

# Confined Space Entry Program (OHS- 0017)

for



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Revised: December 23, 2013



## Confined Space Entry Policy

Dates

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**APPENDICES**

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### **1.0 PURPOSE**

The purpose of this policy is to inform interested persons, including employees that Kent State University is complying with the Occupational Safety and Health Administration's (OSHA) Permit Required Confined Spaces Standard, 29CFR1910.146.

The State of Ohio, OSHA and local agencies commit Kent State University to an employee Safety and Health Program that meets the standards established. As a result, Kent State University will establish written procedures for permit required and non-permit required entry into confined spaces.

If, after reading this policy, you have any questions, please contact your immediate supervisor. It is the goal of the University to provide clear understanding, safe work practices and involvement in the policy from every level within the University.

### **2.0 SCOPE**

All University employees will abide by all procedures set forth in this document. Employees' failure to follow these policies and procedures may subject that employee to disciplinary action

### **3.0 DOCUMENT CONTROL**

**3.1 Approvals:** This procedure as well as all Environmental Health and Safety (EH&S) procedures must be approved by the Manager, Environmental Health and Safety (MEHS).

Approved by: \_\_\_\_\_ Date: \_\_\_\_\_  
Manager, Environmental Health and Safety

#### **3.2 Responsibility:**

**3.2.1** The Administrator of this procedure is the MEHS. This includes updating or revising the procedure, arranging for typing and providing revised copies to the Master Copy Holder for distribution. The Administrator will establish a review schedule for this procedure to ensure that this procedure contains only the most current information relevant to existing federal, state and local laws and regulations governing confined space entry.

- 3.2.2** The Master Copy Holder for this procedure is the MEHS. MEHS is responsible for ensuring that relevant elements of applicable quality control procedures governing policies, programs, procedures and checklists are being followed. This includes the preparation of revisions to this procedure, obtaining approvals, recording changes, distribution and compliance with other document(s).

## **4.0 DEFINITIONS**

*Acceptable entry conditions* Conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.

*Attendant* An individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit space program.

*Authorized Entrant* An employee authorized by the employer to enter a permit space.

*Blanking or Blinding* The absolute closure of a pipe, line, or duct by fastening a solid plate that completely covers the bore. The blank is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

*Capable of being locked out* An energy isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it

*Confined Space* Is a space that:

- Is large enough and so configured that an employee can bodily enter and perform assigned work
- Has limited or restricted means for entry or exit
- Is not designed for continuous employee occupancy

*Confined Space Coordinator* The supervisor of the work crew entering the confined space

*Entry* The action by which a person passes through an opening into a permit-required confined space. Entry occurs as soon as any part of the entrant's body breaks the plane of an opening into the space.



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*Enclosed Space* Work areas that do not meet the definition of a confined space, but may require precautionary measures upon entering. Examples of Enclosed Spaces at Kent State University are crawl spaces, pipe chases, air handlers, and service tunnels.

*Engulfment* The surrounding and effective capture of a person by a liquid or finely divided (flowing) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

*Entry permit (permit)* The written or printed document that is provided by the employer to allow and control entry into a permit space and that contains the information specified in Appendix B of this program.

*Entry supervisor* The person (such as the employer, superintendent or supervisor) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations and for terminating entry.

**NOTE:** An entry supervisor also may serve as an attendant or as an authorized entrant as long as that person received the required training for each role he or she fills. The duties of entry supervisor are transferrable from one individual to another during the course of an entry operation.

*General (dilution) ventilation* A form of exposure control that involves providing enough air in the workplace to dilute the concentration of airborne contaminants to acceptable levels.

*Hazardous atmosphere* An atmosphere that may expose employees to the risk of death, incapacitation, and impaired ability to self-rescue (that is, escape unaided from a permit space), injury or acute illness from one or more of the following causes:

- Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL)
- Airborne combustible dust at a concentration that meets or exceeds its LFL
- Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
- Atmospheric concentration of any substance that exceeds a permissible exposure limit as published in 29 CFR Subpart G, Occupational Health; and



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- Environmental Control, or in 29 CFR Subpart Z, Toxic and Hazardous Substances, which could result in employee exposure in excess of its dose or permissible exposure limit
- Any other atmospheric condition that is immediately dangerous to life or health

**NOTE:** For air contaminants for which OSHA has not determined a permissible exposure limit, other sources of information, such as Safety Data Sheets, can provide guidance in establishing acceptable atmospheric conditions.

*Immediately Dangerous to Life or Health (IDLH)* Any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

*Isolation* The process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout/tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

*Local ventilation* An industrial ventilation system that captures and removes emitted contaminants before dilution into the ambient air of the workplace.

*Non-Permit Confined Space* A confined space that does not contain or have the potential to contain any hazard capable of causing death or serious physical harm.

*Oxygen Deficient Atmosphere* An atmosphere containing less than 19.5 percent oxygen by volume.

*Oxygen Enriched Atmosphere* An atmosphere containing more than 23.5 percent oxygen by volume.

*Permit-Required Confined Space (permit space)* A confined space that has one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere
- Contains a material that has the potential for engulfing an entrant



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- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section
- Contains any other recognized serious safety or health hazard (See Appendix A)

*Qualified Employee* An employee who possesses a recognized degree, certification, or professional standing, or who by expertise, knowledge, training and experience has successfully demonstrated his/her ability to resolve problems relating to the work, subject matter or project.

*Rescue Service* The personnel designated to rescue employees from permit spaces.

*Retrieval System* The equipment (including a retrieval line, chest or full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces

*Short Term Exposure Limit (STEL).* The concentration of which workers can be exposed continuously or in a short period of time without suffering from 1) irritation; 2) chronic or irreversible tissue damage; or 3) narcosis of sufficient degree to increase the likelihood of accidental injury, impair self-rescue, or materially decrease work efficiency while the daily TLV-TWA is not exceeded.

## 5.0 DUTIES

### 5.1 Duties of Management

- 5.1.1 Implement the measures necessary to prevent unauthorized entry
- 5.1.2 Identify and evaluate the hazards of permit spaces before employees enter
- 5.1.3 Provide adequate means, procedures, and practices necessary for safe permit space entry operations, including, but not limited to, the following:
  - 5.1.3.1 Specifying acceptable entry conditions;
  - 5.1.3.2 Isolating the permit space;



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- 5.1.3.3 Purging, inerting, flushing, or ventilating the permit space as necessary to eliminate or control atmospheric hazards;
- 5.1.3.4 Providing pedestrian, vehicle, or other barriers as necessary to protect entrants from external hazards;
- 5.1.3.5 Verifying that conditions in the permit space are acceptable for entry throughout the duration of an authorized entry; and
- 5.1.3.6 Provide and maintain the following equipment and ensure its proper use:
  - Atmospheric Testing and monitoring equipment
  - Ventilating equipment;
  - Communications equipment
  - Personal protective equipment when feasible engineering and work practice controls do not adequately protect employees
  - Lighting equipment to illuminate the space well enough to work safely and to exit the space quickly in an emergency
  - Barriers and shields as required
  - Equipment for safe entry, exit, and/or positioning within the space (See equipment list in Section 5.7.5 and 5.7.6)
  - Rescue and emergency equipment as appropriate for non-entry retrieval and/or entry rescue (See Section 5.7.6)

5.1.4 Each permit space shall be monitored by an attendant. Provide at least one attendant outside the permit space for the duration of entry operations.

5.1.5 Multiple spaces may not be monitored by a single attendant.

5.1.6 If a University employee and a contractor enter a permit space together, then the contractor will follow the Kent State University Permit Entry Confined Space Program. If two separate contractors enter a permit entry confined space together, it will be their responsibility to work together so that they do not endanger each other.

## 5.2 Duties of Entrant



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- 5.2.1 Recognize the hazards of entry, including signs, symptoms and consequences of exposure and possible behavioral effects;
- 5.2.2 Use personal protective equipment and all other equipment appropriately;
- 5.2.3 Maintain communications with attendant;
- 5.2.4 Alert the attendant and immediately exits when recognizing any warning signs or symptom of exposure or detects a prohibited condition; and
- 5.2.5 Evacuate the confined space at the direction of the attendant.
- 5.3 Duties of Attendant
  - 5.3.1 Recognize the hazards of entry, including signs, symptoms and consequences of exposure and possible behavioral effects of hazard exposure in authorized entrants
  - 5.3.2 Ensure proper atmospheric monitoring
  - 5.3.3 Remain outside the permit space at all times during entry operations, unless relieved by another attendant
  - 5.3.4 Keep track of who is in the permit space
  - 5.3.5 Confirm communication method, check communications equipment and maintain communications with the authorized entrant(s)
  - 5.3.6 Keep unauthorized persons away from the space
  - 5.3.7 Monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space, and order evacuation of the confined space, if necessary
  - 5.3.8 Immediately call for rescue services when needed
- 5.4 Duties of Entry Supervisor



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- 5.4.1 Determine if entry is required
- 5.4.2 Identify the hazards of entry, including signs, symptoms and consequences of exposure and possible behavioral effects of hazard exposure
- 5.4.3 List the personnel who will be involved in the entry and verify they have been trained in the roles assigned
- 5.4.5 Ensure the permit is filled out completely
- 5.4.6 Make sure all necessary safety equipment is on hand
- 5.4.7 Verify that non-entry retrieval methods or rescue services are available on-call, and that the means to summon them are operable
- 5.4.8 Ensure that atmospheric monitoring is performed properly
- 5.4.9 Issue the permit after adding any needed information, sign the permit to authorize entry and, post the permit at the confined space
- 5.4.10 Allow only the authorized entrants, attendants, and rescuers listed on the permit to act in these roles
- 5.4.10 Remove unauthorized individuals who enter or try to enter the permit space during entry operations
- 5.4.11 Remain at the permit entry location until relieved by another authorized entry supervisor.
- 5.4.12 Terminate entry or cancel the entry permit when the assigned task has been completed or earlier if a condition not allowed under the permit arises
- 5.4.13 Note on the permit any problems encountered during an entry operation
- 5.5 Duties of Rescue Personnel
  - 5.5.1 To facilitate non-entry rescue, retrieval systems or methods shall be used whenever an entrant enters a permit space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant. Retrieval systems shall meet the following requirements:



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- 5.5.1.1 Each entrant shall use a chest or full body harness, with a retrieval line attached at the center of the entrant's back near shoulder level, or above the entrant's head. Wristlets may be used if a chest or full body harness is infeasible or creates a greater hazard and the use of wristlets is the safest and most effective alternative.
- 5.5.1.2 The other end of the retrieval line shall be attached to a mechanical device or anchorage outside the permit space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary.
- 5.5.2 When arranging to have public responders (Fire Department/Rescue Team) perform permit space rescue, Kent State University shall:
  - 5.5.2.1 Inform the public rescue service of the hazards they may confront when called on to perform rescue at Kent State University;
  - 5.5.2.2 Provide the public rescue service with access to all permit spaces from which rescue may be necessary, so the rescue service can develop appropriate rescue plans and practice rescue operations at least annually;
  - 5.5.2.3 Assure the public rescue service is suitably trained and equipped to respond effectively to the needs of our confined spaces.
- 5.5.3 If an injured entrant is exposed to a substance for which a Safety Data Sheet (SDS) or other similar written information is required to be kept at the Worksite, that SDS or written information shall be made available to the medical facility treating the exposed entrant.
- 5.6 Duties of Employees
  - 5.6.1 Participate in the development, implementation and improvements to all aspects of this program.
  - 5.6.2 All employees shall comply with the requirements of the Kent State University Permit Entry Confined Space Program.



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- 5.6.3 No attempts shall be made to enter a permit entry confined space by any employee unless they have been authorized by department management and have completed the appropriate confined space training.

