

ARCHITECTURAL DESIGN NARRATIVE

BACKGROUND

The Haines Assisted Living Facility is a two-phase project located on a site that offers tremendous southern exposure of the majestic Chilkat Mountains. The floor plan is organized around an interior central garden and glazed two-story 'street/front porch' along the garden that functions as the main corridor. The building design is a blend of oriental/craftsman styles that provide a residential scale, interest, and warmth.

The building is raised slightly to allow views of the Chilkat Range to be unobstructed by parking and the adjacent buildings to the south.

Phase I of the facility will be 19,368 sf plus a 2,398 sf basement and consists of 13 residential living units, a hospice unit, commercial kitchen, two-story dining room with southern exposure, café, ice cream counter, sitting rooms, physical therapy, beauty salon, laundry, offices, support facilities, elevator, resident storage, terraced garden, and parking. To create a dynamic interaction between residents, all units are accessed from the 'corridor/street' and have a semi-private entry zone with windows into the unit and window boxes for gardening. The main entrance to the facility is defined by a large inviting, heavy-timbered, porch with covered drop-off zone.

Phase II of the facility will be 7,472 sf and consists of 11 additional residential units.

SITE

The site was donated by Lucy Harrell and the design was developed, in part, on her vision of an assisted living facility, capturing the exceptional view and promoting resident interaction.

The site is located on the corner of Third Avenue and Union Street and is two blocks from Haines' Main Street and boat harbor.

The site development includes small parking areas at the main entry and staff parking at the alley level with stair access to the central garden. The parking and garden will be developed in Phase I.

The existing two-story building at the SE corner of the site will be demolished as part of the Phase I construction.

MATERIALS AND FINISHES

The facility will be built utilizing two exterior wall systems:

1. The exterior walls adjacent to Third Avenue, Union Street, and the alley will be built with concrete insulated forms for both stories. The lower story will have furred out horizontal fiber cementitious siding, with smooth fiber cementitious panels above.
2. The exterior walls adjacent to the central garden will be built with a heavy-timber frame and wood stud wall (with thermal break) infill. The base of the exterior wall will be built with insulated concrete forms to 24" above finished floor.

The building will be designed to stress energy efficiency, pleasant interior environment, and low future operating expenses. Several features have been incorporated to enhance daylighting of the interior, and minimize mechanical system expenses.

The following is a break-down of typical exterior materials:

Exterior wall panels:	Horizontal fiber cementitious siding with 6" exposure at the lower floor exterior walls and larger cementitious panels at the upper floor exterior walls and at the garden exterior walls.
Exterior wainscot, garden:	Culture stone for 36" up the wall (finished floor will be 12" above garden).
Window systems:	Vinyl-coated wood windows.
Typ. Roof, 5:12 slope:	High-end 40 year warranty asphalt composition shingles with bituthene underlayment at eaves, valleys. Zinc strips @ 6' intervals along the slope will prevent moss growth.

The following is a break-down of typical interior materials:

Interior wall surfaces:	5/8" gypsum wall board, type X, painted
Foyer/ corridor wainscot:	Laminate over hardboard.
Foyer/corridor base:	6" hardwood.
Interior hallway glazing:	Steel frame relites with protected glazing.
Corridor/residential unit floors:	32 oz. Woven carpet, solution dyed.
Foyer/reception flooring:	Stained concrete

Wet area floor/base:	Class A vinyl, Smaragd, self-cove.
Office/residential units base:	4" rubber base
Typical residential unit ceilings:	Painted gypsum wall board
Foyer ceiling:	Glue-on acoustical ceiling tiles.
Corridor ceilings:	Glue-on acoustical ceiling tiles between heavy-timber frame.
Office/kitchen ceiling:	Lay-in acoustical ceiling panels
Stair, balcony railings:	Hardwood top rail with wood vertical balustrade.

ARCHITECTURAL BID ALTERNATES

The following features will be priced as bid alternates, allowing some manipulation of the budget if necessary.

1. Resident Storage at Basement: Provide 1,680 sf of additional resident storage at the basement.

CIVIL DESIGN NARRATIVE

INTRODUCTION

This property is owned by the St. Lucy's Conference of The St. Vincent de Paul Society. Rogers-MRV provided R&M an AutoCAD site drawing on July 26, 2006 to assist in preparing the schematic site development narrative. The site topographic survey was prepared by J.W. Bean, L.S., on June 15, 2006.

