

SAFETY AND HEALTH

Rev 00

Ref No [REDACTED]

Date 02/06/2015

Class Public

Page No 14 of 26

SPECIFICATIONS

		person is readily available and in possession of a valid certificate of competence in first aid	
CR 2014 (23)(1)(d)(i)	Construction vehicles and mobile plant Operators	A contractor must ensure that all construction vehicles and mobile plant(d) are operated by a person who- (i) has received appropriate training, is certified competent and in possession of proof of competency and is authorised in writing to operate those construction vehicles and mobile plant	Contractor
CR 2014 (28)(a)	Stacking and Storage Supervisor	A contractor must, in addition to compliance with the provisions for the stacking of articles in the General Safety Regulations, 2003, ensure that:- (a) a competent person is appointed in writing with the duty of supervising all stacking and storage on a construction site; (b) adequate storage areas are provided; (c) there are demarcated storage areas; and (d) storage areas are kept neat and under control.	Contractor
CR 2014 (24)(c)	Temporary Electrical Installation Controller	A contractor must, in addition to compliance with the Electrical Installation Regulations, 2009, and the Electrical Machinery Regulations, 1988, promulgated by Government Notice No. R. 1593 of 12 August 1988, ensure that- (c) the control of all temporary electrical installations on the construction site is designated to a competent person who has been appointed in writing for that purpose;	Contractor
CR 2014 (21)(2)(g)(i)	Explosive Actuated Fastening Device Controller	A contractor must ensure that:- (g) the issuing and collection of cartridges and nails or studs of an explosive actuated fastening device are-(i) controlled and done in writing by a person having been appointed in writing for that purpose; and (ii) recorded in a register by a competent person and that the recipient has accordingly signed for the receipt thereof as well as the returning of any spent and unspent cartridges.	Contractor
CR 2014 21(2)(b)	Explosive Actuated Fastening	A contractor must ensure that:- (b) an explosive actuated fastening device is cleaned and examined daily before use and as often as may	Contractor

 public works Department Public Works REPUBLIC OF SOUTH AFRICA	SAFETY AND HEALTH	Rev	00
		Ref No	██████████
	Date	02/06/2015	
	Class	Public	
SPECIFICATIONS		Page No	15 of 26

	Device Cleaner and Examiner	be necessary for its safe operation by a competent person who has been appointed for that purpose	
CR 2014 16 (1)	Scaffolding Erectors	A contractor must appoint person in writing who must ensure that all scaffolding work operates are carried out under his or her supervision and that all scaffold erectors, team leaders and inspectors are competent to carry out their work.	Contractor
CR 2014 16 (1)	Scaffolding Inspector	A contractor must appoint person in writing who must ensure that all scaffolding work operates are carried out under his or her supervision and that all scaffold erectors, team leaders and inspectors are competent to carry out their work.	Contractor
CR 2014 16 (1)	Scaffolding Supervisor	A contractor must appoint person in writing who must ensure that all scaffolding work operates are carried out under his or her supervision and that all scaffold erectors, team leaders and inspectors are competent to carry out their work.	Contractor
CR 2014 14 (1)	Demolition expert	A contractor must appoint a competent person to supervise and control all demolition work on site	Contractor
CR 2014 13 (1)	Excavation Supervisor	The contractor must ensure that all excavation work is carried out under the supervision of a competent person who has been appointed in writing for the purpose and evaluate as far as is reasonably practicable, the stability of the ground before excavation work begins	Contractor

Table. 2. Legal appointments and references

3.17. Organogramme

The Principal Contactor shall provide organisational organogramme related to this contract, showing the level of responsibilities from CEO down to the supervisors and every key personnel to the project. The diagram must list of the relevant names of appointees and legal appointment. The competencies and bridged resumes (Curriculum Vitae – CV) should be attached.

The Contractor organizational structure, organograms shall be updated timeously when appointments are changed and filed in the project SHE files.

 public works Department Public Works REPUBLIC OF SOUTH AFRICA	SAFETY AND HEALTH		Rev	00
			Ref No	
	Date	02/06/2015		
	Class	Public		
	Page No	16 of 26		
SPECIFICATIONS				

3.18. Compliance Audits

In terms of CR 2014 (5)(1) A client must -

(o) ensure that periodic health and safety audits and document verification are conducted at intervals mutually agreed upon between the principal contractor and any contractor, but at least once every 30 days;

(p) ensure that a copy of the health and safety audit report contemplated in paragraph (o) is provided to the principal contractor within seven days after the audit.

A Principal Contractor shall ensure that the periodic site audits and document verification are conducted at intervals mutually agreed upon between the principal contractor and any contractor, but at least once every 30 days as contemplated on CR 2014 (7)(c)(vii).

The Contractors are required to conduct internal audits on both their employees and their sub-contractors on the implementation of their SHE Plan on a monthly basis or when the scope of work changes. A summary of the findings and the proposed corrective actions shall be submitted to the CHA on the last day of the audit. The report shall be submitted within one week after completion of the audit.

3.19. Medical Certificates

As contemplated on CR 2014 (7)(1)(g) A principal contractor must (g) ensure that all his or her employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure..

3.20. Training

Appropriate training must be given to employees in order for them to be competent to be able to perform the tasks assigned and expected to perform. Training also gives an employee a chance to develop additional skills which will benefit any organization. The contractor at all times keep on his or her construction site records of the health and safety induction training contemplated in CR7(5) and (6) and such records must be made available on request to an inspector, the client, the client's agent or the principal contractor;

a) Induction training

All contractors, their employees and visitors are required to attend formal induction training courses. Such training shall be conducted by contractor management, construction safety officers, or construction supervisors. Induction training is a chance to inform persons of organizational requirements at the workplaces as well. CR 2014 (7)(5)

 public works Department: Public Works REPUBLIC OF SOUTH AFRICA	SAFETY AND HEALTH		Rev	00
			Ref No	
			Date	02/06/2015
	SPECIFICATIONS		Class	Public
		Page No	17 of 26	

A principal contractor:- may not allow or permit any employee or person to enter any site, unless that employee or person has undergone health and safety induction training pertaining to the hazards prevalent on the site at the time of entry.

b) Site specific and awareness training

Over and above induction training, contractors are required to ensure, before an employee commences work on the project, that the supervisor in control with responsibility for the employee has informed the employee of his/her scope of authority for that site / workplace.

3.21. Health and Safety Representative

The requirements of sections 17 and 18 of the OHS Act shall be complied with. Where operational work is performed by contractors, they shall appoint health and safety representatives for each workplace. A health and safety representative is the go between the employer and the employee. If they perform their functions in terms of the requirements, they will certainly be an asset, not only to the employer, but to the employees as well.

Contractor managers shall permit their appointed health and safety representatives to carry out their functions as required by legislation and support them in fulfilling these functions.

3.22. First aid

The Contractor shall where more than five employees are employed at a workplace, provide a first aid box or boxes at or near the workplace which shall be available and accessible for the treatment of injured persons at that workplace. Such first aid boxes shall contain suitable first aid equipment. The Contractor shall ensure that where there are more than 10 employees employed on the site that for every group of up to 50 employees at that workplace, at least one person is readily available during normal working hours, who is in possession of a valid certificate of competency in first aid.

The Contractor is require from you a "First Aid Register" where all first aid cases must be recorded. It must at least reflect the following information: Date; Name of injured person; ID Number; Type of injury; what treatment was administered; what was used from the first aid box; Annexure One number, if the patient received medical attention other than first aid.

 public works <small>Department Public Works REPUBLIC OF SOUTH AFRICA</small>	SAFETY AND HEALTH	Rev	00
		Ref No	
		Date	02/06/2015
		Class	Public
		Page No	18 of 26
SPECIFICATIONS			

3.23. Accident / Incident reports / Wcl 2 / Annexure 1/ First Medical form and Resumption forms

All incidents where someone received medical attention other than first aid, must be reported on an "Annexure 1" as contemplated in the OHS Act's General Administrative Regulations 9(1). The Department of Labour also doesn't accept any other form. GAR (9)(1) An employer or user shall keep at a workplace a record in the form of Annexure 1 for a period of at least 3 years, which record shall be open for inspection by an inspector, of all incidents which he or she is required to report in terms of section 24 of the Act and also of any other incident which resulted in the person concerned having had to receive medical treatment other than first aid.

An employer or user shall cause the findings of the investigation to be entered in Annexure 1 immediately after completion of such investigation, GAR (9)(3).

In terms of GAR (9)(3) An employer shall cause every Annexure 1 to be examined by the health and safety committee for that workplace at its next meeting and shall ensure that necessary actions, as may be reasonably practicable, are implemented and followed up to prevent the recurrence of such incident.

The following information will be needed for reporting: Photographs; Sketches; Proof of Toolbox Talk after accident; Proof of Toolbox Talk on the subject before the accident; Proof of competency; Proof of authorisation to operate; Proof of training; Copy of victims ID; Physical address & contact no of victim & his family; Proof of victims induction training; PPE Issue Register; Medicals of victim; WCL 2 forms (Annexure 13); Statements; Copy of Police docket; First medical form and resumption form.

All incident investigation reports shall be closed out once all the recommendations to prevent further incidents have been carried out and a copy of the investigation report must filed. Undue time delays must be avoided

3.24. Emergency preparedness

Emergency situations threaten, or may cause harm to the lives of employees, members of the public damage to property, infrastructure, equipment, degradation to the environment and disturb production and the rendering of services. The aim of emergency preparedness and response is to minimize the effects of any emergency and to restore normal activities as soon as practical.

 public works <small>Department Public Works REPUBLIC OF SOUTH AFRICA</small>	<h2 style="margin: 0;">SAFETY AND HEALTH</h2>	Rev	00
		RefNo	██████████
		Date	02/06/2015
		Class	Public
		Page No	19 of 26
SPECIFICATIONS			

The Principal Contractor, together with his appointed contractors, will develop their own emergency response plan for both their worksites. Where any office and or site is located within any Local Authorities area, then the plans must include their involvement. The contractor will ensure that all employees are trained on this plan.

Contingency plans will address all the identified risks of the organization to achieve a quick response and recovery to bring the situation back to normal in the shortest possible period of time and most cost effective way and to provide for:

a) Fire Safety

The Contractor shall ensure that staff are educated in fire prevention and will be held responsible to avoid the risk of fire. Ideally, all employees should receive basic training in fire prevention and use of fire equipment. Fire Safety is an integral part of the general safety and protection of an organization, its employees and members of the public from the effects of fire, heat and smoke. As a minimum, this is ensured by compliance to and the application of legislative and policy requirements. The discipline of Fire Risk Management has many facets and interfaces with many other disciplines and activities. Fire safety requirements are covered in the Construction regulations and the National Building regulations, SANS 10400 (T).

b) First aid planning and emergency care

Every person at a workplace should be afforded applicable and prompt medical treatment/assistance. In the event of an incident and to receive post-incident rehabilitation, organizations are required to meet the first-aid requirements of General Safety Regulation 3: "An employer shall take all reasonable steps that are necessary under the circumstances, to ensure that persons at work receive prompt first aid treatment in the case of injury or emergency.

c) Emergency escape route

The SANS 10400(T) regulations makes provisions for escape routes to be incorporated in buildings. Far too often, when there are fires within building, employees are fatally injured due to the fact that they were unable to evacuate a burning building. This is attributed to the fact that there were no escape routes and or, what routes were in the building, egress was impeded by the routes being used as storage areas

 public works Department Public Works REPUBLIC OF SOUTH AFRICA	SAFETY AND HEALTH		Rev	00
	SPECIFICATIONS		Ref No	
			Date	02/06/2015
			Class	Public
			Page No	20 of 26

3.25. Health and Safety Communication

Communication is a two way process that involves the sending and receiving of symbols, signs or signals (words, pictures, things, actions). It is speaking and listening, writing and reading, behaving, observing behaviour. Its goal is to achieve understanding. The job, relevant procedures, associated hazards, safety measures, i.e., the task risk assessments shall be discussed during the Toolbox talks / Daily team talks / pre-job meetings.

3.26. COC Electrical certificates

All the electrical installation and temporary electrical distribution boxes must have a certificate of compliance (COC) issued by a registered body. Electrical Installation Regulations (7)(1), every user of an electrical installation shall have a valid certificate of compliance for that installation

3.27. Construction Employee's facilities

The Contractor shall provide and keep clean and fit for use at or within reasonable access of the site: at least one shower facility for every 15 workers; at least one sanitary facility for every 30 workers; changing facilities for each sex; and sheltered eating areas. When such facilities are provided, they must comply with the Facilities regulations of the Act and the SANS 10400 standard A to XA.

3.28. Public Safety

Legislation requires that employers shall be responsible, as far as reasonably practicable, for safeguarding persons other than those in their employment who may be directly affected by their activities so that they are not exposed to hazards to their health or safety (section 9 of the OHS Act)

3.29. Vehicle and mobile plant operators

All motor vehicles operated by Contractors within the area shall, in all respects, comply with the Road Traffic Ordinance and Road Traffic Act and as contemplated on the CR2014 (23). Designated drivers shall be in possession of a driver's license, valid for the class of vehicle. The driver's license shall be kept by the person so authorized who shall produce such card on request.

In terms of CR 2014 (23)(1)(d)(i) A contractor must ensure that all construction vehicles and mobile plant are operated by a person who-

 public works Department: Public Works REPUBLIC OF SOUTH AFRICA	<h2 style="margin: 0;">SAFETY AND HEALTH</h2>	Rev	00
		Ref No	██████████
		Date	02/06/2015
		Class	Public
SPECIFICATIONS		Page No	21 of 26

- (i) has received appropriate training, is certified competent and in possession of proof of competency and is authorized in writing to operate those construction vehicles and mobile plant;
- (ii) has a medical certificate of fitness to operate those construction vehicles and mobile plant, issued by an occupational health practitioner in the form of Annexure 3; A contractor must ensure that all construction vehicles and mobile plant as contemplated on CR 2014 (23)(1)(k), are inspected by the authorized operator or driver on a daily basis using a relevant checklist prior to use and that the findings of such inspection are recorded in a register kept in the construction vehicle or mobile plant.

3.30. Electrical installations and machinery

The Contractor must in addition to compliance with the electrical installation regulations as contemplated on CR 2014 (24), must make sure that all parts of electrical installations and machinery are adequate strength to withstand the working conditions on construction site; A competent person for temporary electrical installations on the construction site and electrical machinery are inspected by authorized operator using daily relevant checklist prior to use and inspect are recorded in a register kept on construction site.

3.31. Hazardous chemical substances (HCS)

The handling and the application of hazardous materials has a major impact on the health and wellbeing of all persons and the environment. Various requirements for the handling and storage of hazardous materials and chemicals are listed in the OHS Act, Hazardous Chemical substance Regulations.

In the purchasing of hazardous materials and or chemicals, buying departments can fulfil the legislative requirements by ensuring that purchases are only done from the suppliers and manufacturers who comply with the requirements of Section 10 (General duties of manufacturers and others regarding articles and substances for use at work) and Section 22 (Sale of certain articles prohibited) of the OHS Act.

The storage requirements of any hazardous materials and chemicals, including paint; petrol; gasses must be in compliance to the legislative requirements, local municipal by-laws and SANS building standards.

3.32. Gas; Pressurised systems and Vessels under Pressure

The pressure equipment regulations covers various types of equipment, from gas cylinder, fixed plant compressors, mobile compressors, pressure vessels to fire extinguishers and all piping associated with such equipment. There are strict requirements as regulated by the Pressure Equipment Regulations made under the OSH Act 1993. A poorly maintained; storage and/or operated piece of equipment can have catastrophic consequences.

 public works Department: Public Works REPUBLIC OF SOUTH AFRICA	SAFETY AND HEALTH		Rev	00
			Ref No	
	Date	02/06/2015		
	Class	Public		
	Page No	22 of 26		
SPECIFICATIONS				

3.33. Flammable goods

Small quantities of flammable liquids must be stored in a "Flammable Liquid Store," which is well ventilated, with the appropriate symbolic signs, and an inventory of all liquids stored with quantities. All containers must be tightly closed. Enough and the correct fire extinguishers must be placed in conspicuous places. A bund wall, plastered must be able to contain a spillage if it occurs on the construction site. This should be done in accordance with General Safety Regulation (10); CR 2014 (25)(b)(c) and (e).

3.34. Cutting, Welding, and Hot Work

Prior to cutting or coring of concrete suspended slabs, cast in place or pre-cast walls, slab on grade the contractor must either X-ray the slab or if X-ray is not feasible provide other approved alternate method for determining live electrical concealed in slab or walls. Signage shall be posted to ensure no one enters the affected area during X-raying.

When welding or cutting work is performed, an adequate number of approved fire extinguishers shall be provided by the contractor. The contractor shall provide a thirty minute fire watch after the operations has ended to ensure that no fire starts.

3.35. Excavation

Almost all construction work involves some form of excavation, for foundations of plinth. These can vary greatly in depth and may be only a few centimetres deep or be very deep and very dangerous. The contractor must ensure that all excavation work is carried out under the supervision of a competent person who has been appointed in writing for the purpose and evaluate as far as is reasonably practicable, the stability of the ground before excavation work begins as contemplated of CR13, Excavation.

Falls through openings in walls, floors, excavations, approaching dangerous equipment and operations continue to pose a threat to persons. To prevent persons from any form of injury, through entering unauthorized entrances and or areas or approaching dangerous and or operating equipment, stringent precautions have to be taken to prevent such persons approaching. This is done by erecting substantial barriers, fencing or covers to a degree to prevent unauthorized removal and erecting appropriate signage.

3.36. Demolition work

Demolition of structures is an extremely hazardous task and can only be performed by competent persons. All demolition work must be planned, and all role players be involved in the planning, this includes conducting thorough risk assessments. All demolition work shall be carried out in accordance with Construction Regulation 14, Demolition Work.

 public works <small>Department: Public Works REPUBLIC OF SOUTH AFRICA</small>	<h2 style="margin: 0;">SAFETY AND HEALTH</h2>	Rev	00
		Ref No	██████████
		Date	02/06/2015
		Class	Public
		Page No	23 of 26
SPECIFICATIONS			

3.37. Ladder

All ladders used on the site shall be in compliance with the OHS Act and Regulations. All Ladders shall have an identification tag, logged in a register, and inspected on a monthly basis and prior to use. Prior to work being performed, a risk assessment must be conducted, and work must be conducted as per General Safety Regulation 6 and 13 (A) and Construction Regulation 10 of the OHS Act.

3.38. Scaffold

A working platform can be virtually any surface from which work is carried out, such as a roof, floor, platform on a scaffold, a mobile elevated work platform, the treads of a stepladder, climbing irons, suspended platforms, boatswains chair etc. Working at heights where there is a risk of a fall causing personal injury then measures should be taken to prevent a fall and injury. Previously the notion that a fall occurs from a height (2 metres and above) is outdated. Falls occur at any level. The duty is to prevent falls. It is worth noting that there are almost as many low-fall injuries as high-fall injuries. The incidents of falling at the same level are increasing. Where it is reasonably practicable to take precautions to prevent a falls, steps should be taken to do so.

In an effort to prevent falls, including falling objects and or materials, fall protection plans are required to be compiled and implemented. The Occupational Health and Safety Act places duties on Employers, employees and anyone who controls the way work at height is undertaken. All equipment used for working at height must conform to the OHS Act and relevant SANS standards.

The contractor on site appoint the competent person in writing who must ensure that all scaffold work operations are carried under his or her supervisor and that scaffold, team leader and inspector are competent to carry out their work as contemplated on CR 2014 16(1). The checklist must be signed by the person doing the check and signed off by management. Any discrepancies noted must immediately be actioned and action taken must be noted on the checklist.

3.39. Substance abuse

Alcohol and substance abuse poses a significant threat to any business, more so in industrial incidents and the driving of vehicles. Persons are not permitted from entering or remaining on or at a workplace whilst under the influence of either or both substances, not permitted to be under the influence or consume intoxicating substance whilst at / in the workplace. There is provision regarding the taking of medication. General Safety Regulation 2A is clear on the legal stance regarding intoxication. The alcohol and drug permissible level is 0%.

 public works Department Public Works REPUBLIC OF SOUTH AFRICA	SAFETY AND HEALTH		Rev	00
			Ref No	
	Date	02/06/2015		
	Class	Public		
	Page No	24 of 26		
SPECIFICATIONS				

3.40. House keeping

Good housekeeping fulfils five important functions, which are not only to the advantage of the worker but also to the employer: it saves time taken up by searching for equipment, tools and articles; injuries are prevented as passages, walk areas and workplaces are free from superfluous material; space is saved if equipment and articles are neatly packed and correctly stored; the risk of fire is diminished when provision is made for the correct placing of the right type of refuse bins, store areas comply with good storage practices and stacking is done in accordance with accepted stacking practices and access to emergency and/or safety equipment will be uninterrupted. Prompt disposal of waste materials, scrap, and rubbish is essential to prevent unnecessary storage.

3.41. Workplace Signage and Colour Coding

The purpose of symbolic safety signs is to convey a message without the use of a specific language. In this way instant recognition takes place or the employee can receive a message, order or warning. Symbolic signs are designed so that language, ethnic groups or literacy makes no difference. To prevent confusion symbolic signs should be applied throughout the entire organisation. All signs and notices shall conform to the requirements of SANS 1186 in terms of standard signs, safety colours, geometric forms, and dimensions.

In terms of identification regarding colour marking, ensure that the colours used match the appropriate colours of SANS 10140 and 1091.

3.42. Personal Protective Equipment (PPE)

Personal protective equipment (PPE) may be described as clothing and or equipment used in the workplace to protect the worker from risks and hazards. It includes equipment used to determine, measure or indicate danger. The objective of protective clothing is to prevent exposure or injury to any body parts exposed to operations. The issue register of PPE should be kept on the file for audit purposes. General Safety Regulation 2 of the OHS Act makes provision for the employers make the workplace safe and where required to provide appropriate PPE.

3.43. Unlawful orders

The OHS Act, section 14 (c) specifies that an employee, shall at work, carry out any lawful order given to him/her and obey the health and safety rules and procedures laid down by his/her employer or by anyone authorised thereto by his/her employer in the interest of health and safety. In construction industry, numerous incidents have resulted from workers being given unlawful instructions/orders which have resulted in either injuries and or property damage.

 public works <small>Department: Public Works REPUBLIC OF SOUTH AFRICA</small>	<h2 style="margin: 0;">SAFETY AND HEALTH</h2>	Rev	00
		Ref No	██████████
		Date	02/06/2015
		Class	Public
		Page No	25 of 26
SPECIFICATIONS			

3.44. Work stoppage

a) The conditions that lead to work stoppages are based on:

Management of change – this is when there are changes to the work environment (e.g. climatic changes) and/construction work (e.g. modifications to the design), in any phase of the construction project; amendments; Unsafe acts/behaviours; Unsafe conditions and others.

b) The relevant activity must be stopped:

The DPW/CHA will immediately remove the workforce from the work area and correct the health and safety deficiencies by allowing only the people in the area that are competent to make the area safe. The Contractor and his/her subcontractors shall ensure that no other work is being performed during this time. Should the estimated time from the outset to make the area safe where life threatening/imminent danger situations exist, then the area will be barricaded and a sign placed with the wording “Unsafe Area – Authorized Access Only”.

c) Before the workforce is allowed back in the area, Contractor and his subcontractors shall ensure:

The area is re-inspected by Contractor Safety Officer and supervisor and note corrective actions taken; declare the area safe for work by signing off on the “work stoppage” notice issued by the CHA/Contractor.

To stop the Contractor from executing any construction activity which poses a threat the health and safety of person which is not in accordance with the Client’s health and safety specifications and the principal contractor’s contractor health and safety plan on the site, as contemplated on CR 2014 (q).

The Client, DPW reserves the right to terminate the contract in the event that the Contractor is found to be consistently non-compliance to any SHE related issue.

The Client, DPW reserves the right to impose penalties on Contractors due to poor Health and Safety performance. The terms and conditions shall form part of the initial Tender/Contract.

3.45. Employer’s Construction Health and Safety Agent (CHA)

The agent in appointed in terms of Occupational Health and Safety Act no 85 of 1993 under Construction Regulation 2014, regulation 5(7), the Agent shall:

- a) Audit the Contractor’s compliance with the requirements of this specification prior to the commencement of any physical construction activities on the site;
- b) Review; accept or reject all safety plans, giving reasons for rejecting such plans;
- c) Monitor the effective implementation of all safety plans

 public works Department Public Works REPUBLIC OF SOUTH AFRICA	SAFETY AND HEALTH	Rev	00
		Ref No	
		Date	02/06/2015
		Class	Public
		Page No	26 of 26
SPECIFICATIONS			

- d) conduct periodic and random audits on the health and safety file to establish compliance with the requirements of this specification
- e) Visit the site at regular intervals to conduct site inspections, and based upon such visits issue, wherever necessary, Improvement Notices, Contravention Notices and Prohibition Notices, to the Contractor or any of the Contractor's subcontractors with a copy to the Project Manager and, where relevant, to the Contractor

4. Acceptance of Health and Safety Specifications

I _____ the undersigned hereby declare that I have the authority to sign this document, and that I hereby accept the Health and Safety Specifications in accordance with Occupational Health and Safety Act No 85 of 1993 for the project, Upgrading o of kitchen equipment at Phalaborwa 524 SQN Signal.

Acceptance by the Principal Contractor	
Company name:	
Your name:	
Designation:	
Signature:	
Date:	



public works

Department:
Public Works
REPUBLIC OF SOUTH AFRICA

Department of Public Works

(Client)

HEALTH & SAFETY SPECIFICATION

For the

the Principal Contractor

(Principle Contractor)

FOR

Site Name: Makhado Signal SQN

Scope of Works:

Upgrading of kitchen equipment

INDEX

1. This specification document
2. Notification of construction work
3. Client Baseline Risk Assessment (CR 2014 (5)(1)(a))
4. Mandatory Agreement (OHS ACT Section 37)
5. Letter of Good Standing.
6. Letter of Appointment as Principal Contractor.
7. Safety Plan.
8. The Safety File
9. Sample Safety File Index
10. OHS Act Book & Poster
11. Health and safety policy.
12. Risk Assessments & Risk Assessments Method Document
13. Site Emergency Plan
14. Fall Protection Plan
15. List of Contractors.
16. Contractors.
- 16(a) Contractors Specification Documents
- 16(b) Contractors Appointment Letters.
- 16(c) Contractors "Letter of Good Standing."
- 16(d) Contractor's Safety Plans
- 16(e) Contractor's Safety files
- 16(f) Contractor's Mandatory Agreements
17. Legal Appointments.
 - 17 (1) 16.2 Appointee
 - 17 (2) Construction Manager
 - 17 (3) Construction Supervisors
 - 17 (5) Assistant Construction Supervisor
 - 17 (6) Risk Assessor
 - 17 (7) Scaffolding Inspector
 - 17 (8) Scaffolding Erectors
 - 17 (9) Explosive Actuated Fastening Device Cleaner and Examiner (Hilti)
 - 17 (10) Explosive Actuated Fastening Device Controller
 - 17 (11) Temporary Electrical Installation Controller
 - 17 (12) Stacking and Storage Supervisor
 - 17 (13) Fire Equipment Inspector
 - 17 (14) Health and Safety Representatives
 - 17 (15) Incident Investigator
 - 17 (16) First Aiders
 - 17 (18) Construction vehicles and mobile plant Operators
18. Compliance Audits
19. Medical Certificates
20. Induction Training
20. First Aid Register
21. Incident / Accident reports / Wcl 2 / Annexure one's
22. Safety Representative Elections & Inspections.
23. COC Electrical certificates
24. Risk Assessments
25. Scaffold Register
26. Explosive actuated fastening device
27. Electrical installations and machinery

- 28. Fire Equipment checklists**
- 29. Construction Welfare Facilities**
- 30. Construction Vehicles and Mobile Plant Operators**
- 31. Plant Hire and Labour only Contractor's Mandatory Agreements**
- 32. Flammable Goods**
- 33. Gas Installation**
- 34. Personal Protective equipment**

1. This specification document

This documents requirement is what is required in the documents mentioned herewith, for this project. The ultimate goal of this document is to direct you, the Principal Contractor, to be legal and thereby keep us, the Client, Department of Public Works, legal and free from prosecution.

We will periodically measure your health and safety systems compliance against a set of rules (standards) mutually agreed upon. On this construction site, this agreement will be reached at the signing of the works contract. Therefore, this specification document forms part of the standards we will audit you against.

- o The Occupational health and Safety Act, Act no 85 of 1993, and all it's relevant regulations
- o General Administrative Regulations
- o General Safety regulations
- o Major hazard Installation Regulation
- o Regulations for hazardous Biological Agents
- o Explosive Regulations
- o Construction Regulations 2014
- o Asbestos Regulations
- o Environmental regulations for workplaces
- o Facilities Regulations
- o Hazardous Chemical Substances Regulations
- o Lead Regulations
- o Noise Induced Hearing Loss Regulations
- o Electrical Installation Regulation
- o The road traffic laws.
- o Common law regarding validating legal documents. (Signing, format, certification of copies, etc.)
- o SANS Standards (Ladders, scaffolding, etc)
- o The works contract signed between Department of Public Works and the Principal Contractor.
- o Department of Public Works's health and safety specification document (This document)
- o the Principal Contractor's site rules
- o the Principal Contractor's SHE Policy
- o the Principal Contractor's safety plan

It is also impossible to cover and discuss all the above mentioned standards in this specifications document. Thus, this document is only part of the above standards.

2. Notification of construction work

You must notify the Dept of labour that you intend doing construction work. This be done at least 7 days before you start to work. We want you to report your intended activities on a form similar to an "Annexure 2" as published in the Construction Regulation 2014. Do not fax or email the report form. Take two copies to the Dept of Labour where they will date stamp the report forms. This is the only proof that the Labour Dept accepts. One copy remains with them, file the other copy in your safety file for auditing purposes.

(CR 2014 (4)(1) A contractor who intends to carry out any construction work other than work contemplated in regulation 3(1), must at least 7 days before that work is to be carried out notify the provincial director in writing in a form similar to Annexure 2 if the intended construction work will:-

- (a) include excavation work;*
- (b) include working at a height where there is risk of falling;*
- (c) include the demolition of a structure; or*
- (d) include the use of explosives to perform construction work.)*

Department of Public Works's audit question numbers: 3, 4.

3. Client Baseline Risk Assessment (CR 2014 (5)(1)(a))

Department of Public Works will issue you with the project baseline risk assessment. This doesn't mean that you are now exempted from doing your own risk assessments. Our baseline risk assessment is for your information and knowledge to inform you of the risks we have identified, and to act as a guideline to assist you to do your own assessment of risks on your project.

(CR 2014 (5)(1)(a) A client must prepare a baseline risk assessment for an intended construction work project;)

Department of Public Works's audit question numbers: 5.

4. Mandatory Agreement (OHS ACT Section 37)

You will be required to enter into a Mandatory agreement with us. Make sure that it is properly signed and all pages initialed by all parties concerned. This agreement must be filed in the safety file for auditing purposes.

Department of Public Works's audit question numbers: 7, 8, 9.

5. Letter of Good Standing.

Department of Public Works cannot allow you to let your workers work, without being insured against occupational injuries and diseases. Your "Letter of Good Standing" must be filed in your safety file and the expiry date closely monitored.

(CR 2014 (5)(1)(j) A Client must ensure, before any work commences on a site, that every principal contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer as contemplated in the Compensation for Occupational Injuries and Diseases Act, 1993 (Act No. 130 of 1993);)

Department of Public Works's audit question numbers: 10.

6. Letter of Appointment as Principal Contractor.

It is your duty to see to it that your letter of appointment as a Principal Contractor, is filed in your safety file. If you do not have one, you must then request it from Department of Public Works. Your letter of award will suffice.

CR 2014 (5)(1)(k) A Client must appoint every principal contractor in writing for the project or part thereof on the construction site;)

Department of Public Works's audit question numbers: 11.

7. Safety Plan.

In answer to this safety specification document, you must design a health and safety plan to demonstrate how you will comply with the:

- the OHS Act and all its relevant regulations,
- the Construction Regulation 2014,
- the contract and
- this health and safety specification document.

All sections in this health and safety specification document, must be addressed in your safety plan.

Your safety plan must be site specific. This means that you cannot submit a generic document to us.

Your safety plan must be endorsed (signed) by your CEO as acknowledgement of the content of your safety plan.

Your safety plan must also contain:

- Your company name within the document,
- The Client's name within the document,
- The contract name or number,
- The site address,
- The scope of works.

Your safety plan must also contain your risk assessments at the start of the project.

Your health and safety plan will only be approved in writing when, and if, the above are in order. The approval letter must be filed with your safety plan in your safety file for auditing purposes.

WARNING:

- 1 Do not submit a generic safety plan.
- 2 Do not submit a safety plan that says some items in your plan may not be applicable to the site. that makes it generic. Make it site, and job specific. We don't want to pick which items is applicable.
- 3 If your safety plan is approved, you are obliged to implement everything mentioned in your safety plan.

CR 2014 (7)(1)(a) A principal contractor must provide and demonstrate to the client a suitable, sufficiently documented and coherent site specific health and safety plan, based on the client's documented health and safety specifications, which plan must be applied from the date of commencement of and for the duration of the construction work and which must be reviewed and updated by the principal contractor as work progresses;

CR 2014 (9)(1) A contractor must, before the commencement of any construction work and during such construction work, have risk assessments performed by a competent person appointed in writing, which risk assessments form part of the health and safety plan to be applied on the site.

CR 2014 (5)(l)(1) A Client must discuss and negotiate with the principal contractor the contents of the principal contractor's health and safety plan contemplated in regulation 7(1), and must thereafter finally approve that plan for implementation;
Department of Public Works's audit question numbers: 12, 13, 14, 15.

8. The Safety File

- 1 Use a lever arch file to contain all the documents.
- 2 Divide the documents with dividers of the plastic type, numbered 1 to 31. Use another set of dividers behind the first, if the one set is not sufficient.
- 3 Clearly identify the file with the words "Safety File" and the Company name printed on the side with letters big enough to read from a distance for anyone on site to recognise it as the safety file.
- 4 Always have the safety file available in the site office. It will be handed to the Client at site handover. It may never leave the site.

CR 2014 (7)(1) A principal contractor must -
(b) open and keep on site a health and safety file, which must include all documentation required in terms of the Act and these Regulations, which must be made available on request to an inspector, the client, the client's agent or a contractor;

Department of Public Works's audit question numbers: 16.

9. Sample Safety File Index

Please Laminate the file index to prevent it from tearing. Paste it in front of the file. The following is a sample of a very comprehensive index. There are items that you would want to add or change to fit this site. You may do so. Please note that we need you to keep all documents separate with dividers. It makes it easier to find during an audit and your day to day activities in the file.

INDEX

	Divider Number
Incident / Accident reports / Wcl 2 / Annexure one's	1
Monthly Safety Audit Reports (We will audit you monthly)	3
Letter of Good Standing	4
List of Contractors	6
the Principal Contractor's appointment letter as Principle Contractor	7
<u>Legal Appointments With proof of Competency & Medicals</u>	
* 16.2 Appointee	8
* Construction Manager	9
* Construction Supervisors	12
* Risk Assessor	14
* Scaffolding Inspector	20
* Scaffolding Erectors	21
* Explosive Actuated Fastening Device Cleaner and Examiner (Hilti Gun)	24
* Explosive Actuated Fastening Device Controller	25
* Temporary Electrical Installation Controller	26
* Stacking and Storage Supervisor	27
* Fire Equipment Inspector	28

* Health and Safety Representatives	29
* Incident Investigator	31
* First Aiders	1
* Etc.	10
List of First Aiders	11
List of Plant on Site	12
Client Mandatory Agreement	13
Contractors Mandatory Agreements	14
Contractors Specification Documents	15
Contractors Appointment Letters	16
Plant Hire and Labour only Contractor's Mandatory Agreements	17
Health and Safety Plan	18
Health & Safety Policy Document	19
Risk Assessments Plan/Policy/Procedure	20
Principle Contractor Specification Document (This document)	22
Fall Protection Plan (If you are going to work at heights of more than 1,8m)	23
Emergency Plan	24
Notification of Construction Work	26

For your documents that you are using daily, we suggest you open a separate file. The following is a sample of such a file index. There may be items that you want to add or change to fit your style. You may do so. Please again note that we are keeping all documents separate with dividers.

	Divider Number
Registers Toolbox Talks	1
Induction Training Register	2
PPE Issue Register	3
Hazardous Chemical Substance Register	4
Safety Harness Register	5
First Aid Register	6
Incident/Accident Register	7
Lifting Equipment Register	8
Electrical Equipment Register	10
Fire Equipment Register	11
Scaffold Register	12
Explosive Powered Tool Register	14
Checklists Electrical Extension Cords Checklist	15
Hazardous Chemical Substance Checklist	16
Safety Harnesses Checklist	17
First Aid Boxes Checklist	18
Lifting Equipment Checklists	19
Fire Equipment Checklist	20
Toilets Checklist	21
Kitchen/Cooking Area Checklist	22
Temporary Electrical DB Box Checklist	23
Electric Drills Checklist	24
Angle Grinder Checklist	25
Skill Saw Checklist	26
Ladder Checklist	27

Scaffold Checklist	28
Fire Extinguisher Checklist	29
Hand tools Checklist	2
Etc.	15

It must be clearly noted that we do not accept registers that are also a checklist. We herewith clearly state that the registers and checklists are separate documents and must be utilised as such.

10. OHS Act Book & Poster

You must have a copy of the complete OHS Act on site in book form. You can order it from LexisNexis at tel number: 011 525 9400, or at compliance@lexisnexis.co.za. You must ensure that it is readily available in the site office for everyone to use. An abbreviated copy of the OHS Act in Poster form, must also be posted on your notice board as part of your duty to inform?

General Administrative Regulation 4 Copy of the Act - Every employer with five or more persons in his employ shall have a copy of the Act and the relevant regulations readily available in the workplace: ...

Department of Public Works's audit question numbers: 17, 18, 19.

11. Health and safety policy.

You must submit a health and safety policy and it must contain at least:

- written policy concerning the protection of the health and safety of his employees at work,
- a description of your organization and
- arrangements for carrying out and reviewing the policy.

You must prominently display your health and safety policy document. This is normally done on the site notice board.

In addition to displaying the policy, we require you to communicate the policy to your labour force and have an attendance register signed by everyone present during the communication session.

Your health and safety policy document must be signed by your CEO.

OHS Act 7(1) ...to prepare a written policy concerning the protection of the health and safety of his employees at work, including a description of his organization and the arrangements for carrying out and reviewing that policy. (Construction companies must all have a she policy)

OHS Act 7(3) An employer shall prominently display a copy of the policy, signed by the CEO, in the workplace where his employees normally report for service.

Department of Public Works's audit question numbers: 20, 21, 22, 23, 24.

12. Risk Assessments & Risk Assessments Method Document

You must submit a document explaining the method you use to do risk assessments. It must include a monitoring plan, and a review plan. This document must be signed (endorsed) by management.

All tasks performed on site must be backed by a risk assessment which determined the risks, the hazards and determines the best preventative measures to minimize the risks and hazards. All the risk assessments must have:

- 1 The site name on the risk assessment.
- 2 The date on the risk assessment.
- 3 The person/s name/s that did the risk assessment and their signatures.
- 4 Managements signature.
- 5 An attendance register as proof that the workforce was trained in the risk assessment.

Your risk assessment method document and your risk assessments must be approved by the safety committee.

CR 2014 (9)(1) A contractor must, before the commencement of any construction work and during such construction work, have risk assessments performed by a competent person appointed in writing, which risk assessments form part of the health and safety plan to be applied on the site, and must include-(a) the identification of the risks and hazards to which persons may be exposed to;

(b) an analysis and evaluation of the risks and hazards identified based on a documented method;

(c) a documented plan and applicable safe work procedures to mitigate, reduce or control the risks and hazards that have been identified;

(d) a monitoring plan; and

(e) a review plan.

(3) A contractor must ensure that all employees under his or her control are informed, instructed and trained by a competent person regarding any hazard and the related work procedures and or control measures before any work commences,

(5) A contractor must consult with the health and safety committee or, if no health and safety committee exists, with a representative trade union or representative group of employees, on the monitoring and review of the risk assessments of the relevant site.

Department of Public Works's audit question numbers: 25, 26, 27.

13. Site Emergency Plan

You must develop a site specific emergency plan. Don't make it too complicated, it must be easily understood and executed by anyone. All possible emergencies for this site must be covered. The plan must at least have procedures for:

- small fires
- large fires. The procedure for responding and alerting the Fire Brigade.
- first aid cases. The procedure for responding and alerting the First Aider.
- serious medical cases. The procedure for responding and alerting the ambulance, doctors and hospital.
- also describe the procedure if the ambulance is not available.

- The emergency plan must be communicated to the workforce and proof thereof must be recorded and filed in the safety file.

- The emergency plan must also be pasted on the notice board and in the safety file.

- Emergency numbers must be prominently displayed on the notice board.

- You must install an effective fire alarm on site.

Department of Public Works's audit question numbers: 40, 41, 42, 43, 44, 45, 46, 47, 48.

14. Fall Protection Plan

You must have a fall protection plan in your safety file. The plan must be developed by your appointed Fall Protection Planner. Your fall protection plan must be site specific and practically viable and must cover *this* sites anticipated fall hazards for your work area. Do not submit a generic fall protection plan, we know them all. Make sure that your Construction Manager is in possession of your latest fall protection plan. Your plan must also contain risk assessments for all the work that you will perform from a height. The risk assessments must reflect each location where work from a fall position will be executed. Everyone on site working on heights must have a medical certificate and the certificates must be readily available.

CR 2014 (10)(1) A contractor must-

(a) designate a competent person to be responsible for the preparation of a fall protection plan;

(b) ensure that the fall protection plan contemplated in paragraph (a) is implemented, amended where and when necessary and maintained as required; and

(c) take steps to ensure continued adherence to the fall protection plan.

(2) A fall protection plan contemplated in subregulation (1), must include-

(a) a risk assessment of all work carried out from a fall risk position and the procedures and methods used to address all the risks identified per location;

(b) the processes for the evaluation of the employees' medical fitness necessary to work at a fall risk position and the records thereof;

(3) A contractor must ensure that a construction manager appointed under regulation 8(1) is in possession of the most recently updated version of the fall protection plan.

- All persons working on heights, on site, must be trained in your fall protection plan. The attendance register for The training must be attached to The fall protection plan.
- The plan must also contain a procedure on how you will inspect, test and maintain All your fall protection equipment.
- The plan must also contain a rescue plan for workers hanging from a height in a harness. you only have five minutes to rescue the person hanging from a harness. your plan should include a practical rescue plan, containing a procedure, what personnel is part of the rescue team, and what equipment is used in a rescue. persons executing the rescue plan must be trained and trained in the plan. It must also contain proof of the rescue plan being practiced.
- your site management must endorse (sign) the plan.

CR 2014 (10)(2) A contractor must-

(c) a programme for the training of employees working from a fall risk position and the records thereof;

(d) the procedure addressing the inspection, testing and maintenance of all fall protection equipment; and

(e) a rescue plan detailing the necessary procedure, personnel and suitable equipment required to affect a rescue of a person in the event of a fall incident to ensure that the rescue procedure is implemented immediately following the incident.

Department of Public Works's audit question numbers: 49, 50, 51, 52, 53, 54, 55, 56, 57.

15. List of Contractors.

Please note that the words; "Sub-contractor" are not used in the Act anymore. It is only "contractor." You must always have a comprehensive up to date list of all your contractors on site. This list must be readily available.

CR 2014 (7)(1)(f) A principal contractor must-

(f) make available a comprehensive and updated list of all the contractors on site accountable to the principal contractor,

Department of Public Works's audit question numbers: 58

16. Contractors.

16(a) Contractors Specification Documents

Each Contractor must be issued with a health and safety specification document written by the Principal Contractor. Remember you must issue a site specific, and a job specific health and safety specification document. We don't want to see generic specification documents. We also don't want to see this document (Department of Public Works's specifications) passed onto your Contractors as your specification document to them. Write your own. Only the sections applicable to your contractor may be duplicated in the specification document that you write for them. Contractors must sign for their specification documents.

CR 2014 (7)(1) A principal contractor must-

(c) on appointing any other contractor, in order to ensure compliance with the provisions of the Act-(i) provide contractors who are tendering to perform construction work for the principal contractor, with the relevant sections of the health and safety specifications contemplated in regulation 5(1)(b) pertaining to the construction work which has to be performed;

Department of Public Works's audit question numbers: 59, 60, 61.

16(b) Contractors Appointment Letters.

Each Contractor must be appointed in writing as a Contractor. The letter of award where the Principal Contractor informed the Contractor of the allocation of the tender to them, would suffice. These documents must be filed in your safety file as well as the contractor's safety file for auditing purposes.

CR 2014 (7)(c)(v) A principal contractor must-

(c) on appointing any other contractor, in order to ensure compliance with the provisions of the Act-

(v) appoint each contractor in writing for the part of the project on the construction site;

Department of Public Works's audit question numbers: 62.

16(c) Contractors "Letter of Good Standing."

Contractors may not be allowed to perform any work unless they submit a valid "Letter of Good Standing" as proof that they are in good standing with the Workman's Compensation Commissioner. These letters must be filed in the Contractor's safety files and the validation dates closely monitored.

***CR 2014 (7)(c)(iv)** A principal contractor must-
(iv) ensure prior to work commencing on the site that every contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer as contemplated in the Compensation for Occupational Injuries and Diseases Act, 1993;*

Department of Public Works's audit question numbers: 63.

16(d) Contractor's Safety Plans

All your Contractor's safety plans must be scrutinised by you and if in line with this document, the OHS Act and your health and safety specification document mentioned in 18(a), it must be approved by you in writing. The approval letters must be filed in your and the Contractor's safety file for auditing purposes.

***CR 2014 (7)(c)(vi)** A principal contractor must-
(c) on appointing any other contractor, in order to ensure compliance with the provisions of the Act-
(vi) take reasonable steps to ensure that each contractor's health and safety plan contemplated in subregulation (2)(a) is implemented and maintained on the construction site;
(d) ensure that a copy of his or her health and safety plan contemplated in paragraph (a), as well as the contractor's health and safety plan contemplated in subregulation (2)(a), is available on request to an employee, an inspector, a contractor, the client or the client's agent;*

Department of Public Works's audit question numbers: 64.

16(e) Contractor's Safety files

You must see to it that each contractor on site has a safety file that is kept on site and readily available. The safety file must be audited every month by you and the discrepancies found must be actioned by the contractor. The monthly audit reports must be filed in your contractor's safety file. We will also do periodic audits randomly on your contractors.

***CR 2014 (7)(2)(b)** A contractor must prior to performing any construction work-
(b) open and keep on site a health and safety file, which must include all documentation required in terms of the Act and these Regulations, and which must be made available on request to an inspector, the client, the client's agent or the principal contractor;*

***CR 2014 (7)(1)(c)** A principal contractor must-
(c) on appointing any other contractor, in order to ensure compliance with the provisions of the Act-
(vii) ensure that the periodic site audits and document verification are conducted at intervals mutually agreed upon between the principal contractor and any contractor, but at least once every 30 days;*

Department of Public Works's audit question numbers: 65, 66.

16(f) Contractor's Mandatory Agreements

It is the Principal Contractor's duty to see to it that a mandatory agreement is signed and entered into between the Principal Contractor and all their contractors on site before they come onto site. These agreements must be properly signed and all pages must be initialed by all parties. These mandatory agreements must be done in duplicate. One properly signed copy must be filed in your safety file. The other copy must be filed in the Contractors safety file. You must come to an agreement regarding the Safety Rep and the first aid arrangements with the Contractors. These arrangements must be written in the mandatory agreement. These arrangements are as follow; they must have at least one trained Safety Rep and at least one trained First Aider, whether they qualify to have one or not.

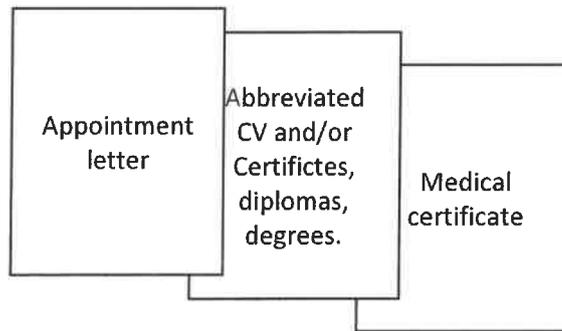
***OHS Act Section 37 & CR 2014 (7)(1)(f)** in addition to the documentation required in the health and safety file in terms of paragraph (c)(v) and subregulation (2)(b), include and make available the agreements between the parties and the type of work, being done;*

17. Legal Appointments.

An appointment letter is a legal document and must be treated as such. Herewith, a list of, at least, the legal appointments we want on site. Herewith also a few notes:

- The appointment letters must be properly signed by all parties involved and in black pen.
- The appointment letters must be properly filled in with no blank spaces.
- The name of the appointment, for example: "CEO Delegation of Duties (16.2) Appointment," must be clearly written on the appointment.
- The site name and date must appear on the appointment letter.
- Proof of competency must be attached to the back of the appointment letter. Proof of competency may be proven with degrees, diploma's, certificates and/or a short abbreviated CV. Where the Act explicitly says, "Competent person," we will require certificates and or diplomas and degrees.
- All appointees must have a medical certificate attached behind the proof of competencies.
- We do not accept appointment letters that has two designation on it. Each designation must have it's own appointment letter.

To make it easier for the auditor (And we know we must never irretate the audit team) we suggest the following sequence for an appointee's documents:



Where the Act requires a "competent" person, the following extract of the Act will be the standard:

CR 2014 (1) Definitions:- "competent person" means a person who-(a) has in respect of the work or task to be performed the required knowledge, training and experience and, where applicable, qualifications, specific to that work or task: Provided that where appropriate qualifications and training are registered in terms of the provisions of the National Qualification Framework Act, 2000 (Act No.67 of 2000), those qualifications and that training must be regarded as the required qualifications and training; and
(b) is familiar with the Act and with the applicable regulations made under the Act;

17 (1) 16.2 Appointee

OHS Act 16(2) Without derogating from his responsibility or liability, a chief executive officer may assign any duty to any person under his control, which person shall act subject to the control and directions of the chief executive officer.

Department of Public Works's audit question numbers: 159, 160, 161 .

17 (2) Construction Manager

CR 2014 (8)(1) A principal contractor must in writing appoint one full-time competent person as the construction manager with the duty of managing all the construction work on a single site, including the duty of ensuring occupational health and safety compliance,

Department of Public Works's audit question numbers: 162, 163, 164, 165, 166, 167.

17 (3) Construction Supervisors

CR 2014 (8)(7) A construction manager must in writing appoint construction supervisors responsible for construction activities and ensuring occupational health and safety compliance on the construction site.

Department of Public Works's audit question numbers: 178, 179, 180, 181.

17 (4) Assistant Construction Supervisor

CR 2014 (8)(8) A contractor must, upon having considered the size of the project, in writing appoint one or more competent employees for different sections thereof to assist the construction supervisor contemplated in subregulation (7), and every such employee has, to the extent clearly defined by the contractor in the letter of appointment, the same duties as the construction supervisor: Provided that the designation of any such employee does not relieve the construction supervisor of any personal accountability for failing in his or her supervisory duties in terms of this regulation.

Department of Public Works's audit question numbers: 182, 183, 184, 185, 186, 187.

17 (5) Risk Assessor

CR 2014 (9)(1) A contractor must, before the commencement of any construction work and during such construction work, have risk assessments performed by a competent person appointed in writing,

Department of Public Works's audit question numbers: 188, 189, 190, 191, 192, 193.

17 (6) Fall Protection Planner

CR 2014 (10)(1) A contractor must-(a) designate a competent person to be responsible for the preparation of a fall protection plan;

Department of Public Works's audit question numbers: 194, 195, 196, 197, 198, 199.

17 (7) Scaffolding Inspector

SANS 10085-1:2004, Edition 1.1,

Section 12.2:- All scaffolding shall be carefully inspected by a person competent in scaffolding supervision, erection and maintenance at least once a week.

14.5 Inspection of the scaffolding

For scaffolding more than 6 m high, a person who is certificated as an Inspector of Scaffolding (see 16.2.6 and 16.3) shall be appointed to:

a) carry out scaffolding inspections;

Department of Public Works's audit question numbers: 236, 237, 238, 239, 240, 241.

17 (8) Scaffolding Erectors

SANS 10085-1:2004, Edition 1.1,

Section 16.1:- Three persons are identified by this part of SANS 10085 as important to the execution of scaffolds that comply with the requirements of this part of SANS 10085. These persons are

a) the scaffolding erector who is competent to erect and dismantle...

Definitions: Section 3.12:- competent person

person who is competent by virtue of his training and experience in the erection and dismantling of scaffolding.

Department of Public Works's audit question numbers: 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259.

17 (9) Explosive Actuated Fastening Device Cleaner and Examiner (Hilti Gun)

CR 2014 (21)(2)(b) A contractor must ensure that:- (b) an explosive actuated fastening device is cleaned and examined daily before use and as often as may be necessary for its safe operation by a competent person who has been appointed for that purpose;

Department of Public Works's audit question numbers: 272, 273, 274, 275, 276, 277.

