



**AT&T Building
Future Use Project**
520 Third Street, Santa Rosa, CA

Electrical Systems Report

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BACKGROUND

The City of Santa Rosa Redevelopment Agency contracted with Winzler & Kelly to investigate the existing conditions of the mechanical and electrical systems at the former AT&T Building located at 520 Third Street, Santa Rosa, California. Additionally the City desired that recommendations be made with regards to future possible uses scenarios. The electrical systems under consideration include power, lighting, emergency & exit lighting, fire alarm, telephone, and CATV.

This purpose of this document is to explore and discuss electrical code and engineering issues relevant to the adequacy and safety of the building as they relate to the proposed reuse of the building. The information presented herein is based upon our walkthrough of the building on Thursday September 27, 2007 and our review of the original building drawings from 1973 & 1979.

GENERAL CONDITIONS SURVEY

Electrical Service and Normal Power Distribution:

The existing electrical service to the building consists of a primary voltage, 12 kV nominal, 600 Amp, main service switchgear. The main switchgear is located in the basement near the north side of the building. The equipment was manufactured by Westinghouse and appears to be original equipment from 1973. The primary service feeder enters the building from a sub-surface PG&E vault outside the building on 3rd Street.

The main overcurrent and feeder protective devices consist of fused, air-interrupter switches. The switchgear has a metering section which is equipped with current and potential metering transformers as well as a PG&E revenue meter.

Normal utilization level voltage within the building is provided by a single transformer located in the basement. The transformer is rated 3000 kVA and has a secondary voltage rating of 480Y/277 Volts, 3-phase, 4-wire. It is a dry-type transformer manufactured by Westinghouse and appears to be original 1973 equipment. This transformer is very loud and may have issues with core de-lamination or winding support failure.

Power from the normal power transformer is routed to the one side of the main distribution switchboard in the basement. This main distribution switchboard contains several inter-locked circuit breakers that are capable of transferring between the normal commercial power system and the emergency power system that is described below.

Several 480 Volt power distribution feeders emanate from the main distribution switchboard and feed various lighting panels, motor control centers, HVAC equipment, elevator equipment and telephone equipment power distribution panels.

Basic utilization voltage for circuits such as receptacles and miscellaneous equipment is derived at various locations in the building by use of 480 to 208Y/120 Volt, 3-phase transformers. These transformers are typically located at each floor of the building and feed one or more general branch circuit panelboards.

In general, most of the electrical distribution equipment is original 1973 or 1979 equipment. The bulk of the distribution equipment was made by Westinghouse and the panelboards were made by Sierra Switchboard. Both manufacturers have been out of the commercial electrical equipment business for some time, the equipment is obsolete, and replacement circuit breakers and components are not readily available. We recommend that all of the original electrical equipment be demolished.

Emergency Power Distribution:

Emergency power for life-safety systems, emergency & exit lighting, telephone distribution equipment, elevators, etc. was originally supplied from a 750 kW turbine generator located on the roof of the adjacent AT&T building. A feeder from the roof delivered power to an emergency distribution transformer located in the basement. This transformer is rated 1000 kVA and has a primary voltage rating of 4160 Volts and a secondary voltage rating of 480Y/277 Volts, 3-phase, 4-wire. The emergency transformer supplies the emergency side of the previously described main distribution switchboard in the basement.

As part of the building abandonment by AT&T, the emergency power feed to the roof of the adjacent AT&T building was severed and removed. Therefore the existing emergency power system is non-functional and does not provide back-up power.

We recommend that all remaining components of the existing emergency power system be demolished and removed as part of the reuse project.

General Lighting:

General lighting throughout the building consists of commercial and industrial grade fluorescent lighting fixtures. Most of the lamps in the existing lighting fixtures are original T-12 type lamps. These lamps and ballasts are generally much less efficient than modern T-8 or T-5 light sources. The majority of the existing lighting fixtures and lamps should be changed to higher efficiency light sources at the earliest convenience.