The proposed new Haines Assisted Living Facility is to be located at the intersection of Third Avenue and Union Street in the Haines Townsite Planning/Zoning District. Both of these streets are paved. The legal description is Lot 14A, Block 8 within the Haines Recording District. This property was formerly 4 lots, one of which is developed as a single family residence. The 4 lots have been combined to create one lot approximately 0.72 acres (31,487 square feet) in size. The property is zoned Commercial by the City of Haines Borough zoning maps.

The planned facility is to be a two story wood framed structure on a concrete foundation, constructed in phases, with the first phase providing 7 resident apartment units with a common kitchen, dining area, café, salon and hospice unit.

SITE UTILITIES

Sanitary sewer and water services for the new Haines Assisted Living Facility will connect to the existing City of Haines public utilities located within Union Street.

Power, telephone and television cable are located above ground in the gravel alley right-of-way to the south of the subject property.

WATER SERVICE

An existing 8" PVC water main is located on the south side of Union Street. Two existing 1" copper water services extend to the north lot lines at two locations from Union Street. The 1" water services are not adequate to provide domestic and fire protection flows. Murray and Associates, mechanical engineers for the project, have stated that a 6-inch water main is required to meet domestic and fire protection (sprinklered system) needs for the building. One 6-inch ductile iron water service will connect to the 8" PVC water main with an 8"x 6"x 8" tee fitting and a 6" gate valve installed prior to the line entering the building. Asphalt pavement removal and replacement will be required for installation of the new water 6-inch water main. It is assumed that there will be adequate water flow and pressure with a 6" water line but this may have to be confirmed during the

design development phase of the project. All water system components will follow current City of Haines Standard Specifications and Details.

SANITARY SEWER SERVICE

Two existing 4" PVC sanitary sewer services are stubbed out to the north property line from Union Street as identified in the topographic survey by J.W. Bean. Collection and discharge of wastewater from the Haines Assisted Living building is assumed to be via gravity methods through 6" PVC piping. The existing 4" PVC sanitary sewer services are not large enough to accommodate the projected wastewater flows from the assisted living building. A new 6" PVC sewer should be installed as far west as possible along Union Street and connect to the existing 8" PVC sewer main in Union Street. A sanitary cleanout would be installed 5' from the building wall. The sanitary sewer mainline in Union Street is approximately 8' feet below the pavement at the sanitary sewer manhole location near the intersection of Union Street and Third Avenue. Asphalt pavement removal and replacement will be required for the installation of the new 6" PVC sewer service. All wastewater generated from this site would be treated at the City of Haines wastewater treatment plant. All sanitary sewer system components will follow current City of Haines Standard Specifications and Details.

STORM WATER SYSTEM

No storm drain structures or underground storm drain pipe were identified in the topographic site survey. Storm water surface runoff will sheet flow away from the building to Union Street, Third Avenue and the gravel alley. Union Street and Third Avenue are both asphalt surfaced streets. Third Avenue has concrete curb and gutter with concrete sidewalks with curb inlets further south from the project site. Grading of the site will be from the east to the west in the same slope as Union Street.

All storm drain structures and pipes will follow current City of Haines Standard Specifications and Details. Roof drains would be routed to the ground surface and routed away from the building foundation walls. Foundation drains would be routed to storm drain catch basins/manholes if elevations were adequate. The parking lot on the south side would drain by surface sheet flow to the gravel alley. It is assumed that the surface storm water will continue to sheet flow along Union Street, Third Avenue and the gravel alley to curb inlet structures or open drainage ditches to a public storm drain system.

SITE ACCESS

The covered porch and drop-off zone will be accessed off of Union Street. Union Street is a two-lane paved street, 18' wide. Sidewalks will connect from the

building to Union Street. Union Street has a gradient of approximately 5.5%. The finish floor elevation of the building is currently set at elevation 136' to allow positive drainage away from the building. Due to the Union Street sloping at 5.5% grade it will be necessary to have combination basement/retaining walls to support the earth embankment. The west end of the building will have terraced landscape walls to support fill slopes and maintain access to the building. 13 parking stalls will be developed for this project that will be accessed off of the existing gravel alley and will be hard surfaced with concrete or asphalt pavement.

SITE PREPARATION METHODS

No subsurface investigation has been performed for this project at this time. The project site slopes from the east to the west at approximately 5-6% slope. There is over 10' of elevation difference across the site (4 lots). Three of the lots have historically been used as a parking area and as a snow storage area in the winter months. The site is gravel surfaced with no standing trees. It can be assumed that this property was cleared of trees and some site preparation work performed to create the existing gravel surface parking area.

