Appendix 5.01

PSU WEST CAMPUS INFRASTRUCTURE
ELECTRICAL SYSTEM TESTING 12.47KV

PART 1 - GENERAL

1.1 RELATED SECTIONS AND INFORMATION

A. Electrical Contractor to provide all labor, materials, apparatus, tools, equipment, transportation, and temporary power as required to perform the following items specified.

B. All inspections and tests shall utilize the following references:

1. Schedule tests: Between December 23 through 31 with the exception of December 25. This time period is during a campus-wide closure. All Partial Discharge System installation and building shutdowns must be performed during this time frame, with no exceptions. In order to meet this time frame, work may be required to be performed during off hours and should be priced as such.
2. After installation of the Partial Discharge Sensors between December 23 through 31, any cable testing still remaining must be completed by January 31.
3. Obtain the services of a third party testing agency for on-line 12.47KV cable Partial Discharge testing.
4. Package Block One - Appendix A
5. Package Block Two – Appendix B
6. Package Block Three – Appendix C
7. Additional Information – Appendix D

1.2 GENERAL SCOPE OF WORK

A. The Electrical Contractor, hereafter referred to as Contractor, shall engage and pay for the services of a recognized independent testing firm for the purpose of performing Medium Voltage cable inspections and tests for cables as herein specified.

1. Provide backup power equipment, cables and labor to electrical equipment indicated to test cables.
2. Prepare 12.47KV gear in preparation for Testing Procedures and Testing Schedules including removal of all enclosure covers and opening of enclosure doors as may be necessary and installing the permanent Partial Discharge Sensors with docking station accessible without opening electrical gear.
3. Exercise all Metal Enclosed - Medium Voltage Switches (12.47KV).
4. Inspect and Test 12.47KV Voltage Cables.
5. Exercise the 12.47KV Automatic Transfer Switches.
6. Determine the length of 12.47KV cables if not indicated on the One-Line drawings. Verify one-line diagram and document any discrepancies as required.
7. Prepare and submit reports of all testing and inspection findings.
8. Coordinate with the Owner for appropriate signage for duration of construction. Coordinate with Owner, communication to campus community before, during and after electrical building shutdowns. Provide photographs and videotape of the inside of all electrical equipment when Partial Discharge sensor systems are installed..
9. Provide the following information on the One-Line Diagrams for all feeders identified under this scope: copper or aluminum, insulation type, number of conductors and whether there is a ground and, if so, what size, and conduit/raceway information.

B. The testing firm shall provide all testing material, equipment, labor, and technical supervision to perform such tests and inspections. The testing firm shall provide all their personnel protection as required to perform such tests and inspections.

C. The testing service firm to provide pricing for material and installation of permanent Partial Discharge Sensors set on each end of the cables to be tested.

D. The contractor is to coordinate testing with the intent to limit the amount of building electrical outages to an absolute minimum. Contractor to staff, stage and sequence testing accordingly.

1.3 JOB CONDITIONS

A. Examination of Site: The Contractor shall visit the site and thoroughly review the locale, working conditions, conflicting utilities, the conditions in which the electrical testing work will take place, and verify all existing conditions in the field. No allowances will be made subsequently for any costs which may be incurred because of any error or omission due to failure to examine the site. Contractor shall make all arrangements for site and weather conditions that may impact his work and account for such in bid.

B. Supervision: The Contractor shall personally, or through an authorized and competent representative, constantly supervise the work from beginning to completion and, within reason, keep the same foreman and workmen on the project throughout

the project duration. The Contractor shall provide sufficient manpower to accomplish the testing within the stated schedule.

C. Safety Plan: The contractor is to provide a project specific safety plan. This plan is to be approved by the Owner prior to the beginning of work. This plan must be posted on the job site.

D. Critical buildings contain critical research activities and/or programming activities where power is a necessity. The maximum time for these buildings to be without power is 60 minutes. The non-critical buildings maximum time without power shall be 120 minutes maximum.

1.4 FIELD TESTING AND OPERATIONAL CHECK

A. General Scope:
   1. Testing Agency to perform field 12.47KV on-line cable testing and report findings.
   2. The cable tests and operational check shall determine the suitability for continuous service.
   3. Identify cable manufacturer, type, insulation rating, and cable length.
   4. Reports:
      a. Report immediately upon the discovery of any obvious defective, dangerous, or unreliable electrical distribution system equipment.
      b. Prepare written reports of test results and observations
      c. Include complete records of repairs and adjustments.
   5. Labeling: Upon satisfactory completion of tests and related effort, apply a label to tested components indicating test results, date, and responsible person and organization.

1.5 QUALITY ASSURANCE

A. Reference to codes, standards of practice specifications, and recommendations of technical societies, trade organizations and governmental agencies shall mean the latest edition of such publications adopted and published prior to submittal of the bid. Such codes or standards shall be considered a part of this specification as though fully repeated herein.

B. Work shall be performed in accordance with all applicable requirements of the latest edition of all governing codes, rules and regulations including, but not limited to, the following minimum standards, whether statutory or not:
   1. National Electrical Code - NEC
   2. National Electrical Manufacturer's Association - NEMA
   3. American Society for Testing and Materials - ASTM
   4. International Electrical Testing Association - NETA
   5. Insulated Cable Engineers Association - ICEA
   6. National Fire Protection Association - NFPA
   7. American National Standards Institute - ANSI
      a. ANSI C2: National Electrical Safety Code
      b. ANSI Z244-1: American National Standard for Personnel Protection
   8. Institute of Electrical and Electronic Engineers
      a. IEEE Standard 400, IEEE Guide for Field Testing and Evaluation of the Insulation of Shielded Power Cable
      b. IEEE Standard 400.3, IEEE Guide for Partial Discharge Testing of Shielded Power Cable

1.6 QUALIFICATIONS OF TESTING AGENCY

A. The testing firm shall be an independent testing organization which can function as an unbiased testing authority, professionally independent of the manufacturers, suppliers, and installers of equipment or systems evaluated by the testing firm.

B. The testing firm shall be regularly engaged in the testing of electrical equipment devices, installations, and systems.

C. The testing firm shall have been engaged in such practices for a minimum of three years.

D. The testing personnel shall be specially trained, certified, and experienced. The lead onsite technical person shall be currently certified by the International Electrical Testing Association (NETA) in Electrical Power Distribution System Testing.

E. The testing firm shall utilize only full-time technicians who are regularly employed by the firm for testing services. Electrically unskilled employees are not permitted to perform testing or assistance of any kind. Electricians and/or linemen may assist, but may not perform testing.

F. The testing firm shall submit proof of the above qualifications with bid documents when requested.

G. All instruments used by the testing firm to evaluate electrical performance shall meet NETA's Specifications for Test Instruments.

H. The terms used here within such as Test Agency, Test Contractor, or Contractor Test Company, shall be construed to mean testing firm.

I. Each on-site crew leader shall hold a current registered certification in electrical testing applicable to each type of apparatus to be inspected or tested. The certification in electrical testing shall be issued by an independent, nationally-recognized, technician certification agency. The following entities shall qualify as independent, nationally-recognized, technician certification agencies:
   1. International Electrical Testing Association (NETA) accepted certifications:
      a. Certified Technician/Level III
      b. Certified Senior Technician/Level IV
   2. National Institute of Certification in Engineering Technologies (NICET) accepted certifications specifically in Electrical Testing Engineering Technology:
      a. Engineering Technician/Level III
      b. Senior Engineering Technician/Level IV

1.7 DIVISION OF RESPONSIBILITY

A. The electrical contractor shall supply a suitable and stable source of electrical power to each test site including temporary lighting. (The testing firm shall specify the specific power requirements.)
B. The electrical contractor shall perform all switching operations as necessary for testing.
C. The electrical contractor shall remove all enclosure covers and open enclosure doors as may be necessary to provide access for the electrical testing firm to conduct testing of equipment.
D. The electrical contractor shall notify the testing firm when equipment becomes available for acceptance tests. Work shall be coordinated to meet the contract schedule.
E. The testing firm shall provide and install the permanent Partial Discharge Sensors and docking set on each end of the cables prior to commencement of any testing. Connections to sensors shall be installed outside of cabinets so that future testing can be done without opening electrical cabinets.
F. The testing firm and Contractor shall notify PSU prior to commencement of any testing.
G. Any system, material, or workmanship which is found defective on the basis of acceptance tests shall be reported.
H. The testing firm shall maintain a written record of all tests and upon completion of project, assemble and certify a final test report. Refer to Part 3 for further information on test reports.

1.8 SAFETY AND PRECAUTIONS

A. This document does not include any procedures, including specific safety procedures. It is recognized that an overwhelming majority of the tests and inspections recommended in these specifications are potentially hazardous. Inherent in this determination is the prerequisite that individuals performing these tests be capable of conducting the tests in a safe manner and with complete knowledge of the hazards involved.
B. Safety practices shall include, but are not limited to, the following requirements:
   1. Occupational Safety and Health Act.
   2. Accident Prevention Manual for Industrial Operations, National Safety Council.
   3. Applicable State and Local safety operating procedures.
   4. NETA Safety/Accident Prevention Program.
   5. Owner's safety practices
   6. IEEE Standard 400, IEEE Guide for Field Testing and Evaluation of the insulation of Shielded Power Cable.
   7. IEEE Standard 400.3, IEEE Guide for Partial Discharge Testing of Shielded Power Cable.
   8. ANSI/NFPA 70E, Electrical Safety Requirements for Employee Workplaces.
   9. ANSI Z244.1 American National Standards for Personnel Protection.
C. The Contractor shall have a designated safety representative on the project to supervise operations with respect to safety.

1.9 POWER SYSTEM REPORTS

A. General:
   1. Reports shall include all portions of electrical distribution system from the Portland General Electric primary switchgear to the PSU medium voltage switchboards and automatic transfer switches.
B. Equipment Evaluation:
   1. An equipment evaluation study shall be performed to determine the adequacy of 12.47KV cables, transfer switches, and fused switches. Any problem areas or inadequacies in the equipment shall be promptly brought to the PSU's attention as soon as they are identified.
   2. Quality Assurance
      a. The Testing Firm shall provide the necessary material, equipment, labor, and technical supervision to perform the work described herein.

b. The Testing Firm shall submit appropriate documentation to demonstrate that it satisfactorily complies with the following. An organization having a "Full Membership" classification issued by the Inter-National Electrical Testing Association shall be deemed as meeting this criteria.
   1) The Testing Firm shall be an independent third party testing organization which can function as an unbiased testing authority, professionally independent of the manufacturers, suppliers, and installers of equipment or systems evaluated by the testing organization.
   2) The Testing Firm shall be regularly engaged in the testing and assessment of electrical systems, including the evaluation of protective device coordination, arc-flash evaluations, adjustment of protective device settings, and performance testing of such devices.

c. The Testing Firm shall utilize engineers and technicians that are experienced and regularly perform electrical power system testing and analysis.

d. Personnel performing this work shall be trained and experienced concerning the apparatus being evaluated.

3. Safety and Procedural Requirements
   a. This document does not include specific safety procedures. It is recognized that tests and inspections set forth by this RFQ may be potentially hazardous. Consequently, individuals performing these tests must be capable of conducting these tests in a safe manner and with complete knowledge of the hazards involved. Each person involved in this project must be provided with and use appropriate PPE.

4. Test Instruments
   a. All test equipment shall be in good mechanical and electrical condition.
   b. The Testing Firm shall have a calibration program that assures that all applicable test instruments are maintained within rated accuracy.
   c. The accuracy shall be directly traceable to the National Institute of Standards and Technology (NIST).
   d. Instruments shall be calibrated in accordance with the following frequency schedule:
      1) Field instruments: Analog, 6 months maximum; Digital, 12 months maximum
      2) Laboratory instruments: 12 months
      3) Leased specialty equipment: 12 months where the lessor guarantees accuracy
   e. Dated calibration labels shall be visible on all test equipment or calibration certification shall be included in the project report discussed above.
   f. Records, which show date and results of instruments calibrated or tested, shall be kept up-to-date.
   g. Up-to-date instrument calibration instructions and procedures shall be maintained for each test instrument.
   h. Calibrating standard shall be of higher accuracy than that of the instrument tested.

5. Division of Responsibility
   a. The Contractor will be supplied with the following for the purposes of completing this project:
      1) A One-Line schematic drawing identifying all equipment to be evaluated.
      2) Any safety policy required information describing PPE classes and equipment mandated by PSU.
      3) Security clearance and access to each point where testing and equipment exercising will be made.
      4) At least one full-time and qualified site representative to accompany the Electrical Testing Firm personnel to ensure access and security issues are resolved in a timely manner and to ensure identification and adherence to any facility-specific safety and procedural requirements. The provision of this representative does not relieve the Contractor from providing supervision and safety measures.

C. Study Report:
   1. The results of the power system study shall be summarized in a final report. Four bound copies of the final report shall be submitted to PSU.
   2. The report shall include the following sections:
      a. Description, purpose, basis, and scope of the study; and a single line diagram of the portion of the power system which is included within the scope of study.
      b. Tabulations of circuit cable insulation type per feeder and associated distance, primary fuse type and trip element (if possible) and commentary regarding the adequacy or inadequacy of the medium voltage cables.
      c. A discussion section which evaluates the degree of system protection and service continuity with overcurrent devices, along with recommendations as required for increasing system protection or device coordination.

1.10 METAL ENCLOSED SWITCHGEAR

A. General:
   1. Procedures: Make field inspections and exercise switchgear assemblies for satisfactory operation in accordance with NETA Standard ATS, applicable IEEE standards, manufacturer's recommendations, and these specifications.
   2. Perform and document the following as applicable, on all switchgear:
      a. Visual and Mechanical Inspection:

1) Inspect, for defects and physical damage, testing laboratory labels and nameplate compliance with current single-line diagram. Report any discrepancies.
2) Exercise operable devices and components.
3) Verify that fuse and types correspond to drawings.
4) Test all electrical and mechanical interlock systems for proper operation and sequencing.
   a) Closure attempt shall be made on locked open devices. Opening attempt shall be made on locked closed devices.
   b) Key exchange shall be made with devices operated in off-normal positions.
5) Inspect insulators for evidence of physical damage or contaminated surfaces.
6) Verify proper barrier and shutter installation and operation.

1.11 AUTOMATIC TRANSFER SWITCHES

A. General: Perform and document the following on all ATS's:
   1. Visual and Mechanical Inspection
      a. Compare equipment nameplate data with drawings and specifications.
      b. Inspect physical and mechanical condition.
      c. Perform transfer operation.
   2. Electrical Tests
      a. Perform automatic transfer tests:
         1) Simulate loss of normal power.
         2) Return to normal power.
      b. Verify correct operation and timing of the following functions:
         1) Automatic transfer operation.

1.12 MEDIUM VOLTAGE CABLES

A. General: Perform and document the following tests on all medium voltage cables:
   1. Visual and Mechanical Inspection
      a. Document existing cable data.
      b. Inspect exposed sections of cables for physical damage.
         1) Perform Partial Discharge testing of cable method.
      c. Inspect for shield grounding, cable support, and termination.
      d. Inspect for correct identification and arrangements.

B. Electrical Tests
   1. Perform a shield-continuity test on each power cable by ohmmeter method.
   2. Perform a Partial Discharge test utilizing existing voltage. Individually test each conductor with all other conductors and shields grounded.
   3. Perform an on-line Partial Discharge test on all cables. Adhere to all precautions and limits as specified in the applicable NEMA/ICEA Standard for the specific cable. Perform tests in accordance with ANSI/IEEE Standard 400, IEE Standard 400.3. Test procedure shall be as follows, and the results for each cable test shall be recorded as specified herein. Test voltages shall not exceed rated voltage of cable.
      a. Insure that the input voltage to the test set is regulated.
      b. Current-sensing circuits in test equipment shall measure only the leakage current associated with the cable under test and shall not include internal leakage of the test equipment.
   4. If any primary cable fails, or tests, in the opinion of the testing agency, show unacceptable cable defects, PSU to be notified immediately.
   5. Report all unacceptable cables to PSU.

PART 2 - PRODUCTS

2.1 POWER SYSTEM TESTING FIRMS

A. The following firms are acceptable for the testing portion of this specification:
   1. Electrical Reliability Service (Mr. Larry Newby, 4099 SE International Way, Suite 201, Milwaukie, OR 97222), Western Electric Services, Inc (Mr. Joshua Garner, 14311 29th St. East, Sumner, WA 98390), or approved equal.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

A. General: Perform tests in presence of the Owner's representative and furnish test equipment, facilities, and technical personnel required to perform tests. Tests shall be conducted during the construction period and at completion to determine conformity with applicable codes and with the related Specifications.

B. Testing Failures: Any system material which is found defective on the basis of performance tests shall be reported directly to the PSU. Any installation or product or workmanship which fail during the tests or are ruled unsatisfactory as a result of this testing shall be replaced, repaired or corrected as prescribed by the PSU's representative. Tests shall be performed again after repairs, replacements or corrections are completed until satisfactory performance is demonstrated, without additional cost to PSU.

C. All devices and materials to perform the inspection and maintenance must be obtained prior to commencing the work.

D. All instruments required must be available and in proper operating condition.

E. All disposable materials such as solvents, rags, and brushes required must be provided.

F. All equipment handling devices such as cranes, vehicles, chain falls, and other lifting equipment must be available or scheduled.

3.2 TEST INSTRUMENT CALIBRATION

A. The testing firm shall have a calibration program which complies with Section 1.9.B.4 above.

3.3 TEST REPORTS

A. General: Submit an electronic file and four typed copies of the completed test reports on 8- 1/2" x 11" paper in neatly bound folders to PSU no later than 10 working days after completion of test unless directed otherwise. The test reports shall be bound and its contents certified.

B. Equipment Test Reports: Provide a complete report listing every device, the date it was tested, the procedures performed, the results, and the date retested (if failure occurred during the previous test). The test report shall indicate that every device tested successfully.

C. Test Report shall also include the following:

1. Summary of project.
2. Date testing was performed.
3. Description of equipment tested.
4. Description of test.
5. Test results.
6. Conclusions and recommendations.
7. Appendix, including appropriate test forms.
8. Identification of test equipment used and their calibration date.
9. Signature of responsible test organization authority.

