

Confined Space Entry Program





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1. Introduction

This document establishes Yale University's Confined Space Entry Program. It is designed to provide for the identification, evaluation, and control of confined space hazards, and ensure that employees and contractors who must enter such locations are trained and apprised of the program. The program provides criteria for identifying confined spaces, including permit-required confined spaces, and establishes the standard precautions and procedures that must be implemented to eliminate potential hazards during actual entries. The program addresses the requirements of the Occupational Safety and Health Administration (OSHA), Title 29 of the Code of Federal Regulations Part 1910.146 (permit-required confined spaces) and Part 1910.269 (e) (enclosed spaces).

2. Definitions

The following definitions are critical for evaluating the various kinds of confined spaces, their hazards, and control.

a. Confined Spaces are locations that meet all three of the following criteria:

- Sufficiently sized and so configured that a person can physically enter the space, and
- Possess a restricted means of entry or exit, and
- Are not designed for continuous occupancy.

Common examples of confined spaces at Yale University include tanks, vaults, manholes, boilers, tunnels, sewer and sump pits, large HVAC equipment, the Physics Department accelerator at WNSL, pipe chases, and some crawlspaces and ductwork interiors. A listing of recognized confined spaces is maintained and periodically updated by OEHS (see Appendix A). Please note that this list is continually revised, and therefore should not alone be relied upon to determine if a location is a confined space.

b. Permit-Required Confined Spaces are confined spaces that possess potential hazards that could result in serious injury or death and are therefore subject to all the provisions of this Program before entry is allowed. A confined space that contains one or more of the following characteristics is considered a Permit-Required Confined Space:

- Contains or could contain a hazardous atmosphere, or
- Contains a material that could engulf an entrant, or
- Possesses an internal configuration that could trap or asphyxiate an entrant, or
- Contains any other recognized serious safety or health hazard.

These spaces require a written permit prior to entry. The process of generating the permit forces supervisors, entrants, and attendants to work together and carefully consider the potential hazards associated with the space in advance, and prepare controls appropriate to the space and entry work activities.



c. Alternate Entry Procedures are confined space entry procedures that can be used in place of a full permit-required entry. These procedures may be adopted if:

- The only hazard in the confined space is an actual or potential hazardous atmosphere, and
- Forced air ventilation alone can maintain a safe atmosphere during entry.

d. Underground Electrical Installations are another specific grouping of confined spaces that can be entered using procedures less stringent than those reserved for permit-required confined spaces. Underground Electrical Installations are typically below-grade vaults used for electrical transmission and switching gear. These locations are generally considered as permit-required confined spaces until pre-entry procedures are completed and the space has been determined to be safe for entry. Provided that the entry work is exclusively for the purpose of inspection, housekeeping, taking readings, or similar routine low hazard work, employees working alone may enter these spaces for brief periods if electrical hazards are controlled or employees are appropriately protected from them.

3. Individuals Covered by this Program

Employees whose job duties involve one or more of the following activities are included:

- Perform actual entries into permit-required confined spaces (Authorized Entrants);
- Serve as an attendants during permit-required confined space entry (Attendant); or
- Supervise others who enter or attend during entries (Entry Supervisor).

No one may serve in any of these capacities without first receiving Confined Space Entry training, either as provided or approved by the Office of Environmental Health and Safety (OEHS).

Contractors needing access into a recognizable confined space must adhere to the requirements of this program, at the minimum. University contractor liaisons must furnish as much available information to the contractor as possible. Contractors and Yale employees who direct contractor activities in confined spaces are also reminded to review the University's Contractor Health & Safety Advisory.

4. Responsibilities

Various Yale University departments and employees have specific responsibilities under this program:

Office of Environmental Health and Safety (OEHS):

- Serves as primary resource and contact on confined space issues;



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- Maintains, revises, and distributes this program to appropriate campus departments;
- Assists in the evaluation and identification of confined spaces;
- Oversees field calibration of atmospheric monitoring equipment used for confined space entry work;
- Performs any additional specialty air monitoring or testing;
- Develops and presents confined space safety training, and maintains applicable records.

Supervisors:

- Ensure overall employee compliance with this program, especially training;
- Provide appropriate air monitoring instruments and all other safety equipment;
- Assist in the development and review of confined space entry permits before signing and authorizing a permit-required confined space entry, and collect and retain all permits after use for at least two years;
- Communicate with contractors about confined space work and disclose known hazards;
- Periodically review the program with OEHS; and
- Serve as Entry Supervisor on permit space entries once so trained.

Attendants:

- Receive confined space training to safely observe and support entrants from outside of confined spaces;
- Prevent entry by unauthorized personnel;
- Understand the hazards or potential hazards of confined spaces;
- Maintain accurate count of authorized entrant(s) in the space;
- Continually observe and communicate with entrants to help ensure the safety of entrants, being on the alert for any signs or symptoms that might indicate hazardous conditions;
- Monitor activities inside and outside the space to ensure that it is safe for entrants to remain in the area;
- Remain at the entry of a confined space until relieved by another attendant;
- Order entrant(s) evacuation if any prohibited or hazardous conditions develop during the entry;
- Perform a non-entry rescue and/or summon rescue in the event of entrant incapacitation.

Authorized Entrants

Make actual entries into confined space, and have been trained and authorized to:

- Understand confined space hazards;
- Use personal protective equipment and entry tools and supplies;
- Follow proper entry procedures and perform assigned job;
- Communicate with attendant; and
- Evacuate space immediately, if necessary.

Control Centers and Security

- Monitor confined space entries off hours for emergency notification purposes.



5. Identification of Confined Spaces

Recognized confined spaces are listed in the OEHS Confined Space Inventory in Appendix A. Since this list is subject to continual updates, inclusion alone should not be relied upon to identify whether a location qualifies as a confined space. Potential entrants are trained to always review the characteristics of a potential confined space against the decision flow chart shown in Appendix B. Recognized spaces that also meet the additional potential hazard criteria for Permit-Required Confined Spaces are also posted to alert potential entrants.

6. Entry Permits

Most confined spaces on campus carry very low hazard potential, and generally may be entered safely following the basic procedures outlined in Appendix B. However, for the small subset of higher hazard locations, Entry Permits must be completed prior to entry. Entry Permits are standardized written documents that help ensure appropriate precautions are taken prior to entry into higher hazard Permit-Required Confined Spaces. They require supervisor authorization before entry and must be posted continuously at the entry site for the duration of work.

Three kinds of Entry Permits are available, depending upon the kind of space to be entered:

- Permit-Required Confined Space Entry Permit (Appendix C);
- Alternate Entry Permit (Appendix D), which is used when the only potential hazard is atmospheric and it can be safely managed;
- Underground Electrical Installation Entry Permit (Appendix E), which is only used for routine work in electrical vaults.

Regardless of type, Entry Permits must remain at the job site until entry work is completed. After use, permits must be returned to the applicable supervisor, and retained in department records for at least two years.