Although no geotechnical investigation was performed we offer the following generalized site preparation methods assuming that conventional concrete spread footings are used for the foundation. *The actual geotechnical investigation will determine the actual site and building foundation preparation methods.*

1. Over-excavation will be required to remove loose, wet and unstable soils. Engineered fill beneath the building would be a minimum 4' thick granular non-frost susceptible backfill or shot rock fill below the bottom of the footing elevation with placement of a sub-grade reinforcing fabric at the bottom of the excavations. The bottom of the sub-cut should be proof rolled and any weak or soft areas removed and backfilled with granular material. De-watering of the excavation area most likely will be required.
2. Parking lot and drop-off zone construction will require removal of a minimum of 36" of existing material. Engineered embankment depth of 36" or greater of granular non-frost susceptible backfill or shot rock fill will be required depending on location. A thicker embankment section maybe required if existing soils are poorly drained or have significant fine grain soils. Geotextile reinforcing fabric is recommended to be placed at the bottom of the excavation limits, after the sub-cut area has been proof rolled.

Vehicle parking lot and drop off zone should have 2" asphalt pavement and 6" base course grading D-1 over the imported fills. Parking stalls should be delineated with striping and signed with appropriate traffic control signs.

3. Utility installation may require de-watering and pumping of all construction excavation.

REQUIRED DEVELOPMENT PERMITS

The following is a list of development permits that most likely will be required from the City of Haines to construct the new Haines Assisted Living Facility.

- City of Haines Conditional Use Permit
- City of Haines Grading and Drainage Permit
- City of Haines Building Permit

ELECTRICAL DESIGN NARRATIVE

BACKGROUND

The Haines Assisted Living Facility will be designed with the end user in mind, keeping health, safety and comfort as top priorities.

This project will consist of designing electrical systems for an assisted living facility. Standard, high quality products will be used for the basis of design. The following information outlines key portions of the design.

SERVICE AND DISTRIBUTION

The existing Alaska Power & Telephone Company (AP&T) utility service line runs overhead east-west along the south side of the site. A 3-phase line extension will be required to serve the new facility. The new extension will begin at a riser pole located across the alley on the south side of the site. The extension will proceed underground to a pad mounted utility transformer located in close proximity to the main electrical room for the building. Alternatively, an existing overhead transformer bank may be utilized to serve the facility via a riser pole and an underground secondary service. The exact routing and configuration of this line extension will be determined during design.

Incoming Service: A single utility service will provide power to the building. This utility service will provide power to the building at 208Y/120 volts, 3 phase, 4 wire as described above. The service ampacity will be sized to include a minimum of 25 percent spare capacity and to support the future Phase II Addition.

Main Distribution: Preliminary calculations indicate that an 800 Amp service will be required. A single main circuit breaker distribution panel located in a basement electrical room will serve the building. The main distribution panel will distribute power to branch circuit panels located throughout the facility. The panels will be placed strategically throughout the facility to minimize branch circuit homerun lengths. A shunt-trip disconnect switch and CT cabinet will be located on the exterior of the building and will comply with local utility requirements.

On-site Generation System: An on-site emergency power generation system will be provided and will be sized to support the entire facility. At a minimum, the generator will be a Level 1, Type 10, Class 2 generator. Per NFPA 110, this classification requires the generator to operate and assume the life safety loads within 10 seconds following loss of normal power and supply those loads for a minimum of 2 hours without refueling. The generator fuel source will be an interior skid mounted diesel fuel day tank located beneath the generator. This tank may be connected to an underground fuel oil storage tank supplying the boilers to allow an extended run time.

"Emergency" panels will provide power to designated loads such as emergency lighting, fire alarms, and other emergency equipment in accordance with Article 700 of the NEC.

All other panels will be "Standby" panels and will provide power to all non-emergency loads in accordance with Article 702 of the National Electric Code (NEC).

LIGHTING SYSTEMS

General:

High efficiency fluorescent lighting will be employed in most interior spaces. In common assembly areas the use of high output fluorescent fixtures (T5HO) will be considered for efficiency. A variety of fixture types will be used to distribute light in a controlled way that will be efficient, flexible and will compliment the architecture in their respective spaces. To avoid the "institutional look", fixtures built in to architectural elements will be considered.

High efficiency electronic ballasts will be used. Fluorescent lamps will have a high color-rendering index and a color temperature as determined during the next design phase. Decisions on specific lamp types will be finalized based on input from the Owner and engineering judgment. Fixtures will be selected to utilize standard lamp types. Lamps will meet the requirements for classification as non-hazardous waste when subjected to the Toxic Characteristic Leaching Procedure (TCLP) prescribed by the Environmental Protection Agency. The use of unique and expensive lamp types will be avoided.