Emergency and Exit Lighting:

Since most of the emergency lighting in the building was powered by the now defunct emergency power system, we recommend that new emergency lighting be installed in the stairwell, corridors, entrances, and other critical areas at the earliest possible convenience. This can consist of individual battery backed wall or ceiling mounted emergency lighting units.

It appears that the exit lighting in the building has been changed from the original equipment at some point in the past. The replacement exit lights are typically of the LED variety with built in battery packs. However, the equipment vintage appears to be of the first-generation LED style; based upon their age the battery life in these units is suspect. We recommend that all of the exit lights be replaced with modern 90-minute battery backed exit lights at the earliest convenience.

Outside Lighting:

The building exterior lighting is minimal and generally consists of institutional type wall-pack

lighting fixtures. In our opinion this lighting probably does not meet Illumination Engineering Society (IES) recommendations for minimum lighting levels at the building entries and parking area. In addition, the wall-pack type lighting fixtures generally do not meet current Title-24 lighting cut-off requirements. We recommend that the exterior lighting be reevaluated and/or redesigned as part of any reuse project.

Fire Alarm:

The existing fire alarm system is located near the south entry station. It is a Cerberus Pyrotronics brand system and looks to be in at least partial operation. The equipment seems to be 1980's vintage equipment and does not appear to be an addressable, fully automatic system. We recommend that this system be retained only to the extent necessary to provide monitoring of existing life safety and fire water systems. It should be completely replaced as part of any reuse project.

Telecommunications:

The building is equipped with a "house" telecommunication infrastructure located in a set of stacked closets on the north side of the building. The closets are accessible from the corridor and they are equipped with conduit chases which could be reused for a modest vertical telecommunication distribution system within the building. We recommend however that a new structured cabling plant and/or conduit infrastructure be installed in accordance with EIA/TIA standards for commercial building distribution systems.

CATV:

The building is not currently equipped with CATV service or infrastructure. We are currently in contact with Paul Alabona, the field engineer for Comcast regarding the possibility of extending service to the building. He will review the Comcast plant infrastructure in the vicinity and provided us with feedback.

RECOMMENDATIONS FOR REUSE SCENARIOS

The three reuse scenarios that are addressed in this document are as follows:

- **Scenario #1 Single User:** One retail or commercial tenant in the existing structure.
- **Scenario #2 Retail/Residential Mixed Use:** Maximum of two floor of retail with 3 or 4 floors of residential above.
- **Scenario #3 Retail/Office Mixed Use:** Maximum of two floors of retail with 3 or 4 floors of commercial use above.

Electrical Service

There are some basic considerations that will be applicable to all of the reuse scenarios. Since the existing medium voltage service will be replaced, a new main service to the building will need to be established. With the exception of a high density data center, it is unlikely that any potential tenant will generate enough electrical load demand to justify a new medium voltage service. Therefore, for the purposes of this discussion, it is assumed that one or more new low-voltage

(less than 2,000 Volts) services to the building will be established.

Our preliminary discussions with PG&E have identified the likelihood of serving the project with two different utilization voltages. Commercial/retail tenants could be served at 480Y/277 Volts, 3-Phase and the residential portions of the building would be supplied at 208Y/120 Volts, 3-Phase. This scheme has the advantage of allowing direct metering of the residential tenants by PG&E, and is consistent with PUC rules that require separate metering for dwelling occupancies. Each individual dwelling unit would then be supplied by a 120/208 Volt feeder to an individual panel in that unit.

The provision of 480 Volt power for the commercial/retail tenants has the advantage of allowing for the use of smaller feeder sizes, results in lower voltage drop and line losses and also provides for the use of larger HVAC and motor driven equipment. Metering at the 480 Volt level would be accomplished using a modular style commercial meter center which would be outfitted with various meter section sizes in anticipation of lease spaces of diverse sizes and quantity.

