. It is preferable to have a clear space between the trees/shrubs and the wall surface, of about 0.5 m to 1.0 m in width. This clear space can be maintained by periodic trimming. It is

recommended that the City trim and remove selected trees and shrubs away from the face of the building.

20.19 BUILDING SECURITY AND ALARM SYSTEMS

As noted earlier in this section, it is recommended that a visitor advisory annunciator and acknowledgement system be designed and installed for the front entry area of the building.

Information provided by the City indicated that the alarm notification system for the Administration Building is separate from the system for other parts of the treatment plant. It is recommended that the plant upgrade/expansion design include an effort to upgrade the alarm system, including alarms for smoke and heat detection as well as security intrusion and major equipment problem conditions, to a unified system. That system would include several levels and categories of alarms such that fire and emergency crews were only notified for appropriate conditions. However, the entire alarm system should be coordinated into one unified program.

During the August 20 presentation and review meeting, the City indicated that building security related to break-ins was a concern, particularly during off-shift hours. It is recommended that the plant upgrade/expansion design include plans for an enhanced monitoring and alarm system for the entire plant, including the Administration Building.

20.20 RECOMMENDED ACTIONS

Related to the items discussed in the preceding sections, it is recommended that the following actions be implemented in conjunction with the pending SEWPCC upgrade/expansion project:

1) Expand the Men's Locker Room by converting the Women's Locker Room – install a connecting doorway.

2) Convert much of the Lab Room to be the new Women's Locker Room.

3) Develop a small new laboratory room in the present HPO compressor building and procure several items of basic laboratory analytical equipment.

4) Install a new Women's Wash Room in part of the existing Lab space.

5) Re-designate the existing upper level Women's wash room to be a Unisex wash room.

6) Install a plant model in the front entry room, add photos on the walls and minor decorative finishing.

7) Update the wall and ceiling treatment in the Lunch room.

8) Repair salt spalling on front concrete steps.

9) Trim and relocate trees and shrubs which are against the building face.

In addition, it is recommended that the City consider the following additional actions, if appropriate through projects other than the plant upgrade/expansion::

- Install a visitor advisory signal system – plant-wide buzzer or similar.
- Coordinate security, smoke/fire alarm systems, and coordinate with Risk and Criticality review actions.
- Repair or replace the UPS.

Figure 20.26 shows a general floor plan layout for the proposed new Women's Locker Room and new Women's Wash Room in the old Lab Room space, and the conversion of the existing Women's Wash Room to a new Unisex Wash Room, on the Main Floor.