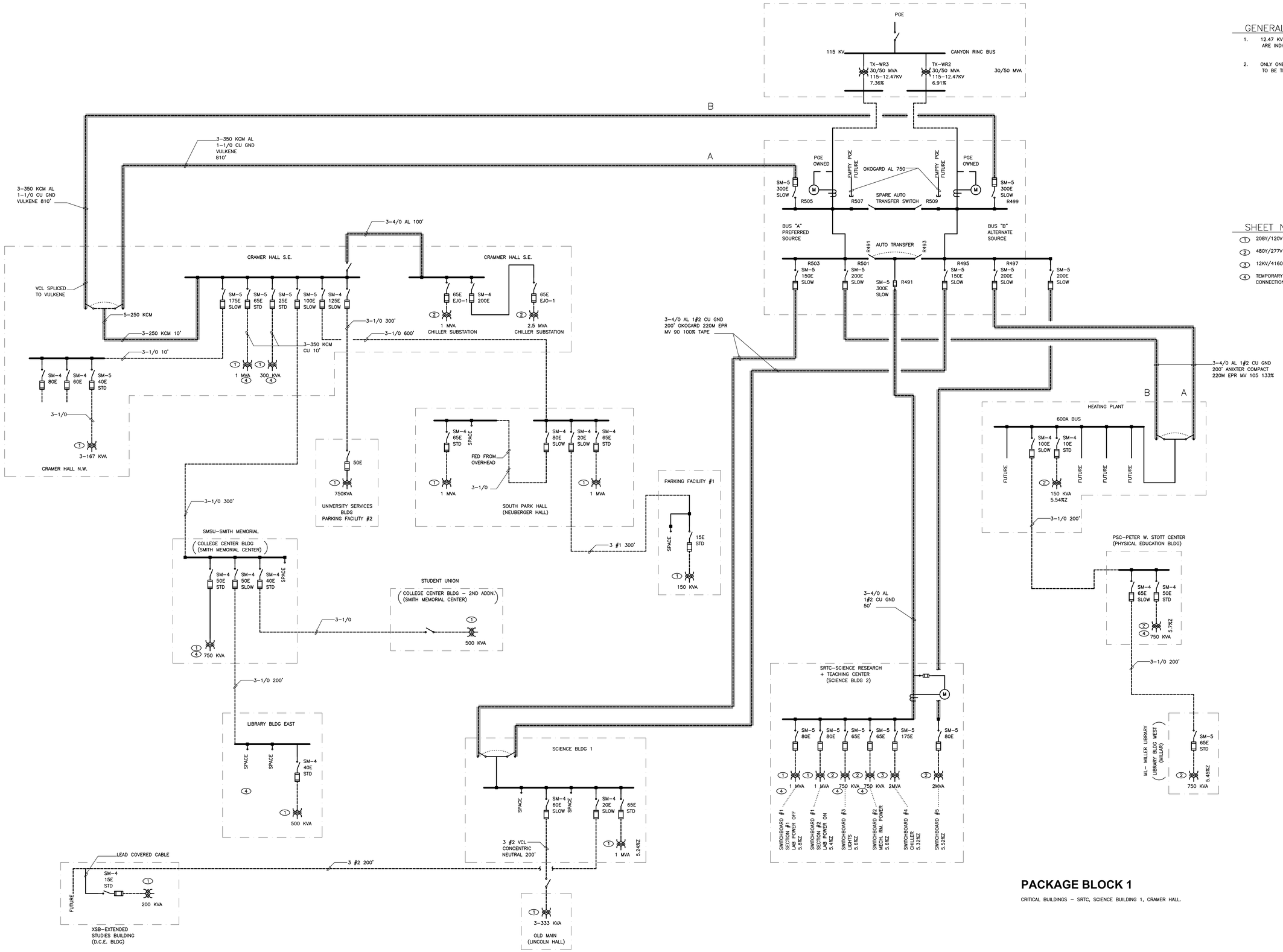
END OF SECTION

Package Block One (Base Bid) Appendix A

Portland State University West Campus 12.47KV Single Line Drawing

Critical Buildings: SRTC, Science Building 1, and Cramer Hall

Non-Critical Buildings: Heating Plant



GENERAL NOTES

1. 12.47 KV CABLE TO BE TESTED ARE INDICATED BY [redacted].
2. ONLY ONE SECTION OF CAMPAS TO BE TESTED AT A TIME.

SHEET NOTES (XX)

1. 208Y/120V
2. 480Y/277V
3. 12KV/4160 DELTA
4. TEMPORARY GENERATOR CONNECTION LOCATION

PACKAGE BLOCK 1

CRITICAL BUILDINGS – SRTC, SCIENCE BUILDING 1, CRAMER HALL.

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Title:

Project:

Revisions:

Drawing No.:

Scale:

Date:

Package Block One (Base Bid) Appendix A

Package Block One Buildings include: SRTC, West Heating Plant, Science Building One and Cramer Hall.

Coordinate with the Owner for appropriate signage for duration of construction. Coordinate with Owner, communication to campus community before, during and after electrical building shutdowns.

Provide photographs and videotape of the inside of all electrical equipment when Partial Discharge sensor systems are installed..

Provide the following information on the One-Line Diagrams for all feeders identified under this scope: copper or aluminum, insulation type, number of conductors and whether there is a ground and, if so, what size, and conduit/raceway information.

Critical Buildings: SRTC, Science Building 1 and Cramer Hall.
Temporary generators are to be staged prior to the start of work for the associated critical buildings with cables run to connection points and tested prior to starting testing.

In the event of a failure resulting in a prolonged power outage, the final emergency generator connections would be performed on a time and material basis and would be a change order to the contract. This scenario is for information only and should not be included in this bid.

1. Science Building One – Switchboard (1 MV Transformer).
   a. Verify existing phase rotation at connection point.
   b. Position temporary 500 KW, 208/120 Volt, 3 phase, 4 wire with ground generator, per attached drawings, and run 300 feet of conductors to connection point.
   c. Test temporary generator and verify phase rotation at cable connection point.
   d. Open the 12.47KV alternate feeder to Science Building 1 transfer switch.
   e. Install permanent Partial Discharge sensors system for cable.
   f. Collect cable information.
   g. Close the 12.47KV alternate feeder to Science Building 1 transfer switch.
   h. Open the 12.47KV preferred feeder to Science Building 1 transfer switch.
   i. Install permanent Partial Discharge sensors system for cable.
   j. Collect cable information.
   k. Close the 12.47KV preferred feeder to Science Building 1 transfer switch.

   In the event of a prolonged power outage:
   l. Isolate transformer switchboard and branch circuit breaker feeders.
   m. Open feeders to Lincoln Hall and XSB buildings.
   n. Connect temporary generator.
   o. Verify phase rotation and voltage match existing.
   p. When work is completed remove temporary generator and return to normal operation.

2.A SRTC Science Building 2 – Switchboard 1 sections 1 & 2 (1 MV Transformer).
   a. Verify existing phase rotation at connection point.
   b. Position temporary 500 KW, 208/120 Volt, 3 phase, 4 wire with ground generator, per attached drawings, and run 310 feet of conductors to connection point.
   c. Test temporary generator and verify phase rotation at cable connection point.
   d. Open the 12.47KV feeder to Science Building 2.
   e. Install permanent Partial Discharge sensors system for cable.
   f. Collect cable information.
   g. Close the 12.47KV feeder to Science Building 2.

   In the event of a prolonged power outage:
   h. Isolate transformer Switchboard sections 1 & 2 and branch circuit breaker feeders.
   i. Connect temporary generator.
   j. Verify phase rotation and voltage match existing.
   k. When work is completed remove temporary generator and return to normal operation.

2.B SRTC Science Building 2 – Switchboard 2 (750 KVA Transformer - Mechanical).
- a. Verify existing phase rotation at connection point.
- b. Position temporary 500 KW, 480/277 Volt, 3 phase, 4 wire with ground generator, per attached drawings, and run 300 feet of conductors to connection point.
- c. Test temporary generator and verify phase rotation at cable connection point.

In the event of a prolonged power outage:
- d. Isolate transformer Switchboard 2 and branch circuit breaker feeders.
- e. Connect temporary generator.
- f. Verify phase rotation and voltage match existing.
- g. When work is completed remove temporary generator and return to normal operation.

2.C SRTC Science Building 2 – Switchboard 3 (750KW Transformer - Lighting).
- a. Verify existing phase rotation at connection point.
- b. Position temporary 500 KW, 480/277 Volt, 3 phase, 4 wire with ground generator, per attached drawings, and run 300 feet of conductors to connection point.
- c. Test temporary generator and verify phase rotation at cable connection point.

In the event of a prolonged power outage:
- d. Isolate transformer Switchboard 3 and branch circuit breaker feeders.
- e. Connect temporary generator.
- f. Verify phase rotation and voltage match existing.
- g. When work is completed remove temporary generator and return to normal operation.

3.A Cramer Hall SE – Panelboard - Main Distribution S.W. (Telecom).
- a. Verify existing phase rotation at connection point.
- b. Position temporary 250 KW, 208/120Volt, 3 phase, 4 wire with ground generator, per attached drawings, and run 250 feet of conductors to connection point.
- c. Test temporary generator and verify phase rotation at cable connection point.
- d. Isolate Main Distribution S.W. panel and open bus feeder.
- e. Connect temporary generator,.
- f. Verify phase rotation and voltage match existing.
- g. When work is completed in Cramer Hall, remove temporary generator and return to normal operation.

3.B Open the 12.47KV alternate feeder to Cramer Hall transfer switch.
- a. Install permanent Partial Discharge sensors system for cable.
- b. Collect cable information.
- c. Close the 12.47KV alternate feeder to Cramer Hall transfer switch.
- d. Open the 12.47KV preferred feeder to Cramer Hall transfer switch.
- e. Install permanent Partial Discharge sensors system for cable.
- f. Collect cable information.
- g. Close the 12.47KV preferred feeder to Cramer Hall transfer switch.

3.C Open the 12.47KV feeder from ATS to Cramer Hall Bus.
- a. Install permanent PD sensors system for cable.
- b. Collect cable information.
- c. Close the 12.47KV feeder from ATS to Cramer Hall Bus.

3.D Open the 12.47KV feeder from to Cramer Hall Bus to Chiller Bus.
- a. Install permanent Partial Discharge sensors system for cable.
- b. Collect cable information.
- c. Open the 12.47KV feeder from to Cramer Hall Bus to Chiller Bus.

In the event of a prolonged power outage.
- d. Cramer Hall SE – MCC4A (Boilers).
  1. Verify existing phase rotation at connection point.
  2. Position temporary 400 KW, 480/277 Volt, 3 phase, 4 wire with ground generator, per attached drawings, and run 450 feet of conductors to connection point.
  3. Test temporary generator and verify phase rotation at cable connection point.

4. Isolate panel and branch circuit breaker feeders.
5. Connect temporary generator.
6. Verify phase rotation and voltage match existing.
7. When work is completed in Cramer Hall, remove temporary generator and return to normal operation.

Non-Critical Building: West Heating Plant
Temporary generators are to be staged prior to the start of work for the associated non-critical buildings.

In the event of a failure resulting in a prolonged power outage, the generator cables would need to be run per the attached drawings and final emergency generator connections would be performed on a time and material basis and would be a change order to the contract. This scenario is for information only and should not be included in this bid.

1. West Heating Plant
   a. Verify existing phase rotation at connection point.
   b. Position temporary generator per attached drawings. Cable is not to be run unless required.

Package Block One Sequence of Testing

Partial Discharge Sensors to be installed in the following order:

1) SRTC - Science Building Two Switchboard #5

2) Heating Plant - ATS Feeder B

3) Heating Plant - ATS Feeder A

4) Science Building One - ATS Feeder B

5) Science Building One - ATS Feeder A

6) Cramer Hall - ATS Feeder B

7) Cramer Hall - ATS Feeder A

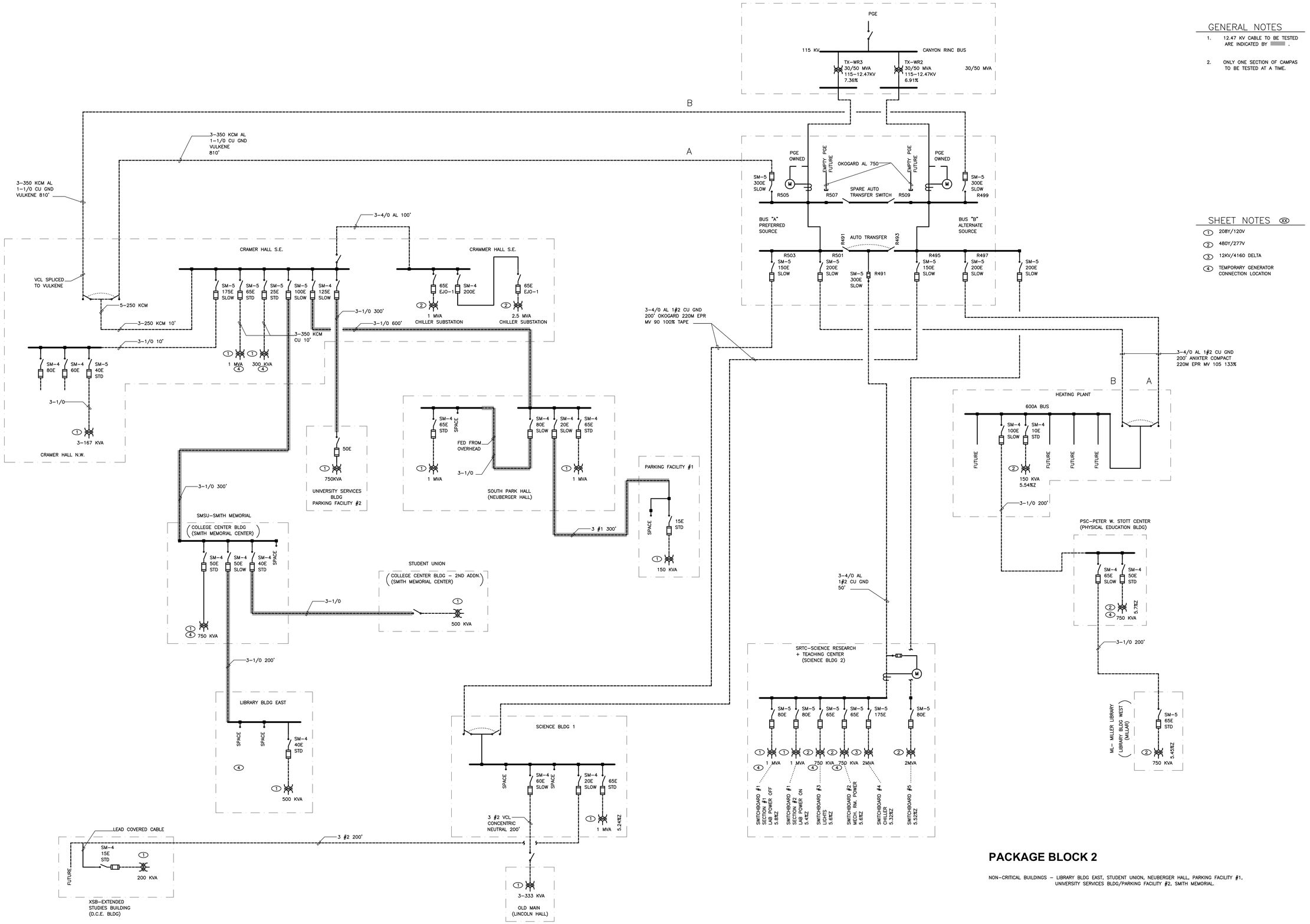
8) Cramer Hall - ATS to Main Bus

9) Cramer Hall - Main Bus to Chiller Bus

Package Block Two (Additive Bid Alternate #1) – Appendix B

Portland State University West Campus 12.47KV Single Line Drawing

Non-Critical Buildings: Smith Memorial, Library Building East, Student Union, Neuberger Hall, Parking Facility #1 and University Services Building/Parking Facility #2



GENERAL NOTES

1. 12.47 KV CABLE TO BE TESTED ARE INDICATED BY ▭ .
2. ONLY ONE SECTION OF CAMPAS TO BE TESTED AT A TIME.

SHEET NOTES (XX)

(1) 208Y/120V
(2) 480Y/277V
(3) 12KV/4160 DELTA
(4) TEMPORARY GENERATOR CONNECTION LOCATION

PACKAGE BLOCK 2

NON-CRITICAL BUILDINGS - LIBRARY BLDG EAST, STUDENT UNION, NEUBERGER HALL, PARKING FACILITY #1, UNIVERSITY SERVICES BLDG/PARKING FACILITY #2, SMITH MEMORIAL.

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Title:
Project:
Revisions:
Drawing No.:
Scale:
Date:

Package Block Two (Additive Bid Alternate #1) – Appendix B

Package Block Two Buildings include: Smith Memorial, Library Building East, Student Union, Neuberger Hall, Parking Facility #1, and University Services Building/Parking Facility #2.

Coordinate with the Owner for appropriate signage for duration of construction. Coordinate with Owner, communication to campus community before, during and after electrical building shutdowns.

Provide photographs and videotape of the inside of all electrical equipment when Partial Discharge sensor systems are installed..

Provide the following information on the One-Line Diagrams for all feeders identified under this scope: copper or aluminum, insulation type, number of conductors and whether there is a ground and, if so, what size, and conduit/raceway information.

Non-Critical Buildings: Library Building East, Student Union, Neuberger Hall, Parking Facility #1 and University Service Building/Parking Facility #2
Temporary generators are to be staged prior to the start of work for the associated non-critical buildings.

In the event of a failure resulting in a prolonged power outage, the generator cables would need to be run per the attached drawings and final emergency generator connections would be performed on a time and material basis and would be a change order to the contract. This scenario is for information only and should not be included in this bid.

Verify existing phase rotation at connection point.
Position temporary generator per attached drawings. Cable is not to be run unless required.

1. Smith Memorial/Library East – Panelboard (Food Services).
   a. Verify existing phase rotation at connection point.
   b. Position temporary 400 KW, 208/120 Volt, 3 phase, 4 wire with ground generator, per attached drawings, and run 200 feet of conductors, south side, to connection point.
   c. Test temporary generator and verify phase rotation at cable connection point.
   d. Open the 12.47KV feeder to Smith Memorial/Library East.
   e. Install permanent Partial Discharge sensors system for cable.
   f. Collect cable information.
   g. Close the 12.47KV feeder to Smith Memorial/Library East.

   In the event of a prolonged power outage:
   h. Isolate panel and open bus feeder.
   i. Open feeders to Library Building East and Student Union buildings.
   j. Connect temporary generator.
   k. Verify phase rotation and voltage match existing.
   l. Run temporary cables to north side freezers.
   m. When work is completed, remove temporary generator and return to normal operation.

2. Library East
   a. Open the 12.47KV feeder to Library East.
   b. Install permanent Partial Discharge sensors system for cable.
   c. Collect cable information.
   d. Close the 12.47KV feeder to Library East.

