

Crabtree Valley

*Mechanical/Electrical/Plumbing
and Fire Protection Design Criteria*

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INTRODUCTION

Tenant Mechanical (HVAQ System Criteria)

The intent of these criteria is to provide a basic outline of the Mechanical (HVAC) systems for a typical Tenant store to be provided and installed by the Tenant within the demised premises at the Tenant's expense. The Landlord will provide a central cooling system and will install a chilled water supply and return line to the Tenant store, for connection to the Tenant's air handling unit by the Tenant, and stub same into the rear 1/3 of the demised space. Tenant will be required to install a fan-coil unit up to 1000 cfm or an approved air handling unit above 1000 cfm sufficient to heat and cool the Tenant's leased premises.

Mechanical Design Criteria

Tenant Responsibilities
Additional structural framing required as a result of roof penetrations or placement of any roof mounted equipment shall be at tenant's expense
Structural plans and calculations must be reviewed and approved by Landlord's engineer at tenant's expense
Blocking and fastening to roof shall be by tenant with approval by Landlord's roofer at tenant's expense
Maintenance of HVAC system throughout the lease term
Installation and distribution of controls, duct system, electrical wiring and temperature controls
Condensate drain routed to roof drain. Must have clean-out trap
Provide duct smoke detectors as required by code and local authorities. Locate inside supply and return ducts downstream of the filters and ahead of any branch connections on all systems
Duct routing may require a rated shaft enclosure per code (coordinate routing with Landlord)
Flex duct must not exceed 5'-0"
Odors must be exhausted to the atmosphere through a Tenant furnished and Tenant installed up blast exhaust fan in accordance with applicable code
Kitchen exhaust fan shall be capable of maintaining a minimum discharge velocity of 2000 FPM
Distance of each exhaust fan from any RTU air intake shall be that which is required by code
Kitchen exhaust fan to be equipped with a residue trough to be maintained by tenant
Toilet exhaust fans to be 2 CFM per sq. ft. or 50 CFM minimum
Electrical interlock required for toilet/kitchen exhaust fans to run simultaneously with tenant lighting
Automatic extinguishing equipment installed in accordance with applicable code
Automatic change over thermostats must be used
No heat pumps or evaporative coolers are permitted
Weatherproof GFCI to be located on RTU
No direct fired make up air units
No economizer allowed with food court tenant RTU
Gas service is available to Food Court tenants only from existing meter banks

SECTION I.

Tenant Mechanical (HVAC System Criteria)

A. General

The general arrangement of the Tenant HVAC systems shall be comprised of a fan-forced, ducted heating and cooling system using chilled water as the cooling source and electricity as the heating source. Toilets shall be exhausted using mechanical ventilation. Controls shall include basic environmental temperature controls as well as automatic smoke evacuation controls that shall be connected to the Landlord's central smoke control/fire alarm system. Controls shall be electric/electronic. The Architectural drawings must include the details of the smoke evacuation system. Units should be designed to use standard items for stock or quick-ship options.

The Tenant is required to provide the Landlord with as-built drawings of HVAC system, providing chilled water piping diagram showing valves, thermometers, pressure gauges, etc. Chilled water piping is to be insulated with cellular glass insulation (fiberglass is not acceptable.)

The Tenant is required to provide a service platform with a light and an outlet for the serving of the HVAC unit.

B. Air Handling Units

1. Air handling units shall be central station type per AFJ standards, typically horizontal draw-through arrangement, suspended above dropped ceilings. Air handling units shall be complete with a return/outdoor air mixing box, an angle filter section, and a chilled water cooling section, a fan section and an electric heating section. Electric heaters shall be installed in the reheat position. Landlord prefers units manufactured by Environmental Technologies (model H), Carrier (model 39T), or Trane (model MCC). Units manufactured by Magic Aire are not acceptable.
2. Chilled water coils shall be fin and tube construction using aluminum plate fins mechanically bonded to copper tubes. An insulated stainless steel drain pan shall extend under the coil section as well as the fan section. Chilled water coils shall be sized for no more than 500 feet per minute face velocity and are to be ARI 410 certified. Coils must have manual air vents.
3. Electric heating elements shall be the sheathed element type designed for zero clearance to combustible materials. Heaters shall include fan interlock, over-temperature protection, and magnetic control contactors, grounding lugs and disconnect switch. Open coil type heaters are not allowed.
4. Air handling unit casings shall be double wall minimum 16 gauge hot-dip galvanized steel with structural steel frame, gaskets between sections and hinged, locking access doors to all internal components. The air-handling unit shall rest on spring isolators or the fan and motor assembly may be internally isolated. Access door shall be on both sides of the fan and filter sections. Access doors shall not require the removal of screws to open.