17 (10) Explosive Actuated Fastening Device Controller

CR 2014 (21)(2)(g)(i) A contractor must ensure that:- (g) the issuing and collection of cartridges and nails or studs of an explosive actuated fastening device are-(i) controlled and done in writing by a person having been appointed in writing for that purpose; and (ii) recorded in a register by a competent person and that the recipient has accordingly signed for the receipt thereof as well as the returning of any spent and unspent cartridges.

Department of Public Works's audit question numbers: 278, 279, 280, 281, 282, 283.

17 (11) Temporary Electrical Installation Controller

CR 2014 (24)(c) A contractor must, in addition to compliance with the Electrical Installation Regulations, 2009, and the Electrical Machinery Regulations, 1988, promulgated by Government Notice No. R. 1593 of 12 August 1988, ensure that-

(c) the control of all temporary electrical installations on the construction site is designated to a competent person who has been appointed in writing for that purpose;

Department of Public Works's audit question numbers: 284, 285, 286, 287, 288, 289.

17 (12) Stacking and Storage Supervisor

CR 2014 (28)(a) A contractor must, in addition to compliance with the provisions for the stacking of articles in the General Safety Regulations, 2003, ensure that:-

- (a) a competent person is appointed in writing with the duty of supervising all stacking and storage on a construction site;
- (b) adequate storage areas are provided;
- (c) there are demarcated storage areas; and
- (d) storage areas are kept neat and under control.

Department of Public Works's audit question numbers: 290, 291, 292, 293, 294, 295.

17 (13) Fire Equipment Inspector

CR 2014 (29)(h) A contractor must, in addition to compliance with the Environmental Regulations for Workplaces, 1987, ensure that-

(h) the fire equipment contemplated in paragraph (g) is inspected by a competent person, who has been appointed in writing for that purpose, in the manner indicated by the manufacturer thereof;

Department of Public Works's audit question numbers: 296, 297, 298, 299, 300, 301.

17 (14) Health and Safety Representatives

OHS Act (17)(1) - every employer who has more than 20 employees in his employment at any workplace, shall designate in writing for a specific period, health and safety representatives for such workplace, or for different sections thereof.

Whether you qualify to have a safety representative or not, we require that you will have at least one safety Representative. Even if you have less than 20 employees. Someone must supervise the safety on site.

Safety Representatives shall be provided with training needed to execute their duties.

OHS Act (18)(3) - An employer shall provide facilities, assistance and training as a safety representative may reasonably require and as have been agreed upon for the carrying out of their functions.

Department of Public Works's audit question numbers: 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 08, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319.

17 (15) Incident Investigator

All incidents and accidents must be investigated and the results thereof must be recorded on an Annexure 1 as published in the Gazette. No other form may be used.

GAR 9(2) An employer or user shall cause every incident which must be recorded to be investigated by the employer, a person appointed by him or her, by a health and safety representative or a member of a health and safety committee...

GAR 9(3) An employer or user shall cause the findings of the investigation to be entered in Annexure 1 immediately after completion of such investigation.

Department of Public Works's audit question numbers: 351, 352, 353, 354, 355.

17 (16) First Aiders

GSR 3(4) Where more than 10 employees are employed at a workplace, the employer shall ensure that for every group of fifty employees, at least one person is readily available and in possession of a valid certificate of competence in first aid, ...

Department of Public Works's audit question numbers: 351, 352, 353, 354, 355.

17 (18) Construction vehicles and mobile plant Operators

CR 2014 (23)(1)(d)(i) A contractor must ensure that all construction vehicles and mobile plant-

(d) are operated by a person who-

(i) has received appropriate training, is certified competent and in possession of proof of competency and is authorised in writing to operate those construction vehicles and mobile plant;

Department of Public Works's audit question numbers: 356 to question number 513.

18. Compliance Audits

We will do a full health and safety audit on your site every month. The results and the report must be filed by you in the safety file. Discrepancies must be actioned within a week and signed off on the audit report. You must also do monthly safety audits on yourself and your Contractors on site, every month. The reports must be filed in the safety file.

CR 2014 (5)(1) A client must

(o) ensure that periodic health and safety audits and document verification are conducted at intervals mutually agreed upon between the principal contractor and any contractor, but at least once every 30 days;

(p) ensure that a copy of the health and safety audit report contemplated in paragraph (o) is provided to the principal contractor within seven days after the audit;

CR 2014 (7)(c)(vii) A principal contractor shall ensure that the periodic site audits and document verification are conducted at intervals mutually agreed upon between the principal contractor and any contractor, but at least once every 30 days;

Department of Public Works's audit question numbers: 514, 515.

19. Medical Certificates

All your personnel on site must be certified medically fit to work on a construction site. They must all be certified by an Occupational Medical Practitioner using the form published in the gazette, Annexure 3. No other medical certificate will be accepted. No person may enter the site to work there if he/she doesn't have medical certification.

CR 2014 (7)(1)(g) A principal contractor must ensure that all his or her employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3.

Department of Public Works's audit question numbers: 516.

20. Induction Training

You, the Principal Contractor, the Principle Contractor, will do the site specific induction training with everyone on site. All induction training must be recorded in an induction training register. No person or employee may be allowed or permitted to work on the site, unless such an employee or person has undergone the site's health and safety induction training, pertaining to the hazards prevalent on the site at the time of entry. The following documents must also be discussed in the induction training session with the employee:

Fall Protection Plan

Site Rules

Emergency Plan

Health & Safety Policy Document

The following shall apply in your recordkeeping:

- All ID numbers must be noted
- The induction date must be noted
- The employees must sign for the training
- There must be proof of what was taught in the induction training session

CR 2014 (7)(5) A principal contractor:-

(5) may not allow or permit any employee or person to enter any site, unless that employee or person has undergone health and safety induction training pertaining to the hazards prevalent on the site at the time of entry.

(6) must ensure that all visitors to a construction site undergo health and safety induction pertaining to the hazards prevalent on the site and must ensure that such visitors have the necessary personal protective equipment.

(7) must at all times keep on his or her construction site records of the health and safety induction training contemplated in subregulation (5) and (6) and such records must be made available on request to an inspector, the client, the client's agent or the principal contractor:

Department of Public Works's audit question numbers: 517, 518, 519, 520, 521.

20. First Aid Register

We require from you a "First Aid Register" where all first aid cases must be recorded. It must at least reflect the following information:

- Date
- Name of injured
- ID Number
- Type of injury
- What treatment was administered
- What was used from the first aid box

Annexure One number, if the patient received medical attention other than first aid.

Department of Public Works's audit question numbers: 522, 523.

21. Incident / Accident reports / Wcl 2 / Annexure one's

All incidents where someone received medical attention other than first aid, must be reported on an "Annexure One" as contemplated in the OHS Act's General Administrative Regulations 9.(1). We will not accept any other form. The Dept of Labour also doesn't accept any other form. The following evidence must be attached to the "Annexure One" form and marked as "Exhibit A", "B" or whatever numbering system you want to use:

- Photographs
- Sketches
- Proof of Toolbox Talk after accident
- Proof of Toolbox Talk on the subject before the accident
- Proof of competency
- Proof of authorisation to operate
- Proof of training
- Copy of victims ID
- Physical address & contact no of victim & his family
- Proof of victims induction training
- PPE Issue Register
- Medicals of victim
- WCL 2 forms
- Statements
- Copy of Police docket

Each Annexure 1 form must be properly completed and submitted to the employer for comment whereafter it must be tabled at the health and safety committee meeting.

GAR (9)(1) An employer or user shall keep at a workplace a record in the form of Annexure 1 for a period of at least 3 years, which record shall be open for inspection by an inspector, of all incidents which he or she is required to report in terms of section 24 of the Act and also of any other incident which resulted in the person concerned having had to receive medical treatment other than first aid.

GAR (9)(3) An employer or user shall cause the findings of the investigation to be entered in Annexure 1 immediately after completion of such investigation.

GAR (9)(3) An employer shall cause every Annexure one to be examined by the health and safety committee for that workplace at its next meeting and shall ensure that necessary actions, as may be reasonably practicable, are implemented and followed up to prevent the recurrence of such incident.

Department of Public Works's audit question numbers: 522 to 554.

22. Safety Representative Elections & Inspections.

Your appointed safety representatives must be nominated and elected by your workforce and proof thereof must be available for auditing purposes. Your safety reps must be involved in your internal audits and also do inspections of the workplace where they are responsible for. They must submit meaningful reports monthly.

OHS Act (17)(2) An employer and the employees shall consult in good faith regarding the arrangements and procedures for the nomination or election, period of office of health and safety representatives.

OHS Act (18)(1)(g) A health and safety representative may inspect the workplace, including any article, substance, plant, machinery or health and safety equipment at the workplace...

OHS Act (18)(2)(f) A safety representative is entitled to participate in any internal health and safety audit.

Department of Public Works's audit question numbers: 555, 556, 557.

23. COC Electrical certificates

Your site electrical installation and all your temporary electrical distribution boxes must have a certificate of compliance (COC) issued by a registered body.

Electrical Installation Regulations (7)(1) Every user of an electrical installation shall have a valid certificate of compliance for that installation...

Department of Public Works's audit question numbers: 558, 559.

24. Risk Assessments

All tasks performed on site must be backed by a risk assessment which determined the risks, the hazards and determines the best preventative measures to minimize the risks and hazards. All the risk assessments must have:

- 1 The site name on the risk assessment.
- 2 The date on the risk assessment.
- 3 The person/s name/s that did the risk assessment and their signatures.
- 4 An attendance register as proof that the workforce was trained in the risk assessment.
- 5 Proof that you consulted with the safety committee regarding the monitoring, review and possible approval of your risk assessments.

CR 2014 (9)(1) A contractor must, before the commencement of any construction work and during such construction work, have risk assessments performed by a competent person appointed in writing,

CR 2014 (9)(1) A contractor must, before the commencement of any construction work and during such construction work, have risk assessments performed by a competent person appointed in writing, and must include (e) a review plan.

CR 2014 (9)(3) A contractor must ensure that all employees under his or her control are informed, instructed and trained by a competent person regarding any hazard and the related work procedures and or control measures before any work commences, and thereafter at the times determined in the risk assessment monitoring and review plan of the relevant site.

Department of Public Works's audit question numbers: 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599,

25. Scaffold Register

All scaffolding on site, whether completed or not, certified safe or not, must be listed on a register. (Example as per SANS underneath) Remember, there are two separate documents. The register and the checklist. All scaffolding on register must be inspected daily, or if any changes on the structure was made. The checklist must be signed by the person doing the check and signed off by management. Any discrepancies noted must immediately be actioned and action taken must be noted on the checklist. No discrepancy may be carried over to the next days checklist.

Your scaffolding must have some kind of identification on them to identify them.

You need to post symbolic signs on your scaffold structures, at least the following:

- Safe/unsafe for use
- Warn the workers that this is hard hat area

When you have scaffolding on site you must have the following competent persons appointed in writing:

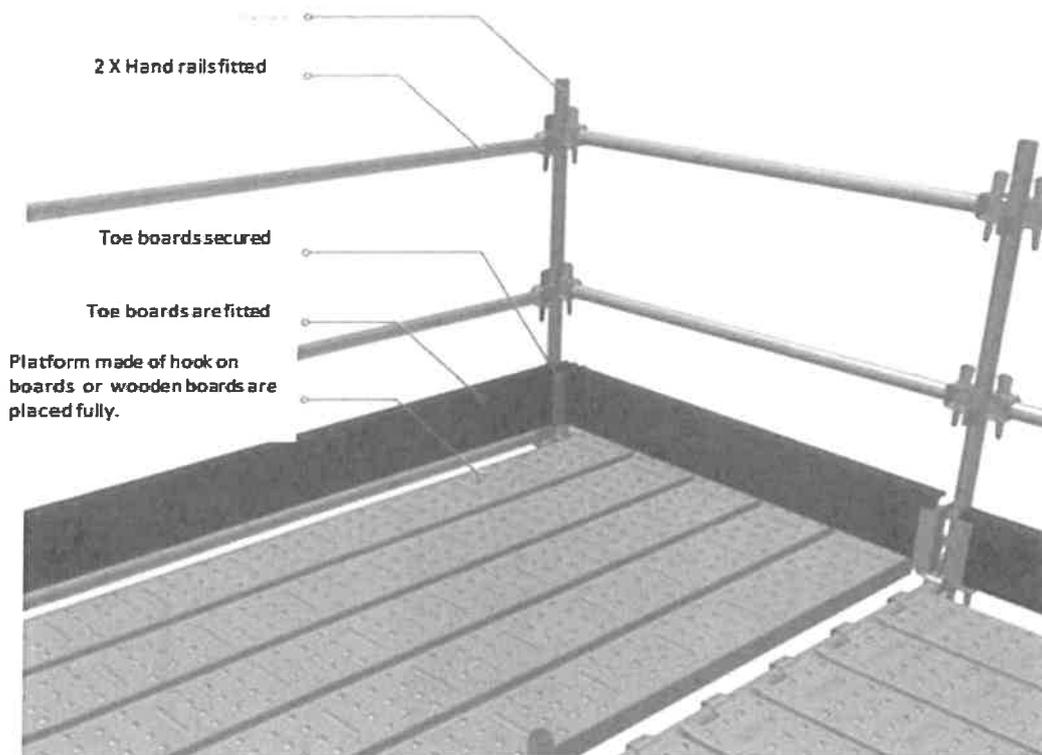
- Scaffold Supervisor
- Scaffold Team Leader
- Scaffold Inspector
- Scaffold Erector

Competent, in short, means that the above persons must have accredited certificates as per the safety standards incorporated for this purpose into the OHS Act Regulations under section 44 of the Act. (SANS 10085-1:2004, Edition

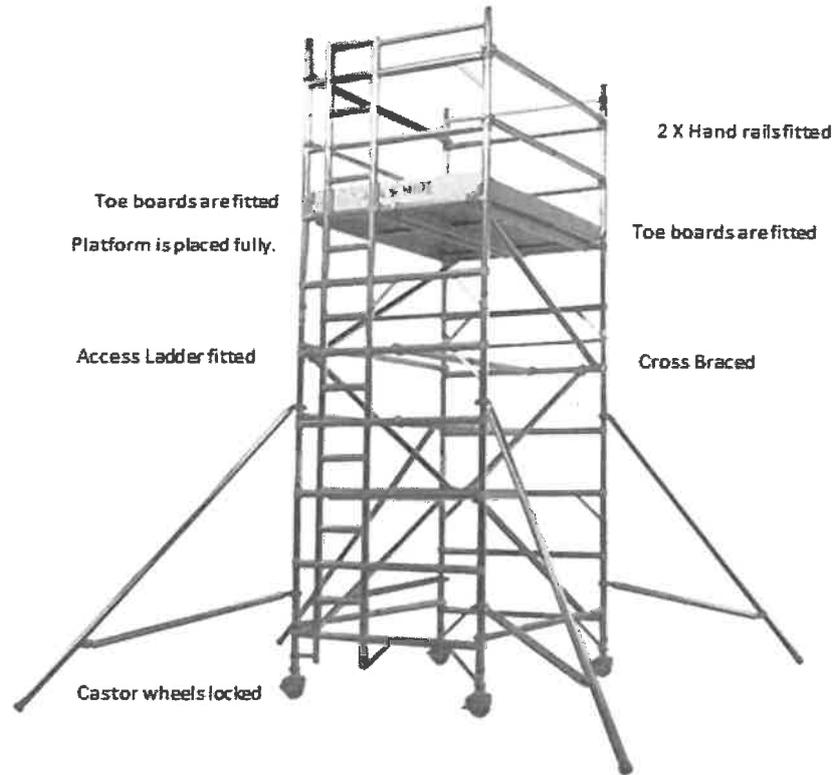
Each scaffold structure must be numbered to enable someone to identify the scaffold as per your scaffold register.

Scaffolding must at least be of the standard shown underneath:

We also require your scaffold supervisor to hand over the scaffolding structure to the person who requested the scaffold. The handover will be done after a thorough inspection of the scaffold. The scaffold supervisor will hand over a signed certificate to the person who will in turn sign the certificate as proof of accepting the scaffold structure as safe and secure.



2 X Hand rails fitted



SANS 10085-1:2004, Edition 1.1 - 11.2.1 Scaffolding shall not be

- a) left partly constructed or partly dismantled except for normal work stoppages (for example, over weekends),
- b) left in an unsafe condition, or

NOTE: If this is unavoidable, the scaffolding should be suitably fenced-off and provided with warning signs.

- c) moved or altered while work is in progress.

SANS 10085-1:2004 Edition 1.1 - 11.6 Safety signs

11.6.1 Symbolic safety signs that comply with the requirements for MV 3 ("Head protection shall be worn") of SANS 1186-1 and of size at least 205 mm × 205 mm shall, if not already required in terms of general site signage, be placed at or be attached to the nearest entry point to the scaffolding.

11.6.2 Symbolic safety signs that comply with the requirements of SANS 1186-1 and of size at least 205 mm × 205 mm shall be used to warn the public, and shall either be attached to the entry point to the scaffolding, or be placed at a prominent position. The symbolic safety signs shall be the appropriate of the following types (see SANS 1186-1):

- a) to warn the public of scaffolding operations (general warning of hazard);
- b) to warn the public of suspended scaffolding operations;
- c) to prevent workers from using incomplete scaffolding; and
- d) to advise workers that scaffolding is safe for use.

SANS 10085-1:2004 Edition 1.1 - 12

12 Inspection

12.2 All scaffolding shall be carefully inspected by a person competent in scaffolding supervision, erection and maintenance at least once a week.

12.5 All scaffolding shall be inspected immediately after inclement weather, after any mishap resulting in jarring, tilting or overloading, after alterations, and before dismantling to ensure that ties are at suitable positions for safe dismantling. Special attention shall be given to the condition of cables, ropes, winches, hoists, ties, baseplates and access ladders. The results of all inspections shall be recorded in the scaffold inspection register (see 12.6).

12.6 Upon completion of an inspection, the inspector shall record the details in a scaffold inspection register, including details of any faults found and corrected during his inspection. The minimum information required to be recorded shall be as shown in annex C, however, the presentation format may be varied to suit individual companies.

Annex C (informative)

Typical format for scaffold inspection register

Location/type of scaffold	Date of inspection	Faults found during inspection	Date corrected	Signature

SANS 10085-1:2004 Edition 1.1 - 14.6 Handover of the scaffold

Subsequent to a satisfactory final inspection, the scaffolding supervisor shall submit a handover certificate to the person requesting the scaffold to be built; this person shall, in turn, sign the certificate to indicate acceptance of the scaffold. The handover certificate shall contain details of the conditions of usage (including regular inspections) of the scaffold.

Department of Public Works's audit question numbers: 608, 609, 610, 611, 612, 613, 614, 615, 616, 617.

26. Explosive actuated fastening device

We are not sure whether you are going to use an Explosive actuated fastening device on this site. If you do, you must appoint an Explosive Actuated Fastening Device Controller and an Explosive Actuated Fastening Device Cleaner and Examiner for this site. You must also have a register for controlling the issuing and collection of cartridges and nails or studs of your explosive actuated fastening device.

You must submit proof of training for your user of the Explosive actuated fastening device before he will be allowed to use the device.

CR 2014 (21)(1)(b) No contractor may use or permit any person to use an explosive actuated fastening device, unless:

(b) the user is trained in the operation, maintenance and use of such a device;

CR 2014 (21)(1)(g) A contractor must ensure that:

(g) the issuing and collection of cartridges and nails or studs of an explosive actuated fastening device are-

(i) controlled and done in writing by a person having been appointed in writing for that purpose; and

(ii) recorded in a register by a competent person and that the recipient has accordingly signed for the receipt thereof as well as the returning of any spent and unspent cartridges.

Department of Public Works's audit question numbers: 618, 619.

27. Electrical installations and machinery

You must inspect your temporary electrical distribution boards (Installations) at least weekly. You need to keep the checklists for auditing purposes. You also need to have a temporary electrical installations inspection register where the results of the inspections are recorded. This register must be available for auditing purposes.

All your electrical machinery, (electric drill, angle grinder, skill saw, etc.) must be inspected daily before use by the operator of such electric machinery. The checklists must be kept for auditing purposes.

CR 2014 (24)(d) A contractor must, in addition to compliance with the Electrical Installation Regulations, 2009, and the Electrical Machinery Regulations, 1988, promulgated by Government Notice No. R. 1593 of 12 August 1988, ensure that

(d) all temporary electrical installations used by the contractor are inspected at least once a week by a competent person and the inspection findings are recorded in a register kept on the construction site; and

CR 2014 (24)(e) A contractor must, in addition to compliance with the Electrical Installation Regulations, 2009, and the Electrical Machinery Regulations, 1988, promulgated by Government Notice No. R. 1593 of 12 August 1988, ensure that (e) all electrical machinery is inspected by the authorized operator or user on a daily basis using a relevant checklist prior to use and the inspection findings are recorded in a register kept on the construction site.

Department of Public Works's audit question numbers: 620, 621, 622, 623.

28. Fire Equipment checklists

All your fire equipment must be inspected monthly and record thereof must be kept. You must also train a sufficient number of persons on site in handling the fire equipment in case of a fire.

Department of Public Works's audit question numbers: 624, 625.

29. Construction Welfare Facilities

Department of Public Works requires that the Principal Contractor provide their workers with at least the following facilities:

- one shower for every fifteen workers.
 - ◊ Running hot and cold water.
 - ◊ floors of the showers slipfree and sloped for easy drainage
 - ◊ showers demarcated "Male" and "Female"
 - ◊ adequate ventilation in the showers
- one clean and hygienic toilet for every thirty workers:
 - ◊ a system of supplying the workforce with toilet paper
 - ◊ if toilets are designed to have a seat, it must have a seat
 - ◊ facilities to wash hands at the toilets
 - ◊ facilities to dry hand after being washed
 - ◊ toilet soap or a similar cleansing agent supplied to employees to wash their hands at the toilets
 - ◊ toilets demarcated "Male" and "Female"
 - ◊ toilets separated and private with doors for privacy

The above will also be the standard for mobile toilets. You may attempt to organise to use existing facilities on site to save costs.

CR 2014 (30)(1)(a) A contractor must, in addition to the construction site provisions in the Facilities Regulations, 2004, promulgated by Government Notice No. R. 924 of 3 August 2004, provide at or within reasonable access of every construction site, the following clean, hygienic and maintained facilities:

- (a) Shower facilities after consultation with the employees or employees representatives, or at least one shower facility for every 15 persons;
- (b) at least one sanitary facility for each sex and for every 30 workers;

Facilities Regulation (2)(4)(a) Every employer shall provide showers for the use of his employees, and he shall:

- (a) provide running hot or cold or premixed hot and cold water for washbasins and showers;
- (b) ensure that the floor thereof is slip-free and sloped for effective drainage;

Facilities Regulation (2)(5)(a) In respect of each room in which there are closets, urinals, showers or washbasins, every employer shall:-

- (a) provide a conspicuous sign outside the entrance of such room to indicate the gender for whom the room is intended;
- (b) ventilate such rooms in accordance with the provisions of Part O of the National Building Regulations;
- (c) shall provide the necessary screen walls, partitions or doors in order to provide privacy;

Facilities Regulations (2)(3)(a) Every employer shall:

- (a) make toilet paper available to employees;
- (b) provide every water closet pan designed to have a seat, with a seat;
- (c) supply a towel to every employee for his sole use or disposable paper towels or hot air blowers or clean portions of continuous cloth towels, at the washbasins;
- (d) provide toilet soap or a similar cleansing agent to employees;

Department of Public Works's audit question numbers: 626, 627, 628, 629, 630, 631, 632, 633, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801.

30. Construction Vehicles and Mobile Plant Operators

Every operator must be authorised in writing with an appointment letter, to operate the plant assigned to him. The letter must be properly dated and signed by both the Construction Manager and the operator. You must also prove the operators competency with an accredited certificate of competence. The certificate must be varify-able. This means that we will need a contact number where we can contact the training provider that issued the certificate, to varify the authenticity of the certificate and their accreditation credentials.

Every operator must have a medical certificate declaring him medically fit to operate the assigned plant. All copies of documents must be certified as being a true copy of the original document. To make it easier for the auditor (And we know we must never irretate the audit team) we suggest the following sequence for an operators documents: first the appointment letter, then the proof of competency and lastly the medical certificate.

Every operator must do his own daily start-up inspection on the plant that he is operating and he must use a checklist for that purpose. The results of the checklist must be recorded on a "Construction vehicles and mobile plant inspection register." The checklist must be properly dated and signed by the operator. It is essential that Management must sign off the checklists. If any discrepancies are noted, you must note the action taken by Management to resolve the discrepancy. There must be a clear trace-able chain of action taken. These documents must be kept in the plant of the operator.

CR 2014 (23)(1)(d)(i) A contractor must ensure that all construction vehicles and mobile plant-

(d) are operated by a person who-

(i) has received appropriate training, is certified competent and in possession of proof of competency and is authorised in writing to operate those construction vehicles and mobile plant;

(ii) has a medical certificate of fitness to operate those construction vehicles and mobile plant, issued by an occupational health practitioner in the form of Annexure 3;

CR 2014 (23)(1)(k) A contractor must ensure that all construction vehicles and mobile plant:

(k) are inspected by the authorised operator or driver on a daily basis using a relevant checklist prior to use and that the findings of such inspection are recorded in a register kept in the construction vehicle or mobile plant.

Department of Public Works's audit question numbers: 374 to 513 and 626 to 785 This is 298 questions on the site plant.

31. Plant Hire and Labour only Contractor's Mandatory Agreements

This is a very contravertial subject. Are they contractors or not? This is how we want you to handle the situation. If you hire a TLB from a person or a few tippers from another, and you want to treat them as a plant hire company and not a Contractor, then we require you to enter into a mandatory agreement with them. In the agreement you must clearly state that the operators are under your full management and control. You must also clearly state that the Principal Contractor takes full responsibility for the operators under their Workman's Compensation insurance. Labour only's must be treated in the same manner. It is clearly stated that all plant hire companies cannot be treated this way just to avoid them having a safety file. We're talking one or two plant being hired.

All the pages of the mandatory agreements must be initialed by all parties. It must also be properly signed by all parties.

This document serves as a guideline on how we want you to manage the safety program on site. It is common sense and common knowledge that the OHS Act must be read, and implemented, in liason with this document and all it's requirements. This document is complimentary to the OHS Act and the standards mentioned in this document.

32. Flammable Goods

Small quantities of flammable liquids must be stored in a "Flammable Liquid Store," well ventilated, with the appropriate symbolic signs, and with an inventory of all liquids stored, with quantities. All containers must be tightly closed. Enough and the correct fire extinguishers must be placed in conspicuous places. A bund wall, plastered must be able to contain a spillage if it occurs.

General Safety Regulation (10) An employer shall cause every flammable liquid store to be --

(a) separated by means of fire-resisting material with a fire-resistance of two hours from any room, cabinet or enclosure contemplated in subregulation (2);

(b) constructed of fire-resisting material with a fire-resistance of two hours;

General Safety Regulation (10) An employer shall cause every flammable liquid store to be:

(d) ventilated to the open air in such a manner that vapour cannot accumulate inside the store;

CR 2014 (25)(b) A contactor must, in addition to compliance with the provisions for the use and storage of flammable liquids in the General Safety Regulations, 2003, ensure that:

(b) no person smokes in any place in which flammable liquid is used or stored, and the contractor must affix a suitable and conspicuous notice at all entrances to any such areas prohibiting such smoking;

CR 2014 (25)(c) A contactor must, in addition to compliance with the provisions for the use and storage of flammable liquids in the General Safety Regulations, 2003, ensure that:

(c) an adequate amount of efficient fire-fighting equipment is installed in suitable locations around the flammable liquids store with the recognized symbolic signs

CR 2014 (25)(e) A contactor must, in addition to compliance with the provisions for the use and storage of flammable liquids in the General Safety Regulations, 2003, ensure that:

(e)all containers holding flammable liquids are kept tightly closed when not in actual use and, after their contents have been used up, are removed from the construction site and safely disposed of;

Department of Public Works's audit question numbers: 859, 860, 861, 862, 863, 864, 865, 866.

33. Gas Installation

The works regarding the gas installation must be done and overseen by a registered competent person and a certificate of compliance must be issued after the gas works are completed.

34. Personal Protective equipment

All workers on site must be issued the correct PPE as per your PPE risk assessment.

This concludes this health and safety specification document. It is impossible to cover and discuss all the mentioned standards in this specifications document. Thus, this document only highlights the priorities and it forms part of the standards.



DEPARTMENT OF PUBLIC WORKS

**STANDARD SPECIFICATION
FOR
KITCHEN EQUIPMENT
(ARCHITECTURAL)**

SEPTEMBER 1994

INDEX

DESCRIPTION	PAGE
ARCHITECTURAL EQUIPMENT	
1. <u>KITCHEN EQUIPMENT (GENERAL CONDITIONS)</u>	1
2. <u>TABLES</u>	3
2.1 STAINLESS STEEL TABLE	3
2.2 MOBILE TABLE	4
2.3 INLET TABLE WITH SCRAPE HOLE AND PRE-RINCE UNIT	4
2.4 OUTLET TABLE	4
2.5 TABLE WITH SCRAPE HOLE AND SPLASH BACK	4
2.6 PURPOSE MADE STAINLESS STEEL TABLE WITH CUPBOARD UNDERNEATH	5
2.7 PURPOSE MADE TABLE AND VEGETABLE CONTAINERS (VEGETABLE PREPARATION AREA)	5
2.8 POTATO SORTING TABLE (SLOPE BOTTOM)	5
2.9 POTATO SORTING TABLE WITH BOWL	5
3. <u>SINKS</u>	5
3.1 SINGLE BOWL SINK	5
3.2 DOUBLE BOWL SINK	6
3.3 SINGLE BOWL SINK WITH SCRAPE HOLE	6
3.4 SINGLE BOWL POT SINK (900 X 650mm)	6
3.5 DOUBLE BOWL POT SINK (2550 X 650mm)	6
3.6 PURPOSE MADE SINGLE BOWL POT SINK	6
3.7 PURPOSE MADE DOUBLE BOWL POT SINK	7
3.8 MOBILE POT SINK	7
3.9 MEAT TROUGH	7
3.10 LEFT-HAND BOWL VEGETABLE PREPARATION SINK	7
3.11 RIGHT-HAND BOWL VEGETABLE PREPARATION SINK	7
4. <u>CUPBOARDS</u>	8
4.1 MOBILE CUPBOARD FOR CHIPS	8
4.2 PURPOSE MADE EQUIPMENT CUPBOARD	8
4.3 CUPBOARD FOR BREAD	8
4.4 PURPOSE MADE LOCKABLE STAINLESS STEEL CUPBOARD FOR BUTCHER SET	8
5. <u>SHELVES</u>	8
5.1 ADJUSTABLE MILD STEEL SHELVES	8
5.2 ADJUSTABLE STAINLESS STEEL SHELVES	9
5.3 ADJUSTABLE STAINLESS STEEL SHELVES FOR BREAD	9
5.4 STAINLESS STEEL SHELF FOR CROCKERY	9
5.5 STAINLESS STEEL SHELVES TO WALL SURFACE	9
5.6 WALL MOUNTED STAINLESS STEEL SLATTED SHELF (POT WASH AREA)	9
5.7 VEGETABLE RACK	9

5.8	POT RACK	9
5.9	MOBILE POT RACK	9
5.10	MOBILE CROCKERY RACK	10
5.11	MOBILE PLATE AND MUG RACK	10
6.	<u>TROLLEYS</u>	10
6.1	TEE TROLLEY WITH PLINT AND DRIP TRAY	10
6.2	PURPOSE MADE KITCHEN EQUIPMENT TROLLEY	10
6.3	LOW BED TROLLEY	10
6.4	WORK TROLLEY	10
6.5	PURPOSE MADE TROLLEY FOR GASTRONORM CONTAINERS	11
6.6	MOBILE DOLLEY AND REFUSE CONTAINER	11
6.7	LOW BED BASKET TROLLEY	11
6.8	TRAY – AND CUTELY TROLLEY	11
6.9	DISH OFF TROLLEY	11
6.10	UNHEATED PASTRY/FOOD TROLLEY	11
6.	<u>GENERAL</u>	12
7.1	TRAY RAIL	12
7.2	MEAT BLOCK	12
7.3	STAINLESS STEEL UNHEATED COUNTER	12
7.4	MOBILE UNHEATED COUNTER	12
7.5	PALLET	12
7.6	POLYPROPELENE CUTTING BOARDS	12
7.7	MANUAL BREAD SLICER	12
7.8	MANUAL POTATO CHIPPER WITH BRIDGE PIECE	12
7.9	FLOOR MOUNTED MEAT RAIL	13
7.10	MOBILE MEAT RAIL	13
7.11	MULTIPOT	13
7.12	PAINT WORK	13
8.	ELECTRIC TILTING FRYING PAN	13

1. KITCHEN EQUIPMENT

SABS-SPECIFICATION

All references to South African Bureau of Standards specifications and codes of practice shall be deemed to be references to the latest issues of such specification and codes.

CUSTOMS DUES

Prices shall include prescribed customs dues on imported equipment. The tenderer cannot therefore claim import duty in pursuance of item 326 of the customs tariff with reference to any imported article.

INSTRUCTION MANUALS

A maintenance and operation instruction manual, including spare parts list shall be provided with each mechanical and electrical unit.

TRADE NAMES

Where trade names and model numbers are mentioned, other similar approved equipment complying with the specification may be offered.

POWER SUPPLY

The electrical equipment shall be suitable for connection to 380/220 V 50 Hz three phase 4-wire A C supply.

SPARE PARTS

Spare parts for each mechanical and electrical appliance shall be readily available in the Republic of South Africa, for a minimum period of ten years.

STAINLESS STEEL

Unless otherwise specified, all stainless steel used in the construction of units/equipment shall be of type 304 (18/8 quality) not less than 1,2mm thick. The construction of the units generally is to comply with the Standard Specification for Stainless Steel sinks for Institutional Use, SABS 907. **All exposed surfaces of stainless steel to be satin finished, except where otherwise specified.** The finish shall be of approximately 220 to 240 grit.

The units except where specified as being movable or mobile must be securely fixed to floors either by non-ferrous bolts in the surface bed or by substantial non-ferrous screws into plugs in the floor.

All welding is to be done in the most up-to-date manner and to be cleaned off flush and smooth where exposed.

CONNECTIONS

Prices of all equipment shall allow for connection to power points, including the connection of water- and waste pipes, complete with the necessary couplings, etc.

FINISHING

Prices of all equipment shall, where applicable, allow for baked on powder-coated enamel finishing on all exposed metal surfaces, except stainless steel work.

MAIN OFFER AND ALTERNATIVE

The tenderer's attention is drawn to the fact that his main offer shall be based on the specification in the Bills of Quantities, before an alternative tender may be submitted.

If the tenderer offers alternatives, the following information shall be submitted with his alternative tender, in

respect of each alternative to be supplied:

- (a) The page and item number for which an alternative is offered.
- (b) The name of the alternative make or model offered, including technical pamphlets and/or complete details relating to the information contained in the Bills of Quantities.
- (c) The name of the manufacturer.
- (d) The country of origin.
- (e) The alternative tariff.
- (f) The amount to be omitted or added to the main offer in respect of each alternative.

GUARANTEE

The tenderer shall guarantee the kitchen equipment **for a period of twelve months from the date on which the installation/fixing of all units is satisfactorily completed.**

The contractor shall repair, at his own cost, defects that may become defective during the guarantee period due to inferior materials or workmanship (fair wear and tear excluded). Any part so replaced, shall be guaranteed for a further year from the date of replacement.

All the equipment and installation shall comply in all respects with the requirements of the Machinery and Occupational Safety Act No 6 of 1983.

ITEM

SAFETY : COMPULSORY SPECIFICATION

Where applicable all electrical equipment shall comply with the "Compulsory Specification for the Safety of Electrical Appliances" as published in the Government Gazette No. 7464, Notice 466 of 1981.

All the electrical equipment shall be provided with a substantial earth terminal to which all metal parts are to be connected.

The tenderer shall submit the following certificates with his tender:

1. Certificate of compliance with the safety requirements of the Compulsory Specification issued by the SABS.
2. Certificate of compliance with the valid requirements as described in the "Limits of Interference to Radio Communications" issued by the Postmaster-General in terms of the Radio Regulations under Section 18(i) (e) of the Radio Act 1952 (Act 3 of 1952).

ITEM

LAYOUT DIAGRAM AND INSTRUCTION

Provide a layout diagram, size approximately 400 x 450mm showing the layout of the kitchen equipment, the diagram to be framed and the framing to be provided with a glass front. Each item to be numbered and named on the diagram.

The tenderer shall instruct the officer in charge of the kitchen where the kitchen equipment are to be installed, in the use of the equipment.

ITEM

DAMAGE

The tenderer will be held entirely responsible for any damage which may occur to the kitchen units during the transportation, setting into position and fixing; also any damage done to the building and must make good any such damage at his own risk.

No patching or repairing of damaged units will be allowed unless such damage can be made completely effectively and to the entire satisfaction of the Representative/Agent.

ITEM

2. TABLES

2 1 **STAINLESS STEEL TABLE**

The table to be of measurements as indicated on the drawing, constructed out of 1,2mm thick type 304-stainless steel top, reinforced with 1,6mm thick mild steel backing plate and with vermin proof

sound deadening material between.

The edges of the top to be turned down all round and lower edge of ("turn down") beaded over. Top supported on mild steel framing with type 304-stainless steel legs, with adjustable non-ferrous feet, complete with similar metal fench to secure unit to floor surface with non-ferrous bolts or screws.

Provide unit at wall sides with approximately 150mm high splash backs.

Provide unit close to the bottom with solid 1,6mm thick type 430-stainless steel shelf.

2.2 MOBILE TABLE

The mobile table to be of measurements as indicated on the drawing, constructed out of 1,2mm thick type 304-stainless steel top, reinforced with 1,6mm thick mild steel backing plate and with vermin proof sound deadening material between.

The edges of the top to be turned down all round and lower edge of ("turn down") beaded over. Top supported on mild steel framing with type 304-stainless steel uprights.

Fit unit with two fixed - and two fully swivelling heavy duty firm castors with rubber - or neoprene tyres. The fixed castors to be fitted with brakes.

Provide unit close to the bottom with solid 1,6mm thick type 430-stainless steel shelf.

2.3 INLET TABLE WITH SCRAPE HOLE AND PRE-RINSE UNIT

The unit to be of measurements as indicated on the drawings, complete with bowls approximately 500 x 450 x 230mm deep. The height and width of unit to suit the dish washing machine.

The top to be constructed out of 1,2mm thick type 304-stainless steel, reinforced with 1,6mm thick galvanised backing plate and with vermin proof sound deadening material between, provided with tuned up edges all round, except the end at the dish washing machine.

The unit to be supported on mild steel framing and type 304-stainless steel legs, with adjustable non-ferrous feet, complete with similar metal fench to secure unit to floor surface with non-ferrous bolts or screws.

Provide unit with a standard size scrape hole with rubber ring.

Provide an integral stainless steel splash back approximately 500 x 600mm wide at back of bowls.

The pre-rinse is to consist of a standard heavy pattern 15mm diameter sink mixer unit with pillar taps and 15mm diameter chromium-plated riser pipe approximately 450mm long, fixed to the wall with a chromium-plated adjustable wall bracket and fitted with a spring-action type high pressure flexible chromium-plated hose, including chromium-plated finger-action jet pre-rinse spray valve with ring.

2.4 OUTLET TABLE

The outlet table to be of measurements as indicated on the drawing. The height and the width of the table must suit the dish washing machine.

The top to be constructed out of 1,2mm thick type 304-stainless steel, reinforced with 1,6mm thick mild steel backing plate and with vermin proof sound deadening material between, provided with turned up edges all round, except the end at the dish washing machine.

The unit to be supported on mild steel framing with type 304-stainless steel legs, with adjustable non-ferrous feet, complete with similar metal fench to secure unit to floor surface with non-ferrous bolts or screws.

Provide unit close to the bottom with 1,6mm thick type 304-stainless steel tubular shelf.

2.5 TABLE WITH SCRAPE HOLE AND SPLASH BACK

The unit to be of measurements as indicated on the drawing, constructed out of 1,2mm thick type 304-stainless steel top, reinforced underneath with 1,6mm thick mild steel backing plate and with vermin proof sound deadening material between.

The edges of the top to be turned down all round and lower edge of ("turn down") beaded over. Top supported on mild steel framing with type 304-stainless steel legs, with adjustable non-ferrous feet, complete with similar metal fench to secure unit to floor surface with non-ferrous bolts or screws.

The unit to be provided with scrape hole, but without rubber ring. A type 304-stainless steel shute to be provided underneath scrape hole.

Provide unit at wall sides with approximately 150mm high splash backs.

2.6 **PURPOSE MADE STAINLESS STEEL TABLE WITH CUPBOARD UNDERNEATH**

The unit to be of measurements as indicated on the drawing, constructed out of 1,2mm thick type 304-stainless steel top, reinforced with 1,6mm thick mild steel backing plate and with vermin proof sound deadening material between.

The edges of the top to be turned down all round and lower edge of ("turn down") beaded over. Top supported on mild steel framing and type 304-stainless steel legs, with adjustable non-ferrous feet, complete with similar metal flench to secure unit to floor surface with non-ferrous bolts or screws.

Provide unit at wall sides with approximately 150mm high splash backs.

Provide underneath top a cupboard of measurements as indicated on the drawing, constructed out of type 430-stainless steel body, fitted with similar stainless steel double doors.

Hang each leaf on chromium-plated piano hinge, pop-rivited to door and body. Fit doors with three lever cupboard lock; chromium-plated handles and 76mm long barrel bolts as necessary.

The unit shall be provided with a type 430-stainless steel middle shelf

2.7 **PURPOSE MADE TABLE AND VEGETABLE CONTAINERS (VEGETABLE PREPARATION AREA)**

The unit to be of measurements as indicated on the drawing, constructed out of 1,2mm thick type 304-stainless steel top, reinforced with 1,6mm thick mild steel backing plate and with vermin proof sound deadening material between.

The edges of the top to be turned down all round and lower edge of "turn down" beaded over. Top supported on mild steel framing with type 304-stainless steel legs, with adjustable non-ferrous feet, complete with similar metal flench to secure unit to floor surface with non-ferrous bolts or screws.

Provide unit at wall sides with approximately 150mm high splash backs. Provide unit with two (2) tiers solid 1,6mm thick type 430-stainless steel shelves.

Provide unit with nine (9) heavy duty plastic vegetable containers.

2.8 **POTATO SORTING TABLE (SLOPE BOTTOM)**

The purpose made unit to be of measurements as indicated on the drawing.

Construct top out of 1,2mm thick type 304-stainless steel, reinforced with 1,6mm thick mild steel backing plate and with vermin proof sound deadening material between, having sloped bottom and turned up edges.

The unit to be supported on mild steel framework with type 304-stainless steel legs, complete with adjustable non-ferrous feet, and secured to floor surface with non-ferrous bolts or screws.

The unit to be provided with scrape hole, but without rubber ring. A type 304-stainless steel shute must be provided underneath scrape hole.

2.9 **POTATO SORTING TABLE WITH BOWL**

The purpose made unit to be of measurements as indicated.

Construct the top out of 1,2mm thick type 304-stainless steel, reinforced with 1,6mm thick mild steel backing plate and with vermin proof sound deadening material between, having turned up edges. Provide unit with bowl at one end as indicated, size 700 x 500 x 380mm deep.

The unit to be supported on mild steel framework with type 304-stainless steel legs, with adjustable non-ferrous feet, complete with similar metal flench to secure unit to floor surface with non-ferrous bolts or screws.

The unit to be provided with scrape hole, but without rubber ring. A shute construct out of type 304-stainless steel must be provided underneath scrape hole.

3. **SINKS**

3.1 **SINGLE BOWL SINK**

The single bowl sink to be of measurements as indicated on the drawing, constructed out of 1,2mm thick type 304-stainless steel draining board and bowl, reinforced with 1,6mm thick mild steel backing plate and with vermin proof sound deadening material between.

The edges of the top to be turned down all round and lower edge of ("turn down") beaded over. Top supported on mild steel framing with type 304-stainless steel legs, with adjustable non-ferrous feet, complete with similar metal flench to secure unit to floor surface with non-ferrous bolts or screws.

Provide unit at wall sides with approximately 150mm high splash back.
Provide unit close to the bottom with solid 1,6mm thick type 430-stainless steel shelf.

3.2 **DOUBLE BOWL SINK**

The double bowl sink to be of measurements as indicated on the drawing, constructed out of 1,2mm thick type 304-stainless steel draining boards and bowls, reinforced with 1,6mm thick mild steel backing plate and with vermin proof sound deadening material between.

The edges of the top to be turned down all round and lower edge of ("turn down") beaded over. Top supported on mild steel framing with type 304-stainless steel legs, with adjustable non-ferrous feet, complete with similar metal flench to secure unit to floor surface with non-ferrous bolts or screws.

Provide unit at wall sides with approximately 150mm high splash backs.
Provide unit close to the bottom with solid 1,6mm thick type 430-stainless steel shelf.

3.3 **SINGLE BOWL SINK WITH SCRAPE HOLE**

The unit to be of measurements as indicated on the drawing, constructed out of 1,2mm thick type 304-stainless steel top and bowl, reinforced underneath with 1,6mm thick mild steel backing plate with vermin proof sound deadening material between.

The edges of the top to be turned down all round and lower edge of ("turn down") beaded over. Top supported on mild steel framing with type 304-stainless steel legs, with adjustable non-ferrous feet, complete with similar metal flench to secure unit to floor surface with non-ferrous bolts or screws.

The unit to be provided with scrape hole, but without rubber ring. A type 304-stainless steel shute to be provided underneath scrape hole.

Provide unit at wall sides with approximately 150mm high splash backs.

3.4 **SINGLE BOWL POT SINK**

The unit to be of measurements as indicated on the drawing, constructed out of 1,2mm thick type 304-stainless steel top and bowl, reinforced with 1,6mm thick mild steel backing plate with vermin proof sound deadening material between.

The edges of the top to be turned down all round and lower edge of ("turn down") beaded over. Top supported on mild steel framing with type 304-stainless steel legs, with adjustable non-ferrous feet, complete with similar metal flench to secure unit to floor surface with non-ferrous bolts or screws.

Provide unit with approximately 150mm high splash back.

3.5 **DOUBLE BOWL POT SINK**

The double bowl pot sink to be of measurements as indicated on the drawing, constructed out of 1,2mm thick type 304-stainless steel draining boards and bowls, reinforced with 1,6mm thick mild steel backing plate with vermin proof sound deadening material between.

The edges of the top to be turned down all round and lower edge of ("turn down") beaded over. Top supported on mild steel framing with type 304-stainless steel legs, with adjustable non-ferrous feet, complete with similar metal flench to secure unit to floor surface with non-ferrous bolts or screws.

Provide unit with approximately 150mm high splash back.

3.6 **PURPOSE MADE SINGLE BOWL POT SINK**

The purpose made unit to be of measurements as indicated on the drawing.

Top to be 1,2mm thick type 304-stainless steel with integral bowl to measurements as indicated on the drawing, reinforced with 1,6mm thick mild steel backing plate and with vermin proof sound deadening material between.

Drainer to be fluted and drained towards bowl and to be turned down and boxed under and provided

with tiling key at the back.
Unit to fit the size of cupboard.

3.7 **PURPOSE MADE DOUBLE BOWL POT SINK**

The purpose made unit to be of measurements as indicated on the drawing.
Top to be 1,2mm thick type 304-stainless steel with integral centre bowls to size as indicated on the drawing, reinforced with 1,6mm thick mild steel backing plate and with vermin proof sound deadening material between.
Drainer to be fluted and drained towards bowls and to be turned down and boxed under, and provided with tiling key at the back.
Unit to fit the size of cupboard.

3.8 **MOBILE POT SINK**

The mobile pot sink to be of measurements as indicated on the drawing, constructed out of 1,2mm thick type 304-stainless steel top and bowl, reinforced with 1,6mm thick galvanised backing plate and with vermin proof sound deadening material between.
The edges of the top to be turned down all round and lower edge of ("turn down") beaded over. Top supported on mild steel framing with stainless steel uprights.
Fit unit with two fixed - and two fully swivelling heavy duty firm castors with rubber - or neoprene tyres.
The fixed castors to be fitted with brakes.

3.9 **HALFROUND MEAT TROUGH**

The unit shall be of measurements as indicated on the drawings.
The half-round body to be formed with 1,6mm thick type 304-stainless steel and to be approximately 300mm deep.
Provide at the wheel end of the unit a 40mm diameter outlet and a brass wheel valve. The framework to be manufactured with type 304-stainless steel. Provide unit at one end with a type 304-stainless steel push handle, firmly welded to the body of the trough.
Fit the unit at the outlet end with 125mm diameter fixed heavy duty castors with rubber-or neoprene tyres.

3.10 **LEFT-HAND BOWL VEGETABLE PREPARATION SINK**

The unit shall be of measurements as indicated on drawings constructed out of 1,2mm thick type 304-stainless steel top, complete with drainer and two bowls, reinforced with 1,6mm thick mild steel backing plate and with vermin proof sound deadening material between.
The far left-hand side bowl shall measure 500 x 500 x 230mm deep and the remaining bowl shall measure 750 x 500 x 380mm deep.
The edges of the top to be turned down all round and lower edge of ("turn down") beaded over. Top supported on mild steel framing with type 304-stainless steel legs, with adjustable non-ferrous feet, complete with similar metal flanges to secure unit to floor surface with non-ferrous bolts or screws.
Provide unit with approximately 150mm high splash back.

3.11 **RIGHT-HAND BOWL VEGETABLE PREPARATION SINK**

The unit shall be of measurements as indicated on drawings constructed out of 1,2mm thick type 304-stainless steel top, complete with drainer and two bowls, reinforced with 1,6mm thick mild steel backing plate and with vermin proof sound deadening material between.
The far right-hand side bowl shall measure 500 x 500 x 230mm deep and the remaining bowl shall measure 750 x 500 x 380mm deep.
The edges of the top to be turned down all round and lower edge of ("turn down") beaded over. Top supported on mild steel framing with type 304-stainless steel legs, with adjustable non-ferrous feet, complete with similar metal flanges to secure unit to floor surface with non-ferrous bolts or screws.

Provide unit with approximately 150mm high splash back.

4. CUPBOARDS

4.1 **MOBILE CUPBOARD FOR CHIPS**

The unit to be suitable to accommodate three (3) 1:1 gastronorm containers.

The unit to be constructed out of type 304-stainless steel, having stainless steel sliding rails for containers.

Provide unit with three (3) 1:1 x 150mm deep type 304-stainless steel gastronorm containers.

Fit unit with two fixed - and two fully swivelling heavy duty firm castors with rubber - or neoprene tyres.

4.2 **PURPOSE MADE STAINLESS STEEL EQUIPMENT CUPBOARD**

The unit to be of measurements as indicated on the drawing.

The top to be constructed out of 1,2mm thick type 304-stainless steel, reinforced with 1,6mm thick mild steel backing plate with vermin proof sound deadening material between. Edges of the top to be tuned down all round.

The body to be constructed out of 0,9mm thick type 430-stainless steel, supported on mild steel framing or formed together with monocoque construction.

Doors to be formed with similar stainless steel, hung on chromium-plated piano hinge, firmly pop-riveted to body end doors. Fit unit with three-lever cupboard lock and 76mm chromium-plated barrel bolts.

Provide unit with short length type 304-stainless steel legs, with adjustable non-ferrous feet, complete with similar metal flanges to secure unit to floor surface with non-ferrous bolts or screws.

Provide unit at wall sides with splash backs. Fit unit with bottom and middle shelf, formed with solid 1,6mm thick type 430-stainless steel.

4.3 **CUPBOARD FOR BREAD**

The unit to be of measurements as indicated on the drawing, constructed out of 0,9mm thick type 304-stainless steel body and back.

The unit to be jointed together by means of monocoque construction. Provide the body with the necessary ventilation openings.

Fit the unit with type 304-stainless steel louvre door/s.

Hang each door on chromium-plated piano hinges, firmly pop-riveted to door/s and body.

Provide door/s with good quality catches.

4.4 **PURPOSE MADE LOCKABLE STAINLESS STEEL CUPBOARD FOR BUTCHER SET**

The unit for butcher set to be of measurements as indicated on the drawing, constructed out of type 304-stainless steel body and back with similar metal double doors, hung on chromium-plated piano hinges, firmly pop-riveted to body and doors.

Fit on the inner side of one leaf, top - and bottom, 75mm chromium-plated barrel bolt and fit the other leaf with three lever cupboard lock.

Fit unit with two (2) type 304-stainless steel shelves. Firmly fix unit to wall surface.

5. SHELVES

5.1 **ADJUSTABLE MILD STEEL SHELVES**

The adjustable shelves to be of measurements and quantity tiers as indicated on the drawing.

The units to be constructed out of mild steel framed supports and mild steel shelves. The shelves shall be approximately 900mm in length, complete with covered sides and backs.

The units shall be provided complete with braces and fixing pegs for shelves.

The framework and shelves to be finished with baked on powder-coated enamel. The shelves to be as manufactured by "Symo Corporation" or similar.

5.2 **ADJUSTABLE STAINLESS STEEL SHELVES**

The adjustable shelves to be of measurements and quantity tiers as indicated on the drawing.