### **5.7 Duties of the Confined Space Coordinator**

- 5.7.1 Assist management in coordination, implementation, and enforcement of the Kent State University Permit Entry Confined Space Program
- 5.7.2 Arrange for applicable training and hands-on entry and rescue drills, in accordance with section 6.0 of this program
- 5.7.3 Investigate and report any confined space incidents involving illness, injury, or near accident, whether with employees or contract personnel to the MEHS.
- 5.7.4 Work with the MEHS to review the Kent State University Permit Entry Confined Space Program annually and update as necessary, consulting with affected employees and their authorized representatives
- 5.7.5 Notify contractors of any known hazards before they enter a permit entry confined space. Emphasize that contractors are required to have a written permit entry confined space program at pre-construction meetings
- 5.7.6 Where a joint project requires the entry into a permit entry confined space by both university employees and contractors, contractors must be trained and follow the guidelines listed in this program.
- 5.7.8 Where a joint project requires the entry into a permit entry confined space by both university employees and contractors, complete Permit Entry Confined Space Pre-Job Meeting Checklist form with contractors to document pre-job meetings. Debrief the contractor after the entry.
- 5.7.9 Where a joint project requires the entry into a permit entry confined space by both university employees and contractors, investigate Kent State University Permit Entry Confined Space Program violations by contractors. Report all violations to the MEHS.

## **6.0 SCOPE AND APPLICATION**

### **6.1 Confined Space Identification**

The Confined Space Coordinator shall work with the MEHS to conduct a survey to identify and document the confined spaces that exist within the facility and determine what are permit entry spaces (Appendices E). All known safety and health hazards must be identified on the survey. The Confined Space Coordinator shall notify the MEHS of changes to the confined space listing in Appendix E.

If a change occurs at any time in the use or configuration of a non-permit confined space that might increase the hazards to entrants, the space must be evacuated immediately and re-evaluated as soon as possible and, if necessary, reclassified as a permit-required confined space.

## 6.2 Documentation Updates

New equipment or modification of existing equipment, and changes in process or materials must be reviewed and updates made to the confined spaces listing. Changes to equipment, process or materials may make a previously non-permit space a permit space. All new equipment which meets the definition of a confined space must be entered on the listing. The updated listing must replace the old listing, in all copies of this program

## 6.3 Communication of Changes

When the confined spaces listing changes, all appropriate personnel must be trained to understand the changes. Appropriate personnel include, but are not limited to, the following:

6.3.1 Authorized entrants

6.3.2 Attendant personnel

6.3.3 Entry supervisors

6.3.4 Contractors

6.3.5 Fire Department or other rescue personnel

## 6.4 Unauthorized Approach or Entry

Since unauthorized approach or entry into a permit space may occur, all permit-required confined spaces must be posted with a warning. The posting may be a sign, tag or other device permanently affixed to or near each entry or access way to each permit space. Employees who work in the vicinity of permit spaces must be trained to understand the hazards and risks.

An example of unauthorized entry can occur when an employee enters into a permit-required confined space to retrieve an inadvertently dropped article.

Any time that an unauthorized approach or entry into a permit space is noted, immediately notify the person that they must stay away/exit the space immediately. Inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space. Secure assistance in enforcement of the policy if needed.

#### 6.5 Signs, Tags or Other Posted Warnings

Post warning signs, tags or other devices at each permit space, to effectively warn employees of the hazards and risks of unauthorized entry. During an entry, portable warning cones, flags or other devices may be used while the space is open.

The warning should read "Danger - Permit Required Confined Space - Do Not Enter". The posting may be in other languages in addition to English and may use graphics to enhance employee comprehension. Where posting is incomplete, weathered or is beginning to deteriorate, it shall be replaced.

#### 6.6 Additional Measures to Discourage Entry

Take other measures as necessary to reduce the potential for unauthorized entry into a permit space, such as a padlock, bolts/lock-nuts, cable tie with tag or other security devices.

#### 6.7 Hazard Identification

Identify and document on the Confined Spaces Survey Form all hazards for each confined space area and its equipment. Examples of specific hazards associated with confined spaces include, but are not limited to, the following:

##### 6.7.1 Oxygen deficiency or enrichment

- 6.7.2 Hazardous materials. This includes, but is not limited to, irritants, corrosives, toxics, flammables, combustibles, carcinogens, explosives, asphyxiates, and agents that cause reproductive or other target organ effects
- 6.7.3 Energy Sources (electrical, mechanical, steam, pneumatic, hydraulic, heat, cold, etc.)
- 6.7.4 Stored or Residual energy (capacitors, gravity, springs, hydraulic accumulators);
- 6.7.5 Process utilities (air, steam, water, cooling or heating media and fuel)
- 6.7.6 Hazardous process materials, including raw materials, intermediates, cleaning materials, purging materials, etc
- 6.7.7 Hazardous processes during the entry (solvents, welding, torch work, live electrical work)
- 6.7.8 Configuration Hazards
  - 6.8.1 Difficult egress due to configuration of opening
  - 6.8.2 Engulfment, drowning.

6.8 Hazard Control

The Entry Supervisor must identify and implement methods to control each of the hazards. Prior to entering the permit space, eliminate or lower to an acceptable level of risk all actual and potential hazards.

6.9 Confined Space Listing Survey

See Appendix E for the confined space listing survey.

## **7.0 METHODS OF COMPLIANCE (Standard Operating Procedures)**



7.1 General Methods

- 7.1.1 Unauthorized entry into permit spaces is not allowed for any reason. All personnel must follow the proper procedures for entry into permit-required confined spaces. This includes management, employees, contractors or others. This shall constitute a serious violation of university policy and shall be addressed in accordance with university disciplinary procedures.
- 7.1.2 Where it is determined that personnel will enter permit-required confined spaces, this written confined space program must be implemented. This program is available for inspection by employees, their authorized representatives, temporary agency employees, contractors and Public Employee Risk Reduction's (PERRP) representatives.
- 7.1.3 Any adverse changes within the space noted by the monitoring device(s), entrant, attendant or entry supervisor requires the immediate evacuation from inside the space and recheck of all required acceptable entry conditions prior to reentry.
- 7.1.4 When there are changes in the use or configuration of a non-permit confined space that might increase the hazards to entrants, the entry supervisor shall reevaluate that space and, if necessary, reclassify it as permit-required confined space.
- 7.1.5 A space classified as a permit-required confined space may be reclassified as a non-permit confined space under the following conditions and procedures:
  - 7.1.5.1 If the permit space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated without entry into the space, the permit space may be reclassified as non-permit confined space for as long as the non-atmospheric hazards remain eliminated.
  - 7.1.5.2 If it is necessary to enter the permit space to eliminate the hazards, the entry will meet all requirements of permit-required confined space entry and with appropriate rescue and emergency service provisions.

*Note: Control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazards.*

- 7.1.5.3 The entry supervisor must document the basis for determining that all hazards in a permit space have been eliminated, through a certification that contains the date, the location of the space, and the signature of the person making the determination. The certification shall be made available to each employee or his or her authorized representative or the contractor employee entering the space.
- 7.1.5.4 If hazards arise within a permit space that has been reclassified to a non-permit space, each employee in the space must exit the space. The entry supervisor must then reevaluate the space and determine whether it must be reclassified as a permit space, in accordance with applicable provisions.
- 7.1.6 When contractors and university employees perform work that involves permit space entry by both parties, Kent State University must implement the Permit Entry Confined Space Pre-Job Meeting Checklist (Appendix H).
- 7.1.6.1 Inform the contractor of the location of any permit spaces and that permit space entry is allowed only through compliance with a permit space program meeting the requirements of the OSHA Standard. The contractor must not assume all locations have been properly noted.
- 7.1.6.3 When both University personnel and contractor personnel will be working in or near permit spaces, coordinate entry operations with the contractor with a pre-job briefing.
- 7.1.7 In addition to complying with permit space requirements that apply to all employers, each contractor hired to perform permit space entry operations shall.
- 7.1.7.1 Obtain any available information regarding permit space hazards and entry operations from Kent State University.
- 7.1.7.2 Coordinate entry operations with Kent State University, when both Kent State University personnel and contractor personnel will be working in or near permit space.
- 7.1.7.3 Contractor shall inform Kent State University of any hazards confronted or created in permit spaces.

7.1.8 No smoking is allowed inside any confined space openings.

7.1.9 No work with flame cutting, brazing, or welding shall be performed when the oxygen content is greater than 23.5% by volume, nor without a signed Hot Work Permit, obtained from the office of Fire Safety.

7.1.10 Conclude the entry by closing the openings, securing the spaces, reposting signs and canceling the permit.

## 7.2 Entry Permit System

7.2.1 Before authorized entry, the entry supervisor (or authorized personnel) must document the completion of measures required by preparing an entry permit. (See Appendix B)

7.2.2 Before entry begins, the entry supervisor identified on the permit must sign the completed permit.

7.2.3 The completed permit must be available at the time of entry to all authorized entrants, by posting it at the entry portal or other equally effective means, so that the entrants can confirm the completion of pre-entry preparations.

7.2.4 The duration of the permit may not exceed the time required to complete the assigned task identified on the permit, or one shift, whichever is shorter.

7.2.5 The entry supervisor must terminate entry and cancel the entry permit when:

7.2.5.1 Completion of the entry operations.

7.2.5.2 A condition prohibited by the entry permit arises in or near the permit space.

7.2.5.3 The permit duration has expired.

7.2.6 The entry permit must identify:

7.2.6.1 The permit designated space.

7.2.6.2 The purpose of the entry.

- 7.2.6.3 The date and the duration of the entry permit.
- 7.2.6.4 The authorized entrants by name(s) or by other means that enable the attendant to determine which authorized entrants are inside the permit space
- 7.2.6.5 The name(s) of the attendant(s).
- 7.2.6.6 The name and signature of the entry supervisor.
- 7.2.6.7 The hazards of the permit space.
- 7.2.6.8 The measures used to isolate the permit space and to eliminate or control permit space hazards before entry.
- 7.2.6.9 The acceptable entry conditions.
- 7.2.6.10 The results of initial and periodic tests performed, accompanied by the names or initials of the testers and time of tests.
- 7.2.6.11 Arrangements with rescue and emergency services (Kent Fire Department) must be made if non-entry rescue methods might be impaired;
- 7.2.6.12 The communication procedures used by authorized entrants and attendants to maintain contact during the entry.
- 7.2.6.13 Equipment, such as personal protective equipment, testing equipment, communications equipment, alarm systems, and rescue equipment provided.
- 7.2.6.14 Any other information whose inclusion is necessary in order to ensure employee safety.
- 7.2.6.15 A reference to any additional permits, such as for hot work, that have been issued to authorize work in the permit space.

**7.2.7 Exception to Permit Requirement - OSHA "Alternate Procedures"**

If the only hazard of a permit space is an actual or potential hazardous atmosphere and continuous forced air ventilation is sufficient to maintain acceptable atmosphere for entry, then a permit is not necessary. Before such an entry, the Confined Space Coordinator must first develop and record monitoring data that demonstrates that continuous forced air ventilation is sufficient to maintain acceptable atmosphere for entry. The determinations and supporting data required to prove the above criteria for "alternate procedures" must be documented and made available to each employee (or their authorized representative) who enters the space under these "alternate procedures." If initial entries are necessary to gather this data, they must be permit entries according to this policy.

7.2.7.1 Eliminate any conditions making it unsafe to remove an entrance cover prior to removal.

7.2.7.2 When removing entrance covers, guard the opening by means of a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and will protect each employee working in the space from foreign objects entering the space.

7.2.7.3 Test the internal atmosphere with a calibrated direct-reading instrument before an employee enters the space. Look for the following conditions:

7.2.7.3.1 Oxygen content

7.2.7.3.2 Flammable gases and vapors

7.2.7.3.3 Potential toxic air contaminants

7.2.7.4 There may be no hazardous atmosphere within the space whenever any employee is inside the space.

7.2.7.5 Mandatory continuous forced air ventilation:

7.2.7.5.1 An employee may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere.

7.2.7.5.2 The forced air ventilation shall be so directed as to ventilate the immediate areas where an employee is or will be present within the space and shall continue until all employees have left the space.

7.2.7.5.3 The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.

7.2.7.5.4 Periodically test the atmosphere in the space to ensure the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere. Any employee who enters the space (or their authorized representative) shall have the opportunity to observe the pre-entry testing. If a hazardous atmosphere exists during entry.

7.2.7.5.4.1 Each employee shall leave the space immediately.

7.2.7.5.4.2 Evaluate the space immediately to determine how the hazardous atmosphere developed.

7.2.7.5.4.3 Take appropriate measures to protect employees from the hazardous atmosphere before any subsequent entry take place.

