

PVC Pipe Study

Installation in Buildings from 1970

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A STUDY OF POLY VINYL CHLORIDE (PVC) PIPES IN MULTI STOREY BUILDINGS IN 1971

CHAPTER 1

On the 12th day of August 1971 the Stock Exchange (Special Provisions) Act of 1970 came into operations (Appendix A) for the Stock Exchange Development in Grenfell Street for Buildings exceeding 200 feet in height. (Figure 1.)

The Stoke Exchange Plaza (Special Provision) Act 1970 had a special regulation (Regulation 336-437) which had been added to the Building Act 1923-1965.

To provide the most current and appropriate building provisions the Regulations had been extracted from the advanced draft of the **Australian Uniform Building Code**.

The Grenfell Center Project documents were approved under that Act in May 1973.

Of particular interest to this paper is Regulation 373 (Appendix B) dealing with Openings in floors for certain services which state,

"Services associated with the functioning of a Building and passing through a floor shall be either be individual metal pipes, metal conduits metal ducts or the like, or be installed in shafts complying with this part"

Appendix A

**STOCK EXCHANGE (SPECIAL PROVISIONS) Act, 1970:
DAY OF COMMENCEMENT**

**SOUTH AUSTRALIA } Proclamation by His Excellency the
to wit { Governor of the State of South Australia
(L.S.) J. W. HARRISON**

BY virtue of the provisions of the Stock Exchange (Special Provisions) Act, 1970, and all other enabling powers, I, the said Governor, with the advice and consent of the Executive Council, do hereby fix the 12th day of August, 1971, as the day on which the said Act shall come into operation.

**Given under my hand and the public seal of South Australia
at Adelaide, this 12th day of August, 1971.**

**By command,
A. J. SHARD, Chief Secretary**

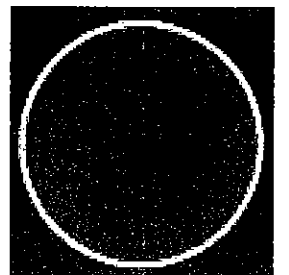
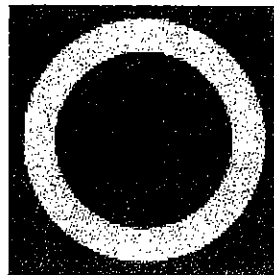
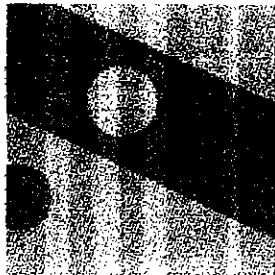
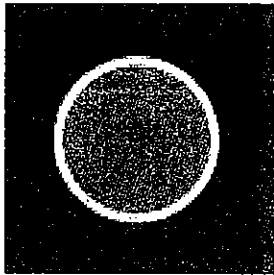
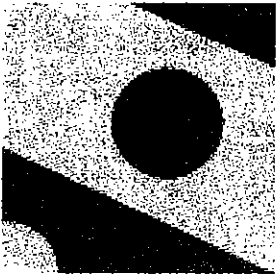
M.R.T., 173/1970

GOD SAVE THE QUEEN!

Appendix B

Openings in Floors for Certain Services

373. Services associated with the functioning of a building and passing through a floor shall either be in individual metal pipes, metal conduits, metal ducts or the like, or be installed in shafts complying with this Part.