3. Student Union
   a. Open the 12.47KV feeder to Student Union.
   b. Install permanent Partial Discharge sensors system for cable.
   c. Collect cable information.
   d. Close the 12.47KV feeder to Student Union.

4. University Service Building/Parking Facility #2
   a. Open the 12.47KV feeder to University Service Building/Parking Facility #2.
   b. Install permanent Partial Discharge sensors system for cable.

c. Collect cable information.
d. Close the 12.47KV feeder to University Service Building/Parking Facility #2.

4.A. Neuberger Hall
a. Open the 12.47KV feeder to Neuberger Hall.
b. Install permanent Partial Discharge sensors system for cable.
c. Collect cable information.
d. Close the 12.47KV feeder to Neuberger Hall.

4.B. Neuberger Hall Bus
a. Open the 12.47KV feeder to Neuberger Hall Bus.
b. Install permanent Partial Discharge sensors system for cable.
c. Collect cable information.
d. Close the 12.47KV feeder to Neuberger Hall Bus.

5. Parking Facility #1
a. Open the 12.47KV feeder to Parking Facility #1.
b. Install permanent Partial Discharge sensors system for cable.
c. Collect cable information.
d. Close the 12.47KV feeder to Parking Facility #1.

Package Block Two Sequence of Testing

Partial Discharge Sensors to be installed in the following order:

1) Smith Memorial – Feeder

2) Library Building East - Feeder

3) Neuberger Hall - Feeder

4) Neuberger Hall Bus - Feeder

5) Student Union - Feeder

6) Parking Facility #1 - Feeder

7) University Services Building / Parking Facility #2

Package Block Three (Additive Bid Alternate #2)Appendix C

Portland State University West Campus 12.47KV Single Line Drawing

Critical Building: Peter W. Stott Center

Non-Critical Buildings: Miller Library Lincoln Hall and

GENERAL NOTES

1. 12.47 KV CABLE TO BE TESTED ARE INDICATED BY ▭ .
2. ONLY ONE SECTION OF CAMPAS TO BE TESTED AT A TIME.

SHEET NOTES (XX)

1. 208Y/120V
2. 480Y/277V
3. 12KV/4160 DELTA
4. TEMPORARY GENERATOR CONNECTION LOCATION

PGE
115 KV
CANYON RINC BUS
TX-WR3 30/50 MVA 115-12.47KV 7.36%
TX-WR2 30/50 MVA 115-12.47KV 6.91%
30/50 MVA
B
A
3-350 KCM AL 1-1/0 CU GND VULKENE 810'
3-350 KCM AL 1-1/0 CU GND VULKENE 810'
PGE OWNED
EMPTY PGE FUTURE
OKOGARD AL 750
EMPTY PGE FUTURE
PGE OWNED
SM-5 300E SLOW
R505
R507
SPARE AUTO TRANSFER SWITCH
R509
SM-5 300E SLOW
R499
BUS "A" PREFERRED SOURCE
BUS "B" ALTERNATE SOURCE
AUTO TRANSFER
R491
R493
R503 SM-5 150E SLOW
R501 SM-5 200E SLOW
SM-5 300E SLOW R491
R495 SM-5 150E SLOW
R497 SM-5 200E SLOW
SM-5 200E SLOW
3-4/0 AL 100'
CRAMER HALL S.E.
CRAMMER HALL S.E.
VCL SPLICED TO VULKENE
5-250 KCM
3-250 KCM 10'
SM-5 175E SLOW
SM-5 65E STD
SM-5 25E STD
SM-5 100E SLOW
SM-4 125E SLOW
65E EJO-1
SM-4 200E
65E EJO-1
2 1 MVA CHILLER SUBSTATION
2 2.5 MVA CHILLER SUBSTATION
3-1/0 300'
3-1/0 600'
3-350 KCM CU 10'
3-1/0 10'
SM-4 80E
SM-4 60E
SM-5 40E STD
1 MVA 4
1 300 KVA 4
3-1/0
1 3-167 KVA
CRAMER HALL N.W.
3-4/0 AL 1#2 CU GND 200' OKOGARD 220M EPR MV 90 100% TAPE
3-4/0 AL 1#2 CU GND 200' ANIXTER COMPACT 220M EPR MV 105 133%
B A
HEATING PLANT
600A BUS
SM-4 100E SLOW
SM-4 10E STD
FUTURE
FUTURE
FUTURE
FUTURE
2 150 KVA 5.54%Z
3-1/0 200'
PSC-PETER W. STOTT CENTER (PHYSICAL EDUCATION BLDG)
SM-4 65E SLOW
SM-4 50E STD
2 4 750 KVA 5.7%Z
3-1/0 200'
MI - MILLER LIBRARY (LIBRARY BLDG WEST) (MILLAR)
SM-5 65E STD
2 750 KVA 5.45%Z
3-1/0 300'
50E
1 750KVA
UNIVERSITY SERVICES BLDG PARKING FACILITY #2
SM-4 65E STD
SPACE
FED FROM OVERHEAD
SM-4 80E SLOW
SM-4 20E SLOW
SM-4 65E STD
1 1 MVA
3-1/0
1 1 MVA
SOUTH PARK HALL (NEUBERGER HALL)
3 #1 300'
PARKING FACILITY #1
SPACE
15E STD
1 150 KVA
SMSU-SMITH MEMORIAL
COLLEGE CENTER BLDG (SMITH MEMORIAL CENTER)
SM-4 50E STD
SM-4 50E SLOW
SM-4 40E STD
SPACE
1 4 750 KVA
3-1/0
STUDENT UNION
COLLEGE CENTER BLDG - 2ND ADDN. (SMITH MEMORIAL CENTER)
1 500 KVA
3-1/0 200'
LIBRARY BLDG EAST
SPACE
SPACE
SM-4 40E STD
4 1 500 KVA
3-4/0 AL 1#2 CU GND 50'
SRTC-SCIENCE RESEARCH + TEACHING CENTER (SCIENCE BLDG 2)
M
SM-5 80E
SM-5 80E
SM-5 65E
SM-5 65E
SM-5 175E
SM-5 80E
1 1 MVA 4 SWITCHBOARD #1 SECTION #1 LAB POWER OFF 5.8%Z
1 1 MVA 4 SWITCHBOARD #1 SECTION #2 LAB POWER ON 5.74%Z
2 750 KVA 4 SWITCHBOARD #3 LIGHTS 5.8%Z
2 750 KVA 4 SWITCHBOARD #2 MECH. RM. POWER 5.6%Z
3 2MVA SWITCHBOARD #4 CHILLER 5.32%Z
2 2MVA SWITCHBOARD #5 5.52%Z
SCIENCE BLDG 1
SPACE
SM-4 60E SLOW
SPACE
SM-4 20E SLOW
65E STD
3 #2 VCL CONCENTRIC NEUTRAL 200'
1 1 MVA 5.24%Z
3 #2 200'
LEAD COVERED CABLE
SM-4 15E STD
1 200 KVA
FUTURE
XSB-EXTENDED STUDIES BUILDING (D.C.E. BLDG)
1 3-333 KVA
OLD MAIN (LINCOLN HALL)

PACKAGE BLOCK 3

CRITICAL BUILDINGS - PETER W. STOTT CENTER.
NON-CRITICAL BUILDINGS - MILLER LIBRARY, LINCOLN HALL.

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724 S.W. HARRISON ST. PORTLAND, OREGON

Title:
Project:
Revisions:
Drawing No.:
Scale:
Date:

Package Block Three (Additive Bid Alternate #2) – Appendix C

Package Block Three Buildings include: Peter W. Stott Center, Millar Library, Lincoln Hall, XSB.

Coordinate with the Owner for appropriate signage for duration of construction. Coordinate with Owner, communication to campus community before, during and after electrical building shutdowns.

Provide photographs and videotape of the inside of all electrical equipment when Partial Discharge sensor systems are installed..

Provide the following information on the One-Line Diagrams for all feeders identified under this scope: copper or aluminum, insulation type, number of conductors and whether there is a ground and, if so, what size, and conduit/raceway information.

Critical Building: Peter W. Stott Center
Temporary generators are to be staged prior to the start of work for the associated buildings with cables run to connection points and tested prior to starting cable testing.

In the event of a failure resulting in a prolonged power outage, the final emergency generator connections would be performed on a time and material basis and would be a change order to the contract. This scenario is for information only and should not be included in this bid.

1. Peter W. Stott Center - Panelboard (Green house).
   a. Verify existing phase rotation at connection point.
   b. Position temporary 250 KW, 480/277 Volt, 3phase, 4 wire with ground generator, per PSU direction, and run 500 feet of conductors to connection point.
   c. Test temporary generator and verify phase rotation at cable connection point.
   d. Open the 12.47KV feeder to Peter W. Stott Center.
   e. Install permanent Partial Discharge sensors system for cable.
   f. Collect cable information.
   g. Close the 12.47KV feeder to Peter W. Stott Center.

   In the event of a prolonged power outage:
   h. Isolate panel and branch circuit breaker feeders.
   i. Connect temporary generator.
   j. Verify phase rotation and voltage match existing.
   k. When work is completed in Peter W. Stott Center, remove temporary generator and return to normal operation.

Non-Critical Buildings: Millar Library and Lincoln Hall
Temporary generators are to be staged prior to the start of work for the associated non-critical buildings.

In the event of a failure resulting in a prolonged power outage, the generator cables would need to be run per the attached drawings and final emergency generator connections would be performed on a time and material basis and would be a change order to the contract. This scenario is for information only and should not be included in this bid.

1. Millar Library
   a. Open the 12.47KV feeder to Millar Library.
   b. Install permanent Partial Discharge sensors system for cable.
   c. Collect cable information.
   d. Close the 12.47KV feeder to Millar Library.
   e. Verify existing phase rotation at connection point.
   f. Position temporary generator per attached drawings. Cable is not to be run unless required.

2. Lincoln Hall
   a. Open the 12.47KV feeder to Lincoln Hall.
   b. Install permanent Partial Discharge sensors system for cable.
   c. Collect cable information.
   d. Close the 12.47KV feeder to Lincoln Hall.

e. Verify existing phase rotation at connection point.
f. Position temporary generator per attached drawings. Cable is not to be run unless required.

Package Block Three Sequence of Testing

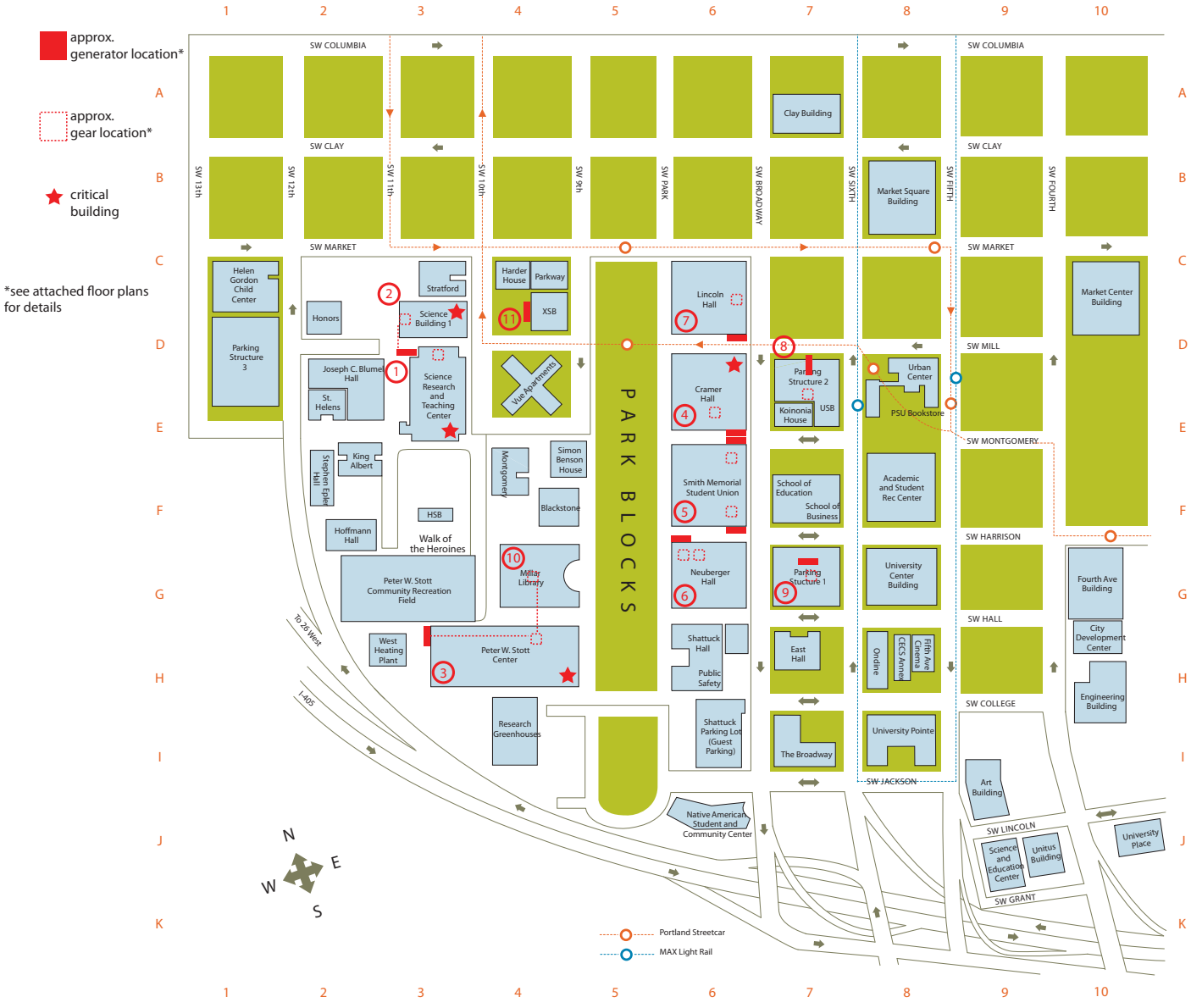
Partial Discharge Sensors to be installed in the following order:

1) Peter W. Stott Center - Feeder

2) Millar Library - Feeder

3) Lincoln Hall - Feeder

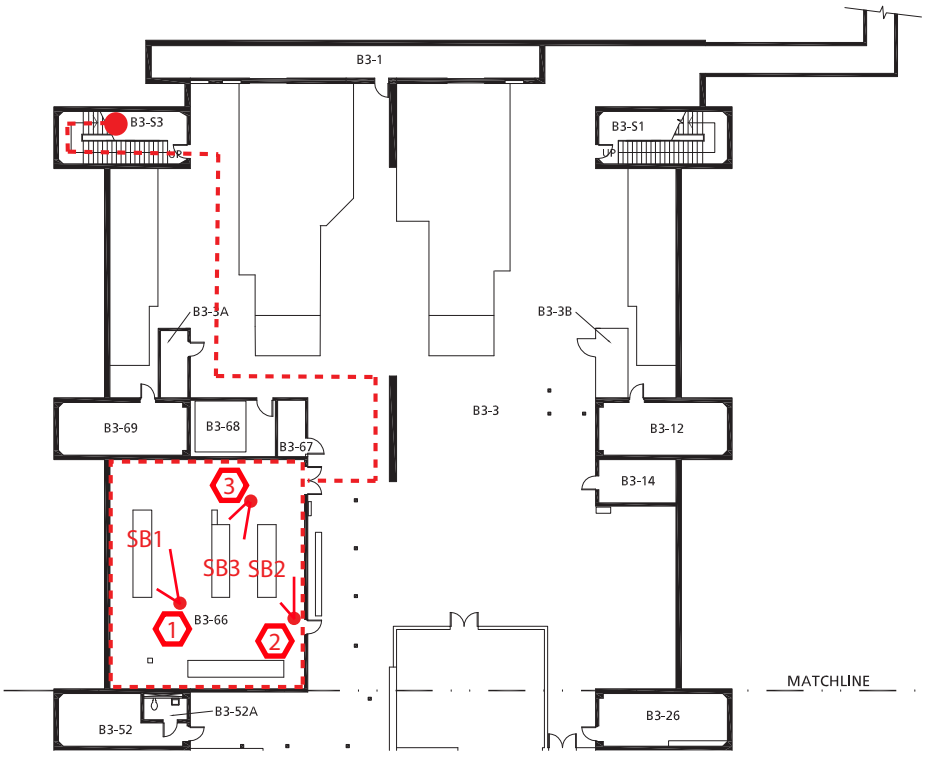
Additional Information – Appendix D


approx. generator location*
approx. gear location*
critical building
*see attached floor plans for details
SW COLUMBIA
SW CLAY
SW MARKET
SW MILL
SW MONTGOMERY
SW HARRISON
SW HALL
SW COLLEGE
SW JACKSON
SW LINCOLN
SW GRANT
SW 13th
SW 12th
SW 11th
SW 10th
SW 9th
SW PARK
SW BROADWAY
SW SIXTH
SW FIFTH
SW FOURTH
PARK BLOCKS
Clay Building
Market Square Building
Market Center Building
Helen Gordon Child Center
Parking Structure 3
Honors
Stratford
Science Building 1
Harder House
Parkway
XSB
Vue Apartments
Lincoln Hall
Joseph C. Blumel Hall
St. Helens
Science Research and Teaching Center
Cramer Hall
Parking Structure 2
Koinonia House
USB
Urban Center
PSU Bookstore
Stephen Epler Hall
King Albert
Simon Benson House
Montgomery
Blackstone
Smith Memorial Student Union
School of Education
School of Business
Academic and Student Rec Center
HSB
Hoffmann Hall
Walk of the Heroines
Peter W. Stott Community Recreation Field
Millar Library
Neuberger Hall
Parking Structure 1
University Center Building
Fourth Ave Building
City Development Center
Engineering Building
To 26 West
West Heating Plant
Peter W. Stott Center
Shattuck Hall
Public Safety
East Hall
Ondine
CECS Annex
Fifth Ave Cinema
I-405
Research Greenhouses
Shattuck Parking Lot (Guest Parking)
The Broadway
University Pointe
Art Building
Native American Student and Community Center
Science and Education Center
Unitus Building
University Place
N
E
W
S
Portland Streetcar
MAX Light Rail

1

2

3



Generator placement is on the North side of building, see dwg A3.1 (1e). It can be fed through stairwell at basement level to the sub-basement. Gear is in room B3-66. Three locations need to be powered SB1, SB2, and SB3

1a

Critical Bldg

SUB-BASEMENT FLOOR PLAN (NORTH)

