Historic St. Mary's City Boutique Hotel MEP Schematic Design

St. Mary's, MD



MEP Schematic Design Narrative

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Prepared By:

CFR Engineering Consultants, Inc.

20251 Century Blvd, Suite 120

Germantown, MD 20874

(877) 871-4229

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1.1 MECHANICAL

1.1.1 GENERAL

The proposed mechanical design for the Historic St. Mary's boutique hotel and conference center has been developed as a schematic-level basis of design consistent with the project proposal and intended to support early owner decision-making. As outlined in the proposal, the project is a new-build hospitality boutique hotel development in Historic St. Mary's, Maryland, anticipated to include over 100 guestrooms, public amenities spaces, a rooftop bar, and a conference center.

Preliminary layouts of the building include room types: guestrooms, public spaces, rooftop bar, conference center, restaurant, dining mechanical rooms, fitness room and back of house spaces. Because these areas have different occupancy patterns, operating schedules, and comfort expectations, the mechanical systems have been organized to respond to each use type while maintaining an overall approach appropriate for a boutique hospitality project. Across all options, the design will include space heating and cooling, outdoor air ventilation, toilet and general exhaust, commercial kitchen grease exhaust, building pressurization, building humidity control and a building automation system for scheduling, monitoring, and system control.

1.1.2 APPLICABLE CODES AND CALCULATIONS

1.1.2.1 Codes, guidelines and standards:

- ASHRAE 62.1 (2019) – Ventilation for Acceptable Indoor Air Quality
- ASHRAE 90.1 (2019) – Energy Standard for Buildings
- IBC (2021) – International Building Code
- IECC (2021) – International Energy Conservation Code
- IFGC (2021) – International Fuel Gas Code
- IFC (2021) – International Fire Code
- IMC (2021) – International Mechanical Code
- IPC (2021) – International Plumbing Code
- NFPA 70 (2023) – National Electric Code
- NFPA 90A (2018) – Standard for the Installation of Air conditioning and Ventilating Systems

1.1.2.2 Calculation Methodology:

WEATHER

- Minimum Cooling Design = Exceeding ASHRAE 1%
  = 95°F Dry-Bulb
  = 78°F Wet-Bulb
- Maximum Heating Design = Exceeding ASHRAE 99.6%
  = 10°F

ENVELOPE LOADS

- The minimum envelope construction will meet baseline building performance rating per ASHRAE Standard 90.1–2019 for the building envelope components such as glazing, insulation, roofing, and slab. For walls in ASHRAE Climate Zone 4A, this implies a U-Value that is equal to, or better than, 0.0544 BTU / h / sq. ft. / °F, or R-value of 18.4. For windows, this implies a U-Value equal to, or better than, 0.4675 BTU / h / sq. ft. / °F, and a maximum solar heat gain coefficient of 0.36. Refer to architectural sections for additional information on envelope design.

INTERNAL LOADS

Guestrooms

- Two (2) people per one-bedroom guestroom.
- Maximum allowable lighting power density will range from 0.75 to 1 W/SF.

Public spaces

- Loads for public spaces will be determined and calculated in greater detail at design development phase.

VENTILATION

- ASHRAE 62.1 compliant
- Hotel Guestrooms
  - 2 occupants for each hotel room
  - 10 people/1000 ft²with a ventilation rate of 5 CFM/occupant and 0.06 CFM/SF
  - A minimum of 50 cfm per guestroom
- Restrooms
  - Guestrooms: 30 CFM of continuous exhaust
  - Public Restrooms: 50 CFM of continuous exhaust per fixture
- Corridors
  - 0.06 CFM/SF, minimum
- Restaurant/Bar
  - Restaurant: 70 people/1000 ft² with a ventilation rate of 7.5 CFM/occupant and 0.18 CFM/SF.
  - Bar: 100 people/1000 ft² with a ventilation rate of 7.5 CFM/occupant and 0.18 CFM/SF.
  - Kitchen exhaust will be provided for 12' of kitchen exhaust hoods at 500 CFM/LF of hood (6,000 CFM per hood).
  - Design ventilation will be progress and subject to change as determined by food consultants design development.
- Lobby
  - 30 people/1000 ft² with a ventilation rate of 7.5 CFM/occupant and 0.06 CFM/SF.
- Fitness Center
  - 10 people/1000 ft² with a ventilation rate of 20 CFM/occupant and 0.06 CFM/SF.

PRESSURE RELATIONSHIPS

- Ventilation air, serving also as exhaust make-up air, will be provided to each guestroom. The guestrooms will be slightly positive with bathroom exhaust balanced to a lower airflow than required ventilation air to maintain positive pressure to the corridor.
- Make up air will be provided for the kitchen commercial exhaust hood with exhaust air balanced to a higher airflow to maintain the kitchen negatively pressurized to surrounding areas.

INDOOR DESIGN CONDITIONS

- Summer = 73°F Dry Bulb +/- 3°F
- Winter = 70°F Dry Bulb +/- 3°F

1.1.2.3 PROPOSED MECHANICAL SYSTEM(S)

The mechanical system design for the new boutique hotel and conference center in Historic St. Mary's City, Maryland, will provide a preliminary basis of design for occupant comfort, ventilation, and operational flexibility appropriate to a hospitality facility with over 150 guestrooms and associated public/support spaces. At this concept stage, the design will address supply and exhaust air systems; cooling and heating; outside air ventilation; grease exhaust for the commercial kitchen; and building automation, with emphasis on a practical, energy-conscious approach that can support guest comfort, conference functions, and back-of-house operations while remaining consistent with the schematic nature of the project.

Space Type	Option 1	Option 2	Option 3
Guestrooms(GR)	PTAC + OA louver	VRF	4 pipe FCU
Public Spaces(PS)	Multi Zone DX	VRF	4 pipe FCU
Restaurant/Bar	Multi Zone DX	VRF	4 pipe FCU
Conference Center	Multi Zone VAV AHU + FPB w/elec RH	Multi Zone VAV AHU + FPB w/elec RH	Multi Zone VAV AHU + FPB terminal units w/ HW RH
Ventilation	GR: PTAC OA louver PS:DOAS w/ energy recovery	DOAS w/ energy recovery	DOAS w/ energy recovery
First Cost	Lowest	Highest	Moderate to High
Operating/Life cycle Cost	Lowest	Highest to moderate	Moderate
Key Advantages	Lowest initial guestroom cost; simple guestroom replacement strategy; VRF/DOAS still provides strong comfort in public spaces and rooftop bar	Best comfort and acoustics in guestrooms; consistent system strategy across hotel amenity areas; strong zoning and part-load efficiency; good humidity/ventilation	Provides simultaneous heating and cooling, good room-by-room control, and aligns well with hotel operation. Requires chilled water, heating water, condensate, and ventilation distribution.
Key Drawbacks	PTAC noise in guestrooms; more façade penetrations; weaker hospitality aesthetic; less premium guest experience	Highest first cost; more controls integration; more distributed refrigerant equipment than PTAC approach	Higher first cost than simpler packaged systems; more coordination for chilled water, heating water, condensate; more in-room maintenance access requirements; air-cooled chiller sound can be less favorable.
Assessment	Budget-driven option. Best when first cost is the primary driver	Preferred basis of design. Best balance of guest experience, flexibility, acoustics, and long-term performance	Good guest comfort and zoning flexibility. Best suited if the owner accepts added first cost and maintenance complexity in exchange for better controllability and zoning and expansion flexibility.

1.1.3 THE GUESTROOMS

Option 1

Each guestroom will be conditioned via Packaged Terminal Air Conditioning Units (PTACs) located at perimeter wall under window. The basis of design PTAC product is a Dr. PTAC unit. The PTACs will vary in size, based on the required conditioning loads and perimeter exposure of each guest room. PTAC basis of design provides outside air intake integral to PTAC unit and equipped with enhanced dehumidification to assist with reducing excess moisture and odor, as well as providing increased air quality. This PTAC arrangement will not require ducted OA to individual guestrooms from a DOAS unit. PTACs do not require any outdoor units as their condensers are integral to each unit and mounted thru façade.



Figure 1.1 – Typical PTAC for Guestroom Application

Option 2

Each guestroom will be conditioned via a variable refrigerant flow VRF indoor air handling unit concealed above the ceiling at the entrance way to each guestroom with a plenum return grille. AHU will include a side wall supply grille with a plenum return. The VRF indoor units will vary in size, based on the required conditioning loads and perimeter exposure of each guest room. VRF system basis of design is Mitsubishi VRF system. This system will include an outdoor condensing unit located on flat roof or on grade which will connect to multiple indoor units with branch circuit controller to direct refrigerant to each individual indoor AHU.

This option would require two dedicated outside air unit(DOAS) located on roof above the two guestroom wings of the hotel. DOAS units will provide ventilation to each guestroom and include outside air shafts with ducted side wall supply grilles to each guestroom and ventilation to public spaces. See section 1.1.5 below for more information.

Due to refrigerant use in occupied spaces, compliance with ASHRAE 15 will be evaluated to determine if refrigerant monitoring will be required in guestrooms.

Option 3

This option uses 4-pipe concealed fan coil units located above the entryway of each guestroom with side wall supply grille and return duct to ceiling return grille above entry door of the guestroom. An air-cooled chiller located outdoors produces chilled water for cooling, while a condensing boiler plant produces heating hot water for space heating. The 4-pipe arrangement allows chilled water and heating hot water to be available simultaneously, which is beneficial for a hotel program where guestrooms, lobby, meeting spaces, and back-of-house areas may have different load demands at the same time.

Bathroom Exhaust System

Guestroom bathroom exhaust air will be routed to fire-rated exhaust shafts from bathrooms and routed back to DOAS unit for energy recovery. Vertical exhaust risers will extend downward from the roof to serve stacked guestrooms, with adjacent guestrooms sharing a common riser between bathrooms. Each bathroom will connect to the riser through a ceiling-mounted exhaust grille with a fire damper or subduct exhaust connection to the exhaust riser to avoid needing a fire damper and access door. If subduct is used the exhaust system will be required to have emergency power per code.

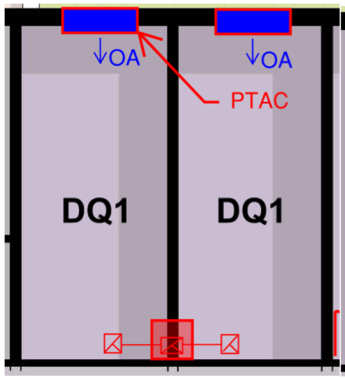


Figure 1.2 – Option 1

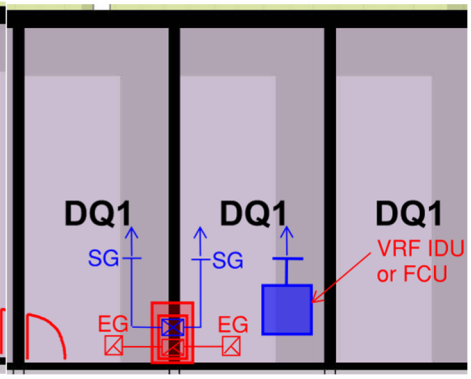


Figure 1.3 – Option 2 & 3

1.1.4 PUBLIC SPACES(CORRIDORS, FITNESS, LOBBY, RESTAURANT AND BOH SPACES)

Option 1

Mechanical design is to serve public spaces via DX multi zone heat pumps that can serve 5 zones with a single outdoor unit. This approach offers lower up front cost and will require more outdoor units to serve these zones. These zones will not the integrated into a VRF and will be a standalone systems. Ventilation will be served via a DOAS unit with outside air ductwork and air devices for each space.

Option 2

The public space mechanical systems for the hotel, including corridors, fitness, lobby, restaurant/dining, and back-of-house spaces, are intended to be served by a variable refrigerant flow (VRF) system with ceiling-concealed or other appropriate indoor fan coil units located to suit the architectural layout and zoning needs of each area. The VRF system will provide space heating and cooling with individual zone control to accommodate varying occupancy patterns, internal loads, and operating schedules throughout the public areas. Refrigerant distribution to the indoor units shall be provided through Mitsubishi branch circuit controllers as required for the selected VRF system configuration.

Ventilation air for these public spaces will be provided by a dedicated outdoor air unit (DOAS). The DOAS will condition and dehumidify outside air prior to delivery to the occupied spaces to satisfy ventilation requirements and reduce latent load on the VRF indoor units. The overall system intent is to separate sensible space conditioning from outside air treatment, improving zoning flexibility, humidity control, and part-load performance.

Due to refrigerant use in occupied spaces, compliance with ASHRAE 15 will be evaluated to determine if refrigerant monitoring will be required in any of the public spaces.

Option 3

This option uses 4-pipe fan coil units distributed throughout the hotel to provide individual zone cooling and heating control. An air-cooled chiller located outdoors produces chilled water for cooling, while a condensing boiler plant produces heating hot water for space heating. The 4-pipe arrangement allows chilled water and heating hot water to be available simultaneously, which is beneficial for a hotel program where guestrooms, lobby, meeting spaces, and back-of-house areas may have different load demands at the same time.

This system requires a building-wide hydronic infrastructure, including separate chilled water supply/return piping and heating hot water supply/return piping routed horizontally and through vertical piping risers to serve fan coil units on each floor. Variable volume pumping will be required for both the chilled water and heating hot water systems to improve part-load efficiency and reduce pumping energy. Adequate mechanical space will be needed for the boiler plant, pumps, expansion tanks, air separators, hydronic accessories, and associated controls, in addition to space allocation for piping mains, risers, and fan coil service access throughout the building.

1.1.5 DEDICATED OUTDOOR AIR SYSTEMS

Ventilation air will be provided to each guestroom and public spaces via a roof-mounted Dedicated Outdoor Air Systems (DOAS) unit. Each guestroom wing will require separate DOAS unit mounted on the flat roof. The DOAS will include a heat pump DX (refrigerant) coil with unit mounted condenser coil/fan, emergency electric heating coil and humidifier to humidify air in the winter. DOAS unit will discharge ventilation air at room neutral air temperature. If guestroom option 2/3 are engaged outside air risers will route down building and will provide side wall supply grilles to discharge outside air to each guestroom and public spaces will be provided with ceiling mounted supply grilles. The outside air duct riser will be required to be routed within a 2 hour fire rated shaft and as the branch duct leaves the shaft a fire damper will be required at this penetration with ceiling access door to the fire damper. To limit access doors in guestroom bathrooms exhaust system can be installed with sub ducts to avoid access doors for fire damper access, however this will require shafts to be larger to accommodate larger exhaust riser to fit sub ducts fittings. Exhaust from public spaces and guestrooms will be routed to DOAS unit for energy recovery via energy recovery wheel integral to DOAS unit.

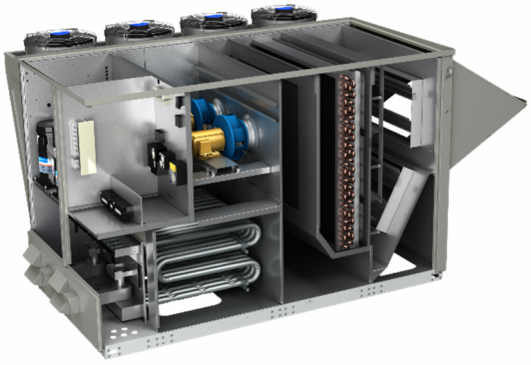


Figure 1.4 – Typical Dedicated Outdoor Air System

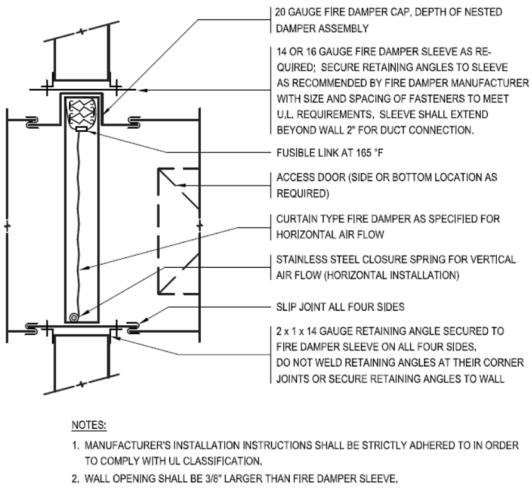


Figure 1.5 – Typical Fire Damper Installation

1.1.6 KITCHEN

The kitchen located on the first floor of the hotel will be conditioned via variable refrigerant flow (VRF) system with ceiling-concealed or other appropriate indoor fan coil units located to suit the kitchen layout and zoning needs. It is anticipated that this kitchen will be a full service kitchen with a grease kitchen hood. The hood will require a roof mounted grease exhaust fan with 2 hour fire rated insulated grease ductwork routed in a fire rated shaft up building. Grease ducts will need to be sized to handle this airflow at a velocity of at least 500 feet-per-minute, per IMC. The hood will be provided with a kitchen makeup air unit with heating only and will be located on grade near the loading dock. Kitchen hood and associated exhaust fan and makeup air unit will be coordinated with kitchen designer and sized as required per kitchen hood manufacturer recommendations. Further coordination with the kitchen designers will be required to determine if a separate dishwasher exhaust and hood is required to serve the dishwasher located in the kitchen.