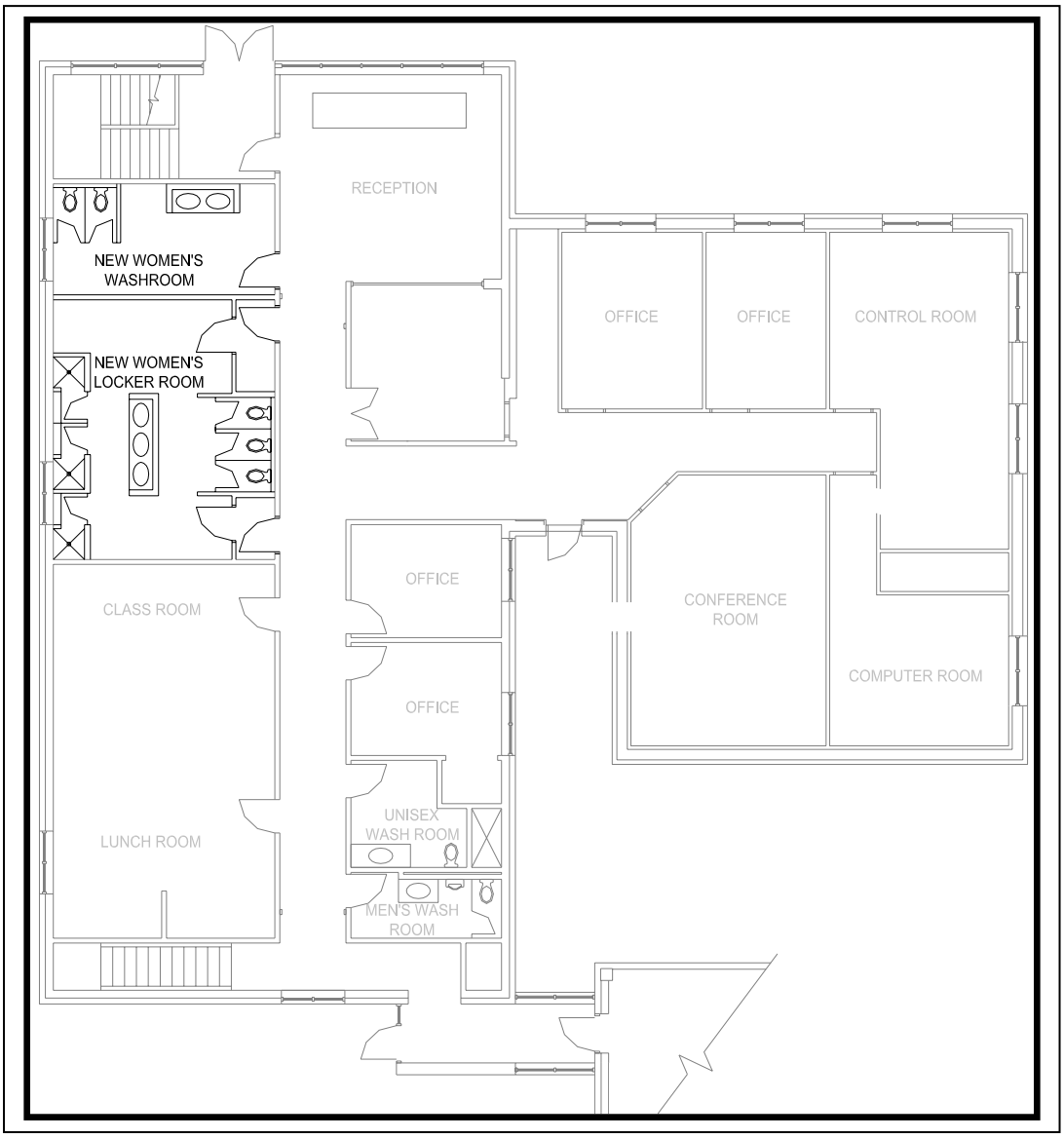

Figure 20.26: Proposed New Women's Locker Room and Washroom Layouts – Main Floor

20.21 OPINION OF PROBABLE COST

The following is a planning-level opinion of capital cost for the major items recommended above:

Table 20.2 - Opinion of Probable Capital Cost for Proposed Modifications

	Item:	Cost:
1.	Expand Men's Locker Room by converting the Women's Locker Room	$ 30,000
2.	Convert much of the Lab to Women's Locker Room, plumbing	150,000
3.	Develop a small lab in the HPO area building	120,000
4.	Install new Women's Wash Room in Lab space	80,000
5.	Re-designate the upper Women's Wash Room as a Uni-sex Wash Room	1,000
6.	Install model and perform other upgrades in the Entry room	40,000
7.	Update the wall and ceiling treatment in the Lunch room;	10,000
8.	Repair salt spalling on front concrete steps	45,000
9.	Trim and relocate trees and shrubs	5,000
	Total Construction Cost	**$ 481,000**

Costs for upgrading the visitor advisory, security and alarm systems and UPS are not included in the estimate. Those items should be developed in coordination with actions taken subsequent to the Risk and Criticality review studies. Other items which were noted in the 2006 Comprehensive Code Review are not included; it is assumed that those items will be addressed through other City programs.

The cost estimates shown above do not include taxes, contingencies, engineering and architectural design, or construction supervision.