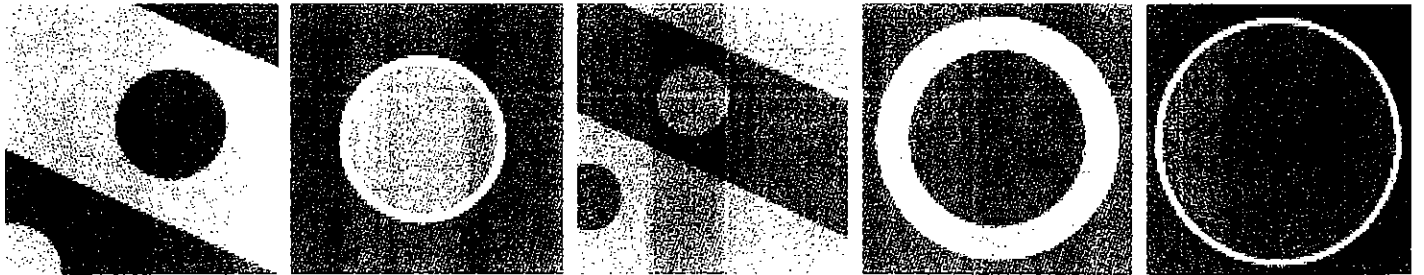
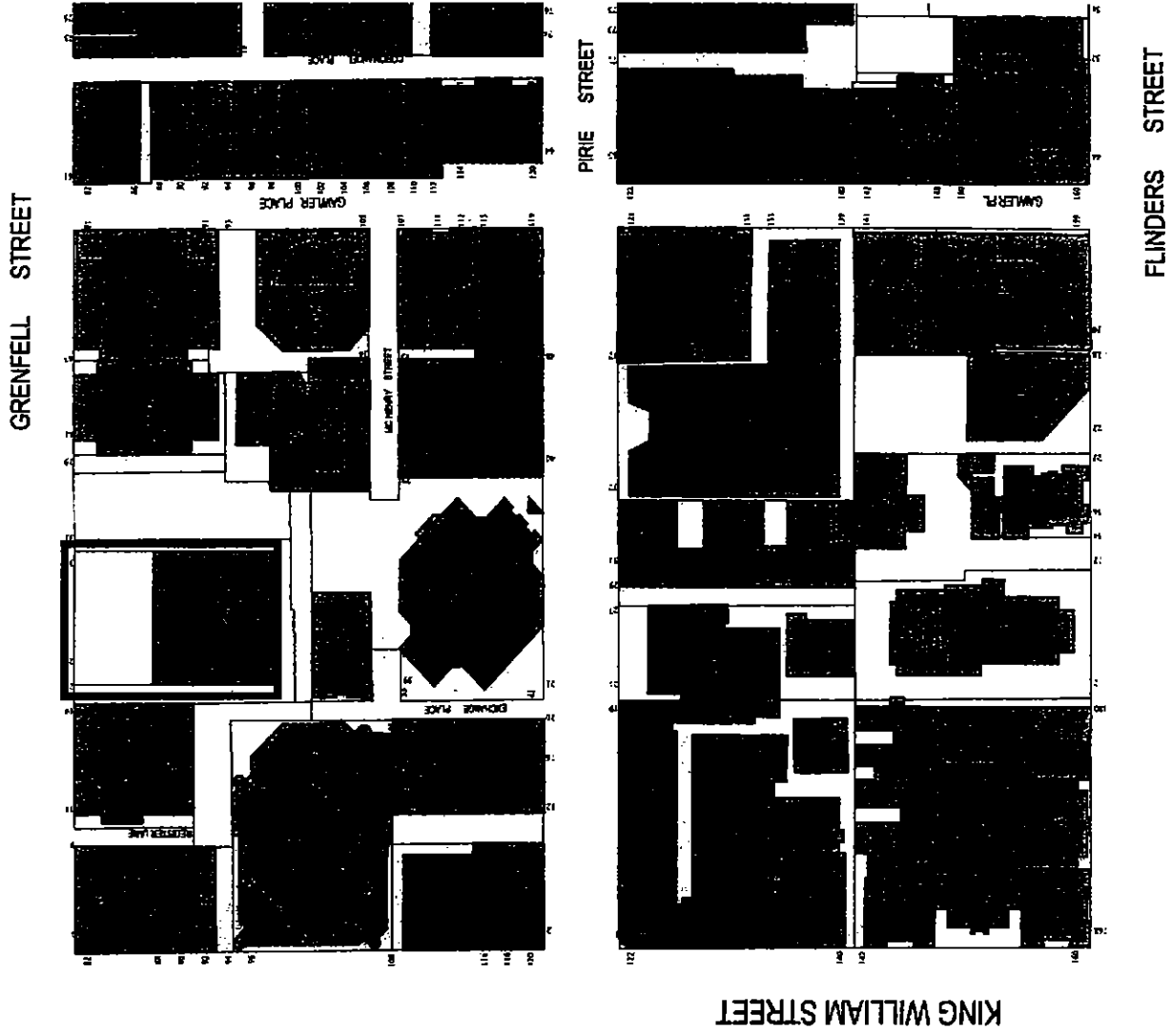
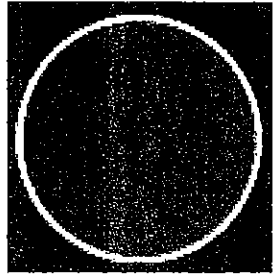
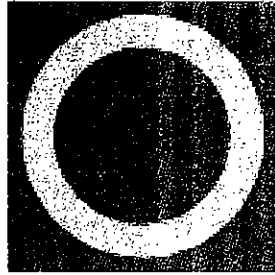
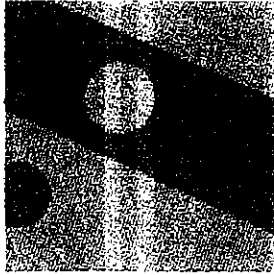
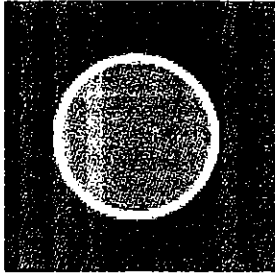
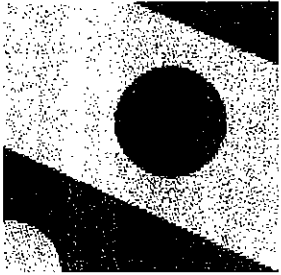


Figure 1





The Grenfell Center Project at 21-33 Grenfell Street is 103 m in height and has a rise of 27 floors with a basement. A typical floor plan is shown in Figure 2.