241 - A1.1

DRAWN BY:
LRR

DATE:
7/2011

SUB-BASEMENT FLOOR PLAN (NORTH)
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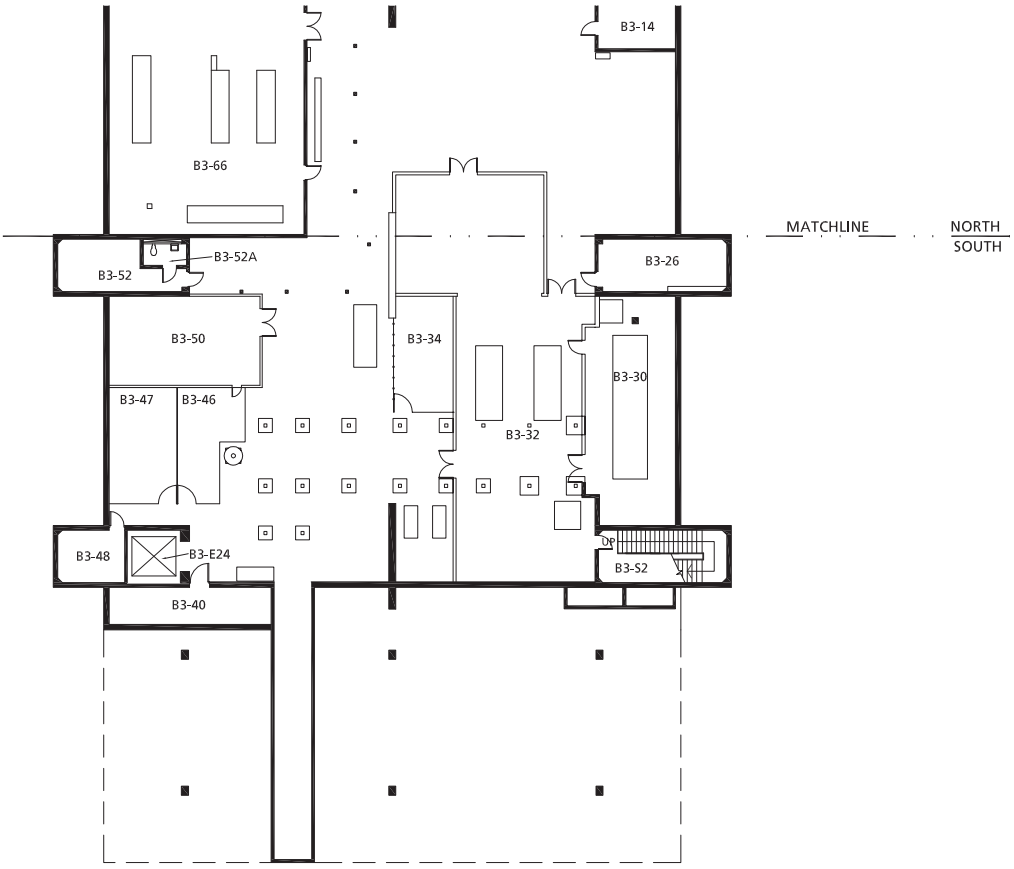

SUB-BASEMENT FLOOR PLAN (SOUTH)

1b

Critical Bldg

241 - A1.2

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7/2011

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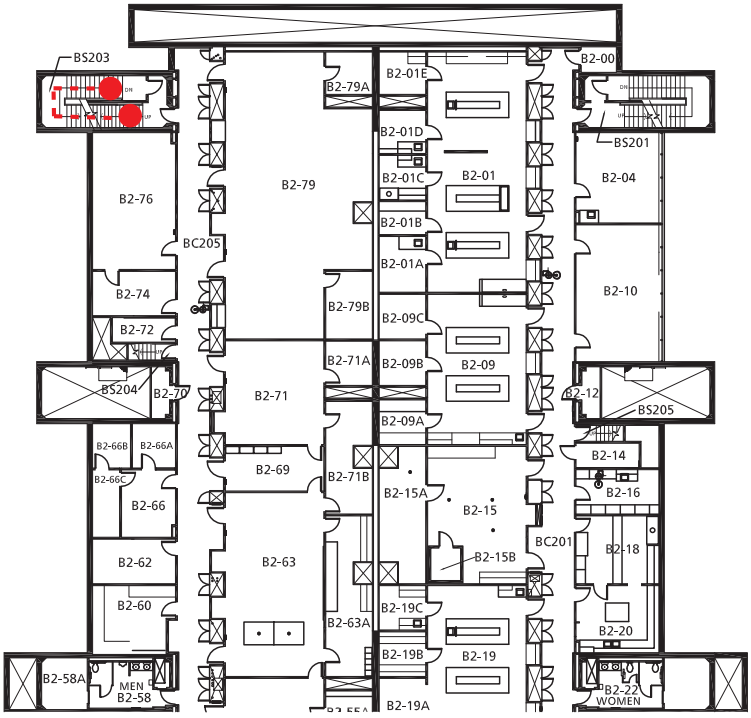

LOWER BASEMENT FLOOR PLAN (NORTH)

1c

Critical Bldg

241 - A2.1

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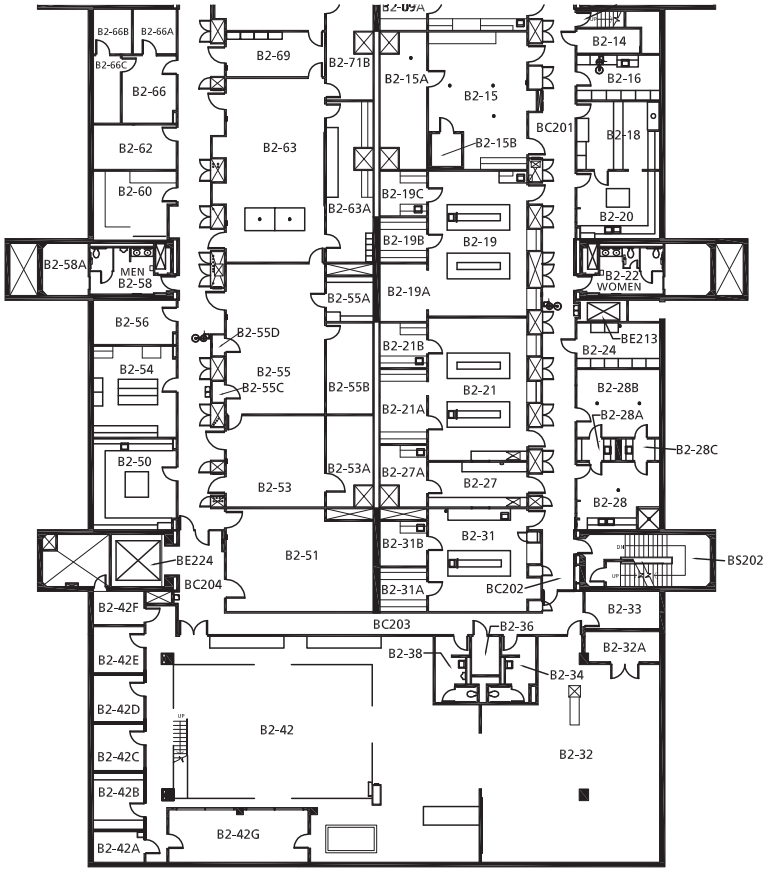

LOWER BASEMENT FLOOR PLAN (SOUTH)

1d

Critical Bldg

241 - A2.2

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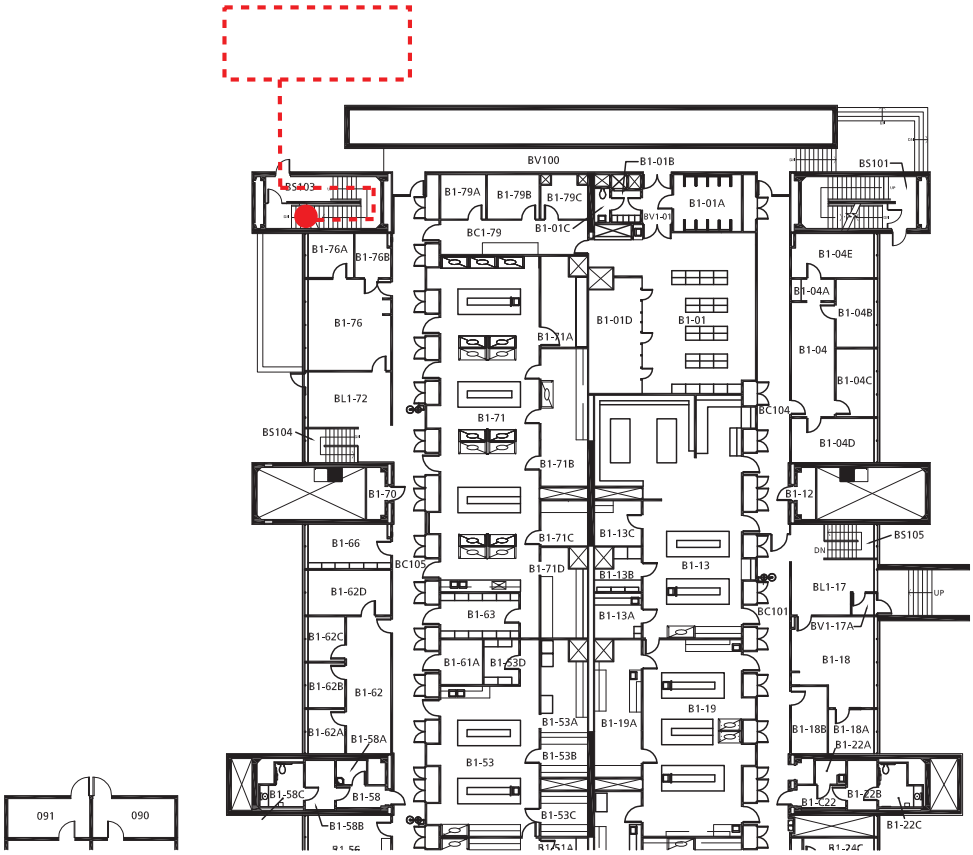

UPPER BASEMENT FLOOR PLAN (NORTH)

1e

Critical Bldg

241- A3.1

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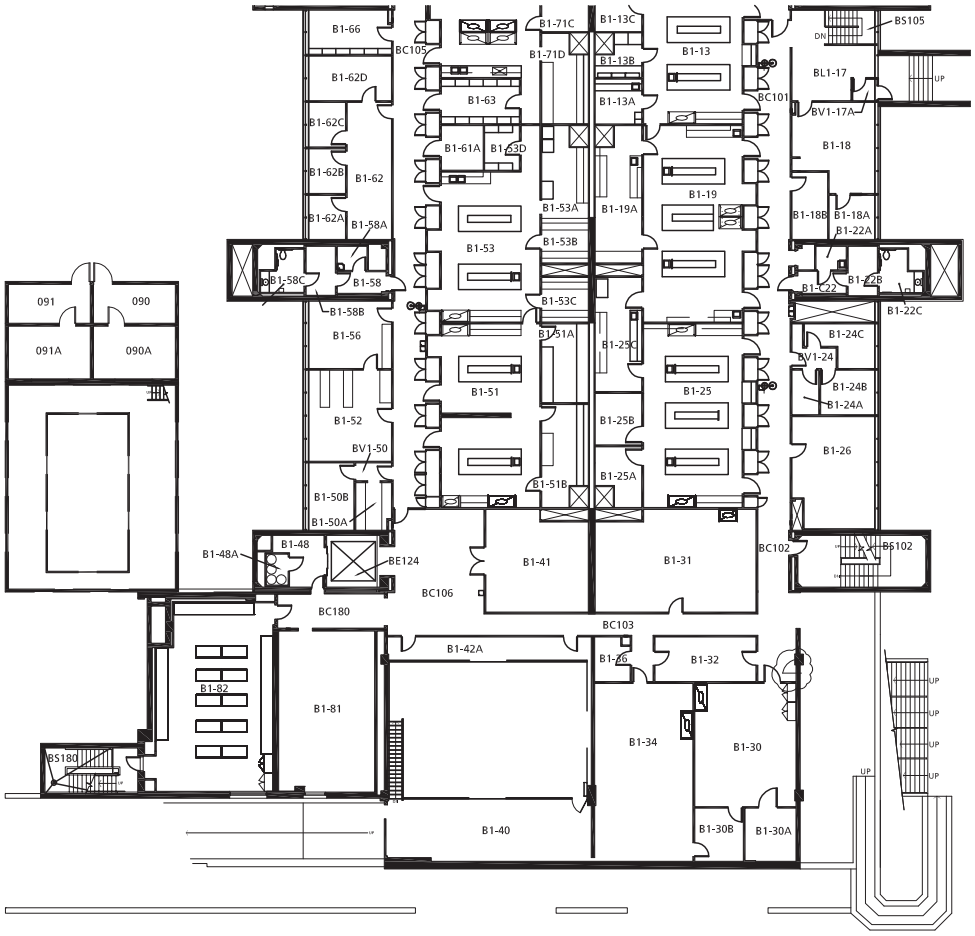

UPPER BASEMENT FLOOR PLAN (SOUTH)

1f

Critical Bldg

241 - A3.2

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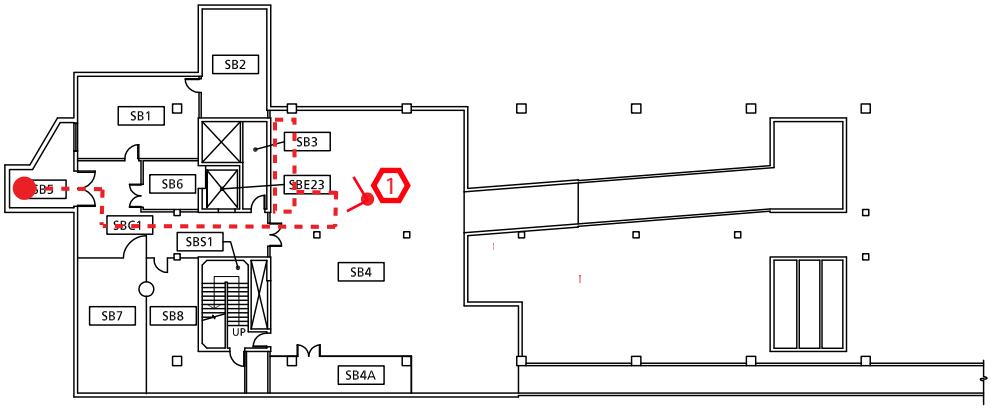
1



Generator placement can be the same place as SRTC or more north to be closer to SBI. There is a hatch leading to the sub-basement in front of the West enterance.

2a

Critical bldg

SUB-BASEMENT FLOOR PLAN

242 - A1

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DATE:
10/01/2003

SUB-BASEMENT FLOOR PLAN
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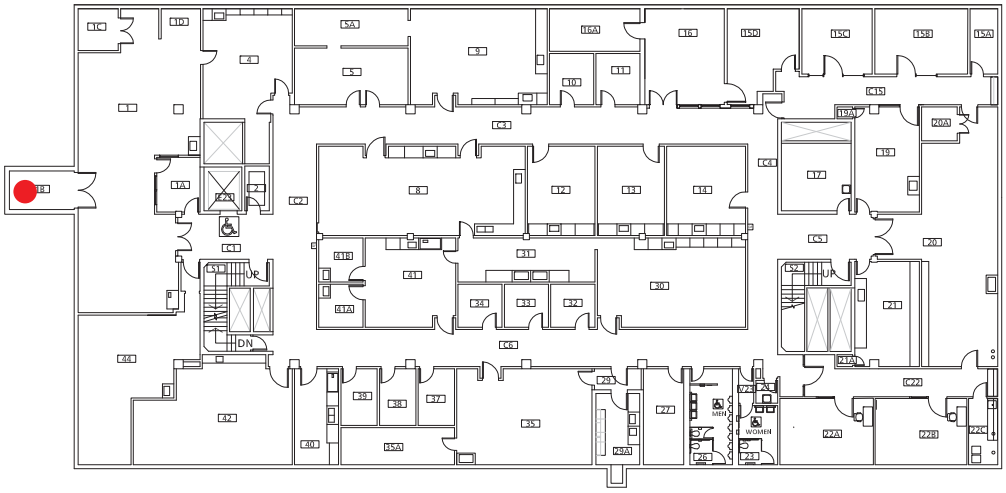

BASEMENT FLOOR PLAN

2b

Critical bldg

242 - A2

DRAWN BY:
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DATE:
2/2012

BASEMENT FLOOR PLAN
SCIENCE BUILDING ONE
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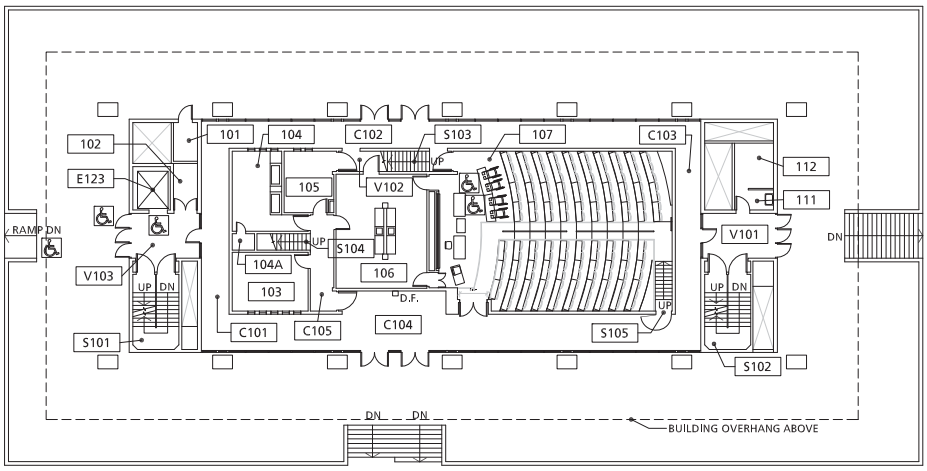
hatch to
sub-basement



