



DEPARTMENT OF PUBLIC WORKS

FIRE SECURITY

A GUIDE TO ARCHITECTS

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FIRE SECURITY

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1. GENERAL

1.1 S.A.B.S CODE

This Department's fire regulations are based on Section TT and WW of SABS 0400 - 1990 as amended.

The regulations should be applied in all cases not specifically covered by regulations contained herein.

1.2 LOCAL BY-LAWS

The private architect is requested to consult the local authority administering fire regulations applicable to the city, town or village in which the new service is to be undertaken.

Should the local authority particularly request compliance with any by-law considered to conflict with these regulations, full particulars must be submitted by the architect and approval obtained before incorporating such variation in the drawings.

2. FIRE PREVENTION

2.1 BUILDING RATING

Buildings are rated according to the degree of fire risk presented by the sum total of the materials of their construction plus their contents, into LOW. MODERATE and HIGH Fire Loading hazards.

The average type of building erected by this Department could be classified as having a "Low Fire Loading", i.e. concrete floors, columns, roofs, etc. A building having a "Moderate Fire Loading", would be one which has a timber constructed roof and combustible ceilings. Buildings classified as "High Fire Loading" would be buildings with special fire hazards.

2.2 EXITS

2.2.1 MEANING

An exit may comprise a stairway, corridor, or doorway, or any combination of these, providing a safe route in case of fire. from any occupancy hazard to the open air at ground level.

2.2.2 PROPER EXITS

All buildings are to have approved exits which must be located with proper regard to safety of the occupants and ease of exit. bearing in mind the classification outlined.

2.2.3 LOCATION OF EXITS

The following table is a guide to the location of exists:

TABLE 1: LOCATION OF EXITS

Fire Loading	Maximum distance of travel in metre to nearest exit when alternative exits are available		Maximum distance of travel in metre to single exit along a dead-end corridor
	Undivided floor area	Subdivided floor area	
Low	30	40	15
Moderate	25	30	12
High	15	25	8

2.2.4 STAIRWAY CUT-OFFS

All interior stairways connecting two or more storeys of a building and forming required exit shall be enclosed by materials of fire resisting construction having a fire rating as specified below and be fitted with self-closing doors having a fire-resistance of the same rating.

Buildings not exceeding 3 storeys: Class A Fire door.
Buildings exceeding 3 storeys : Class B Fire door.

2.2.5 NUMBER OF EXITS

Buildings of two or more storeys shall have two separate exits and three exits where the floor area of any storey exceeds:

- (a) 1 000 m² in buildings of low fire loading.
- (b) 600 m² in buildings of moderate fire loading.
- (c) 400 m² in buildings of high fire loading.

Notwithstanding the foregoing, a building of two storeys and of fire-resisting construction having a low fire loading, need have only one exit provided that:

- (a) the distance of travel required to reach the stairs on the upper floor does not exceed 15 metre;
- (b) the stairs lead directly to the open air at ground level and are enclosed by construction having a fire rating of not less than one hour. Communication with the ground and upper floors must be by self-closing doors having the same rating;
- (c) the upper floor is not intended for occupation by more than 12 (twelve) people;
- (d) sleeping accommodation is not provided on upper floor.

2.3 FIREWALLS

2.3.1 LOCATION OF FIRE WALLS

Fire walls shall be provided where roof spaces are greater than "A" in area or, exceed "B" metre in length for:

- (a) Residential occupancy: where "A" = 180 m²
"B" = 15m
- (b) Other than residential occupancy: where "A" = 270 m²
"B" = 30m

2.3.2 FIRE WALLS IN ROOFSPACES

Fire walls, where required, shall be carried up tightly against the underside of the floor except that combustible minor structural members, such as battens, to which roofing material is directly fastened, may be permitted. Purlins must not penetrate a fire wall for a distance greater than 80 mm, but if they penetrate from both sides of the wall, at least 80mm of noncombustible material must separate them.

2.3.3 ACCESS DOORS

Each fire wall shall have an access door not exceeding 1,000 X 0,600 m as class D fire door. Access doors shall not be provided however, in fire walls forming party walls between separate flats or maisonettes.

2.3.4 FIRE WALLS IN PARKING AREAS

2.3.4.1 See attached sheet.

Parking areas for the accommodation of more than 12 motor vehicles are to be subdivided by fire walls, as follows:

<u>NUMBER OF VEHICLES</u>	<u>FIREWALL</u>
(i) Up to 12 vehicles in a single row with rear of garage closed	115 mm wall cement-plastered both sides.
(ii) Up to 24 vehicles in 2 rows with rear of garage open (i.e. drive-through parking).	DITTO
(iii) Up to 12 vehicles in 4 rows of 3. with rear of garage closed.	220 mm wall cement-plastered both sides.
(iv) Up to 18 vehicles in 6 rows of 3. with rear of garage open.	DITTO

3. FIRE PROTECTION

3.1 WATER MAINS

- (a) Fire mains of domestic water supplies must be shown on the same drawing by separate symbols and due regard must be taken of pipe sizes, stop valves and branch pipes, as these systems are related to each other.
- (b) The water and drainage drawings are to have the suffix A added after the drawing number, as general instruction S.15.3. e.g. Number/1A, Number/2A, etc.
- (c) Any existing water reticulation including pipe sizes, water pressure and any existing fire hydrants must be shown on the site plan.
- (d) Fire mains must be separated from domestic water supplies in all cases where domestic supplies require the provision of pressure reducing valves. Where the pressure in the fire mains is to be mechanically boosted, domestic connections must not be taken from this main.

- (e) Branches for domestic water and/or fire services may be taken at random off water mains of diameter 80 mm or larger. Branches for fire services under 80 mm taken from a main supply pipe may not be used to serve domestic supplies.
- (f) Branches to single fire hydrants may not be smaller than 80 mm diameter nor longer than 30 metre at this diameter if pressure is less than 330 kPa.
- (g) The number of stop valves on ring fire mains must be kept to an absolute minimum. However, they must be so positioned that; should the supply to any fire equipment require to be turned off, the supply to the domestic equipment will also be affected. In cases where water mains for fire services are provided independent of domestic mains, they may not be fitted with stop valves.
- (h) Where a fire service incorporates a fire hose reel system, a water pressure gauge must be provided on the branch connection to the fire hose reel nearest to the main entrance of the building and as close to the reel as is practicable. The gauge must be fixed firmly against the wall.
- (i) Where a main feeding a fire hose reel service is smaller than diameter 80 mm however, domestic connections must be limited as follows:

SIZE OF MAIN SERVING FIRE HOSE REELS	NUMBER AND SIZE O DOMESTIC CONNECTIONS PERMITTED
65 mm DIA	2 x 25 mm or 1 x 40 mm dia.
50 mm DO	1 x 25 mm or 2 x 20 mm dia.
40 mm DO	NO DOMESTIC CONNECTIONS PERMITTED.

3.2 MAJOR FIRE PROTECTION

3.2.1 FIRE HYDRANTS

Where an adequate water supply can be made available every new building, excluding private dwellings in one occupancy only, which exceeds in height 3 floors or 12 metre measured vertically from the ground to the underside of the eaves in the case of pitched roofs or the top floor ceiling level in the case of flat roofs, shall be provided with the following fire appliances:

- (a) A hydrant main of 80 mm internal diameter shall be provided leading to each floor of the building and shall be fitted with an approved gun-metal wheel-valve pattern hydrant having a 80 mm diameter inlet and a female outlet of the pattern and size required by the local authority. The number of hydrants required for each floor or level shall be in accordance with Tabel 2 hereunder and they shall be located in easily accessible positions.
- (b) In buildings exceeding 30 metre in height, the pipe from the street main and any portion of the rising main serving hydrants shall be 100 mm in diameter up to the last 30 metre.
- (c) The hydrants should be located as close as possible to the main stairs. Where more than one hydrant is required per floor to comply with Table 2, the remaining hydrants should also be located as close as possible to staircases. An exception may be made in the case of buildings of Low fire loading only, if it is found that according to column 3 of Table 2, two hydrants should be provided but the area of the floor is well within column 2. In this case a single hydrant may be located away from the stairs, but not more than 15 metre. The architect may provide special recesses for hydrants if he should wish to do so.
- (d) A twin-inlet fire pump boosting connection must be provided on the ground floor,

connected to the hydrant main with a reflux or nonreturn valve on the street side of the connection in all cases where the pressure at the highest hydrant would be less than 400 kPa.

- (e) In addition to the foregoing, all buildings exceeding 27 m in height, measured as described above, shall be provided with a storage tank containing not less than 9 000 litre of water and having its bottom above the top floor ceiling and connected to the hydrant main through a 80 mm minimum diameter stop valve and non-return valve. The stop valve is to be fitted on the tank side of the nonreturn valve. A 20 mm minimum diameter feedpipe fitted with a stop valve and terminating in a high pressure ball valve to supply the tank, is to be connected to the hydrant main between the highest fire hydrant and the reflux valve, if the tank is not supplied from the domestic reticulation.

3.2.2 SPACING OF HYDRANTS

Hydrants in buildings shall be provided in accordance with Table 2.

TABLE 2: SPACING OF HYDRANTS

Fire Loading	Maximum floor area permitted per hydrant in m ²	Maximum distance of travel in m permitted to reach a hydrant on any floor
Low	1 000	40
Moderate	750	30
High	500	25

3.3 FIRST-AID FIRE APPLIANCES

3.3.1 FIRE HOSE-REELS

- (a) All fire hose-reels shall be 20 mm x 30 m non-swinging types and shall be located at strategic positions. The effective range of a hose-reel shall be considered as 25 m measured from the reel, (along a corridor if located therein) to the farthest corner of any room it is intended to protect. A sufficient number of hose-reels must be installed to cover all sections of the building.

The supply pipes to hose-reels shall be of the sizes shown in Table 3 below. Where a hose-reel is located alongside a hydrant main, the reel may be fed by a 25 mm branch from this main.

- (b) The minimum permissible water pressure at any fire hose-reel in a building is 130 kPa. In buildings exceeding 27 m in height where a storage tank is provided, pressure feed may be increased by an electric pump delivering 4 litres per second at a pressure of 400 kPa, connected to emergency supply and provided with an audible device or a red flash light to indicate when the pump is in operation. (For more information, see Fire Appliance Details F/1/F)

TABLE 3: FEED PIPES TO HOSE-REELS

Diameter of feed	Maximum length in metre of feed pipes of diameter indicated, to serve the hose-reels in Columns 3 & 4	Maximum number of hose reels in communicating sections of a building that may be fed by the pipe indicated	Maximum number of hose-reels complying with col. 3, on floors, separated by fire resisting constructions or in separate buildings, that may be fed by the pipe indicated	
Not less than:			Up to 260 KPa	Over 260 kPa
32 mm 40 mm 50mm 80 mm	25 m 60 m 150m unlimited	1 2 4 unlimited	1 4 unlimited unlimited	1 8

3.3.2 FIRE EXTINGUISHERS

- (a) Water type extinguishers are to be provided in cases where there is no water available or where the water pressure would be less than 130 kPa at the level of the highest hose-reel.
- (b) Dry chemical powder type fire extinguishers are to be provided for special hazards in the open such as petrol stores, parking places, etc.
 - (i) A 2,5 kg size dry chemical fire extinguisher is to be hung alongside every hose-reel or every water type fire extinguisher where these have been provided instead of hose-reel because of lack of water pressure.
 - (ii) For basement parking, treat the hazard as High fire loading and provide 2,5 kg size extinguishers in accordance with Table 4.
 - (iii) A 9 kg size dry chemical fire extinguisher shall be provided for an open parking space under a building. Where vehicles exceed 4 in number, the hazard must be treated as High fire loading.

The fire extinguishers should be of 2,5 kg capacity each and the quantity decided according to table 4 here-under.

(c) CARBON-DIOXIDE TYPE (C02) FIRE EXTINGUISHERS

C02-Fire extinguishers are to be provided as follows:

- (i) In large kitchens e.g. in a hostel a 5 kg-C02 must be provided near the matron's office.
- (ii) Provide a 5 kg-C02 for each compressor room.
- (iii) A 5 kg is to be provided in transformer- and switch room.
- (iv) For automatic telephone exchanges, treat the hazard as high fire loading and provide 2,5 kg extinguishers according to the table. (Hose-reels must not be provided in the auto exchange equipment rooms.)

- (v) In lift machine rooms provide a 5 kg size CO2 extinguisher.
- (vi) Treat a library as a moderate hazard and provide 2,5 kg size CO2 extinguishers in accordance with Table 4.
- (c) If any of these fire extinguishers are likely to be exposed to the weather, they are to be placed in a fire extinguisher cupboard as P.W.D. type F/S2 (F/21A/F).

3.3.3 DISTRIBUTION OF EXTINGUISHERS

Fire extinguishers are to be distributed in accordance with Table 4, showing the spacing required to suit the three categories of fire hazards into which buildings are classified.

TABLE 4: SPACING OF FIRE EXTINGUISHERS

Fire Loading	Maximum floor area permitted per fire extinguisher in m ²	Maximum distance of travel in metre necessary to reach a fire extinguisher
Low	500	15
Moderate	250	12
High	200	8

SPECIAL HAZARDS

4.1 PETROL STORES

4.1.1. CONSTRUCTION

All petrol stores or any other store containing flammables having a low flash point must be 7 metre away from any other major building on the site. The store must be built according to P W D specification, i.e. it must have a concrete roof, sunken floor, outward opening door and be well ventilated by gauze covered terracotta air bricks. Windows are not permitted.