The following are some of the main issues regarding the electrical service to the building:

1. Location of new PG&E service transformers:

- a) In the basement – This will require the construction of a 3-hour vault in the basement that conforms to PG&E requirements as well as dedicated access for transformer installation and removal.
- b) Outside the building in-grade at sidewalk level – This involves the placement of one or more subsurface transformer vaults for PG&E transformers. Sidewalk and utility conditions on 3rd Street will determine whether this is feasible.
- c) Outside the building using standard padmount transformers – Depending upon the desired transformer placement, this may be the most economical option since it does not require any special considerations from PG&E other than the dedicated space outside.
- d) Considerations for transformers located in the building:
 - i) Provide Dry-type or Less-Flammable Fluid-Insulated transformers. – The existing transformers are dry-type units but should be replaced as previously noted.
 - ii) Comply with all of the requirements for the listing of the transformer fluid.
 - iii) Construct a transformer vault that meets current Code and PG&E requirements for a 3-hour rated vault
 - iv) Comply with all Code mandated and PG&E published clearances in front of and around electrical equipment.
 - v) Provide fully-automatic fire detection devices (smoke detectors) throughout the transformer vaults and metering rooms and interconnect to the building fire alarm system.

2. Location of new service metering equipment:

- a) Construct a new metering room in the basement – PG&E will require 24-hour access to the room for meter reading and trouble calls. A key lock-box can be provided to meet this requirement.
- b) Construct a new metering room at the 1st Floor level – This will still require 24-hour access for PG&E but allows for a more direct connection from the pad mount transformers if they need to be bus-duct connected.
- c) Provide an additional meter room at an upper floor – In the event that additional floors are added to the building, PG&E rules may allow for additional metering at the upper level (applies to residential units only).

ELECTRICAL REQUIREMENTS FOR VARIOUS SCENARIOS

The electrical requirements for the three major scenarios are listed in the Scenario Matrix table below. Refer to the notes that follow for a description of the specific electrical system requirements for each scenario.

Scenario Matrix for Electrical Systems

	Normal Power	Emergency Power	General Lighting	Emerg. & Exit Ltg.	Outside Lighting	Fire Alarm	Telecom	CATV
Scenario #1 Single User	NP1,4	EP1,2	GL1,2	EL1,2	OL1	FA1	TC1,2	CA1
Scenario #2 Retail/Residential Mixed-Use	NP2,4	EP1,3	GL1,2,3	EL1,2	OL1	FA2	TC1,3	CA2,3
Scenario #3 Retail/Office Mixed-Use	NP3,4	EP1,3	GL1,2	EL1,2	OL1	FA1	TC1,4	CA1

Normal Power:

- NP1 A single 480Y/277 Volt service in the range of 1200 to 2000 Amps could be used for a single tenant feed to the building. One PG&E revenue meter would be provided which would keep track of all electrical energy use. If it is desired to have the ability to track separate “house” electrical use, then a multi-meter service switchboard would need to be provided.
- NP2 Separate services for the retail and residential components would be provided. The retail service would be a multi-meter 480Y/277 Volt service in the range of 800 to 1200 Amps. The residential service would be a multi-meter 208Y/120 Volt service in the range of 1200 to 2000 Amps.
- NP3 A single 480Y/277 Volt service in the range of 1200 to 2000 Amps could be used. A multi-metered service switchboard could be used with a mix of 800A, 400A, 200 A, and 100A meters. If separate PG&E metering is desired for each of the office tenants, then all metering must take place at the main service meter room and individual feeders will need to be run to each (potential) tenant space.
- NP4 Provide new power distribution panels, feeder, transformers, and branch circuit panelboards throughout the building.

Emergency Power:

- EP1 The existing emergency power system is defunct and will be removed. The need for a replacement emergency power system will be contingent upon local interpretation of the fire and building codes.
- EP2 The existing fire hose/domestic booster pump system and elevators will need to be re-evaluated to determine whether they need to be powered from a code compliant emergency power or legally required standby power system.

- EP3 The need for a new emergency power system will be based upon a number of considerations:
- Ultimate height of the building
 - Revised elevator configuration (may be equipped with rescuator)
 - Revised fire pump configuration (may be diesel-engine driven)
 - The need for smoke control systems
 - Other life-safety considerations.