5. Filters shall be the replaceable, 2-inch thick, extended surface type similar to the Newport Nu-Pleat Model 40 produced by Newport Manufacturing Corporation. Filters shall be sized for no more than 300 feet per minute face velocity. Filter section must have latched type door with ample clearance for access.

C. Chilled Water Piping

1. The Landlord at the boundary of the Tenant demised premises will supply chilled water supply and return piping. The Tenant shall connect water piping from the Landlord's piping branches to the air handling unit chilled water coil.
2. Chilled water piping shall be Schedule 40 black steel using malleable iron threaded fittings for pipe sizes two and one half (2-1/2") inches and less, and forged steel welded fittings for pipe sizes 3" and larger.
3. Chilled water piping shall be insulated using one and one half (1-1/2") inches thick pre-molded cellular glass pipe insulation with vapor barrier jacket.
4. At the connection to the cooling coil shall be provided a modulating two-way control valve with electronic actuator, isolating valves on both the supply and return piping, balancing valves on the return piping, gauge cocks and thermometer wells all in accordance with the chilled water coil piping diagram. System must include a strainer to catch sediment.

D. Condensate Drain Piping

1. A condensate drain shall be run from the air handling unit drain pan to the nearest trapped plumbing drain. The condensate drain line shall incorporate a trap, sized 1/2 inch deeper than maximum fan static pressure, in inches water column.
2. Condensate drain piping shall be galvanized, minimum one inch in size, and with threaded fittings. Condensate drain piping shall be insulated using 1/2 inch thick closed cell flexible rubber pipe insulation.

E. Ductwork

1. Supply, return and exhaust ductwork shall be fabricated from galvanized steel sheets in accordance with the latest issue of the SMACNA HVAC Duct Construction Standards, Metal and Flexible. Elbows shall be radius type, or may be square type if double thickness turning vanes are installed. All branch connections to air distribution devices shall contain a balancing damper at the branch take-off.
2. At the connection to all air handling units, exhaust fans and other rotating equipment a minimum 4-inch wide flexible duct connection shall be installed.

3. All supply ductwork shall be insulated on the exterior using 1-1/2 inch thick fiberglass blanket insulation with foil-faced vapor barrier jacket, secured to the duct-using adhesive. All joints and seams shall be vapor sealed. AN return ductwork not installed in the conditioned space or within a return air plenum shall be insulated on the exterior same as for supply ductwork.
4. All Tenants in the following use groups shall install a complete return air ductwork system:
 - a. Food Establishments
 - b. Pet Stores
 - c. Hair Salons
 - d. Any other use deemed appropriate by the Landlord.Tenants in other use groups may use the space above suspended ceilings as the return air plenum.
5. Tenant shall provide fire dampers and fire stops as required by Code.
6. The Landlord will provide a system of toilet exhaust ductwork and stub it into the rear 1/3 of the demised space. Tenant will be required to install an exhaust duct from the Tenant's toilet rooms and from other equipment requiring venting and make connection to the Landlord's ductwork system.
7. Food Court Tenants will be required to provide a separate source of tempered make-up air to replenish exhaust air lost through range exhaust hoods and other specialized exhaust systems.

F. Temperature Controls

1. Automatic temperature controls shall be provided to automatically control heating and cooling in sequence.
2. Space thermostats shall be automatic changeover type with a sub-base containing "System-On-Off" and "Fan-On-Auto" switches.
3. Deleted
4. Chilled water control valves shall be two-position normally open spring return type. Electric heating coils shall be staged (two stages minimum). A freezestat shall be provided at this inlet to all air handling units set at 35 degrees Fahrenheit wired to shut down the respective fan and open the two way chilled water valve to prevent coil freezing.
5. Valve actuators, thermostats and other devices shall be electric/electronic.