7.2.7.5.4.4 Verify the space is safe for entry and that the measures required by this section have been taken, through a written certification (7.2.7) that contains the date, the location of the space, and the signature of the person providing the certification. This certification shall be made before entry and shall be made available to employees entering the space, or their authorized representative.

### 7.3 Atmospheric Evaluation and Monitoring

7.3.1 Determine what materials are involved in the necessary work. Evaluate materials for their hazards when used in a confined space.

7.3.2 Thoroughly test for those hazardous materials, which may endanger the safety and health of personnel.

- 7.3.3 Provide atmospheric testing instruments equipped with alarms that activate at a pre-set level and function as continuous monitoring devices during entry. Instrument alarms should be both visible and audible.

Conduct atmospheric testing without entry by inserting a probe with air pump, or the entire instrument into the permit space through an opening. Always test from outside the confined space. Never enter the permit space to test the atmosphere. Personnel shall not place their head or face in the opening.

Begin testing at the opening, and continue downward, testing at various heights within the space. Test in pockets and around irregular surfaces of the interior. Once inside the space, test at least four feet in advance of any direction of travel.

Perform atmospheric testing during entry, when feasible.

Provide each authorized entrant or that employee's authorized representative an opportunity to observe the pre-entry and any subsequent testing or monitoring of permit spaces.

Reevaluate the permit space in the presence of any authorized entrant or that employee's authorized representative who requests that the employer conduct such reevaluation because the entrant or representative has reason to believe that the evaluation of that space may not have been adequate.

Immediately provide each authorized entrant or that employee's authorized representative with the results of any testing conducted.

- 7.3.3 Test for oxygen first whenever there is a possibility for oxygen deficiency or enrichment. Second, test for flammable/explosive hazards. Third, test for health hazards such as toxicity and corrosives.
- 7.3.5 Recheck all acceptable entry conditions at the entry mid-point when an entry lasts four or more hours.
- 7.3.6 Whenever direct-reading colorimetric indicator tubes are used for measuring corrosive or toxic gases and vapors that cannot be detected by direct reading instruments, the Environmental Health and Safety Department or outside consultants shall be used. Take frequent readings to approximate continuous monitoring.

- 7.3.7 Where continuous monitoring of any hazard is not feasible, recheck of conditions must be performed at least every hour or more frequently as appropriate. The testing intervals should be marked on the permit, after being established by the Confined Space Coordinator.
- 7.3.8 If entrants exit the confined space for any reason, the atmosphere must be re-tested and a new permit issued before re-entering the space.
- 7.3.9 When the permit space responsibility changes (shift change), the new group with responsibility must completely verify that all conditions are acceptable, by visual inspection and air monitoring. Complete a new permit for the new shift.
- 7.4 Permit Entry Confined Space Preparation
  - 7.4.1 All permit-required confined spaces shall be properly prepared prior for entry. This includes the emptying, decommissioning, removal of residual materials, isolation from energy sources or mechanical equipment, and proper environmental conditioning.

If cleaning is necessary in a confined space to achieve acceptable atmospheric conditions, adhere to the following procedures:

    - 7.4.1.1 All entrants must be equipped with designated safety equipment appropriate for the hazards present
    - 7.4.1.2 All entrants must be equipped with pressure-demand, air-line respirators with escape SCBA or equip entrants with an SCBA
    - 7.4.1.3 Allow only non-sparking tools for use in the space.
  - 7.4.2 Evaluate the potential hazards and atmosphere of the space thoroughly. Assure that there is clear means of exit from all accessible parts of the permit space.
  - 7.4.3 Assure that work tasks inside the space do not adversely affect the environment inside the permit space. Conditions in the area outside the permit space must also be evaluated for potential to create hazards inside the permit space.
  - 7.4.4 Disconnect, tag, and lock out any mechanical, pneumatic, hydraulic, or electrical equipment that, if activated, could cause injury or damage within the confined



space. Refer to the Kent State University Lock-out/Tag-out Program Procedures.

- 7.4.5 Physically cap the open end, bleed, and/or lock out all valves in supply lines that open into the permit space regardless of whether the line is for flow into or out of the space. In addition, pipes need to be double blanked in accordance with Kent State University's Control of Hazardous Energy Policy
  - 7.4.6 Provide adequate lighting in the work area and travel paths.
  - 7.4.7 Select personal protective equipment, tools, or other required equipment suitable for work in the confined space environment. Hot work performed inside the space may require additional gas testing, stand-by fire extinguishers, and a "fire-watch." Use of a Hot Work Permit, from the Fire Prevention Office must accompany such work.
  - 7.4.8 Atmospheric conditions
    - 7.4.8.1 If oxygen content is other than 20.8% - 21.9% by volume, at 132 mm mercury partial pressure, determine the cause and take corrective action. If ventilation is the corrective action, ventilate as appropriate then shut-off ventilation equipment and re-test the oxygen content to determine if acceptable entry conditions exist.
    - 7.4.9 If the concentration is greater than 10% of the lower explosive limit (LEL), determine the cause and take corrective action. If ventilation is the corrective action, ventilate as appropriate then shut-off ventilation and retest the atmosphere. (If the concentration of oxygen in the atmosphere is abnormal, correct the measured value of flammability)
- If the atmosphere is still above 10% of the LEL after ventilation and re-testing, clean the confined space or the source of the flammables eliminated, before permitting entry. (See 7.4.1 for cleaning procedures)

## 7.5 Ventilation

- 7.5.1 Provide adequate ventilation to prevent explosive concentrations of combustible dusts.

- 7.4.2 Provide adequate ventilation to prevent toxic, asphyxiating, corrosive or other contaminants in the atmosphere at a concentration equal or greater than the lowest published exposure limit. If a permit entry confined space cannot be isolated from the possible release of hazardous substances, treat the space at IDLH levels and use the proper personal protective equipment.
- 7.5.3 Ventilate a confined space whenever the atmosphere does not meet acceptable entry conditions.
- 7.5.4 Never ventilate with oxygen. Always use fresh air.
- 7.5.5 Select ventilation equipment appropriate for the hazards, such as explosion-proof or corrosion resistant.
- 7.5.6 Begin ventilating far enough in advance, so that the air will be safe before anyone enters the space.
- 7.5.7 Before entry, test the atmosphere to determine if acceptable entry conditions exist. If not, continue ventilation. If continued ventilation and retesting does not result in acceptable conditions, enter under continuous ventilation.
- 7.5.8 If required during entry, provide continuous ventilation for as long as anyone is in the space.
  - 7.5.8.1 If work operations inside the space can make the air unsafe, (i.e. hot work, painting, coating, rising, solvents, sandblasting,) ventilation must be continuous during the duration of the entry.
  - 7.5.8.2 The confined space entry permit must state if there is a need for continuous ventilation.
  - 7.5.8.3 Use local exhaust ventilation whenever possible during hot work and operations that use toxics or flammables.
  - 7.5.8.7.4 If local exhaust ventilation is not adequate when contaminants are widely dispersed, use general ventilation and monitor to determine its effectiveness.
- 7.5.9 General ventilation does not decrease the amount of released contaminants, thus limiting its effectiveness. To avoid this concern, please note the following:

- 7.5.9.1 Entrant must be as far as possible from contaminant source.
- 7.5.9.2 Contaminants must not be highly toxic.
- 7.5.9.3 The contaminant concentration must be low.
- 7.5.9.4 The contaminants must be produced at a uniform rate.
- 7.5.9.5 Electrical ventilation equipment must be grounded.
- 7.5.9.6 Ventilation equipment must be grounded to the confined space.
- 7.5.9.7 Explosion proof equipment must be used in the presence of flammable or combustible contaminants.
- 7.5.9.8 In order to protect the air supply from contaminants, place the general ventilation air intake outside the confined space and as far away as possible from flammable or toxic materials.
- 7.5.10 Place the outlet where air currents will disperse the exhaust quickly.
- 7.5.11 Remove all ignition sources if the exhaust is flammable.
- 7.5.12 Ventilation must provide constant circulation of fresh air through all areas of a confined space. There are two main problems to prevent:
  - 7.5.12.1 Re-circulating contaminated exhaust back into the space.
  - 7.5.12.2 Short-circuiting the air flow. This happens when fresh air moves directly from the inlet to the exhaust outlet, without reaching the other areas of the space. Avoid these problems by using equipment that has enough power to:
    - 7.5.12.2.1 Deliver enough fresh air to ventilate the entire space.
    - 7.5.12.2.2 Capture and carry away hazardous contaminants.

7.5.12.2.3 Use a series of ventilation units, if needed, to move air long distances or to ventilate a large area.

7.5.12.2.4 Locate fresh air inlets and exhaust outlets properly. Supply and exhaust air should move through separate openings, located far apart.

7.5.12.3 Use duct work effectively by:

7.5.12.3.1 Directing airflow to all areas of the space.

7.5.12.3.2 Placing ducts where they will not be damaged by work operations.

7.5.12.3.3 Keeping ducts as short and straight as they can be and still reach the areas they must get to.

7.5.12.3.4 Avoiding sharp bends in the ducts.

7.5.12.3.5 Assure all connections are tight.

7.5.12.4 Supply breathable air (not oxygen) to power pneumatic tools. The use of inert gasses, such as nitrogen, is prohibited.

7.6 Communication must include, at a minimum:

7.6.1 A discussion of the work, well in advance of entry. Determine if the work is necessary.

7.6.2 Plan work activities to minimize the amount of entry time needed.

7.6.3 Include pre-job discussions with any involved contractors and rescue personnel.

7.7 Equipment

7.7.1 All personnel involved in confined space entry must have knowledge of the proper Personal Protective Equipment (PPE) needed for entry and exit from the space.

- 7.7.2 All attendants and entry personnel must be trained in the operation of air monitoring equipment. The training will also include understanding the warnings and what hazards they represent.
- 7.7.3 All personnel must be trained to properly use the PPE.
- 7.7.4 Rescue personnel must have familiarity with the space and have the proper equipment to perform rescue, if needed.
- 7.7.5 Attendant personnel must have the proper PPE needed to protect entry operations.
- 7.7.6 PPE should include, but is not limited to:
  - 7.7.6.1 Protective clothing.
  - 7.7.6.2 Hand and foot protection.
  - 7.7.6.3 Eye protection.
  - 7.7.6.4 Respiratory protection specifically selected for the hazards anticipated.
  - 7.7.6.5 Hearing protection if the noise exposure within the space is greater than 85 Dba.
  - 7.7.6.6 Any other protective equipment needed to protect workers from the hazards associated with the type of work taking place.
- 7.7.7 After equipment has been utilized during entry, it must be cleaned and properly stored for the next intended use. Equipment used, such as fire extinguishers and fall arresting devices, must be recharged or replaced and returned to its proper location.
- 7.8 Emergency Rescue
  - 7.8.1 To assist with rescue, authorized entrants must use retrieval systems, unless entry would not help rescue the entrant. The confined entry coordinator must coordinate with the MEHS and rescue personnel to approve all entries where retrieval systems cannot be used.



## **Confined Space Entry Policy**

**Dates**

**Original:**

**Revised: December 23, 2013**

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7.8.2 In the event of a medical emergency involving the entrant, the attendant shall:

7.8.2.1 Immediately call the City of Kent Fire department by dialing 911.

7.8.2.2 Attempt to remove the victim by use of the retrieval line from outside the confined space only if this can be accomplished without creating additional hazards for the entrant or attendant.

7.8.2.3 If the attendant is able to remove the entrant with the retrieval line, administer aid within the limits of training until emergency rescue services arrive.

7.8.2.4 If the attendant is unable to remove the entrant using the retrieval line, the attendant must wait for help to arrive. The attendant is not to enter the confined space for any reason.

7.8.2.5 Confined space rescue by entry may only be performed by the City of Kent Fire Department and in instances when non-entry retrieval is infeasible.