7. Entry Procedures

The following steps must be taken before entry is made into any known or suspected confined space:

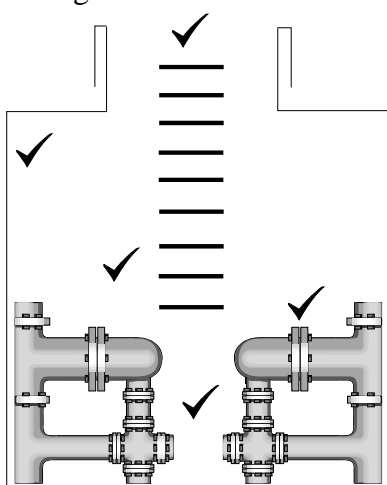
- a. Use the Confined Space Decision Flow Chart (Appendix B) to determine if a space meets the definition of a Confined Space, and if so, what procedures are required for entry.
- b. Organize and obtain required forms and equipment as follows:
 - Entry Permit,
 - Permit-Required Confined Space Entry Permit (Appendix C),
 - Alternate Entry Permit (Appendix D),
 - Underground Electrical Installation Entry Permit (Appendix E).
 - Air monitoring equipment (check battery and calibration),
 - Ventilation equipment and power supply,
 - Qualified attendant and appropriate communication equipment,



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- Tripod, winch, and full body harness (for vertical entry), and
 - Barricades, as needed.
- c. Secure the environment using the appropriate Lock-Out/Tag-Out (LOTO) procedure.
- d. Perform initial monitoring with a Lumidor Micro Max multi-gas meter or other OEHS approved meter that has been calibrated with all sensors in operation:

- Turn meter on and check battery charge.
- Confirm that oxygen, lower explosive limit, and toxic gas sensor(s) (carbon monoxide) are operating and reading normal levels. Reset meter in a clean air environment before using meter in confined space. If meter cannot be reset to normal readings, or any sensors are malfunctioning, stop work until another operating meter is obtained.



- For manhole entries, insert probe into opening of the manhole lid or other access point, and sample for at least 15 to 30 seconds.
- If readings are within acceptable levels, continue to sample the atmosphere by lowering the probe through the lid opening to several different heights above the floor. Allow adequate time for the instrument to draw the sample up the extended hose

and conduct the analysis, typically 30 to 60 seconds. These samples will analyze for heavier-than-air gases that could be found near the bottom of the space. Do not open the lid until acceptable levels are obtained. Where interconnected spaces are blinded off, each space should be monitored separately. The most hazardous conditions found in any portion of the area dictate the appropriate action to be taken.

- Record all monitoring results on the Entry Permit form. If unacceptable readings and/or alarms are activated during any monitoring tests, the atmosphere is likely to be contaminated and unsafe for entry. Ventilate for at least five minutes and resample. If the atmosphere has not cleared after this initial forced ventilation attempt, **DO NOT ENTER THE SPACE!** Contact your supervisor and OEHS. The source of contamination must be identified and eliminated before any entry can occur.
- e. For off-hours work, notify the appropriate Control Center that a confined space entry will occur. Upon completion of work, notify Supervisor and Control Center that the space has been vacated and secured.



8. Hazards and Safe Work Practices

The following kinds of hazards may potentially exist in confined spaces. Each hazard is followed by a description of recommended safe work practice(s) for eliminating or appropriately controlling the hazard.

a. Excess Pressure Hazards:

The build-up of pressure inside a space can create a serious physical hazard during cover/hatch opening. Pressure build-up could occur as a result of internal reactions inside the space, or from a very tightly sealed space that have not off-gassed.

Safe Work Practice: Prior to removing an entry manhole cover or hatch, visually inspect the area for any obvious discoloration, deterioration, or deformation. Prior to physically touching the cover, hold your hand above the cover to determine if it is excessively warm. The presence of vent or hook holes may prevent pressurization of the space. If no vent or hook holes are present, open the cover gradually to release any residual pressure that may be present. After removing the cover/hatch, install safety railings with an access chain to prevent an accidental fall into the space.

b. Atmospheric Hazards:

Atmospheric hazards are among the most common hazards posed by confined spaces. The atmosphere inside a confined space is considered hazardous if it contains dangerous concentrations of certain contaminants, is deficient in or overly enriched with oxygen, or contains sufficient flammable vapors or gas to be potentially explosive.

Safe Work Practice: Confined spaces must always be tested prior to entry to determine whether an oxygen deficient, flammable, or toxic atmosphere exists. Acceptable atmospheric levels are:

Oxygen	19.5 to 23.5%
Flammability (% of Lower Explosive Limit)	< 10%
Carbon Monoxide	< 35 ppm
Hydrogen Sulfide	< 10 ppm

Atmospheric monitoring must be made with a calibrated, OEHS-approved alarming multiple gas monitor. Employees may only enter a confined space after initial testing indicates that no atmospheric hazards exist; continuous monitoring is required while a confined space is occupied. Workers must immediately leave the space if any of the gas monitor alarm set points are reached. Workers may not return into the space until forced ventilation has been completed and the gas detector indicates that it is safe to re-enter. In addition to the multi-gas meter, individuals entering into atmospheric hazard confined spaces must also wear a personal, direct reading, alarming oxygen meter calibrated to the same set points as above.



Note: For routine work inside Underground Electrical Vaults, forced ventilation must be applied at all times even if initial monitoring indicates safe atmospheric conditions. Entrants must immediately exit the confined space if any gas monitor alarm set points are reached, and also if the forced ventilation system shuts down or fails.

c. Electrical Hazards:

Confined spaces may also present serious electrical shock or electrocution hazards from potentially defective cables, the presence of water (flooded vault) in contact with electrical wiring, or by accidental physical contact with charged cables or wire leads.

Safe Work Practice: The risks from electrical hazards depend upon the presence and condition of electrical sources and conduits inside the space, the physical configuration of access, and the activity or work to be conducted inside the confined space. Employees are cautioned to NOT ENTER THE SPACE if an electrical shock potential is identified.

Note: Underground Electrical Vaults may be entered without additional electrical hazard protections for “routine work” only. “Routine work” here refers to non-invasive, low hazard activities such as inspection, meter or dial reading, housekeeping, and other similar work. Entries into these kinds of locations for any other purpose than routine work may only occur under either a Permit-Required or Alternate Entry Procedure, using the appropriate entry permit, attendant, and rescue equipment.

d. Engulfment Hazards:

Engulfment hazards are either active or potential conditions that could crush, suffocate, drown, or otherwise engulf and incapacitate an entrant. The most common examples of confined space engulfment hazards on campus are the presence of high water levels or the potential for flooding while working inside a confined space. Other less common engulfment hazards are possible from the shifting or collapse of surrounding soil or sand, and the release or falling of supplies or other materials stored inside a confined space.

Safe Work Practice: Before an entry is performed, confined spaces must be thoroughly visually inspected for potential engulfment hazards. Accumulated water must be pumped out of the space before entry is made. If there is a potential for flooding from an incoming feed pipe or valve, an appropriate lock-out/tag-out must be applied to prevent inadvertent filling.

e. Accumulated Water Hazards:

Small amounts of water often accumulate in the base of many confined spaces, especially those located outdoors. When water accumulates in excess of dampness or minor wetting, it can create or mask other hazards. These include slippery walking surfaces, the obscuring of trip or fall hazards, and increasing the potential for electrical hazards.

Safe Work Practice: Prior to entry, accumulated water must be pumped down to ensure a clear and unobstructed view into the space, and visually confirmed as free from other recognizable hazards. Portable electrical lighting and other equipment for use inside a



wet or damp confined space must be limited under most circumstances to self-contained battery operated devices, low voltage equipment, or protected by a functioning GFCI.

f. Entrant-Generated Hazards

Certain maintenance and repair operations performed in confined spaces have the potential to generate their own hazards. Some examples include: i) the use of volatile cleaning, stripping, or coating chemicals that can pose toxicity, flammability, or oxygen displacement hazards; ii) introduction of flames and other ignition sources through welding or cutting work; and iii) high potential exposures to silica and metal during sandblasting operations.