1.1.7 CONFERENCE CENTER

The conference center shall be served by a central recirculating VAV air-handling unit located in a dedicated basement mechanical room. The AHU shall include an electric preheat coil and provide cooling by either a DX cooling coil connected to a remote air-cooled condensing unit located near the loading dock, or a chilled water cooling coil served by an outdoor air-cooled chiller. The system shall include demand control ventilation for high-occupancy assembly spaces and an air-side economizer to provide free cooling when outdoor conditions permit. Outside air and relief air louvers shall be provided and coordinated with the architectural and structural design to serve the basement AHU. Perimeter spaces shall be served by fan-powered terminal units with electric heat, and smaller back-of-house spaces shall be served by single-duct VAV terminal units with electric reheat. Conference room restrooms will require a bathroom exhaust fan to be located on roof of restaurant and shall be down blast exhaust fans with ductwork routed down to restrooms.

1.1.8 MECHANICAL SCHEMATICS AND PLANS

See below for mechanical schematic designs .



Figure 1.6 –LEVELB1 Conference Center Schematic Mechanical Plan

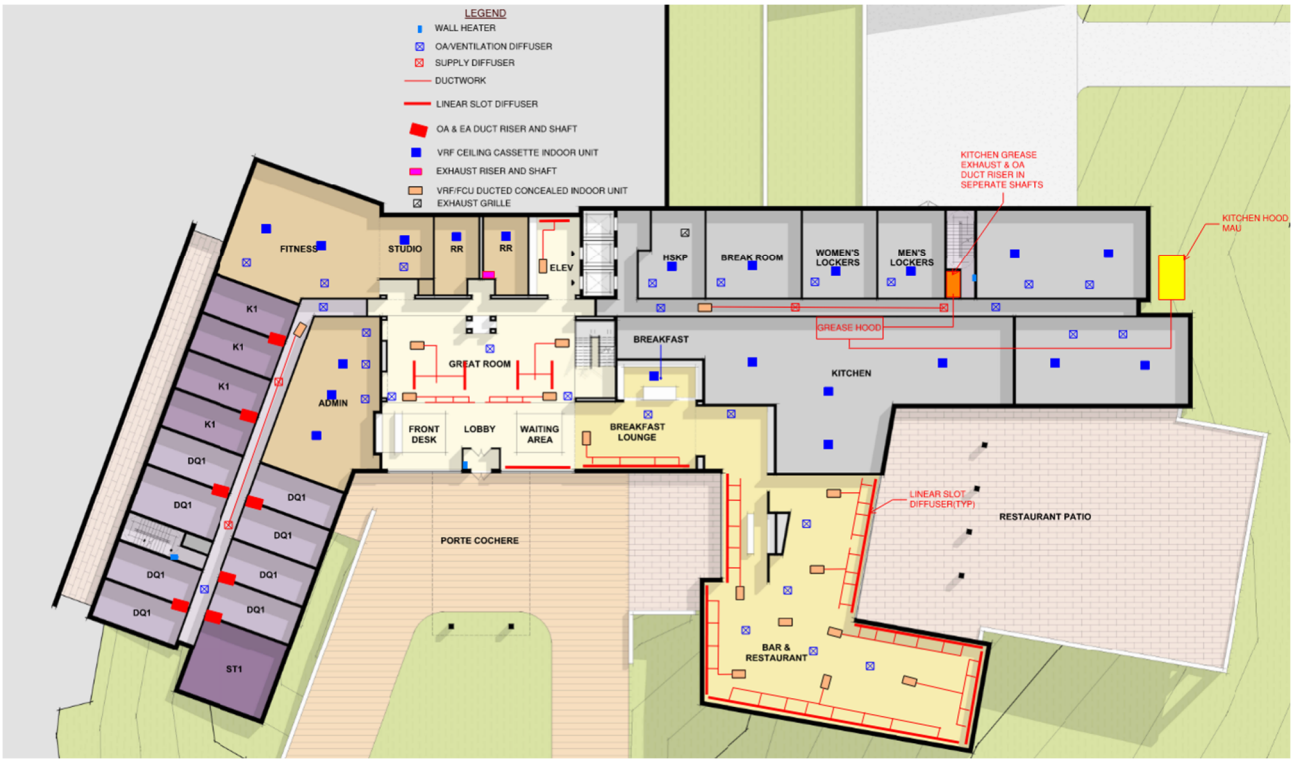


Figure 1.7 – LEVEL 1 Schematic Mechanical Plan

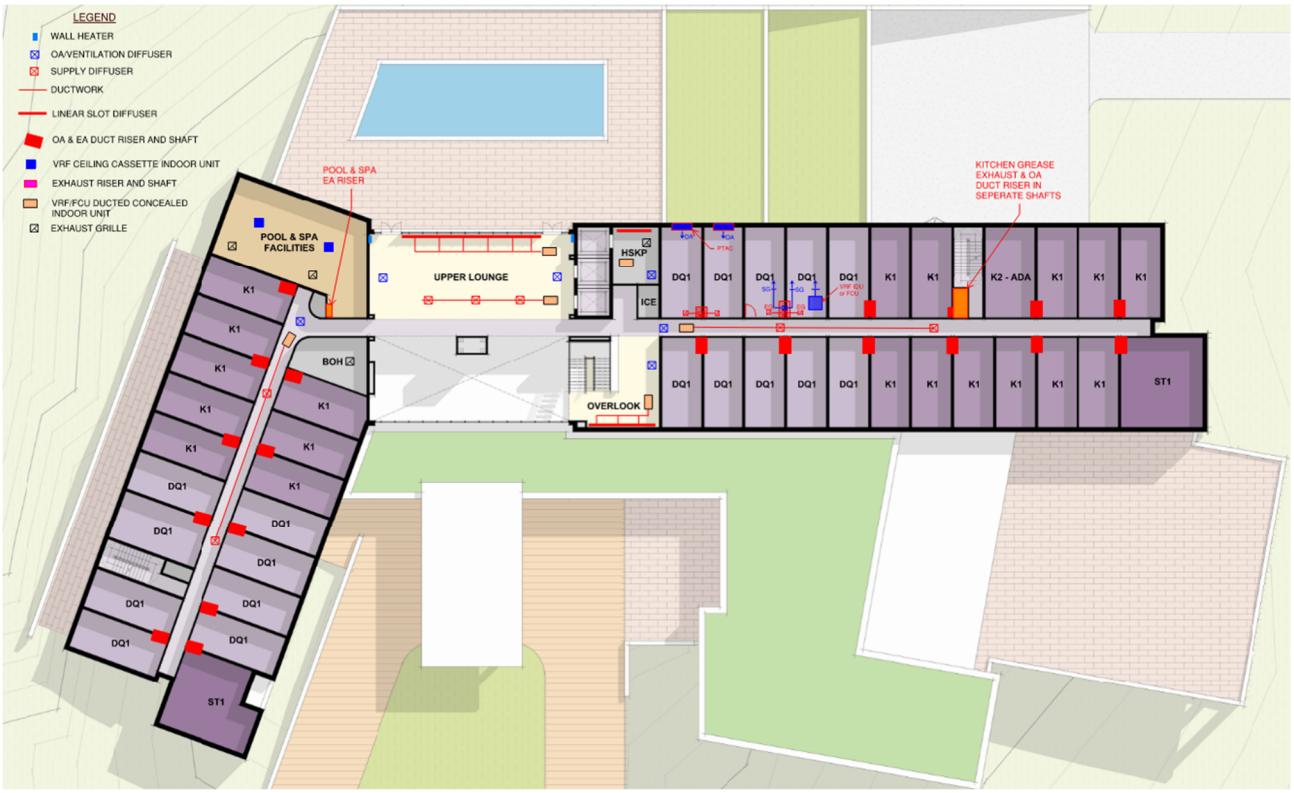


Figure 1.8 – LEVEL 2 Schematic Mechanical Plan



Figure 1.9 – LEVEL 3 Schematic Mechanical Plan



Figure 1.10 – LEVEL 4 Schematic Mechanical Plan

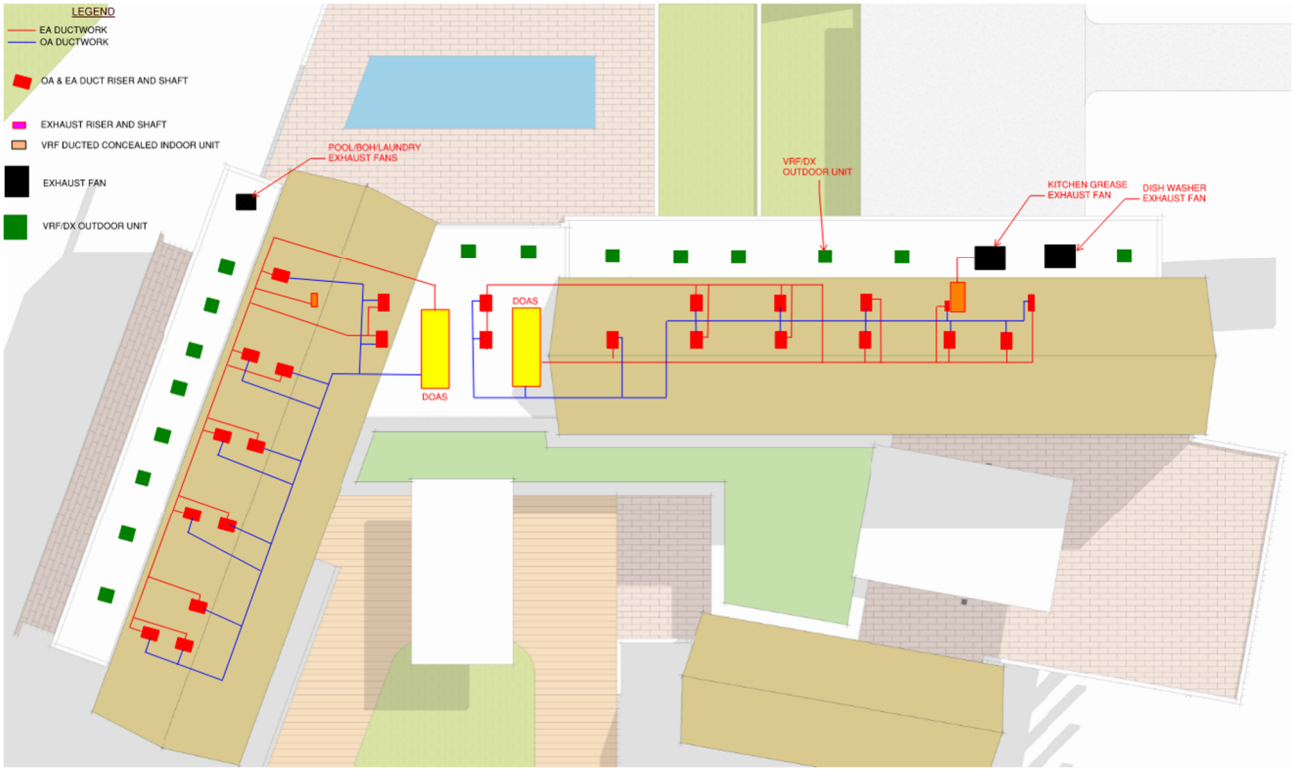


Figure 1.11 – ROOF Schematic Mechanical Plan

1.1.9 OTHER HVAC SYSTEMS AND CONSIDERATIONS

Elevator Machine Room HVAC

The elevator machine room will be provided with a split system heat pump to satisfy conditioning loads and connected to emergency power.

Building Entry HVAC

Doorways and entry vestibules will be provided with wall mounted electric wall heaters to maintain space temperature near entryways while occupants open and close doors.

1.1.10 BUILDING AUTOMATION SYSTEM

The building will be designed with a Trane, Siemens, or Johnson Controls Building Automation System (BAS) to allow for optimal control of the HVAC and energy systems. A BAS allows for better maintenance, monitoring of equipment, easier trouble shooting and scheduling, accurate trending of setpoints, runtime and energy usage, alarm notifications and input control. The front-end workstation can be located in the back of house space to be coordinate with owner.

2.1 PLUMBING

2.1.1 GENERAL

Plumbing scope is limited to preliminary concept/Basis of Design level for the new boutique hotel and conference center in Historic St. Mary's City, MD. The proposed plumbing systems include domestic hot and cold water, non-potable makeup water, storm and sanitary waste, domestic water and sewer mains extended to 5 feet beyond the building foundation, and a grease interceptor for the food preparation area. Plumbing utility connections and services beyond 5 feet outside the building are by the civil engineer.

2.1.2 APPLICABLE CODES AND ASSUMPTIONS

2.1.2.1 Codes, guidelines and standards:

- ASHRAE 90.1 (2019) – Energy Standard for Buildings Except Low-Rise Residential Buildings
- IBC (2021) – International Building Code
- IPC (2021) – International Plumbing Code
- IFGC (2021) – International Fuel Gas Code
- IECC (2021) – International Energy Code
- NFPA 70 (2020) – National Electric Code

Our recommendation is that the following piping materials are used:

- Domestic Cold and Hot: Copper pipe type L
- Storm Water: Cast Iron
- Sanitary risers & branch piping to flush fixtures: Cast iron.
- Sanitary branch piping to non-flush fixtures: Cast iron.
- Sanitary - Below grade: Cast iron
- Gas Piping – Schedule 40 black steel pipe.
- Owner shall consult engineer if alternate materials are desired.

2.1.3 PLUMBING SERVICE

Based on the provided architectural schematic plans, the water demand is estimated to be 208 GPM, and the main domestic water service is estimated to be 4" diameter line with the main building cold water entry service, associated back flow prevention and main water meter located in the BOH/Service room on Level B1. A letter will be provided to local authorities to request a 3" water meter to be located inside the building.

Based on provided civil plans, the new domestic and fire protection water service entrance will be located at the west side of the building near the Level 1 ST1 room type. However, IMEG requests that the water entrance and other sanitary and storm service entrance be located in the BOH/Service on level B1.The pipes will be routed under the building and enter the BOH/Service where the water meter and backflow prevention will be located. Detail of pipe burying, routing, and slab penetration will be per latest requirements, and will be coordinated between architectural and civil engineers during further design.

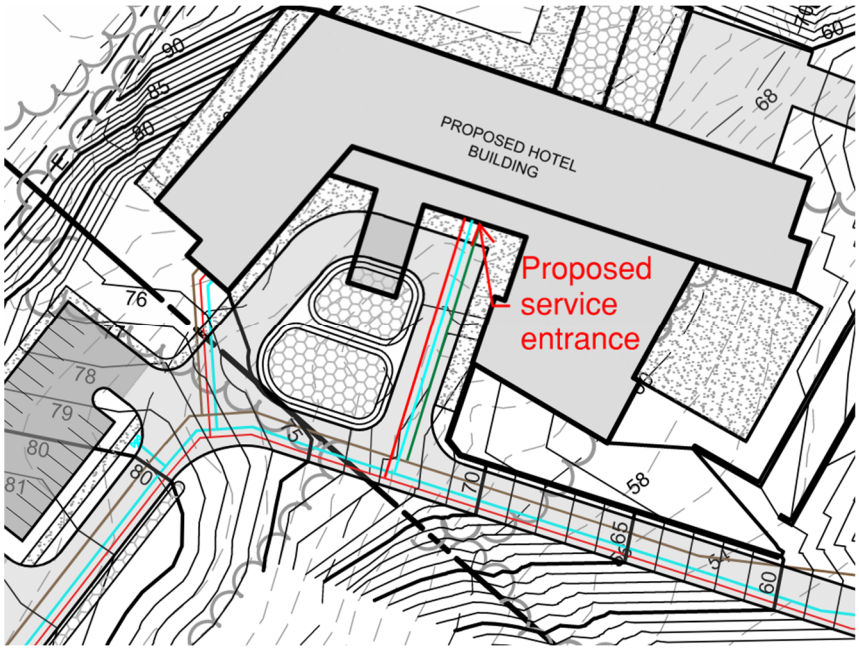


Figure 2.1 Proposed Utilities configuration

Sizing is based upon Type L copper piping at 3.5ft/100 ft total friction loss and 6 feet per second water velocity. A hydrant Flow Test Report was not available at the time; however, it is assumed that the domestic water duplex booster pump will be required. The exact size will be determined as the Flow Test Report is provided and the design progresses. The flow test shall be ordered immediately to proceed with design.

The building will be slab on grade with basement. It is assumed that no sewer ejector pump is required for this Hotel project, and all sanitary will tie to the main service line under the street level by gravity. This will be evaluated as the civil design documents are available, and the sewer ejector pump will be provided if needed. It is estimated that the sanitary line will be 8" diameter at 2% slope. See appendix for total drainage fixture calculations.

Along perimeter of basement a perforated drainpipe shall route around basement foundation with sump pump to remove any ground water around foundation. A geotechnical analysis of ground water is required to determine if the existing site will require a sump pump. For preliminary planning, it will be assumed that a sump pump is required, until geotechnical analysis determines otherwise.

Storm water from area roof drains with an internal storm riser system within the building and pitched roof storm water will be removed via gutters with downspouts to grade. At this point, it is assumed that no storm sump pump is required for the Hotel, and all storm lines will be routed and tied into the main service line by gravity. This assumption will be evaluated and coordinated with civil engineer. It is estimated that the main storm line will be 6" diameter at 2% slope. The termination of ERD's (Emergency Roof Drain) at level 1 will be coordinated during further design.