We will be using the latest edition of the (Illuminating Engineering Society of North America) IESNA Lighting Handbook for determining horizontal and vertical illuminance levels.

Lighting concepts will be fully developed with the architect during the next design phase. Some preliminary concepts are described below based on area types. These are ideas for consideration in lieu of specific layouts.

1. General Lighting Concepts:

Seniors have special lighting needs. As the eye ages, higher illuminances are required to perform tasks that previously required a lower illuminance. Also, because senior's eyes require increased adaptation time, abrupt changes in luminance between contiguous spaces will be limited.

Fixture types and geometric layout patterns will be selected to compliment room shapes and features.

Task lighting and display lighting will be utilized to handle specific lighting tasks. Specific applications and control schemes will be developed with the architect during the next design phase.

Exit signs will be LED type with battery backup.

2. Specific Lighting Concepts:

- **Common Corridors:** Recessed cove or surface wall-mounted linear perimeter-type fluorescent lighting will be developed for common corridors and low ceiling traffic areas.
- **Living Units:** Fixtures will be selected to illuminate the volume of the space with direct and indirect components to provide increased depth perception and better visual recognition of faces and objects.
- **Site Parking:** Site Lighting will be furnished in accordance with the IES Lighting Handbook, 9th Edition, and the current State of Alaska regulations administered by DEC. The exterior lighting will be comprised of 15 foot poles with single light fixture configurations.

POWER SYSTEMS

General:

Grounding type receptacles will be provided in accordance with National Electrical Code requirements, or as required to match equipment. Receptacles will be 20A/120V in all areas.

Living Units:

1. Receptacles will be provided so that no point along the floor line in any wall space is more than 6 feet, measured horizontally, from an outlet in that space, including any wall space 2 feet or more in width. "Wall space" is considered a wall unbroken along the floor line by doorways, fireplaces and similar openings. Each wall space 2 feet or more wide will be treated separately from other wall spaces within the room. A wall space can include two or more walls of a room (around corners) where unbroken at the floor line. Receptacles will, insofar as practical, be spaced equal distances apart.
2. Two 20 amp small appliance circuits will be provided to serve receptacle outlets at the kitchen counter area for small refrigerators, microwaves and coffee machines.
3. One 20 amp circuit (feeding a dedicated GFCI receptacle) will be provided to serve a hair dryer/curling iron receptacle at each bathroom sink.

General Offices: One duplex receptacle per wall. Additional receptacles will be provided as required.

Corridors: Duplex receptacles every 30-40 feet (nominal).

Other Areas: As determined during design.

FIRE ALARM SYSTEM

An electrically operated, electrically supervised addressable fire alarm system will be provided in accordance with the International Fire Code requirements for Group I occupancies. The system will comply with the applicable provisions of the current NFPA Standard 72 National Fire Alarm Code, local building codes, and meet all requirements by Underwriters Laboratories Inc. and/or the Factory Mutual System. The system will operate as a low voltage, general evacuation fire alarm system.

Alarms will be annunciated at the fire alarm control panel located in the main entry.

Manual pull stations will be provided at every exit from every level and additional pull stations will be provided as required to ensure the travel distance to the nearest pull station does not exceed 200 feet.

Both audible and visual alarms will be provided throughout the facility to meet Code requirements and City of Haines requirements. Audio-visual horn/strobe units with combination horn and flashing alarm strobe will be used. The latest ADA requirements allow the use of ceiling mounted horn/strobes. It is anticipated that these will be utilized where appropriate to lower installation costs.

Smoke detectors will be installed in mechanical return air ducts in accordance with International Mechanical Code (IMC) requirements and will shut down air handling units upon alarm.

The facility will be equipped throughout with an automatic fire detection system. This system will include an approved automatic smoke detection system installed throughout resident housing areas, including sleeping areas and contiguous day rooms, group activity spaces and other common spaces normally accessible to residents.

Smoke detectors will be installed in corridors and spaces open to corridors.

NURSE CALL SYSTEM

General:

A small nurse call system is anticipated and will consist of the following:

- Hard wired bed stations
- Toilet room emergency call stations with pull strings
- Individual personal “call-for-help” portable wireless call station (A few will be provided for select residents)
- Nurse call dome lights (discreet installation)
- Central Control console

The exact requirements and device locations will be determined during the next design phase.

PAGING SYSTEM

Paging: A building-wide paging system will provide paging to all areas of the building via wall or ceiling mounted speakers. The paging system will have the ability to be interfaced with the Owner provided telephone switch.