A mid level plant room is located on level on the 16th floor.

Most of the toilet plumbing consists of PVC pipes and is enclosed in a masonry shaft (Gypsum Blocks, with cement render on the outside) in the men's toilet and vent pipes in the ladies toilet are enclosed in a 1.6mm metal Shaft. (Figure 3-Vent duct).

The Ladies and Men's toilets are enclosed because of their position by concrete walls and openings fitted with 1-hour self-closing fire doors.

The roof draining system discharges its water in a vertical pipe stack in four columns (Figure- 4 vertical plumbing stack) and are also enclosed with 1.6mm thick metal and clad with asbestos sheet.

The stack provides for future connections to Toilets, Showers and Lunchrooms facilities.

Where the PVC pipes leave the stack in the basement and connects in to a cast iron pile, the junction is enclosed with Gypsum on metal lath to maintain the fire rating of the floor where the penetration occurs. A built-in drip tray with a drain pipe is provided at the junction of the PVC pipes, it is cast to over come leakage at that point and is drained by a 25mm copper pipe into nearby traps. (Figure 5)

Later plumbing, which was added, was constructed in copper piping or was enclosed with 1.6mm thick galvanised iron. (Figure 6)

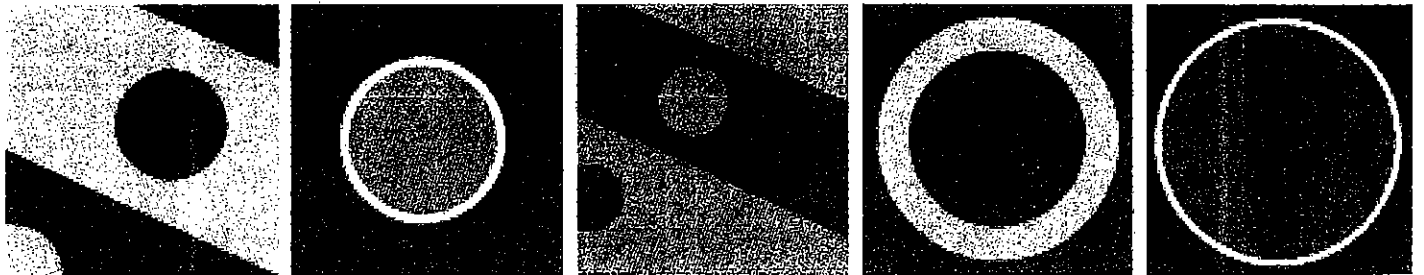
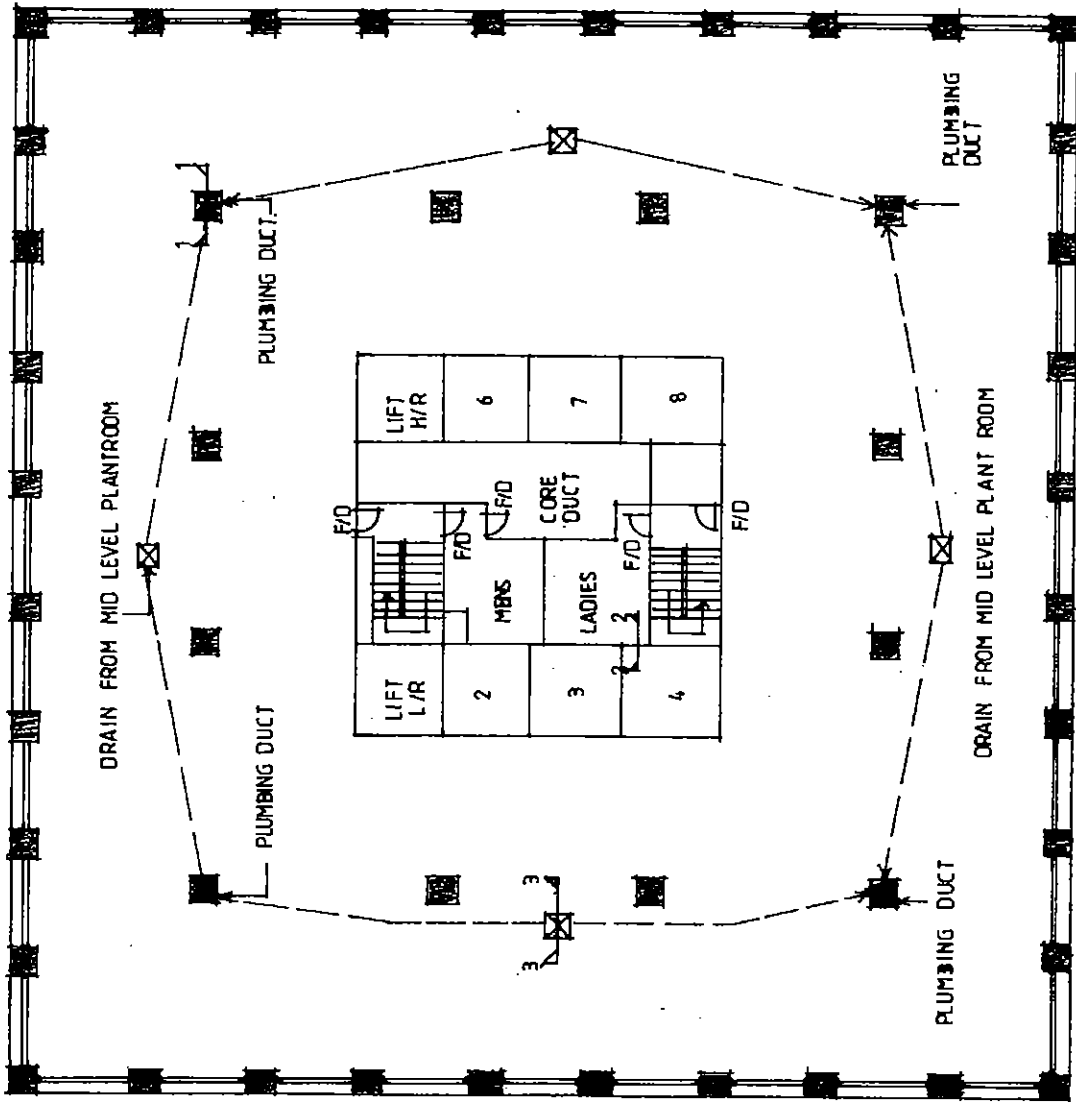