4.1.2 FIRE PROTECTION EQUIPMENT

The fire protection equipment for this building is to comprise a 9 kg dry chemical fire extinguisher in a F/S2 (F/21A/F) cupboard to be provided externally on a side wall and a 4,5 kg B.C.F. automatic extinguisher against the ceiling.

5. AUTOMATIC SPRINKLER SYSTEMS

5.1 WHERE REQUIRED

Automatic sprinklers are required for enclosed roofed parking areas or basement parking garages in multistoreyed buildings. They may also be required to protect certain bulk combustible stores.

5.2 PROVISION

Provision of automatic sprinklers will depend upon the availability of an adequate water supply. The Department will be responsible for the design and the invitations of tenders for such services when required.

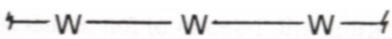
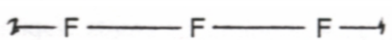
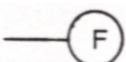
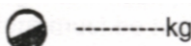
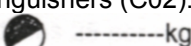
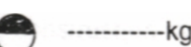
5.2.1 CONTROL VALVES CUPBOARD

In a case where a sprinkler system is to be installed, the architect will be advised

to make provision for a sprinkler cupboard according to P.W.D. type F/25/F, (which will be forwarded when applicable). He may also be required to include a suitable 80 mm dia. drain and/or the necessary water supply connections to the underside of the control valves. This work is normally included in the General contract and not in the specialist contract.

6. SYMBOLS

6.1 The following symbols with regard to fire protection, together with a legend, must be shown on the drawings.

- | | | |
|-----|--|---|
| (a) | Main water supply pipe: |  |
| (b) | Ring main: |  |
| (c) | Fire main: |  |
| (d) | Domestic water supply pipe: |  |
| (e) | Fire hydrant: |  |
| (f) | Fire hose reel: |  |
| (g) | Dry chemical fire extinguisher (DCP): | (Capacities must be shown on drawings) |
| | |  |
| (h) | Carbon dioxide extinguishers (C02): | Ditto |
| | |  |
| (i) | Bromochlorodifluoromethane fire extinguishers (BCF): | Ditto |
| | |  |
| (j) | Water- carbon dioxide fire extinguishers (H2O-C02): | Ditto |
| | |  |

STORAGE OF FLAMMABLE LIQUIDS

1. The policy of the Department is, wherever possible, not to exceed the storage of 900 litres of flammable liquids in a single flammable liquid store.
2. A series of two or more adjoining flammable liquid stores according to P.W.D. - type design no. GEN. 002, containing not more than 900 litre of flammable liquids in each store, is preferred as this will reduce the fire hazard and losses that may result from a fire..
3. Type flammable liquid stores can be protected against fire at a minimum cost. whereas bulk storage requires the protection of a sophisticated extinguisher medium at a much higher cost.
4. All stores containing flammables having a low flash point must be 7 metre away from any major building on the site. The store must be built according to P.W.D. - specifications, i.e.:
 - (a) It must have a sunken floor in which the depth must be determined by the quantity of liquids to be stored plus 25 per cent of such quantity. Inadequate depth may cause overflowing in case of a fire, and could result in spreading of the fire to adjacent buildings.
 - (b) The walls, floor, roof or ceiling construction must have a fire resistance of not less than 4 hours.
 - (c) The door must have a fire resistance of not less than 1 hour, be robust and open outwards.
 - (d) Such room shall have no windows, but shall be ventilated by air brick openings, set in the exterior and interior faces of the external walls, in ratio of 0,15 square metre for every 5 square metre or remaining part thereof of the floor area of such room. Fifty per cent of such air bricks shall be located in the walls immediately above the level of the door sill, and the remainder located as near to the ceiling level as is practicable. The backs of all such air bricks shall be covered with woven copper, brass or bronze wire gauge with an aperture size of not less than 0,78 millimetre or greater than 3 millimetre securely fixed to the air brick.
 - (e) The words "DANGER - FLAMMABLE LIQUID - NO SMOKING" must be painted in 100 millimetre block letters in both official languages on the outside of the door.
 - (f) Such room shall be used for no other purpose than for storage or keeping of flammable liquids and/or substances.

SPRAY ROOMS

1. Every room used or intended to be used for spraying cellulose or other flammable paints or lacquers or other volatile flammable liquids shall be constructed in accordance with the requirements as follow. NO such room shall be used for any purpose other than for such spraying.
2. The walls, floor and ceiling-roof assembly of every spray room shall be constructed of non-combustible smooth materials and have a fire-resistance rating of not less than 2 hours. Such walls, floor and ceiling-roof assembly shall be vapour tight. The clear height measured from floor to the lowest point of the ceiling must not be less than 3 metre.
3. The doorways and doors to a spray room shall comply with the following requirements:
 - a)
 - (i) There shall be not less than two doorways, which shall be separated by as great a distance as is practicable, and in any case by not less than half the length of the room.
 - (ii) One of these doorways shall be fitted with a swinging door opening outwards and must be provided with a locking device as "Solid SS 443 R/360 S" or similar. (Fitted with a dummy handle on the outside.)
 - (iii) The other doorway may be fitted with a sliding door, or single or double leaf swinging door opening outwards.
 - b) Doorways shall not exceed 3 metre in height.
 - c) Every such swinging and sliding door that joins a spray room with any part of a building shall be a Class A or B grading fire door and shall have an observation panel not less than 300 mm square and not more than 600 mm square, of clear wirewoven or laminated glazing of not less than 7,5 mm thick.
4. Approved fire dampers fitted with fusible links must be provided in front of all openings other than doorways in a wall that separates the spray room from the remainder of a building, and must in any case be provided for the air-intake and discharge openings where such openings do not lead direct to the open air or into a fireproof construction.
5. No artificial illumination other than electric lights shall be used in a spray room. All electrical fittings and apparatus in such rooms or forming part of a ventilation system thereof shall be flame-proof and vapour-proof, and all wiring thereto shall be through seamless screwed metal conduit and shall be effectively bonded to earth. Fuses for electrical lighting and apparatus shall be located outside such room.
6. Every spray room shall have an effectual mechanical ventilation system which will extract the fumes from such room and discharge them in such manner that they do not create a public nuisance. Wherever practicable such systems shall take the form of an extract fan situated in an external wall of such room and discharging direct to the open air without the intermediary of a duct. Where this is impracticable, any extract duct provided shall be of metal, shall be as short as possible, shall have no sharp bends and shall be taken through an external wall without passing through any other part of building in which the spray room is located. In this case the discharge opening must be fitted with an approved fire damper, and if a water sprinkler system is provided for the complex, sprinklers must be installed in the extract duct. Should the duct form part of a brick or concrete structure, discharging through the roof or external wall or if such an extract duct is situated within the paint room, discharging directly into an outside wall, the provision of a fire damper is no requirement.

All fans shall be readily accessible, and ducts, if any, shall be fitted with doors for cleaning. Inlets for fresh air shall be provided, and shall be located as high as possible above floor level.
7. Every door in a spray room shall be marked on both sides of such door in 50 millimetre block letters:

"THIS DOOR TO BE KEPT CLOSED WHEN SPRAYING IS IN PROGRESS" - "HIERDIE DEUR MOET TOE BLY TERWYL SPUITWERK VERRIG WORD".

At least one notice in 150 millimetre block letters "NO SMOKING" - "ROOK VERBODE" shall be painted on a wall of every spray room.

8. Whenever possible, every spray room should be provided with an automatic water sprinkler system, and shall be provided with hand fire extinguishers in accordance with departmental requirements.

Should a sprinkler system be provided, a flow switch must be fitted in the water supply to switch off the extract fan in case of a fire.

DEPARTMENT OF PUBLIC WORKS

STANDARD TECHNICAL SPECIFICATION

N0.36

FIRE DOOR ASSEMBLIES

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FIRE DOOR ASSEMBLIES

SCOPE

This specification covers the technical requirements of a fire door assembly. The main purpose of a door of this nature is to stop the passage of heat, flames and smoke from one fire zone to another and, in so doing, safeguard life and property.

2. GENERAL

A fire door is a very important component in the fire protection scheme of any complex and should therefore be treated with the appropriate responsibility. Fire doors should always, without exception, be of a reliable standard complying with the minimum requirements of a recognised standards organisation. Unless otherwise stated, this standard should be that administered by the South African Bureau of Standards

This document must be interpreted with other relevant documents having specific reference to a particular service where the doors will be used. As the applicable requirement for any one door could differ from that for another, the specific requirements for a particular door must be stated when it is specified and ordered. Annexure A of this specification is an example of the information that is required for each specification or for an order.

3. THE DOOR

A fire door is a door and frame assembly which together can stop the passage of heat, flames and smoke for various periods depending on varying factors. An ordinary solid door excluding hollow-core doors, will stop a fire for approximately 30 minutes. A fire door is therefore a door that will perform better than just an ordinary door.

Fire doors are classified into four categories, determined by the situation for which they are required:

Class A situations are those where low hazard occupancies have to be separated, e.g.:

- (a) flat and office suite doors leading to passages and exit routes also used by other tenants; and
- (b) flat and office tenant separation.

NOTE: Passages and exit routes mentioned here lead to, but are not necessarily themselves, places of refuge.

CLASS B situations concern the separation of residential, commercial and institutional occupancies from exit or escape routes which are also places of refuge, and from stairwells and lift lobbies.

CLASS C situations are those where the fire door is exposed to mechanical damage. They normally have low population density, a high fire risk or a high fire load and often also high goods traffic. Storage separation from other or similar occupancies and the separation of parking garages from other (usually residential) occupancies are examples of such situations.

CLASS D situations require fire door and frame assemblies in division walls. These door or door combinations are expected to be as safe as the structure which serves to divide a single building into two separate (from a fire point of view) buildings. They need to be robust enough to withstand structural damage associated with fire and should be able to stop heat and fire for long periods. It is preferable to use more than one door or sets of doors in series to meet the high degree of heat, smoke and fire separation required in Class D situations.

For test and evaluation purposes the sample door and frame assembly is exposed to heat in

accordance with the time temperature curve and test conditions of Appendix A of Chapter 14 of the Standard Building Regulations, ISO R834, and BS 476, Part 8, with some modifications of a minor nature.

Once a prototype has been satisfactorily fire-tested, the SABS is prepared to inspect consignments and to label each door with its Class and an identification number.

There are four qualities which determine the suitability of a door for any particular occupancy situation.

- (a) Stability is its ability to fulfil its design function of keeping an opening closed in the face of fire so that no fissure or opening wider than 25 mm develops.
- (b) Integrity enables a door to resist fire without the development of perpendicular through openings wider than 6 mm and longer in total than the largest dimension of the door.
- (c) Insulation means the ability to prevent the transmission of enough heat to raise the mean unexposed face temperature by more than 140° C above the initial temperature.
- (d) Structural strength enables the sample to resist two successive impacts of a sandbag 250 mm in diameter and of mass 27 kg without the formation of any opening wider than 25 mm. This test, which is fully described in Appendix A of Chapter 14 of the Standard Building Regulations, is carried out after the test sample has cooled subsequent to fire testing for the period of required stability.

Resistance periods required for the various criteria in the four classes are:

Class A stability 60 min integrity and insulation 30 min

Class B stability 120 min integrity and insulation 60 min

Class C stability and integrity 120 min. no insulation but with a successful impact test.

Class D stability, integrity and insulation 120 min with a successful impact test.

For the test, the door and frame assembly must be installed in the same way in the furnace opening as would be the case in practice. The door must have hardwood edges on the side and the bottom to enable planing on site.

4. THE FRAME

The frame is an integral part of the assembly and therefore must always be supplied with the door as a complete unit, representing the sample submitted to the testing authority. The frame may take the shape of an ordinary standard mild steel frame except that it must be fabricated of 1,5 mm (minimum) steel and have a door rebate of 50 mm x 25 mm. The frame must be braced at the bottom in an approved manner to avoid distortion during transit or when being built in. If required, the necessary electrical conduit for door release and security locks must be welded to the frame. Frames for double or sliding fire doors must meet the requirements of the testing authority.

5. HARDWARE

The hardware associated with any fire door is very important and therefore no inferior material can be allowed to be used. As each door is required to fulfil a particular function, the requirements for the hardware could vary from door to door and it is therefore important to specify the correct articles.

- (a) Hinges: Must comply with S.A.B.S. - requirements.

- (b) The door assembly must be equipped with an acceptable door lock which may vary in its function, depending on the location of the door in a particular building. It is therefore important to specify the type of lock required. The locking mechanism of the lock must be constructed of steel, brass or bronze only, and all exposed components, comprising back plates, handles and escutcheons are to be of approved materials only. The following four types of locks are to be used on the fire doors:

Reference (P.W.D Sample Number)	DESCRIPTION OF THE LOCK
21	Upright mortice latch for fire doors, complete with approved handles, to be operated from internal side only and approved pull handle on external side
22	As above, but latch to be operated from both sides.
23.	Single cylinder five pin tumbler upright mortice lock for fire door, complete with approved handles. Handle to be operated from internal side only having tumbler set flush with face of escutcheon in external position and with approved pull handle on external side.
24.	As above, but handles to be operated from both sides having turn button release internally to tumbler.