Safe Work Practice: Prior to making any confined space entry, the authorized entrant(s) and their supervisors must review the anticipated purpose of the entry and any planned work activities. Special attention must be given to evaluating and controlling hazards from in-space work activities, e.g., additional local exhaust or supply ventilation, changing chemical products to lower hazard materials, working remote, etc. Contact OEHS for additional information on controlling hazardous operations; hot work also requires review by the Yale Fire Marshal in advance.

9. Employee Qualifications and Training

Individuals involved in any aspect of work with confined spaces work must receive confined space safety training. This training must cover: (1) classification and evaluation of confined spaces, (2) confined space hazards, (3) the University's Confined Space Entry Program, (4) appropriate use and care of atmospheric monitoring equipment, (5) forced ventilation, and (5) emergency procedures, including the use of rescue equipment. Employees must successfully complete this training before any confined space entry, attendant, or supervision work is performed.

10. Emergency Rescue Procedures

Emergencies during a confined space entry can have catastrophic consequences if entrants, attendants, and potential rescuers have not developed a plan of action in advance. Appropriate means for rescue must be established prior to entry, selected from the following gradations of rescue procedures:

a. Self-Rescue: Entrant self-rescue generally provides the most effective means of escaping a recognized confined space hazard. Self-rescue must immediately be effected whenever an entrant, fellow entrant, or attendant recognizes the presence of a hazardous atmosphere, any signs or symptoms of over-exposure, or any other serious space hazards. Self-rescue must also be implemented in the event of forced ventilation system failure during entry inside an Underground Electrical Vault.

Self-rescue requires entrants to safely stop whatever they are doing and exit the space in the most expedient and safe manner possible. Self-rescue is simple, fast, provides individuals



with the ability to alert fellow workers, and does not require anyone else to enter the space, thereby avoiding the endangerment of more people. The obvious drawback is that it requires the entrant to be conscious and physically mobile, and therefore unsuited for entrants who have suffered serious exposure or injury.

b. Non-Entry Rescue: When self-rescue is not possible due to unconsciousness or incapacitation of an entrant, non-entry rescue should be initiated. Under this method, mechanical equipment is used to physically extract, lift, pull, or otherwise remove entrants from the confined space without requiring any additional persons to enter into the space. Non-entry rescue equipment typically consists of a body harness, non-conductive cable or rope, winch, and tripod that can be operated from outside of the confined space by the attendant. Non-entry rescue reduces the risk of collateral injury to rescuers, but is only effective on simple vertical or clear horizontal spaces. Since mechanical retrieval of unconscious or incapacitated entrants from complex, convoluted spaces can cause serious injuries from entanglement, strangulation, and blunt force impacts, this method of retrieval must be carefully evaluated before implementation.

c. Entry Rescue: Entry rescues are the most dangerous form of confined space rescue since they require additional persons to enter into the very space that caused injury or over-exposure to the entrant(s). Entry rescue may only be attempted by appropriately trained individuals possessing active certification in and knowledge of first aid/CPR, self-contained breathing apparatus, rescue/retrieval equipment, and rescue training.

An entry rescue plan must be developed prior to implementing this level of rescue responsibility, and include the following elements:

- Barricades for crowd/traffic control,
- Additional ventilation options,
- Controls for other potential hazards (e.g., cave-ins, fire),
- Protective clothing and equipment,
- Explosion-proof lighting equipment,
- Redundant methods of communication,
- Standby rescue team,
- Victim removal procedures and devices,
- Available emergency vehicles,
- Medically trained personnel.

11. Recordkeeping

The Office of Environmental Health and Safety maintains copies of the inventory of recognized confined spaces, training records, safety audits, and incident/accident investigations. Owner departments maintain copies of completed entry forms, and service and maintenance records for work in all locations, including confined spaces.



12. Contractors and Visitors

Contractors, vendors, and other visitors are responsible for their own health and safety programs, including programs for any confined space entry work. Their programs must meet the requirements of this program, at the minimum. University contacts and liaisons with these individuals are responsible for sharing information about known or suspected confined spaces in advance.

END

Appendix A

CONFINED SPACES at YALE UNIVERSITY

Confined Space	Building	Location	Type of Space	Detail/Hazards
High Voltage Vault	Beinecke	North Side	Alt Entry	High Voltage Equipment
High Voltage Vault	Harkness Dorm Med School	Grass area by Frontage -York	Alt Entry	High Voltage Equipment
High Voltage Vault	Helen Hadley Hall	Rear of Bldg.	Alt Entry	High Voltage Equipment
High Voltage Vault	KCL	In Rear by Chem Storage Bldg	Alt Entry	High Voltage Equipment
High Voltage Vault	Berkeley North	Grass walkway by Calhoun	Alt Entry	High Voltage Equipment
High Voltage Vault	Peabody	Grass area off Whitney	Alt Entry	High Voltage Equipment
High Voltage Vault	Pierson Sage	Grass Fence Area by Parking	Alt Entry	High Voltage Equipment
High Voltage Vault	Sachem	Near Sachem	Alt Entry	High Voltage Equipment
High Voltage Vault	SSS Strathcona	Bsmt Tunnel	Alt Entry	High Voltage Equipment
Electrical Vault	Davenport	Front Moat	Alt Entry	Atmosphere Risk
Water Tank	KBT	13 th Floor	Non Permit	Water Storage Vessel
Sump Pump Pit	KBT	Sub Bsmt	Alt Entry	Atmosphere Risk, LO-TO of Equipment
Condensate Receiver Pit	KBT	Sub Bsmt	Alt Entry	Atmosphere Risk, LO-TO of Equipment
Crawl Space	KBT	Btwn 1 st /2 nd	Non-Permit	Mechanical Crawl Space-Must Stay on Platforms
Air Handling Plenum (2)	SCL	Saw Tooth Areas	Non-Permit	Air Handling Equipment above ceilings
Sump Pump Pit	KCL	Mechanical Room	Alt Entry	Atmosphere Risk, LO-TO of Equipment
Steam/Utilities Tunnel (3)	OML	Sub-Bsmt	Non-Permit	Entry Difficulties
Sewage Ejector Pit	KGL	At Loading Dock	Alt-Entry	Atmosphere Risk, LO-TO of Equipment
Water Cooling Tower	Ingalls Rink	Rear of Bldg	Non-Permit	Tight Spaces
Hot Water Holding Tank	Ingalls Rink	Bsmt of Bldg	Non-Permit	Difficult entry
Sump Pump Pit	Ingalls Rink	Bsmt of Bldg	Alt-Entry	Atmosphere Risk, LO-TO of Equipment
Steam/Utilities Tunnel	17 Hillhouse	Sub-Bsmt	Non-Permit	Entry Difficulties, Hot Air Temp
Sewage Ejector Pit	17 Hillhouse	Sub-Bsmt	Alt-Entry	Atmosphere Risk, LO-TO of Equipment
Sewage Ejector Pit	17 Hillhouse	For HHH	Alt-Entry	Atmosphere Risk, LO-TO of Equipment

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CONFINED SPACES at YALE UNIVERSITY