General Lighting:

- GL1 General lighting throughout the core areas of the building should be replaced with modern energy-efficient lighting fixtures that meet current Title-24 Building Energy Efficiency Standards. This would generally consist of new commercial fluorescent fixtures with T-8 or T-5 lamps and electronic ballasts.
- GL2 Lighting in the tenant occupied portions of the building could be included as part of each tenant improvement project. We suggest the conversion to a minimal lighting to allow the space to be accessed and inspected.
- GL3 Lighting in the residential portion of the project will need to be provided in both the dwelling units and common areas. Lighting in these areas will need to meet Title-24 Residential and Non-Residential Standards respectively.

Emergency and Exit Lighting:

- EL1 If an emergency power system for the building is to be re-established, then a portion of the general lighting can serve as the required emergency egress lighting by connecting them to the emergency power system. Illuminated exit signs should also be connected to the emergency power system.
- EL2 In the absence of new emergency power system, emergency egress lighting should be provided in stairwells, corridors, lobbies, and other common areas in accordance with local building and fire codes. Emergency lights would be self-contained, battery backed units with 90-minute backup. Illuminated exit signs should use new LED battery backed units with 90-minute backup.

Outside Lighting:

- OL1 We recommend the replacement of all exterior lighting to meet the desired architectural aesthetics of the project, IES recommendations, and current Title-24 Energy Efficiency Standards for exterior lighting. The total wattage of installed exterior lighting and type of fixtures used will need to meet the mandatory and prescriptive requirements of Title-24.

Fire Alarm:

- FA1 Replace the existing fire alarm system with a new modern addressable fire alarm system with 24 or 72 hour battery backup as mandated by the local fire authority. The system may consist of sprinkler monitoring only, manual initiation devices, or a fully automatic system with smoke/heat detectors throughout the building. The local fire authority will need to be consulted for system requirements based upon the actual tenant use and building occupancy.
- FA2 Inclusion of residential component will dictate the provision of a new modern addressable fire alarm system with automatic detection throughout the common areas of

the building. The system will likely consist of fire sprinkler monitoring, smoke/heat detectors throughout the building, duct smoke detectors, elevator smoke detection and recall system tie-in and audible/visible notification devices (horn/strobes) in common areas. Dwelling units will need to be provided with stand-alone individual smoke alarms as well as horn/strobe units connected to the building system for general evacuation.

Telecom:

- TC1 Establish a dedicated room for a new telecommunications Minimum Point of Entry (MPOE) and main distribution backboards. A new service consisting of two to four 4” conduits will be provided from the existing AT&T underground infrastructure to the new main telecom room.
- TC2 Telecom infrastructure within the building for a single user tenant would be provided by the tenant.
- TC3 Telecom infrastructure for the retail component of the project would consist of empty conduits stubbed from the MPOE to each prospective lease space at each floor. Telecom infrastructure within the building for the residential component would need to consist of dedicated copper backbone cabling to each residential dwelling unit. Intermediate telecom distribution rooms may be provided at one or more of the upper floors.
- TC4 Telecom infrastructure for both retail and office components of the project would consist of empty conduits stubbed from the MPOE to each prospective lease space at each floor. Intermediate telecom distribution rooms may be provided at one or more of the upper floors. Distribution between floors may consist of either shared backbone cable infrastructure or a system of multiple vertical conduits to be made available to each tenant.

CATV:

- CA1 Under this scenario it is not anticipated that CATV service would need to be extended to or distributed throughout the building.
- CA2 Current Comcast franchise agreements will dictate the extent of upgrades to the local infrastructure that will need to be incorporated. This may involve provisions for extending underground conduits from the street to the new main telecom distribution room. Empty conduits only can be provided to selected retail tenants.
- CA3 CATV backbone cabling and horizontal service cabling to each residential dwelling unit may be arranged with Comcast on a “pre-wire” basis.