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File

Nassau County
Department of Public Works
Buildings Division
One West Street
Mineola, New York 11501
Attn: Mr. Shlomo Talmor
Acting Deputy Commissioner

RECEIVED
OCT 10 1985
SOLID WASTE MANAGEMENT
DEC REGION I

Re: Mitchel Field Transit Facility
Purex Site

Dear Mr. Talmore:

Subsequent to a series of discussions with Mr. Frank Reda and Mr. Al Machlin, regarding the underslab volatile organic vapor monitoring system included in the New MSBA bus garage, the information requested by Mr. Machlin is briefly summarized as follows:

1. The design concept as originally developed was reviewed with Mr. Machlin as outlined in the Conceptual Design Report for Implementation of the Remedial Action Plan for the Mitchel Field Transit Site, November 1983.

2. The design concept for the system consists of two specific phases:

    1. Passive Monitoring
    2. Active Vent System

3. The contract documents (Plans and Specifications) for the MSBA Transit Facility as prepared by Wiedersum Associates and Michael Baker, Jr. included installation of the passive monitoring components only, based on the recommendation as outlined in the Conceptual Design Report, to provide for volatile organic vapor accumulation under the bus garage floor slab.

4. In discussion with Mr. Machlin, the future implementation of the Active Vent System was described. However, the details of the additional components needed to convert the passive monitoring system to an active vent system are not shown on the MSBA drawings at this time.

5. Design criteria in the passive monitoring components (underslab vapor collection system) included future conversion to an active vent system as necessary through addition of above slab components only.

The following is a brief summary of information provided to Mr. Machlin.

Ventilation System

The under slab organic volatile vapor system designed for the MSBA Transit Facility consists of a grid of 4-inch diameter slotted PVC pipe, imbedded in a layer of crushed stone connected to a 6-inch diameter solid PVC pipe. The 6-inch PVC pipe will be referred to as a "header" for the remaining portion of this summary.

The purpose of the system is to monitor and if required to remove volatile organic vapors that may occur due to prior contamination of soils.

Passive Monitoring

Initially, a passive monitoring system will be installed. The purpose of the passive system is to monitor for the possible occurance of volatile organic vapors. This is accomplished by the piping sysstem installed. (See Figures 1 and 2).

As illustrated in Figure 1, a system of 4-inch, slotted PVC pipe is provided within a 14-inch bed of crushed stone underneath the entire floor slab. The two separate piping systems illustrated are connected to two separate headers which run along the inside wall of the structure. At equal intervals along the length of the headers the header will be extended upward, to a point flush with the interior floor slab surface. This air exit port will be provided with a cap. Periodically, air entrapped in the header will be sampled by removing the vent cap and withdrawing an air sample. In the event that volatile organic vapors are detected in the samples in excessive concentrations, an active system will be employed to remove the vapors by expanding the existing passive system.

Active Ventilation System

The active ventilation system as previously stated is a expansion of the passive system. (See Figure 3). By adding riser pipes to the flush mounted floor header (sampling port) up through the roof, the active system is an effective means of removing vapors entrapped in the underslab crushed stone PVC piping system. One side of the PVC piping system will be used as a fresh air intake while an exhaust fan will be installed on piping attached to the header of the companion slotted pipe system. The exhaust fan will chaw air through the system thus removing the volatile organic vapors. The vent system will discharge to the atmosphere above the bus garage, where dispersion will take place.

The passive monitoring system currently provides for nine zones within the under slab grid system. Each zone will be eqipped with an exhaust fan providing an air flow through the zone of approximately 100 cubic feet per minute. The exhaust fans will be roof mounted, outside the bus garage to reduce any potential of leakage of volatile organic vapors inside the garage.

As requested a copy of this summary is being forwarded directly to Mr. Machlin.

Please do not hesitate to call me if you need any further information or clarification of the system design criteria.

A copy of Section 2B of the Conceptual Design Report is attached for your information.