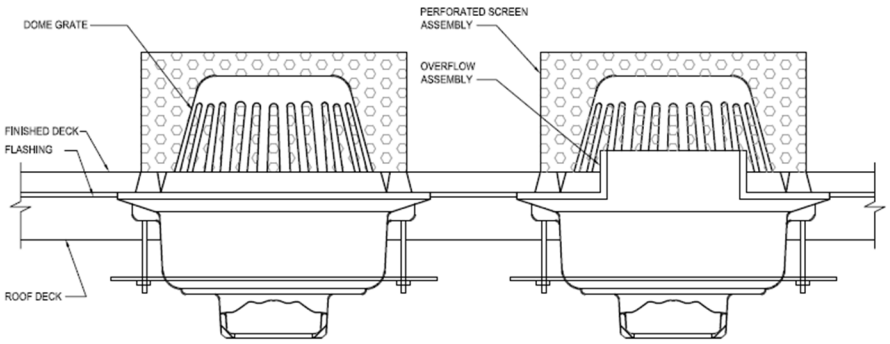


Figure 2.2 Roof Drain with Integral Emergency

A natural gas service connection is not shown to be available in the civil drawings. It is recommended that natural gas to be provided to building for kitchen equipment and for mechanical heating. If natural gas is not available an alternate is to provide a below grade propane tank and will require coordination with civil and architecture. The exact use of natural gas and size of service will be finalized as the design progresses. One central gas meter—located outdoors—will be provided for the building gas usage and a dedicated service line with meter, also located outdoors, will serve the emergency generator. The gas will serve if available the following equipment and appliances: DOAS RTUs, generator, kitchen make up air, domestic water heaters, and kitchen equipment. If natural gas is available water heaters will be natural gas burning and will require flue up to roof. Note that the flue discharge will need to be a minimum of 4'-0" below any operable window, in accordance with NFPA 54.

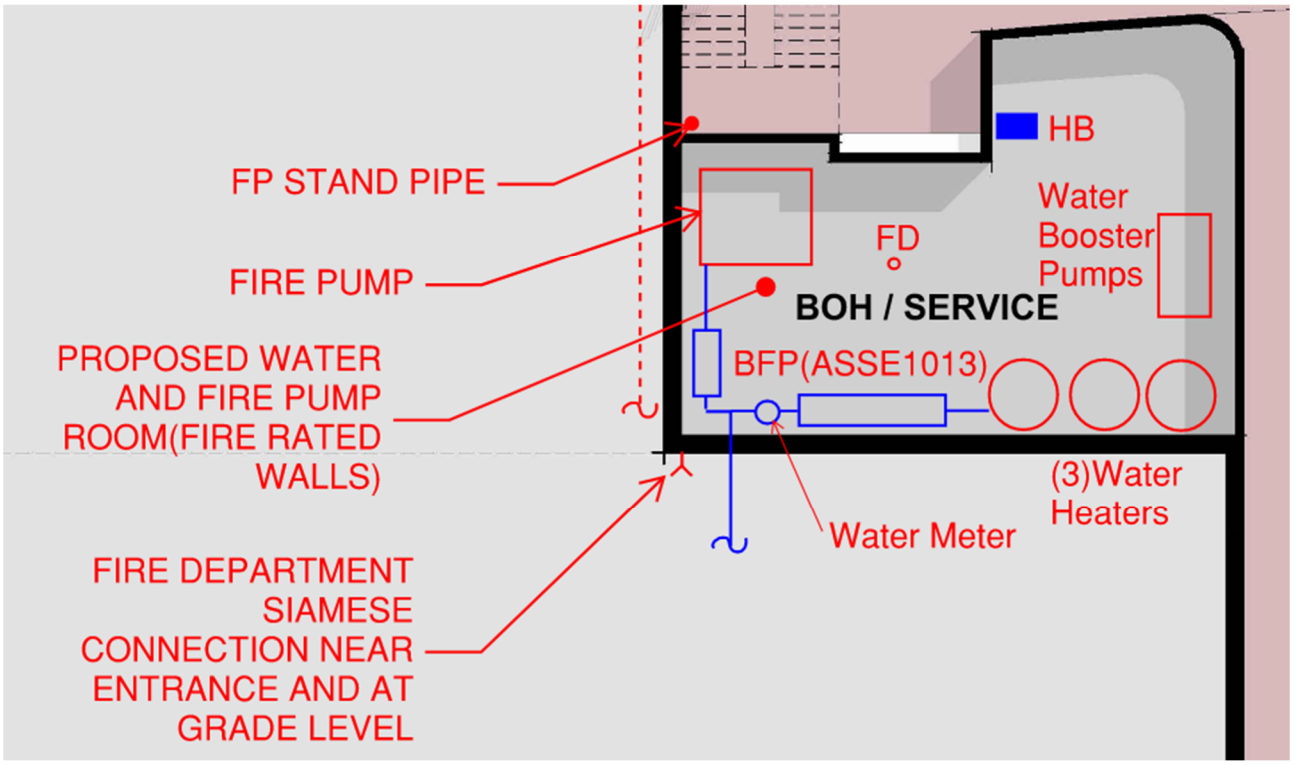


Figure 2.3 Proposed Water Room configuration

Elevators hoistway pit sumps will be provided with a sump pump. The pump will be simplex unit with an oil minder switch, which will enable the pump operation if oil is detected. It is assumed that the elevator hoistway is a single pit encompassing all three elevators and each elevator is not provided with its own hoitway pit.

A centralized hot water heating system will be provided to serve all hotel public spaces and guestrooms. If natural gas is available water heaters will utilize natural gas burning water heater. If gas is available (3) high efficiency condensing water heater will be required at 700 MBH each with 110 gallon storage. The electrical alternative is (3) 300 gallon 126 KW high efficiency electric tank type water heaters. The hot water distribution system will be provided with a recirculation system including associated piping, pump and balancing valves.

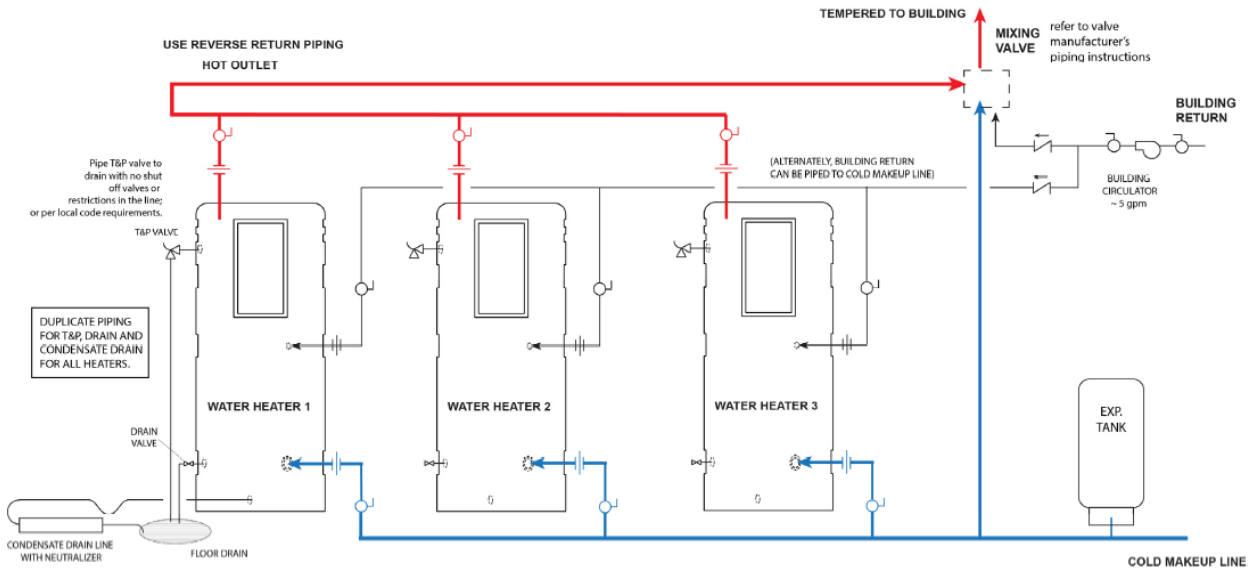


Figure 2.4 Proposed Water Heating System

2.1.4 LEVEL 1 Public Spaces, Kitchen and Restaurant

Kitchen and Restaurant: A single flow type grease interceptor will be provided to serve the kitchen with a dedicated Grease Sewer line. The grease interceptor to be located underground, outside of the building – preferably in the loading dock area. The grease interceptor will need full access for cleaning and maintenance. The exact size and location of the interceptor will be evaluated during further design. Coordination between civil and architect design groups will decide the placement. Cold water and hot water will be provided to kitchen plumbing fixtures and restaurant bar sink.

Employee Breakroom, Lockers and Restrooms: Cold and hot water from the building main loop will be routed to the breakroom, locker room and restrooms. Sanitary piping will serve these area and connect into new

sanitary main system. Kitchen sink is anticipated to be required in the breakroom. Locker rooms is anticipated to be provided with a single shower, water closet and lavatory sinks.

Restaurant Patio: The patio will be provided with area drains to remove storm water and connect to existing storm system. Cold water will be routed to freeze proof hose bibs located out on the patio area.

2.1.5 Level 2-4 Public Spaces

Ice Room: The ice room will include an ice machine which will require a cold water connection with a back flow prevent. Behind the ice machine a floor drain will be required with a trap primer and connected to sanitary system.

Pool and Spa Facilities: Coordination with architect as to what will be in this room. It is assumed that there maybe plumbing fixtures in this room with possible make up water connection for pool equipment and pumps. Water make up for pool equipment will require coordination with pool equipment vendor.

GUEST LAUNDRY: Domestic style washing machines are assumed for guest laundry. Typical water and sanitary connections will be provided for the washing machine.

2.1.6 ROOF

The roof will be drained via roof drains to internal storm system and roof gutters for pitched roofs will drain to grade with downspouts. Cold water connection will be provided for required freeze proof hose bibs located on roof for maintenance purposes..

2.1.7 THE GUESTROOMS

A single domestic water riser will be provided for each guestroom stack, so that a single set of shut off valves can be provided for each room. A single sanitary riser stacks will be provided for each unit to accommodate bathrooms. The proposed location is indicated in plumbing sketches.

All fixtures shall be EPA WaterSense listed with the exception of Kitchenette sinks:

- Water Closets: tank type, 1.28 gallons per flush
- Lavatories: 1.0 GPM
- Showers: High efficiency 2.0 GPM max.