CATV (Cable TV) DISTRIBUTION

A CATV distribution system will be provided. The local cable television provider will provide service to the building. An outlet will be provided at select locations in the commons areas, in all of the bedrooms in the residential housing units and in the gathering area in the residential units. Space and power (dedicated receptacle) will be provided at the headend location for the local cable provider's distribution equipment. No provisions for "off air" reception (master antenna system) will be made.

TELECOMMUNICATIONS SYSTEM

The building will be wired to the latest TIA/EIA standard for telecommunications using Category 6, unshielded, twisted pair products.

The components of the telecommunications distribution system are as follows:

Main Telecommunication Room (MTR): The MTR will serve as the main hub for the telecommunications systems for the facility and will contain the following equipment:

- Telephone service entrance.
- Phone Switch (Owner provided).
- Head-end equipment for the TV system.
- Head-end equipment for the Paging system.
- Data and Voice horizontal modular patch panels.
- Owner provided data network equipment.

The MTR will be centrally located on the first floor level near the entrance and will serve as the homerun location for all telecommunication, paging, and TV cabling.

Telecommunication Outlets: Multi-port telecommunication outlets will be provided in each residential unit and common areas as determined during the next design phase. Conduit from each outlet will be stubbed to the MTR.

KITCHEN DESIGN NARRATIVE

The food services for Haines Assisted Living facility will focus on providing meal service with limited menu selections to the HAL residents. The seating will accommodate 100% of the residents.

The kitchen will be designed to provide a limited restaurant service menu meaning the management for the food services can provide either a small range of entrée options or they can choose a fixed menu system. Full preparation and production will be available using fewer but versatile cooking appliances including a range and combination oven/steamer.

Refrigerated and dry storage space will be provided along with preparation and ware washing areas. A small foodservice staff is expected.

MECHANICAL DESIGN NARRATIVE

PLUMBING SYSTEM

The project will consist of designing mechanical systems for an assisted living facility in Haines, Alaska. High quality products and locally proven efficient systems will be used for the basis of mechanical design. Mechanical systems and equipment utilized will be familiar to local contractors and maintenance personnel to maximize ease in operations, system efficiencies, and long term care. The following information outlines key portions of the mechanical systems design and does not include all details of all intergraded systems. Some systems will require collaboration with the Owner and possibly further life cycle cost analysis for determination if they are viable or not.

DESIGN CRITERIA: The Haines Assisted living facility mechanical systems will be designed and constructed in accordance with the following codes:

- 2003 International Building Code
- 2003 International Fire Code
- 2003 Uniform Plumbing Code
- 2003 International Mechanical Code
- National Fire Protection Association
- ASHRAE 62-1989 Ventilation Standard

PLUMBING SYSTEM

Plumbing Fixtures:

Toilet Rooms: All plumbing fixtures located in toilet rooms, unless otherwise noted, shall be vitreous china. Water closets in the residential rooms will be the floor mounted type with insulated tank type flush. Water closets in the public areas will be the floor mounted type with pressure assist type flush. Lavatories will be wall mounted or counter mounted as applicable with dual wrist handle blades and short goose neck type faucets. All sinks will be stainless steel with gooseneck type faucets and single mixing handle.

Bathtub/shower combination units will be acrylic type with full ADA trim and faucet. The plumbing fixtures will be institutional type as manufactured by Kohler, American Standard, or Eljer unless otherwise noted. ADA fixtures will be provided throughout unless noted otherwise. All fixtures will be the water saving type. Floor drains with trap primers will be installed in all public toilet rooms but not the resident toilet rooms.

A dual drinking fountain will be installed on each floor. Drinking fountains will typically be a double unit, non-cooler type, ADA approved, of stainless steel construction.

Kitchen: Kitchen will have a triple pot sink, vegetable preparation sink, and hand wash sink, dishwasher with booster water heater, and grease trap interceptor. Sinks shall be of stainless steel construction with swivel gooseneck faucets and wrist-blade handles. ADA approved shallow depth basins will be installed where required. All sinks shall have cleanouts on the waste piping. A minimum of three floor sinks will be installed for indirect drainage from fixtures and refrigerator units condensate.

Custodial Rooms shall have floor mounted cast-iron service sinks with wall-mounted faucets, hose attachments, and pail hooks.

Hair Salon area will have a minimum of two floor mounted sinks and retractable type faucets appropriate for hair washing. A floor drain will be located in the Salon area.

Laundry area will have two recessed washer boxes with hot, cold, and waste connections, two dryer duct connections; one floor mounted molded stone type laundry sink, and a floor drain.