Very truly yours,

CAMP DRESSER & McKEE

George A Rief

George A. Rief, P.E.
Senior Associate

cc: A.Machlin, Regional Engineer NYS.DEC Stony Brook
F. Reda
C. McDonald
D. Mulligan
M. Memoli

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(MAM2/19)NY

MSBA BUS GARAGE FACILITY

PROCESS AIR FLOW FOR VENT SYSTEM (PASSIVE)

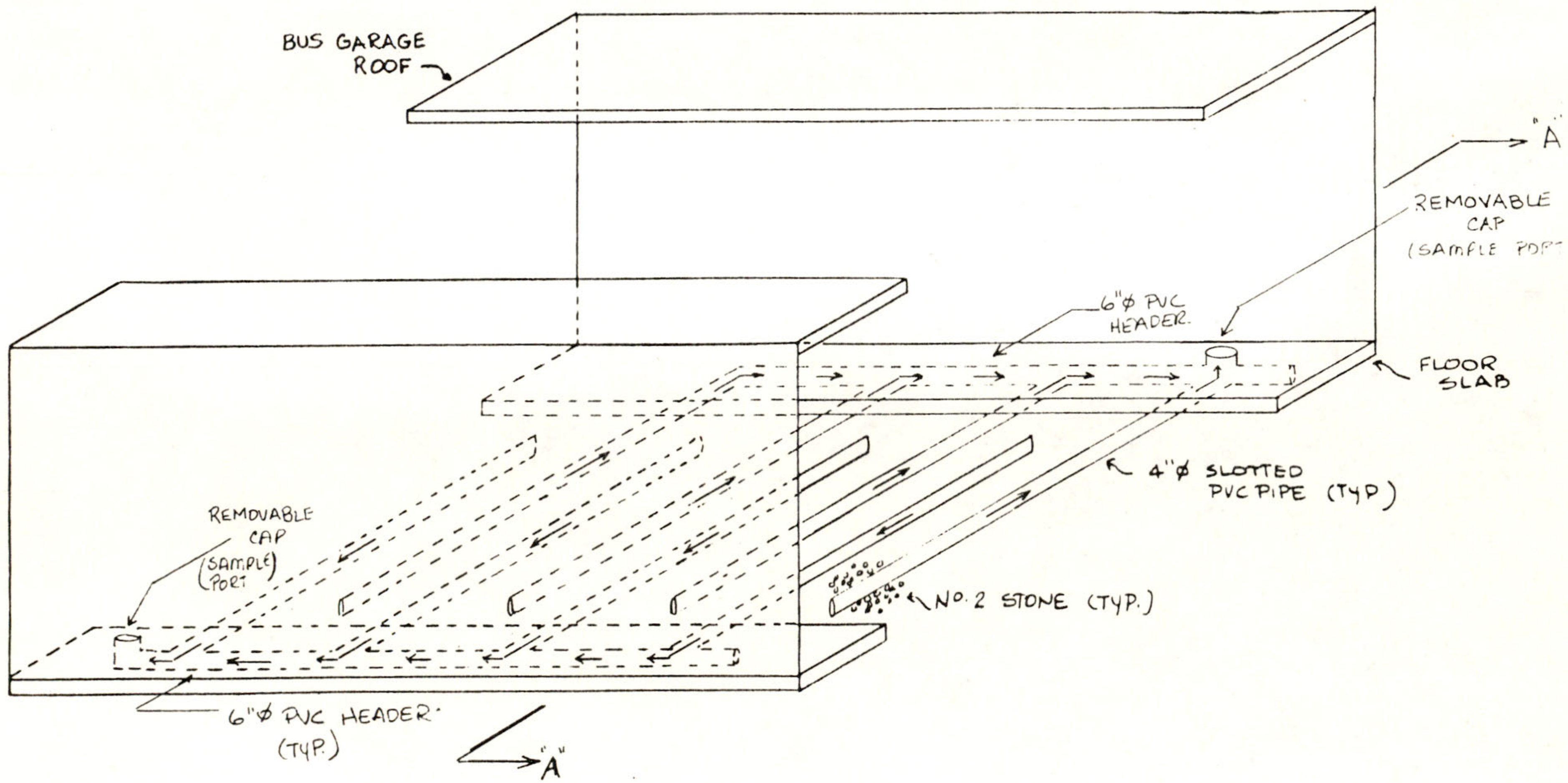

FIGURE 1

SECTION "A-A" (PASSIVE)