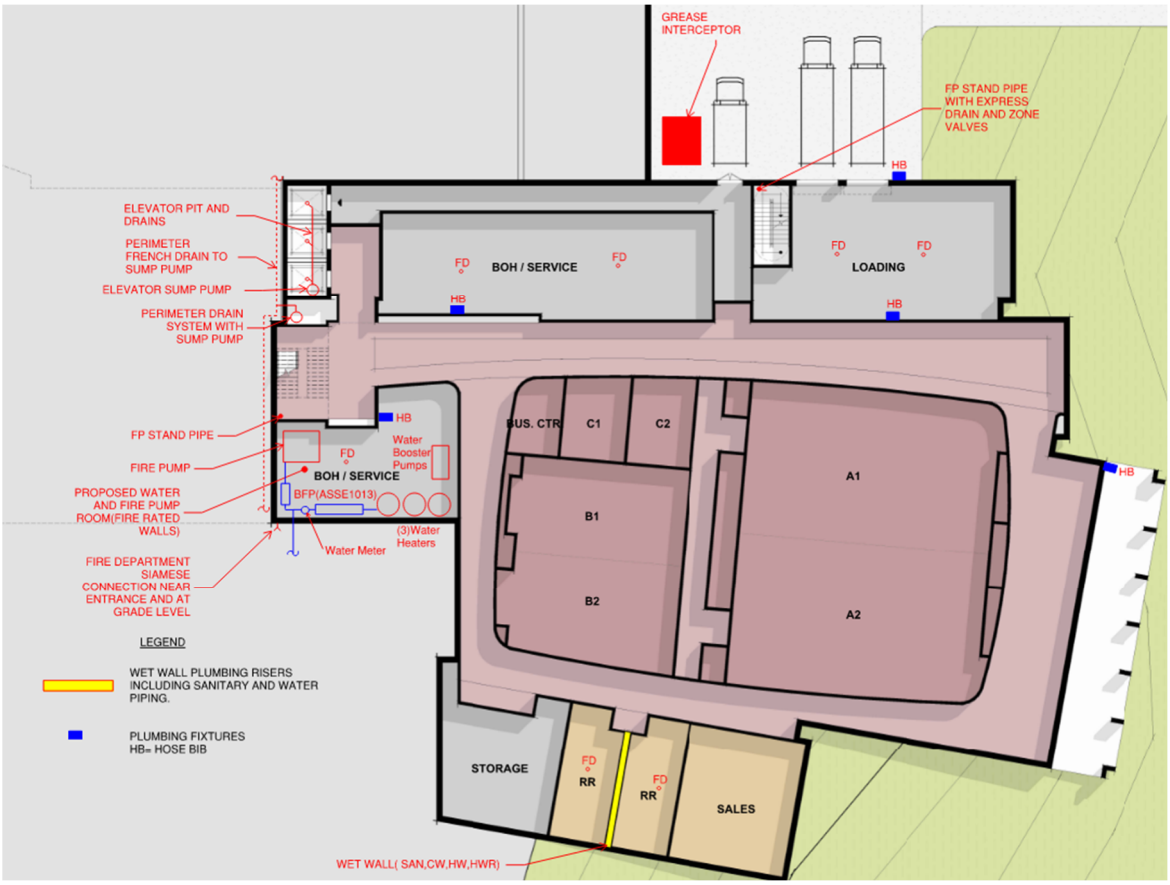


Figure 2.5 LEVEL B1 PLUMBING PLAN

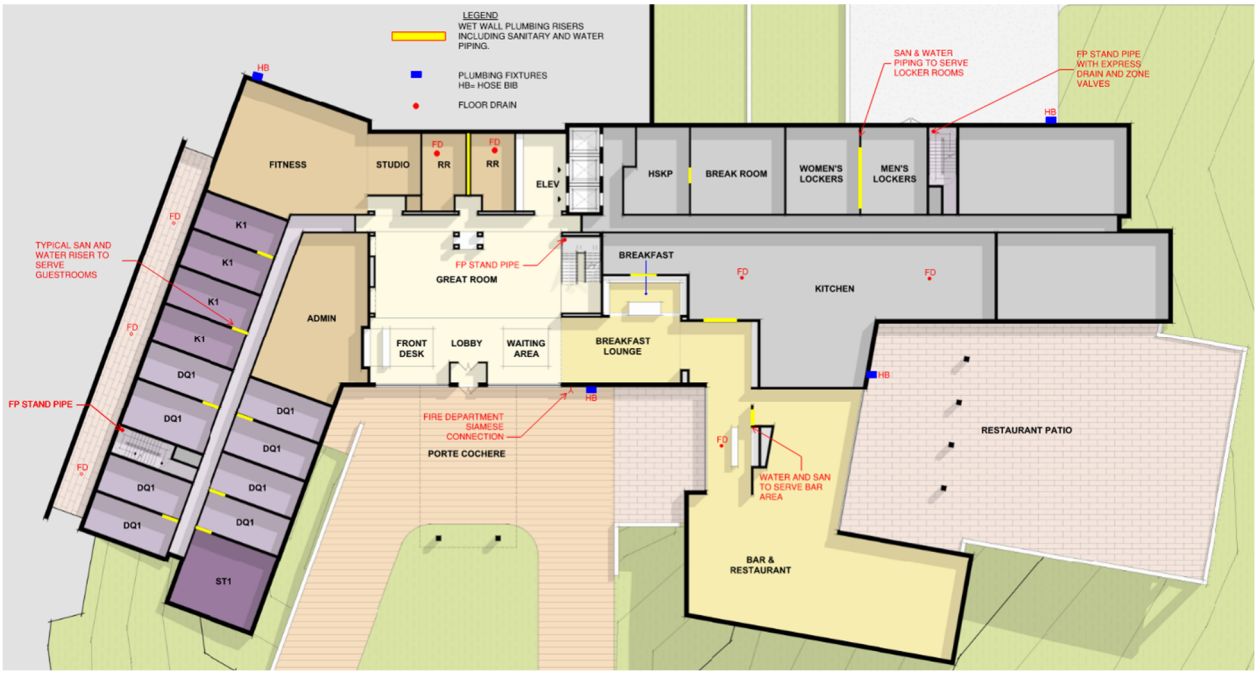


Figure 2.6 LEVEL 1 PLUMBING PLAN

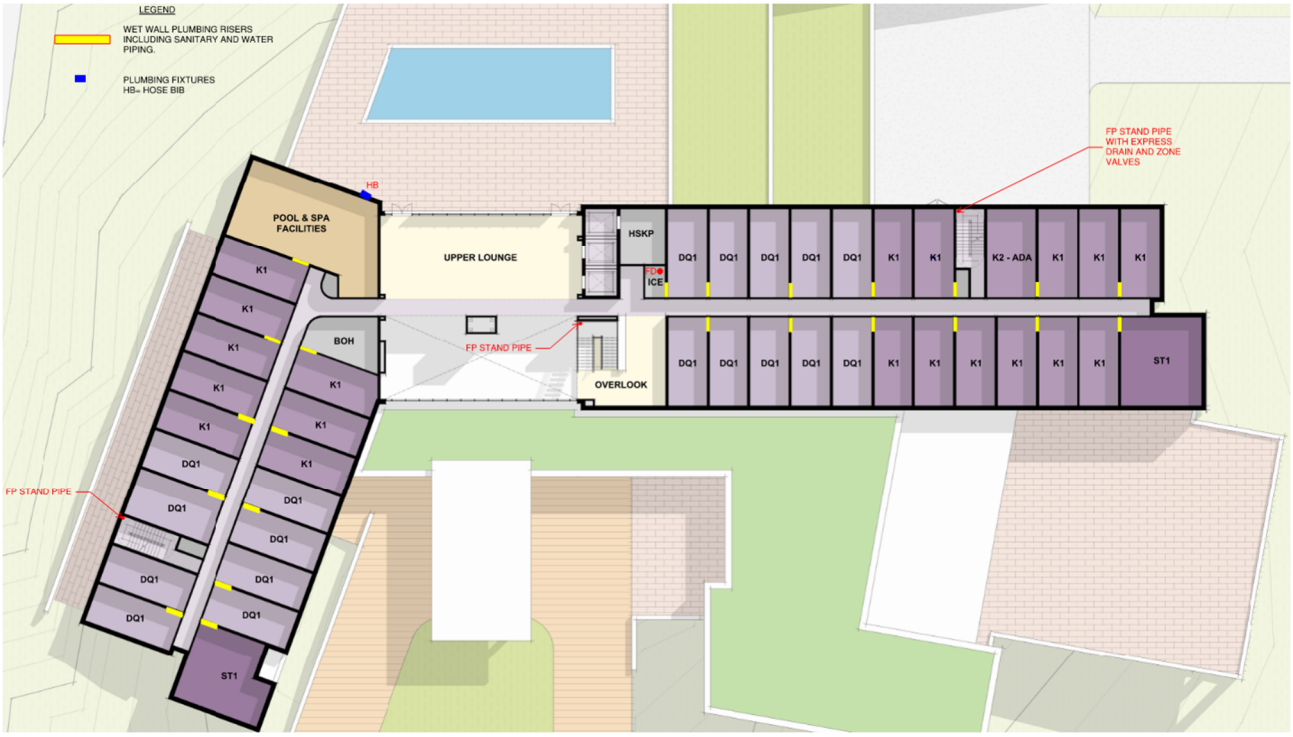


Figure 2.7 LEVEL 2 PLUMBING PLAN



Figure 2.8 LEVEL 3 PLUMBING PLAN

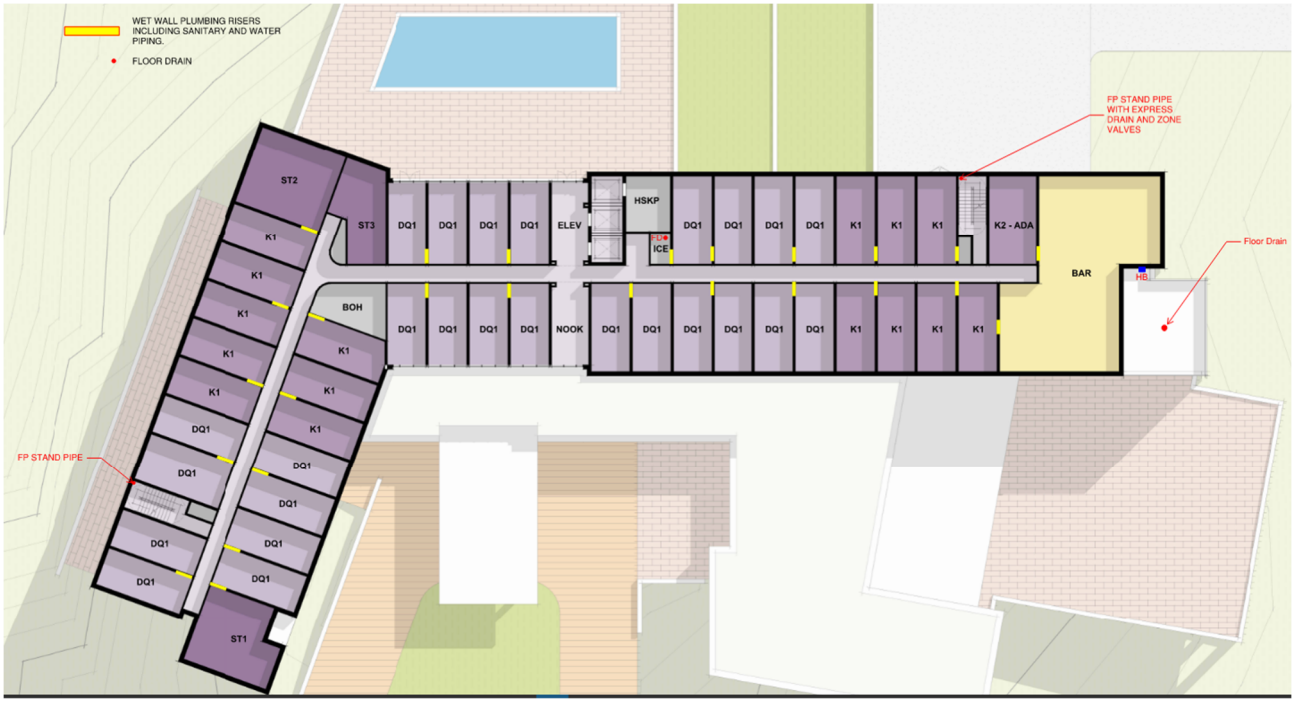


Figure 2.9 LEVEL 4 PLUMBING PLAN

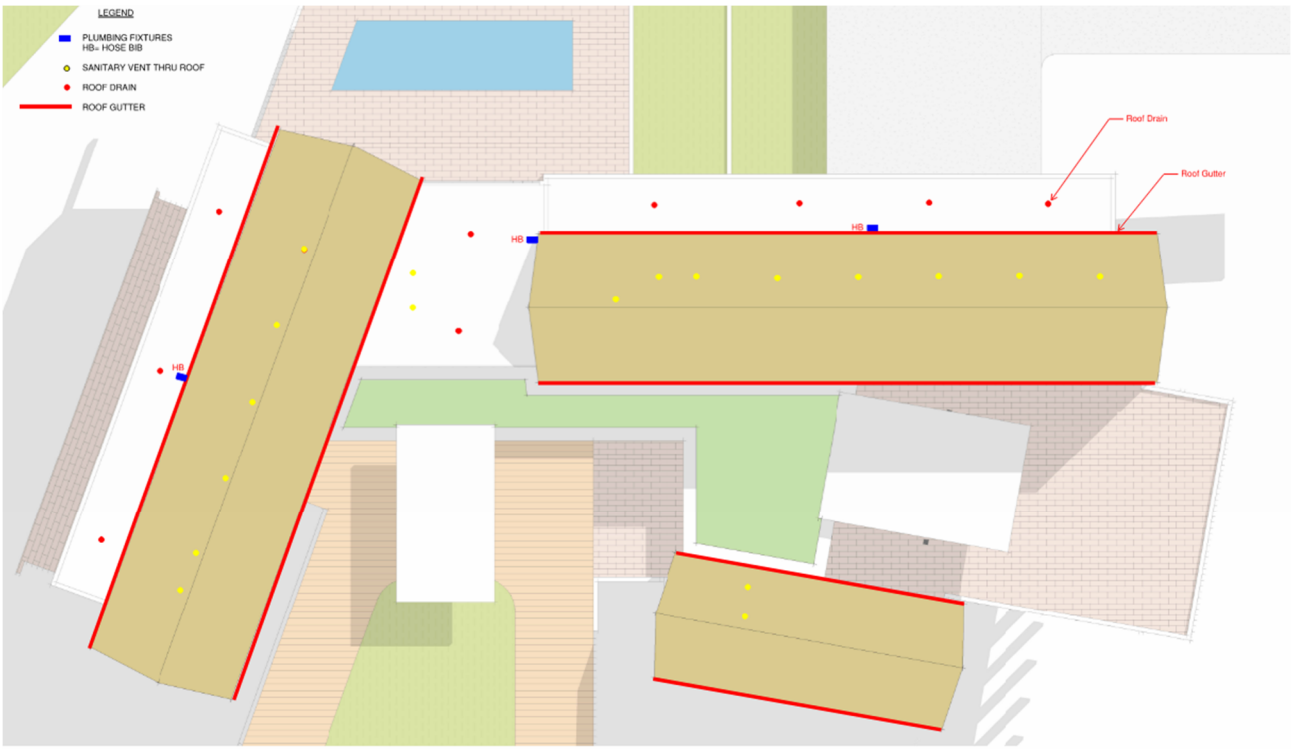


Figure 2.10 ROOF PLUMBING PLAN

2.1.8 HVAC CONNECTIONS

Water will be required for connections to HVAC systems including if used the air-cooled chiller near loading dock.

3.1 FIRE PROTECTION

3.1.1 GENERAL

An automatic wet-pipe type sprinkler system will be provided throughout all areas of the building. The performance specifications will require the design of the system to be in accordance with NFPA 13 with hydraulic calculations and shop drawings done by the Fire Protection contractor. A sprinkler zone with zone valve assembly will be provided for each floor and located within a stairwell.

A Class I standpipe system is required. The system will be designed with compliance of NFPA 14 as manual wet standpipe system.

The fire pump will be sized based on building hazard class and required sprinkler flow. Exact size will be developed during design and when Flow Tests are available. The project is assumed to be building light hazard classification.

3.1.2 APPLICABLE CODES AND STANDARTS

- NFPA 13R (2022) – Standard for the Installation of Sprinkler System
- NFPA 14 (2024) - Standard for the Installation of Standpipe and Hose System
- IFC (2024) – International Fire Code

3.1.3 FIRE PROTECTION SERVICE

It is estimated that an 6” fire water supply service will be provided for the automatic sprinkler system. A wall mounted fire department connection (FDC) will be provided and located where it will be clearly visible to the fire department from the street. The proposed test header to be 2 outlets at 250 GPM each, for a total of 500 GPM.

The Fire Pump Room is assumed to be located at the B1 level and will host the pump system with its controls as well as fire protection backflow prevention.

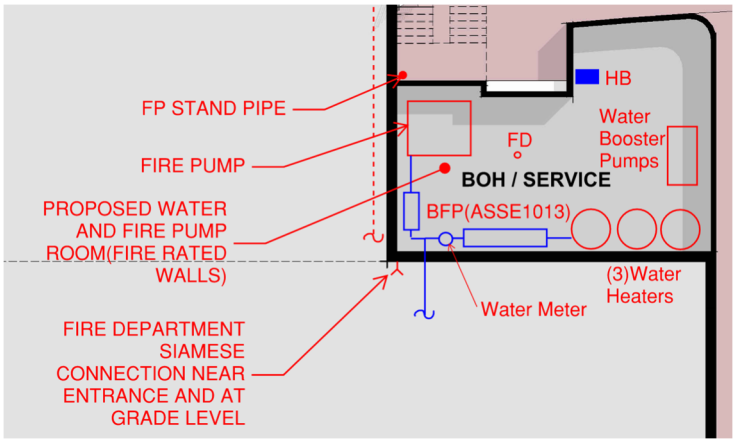


Figure 3.1 FIRE PUMP ROOM PLAN

4.1 ELECTRICAL

4.1.1 GENERAL

The following is a narrative outlining the electrical systems and equipment required to support the St. Mary's Hotel & Conference Center located in St. Mary's City, Maryland.

The new hotel will be composed of four (4) floors of guestrooms, a ground floor lobby, fitness room, restaurant, conference center, and pool. The ground floor will also house the main electrical rooms, laundry room, fire control room and loading dock. There will be 13 guestrooms on L1, 40 guestrooms on L2, 52 guestrooms on L3, and 45 guestrooms on L4. In total, there will be 150 guestrooms, approximately 60,696 enclosed square footage. The new ground floor lobby, restaurant, locker rooms, administration office, and break room will be approximately 26,469 square feet. The lower level conference center, loading dock, and storage will be 29,885 square feet.

4.1.2 APPLICABLE CODES, GUIDELINES AND STANDARDS

- St. Mary's County Building Code Ordinance (Ch. 203)
- IBC 2021 International Building Code
- IECC 2021 International Energy Conservation Code
- IEEE Institute of Electrical and Electronics Engineers
- IESNA Illuminating Engineering Society of North America
- NEMA National Electrical Manufacturers Association
- UL Underwriters Laboratories
- NEC National Electrical Code (NFPA 70 - 2026)
- ADA 2019 Maryland Accessibility Code (MAC)
- NFPA 1 (2024), 101 (2024)

4.1.3 ELECTRICAL SERVICE

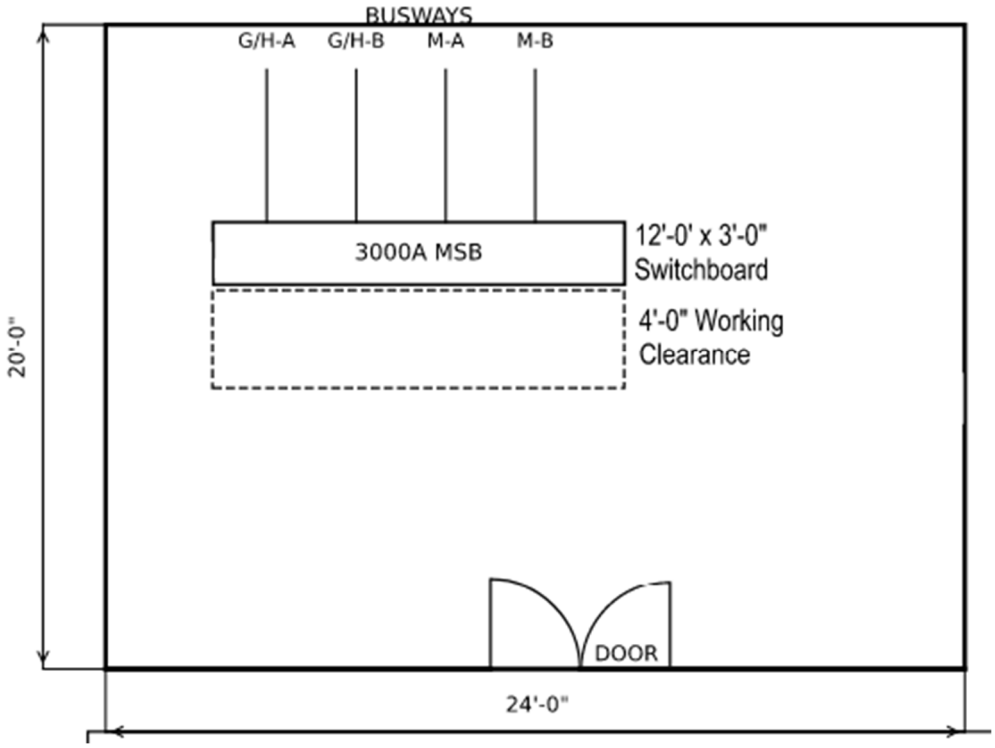
Electrical service to the building will be provided by the local utility company, Southern Maryland Electric Cooperative (SMECO) and enter the building from new electrical vault location, at building entrance, into the Main Electrical Room. The new electrical service will be rated at 3000A, 480/277V, 3 phase, 4 wire. The service will be concrete encased from the utility transformer to the service equipment. The service equipment will consist of (1) switchboard 'MSB' rated at 3000A, 480/277V, 3 phase, 4 wire. The lineup will include a utility metering section, a main section with main circuit breaker, and multiple distribution sections for house, mechanical, and guestroom loads. The switchboard will be provided with molded case type circuit breakers.

The switchboard ‘MSB’ will distribute the power throughout the building to the following:

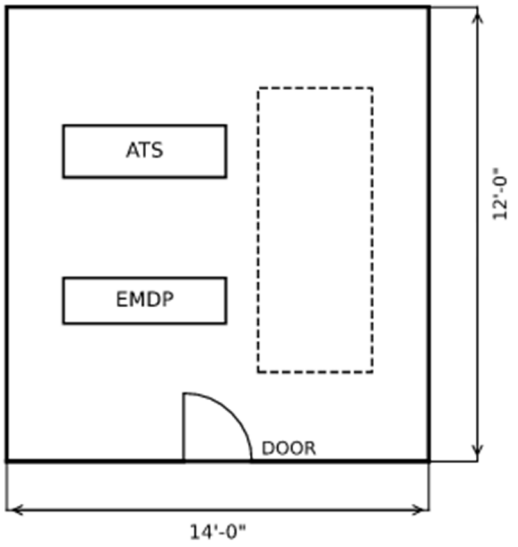
- (4) busway risers originating from the main switchboard (MSB) will distribute 480/277V power vertically throughout the building. Busways configured to serve:
  - Guest room & House Loads Wing A
  - Guest Room & House Loads Wing B
  - Mechanical loads Wing A
  - Mechanical loads Wing B
- At each floor, for each Guest & House loads wing, plug-in busway tap boxes shall provide power to floor-level distribution equipment consisting of:
  - (1) 480/277V high-voltage panelboard
  - (1) associated step down transformer serving a 3-section 208/120V low-voltage panelboard for branch circuit distribution
- At each floor, for each Mechanical loads wing, plug-in busway tap boxes shall provide power to floor-level distribution equipment consisting of:
  - (1) 480/277V high-voltage panelboard
- Restaurant will include dedicated power from guest & house load busway including:
  - (1) 480/277V high-voltage panelboard
  - (1) associated step down transformer serving a 208/120V low-voltage panelboard for branch circuit distribution
  - (1) 400A circuit breaker providing a lockable disconnect for Emergency service and ATS
- (1) tap for Fire Pump with VFD or Soft start controller and ATS w/concrete encased feeders

The Emergency Electrical room will house all equipment related to emergency service including the ATS, a 480/277V emergency distribution panel ‘EMDP’, a transformer, and 208/120V electrical panel for miscellaneous loads ‘ELP’. This room will be 2-hour fire rated.