Various sinks, floor drains, floor sinks, area drains, and other plumbing fixtures will be provided as needed according to the facility layout. ADA fixtures will be provided where required. The building exterior will have non-freeze, lockable, recessed type wall hydrants spaced as needed to provide cold water to the building exterior and landscaping, estimated at providing five total wall hydrants. Hot and cold-water hose bibs will be provided in the Mechanical Room with vacuum breakers and threaded caps.

Domestic Hot Water:

Domestic hot water will be stored in two indirect fired 60 gallon hot water tanks, stainless steel tank-within-a-tank, located in the boiler room and heated by circulated boiler heating water through a double wall immersion heater. Domestic hot water will be maintained at 140F by the water heaters. A tempering valve installed at the hot water tank will temper the water for a maximum of 115F water temperature to be supplied to lavatory and sink faucets. A hot water recirculating pump (HWRP) located in the Boiler Room will circulate water throughout the building hot water mains to reduce hot water wait time at remote fixtures.

Hot Water Tanks Design: Triangle Tube TR-60.

HEATING SYSTEM

Heating Plant:

Three oil fired cast-iron sectional high efficiency heat exchanger forced draft boilers sized at 35% total heating capacity will provide heating water for the building heating system. Preliminary boiler sizes are 150,000 Net Btu/hr each, fuel burner capacity of 1.25 gph, meeting National CSD-1 fuel fired boiler requirements, and minimum DOE Seasonal Efficiency AFUE of 86.5 recommended. Combustion products would be routed to roof cap through double metal wall insulated chimney. Future phase, is estimated at 30% of base heating load, would require an additional boiler roughly the same size as in the base construction. Total of four boilers should be accounted for in the boiler room layout. The Contractor will adjust the fuel and combustion delivery system providing certificates and reports as required for operation and O&M requirements.

Oil-fired Hot Water Boiler Design: Weil McLain Ultra Oil.

Heating water circulated to heating units and domestic water production would be monitored and adjusted for shared load/priority requirements through a packaged control or direct digital control system depending on the extent of the building automation control.

Variable speed pipe mounted circulating pumps will circulate hot water through the building and adjust the flow rate according to actual needs of the heating zones. P-1 and P-2, will be primary pumps to heating, domestic water, and ventilation heating systems. The backup P-1/P-2 pump will operate if the primary pump fails. Secondary P-3 will serve the radiant floor systems.

A pipe mounted circulating pump (P-4, P-5, P-6), also variable speed, would be located on each boiler to circulate heating water through the boiler sections to help prevent boiler shock from too cold of return water.

Preliminary Pump Horsepower: P-1/P-2 three hp. P-3 fractional hp. P-4, P-5, P-6 one hp.

Fuel oil will be supplied to the burners from an underground 1000 gallon double wall tank with leak detection located adjacent to the Boiler Room. Monitoring panel for leak detection and fuel capacity sensing ability will be mounted on the wall of the boiler room. It is not anticipated that a day tank would be required due to the proximity of the underground tank. A man way sump manhole, containment fill manhole, and a monitoring manhole will be provided at the tank. The manholes tops will be coordinated with landscaping for ease of access. Underground fuel oil piping will consist of double wall flexible tubing installed in a 4-inch flexible containment conduit. Oil safety and anti-siphon valves will be used in accordance with code requirements.

Please Note:

Electric heat was suggested by the Owner as a possible alternative to oil heat. The current rate for electricity is 19 cents/kwh. For electricity to pay out rates must be below 9-10 cents/kwh. We recognize that there will be less maintenance cost with electric heat and we will investigate the Life Cycle Costs during the later phases.

Heating Delivery Systems:

Radiant floor heating is intended to heat all areas of the building. Each unit would be a single individual heating zone controlled by wall mounted electronic thermostat. Commons areas, especially those with high thermal loss area, such as glass and doors will need supplemental heating, suggested radiant ceiling heaters. Each floor of the common area would be divided into three zones with similar thermostats. Total zones per floor would be 11 on first floor and 10 on second floor.

Ventilation air to HRV's and other booster coils would be heated from the primary heating system. A two pipe variable flow heating piping system will be installed to provide heating water to all the heating units. Flow of the heating water would vary with actual heating requirements for the facility. The Contractor will adjust the heating water system and provide a report log to the Owner.

Fireplaces:

The fireplaces will be enclosed, and fired by propane. A central 200 gallon propane tank would be located exterior near the fireplaces. ¾-inch black steel piping would be routed to all fireplaces. Vent piping from the fireplaces will probably be a high sidewall discharge.

