



February 6, 2013

## **Corbett School District Electrical Assessment**

### **High School Building**

#### **Power Distribution**

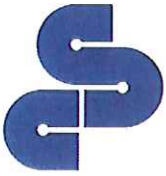
The High School Building is fed underground from a padmount transformer located to the NW of the building. The Main Distribution Panel was installed in 1977, manufactured by ITE and is rated at 1200A, 208Y/120V, 3Ph, 4W. There is one 400A space and is in acceptable condition. The 12 month high demand on the system was recorded in September at 96.0kw, or 266A, thus indicating ample capacity for allowing future flexibility. We recommend maintaining existing distribution equipment and servicing by retightening cable lugs.

There is a 200A-3P emergency disconnect and 125A-3P Automatic Transfer Switch feeding emergency panel 'E1' which in turn serves emergency lighting, fire alarm panel and various mechanical and telephone equipment. This standby/emergency system does not comply with current codes requiring separate systems for standby loads (such as mechanical systems) and emergency loads (such as lighting and life safety). The generator is located in the Middle School Basement, refer to the Middle School section in this report for assessment of generator. We recommend replacement of this emergency system to comply with current code requirements.

There are two 400A branch circuit panelboards located in the Electrical Room in acceptable condition and containing 10-20% spare mounting capacity for additional circuit breakers. There is one 100A panel located in a classroom and one 200A panel located in a work area, both in acceptable condition and containing 15-30% spare capacity. We recommend maintaining existing branch panelboards.

#### **Lighting**

Lighting predominantly consists of linear fluorescent fixtures with T8 lampholding and magnetic ballasts and incandescent recessed can lights with screw-in fluorescent lamps. Magnetic ballasts of this era typically may contain PCB's and should be considered for replacement. Linear fluorescent lensed troffers are located throughout hallways and classrooms and are generally in poor condition with broken and missing lenses. The incandescent recessed canlights located in the hallways have several broken lenses and are in poor condition as well. Some linear fluorescent pendant fixtures in the commons



area are in fair condition. It is unlikely the existing lighting system complies with current emergency egress lighting requirements. We recommend replacement of entire emergency egress lighting system in this building.

There currently are no automatic lighting controls, such as occupancy sensors or timer based controls, which current energy code requires. We recommend provision of said controls to meet current code requirements and provide significant energy savings.

### **Middle School Building**

#### **Power Distribution**

The Middle School Building is fed with two overhead services of 120/240V, 1PH from pole at NW of building. Two services of the same electrical characteristics does not comply with current code requirements. One service consists of 400A, 120/240V, 1PH, 3W panel located in basement, fed from a main switch in the basement Electrical Room. The other service panel located adjacent to this main switch is not labeled and thus of unknown capacity, but assumed to be 400-600A. The first service panel is newer, manufactured by Siemens, and feeds two 200A and three 100A branch circuit panelboards and appears in adequate condition. The second service panel is antiquated and serves (5)-100A-2P loads. The transformers and meter is shared with the Multi-Purpose Building, the 12 month peak demand on this meter was recorded in June at 85kw.

There are three branch panelboards located in the basement, one in poor condition and the other two in fair condition, but all dated. There are four branch panels located on the main floor, all antiquated and in poor condition. There is one newer branch panel on the main floor in good condition.

The existing system is poorly labeled; the antiquated service equipment and panelboards will be problematic for future maintenance due to unavailability of replacement parts and lack of mounting space for any additional loads required. We recommend replacement of existing distribution equipment and branch panelboards in their entirety, consolidating all service equipment to one location and eliminating the multiple service code violation as well as updating all branch panelboards.

There is a 35kw generator located in the basement which serves this building as well as the High School Building. The generator serves exit lighting as well as some non-emergency loads. The generator has not worked in several years and poses a significant liability as well as current code violations. We recommend replacement of generator and provision of a new system including disconnects, transfer switches and



panelboards for both standby and emergency systems within each building to comply with current code requirements.

## **Lighting**

Lighting predominantly consists of linear fluorescent fixtures with wraparound lenses, T8 lamping and magnetic ballasts. These fixtures are in very poor condition with several broken lenses. Magnetic ballasts of this era typically may contain PCB's. We recommend replacement of entire lighting system in this building.

It is unlikely the existing lighting system complies with current emergency egress lighting requirements. We recommend replacement of entire emergency egress lighting system in this building.