FIRST FLOOR PLAN

2c

Critical bldg

242 - A3

DRAWN BY:
LRR

DATE:
6/7/2005

FIRST FLOOR PLAN
SCIENCE BUILDING ONE
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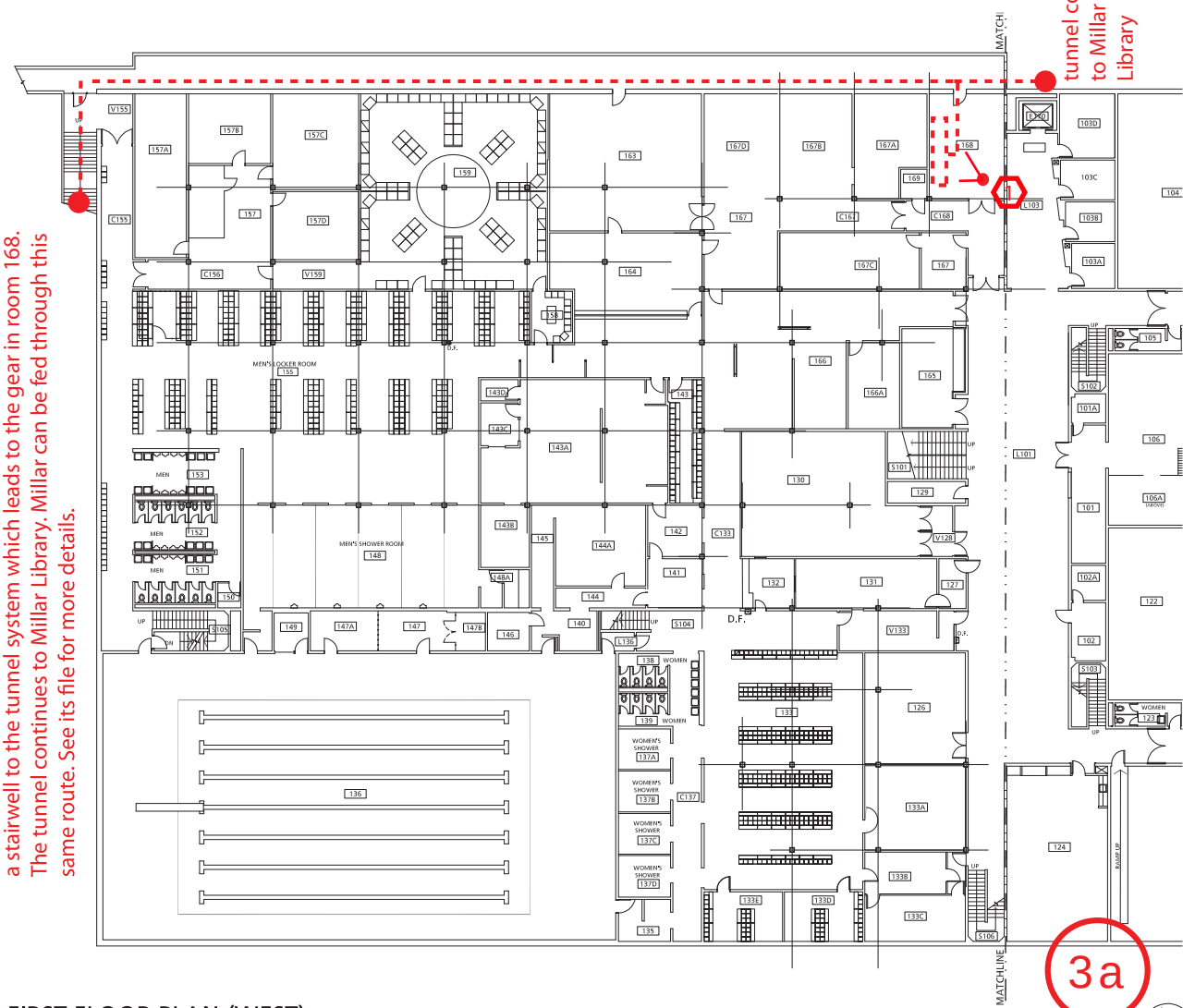
1

Generator placement is on West side of building. Fed through a stairwell to the tunnel system which leads to the gear in room 168. The tunnel continues to Millar Library. Millar can be fed through this same route. See its file for more details.



FIRST FLOOR PLAN (WEST)

Critical Bldg

Note: this will feed power the Research Green House too

231 - A2.1

DRAWN BY:
LRR

DATE:
12/2011

FIRST FLOOR PLAN (WEST)
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930 S.W. HALL

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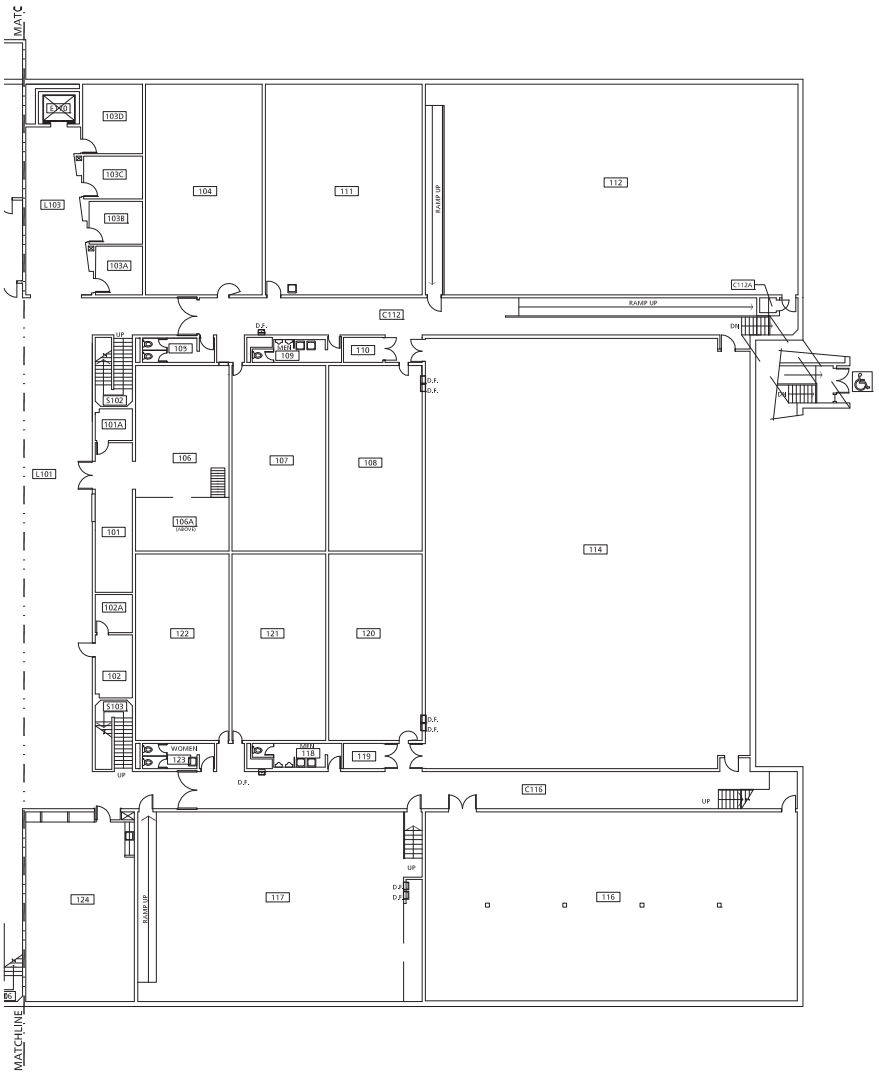

FIRST FLOOR PLAN (EAST)

3b

Critical Bldg

231 - A2.2

DRAWN BY:
LRR

DATE:
8/2011

FIRST FLOOR PLAN (EAST)
PETER W. STOTT CENTER
930 S.W. HALL

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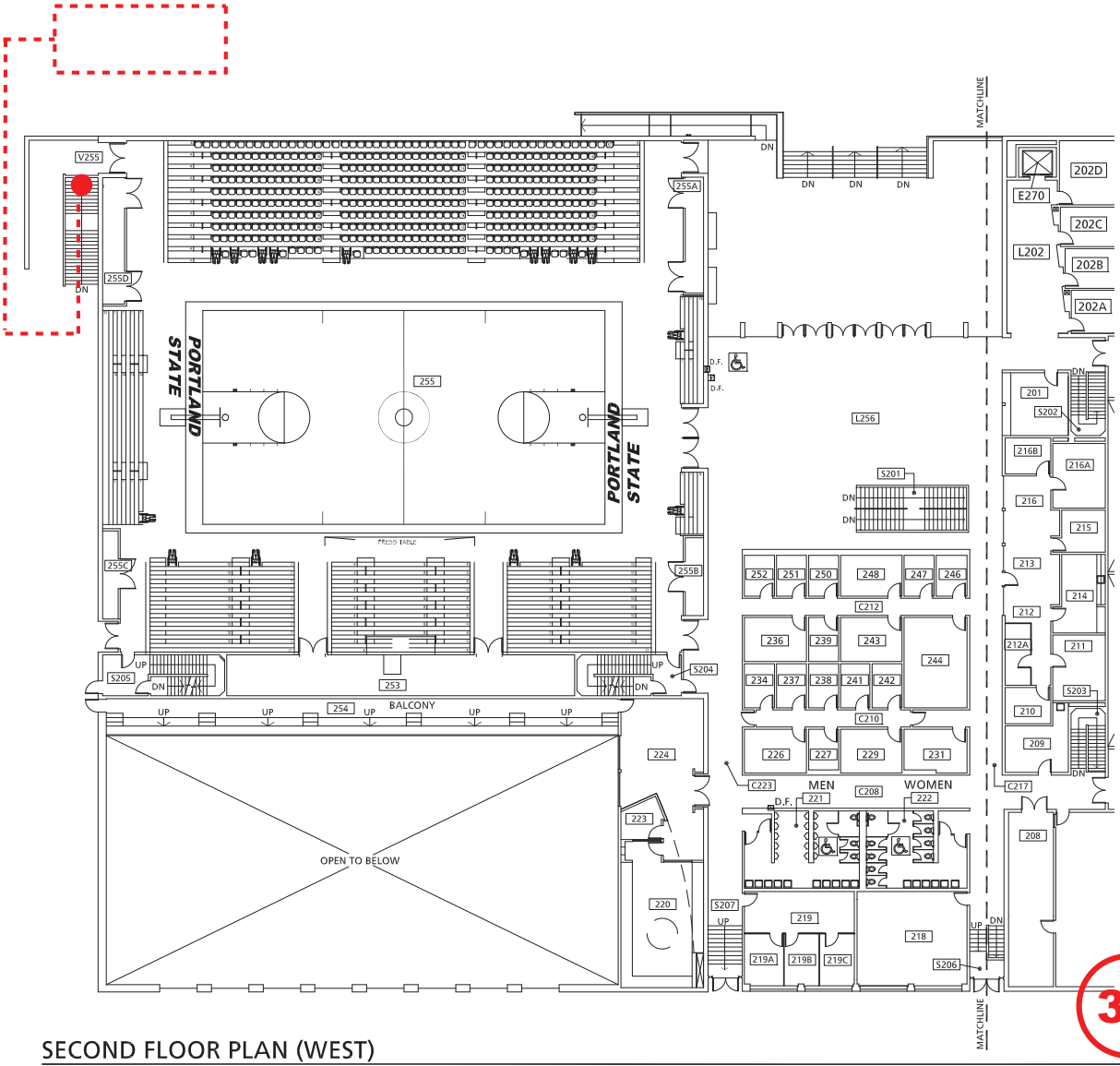

SECOND FLOOR PLAN (WEST)

3c

Critical Bldg

231 - A3.1

DRAWN BY:
LRR

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8/2011

SECOND FLOOR PLAN (WEST)
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930 S.W. HALL

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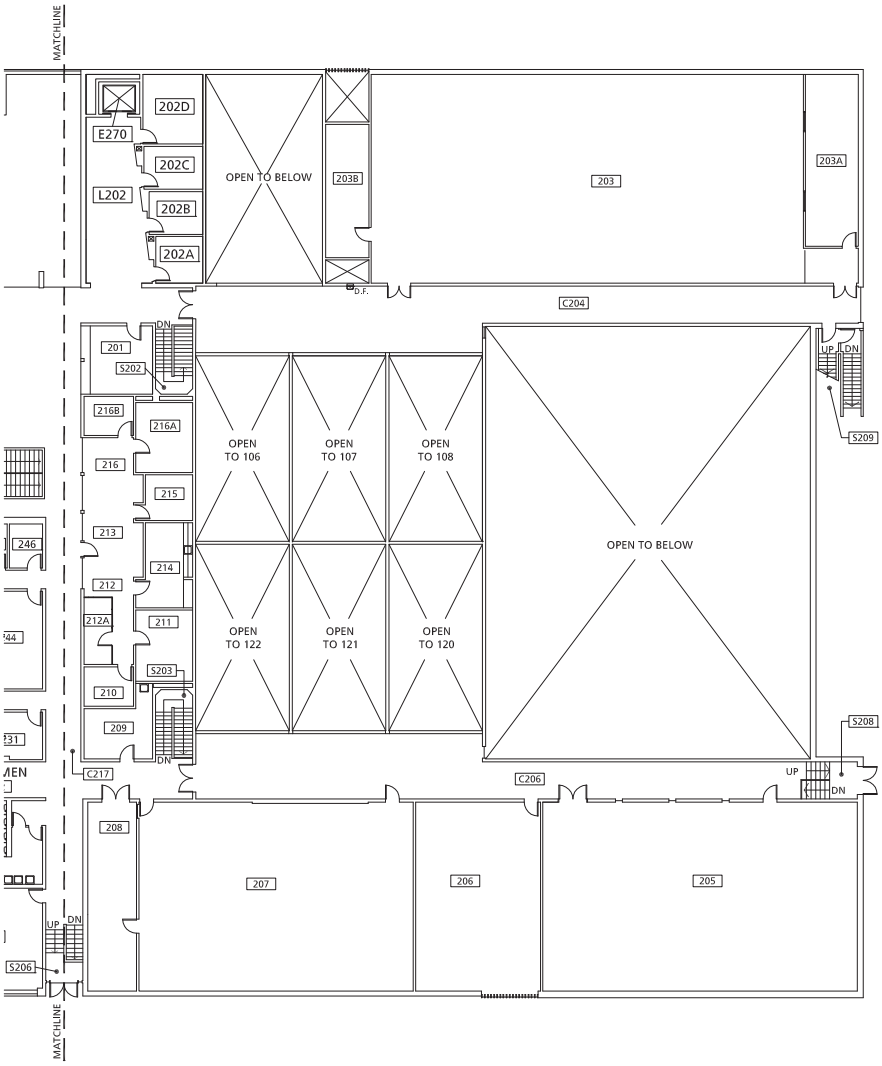

SECOND FLOOR PLAN (EAST)

3d

Critical Bldg

231 - A3.2

DRAWN BY:
LRR

DATE:
8/2011

SECOND FLOOR PLAN (EAST)
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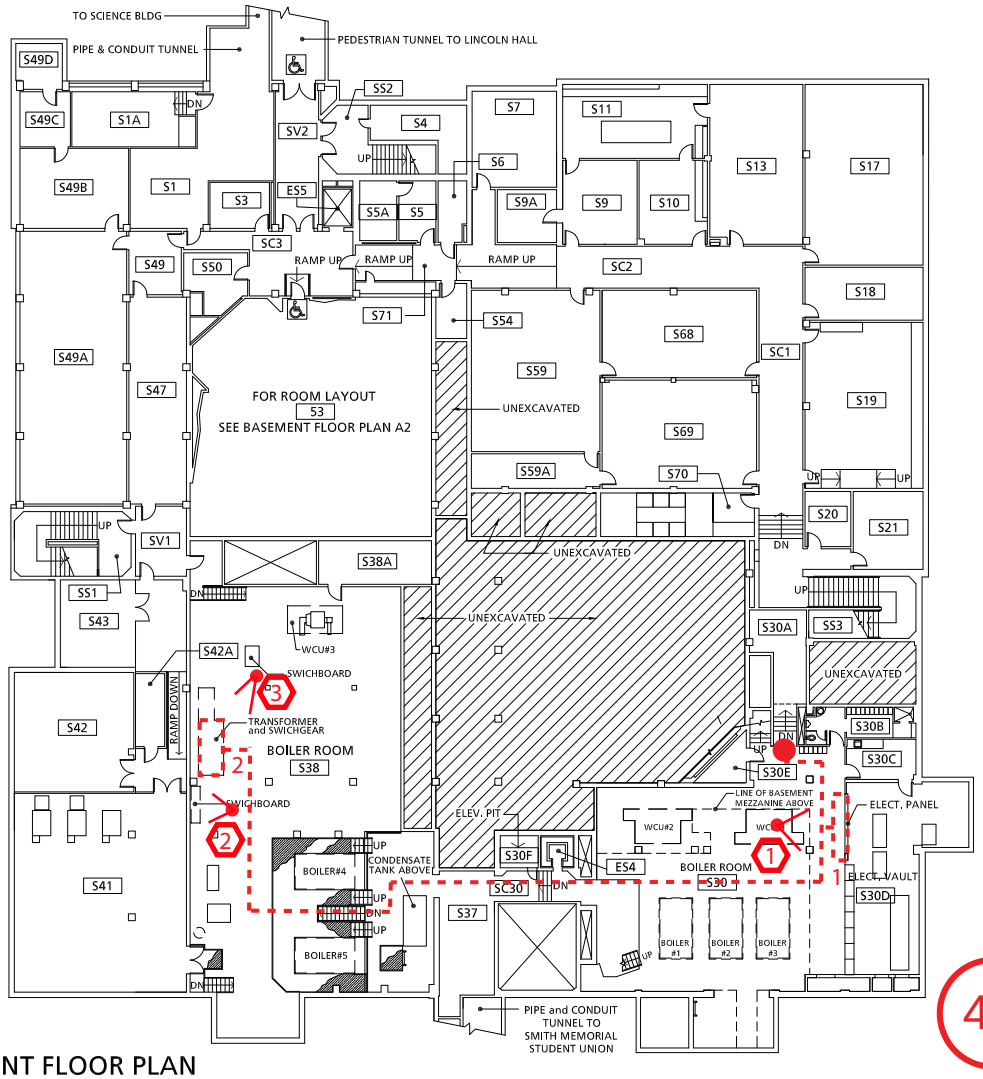
1

2

3



SUB - BASEMENT FLOOR PLAN

Generator placement is on SE side of building and fed through East doors down stairs to sub-basement. There are two panel areas that need to be fed (1) is Siemens/Boiler Controls, and Telecom (2) Boilers 4 & 5, and the Motor Control Center.