Figure 2

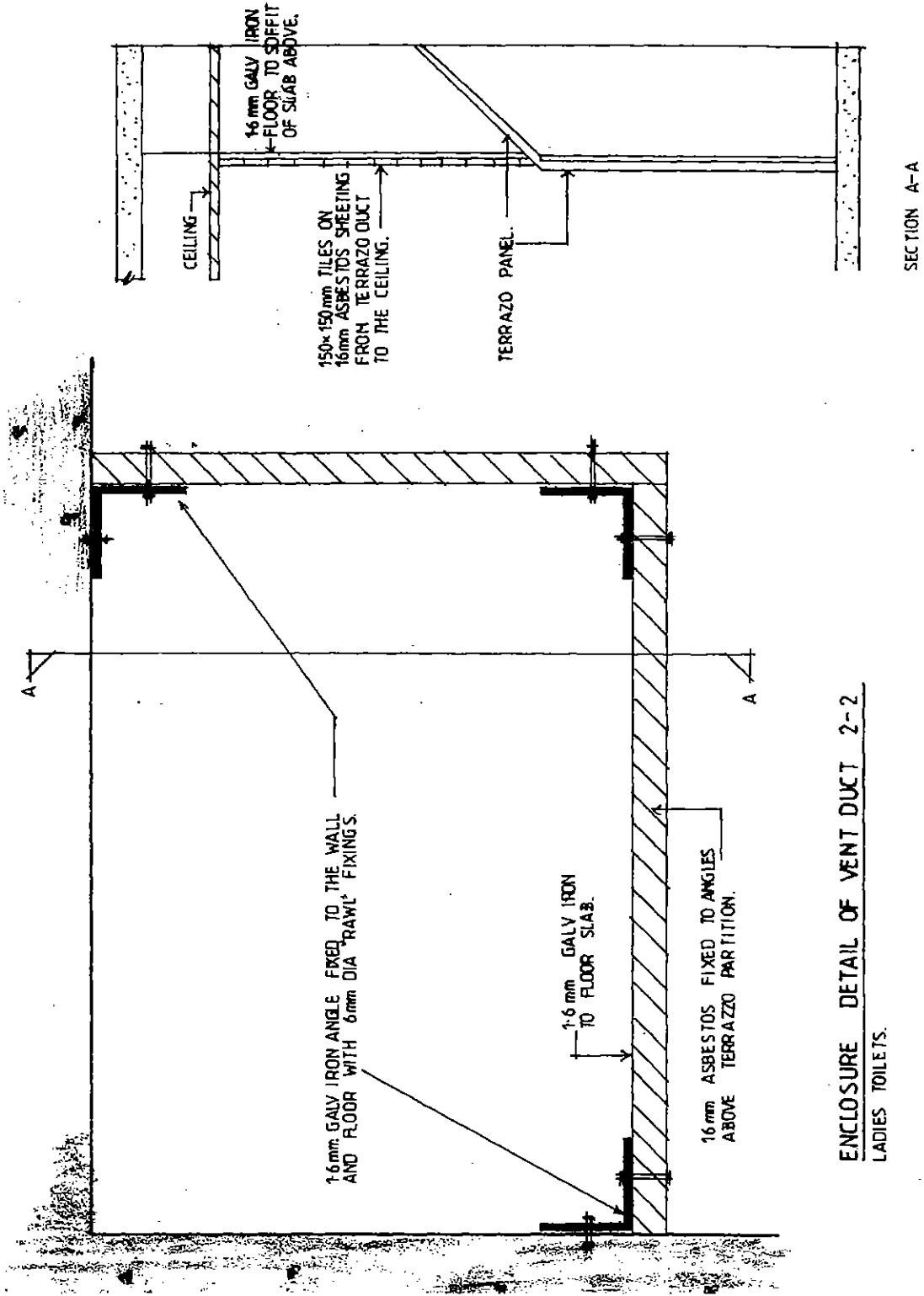
21-33 GRENFELL STREET

NORTH



FLOOR PLAN OF THE GRENFELL CENTRE
SHOWING PLUMBING STACK & PENETRATION