## **8.0 TRAINING**

8.1 The confined space employee's supervisor will arrange training to ensure all attendants, entrants and supervisors are familiar with this program and their duties under it. Training will be provided:

8.1.1 Before an employee is assigned duty involving confined space activities.

8.1.2 Before a change in duties or responsibilities.

8.1.3 Before a change in permit entry operations that may present hazards for which the employee has not been trained.

8.1.4 When inadequacies in the confined space program become apparent.



## **Confined Space Entry Policy**

**Dates**

**Original:**

**Revised: December 23, 2013**

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### **9.0 PROGRAM AUDITS**

- 9.1 The office of Environmental Health and Safety shall conduct periodic audits of the permit Required Confined Space Entry Program. The audits will include the following tasks:
  - 9.1.1 Review entry procedures when an employee has reason to believe the measures taken under the program do not provide adequate protection.
  - 9.1.2 Consult with affected employees and their supervisors on any deficiencies discovered and request input on appropriate corrective actions.
  - 9.1.3 Periodically review cancelled permits retained under the program and revises the policy as needed to ensure employees are protected from permit space hazards.

### **10.0 RECORDKEEPING**

- 10.1 University management will retain cancelled permits for at least one year to facilitate the review of the permit-required program.
- 10.2 Accident investigations that involve rescue, unplanned exit, injury, illness, or cancellation of a permit will be retained to facilitate policy review and possible revision.
- 10.3 Training documentation will be retained until subsequent training is performed.
- 10.4 The office of Environmental Health and Safety will:
  - 11.4.1 Develop, implement and maintain the Confined Space Program
  - 11.4.2 Provide review and updates to procedures as needed
  - 11.4.3 Maintain Confined Space records as needed
- 10.5 Department Supervisors
  - 10.5.1 Ensure all affected Kent State University employees under their direct supervision understand and adhere to adopted procedures during confined space entry operations;



## **Confined Space Entry Policy**

**Dates**

**Original:**

**Revised: December 23, 2013**

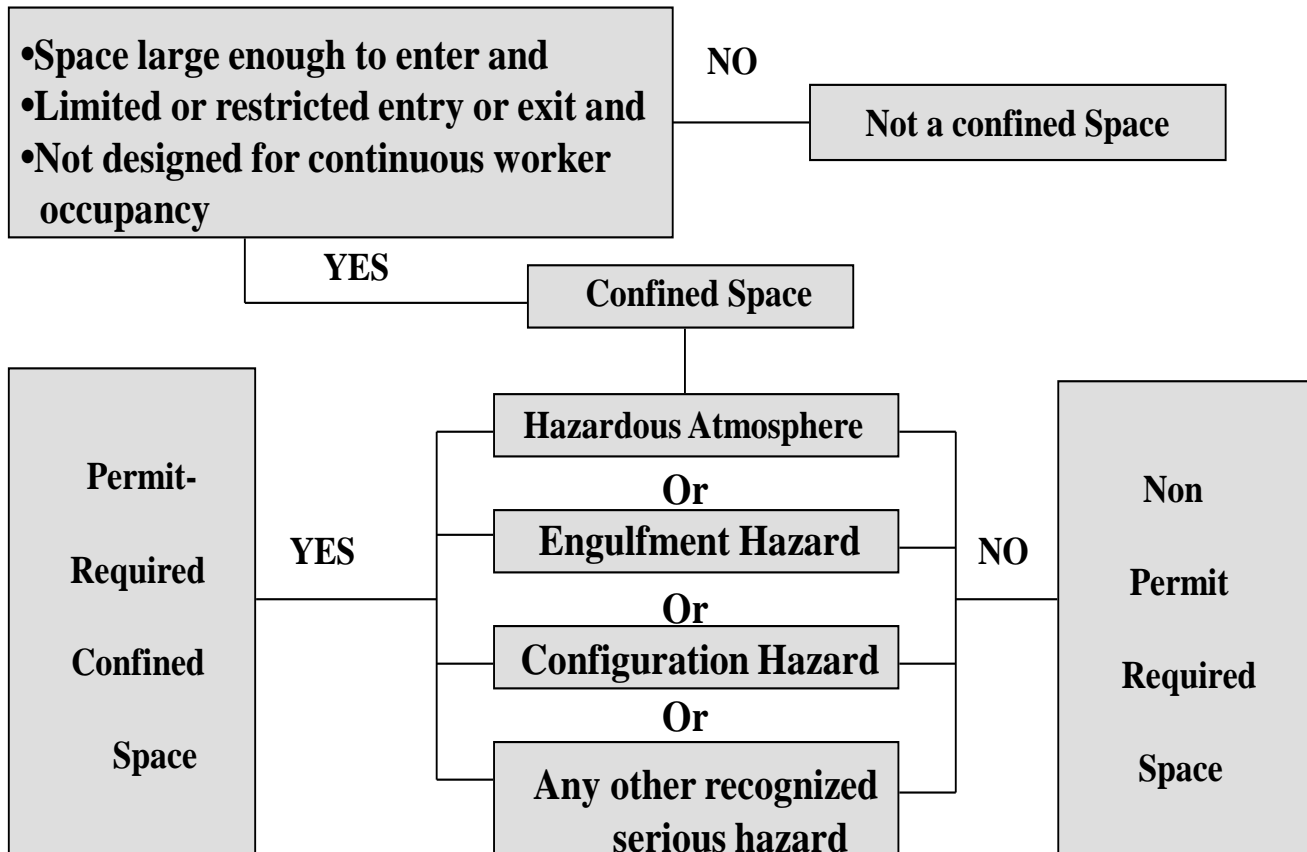
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- 10.5.2 Assure employees will receive necessary training prior to the employee conducting work in a confined space;
- 10.5.3 Maintain copies of all Confined Space Entry Permits, including all air monitoring results for a period of one year after the permit has been cancelled;
- 10.5.4 Provide necessary operations equipment and resources, including confined space entrants, and;
- 10.5.5 Identify locations and potential hazards of each confined space that may require entry by employees.



## Appendix A

### What is a Permit Required Confined Space?



## Appendix B

Location			Work Description		
Work Site					
Area/Department:					
Authorized Entrants					
			Entry Supervisor		
			Attendant		
Duration of Permit Date		Time	Expires		
<b>AIR MONITORING RESULTS -  Check Appropriate Box</b>					
Time	Initials	Oxygen >19.5% <23.5%	Combustible Gas<10% LFL	Carbon – Monoxide <35 PPM	Other Toxic Gases <PEL
<b>ENTRY REQUIREMENTS -  Check Appropriate Boxes</b>					
Ventilation Types	Lockout	Electrical	Access & Rescue		
__ Natural Draft Ventilation	__ Deenergized/Lockout Switch/Try-Out	__ GFCI for All Equipment	__ Scaffold		
__ Forced Air Ventilation	__ Pipelines Broken, Capped or Blanked	__ Low Voltage Lights	__ Ladder		
__ Continuous Ventilation	__ Double Block & Bleed Lines	__ Water Vapor- Proof	__ Safety Belt		
__ Local Exhaust Ventilation	__ Purge Flush & Vent System	Lights	__ Full Body Harness		
__ Other _____	__ Interconnected Pipe	__ Explosion-Proof Equipment	__ Wrist Harness		
_____	Valve Closed & Locked	__ Flashlights	__ Retractable Lifeline		
_____	__ Lock Valves to Prevent Opening	__ Other _____	__ Lanyard		
_____	__ Tags or Signs Attached to Valves and Switches	_____	__ Stand-by Rescue Person		
_____	__ None Required	_____	__ City of Kent Rescue has been notified		
_____			Other _____		
_____			_____		
_____			_____		
_____			_____		

PPE	Monitoring	Other	Limitations
<input type="checkbox"/> Coveralls <input type="checkbox"/> Gloves <input type="checkbox"/> Boots <input type="checkbox"/> Respirator <input type="checkbox"/> Other _____  <input type="checkbox"/> None Required	<input type="checkbox"/> Continuous <input type="checkbox"/> Periodic, Frequency For _____ _____ _____ <input type="checkbox"/> None Required	<input type="checkbox"/> Pre-job Briefing <input type="checkbox"/> Attachment Sheet <input type="checkbox"/> Additional Permits <input type="checkbox"/> Welding <input type="checkbox"/> Fire Extinguisher <input type="checkbox"/> Warning Signs & Barriers <input type="checkbox"/> None Required	_____ _____ _____ _____
I have supervised or conducted each requirement on this permit. This work can be done safely and in compliance with the rules of this company.			
Entry Supervisor		Date	
Permit Canceled Entry Supervisor		Date	Time Reason

**APPENDIX C**  
**CONFINED SPACE ENTRY PROGRAM**  
**OPERATIONS FOR ATMOSPHERIC MONITORING EQUIPMENT**

1. Follow written standard operating procedures for all atmospheric monitoring instruments.
2. Train personnel in proper use of air monitoring instruments and assure proficiency.
3. Zero the instrument if a fault is indicated. If the instrument cannot be zeroed, obtain factory authorized service, or recalibrate with calibration gas.
4. Calibrate instruments before and after each use, as instructed by the manufacturer.
5. Follow all of the manufacturer's operating instructions. Maintain a service and calibration log for each instrument.
6. Perform function tests to confirm operation of alarm functions, immediately before each use.
7. See the Confined Space Coordinator for assistance with monitoring.
8. Shut off ventilation equipment before conducting any atmospheric tests.

**APPENDIX D**  
**RECLASSIFICATION OF PERMIT ENTRY CONFINED SPACE TO NON-PERMIT ENTRY**

Certification Valid On:	(Date)
Entrant's Name:	
Time of Entry:	<input type="checkbox"/> AM <input type="checkbox"/> PM
Space Entering:	
Certification and Testing performed By: (Name)	
Testing performed: Date:	Time:  <b>OR END OF SHIFT, WHICHEVER COMES FIRST</b>
Permit Expires On	
Date:	Time:
Describe methods used to reclassify as non-permit space:	
Describe test methods used to verify elimination of hazards:	
Describe potential occurrences that would cancel this certification and require immediate exit from space for evaluation:	

# APPENDIX E

## KSU CONFINED SPACE INVENTORY

Facility: Kent State University – Exterior Locations

Sheet: 1

Address: Loop Rd., Eastway Dr., Kent, OH

Date of Survey: August 1, 2006

Inventoried By: Pete Dell, Dennis Baden

Revision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible ?
<b>EASTWAY DRIVE</b>							
De Weese	Steam Vaults	A,D,F,L,O,T	Manhole Cover	No	Yes	No	Yes
<b>EXTERIOR LOCATIONS</b>							
Numerous Electrical Vaults	3' – 6' Deep in Yard Areas	A,D,O,V	Top Grate	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes
Numerous Communication Vaults	3' – 6' Deep in Yard Areas	A,D,O,V	Top Grate	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes
<b>ALL BUILDINGS</b>							
Pipe Chases Behind Walls	Not a Confined Space	S	Doors	No	No	N/A	Yes <sup>5</sup>

- Footnote:
1. May be reclassified if NO HOT WORK is performed, and all hazards can be controlled or isolated/locked-out without entry and after air monitoring from outside space proves acceptable conditions at all levels, prior to entry. Monitor air continuously during entry.
  2. If HOT WORK performed, space is PERMIT REQUIRED and may NOT be reclassified. Continuous local exhaust ventilation to outside space is required during Hot Work.
  5. No retrieval/rescue provisions required by regulations if entry is not Permit-Required

Facility: Kent State University – White Hall Tower, Music & Speech, Lab Hoods

Sheet: 2

Address: Terrace Drive & Theatre Drive, Kent, OH

Date of Survey: August 1, 2006

Inventoried By: Pete Dell, Dennis Baden

Revision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>VARIOUS BUILDINGS WITH LABORATORIES</b>							
Laboratory Hoods	Exhaust Ducts	A,C,L,M,O, P,S	Hatches or Plenum	No	Yes	No	No
<b>WHITE HALL TOWER – Terrace Drive</b>							
Below Ground Vault	Outdoor Sump Pump	A,D,F,L,O	Hinged Hatch Fixed Ladder	No	Yes	Yes <sup>1</sup>	Yes
Below Ground Vault	Manhole within vault. Entry only required to work on Floats	A,D,F,L,O	Manhole – Tools & Hands Only	No	Yes	No	Yes
Lower Level Mechanical Room Hot Water Tank		A,L,O,P, S,T	12" x 15" Side Hatch	No	Yes	Yes <sup>1</sup>	Yes

Footnote: 1. May be reclassified if NO HOT WORK is performed and all hazards can be controlled or isolated/locked-out without entry and after air monitoring from outside space proves acceptable conditions at all levels, prior to entry. Monitor air continuously during entry.