Confined Space	Building	Location	Type of Space	Detail/Hazards
Air Tank	Becton Lab	Bsmt	Non-Permit	Entry Difficulties
Hot Water Holding Tank	Becton Lab	6 th Floor of Bldg	Non-Permit	Difficult entry
Crawl Space (2)	Divinity School	1st Fl Kitchen	Non-Permit	Difficult entry
Air Tank	Dunham Lab	2nd Floor	Non-Permit	Entry Difficulties
Sewage Ejector Pit	Morse College	Bsmt Area	Alt-Entry	Atmosphere Risk, LO-TO of Equipment
Compensating Water Tanks	Morse College	Tower Basement	UN	UN
Air Handling Plenum	Mason Labs	Bsmt Areas	Non-Permit	Air Handling Equipment
Accelerator-Nuclear	WNSL	1 st Floor	Alt-Entry	Potential Oxygen Deficiency
Nitrogen Storage Tank	WNSL	1 st Floor	Alt-Entry	Potential Oxygen Deficiency
Storage Tank SFL6	WNSL	In Ground Front of Bldg	Alt-Entry	Potential Oxygen Deficiency
Exhaust Duct Works HRSG 3-Sets				
Gas Gen Turbine Area 3-Sets	Central Power	1 st and 2 nd FL	Non-Permit	Cool Down, LO-TO, Fall Protection
Waterside Boiler LG Drum	Central Power	1 ST Rear	Non-Permit	Cool Down, LO-TO
Fire, Mud & Steam AUX Boiler	Central Power	1 ST Floor	Non-Permit	LO-TO of System
De-Aerator Tank	Central Power	1 ST Floor	Non-Permit	Cool Down, LO-TO
HVAC/EXH Ductwork	Central Power	Upper Level	Non-Permit	Cool Down, LO-TO
Roof Post Inlet Filter	Central Power	Upper Level	Non-Permit	Cool Down, LO-TO, Fall Protection
Water Tower	Central Power	Roof Top	Non-Permit	Difficult Access Entry
Condensate Receiver Tank	Central Power	Roof Top	Non-Permit	LO-TO of System, Difficult Access Entry, 2 nd Person assistance
Condensate Softener Tank	Central Power	Upper Level	Non-Permit	Cool Down, LO-TO
Condensate Polisher Tank	Central Power	Upper Level	Non-Permit	LO-TO of System, Drain, Avoid Skin Contact
Water Separator Pit	Central Power	Upper Level	Non-Permit	Cool Down, LO-TO
Oil Tanks (3)	Central Power	Basement	Alt-Entry	LO-TO of System
Ammonia Tank	Central Power	Rear Yard	Permit Required	Oil Vapor-Explosive Atmosphere
Ammonia Vault	Central Power	Rear of Plant	Permit-Required	Ammonia Vapor Exposure
Compensating Tank	Central Power	Basement Entry	UN	UN

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CONFINED SPACES at YALE UNIVERSITY

Confined Space	Building	Location	Type of Space	Detail/Hazards
Condensate/ Steam Vaults-2	Central Power	Outside Gas Compressor House	UN	UN
Condensate/ Steam Vaults-2	Steam Dist Sys	Ashmun ST	Permit Required	High Vault Temp >160° F
Condensate/ Steam Vaults-4	Steam Dist Sys	Lock St	Permit Required	High Vault Temp >160° F
Condensate/ Steam Vaults-2	Steam Dist Sys	Prospect St	Permit Required	High Vault Temp >160° F
Condensate/ Steam Vaults-1	Steam Dist Sys	Hammond Hall	Permit Required	High Vault Temp >160° F
Condensate/ Steam Vaults-1	Steam Dist Sys	Mansfield St.	Permit Required	High Vault Temp >160° F
Attic Space	Steam Dist Sys	Sachem St.	Permit Required	High Vault Temp >160° F
Attic Space	Art Gallery	Attic	Permit-Required	Fall Risk uncontrolled
Oil Tanks (4)	Woolsey Hall	Attic	Non-Permit	Difficult Entry
Crawl Space	Sterling Power	Rear Yard	Permit Required	Oil Vapor-Explosive Atmosphere
Mechanical Space	155 Whitney	Sub-Bsmt	Non-Permit	Difficult Entry through Hatches- Mechanical & Venting
Ventilation Shaft	155 Whitney	Rear-IT Area	Non-Permit	Difficult Entry-Mechanical Space
Mechanical Space	A&A Bldg	Rear Verticals	Permit Required	Very Difficult Entry/Unsafe Ladders-Fall Risk
Air Plenum Space	SHM C-Wing	Roof Access	Non-Permit	Difficult Entry-Mechanical Space
Gas-Steam Boilers (7)	SHM B-Wing	SHM BE 06	Non-Permit	Difficult Entry-Walkway space surrounding Harkness Aud.
Condensate Vaults (3)	Sterling Power	Rear/Side	Non-Permit	Cool Down, LO-TO
De-Aerator Tank	Sterling Power	Congress Ave	Permit-Required	High Vault Temp >160° F
Water Holding Tank	Sterling Power	1 st Floor	Non-Permit	Cool Down, LO-TO, Remove Accumulating Sludge
Water Cooling Towers (4)	Sterling Power	1 st Floor	Non-Permit	Difficult Access Entry, LO-TO of System
Water Meter Vaults (2)	Sterling Power	Roof	Non-Permit	LO-TO of System, Difficult Access Entry, 2 nd Person assistance
Steam Pipe Floor Chases	Sterling Power	Side-College St.	Alt-Entry	Potential Oxygen Deficiency
Blow Down Tank	Sterling Power	Bsmt Floor	Non-Permit	Difficult Entry
Condensate Tanks (2)	Sterling Power	Bsmt	Non-Permit	Difficult Entry, LO-TO of System
Sump Pump Pit	Sterling Power	Bsmt	Non-Permit	Difficult Access Entry, Cool Down, LO-TO
Chilled Water Tanks (2)	Sterling Power	Bsmt	Alt-Entry	Potential Oxygen Deficiency
	Sterling Power	Bsmt	Non-Permit	LO-TO of System, Difficult Access Entry

Appendix A

CONFINED SPACES at YALE UNIVERSITY

Confined Space	Building	Location	Type of Space	Detail/Hazards
Water Main Vault	Payne Whitney Gym	UN	UN	
HVAC Rooms	Payne Whitney Gym	All	UN	
Compensating Tank	Central Power	Outside Gas Compressor House	UN	
Ammonia Vault	Central Power	Basement Entry	UN	
Compensating Water Tank	Morse	Tower Basement	UN	
Return Air Plenum	Art and Architecture Building	UN	UN	
Air Shafts	Beinecke	UN	UN	
Sewer Ejector Pits	All	All	UN	
Oxygen Storage Area	17 Hillhouse Ave.	UN	UN	
Generator Room	17 Hillhouse Ave.	UN	UN	
Attic Space	Sprague Memorial Hall	UN	UN	
Attic Space	Sterling Library	Great Hall	UN	
Underground Utility Vaults	CAB	UN	UN	
Elevator Pits	All	UN	UN	