The units to be constructed out of type 304-stainless steel framed supports and similar stainless steel shelves. The shelves shall be approximately 900mm in length, complete with covered sides and backs.

The units shall be provided complete with braces and fixing pegs for shelves.

5.3 **ADJUSTABLE STAINLESS STEEL SHELVES FOR BREAD**

The adjustable shelves to be of measurements and quantity tiers as indicated on the drawing.

The units to be constructed out of type 304-stainless steel framed supports and similar stainless steel shelves. The shelves shall be approximately 900mm in length, complete with covered sides and backs.

The units shall be provided complete with braces and fixing pegs for shelves.

Shelves to be provided with type 304-stainless steel back.

The shelves to be as manufactured by "Symo Corporation" or similar.

5.4 **STAINLESS STEEL SHELF FOR CROCKERY**

The unit to be of measurements as indicated on the drawing, constructed out of solid 1,2mm thick type 304-stainless steel shelf reinforced with 1,6mm thick galvanised backing plate and with vermin proof sound deadening material between, mounted on sturdy non-ferrous brackets, fixed to wall surface with non-ferrous bolts.

5.5 **STAINLESS STEEL SHELVES TO WALL SURFACE**

The shelves to be of measurements as indicated on the drawing, constructed out of solid 1,2mm thick type 304-stainless steel, reinforced with 1,6mm thick galvanised backing plate and with vermin proof sound deadening material between.

The unit to be supported on non-ferrous brackets, properly screwed to wall surface.

5.6 **WALL MOUNTED STAINLESS STEEL SLATTED SHELF (POT WASH AREA)**

The units to be of measurements as indicated on the drawing, constructed out of type 304-stainless steel slats, fixed to non-ferrous brackets, and brackets properly screwed to wall surface.

5.7 **VEGETABLE RACK**

The vegetable rack to be of measurements and quantity tiers as indicated on the drawing, constructed out of 40 x 40 x 3mm thick framed angle iron uprights at approximately 1000mm centres with 40 x 40 x 3mm thick reversed angle iron rails, filled in with expanded metal.

NB:

At coastal areas the metalwork shall be hot dip galvanised.

5.8 **POT RACK**

The pot rack to be of measurements as indicated on the drawing and to be fitted with four (4) tiers shelves.

The unit to be constructed out of type 304-stainless steel uprights with type 430-stainless steel rails filled in with galvanised mild steel tubular shelves.

5.9 **MOBILE POT RACK**

The mobile pot rack to be of measurements as indicated on the drawing and to be fitted with four (4) tiers shelves.

The unit to be constructed out of type 304-stainless steel uprights and type 430-stainless steel rails, filled in with galvanised mild steel tubular shelves.

Fit unit with two fixed - and two fully swivelling heavy duty firm castors with rubber - or neoprene tyres.

5.10 **MOBILE CROCKERY RACK**

The mobile crockery rack to be of measurements as indicated on the drawing.

The unit must be suitable to accommodate mixed, plates, cups, sauces and glasses with a capacity as indicated on the drawing.

The unit to be constructed out of mild steel uprights and framework, reinforced with flat mild steel braces.

Fill the framework in with heavy-duty plastic coated wire racks.

5.11 **MOBILE PLATE AND MUG RACK**

The mobile plate and mug rack to be approximate 1180x715x 1600 high. The unit to be constructed out of type 304 stainless steel uprights and frame.

The unit to be suitable fitted with three plate and two mug shelves, manufactured with heavy-duty plastic coated wire shelves.

The unit to be fitted with two 160mm diameter fixed and two fully swivelling heavy-duty casters with rubber or neoprene tyres.

The unit to be of equal manufacture as manufactured by "Vulcan" or other approved.

6. **TROLLEYS**

6.1 **TEE TROLLEY WITH FLINT AND DRIP TRAY**

The unit to be of measurements as indicated on the drawing, complete with top and two tiers shelves.

The framework to be constructed out of tubular mild steel, filled in with 1,2mm thick type 430-stainless steel top and shelves, reinforced with 1,6mm thick galvanised backing plate with vermin proof sound deadening material between. Each end frame to be served as a push handle.

Provide unit with type 304-stainless steel plint and drip tray.

The unit to be provided with two fixed - and two fully swivelling heavy-duty firm castors with rubber - or neoprene tyres.

6.2 **PURPOSE MADE KITCHEN EQUIPMENT TROLLEY**

The purpose made unit to be of measurements as indicated on the drawing, constructed out of type 304-stainless steel top and type 430-stainless steel body, joined together by means of monocoque construction.

The unit to be fitted with three (3) similar stainless steel drawers. Drawers to be provided with rollers or runners for proper working when fully loaded.

Each drawer to be fitted with three-lever drawer lock and chromium-plated or stainless steel handles.

The unit to be fitted with two fixed - and two fully swivelling heavy-duty firm castors with rubber - or neoprene tyres.

6.3 **LOW BED TROLLEY**

The low bed trolley to be of measurements as indicated on the drawing. The trolley to be suitable to wheel heavy goods to build store.

Provide unit with mild steel pull rod or push rail. Fit unit with two fixed - and two fully swivelling heavy-duty firm castors with rubber - or neoprene tyres.

6.4 **WORK TROLLEY**

The work trolley to be of measurements as indicated on the drawing, constructed out of mild steel framework with uprights, filled in with type 43-stainless steel top and shelf, having turned up edges all round, reinforced with 1,6mm thick galvanised backing plate and with vermin proof sound deadening material between.

Fit unit with two fixed - and two fully swivelling heavy-duty firm castors with rubber - or neoprene tyres.

6.5 **PURPOSE MADE TROLLEY FOR GASTRONORM CONTAINERS**

The purpose made trolley shall be suitable to accommodate two (2) 1:1 gastronorm containers, and shall fit underneath table.

Provide the unit on the one end with a push rail at a suitable height, constructed out of type 430-stainless steel.

The unit to be constructed out of type 430-stainless steel framework. The material must be of suitable size and thickness to obtain a firm construction.

Provide the trolley with a solid 1,6mm thick type 43-stainless steel shelf, having turned up edges all round.

Fit unit with two fixed - and two fully swivelling heavy duty firm castors with rubber - or neoprene tyres.

Provide unit with four (4) 1:1 x 150mm deep type 304-stainless steel gastronorm containers.

6.6 **MOBILE DOLLEY AND REFUSE CONTAINER**

The plan area of drolley shall be suitable to accommodate a standard refuse container.

The unit to be constructed out of type 304 - stainless steel, having turned up edges.

Fit the unit with three - or four fully swivelling heavy-duty firm castors with rubber - or neoprene tyres.

Provide unit with a standard heavy-duty non-toxic plastic refuse container.

6.7 **LOW BED BASKET TROLLEY**

The low bed basket trolley to be of measurements as indicated on the drawing, constructed out of mild steel framework and push on the one end.

The unit shall be accommodated the standard baskets for dish washing machine.

Fit trolley on two fixed - and two fully swivelling heavy-duty firm castors with rubber- or neoprene tyres.

6.8 **TRAY - AND CUTLERY TROLLEY**

The unit to be of measurements as indicated on the drawing, constructed out of mild steel framework.

Provide unit with 1,2mm thick type 430-stainless steel shelf to accommodate approximately 100 stacked trays. Fit in top of framework 2 x 4-division heavy-duty plastic cutlery boxes.

The unit shall be mounted on two fixed - and two fully swivelling heavy-duty firm castors with rubber - or neoprene tyres.

6.9 **DISH OFF TROLLEY**

The unit to be of measurements as indicated on the drawing, constructed out of mild steel framework and uprights, filled in with three heavy duty plastic of type 304-stainless steel dish containers and one removable type 304-stainless steel trash bin and one removable stainless steel solid shelf.

The unit shall be fitted with two fixed and two fully swivelling heavy-duty firm castors with rubber - or neoprene tyres.

6.10 **UNHEATED PASTRY/FOOD TROLLEY**

The unit shall be approximately 670 x 550 x 1850mm high.

The framework shall be constructed out of 38 x 38mm hollow type 304-stainless steel tubing, all neatly welded together.

The sides to be covered with 0,9mm thick type 430-stainless steel corrugated panels, but the front and back shall be open for usage from both sides.

Fit the unit with 20 bun trays, constructed out of 20 gauge type 430-stainless steel.

The unit shall be fitted with two fixed - and two fully swivelling heavy-duty firm castors with pneumatic tyres of 350kg load. The two fixed castors to be fitted with brakes.

Rubber corner bumpers shall be fitted to the base of the trolley.

7. GENERAL

7.1 **TRAY RAIL**

The tray rail shall be approximately 300mm wide and to length as indicated on the drawing, constructed out of type 304-stainless steel tubes or slats, supported and fixed to non-ferrous brackets and screwed to units with non-ferrous screws.

7.2 **MEAT BLOCK**

The meat block to be of measurements as indicated on the drawing, constructed out of laminated hardwood block and legs or provide with mild steel framework and legs.
The height of the unit shall be approximately 900mm.

7.3 **STAINLESS STEEL UNHEATED COUNTER**

The unit to be of measurements as indicated on the drawing. The top and body to be constructed out of 1,2mm thick type 430-stainless steel.

The body to be jointed together with monocoque construction. The top reinforced with 1,6mm thick galvanised mild steel backing plates and with vermin proof sound deadening material between.

The unit to be provided with short length type 304-stainless steel legs, complete with adjustable non-ferrous feet, and secured to floor surface with non-ferrous bolts or screws.

Provide unit with one middle shelf, constructed out of 1,6mm thick type 430-stainless steel.

7.4 **MOBILE UNHEATED COUNTER**

The unit to be of measurements as indicated on the drawing, constructed out of type 304-stainless steel top and with type 430-stainless steel body, supported on mild steel framing or fitted together by means of monocoque construction.

Provide unit with 1,6mm thick type 430-stainless steel shelf.

Fit unit on two fixed - and two fully swivelling heavy-duty firm castors with rubber - or neoprene tyres.

7.5 **PALLET**

The pallet to be of measurements as indicated on the drawing.

The unit to be firm enough to carry bags of mealy meal.

The unit to be constructed out of stainless steel or galvanised mild steel tubular framework, filled in with galvanised mild steel tubular slats.

The unit to be supported on type 304-stainless steel legs.

7.6 **POLYPROPELENE CUTTING BOARDS**

The cutting boards to be of measurements as indicated on the drawing, constructed out of polypropelene with arris-rounded edges.

7.7 **MANUAL BREAD SLICER**

The unit to be a standard manual type bread slicer of good quality.

The unit shall be manufactured out of type 304-stainless steel and the blade shall be approximately 280mm diameter.

7.8 **MANUAL POTATO CHIPPER WITH BRIDGE PIECE**

The unit to be robustly constructed and especially for the commercial catering trade.

The unit to have combination of positive double bearing slide and a spring counter-passed operating handle.

The knives to be type 304-stainless steel, both knife assembly and block to be detachable. Knife and block supplied to cut 12mm square chips.

Provide unit with type 304-stainless steel bridge piece to fit over sink bowl.

7.9 FLOOR MOUNTED MEAT RAIL

The unit to be of measurements as indicated on the drawing, constructed out of tubular galvanised mild steel uprights, fitted with non-ferrous flanges, properly bolted to floor surface with non-ferrous expansion bolts.

Provide to top of uprights a type 304-stainless steel cross bar, having four (4) non-ferrous hooks.

7.10 MOBILE MEAT RAIL

The unit to be of measurements as indicated on the drawing, constructed out of 50 x 10mm thick stainless steel flat bar meat rail, supported at either end by an A-frame, constructed out of 45mm diameter type 304-stainless steel tubular uprights on a 2mm thick type 304-stainless steel channel section base no more than 750mm wide to allow access through standard doorways.

The A-frame base shall be interconnected to provide rigidity as well as support to the removable type 304-stainless steel drip tray.

Provide unit with four (4) removable double meat hooks manufactured from non-ferrous round bar.

The unit shall be mounted on two fixed - and two fully swivelling heavy-duty firm castors with rubber - or neoprene tyres.

7.11 MULTIPOT

The unit to be of capacity as indicated on the drawing, constructed with inner liner and outer casing of type 304-stainless steel, insulated with glass fibre or mineral wool, having insulating properties such that the drop in temperature of liquid stored at 82 grade Celsius shall not drop more than 12 grade Celsius over a period of two hours.

The unit to be complete with strong metal lifting handles, type 304-stainless steel lid and large bore easy to clean drain-off tap.

All exposed parts, except where stainless steel occurs, are to have chromium-plated finish.

7.12 PAINTWORK

All metal work, except stainless steel, shall be finished with baked on powder-coated enamel.

8. ELECTRIC TILTING FRYING PAN

The pan shall be rectangular in shape and shall be positioned in between a U-shaped pedestal. The pedestal shall be enclosed with Grade 430 stainless steel, and equipped with adjustable feet.

PAN : 80 Litre capacity : 10mm thick close grained cast iron treated to give a non-porous surface with integrated pouring lip.

LID Grade 304 stainless steel, 1mm thick, with internal drip flange; counterbalanced to hold lid at any angle; side mounted handle.

TILTING MECHANISM : Screwed spindle and bush which is self-locking at any angle when the hand wheel or handle is released; lubricated bearings.

HEATING ELEMENTS : 12kW Thermostatically controlled with power "ON" and heat "ON" indicator lights.

ELECTRICAL SUPPLY : 380V, 3 phase 4 wire, 50Hz. Each circuit shall be protected by a circuit breaker.

DIMENSIONS-EXTERNAL: Approximately 1,4 x 0,9m x 0.9m high.
PAN ; 0,8m x 0,56 x 0,16m deep.

The following tilting frying pans are acceptable:

VULCAN FOOD SERVICE EQUIPMENT : ALOE MODEL FET80-E
MARLIN CATERING EQUIPMENT : MODEL TIPE

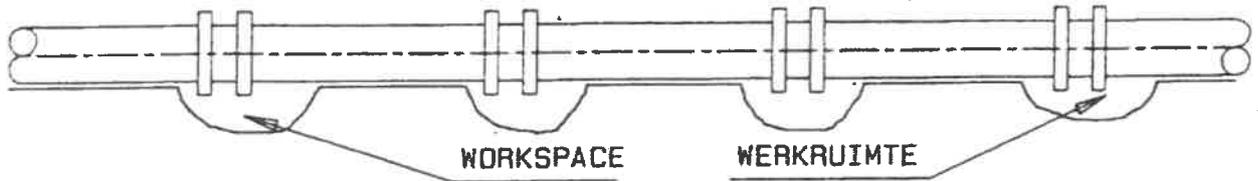


DEPARTMENT OF PUBLIC WORKS

DRAINAGE DETAILS

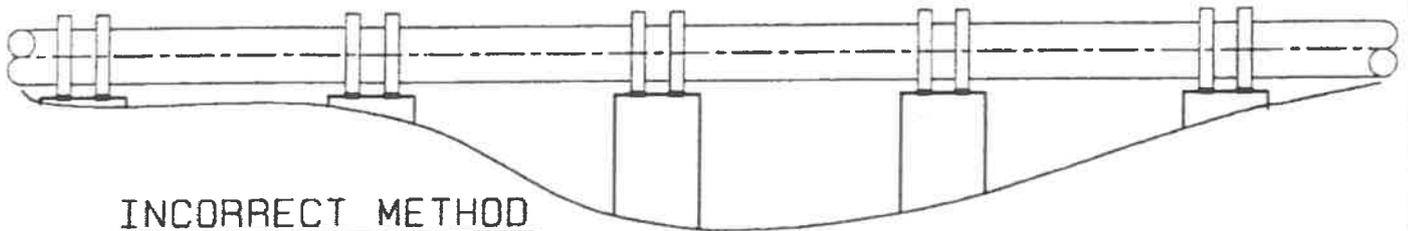
**REVISED EDITION
DECEMBER 1998**

A. UNDER NORMAL SOIL CONDITIONS
 ONDER NORMALE GROND OMSTANDIGHED



CORRECT METHOD
KORREKTE METODE

BARREL OF PIPE MUST REST-ON RIGID GROUND
 BODEM VAN PYP MOET OP VASTE GROND RUS



INCORRECT METHOD
VERKEERDE METODE

NOTE

EXCAVATIONS TAKEN OUT TOO DEEP MUST BE MADE UP WITH APPROVED FILLING AT CONTRACTORS EXPENSE.
 EXCAVATIONS IN ROCK MUST BE LEVELLED UP WITH GRANULAR MATERIAL TO ENSURE PIPES HAVING AN EVEN BEARING.

NOTA

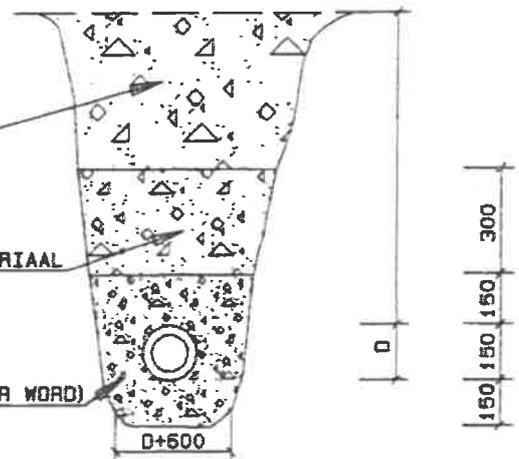
UITGRAWINGS WAT TE DIEP UITGEGRANE IS MOET MET GOEDGEKEURDE VULMATERIAAL OPGEVUL WORD OP ONKOSTE VAN DIE KONTRAKTEUR.
 UITGRAWINGS IN ROTS MOET MET KORRELAGTIGE MATERIAAL OPGEVUL WORD, SODAT PYP GELYKMATIG GESTEUN WORD.

B. IN KLEI OF SWART TURF
IN CLAY OR BLACK TURF

HOOFVULMATERIAAL
 MAIN FILL

VERDIGTE UITGESOEKTE VULMATERIAAL
 COMPACTED SELECTED FILL

VERDIGTE KORRELMATERIAAL
 (GRADERING MOET BESPEFISEER WORD)
 COMPACTED GRANULAR MATERIAL
 (GRADING TO BE SPECIFIED)



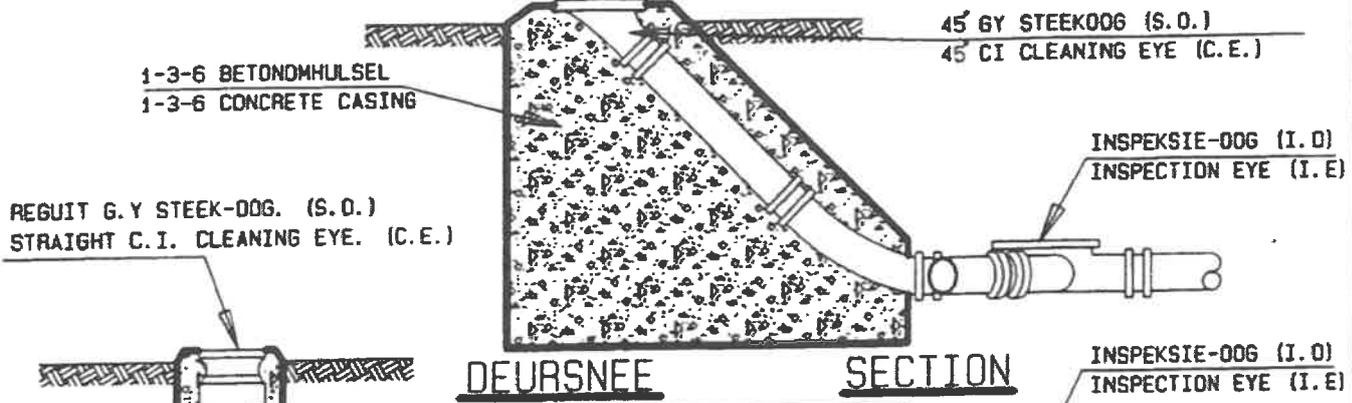
GETEKEN. J. A. C RABE
 DRAWN.

NAGESIEN.
 CHECKED.

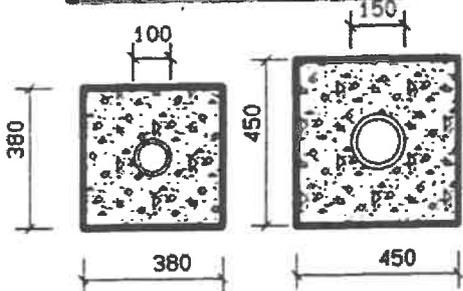
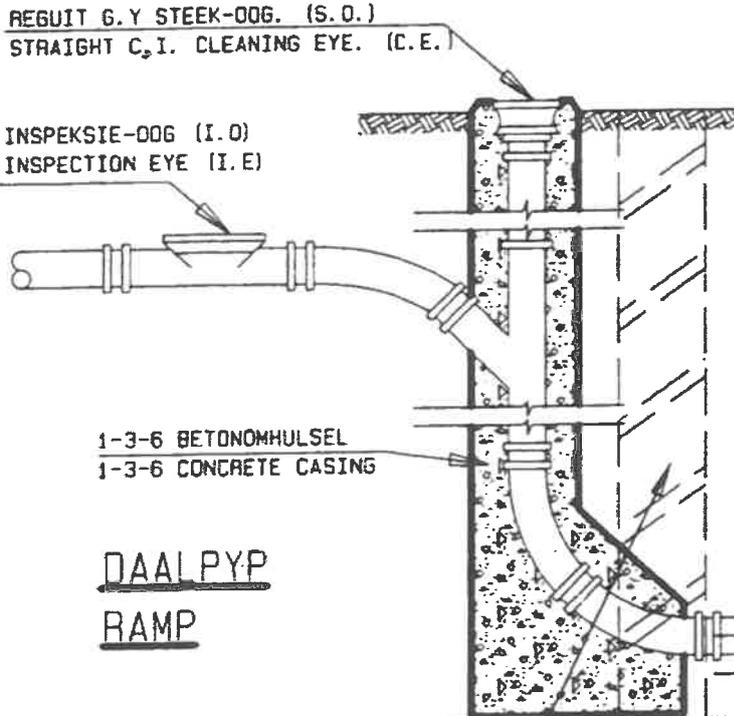
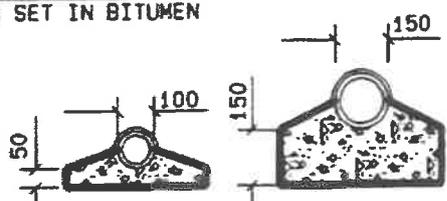
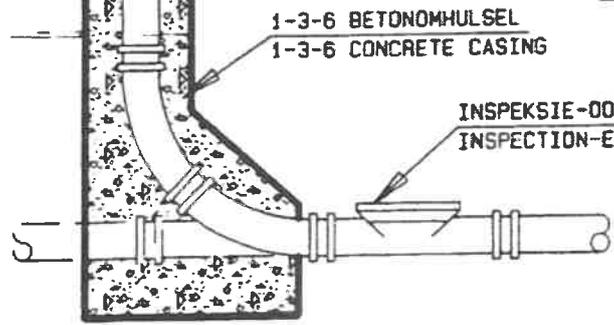
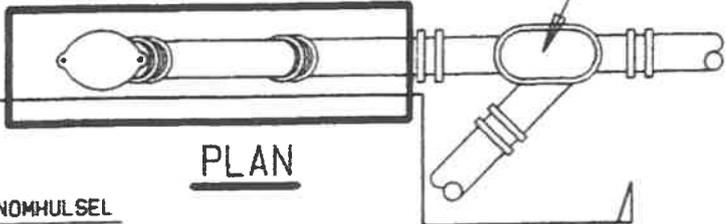
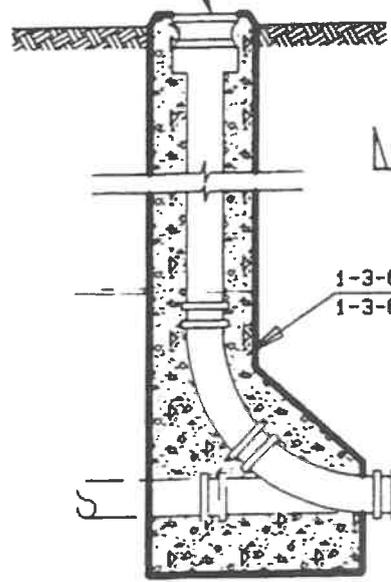
SKAAL. 1 : 20
 SCALE.

METODE VIR DIE LE VAN RIOLE.
 METHOD OF LAYING DRAINS.

D10



DEURSNEE SECTION



Inspeksiekamer deur stippellyn aangedoon.
Dotted lines show inspection chamber.

INSPEKSIE-DOG DEKSEL GEË IN BITUMEN
INSPECTION-EYE COVER SET IN BITUMEN

GETEKEN. J.A.C. RABE
DRAWN.
NAGESIEN. *[Signature]*
CHECKED.
SKAAL. 1 : 20
SCALE.

STEEKDOË, INSPEKSIEOË, DAALPYP.
CLEANING EYE, INSPECTION EYE, RAMP.

020

50 Dia VUILWATERPYP
WASTE PIPE

ROOSTER
GRATING

MIN 100

BETONMHULSEL
1-3-8 CONC. CASING

MUUR
WALL

DEURSNEE
SECTION

ROOSTER
GRATING

100

BETONMHULSEL
1-3-6 CONC. CASING

2mm.GEGALV. PLAATHOER
GEPERFOREER MET 6 Dia GATE.

2mm.GALV. IRON CONTAINER
PERFORATED WITH 6 Dia
HOLES.

STALRIOOLPUT
STABLE GULLY

PLAN

50 Dia Vuilwaterpyp
50 Dia Waste pipe

MUUR
WALL

50
650
750
50

50 450 25

GEKOMDE RIOOLPUT
DISHED GULLY

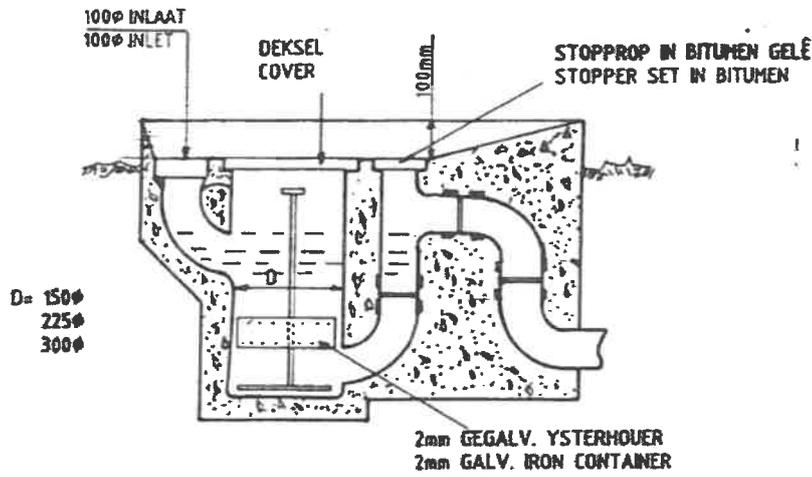
GETEKEN. J. A. C. BABB
DRAWN.

NEGESIEN.
CHECKED.

SKAAL. 1 : 20
SCALE

STAL- EN GEKOMDERIOOLPUT.
STABLE- EN DISHED GULLY.

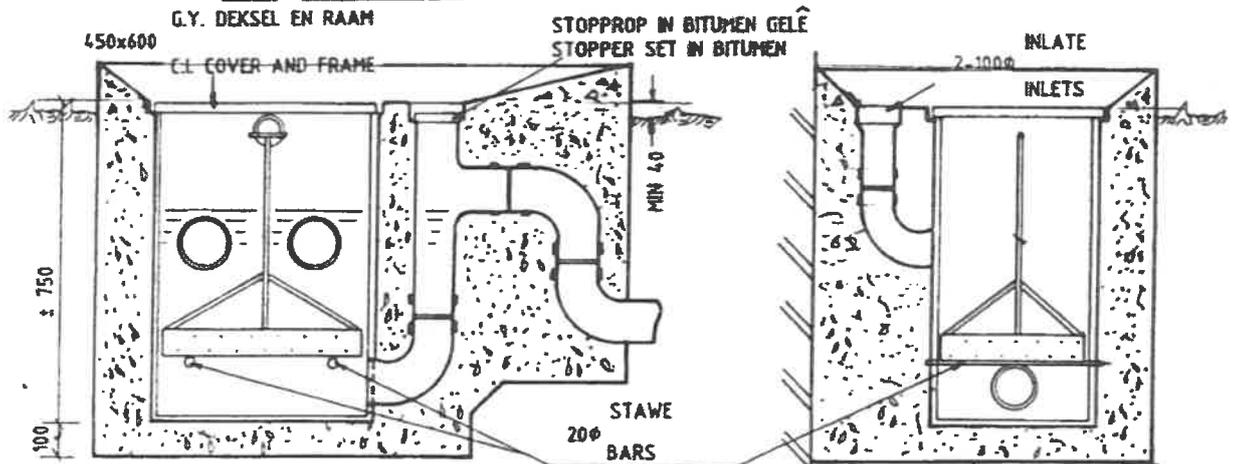
D40



TIPE VETVANGER

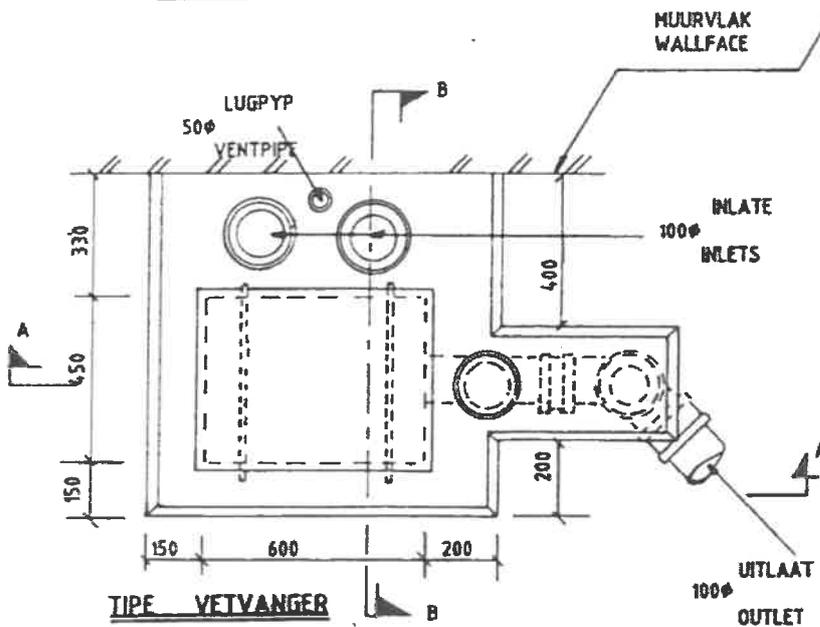
SABS. 559 FIG 27

TYPE A GREASE TRAP



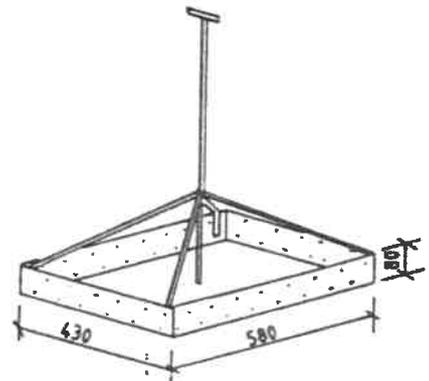
DEURSNEE SECTION A-A

DEURSNEE SECTION B-B



TIPE VETVANGER

TYPE B GREASE TRAP



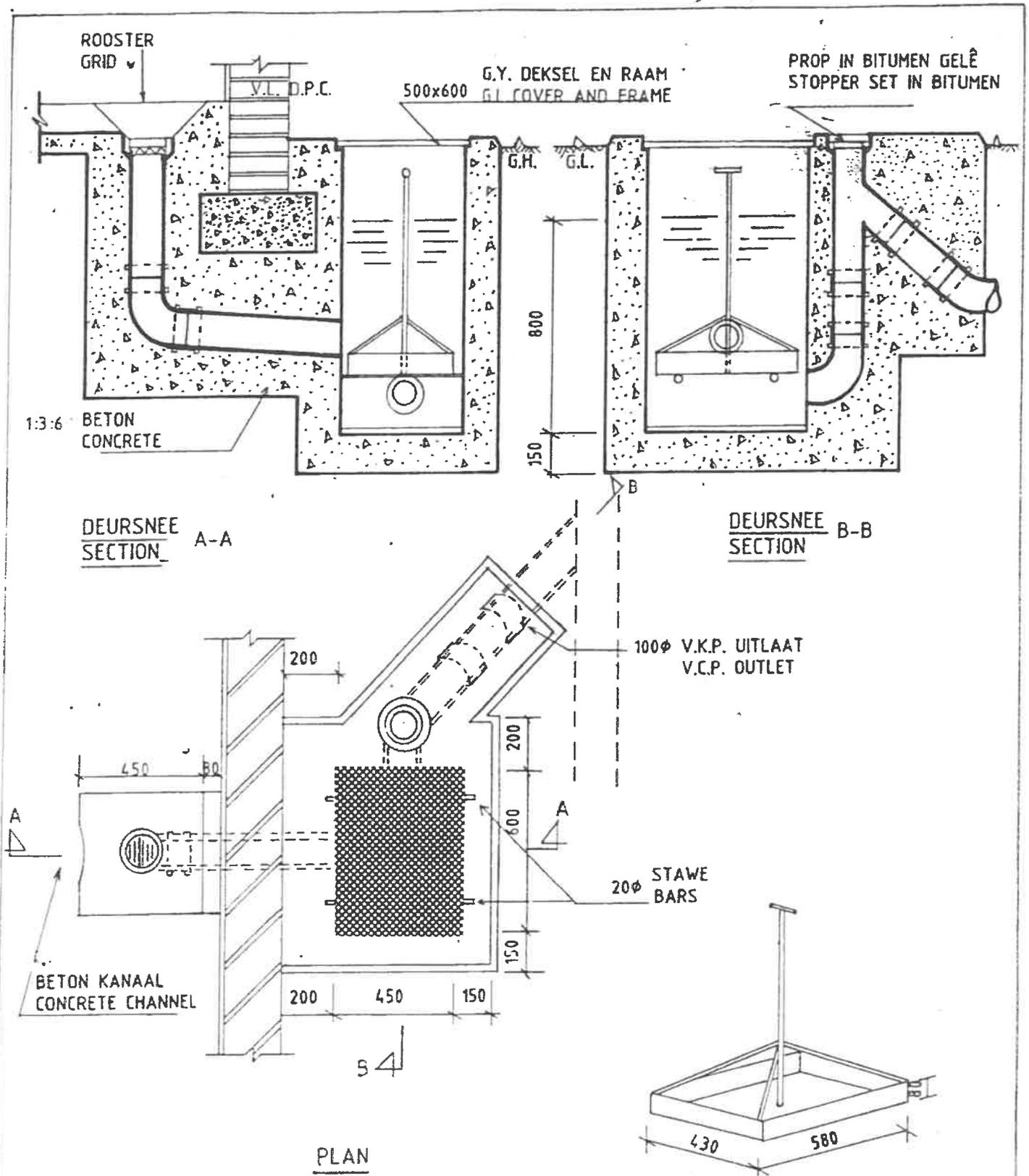
GETEKEN
DRAWN SP. CILLIERS

NAGESIEN
CHECKED *[Signature]*

SKAAL
SCALE 1:20

VETVANGER TIPE A EN B
GREASE TRAP TYPE A AND B

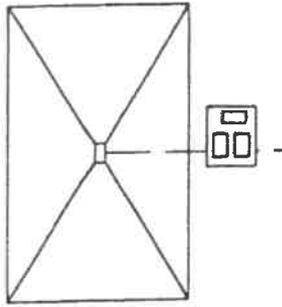
D50



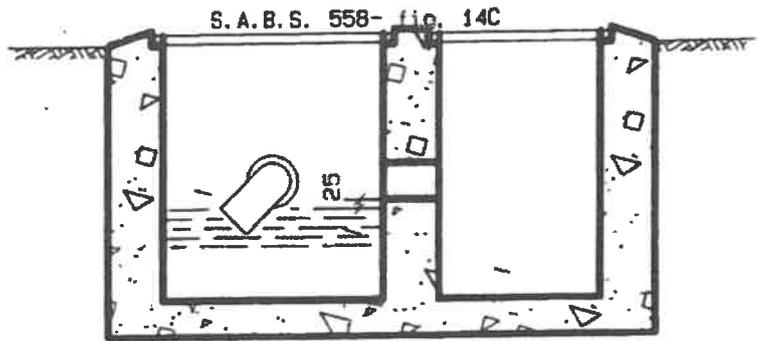
GEGALV. PLAATHOUER, GEPERFOREER MET 6φ GATE.
 2 mm GALV. SHEETKUN CONTAINER PERFORATED WITH 6φ HOLES.

GETEKEN. DRAWN R.W.BRAND.	DEPARTEMENT VAN OPENBARE WERKE DEPARTMENT OF PUBLIC WORKS	060
NAGESIEN CHECKED <i>[Signature]</i>	DETRITUSVANGER VIR STALLE DETRITUS INTERCEPTING TRAP FOR STABLES.	
SKAAL SCALE 1:20		

450x600-38 Kg BY MANGATDEKSEL ENKELDIGHTEID EN RAAM.
 450x600-38 Kg CI SINGLE SEAL MANHOLE COVER AND FRAME.

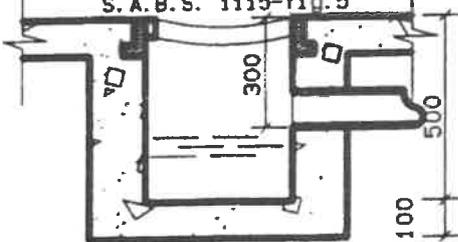


PLAN VAN WASBLAD
PLAN OF WASH BAY
1:200

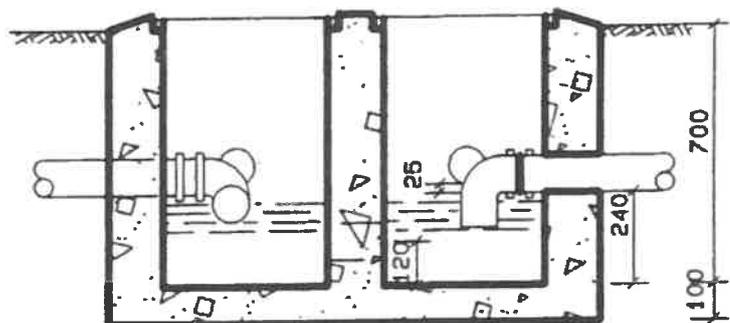


SNIT B-B
SECTION B-B

450x600 STORMWATER ROOSTER.
 450x600 STORM-WATER GRATING.
 S. A. B. S. 1115-fig. 5



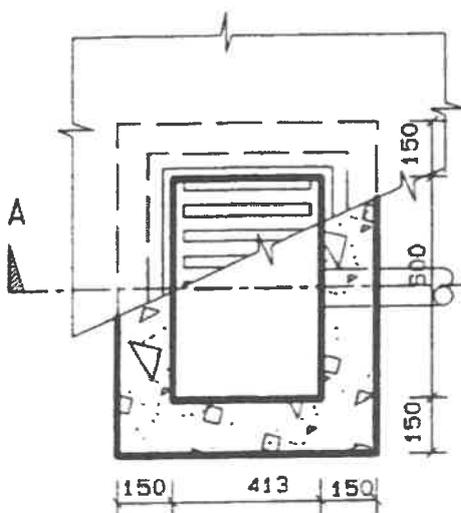
SNIT A-A
SECTION A-A



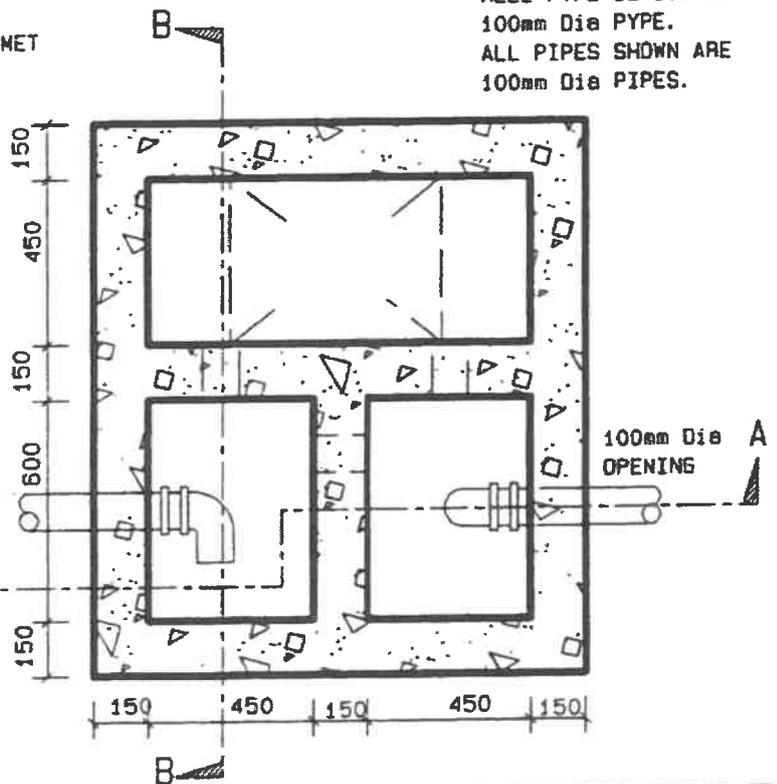
NB. GEEN VERKEER MAG OP DIE DEKSEL TOEGELAAT WORD NIE.
 NO TRAFFIC WILL BE ALLOWED ON THE COVERS.

NOTA: BINNEMATE VAN KAMERS MOET OOREENSTEM NET
 DAGMATE VAN RAAM.
 NOTE: INNER DIMENSIONS OF CHAMBERS MUST BE
 ACCORDING TO THE DAYLIGHT OPENING
 OF FRAMES.

ALLE PYPE GETOON IS
 100mm Die PYPE.
 ALL PIPES SHOWN ARE
 100mm Die PIPES.



PLAN



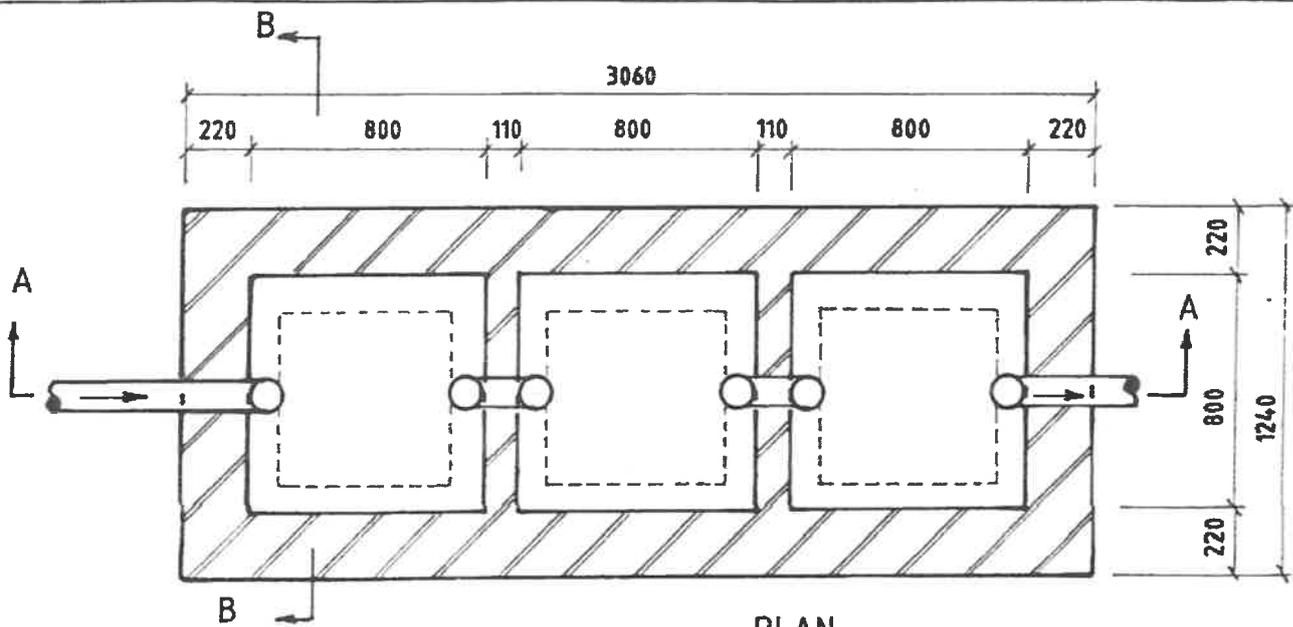
GETEKEN. J. A. C. RABE
 DRAWN.

NAGESIEN.
 CHECKED.

SKAAL. 1 : 20
 SCALE.

OLIE EN VETVANGER VIR VOERTUIG
 WASBLAD
 OIL AND GREASE TRAP FOR VEHICLE
 WASH BAY

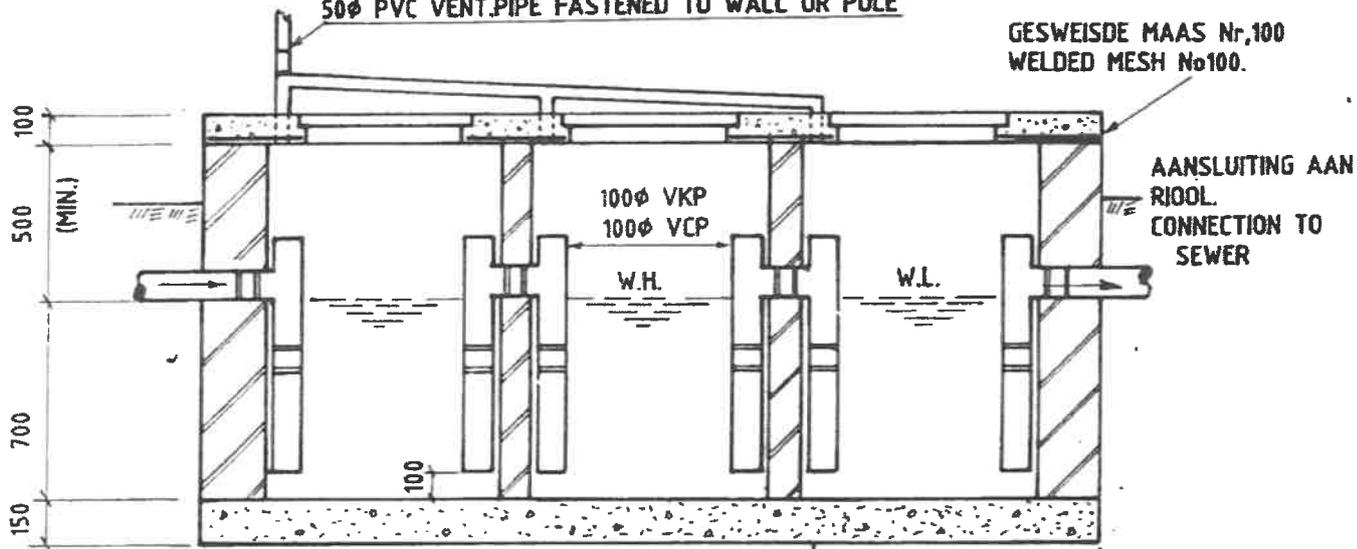
070



PLAN

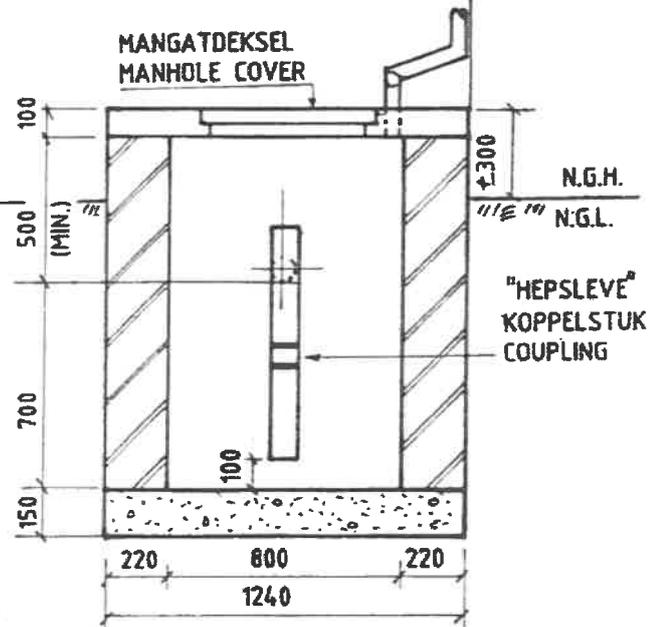
50φPVC LUGPYP VASGEMAAK AAN MUUR OF PAAL.
50φ PVC VENT.PIPE FASTENED TO WALL OR POLE

GESWEISDE MAAS Nr,100
WELDED MESH No100.



**SNIT A-A
SECTION A-A**

600 x 600 VIERKANTIGE
DUBBELAFDIGTING
MANGATDEKSEL VOLGENS
SABS 558-1973 TIPE 8B.
600 x 600 SQUARE
DOUBLE SEAL MANHOLE
COVER ACCORDING TO
SABS 558-1973 TYPE 8B.



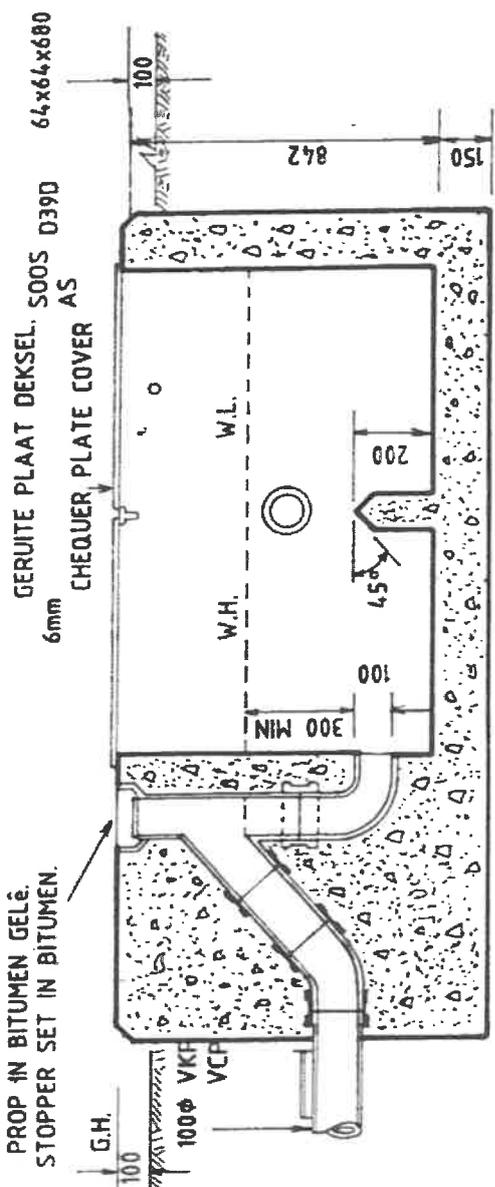
**SNIT B-B
SECTION B-B**

GETEKEN DRAWN	WAB.
NAGESIEN CHECKED	<i>[Signature]</i>
SKAAL SCALE	1 : 25

DEPARTEMENT VAN OPENBARE WERKE
DEPARTMENT OF PUBLIC WORKS

**PETROLVANGER
PETROL INTERCEPTER**

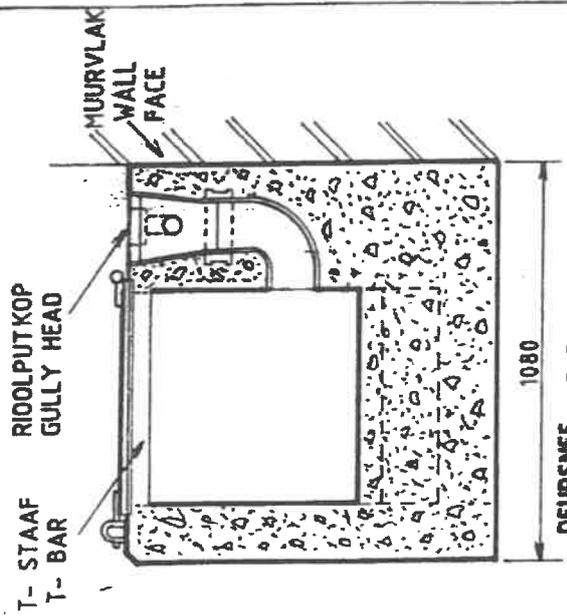
D 7(A)D



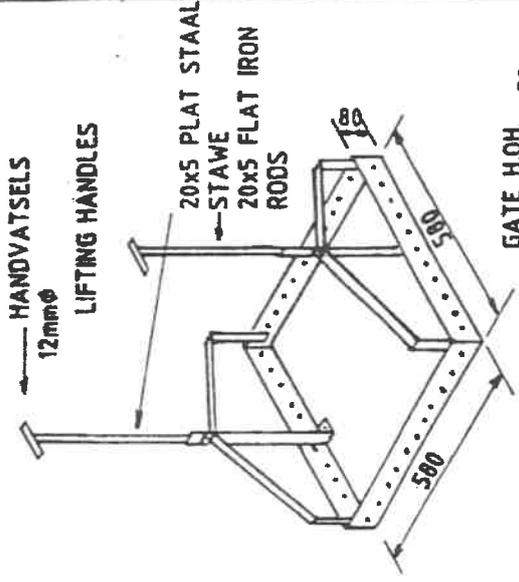
DEURSNEE A-A SECTION

RIOOLPUTKOP MET EEN OF TWE VERTIKALE INLASTE SOOS VERLANG GULLY HEAD WITH ONE OR TWO VERTICAL INLETS AS REQUIRED

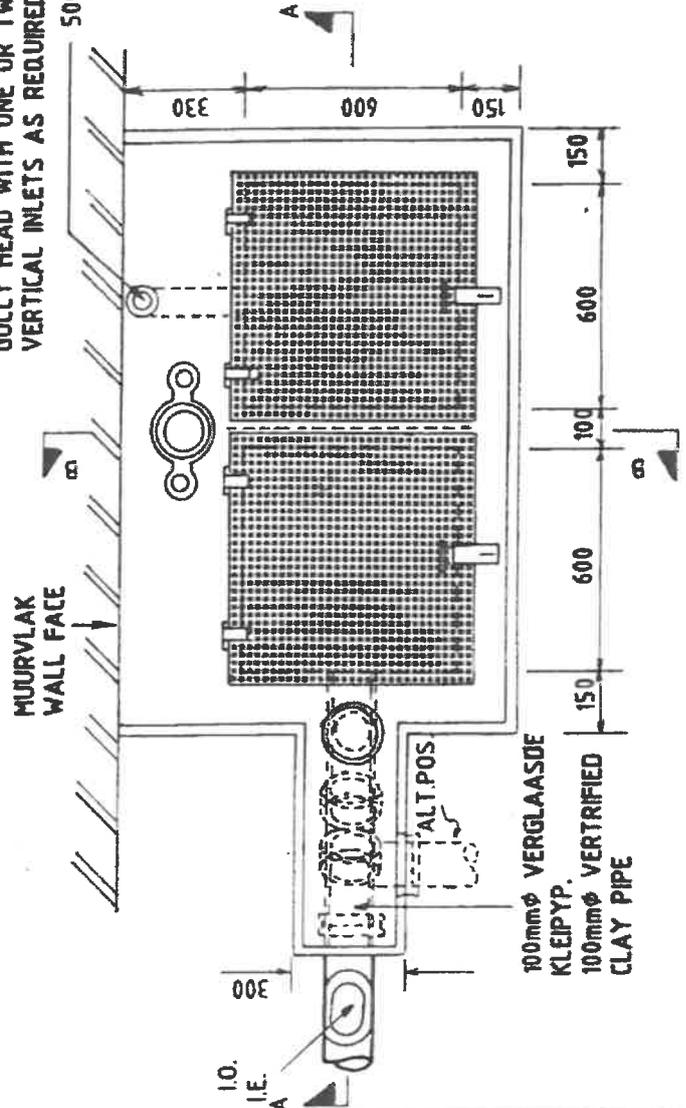
50 Ø V.P. L.P.