Facility: Kent State University – Tunnel & LCM Building

Sheet: 3

Address: Summit Drive, Kent, OH

Date of Survey: August 1, 2006

Inventoried By: Pete Dell, Dennis Baden

Revision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible ?
<b>PLAZA EAST TUNNEL</b>							
Tunnel contains chilled water, high-pressure steam, return lines, condensed water, sanitary & storm sewers, 13,200 volt electrical feeds. Cell phones and radios do not work reliably in many areas. Some portions of tunnel require squeezing through small openings sideways and crawling due to low clearance. Atmospheric hazards may be present due to Hot Work in or near tunnel or other NRWA. <sup>7</sup> <u>Entry:</u> Door in LCM Basement. Plaza East Tunnel, Fixed Ladder to Yard Hatches or Math Building Basement. Non-entry retrieval may be feasible at certain, limited areas.							
		A,F,L,O,T	See Above	No	Not Unless NWRA <sup>7</sup>	Yes	Not All Areas
<b>LCM Building – Summit Drive</b>							
Tower Water Chiller	Sump/Tank	A,C,D,F,O	2 – 24" Dia. Hatches	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes
Air Handler	Various Sections	M	Doors	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>



Facility: Kent State University - Tunnels

Sheet: 4

Address: Main Campus – Kent, OH

Date of Survey: October 19, 2006

Inventoried By: Pete Dell, Dennis Baden

Revision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>POWER PLANT TUNNEL</b>							
Tunnel contains steam, electrical feeds, natural gas and water. Cell phones and radios do not work reliably. Atmospheric hazards may be present due to Hot Work in or near tunnel or other NRWA <sup>7</sup> . Non-entry retrieval may be feasible at certain, limited areas. <u>Entry</u> : Door to Power Plant Basement, or LCM Tunnel.							
		A,C,F,L,O,T	See Above	No	Not Unless NWRA <sup>7</sup>	Yes	Not All Areas <sup>5</sup>

Footnotes: 5. No retrieval/rescue provisions required by regulations if entry is not Permit-Required

7. NRWA: Non-Routine Work Activities include, but are not limited to, repair or replacement of gas lines, electrical lines, steam lines, asbestos abatement, or Hot Work. Tunnels are Permit Spaces when these activities are performed. If no NRWA, follow KSU Tunnel Entry Procedure.

Facility: Kent State University – TunnelsSheet: 5Address: Main Campus – Kent, OHDate of Survey: October 19 & 20, 2006Inventoried By: Pete Dell, Dennis BadenRevision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>PLAZA TUNNEL</b>							
Tunnel contains steam, electrical feeds, natural gas and water. Cell phones and radios do not work reliably. Atmospheric hazards may be present due to Hot Work in or near tunnel or other NRWA. <sup>7</sup> Non-entry retrieval may be feasible at certain, limited areas. <u>Entry</u> : Fixed Ladder to Fountain in front of Library Building, door to Math & Science Basement, and Plaza East Tunnel.							
		A,F,L,O,T	See Above	No	Not Unless NWRA <sup>7</sup>	No	Not All Areas <sup>5</sup>
<b>CENTENNIAL E BASEMENT STORE ROOM – DEAD END TUNNEL</b>							
Tunnel is chest high; accessed from 3' fixed ladder. Stooping position required; dead ends in about 75 feet, where utilities continue as direct burial. Contains electrical feeds, steam, and chilled water. Stooping position required; dead ends in about 75 feet, where utilities continue as direct burial. Atmospheric hazards may be present due to Hot Work in or near tunnel or other NRWA. <sup>7</sup> Communication by voice is feasible.							
		None Anticipated	3' Fixed Ladder	No	Not Unless NWRA <sup>7</sup>	Yes	Yes

Footnotes: 5. No retrieval/rescue provisions required by regulations if entry is not Permit-Required

7. NRWA: Non-Routine Work Activities include, but are not limited to, repair or replacement of gas lines, electrical lines, steam lines, asbestos abatement, or Hot Work. Tunnels are Permit Spaces when these activities are performed. If no NRWA, follow KSU Tunnel Entry Procedure.

Facility: Kent State University - TunnelsSheet: 6Address: Janik Drive – Kent, OHDate of Survey: October 19 & 20, 2006Inventoried By: Pete Dell, Dennis BadenRevision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>STOPHER – OLD TUNNEL – TO ART BUILDING YARD</b>							
Tunnel contains steam, electrical feeds and chilled water. Stooping position required. Very narrow, conduits block entry for all but smallest person. Cell phones and radios do not work reliably. Atmospheric hazards may be present due to Hot Work in or near tunnel or other NRWA. <sup>7</sup> Non-entry retrieval may be feasible at certain, limited areas. <u>Entry</u> : Door to mezzanine over pit. Pit entered via fixed ladder, Art Building basement door.							
		A,F,L,O,T	See Above	No	Not Unless NWRA <sup>7</sup>	No	Not All Areas <sup>5</sup>
<b>MIDWAY TUNNEL - (From Commons Tunnel to Manchester Field, Cunningham Hall Basement Mechanical Room And Plaza Tunnel)</b>							
Contains electrical feeds, steam and chilled water. Tunnel is tall and wide – normal walking possible. One stairway and several fixed ladders to sidewalk/yard areas. Atmospheric hazards may be present due to Hot Work in or near tunnel or other NRWA. <sup>7</sup> Non-entry retrieval may be feasible at certain, limited areas. <u>Entry</u> : Via Commons Tunnel, (2) ladders to sidewalk grates, stairway to Manchester Field, or Spurs to Prentice/Taylor and Residence/Centennial via their basement mechanical rooms. Connect to Plaza Tunnel.							
		A,F,L,O,T	See Above	No	Not Unless NWRA <sup>7</sup>	Yes	Not All Areas <sup>5</sup>

Facility: Kent State University – TunnelsSheet: 7Address: Main Campus & Janik Drive – Kent, OHDate of Survey: October 19 & 20, 2006Inventoried By: Pete Dell, Dennis BadenRevision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>JOHNSON – MECHANICAL ROOM – NEW UTILITY TUNNEL – SPUR TO PLAZA TUNNEL</b>							
Contains electrical feeds, steam and chilled water. Stooping position required. Narrow, but could be crawled into. Cell phones and radios do not work reliably. Atmospheric hazards may be present due to Hot Work in or near tunnel or other NRWA. <sup>7</sup> Non-entry retrieval may be feasible at certain, limited areas. <u>Entry</u> : Man doors and steps, Plaza Tunnel, Art Building.							
		A,F,L,O,T	See Above	No	Not Unless NWRA <sup>7</sup>	Yes <sup>2</sup>	Not All Areas <sup>5</sup>
<b>NIXSON TUNNEL TO CENTER FOR PERFORMING ARTS AND MIDWAY TUNNEL</b>							
Contains electrical feeds, steam and chilled water. Standing position possible in most areas. One stairway and several fixed ladders to sidewalk/yard areas. Ladders are more restriction to exit than aid. Cell phones and radios do not work reliably. Atmospheric hazards may be present due to Hot Work in or near tunnel or other NRWA. <sup>7</sup> Non-entry retrieval may be feasible at certain, limited areas. <u>Entry</u> : 24" X 18" Hatch in Verder Hall, Nixson (fixed ladder), and Music/Speech basements via their Mechanical Rooms. Connects to Midway Drive Tunnel, north end near Commons Tunnel.							
		A,F,L,O,T	See Above	No	Not Unless NWRA <sup>7</sup>	Yes <sup>2</sup>	Not All Areas <sup>5</sup>

Footnotes:

2. If HOT WORK performed, space is PERMIT REQUIRED and may NOT be reclassified. Continuous localexhaust ventilation to outside space is required during Hot Work.

5. No retrieval/rescue provisions required by regulations if entry is not Permit-Required.

7. NRWA: Non-Routine Work Activities include, but are not limited to, repair or replacement of gas lines, electrical lines, steam lines, asbestos abatement, or Hot Work. Tunnels are Permit Spaces when these activities are performed. If no NRWA, follow KSU Tunnel Entry Procedure.

Facility: Kent State University – Power Plant

Sheet: 8

Address: Ted Boyd Drive, Kent, OH

Date of Survey: January 17, 2007

Inventoried By: Pete Dell, Dennis Baden

Revision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>POWER PLANT – Ted Boyd Drive</b>							
Diesel USTs in Yard		A,C,D,F, L,O	4' Diameter Hatch	No	Yes	No	Yes
Diesel Delivery Truck Spill Containment Pits		A,C,D,F, L,O	Large Top Grate	No	Yes	Yes	Yes
Basement Vent Adjacent to Wall	Well in Yard	F	Top Grate	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes
Boilers (2)	Natural Gas/Heating Oil	A,C,D,F,L,O ,P,S,T	Open End or Side Hatch	Yes	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes
Mud Drum	Part of Boilers	A,C,D,F,L,O ,P,S,T	12" x 15" Side Hatches and Top	No	Yes <sup>2</sup>	Yes <sup>2</sup>	Yes
DA Tank (2)		A,C,D,F,O,S ,T	12" x 15" Side Hatches and Top	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes
Heat Recover Units GT 1 & 2		S,T	(2) 18" x 18" Side Hatches	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes
Duct From Boiler to HRU GT - 1		S,T	(2) 16" x 20" Bolted Side Hatches	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes
Duct From Boiler to HRU GT - 2		F,S,T	(2) 18" x 18" Bolted Side Hatches	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes

Facility: Kent State University – Power Plant - Continued

Sheet: 9

Address: Ted Boyd Drive, Kent, OH

Date of Survey: January 17, 2007

Inventoried By: Pete Dell, Dennis Baden

Revision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>POWER PLANT – Ted Boyd Drive</b>							
Basement Condensate Receiver Tank		A,C,D,O,S,T	12" x 15" Side Hatches	No	Yes	Yes	No <sup>5</sup>
Rooftop Cooling Chiller Towers	Chiller	D,M	3' x 4' Door Chiller	No	Yes	Yes	Yes
	Closed Loop	D,M,S	(2 ) 18" Diameter Side Hatches	No	Yes	Yes	Yes
Turbines		A,C,M,T	No Limited Entry/Egress, therefore, Not a Confined Space				
Transformers		V,T	No Limited Entry/Egress, therefore, Not a Confined Space				
Turbine Intake T - 2	Duct	F	24 " x 24" Side Hatch	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes
Exhaust GT – 2	Duct	A,T	24 " x 24" Side Hatch	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes
Intake GT – 1	Duct	None	18" x 5' Door	No	No	N/A	Yes <sup>5</sup>
Building Exhaust	(4) Ducts	A,C,L,M,O, P	24 " x 24" Side Hatch	No	Yes	Yes	Yes
Brine	Tank	A,D,F,O	(2) 24" Hatch Top/Side	No	Yes	Yes	Yes

Facility: Kent State University – Power Plant - Continued

Sheet: 10

Address: Ted Boyd Drive, Kent, OH

Date of Survey: January 17, 2007

Inventoried By: Pete Dell, Dennis Baden

Revision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>POWER PLANT – Ted Boyd Drive</b>							
Air Handling	Units	M	Various	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>
Diverter	Duct	A,F,O,T	24" x 24" Side Hatch	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes <sup>5</sup>
Basement Forced Draft Ducts (2)		None	?	No	No	N/A	Yes <sup>5</sup>
Basement Brine Day Tank		D,F	Open Top	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes <sup>5</sup>
Basement Blow Down Flash Tank		A,D,C,O,S,T	12" x 15" Side Hatch	No	Yes <sup>1</sup>	Yes <sup>6</sup>	No
Basement Compressor Air Tanks (2)		A,O,S	12" x 15" Side Hatch	No	Yes	No	No
		<b>NO ENTRY ALLOWED BY UNIVERSITY OR CONTRACTOR PERSONNEL</b>					