Appendix A

CONFINED SPACES at YALE UNIVERSITY

Confined Space	Building	Location	Type of Space	Detail/Hazards
Telecommunications Vaults				
Telecomm Vault	409 Prospect	MH	Alt-Entry	Atmosphere Risk
Telecomm Vault	219 Prospect	ST-1	Alt-Entry	Atmosphere Risk
Telecomm Vault	Science Hill	ST-2	Alt-Entry	Atmosphere Risk
Telecomm Vault	Science Hill	ST-3	Alt-Entry	Atmosphere Risk
Telecomm Vault	Science Hill	ST-4	Alt-Entry	Atmosphere Risk
Telecomm Vault	Science Hill	ST-5	Alt-Entry	Atmosphere Risk
Telecomm Vault	51 Prospect	TT-1	Alt-Entry	Atmosphere Risk
Telecomm Vault	37 Hillhouse	TT-3	Alt-Entry	Atmosphere Risk
Telecomm Vault	56 Hillhouse	UT-1	Alt-Entry	Atmosphere Risk
Telecomm Vault	56 Hillhouse	UT-2	Alt-Entry	Atmosphere Risk
Telecomm Vault	56 Hillhouse	UT-3	Alt-Entry	Atmosphere Risk
Telecomm Vault	135 Prospect	UT-4	Alt-Entry	Atmosphere Risk
Telecomm Vault	46 Hillhouse	UT-5	Alt-Entry	Atmosphere Risk
Telecomm Vault	38 Hillhouse	UT-6	Alt-Entry	Atmosphere Risk
Telecomm Vault	34 Hillhouse	UT-7	Alt-Entry	Atmosphere Risk
Telecomm Vault	140 Prospect	VT-1	Alt-Entry	Atmosphere Risk
Telecomm Vault	140 Prospect	VT-2	Alt-Entry	Atmosphere Risk
Telecomm Vault	155 Whitney	XT-1	Alt-Entry	Atmosphere Risk
Telecomm Vault	SE-HGS	H-2	Alt-Entry	Atmosphere Risk
Telecomm Vault	SSS	NT-00	Alt-Entry	Atmosphere Risk
Telecomm Vault	SSS-Rear Patio	NT-1	Alt-Entry	Atmosphere Risk
Telecomm Vault	Kirkland Hall	NT-2	Alt-Entry	Atmosphere Risk
Telecomm Vault	Dunham Lab	NT-3	Alt-Entry	Atmosphere Risk
Telecomm Vault	SW Leete Oliver	NT-4	Alt-Entry	Atmosphere Risk
Telecomm Vault	N- Leete Oliver	NT-5	Alt-Entry	Atmosphere Risk
Telecomm Vault	W- Watson	NT-6	Alt-Entry	Atmosphere Risk
Telecomm Vault	NE-Dunham	NT-7	Alt-Entry	Atmosphere Risk
Telecomm Vault	SE-Leete Oliver	NT-9	Alt-Entry	Atmosphere Risk
Telecomm Vault	SE-Stats/W- Trumbull	NT-10	Alt-Entry	Atmosphere Risk
Telecomm Vault	SW-Kirkland	NT-11	Alt-Entry	Atmosphere Risk
Telecomm Vault	W-YHP	OT-1	Alt-Entry	Atmosphere Risk

Appendix A

CONFINED SPACES at YALE UNIVERSITY

Confined Space	Building	Location	Type of Space	Detail/Hazards
Telecomm Vault	N-Temple/SE-Mason	OT-2	Alt-Entry	Atmosphere Risk
Telecomm Vault	N-Temple/180'W Trumbull	OT-3	Alt-Entry	Atmosphere Risk
Telecomm Vault	SW- College & Prospect	PT-1	Alt-Entry	Atmosphere Risk
Telecomm Vault	S-Temple 200' E of Grove	RT-1	Alt-Entry	Atmosphere Risk
Telecomm Vault	SE Law Sch Court Yard	A-2	Alt-Entry	Atmosphere Risk
Telecomm Vault	NE Corner Law Sch Bldgs	A-3	Alt-Entry	Atmosphere Risk
Telecomm Vault	W-Wall & 180' N High	B-1	Alt-Entry	Atmosphere Risk
Telecomm Vault	30' NE of B-3	B-2	Alt-Entry	Atmosphere Risk
Telecomm Vault	40' NE of B-4	B-3	Alt-Entry	Atmosphere Risk
Telecomm Vault	80' E Trumbull College	B-4	Alt-Entry	Atmosphere Risk
Telecomm Vault	S side of York NW of JE	E-6	Alt-Entry	Atmosphere Risk
Telecomm Vault	NE 143 Temple	MT-1	Alt-Entry	Atmosphere Risk
Telecomm Vault	Btwn 149 Elm & 302 Temple	MT-2	Alt-Entry	Atmosphere Risk
Telecomm Vault	SW of Corner of Chaple/York	D-7	Alt-Entry	Atmosphere Risk
Telecomm Vault	217 Prospect	AA	Alt-Entry	Atmosphere Risk
Telecomm Vault	225 Prospect	BB	Alt-Entry	Atmosphere Risk
Telecomm Vault	350 Edwards	CC	Alt-Entry	Atmosphere Risk
Telecomm Vault	340 Edwards	DD	Alt-Entry	Atmosphere Risk
Telecomm Vault	295 Congress-Air Tower	BCMM1	Alt-Entry	Atmosphere Risk
Telecomm Vault	295 Congress in Drive Way	BCMM2	Alt-Entry	Atmosphere Risk
Telecomm Vault	184 Liberty	LV1	Alt-Entry	Atmosphere Risk

Appendix A

CONFINED SPACES at YALE UNIVERSITY

Confined Space	Building	Location	Type of Space	Detail/Hazards
Telecomm Vault	100 Church St S Front Entrance	CSS1	Alt-Entry	Atmosphere Risk
Telecomm Vault	100 Church St S Front Load Dock	CSS2	Alt-Entry	Atmosphere Risk
Telecomm Vault	100 Church St S Front 20' Fence	CSS3	Alt-Entry	Atmosphere Risk

Appendix A

CONFINED SPACES at YALE UNIVERSITY

Confined Space	Building	Location	Type of Space	Detail/Hazards
High Voltage Vaults				
High Voltage Vaults	1A York Street	BackSwingDorm	Alt-Entry	Atmosphere Risk
High Voltage Vaults	1B Tower Pkwy	CPP Parking Lot	Alt-Entry	Atmosphere Risk
High Voltage Vaults	A1 Law School	Room 119	Alt-Entry	Atmosphere Risk
High Voltage Vaults	A2 Law School	Courtyard Walk	Alt-Entry	Atmosphere Risk
High Voltage Vaults	A3 C.C.	Bsmt Rm M03	Alt-Entry	Atmosphere Risk
High Voltage Vaults	A4 Law School	Moat	Alt-Entry	Atmosphere Risk
High Voltage Vaults	B1 SML	Moat	Alt-Entry	Atmosphere Risk
High Voltage Vaults	B2 CC Library	Café	Alt-Entry	Atmosphere Risk
High Voltage Vaults	B3 SML	Tunnel Stacks	Alt-Entry	Atmosphere Risk
High Voltage Vaults	B4 SML	Tunnel	Alt-Entry	Atmosphere Risk
High Voltage Vaults	B5Trumbull Coll	Moat	Alt-Entry	Atmosphere Risk
High Voltage Vaults	C6Saybrook Coll	Bsmt Closet	Alt-Entry	Atmosphere Risk
High Voltage Vaults	C1Saybrook Coll	Elm St.	Alt-Entry	Atmosphere Risk
High Voltage Vaults	C2Branford Coll	N Courtyard	Alt-Entry	Atmosphere Risk
High Voltage Vaults	C3Branford Coll	S Courtyard	Alt-Entry	Atmosphere Risk
High Voltage Vaults	C4Saybrook Coll	High St Masters	Alt-Entry	Atmosphere Risk
High Voltage Vaults	D1 Mason Lab	Front	Alt-Entry	Atmosphere Risk
High Voltage Vaults	D1 JE College	Entrance	Alt-Entry	Atmosphere Risk
High Voltage Vaults	D2 17 Hillhouse	Tunnel	Alt-Entry	Atmosphere Risk
High Voltage Vaults	D2 JE College	Back of Masters	Alt-Entry	Atmosphere Risk
High Voltage Vaults	D3 JE College	Lin Chit	Alt-Entry	Atmosphere Risk
High Voltage Vaults	D4 JE College	Moat York St.	Alt-Entry	Atmosphere Risk
High Voltage Vaults	D5 JE College	Moat York St.	Alt-Entry	Atmosphere Risk
High Voltage Vaults	D6Art Gallery	Driveway	Alt-Entry	Atmosphere Risk