G. Exhaust Systems

All odor and moisture producing areas, including pet shops, hair salons, etc. and high heat producing equipment and appliances must be exhausted by special mechanical exhaust systems to the atmosphere. Special exhaust systems shall be designed to prevent odors, heat and/or moisture from entering the mall and the Landlord's air conditioning system. Exhaust air quantities shall be in adequate amounts and shall be no less than required by code. Exhaust to exceed outside air intake by a minimum of 10%, more if required to control odors. Makeup air for exhaust systems from kitchen, food preparation area, dining area and cafeteria area must be accomplished by tenant furnished and installed make up air systems.

G. Smoke Evacuation Controls

1. Smoke evacuation controls shall be installed which shall include a direct ducted outdoor air connection to the air handling unit, motorized control dampers and connection to the Landlord's fire alarm system.
2. An outdoor air duct shall be connected directly to the air-handling unit mixing box, sized to handle 100% of the air handling unit air quantity in CFM. The outdoor air duct shall be routed to an exterior wall louver for Tenants on the lower level and to a roof-mounted hood for Tenants on the upper level. This should be verified at the site survey.
3. Motorized dampers shall be installed both in the outdoor air duct connection to the air handling unit mixing box and in the return air duct connection to the air handling unit. The outdoor air damper shall be normally closed and the return air damper shall be normally open. Dampers shall comply with UL 555S.
4. Should smoke or fire be detected within the Tenant demised premises the following sequence shall occur:
 - a. The outside air damper shall go full open and the return air damper shall go full closed.
 - b. The supply fan in the air-handling unit shall run to flush the products of combustion into the common mall area where it will be exhausted to the outdoors. Any duct smoke detector, freezestat or other safety device in the air stream shall be bypassed or de-activated to prevent automatic fan shutdown during smoke evacuation.
 - c. The chilled water two-way control valve shall open fully to the coil to provide water flow in the coil and prevent freezing.
 - d. The Landlord's addressable fire alarm system shall be activated through a connection with the Tenant smoke evacuation control system.

Tenant's design professional shall be responsible for verifying chilled water system design conditions, contact the Mall's consulting engineers, Bass, Nixon & Kennedy, Inc., Consulting Engineers 919-851-4422.

SECTION II.

Tenant Electrical Systems Design Criteria

A. General

1. Tenant's entire electrical system shall conform to the following:
 - a. The requirements of all authorities having jurisdiction over the work, Raleigh, North Carolina Electrical Code, the National Electrical Code, Landlord's insurance carrier, and Title III of the Americans with Disabilities Act (ADA).
 - b. The requirements for all roof and wall openings described herein.
 - c. **No appurtenances (including light fixtures, antennas, signs, etc.) shall be affixed to the exterior walls or roof of Landlord's building without Landlord's prior written approval.**
 - d. All electrical equipment shall be UL listed.

B. Power Criteria

1. Tenant shall furnish and install all electrical facilities for the premises including, but not limited to, the following
 - a. Conduit from the Landlord electric trough to Tenant power distribution equipment. Wiring from the Landlord meter base to the premises. If service required by Tenant's particular use or design exceeds conduit size or CP&C meter size, additional service will be provided by Landlord at Tenant's expense.
 - b. Tenant main service disconnect.
 - c. Distribution and/or branch circuit panels.
 - d. **Transformers to step down voltage from 480 to 120, 208 or 240 volts.**
 - e. All feeder and branch circuit wiring and conduit.
 - f. Tenants requiring supplemental heating shall furnish and install power wiring to the electric heating unit supplied by Tenant. Power wiring shall extend from Tenant's power distribution equipment to the heater.
 - g. Tenant must use Landlord's required Electrical Contractor
2. All Tenants wiring shall utilize copper conductors with 600-volt insulation.
3. All Tenants wiring shall be installed in EMT conduit.