4a

Critical Bldg

201_A1

DRAWN BY:
LRR

DATE:
9/29/2003

SUB - BASEMENT FLOOR PLAN
201, CRAMER HALL
1721 S.W. BROADWAY

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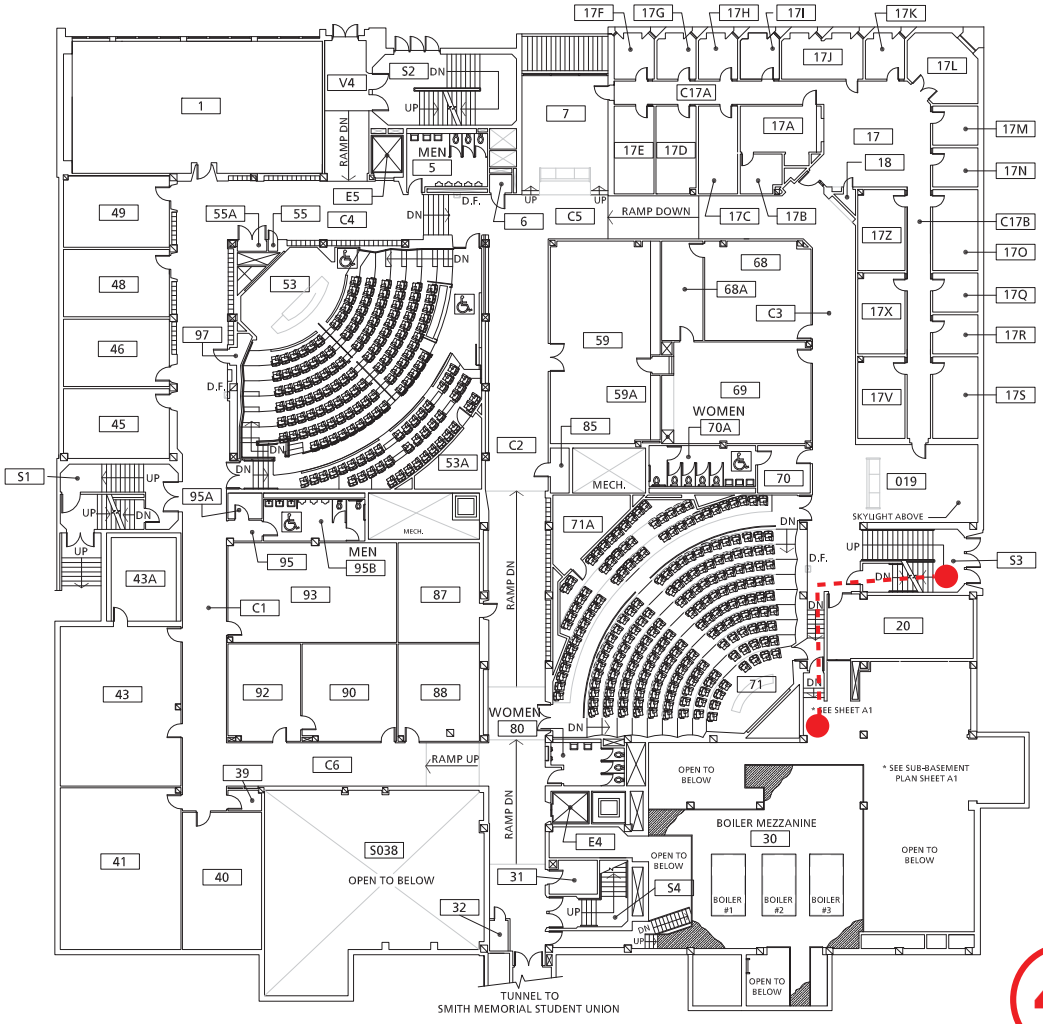

BASEMENT FLOOR PLAN

4b

Critical Bldg

201 - A2

DRAWN BY:
LRR

DATE:
6/19/2007

BASEMENT FLOOR PLAN
201, CRAMER HALL
1721 S.W. BROADWAY

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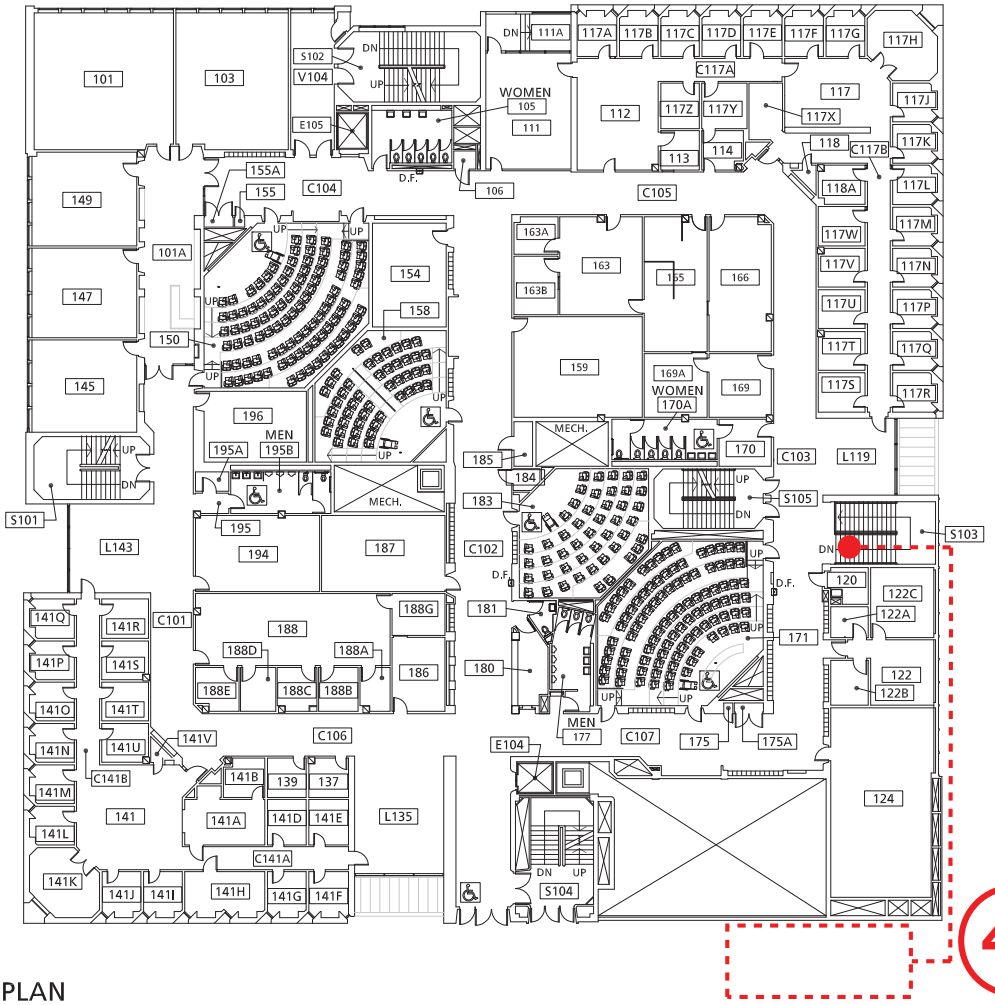

FIRST FLOOR PLAN

201 - A3

DRAWN BY:
LRR

DATE:
1/2012

FIRST FLOOR PLAN
201, CRAMER HALL
1721 S.W. BROADWAY

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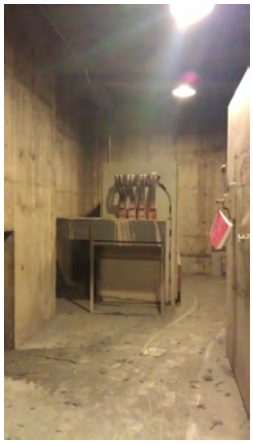
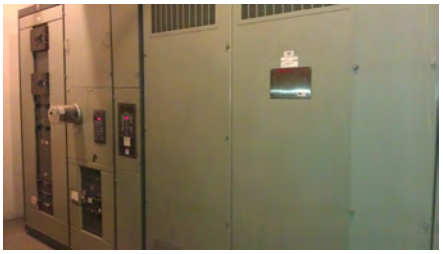
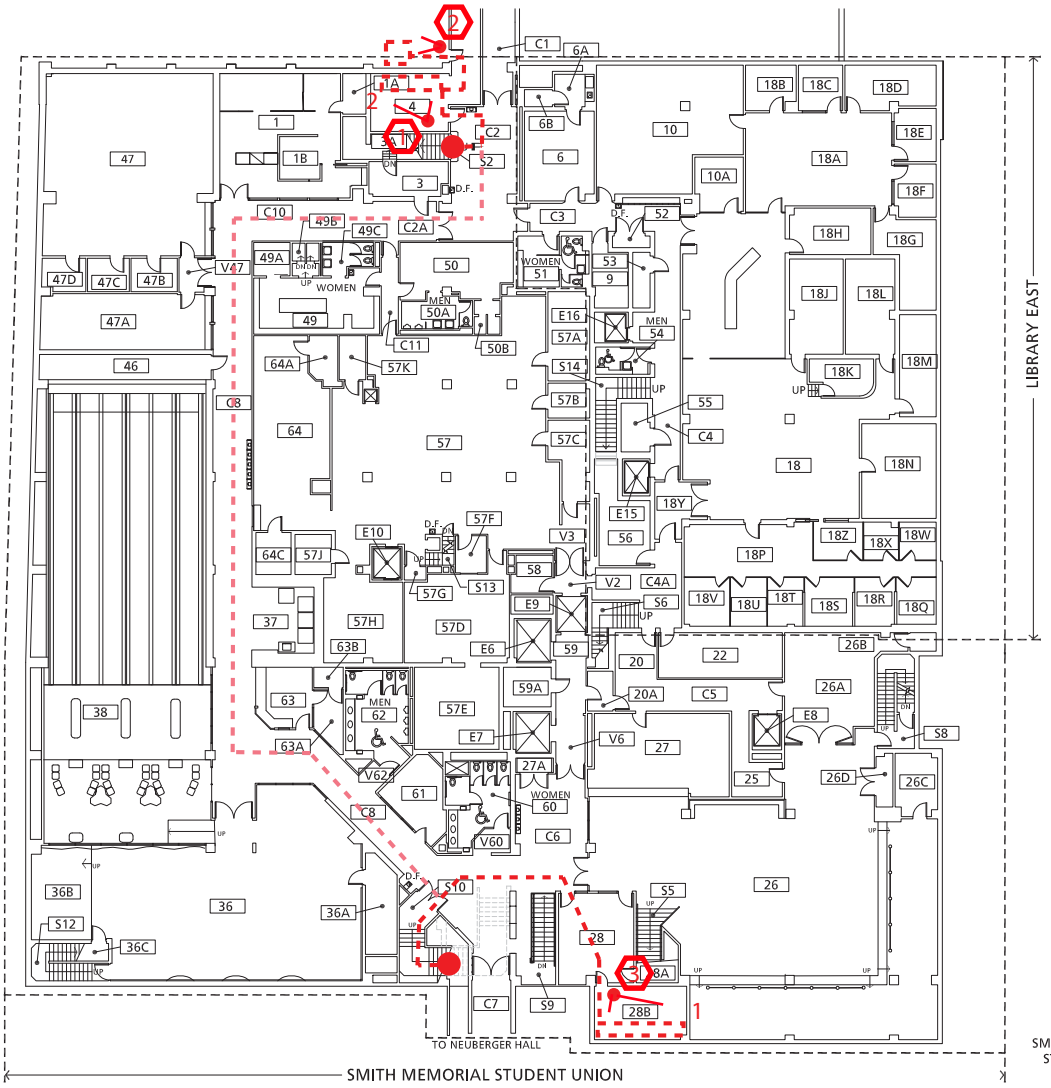


2



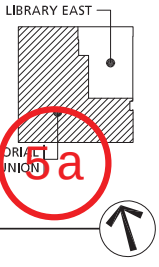
3



BASEMENT FLOOR PLAN (SMSU)

Two Generators would be required for SMSU. One on the North and one on the South side. Each could be fed down stairs on the corresponding N and S entries to the gear. (1) South gear is non-priority. N gear at Location (2) feeds dining coolers.

Alternatively, cable could be fed down hallway between gear rooms



200_A2

DRAWN BY:
LRR

DATE:
9/2011

BASEMENT FLOOR PLAN

200, SMITH MEMORIAL STUDENT UNION
1825 S.W. BROADWAY

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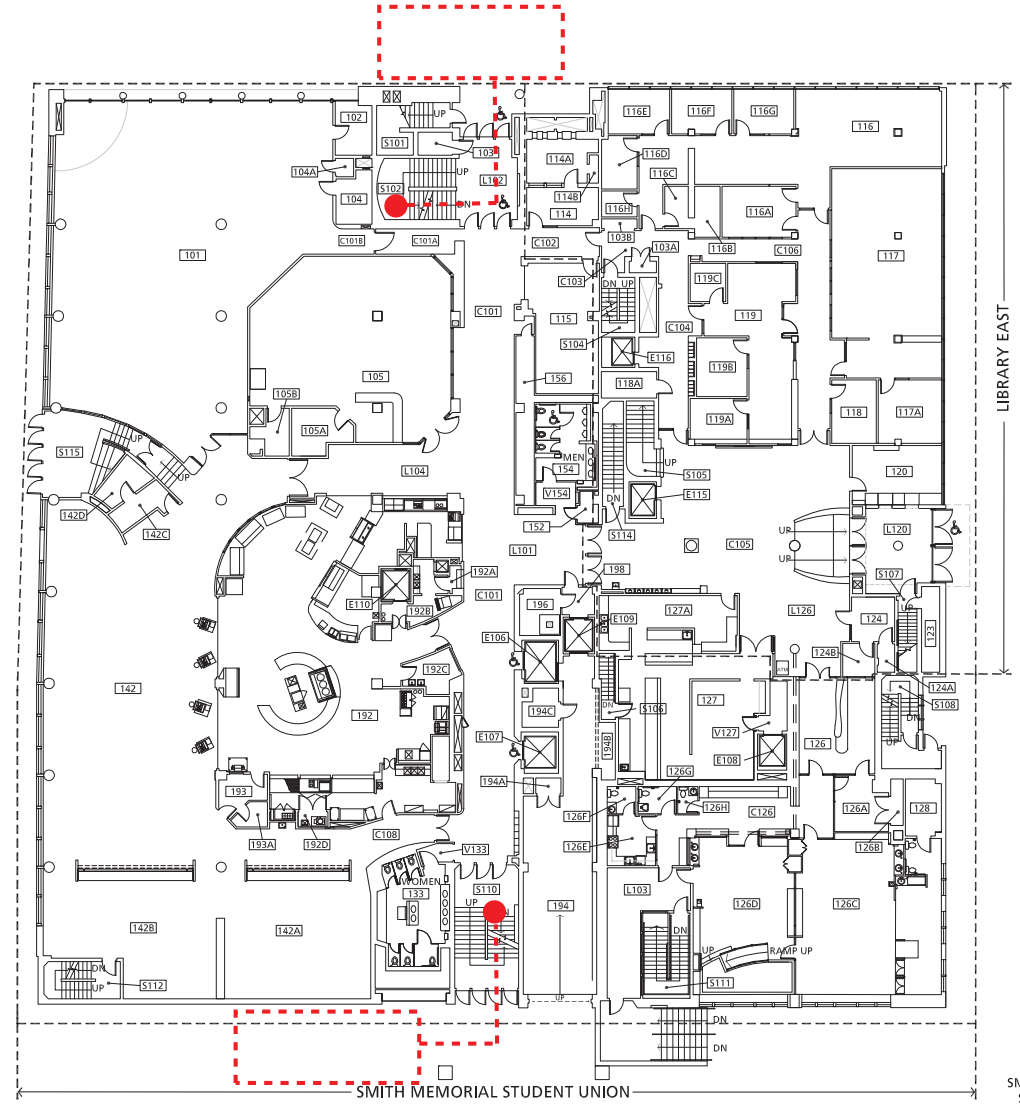
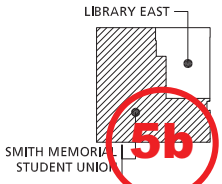


FIRST FLOOR PLAN (SMSU)



200_A3

DRAWN BY:
LRR

DATE:
9/2011

FIRST FLOOR PLAN
200, SMITH MEMORIAL STUDENT UNION
1825 S.W. BROADWAY

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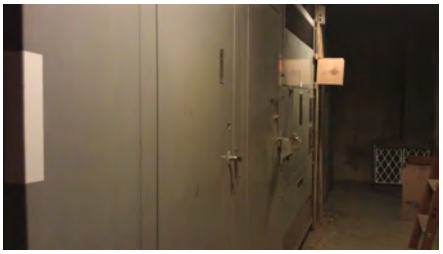

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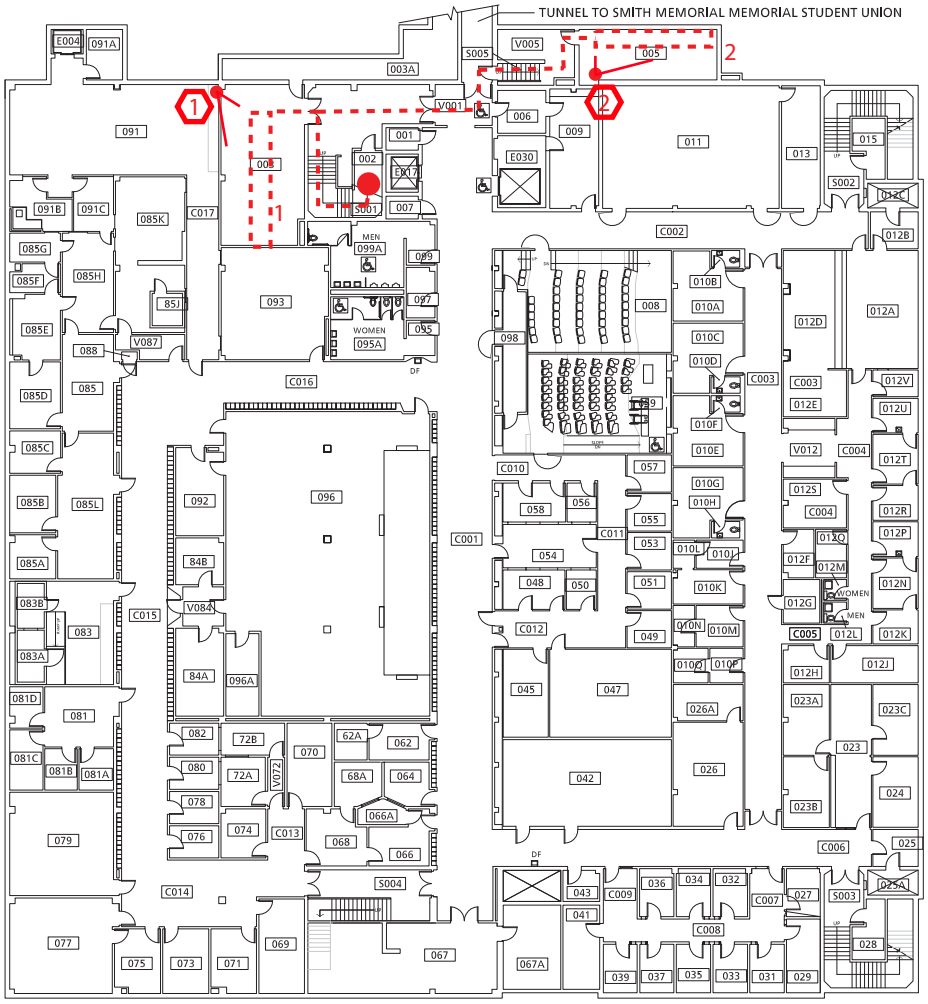

Generator placement is on the North side of the building. It can be fed down N stairwell to gear rooms (1) and (2). Niether room has more importance over the other.