Facility: Kent State University – Dunbar, Prentice, Verder, Lake, Olson

Sheet: 11

Address: Midway Drive & Janik Drive, Kent, OH

Date of Survey: October 20, 2006

Inventoried By: Pete Dell, Dennis Baden

Revision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>DUNBAR– Midway Street</b>							
Crawl Space		None	3 Doors / Stairs	N/A	No <sup>2</sup>	N/A	Yes <sup>5</sup>
First Floor Mechanical Room Hot Water Tank		A,C,D,O,S, T	12" x 15" Side Hatch	No	Yes	No	No
<b>PRENTICE – Midway Street</b>							
First Floor Mechanical Room	Hot Water Tank	A,C,D,O,S, T	12" x 15" Side Hatch	No	Yes	No	No <sup>5</sup>
	Cold Water Tank	A,C,D,O,S	12" x 15" Side Hatch	No	Yes	No	No <sup>5</sup>
<b>NO ENTRY ALLOWED BY UNIVERSITY OR CONTRACTOR PERSONNEL</b>							
<b>VERDER – Midway Street</b>							
First Floor Mechanical Room Hot Water Tank		A,C,D,O,S, T	12" x 15" Side Hatch	No	Yes	No	No
Crawl Space		None	Doors	N/A	No <sup>2</sup>	N/A	Yes <sup>5</sup>
<b>LAKE OLSON – Janik Drive</b>							
First Floor Mechanical Room Steam Pit		T	Open Top	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes <sup>5</sup>
Crawl Space		None	30" x 24" Opening	No	No <sup>2</sup>	N/A	Yes <sup>5</sup>



Facility: Kent State University – Johnson, Stopher, Recreational & Wellness Center Sheet: 12

Address: Janik Drive & Ted Boyd Drive, Kent, OH

Date of Survey: October 19, 2006

Inventoried By: Pete Dell, Dennis Baden

Revised Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>JOHNSON – Janik Drive</b>							
Lower Level Mechanical Room Steam Pit		T	Open Top	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes
Mechanical Room Air Handler HRU – JOH		M	Side Hatch/ Doors	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>
<b>STOPHER – Janik Drive</b>							
Crawl Space		None	Side Hatch/ Doors	N/A	No <sup>2</sup>	N/A	Yes <sup>5</sup>
Lower Level Mechanical Room Steam Pit		T	Open Top	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes <sup>5</sup>
Mechanical Room Air Handler HRU – STO		M	Side Hatch/ Doors	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>
<b>RECREATIONAL AND WELLNESS CENTER - Ted Boyd Drive</b>							
Pool Water Treatment Pit		A,C,D,F,O	Open Top	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes <sup>5</sup>

Sheet: 13

Date of Survey: October 19, 2006

Revision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
MATH AND SCIENCE BUILDNG – Summit Drive							
Basement Mechanical Room Air Handler 2	M	Side Doors / Hatches	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>	
CENTENNIAL F – Chiarucci Drive							
Steam Pit with Sump	A,O,F,T	Exterior Door	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes	
Sump with Pump in Pit	A,D,L,O,F,S	20" Top Hatch	No	Yes	No	Yes	
Rooftop Air Handler	M	Hatch / Doors	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>	
SAME AS at Centennial A,B,C,D & E Roof Top – Chiarucci Drive and Midway Drive							
CENTENNIAL – A, B, C, E – Midway Drive & Chiarucci Drive							
Lower Level Mechanical Room Condensate Pits	A,O,F	5' x 3' Open Top	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes <sup>5</sup>	
Sumps with Pump in Pits Above	A,D,L,O,F,S	Top Hatch	No	Yes	N/A	N/A	
	NO ENTRY ALLOWED: IF PUMP REPLACEMENT NEEDED CUT PVC PIPE AND LIFT OUT TO REPLACE						

Facility: Kent State University – Eastway, Business Administration, Nixon

Sheet: 14

Address: Petrarka Street, Janik Drive, Theatre Drive, Kent, OH Date of Survey: November 14, 2006

Inventoried By: Pete Dell, Dennis Baden

Revision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
EASTWAY BUILDING – Petrarka Street							
Basement Mechanical Room – Steam Pit		F,T	Hinged Grate/Fixed Ladder 6’ Deep	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes <sup>5</sup>
Basement Mechanical Room – Sump with Pump in Pit Above		A,D,O,F,L,S ,T	Sump with Pump in Pit Above	No	Yes	No	Yes
Basement Mechanical Room – Air Handler Units AHU-1,2,3		M	Hatch/ Doors	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>
BUSINESS ADMINISTRATION BUILDING – Janik Drive							
Basement Mechanical Room – Small Pipe Access Room Next to Men’s Room & Water Fountain		None	18” Wide Door	N/A	No <sup>2</sup>	N/A	Yes
NIXSON HALL – Theatre Drive							
Basement Mechanical Room – Crawl Space		None	5’ Fixed Ladder up to 4’ x 4’ door	N/A	No <sup>2</sup>	N/A	Yes

Facility: Kent State University – Pits & Sumps in Tunnels

Sheet: 15

Address: Main Campus, Kent, OH

Date of Survey: November 14, 2006

Inventoried By: Pete Dell, Dennis Baden

Revision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
RESIDENCE SERVICES TUNNEL							
Large Area – 3’ Deep Pit with Steam Lines		A,L,O,T	Open Top with Grate	No	Yes	Yes <sup>1</sup>	Yes <sup>5</sup>
Sumps with Pump in Pit Above		A,D,F,L,O,T	Open Top with Grate, 5’ Deep	No	Yes	N/A	N/A
	NO ENTRY ALLOWED: IF PUMP REPLACEMENT NEEDED CUT PVC PIPE AND LIFT OUT TO REPLACE						
NIXSON TUNNEL							
Sump with Pump		A,D,F,O	4’ x 4’ Grate – Open Top	No	Yes	N/A	N/A
	NO ENTRY ALLOWED: IF PUMP REPLACEMENT NEEDED CUT PVC PIPE AND LIFT OUT TO REPLACE						
PLAZA TUNNEL SPUR TO BUSINESS ADMINISTRATION							
Sump with Pump Under Sidewalk Grate		A,D,F,L,O,T	24” Diameter Grate	No	Yes	N/A	N/A
	NO ENTRY ALLOWED: IF PUMP REPLACEMENT NEEDED CUT PVC PIPE AND LIFT OUT TO REPLACE						

Footnote: 1. May be reclassified if NO HOT WORK is performed, and all hazards can be controlled or isolated/locked-out without entry and after air monitoring from outside space proves acceptable conditions at all levels, prior to entry. Monitor air continuously during entry.

5. No retrieval/rescue provisions required by regulations if entry is not Permit-Required.

Facility: Kent State University - Tunnel

Sheet: 16

Address: Main Campus, Kent, OH

Date of Survey: November 14, 2006

Inventoried By: Pete Dell, Dennis Baden

Revision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>PLAZA TUNNEL -- (Business Administration Spur to Bowman Sidewalk, KIVA and Student Center)</b>							
<p>Contains electrical feeds, steam and chilled water. Standing position possible in most areas. Several fixed ladders and sidewalk grates; one spur leads to Bowman sidewalk. Cell phones and radios do not work reliably. Atmospheric hazards may be present due to Hot Work in or near tunnel or other NRWA.<sup>7</sup> Non-entry retrieval may be feasible at certain, limited areas. <u>Entry</u>: Via Business Administration tunnel spur, with some climbing over and crawling under pipes required. Very low and difficult crawling required at Summit Drive, spur leading to Michael Schwartz, dead end direct burial. Spur to KIVA has fixed ladder to hatch. Spur to Student Center terminates at Basement Mechanical Room via fixed ladder. Spur to Gym Annex, Room 103.</p>							
		A,F,L,O,S,T <b>COLLAPSE</b>	See Above	No	Not Unless NWRA <sup>7</sup>	No*	Not All Areas <sup>5</sup>

Facility: Kent State University – Tunnels & Sumps

Sheet: 17

Address: Main Campus, Kent, OH

Date of Survey: November 14, 2006

Inventoried By: Pete Dell, Dennis Baden

Revision Date: March 2, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
BUSINESS ADMINISTRATION TUNNEL SPUR TO PLAZA TUNNEL AND STOPHER/ JOHNSON							
Tunnel contains steam, electrical feeds and chilled water. Stooping position required. Narrow, but could be crawled into. Radios worked, cell phone did not. Atmospheric hazards may be present due to Hot Work in or near tunnel or other NRWA. <sup>7</sup> Non-entry retrieval may be feasible at certain, limited areas. <u>Entry:</u> Via Business Administration Basement Mechanical Room with some climbing over and crawling under pipes required. Entry at Stopher is first floor door to mezzanine over basement pit, and Plaza Tunnel.							
		A,F,L, O,T	See Above	No	Not Unless NWRA <sup>7</sup>	Yes <sup>2</sup>	Not All Areas <sup>5</sup>
PLAZA TUNNEL SPUR TO MICHAEL SCHWARTZ UNDER Very Low Crawl Section Under Summit Drive							
Open, Uncovered Sump with Pump	A,D,F, L,O	18" x 18" Open Top	No	Yes	N/A	Not All Areas <sup>5</sup>	
	NO ENTRY ALLOWED: IF PUMP REPLACEMENT NEEDED CUT PVC PIPE AND LIFT OUT TO REPLACE						
PLAZA TUNNEL SPUR TO KIVA							
Sump with Pump	A,D,F, L,O	24" Diameter Grate	No	Yes	N/A	Not All Areas <sup>5</sup>	
	NO ENTRY ALLOWED: IF PUMP REPLACEMENT NEEDED CUT PVC PIPE AND LIFT OUT TO REPLACE						

Facility: Kent State University – Bowman Hall / Eastway / Merrill / Rockwell

Sheet: 18

Address: Petrarka St., Janik Dr., Hilltop Dr. & Lincoln St., Kent, OH

Date of Survey: October 30 and November 22 , 2006

Inventoried By: Pete Dell, Dennis Baden

Revision Date: January 21, 2014

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>BOWMAN HALL – Janik Drive</b>							
	Crawl Space	None	3 Doors / Stairs	N/A	No <sup>2</sup>	N/A	Yes <sup>5</sup>
	Small Air Handlers Air Handler Unit- 7 & 9	M	Small Side Hatch – Hands Only	No	Yes <sup>1</sup>	Yes <sup>4</sup>	No <sup>5</sup>
<b>EASTWAY – Petrarka Street</b>							
	Basement Mechanical Rooms - Air Handler Units	M	Side Hatch/Door	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>
<b>MERRILL HALL – Hilltop Drive</b>							
First Floor Mechanical Room	AHU – 1	M	Side Hatch / Door	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>
	Duct to Outside Louvers	S	20" x 20" Hatch	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>
<b>ROCKWELL HALL – Lincoln Street</b>							
	Basement Mechanical Room AHU – 1	M	Side Hatch	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>

Facility: Kent State University – Mac Center / Gym Annex and Tunnel

Sheet: 19

Address: Summit Drive, Kent, OH

Date of Survey: October 30, 2006

Inventoried By: Pete Dell, Dennis Baden

Revision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>MAC CENTER</b>							
Third Floor Mechanical Room	Air Handlers	M	Side Hatch / Door	No	Yes <sup>1</sup>	No <sup>4</sup>	Yes <sup>5</sup>
<b>GYM ANNEX</b>							
Mechanical Room 103	2 Domestic Hot Water Tanks with Steam Bundles	A,D,O,S,T	Side Hatch 15" x 12"	No	Yes	No	No <sup>3</sup>
<b>TUNNEL SPUR FROM GYM ANNEX, ROOM 103 TO MIDWAY TUNNEL</b>							
Contains electrical feeds, steam and chilled water. Standing position possible in most areas. Several fixed ladders and sidewalk grates; one spur leads to Bowman sidewalk. Cell phones and radios do not work reliably. Atmospheric hazards may be present due to Hot Work in or near tunnel or other NRWA. <sup>7</sup> Non-entry retrieval may be feasible at certain, limited areas. <u>Entry</u> : Gym Annex Mechanical Room 103, fixed ladder to pit, and Midway Tunnel.							
		A,D,F, L,O,T	See Above	No	Not Unless NWRA <sup>7</sup>	No	Not All Areas <sup>5</sup>

- Footnote:
1. May be reclassified if NO HOT WORK is performed, and all hazards can be controlled or isolated/locked-out without entry and after air monitoring from outside space proves acceptable conditions at all levels, prior to entry. Monitor air continuously during entry.
  3. Non-entry retrieval is feasible if steam bundle removed first without entry (from outside space).
  4. May be reclassified after electrical lock-out, and fan blades physically clamped to preclude movement and air monitoring from outside prior to entry. May NOT be reclassified if HOT WORK is performed. Continuous air monitoring and continuous local exhaust ventilation to outside space is required during Hot Work.
  5. No retrieval/rescue provisions required by regulations if entry is not Permit-Required.
  7. NRWA: Non-Routine Work Activities include, but are not limited to, repair or replacement of gas lines, electrical lines, steam lines, asbestos abatement, or Hot Work. Tunnels are Permit Spaces when these activities are performed. If no NRWA, follow KSU Tunnel Entry Procedure.