C. Lighting Criteria

The intent of these criteria is to provide a basic approach to illumination that will maintain good visual variety and balance. The criteria shall govern the design and installation of all store lighting by the Tenant that is visible to the public. The following general lighting criteria shall apply to all stores except as otherwise indicated in the specific area criteria. Tenant shall consult the specific area criteria applicable to the premises.

1. General

- a. All light fixtures shall be of the glare-free type. Light sources shall not be visible from the mall.
- b. No exposed or colored lamps or bulbs shall be permitted.
- c. No high intensity discharge lamps (i.e. mercury vapor, high pressure sodium or metal halide) shall be used within the premises.
- d. No lighting shall be installed in the Landlord's ceiling for any purpose.
- e. Pendant light fixtures, luminous ceilings, chandeliers, wall brackets or glitter strips may be used only if Tenant has established an identity based on this theme or motif, and these must be approved in writing by the Landlord.
- f. No strobe, spinner or chase-type lighting shall be used.
- g. All lighting shall comply with applicable codes and jurisdictions.
- h. All storefront neon signage must have dimmer switch control.
- i. Landlord must approve all exterior signage.
- j. All fluorescent fighting shall have either high power factor magnetic ballast or electronic ballast installed.
- k. Tenant's light fixture installation shall conform to the requirements of the one- (1) hour rated ceiling.
- l. All sign, logo and storefront illumination shall be controlled by a time clock furnished by Tenant. Landlord's General Manager shall establish time settings.

2. Tenant Design Responsibilities

Tenant shall field verify existing electrical service and provide a complete electrical system from Landlord's distribution point, including but not limited to, all necessary labor, branch and main circuit breakers, disconnects, panels, transformers, conduit, wire, etc. necessary for the satisfactory operation of an electrical system.

Tenant Design Responsibilities

Transformers shall be installed below finished ceiling and may not be anchored to or suspended from the existing mall structure, exterior or demising walls. Transformers are to be floor, platform or non demising wall mounted.
Electrical equipment and materials shall be new in accordance with the national electrical code standards and local codes and shall bear the Underwriters Laboratories label.
Time clock to control storefront signage and show window lighting.
Electrical panel shall be provided with bolt on breakers and copper bus bars. Load centers are not acceptable.
Panel loads to be balanced to within 10% of each phase.
Lighting circuit breakers shall be rated for switching duty.
Additional capacity may be available; upgrades to service size shall be at tenant's expense upon Landlord's approval.
All wire must be copper

2. Show Window Display Lighting

- a. Show window lighting shall be incandescent.
- b. All light sources, i.e. lamps or bulbs for direct (downlights, track lights, soffit lights, etc.) or indirect (cove, sconce, etc.) fixtures must be shielded from view.
- c. All illumination shall be directed away from the mall to prevent glare into any public areas.
- d. All showcase storefront lighting must be incandescent.

3. Interior Lighting

- a. All light sources, i.e. lamps or bulbs for direct (downlights, track lights, soffit lights, etc.) or indirect (cove, sconce, etc.) fixtures must be shielded from view.
- b. Fluorescent fixtures shall have parabolic diffusers, either metal paralume-type or acrylic paracube-type. No other lens shall be used except in storage or other areas removed from public view.
- c. Incandescent fixtures shall have specular or semi-specular Alzak reflectors, coilex baffles, or other glare-free shielding devices.
- d. The use of cool white, daylight or warm white fluorescent lamps shall not be permitted. Deluxe warm white, deluxe cool white fluorescent or tri-phosphor lamps are recommended.
- e. Surface or pendant mounted track and track light fixtures may be used on the premises side of the storefront, but not on the mall side. The color of the track and track lights shall match the ceiling color.

- f. All internally illuminated show cases and display cases must be adequately illuminated and ventilated.
- g. Interior emergency fighting and exit lights shall be installed as required by applicable codes. All emergency and exit lighting shall have individual auxiliary battery power.
- h. Fluorescent lighting is not permitted within eight feet of the lease fine.
- i. All storefront lighting shall be mounted to and fully supported from Tenant storefront construction only.