Where fire doors are to serve as security doors, different locks may be required, in which case these will be specified accordingly.

- (c) Door closer: It is imperative that the fire door should be closed during a fire condition and therefore each door leaf should be fitted with an approved closing device. Closers are divided into three categories; as follows:

P.W.D REFE- RENCE	TYPE OF DOOR	DESCRIPTION OF DEVICE	BENDING MOMENT Nm
40	Door less than 40 kg	Single action, surface mounted hydraulic check door closers with coil springs.	3,75
80	Door between 40 - 80 kg	As above.	5,00
120	Door between 80-120 kg or for doors opening outward with closer on inside.	As above but with lever arms to suit application.	7,50

All door closers must be of the overhead type suitable for left and right hand operating doors, without alteration. The basic driving force of the closer when the door is in the open position must be a mechanical coil spring with hydraulic retarding

speed control which must be adjustable. A built-in auxiliary valve must allow the closer to be adjusted to swing the door at an accelerated speed for the last 10° to overcome a stubborn catch. The closer unit must be neat in appearance. Double-selfclosing fire doors must be equipped with a sequence selected.

- (d) Door release unit: Where fire doors are fitted to staircases, they should remain closed, but there are instances where they must be fitted in high traffic areas and, because of the nuisance so created, motivate people to wedge them open. To avoid this, they must be fitted with holding devices controlled by automatic release mechanisms enabling them to be fastened in an open position but released immediately in a fire condition. Such automatic door release mechanisms must be designed in such a way that they operate automatically in a case of fire or with a power failure. These units could be divided into the following categories: When specified, the applicable category should be mentioned:

TYPE NO.	FUNCTION AND POSITION
RMF	Electro-magnet, 24 Volt D.C., 0,1A, with a break away force of 100 kPa, complete with steel, swivel type holding plate. The unit must be mounted in a suitable box if not robust enough in itself. The complete unit must be suitable for floor mounting with bottom cable entry. This unit to be energised continuously <u>NOTE</u> : A rubber gasket must be used between the concrete screed and the unit.
RMW	As above, but suitable for wall mounting.
RMC	As above, but suitable for ceiling mounting, including a mounting bracket, to be fitted to the ceiling slab and penetrate through false ceilings if provided.
RMSD	As above, but for sliding door release.
RMST	An electro-magnet incorporated in a stay, forming part of the mechanical/hydraulic overhead mounted door closer. The magnet must hold the door open against the closer but release it when the magnetic force is overcome or when the detection system cuts the 24 Volt D.C. power supply to the magnet. The power requirements of the electro-magnet must not exceed 0.3A.
RMST/B	As above, but fitted with a release button in the door frame and a micro limit switch in the rebate to indicate that the door has closed.
RSF	A solenoid operated mechanical door release, which is energised only when the release mechanism is activated by the solenoid. The solenoid to be 24 Volt D.C. with a power requirement of 0,25A with the necessary control equipment to protect the solenoid from burning out. The unit to be suitable for floor mounting.
RSC	As above, but for ceiling mounting with the necessary supporting bracket.

RSW	As above, but for wall mounting.
RSSD	As above, but for sliding door release.

FIRE DOOR ASSEMBLIES

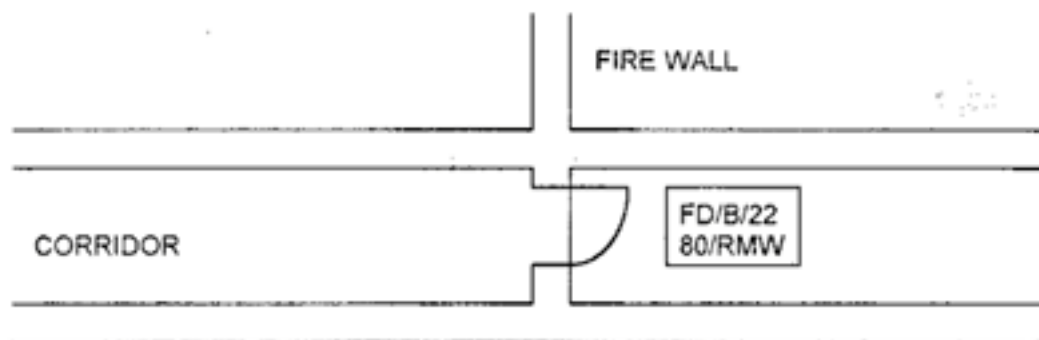
STANDARD TECHNICAL SPECIFICATION

N0.36

ANNEXURE C1

ORDERING AND SPECIFICATION INFORMATION

The building contractor will specify requirements such as, type of door, finish, colour, swing, notices, etc., but the following information must be specified on the drawing and to avoid long descriptions on the drawings, the following code and drawing office practice is recommended:



LEGEND TO THE CODE

FD	=	FIRE DOOR	(3)
/B	=	TYPE OF DOOR	(3)
/22	=	DOOR LOCK	(5b)
/80	=	DOOR CLOSER	(5c)
/RMW	=	DOOR RELEASE	(5d)

SMOKE CONTROL DOORS

Smoke control doors to be not less than 44 mm thick and of approved manufacture.

The single door /or doors in two leaves are to be the following types, namely:-

FRAMED HARDWOOD DOORS

The framed single doors and each leaf of doors in two leaves are to be constructed with hardwood stiles, rails and/or ledges, all properly framed together in one or two panels and with outer edges of hanging and meeting stiles to each leaf of doors in two leaves to be slightly rounded.

The inner edges of framing to be grooved for and filled in with tongued, grooved and V-jointed on external faces, hardwood boarding in narrow width to finish flush with framing on outside and with abutting edges of boarding with framing V-jointed on outside or the inner edges of framing to be rebated for and filled in with hardwood panels or plywood or chipboard panels, faced on outside with hardwood veneer or with tempered hardboard panels or other similar approved.

Hang each single door and each leaf of door in two leaves to swing one way on butt hinges with approved door closer as Briton 2000 or similar, or both ways on an approved double action satin chrome brass floor spring hinge with hydraulic check and top centre, but no right angle stop. Fit each door and/or each leaf with two 300 mm long satin chrome or natural anodised aluminium door pull handles as sample 133 or other similar approved if required. No locks are required to be fitted.

The door frame to each single door or door in two leaves to be metal pressed or to be formed with no less than 140 x 44 mm thick hardwood framing.

FRAMED HARDWOOD GLASS PANELLED DOORS

The framed glass panelled single doors and each leaf of doors in two leaves are to be constructed with hardwood all as generally specified for framed hardwood doors, but with upper portion of door or each leaf provided with opening for glass viewing panel and fitted with arris rounded hardwood glazing beads. The opening to be filled in with 7,5 mm thick high impact laminated safety glass.

Hang each door and/or each leaf of door in two leaves and fit each door and/or leaf with furniture all as specified for framed hardwood doors.

FRAMED METAL DOORS

The framed single doors and each leaf of doors in two leaves are to be constructed of mild steel or anodised aluminium framing, having openings filled in with metal panels as recommended by the manufacturers of the doors or openings may be filled in with suitable panels as specified for framed hardwood doors except boardings.

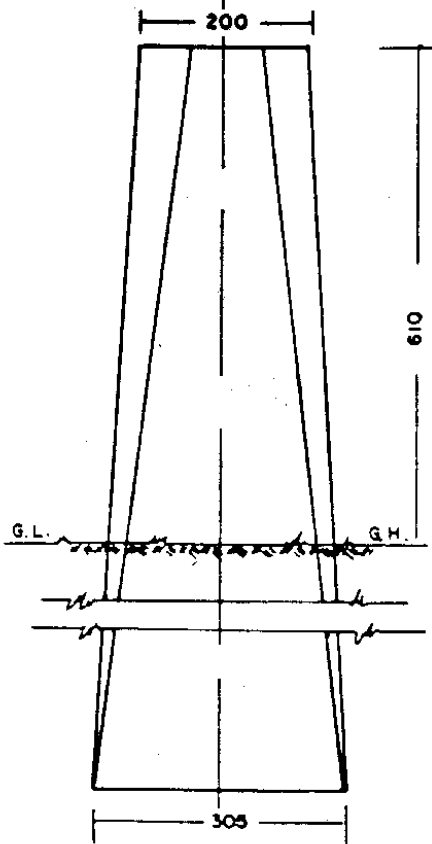
Full glass metal doors or doors having opening in upper portion for glass panels are to have openings fitted with metal glazing beads and glazed with safety glass as specified for framed hardwood glass panelled doors. Hang each door /or each leaf of door in two leaves to swing one way or both ways and fit each door and/or each leaf with door pull handles if required, all as generally specified for framed hardwood doors and as recommended by the manufacturers of the metal doors.

The door frames to be as supplied by the manufacturers and where of mild steel in coastal areas are to be hot dip galvanised and where of aluminium it is to be protected from injury or damage due to mortar, stains, scratches, etc., and is to be handed over in a perfect condition.

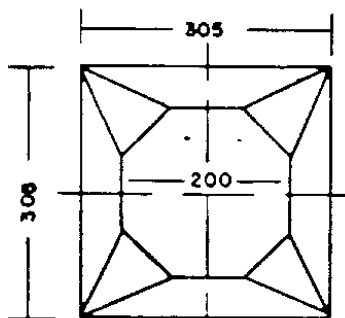
1. 12. 1975.

DETAIL VAN BRANDBLUSTOESTEL

R.S.A.
P.W.D.



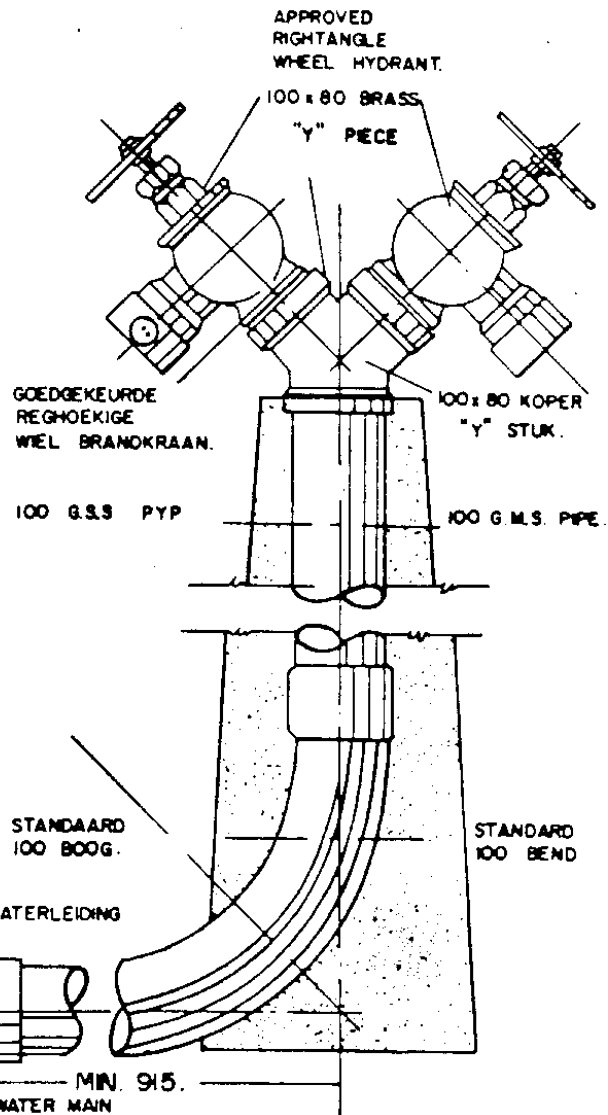
ELEVATION
AANSIG



PLAN

OCTAGONAL TOP
SIDES 83.
AGTKANTIGE KOP
KANTE 83.

CONCRETE PEDESTAL
TO BE PAINTED GOLDEN
YELLOW B.S.S. 356.
BETONVOETSTUK
MOET GOUDGEEL GEVERF
WORD B.S.S. 356.



NB
PEDESTAL MUST NOT BE ERECTED
DIRECTLY OVER MAIN.

LW
DIE VOETSTUK MAG NIE OP DIE
WATERLEIDING GEPLAAS WORD NIE.

**ARRANGEMENT OF HYDRANT
AND PIPING**
**AANLEG VAN BRANDKRAAN
EN PYPLEIDING**

VALVE HYDRANT FOR DOUBLE TYPE HYDRANT STANDPOST.
KLEP BRANDKRAAN VIR DUBBEL TPE BRANDKRAANSTAANPYP.