PIPING MATERIALS:

Domestic and Heating Water Piping: A building water main (6-inch) will be sized to serve the fire protection and domestic water system. A 3-inch domestic cold water main and water meter to serve the hot water tank and plumbing fixtures is anticipated. The building main will be ductile iron piping until after the fire protection main take-off. Domestic and heating piping material shall be hard-drawn copper tubing, ASTM B 88, Type L with 95-5 solder fittings or equivalent. Belowground domestic piping shall be Type K with brazed fittings. Cold water main is anticipated to be located in the basement mechanical room.

Vent and Waste Drainage Piping: Sanitary waste piping will be routed through the building and discharged to the sewer main located outside of the building. Waste and Vent material shall be cast-iron bell and spigot piping below grade and cast-iron no-hub piping above ground. Heavy duty stainless steel clamp-and-shield joint assemblies equal to Clamp-All or Husky Series 4000 for no-hub piping shall be used. Copper DWV shall be acceptable for above ground waste and vent. Equipment drains will be copper DWV or Schedule 40 black steel.

Valves: Domestic and heating water valves shall be provided rated for 400 psig working pressure. Valves 2-inches and smaller are to be bronze body, two-piece, quarter turn full port ball valves. Valves over 2-inches shall be gate valves. Valves 3-inches and smaller shall have threaded end connections with a union installed within four lineal feet of the valve. Valves 1" and smaller may have solder ends. Valves will be installed accessibly to individually shut off each heating/cooling unit or domestic water piping to each room. Heating water and domestic water drain valves shall have screwed caps. Vacuum breakers shall be installed on domestic piping drain valves.

PIPE AND EQUIPMENT INSULATION:

Pipe Insulation: Vent piping within 10 feet of roof penetration, all domestic cold, hot and recirculating water piping, and chilled water piping shall be insulated with sectional pipe covering, mineral fiber, 1 inch IPS thick. 2-inch and smaller heating piping shall be insulated with 1-1/2 inch thick mineral fiber insulation, 2-inch thick on piping over 2-inch in diameter.

Duct insulation: Outside air duct from louver to fan, exhaust duct from louver to fan exhaust air damper, and all supply air heating or cooling ducts insulated with faced 1-1/2 inch thick glass-fiber blanket having a minimum density of 1 pound per cubic foot and vapor barrier facing consisting of aluminum foil laminated to a sheet of flame-resistant 30 pound paper with glass-fiber reinforcing mesh between.

VENTILATION AND FAN SYSTEMS

Ventilation/Air-conditioning:

Phase 1 area residential units require roughly 1400 cfm of circulated outside air and exhaust air to transfer heat from the exhaust air to outside air. Proposed would be a central heat recovery ventilation unit with cross flow heat recovery metal core, separate supply and exhaust centrifugal fans, filters on both supply and exhaust, that would supply heated outside air and exhaust all toilet room air. The HRV would recover approximately 50% of the exhausted heat and transfer it to the outside air, a booster coil would be needed to further increase the temperature of supply air to the residential

rooms. Approximate size of the HRV unit would be 1500 cfm. Roof top caps would be used for intake and exhaust. Wall mounted louvers would be used if available. It is not proposed at this time to air-condition the residential spaces. Future Phase 2 area would require a separate HRV unit.

Commons area requires roughly 4,500 cfm ventilation capacity for air conditioning of this space. Cooling system would be a standard commercial type refrigeration split system using exterior compressor-condensers with circulated refrigerant fluid to one DX type cooling coils in the main ventilation unit. Approximate size of the cooling system would be 94,000 Btu/hr or 8 tons of cooling. Exterior condenser would be located on concrete pads.

Exhaust Fans: Custodial Rooms, Laundry, Salon, and Elevator Machinery will be exhausted by with ceiling mounted exhaust fans, size of 150 cfm each. Controlled by wall mounted switch or room thermostat.

Kitchen: A Type I grease range commercial hood fan and ducting would be installed above the oven/ranges in the kitchen. Exhaust Fan EF-1 would be located on the roof on a ventilated curb. Size of EF-1 is estimated to be at 2000 cfm. Make-up air fan SF-1, would be located in the second floor Fan Room and supply heated outside air to make-up the exhaust air from the kitchen. SF-1 would have face and bypass dampers heating coil and 30% efficiency filters.

Boiler room will have a wall mounted propeller type fan to help control heat in the room. Approximate size of wall mounted fan is 1400 cfm. Control by wall mounted room thermostat.

Adjustment of air systems: Supply, return, and exhaust air volumes are to be adjusted by the contractor and a log is to be provided to the Owner. Supply systems shall be measured at the full outside air position and the full recirculating position. Minimum code required outside air volumes shall be adjusted and verified.