DEURSNEE B-B SECTION



GATE H.O.H. ±70
6mm Ø
HOLES C.T.C.
2mm GEGALV. PLAATHOUER
2mm GALV. IRON CONTAINER



100mm Ø VERGLAASDE KLEIPYP.
100mm Ø VERTRIFIEED CLAY PIPE

PLAN

GETEKEN M.J.PAPENHUYZEN.
DRAWN.

NAGESIEN CHECKED. *[Signature]*

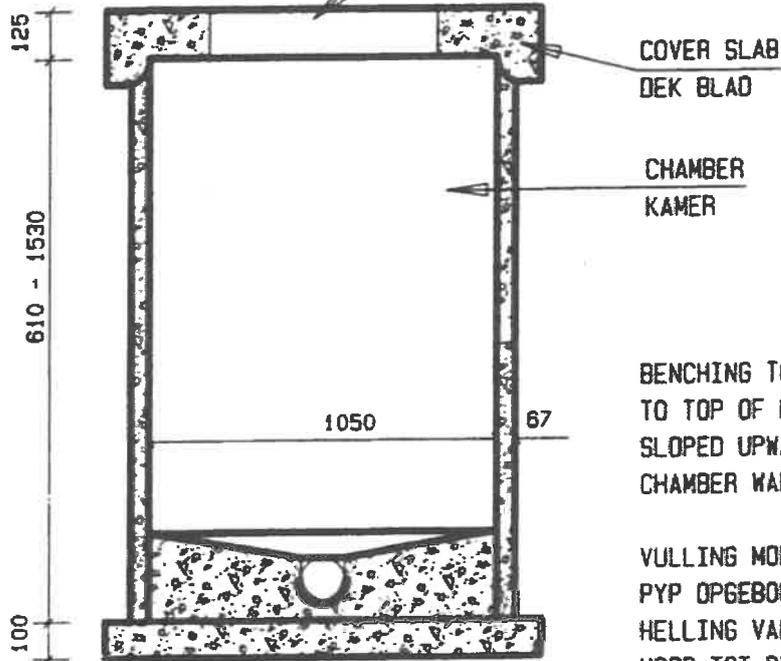
SKAAL 1 : 20
SCALE

VETVANGER
GREASE TRAP

TIPE TYPE C

D9D

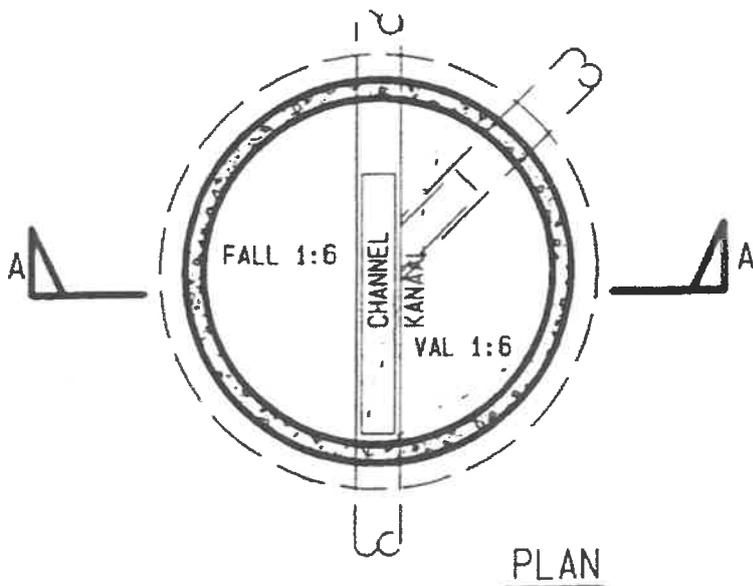
DOUBLE SEAL C.I. COVER AND FRAME TO BE SUPPLIED.
 DUBBLE SEËL G.Y. DEKSEL EN RAAM MOET VOORSIEN WORD.



BENCHING TO BE BROUGHT UP VERTICALLY TO TOP OF MAIN DRAIN PIPE AND THEN SLOPED UPWARDS AT 1:6 TOWARDS CHAMBER WALLS.

VULLING MOET VERTIKAAL TOT KRUIN VAN PYP OPGEBOU WORD EN DAN MET HELLING VAN 1:6 SKUINS AFGEWERK WORD TOT BY I.K. MUUR.

SNIT A-A
SECTION A-A



NOTE
 CHAMBER CAN BE SUPPLIED WITH SLOTTED CUTOUTS AT THE BASE TO SUIT SEWERS AS REQUIRED.

NOTA
 KAMER KAN MET UITSNYDINGS OP BASIS VOORSIEN WORD VIR VERSKILLENDE DEURSNEE PYPE SOOS BENODIG.

GETEKEN. J. A. C. RABE
 DRAWN.

NAGESIEN.
 CHECKED.

SKAAL. 1 : 20
 SCALE.

INSPECTION CHAMBER (UNDER 1 530 DEEP)
 INSPEKSIEKAMER (MINDER AS 1 530 DIEP)

D100

G.Y. Raam in beton gele.
C.I. Frame set in concrete.

450x600 G.Y. Deksel en raam.
450x600 C.I. Cover and frame.

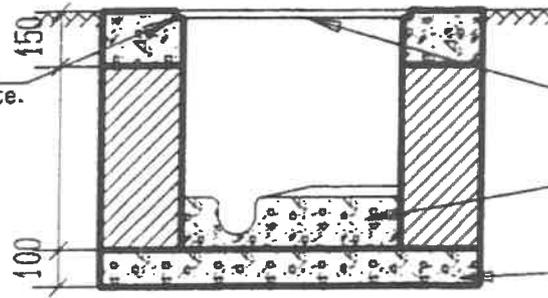
Vloevulling.
Benching.

1-3-6 Beton.
1-3-6 Concrete.

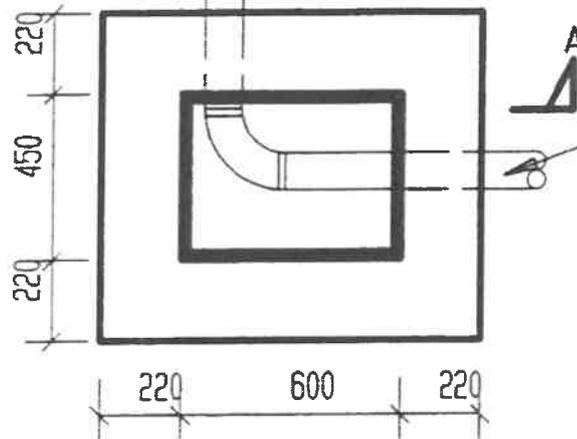
TIPE A
TYPE A

Kamer minder as 600 diep.
Chamber under 600 deep.

Vulling moet vertikaal tot bokant van pyp opgebou word en dan met helling 1:6 skuins afgewerk word tot by I.K. muur. Benching to be brought up vertically to top of main drain and then sloped upwards at 1:6 towards chamber walls.



DEURSNEE A-A
SECTION A-A



V.K.P. Kanaal.
V.C.P. Chanel.

TIPE B
TYPE B

Kamers 600 tot 1530 diep.
Chambers 600 to 1530 deep.

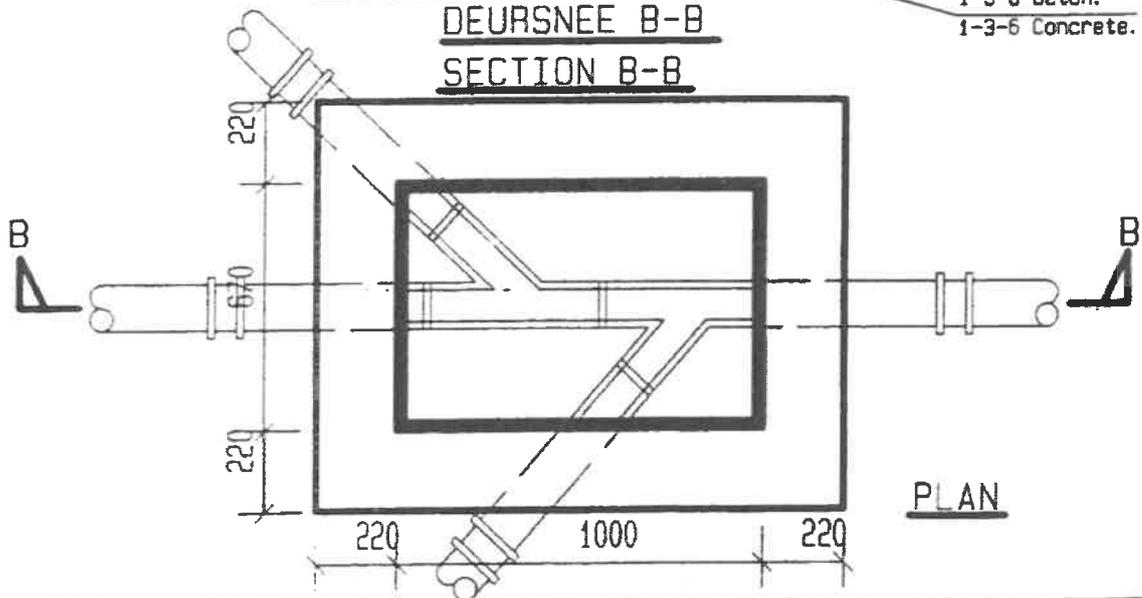
450x600 G.Y. Deksel en raam.
450x600 C.I. Cover and frame.

G.Y. Raam in beton gele.
C.I. Frame set in concrete.

Vloevulling.
Benching.

1-3-6 Beton.
1-3-6 Concrete.

DEURSNEE B-B
SECTION B-B



PLAN

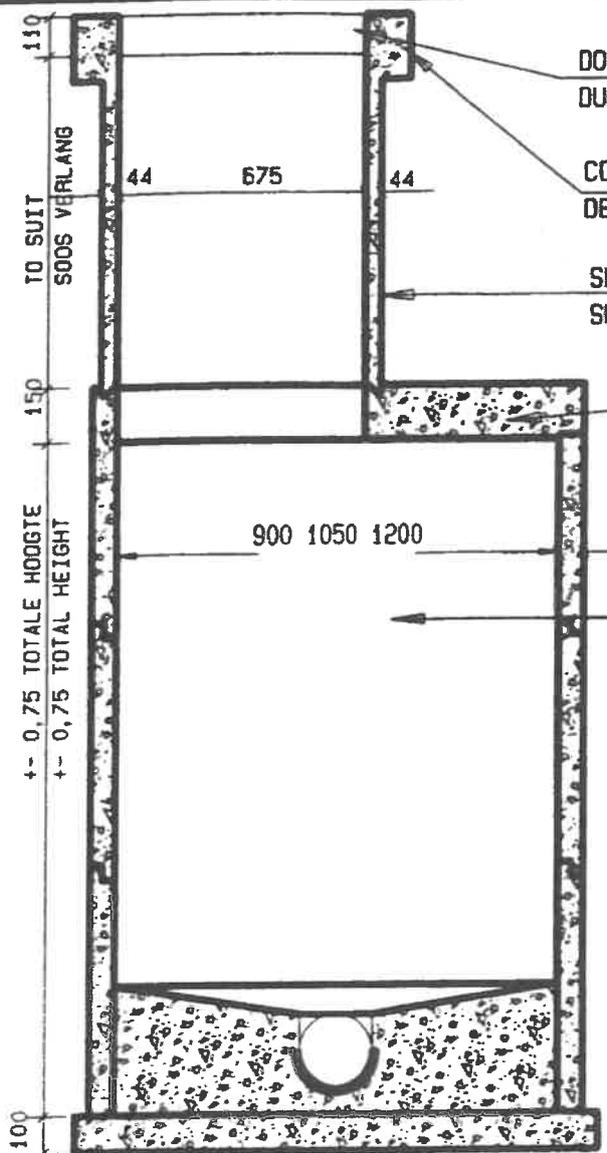
GETEKEN. J.A.C. RABE
DRAWN.

NAGESIEN.
CHECKED.

SKAAL. 1 : 20
SCALE.

INSPEKSIEKAMER. (BAKSTEEN
MET DIEPTE MINDER AS 1530)
INSPECTION CHAMBER.
(BRICK WORK LESS THAN 1530)

D10/AD



DOUBLE SEAL C.I. COVER AND FRAME TO BE SUPPLIED.
 DUBBEL SEËL G.Y. DEKSEL EN RAAM MOET VOORSIEN WORD.

COVER SLAB.
 DEK BLAD.

SHAFT
 SKAG

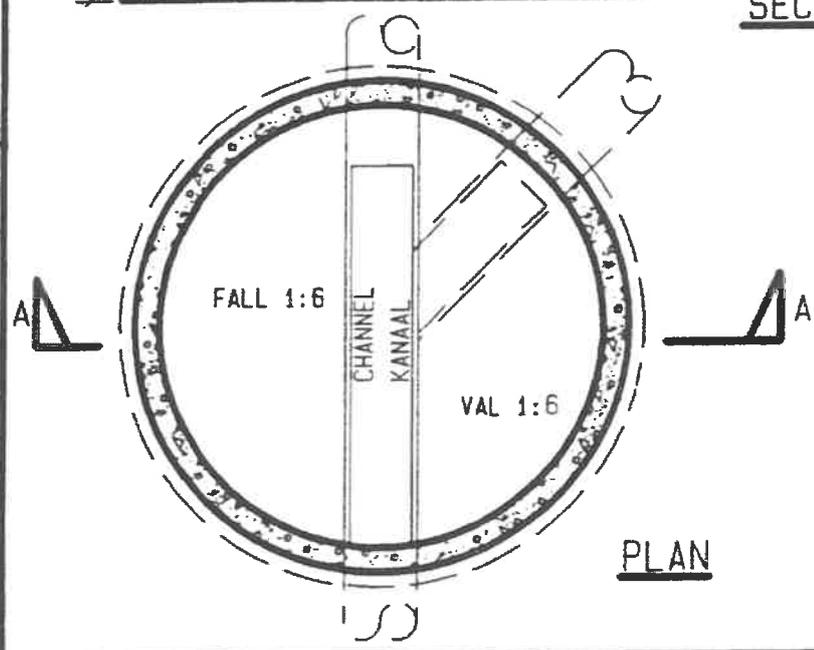
REDUCER SLAB.
 VERLOOP BLAD.

CHAMBER.
 KAMER.

BENCHING TO BE BROUGHT UP VERTICALLY TO TOP OF MAIN DRAIN PIPE AND THEN SLOPED UPWARDS AT 1:6 TOWARDS CHAMBER WALLS.

VULLING MOET VERTIKAAL TOT KRUIJ VAN PYP OPGEBOU WORD EN DAN MET HELLING VAN 1:6 SKUINS AFGEWERK WORD TOT BY I.K. MUUR.

SNIT A-A
SECTION A-A



NOTE
 CHAMBER CAN BE SUPPLIED WITH SLOTTED CUTOUTS AT THE BASE TO SUIT SEWERS AS REQUIRED.

NOTA
 KAMER KAN MET UITSNYDINGS OP BASIS VOORSIEN WORD VIR VERSKILLENE DEURSNEE PYPE SOOS BENODIG.

PLAN

GETEKEN. J. A. C. RABE
 DRAWN.
 NAGESIEN. *[Signature]*
 CHECKED.
 SKAAL. 1 : 20
 SCALE.

MANGATE (DIEPER AS 1 530)
 MANHOLES (OVER 1 530)

D110

450x600 G.Y. Deksel en raam.
450x600 C.I. Cover and frame.

Granolitiese afwerking.
Grano. finish.

Beton gevorm om G.Y. raam te neem.
Concrete rebated to take C.I. frame.

$Y = (3/4) \times (X)$
Vloei-vulling moet vertikaal tot top van pyp opgebou word en dan met helling van 1:6 skuins afgewerk word tot by I.K. muur.

Benching to be brought up vertically to top of main drain pipe and then sloped upwards at 1:6 towards chamber walls.

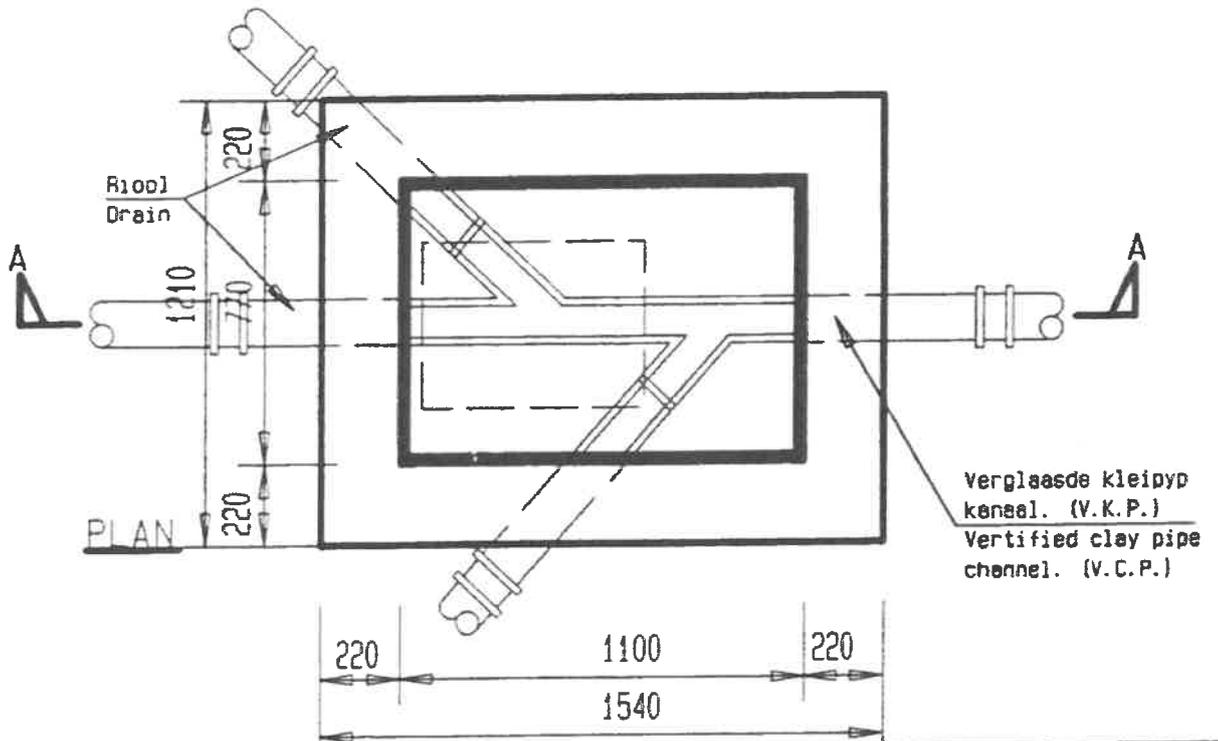
Riool
Drain

760x600 Opening.
760x600 Opening.

Hardgebakte stene met smel voë.
Hard brick with narrow joints.

150 Beton.
150 Concrete.

DEURSNEE A-A
SECTION A-A



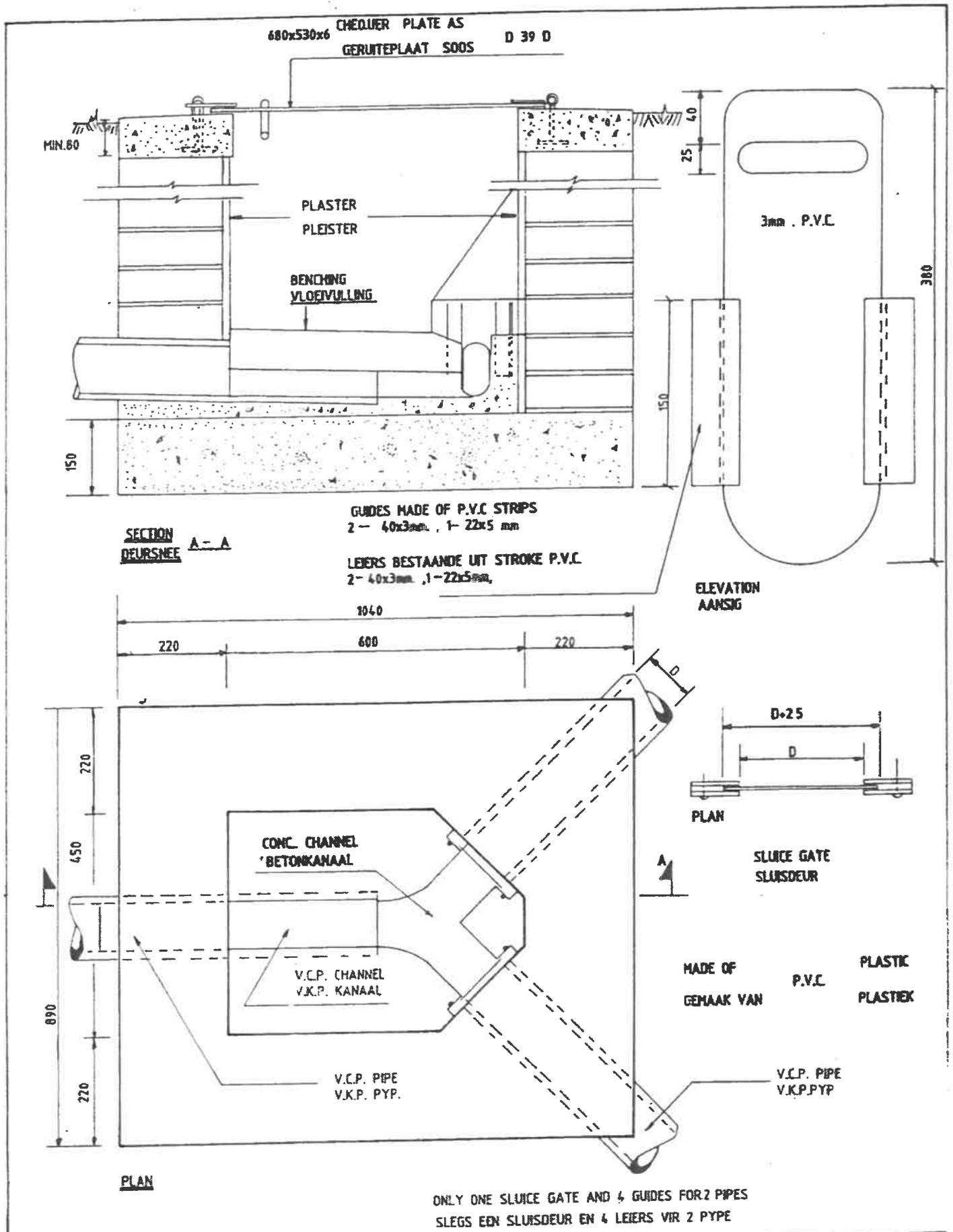
GETEKEN. J.A.C. RABE
DRAWN.

NAGESIEN.
CHECKED.

SKAAL. 1 : 20
SCALE.

MANGATE. (BAKSTEEN DIEPER
AS 1530)
MANHOLES. (BRICK WORK
OVER 1530)

D11/AD



GETEKEN.
DRAWN. S. CILLIERS

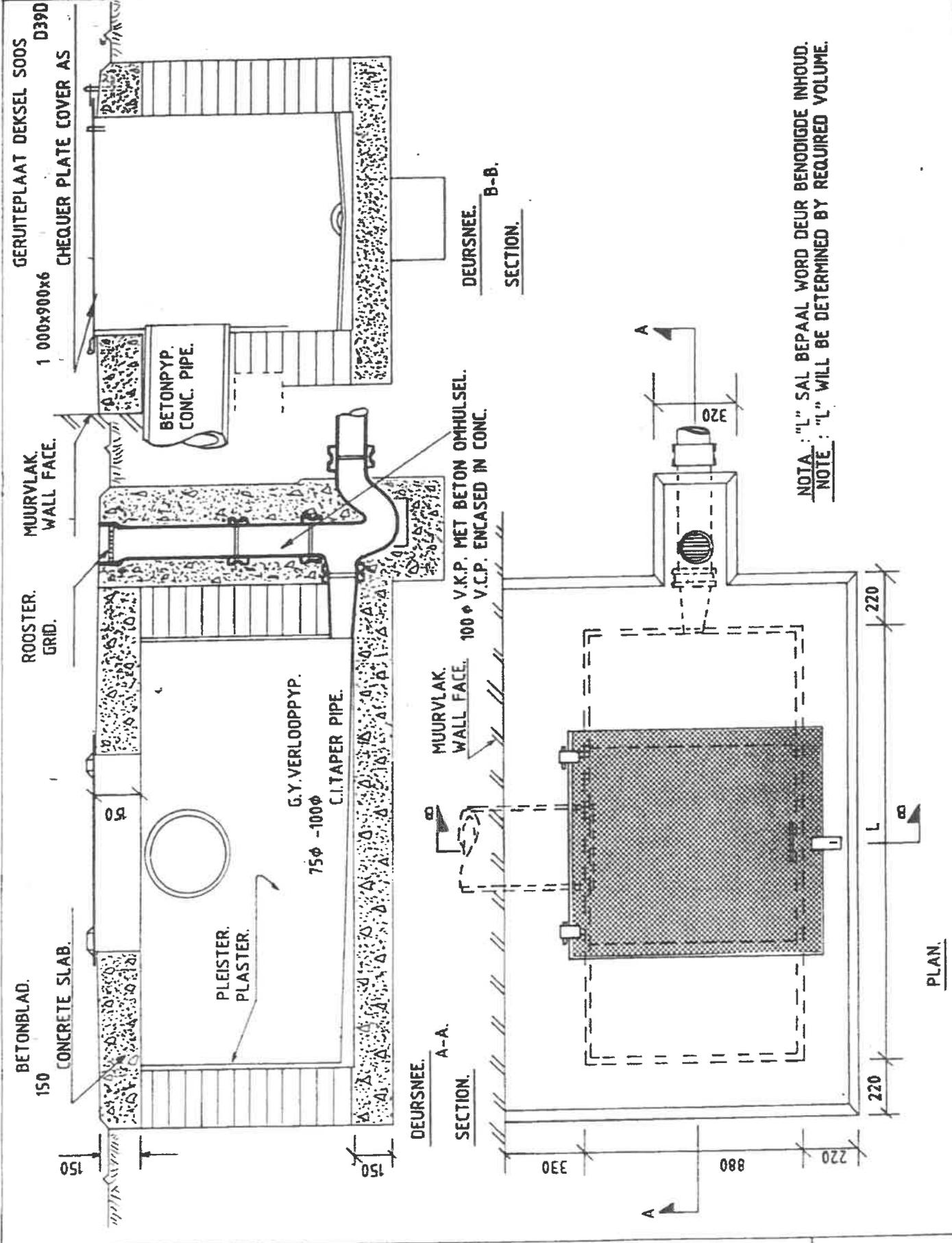
NAGESIEN.
CHECKED. *[Signature]*

SKAAL.
SCALE. 1:10

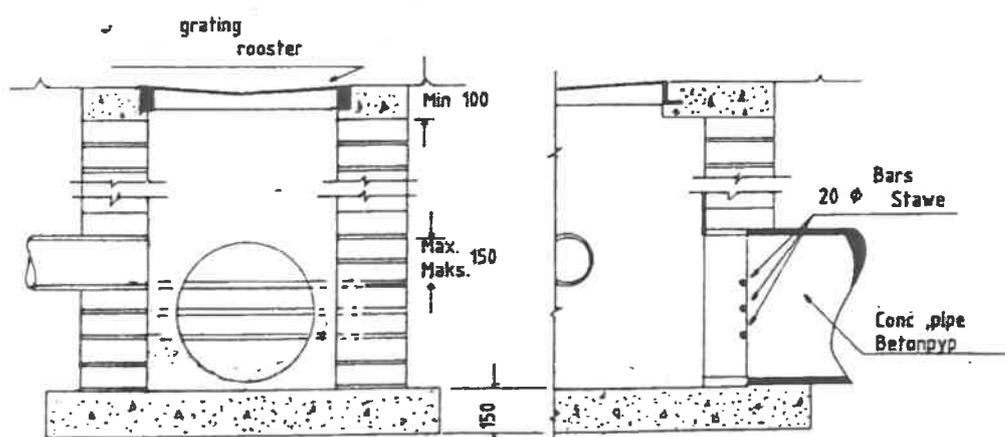
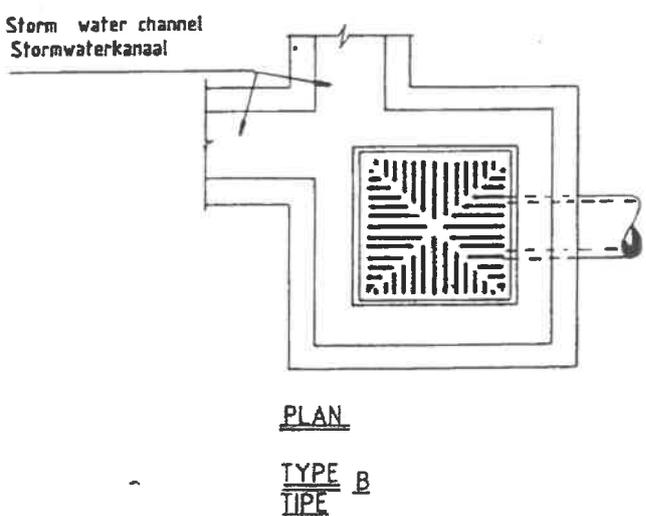
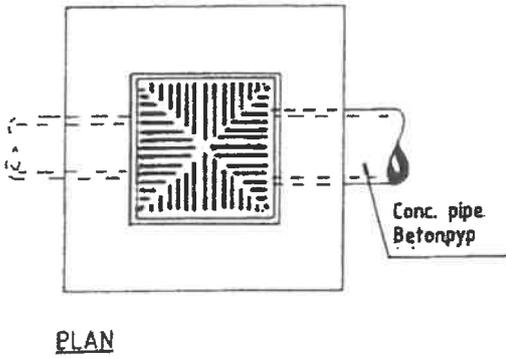
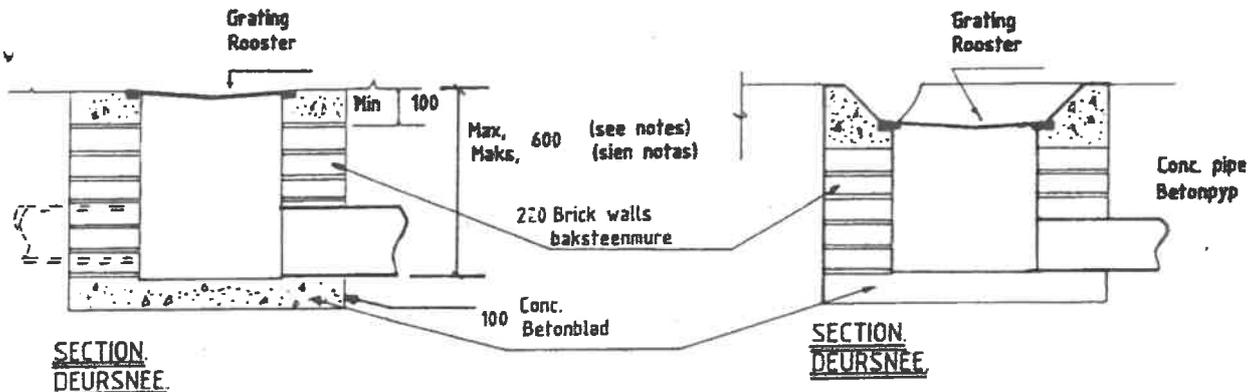
DEPARTEMENT. VAN OPENBARE WERKE
DEPARTMENT OF PUBLIC WORKS

CONTROL CHAMBER
KONTROLEKAMER

D 12 D



GETEKEN. DRAWN. M.J. PAPENHUYZEN.	DEPARTEMENT VAN OPENBARE WERKE DEPARTMENT OF PUBLIC WORKS	
NAGESIEN CHECKED <i>[Signature]</i>	EWENAARSTENK VIR WASHUIS. BALANCING TANK FOR LAUNDRY BLOCK.	D 13 D
SKAAL SCALE 1: 20		



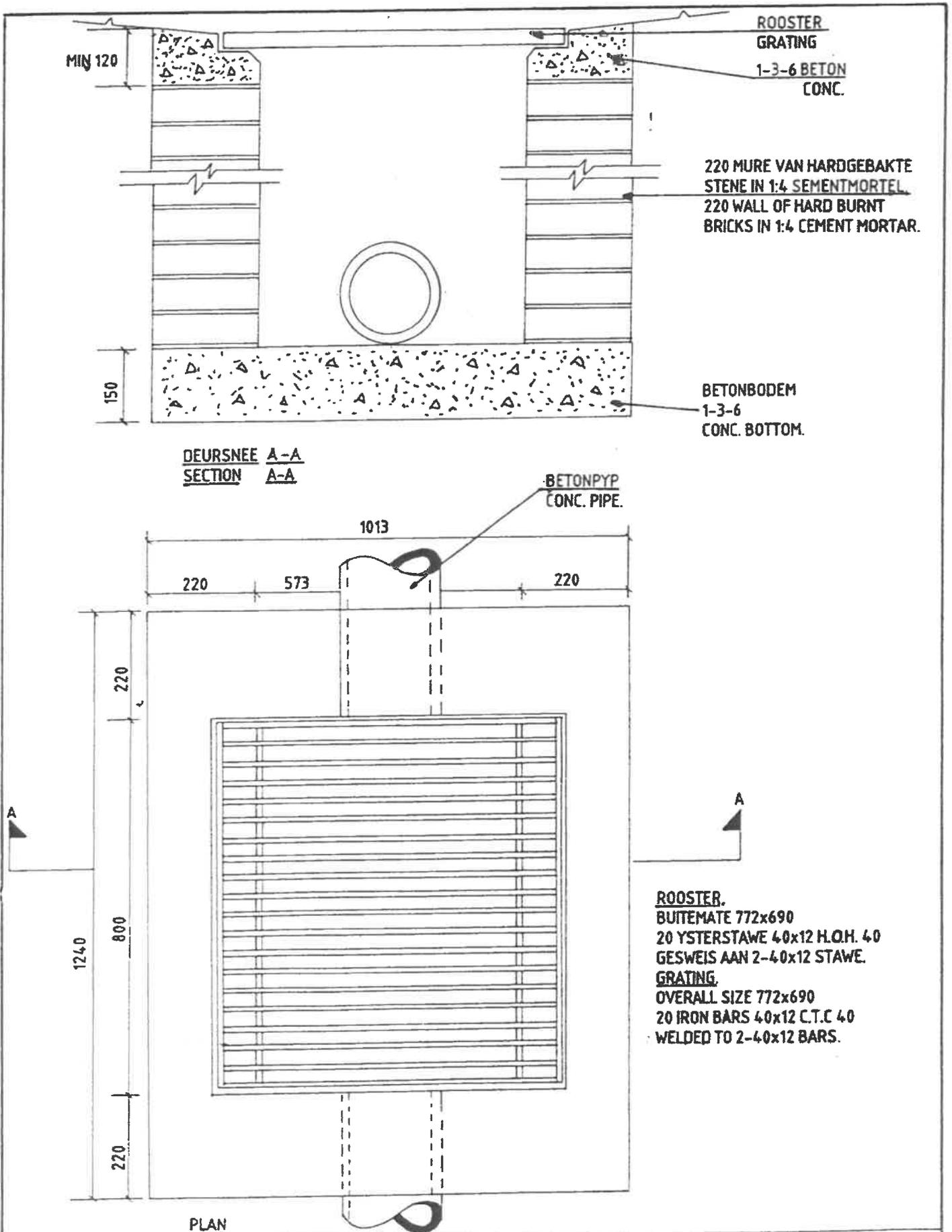
SECTION OF CATCHPITS WITH SECURITY BARS IN PRISON YARDS, FOR CONC. PIPES 380 Ø AND LARGER.
 DEURSNEE VAN VANGPUTTE MET VEILIGHEIDSSTAWE IN GEVANGENISBINNEPLASE, VIR BETONPYPE 380 Ø EN GROTER.

- GRATING SIZES.
ROOSTERMATES.**
- 300x300
 - 350x350
 - 380x380
 - 400x400
 - 450x450
 - 500x500
 - 600x600

NOTES:
 Catchpits under 600Ø deep:
 Inside dimensions of finished wall is equal to daylight sizes of C.I. frame.
 Catchpits 610 - 1 530 deep : (as D 10 D)
 Grating sizes to suit framework.
 Catchpits over 1.530 deep (as D11D)
 Grating sizes to suit framework.

NOTAS:
 Vangputte minder as 600 diep:
 Binnemate van afgewerkte mure is gelyk aan dagmate van G.Y. raam.
 Vangputte 610/1 530 diep (soos D 10 D)
 Roosterwerk moet by raamwerk pas.
 Vangputte dieper as 1 530: (soos D 11 D).
 Roostermate moet by raamwerk pas.

GETEKEN. DRAWN.	S. CILLIERS.		
NAGESIEN. CHECKED.	<i>[Signature]</i>	CATCHPITS. ——— TYPE A AND B	D 14 D
SKAAL. SCALE.	1:25	VANGPUTTE ——— TIEPE A EN B.	



GETEKEN.
DRAWN. JAC. RABE
NAGESIEN.
CHECKED. *[Signature]*
SKAAL.
SCALE. 1:10

VANGPUT TIPE C.
CATCHPIT TYPE C.

D150

STONE OR CONC. SLAB OVER CAVITY
KLIP OF BETONBLAD OOR HOLTE

FILLING
VULLING

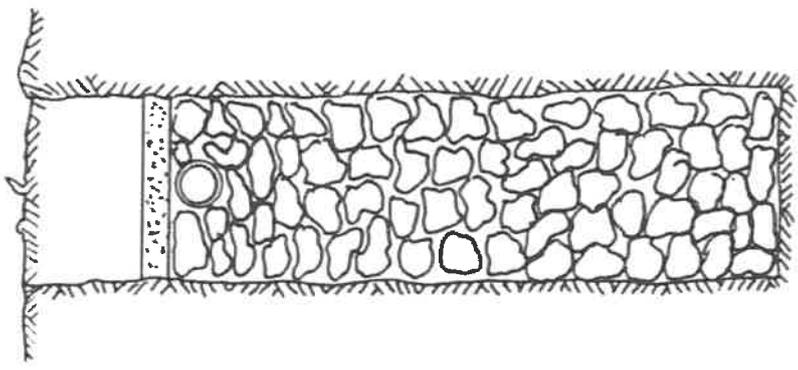
INLET PIPE
INLAATYP

THE DEPTH WILL DEPEND UPON
THE NATURE AND ABSORPTIVE
CAPACITY OF THE SOIL.

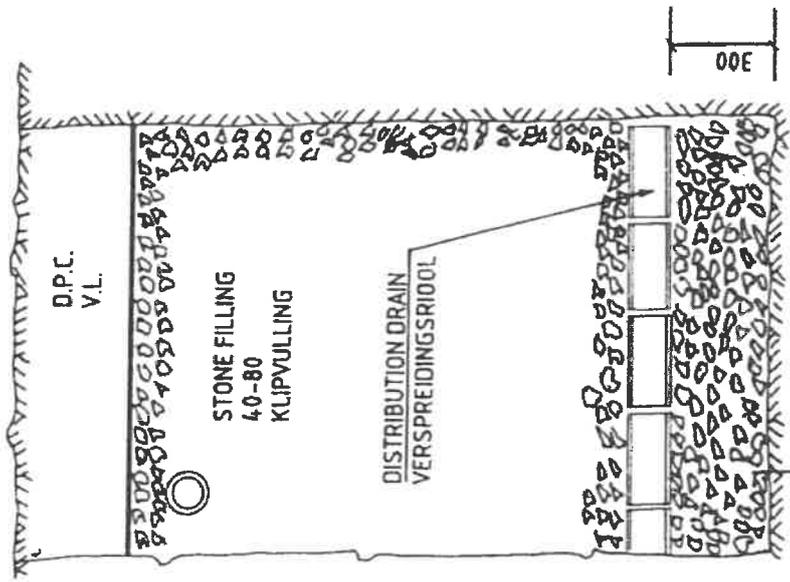
DIEPTE HANG AF VAN DIE TYP
EN ABSORBERVERMOE VAN DIE
GROND.

FORM CAVITY WITH ROUGH STONES,
DRY PACKED.

VORM HOLTE MET GROMME KLIPPE,
DROOG GEPAK.

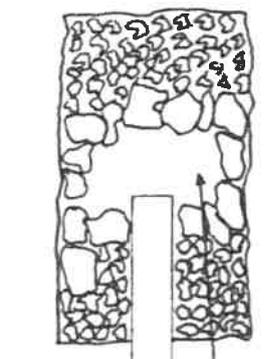
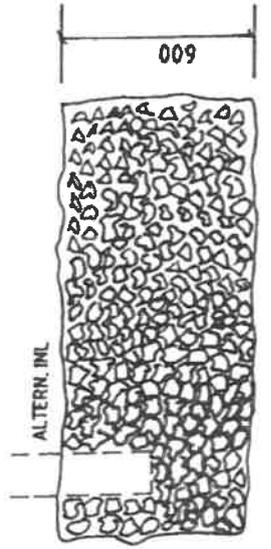


CROSS SECTION
DWARSDERSNEE



AGRICULTURAL PIPES WITH OPEN JOINTS.
SUGRIOOLTYPE MET OOP VOEG

LONGITUDINAL SECTION
LANGDEURSNEE



PLAN

INLET PIPE
INLAATYP

CAVITY

HOLE

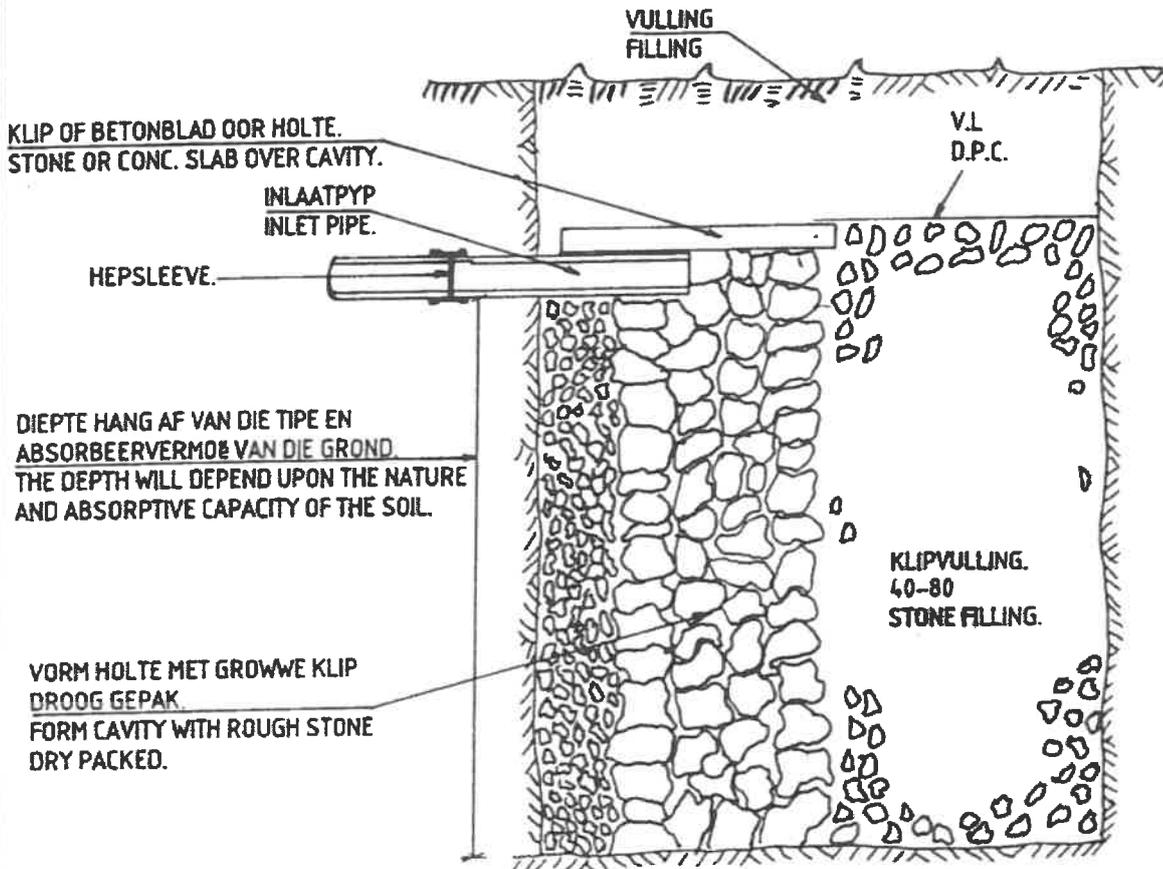
GETEKEN.
DRAWN. JAC. RABE

NABESIEN.
CHECKED. *JCR*

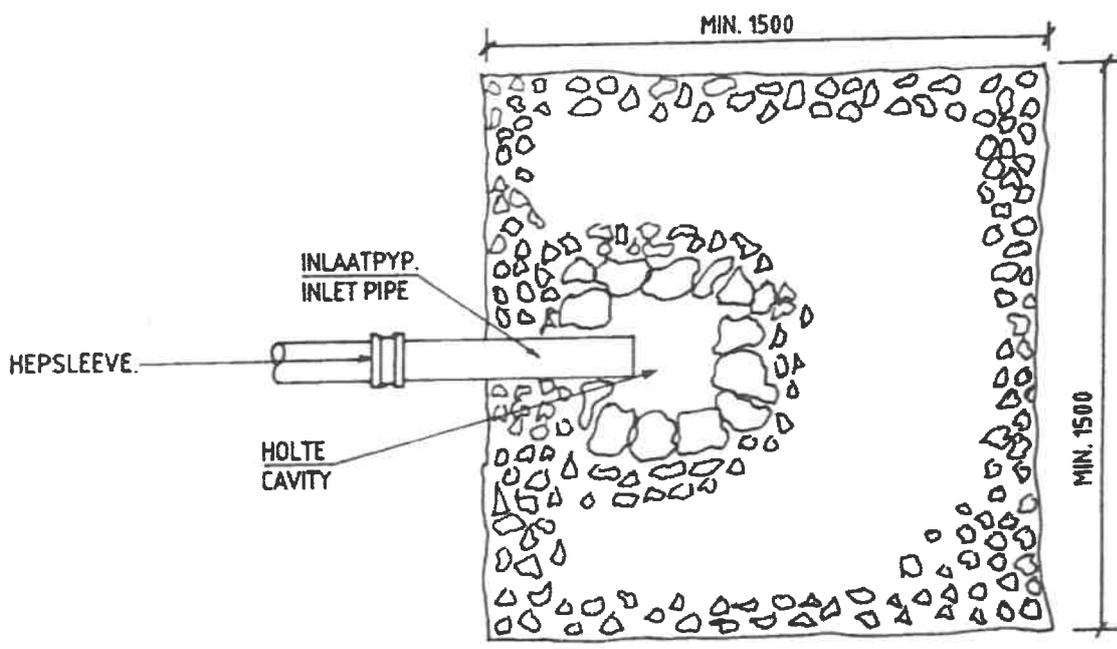
SKAAL.
SCALE. 1:20

STAFEL RIJOL
FRENCH DRAIN

D160

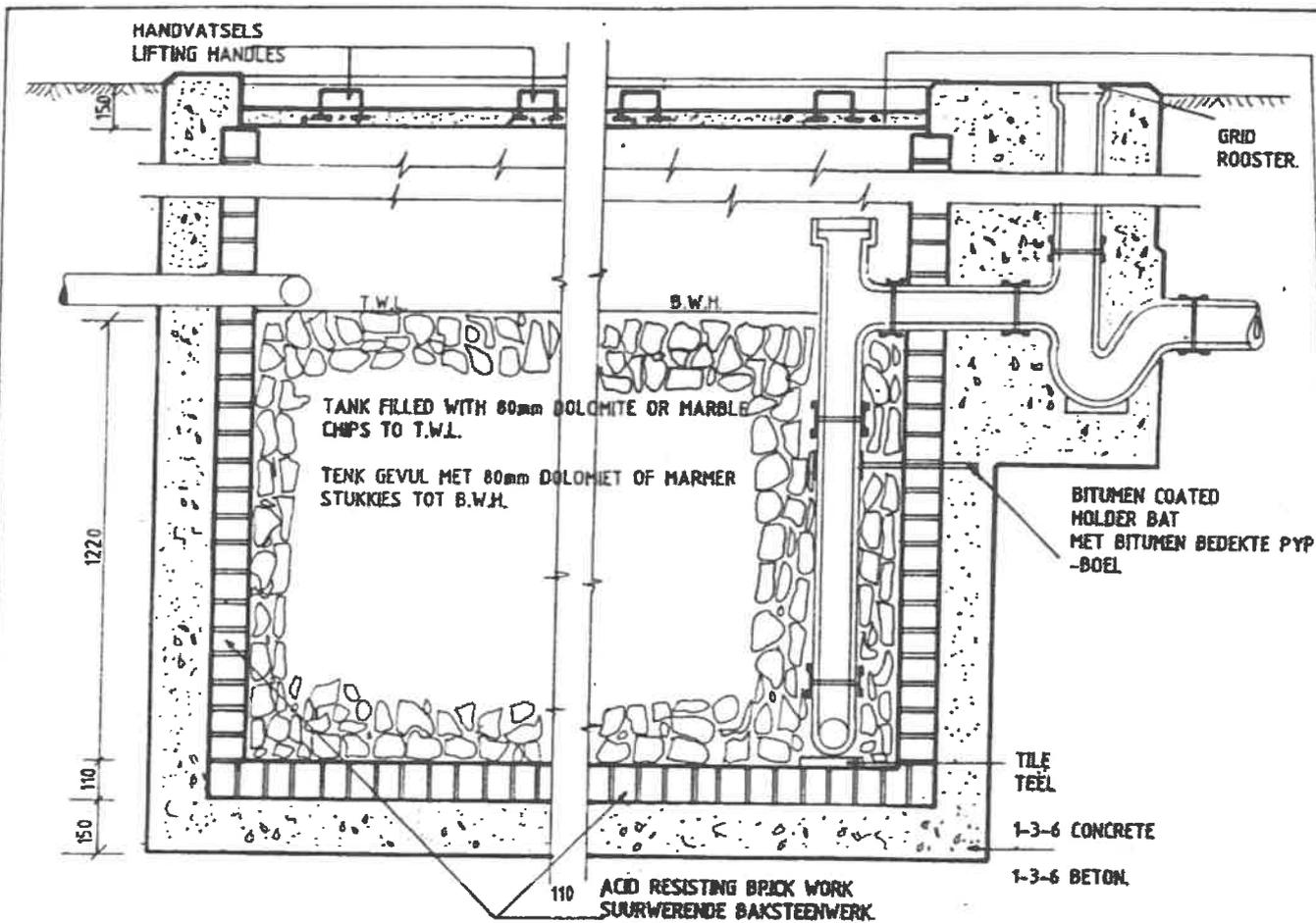


DEURSNEE SECTION



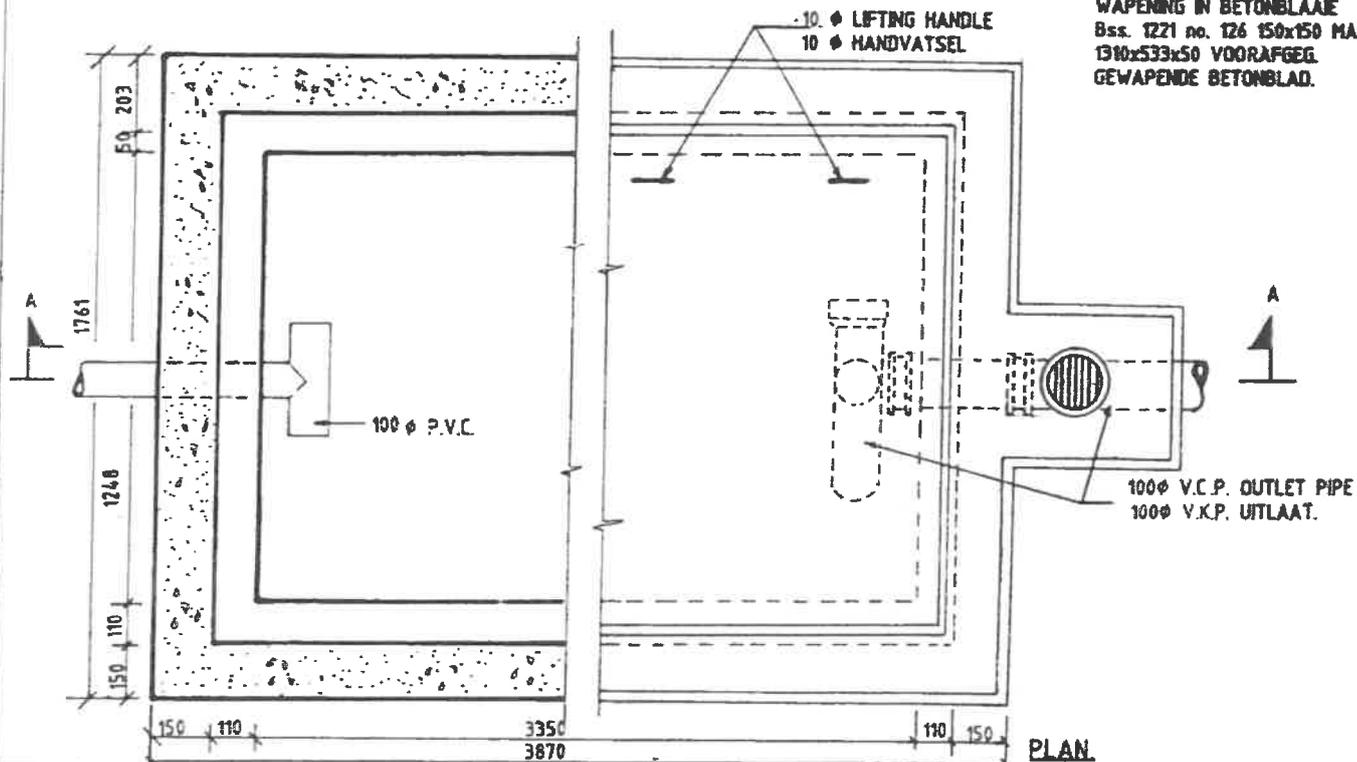
PLAN

GETEKEN. DRAWN. JAC. RABE		
NAGESIEN. CHECKED. <i>[Signature]</i>	SYFERPUT SOAKAGE PIT	D17D
SKAAL. SCALE. 1:20		



SECTION A-A
DEURSNEE A-A

REINFORCEMENT IN CONC SLABS
Bss. 1221 NO. 126 150x150 MESH.
1310x533x50 PRECAST REINFORCED
CONC. SLAB
WAPENING IN BETONBLAAE
Bss. 1221 no. 126 150x150 MAAS.
1310x533x50 VOORAFGEG.
GEWAPENDE BETONBLAD.