F/ 8/ F

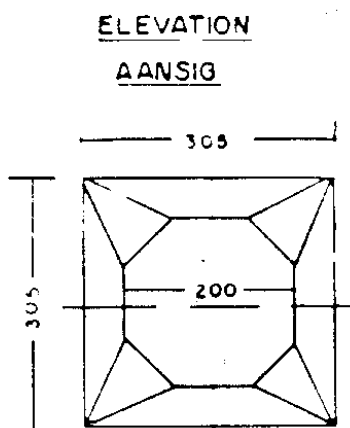
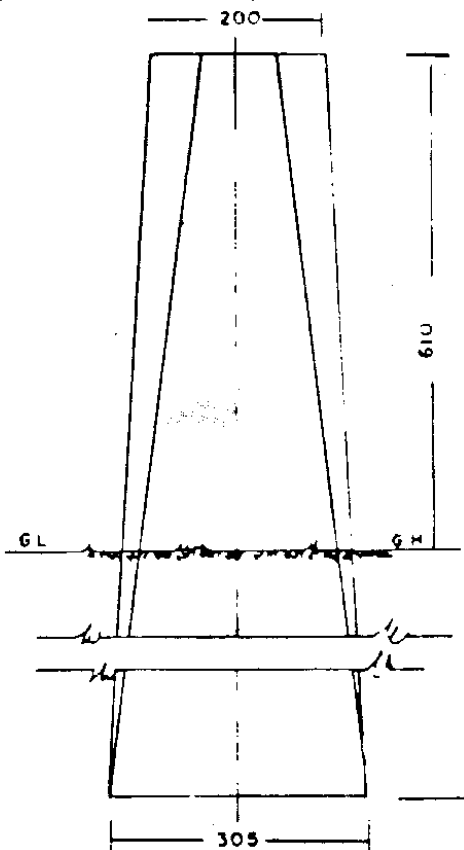
FIRE APPLIANCE DETAIL

R.S.A.
P.W.D.

1 12 1975

DETAIL VAN BRANDBLUSTOESTEL

R S A
P.W.D.



OCTAGONAL TOP
SIDES 83
AGTKANTIGE KOP
KANTE 83
CONCRETE PEDESTAL
TO BE PAINTED GOLDEN
YELLOW BSS 356
BETONVOETSTUK
MOET GOUDEEL GEVERF
WORD BSS 356.

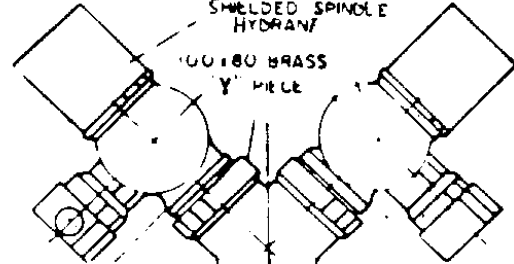


HYDRANT KEY



BRANDKRAAN SLEUTEL

APPROVED
RIGHT ANGLE
SHIELDED SPINDLE
HYDRANT

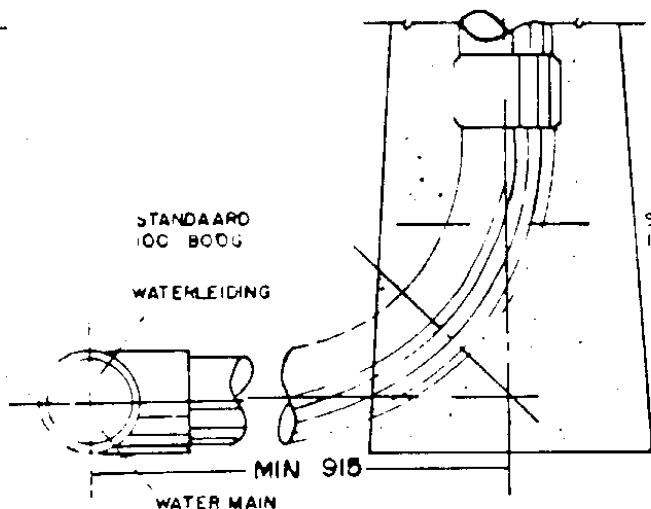


GOLDFOERME
HEGHOEKIGE
BESKUTTE SPIL
BRANDKRAAN

100x80 WOPEN
"Y" STUK

100 GSS PYP

100 GMS PBE



STANDAARD
100 BOOG

WATERLEIDING

STANDAARD
100 BEND

MIN 915
WATER MAIN

NB
PEDESTAL MUST NOT BE ERECTED
DIRECTLY OVER MAIN

NB
DIE VOETSTUK MAG NIE OP DIE
WATERLEIDING GEPLAAS WORD NIE
ARRANGEMENT OF HYDRAT
AND PIPING
AANLEG VAN BRANDKRAAN
EN PYP LEIDING

VALVE HYDRANT FOR DOUBLE TYPE HYDRANT STANDPOST
KLEP BRANDKRAAN VIR DOUBBEL TIEP BRANDKRAANSTAANPYP

F/8A/F

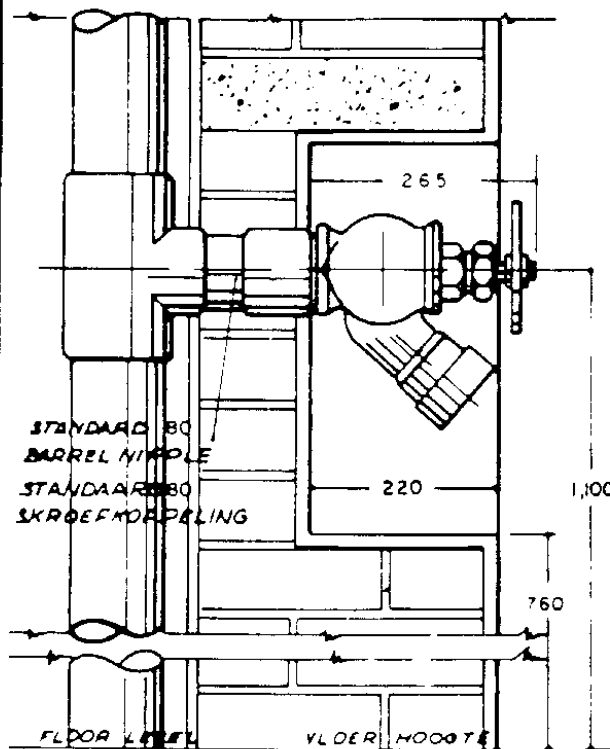
FIRE APPLIANCE DETAIL

R S A
P.W.D.

1.5. 1972.

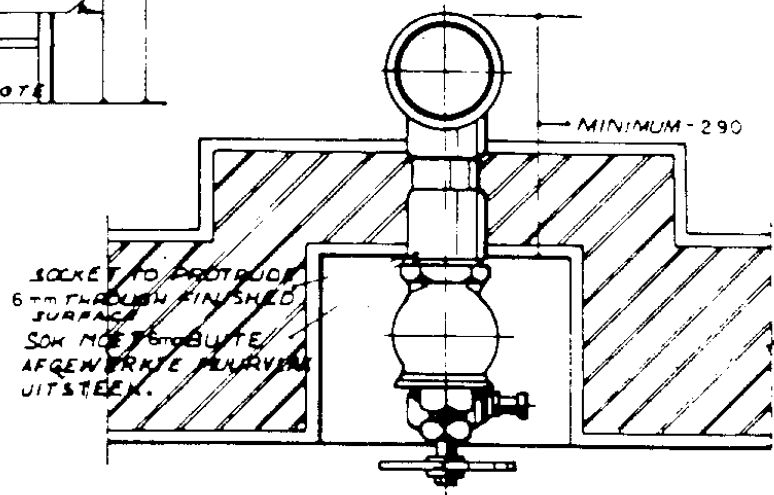
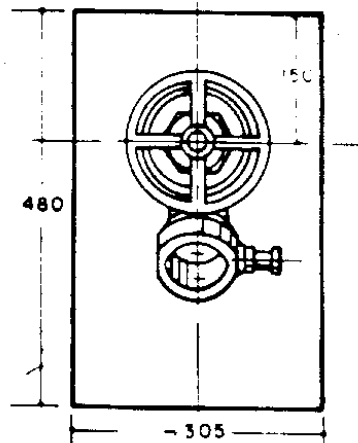
DETAIL VAN BRANDBLUSTOESTEL

R.S.A.
P.W.D.



SECTION.
DEURSNEE.

FRONT ELEVATION.
VOORAANSIG.



PLAN.

N.B.

BRICKWORK SURROUND OF RECESS IS TO BE AS INDICATED ON ARCHITECTURAL DRAWINGS OF THE SERVICE CONCERNED. THIS DETAIL IS ISSUED SOLELY FOR THE PURPOSE OF INDICATING THE MINIMUM REQUIREMENTS FOR A HYDRANT RECESS. HOSE EQUIPMENT NOT REQUIRED.

L.W.

MESSELWERK RONDOM DIE NIS MOET WEES SOOS AANGEDUI OP DIE BOUKUNDIGE TEKENINGE VAN DIE BETROKKE DIENS. HIERDIE DETAIL WORD ALLEENLIK UITGEREIK OM DIE MINIMUM VEREISTES VIR 'N BRANDKRAANNIS TE WYS. BRANDSLANGTOERUSTING WORD NIE BENODIG NIE.

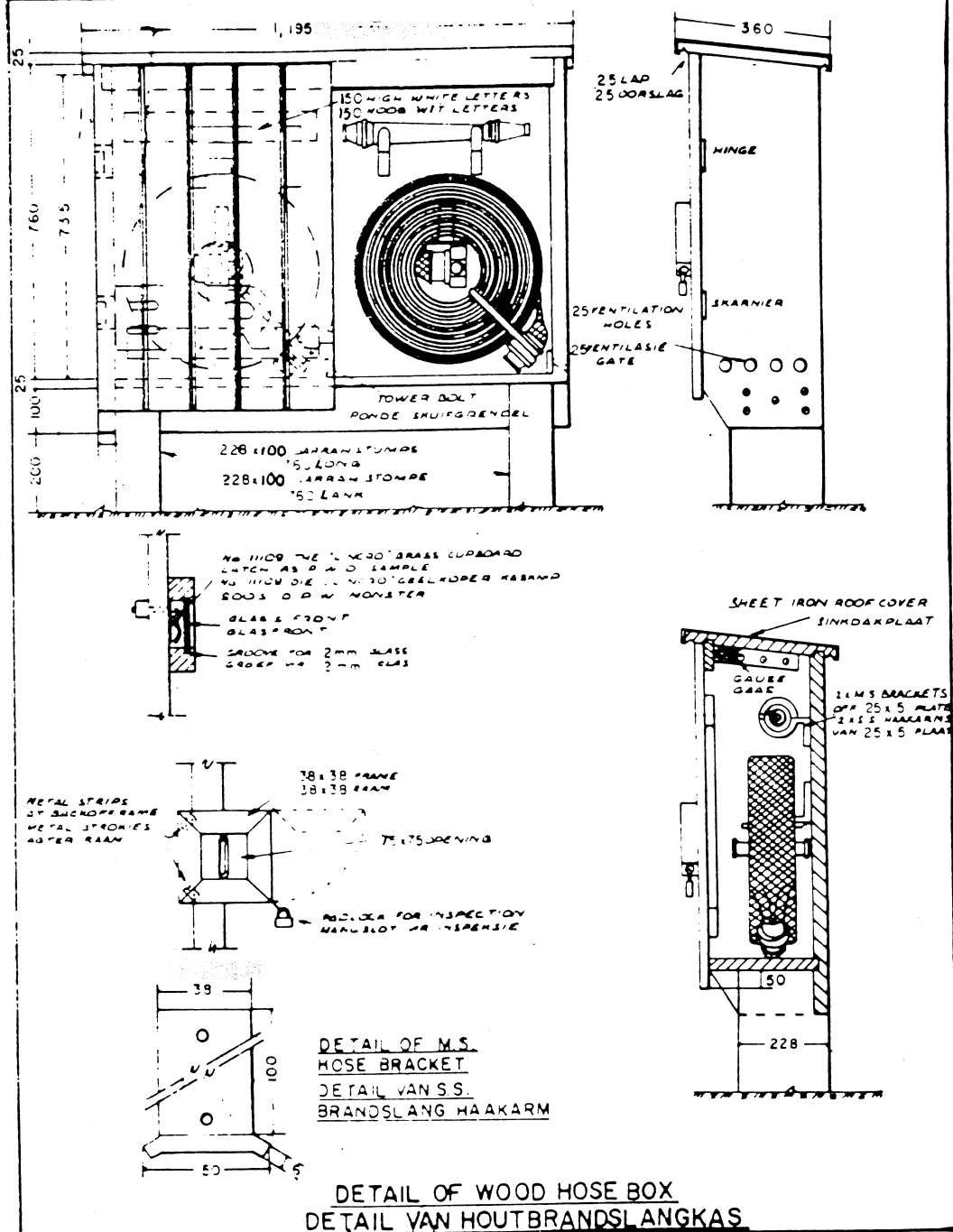
DETAIL OF RECESS FOR FIRE HYDRANT IN BUILDINGS.
DETAIL VAN BRANDKRAANNIS IN GEBOUE.

F/12/F

FIRE APPLIANCE DETAIL

R.S.A.
P.W.D.

R S. A.
P. W. D.