Appendix A

CONFINED SPACES at YALE UNIVERSITY

Confined Space	Building	Location	Type of Space	Detail/Hazards
High Voltage Vaults	D7Chapel - York	Corner of Streets	Alt-Entry	Atmosphere Risk
High Voltage Vaults	D8High&Chapel	Corner Art Gallery	Alt-Entry	Atmosphere Risk
High Voltage Vaults	E1 Wright Hall	Rear	Alt-Entry	Atmosphere Risk
High Voltage Vaults	E2Dwight Chapel	Wall St Side	Alt-Entry	Atmosphere Risk
High Voltage Vaults	E3Old Campus	Center Court Yd	Alt-Entry	Atmosphere Risk
High Voltage Vaults	E4 Linsly-Chit	High St Sidewalk	Alt-Entry	Atmosphere Risk
High Voltage Vaults	E4 Linsly-Chit	Side High St	Alt-Entry	Atmosphere Risk
High Voltage Vaults	E5 Street Hall	Lin Chit & St	Alt-Entry	Atmosphere Risk
High Voltage Vaults	E6 McClellan Hall	MCCL-Vander	Alt-Entry	Atmosphere Risk
High Voltage Vaults	E7CT Hall	CT Hall&Vander	Alt-Entry	Atmosphere Risk
High Voltage Vaults	E8Wright Hall	Rear on Wall St	Alt-Entry	Atmosphere Risk
High Voltage Vaults	F1British Arts	Chapel & High	Alt-Entry	Atmosphere Risk
High Voltage Vaults	GS1 Grove St	YorkGroveTP	Alt-Entry	Atmosphere Risk
High Voltage Vaults	GS2 Grove St	Law Sch Entr	Alt-Entry	Atmosphere Risk
High Voltage Vaults	GS3 Grove St	Snake/Bones	Alt-Entry	Atmosphere Risk
High Voltage Vaults	GS4 Grove St	Grove/College	Alt-Entry	Atmosphere Risk
High Voltage Vaults	HH KBT	Load Dock	Alt-Entry	Atmosphere Risk
High Voltage Vaults	H1Sachem St	Rear CarriageSd	Alt-Entry	Atmosphere Risk
High Voltage Vaults	H2 37 Hillhouse	Bhnd rear Fence	Alt-Entry	Atmosphere Risk
High Voltage Vaults	H2 HGS	Bsmt B53	Alt-Entry	Atmosphere Risk
High Voltage Vaults	H3 85 Trumbull	Behind	Alt-Entry	Atmosphere Risk
High Voltage Vaults	I1 CPP	Park Lot	Alt-Entry	Atmosphere Risk
High Voltage Vaults	I2 CPP	Park Lot	Alt-Entry	Atmosphere Risk
High Voltage Vaults	I3 CPP	Park Lot	Alt-Entry	Atmosphere Risk
High Voltage Vaults	I4 CPP	Tower Pkwy	Alt-Entry	Atmosphere Risk
High Voltage Vaults	K1 Bienecke	StairBonesSnake	Alt-Entry	Atmosphere Risk

Appendix A

CONFINED SPACES at YALE UNIVERSITY

Confined Space	Building	Location	Type of Space	Detail/Hazards
High Voltage Vaults	K2 Bienecke	Courtyard	Alt-Entry	Atmosphere Risk
High Voltage Vaults	K3 Bienecke	Courtyard to NB	Alt-Entry	Atmosphere Risk
High Voltage Vaults	K4 WoosleyHall	Closet in Bsmt	Alt-Entry	Atmosphere Risk
High Voltage Vaults	K5 Commons	BsmtWoosleyKit	Alt-Entry	Atmosphere Risk
High Voltage Vaults	K6 WoosleyHall	Front Steps	Alt-Entry	Atmosphere Risk
High Voltage Vaults	L1 N Berkeley	At C.C.L.	Alt-Entry	Atmosphere Risk
High Voltage Vaults	L2 S Berkeley	By Calhoun	Alt-Entry	Atmosphere Risk
High Voltage Vaults	L3 N Berkeley	At Wall St.	Alt-Entry	Atmosphere Risk
High Voltage Vaults	M1 435 College	Front	Alt-Entry	Atmosphere Risk
High Voltage Vaults	M2 435 College	Side	Alt-Entry	Atmosphere Risk
High Voltage Vaults	M3 435 College	Rear	Alt-Entry	Atmosphere Risk
High Voltage Vaults	M4 149 Grove	Side	Alt-Entry	Atmosphere Risk
High Voltage Vaults	M5 149 Grove	Rear	Alt-Entry	Atmosphere Risk
High Voltage Vaults	M6 451 College	Front	Alt-Entry	Atmosphere Risk
High Voltage Vaults	MHX1155Whitn	Front of Bldg	Alt-Entry	Atmosphere Risk
High Voltage Vaults	N10 24Hillhouse	Corner	Alt-Entry	Atmosphere Risk
High Voltage Vaults	N00 Strath Hall	Front on Grove	Alt-Entry	Atmosphere Risk
High Voltage Vaults	N1 Strath Hall	In Courtyard	Alt-Entry	Atmosphere Risk
High Voltage Vaults	N11 Strath Hall	Hillhouse Side	Alt-Entry	Atmosphere Risk
High Voltage Vaults	N2 Kirkland	Driveway btwn	Alt-Entry	Atmosphere Risk
High Voltage Vaults	N3 Dunham Lab	Front	Alt-Entry	Atmosphere Risk
High Voltage Vaults	N4 Dunham Lab	Driveway	Alt-Entry	Atmosphere Risk
High Voltage Vaults	N5 Watson Hall	Btwn Bldgs	Alt-Entry	Atmosphere Risk
High Voltage Vaults	N7 Dunham Lab	Load Dock	Alt-Entry	Atmosphere Risk
High Voltage Vaults	N8 Dunham Lab	Room C037	Alt-Entry	Atmosphere Risk
High Voltage Vaults	N9 24 Hillhouse	Opp 17Hillhouse	Alt-Entry	Atmosphere Risk