Facility: Kent State University – Michael Schwartz Bldg. & Satterfield Hall

And Business Administration Building

Sheet: 20

Address: Summit Dr. & Janik Dr., Kent, OH

Date of Survey: October 30, 2006

Inventoried By: Pete Dell, Dennis Baden

Revision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>MICHAEL SCHWARTZ BUILDING – Summit Drive</b>							
Rooftop Air Handler Units		M	Side Hatch/Door	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>
First Floor Ceramic Class Kilns		A,L,O,T	Side or Top Openings	No	Yes	No	Yes
<b>SATTERFIELD HALL – Janik Drive</b>							
Basement Mechanical Room	Tower Water Storage Tank	A,C,D,O,S	16" Diameter Side Hatch	No	Yes	No	No
	Air Handler Units	M	Side Hatch	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>
Third Floor Mechanical Room	Air Handler Units	M	Side Hatch	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>
<b>BUSINESS ADMINISTRATION BUILDING</b>							
Basement Mechanical Room 018 Air Handler Units	M	Side Hatch/Door	No	Yes <sup>1</sup>	Yes <sup>4</sup>	No <sup>5</sup>	Yes <sup>5</sup>
Rooftop Air Handler Units	M	Side Hatch	No	Yes <sup>1</sup>	Yes <sup>4</sup>	No <sup>5</sup>	Yes <sup>5</sup>
Basement Mechanical Room 020	Domestic Hot Water Tanks with Steam Bundles	A,D,O,S,T	Side Hatch 15" x 12"	No	Yes	No	No <sup>3</sup>

Facility: Kent State University – Tunnel Spur, Van Duesen and Taylor Hall

Sheet: 21

Address: Janik Drive, Kent, OH

Date of Survey: October 30, 2006

Inventoried By: Pete Dell, Dennis Baden

Revision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
TUNNEL SPUR FROM B.A., ROOM 018 TO PLAZA TUNNEL							
Sump with Pump in Pit in Tunnel Above	A,D,F,L,O	Grate	No	Yes	N/A	N/A	
	NO ENTRY ALLOWED: IF PUMP REPLACEMENT NEEDED CUT PVC PIPE AND LIFT OUT TO REPLACE						
Storm Sewer Outfall	A,D,F,L,O	30" Dia. Grate	No	Yes	No	Yes	
Outside Mechanical Room Elevator Hydraulic Tanks	A,C,D,L,M, O	Top Cover (4' Deep)	No	Yes <sup>1</sup>	Yes <sup>4</sup>	N/A	
	NO ENTRY ALLOWED BY UNIVERSITY OR CONTRACTOR PERSONNEL						
VAN DUESEN HALL – Terrace Drive							
Crawl Space Under First Floor	None	3 Doors / Stairs	N/A	No <sup>2</sup>	N/A	Yes <sup>5</sup>	
Rooftop Air Handler Units	M	Side Hatch / Door	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>	
TAYLOR HALL – Midway Drive							
Basement Mechanical Room Air Handler Units	M	Side Hatch / Door	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>	
Basement Mechanical Room -Domestic Hot Water Tanks	A,D,O,S,T	Side Hatch 15" x 12"	No	Yes	No	No	

Facility: Kent State University - Old Power Plant

Sheet: 22

Address: Terrace Drive, Kent, OH

Date of Survey: October 30, 2006

Inventoried By: Pete Dell, Dennis Baden

Revision Date: June 28, 2007

**NOTE: ENTIRE BUILDING AND EQUIPMENT IS DECOMMISSIONED, LOCKED AND UNUSED. NO ENTRY CURRENTLY ALLOWED IN ANY SPACES LISTED BELOW**

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>OLD POWER PLANT</b>							
Basement Mechanical Room 034	Steam Pit	A,D,F,L,O	Top Plate	No	Yes	Yes	Yes
Smoke Stack		A,C,O,P	Hatch Bolted Shut	No	Yes	No	N/A
		<b>NO ENTRY ALLOWED BY UNIVERSITY OR CONTRACTOR PERSONNEL</b>					
Many Ash Pits and Coal Bins Under Grates or Plates		A,D,D,F,O,P	Fixed Ladders Under Plate/Grate	None	Yes	No	Yes
Many Boilers		A,D,F,O,P,S	Open End or Side Hatch	No	Yes <sup>1</sup>	Yes <sup>2</sup>	No <sup>5</sup>
Many Tanks		A,D,F,O,S	Various	No	Yes <sup>1</sup>	Yes <sup>2</sup>	No
Many Air Handler Units		M	Side Hatch/Door	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>

Facility: Kent State University - Old Power Plant - CONTINUED - TunnelsSheet: 23Address: Terrace Drive, Kent, OHDate of Survey: October 30, 2006Inventoried By: Pete Dell, Dennis BadenRevision Date: June 28, 2007

**NOTE: ENTIRE BUILDING AND EQUIPMENT IS DECOMMISSIONED, LOCKED AND UNUSED. NO ENTRY CURRENTLY ALLOWED IN ANY SPACES LISTED BELOW**

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>COMMONS TUNNEL – From Old Power Plant to Midway Tunnel Near Nixon Hall Tunnel</b>							
Tunnel contains steam, electrical feeds, natural gas and water. Radios do not work reliably. Atmospheric hazards may be present due to Hot Work in or near tunnel or other NRWA. <sup>7</sup> Non-entry retrieval may be feasible at certain, limited areas. <u>Entry</u> : Many Fixed Ladders to Yard Areas, with Spurs to Oscar Ritchie, Verder Crawl Space, and Engelman Basement Mechanical Room.							
		A,F,L,O,T	See Above	No	Not Unless NWRA <sup>7</sup>	Yes <sup>2</sup>	Not All Areas <sup>5</sup>
<b>COMMONS TUNNEL SPUR TO OSCAR RITCHIE BUILDING</b>							
Tunnel contains steam, electrical feeds, natural gas and water. 30' length, very low - crawl only. Cell phones and radios do not work reliably. Atmospheric hazards may be present due to Hot Work in or near tunnel or other NRWA. <sup>7</sup> Non-entry retrieval may be feasible by dragging. <u>Entry</u> : Oscar Ritchie Basement Mechanical Room and Commons Tunnel 4' x 4' Opening.							
		A,F,L,O,T	See Above	No	Not Unless NWRA <sup>7</sup>	No	Not All Areas <sup>5</sup>
<b>COMMONS TUNNEL SPUR TO VERDER CRAWL SPACE</b>							
Tunnel contains steam, electrical feeds, natural gas and water. 125' length, very low - crawl only. Cell phones and radios do not work reliably. Atmospheric hazards may be present due to Hot Work in or near tunnel or other NRWA. <sup>7</sup> Non-entry retrieval may be feasible by dragging. <u>Entry</u> : Verder Crawl Space 24 x 30" Hatch.							
		A,F,L,O,T	See Above	No	Not Unless NWRA <sup>7</sup>	No	Not All Areas <sup>5</sup>

Facility: Kent State University – Oscar Ritchie, Engleman

Old Power Plant - CONTINUED - Tunnels

Address: Terrace Drive, Kent, OH

Inventoried By: Don Head, Hal Lehman

Sheet: 24

Date of Survey: October 30, 2006

Revision Date January 21, 2014

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>OSCAR RITCHIE HALL – Terrace Drive</b>							
Basement Mechanical Room 115 – AHU - 1, 2, 3, 4		M	Plenum Doors	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>
Exterior Pit Basement to Grade		F	Ladder from Top Exterior Grate	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes <sup>5</sup>
<b>ENGLEMAN HALL – Fleming Circle</b>							
Basement Mechanical Room – AHUs		M	Plenum Doors	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>
Steam Pit		F,T	4' x 6'	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes <sup>5</sup>

- Footnote:
1. May be reclassified if NO HOT WORK is performed, and all hazards can be controlled or isolated/locked-out without entry and after air monitoring from outside space proves acceptable conditions at all levels, prior to entry. Monitor air continuously during entry.
  2. If HOT WORK performed, space is PERMIT REQUIRED and may NOT be reclassified. Continuous local exhaust ventilation to outside space is required during Hot Work.
  4. May be reclassified after electrical lock-out, and fan blades physically clamped to preclude movement and air monitoring from outside prior to entry. May NOT be reclassified if HOT WORK is performed. Continuous air monitoring and continuous local exhaust ventilation to outside space is required during Hot Work.
  5. No retrieval/rescue provisions required by regulations if entry is not Permit-Required.

Facility: Kent State University - Art Buildings

Sheet: 25

Address: Janik Drive, Kent, OH

Date of Survey: October 30, 2006

Inventoried By: Pete Dell, Dennis Baden

Revision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
ART BUILDING							
Mechanical Room 109a	Domestic Hot Water Tanks w/Steam Bundle	A,D,O,S,T	Side Hatch 15" x 12"	No	Yes	No	Yes <sup>3</sup>
	Air Handlers	M	Side Hatch / Door	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>
	Sanitary Sewer Sump with Pumps	A,D,F,L,O,S	Top Hatch 20" Diameter	No	Yes	No	N/A
		NO ENTRY ALLOWED: IF PUMP REPLACEMENT NEEDED CUT PVC PIPE AND LIFT OUT TO REPLACE					
ART ANNEX BUILDING							
Mechanical Room 140	Air Handler Units	M	Side Hatch / Door	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>
	Man Holes to Sewer (Many)	A,D,F,L,O,S	Man Hole Covers	No	Yes	No	N/A
		NO ENTRY ALLOWED BY UNIVERSITY OR CONTRACTOR PERSONNEL					

Footnote: 1. May be reclassified if NO HOT WORK is performed, and all hazards can be controlled or solated/locked-out without entry and after air monitoring from outside space proves acceptable conditions at all levels, prior to entry. Monitor air continuously during entry.

3. Non-entry retrieval is feasible if steam bundle removed first without entry (from outside space).

4. May be reclassified after electrical lock-out, and fan blades physically clamped to preclude movement and air monitoring from outside prior to entry. May NOT be reclassified if HOT WORK is performed. Continuous air monitoring and continuous local exhaust ventilation to outside space is required during Hot Work.

5. No retrieval/rescue provisions required by regulations if entry is not Permit-Required.

Facility: Kent State University – Tunnels

Sheet: 26

Address: Main Campus, Kent, OH

Date of Survey: Nov 22, 2006 and Dec 15, 2006

Inventoried By: Pete Dell, Dennis Baden

Revision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>COMMONS TUNNEL SPUR TO ENGLEMAN</b>							
Tunnel contains steam, electrical feeds, natural gas and water. 125' length, very low - crawl only. Cell phones and radios do not work reliably. Atmospheric hazards may be present, however, due to Hot Work in or near tunnel or other NRWA. <sup>7</sup> Non-entry retrieval may be feasible by dragging. <u>Entry</u> : Hall Basement Mechanical Room 3' x 3' Opening.							
		A,F,L,O,T	See Above	No	Not Unless NWRA <sup>7</sup>	No	Not All Areas <sup>5</sup>
<b>FRONT CAMPUS TUNNEL</b>							
Tunnel is permit required due to extremely tight access areas, standing water, crawling under hot steam pipes, 13,200 volt lines in cable trays not secured to walls and difficult rescue conditions. <b><u>Reclassification to non-permit is not allowed.</u></b> Spur to Rockwell very hazardous due to dust, other particulate, and inability to perform a timely rescue. Spur to Lowry/Moulton, last 100 feet too small to crawl for exit, no timely rescue possible. Spur to Kent Hall requires crawl. Turn into spur toward Auditorium can be accessed by crawling but no actual exit in Auditorium available. One yard hatch. No communication by wireless device possible. <u>Entry</u> : 36" x 30" Hatch in room 10B of Kent Hall Basement; Fixed ladder to door of Merrill; 2 <sup>nd</sup> Merrill entry is fixed ladder from First Floor Mechanical Room; 24 x 36" Hatch in Rockwell Basement; 3' x 4' door Room 001T, 4' above floor in hallway between Kent Hall and McGilbery; Wall opening in Lowery Basement Mechanical Room – pipe clearance (12") too small to enter tunnel.							
		A,C,F,L,O,P ,S,T,V	See Above	No	Yes	No	No

Footnote: 5. No retrieval/rescue provisions required by regulations if entry is not Permit-Required.