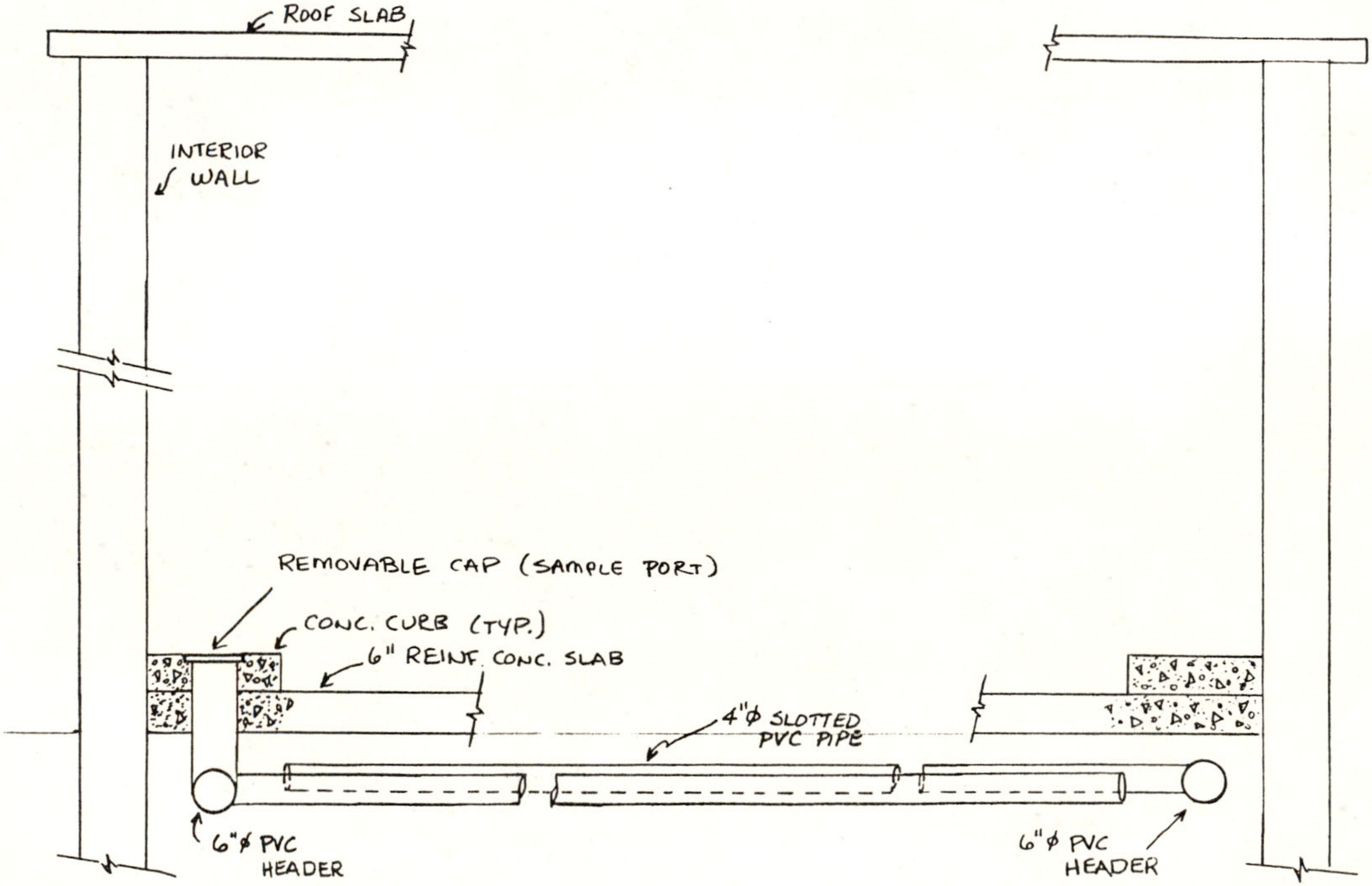

FIGURE 2

MSBA BUS GARAGE FACILITY

PROCESS AIR FLOW FOR VENT SYSTEM

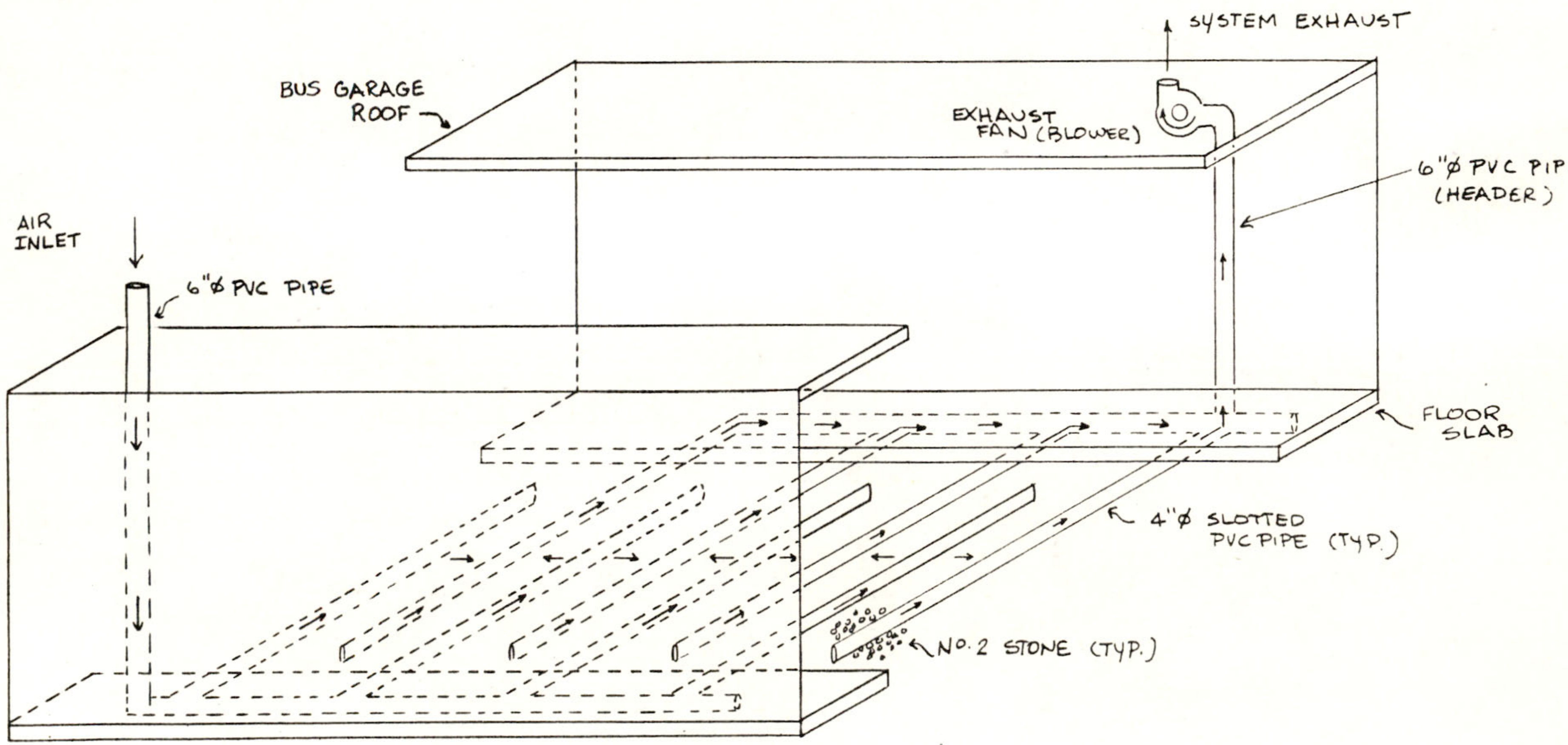

FIGURE 3

B. ORGANIC VAPOR VENTING SYSTEM

1. Statement of the Problem

Field investigations on and around the suspected source contamination area indicate that there is a contaminant plume in the groundwater that is migrating to the southwest. Laboratory analysis of the groundwater samples indicates concentration of toluene, xylene, trichloroethylene (TCE), 1,1,1 - trichloroethane, tetrachloroethylene and carbon tetrachloride, as well as other organic compounds in lesser quantities. Construction of the new MSBA garage will take place over a portion of the area that is underlain by the contaminated plume. The depth to groundwater in this area is between 25 and 35 feet and the unsaturated zone is comprised primarily of sand and gravel. Even though field and analytical measurements taken to date do not indicate any upward migration of the contaminants through the unsaturated zone and the MSBA facility is not being constructed over the soure area of contamination, it was considered appropriate to evaluate methods to ensure that contaminants from the source area or the plume would not enter the facility from underneath.