Appendix A

CONFINED SPACES at YALE UNIVERSITY

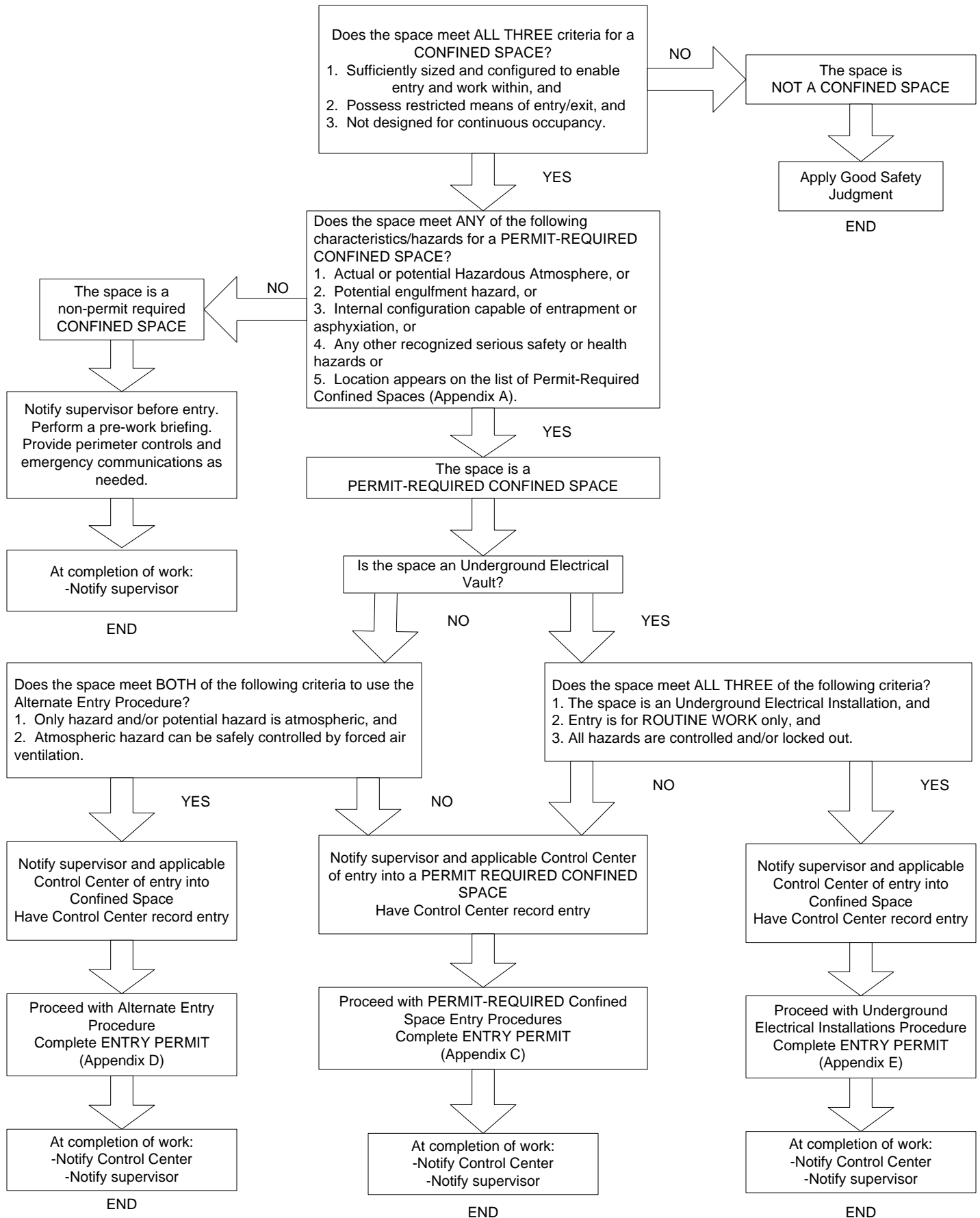
Confined Space	Building	Location	Type of Space	Detail/Hazards
High Voltage Vaults	P0 Silliman Coll	Bsmt CC	Alt-Entry	Atmosphere Risk
High Voltage Vaults	P1 Silliman Coll	On Wall	Alt-Entry	Atmosphere Risk
High Voltage Vaults	P2 Silliman Coll	In Pit	Alt-Entry	Atmosphere Risk
High Voltage Vaults	P3 Silliman Coll	Cyard CollegeSt	Alt-Entry	Atmosphere Risk
High Voltage Vaults	P4 Silliman Coll	Cyard TempleSt	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S PiersonSageP P	End ofPowerHse	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S1 KBT	Load Dock	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S10Pierson Sage	ByStairs PSPP	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S11 Pierson Sage	End of PH Wall	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S12 WNSL	Corner WNSL	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S13 WNSL	Middle WNSL	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S14Sterling Che	Back of MB&B	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S15 MB&B	Front Entr	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S16 WNSL	Back by Garage	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S17 WNSL	Back by Garage	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S18 340Edwards	By 340 Edwards	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S18 SterlingChe	BtwnSCLMB&B	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S19 Chem Bldg	Load Dock	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S2 Science Hill	Near Statue	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S3 Peabody	Corner Bldg	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S4 Sachem Vault	Corner Bldg	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S5 OML	On Sachem	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S6 OML	Main Entrance	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S7 OML	PSPP Prospect	Alt-Entry	Atmosphere Risk

Appendix A

CONFINED SPACES at YALE UNIVERSITY

Confined Space	Building	Location	Type of Space	Detail/Hazards
High Voltage Vaults	S8 Sloan Lab	ByVaultProspect	Alt-Entry	Atmosphere Risk
High Voltage Vaults	S9 KGL	InHill by KGL	Alt-Entry	Atmosphere Risk
High Voltage Vaults	SA OML	Sachem Side	Alt-Entry	Atmosphere Risk
High Voltage Vaults	U1 60 Sachem	Court Yard	Alt-Entry	Atmosphere Risk
High Voltage Vaults	U2 56 Hillhouse	Front	Alt-Entry	Atmosphere Risk
High Voltage Vaults	U4 56 Hillhouse	Front	Alt-Entry	Atmosphere Risk
High Voltage Vaults	U5 46 Hillhouse	Front	Alt-Entry	Atmosphere Risk
High Voltage Vaults	U6 38 Hillhouse	Front	Alt-Entry	Atmosphere Risk
High Voltage Vaults	U7 30 Hillhouse	Front	Alt-Entry	Atmosphere Risk
High Voltage Vaults	V1 140 Prospect	Front	Alt-Entry	Atmosphere Risk
High Voltage Vaults	V2 140 Prospect	Front	Alt-Entry	Atmosphere Risk
High Voltage Vaults	V3 135 Prospect	Parking Lot	Alt-Entry	Atmosphere Risk
High Voltage Vaults	V5 HammonHall	Frt Mansfield St	Alt-Entry	Atmosphere Risk
High Voltage Vaults	VAHammonHall	Parking Lot	Alt-Entry	Atmosphere Risk
High Voltage Vaults	W1Ingalls Rink	Prospect St	Alt-Entry	Atmosphere Risk
High Voltage Vaults	WA Ingalls Rink	SachemMansfield	Alt-Entry	Atmosphere Risk
High Voltage Vaults	WB Ingalls Rink	Sachem Side	Alt-Entry	Atmosphere Risk
High Voltage Vaults	ZA Canal Street	Canal&Lock	Alt-Entry	Atmosphere Risk
High Voltage Vaults	ZB Lock ST	LockSt	Alt-Entry	Atmosphere Risk
High Voltage Vaults	ZC Ashmun St	Lock&Ashmun	Alt-Entry	Atmosphere Risk
High Voltage Vaults	ZD Ashmun	Ashmun&York	Alt-Entry	Atmosphere Risk

Appendix B CONFINED SPACE DECISION FLOW CHART



Appendix C

PERMIT-REQUIRED CONFINED SPACE PROCEDURES AND ENTRY PERMIT

To be used for entering tanks, boilers, combustion chambers, and spaces with moving machinery. Yale University employees are only authorized to enter Permit-Required Confined Spaces after having received training in specialized entry procedures. Notify Supervisor or Control Center before entering and upon exiting space.

Job Site/Space ID Number _____ Job Supervisor _____

Equipment to be worked on _____

Work to be performed _____

PREPARATION

1. Follow appropriate pre-entry Lock Out/Tag Out (LOTO) procedures.
2. Check air monitor calibration status and battery condition.
3. Arrange for ventilation equipment and power supply as needed.
4. Arrange for standby person and communication, as required.
5. Arrange for Rescue Equipment, as required.

ON-SITE MONITORING

1. Test air at the top of the space (through the cover for manholes). Record the results.
2. If acceptable, open the cover. Test the air at the middle and bottom of the space. Record the results. If the combustibility reading at the bottom is greater than at the top of the space, notify your supervisor and the Office of Environmental Health and Safety (OEHS).
DO NOT ENTER THE SPACE!
3. If the air is not safe, ventilate, purge and retest. If the atmosphere does not clear,
DO NOT ENTER THE SPACE!
4. Ventilate the space for a minimum of 5 minutes.
5. Continuously monitor the space and record the results every hour. Retest the air after breaks and lunch.