Figure 3



ENCLOSURE DETAIL OF VENT DUCT 2-2
LADIES TOILETS.

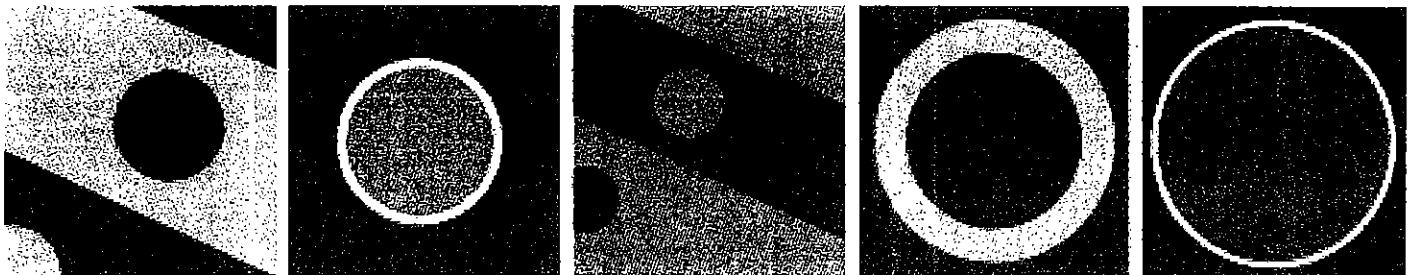
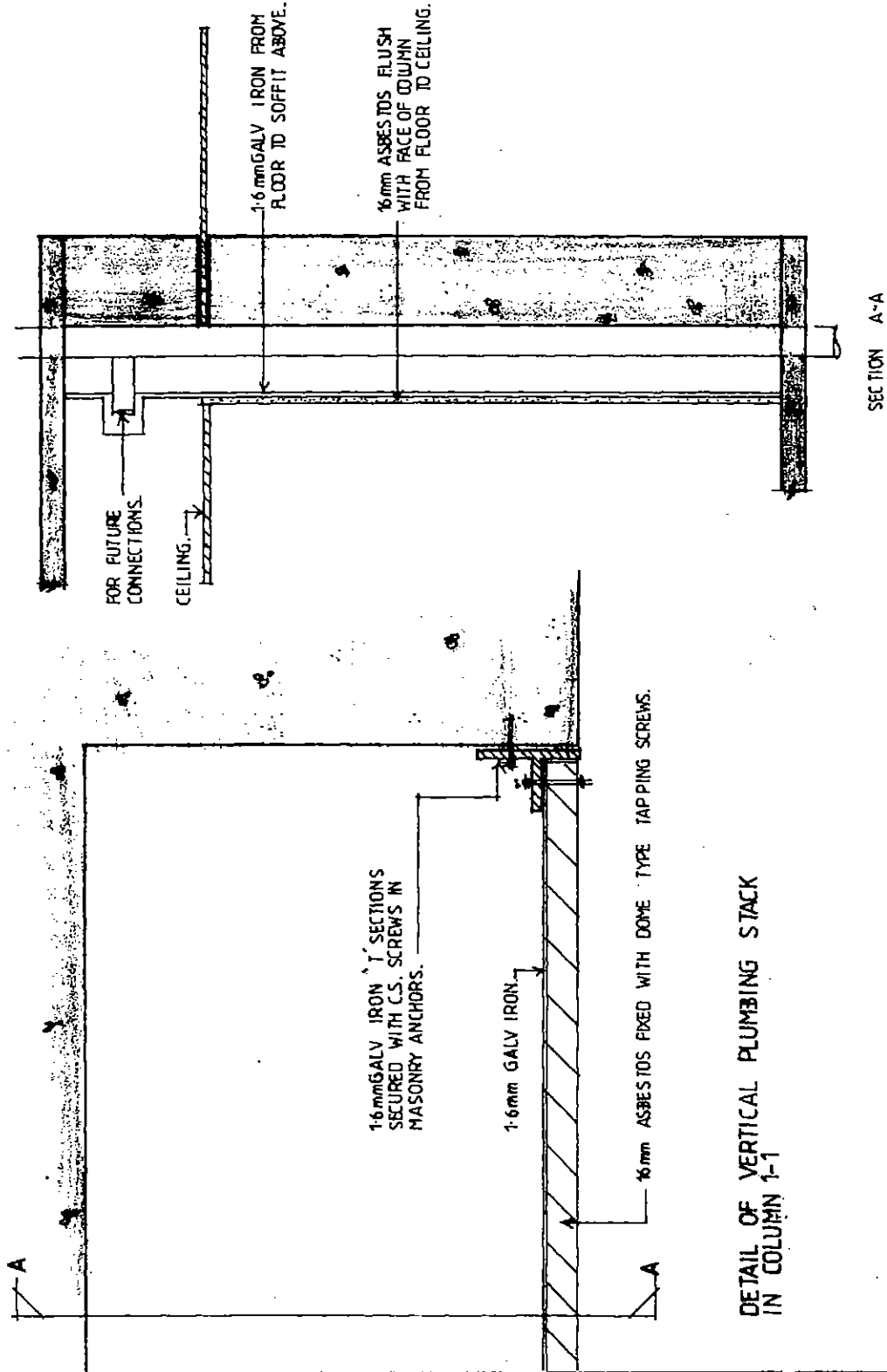