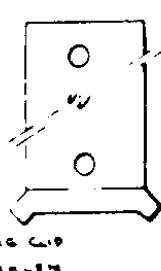
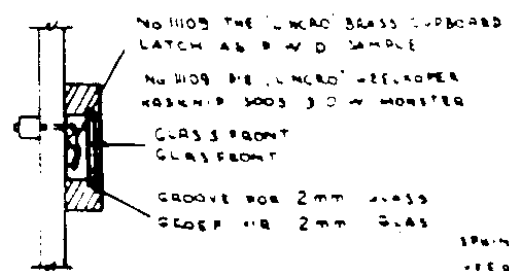
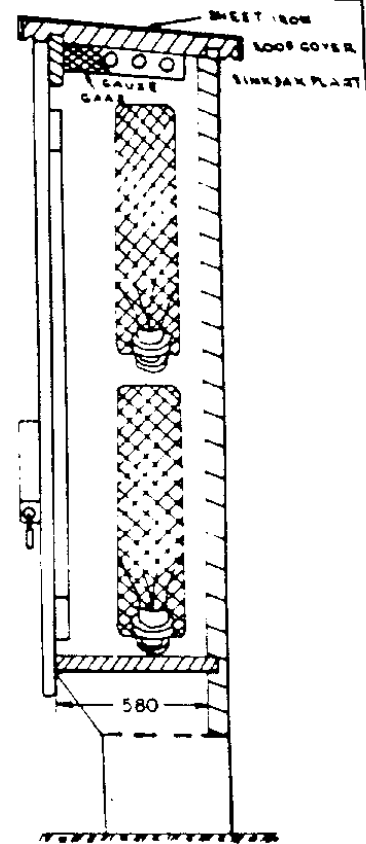
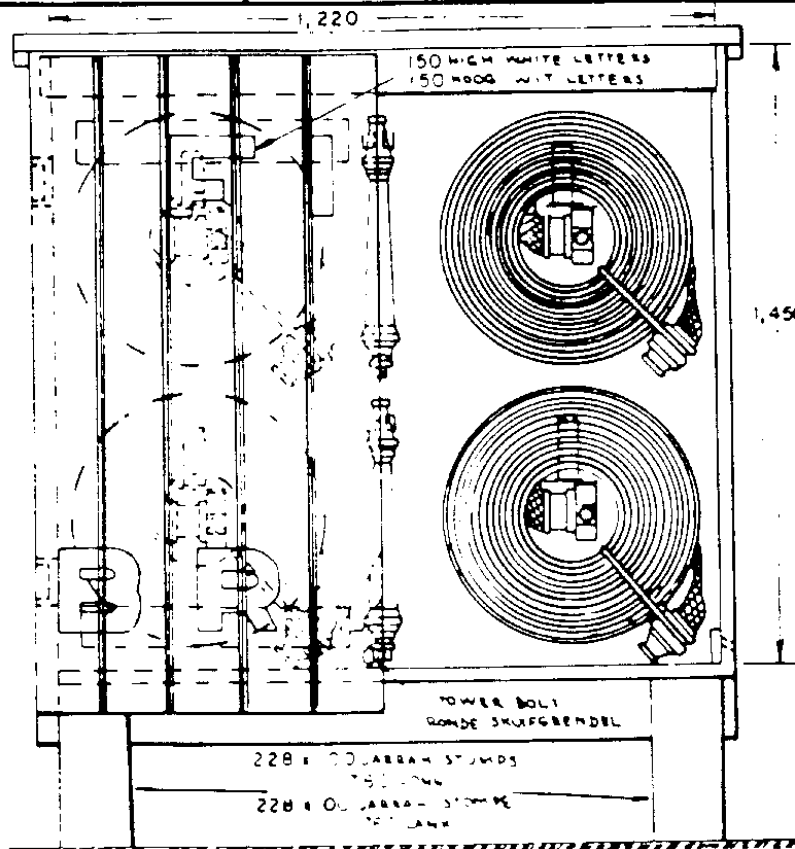


R. S. A.
P. W. D.

1 5 1972

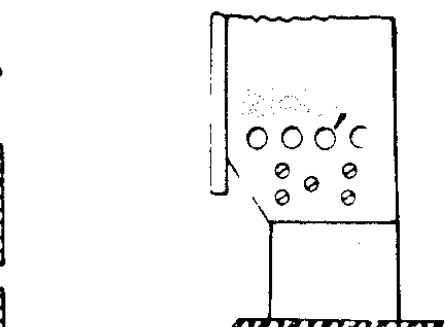
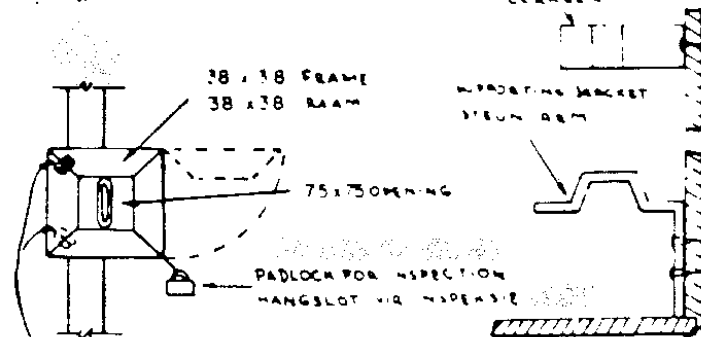
DETAIL VAN BRANDBLUSTOESTEL

R S A
P.W.D.



DETAIL OF M.S.
HOSE BRACKET
DETAIL VAN S.S.
BRANDSLANG HAARARM

25 VENTILATION
HOLES
25 VENTILASIE
GATE



BRANCHPIPE HOLDERS
SPUITPYP HOUDERS

ALL VENT HOLES
TO BE CAUSE PROTECTED
ALLE VENTILASIE
GATE BESKERM
MET GAAS

METAL STRIPS
AT BACK OF FRAME
METAL STRIPS
AFTER BEAM

DETAIL OF WOOD HOSE BOX
DETAIL VAN HOUT BRANDSLANGKAS

F/16/F

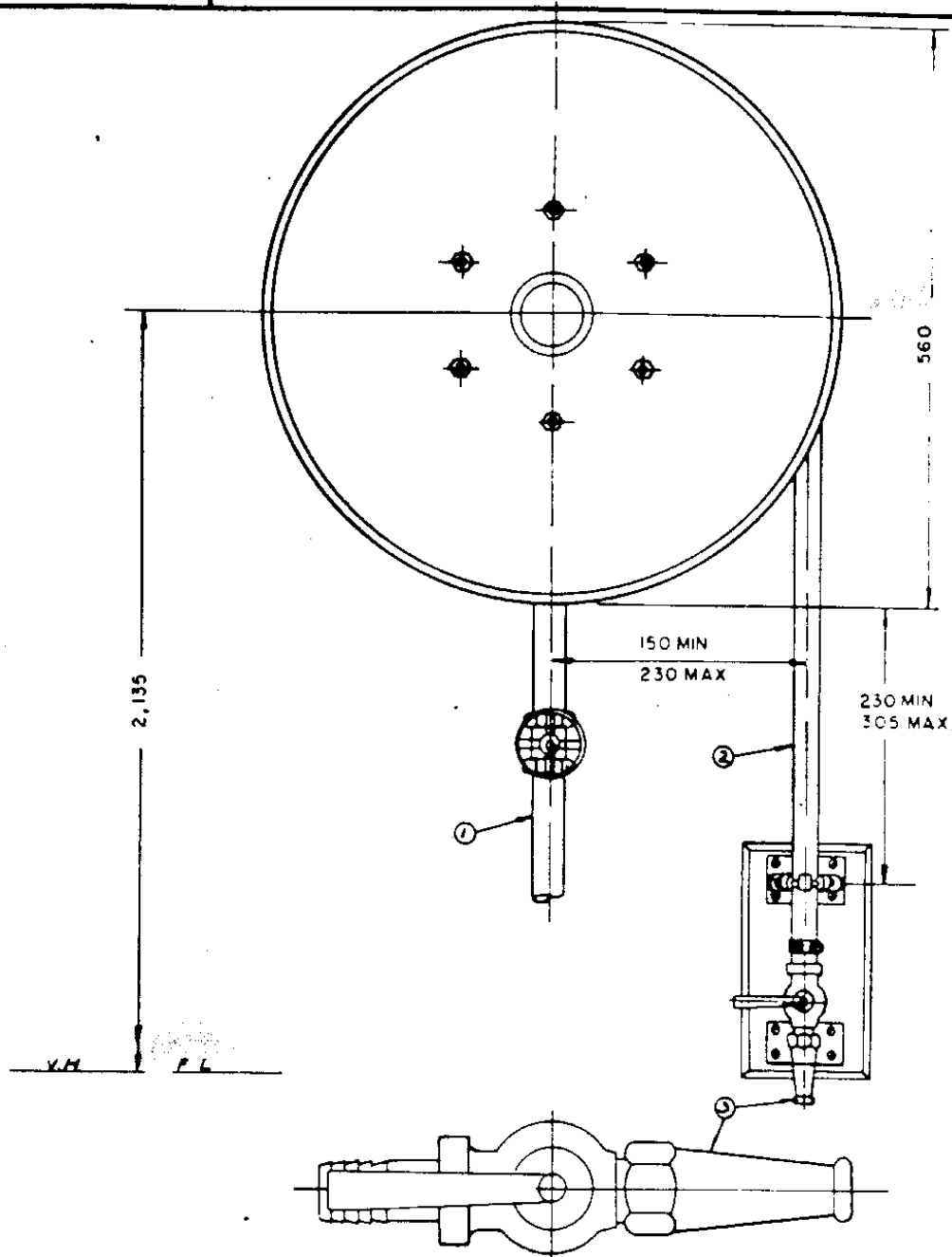
FIRE APPLIANCE DETAIL

R S A
P.W.D.

1.5.1972.

DETAIL VAN BRANDBLUSTOESTEL

R.S.A.
P.W.D



COMBINED NOZZLE - COCK AS P.W.D. SAMPLE 86
GECOMBINEERDE SPRUITSTUKKRAAN 8006 O.P.W. MONSTER 86

NOTE

- ① 25W S.P. — MAX 10m
- 40 W S.P. — MAX 60m
- ② HOSE 20 + 23m OR 30m
- ③ REMOVABLE NOZZLE

NOTA

- ① 25W T.P. — MAX 10m
- 40 W T.P. — MAX 60m
- ② BRANDSLANG 20 + 23 OF 30m
- ③ VERWIJDERBARE SPRUITSTUK.

FIRE HOSE REEL.
BRANDSLANGTOL.

F/17/F

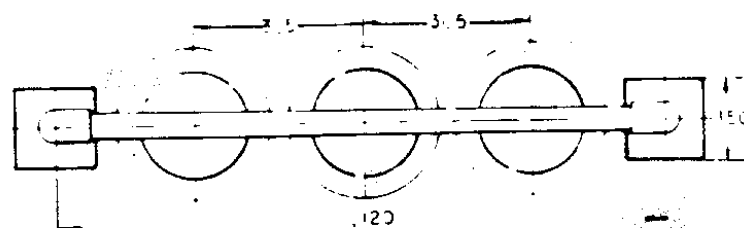
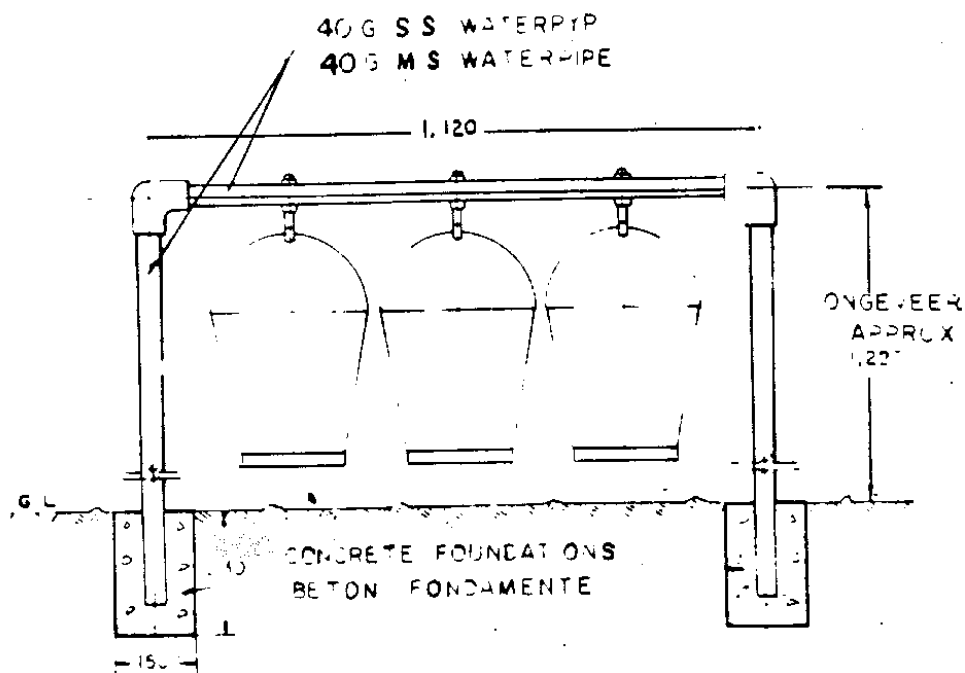
FIRE APPLIANCE DETAIL

R.S.A.
P.W.D

1.5.1972

DETAIL VAN BRANDBLUSTOESTEL

R.S.A
P.W.D.

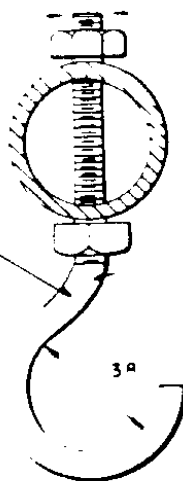


MOET GEKLINK WORD

TO BE RIVETED OVER

HOOK OFF 10 Ø ROD
THREADED FOR TWO
LOCKNUTS

HAAK VAN 10 Ø STAAF
MET SKHOEFDRAAD VIR
TWEЕ SLUITMOERE



DETAIL OF GROUND TYPE FIRE BUCKET RAIL.
DETAIL VAN GROND TIPE BRANDEMMERHANGSTAAF.