D. Telephone Criteria

- 1. Unless already existing, the Tenant's Electrician shall install telephone conduit to service the premises into the back 1/3 of the demised space. Tenant shall make the arrangements for all telephone service for the premises as well as the installation of wiring and equipment from Landlord's equipment location to and within the premises as may be required to accommodate Tenant's use thereof.

E. Fire Alarm Criteria

- 1. The Landlord's fire alarm system includes provisions for connecting the Tenant's fire alarm system into the Landlord's system. The Tenant is required to use the Landlord's Fire Alarm contractor for the purchase and installation of the system. A junction box is provided for this Tenant system interconnection adjacent to the storefront. Tenant shall provide fire alarm system as required to comply with applicable codes and Tenant's needs and shall connect system to Landlord system junction box described above. Tenant fire alarm system shall include, but not limited to the following:
 - a. Visual alarm(s) in store bathroom(s)
 - b. Audio visual alarm(s) in stockroom(s)
 - c. Audio visual alarm(s) on sales floor
 - d. Firestat connection(s) see Mechanical.
- 2. Fire alarm/life safety equipment **will** be purchased and installed by the Landlord Contractor at Tenant's expense. Tenant to provide all conduits and pull wires to junction box location in Tenant's storefront. The coordination of locations of such conduits shall be coordinated with the Landlord's Construction Coordinator.

Fire Alarm Contractor: Gleeco Controls, (919) 598-1905, Greg Ferrell.

F. Tenant Drawings

1. Tenant's electrical drawings submitted for review shall include the following:

Electrical Drawing Requirements

All connections to Mall distribution system
Floor and wall receptacles (locations and type)
Fans, motors and all electrical equipment (locations and type)
Floor and wall voice/data outlets (locations and type)
Fire rated walls and penetration details on all drawings
POS outlets (voice/data outlets and isolated ground receptacles) (location and type)
Lighting fixture layout. Lighting fixture schedule (including lamp type and voltage)
Emergency, exit and night lighting fixture layout (all with battery back up)
Electrical powered equipment assigned to circuits
Feeder conduit and wire size indicated
Branch circuit conduit, wire size and layout
Electrical room layout (showing arrangement of panels, transformers, time clock, etc.) plan must be to ¼" = 1'-0" scale
Conduit and wire size to HVAC equipment and panels, indicate overcurrent protection device type and size for electrical panel
Notes and specifications
Electrical panel schedule and electrical room riser diagram
Fire alarm system tie-in, location, type and manufacture of devices, manufacturer and system to adhere to Mall standards
Show and specify transformer to be grounded to building steel
All loads assigned to circuits
All lighting assigned to circuits
Tenant space number to be shown in title block
Drawings to show column lines with designations
Drawings to be signed and sealed by the applicable state engineer
Maximum coincident demand in KVA for general light and miscellaneous power.
Maximum coincident demand and estimated hours of demand use for special equipment power such as refrigeration, cooking, etc.

SECTION III

Tenant Plumbing Systems

A. Plumbing Design Criteria

1. Utilities provided by Landlord

- a. Each tenant space shall be provided with a 4" sanitary connection below the finished floor and a 2" vent connection above the ceiling level. A 3/4" water connection is provided above the ceiling for each Lower Level Tenant space and below the floor for each Upper Level Tenant space. Locations must be field verified by Tenant Contractor.