MAIN ELECTRICAL ROOM (20' x 24')



EMERGENCY ELECTRICAL ROOM (12' x 14')



NOTES

1. Concept only - final equipment dimensions to be verified with manufacturer submittals.
2. ATS to be located in separate emergency electrical room.
3. Provide 12'-0" clear ceiling minimum where busway risers originate above MSB.

4.1.3.1 LOAD CALCULATIONS

Electrical Service Calculation Load					
GUESTROOMS LOADS:					
NET CALCULATED GUESTROOMS LOAD:				=	258.8 KVA
TOTAL GUESTROOMS LOAD AMPS AT 480V/3-PH:					311 A
		Building Area B1 (SqFt)	29885		
		Building Level 1 (SqFt)	32364		
		Building Level 2-4 typical floor (SqFt)	4073	(excludes guestrooms)	
		Total Area	74468	SqFt	
HOUSE LOADS:					
RECEPTACLES					
1 UNIT	X	55395	VA	=	55.4 KVA
LIGHTING	1W/SF				
1 UNIT	X	74468	VA	=	74.5 KVA
HVAC	25W/SF				
1 UNIT	X	1861700		=	1861.7 KVA
ELEVATORS					
1 UNIT	X	33254	VA	=	33.3 KVA
2 UNIT	X	29098	VA	=	58.2 KVA
ELEVATOR SUMP PUMP - ESP-1					
1 UNIT	X	2024	VA	=	2.0 KVA
FIRE PUMP - 30HP					
1 UNIT	X	31869	VA	=	31.9 KVA
JOCKEY PUMP - 3HP					
1 UNIT	X	3824	VA	=	3.8 KVA
DRYERS					
4 UNIT	X	4760	VA	=	19.0 KVA
ELECTRIC COOKING					
1 UNIT	X	41000	VA	=	41.0 KVA
NET CALCULATED HOUSE LOADS:					2180.8 KVA
TOTAL HOUSE LOAD AMPS AT 480V/3-PH					2623 A
ELECTRICAL HOTEL SERVICE SIZE	AT 480V/3-PH				2934 A

FIRE PUMP - 75HP					
1 UNITS	X	79811	VA	=	79.8 KVA
TOTAL FIRE PUMP LOAD AMPS AT 480V/3-PH					96 A

NEC 220.82 Guestrooms Calculation Load

ENTIRE BUILDING GUESTROOM CALCULATION

	150 Rooms						
L1	5295	SQFT	13 Guestrooms				
L2	15771	SQFT	40 Guestrooms				
L3	19815	SQFT	52 Guestrooms				
L4	19815	SQFT	45 Guestrooms				
GENERAL LIGHTING LOAD	60696	SQFT	X	3	W/SQFT	=	182088 VA
REFRIGERATOR	900	VA	X	150	rooms	=	135000 VA
GARBAGE DISPOSAL	1000	VA	X	150	rooms	=	150000 VA
MICROWAVE	1100	VA	X	150	rooms	=	165000 VA
				SUBTOTAL:			632088 VA
1ST 10KVA	@ 100%						10000 VA
REMAINDER	@ 40%						248835.2 VA
			TOTAL GUESTROOM LOAD:				258835.2 VA
							233 KW
							718 Amps @208V 3Ph,4W

4.1.4 EMERGENCY GENERATOR

The building design will include a 480V, 3 phase Natural Gas Generator approximately 150KW in capacity that will support life safety requirements. The new generator will feed the following loads:

- Kitchen Hood
- DOAS Exhaust fans
- Elevators
- Emergency Lighting
- Fire Alarm System
- Fire Pump – 75HP

The generator will be located on the roof level. It will be provided with a sound attenuated weatherproof enclosure and mounted on a concrete pad. The size of the generator will be finalized as building design progresses. The generator will be provided with starting equipment such as battery charger. The Generator Annunciator panel will be in the Fire Control room on B1 level and a secondary annunciator panel will be located within the generator enclosure.

4.1.5 POWER DISTRIBUTION

Normal power will be distributed throughout the building via a 480/277V, 3-phase, 4-wire system originating from the main switchboard 'MSB' located in the main electrical room.

For Guest Room & House Loads, plug-in busway tap boxes at each floor will feed floor-level electrical distribution equipment consisting of (1) 480/277V high-voltage panelboard, (1) associated step-down transformer (480V to 208/120V), and (1) multi-section 208/120V, 3-phase, 4-wire low-voltage panelboard for branch circuit distribution. These panelboards will serve guestroom load centers, corridor lighting, receptacles, and general house loads.

For Mechanical Loads, plug-in busway tap boxes at each floor will feed (1) 480/277V high-voltage panelboard serving HVAC and other mechanical equipment.

It is anticipated that each guestroom will be provided with a 120/208V, single-phase load center serving lighting, receptacles, and small appliance loads, along with a dedicated 277/480V circuit for HVAC equipment, as required.

First floor and common area loads, including but not limited to restaurant, trash compactor, sump pumps, heating equipment, lighting, and other building systems, will be served from distribution equipment connected to the Guest Room & House Loads busway system. This equipment will consist of (1) 480/277V high-voltage panelboard, (1) associated step-down transformer, and (1) 120/208V low-voltage panelboard. Additional panels serving areas such as laundry, pantry, site lighting, and lighting control systems will be derived from this distribution.

The building will be provided with convenience receptacles and data outlets throughout. Receptacles located in mechanical and electrical rooms, storage areas, and exterior or parking areas shall be GFCI-protected and provided with weatherproof covers where required.

Emergency power will be distributed from a 480/277V, 3-phase, 4-wire emergency distribution system supplied via an automatic transfer switch (ATS). Emergency power distribution will serve life safety systems including, but not limited to elevators, emergency lighting, fire alarm systems, and other code-required loads. Step-down transformers and 120/208V panelboards will be provided as required to serve emergency loads at appropriate voltage levels throughout the building.

4.1.6 LIGHTING SYSTEMS

Lighting in all hotel main areas such as lobby, corridors and guestrooms will be designed by Lighting and Interior designers. All lighting in back of house areas, such as utility rooms and stairways will consist of LED fixtures. Stairways will be provided with linear LED fixtures with integral occupancy sensors. Utility spaces such as mechanical and electrical rooms, and storage spaces will be provided with industrial type linear LED lighting fixtures. Wall switches and occupancy sensors will also be provided in these rooms for lighting control.

Lighting controls in lobby area will consist of a Dimming system such as Lutron Grafik eye or similar. This system will also include occupancy and daylights sensors as required by codes. Corridors will have ceiling mounted occupancy sensors for lighting control. Lighting within guestrooms will be locally controlled by wall switches. A master light switch at the entrance of each guestroom will control all lighting within each room to comply with current energy codes.

Exterior lighting will be provided around the perimeter of the building. Photocell and time clock control will be provided for all exterior lighting control.

4.1.7 THE GUESTROOMS

Each guestroom unit will be served by (5) 208/120V circuits. Each guestroom's mechanical unit will also be served by (1) circuit from a local 277/480V, 3 phase panel also located at each level electrical room. Lighting will be served from local 277/480V, 3 phase panel located at each level electrical room. Arc Fault circuit breakers will be provided for all guestroom receptacle circuits. All receptacles in guestrooms will be tamper resistant. The kitchen equipment in each guestroom will be served by the local low voltage electrical panel and will include the following:

- Refrigerator
- Microwave
- Coffee Maker

The lighting in guestrooms will be LED lamps throughout. The lighting in shower areas will be rated for wet location. A master light switch at the entrance of each guestroom will control all lighting within each room. The guestroom bathroom lights will be controlled by a vacancy sensor in the ceiling or integrated into the bathroom light switch, to comply with current energy codes.

4.1.8 RESTAURANT

The restaurant will be provided with an electrical panel rated at 480/277V, a step down transformer, and a low voltage panelboard for connection to kitchen equipment.

4.1.9 TELECOMMUNICATIONS SYSTEM

The Telecommunications systems into the building will be terminated into (1) 8'X8' backboard for tele/data use, located in a proposed telecommunications AT/IT closet located on the 1st floor. Telecomm distribution on guestroom floors is anticipated to be served by a small 24" x 24" AV rack located on floors L1 throughL4.

4.1.10 FIRE ALARM SYSTEM

The building will be provided with a complete addressable Fire Alarm system and Voice Evacuation system with a Controller and Annunciator. The basis of design will be Notifier NFS2-640 by Honeywell. The Fire Alarm Control Panel "FACP" will be located in the Fire Control room. The Fire Alarm Annunciator Panel "FAAP" will be located at the main entrance to the building and a second one will be located in the Fire Control room. Every floor will have a fire alarm extender panel 'FAEP' designed to extend a fire alarm panel's signaling capacity.

An amplification system will be provided for the emergency responder radio system to maintain desired radio coverage by the local fire code official.

Initiating devices will be addressable. Manual pull stations will be provided within 5 feet of stairwells and egress doors. Smoke detectors will be provided in corridors, electrical and mechanical rooms, and storage rooms. A two-way communication system will be provided in elevator lobbies for Fire Dept use. Smoke detectors will also be provided in elevator lobbies and elevator machine room. Heat detectors will be provided in the elevator hoistway and elevator machine room.

New Audio system will be provided for voice evacuation and mass notification.

Notification devices, including speaker and visual devices will be provided in corridors, public spaces (including breakfast area and hotel lobby), and stairwells.

In all guestrooms, speaker devices will be provided. In ADA rooms, 177cd combination strobe/speaker will be provided in bedrooms and bathrooms. Low frequency horn devices and smoke detectors will be provided in all in sleeping rooms.

APPENDIX A – MECHANICAL SCHEMATIC DIAGRAMS



1 CONCEPT - LEVEL B1

1/16" = 1'-0"

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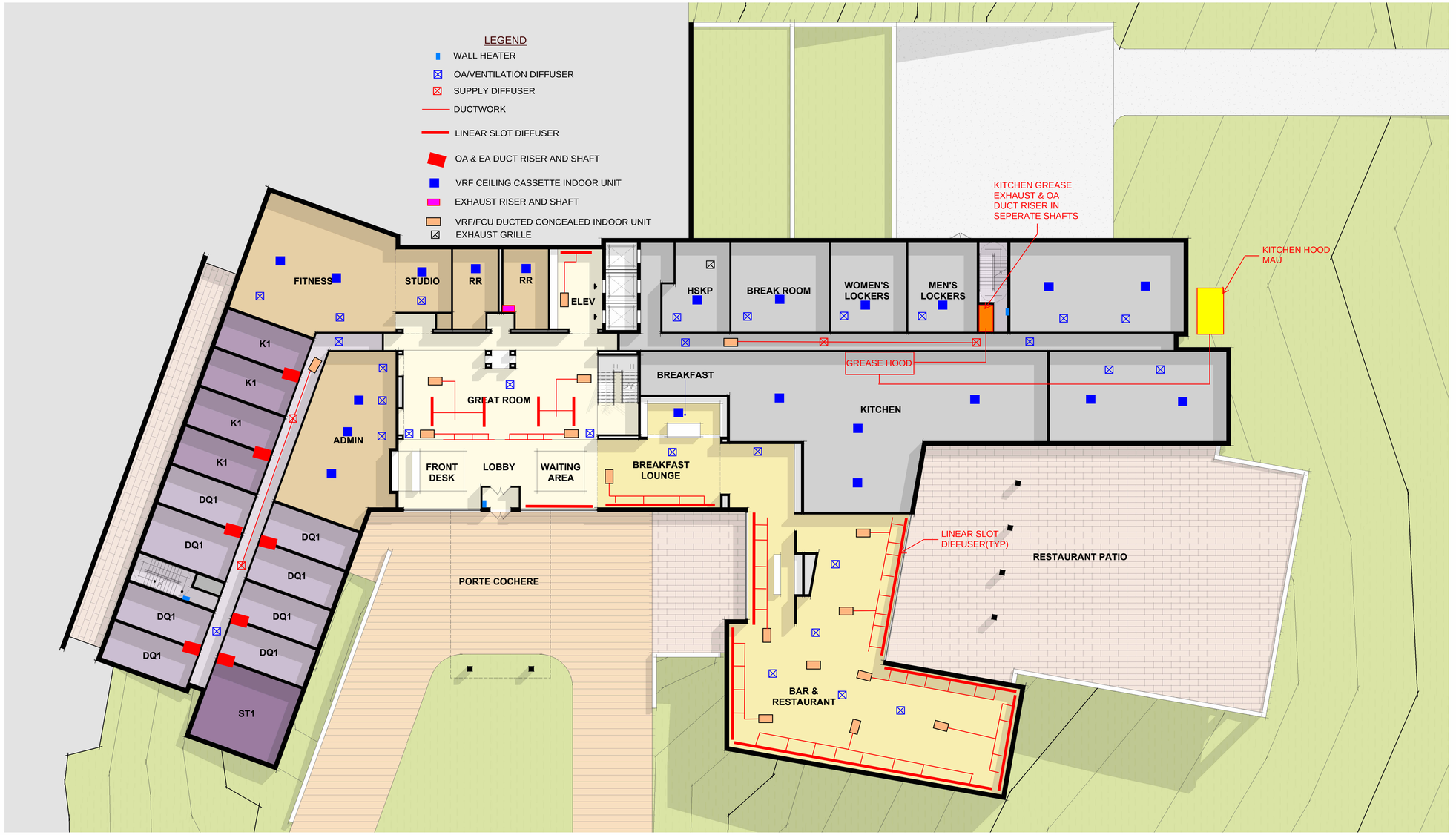
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1 CONCEPT - LEVEL 1

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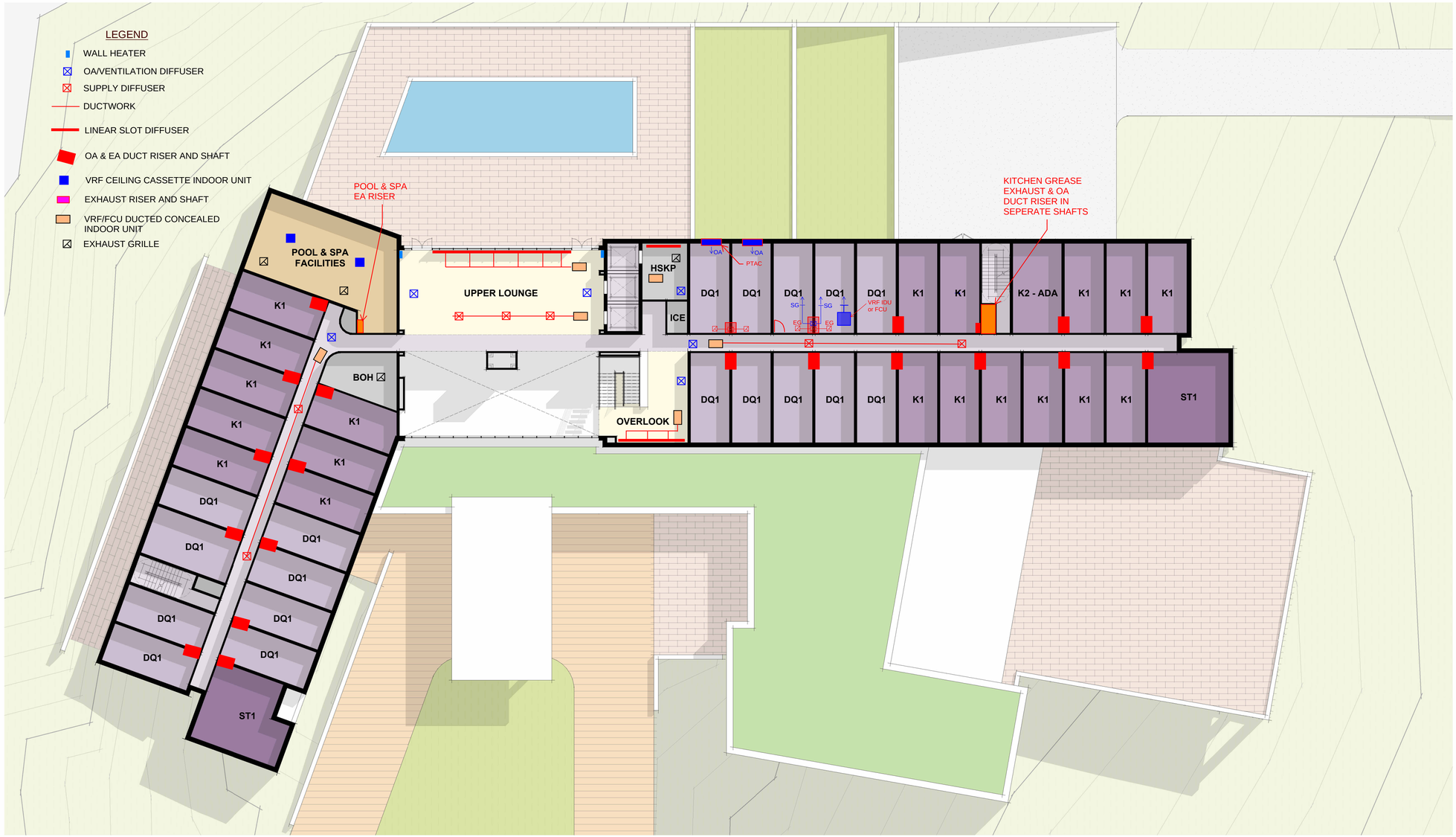
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1 CONCEPT - LEVEL 2