F/19/F

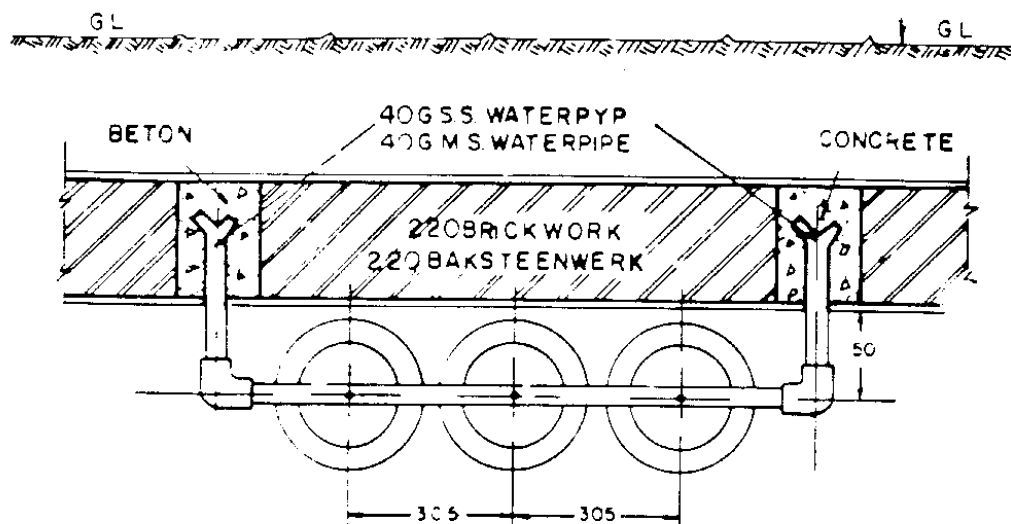
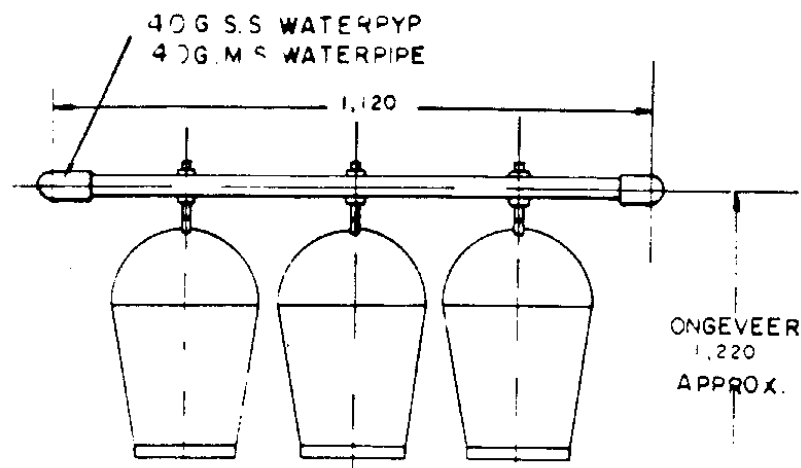
FIRE APPLIANCE DETAIL

R.S.A
P.W.D.

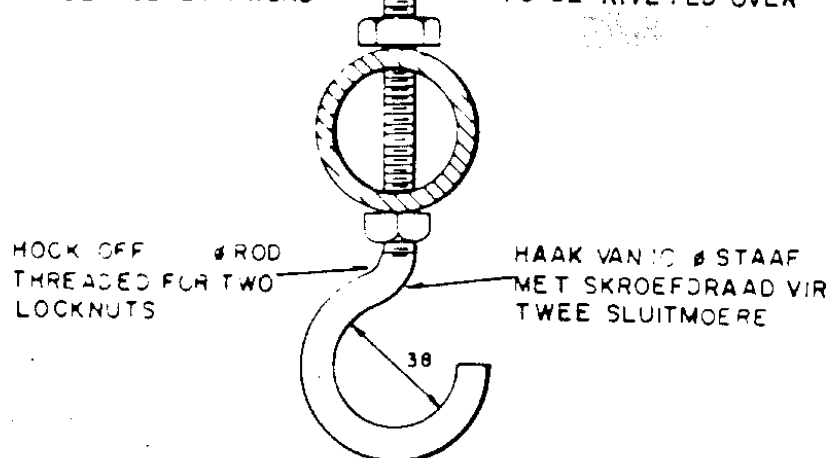
1. 5. 1972.

DETAIL VAN BRANDBLUSTOESTEL

R.S.A.
P.W.D.



MOET GEKLINK WORD — TO BE RIVETED OVER



DETAIL OF WALL TYPE FIRE BUCKET RAIL.
DETAIL VAN MUUR TIPE BRANDEMMERHANGSTAAF.

F/20/F

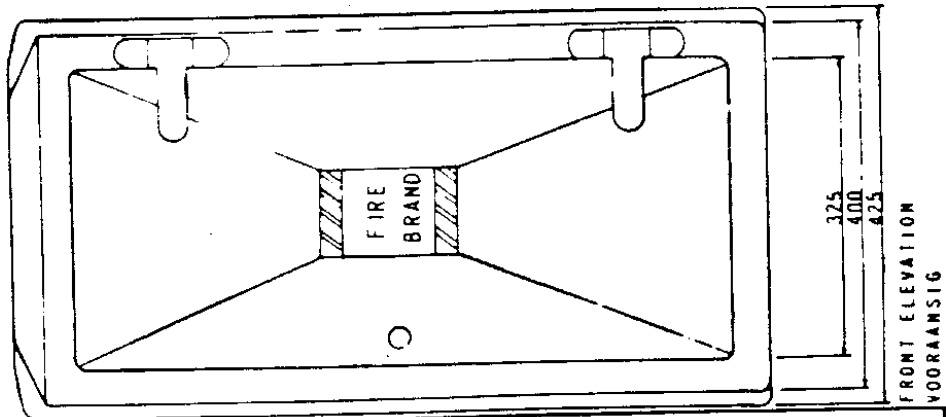
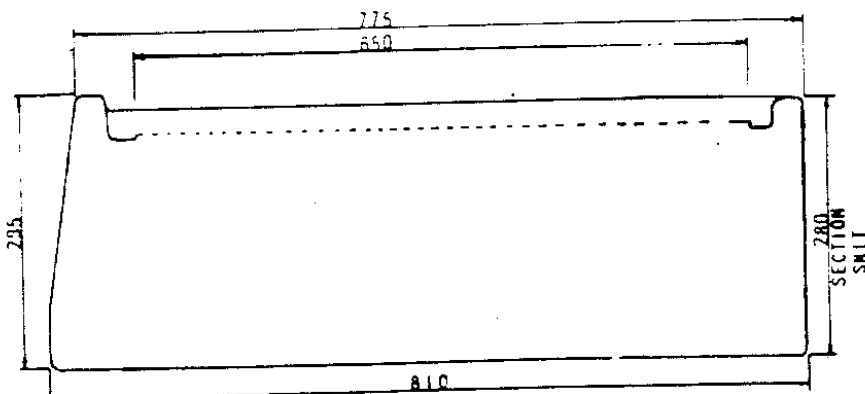
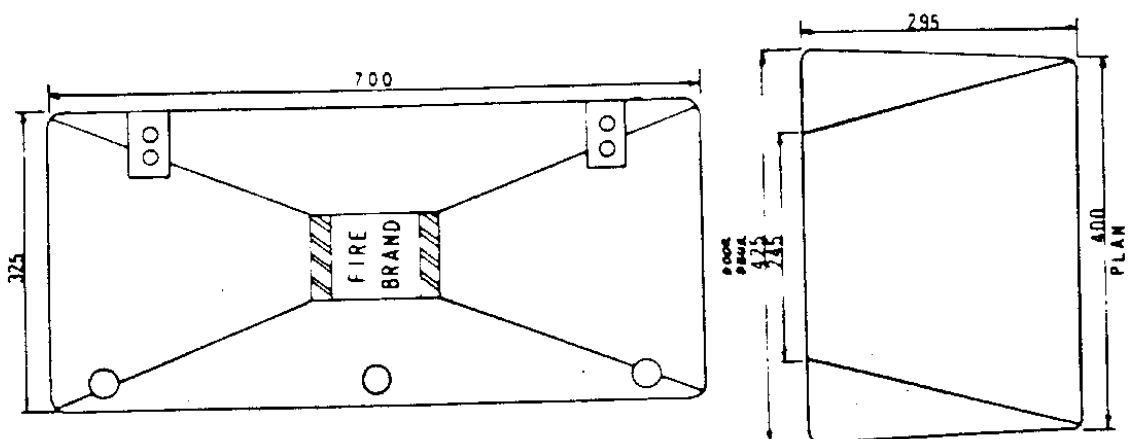
FIRE APPLIANCE DETAIL

R.S.A.
P.W.D.

Let Wel: Hierdie item word vervaardig uit glas-vesel en is verkrygbaar onder jaarlikse staatskontrak no.82. Hierdie is n verwerking van tekening no. F/S2 en dien slegs as leiding ten opsigte van afmetings.

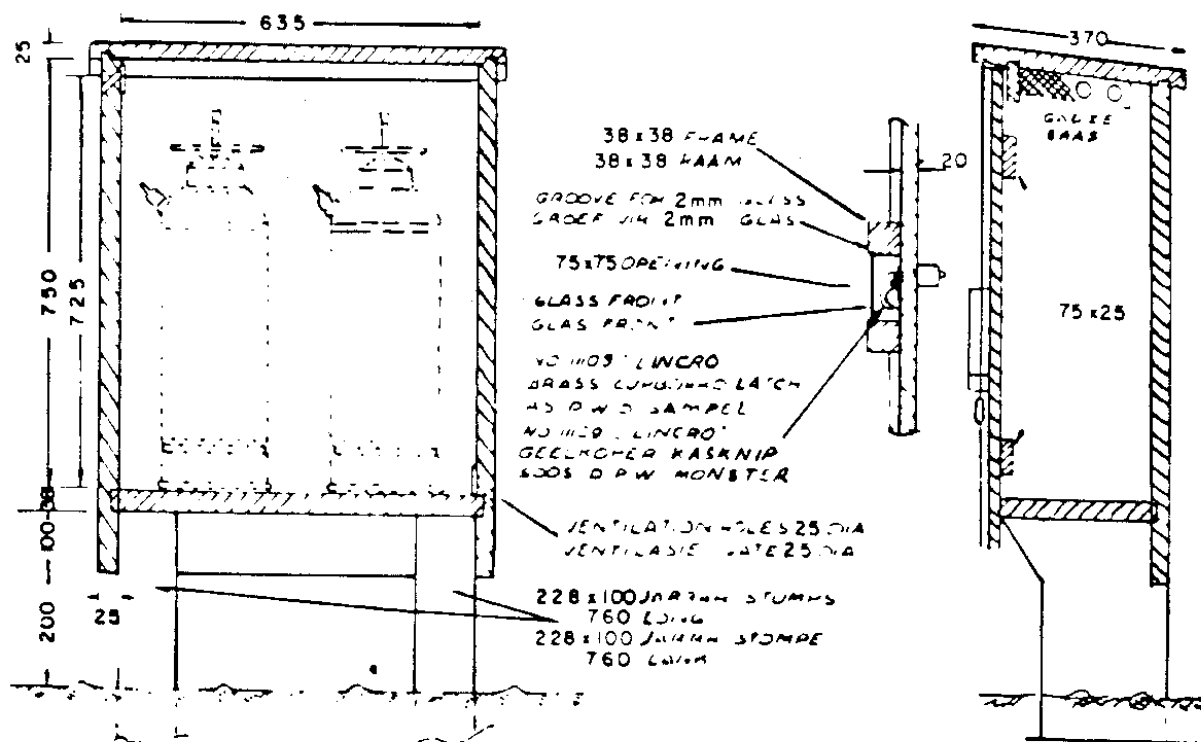
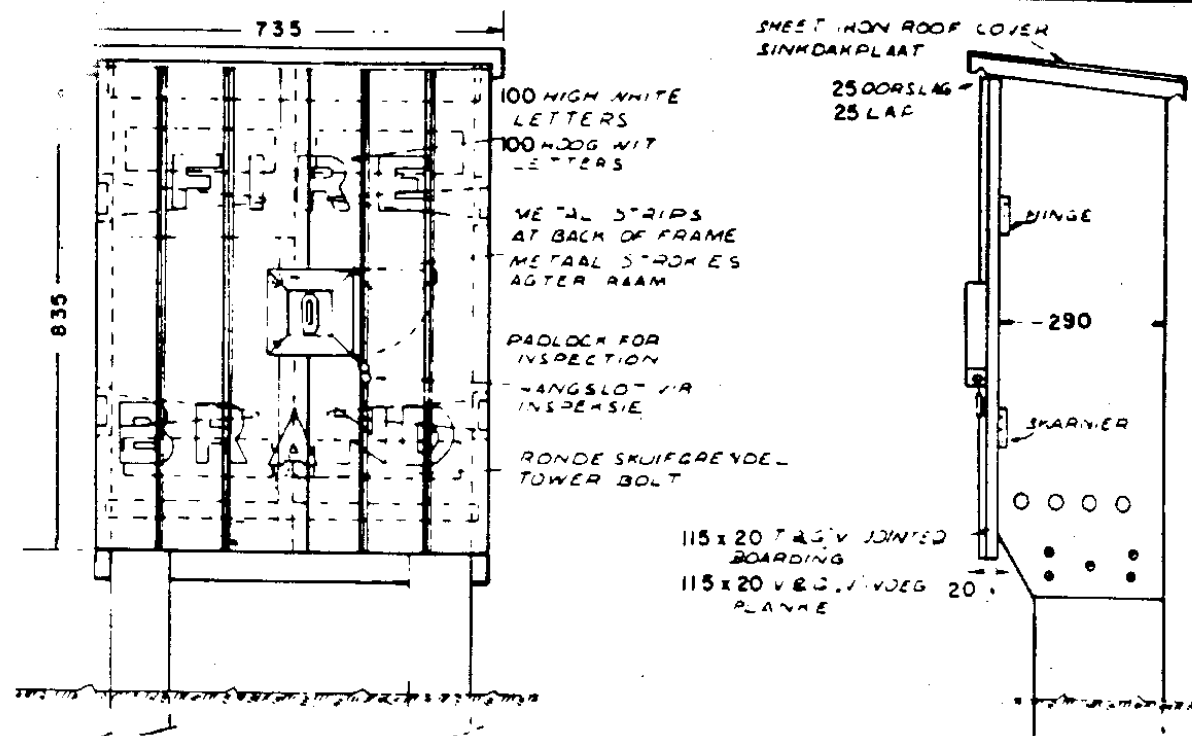
Please Note: This item is manufactured out of fibre-glass and obtainable under annual state contract no. 82. This is taken from drawing no. F/S2 to serve as guidance with regard to overall dimensions.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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1972.