Ductwork Materials: Ducting shall be located concealed above the ceiling. All ducts shall be fabricated of galvanized steel sheet metal. Ducts will be fabricated in accordance with SMACNA HVAC Duct Construction Standards low pressure (2-inch) Class. Ducts shall be hung and supported from structural members. Flexible duct will be utilized for straight horizontal connections to diffusers, limited to a 5-foot length.

AUTOMATIC CONTROLS

Controls: A Building Automation System (BAS), direct digital controls, would operate the mechanical equipment and control automatic valves, automatic dampers, room thermostats, and controllers to provide the sequence of operations for the mechanical systems. Thermostat set points will be controllable at each zone with override capability through the BAS. Room temperatures will also be monitored by the BAS system.

The Building Automation System (BAS) and automatic control system will be an electric/electronic control system. The system will provide automatic control, sequencing,

monitoring, alarming and trending of the building mechanical systems. Terminal equipment controllers will be installed at each air handling system and possibly in several locations throughout the building for control of heating zones.

A modular controller field panel connecting all the terminal equipment controllers will be located in the Mechanical Room. A modem connection will enable remote interface with the system as well as a LAN network for access over the internet. At start-up, the Control Contractor will provide two days of training for the Owner.

AUTOMATIC FIRE PROTECTION

An underground 6" cold water main will serve both the domestic water and automatic sprinkler system for the building. The sprinkler header will be located in the Boiler Room and will consist of a double check backflow preventer and wet valve. The wet valve will serve a sprinkler system for all interior portions of the building including warm attic spaces with dry recessed pendent heads protecting entryways. The Fire Department pumper connection and alarm bell will be located on the exterior Boiler Room wall. Sprinkler heads are to be recessed pendent heads in all occupied areas with ceiling space or sidewall heads with no ceiling space. Standard pendant heads will be acceptable in all unoccupied rooms such as storage and custodial rooms where surface mounted lights are utilized. Ceiling space is anticipated to be combustible and so will need to be sprinklered also.

END OF MECHANICAL NARRATIVE

STRUCTURAL DESIGN NARRATIVE

GENERAL REQUIREMENTS

1. **Codes and Standards:** The latest editions of the codes and standards will be used.
 - a. International Building Code, 2003 Edition.
 - b. American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures SEI/ASCE 7-02
 - c. American Concrete Institute, Building Code Requirements for Structural Concrete ACI 318-02.
 - d. American Institute of Steel Construction, Allowable Stress Design, Ninth Edition.
 - e. American Institute of Steel Construction, Seismic Provisions for Structural Steel Buildings, ANSI/AISC 341-02
 - f. National Design Specification for Wood Construction 2005 Edition.

2. Design Loads:

- | | |
|---------------------|---|
| a. Roof – Snow Load | $P_g = 90$ psf Ground Snow Load
$C_e = 0.9, C_t = 1.0, I_s = 1.0$
$P_f = 83$ psf Roof Snow Load
Snow Drift per SEI/ASCE 7-02 |
| b. Wind Load | $V = 130$ mph, 3 second gust
$I_w = 1.0$, Exposure B |
| c. Seismic Loads | $S_s = 1.25, S_1 = 0.5$
$S_{ds} = 0.73, S_{d1} = 0.465$
Seismic Use Group II
$R = 6.5, \text{Omega} = 3$
Light Framed Shear Walls |
| d. Floor: | |
| i. Typical | 50 psf |
| ii. Public Areas | 100 psf |
| iii. Storage Areas | 125 psf |

3. **General Building Description:** The building is a two story wood framed structure supported on cast in place concrete strip footings and stem walls. Floors and roof are plywood or oriented strand board (OSB) sheathing over wood joists.
- a. The building superstructure will be wood framed construction.
 - i. The roof deck will be 3/4" thick sheathing spanning over the gang nail roof trusses at 24" on center. Heavy timber framing will be used at the entry and public areas.
 - ii. The floor decks will typically be 3/4" thick sheathing. A concrete slab of approximately 1 1/2" to 2" thickness can be provided for noise control and possibly in-floor heat. The floor deck will be supported by wood I joists similar to the Truss-Joist McMillan I series joists.
 - iii. The columns will typically be heavy timber wood posts to continue the heavy timber truss concept down through the structure.
 - iv. The lateral load resisting system will be plywood or OSB sheathed shear walls. The typical shear wall locations will be around the exterior of the building and at the party walls between alternate units.
 - b. The foundation system is cast in place reinforced concrete strip footings and stem walls with concrete piers and pads at column locations. A partial basement area is provided. 8" thick reinforced concrete walls will be provided around the perimeter of the basement area.