2. Tenant Construction Requirements

- a. The tenant shall be responsible for compliance with all local authorities and North Carolina code requirements.
- b. The Tenant shall be responsible for procurement of all necessary permits.
- c. All work to be performed must be scheduled and approved by the Landlord prior to commencement of construction. Upper level Tenant spaces with utility connections that occur in the ceiling space of a lower level Tenant must also schedule all work and associated costs with that Tenant prior to commencement of construction.
- d. The Tenant is to provide a reduced pressure backflow preventor located within its space after connection to the domestic water service.
- e. All domestic water piping is to be Type M copper with lead free soldered joints and be insulated a minimum of one inch (1") thick fiberglass insulation having an all service jacket with self-sealing lip.
- f. All above ground sanitary and vent piping is to be cast-iron with no-hub joints and stainless steel couplings, below ground sanitary piping shall be Schedule 40 PVC piping with cemented joints. PVC is not acceptable in the ceiling of a space.
- g. All domestic cold water piping and drainage piping receiving condensate waste located above ceiling other than the individual Tenant space are to be provided with 1/2" minimum thickness fiberglass insulation.
- h. Piping shall be supported from hangers at an adequate distance with adequate supporting hanger rods fastened to building framing whenever possible. Support shall not be fastened to roof decking or ductwork.
- i. The Tenant must install hair and lint interceptors. Individual trap type hair and lint receptors as manufactured by JR. Smith or equal shall be installed in all sinks, basins and special use sinks.
- j. Tenant shall provide access to all Landlord clean-outs that may occur in Tenant's space.

- k. Upper level tenants shall provide all required floor penetrations for connecting plumbing to sanitary sewer stubs installed by Landlord. All penetrations (pipes, conduits, etc.) passing through the floor slab shall be sleeved one and one half inches (1 ½”) above finished floor. All floor penetrations shall be sealed in an acceptable manner to prevent penetration of odors or liquids to the space below.
- l. Food Court Tenants will connect into the dedicated grease line where applicable. Individual grease interceptors, adequately sized, shall be installed and maintained on all sinks, pre-wash sinks, dishwashers, and any other kitchen equipment. All grease interceptors shall be the type that will plug solid if not maintained properly.
- m. As-built plumbing drawings must be provided to the Landlord by the Tenant of Tenant's final plumbing system.
- n. All Tenants serving food to the public shall install individual trash compactors. Tenants are to compact all trash into sealed leak-proof containers prior to disposing trash in the mall designated compactor.

SECTION IV.

Tenant Fire Protection Systems Criteria

A. Fire Protection Design Criteria

1. Utilities provided by Landlord

- a. Each Tenant space is provided with a flanged connection in the ceiling Space area, from the fire sprinkler mains serving the facility with additional Main and branch piping serving upright brass, quick response sprinkler Heads installed in each unfinished tenant space.
- b. Landlord will leave existing sprinkler piping intact for alteration as required by Tenant within the demised area to meet local codes.

2. Tenant Construction Requirements:

- a. The Tenant shall be responsible for compliance with all requirements of the Local codes, authorities and the North Carolina State code requirements. Fire protection sprinkler installation shall be in strict compliance with NFPA 13, latest edition.
- b. The Tenant shall be responsible for procurement of all required permits.
- c. Landlord required Contractor at Tenant's expense must perform all sprinkler work, contact Landlord's Construction Coordinator for CVM list of approved contractors.
- d. All work to be performed must be scheduled and approved by the Landlord prior to commencement of construction or any interruption or tie-in to existing systems.
- e. All fire protection sprinkler piping shall be welded or seamless black steel pipe ASTM A-53 or A-135, Schedule 40 for 6" and smaller or at the Contractor's option Schedule 10 for 5" and smaller. Pipe may be rolled, grooved or Schedule 40 pipe may be threaded.
- f. Fittings shall be Class 150 malleable iron threaded, ANSI A16.3, factory fabricated wrought steel, butt welded, ANSI B 16.9, cast iron flanged Class 125, ANSI B 16. 1, with 1/8" minimum red rubber gaskets, or malleable iron mechanical grooved type fittings and couplings, ASTM A47, 500 psi Minimum with EDPM gasket, UL listed or FM approved.
- g. All sprinkler heads must be recessed quick response type.
- h. Tenant is required to install and maintain proper amounts of fire extinguishers as per code.
- i. Tenant Contractor is required to provide a permanent sign identifying the sprinkler riser and its location, and mount next to fire control panel

SECTION V.

Tenant Fire Alarm Systems Criteria

A. **Fire Alarm System Criteria**

The City of Raleigh requires the Tenant purchase and installs an addressable fire alarm system compatible with the Crabtree Valley Mall Fire Alarm System. The fire alarm must be purchased from and installed by:

Gleeco Controls,
Greg Ferrell,
919-598-1905.