GETEKEN.
DRAWN. S.P. CILLIERS.

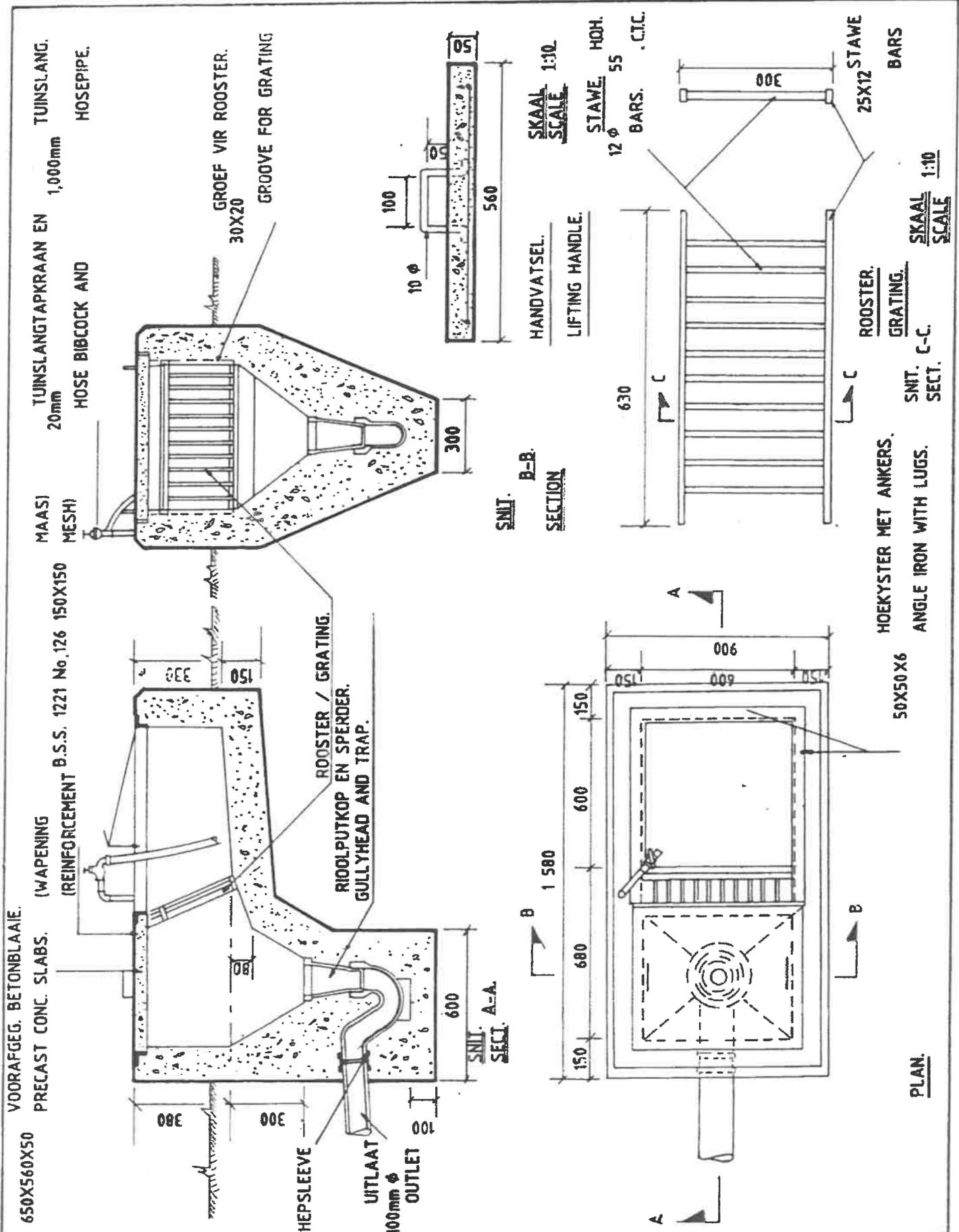
NAGESIEN.
CHECKED.

SKAAL.
SCALE. 1:20

DEPARTEMENT VAN OPENBARE WERKE
DEPARTMENT OF PUBLIC WORKS

ACID NEUTRALIZING TANK.
SUUR NEUTRALISERINGSTENK.

D18D



GETEKEN.
 DRAWN **S.P. CILLIERS**

NAGESIEN
 CHECKED *[Signature]*

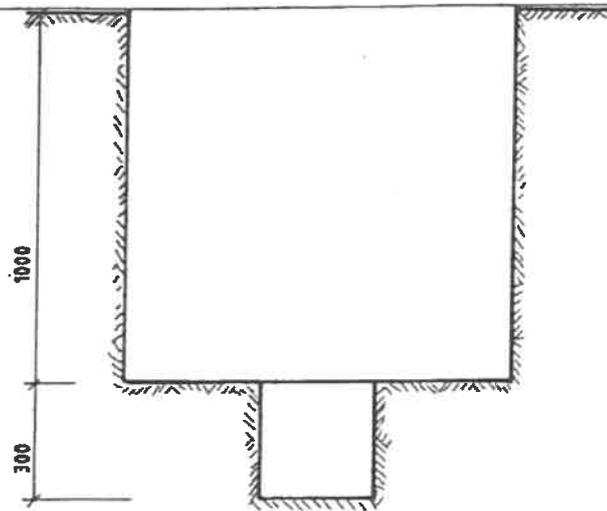
SKAAL
 SCALE **1:20**

DEPARTEMENT VAN OPENBARE WERKE
 DEPARTMENT OF PUBLIC WORKS

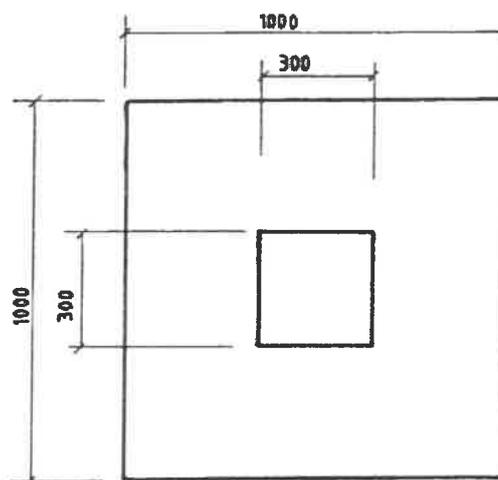
STORTINGSPUT.
DUMPING PIT.

D 19 D

THE 300x300mm TEST HOLE IS TO BE THOROUGHLY SOAKED BY FILLING IT WITH WATER TO A DEPTH OF 300mm. THIS WATER LEVEL MUST BE MAINTAINED FOR AT LEAST 4 HOURS BY CONSTANTLY ADDING WATER IMMEDIATELY AFTER THIS INITIAL SOAKING AND WITH THE WATER LEVEL STILL AT THE REQUIRED DEPTH, (NO FURTHER WATER IS TO BE ADDED AFTER THIS) THE DROP IN THE WATER SURFACE MUST BE OBSERVED FOR A PERIOD OF 30 MINUTES, THEN MEASURED. FROM THESE OBSERVATIONS THE AVERAGE TIME FOR THE WATER TO DROP 25mm CAN BE CALCULATED AND THE LENGTH OF THE FRENCH DRAIN DETERMINED FROM THE TABLE BELOW.



SECTION.



PLAN.

AVERAGE TIME TAKEN FOR WATER TO DROP 25mm IN 300x300x300 HOLE.	COMMENTS.	LENGTH OF FRENCH DRAIN PER PERSON. DEPTH 1.5 m BELOW INVERT OF INLET PIPE. (DOMESTIC SEWAGE EFFLUENT INCLUDING WASTE WATER.)
15 SECONDS OR LESS.	EXCELLENT.	300 mm
30 SECONDS OR LESS.	VERY GOOD	450 mm
1 MINUTE	GOOD	600 mm
2 MINUTE	GOOD	750 mm
3 MINUTE	GOOD	1,1 m
4 MINUTE	GOOD	1,4 m
5 MINUTE	GOOD	1,55 m
10 MINUTE	FAIR	1,8 m
15 MINUTE	FAIR	2,3 m
30 MINUTE	TIGHT	3 m
60 MINUTE	BAD	4,5 m

GETEKEN.
DRAWN S.P. CILLIERS.

DEPARTEMENT VAN OPENBARE WERKE
DEPARTMENT OF PUBLIC WORKS

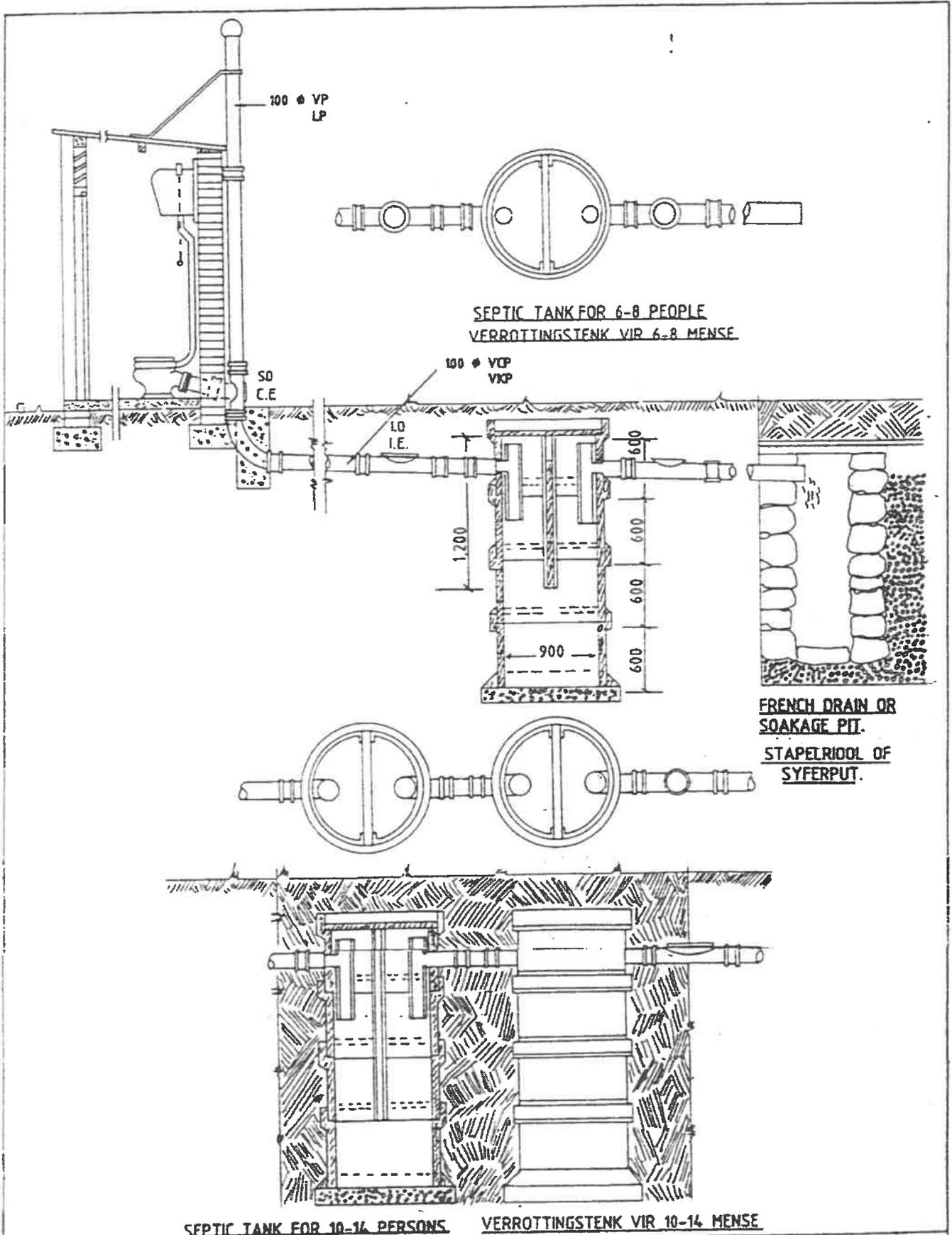
NAGESIEN
CHECKED

ABSORPTION TEST HOLE.

D20D

SKAAL
SCALE 1:25

WEGSYFER TOETSGAT



GETEKEN. DRAWN. S.P. CILLIERS	DEPARTEMENT VAN OPENBARE WERKE DEPARTMENT OF PUBLIC WORKS	
NAGESIEN. CHECKED. <i>[Signature]</i>	PREFABRICATED CIRCULAR SEPTIC TANKS.	D210
SKAAL. SCALE 1:20	VOORAFVERVAARDIGE RONDE VERROTINGSTENK.	

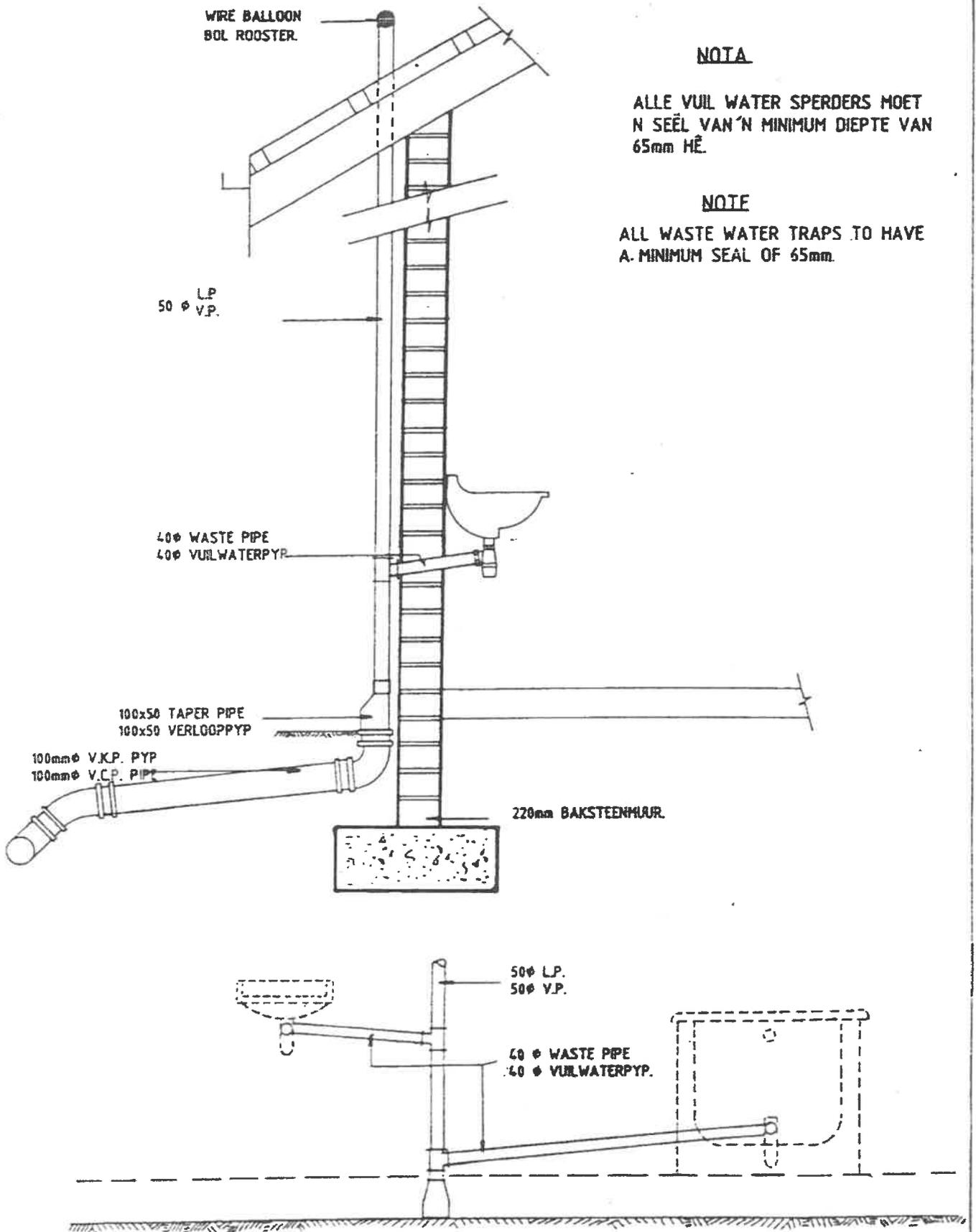
WIRE BALLOON
BOL ROOSTER.

NOTA

ALLE VUIL WATER SPERDERS MOET
N SEËL VAN 'N MINIMUM DIEPTE VAN
65mm HË.

NOTE

ALL WASTE WATER TRAPS TO HAVE
A MINIMUM SEAL OF 65mm.



GETEKEN.
DRAWN. S.P. CILLIERS.

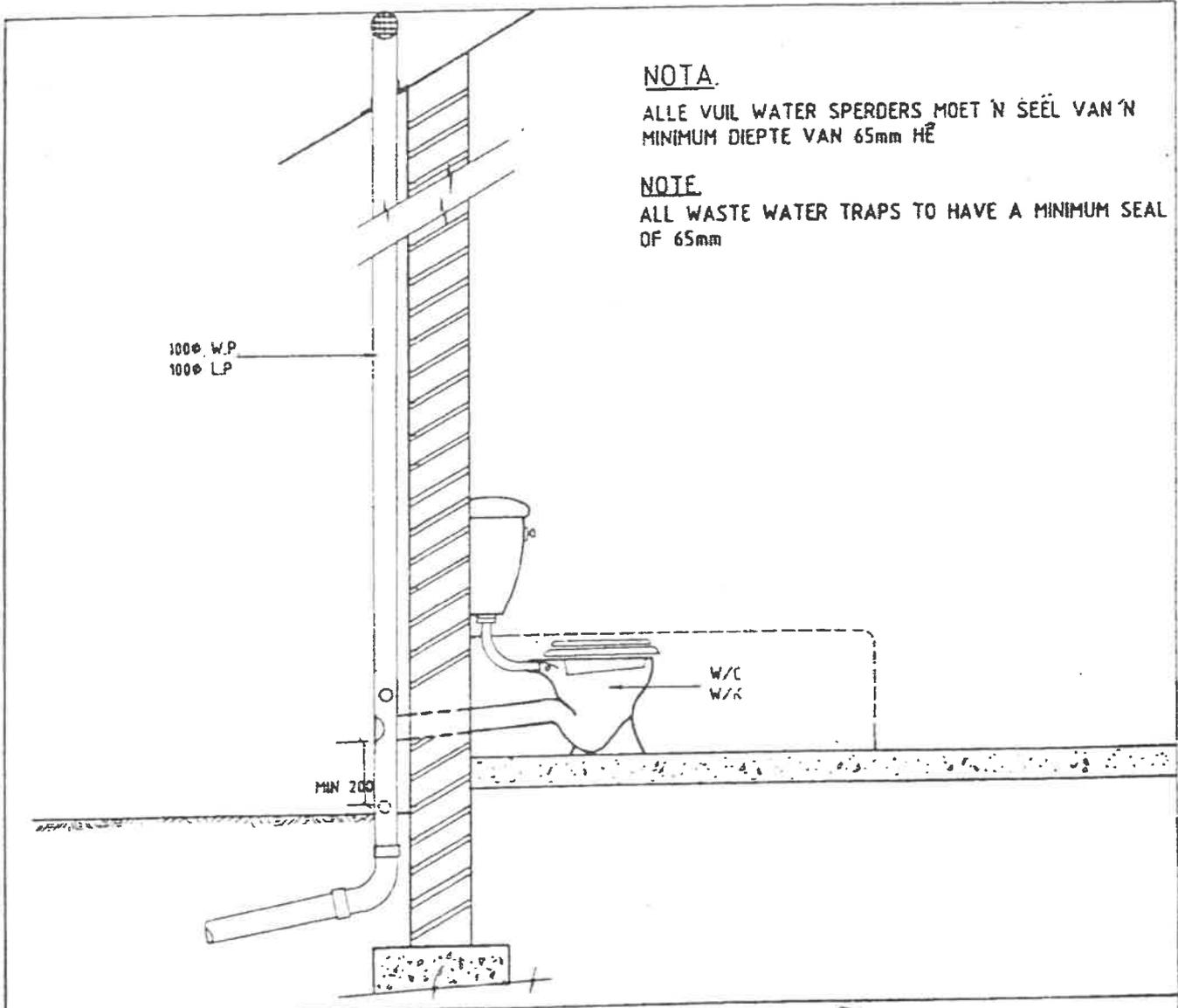
DEPARTEMENT VAN OPENBARE WERKE
DEPARTMENT OF PUBLIC WORKS

NAGESIEN
CHECKED *[Signature]*

TIPIESE VUILWATERPYP AANSLUITING MET
RIOOL.
TYPICAL WASTE PIPE CONNECTION TO DRAIN.

SKAAL.
SCALE. N.V.S.

D22(A)D

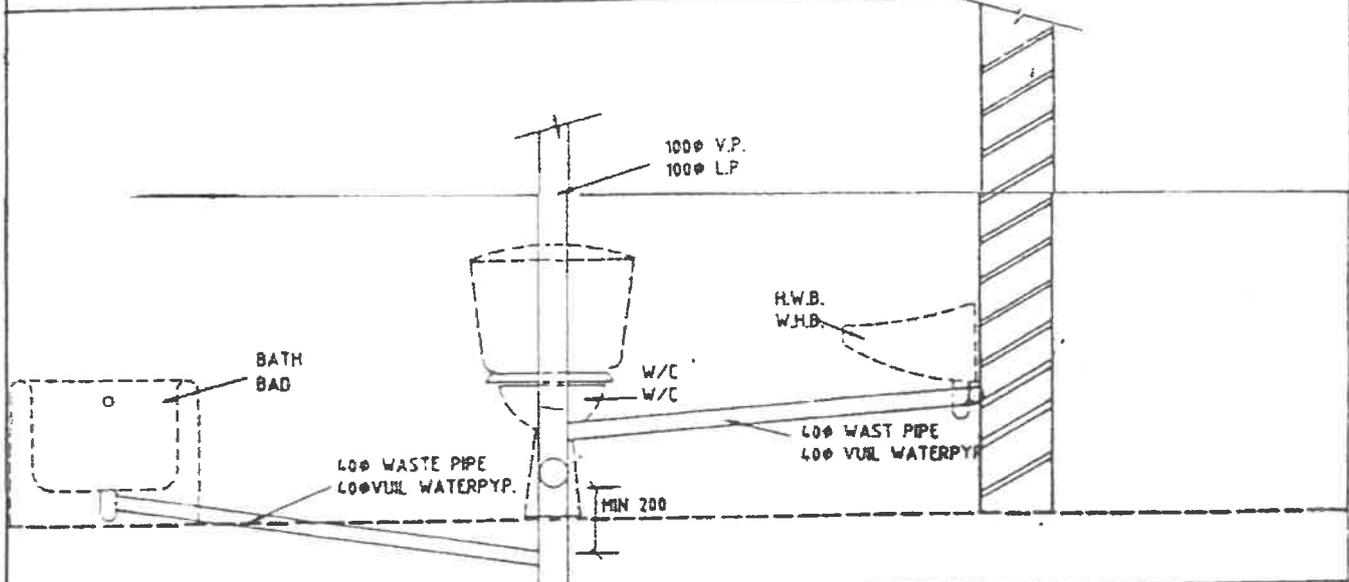


NOTA.

ALLE VUIL WATER SPEDERS MOET 'N SEËL VAN 'N MINIMUM DIEPTE VAN 65mm HË

NOTE.

ALL WASTE WATER TRAPS TO HAVE A MINIMUM SEAL OF 65mm

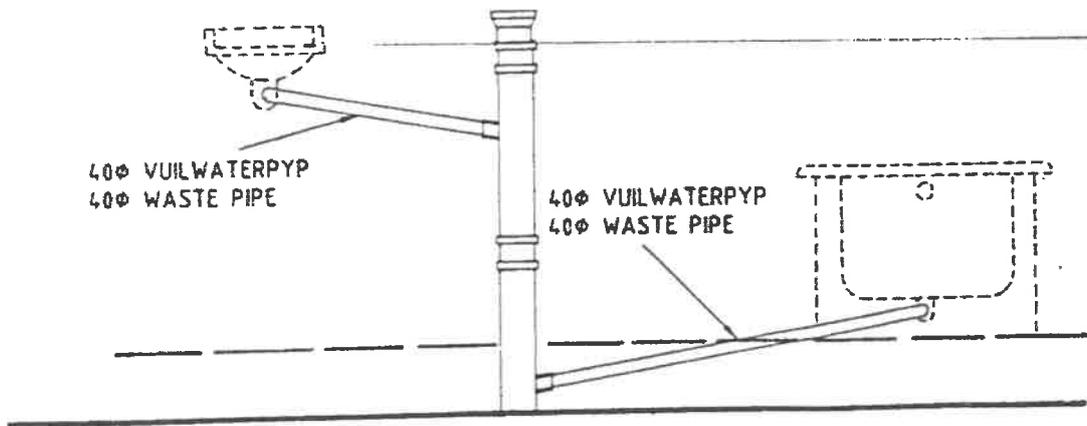
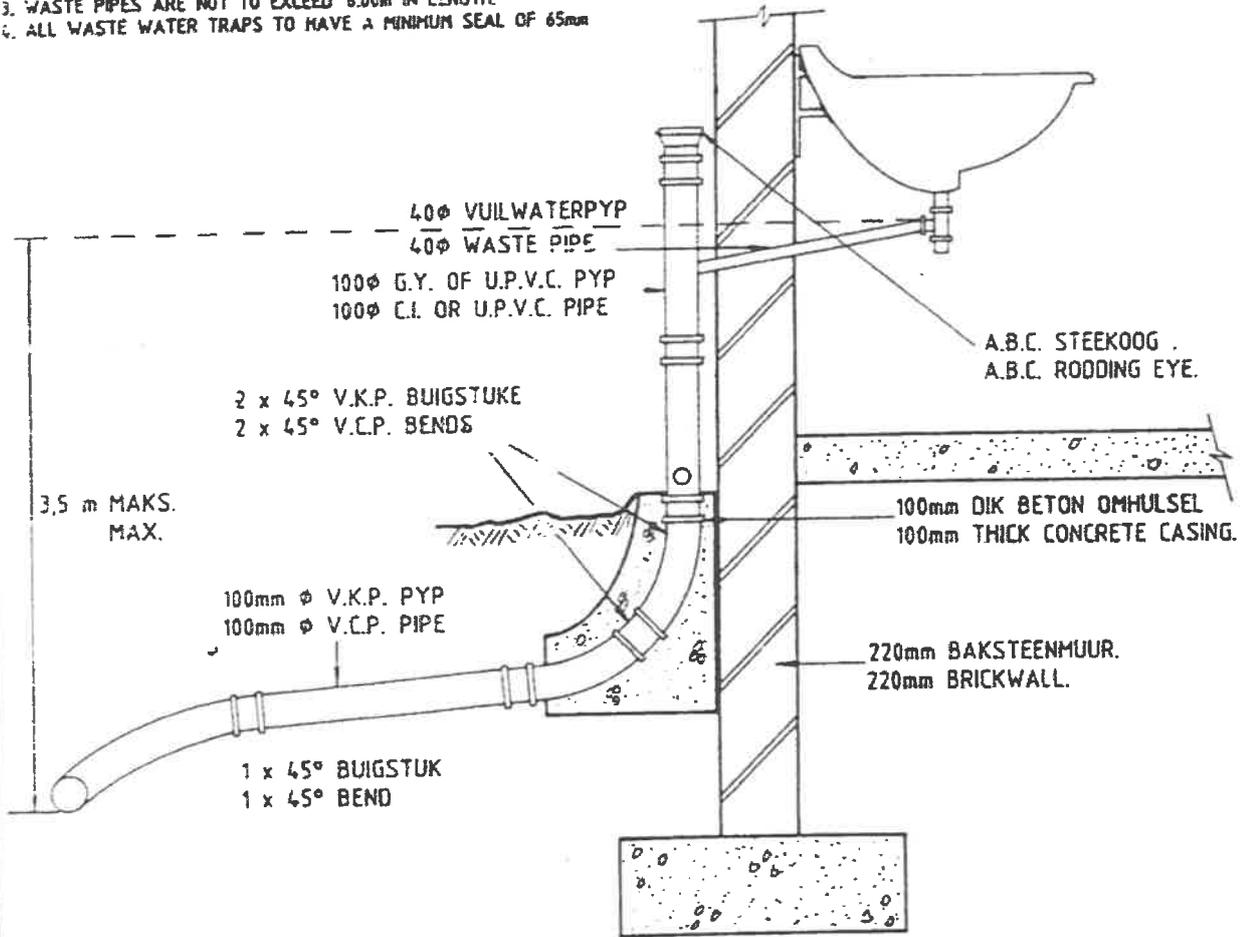


GETEKEN DRAWN S.P. CILLIERS	DEPARTEMENT VAN OPENBARE WERKE DEPARTMENT OF PUBLIC WORKS	
NAGESIEN CHECKED <i>[Signature]</i>	TPIESE AANSLUITING MET RIOOL. TYPICAL CONNECTION TO DRAIN.	022(B)D
SKAAL SCALE 1:20		

NOTAS : NOTES.

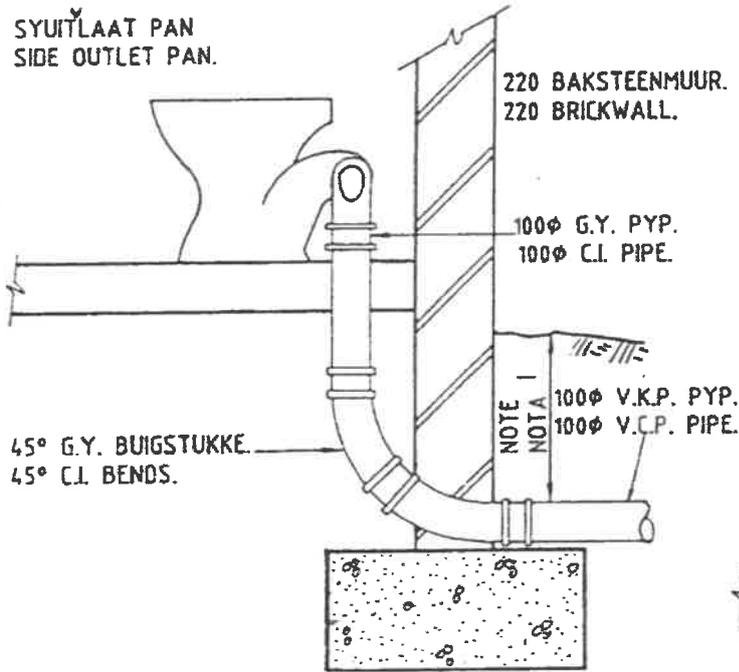
1. ALLE VUILWATERPYPE MOET 40φ WEES EN TEEN N' HELLING VAN 1 : 25 GELE WOrd.
2. INDIEN DIE AFSTAND TUSSEN DIE BOONSTE AANSLUITING EN DIE INLOOP VLAK VAN DIE TAK RIOOL 3.5m OORSKRY MOET DAAR TERUGGEKEER WOrd NA TEKENING D22(A)D
3. VUILWATERPYPE MOET NIE 6.00m IN LENGTE OORSKRY NIE.
4. ALLE VUILWATER SPERDERS MOET N' SEEL VAN N' MINIMUM DIEPTE VAN 65mm HE.

1. ALL WASTE PIPES TO BE 40φ LAID AT A GRADIENT OF 1 : 25.
2. IF THE DISTANCE OF THE UPPERMOST CONNECTION AND THE INVERT LEVEL OF THE BRANCH DRAIN EXCEEDS 3.5m THEN REVERT TO TYPE DRAWING D22(A)D.
3. WASTE PIPES ARE NOT TO EXCEED 6.00m IN LENGTH.
4. ALL WASTE WATER TRAPS TO HAVE A MINIMUM SEAL OF 65mm



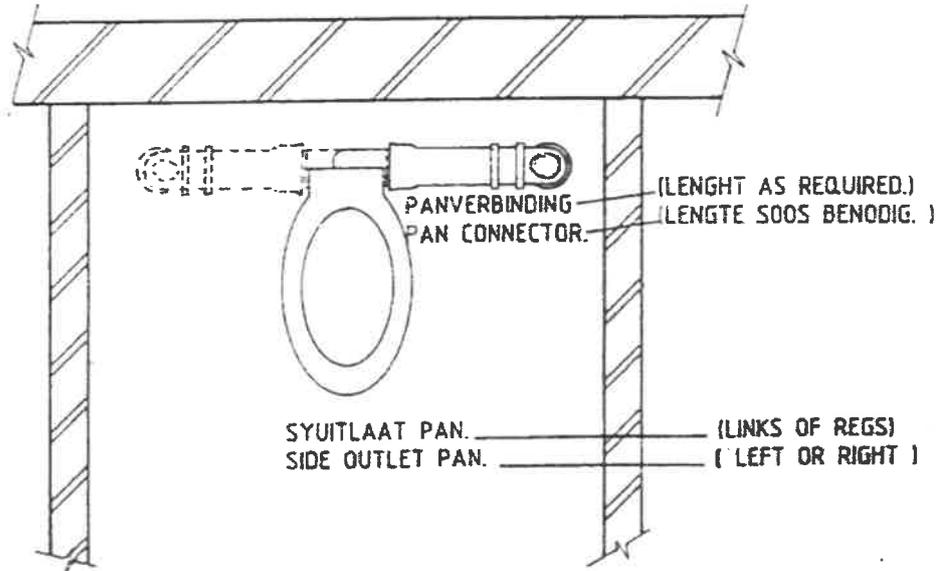
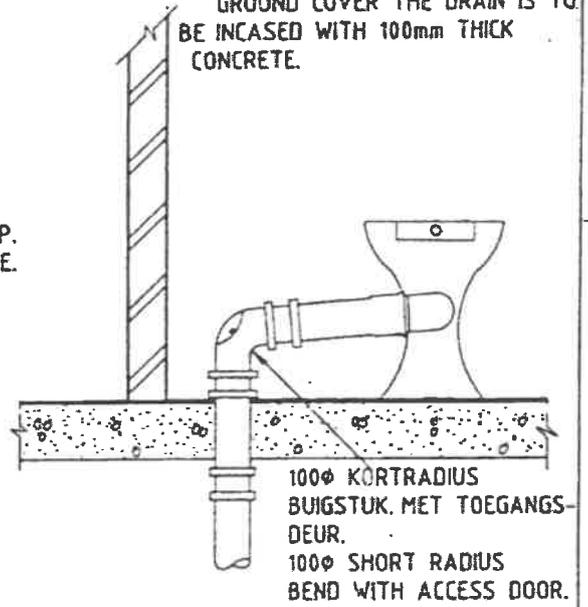
GETEKEN DRAWN M.C. BOTHA.	DEPARTEMENT VAN OPENBARE WERKE DEPARTMENT OF PUBLIC WORKS	D22(C)D
NAGESIEN CHECKED <i>[Signature]</i>	TIPIESE VUILWATERPYPE AANSLUITING MET RIOOL	
SKAAL SCALE 1 : 20	TYPICAL WASTE PIPE CONNECTION TO DRAIN.	

SYUITLAAT PAN
SIDE OUTLET PAN.



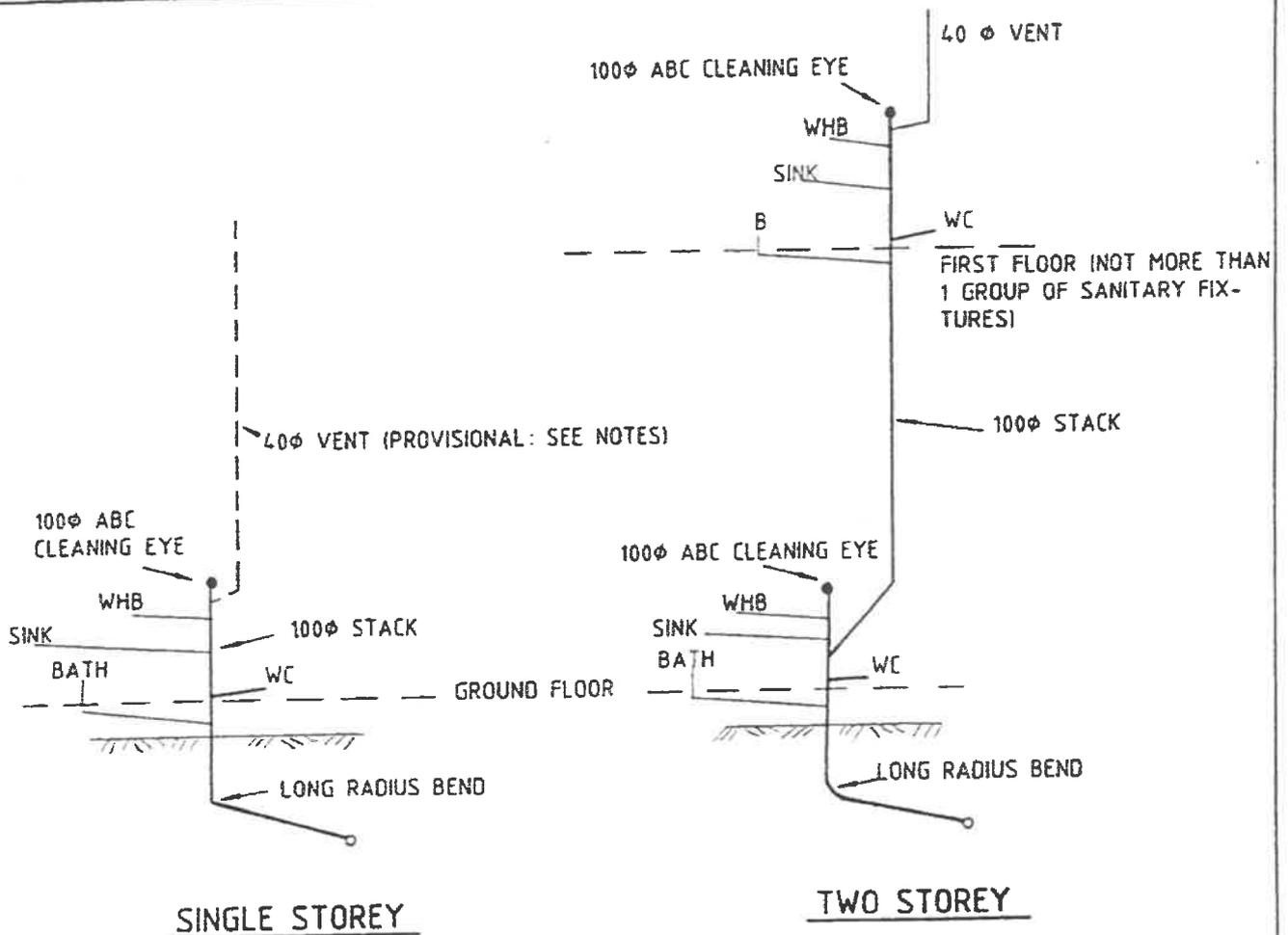
NOTAS - NOTES.

- I. INDIEN MINDER AS 300mm GROND DEKKING MOET RIOOLPYP OMHUL WORD MET 100mm DIK BETON.
- I. IF THERE IS LESS THAN 300mm GROUND COVER THE DRAIN IS TO BE INCASED WITH 100mm THICK CONCRETE.



THIS TYPE OF CONNECTION MUST BE USED IN LIEU OF AN "S" TRAP WHICH IS NOT PERMITTED.
HIERDIE TIEPE AANSLUITING MOET GEBRUIK WORD IN PLEK VAN N' "S" SPERDER WAT NIE TOEGELAAT WORD NIE.

GETEKEN DRAWN	M.C. BOTHA.	DEPARTEMENT VAN OPENBARE WERKE DEPARTMENT OF PUBLIC WORKS	D22(D)D
NAGESIEN CHECKED	<i>[Signature]</i>	TIPIESE W.K. AANSLUITING. TYPICAL W.C. CONNECTION.	
SKAAL SCALE	1 - 20		



NOTES.

1. ALL WASTE PIPES TO BE 40φ LAID AT A GRADIENT OF 1:25
2. THE CROWN OF THE W.C. TRAP MAY NOT BE MORE THAN 1,5 m ABOVE THE DRAIN INVERT.
3. THE HIGHEST WASTE PIPE CONNECTION TO THE STUB STACK MAY NOT BE MORE THAN 2m ABOVE THE DRAIN INVERT.
4. NOT MORE THAN ONE GROUP OF SANITARY FIXTURES ON GROUND FLOOR.
5. SHOULD ANY OF THE REQUIREMENTS IN 2 TO 4 BE EXCEEDED THEN A 40φ VENTILATION PIPE MUST BE PROVIDED.
6. WASTE PIPES MAY NOT EXCEED 5m IN LENGTH.
7. NO CONNECTION TO THE STACK MAY BE MADE BETWEEN THE CENTRE LINE OF THE W.C. CONNECTION AND 200mm BELOW.
8. EACH FITTING MUST BE SEPARATELY CONNECTED TO THE STUBSTACK.
9. ALL WASTE FITTINGS ARE TO BE FITTED WITH DEEP SEAL TRAPS (75mm)
10. W.C. AND FLOOR OUTLETS MUST BE WITHIN 3m OF THE STUBSTACK. BATHS, BASINS, SINKS, SHOWERS, URINALS AND WASH TROUGHS MUST BE WITHIN 5m.