ATMOSPHERIC CHECK: INITIAL

Time: _____
 Oxygen: _____ %
 Explosive: _____ % LFL
 Toxic: _____ % PPM
 Toxic: _____ % PPM Testers Signature: _____

PREPERATION

SOURCE ISOLATION (NO ENTRY REQUIRED)	N/A	YES	NO
Pumps or lines Blinded			
Pumps or lines Disconnected			
Pumps or lines Blocked			
Other:			

VENTILATION

VENTILATION MODIFICATION	N/A	YES	NO
Mechanical			
Natural Ventilation			
Other:			

Appendix C

PERMIT-REQUIRED CONFINED SPACE PROCEDURES AND ENTRY PERMIT

ATMOSPHERIC CHECK: AFTER ISOLATION AND VENTILATION

Time: _____
 Oxygen: _____ %
 Explosive: _____ % LFL
 Toxic: _____ % PPM
 Toxic: _____ % PPM Testers Signature: _____

INSTRUMENT:

Name: _____ Model Number: _____ Serial Number: _____

COMMUNICATION PROCEDURES

RESCUE PROCEDURES

If an emergency should occur, first summon help. Call Ext.111, 432-4400, or 911 and request help from the fire department. Tell the operator that you have a "Confined Space rescue situation". If Non-Entry Rescue equipment is in place, initiate rescue. If a person is down for no apparent reason, you must assume that toxic gases or oxygen deficient atmosphere conditions exist.

DO NOT ENTER THE SPACE

Fire department personnel using self-contained breathing apparatus and full protective gear will manage the rescue effort.

TRAINING

PRINT NAME (ATTENDANT, ENTRANT, BACK-UP, RESCUE)	TRAINING		
	YES	NO	CURRENT

EQUIPMENT

TYPE	YES	NO	N/A
Direct reading gas monitor			
Safety harnesses and lifelines for entry and standby persons			
Hoisting equipment			
Powered communications			
SCBA's for entry and standby persons			
Protective clothing			
All electric equipment listed Class I, division I, Group D and non-sparking tools			
Other:			

Appendix C

PERMIT-REQUIRED CONFINED SPACE PROCEDURES AND ENTRY PERMIT

PERIODIC ATMOSPHERIC TESTS

Instrument:

Name: _____ Model Number: _____ Serial Number: _____

TIME OF READING	OXY Safe Range (19.5-23.5%)	LEL Safe Range (<10%)	CO Safe Range (<35ppm)	TOXIC Safe Range (_____)	TESTER'S SIGNATURE

AUTHORIZATION

We have reviewed the work authorized by this permit and the information contained here-in. Written instructions and safety procedures have been received and are understood. Entry cannot be approved if any of the TABLE items are marked in the "NO" column. This permit is not valid unless all appropriate items are completed and signatures obtained.

TITLE (ATTENDANT, ENTRANT, BACK-UP, RESCUE)	PRINT NAME	SIGNATURE

Date/Time Entered _____ Date/Time Exited _____ Permit Expiration Date _____

Supervisor's Signature _____ Date _____
(Required)

**Keep this log at the work site during the operation
Complete this form and return it to your supervisor when finished.**

Appendix D

ALTERNATE ENTRY PROCEDURES AND PERMIT

To be used where the only hazard in the space is an actual, or potential, hazardous atmosphere that can be controlled with forced air ventilation. If these conditions change, a Confined Space Entry Permit is required.

Yale University employees are only authorized to enter confined spaces after having received training in specialized entry procedures. Notify Supervisor or Control Center before entering and upon exiting space.

Date _____ Location _____ Type of Space _____

Reason for Entry _____ Form Completed By _____

Person(s) Entering _____

PREPARATION

1. Check air monitor calibration status and battery condition,
2. Protect Entry Perimeter,
3. Arrange for ventilation equipment and power supply,
4. Arrange for attendant person and communication.
- For entry into Electrical Vaults, attendant must be First Aid and CPR trained.

ON-SITE MONITORING

1. Test air at the top of the space through the cover. Record the results.
2. If acceptable, open the cover. Test the air at the middle and bottom of the space. Record the results. If the combustibility reading at the bottom is greater than at the top of the space, notify your supervisor and the Office of Environmental Health and Safety (OEHS). **DO NOT ENTER THE SPACE!**
3. If the air is not safe, ventilate, purge and retest. If the atmosphere does not clear, **DO NOT ENTER THE SPACE!**
4. Ventilate the space for a minimum of 5 minutes.
5. Continuously monitor the space and record the results every hour. Retest the air after breaks and lunch.

MEASUREMENT

Instrument:

Name: _____ Model Number: _____ Serial Number: _____

TIME OF READING	OXY Safe Range (19.5-23.5%)	LEL Safe Range (<10%)	CO Safe Range (<35ppm)	OTHER

If an emergency should occur, first summon help. Call Ext. 111, 432-4400, or 911 and request help from the fire department. Tell the operator that you have a "manhole rescue situation". If a person is down for no apparent reason, you must assume that toxic gases or oxygen deficient atmosphere conditions exist. **DO NOT ENTER THE SPACE** – Fire department personnel using self-contained breathing apparatus and full protective gear will manage the rescue effort.

Date/Time Entered _____ Date/Time Exited _____

Supervisor's Signature _____ Date _____

**Keep this log at the work site during the operation
Complete this form and return it to your supervisor when finished.**

Appendix E

UNDERGROUND ELECTRICAL INSTALLATIONS ENTRY PERMIT

To be used for routine entry into meter vaults, telecommunications vaults, electrical manholes where no electrical work (other than with a Lock-Out/Tag-Out procedure) will be done. If these conditions change, a Confined Space Entry Permit is required. Routine work includes inspection, housekeeping, taking readings, or similar routine low hazard work. Notify Supervisor or Control Center before entering and upon exiting space.

Yale University employees are only authorized to enter confined spaces after having received training in specialized entry procedures.

Date _____ Location _____ Type of Space _____

Reason for Entry _____ Form Completed By _____

Person(s) Entering _____

PREPARATION

1. Check air monitor calibration status and battery condition.
2. Arrange for ventilation equipment and power supply.
3. Arrange for standby person and communication.

ON-SITE MONITORING

1. Test air at the top of the space through the cover. Record the results.
2. If acceptable, open the cover. Test the air at the bottom of the space. Record the results. If the combustibility reading at the bottom is greater than at the top of the space, notify your supervisor and the Office of Environmental Health and Safety (OEHS). **DO NOT ENTER THE SPACE!**
3. If the air is not safe, ventilate, purge and retest. If the atmosphere does not clear, **DO NOT ENTER THE SPACE!**
4. Ventilate the space for a minimum of 5 minutes.
5. Continuously monitor the space and record the results every hour. Retest the air after breaks and lunch.

MEASUREMENT

Instrument:

Name: _____ Model Number: _____ Serial Number: _____

TIME OF READING	OXY Safe Range (19.5-23.5%)	LEL Safe Range (<10%)	CO Safe Range (<35ppm)	OTHER

If an emergency should occur, first summon help. Call Ext. 111, 432-4400, or 911 and request help from the fire department. Tell the operator that you have a "manhole rescue situation". If a person is down for no apparent reason, you must assume that toxic gases or oxygen deficient atmosphere conditions exist. **DO NOT ENTER THE SPACE** – Fire department personnel using self-contained breathing apparatus and full protective gear will manage the rescue effort.

Date/Time Entered _____ Date/Time Exited _____

Supervisor's Signature _____ Date _____

**Keep this log at the work site during the operation
Complete this form and return it to your supervisor when finished.**