DETAL VAN BRANDBLUSTOESTEL

R.S.A.
P.W.D.

NB
DOORS FINISHED IN POST OFFICE
RED AS B S S 538

LW
AFWERKING VAN DEURE MOET
POSTKANTOOR RTO. WEES SOOS
B S S 538

DETAIL OF CUPBOARD FOR TWO FIRE EXTINGUISHERS
DETAL VAN KAS VIR TWEË BRANDBLUSSERS

F/22/F

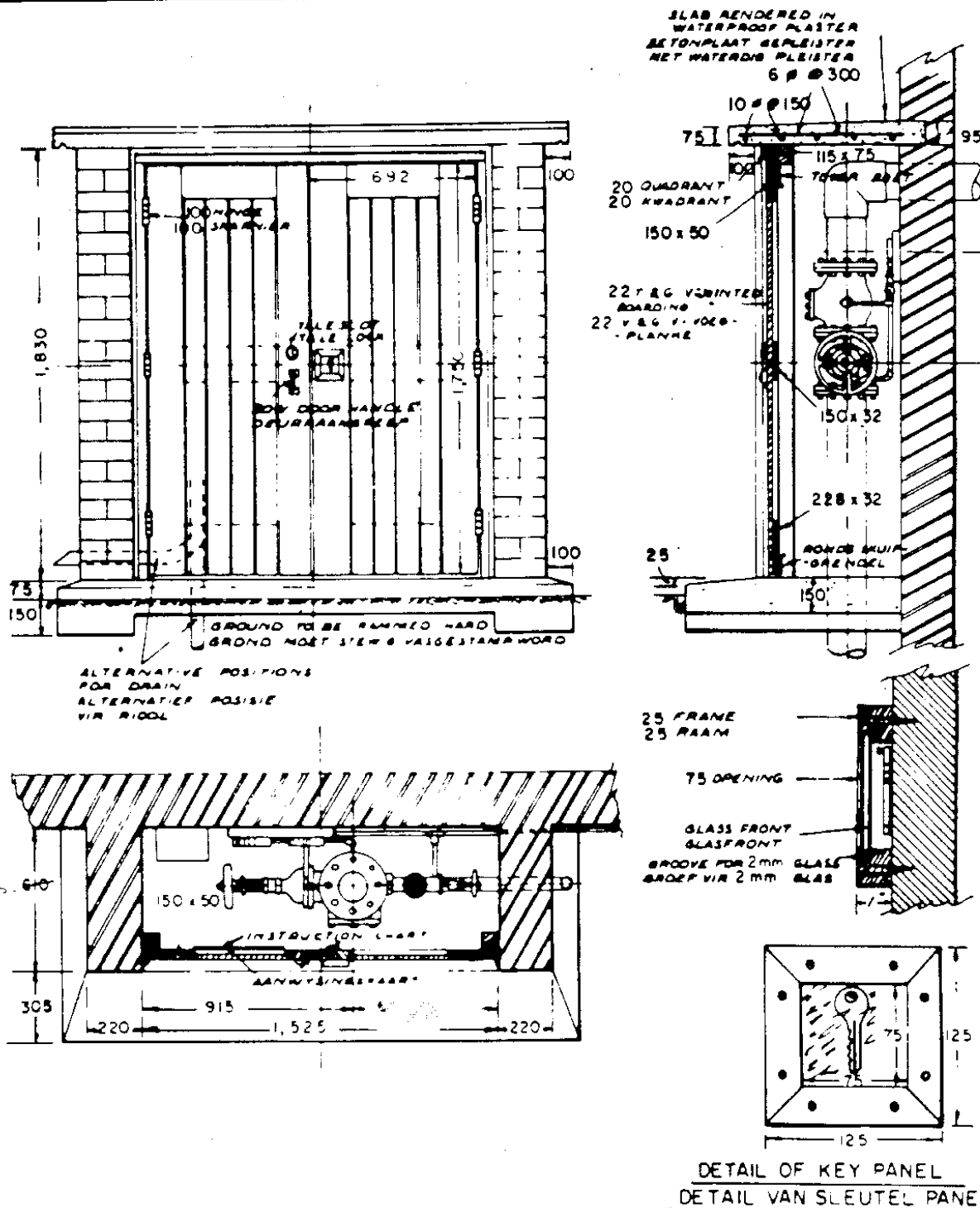
FIRE APPLIANCE DETAIL

R.S.A.
P.W.D.

1. 5. 1972.

DETAIL VAN BRANDBLUSTOESTEL

R.S.A.
P.W.D.



NB
DOORS TO BE MADE OF HARDWOOD
VALVE LOCATION PLATE TO BE
ATTACHED TO OUTSIDE OF DOORS

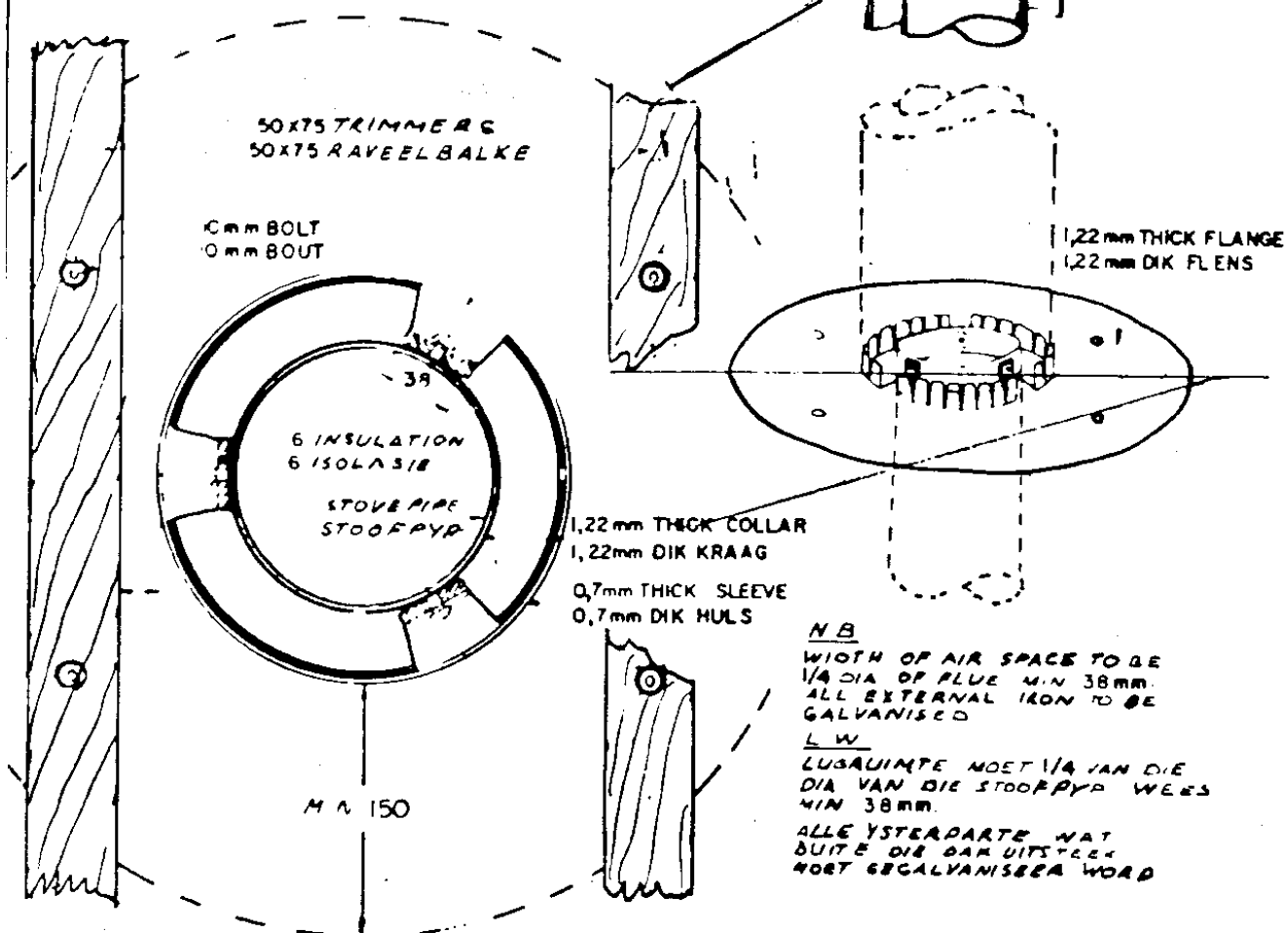
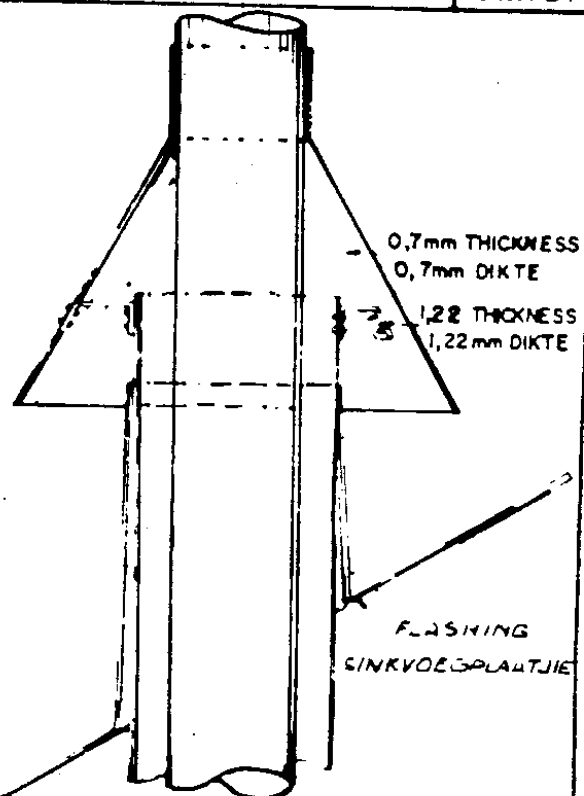
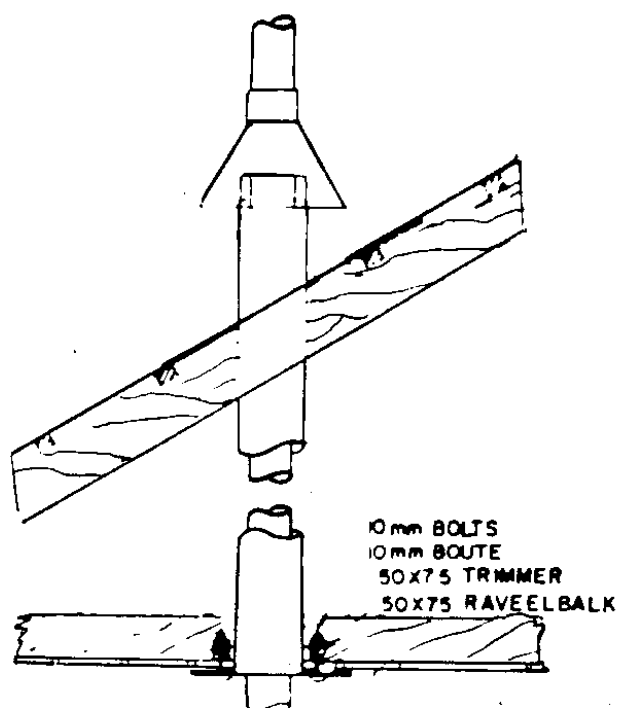
LW
DEURE MOET VAN HARDEHOUT
GEMAAK WORD
POSISIEPLAAT VAN KLEPPE MOET AAN
BUITEKANT VAN DEURE BEVESTIG WORD

DETAIL OF SPRINKLER VALVES CUPBOARD.
DETAIL VAN KAS VIR SPRINKELAARKLEPPE.