GETEKEN DRAWN	J.C. MINNIE	DEPARTEMENT VAN OPENBARE WERKE DEPARTMENT OF PUBLIC WORKS	D22(E)D
NAGESIEN CHECKED	<i>[Signature]</i>	STUB STACK SYSTEM	
SKAAL SCALE		(TWO STOREY MAXIMUM)	

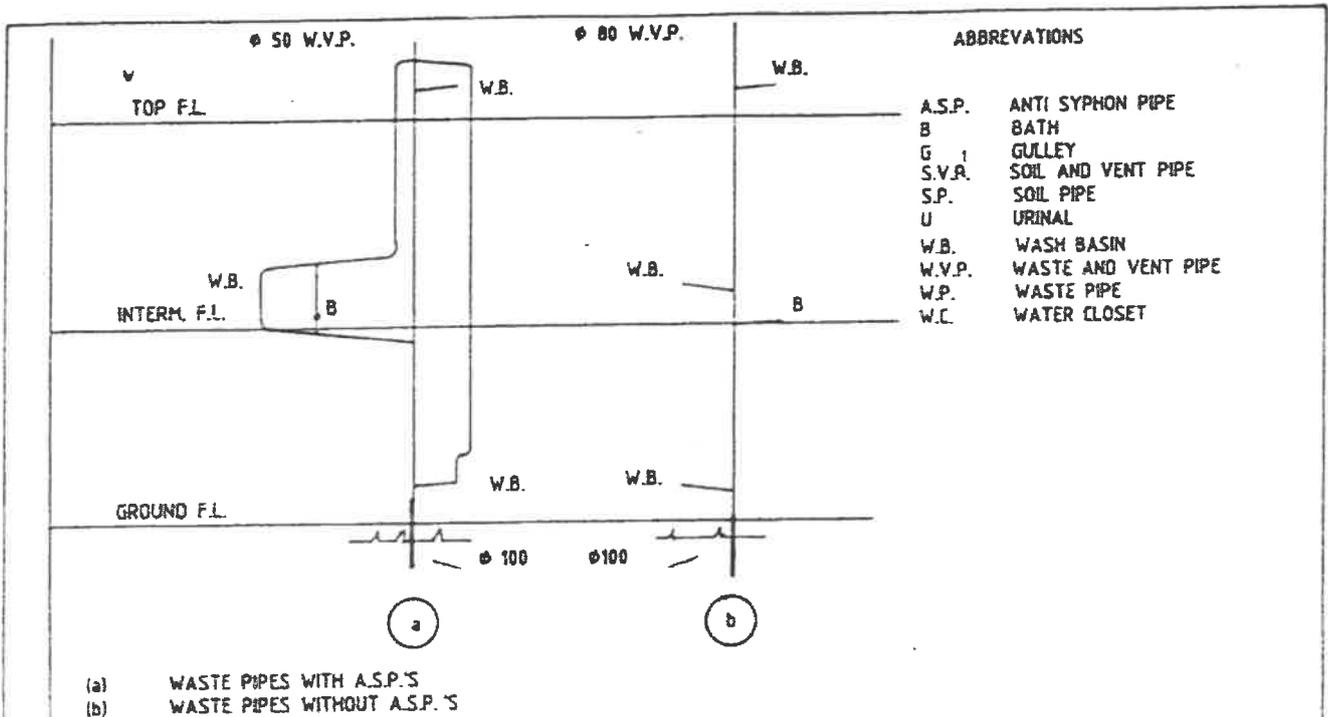
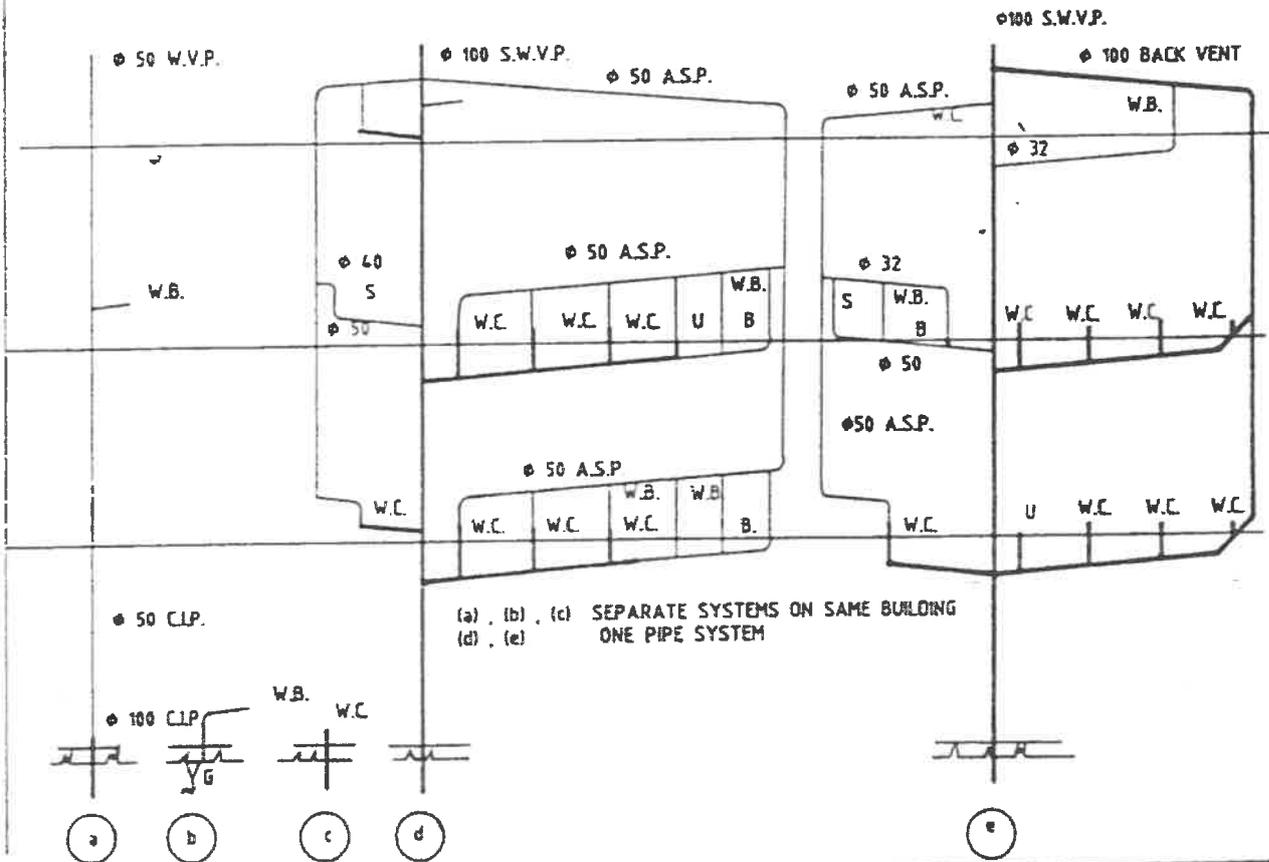
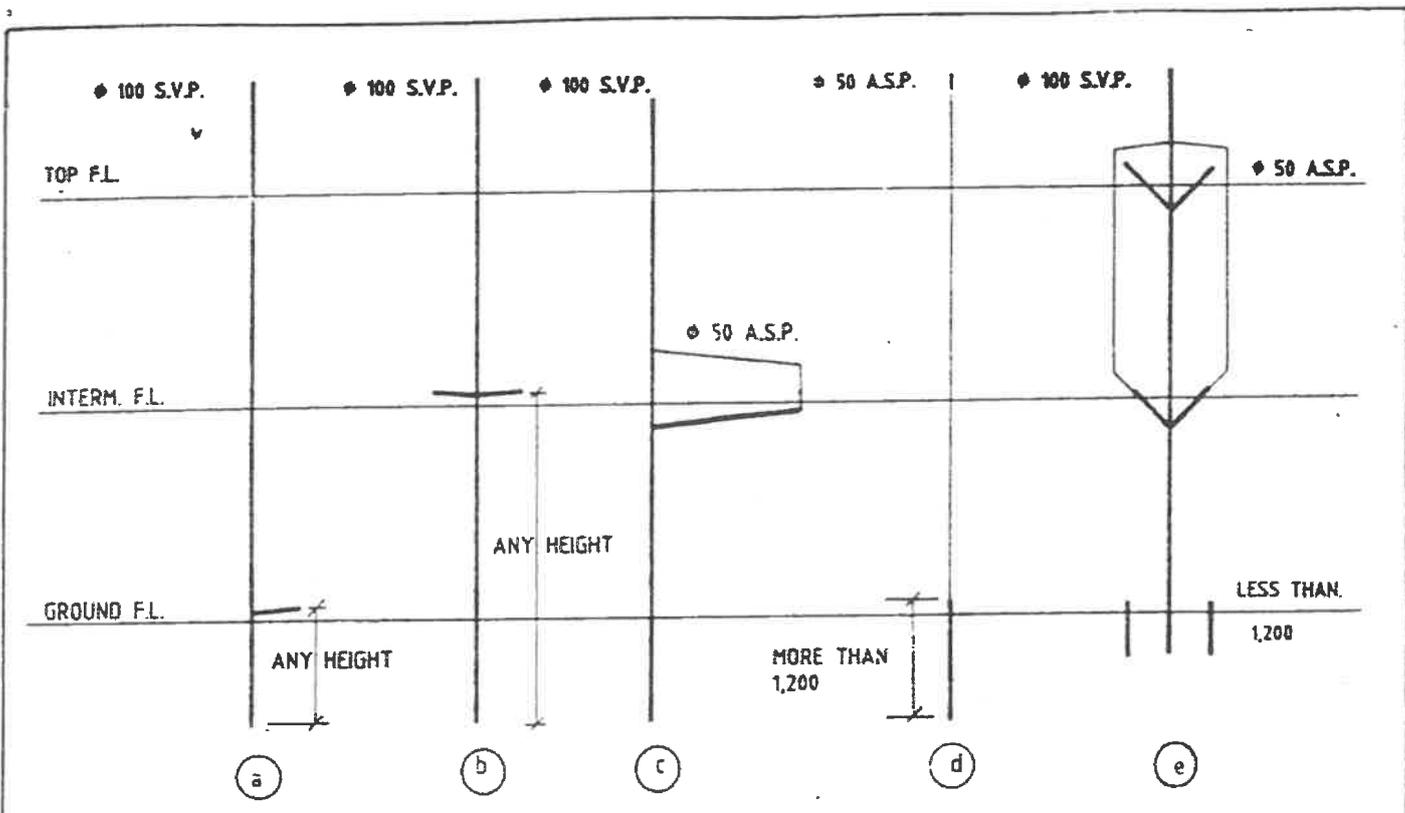


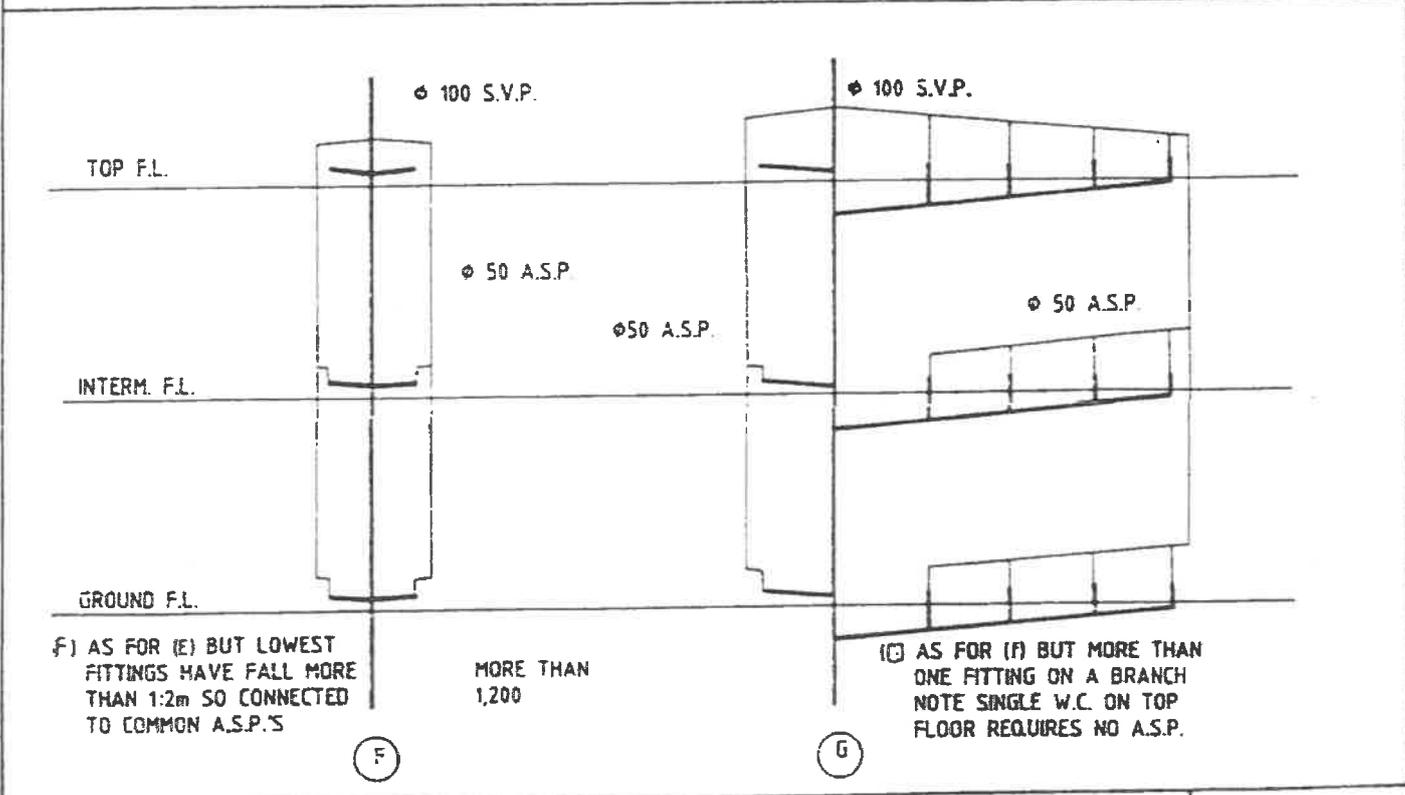
FIG. 5A VENTING OF WASTE PIPES



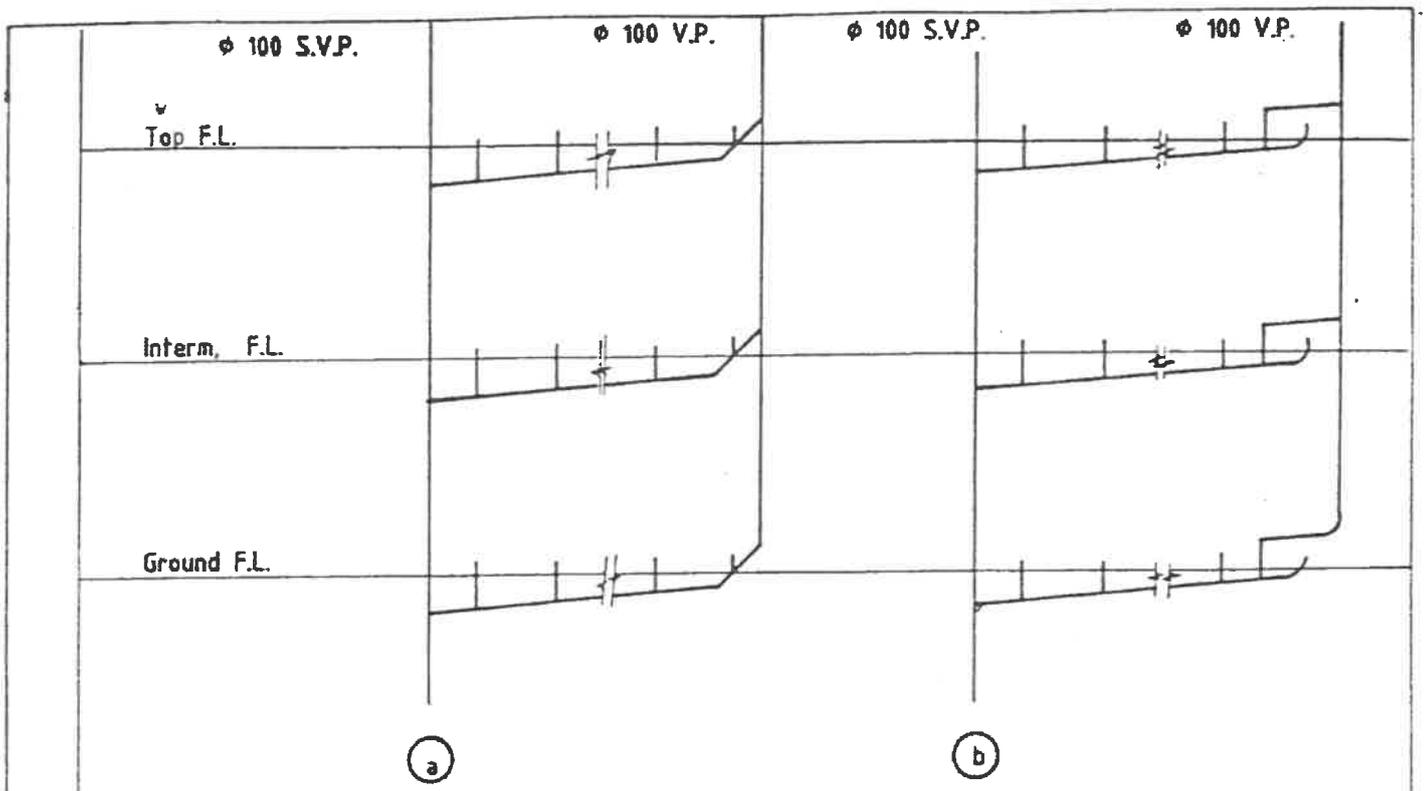
GETEKEN DRAWN S.P. CILLIERS	DEPARTEMENT VAN OPENBARE WERKE DEPARTMENT OF PUBLIC WORKS	D23(A)D
NAGESIEN CHECKED <i>[Signature]</i>	THE ONE PIPE SYSTEM EENPYPSTELSEL.	
SKAAL SCALE NOT TO SCALE		



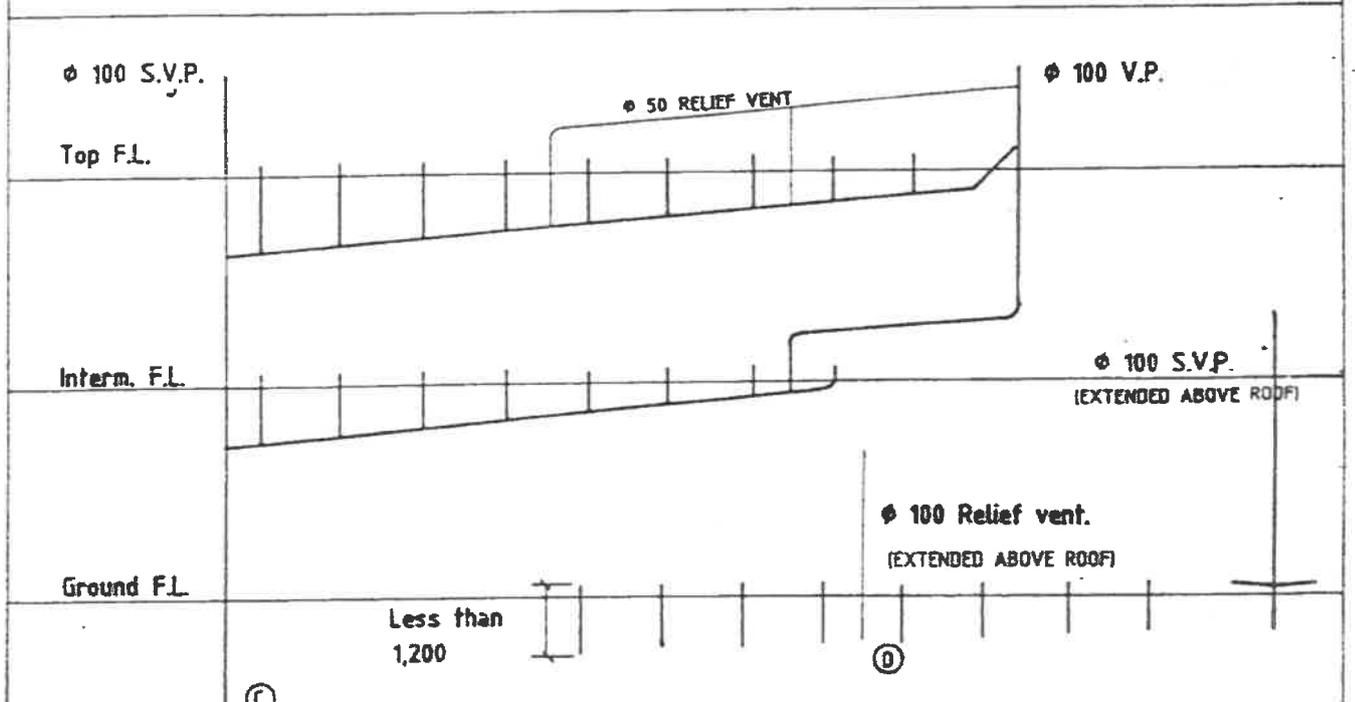
- (a)-(b) SOIL FITTINGS LESS THAN 6m FROM V.P. — NO A.S.P. REQUIRED
- (c) SOIL FITTING TRAP IS MORE THAN 6m FROM V.P. — A.S.P. REQUIRED
- (d) SOIL FITTING HAS DROP MORE THAN 1,2m — A.S.P. REQUIRED
- (e) GROUND FLOOR SOIL FITTINGS HAVE FALL LESS THAN 1,2m, SO CONNECT DIRECT TO SEWER — TOP FLOOR FITTINGS HAVE NO A.S.P. (AS FOR $\frac{1}{2}$ INTERM. HAVE A.S.P. BECAUSE OF FITTINGS ABOVE)



GETEKEN DRAWN C.J. PRITCHARD	DEPARTEMENT VAN OPENBARE WERKE DEPARTMENT OF PUBLIC WORKS	
NAGESIEN CHECKED <i>[Signature]</i>	USE OF ANTI-SIPHON PIPES ON SOILFITTINGS IN THE TWO PIPE SYSTEM GEBRUIK VAN SLUKPYP OP GREKWATERTOEBEHORE IN TWEEPYPSTELSEL.	D23(B)D
SKAAL SCALE NOT TO SCALE		

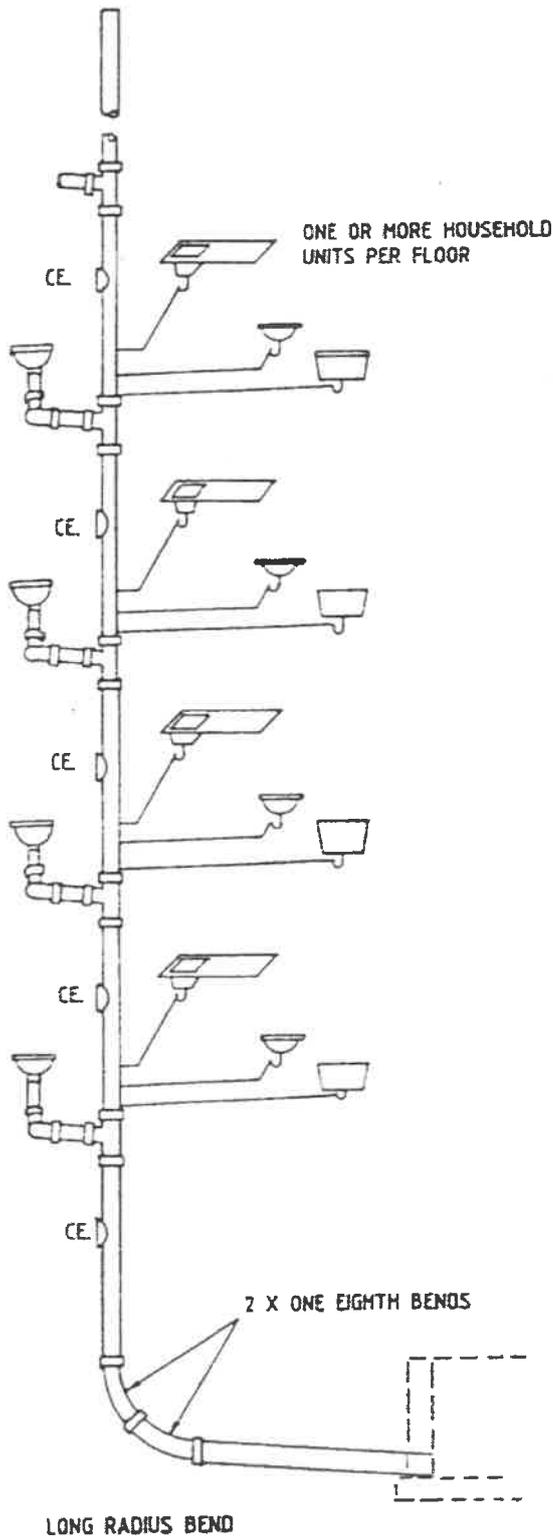


- (a) Back venting - Up to 7 soil fittings per branch.
 (b) Alternative means of back venting - Up to 8 soil fittings per branch.



- (c) On top floor back venting with relief vents where more than 8 fittings per branch
 On intermediate floor back venting for 8 soil fittings per branch.
 (d) Recommended relief vents where more than 8 fittings, next to each other, run directly into the drain.

GETEKEN. DRAWN. S.P. Cilliers,	DEPARTEMENT VAN OPENBARE WERKE DEPARTMENT OF PUBLIC WORKS	D23(C)D
NAGESIEN. CHECKED. <i>[Signature]</i>	USE OF RELIEF AND BACK VENTS IN THE TWO PIPE SYSTEM VENTILASIEPYPE IN DIE TWEOPYPSTELSEL.	
SKAAL-NOT TO SCALE SCALE		



IMPORTANT

- 1) EACH FITTING MUST BE TAKEN SEPARATELY TO THE SINGLE STACK.
- 2) EACH PIPELINE MUST HAVE FACILITIES TO CLEAN THE PIPE.
- 3) A CLEANING EYE MUST BE PROVIDED FOR THE STACK ON EACH FLOOR.
- 4) THE GROUND FLOOR MUST BE DRAINED INDEPENDENTLY WHERE MORE THAN TWO FLOORS ARE INVOLVED.
- 5) W.C.'S MUST BE WITHIN 3 METERS OF THE STACK, BATHS, BASINS, SINKS AND SHOWERS, WITHIN 5 METERS.
- 6) ALL WASTE PIPES MUST BE A MIN. OF 40mm DIA. AND FITTED WITH UNSYPHONABLE TRAPS WITH A SEAL OF AT LEAST 75mm.
- 7) THE STACK MUST BE PROVIDED WITH A LONG RADIUS BEND AT GROUND LEVEL LEADING TO A MANHOLE e.a. TWO ONE-EIGHTH BENDS.

FIGURE 7

GETEKEN
DRAWN S.P. CILLIERS

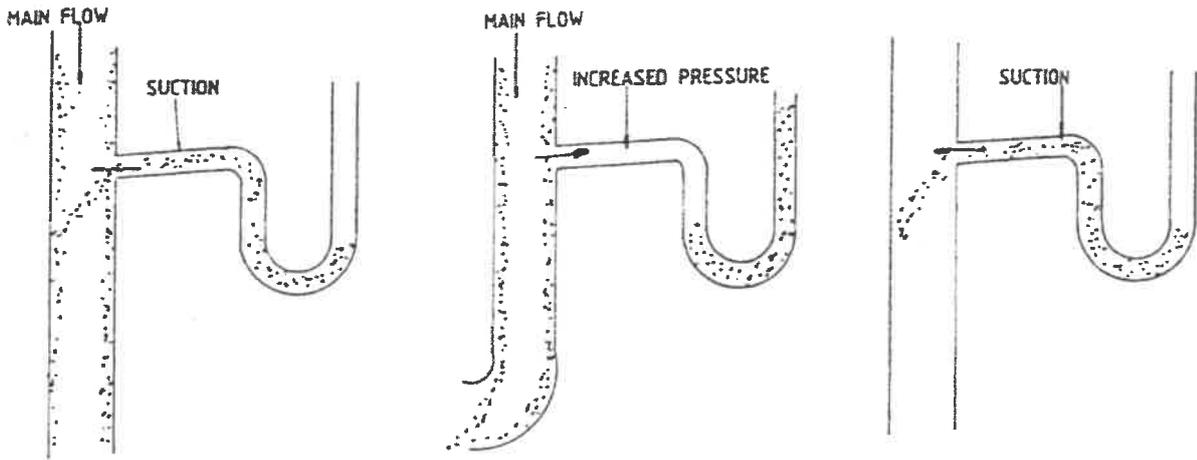
DEPARTEMENT VAN OPENBARE WERKE
DEPARTMENT OF PUBLIC WORKS

NAGESIEN
CHECKED *[Signature]*

D23(D)0

SKAAL
SCALE NOT TO SCALE

SINGLE STACK SYSTEM
ENKELSTAMSTELSEL.



(1) INDUCED SIPHONAGE

(2) BACK PRESSURE

(3) SELF-SIPHONAGE

FIGURE 6

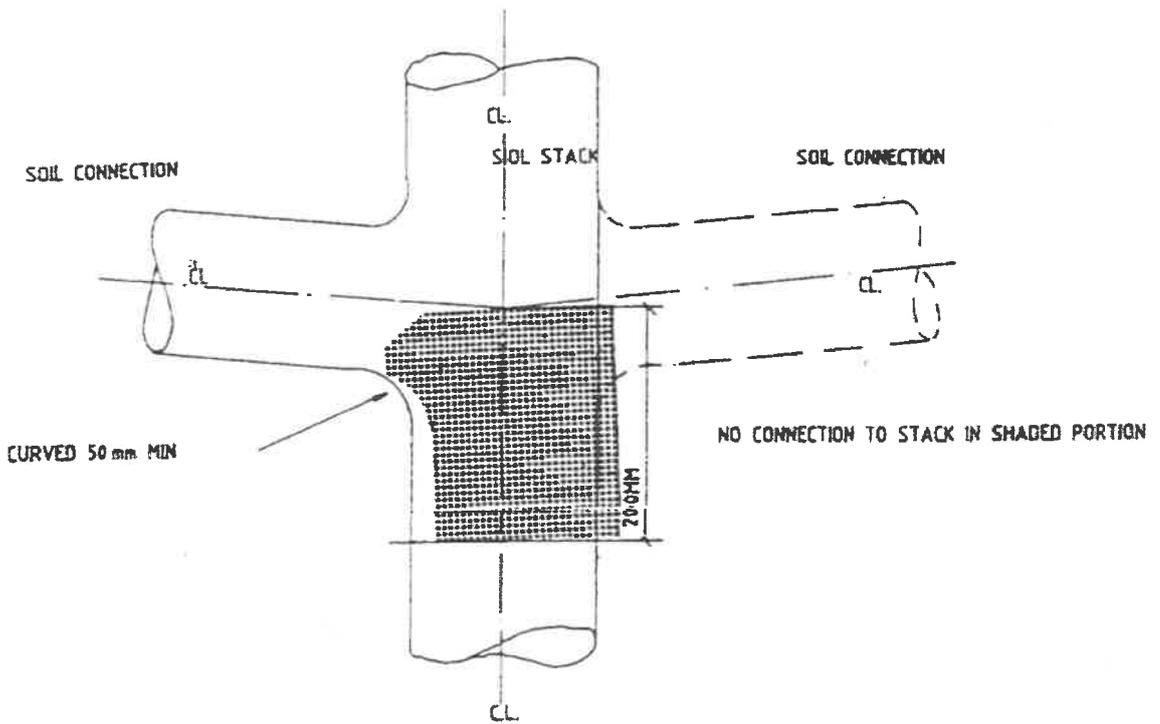


FIGURE 8.

GETEKEN.
DRAWN S. CILLIERS.

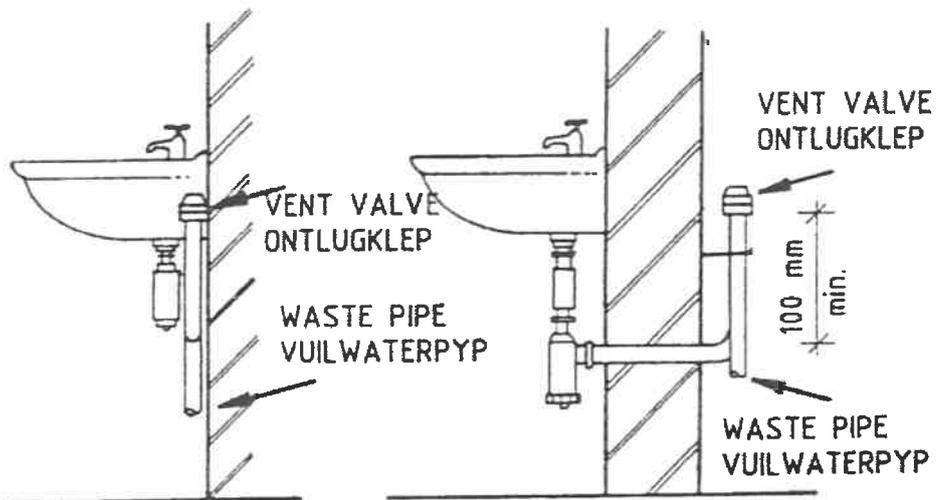
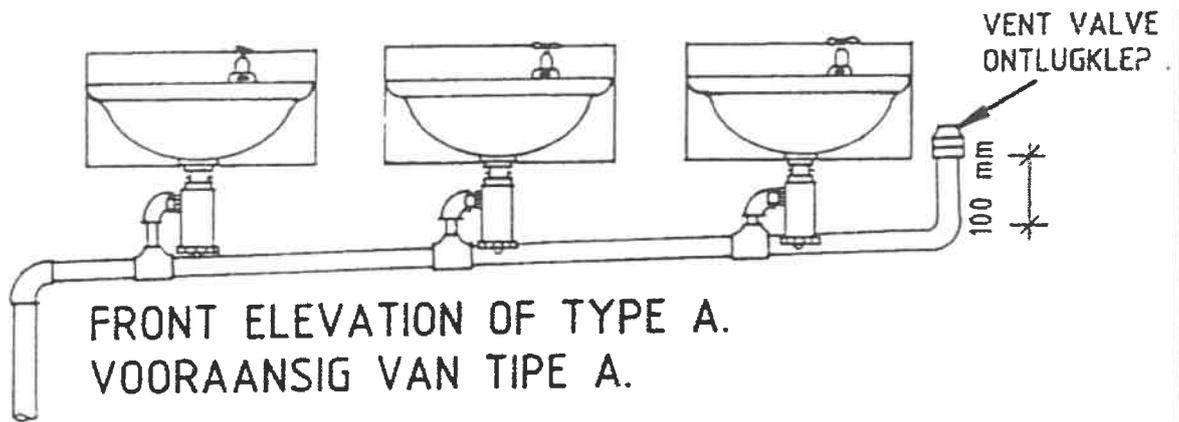
NAGESIEN
CHECKED *[Signature]*

SKAAL
SCALE NIE VOLGENS SKAAL

DEPARTEMENT VAN OPENBARE WERKE
DEPARTMENT OF PUBLIC WORKS

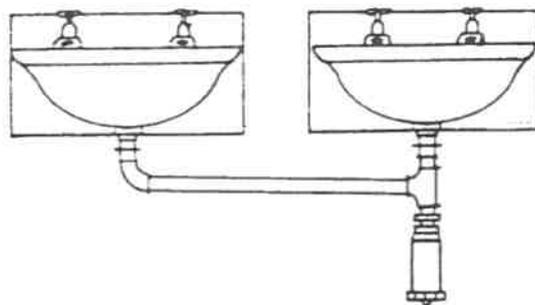
SINGLE STACK SYSTEM.
ENKELSTAMSTELSEL

023(E)D

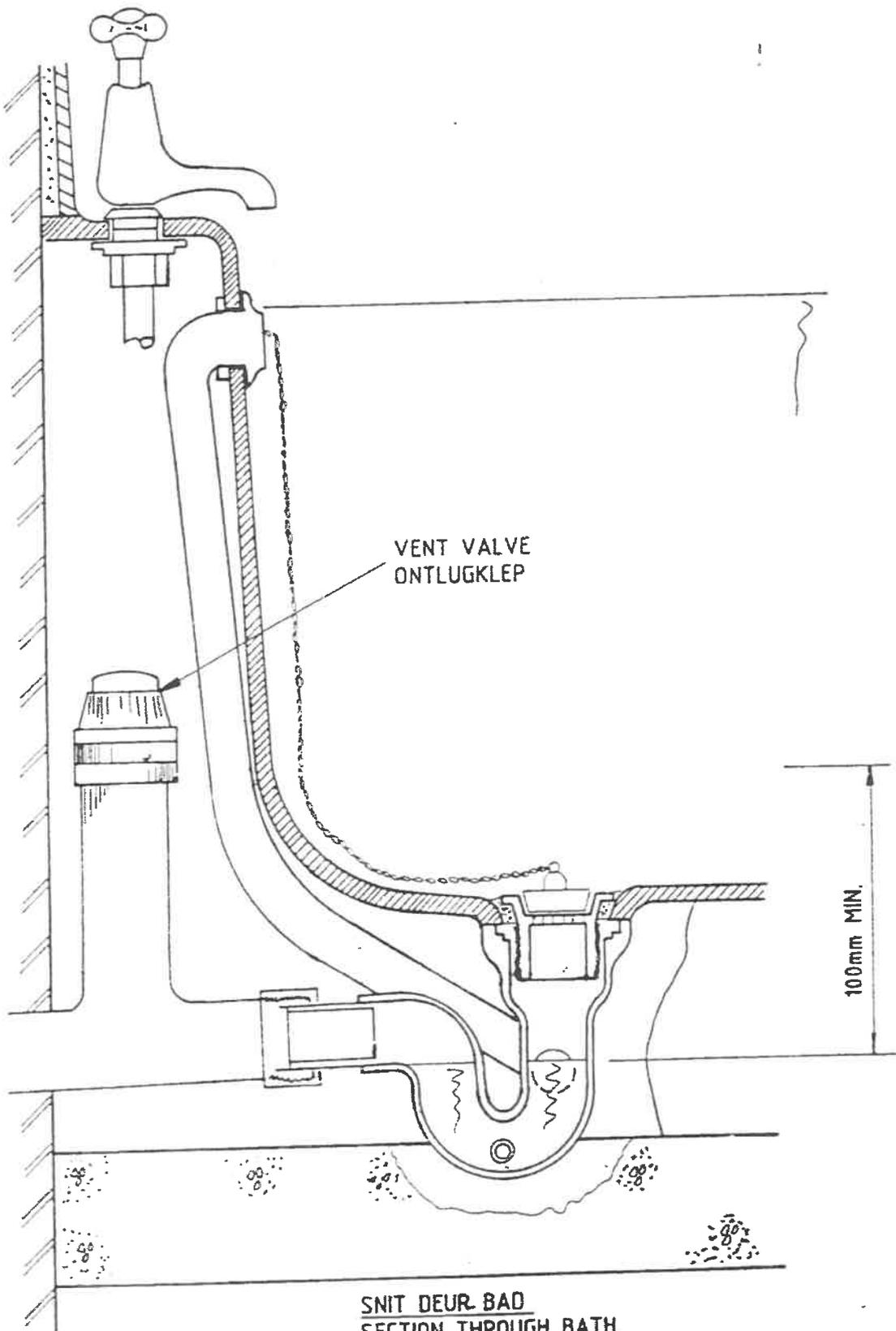


SECTION THROUGH TYPE A.
SNIT DEUR TIPE A.

SECTION THROUGH TYPE B.
SNIT DEUR TIPE B.



GETEKEN DRAWN	T.C. MYNHARDT.	DEPARTEMENT VAN OPENBARE WERKE DEPARTMENT OF PUBLIC WORKS	D 24 (B) D
NAGESIEN CHECKED	<i>[Signature]</i>	TYPICAL DETAIL OF VENT VALVE (ANTI-SYPHON) FOR WASTE FITTINGS. TIPIESE DETAIL VAN ONTLUGKLEP (ONTLUGTER) VIR VUILWATER TOEBEHORE.	
SKAAL SCALE			



SNIT DEUR BAD
SECTION THROUGH BATH

GETEKEN
DRAWN M.J.PAPENHUYZEN

NAGESIEN
CHECKED *[Signature]*

SKAAL
SCALE N.V.S./N.T.S.

DEPARTEMENT VAN OPENBARE WERKE
DEPARTMENT OF PUBLIC WORKS

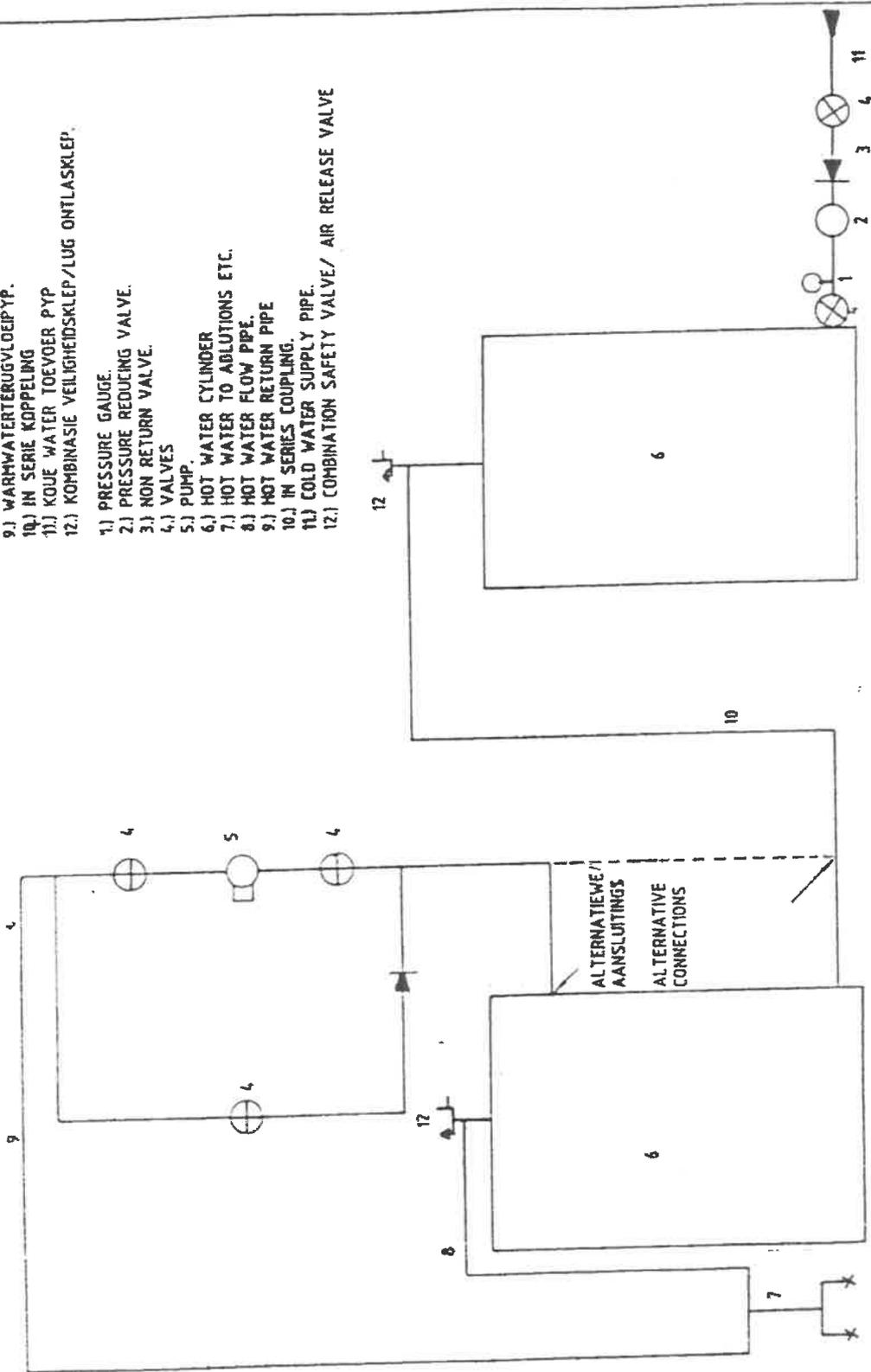
TYPICAL DETAIL OF VENT VALVE
(ANTI-SYPHON) FOR BATHS.
TIPIESE DETAIL VAN ONTLUGKLEP
(ONTLUGTER) VIR BADDENS.

D 24 (C) D

**SERIE.
SERIES.**

HIERDIE TIPE SISTEEM WORD
AANBEVEEL.
THIS TYPE OF SYSTEM IS
RECOMMENDED.

- 1.) DRUKMETER
- 2.) DRUK VERMINDERINGSKLEP.
- 3.) TERUGSLAGKLEP.
- 4.) KLEPPE
- 5.) POMP
- 6.) WARMWATER SILINDER.
- 7.) WARMWATER NA ABLUSIE ENS.
- 8.) WARMWATERVLOEIPYP
- 9.) WARMWATERTERUGVLOEIPYP.
- 10.) IN SERIE KOPPELING
- 11.) KOUE WATER TOEVOER PYP
- 12.) KOMBINASIE VEILIGHEIDSKLEP/LUG ONTLASKLEP.
- 1.) PRESSURE GAUGE
- 2.) PRESSURE REDUCING VALVE.
- 3.) NON RETURN VALVE.
- 4.) VALVES
- 5.) PUMP.
- 6.) HOT WATER CYLINDER
- 7.) HOT WATER TO ABLUTIONS ETC.
- 8.) HOT WATER FLOW PIPE.
- 9.) HOT WATER RETURN PIPE
- 10.) IN SERIES COUPLING.
- 11.) COLD WATER SUPPLY PIPE.
- 12.) COMBINATION SAFETY VALVE/ AIR RELEASE VALVE



GETEKEN.
DRAWN. S.P. CILLIERS

NAGESIEN.
CHECKED. *[Signature]*

SKAAL. NIE VOLGENS SKAAL
SCALE.

DEPARTEMENT VAN OPENBARE WERKE
DEPARTMENT OF PUBLIC WORKS

TIPIESE WARMWATER SISTEEM (IN SERIE)
TYPICAL HOT WATER SYSTEM (IN SERIES).

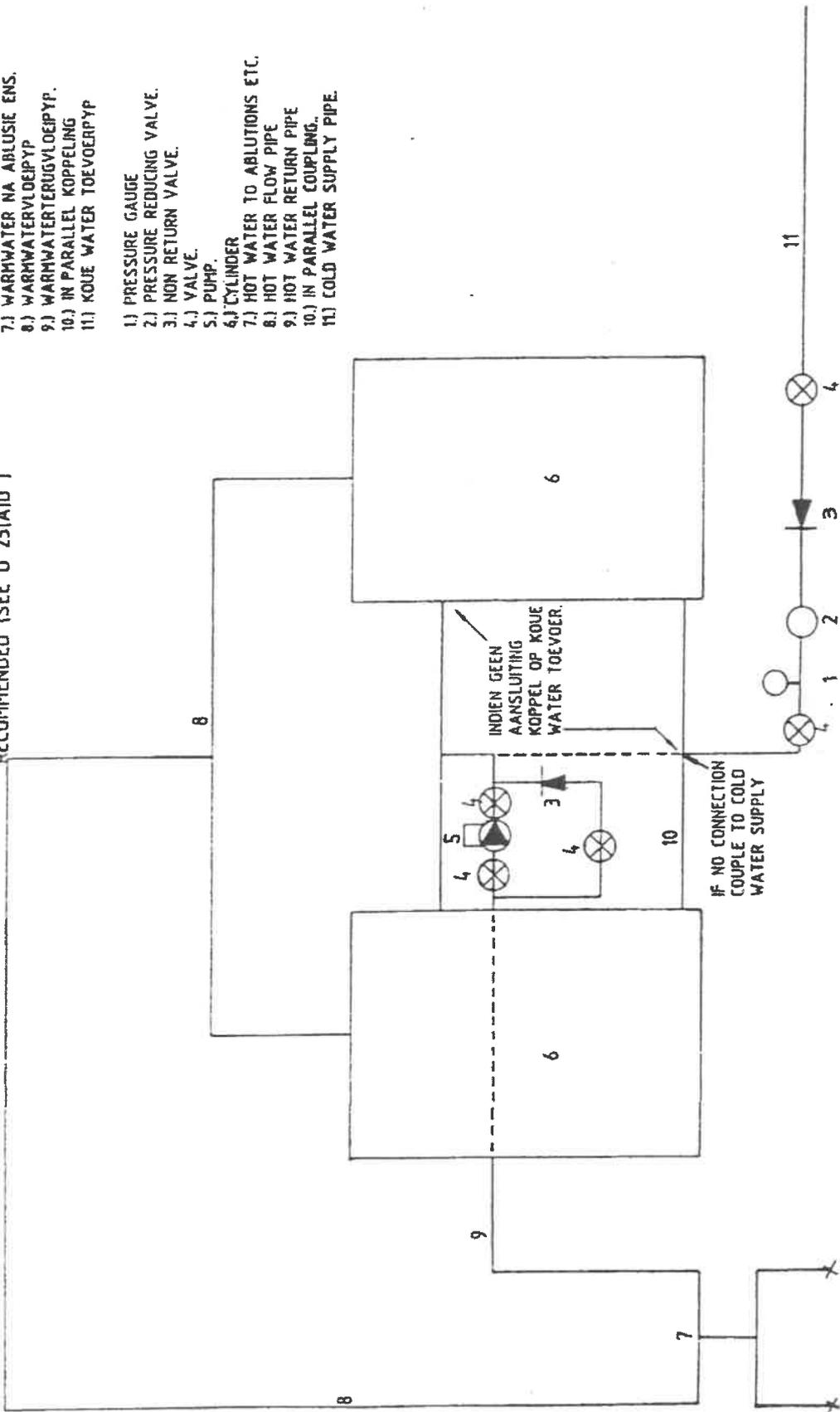
D25(A)10

PARALLEL PARALLEL

HIERDIE TIEPESISTEEM 'N'D NIE
AANBEVEEL NIE (SIEN O 25(A)D 1).

THIS TYPE OF SYSTEM IS NOT
RECOMMENDED (SEE O 25(A)D 1)

- 1.) DRUKMETER.
 - 2.) DRUK VERMINDERINGS KLEP.
 - 3.) TERUGSLAATKLEP.
 - 4.) KLEPPE
 - 5.) POMP
 - 6.) WARMWATER SILINDER.
 - 7.) WARMWATER NA ABLUSIE ENS.
 - 8.) WARMWATERVLOEIPYP
 - 9.) WARMWATERTERUGVLOEIPYP.
 - 10.) IN PARALLEL KOPPELING
 - 11.) KOUE WATER TOEVOERYPYP
- 1.) PRESSURE GAUGE
 - 2.) PRESSURE REDUCING VALVE.
 - 3.) NON RETURN VALVE.
 - 4.) VALVE.
 - 5.) PUMP.
 - 6.) CYLINDER
 - 7.) HOT WATER TO ABLUTIONS ETC.
 - 8.) HOT WATER FLOW PIPE
 - 9.) HOT WATER RETURN PIPE
 - 10.) IN PARALLEL COUPLING.
 - 11.) COLD WATER SUPPLY PIPE.



GETEKEN.
DRAWN S.P. CILLIERS.

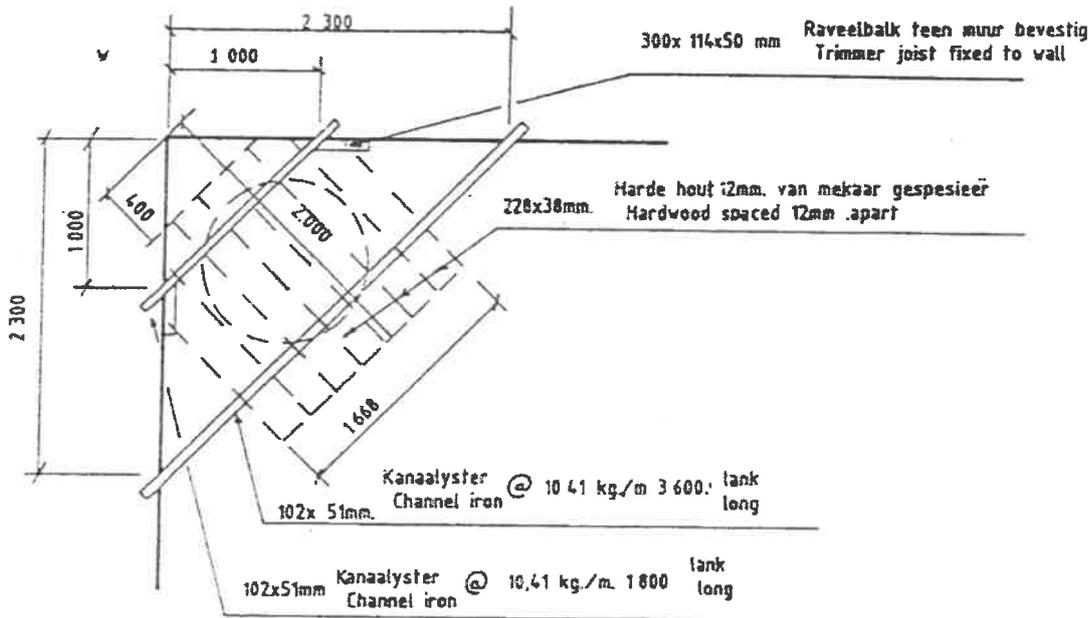
NAGESIEN
CHECKED. *[Signature]*

SKAAL.
SCALE. NIE VOLGENS SKAAL.

DEPARTEMENT VAN OPENBARE WERKE
DEPARTMENT OF PUBLIC WORKS

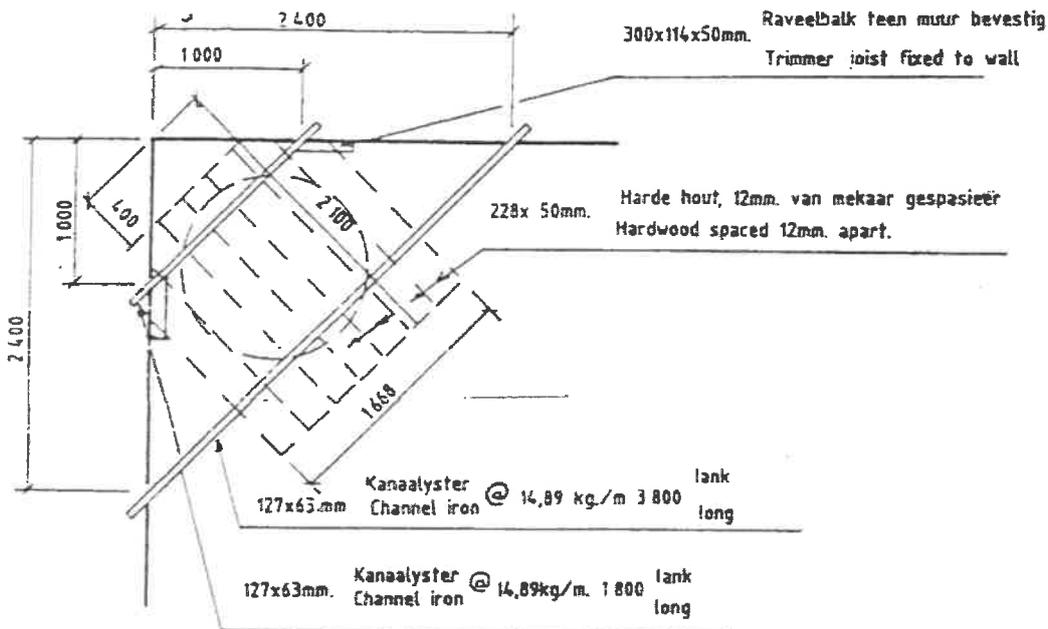
TIPIESE WARMWATER SISTEEM (IN PARALLEL).
TYPICAL HOT WATER SYSTEM (IN PARALLEL).

D25(B)D



VIR 1 400 LITER TENK

FOR 1 400 LITRE TANK



VIR 2 300 LITER TENK

FOR 2 300 LITRE TANK

GETEKEN.
DRAWN. S.P. CILLIERS.

DEPARTEMENT VAN OPENBARE WERKE
DEPARTMENT OF PUBLIC WORKS

NAGESIEN.
CHECKED.