Figure 4



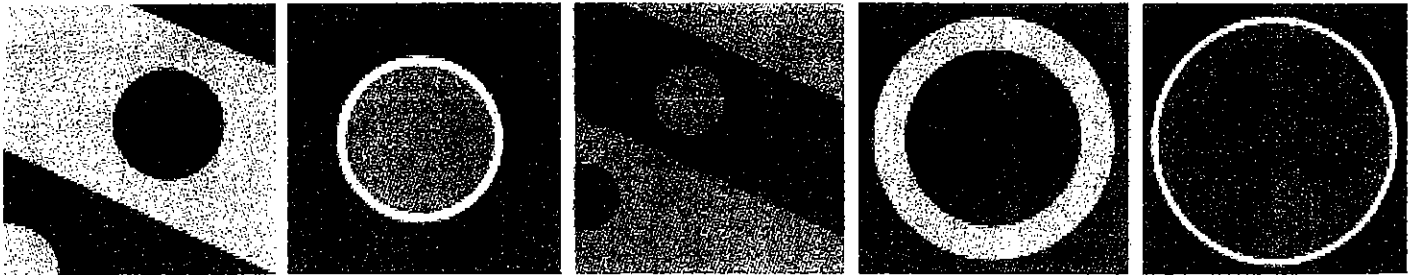
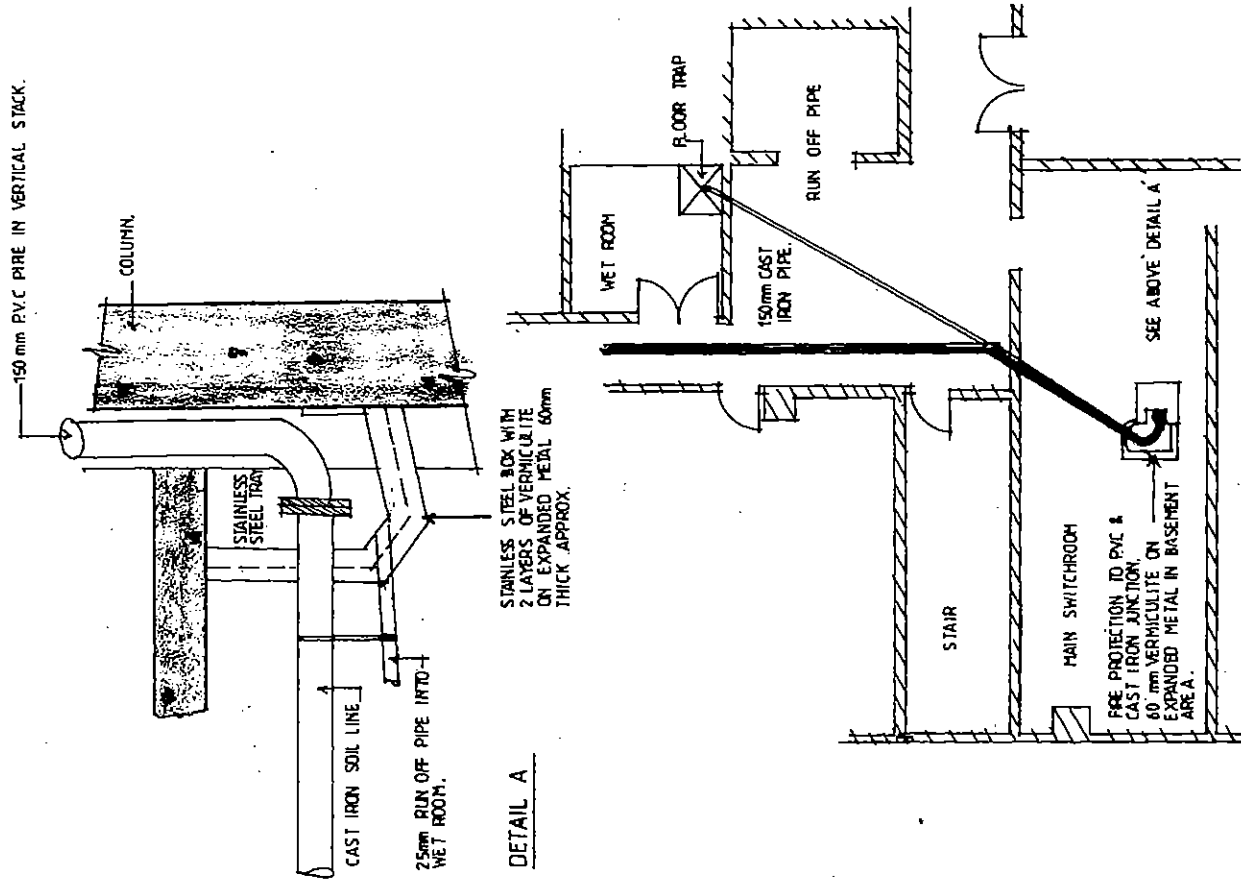