F/25/F

FIRE APPLIANCE DETAIL

R.S.A.
P.W.D.



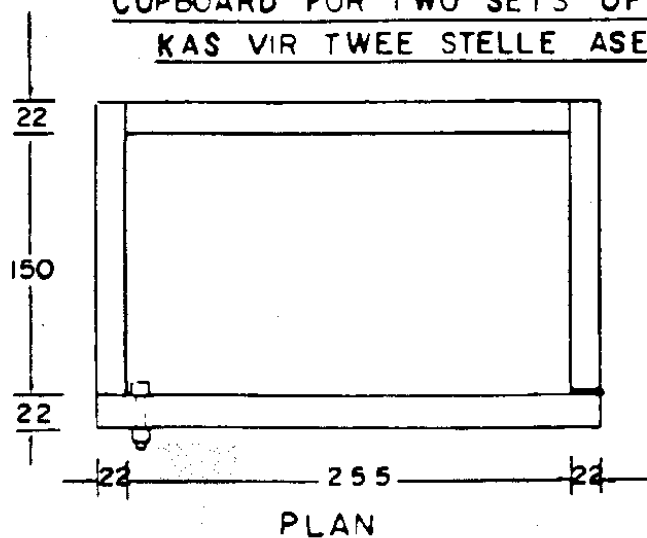
DETAIL OF SAFETY SLEEVE FOR STOVE PIPES
DETAIL VAN VEILIGHEIDSHULS VIR STOOFPYP

L 5. 1972.

DETAIL VAN BRANDBLUSTOESTEL.

R.S.A.
P.W.D.

CUPBOARD FOR TWO SETS OF BREATHING APPARATUS.
KAS VIR TWEE STELLE ASEMHALINGSAPPARAAT.



Latch as P.W.D. sample no. 57
Knip soos D.O.W. monster no. 57

PLASTIC INSTRUCTION PLATE
355X200 WITH 6 LETTERS
SCREWED TO CUPBOARD DOOR

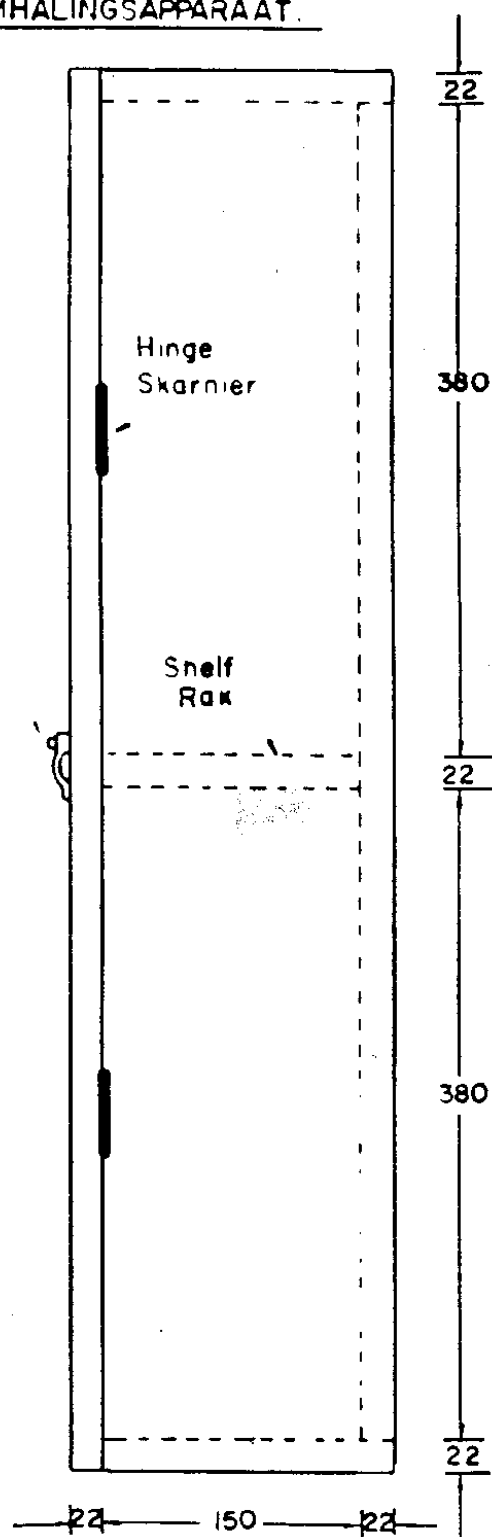
355

BREATHING
APPARATUS
TO BE USED IN
CASE OF GAS
FLOODING
DO NOT TAMPER

ASEMHALINGS -
APPARAAT
GEBRUIK IN GEVAL
VAN GASVRYLATING
MOENIE
PEUTER NIE

200

PLASTIESE AANWYSINGSPLAAT
355X200 MET 6 LETTERS AAN
KAS DEUR VASGESKROEF



F/27/F

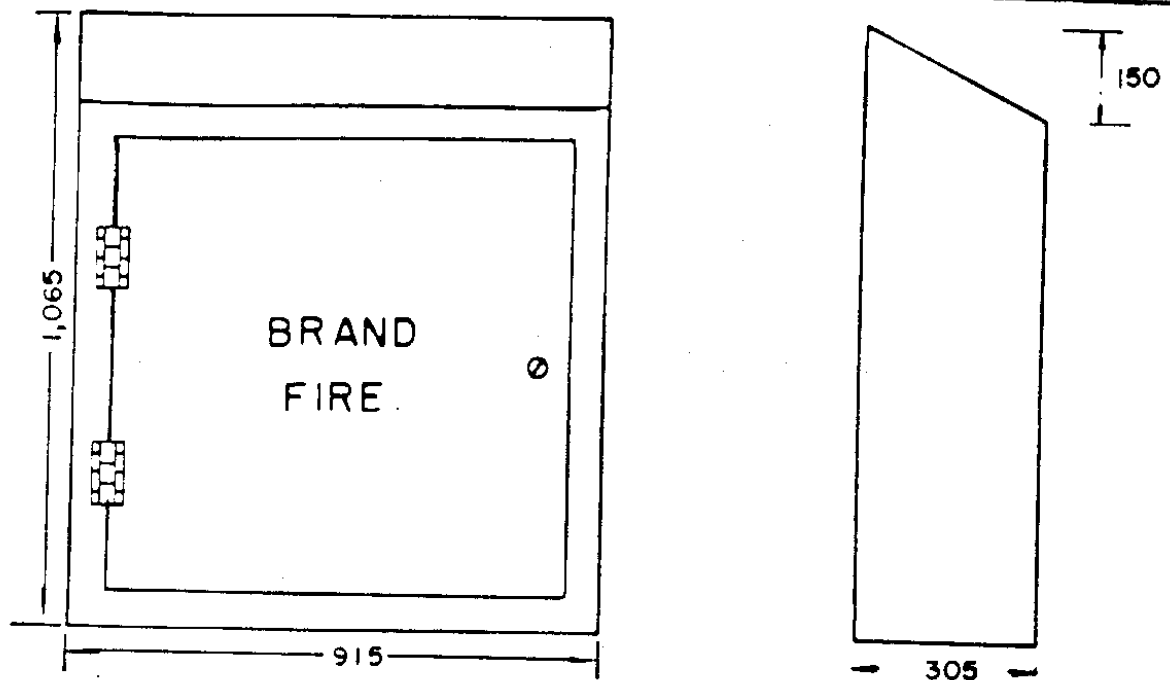
FIRE APPLIANCE DETAIL

R.S.A..
P.W.D.

1 . 5 . 1972.

DETAIL VAN BRANDBLUSTOESTEL.

R.S.A.
P.W.D.



RAAMWERK Hoekyster skuins gesny en aanmekaar gesweis.
FRAMEWORK Angleiron mitred and welded together.

DEKPLATE Gegalaniseerde plaatmetaal (1,6mm).
COVERPLATES Galvanised sheet metal (1,6mm).

NAGSLOT EN SKARNIERE Bevestig met moere en boute, omgeklank aan agterkant.
NIGHT LATCH AND HINGES Secured with nuts and bolts riverted over on the inside.

AFWERKING Poskantoorrooi met "BRAND FIRE" in wit blok-letters, 75 hoog.

FINISH Post Office red with "BRAND FIRE" in white block letters, 75 high.

VEILIGHEIDSKAS VIR BRANDBLUSAPPARAAT.

SECURITY CUPBOARD FOR FIRE EXTINGUISHING EQUIPMENT.

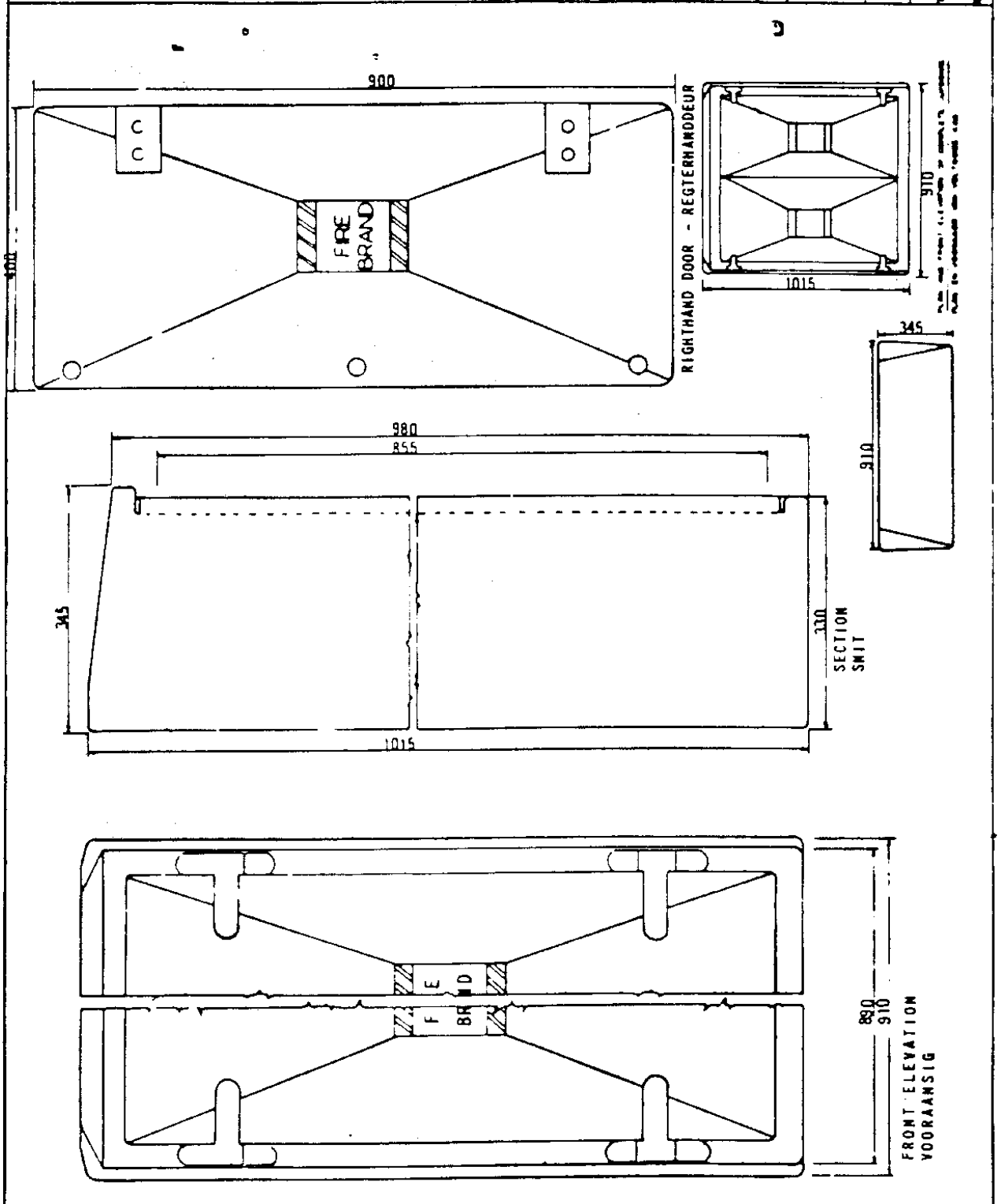
F/29/F

FIRE APPLIANCE DETAIL.

R.S.A.
P.W.D.

Let Wel: Hierdie item word vervaardig uit glasvesel en is
 verkrygbaar onder jaarlikse staatskontrak no. 82.
 Hierdie is 'n verwerking van tekening nr. F/S4 en dien
 slegs as leiding ten opsigte van afmetings.
 Please Note: This item is manufactured out of fibre-glass
 and is obtainable under annual state contract no.82. This
 is taken from drawing no. F/S4 to serve as guidance with
 regard to overall dimensions.

(F/29A/E)
 R.S.A.
 P.W.D.



F/29A/F

FIRE APPLIANCE DETAIL (F/S/4)

R.S.A.
 P.W.D.