There currently are no automatic lighting controls, such as occupancy sensors or timer based controls, which current energy code requires. We recommend provision of said controls to meet current code requirements and provide significant energy savings.

## **Multi-Purpose Building**

### **Power Distribution**

The Multi-Purpose Building is fed underground from pole mounted transformers located to the NW of the Middle School Building and shares the meter and transformers with the Middle School. The Main Distribution Panel was installed in 1970 and is in fair condition. It is manufactured by Circle AW and is rated at 600A, 120/240V, 3Ph, 4W Delta system. There are two 400A, one 200A and one 100A switches in this gear serving panelboards and equipment, as well as two exterior switches serving an emergency panel and fire alarm panel. One 100A switch appears to be a spare. The 12 month peak demand on the shared meter was recorded in June at 85kw.

An emergency panel 'E' is fed from the MDP, not an emergency source which does not meet current code requirements. We recommend feeding this panel from a new emergency generator, or providing adequate battery backup for emergency egress and exit lighting.

There is one 400A and one 200A, 120/240V, 3Ph, 4W branch panelboard and one 250A, 208V, 1Ph, 3W branch panelboard with 5-10% additional mounting capacity. These panels were installed in 1970 and are in fair condition.

Although the service distribution equipment and branch circuit panelboards are in fair condition, with any major upgrade of the building, we recommend replacement of the



system in it's entirety to a 208Y/120V, 3Ph, 4W system, eliminating the outdated existing 240V Delta system and allowing for greater future capacity and flexibility. Although it should be verified that there are no large motor loads that require the 240V system prior to any changeover.

### **Lighting**

Lighting in the Cafeteria consists of open industrial linear fluorescent fixtures. Lighting in the Kitchen Dry Storage consists of open strip fluorescent fixtures. Kitchen food prep lighting consists predominantly of linear fluorescent recessed lensed troffers, but there are a few fluorescent parabolic troffers directly above the student serving area. The lamps on these fixtures should have protective sleeves installed over them to meet health code requirements but we recommend fully lensed fixtures in any food storage, prep or serving areas for cleanliness and food safety. All the fluorescent fixtures utilize T8 lamping and magnetic ballasts. Magnetic ballasts of this era typically may contain PCB's. We recommend replacement of entire lighting system in this building.

Egress lighting consists of bug-eye type emergency lights. It is unlikely the existing system complies with current emergency egress lighting requirements. We recommend replacement of entire emergency egress lighting system in this building.

There currently are no automatic lighting controls, such as occupancy sensors or timer based controls, which current energy code requires. We recommend provision of said controls to meet current code requirements and provide significant energy savings.

### **Gymnasium Building**

#### **Power Distribution**

The Gymnasium Building is fed overhead from a power pole at NE of building. The Main Distribution Panel was installed in 1970, manufactured by Circle AW and is rated at 1000A, 240/120V, 3Ph, 4W SN Delta. There is one 200A switch serving branch panel 'D' and one 600A switch serving a sub distribution panel 'D1', both located in the basement boiler room adjacent to the boy's locker room. These two panels serve the locker room as well as feeding four other branch panels serving the secondary Gymnasium and Wrestling Room. There is one 400A switch in the Main Distribution Panel feeding an older distribution panel. This sub-distribution panel serves mechanical equipment and two branch panelboards. There appears to be at least one spare 100A switch in the Main Distribution Panel.

The sub distribution panel and branch panelboards are antiquated and have no capacity for future mounting space. Although the Main Distribution Panel is in fair condition, we



recommend replacement of the system in its entirety to a 208Y/120V, 3Ph, 4W system, eliminating the outdated existing 240V Delta system, and allowing for greater future capacity and flexibility. Although it should be verified that there are no large motor loads that require the 240V system prior to any changeover.

An emergency panel 'E' is fed from the MDP, not an emergency source which does not meet current code requirements. We recommend feeding this panel from a new emergency generator, or providing adequate battery backup for emergency egress and exit lighting.

### **Lighting**

The lighting in the Gymnasium consists of high-bay HID luminaires that provide adequate lighting levels, but are not currently legal in an education facility and provide a liability to the school district. The halls contain linear fluorescent fixtures with wraparound lenses and incandescent can lights. Several lenses are broken and the fixtures are in poor condition. The classrooms contain pendant linear fluorescents with louvers, the fixtures are outdated and in poor condition.