Figure 5



FIRE PROTECTION TO PVC & CAST IRON JUNCTION IN BASEMENT AREA

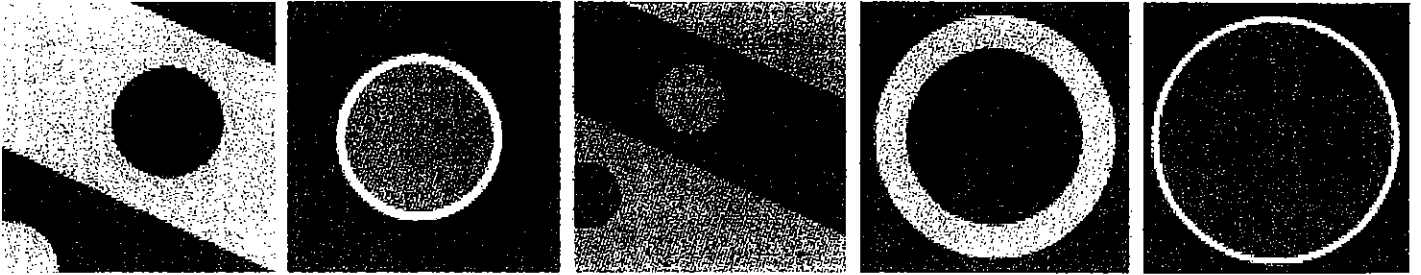
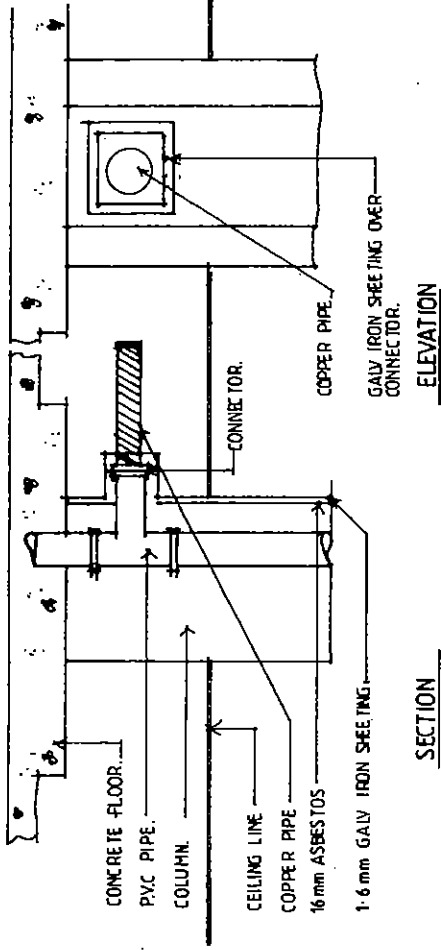
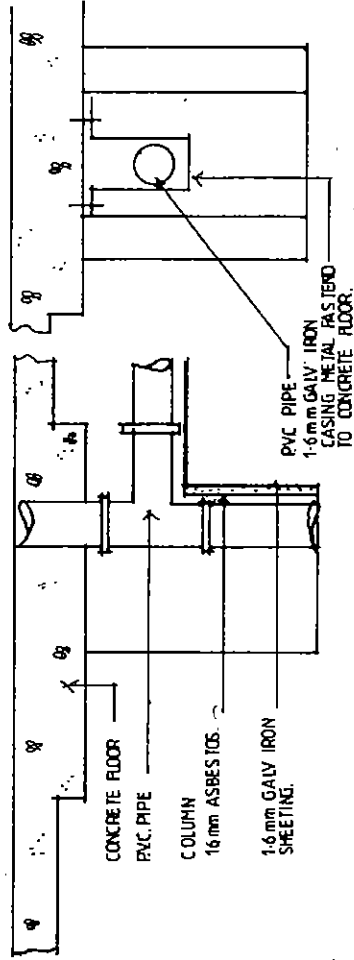