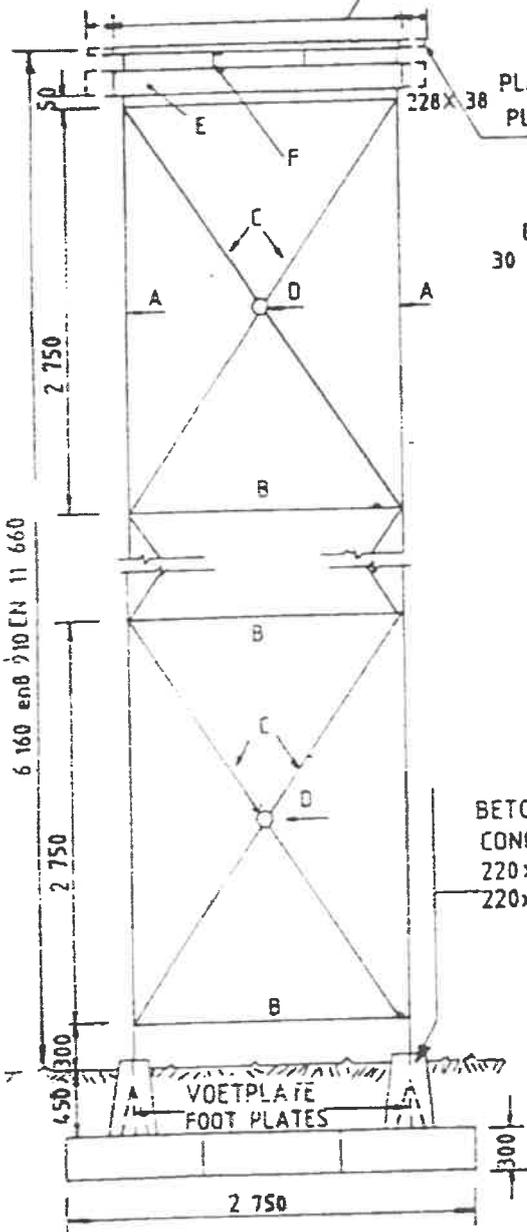
HOEKSTEEN VIR WATERTENK.
CORNER SUPPORT FOR WATER TANK

SKAAL.
SCALE 1:50

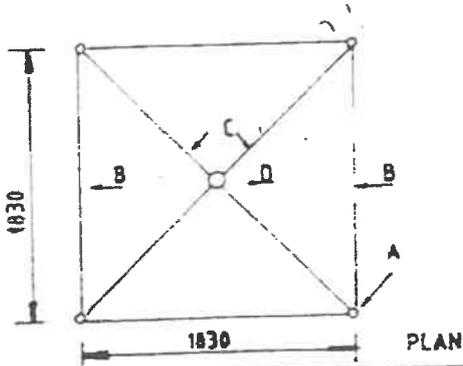
0330

1900 FOR 4546L TANK/TENK

VIR 9092L TENK
2250 FOR TANK



AANSIG
ELEVATION



PLAN

6 ϕ BEVELS ϕ 300 h/h
STIRRUPS c/c

PLANKE
PLANKS

DEKING
COVER

SNIT.
SEC. X-X

70 DEKING
COVER

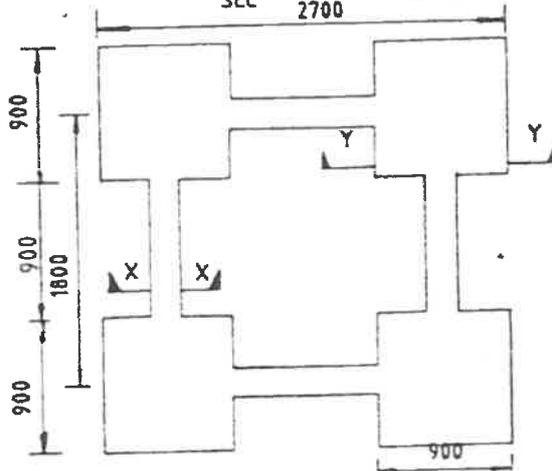
3-16 ϕ ELKE RIGTING
3-16 ϕ EACH WAY

SNIT

SEC. Y-Y

2700

SKAAL 1:20
SCALE 1:20



PLAN VAN VOETSTUK
PLAN OF FOOTING

BETON BLOK
CONC. BLOCK
220 x 220 TO 300 x 300
220x220 NA 300x300

A: 80 X 4, 85mm N.D. PYP
B: 32 X 2,65 N.D. PYP
C: 16 ϕ S. S. STAAF
D: 110 X 8 S. S. RING
E: 152x76x18 kg/m KANAAL
F: 127x64x15 kg/m KANAAL

A: 80 x 4,85mm N.B. PIPE
B: 32 x 2,65 N.B. PIPE
C: 16 ϕ M.S. ROD
D: 110 x 8 M.S. RING
E: 152x76x18 kg/m CHANNEL
F: 127x 64x15 kg/m CHANNEL

VERBINDINGS

B en C tot A: 1-16 ϕ bout
A tot E: 2-12 ϕ boute
E tot F: 2-12 ϕ boute

CONNECTIONS

B and C to A: 1-16 ϕ bolts
A to E: 2-12 ϕ bolts
E to F: 2-12 ϕ bolts

NOTA. VIR KATLEER SIEN D37D
VIR DETAILS EN VERBINDINGS
SIEN TEK. D38 D
NOTE FOR CATLADDER SEE D 37 D
FOR DETAILS AND CONNECTIONS
SEE DRWG D 38 D

TOELAATBARE GRONDDRUK 100 kPa
ALLOWABLE GROUND PRESSURE

GETEKEN.
DRAWN. S.P. CILLERS

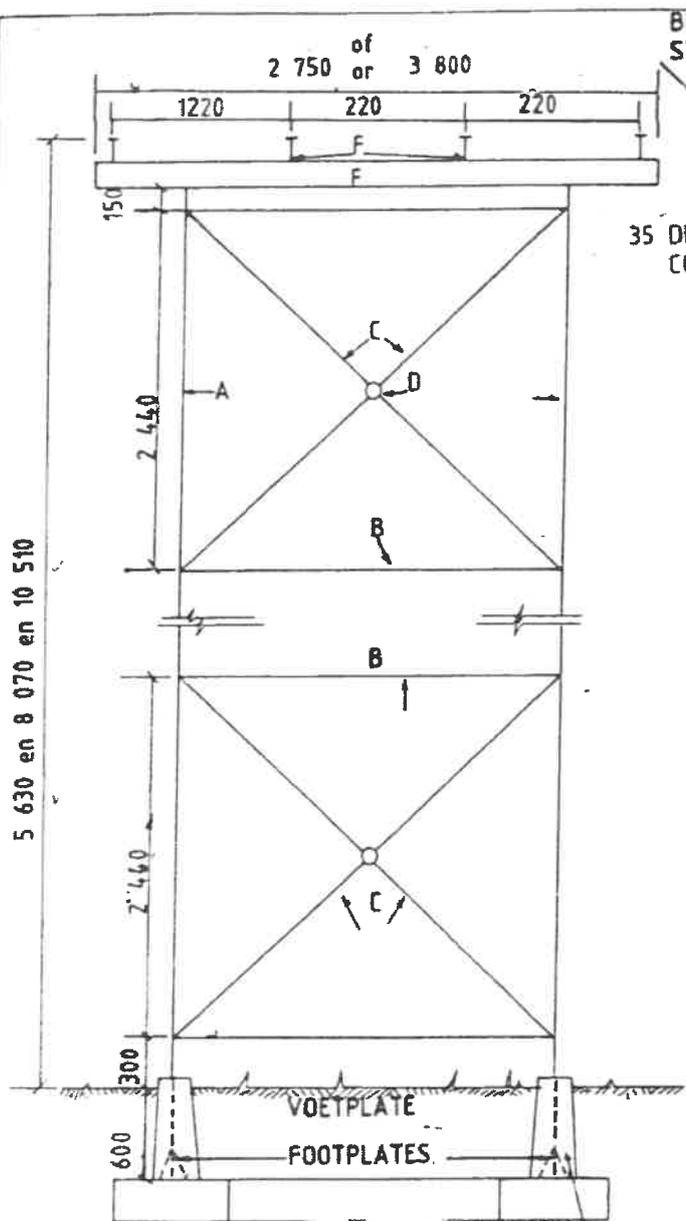
NAGESIEN.
CHECKED. *[Signature]*

SKAAL 1:20
84-05-04

DEPARTEMENT VAN OPENBARE WERKE
DEPARTMENT OF PUBLIC WORKS

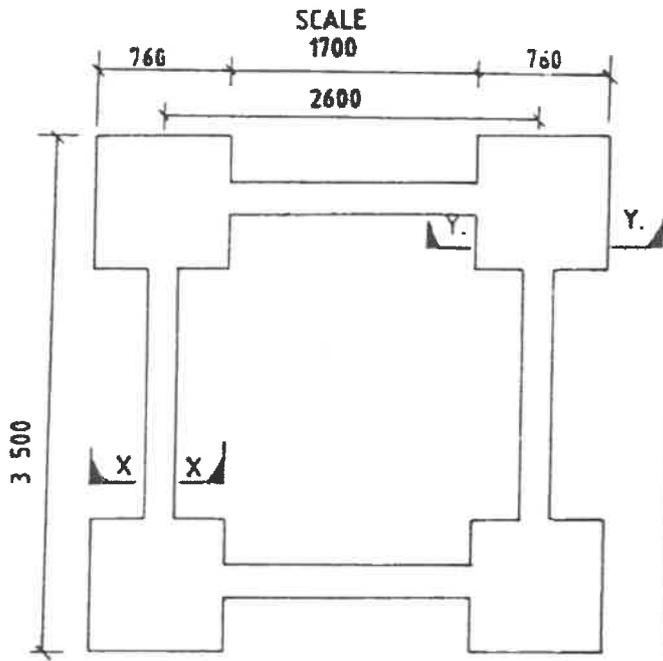
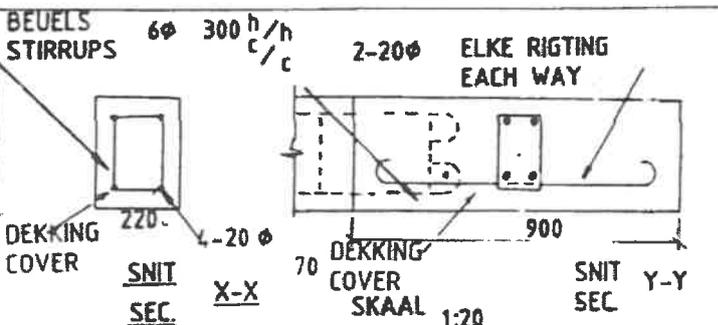
STAANDER 4546 EN 9092 LITER TENK
STAND FOR 4546 AND 9092 LITRE TANK

D 34 D



AANSIG ELEVATION

220x220 BETONBLOK
na - to
300x300 CONC. BLOCK



PLAN VAN VOETSTUK
PLAN OF FOOTING

- | | |
|-----------------------------|---------------------------|
| A: 65 N.D. x 4,5mm. PYP | A: 65 N.B. x 4,5mm PIPE. |
| B: 32 " x 2,65mm. " | B: 32 " x 2,65mm " |
| C: 16 ø S.S. STAAF | C: 16 ø M.S. ROD. |
| D: 110 x 8ø S.S. RING. | D: 110 x 8 ø M.S. ROD. |
| E: 152x89x17 kg/m I-PROFIEL | E: 152x89x17 kg/m } PRO- |
| F: 152x89x17 kg/m I-PROFIEL | F: 152x89x17 kg/m } FILE. |

- | | |
|---------------------------|----------------------------|
| VERBINDINGS: | CONNECTIONS: |
| B en C na A: 1-16 ø BOUT. | B and C to A: 1-16 ø bolt. |
| A na E: 2-12 ø BOUTE. | A to E: 2-12 ø BOLTS. |
| E na F: 2-12 ø " | E to F: 2-12 ø " |

NOTAS
TENKINHOUDE: 5455 en 10910 en 16365 liter.
Sien D37D vir platvorm en katleer
en D38D vir verbindings en voetplaat.

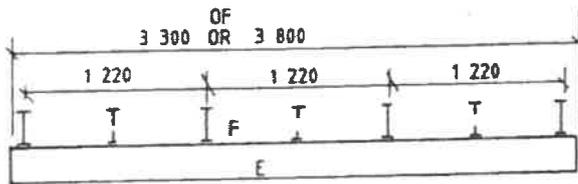
NOTES
TANK CAPACITIES: 5455 and 10910 and 16365 litre
See D37D for platform and cat-
ladder and D38D for connection
and foot plate.

TOELAATBARE GRONDDRUK
ALLOWABLE GROUND PRESSURE 100 kPa

GETEKEN DRAWN	S.P. CILLIERS	DEPARTEMENT VAN OPENBARE WERKE DEPARTMENT OF PUBLIC WORKS		
NAGESIEN CHECKED	<i>[Signature]</i>	STAANDER VIR	HOË PERSSTAALTENKE	D35D
SKAAL SCALE	1:50	1 220	HIGH PRESSED STEEL TANKS.	

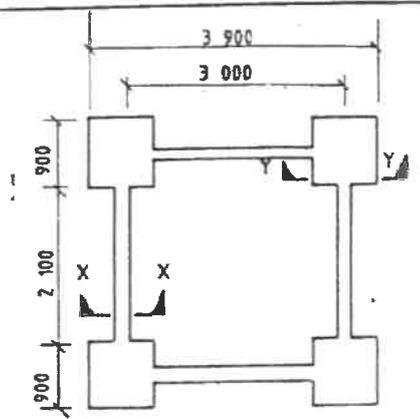
TOELAATBARE GRONDDRUK
ALLOWABLE GROUND PRESSURE

125 kPa

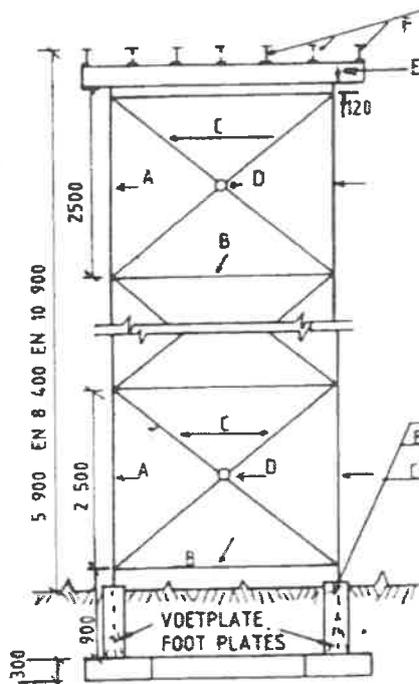


DETAIL VAN KOP
OF HEAD

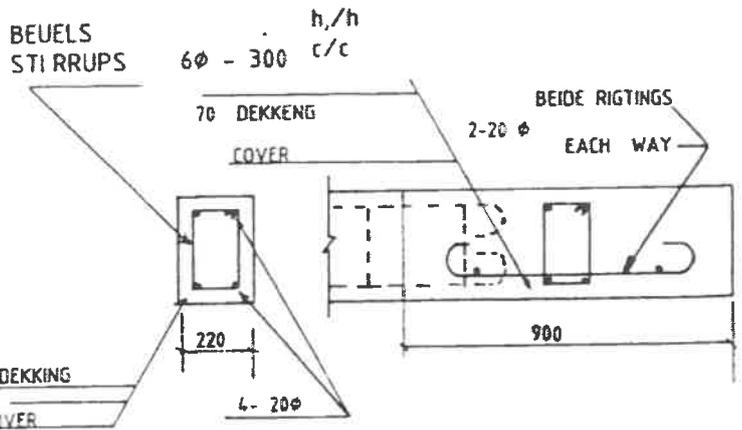
SKAAL
SCALE 1:50



PLAN VAN VOETSTUK
PLAN OF FOOTING



AANSIG
ELEVATION



BEUELS
STIRRUPS 6φ - 300 h/h
c/c

BEIDE RIGTINGS
EACH WAY 2-20 φ

BETONBLOK
CONC. BLOCK 300x300

SNIT
SEC X-X

SNIT
SEC Y-Y

SKAAL:
SCALE: 1:20

- A: 90ND.x4,85mm PYP.
- B: 32 ND x2,65 mm PYP
- C: 16 φ S.S. STAAF
- D: 110ND.x 8 RING
- E: 254x146x37 kg/m I-PROFIEL
- F: 203x133x25 kg/m I-PROFIEL

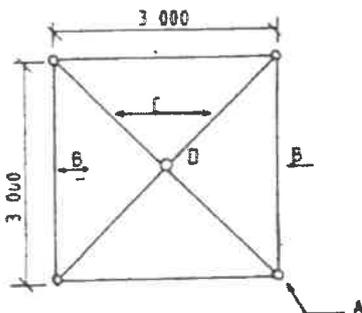
- A: 90NB. x4,85mm PIPE
- B: 32 NB x2,65mm PIPE
- C: 16φ M.S. ROD
- D: 110 N.B. x8 RING
- F: 254x146x37 kg/m I-PROFILE
- F: 203x133x25 kg/m I-PROFILE

VERBINGINGS

Ben C na A: 1-16φ BOUT
A en E: 2-12φ BOUTE
E na F: 2-12φ BOUTE

CONNECTIONS

B and C to A: 1-16φ bolt
A to E: 2-12φ bolt
E to F: 2-12φ bolts



PLAN

NOTAS:

TENKHOUDE: 21820 EN 32730 LITER
SIEN D 37 D VIR PLATFORMS EN KATLEER
EN D38D VIR VERBINGINGS EN VOETPLAAT

NOTES:

TANK CAPACITIES: 21820 AND 32730 LITRE
SEE D 37 D FOR PLATFORMS AND CAT LADDER
AND D 38 D FOR CONNECTIONS AND FOOT PLATE

GETEKEN.
DRAWN. S.P. CILLIERS

NAGESIEN.
CHECKED. *[Signature]*
24-05-04

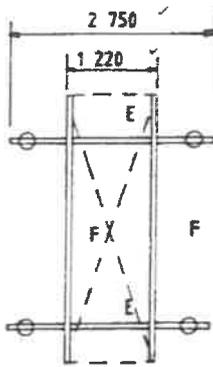
SKAAL.
SCALE. 1:100

DEPARTEMENT VAN OPENBARE WERKE
DEPARTMENT OF PUBLIC WORKS

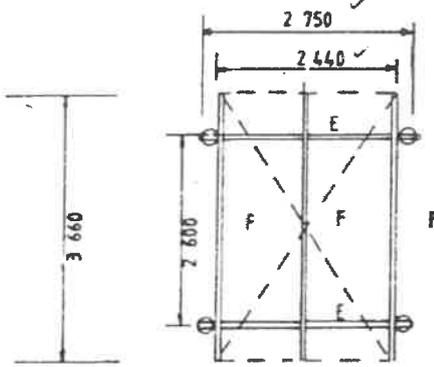
STAANDER VIR HOË PERSSTAALTENKE
2440

STAND FOR HIGH PRESSED STEEL TANK

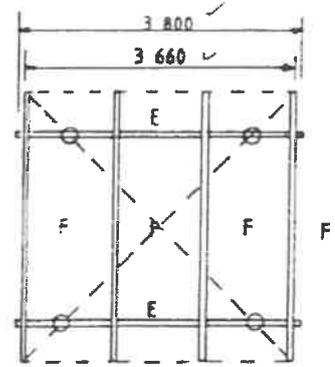
D36D



TENKE
TANKS 3 660x1 220-5455 L



3 660x2 440-10910L

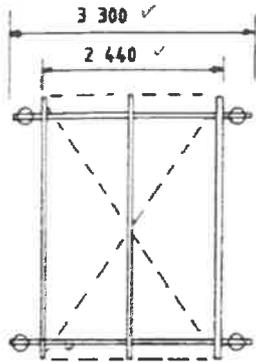


3 660 x3 660-16365L

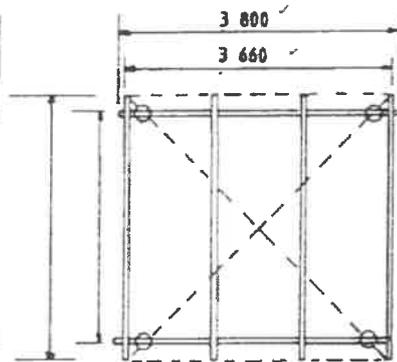
PLATFORMS VIR TENKE
FOR TANKS 1 220

HOOG
HIGH

SKAAL:
SCALE: 1: 100



TENKE
TANKS 3 660x2 440-21820 L



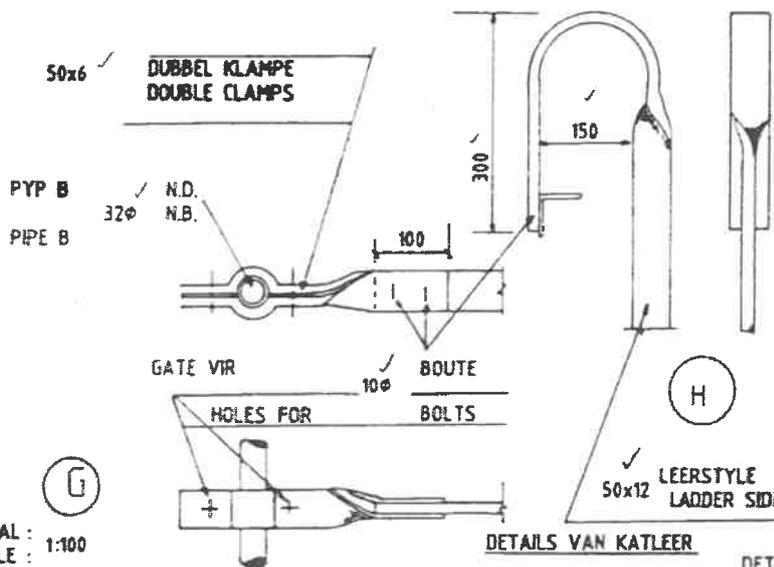
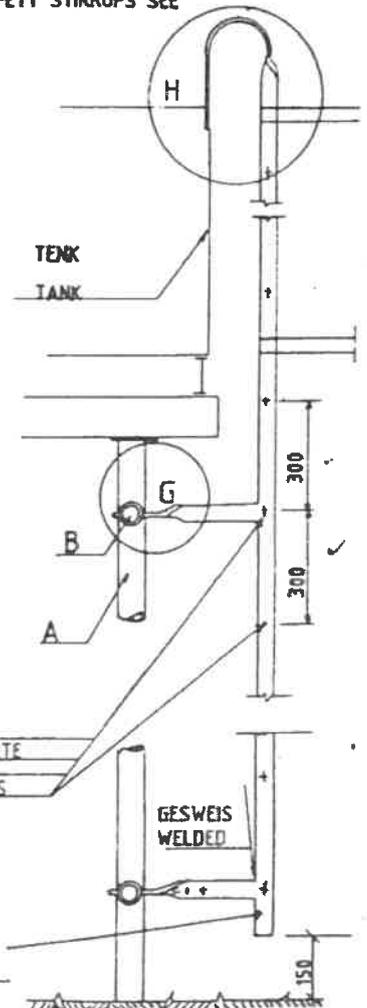
3 660x3 660-32730 L

PLATFORMS VIR TENKE
FOR TANKS 2 440

HOOG
HIGH

SKAAL:
SCALE: 1:100

VEILIGHEIDSBUELS SIEN
SAFETY STIRRUPS SEE



SKAAL:
SCALE: 1:100

DETAILS VAN KATLEER

DETAILS OF CAT LADDER

GETEKEN.
DRAWN. S. EILLIERS

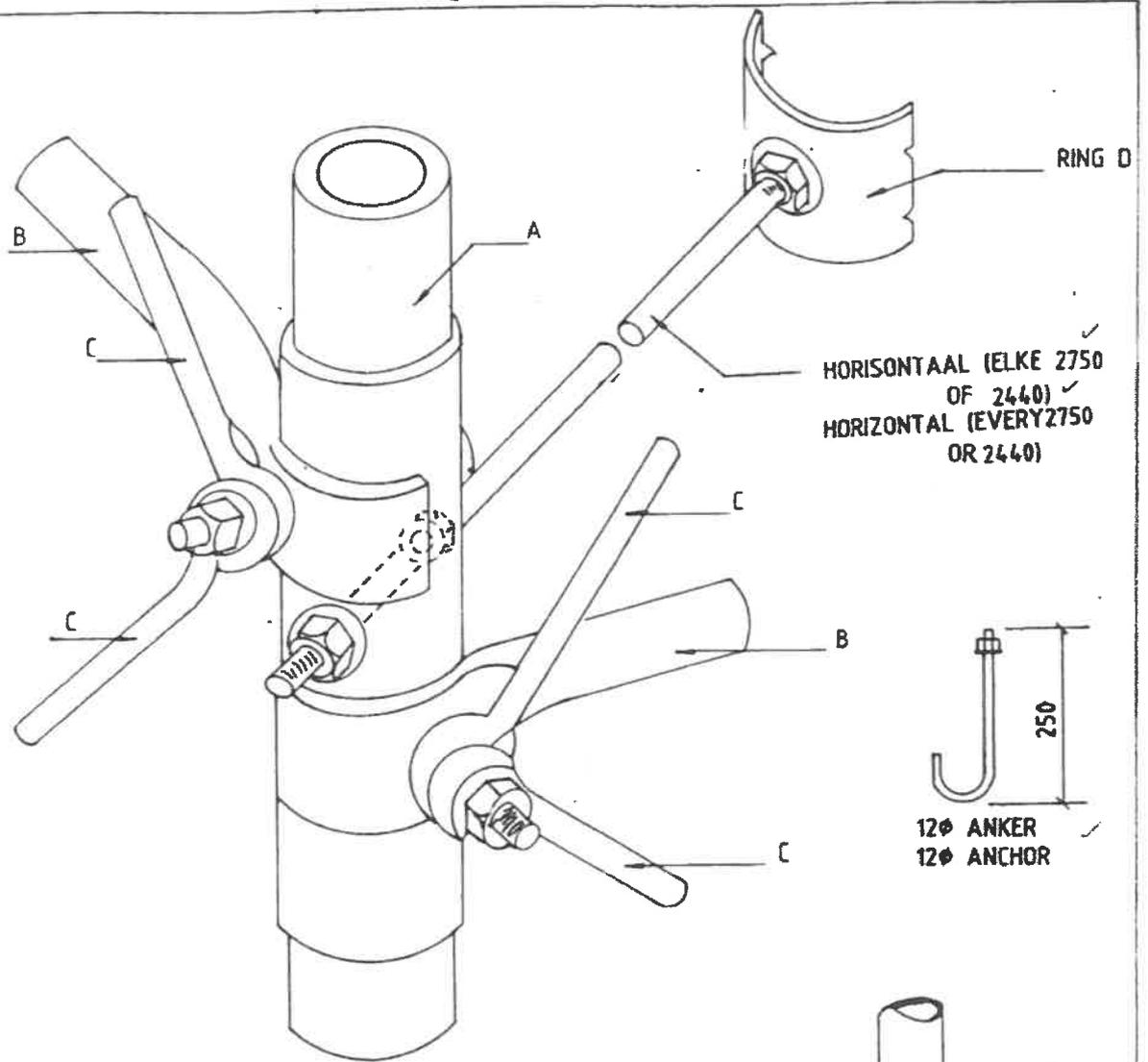
DEPARTEMENT VAN OPENBARE WERKE
DEPARTMENT OF PUBLIC WORKS

NAGESIEN.
CHECKED. *[Signature]*

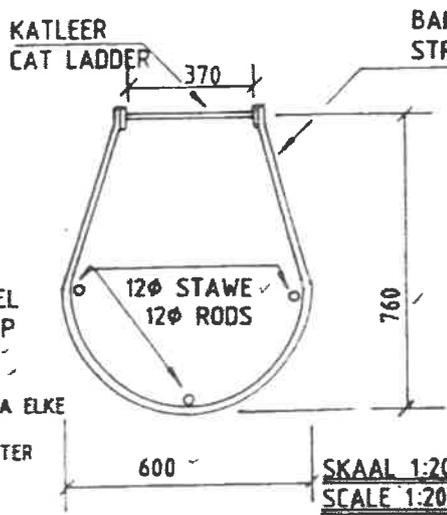
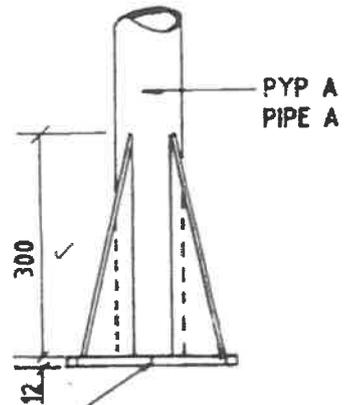
PLATFORMS EN KATLEER
AND CAT LADDER

D 37 D

SKAAL: 1:100
SCALE: 1:20



VERBINDINGS
CONNECTIONS.
NIE OP SKAAL
NOT TO SCALE.

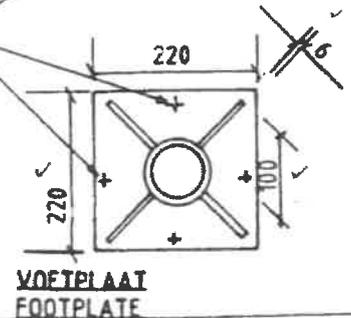


VEILIGHEIDSBUEL
SAFETY STIRRUP
1ste BUEL 3000
1ste STIRRUP 3000
BOKANT G.M. DAARNA ELKE
1200
ABOVE G.L. THEREAFTER
EVERY 1200

BANDYSTER 35x6
STRIP IRON 35X6

GATE VIR 12φ
ANKERS
HOLES FOR 12φ ANCHORS

DRIEHOEK AAN PYP A EN
VOETPLAAT GESWEIS.
TRIANGLES WELDED TO PIPE
A AND FOOTPLATE.



GETEKEN
DRAWN S.P. CILLIERS.

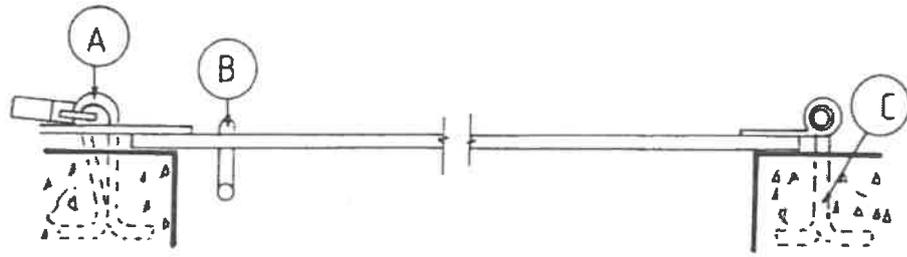
DEPARTEMENT VAN OPENBARE WERKE
DEPARTMENT OF PUBLIC WORKS

NAGESIEN
CHECKED. *[Signature]*
24-05-04

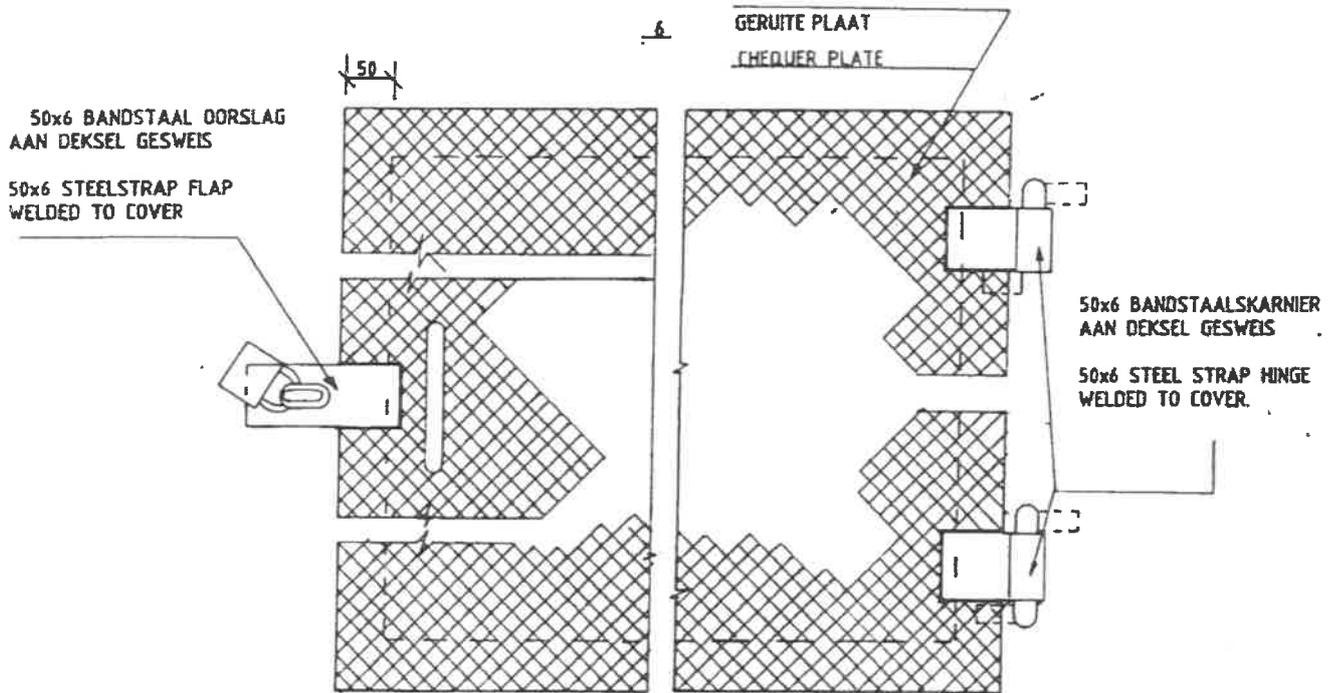
VERBINDINGS EN VOETPLAAT
CONNECTIONS AND FOOTPLATE

D 38 D

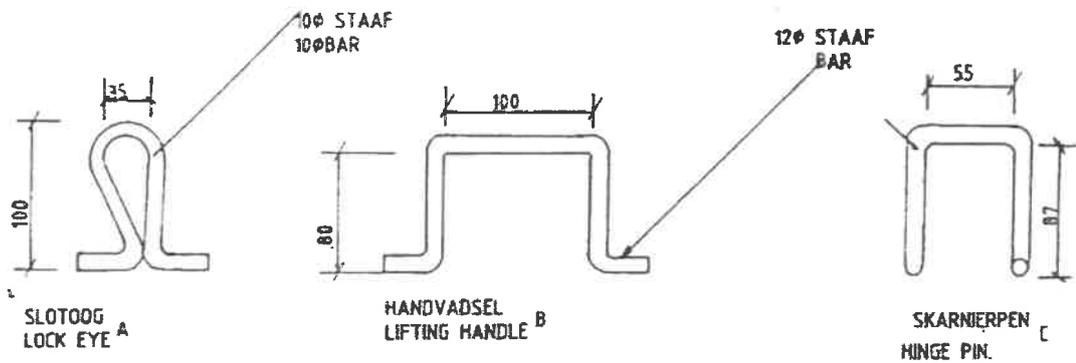
SKAAL
SCALE 1:10



DEURSNEE SECTION



PLAN. NIE OP SKAAL.
NOT TO SCALE



GETEKEN.
DRAWN. S.CILLIERS.

NAGESIEN.
CHECKED.

SKAAL. 1:5
SCALE.

DEPARTEMENT VAN OPENBARE WERKE
DEPARTMENT OF PUBLIC WORKS

GERUITEPLAATDEKSEL.
CHEQUER PLATE COVER

D 39 D

100 Ø LANDBOUPIPE MET 10 mm OOP VOER
 100 Ø AGRICULTURAL PIPES WITH 10 mm OPEN JOINTS

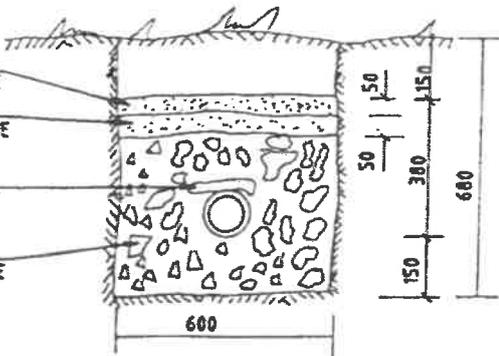
ENTDOP
 END CAP

2 000 Min.

600

GRONDVULLING
 GROUND FILLING.

6mm KLIP
 6mm STONE
 25mm KLIP
 25mm STONE
 PLAT KLIP
 FLAT STONE
 75mm KLIP
 75mm STONE



SNIT A-A
 SECTION A-A

100 Ø VKP
 100 Ø VCP

NOTA
 PLAAS PLAT KLIP OOR
 PYPLASSE OM SAND
 UIT TE HOU.
NOTE
 PLACE FLAT STONES
 OVER PIPE JOINTS TO
 STOP SAND FILTERING
 IN.

GETEKEN.

DRAWN. J.A.C. RABE

NAGESIEN.

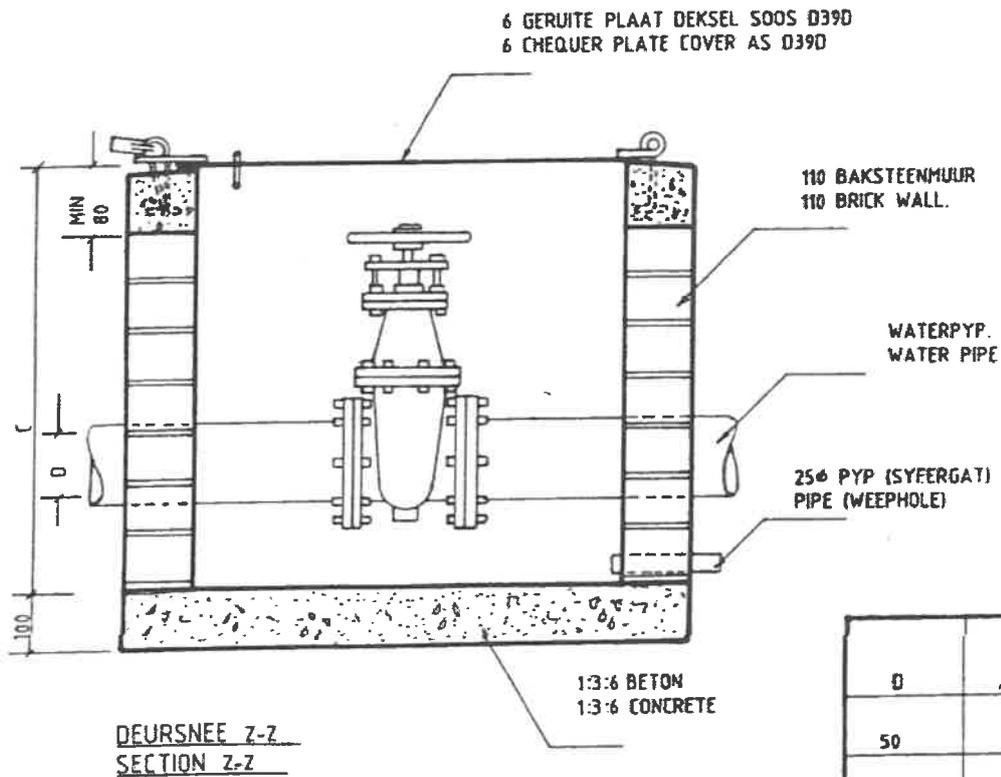
CHECKED.

SKAAL.

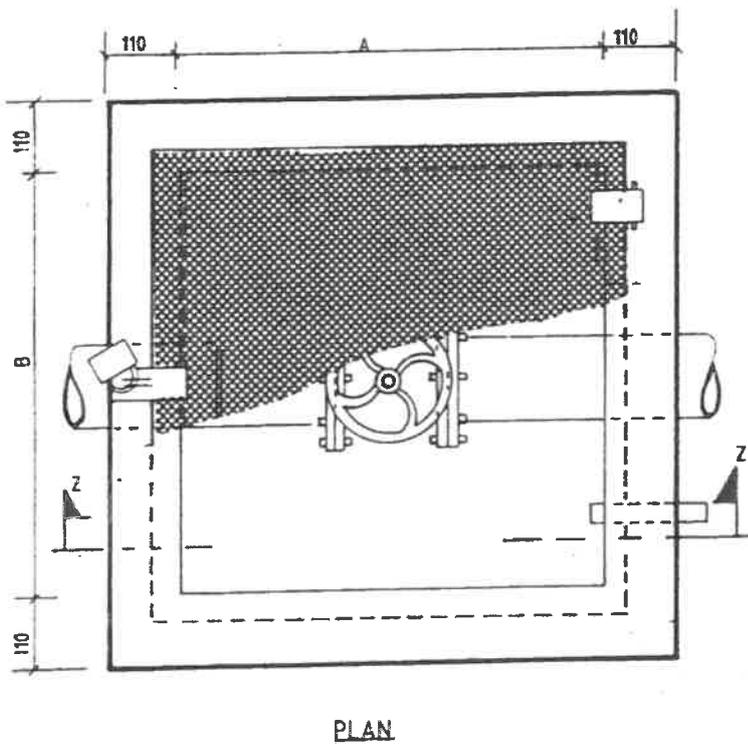
SCALE. 1:20

SUGRIPOOL
 AGRICULTURAL DRAIN

0410



D	A	B	C
50	570	570	600
80	680	680	675
100	680	680	675
125	680	800	750
150	680	800	830
180	680	800	900
200	800	900	980
225	800	900	1050
250	800	900	1120
300	800	1020	1280



GETEKEN.
DRAWN. S.P. CILLIERS.

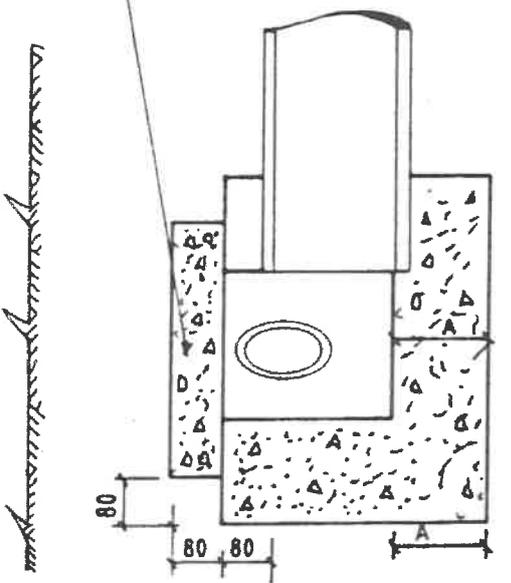
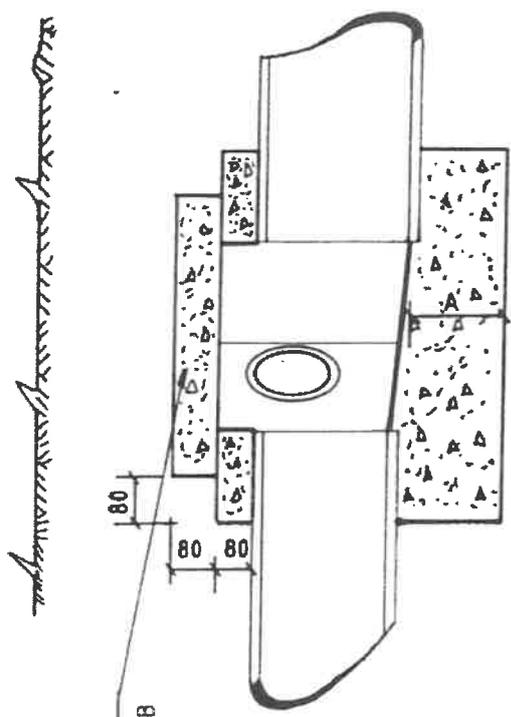
DEPARTEMENT VAN OPENBARE WERKE
DEPARTMENT OF PUBLIC WORKS

NAGESIEN.
CHECKED. *[Signature]*

KLEPKAMER.
VALVE CHAMBER.

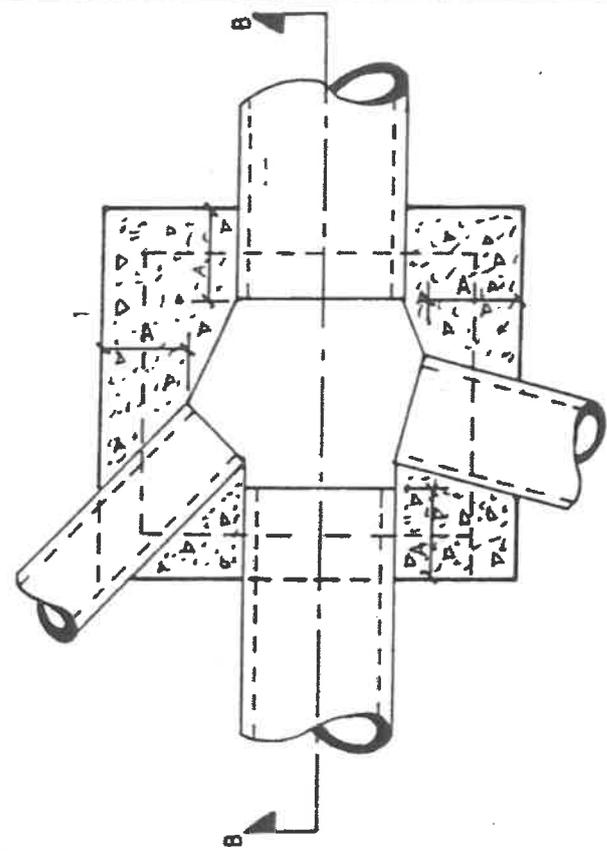
D42D

SKAAL.
SCALE. NIE VOLGENS SKAAL



LOS BETONBLAD
 LOOSE CONC. COVER SLAB

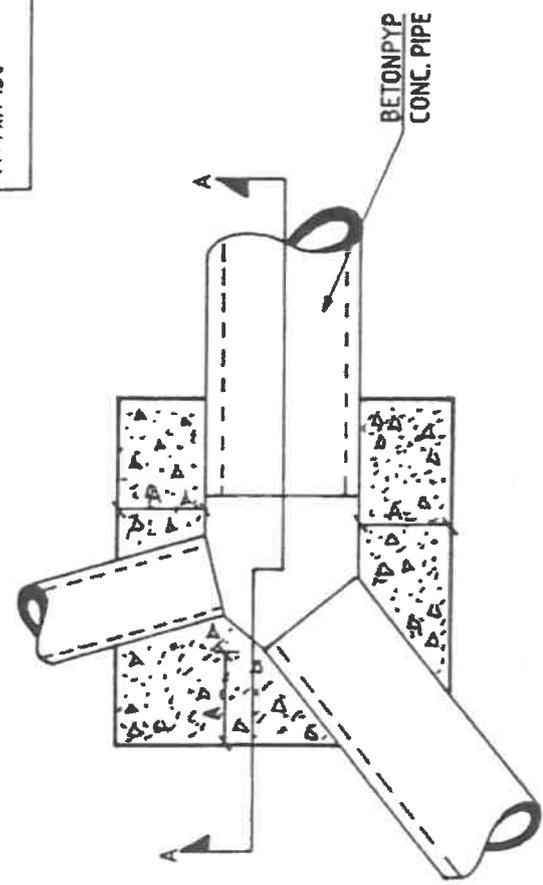
DEURSNEE B-B
 SECTION B-B



PLAN

A = MIN 150

DEURSNEE A-A
 SECTION A-A



PLAN

GETEKEN.
 DRAWN. J.A.C. RABE

NAGESIEN.
 CHECKED. *[Signature]*

SKAAL.
 SCALE. 1:20

AANSLUITING VIR STORMWATERPYPE
 JUNCTION BOX FOR STORMWATER PIPES

D44D



public works

Department:
Public Works
REPUBLIC OF SOUTH AFRICA

SAMPLE SPECIFICATION
FOR THE
ELECTRICAL INSTALLATION
OF A
COMPREHENSIVE SERVICE

MARCH 2018

SAMPLE SPECIFCATION FOR THE ELECTRICAL INSTALLATION
OF A COMPREHENSIVE SERVICE

AT

CONSISTING OF:

SECTION C3..... : ELECTRICAL INSTALLATION WORK

In part C3 see separate documents for:

Building work
Mechanical work
Fire detection work
Generator
Lift
Etc.

INDEX

PAGE NO.

SPECIFICATION FOR ELECTRICAL WORK1
PART 1 - GENERAL2
PART 2: INSTALLATION DETAILS10
PART 3: SPECIFICATION FOR MATERIALS AND EQUIPMENT OF ELECTRICAL INSTALLATIONS19
PART 4: BILLS OF QUANTITIES22
PART 5: ELECTRICAL WORK MATERIAL SCHEDULE.....23
PART 6: DRAWINGS24

SPECIFICATION FOR ELECTRICAL WORK

PART 1 - GENERAL

CONTENTS

1	TESTS	2
2	MAINTENANCE OF INSTALLATIONS	2
3	REGULATIONS	2
4	NOTICES AND FEES	2
5	SCHEDULE OF FITTINGS	2
6	QUALITY OF MATERIALS	2
7	CONDUIT AND ACCESSORIES	2
8	CONDUIT IN ROOF SPACES	3
9	SURFACE MOUNTED CONDUIT	4
10	CONDUIT IN CONCRETE SLABS	4
11	FLEXIBLE CONNECTIONS FOR CONNECTING UP OF STOVES, MACHINES, ETC.	5
12	WIRING:	5
13	SWITCHES AND SOCKET OUTLETS	5
14	SWITCHGEAR	6
15	SWITCHBOARDS	6
16	WORKMANSHIP AND STAFF	6
17	CERTIFICATE OF COMPLIANCE	6
18	EARTHING OF INSTALLATION	6
19	MOUNTING AND POSITIONING OF LUMINAIRES	8

PART 1 - GENERAL

1 TESTS

After completion of the works and before practical completion is achieved, a full test will be carried out on the installation for a period of sufficient duration to determine the satisfactory working thereof. During this period the installations will be inspected and the Contractor shall make good, to the satisfaction of the Principle Agent/Electrical Engineer or the employer, any defects which may arise.

The Contractor shall provide all instruments and equipment required for testing and any water, power and fuel required for the commissioning and testing of the installations at completion.

2 MAINTENANCE OF INSTALLATIONS

With effect from the date of the Practical completion Certificate the Contractor shall at his own expense undertake the regular servicing of the installation during the maintenance period and shall make all adjustments necessary for the correct operation thereof.

If during the said period the installations is not in working order for any reason for which the Contractor is responsible, or if the installations develops defects, he shall immediately upon being notified thereof take steps to remedy the defects and make any necessary adjustments.

Should such stoppages however be so frequent as to become troublesome, or should the installations otherwise prove unsatisfactory during the said period the Contractor shall, if called upon by the Principle Agent/Electrical Engineer or the Employer, at his own expense replace the whole of the installations or such parts thereof as the Principal Agent/Electrical Engineer or the Employer may deem necessary with apparatus specified by the Principal Agent/Electrical Engineer or the Employer.

3 REGULATIONS

The installation shall be erected and tested in accordance with the Acts and Regulations as indicated in the scope of works

4 NOTICES AND FEES

The Contractor shall give all notices required by and pay all necessary fees, including any inspection fees, which may be due to the local Supply Authority.

On production of the official account, only the net amount of the fee charged by the Supply Authority for connection of the installation to the supply mains, will be refunded to the Contractor by the Employer.

5 SCHEDULE OF FITTINGS

In all instances where schedule of light, socket outlet and power points are attached to or included on the drawings, these schedules are to be regarded as forming part of the specification.

6 QUALITY OF MATERIALS

Only materials of first class quality shall be used and all materials shall be subject to the approval of the Employer. Departmental specifications for various materials to be used on this Contract are attached to and form part of this specification.

Wherever applicable the material is to comply with the relevant South African Bureau of Standards, specifications, or to IEC Specifications, where no SANS Specifications exist.

Materials wherever possible, must be of South African manufacture.

7 CONDUIT AND ACCESSORIES

The type of conduit and accessories required for the service, i.e. whether the conduit and accessories shall be of the screwed type, plain-end type or of the non-metallic type and whether metallic conduit shall be

black enamelled or galvanised, is specified in Part 2 of this specification.

Unless other methods of installation are specified for certain circuits, the installation shall be in conduit throughout. No open wiring in roof spaces or elsewhere will be permitted.

The conduit and conduit accessories shall comply fully with the applicable SANS specifications as set out below and the conduit shall bear the mark of approval of the South African Bureau of Standards.

- a) Screwed metallic conduit and accessories: SANS 61386-1 and 21.
- b) Plain-end metallic conduit and accessories: SANS 61386-1 and 21.
- c) Non-metallic conduit and accessories: SANS 61386-1 and 21.

All conduit fittings except couplings, shall be of the inspection type. Where cast metal conduit accessories are used, these shall be of malleable iron. Zinc base fittings will not be allowed.

Bushes used for metallic conduit shall be brass and shall be provided in addition to locknuts at all points where the conduit terminates at switchboards, switch-boxes, draw-boxes, etc.

Draw-boxes are to be provided in accordance with the "Wiring Code" and wherever necessary to facilitate easy wiring.

For light and socket outlet circuits, the conduit used shall have an external diameter of 20mm. In all other instances the sizes of conduit shall be in accordance with the "Wiring Code" for the specified number and size of conductors, unless otherwise directed in part 2 of this specification or indicated on the drawings.

Only one manufactured type of conduit and conduit accessories will be permitted throughout the installation.

Running joints in screwed conduit are to be avoided as far as possible and all conduit systems shall be set or bent to the required angles. The use of normal bends must be kept to a minimum with exception of larger diameter conduits where the use of such bends is essential.

All metallic conduit shall be manufactured of mild steel with a minimum thickness of 1,2mm for plain-end conduit and 1,6mm in respect of screwed conduit.

Under no circumstances will conduit having a wall thickness of less than 1,6mm be allowed in screed laid on top of concrete slabs.

Bending and setting of conduit must be done with special bending apparatus manufactured for the purpose and which are obtainable from the manufacturers of the conduit systems. Damage to conduit resulting from the use of incorrect bending apparatus or methods applied must on indication by the Department's inspectorate staff, be completely removed and rectified and any wiring already drawn into such damaged conduits must be completely renewed at the Contractor's expense.

Conduit and conduit accessories used for flame-proof or explosion proof installations and for the suspension of luminaires as well as all load bearing conduit shall in all instances be of the metallic screwed type.

All conduit and accessories used in areas within 50 km of the coast shall be galvanised to SANS 32 and SANS 121.

Tenderers must ensure that general approval of the proposed conduit system to be used is obtained from the local electricity supply authority prior to the submission of their tender. Under no circumstances will consideration be given by the Department to any claim submitted by the Contractor, which may result from a lack of knowledge in regard to the supply authority's requirements.

8 CONDUIT IN ROOF SPACES

Conduit in roof spaces shall be installed parallel or at right angles to the roof members and shall be secured at intervals not exceeding 1,5m by means of saddles screwed to the roof timbers.

Nail or crampets will not be allowed.

Where non-metallic conduit has been specified for a particular service, the conduit shall be supported and fixed with saddles with a maximum spacing of 450 mm. The Contractor shall supply and install all additional supporting timbers in the roof space as required.

Under flat roofs, in false ceilings or where there is less than 0,9m of clearance, or should the ceilings be insulated with glass wool or other insulating material, the conduit shall be installed in such a manner as to allow for all wiring to be executed from below the ceilings.

Conduit runs from distribution boards shall, where possible terminate in fabricated sheet steel draw-boxes installed directly above or in close proximity to the boards.

9 SURFACE MOUNTED CONDUIT

Wherever possible, the conduit installation is to be concealed in the building work; however, where unavoidable or otherwise specified under Part 2 of the specification, conduit installed on the surface must be plumbed or levelled and only straight lengths shall be used.

The use of inspection bends is to be avoided and instead the conduit shall be set uniformly and inspection coupling used where necessary.

No threads will be permitted to show when the conduit installation is complete, except where running couplings have been employed.

Running couplings are only to be used where unavoidable, and shall be fitted with a sliced couplings as a lock nut.

Conduit is to be run on approved spaced saddles rigidly secured to the walls.

Alternatively, fittings, tees, boxes, couplings etc., are to be cut into the surface to allow the conduit to fit flush against the surface. Conduit is to be bedded into any wall irregularities to avoid gaps between the surface and the conduit.

Crossing of conduits is to be avoided, however, should it be necessary purpose-made metal boxes are to be provided at the junction. The finish of the boxes and positioning shall be in keeping with the general layout.

Where several conduits are installed side by side, they shall be evenly spaced and grouped under one purpose-made saddle.

Distribution boards, draw-boxes, industrial switches and socket outlets etc., shall be neatly recessed into the surface to avoid double sets.

In situations where there are no ceilings the conduits are to be run along the wall plates and the beams.

Painting of surface conduit shall match the colour of the adjacent wall finishes.

Only approved plugging materials such as aluminium inserts, fibre plugs, plastic plugs, etc., and round-head screws shall be used for fixing saddles, switches, socket outlets, etc., to walls, wood plugs and the plugging in joints in brick walls are not acceptable.

10 CONDUIT IN CONCRETE SLABS

In order not to delay building operations the Contractor must ensure that all conduits and other electrical equipment which are to be cast in the concrete columns and slabs are installed in good time.