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0' 16' 32' 48'

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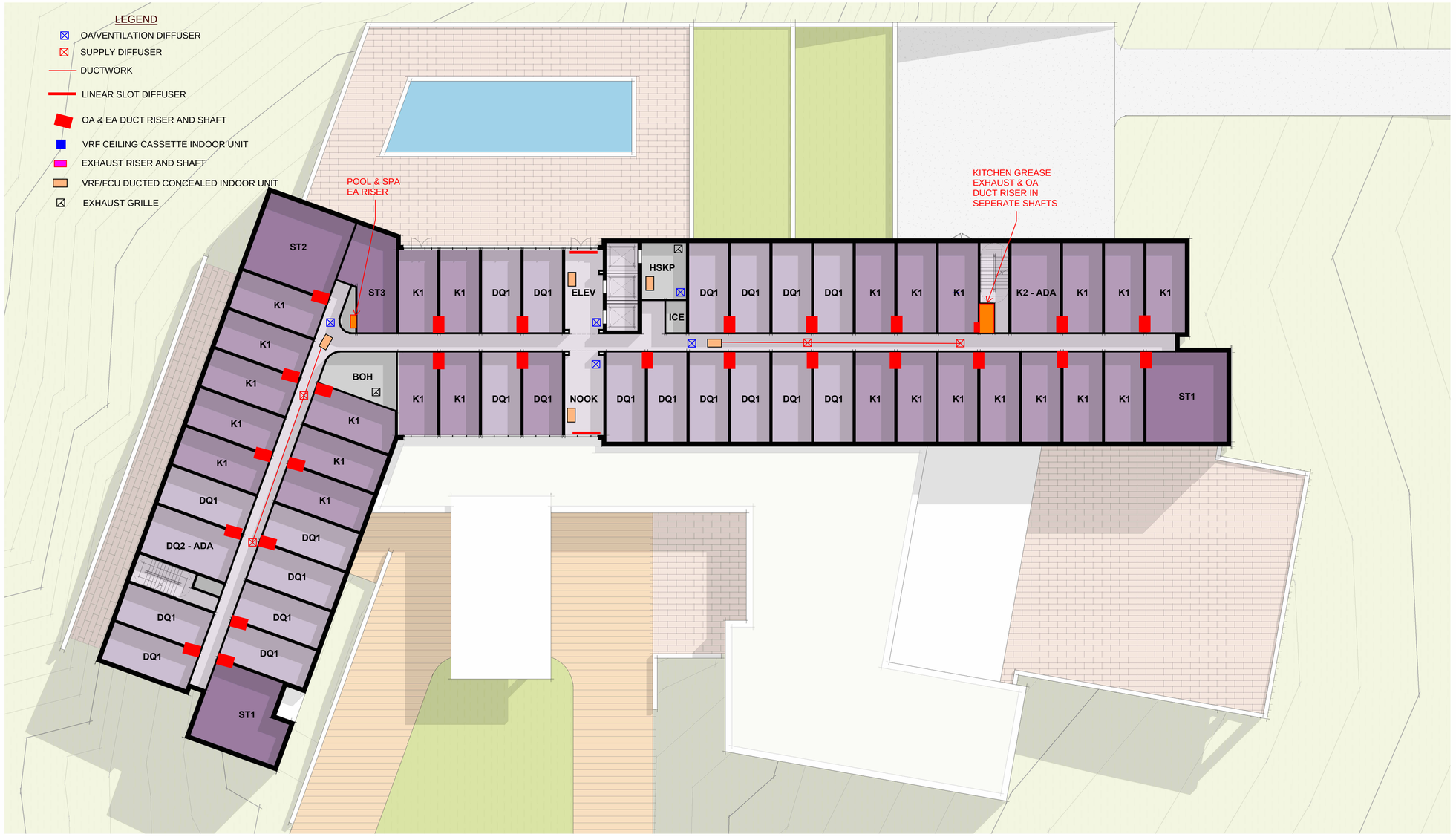
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1 CONCEPT - LEVEL 3

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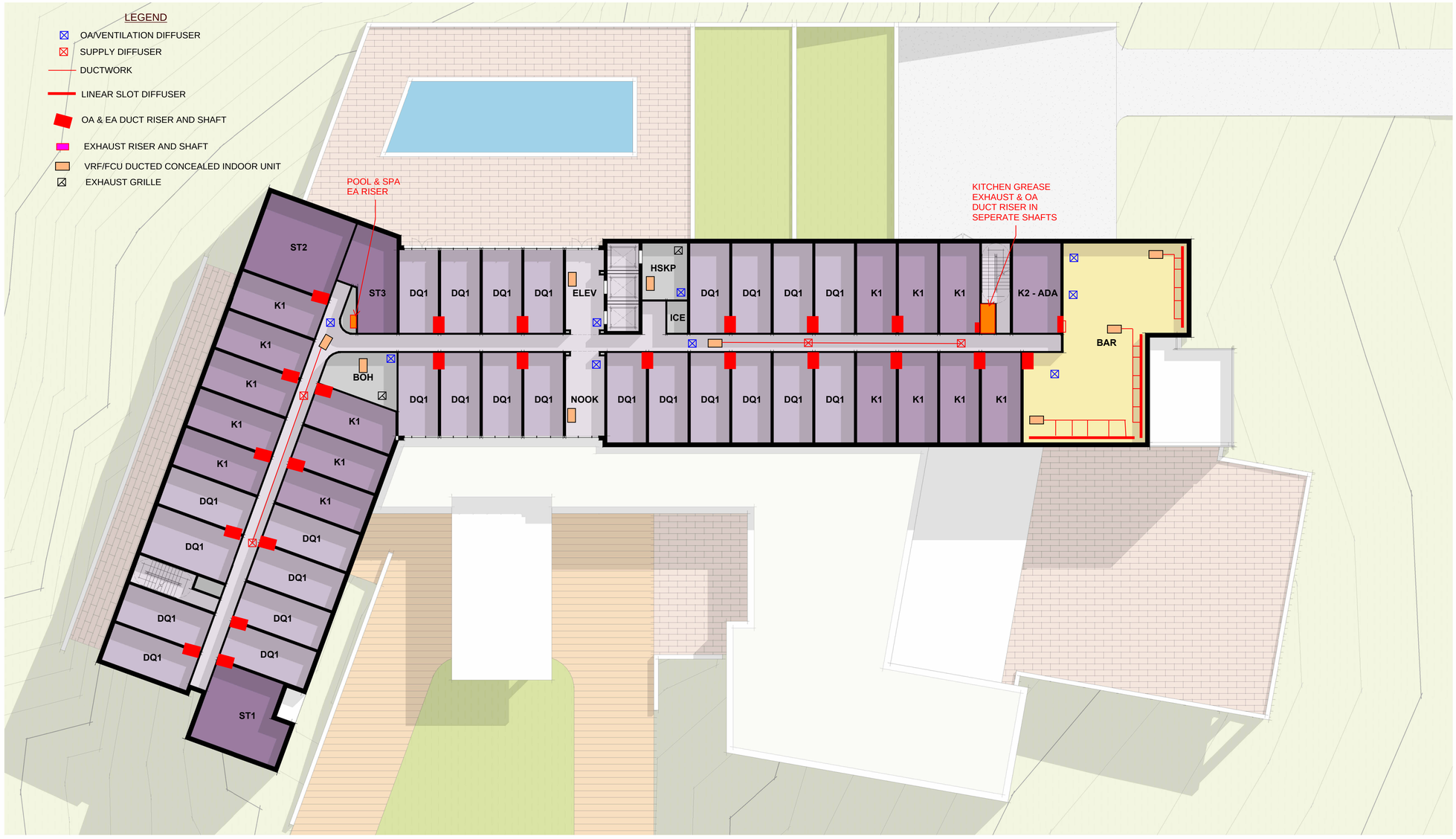
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0' 16' 32' 48'

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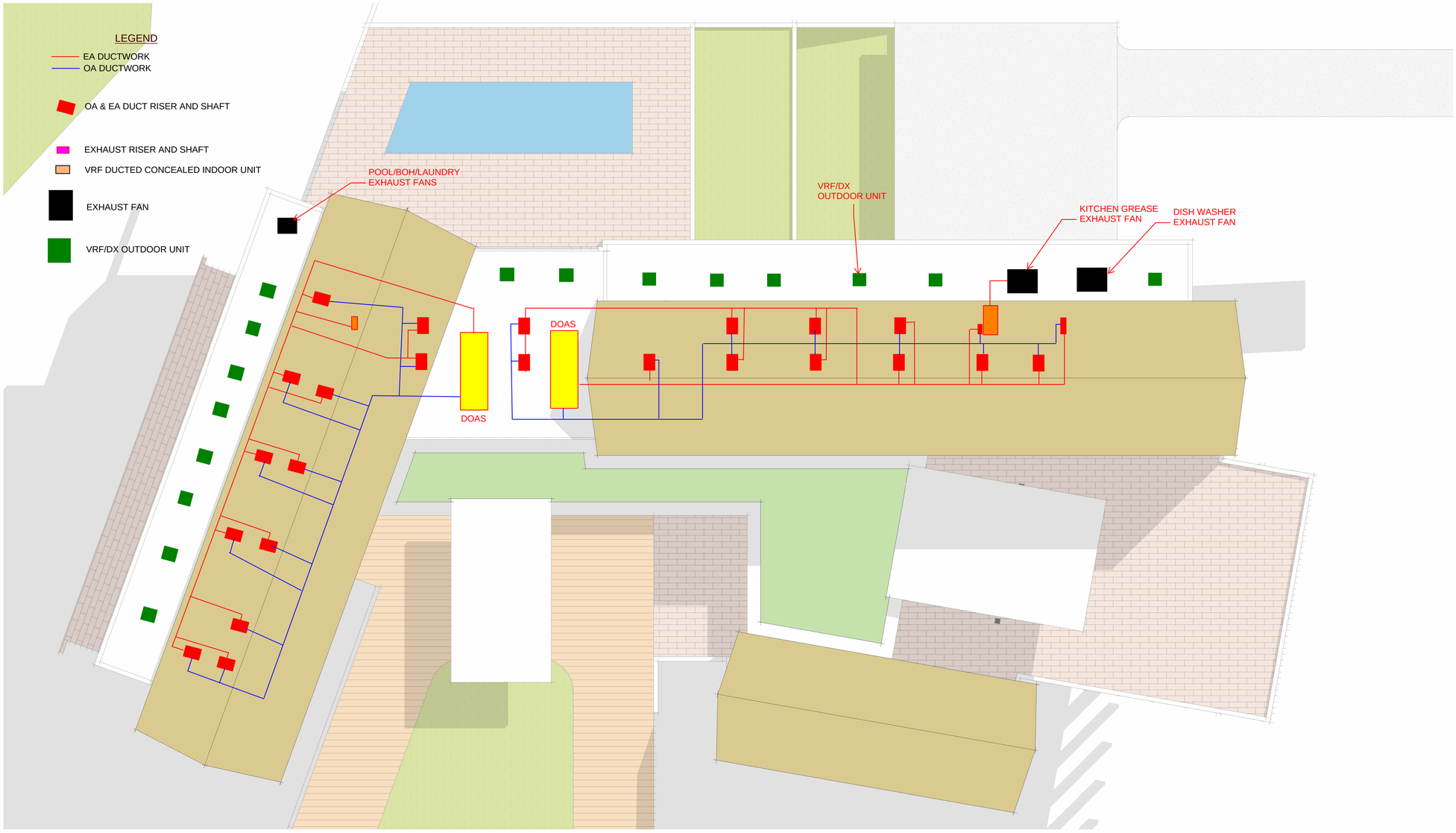
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1 CONCEPT - ROOF PLAN

1/16" = 1'-0" DRAWING REF: 1 / A106

0' 16' 32' 48'

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Keyplan

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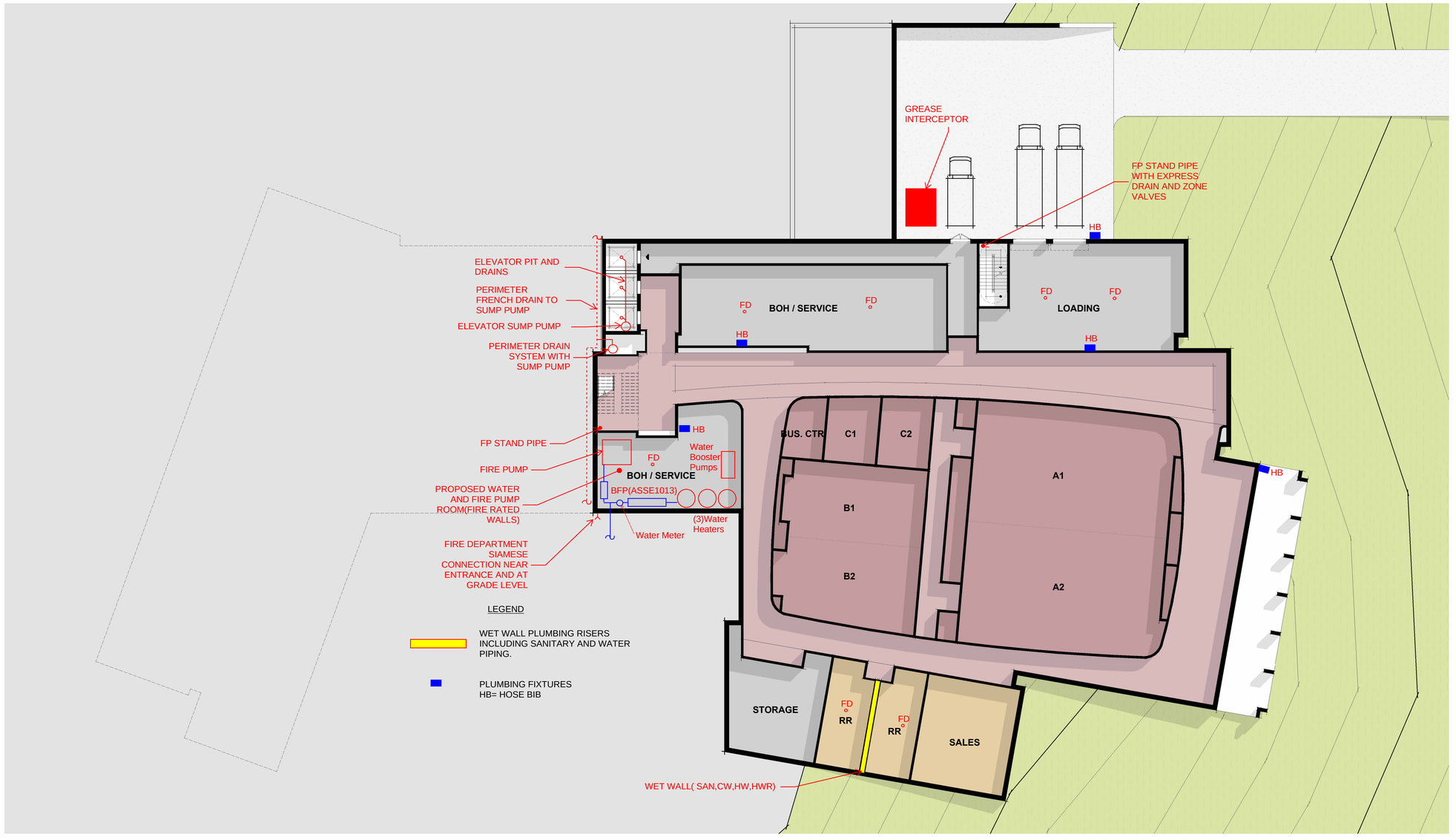
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APPENDIX B – PLUMBING SCHEMATIC DESIGN AND LOADS



1 CONCEPT - LEVEL B1

1/16" = 1'-0"