2. Alternatives

A wide range of alternative actions were considered to address both passive and active systems to protect employees inside the MSBA facility from contaminants that may be under the building. The alternatives that were considered include:

- No Action
- Clay Layer
- Synthetic Layer
- Ventilation System

a. No Action: The no action alternative in this instance was very attractive. Sampling and analyses to date have not detected contamination at the elevations that represent the finished floor level in the proposed facility. There is no reason to predict that organic vapors will migrate upward from the plume area or that sufficient soil contamination exists within the footprint of the building to constitute a problem for workers inside the proposed MSBA garage. However, a few borings indicate two apparently isolated locations where some contamination exists at depths of 10-15 feet below the finished grade. For this reason and to ensure the safety of the employees over the long-term the no action alternative was not selected.

b. Clay Layer: The placement of a clay layer underneath the building as a barrier to prevent upward migration was considered. This represents a passive system against contamination. Placement of a clay layer is possible and with the necessary precautions during installation and subsequent building construction a reasonably intact clay barrier would be in place. A major drawback to clay barriers is that they tend to shrink and crack under conditions of decreasing moisture content. A clay barrier under a building would be inaccessible even for routine maintenance and would be costly to repair once the floor of the facility has been constructed. Additionally any vapor buildup under the cap would be unaccessible for remediation. For these two reasons, a clay barrier was considered inappropriate.

c. Synthetic Liner: Some of the basic disadvantages attributable to a clay barrier are also disadvantages for synthetic liners. They require substantial care during installation and construction to ensure there are no holes or rips in the material. This would be especially difficult with a liner that would accomodate the varying depths of foundation footings and be large enough to cover the area within the footprint of the building. Once again a basic drawback is the inability to remove any vapor buildup that may occur under the barrier after construction has been completed. A synthetic liner system was also considered inappropriate.

d. Ventilation System: A ventilation system would consist of a layer of crushed stone under the floor slab. Within the crushed stone layer, slotted pipe would form a collection system which would be connected to header pipes and risers up through the floor. At the floor level, the system could be closed off and used for monitoring only or alternatively as an active air moving system with roof discharges installed. In the first case, the under slabvent system would be periodically monitored to determine if any organic vapor buildup exists. If contamination were detected under the building in sufficient concentrations to cause concerns the air moving and exhaust system would be installed at that time and the system would be operated. This system allows for monitoring under the floor slab to determine if contamination is present and if it does accumulate during the future, then positive measures can be implemented to remove the contamination and therefore protect the personnel conditions inside the facility. Because this type of system allows for detection and then remediation of a potential situation it was chosen as the appropriate alternative for the MSBA facility.

3. Evaluation and Recommended Plan

The existing information concerning the contamination at the site and future projections indicate that the probability of wastes accumulating under the building is low. However, by planning a ventilation and withdrawal system under the floor slab during construction, the very costly possibility of having to install this type of system or other remedial measure after construction as been completed is avoided. It is recommended however, that the system be built only to just above the finished floor level and capped with locked covers. The additional cost of fans, risers, and required air pollution control devices is not warranted at this time. Modifications to the building would be minimal and installation cost would not be inordinately higher in the future if the need for the system exists. The installed vent system should be monitored once each month for the first year to ensure the quality under the building. After 1 year a determination on future monitoring requirements will be made.

4. <u>Vent System Design Criteria</u>

The system consists of 14 inches of crushed stone under the garage floor slab and below grade money room. Lateral perforated PVC pipe 4 inches in diameter will be placed approximately 15 feet on centers. The pipe will be slotted to collect possible vapors and will connect to 6 inch diameter PVC header pipes. At regular intervals 6 inch riser pipes will project vertically up through the floor slab where the pipe will be capped with a locked cover. The riser pipes will be steel and are positioned to avoid potential damage with respect to bus traffic but are accessible for monitoring and future extension to the roof if the system needs to be activated. A layout of this system is included in the Appendix.

Section 3
Section 4