6a

BASEMENT FLOOR PLAN

199 - A1

DRAWN BY:
LRR

DATE:
2/2012

BASEMENT FLOOR PLAN
199, NEUBERGER HALL
724 S.W. HARRISON

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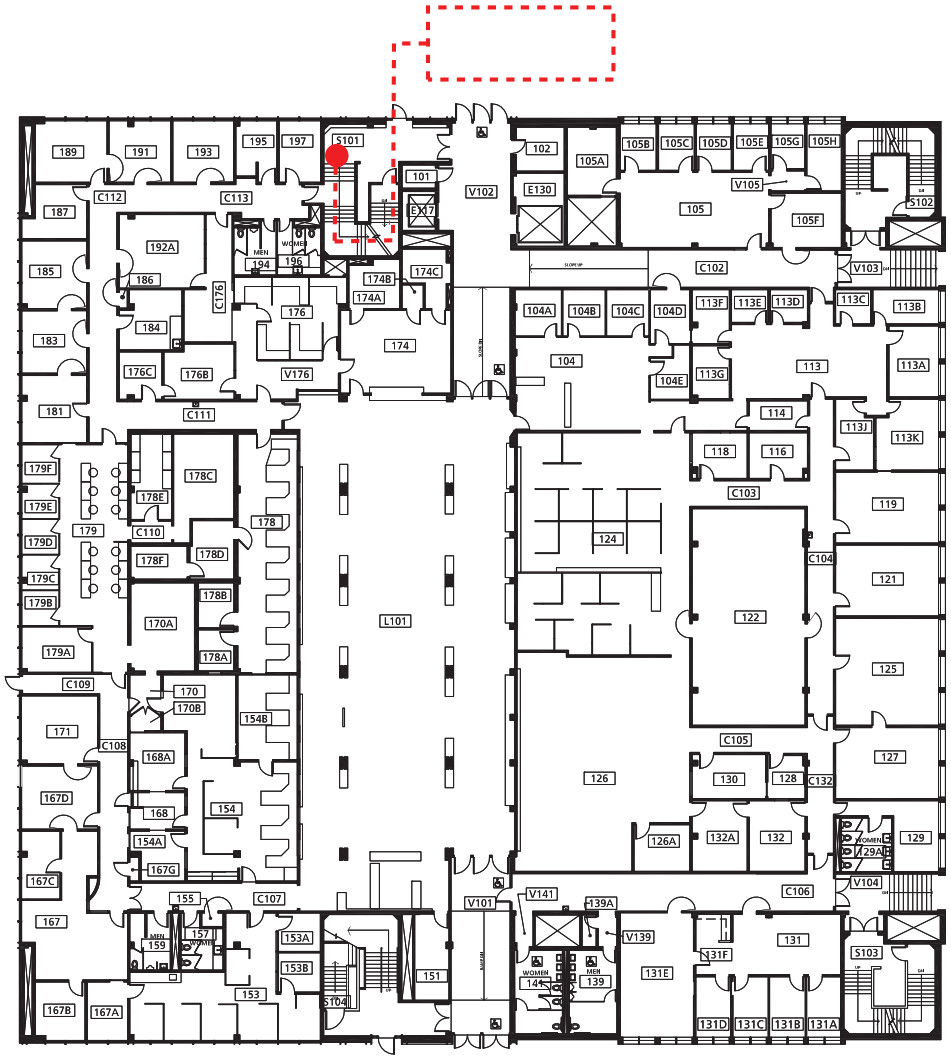

6b

FIRST FLOOR PLAN

199 - A2

DRAWN BY:
LRR

DATE:
2/2012

FIRST FLOOR PLAN
199, NEUBERGER HALL
724 S.W. HARRISON

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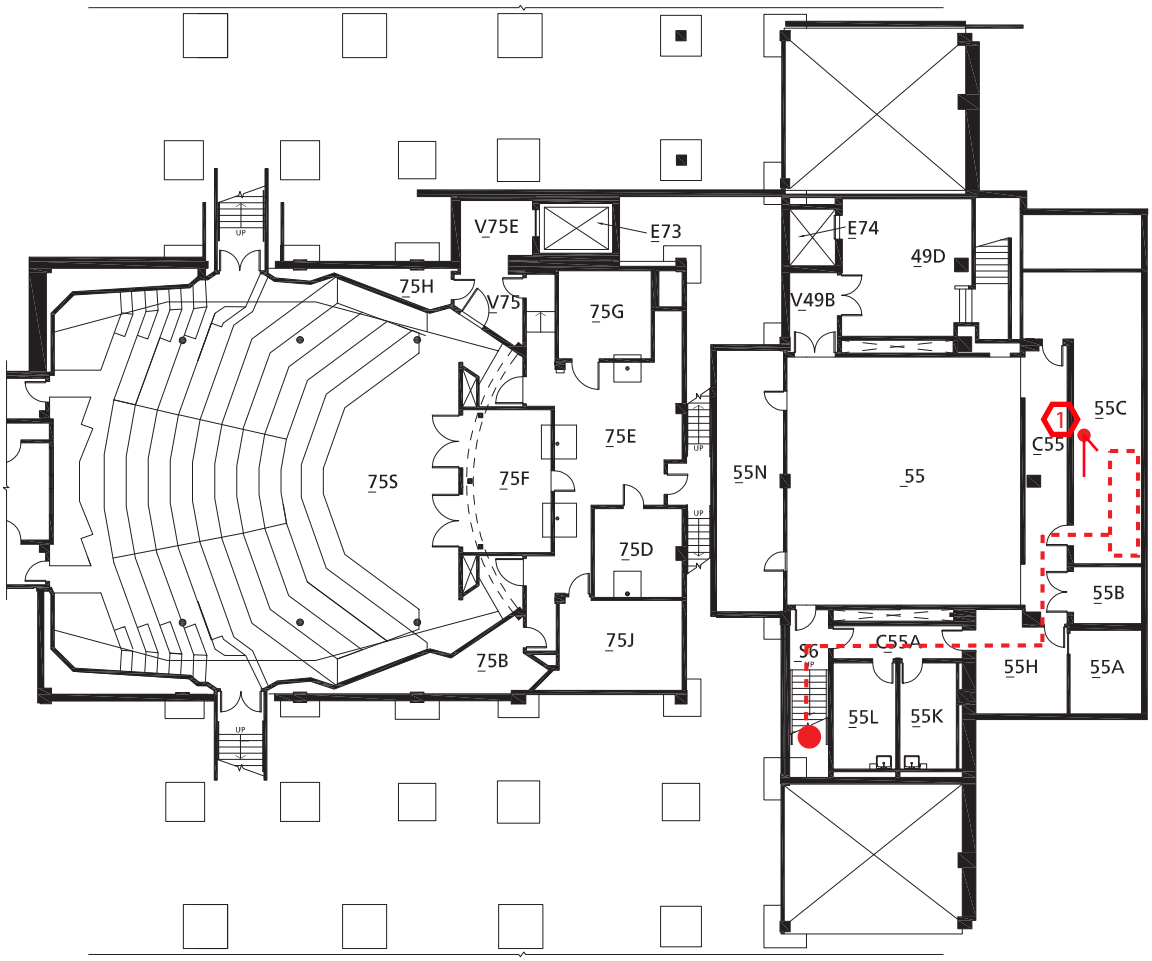

Generator placement in on SE corner of building. Cable can be fed through Floor-1 window or front door then down to the sub-basement.

7a

SUB-BASEMENT FLOOR PLAN

202 - A0

DRAWN BY:
LRR

DATE:
1/2012

SUB-BASEMENT FLOOR PLAN
202, LINCOLN HALL
1620 S.W. PARK AVENUE

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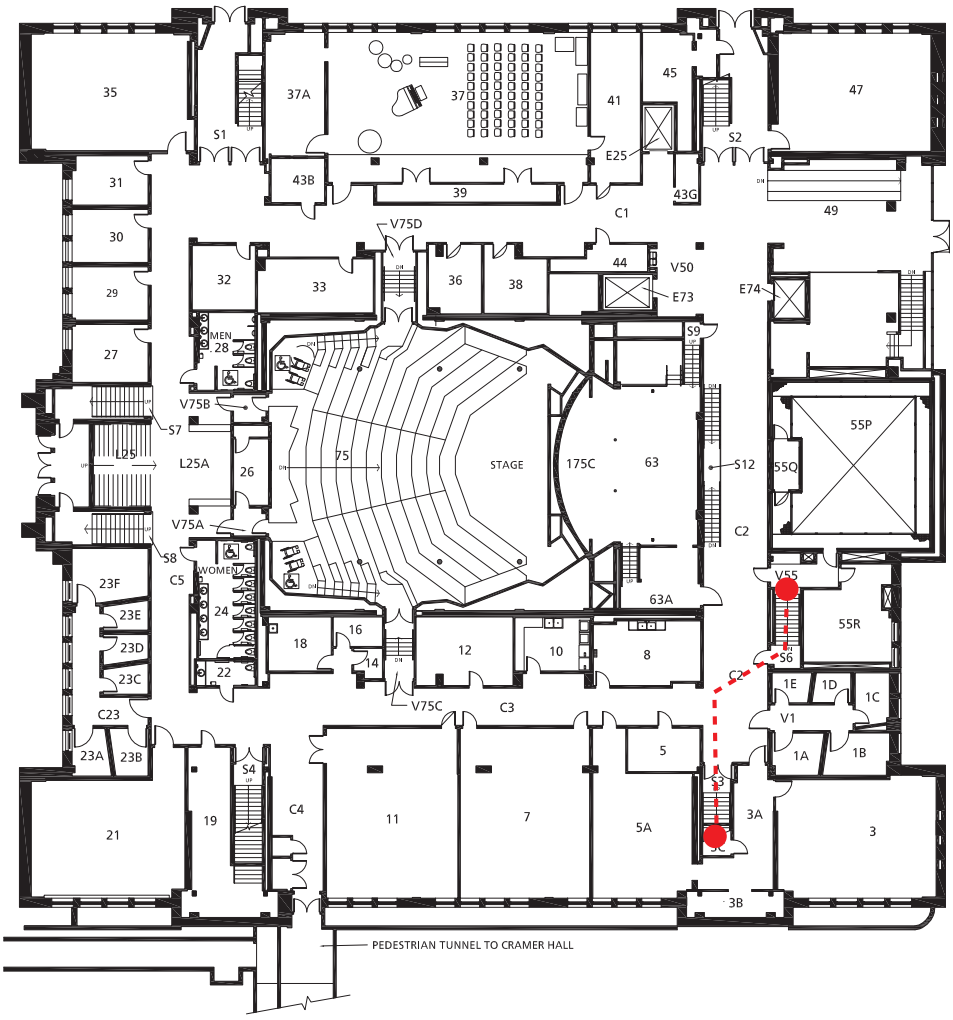

BASEMENT FLOOR PLAN

7b

202 - A1

DRAWN BY:
LRR

DATE:
1/2012

BASEMENT FLOOR PLAN
202, LINCOLN HALL
1620 S.W. PARK AVENUE

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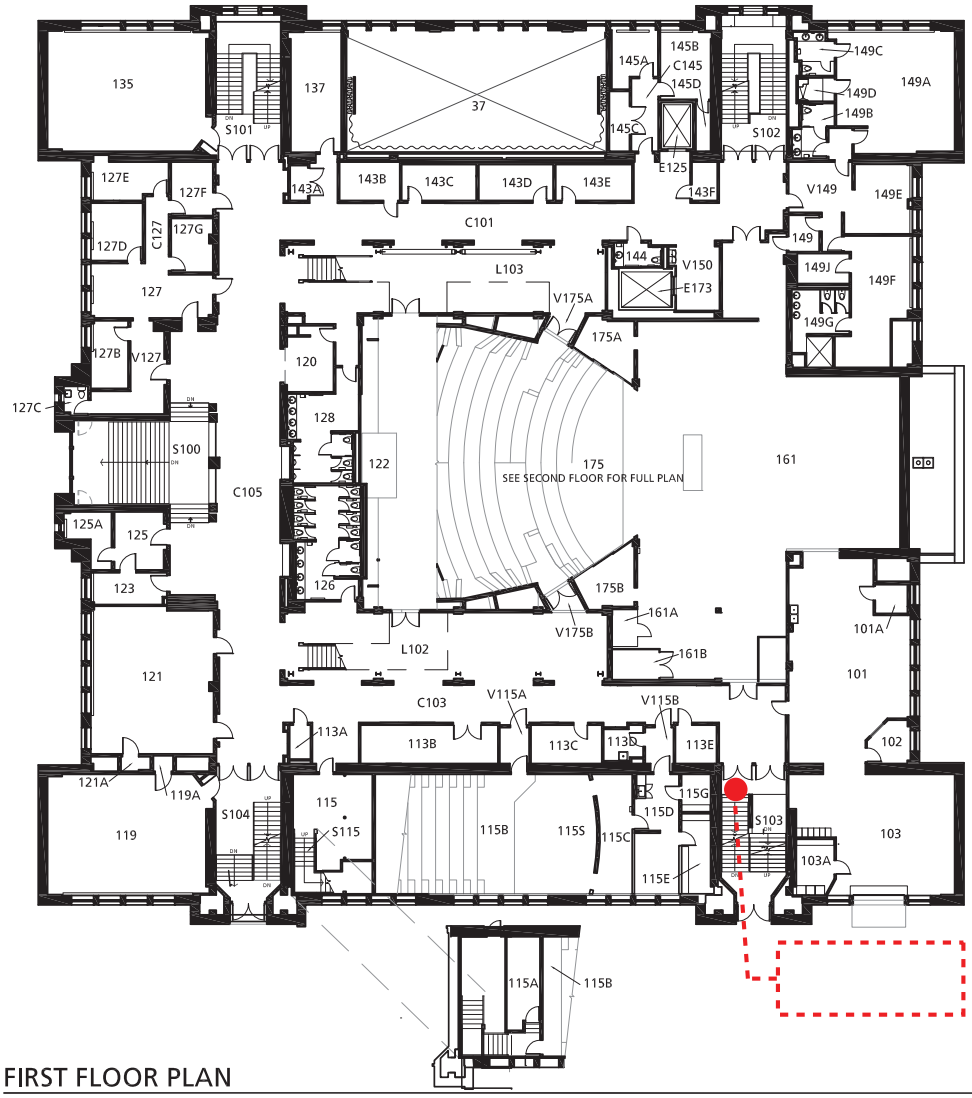

FIRST FLOOR PLAN

7c

202 - A2

DRAWN BY:
LRR

DATE:
10/2011

FIRST FLOOR PLAN
202, LINCOLN HALL
1620 S.W. PARK AVENUE

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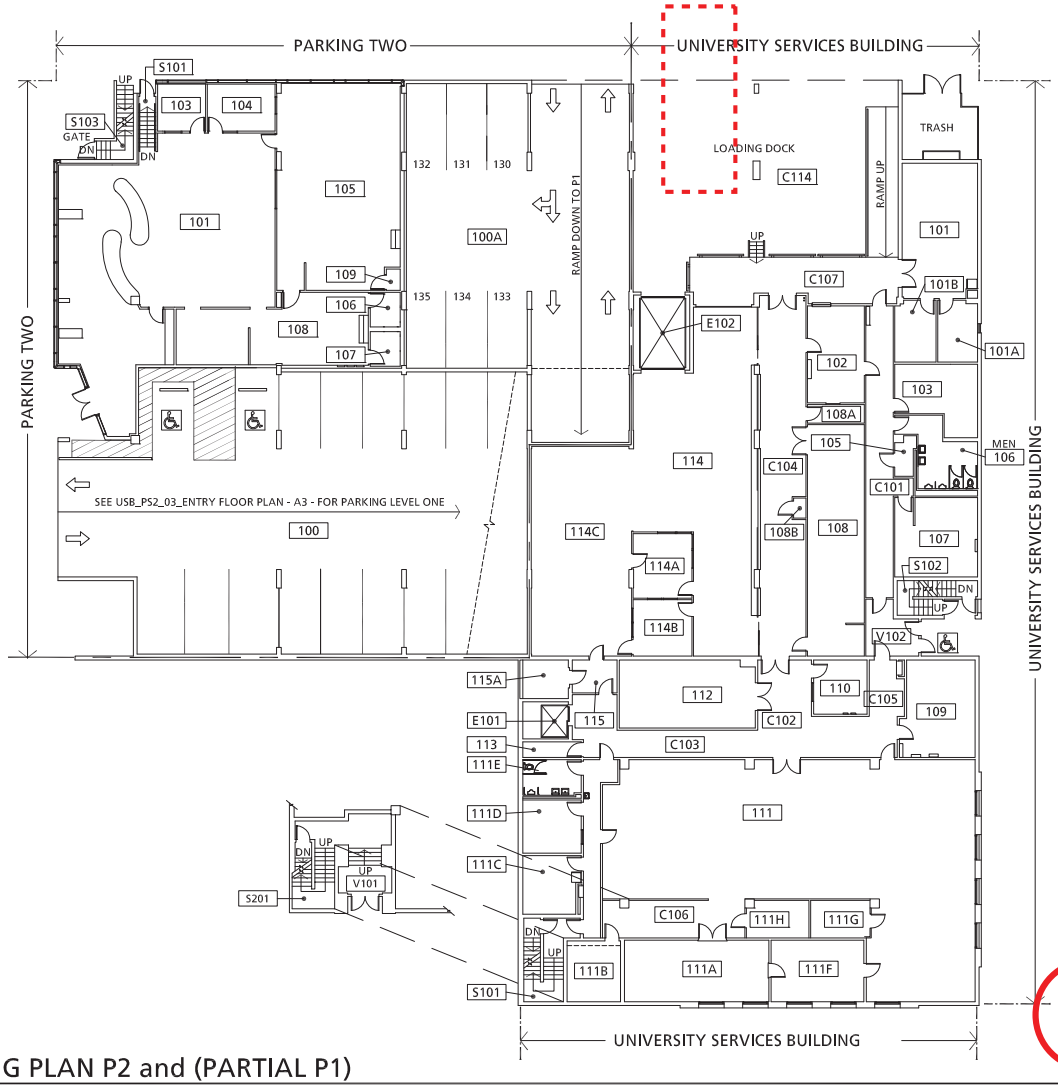

Gear is on Level 3. Generator can be placed on loading dock sidewalk area and be fed up the side of the parking structure.