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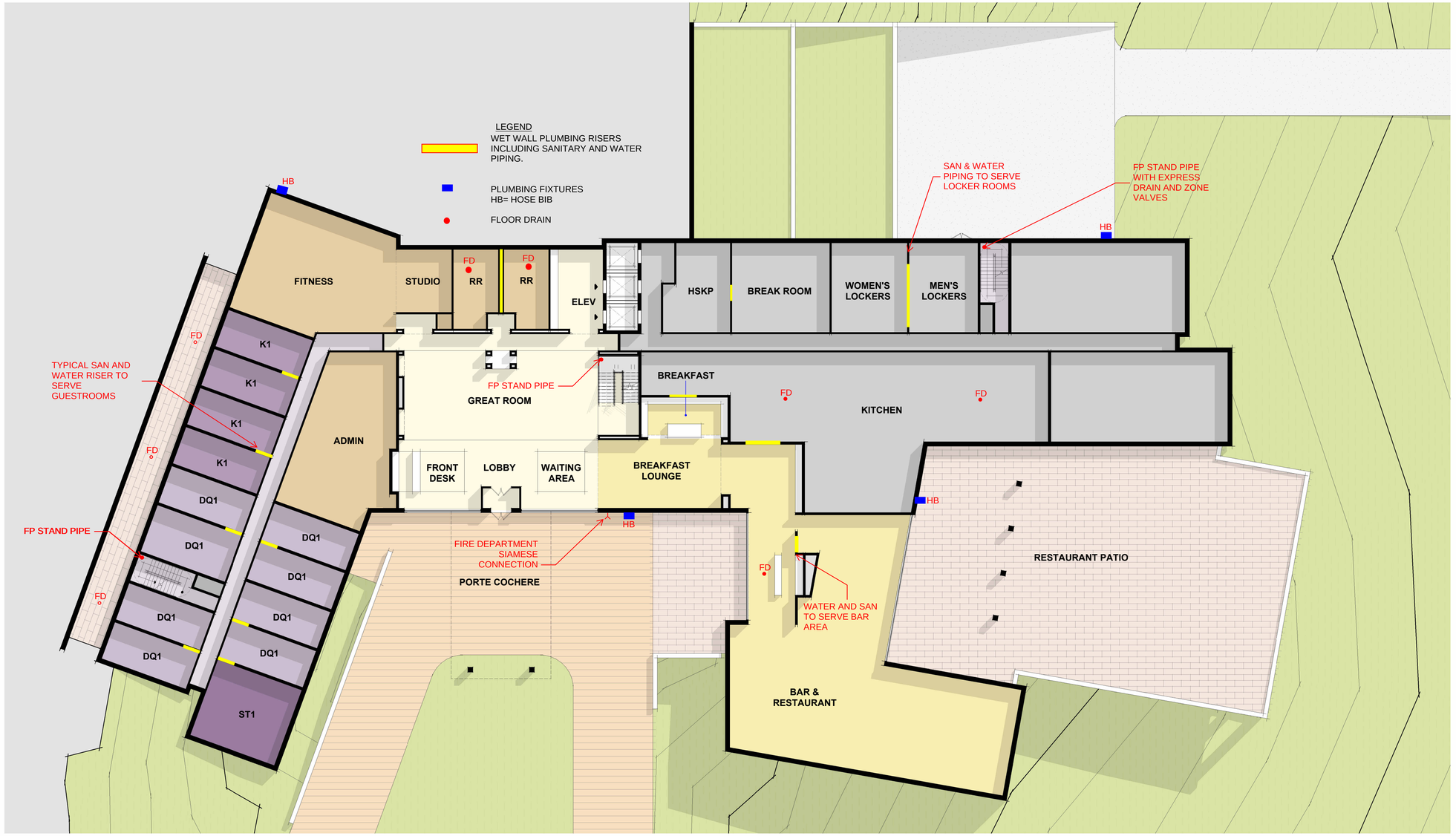
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LEVEL B1

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1 CONCEPT - LEVEL 1

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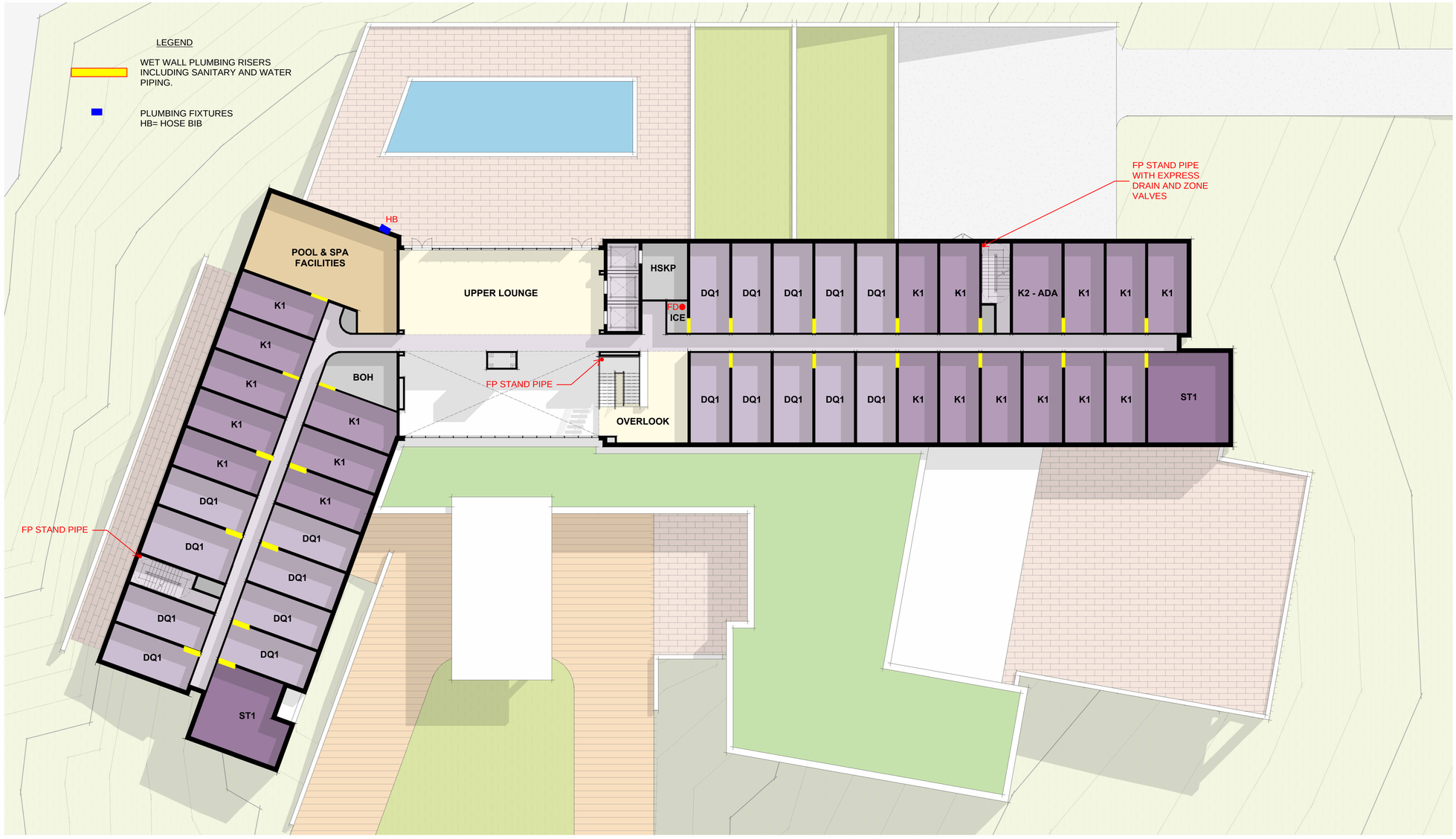
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LEVEL 1

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1 CONCEPT - LEVEL 2

1/16" = 1'-0"

0' 16' 32' 48'

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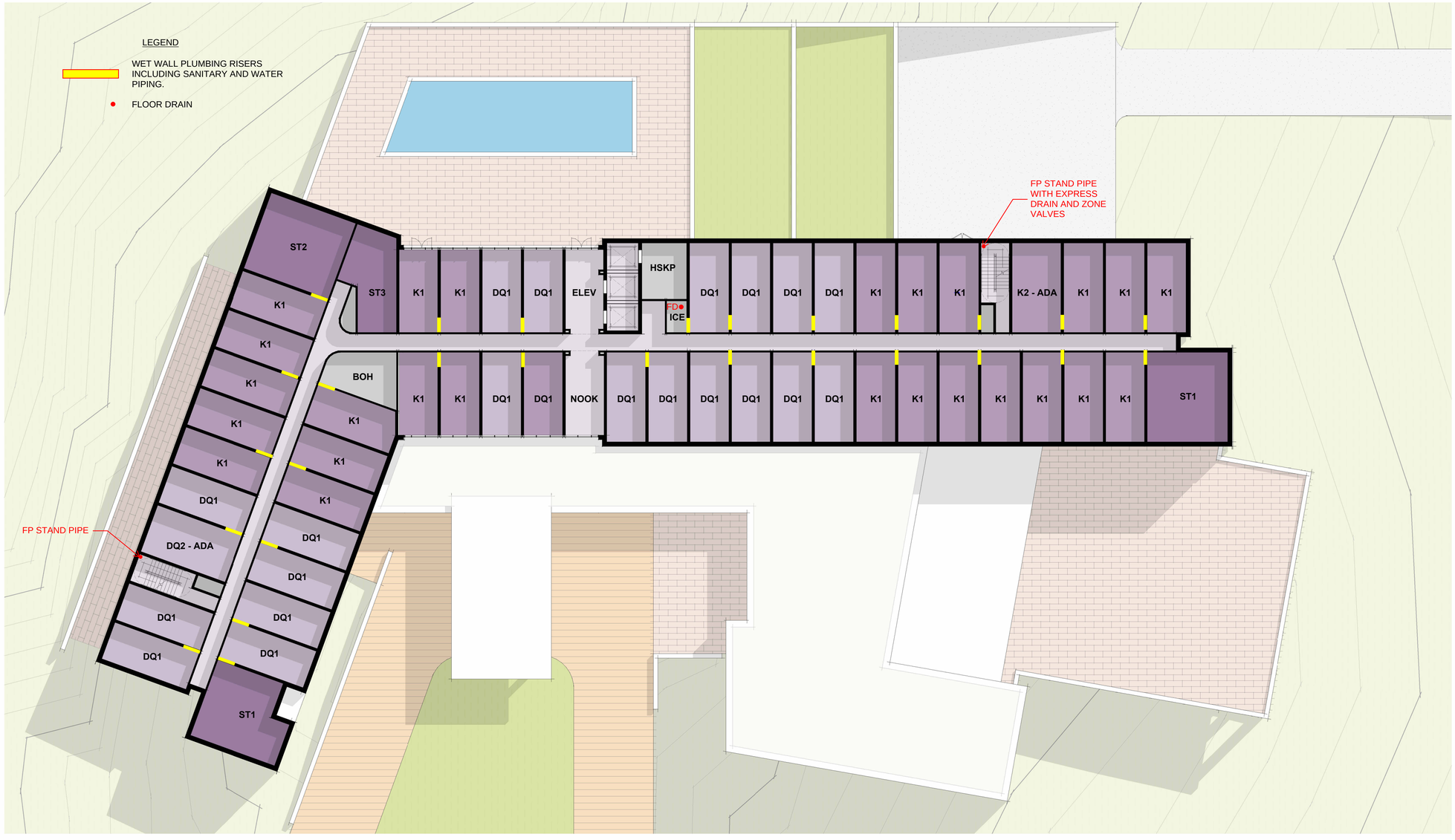
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LEVEL 2

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1 CONCEPT - LEVEL 3

1/16" = 1'-0"

0' 16' 32' 48'

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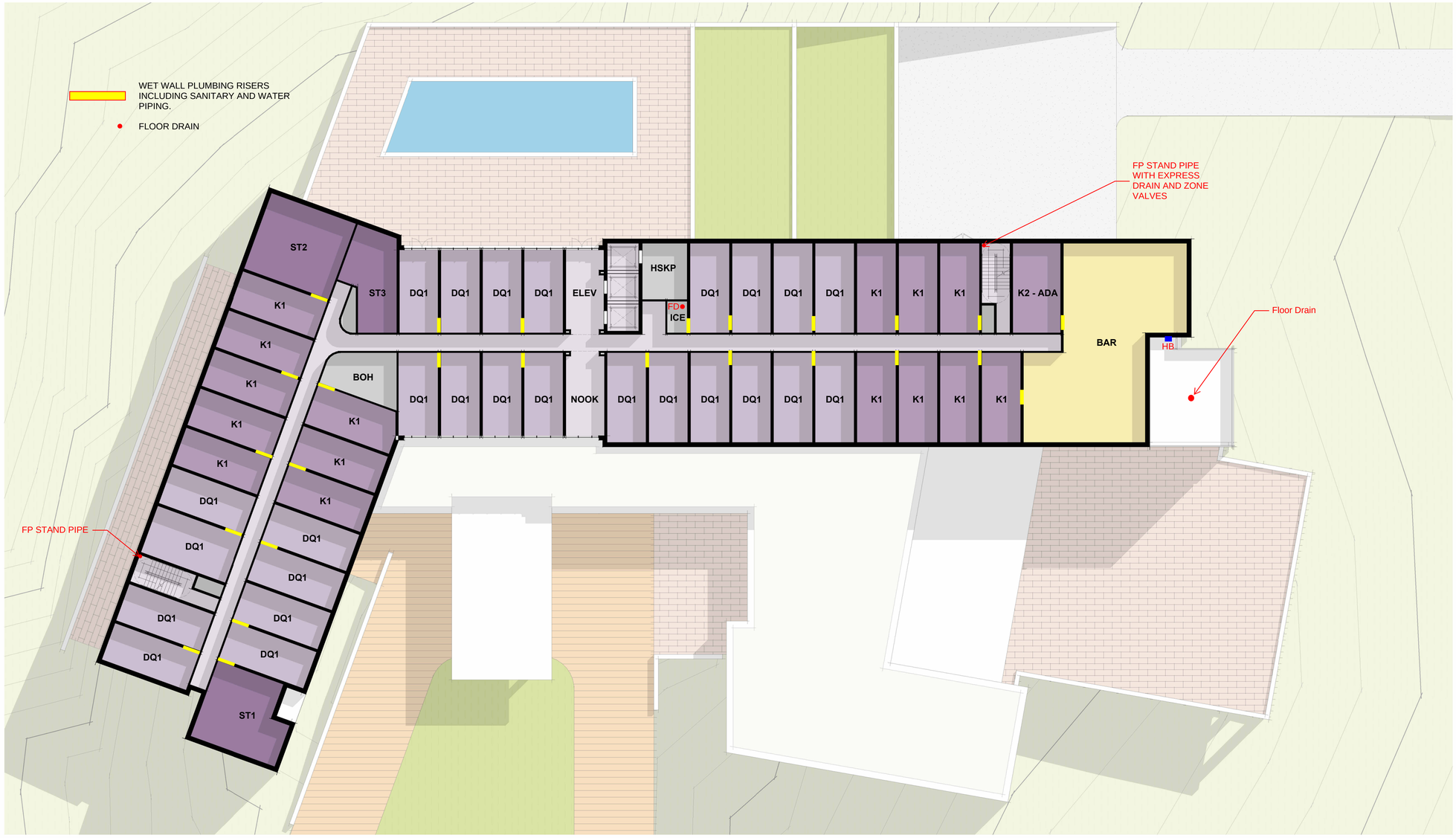
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LEVEL 3

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1 CONCEPT - LEVEL 4

1/16" = 1'-0"

0' 16' 32' 48'

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CITY, STATE

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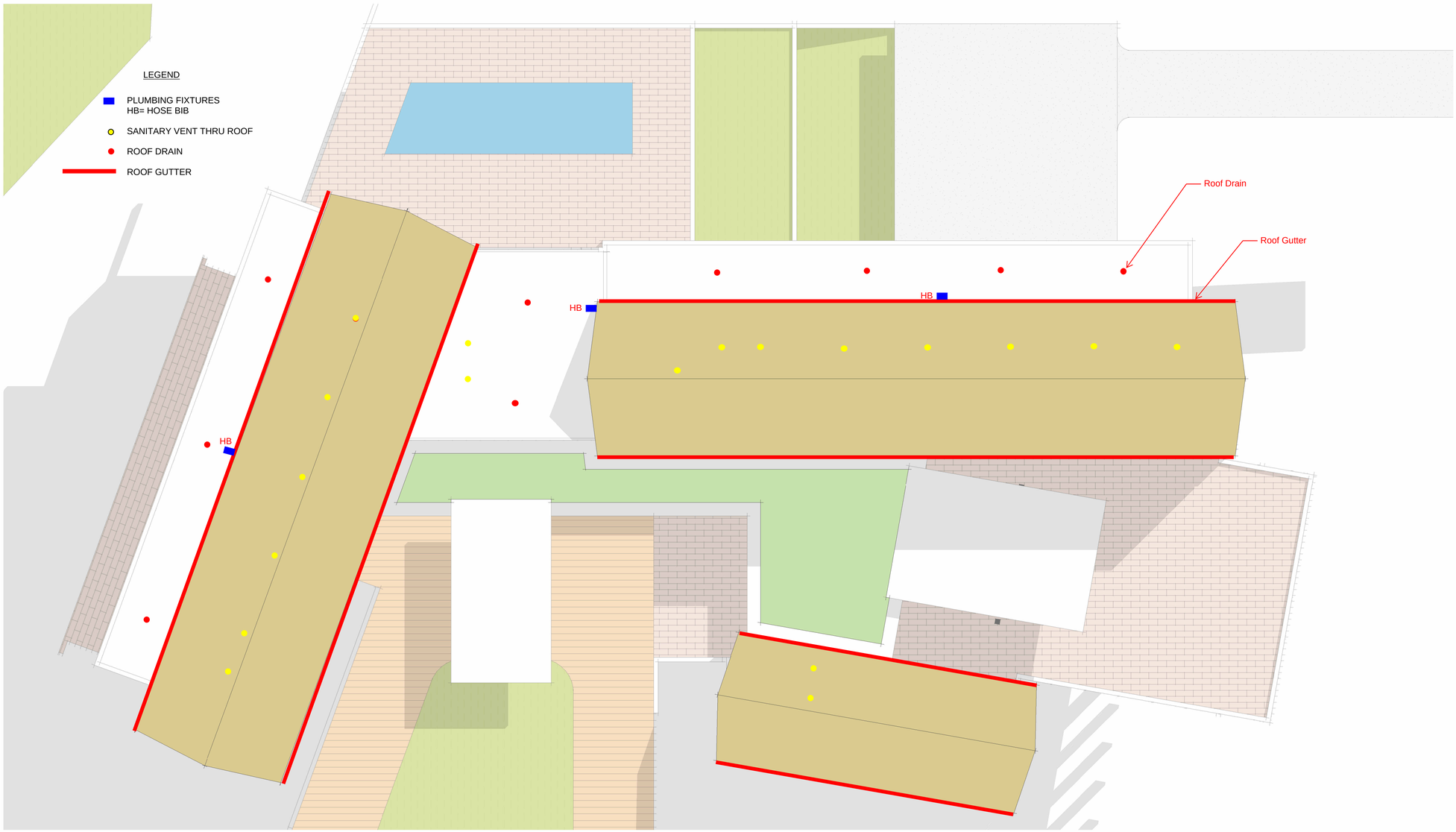
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DATE April 1, 2026