7. NRWA: Non-Routine Work Activities include, but are not limited to, repair or replacement of gas lines, electrical lines, steam lines, asbestos abatement, or Hot Work. Tunnels are Permit Spaces when these activities are performed. If no NRWA, follow KSU Tunnel Entry Procedure.

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
KENT HALL							
Basement Room 001 - Sump with 2 Pumps	A,D,F,L,O,S	18” Dia. Sub-Hatch	No	Yes	N/A	N/A	
Hallway Under Kent Hall Floor Between Rest Rooms Under Water Cooler for Sump Pump	None	20” Dia. Floor Hatch	No	Yes	Yes	Yes	
		Note: Too small to bodily enter. If pump replacement needed cut pipe and lift out					
MOULTON HALL							
Basement Mechanical Room AHU – 1	M	Side Door / Hatch	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>	
LOWERY HALL							
Basement Mechanical Room AHU – 1	M	Side Door / Hatch	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>	
Narrow Space Between Outdoor Air Intake Well and Interior Wall	None	18” Wide Door	No	No	N/A	Yes <sup>5</sup>	
CARTWRIGHT HALL							
Mechanical Room 403A AHU-2	M	Side Door / Hatch	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>	
Roof Above Room 305A – Air Handlers	M	Fixed Ladder	NO	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>	
Outdoor Pits for Air Intakes Around Foundation – 12” Deep	F	Top Grates	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes <sup>5</sup>	
Areas above Ceiling	F (No anchorage point available)	30” x 30” Hatches in Roof Top	No	Yes <sup>1</sup>	Yes <sup>2</sup>	No	



Facility: Kent State University Front Campus Tunnel from

Sheet: 28

McGilvrey Hall to Moulton and Franklin

Address: Main Campus, Kent, OH

Date of Survey: November 22, 2006

Inventoried By: Pete Dell, Dennis Baden

Revision Date: March 2, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>FRONT CAMPUS TUNNEL FROM FRANKLIN TO MCGILVREY HALL TO MOULTON</b>							
Tunnel is confined space and permit-required. Contains electrical feeds, steam and chilled water. Walking position to Franklin. No top grates or openings. No air sampling history or data. Cell phones and radios do not work reliably. Atmospheric hazards may be present, due to Hot Work in or near tunnel, or other unanticipated or non-routine activities. Entry rescue will be required in most instances where a permit is required. <u>Entry:</u> To Moulton Spur - 4' x 16" Door from McGilbery Hall Basement Mechanical Room. To Franklin Spur - 4' x 3' door, 30" above floor down steps from McGilbery Hall Basement Mechanical Room.							
		A,L,O,T	See Above	No	Not Unless NWRA <sup>7</sup>	Yes <sup>2</sup>	Not All Areas

Footnote: 2. If HOT WORK performed, space is PERMIT REQUIRED and may NOT be reclassified. Continuous local exhaust ventilation to outside space is required during Hot Work.

Facility: Kent State University – Centennial E and F

Sheet: 29

Address: Centennial E 1400 Chiarucci Drive 153 Kent OH 44243 and

Centennial F 1450 Chiarucci Drive 154 Kent OH 44243

Date of Survey: January 21, 2014

Inventoried By: Hal Lehman, Don Head

Revision Date: January 21, 2014

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>Centennial Building E</b>							
Steam Vault		M, F, T	Fixed Ladder	No	Yes <sup>1</sup>	No	Yes <sup>5</sup>
<b>Centennial Building F</b>							
Steam Vault		M,F,T	Fixed Ladder	No	Yes <sup>1</sup>	No	Yes <sup>5</sup>

Footnote: 1. May be reclassified if NO HOT WORK is performed, and all hazards can be controlled or isolated/locked-out without entry and after air monitoring from outside space proves acceptable conditions at all levels, prior to entry. Monitor air continuously during entry.

2. If HOT WORK performed, space is PERMIT REQUIRED and may NOT be reclassified. Continuous local exhaust ventilation to outside space is required during Hot Work.

4. May be reclassified after electrical lock-out, and fan blades physically clamped to preclude movement and air monitoring from outside prior to entry. May NOT be reclassified if HOT WORK is performed. Continuous air monitoring and continuous local exhaust ventilation to outside space is required during Hot Work.

5. No retrieval/rescue provisions required by regulations if entry is not Permit-Required.

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>KORB HALL</b>							
Basement Mechanical Room	AHUs	M	Side Hatch	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>
	Domestic Hot Water Tank w/ Steam Bundle	A,C,D,O,S,T	12" x 15" End Hatch	No	Yes	No	No
	Storage Room Light Well	F	Strg. Room Window or Yard Grate	No	Yes <sup>1</sup>	Yes <sup>2</sup>	Yes
	Incinerator (Unused)	A,C,L,O,P,S,T	24" x 30" Door Bolted Shut	No	Yes	No	N/A
<b>NO ENTRY ALLOWED BY UNIVERSITY OR CONTRACTOR PERSONNEL</b>							
<b>EAST CHILLER BUILDING</b>							
First Floor Mezzanine	AHU	M	Side Hatch / Door	No	Yes <sup>1</sup>	Yes <sup>4</sup>	Yes <sup>5</sup>
	Trench for Chilled Water (50' Long) Pipe	None	Open Top with Grate	No	No	N/A	N/A

Footnote: 1. May be reclassified if NO HOT WORK is performed and all hazards can be controlled or isolated/locked-out without entry and after air monitoring from outside space proves acceptable conditions at all levels, prior to entry. Monitor air continuously during entry.

4. May be reclassified after electrical lock-out, and fan blades physically clamped to preclude movement and air monitoring from outside prior to entry. May NOT be reclassified if HOT WORK is performed. Continuous air monitoring and continuous local exhaust ventilation to outside space is required during Hot Work.

5. No retrieval/rescue provisions required by regulations if entry is not Permit-Required

Facility: Kent State University - Tunnel

Sheet: 31

Address: Main Campus, Kent, OH

Date of Survey: November 14, 2006

Inventoried By: Pete Dell, Dennis Baden

Revision Date: June 28, 2007

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
<b>RESIDENCE SERVICES TUNNEL - (From Midway Tunnel to Korb Hall Basement Mechanical Room And East Chiller Plant Basement)</b>							
Contains electrical feeds, steam and chilled water. Tunnel is tall and wide – normal walking possible. Several fixed ladders to sidewalk/yard areas. Radios generally work reliably. Atmospheric hazards may be present due to Hot Work in or near tunnel or other NRWA. <sup>7</sup> Non-entry retrieval may be feasible at certain, limited areas. <u>Entry</u> : Via Midway Tunnel, (2) ladders to sidewalk grates, or Spurs to Korb Hall and East Chiller Plant via their basement mechanical rooms.							
		A,F,L,O,T	See Above	No	Not Unless NWRA <sup>7</sup>	Yes	Not All Areas <sup>5</sup>

Footnotes: 5. No retrieval/rescue provisions required by regulations if entry is not Permit-Required.

7. NRWA: Non-Routine Work Activities include, but are not limited to, repair or replacement of gas lines, electrical lines, steam lines, asbestos abatement, or Hot Work. Tunnels are Permit Spaces when these activities are performed. If no NRWA, follow KSU Tunnel Entry Procedure.

Name of Confined Space	Description of Space	Hazard Codes	Entry	Sign Posted? Yes/No	Permit Req'd.? Yes/No	Reclass as Non-Permit?	Non-Entry Retrieval Feasible?
RESIDENCE SERVICES TUNNEL							
Sumps with 2 Pumps, Labeled Res. 2, 3, 4, 5, 6		A,D,F,O	4' X 4' Grate	No	Yes	N/A	N/A
		NO ENTRY ALLOWED: IF PUMP REPLACEMENT NEEDED CUT PVC PIPE AND LIFT OUT TO REPLACE					
RESIDENCE SERVICES TUNNEL SPUR TO EAST CHILLER PLANT							
Sump with Pump, Labeled Res. 4		A,D,F,O	4' x 4' Grate – Open Top	No	Yes	N/A	N/A
		NO ENTRY ALLOWED: IF PUMP REPLACEMENT NEEDED CUT PVC PIPE AND LIFT OUT TO REPLACE					
MIDWAY TUNNEL SPUR BETWEEN NIXON/COMMONS AND RESIDENCE SERVICES TUNNELS							
Sump with Pump, Labeled Mid. 3		A,D,F,O,	4' x 4' Grate	No	Yes	N/A	N/A
		NO ENTRY ALLOWED: IF PUMP REPLACEMENT NEEDED CUT PVC PIPE AND LIFT OUT TO REPLACE					

- Footnote:
1. May be reclassified if NO HOT WORK is performed, and all hazards can be controlled or isolated/locked-out without entry and after air monitoring from outside space proves acceptable conditions at all levels, prior to entry. Monitor air continuously during entry.
  2. If HOT WORK performed, space is PERMIT REQUIRED and may NOT be reclassified. Continuous local exhaust ventilation to outside space is required during Hot Work.
  3. Non-entry retrieval is feasible if steam bundle removed first without entry (from outside space).
  4. May be reclassified after electrical lock-out, and fan blades physically clamped to preclude movement and air monitoring from outside prior to entry. May NOT be reclassified if HOT WORK is performed. Continuous air monitoring and continuous local exhaust ventilation to outside space is required during Hot Work.
  5. No retrieval/rescue provisions required by regulations if entry is not Permit-Required.
  6. Not Permit-Required UNLESS HOT WORK performed. If HOT WORK performed, space is PERMIT-REQUIRED and may NOT be reclassified. Continuously air monitoring and continuous exhaust ventilation required during Hot Work. Exhaust ventilation must employ HEPA filter due to proximity to occupants.
  7. NRWA: Non-Routine Work Activities include, but are not limited to, repair or replacement of gas lines, electrical lines, steam lines, asbestos abatement, or Hot Work. Tunnels are Permit Spaces when these activities are performed. If no NRWA, follow KSU Tunnel Entry Procedure.

**APPENDIX F**  
**KSU CONFINED SPACE INVENTORY**

<b>HAZARD CODES</b>	
<b>A</b>	<b>- Atmospheric Hazard</b>
<b>C</b>	<b>- Chemical</b>
<b>D</b>	<b>- Drowning Hazard</b>
<b>E</b>	<b>- Engulfment</b>
<b>F</b>	<b>- Fall Hazard</b>
<b>I</b>	<b>- Inwardly Converging</b>
<b>L</b>	<b>- &gt; 10% L.E.L</b>
<b>M</b>	<b>- Mechanical Hazard</b>
<b>O</b>	<b>- Oxygen Deficiency</b>
<b>P</b>	<b>- Particulate</b>
<b>S</b>	<b>- 18" or smaller entry/exit</b>
<b>T</b>	<b>- Thermal</b>
<b>V</b>	<b>- Electrical</b>

## APPENDIX G

### CONFINED SPACES EQUIPMENT MAINTENANCE LOG

[illegible]

**APPENDIX H**  
**Permit Entry Confined Space Pre-Job Meeting Checklist**

Date:		
Attendees:		
Confined Space Supervisor:		
Confined Space Entrant:		
Confined Space Attendant:		
Contract Employer:		
Address:		
City:	State:	Zip Code:
Contact Name:		
Telephone Numbers: Office:		Cell Phone:
Name and Location of Permit Entry Confined Space:		
Purpose of Entry:		
Anticipated Hazards:		
Control Measures Required:		
Hazardous Energy Control Procedures:		
Equipment and Instruments Used:		
The following items have been reviewed (Initials of all personnel):		
Acceptable Entry Conditions:		
Applicable Safety Data Sheets		
Entry Permit, Hot Work Permits or Others:		



## APPENDIX H CONTINUED

[illegible]