8a

PARKING PLAN P2 and (PARTIAL P1)

189 - A2

DRAWN BY:
LRR

DATE:
8/2011

PARKING PLAN P2 and (PARTIAL P1)
189, PARKING TWO
1724 S. W. BROADWAY

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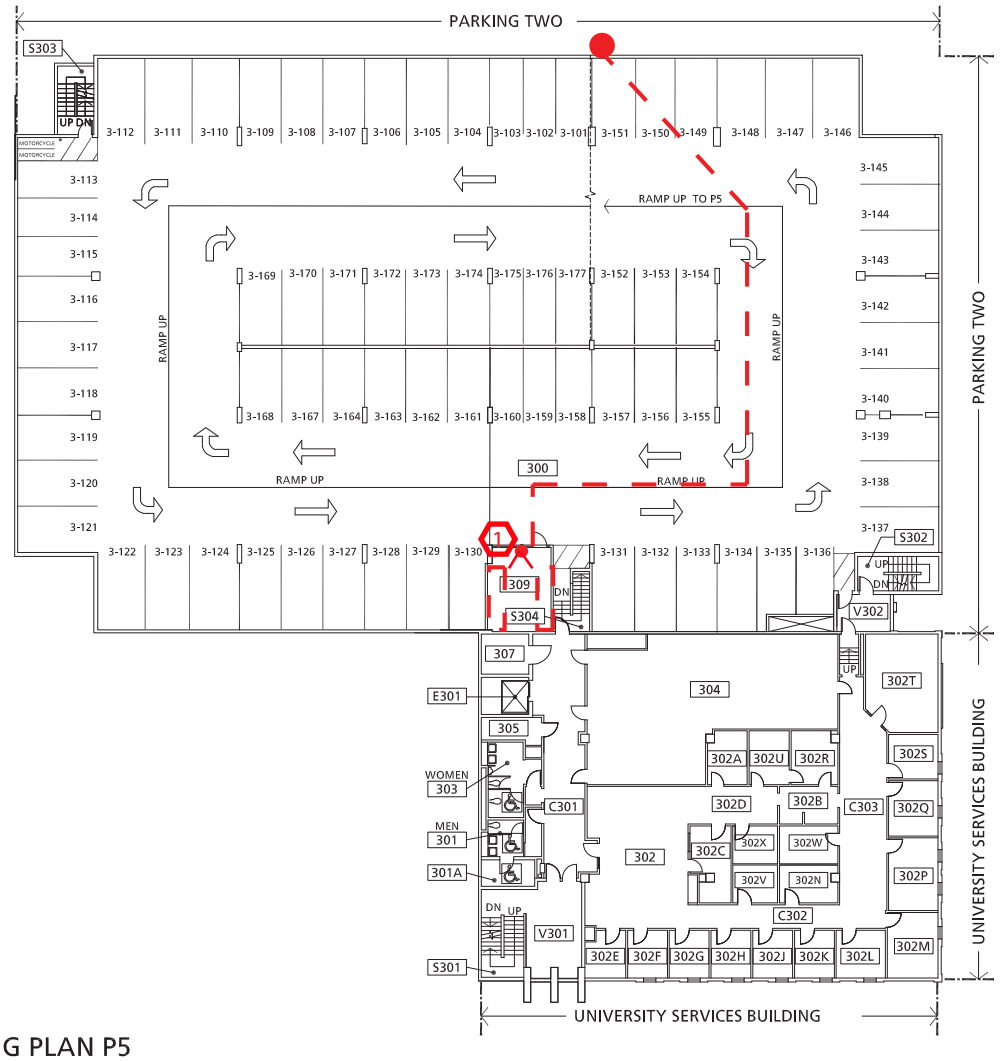

8b

PARKING PLAN P5

189 - A5

DRAWN BY:
LRR

DATE:
8/2011

PARKING PLAN P5
189, PARKING TWO
1724 S. W. BROADWAY

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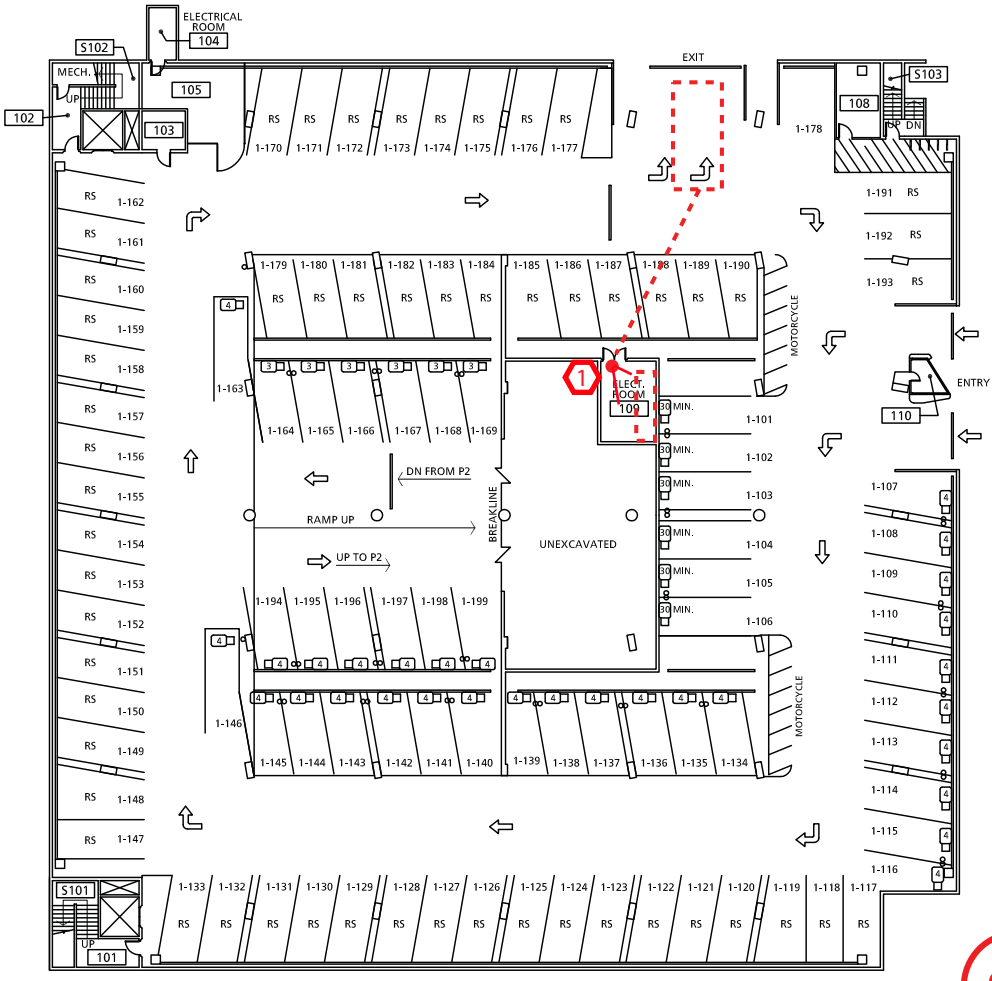
1



City of Portland will not allow generator on the street.
A smaller generator would have to sit inside the Parking Structure.

9a

PARKING PLAN ONE (BASEMENT)

191 - A1

DRAWN BY:
LRR

DATE:
01/20/2009

PARKING PLAN ONE (BASEMENT)
191, PARKING STRUCTURE 1 (ONE)
1872 S.W. BROADWAY

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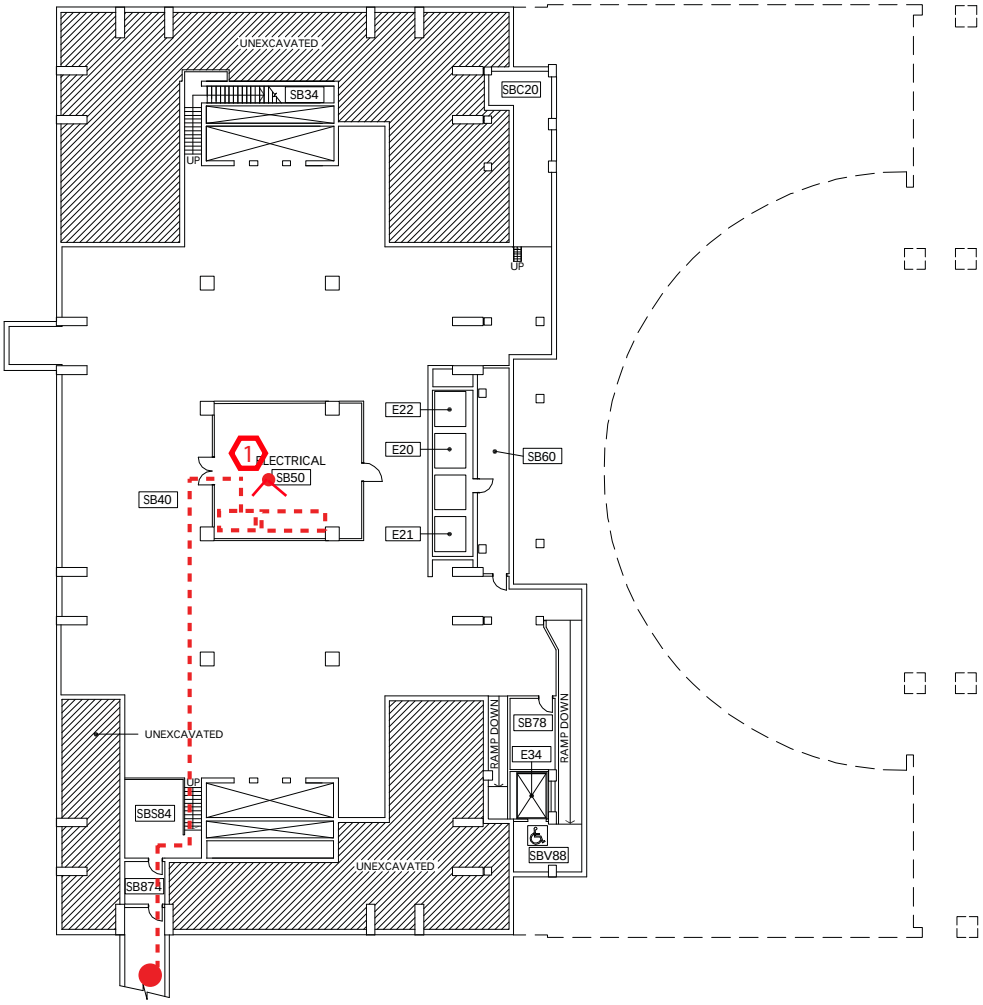

SUB-BASEMENT FLOOR PLAN

Generator placement is the same location at Peter Stott Center and fed from the PSC utility tunnel. See PSC drawings for more details.

10a

230 - A1

DRAWN BY:
LRR

DATE:
5/12/2003

SUB-BASEMENT FLOOR PLAN
230, MILLAR LIBRARY
1875 S.W. PARK AVENUE

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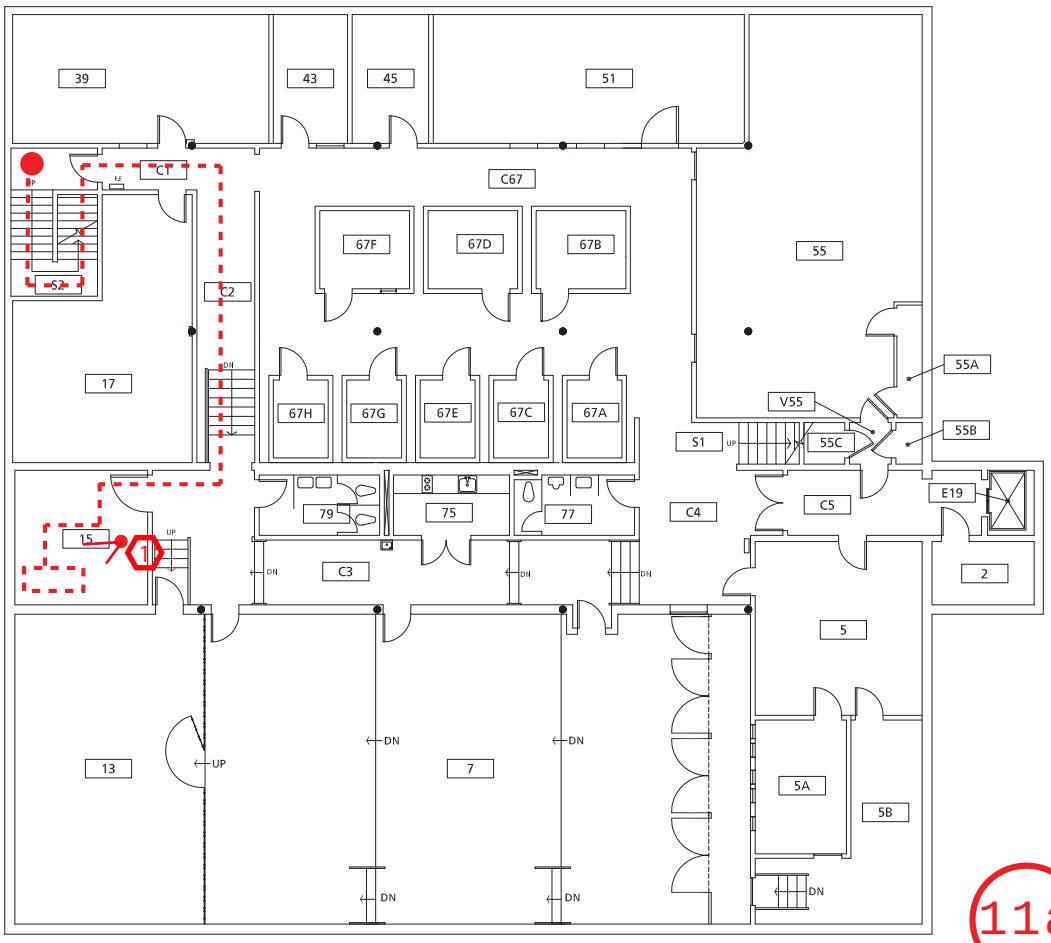

Generator placement is in parking lot on west side of building. It can be fed through door leading to a stairwell down stairs to gear in room 15.

11a

BASEMENT FLOOR PLAN

227 - A1

DRAWN BY:
LRR

DATE:
10/2011

BASEMENT FLOOR PLAN
EXTENDED STUDIES BUILDING
1633 S.W. PARK

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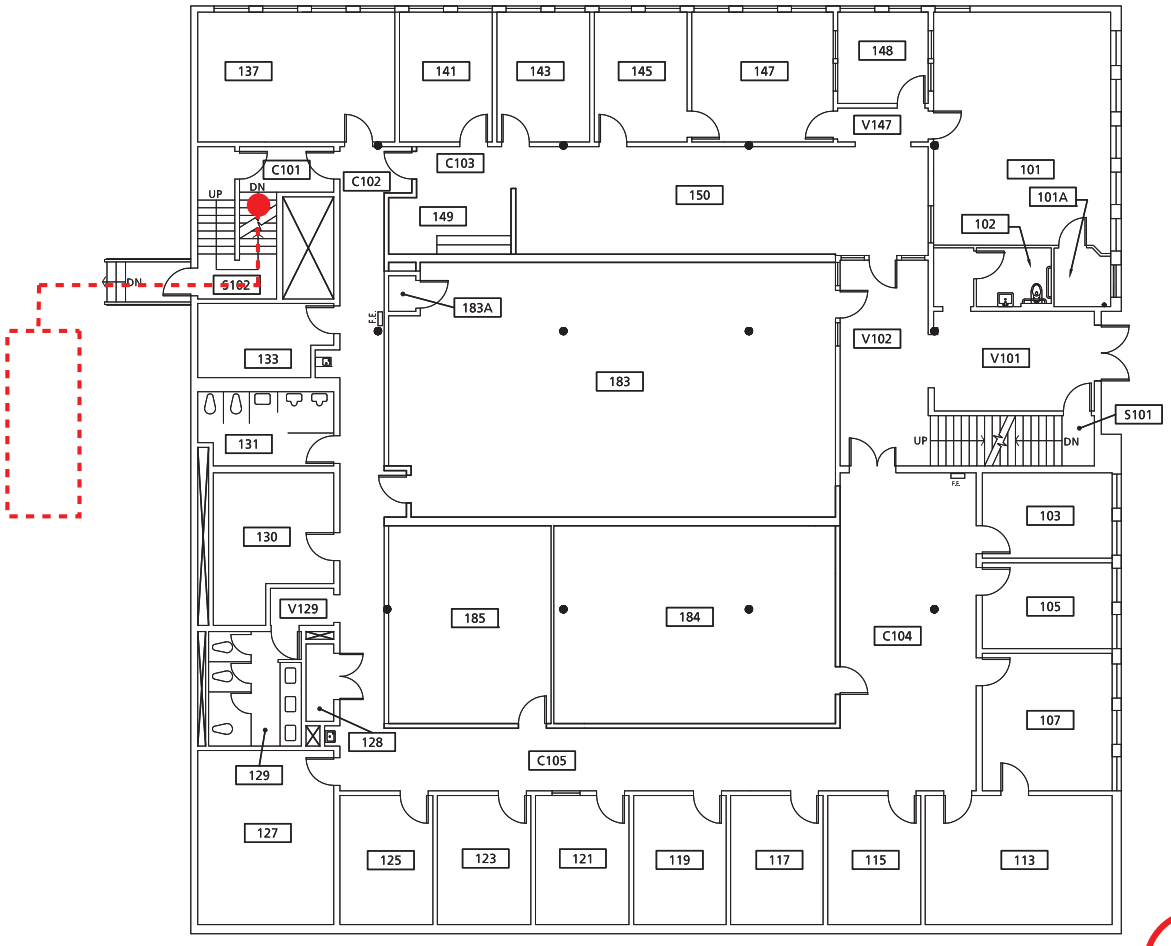

11b

FIRST FLOOR PLAN

227 - A2

DRAWN BY:
LRR

DATE:
8/2011

FIRST FLOOR PLAN
EXTENDED STUDIES BUILDING
1633 S.W. PARK

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