TOTAL SANITARY SEWER SIZING

BY MZO

JOB NO. 25038

ITEM No.	FIXTURE DESCRIPTION	NO. OF FIXTURES	DRAINAGE FIX. UNITS		CALCULATED DRAINAGE FIXTURE UNITS
1	Automatic clothes washers, Commercial	0	3	=	0
2	Automatic clothes washers, residential	0	2	=	0
3	Bathroom group (1.6 gpf water closet)	150	5	=	750
4	Bathroom group (Flush valve water closet)	0	6	=	0
5	Bathtub (with or without overhead shower or whirlpool attachements)	0	2	=	0
6	Bidet (Private)	0	1	=	0
7	Coimbination sink and tray	0	2	=	0
8	Dental lavatory	0	1	=	0
9	Dental unit or cuspidor	0	1	=	0
10	Dishwashing Machine (domestic)	0	2	=	0
11	Drinking fountain (Offices, etc.)	4	0.5	=	2
12	Emergency floor drain		0	=	0
13	Floor drains	10	2	=	20
14	Kitchen sink (domestic)	0	2	=	0
15	Kitchen sink (domestic with food grinder and dishwasher)	2	2	=	4
16	Kitchen sink (Hotel, restaurant)	4	5	=	20
17	Laundry trays (1 to 3 compartmnets)	0	1	=	0
18	Lavatory (Private)	8	2	=	16
19	Lavatory	0	1	=	0
20	Pantry Sink	0	2	=	0
21	Shower	4	2	=	8
22	Service sink (Offices, etc.)	4	4	=	16
23	Urinal	0	4	=	0
24	Urinal (One gallon flush or less)	0	2	=	0
25	Wash Sink (circular or multiple) each set of faucets	0	2	=	0
26	Water closet, flushometer tank, public or private	0	4	=	0
27	Water closet, private 1.6 gpf		3	=	0
28	Water closet, private (flushing greater than 1.6 gpf)	0	4	=	0
29	Water closet, Public (1.6 gpf)	8	4	=	32
30	Water closet, Public (flushihng greater than 1.6 gpf)	0	6	=	0
				=	0
31	Fixture drain or trap - 1 1/4" (32 mm)	0	1	=	0
32	Fixture drain or trap - 1 1/2" (40 mm)	0	2	=	0
33	Fixture drain or trap - 2" (50 mm)	0	3	=	0
34	Fixture drain or trap - 2 1/2" (65 mm)	0	4	=	0
35	Fixture drain or trap - 3" (80 mm)	0	5	=	0
36	Fixture drain or trap - 4" (100 mm)	0	6	=	0

TOTAL CALCULATED DRAINAGE FIXTURE UNITS **868**

BUILDING DRAIN SLOPE 1/4 PER FOOT

BUILDING DRAIN SIZE **8** IN. DIA.

(Based on IPC Table 710.1(1))

SELECTED SIZE WILL SERVE **1600** DRAINAGE FIXTURE UNITS

DATE April 1, 2026

TOTAL WATER DEMAND

BY MZO

JOB NO. 25038

ITEM NO.	FIXTURE DESCRIPTION	NO. OF FIXTURES	LOAD VALUES (wsfu) COLD	HOT	TOTAL		CALCULATED FIXTURE UNITS
1	Bathroom Group (Private Flush tank))	150	2.7	1.5	3.6	=	540
2	Bathroom Group (Private Flush valve)	0	6.0	3.0	8.0	=	0
3	Bathtub	0	1.0	1.0	1.4	=	0
4	Bathtub (Public)	0	3.0	3.0	4.0	=	0
5	Bidet (Private)	0	1.5	1.5	2.0	=	0
6	Coimbination fixture (Private)	0	2.25	2.25	3.0	=	0
7	Dishwashing Machine (Private)	0	-	1.4	1.4	=	0
8	Drinking fountain (Offices, etc.)	4	0.25	-	0.3	=	1
9	Kitchen sink/Pantry/Workstation	0	1.0	1.0	1.4	=	0
10	Kitchen sink (Hotel, restaurant)	4	3.0	3.0	4.0	=	16
11	Laundry trays (1 to 3) (Private)	0	1.0	1.0	1.4	=	0
12	Lavatory (Private)	0	0.5	0.5	0.7	=	0
13	Lavatory (Public)	8	1.5	1.5	2.0	=	16
14	Service sink (Offices, etc.)	4	2.25	2.25	3.0	=	12
15	Shower head (Public)	4	3.0	3.0	4.0	=	16
16	Shower head (Private)	0	1.0	1.0	1.4	=	0
17	Urinal (Public 1" flush valve)	0	10.0	-	10.0	=	0
18	Urinal (Public 3/4" flush valve)	0	5.0	-	5.0	=	0
19	Urinal (Public flush tank)	0	3.0	-	3.0	=	0
20	Washing Machine (Private)	0	1.0	1.0	1.4	=	0
21	Washing machine (Public)	0	2.25	2.25	3.0	=	0
22	Washing machine (15 lb. Public)	0	3.0	3.0	4.0	=	0
23	Water closet (Private Flush valve)	0	6.0	-	6.0	=	0
24	Water closet (Private Flush tank)	0	2.2	-	2.2	=	0
25	Water closet (Public Flush valve)	8	10.0	-	10.0	=	80
26	Water closet (Public Flush tank)	0	5.0	-	5.0	=	0
27	Water closet (Public or private Flushometer)	0	2.0	-	2.0	=	0
28	Kitchen (Commercial)	2	20.0	20.0	35.0	=	70
29	Dishwashing Machine Kitchen	2	-	15.0	15.0	=	30
30	Hydrants	5	2.0	-	2.0	=	10
	TOTAL CALCULATED FIXTURE UNITS		**581**	**340**			**791**

ADD CONTINUOUS SUPPLY DEMANDS

HVAC	0	**GPM**	
LAWN SPRINKLERS	0	**GPM**	
OTHER	0	**GPM**	

PREDOMINANTLY FLUSH TANKS OR FLUSH VALVES? (1=tanks; 2=valves) **1**

CALCULATED SYSTEM DEMAND (GALLONS PER MINUTE) **208**

(Based on IPC Table E102)

TOTAL SYSTEM DEMAND (GALLONS PER MINUTE) **208**

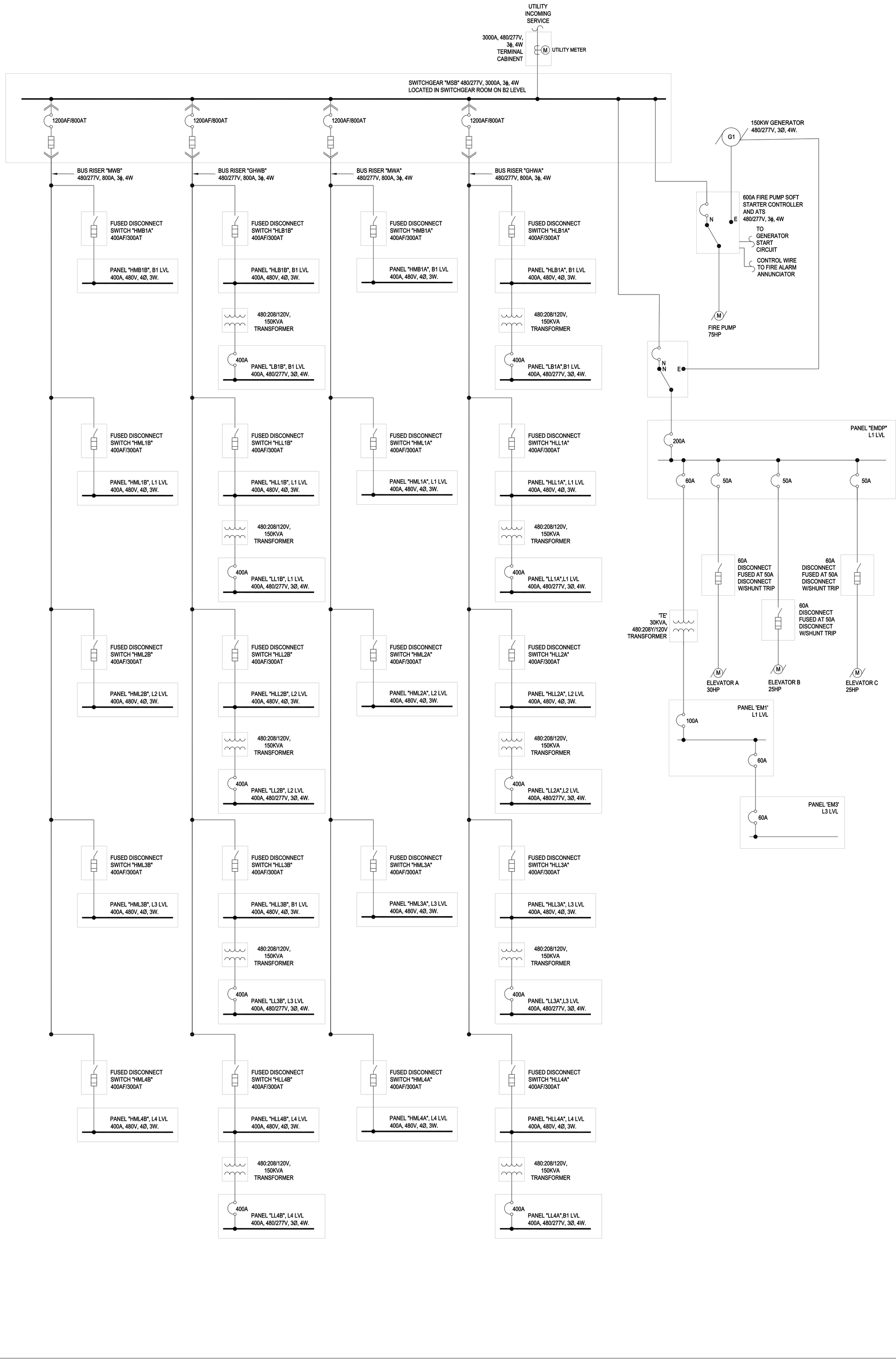
BLDG WATER SERVICE PIPE SIZE (INCHES DIAMETER) **4**

CALCULATED METER DEMAND (GALLONS PER MINUTE) **166**

(Based on calculated system demand x 80%)

BUILDING WATER METER SIZE (INCHES DIAMETER) **3**

APPENDIX C - ELECTRICAL ONE LINE


UTILITY
INCOMING
SERVICE
3000A, 480/277V,
3ϕ, 4W
TERMINAL
CABINENT
M
UTILITY METER
SWITCHGEAR "MSB" 480/277V, 3000A, 3ϕ, 4W
LOCATED IN SWITCHGEAR ROOM ON B2 LEVEL
1200AF/800AT
1200AF/800AT
1200AF/800AT
1200AF/800AT
BUS RISER "MWB"
480/277V, 800A, 3ϕ, 4W
BUS RISER "GHWB"
480/277V, 800A, 3ϕ, 4W
BUS RISER "MWA"
480/277V, 800A, 3ϕ, 4W
BUS RISER "GHWA"
480/277V, 800A, 3ϕ, 4W
FUSED DISCONNECT
SWITCH "HMB1A"
400AF/300AT
PANEL "HMB1B", B1 LVL
400A, 480V, 4Ø, 3W.
FUSED DISCONNECT
SWITCH "HLB1B"
400AF/300AT
PANEL "HLB1B", B1 LVL
400A, 480V, 4Ø, 3W.
480:208/120V,
150KVA
TRANSFORMER
400A
PANEL "LB1B", B1 LVL
400A, 480/277V, 3Ø, 4W.
FUSED DISCONNECT
SWITCH "HMB1A"
400AF/300AT
PANEL "HMB1A", B1 LVL
400A, 480V, 4Ø, 3W.
FUSED DISCONNECT
SWITCH "HLB1A"
400AF/300AT
PANEL "HLB1A", B1 LVL
400A, 480V, 4Ø, 3W.
480:208/120V,
150KVA
TRANSFORMER
400A
PANEL "LB1A",B1 LVL
400A, 480/277V, 3Ø, 4W.
FUSED DISCONNECT
SWITCH "HML1B"
400AF/300AT
PANEL "HML1B", L1 LVL
400A, 480V, 4Ø, 3W.
FUSED DISCONNECT
SWITCH "HLL1B"
400AF/300AT
PANEL "HLL1B", L1 LVL
400A, 480V, 4Ø, 3W.
480:208/120V,
150KVA
TRANSFORMER
400A
PANEL "LL1B", L1 LVL
400A, 480/277V, 3Ø, 4W.
FUSED DISCONNECT
SWITCH "HML1A"
400AF/300AT
PANEL "HML1A", L1 LVL
400A, 480V, 4Ø, 3W.
FUSED DISCONNECT
SWITCH "HLL1A"
400AF/300AT
PANEL "HLL1A", L1 LVL
400A, 480V, 4Ø, 3W.
480:208/120V,
150KVA
TRANSFORMER
400A
PANEL "LL1A",L1 LVL
400A, 480/277V, 3Ø, 4W.
FUSED DISCONNECT
SWITCH "HML2B"
400AF/300AT
PANEL "HML2B", L2 LVL
400A, 480V, 4Ø, 3W.
FUSED DISCONNECT
SWITCH "HLL2B"
400AF/300AT
PANEL "HLL2B", L2 LVL
400A, 480V, 4Ø, 3W.
480:208/120V,
150KVA
TRANSFORMER
400A
PANEL "LL2B", L2 LVL
400A, 480/277V, 3Ø, 4W.
FUSED DISCONNECT
SWITCH "HML2A"
400AF/300AT
PANEL "HML2A", L2 LVL
400A, 480V, 4Ø, 3W.
FUSED DISCONNECT
SWITCH "HLL2A"
400AF/300AT
PANEL "HLL2A", L2 LVL
400A, 480V, 4Ø, 3W.
480:208/120V,
150KVA
TRANSFORMER
400A
PANEL "LL2A",L2 LVL
400A, 480/277V, 3Ø, 4W.
FUSED DISCONNECT
SWITCH "HML3B"
400AF/300AT
PANEL "HML3B", L3 LVL
400A, 480V, 4Ø, 3W.
FUSED DISCONNECT
SWITCH "HLL3B"
400AF/300AT
PANEL "HLL3B", B1 LVL
400A, 480V, 4Ø, 3W.
480:208/120V,
150KVA
TRANSFORMER
400A
PANEL "LL3B", L3 LVL
400A, 480/277V, 3Ø, 4W.
FUSED DISCONNECT
SWITCH "HML3A"
400AF/300AT
PANEL "HML3A", L3 LVL
400A, 480V, 4Ø, 3W.
FUSED DISCONNECT
SWITCH "HLL3A"
400AF/300AT
PANEL "HLL3A", L3 LVL
400A, 480V, 4Ø, 3W.
480:208/120V,
150KVA
TRANSFORMER
400A
PANEL "LL3A",L3 LVL
400A, 480/277V, 3Ø, 4W.
FUSED DISCONNECT
SWITCH "HML4B"
400AF/300AT
PANEL "HML4B", L4 LVL
400A, 480V, 4Ø, 3W.
FUSED DISCONNECT
SWITCH "HLL4B"
400AF/300AT
PANEL "HLL4B", L4 LVL
400A, 480V, 4Ø, 3W.
480:208/120V,
150KVA
TRANSFORMER
400A
PANEL "LL4B", L4 LVL
400A, 480/277V, 3Ø, 4W.
FUSED DISCONNECT
SWITCH "HML4A"
400AF/300AT
PANEL "HML4A", L4 LVL
400A, 480V, 4Ø, 3W.
FUSED DISCONNECT
SWITCH "HLL4A"
400AF/300AT
PANEL "HLL4A", L4 LVL
400A, 480V, 4Ø, 3W.
480:208/120V,
150KVA
TRANSFORMER
400A
PANEL "LL4A",B1 LVL
400A, 480/277V, 3Ø, 4W.
150KW GENERATOR
480/277V, 3Ø, 4W.
G1
600A FIRE PUMP SOFT
STARTER CONTROLLER
AND ATS
480/277V, 3ϕ, 4W
N
E
TO
GENERATOR
START
CIRCUIT
CONTROL WIRE
TO FIRE ALARM
ANNUNCIATOR
M
FIRE PUMP
75HP
N
N
E
PANEL "EMDP"
L1 LVL
200A
60A
50A
50A
50A
60A
DISCONNECT
FUSED AT 50A
DISCONNECT
W/SHUNT TRIP
60A
DISCONNECT
FUSED AT 50A
DISCONNECT
W/SHUNT TRIP
60A
DISCONNECT
FUSED AT 50A
DISCONNECT
W/SHUNT TRIP
'TE'
30KVA,
480:208Y/120V
TRANSFORMER
M
ELEVATOR A
30HP
M
ELEVATOR B
25HP
M
ELEVATOR C
25HP
PANEL 'EM1'
L1 LVL
100A
60A
PANEL 'EM3'
L3 LVL
60A