All the fluorescent fixtures utilize T8 lamping and magnetic ballasts. Magnetic ballasts of this era typically may contain PCB's. We recommend replacement of entire lighting system in this building.

There are rebates available to assist in replacing the existing Gymnasium HID fixtures to new LED luminaires.

Egress lighting consists of bug-eye type emergency lights. It is unlikely the existing system complies with current emergency egress lighting requirements. We recommend replacement of entire emergency egress lighting system in this building.

There currently are no automatic lighting controls, such as occupancy sensors or timer based controls, which current energy code requires. We recommend provision of said controls to meet current code requirements and provide significant energy savings.

### **Secondary Gymnasium and Locker Rooms**

#### **Power Distribution**

There is one 600A Distribution Panel and one 200A branch panel at 240/120V, 3Ph, 4W SN Delta located in the Boiler Room adjacent to the Boys Locker Room fed from the Main Gymnasium Building service panel. The distribution panel feeds two 200A branch



panels serving the Wrestling Room, one 200A panel serving the Secondary Gym and one 200A panel serving the Girls Locker Room.

The distribution equipment and branch panelboards are outdated and should be considered for replacement in their entirety to provide reasonable flexibility and life extension of the facility. Refer also to the recommendations within the Gymnasium Building above.

### **Lighting**

The lighting in the Secondary Gymnasium consists of linear fluorescent open industrial luminaires. The halls contain linear fluorescent fixtures with wraparound lenses and incandescent can lights. Several lenses are broken and the fixtures are in poor condition. The locker rooms contain linear fluorescent watertight fixtures and wraparound fixtures, as well as incandescent vaportight "jelly jar" fixtures. The fixtures are outdated and in poor condition.

All the fluorescent fixtures utilize T8 lamping and magnetic ballasts. Magnetic ballasts of this era typically may contain PCB's. We recommend replacement of entire lighting system in this building.

Egress lighting consists of bug-eye type emergency lights. It is unlikely the existing system complies with current emergency egress lighting requirements. We recommend replacement of entire emergency egress lighting system in this building.

There currently are no automatic lighting controls, such as occupancy sensors or timer based controls, which current energy code requires. We recommend provision of said controls to meet current code requirements and provide significant energy savings.

### **Wrestling Room**

#### **Power Distribution**

There are two 200A branch panels at 240/120V, 1Ph, 3W serving the Wrestling Room, fed from the distribution equipment located in the Basement Boiler Room adjacent to the Boys Locker Room. The panels contain approximately 20% additional circuit capacity, however they are outdated and should be considered for replacement in their entirety to provide reasonable flexibility and life extension of the facility. Refer also to the recommendations within the Gymnasium Building above.

#### **Lighting**



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The lighting in the Wrestling Room consists of linear fluorescent open striplight fixtures in fair condition. The fixtures utilize T8 lampholding and magnetic ballasts. Magnetic ballasts of this era typically may contain PCB's. We recommend replacement of entire lighting system in this building.

Egress lighting consists of bug-eye type emergency lights. It is unlikely the existing system complies with current emergency egress lighting requirements. We recommend replacement of entire emergency egress lighting system in this building.

There currently are no automatic lighting controls, such as occupancy sensors or timer based controls, which current energy code requires. We recommend provision of said controls to meet current code requirements and provide significant energy savings.

**PRELIMINARY CODE REVIEW CHECKLIST:**

Existing Middle School



**February 6, 2013**

Owner: Corbett School District

Address: 35800 East Historic Columbia River Highway  
Corbett, Oregon 97019

Building Area: Main Floor: 15,044 s.f.  
Lower Level: 15,044 s.f.

Governing Codes: 1. Oregon Specialty Structural Code (OSSC)  
2. Oregon Energy Efficiency Specialty Code  
3. American National Standard 2003 (ICC/ANSI A117.1-2003)

Occupancy Groups: Group E, Education

Construction Type: Type VB (non-rated)

Total Occupant Load: 445 Occupants

Fire Protection: **Required;** (OSSC 903.2.3) An automatic sprinkler system is required for group E fire areas greater than 12,000 square feet in area. (OSSC 903.3.1.1) Sprinklers shall be installed throughout in accordance with NFPA 13.

**Middle School does not comply with this standard.**

Fire Alarm System: **Required;** (OSSC 907.2.3) A manual fire alarm system that activates the occupant notification system in accordance with section 907.5 shall be installed in group E occupancies. When automatic sprinkler systems or smoke detectors are

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