Figure 6



Copper Pipe Connecting into P.V.C Stack



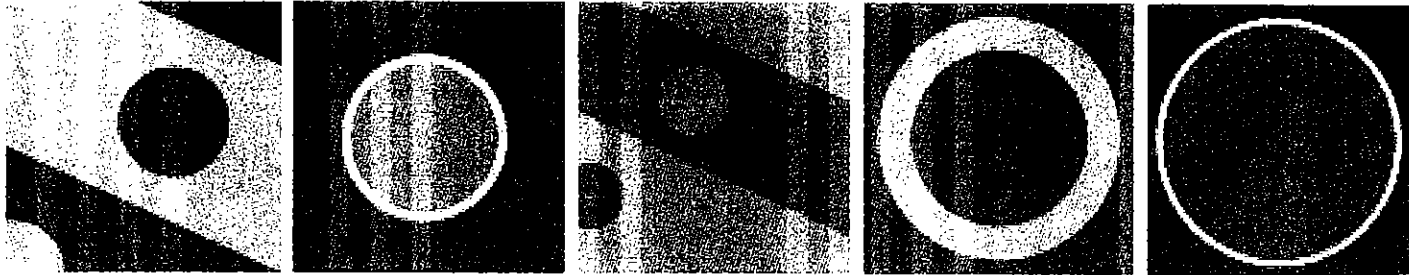
P.V.C Pipe Enclosed in a Metal Casing

Sketch No 1

Copper piping (is only) where connected to the stack is only for additional toilets, showers and tea room.

Sketch No 2

U.P.V.C piping enclosed in a 1.6mm thick galvanised iron duct is only used in areas of Laboratories with acid use and copper pipe as it will corrode is not suitable.



In March, 1975 the Architect, Cheesman, Doley, Neighbour and Raffin Pty Ltd for the Grenfell Center Proprietors made an Appeal to the building Referees under section 72 of the Building act 1923-1965 to permit the use of unprotected PVC pipes for the drainage services from the Mid Level Plant Room in the Grenfell Center Building.

The proposal by the Architect was to provide a copper sump at the penetration points of the floor, enclose it with Gypsum and metal lath and provide a 10mm checker plate and a removable metal plug (valve) to the sump. (Figure 7-sump penetration).

The Building Surveyor in opposing the Appeal stated that in California and other Overseas Building Codes PVC pipes were not allowed in buildings over 2 storeys in height.

In this building it contravened Regulation 373 and PVC piping was considered a hazard to the safety of the building and its occupants. He also expressed the view that the metal plug could be removed and if not replaced, smoke could escape from the floor below through the unprotected PVC pipe. This would enable smoke to enter the air conditioning system, be taken in to the Plant Room and be distributed to other parts of the building.

The Referees did not allow the appeal and the plumbing system had to be replaced with copper piping.

(See Referees appeal- Appendix C).

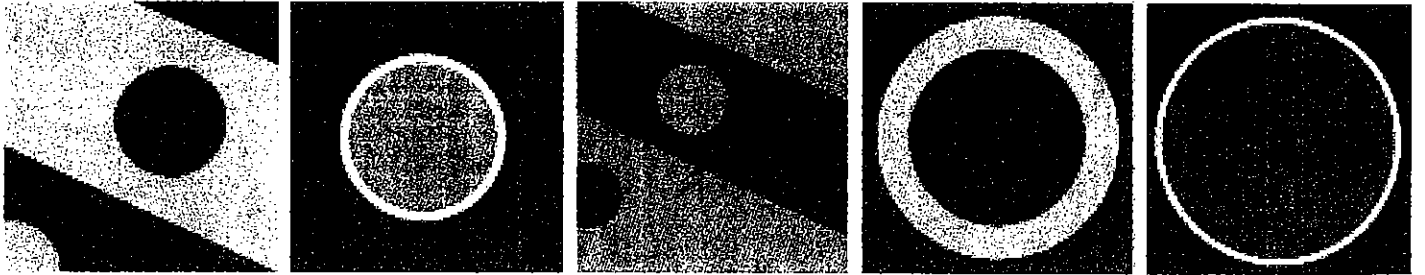


Figure 7