The Contractor shall have a representative in attendance at all times when the casting of concrete takes place.

Draw-boxes, expansion joint boxes and round conduit boxes are to be provided where necessary. Sharp

bends of any nature will not be allowed in concrete slabs.

Draw and/or inspection boxes shall be grouped under one common cover plate, and must preferably be installed in passages or male toilets.

All boxes, etc., are to be securely fixed to the shuttering to prevent displacement when concrete is cast. The conduit shall be supported and secured at regular intervals and installed as close as possible to the neutral axis of concrete slabs and/or beams.

Before any concrete slabs are cast, all conduit droppers to switchboards shall be neatly spaced and rigidly fixed.

11 FLEXIBLE CONNECTIONS FOR CONNECTING UP OF STOVES, MACHINES, ETC.

Flexible tubing connections shall be of galvanised steel construction, and in damp situations of the plastic sheathed galvanised steel type. Other types may only be used subject to the prior approval of the Department's site electrical representative.

Connectors for coupling onto the flexible tubing shall be of the gland or screw-in types, manufactured of either brass or cadmium or zinc plated mild steel, and the connectors after having been fixed onto the tubing, shall be durable and mechanically sound.

Aluminium and zinc alloy connectors will not be acceptable.

12 WIRING:

Except where otherwise specified in Part 2 of this specification, wiring shall be carried out in conduit throughout. Only one circuit per conduit will be permitted.

No wiring shall be drawn into conduit until the conduit installation has been completed and all conduit ends provided with bushes. All conduits to be clear of moisture and debris before wiring is commenced.

Unless otherwise specified in Part 2 of this specification or indicated on the service drawings, the wiring of the installation shall be carried out in accordance with the "Wiring Code". Further to the requirements concerning the installation of earth conductors to certain light points as set out in the "Wiring Code", it is a specific requirement of this document that where plain-end metallic conduit or non-metallic conduit has been used, earth conductors must be provided and drawn into the conduit with the main conductors to all points, including all luminaires and switches throughout the installation.

Wiring for lighting circuits is to be carried out with 1,5mm² conductors and a 1,5mm²-earth conductor. For socket outlet circuits the wiring shall comprise 4mm² conductors and a 2,5mm²-earth conductor. In certain instances, as will be directed in Part 2 of this specification, the sizes of the aforementioned conductors may be increased for specified circuits. Sizes of conductors to be drawn into conduit in all other instances, such as feeders to distribution boards, power points etc., shall be as specified elsewhere in this specification or indicated on the drawings. Sizes of conductors not specified must be determined in accordance with the "Wiring Code".

The loop-in system shall be followed throughout, and no joints of any description will be permitted.

The wiring shall be done in PVC insulated 600/1000 V grade cable to SANS 1507.

Where cable ends connect onto switches, luminaires etc., the end strands must be neatly and tightly twisted together and firmly secured. Cutting away of wire strands of any cable will not be allowed.

13 SWITCHES AND SOCKET OUTLETS

All switches and switch-socket outlet combination units shall conform to the Department Quality Specifications, which form part of this specification.

No other than 16 A 3 pin sockets are to be used, unless other special purpose types are distinctly specified or shown on the drawings.

All light switches shall be installed at 1,4m above finished floor level and all socket outlets as directed in the Schedule of Fittings which forms part of this specification or alternatively the height of socket outlets may be indicated on the drawings.

14 SWITCHGEAR

Switchgear, which includes circuit breakers, iron-clad switches, interlocked switch-socket outlet units, contactors, time switches, etc., is to be in accordance with the Departmental Quality Specifications which form part of this specification and shall be equal and similar in quality to such brands as may be specified.

For uniform appearance of switchboards, only one approved make of each of the different classes of switchgear mentioned in the Quality Specifications shall be used throughout the installations.

15 SWITCHBOARDS

All boards shall be in accordance with the types as specified, be constructed according to the detail or type drawings and must be approved by the Employer before installation.

In all instances where provision is to be made on boards for the supply authority's main switch and/or metering equipment the contractor must ensure that all requirements of the authorities concerned in this respect are met.

Any construction or standard type aboard proposed, as an alternative to that specified must have the prior approval of the Employer.

All busbars, wiring, terminals, etc., are to be adequately insulated and all wiring is to enter the switchgear from the back of the board. The switchgear shall be mounted within the boards to give a flush front panel. Cable and boxes and other ancillary equipment must be provided where required.

Clearly engraved labels are to be mounted on or below every switch. The working of the labels in English, is to be according to the lay-out drawings or as directed by the Electrical Engineer and must be confirmed on site. Flush mounted boards to be installed with the top of the board 2,0m above the finished floor level.

16 WORKMANSHIP AND STAFF

Except in the case of electrical installations supplied by a single-phase electricity supply at the point of supply, an accredited person shall exercise general control over all electrical installation work being carried out.

The workmanship shall be of the highest grade and to the satisfaction of the Employer.

All inferior work shall, on indication by the Employer's inspecting officers, immediately be removed and rectified by and at the expense of the Contractor.

17 VERIFICATION AND CERTIFICATION OF ELECTRICAL INSTALLATION (CERTIFICATE OF COMPLIANCE AND TEST REPORT

On completion of the service, a certificate of compliance must be issued to the Principal Agent/Electrical Engineer or Employer in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) in the format as set out in SANS 10142-1 & 2.

18 EARTHING OF INSTALLATION

Main earthing

The type of main earthing must be as required by the supply authority if other than the Employer, and in any event as directed by the Principal Agent/Electrical Engineer, who may require additional earthing to meet test standards.

Where required an earth mat shall be provided, the minimum size, unless otherwise specified, being 1,0m

x 1,0m and consisting of 4mm diameter hard-drawn bare copper wires at 250mm centres, brazed at all intersections.

Alternatively or additionally earth rods or trench earths may be required as specified or directed by the Electrical Engineer.

Installations shall be effectively earthed in accordance with the "Wiring Code" and to the requirements of the supply authority. All earth conductors shall be stranded copper with or without green PVC installation.

Connection from the main earth bar on the main board must be made to the cold water main, the incoming service earth conductor, if any and the earth mat or other local electrode by means of 12mm x 1,60 mm solid copper strapping or 16 mm² stranded (not solid) bare copper wire or such conductor as the Department's representative may direct. Main earth copper strapping where installed below 3m from ground level, must be run in 20 mm diameter conduit securely fixed to the walls.

All other hot and cold water pipes shall be connected with 12mm x 0,8mm perforated for solid copper strapping (not conductors) to the nearest switchboard. The strapping shall be fixed to the pipework with brass nuts and bolts and against walls with brass screws at 150-mm centres. In all cases where metal water pipes, down pipes, flues, etc., are positioned within 1,6m of switchboards an earth connection consisting of copper strapping shall be installed between the pipework and the board. In vertical building ducts accommodating both metal water pipes and electrical cables, all the pipes shall be earthed at each distribution board.

Roofs, gutters and down pipes

Where service connections consist of overhead conductors, all metal parts of roofs, gutters and down pipes shall be earthed. One bare 10mm² copper conductor shall be installed over the full length of the ceiling void, fixed to the top purlin and connected to the main earth conductor and each switchboard. The roof and gutters shall be connected at 15m intervals to this conductor by means of 12mm X 0,8mm copper strapping (not conductors) and galvanised bolts and nuts. Self-tapping screws are not acceptable. Where service connections consist of underground supplies, the above requirements are not applicable.

Sub-distribution boards

A separate earth connection shall be supplied between the earth busbar in each sub-distribution board and the earth busbar in the Main Switchboard. These connections shall consist of a bare or insulated stranded copper conductors installed along the same routes as the supply cables or in the same conduit as the supply conductors. Alternatively armoured cables with earth continuity conductors included in the armouring may be utilised where specified or approved.

Sub-circuits

The earth conductors of fall sub-circuits shall be connected to the earth busbar in the supply board in accordance with SANS 10142.

Ring Mains

Common earth conductors may be used where various circuits are installed in the same wire way in accordance with SANS 10142. In such instances the sizes of earth conductors shall be equivalent to that of the largest current carrying conductor installed in the wire way, alternatively the size of the conductor shall be as directed by the Engineer. Earth conductors for individual circuits branching from the ring main shall be connected to the common earth conductor with T-ferrules or soldered. The common earth shall not be broken.

Non-metallic Conduit

Where non-metallic conduit is specified or allowed, the installation shall comply with the Department's standard quality specification for "conduit and conduit accessories".

Standard copper earth conductors shall be installed in the conduits and fixed securely to all metal appliances and equipment, including metal switch boxes, socket-outlet boxes, draw-boxes, switchboards,

luminaires, etc. The securing of earth conductors by means of self-threading screws will not be permitted.

Flexible Conduit

An earth conductor shall be installed in all non-metal flexible conduit. This earth conductor shall not be installed externally to the flexible conduit but within the conduit with the other conductors. The earth conductor shall be connected to the earth terminals at both ends of the circuit.

Connection

Under no circumstances shall any connection points, bolts, screws, etc., used for earthing be utilised for any other purpose. It will be the responsibility of the Contractor to supply and fit earth terminals or clamps on equipment and materials that must be earthed where these are not provided.

Unless earth conductors are connected to proper terminals, the end shall be tinned and lugged.

19 MOUNTING AND POSITIONING OF LUMINAIRES

The Contractor is to note that in the case of board and acoustic tile ceilings, i.e. as opposed to concrete slabs, close co-operation with the building contractor is necessary to ensure that as far as possible the luminaires are symmetrically positioned with regard to the ceiling pattern.

The layout of the luminaires as indicated on the drawings must be adhered to as far as possible and must be confirmed with the Department's representative.

Fluorescent luminaires installed against concrete ceilings shall be screwed to the outlet boxes and in addition 2 x 6mm expansion or other approved type fixing bolts are to be provided. The bolts are to be $\frac{3}{4}$ of the length of the luminaires apart.

Fluorescent luminaires to be mounted on board ceilings shall be secured by means of two 40mm x No. 10 round head screws and washers. The luminaires shall also be bonded to the circuit conduit by means of locknuts and brass bushes. The fixing screws are to be placed $\frac{3}{4}$ of the length of the fitting apart.

Earth conductors must be drawn in with the circuit wiring and connected to the earthing terminal of all fluorescent luminaires as well as other luminaires exposed to the weather in accordance with the "Wiring Code".

Incandescent luminaires are to be screwed directly to outlet boxes in concrete slabs. Against board ceilings the luminaires shall be secured to the bracing or joists by means of two 40mm x No. 8 round head screws.

PART 2: INSTALLATION DETAILS

[Omit which is not applicable. Clauses 1 to 10 of Part 2 are standard clauses (which should not be altered) and must be inserted in the document in the order as set out.]

CONTENTS

1	CABLE SLEEVE PIPES	10
2	NOTICES.....	10
3	ELECTRICAL EQUIPMENT	10
4	DRAWINGS.....	10
5	BALANCING OF LOAD.....	10
6	SERVICE CONDITIONS	10
7	SWITCHES AND SOCKET OUTLETS	10
8	LIGHT FITTINGS AND LAMPS.....	10
9	EARTHING AND BONDING	10
10	MAINTENANCE OF ELECTRICAL SUPPLY	11
11	EXTENT OF WORK.....	11
12	SUPPLY AND CONNECTION	11
13	CONDUIT AND WIRING.....	11
14	POWER POINTS	12
15	CABLES	12
16.	DISTRIBUTION BOARDS	15
17.	SUBSTATION	16
18.	SCHEDULE OF LIGHT FITINGS.....	16
19.	SCHEDULE OF POWER POINTS	16
20.	SCHEDULE OF CABLES, CONDUIT AND WIRING.....	17
21.	SCHEDULE OF DISTRIBUTION BOARDS.....	17
22.	SUMMARY OF SWITCHGEAR AND CIRCUITS	17

PART 2: INSTALLATION DETAILS

1 CABLE SLEEVE PIPES

Where cables cross under roadways, other services and where cables enter buildings, the cables shall be installed in earthenware or high-density polyethylene pipes.

The ends of all sleeves shall be sealed with a non-hardening watertight compound after the installation of cables. All sleeves intended for future use shall likewise be sealed.

2 NOTICES

The Contractor shall issue all notices and make the necessary arrangements with Supply Authorities, the Postmaster-General, and S.A. Transport Services, Provincial or National Road Authorities and other authorities as may be required with respect to the installation.

3 ELECTRICAL EQUIPMENT

All equipment and fittings supplied must be in accordance with the attached quality specification (Part 3 of this document), suitable for the relevant supply voltage, and frequency and must be approved by the Employers Electrical Engineer.

4 DRAWINGS

The drawings generally show the scope and extent of the proposed work and shall not be held as showing every minute detail of the work to be executed.

The position of power points, switches and light points that may be influenced by built-in furniture must be established on site, prior to these items being built in.

5 BALANCING OF LOAD

The Contractor is required to balance the load as equally as possible over the multiphase supply.

6 SERVICE CONDITIONS

All plant shall be designed for the climatic conditions appertaining to the service.

7 SWITCHES AND SOCKET OUTLETS

The installation of switches and socket outlets must conform to clause 13 of Part 1 of this specification.

8 LIGHT FITTINGS AND LAMPS

The installation and mounting of luminaires must conform to clause 19 of Part 1 of this specification.

All fittings to be supplied by the Contractor shall have the approval of the Employer.

The light fittings must be of the type specified in the Schedule of Light Fittings.

9 EARTHING AND BONDING

The Contractor will be responsible for all earthing and bonding of the building and installation. The earthing and bonding is to be carried out strictly as described in clause 18 of Part 1 of this specification and to the satisfaction of the Employer/s Electrical Engineer.

10 MAINTENANCE OF ELECTRICAL SUPPLY

All interruptions of the electrical supply that may be necessary for the execution of the work, will be subject to prior arrangement between the Contractor and the Client and the Employer's Electrical Engineer.

11 EXTENT OF WORK

The work covered by this contract comprises the complete electrical installation, in working order, as shown on the drawings and as per this specification, including the supply and installation of all fittings and also the installation of such equipment supplied by the Employer.

12 SUPPLY AND CONNECTION

[The supply voltage, responsibility of the Supply Authority and the contractor must be specified]

EXAMPLE:

The supply will be at 400/230 Volt 50Hz.

The Contractor must arrange in good time with the local Municipality for the installation of the 500kVA transformer and low-tension meter point and submit the account to the Employer's Regional Office for payment.

The Contractor will be responsible for the supply and installation of the supply cable from the meter box to the main low-tension distribution board (MDB). The size and length of the cable is listed in the Schedule of Cables and measured in the Bills of Quantities.

Standby Plant

The 10kVA standby plant complete with automatic changeover control panel (Distribution Board – X) be supplied, installed and commissioned by others.

The Contractor will only be responsible for the supply and installation of the cable connections between the Main Distribution Board and the Charge- over Control Panel (Distribution Board - X).

The supply cables are listed in the Schedule of Cables and measured in the Bills of Quantities.

13 CONDUIT AND WIRING

Conduit and conduit accessories shall be black enameled/galvanized screwed conduit or black enameled/galvanized plain end conduit in accordance with SANS 61386.

All conduits, regardless of the system employed, shall be installed strictly as described in the applicable paragraphs of clauses 4 to 8 of Part 1 of the specification. Wiring of the installation shall be carried out as directed in clause 9 part 1 of this specification.

Where plain end conduit is offered all switches and light fittings must be supplied with a permanent earth terminal for the connection of the earth wire.

Luqs held by switch fixing screws or self tapping screws will not be acceptable.

13.1 Telephone Installation

The Contractor shall allow for the complete installation of all conduits, outlet boxes, the communication service provider Distribution boards, sleeve pipes, etc., required for the telephone system as shown on the drawings.

The sizes of all telephone conduits are indicated on the drawings and must be installed in the floor slab. Galvanized steel draw-wires shall be installed in all conduits.

End boxes must consist of a 50mm x 100 mm x 100mm outlet box fitted with suitable blank cover plates, flush mounted 0,4m above floor level.

The communication service provider Distribution Board must consist of a 150mm x 600mm x 600mm metal box and hinged door with a 20mm thick wooden backboard. The board must be flush mounted, 1,37m above the floor.

13.2 Intercom Installation

The supply and installation of the intercom system is not included in this Contract.

The Contractor shall allow for the complete supply and installation of all conduits and outlet boxes required for the intercom installation as shown on the drawings.

The size of all conduits, boxes and mounting heights of the end boxes are indicated on the drawings. Galvanized steel draw-wires shall be installed in all conduits and the boxes fitted with suitable blank cover plates.

13.3 Power Trunking

The Contractor shall be responsible for the supply and installation of all power trunking complete with corner pieces, end pieces, junction pieces, supply conduits, cover plates and power outlets as specified and indicated on the drawings.

The power trunking must comply with SANS 61084. The Contractor must ensure that the power trunking is installed to satisfaction of the Employer's Electrical Engineer before commencing with the wiring of the power trunking.

[The method of installing and wiring of the power trunking must be specified in detail.]

14 POWER POINTS

Allow for the installation of power points and equipment as listed in the schedule, indicated on the drawings and described below:

- 14.1 ELECTRIC STOVE
- 14.2 ELECTRIC COOKING TOP
- 14.3 WATER HEATERS, ETC.

[The power points required for the service must be specified in detail with reference to supplier of the equipment, method of installation and final connection. The size of the conduit/the conductors and cable must be listed in the Schedule of Power Points.]

Example: Water Heaters

The Contractor must electrically connect all water heaters as specified and listed in the Schedule of Power Points.

NOTE: The hot water installation must be approved by the Employers Electrical Engineer. Detail with regard to the size and type of water heaters that must be provided must be obtained from the Architect.

15 CABLES

The Contractor shall supply and completely install all distribution cables as indicated on the drawings, and listed in the Schedule of Cables.

The storage, transportation, handling and laying of the cables shall be according to first class practice, and the contractor shall have adequate and suitable equipment and labour to ensure that no damage is done to cables during such operations.

The cable-trenches shall be excavated to a depth of 0,9m deep below ground level and shall be 450mm wide for one to three cables, and the width shall be increased where more than three cables are laid together so that the cables may be placed at least two cable diameters apart throughout the run. The bottom of the trench shall be level and clean and the bottom and sites free from rocks or stones liable to cause damage to the cable.

The Contractor must take all necessary precautions to prevent the trenching work being in any way a hazard to the personnel and public and to safeguard all structures, roads, sewage works or other property on the site from any risk of subsidence and damage.

In the trenches the cables shall be laid on a 75mm thick bed of earth and be covered with a 150-mm layer of earth before the trench is filled in.

All joints in underground cables and terminations shall be made either by means of compound filled boxes according to the best established practice by competent cable jointers using first class materials or by means of approved epoxy-resin pressure type jointing kits. Epoxy-resin joints must be made entirely in accordance with the manufacturer's instructions and with materials stipulated in such instructions. Low tension PVCA cables are to be made off with sealing glands and materials designed for this purpose which must be of an approved make. Where cables are cut and not immediately made off, the ends are to be sealed without delay.

The laying of cables shall not be commenced until the trenches have been inspected and approved. The cable shall be removed from the drum in such a way that no twisting, tension or mechanical damage is caused and must be adequately supported at intervals during the whole operation. Particular care must be exercised where it is necessary to draw cables through pipes and ducts to avoid abrasion, elongation or distortion of any kind. The ends of such pipes and ducts shall be sealed to approval after drawing in of the cables.

Backfilling (after bedding) of the trenches is to be carried out with a proper grading of the material to ensure settling without voids, and the material is to be tamped down after the addition of every 150mm. The surface is to be made good as required.

On each completed section of the laid and jointed cable, the insulation resistance shall be tested to approval with an approved "Megger" type instrument of not less than 500 V for low tension cables.

Earth continuity conductors are to be run with all underground cables constituting part of a low tension distribution system. Such continuity conductors are to be stranded bare copper of a cross-sectional area equal to at least half that of one live conductor of the cable, but shall not be less than 4mm² or more than 70mm². A single earth wire may be used as earth continuity conductor for two or more cables run together, branch earth wires being brazed on where required.

15.1 LAYING, JOINTING AND MAKING OFF OF ELECTRICAL CABLES

[The requirements specified hereafter, are aimed essentially at high tension cable but are also valid for low tension cable, where applicable.]

1. The use of the term "Inspector", includes the engineer or inspector of the Department or an empowered person of the concerned supervising consulting engineer's firm.
2. No cable is to be laid before the cable trench is approved and the soil qualification of the excavation is agreed upon by the Contractor and inspector.
3. After the cable has been laid and before the cable trench is back-filled the inspector must ensure that the cable is properly bedded and that there is no undesirable material included in the bedding layer.
4. All cable jointing and the making off of the cables must only be carried out by qualified experienced cable jointers. Helpers of the jointers may not saw, strip, cut, solder, etc. The cable and other work undertaken by them must be carried out under the strict and constant supervision of the jointer.
5. Before the Contractor allows the jointer to commence with the jointing work or making off of the

cable (making off is recognized as half a joint) he must take care and ensure:

- 5.1 That he has adequate and suitable material available to complete the joint properly and efficiently. Special attention must be given to ensure the cable ferrules and cable lugs are of tinned copper and of sufficient size. The length of the jointing lugs must be at least six times the diameter of the conductor,
- 5.2 That the joint pit is dry and that all loose stones and material are removed,
- 5.3 That the walls and banks of the joint pit are reasonable firm and free from loose material which can fall into the pit,
- 5.4 That the necessary coffer-dams or retaining walls are made to stop the flow of water into the joint pit,
- 5.5 That the joint pit is provided with suitable groundsheets so that the jointing work is carried out in clean conditions,
- 5.6 That the necessary tents or sails are installed over the joint pit to effectively avert unexpected rainfall and that sufficient light or lighting is provided,
- 5.7 That the necessary means are available to efficiently seal the jointing or cable end when an unexpected storm or cloudburst occurs, regardless of how far the work has progressed,
- 5.8 That the cables and other materials are dry, undamaged and in all respects are suitable for the joint work or making off,
- 5.9 That the heating of cable oil, cable compound, plumbers metal and solder is arranged that they are at the correct temperature when required so that the cable is not unnecessarily exposed to the atmosphere and consequently the ingress of moisture (care must be taken of overheating)

Flow temperatures of cable oil and compound must be determined with suitable thermometers. Cable oil and compound must not be heated to exceed the temperatures given on the containers and precaution must be taken to ensure that the tin is not overheated in one position. The whole mass must be evenly and proportionally heated.

(Temperatures of solder and plumbers metal may be tested with brown paper (testing time: 3 seconds). The paper must colour slightly - not black or burnt).

6. Before the paper-insulated cables are joined, they must be tested for the presence of moisture by the cable jointers test. This consists of the insertion of a piece of unhandled insulated impregnated paper tape in warm cable oil heated to a temperature of $130 \pm 5^{\circ}\text{C}$.

Froth on the surface of the oil is an indication that moisture is present in the impregnated insulation and the amount of the froth gives an indication of the moisture present.

7. If the cable contains moisture or is found to be otherwise unsuitable for jointing or making of the inspector is to be notified immediately and he will issue the necessary instruction to cope with the situation.
8. The joint or making off of paper insulated cables must not be commenced during rainy weather.
9. Once a joint is in progress the jointer must proceed with the joint until it is complete and before he leaves the site.
10. The jointer must ensure that the material and his tools are dry at all times, reasonably clean and absolutely free from soil.
11. Relating to the jointing of the cable the following requirements apply:
 - 11.1 All jointing must be carried out in accordance with recognized and tried techniques and comply

strictly with the instructions given by the supplier of the jointing kit.

- 11.2 The cables must be twisted by hand so that the cores can be joined according to the core numbers. If necessary the cable is to be exposed for a short distance to accomplish this. Under no circumstances may the cores in a joint be crossed so as to enable cores to be joined according to the core numbers. If it is not possible to twist the cables so that the preceding requirements can be met, then cores are to be joined in the normal way without any consideration of the core numbers.
- 11.3 Normally the cables will have profile conductors. The conductors shall be pinched with gas pliers to form a circular section, bound with binding wire so that they do not spread, and then tinned before jointing.
- 11.4 Jointing ferrules, the length of which are at least 6 times the diameter of the conductors, must be slid over the conductor ends to be joined and pinched tightly. Then they are soldered by means of the ladle process whilst being pinched further closed.

Use resin only as a flux. The slot opening in the ferrule must be completely filled, including all depressions.

Remove all superfluous metal with a cloth dipped in tallow. Work during the soldering process must be from top to bottom. Rub the ferrule smooth and clean with aluminium oxide tape after it has cooled down to ensure that there are not any sharp points or edges.

NB: The spaces between the conductor strands must be completely filled by soldering process and must be carried out quick enough to prevent the paper insulation from burning or drying out unnecessarily.

- 11.5 After the ferrules have been rubbed smooth and clean, they and the exposed cores must be treated with hot cable oil (110°C) to remove all dust and moisture. These parts are to be thoroughly basted with the oil.
- 11.6 The jointer must take care that his hands are dry and clean before the joint is insulated. Also the insulating tape which is to be used must first be immersed in warm cable oil (110°C) for a sufficient period to ensure that no moisture is present.
- 11.7 After the individual cores have been installed they must be well basted with hot cable oil and again after the applicable separator and/or belt insulation tape is applied before the lead joint sleeve is placed in position.
- 11.8 The lead joint sleeve must be thoroughly cleaned and prepared before it is placed on the cable and must be kept clean during the whole jointing process. Seal the filling apertures of the sleeve with tape until the sleeve is ready for compound filling.
- 11.9 The plumbing joints employed to solder the joint sleeve to the cable sheath, must be cooled off with tallow and the joint sleeve is to be filled with compound while it is still warm. Top up continuously until the joint is completely filled to compensate for the compound shrinkage.
- 11.10 The outer joint box must be clean and free from corrosion. After it has been placed in position it must be slightly heated before being filled with compound. Top up until completely full.
12. As far as cable end boxes are concerned the requirements as set out above are valid where applicable.

16. DISTRIBUTION BOARDS

In addition to clause 14 and clause 15 of Part 1 of this specification the following shall also be applicable to switchboards required for this service.

The Contractor shall supply and install the distribution boards as indicated on the drawings and listed in the

distribution Board Schedule. All distribution boards shall comply with the quality specification in Part 3 of this specification, and be approved by the Employer's Electrical Engineer.

The following types of distribution boards are required for the service:

[All buildings and the types of boards required for the service must be listed.

The latest Departmental Quality Specification Section for Distribution Boards must be included in Part 3 of the specification.]

17. SUBSTATION

- 17.1 GENERAL SUB-STATION WORK
- 17.2 SUB-STATION EARTHING
- 17.3 CONTRACTOR'S RESPONSIBILITY

18. SCHEDULE OF LIGHT FITINGS

The Departmental Quality Specification for the relevant luminaires must be included in Part 3 of the specification.

The light fittings and accessories are to be according to the quality specifications in Part 3 and shall be approved by the Employer.

Type A: Industrial 40W LED surface mounted channel luminaire with mid-power LED strip complete with diffuser colour 4000K with SANS approved mark.

Type B: Industrial 2 x 40W LED surface mounted channel luminaire with mid-power LED strips complete with diffuser colour 4000K with SANS approved mark.

Type C: Decorative 2 x 40W LED office luminaire with mid-power LED strips and low brightness double parabolic diffuser colour 4000K with SANS approved mark.

Type D: 53W wall/pole/stirrup mounted LED bulkhead luminaire with corrosion resistant aluminium housing and high impact UV resistant polycarbonate protector for LED's, IP66 with optimal photometric performance and flexible combinations of LED arrays, colour 4000K.

19. SCHEDULE OF POWER POINTS

BOARD	OWER POINT	TYPE	SIZE OF CABLES, CONDUIT AND WIRING	LOAD WATTS
MDB	PP1	150 liter	20mm dia. conduit with 2 x 4mm ² conductors and 2,5mm ² earth wire	3000
	PP2	4 plate electric stove	25 mm dia. conduit with 2 x 10mm ² conductors and 6mm ² earth wire	9000
DB-A	PP3	350 liter water heater	25 mm dia. conduit with 4 x 4mm ² conductors and 2,5mm earth wire	3 x 3000
DB-C	PP1	Petrol pump	4mm ² 2-core PVCA cable with 4mm ² earth wire	1000

20. SCHEDULE OF CABLES, CONDUIT AND WIRING

Supply, install and connect the following cable, conduit and wiring:

FROM	TO	SIZE AND TYPE	LOAD (kVA)
Meter box Normal Power	MDB	70mm ² 4-core PVCA cable and 35mm ² earth wire	114
MDB Normal Power	DB-A	25mm ² 4-core PVCA cable and 16mm ² earth wire	50
MDB Normal Power	DB-B	16mm ² 4-core PVCA cable and 10mm ² earth wire	36
MDB Normal Power	DB-X	25mm dia. conduit with 4 x 6mm ² conductors and 4mm ² earth wire	10
DB-X Standby Power	MDB	25mm dia. conduit with 4 x 6mm ² conductors and 4mm ² earth wire	-
MDB Standby Power	DB-C	4mm ² 4-core PVCA cable and 4mm ² earth wire	7
DB-C Standby Power	PP1	4mm ² 4-core PVCA cable and 4mm ² earth wire	1

21. SCHEDULE OF DISTRIBUTION BOARDS

The front panels of normal supply, standby power and no-break supply sections shall be painted in distinctive colours as follows:

Normal supply : Light Orange, colour B26 of SANS 1091.
 Standby power : Signal Red, colour A11 of SANS 1091.
 No-break supply: Dark Violet, colour F06 or Olive Green, Colour H05 of SANS 1091.

Indicated is the probable fault level rating (kA) of the busbars. Refer to the Summary of Switchgear and Circuits for the minimum fault level rating of specified equipment.

BOARD	TYPE	PANEL	FAULT LEVEL	LOAD kVA
MDB	Floor standing, without door	Normal power	10	114
		Standby power	2,5	10
DB-A	Surface, with door	Normal power	5	50
DB-B	Flush, without door	Normal power	2,5	36
DB-C	Weather-proof	Standby power	2,5	8

22. SUMMARY OF SWITCHGEAR AND CIRCUITS

The indicated fault current rating (kA) is the minimum value that the switchgear must comply with for connecting to the busbars of the respective panels-distribution boards.

MAIN DISTRIBUTION BOARD : MDB

PANEL - 1 : NORMAL POWER

Main switch : 200A three pole 10kA circuit breaker.
 Distribution board – A : 100A three pole 10kA circuit breaker.
 Distribution board – B : 60A three pole 10kA circuit breaker.
 10kVA Standby plant : 30A three pole 10kA circuit breaker.

PANEL-2 : NORMAL POWER

Local main switch: 60A three pole isolator
 Lighting circuits 1-3: 3 x 10A one pole 5kA circuit breakers.
 Socket outlets : 3 x 60A two pole 30mA single-phase earth leakage relays, and 10 x 20A Single pole 5kA circuit breakers.

Circuits P1 to P10

Water heater PP1 20A two pole 5kA circuit breaker.

4 Plate stove PP2 40A single pole 5kA circuit breaker.

PANEL – 3 : STANDBY POWER

Local main switch 30A three pole 5kA circuit breaker.
 Distribution Board-C : 20A three pole 5kA circuit breaker.
 Lighting circuits x 4 & x 5 : 2 x 10A single pole 5kA circuit breakers.
 Socket outlets Circuit x P11 : 40A two pole 30mA single phase earth leakage relay, and 1 x 20A single pole 5kA circuit breaker.

[Socket outlets circuits (P) must be controlled by 60A two pole 30mA single phase earth leakage relay and 20A single pole 5kA circuit breakers. With a maximum of 5 circuits (10 plugs) per earth leakage relay.]

MDB: PANEL-2: POWER

CIRCUIT NO.	FITTING NO.	TYPE OF FITTING	QTY	LOAD EACH (W)	LOAD TOTAL (W)	MOUNTING
1	1-4	Type B	4	130	520	Ceiling
	5-8	Type A	4	100	400	Ceiling
2	1,3	Type D	2	8	16	Wall 2,8m above floor level
	2,4,6	Type D	3	65	195	Tie beam
	5,7	Type D	2	300	600	Ceiling
	8	Type C	2	130	260	Ceiling
3	1,2,5,6	Type D	4	65	260	Tie beam
	3,4,7,8	Type B	4	130	520	Ceiling
P1-P4	1,2	Socket outlets	8	500	4 000	Wall, 0,4m above floor
P5-P7	1,2	Socket outlets	6	500	3 000	Wall, 1,4m above floor
P8-P10	1,2	Socket outlets	6	500	3 000	Power skirting 1,2m above floor
PP1	1	150 l Water heater	1	3 000	3 000	See power points
PP2	1	4 Plate stove	1	9 000	9 000	See power points

MDB: PANEL 3: STANDBY POWER

CIRCUIT NO.	FITTING NO.	TYPE OF FITTING	QTY	LOAD EACH (W)	LOAD TOTAL (W)	MOUNTING
X4	1-8	Type A	8	100	800	Ceiling
X5	1-8	Type D	8	100	800	Wall 2,8m above floor level
XP1-XP4	1,2	Socket outlets	2	500	1 000	Wall, 0,4m above floor

PART 3: QUALITY SPECIFICATION FOR MATERIALS AND EQUIPMENT OF ELECTRICAL INSTALLATIONS

“Part 3: Quality specification for materials and equipment” manual of the Department of Public Works is applicable for this Contract and the manual can be obtained from the Department of Public Works.

[ONLY ITEMS OF MATERIAL applicable to the Contract must be included in Part 3]

CONTENTS

<u>CLAUSE</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
1.		
1.1		
1.2		
1.3		
1.4		
1.5		
1.6		
1.7		
2.		
2.1		
2.2		
2.3		
2.4		

ADDITIONAL REQUIREMENTS OR SPECIFICATIONS NOT COVERED IN QUALITY SPECIFICATIONS ABOVE

LED LIGHTS

All Light fittings installed for this project is to be of the LED type, unless otherwise stated.

The following international standard specifications and South-African Bureau of Standards shall apply to the LED luminaire specification:

SANS 475	Luminaires for interior lighting, street lighting and floodlighting – Performance and requirements
SANS 10114-1	Interior lighting part 1: Artificial lighting of interiors
SANS 10114-2	Interior lighting part 2: Emergency lighting
SANS 60598-1	Luminaires part 1: General requirements and tests
SANS 60598-2.1	Luminaires part 2: Particular requirements section 1 – Fixed general purpose luminaires.
SANS 60598-2.2	Luminaires part 2: Particular requirements section 2 – Recessed luminaires.
SANS 60598-2.3	Luminaires part 2: Particular requirements section 3 – Luminaires for road and street lighting.
SANS 60598-2.5	Luminaires part 2: Particular requirements section 5 – Flood lighting.
SANS 61347-1 to 13	Lamp control gear
SANS 62031	LED modules for general lighting – Safety specifications

SANS 62384	DC or AC supplied electronic control gear for LED modules – Performance requirements.
SANS 62560	Self-ballasted LED lamps for general lighting services with supply voltages > 50V – Safety specification.
SANS 62612	Self-ballasted LED lamps for general lighting services with supply voltages > 50V – Performance requirements
EN 55015	Limits and methods of measurement of radio disturbance of electrical lighting or equipment.
EN 61000-3.2	Electromagnetic compatibility (EMC) limits for harmonic current emissions.
EN 61000-3.3	Electromagnetic compatibility (EMC) limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems.
EN 61547	Equipment for general lighting purposes: EMC immunity requirements.
IEC-EN 62471	Photo biological safety of lamps and lamp systems for LEDs
IES LM-79-08	Approved method: Electrical and photometric measurement of solid-state lighting products.
IES LM-80	Approved method: Measuring lumen maintenance of LED light sources.

General requirements:

The luminaire shall be suitable for operation with mid-power LEDs. **Note that no LED tubes are allowed to be used.**

The luminaire shall be suitable for operation on a 230V single phase 50Hz mains supply.

Power factor capacitors shall be supplied to correct the power factor to at least 0.95 or higher.

The luminaire shall be marked with identification labels stating the brand name and model and shall bear the SANS approval mark.

The driver shall comply with IEC 61347-1 and IEC 61347-2B as applicable and shall be suitable for operation on 230V +/-10%, 50Hz single phase system and it must be insured that harmonics filter is provided as per SANS 61000-3-2. The drivers and LED circuitry shall be protected against lighting and power surges. Suitable surge arrestors with a 10kA rating shall be provided for indoor installations and 20kA for outdoor installations.

Colour rendering (Ra) shall be not less than 80 and lumen depreciation of not more than 30% L70 at 50 000 hours @ Tq 25°C. Colour temperature of the LED lamp shall be 4000K, unless otherwise stated.

Thermal requirements:

The luminaire must be able to withstand an ambient temperature of 35°C. Storage temperature of this luminaire should be able to handle -40°C < T < 60°C.

To this end internal electrical and mechanical components shall not be allowed to exceed their maximum temperature ratings of 75°C. Test reports from an independent authorised testing facility proving this requirement shall be made available on request.

Noise requirements:

The noise level emitted from the luminaire shall be kept as low as possible. Drivers/electronic components shall therefore fully comply with the latest edition of SANS 55015.

= END OF SPECIFICATION =

PART 4: BILLS OF QUANTITIES

Electrical, mechanical and/or any other engineering work must be measured by the quantity surveyor and must be prepared in accordance with the latest edition of the Standard System of Measuring Building Work.

No additional provision for Preliminaries may be included in the engineering sections of the bills of quantities.

Bills of Quantities are included in part C2.2 of the tender document.

PART 5: ELECTRICAL WORK MATERIAL SCHEDULE

The Contractor shall complete the following schedules and submit them to the Electrical Engineer within 21 days of the date of the acceptance of the tender.

The schedules will be scrutinised by the Electrical Engineer and should any material offered not comply with the requirements contained in the specification, the Contractor will be required to supply material in accordance with the contract at no additional cost.

NB: Only one manufacturer's name to be inserted for each item.

Item	Material	Make or trade name	Country of origin
1.	Distribution boards		
2.	Circuit breakers 1P, 2P, 3P		
3.	On load isolators without trips		
4.	Contactors 1P, 2P, 3P		
5.	Earth leakage relays 1 & 3 phase		
6.	H.R.C. fuse switches		
7.	Kilowatt hour meter		
8.	Current transformers		
9.	Voltmeter		
10.	Maximum demand ammeter		
11.	Daylight sensitive switch		
12.	Time switch		
13.	Conduit		
14.	Conduit boxes		
15.	Power skirting		
16.	Surface switches		
17.	Watertight switches		
18.	16A flush socket outlets		
19.	16A surface socket outlets		
20.	16A watertight socket outlets		
21.	Fluorescent luminaires		
22.	Type A		
	Type B		
	Type C		
	Type D		
	Etc.		
23.	Bulkhead fittings: Type F		
24.	Spherical fittings: Type G		
25.	4 plate stove		
26.	Convection heater		
27.	Fan heater		
28.	Fans		
29.	Clocks		
30.	PVCA cable		
31.	Cable trays		

PARTICULARS OF ELECTRICAL CONTRACTOR

Note to consultants

Please ensure that DPW -22(EC) Particulars of electrical contractor is inserted in main tender document.

PART 6: DRAWINGS

NOTE TO CONSULTANTS

List all drawings

Part C4: Site Information

C4 Site Information

PG-03.1 (EC) SITE INFORMATION – GCC 3rd Edition (2015)

Project title:	PHALABORWA 524: UPGRADING OF KITCHEN AND INSTALLATION OF KITCHEN EQUIPMENTS		
Tender no:	PLK24/12	WCS no:	Reference no: 6017/0612

C4 Site Information

The Site Location is

Phalaborwa 524 Signal Military Base, approximately 9 km West of Phalaborwa Town along R71

GPS CORDINATES 23°54'6.36"S, 31°6'41.56"E

Average Temperatures are the area vary from 25 to 30°C - Due care should be taken for staff working outside to be well hydrated with sufficient sun protective items that do not interfere with the general safety and protective ware

The Site is a Military base therefore access to the site is scheduled with the Client onsite

Moderate Traffic can be expected as R71 is a main Highway for Phalaborwa residence and those accessing the Krugar National Park.

Site Facilities available are as follows;

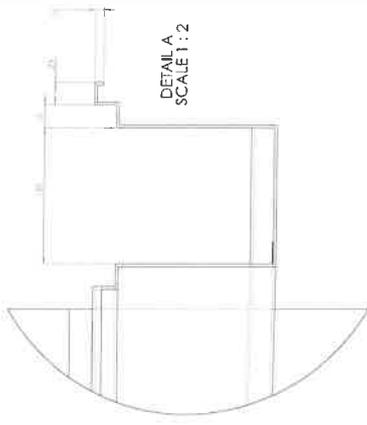
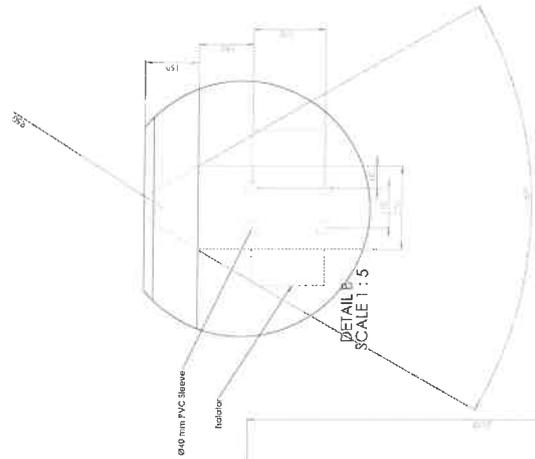
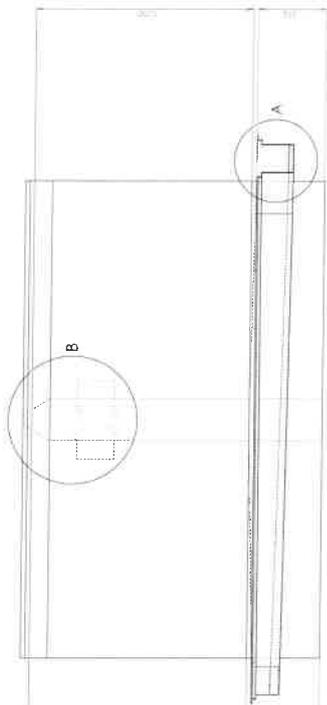
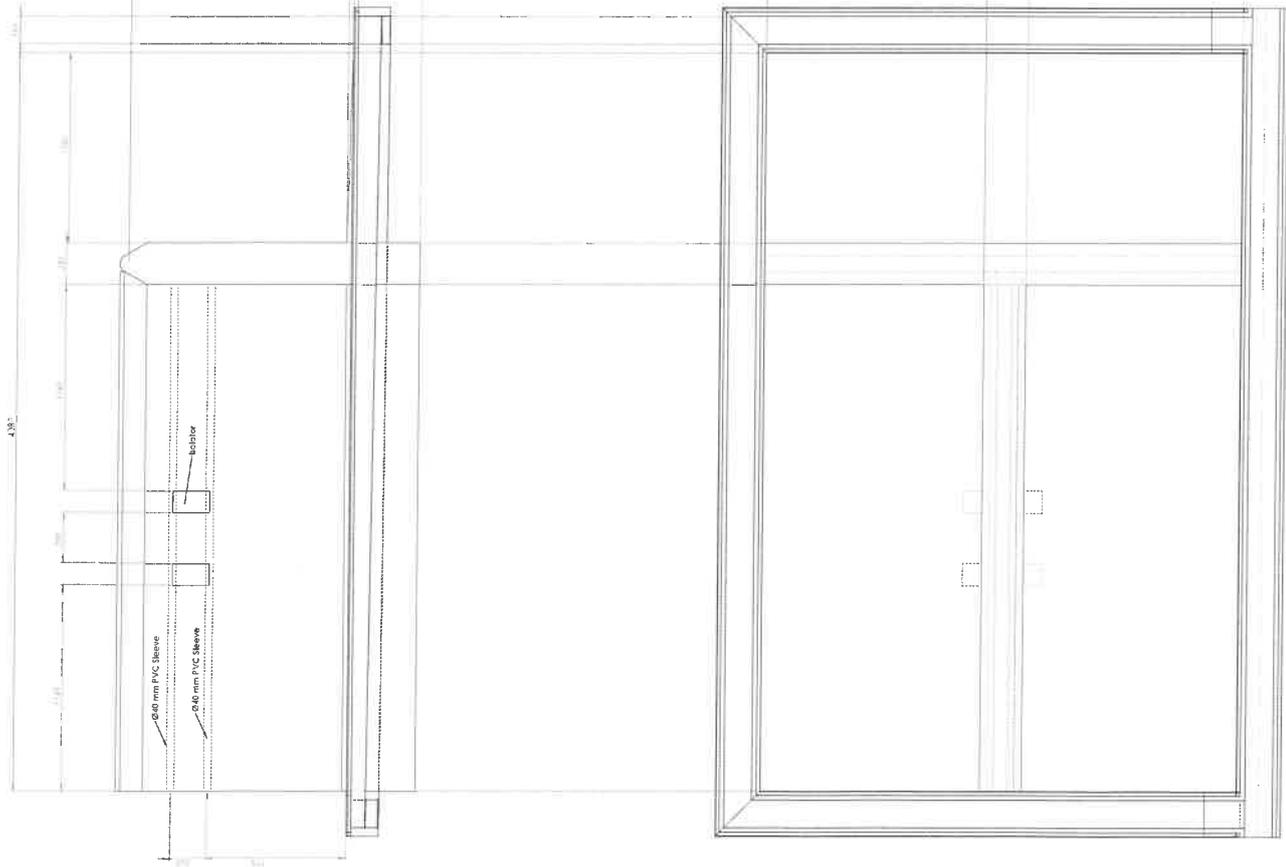
Water, Electricity and Ablution Facilities.

There is no area or office that can provided as a "Site office" for the contractor therefore provision will have to be made for Site Office Establishment.

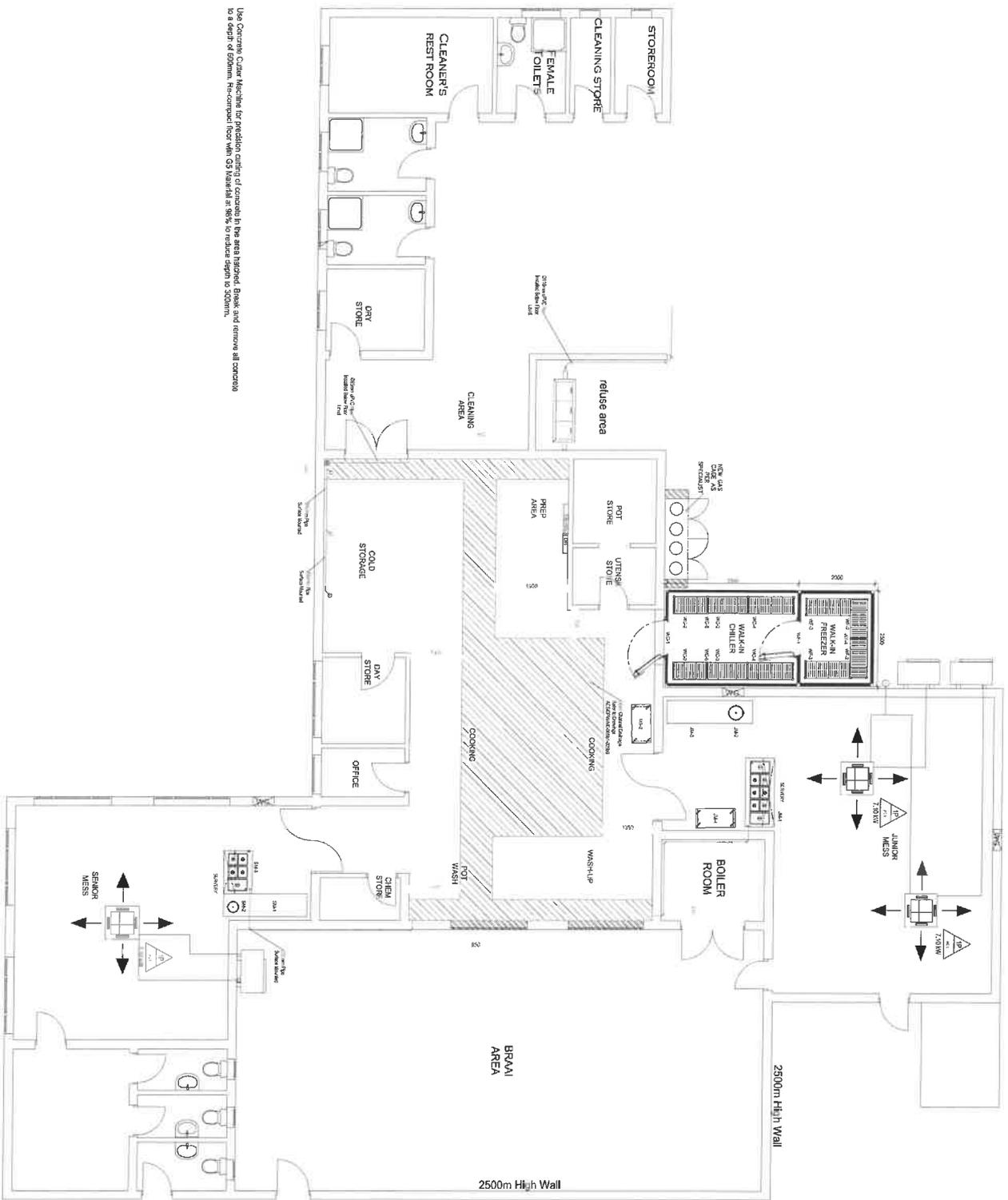
The Site also has very LIMITED storage for large items and therefore provision should be made for storage, ideally new equipment to be installed should arrive on a "just in time" basis to reduce the risk of damage, vandalism or theft prior to installation.

There will also be no accommodation on site; therefore, provision should be made for offsite accommodation. Due to the secure nature of the area, it is the contractor's responsibility that staff member enters and exit the site as a team unless extenuating circumstances arise that require staff member to leave site individually. This can be discussed with the client on site

C5 Site Drawing(s)

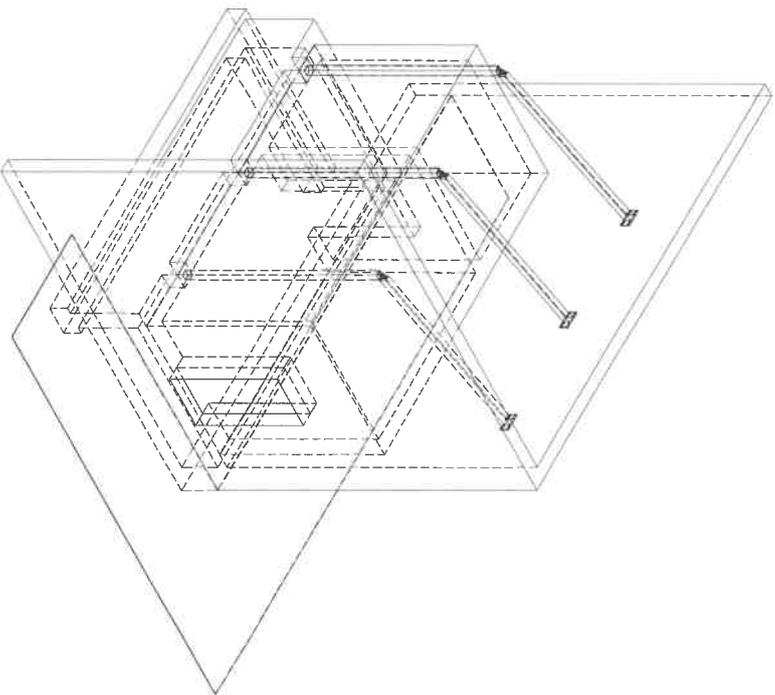
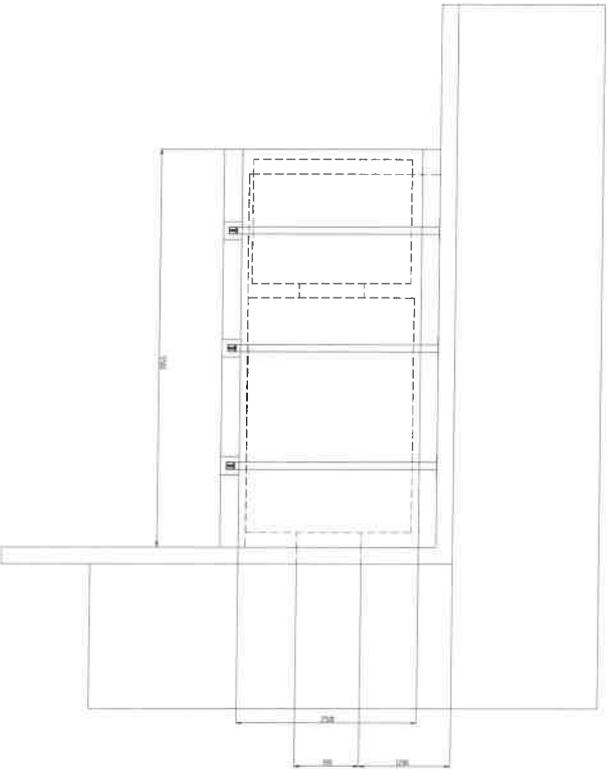
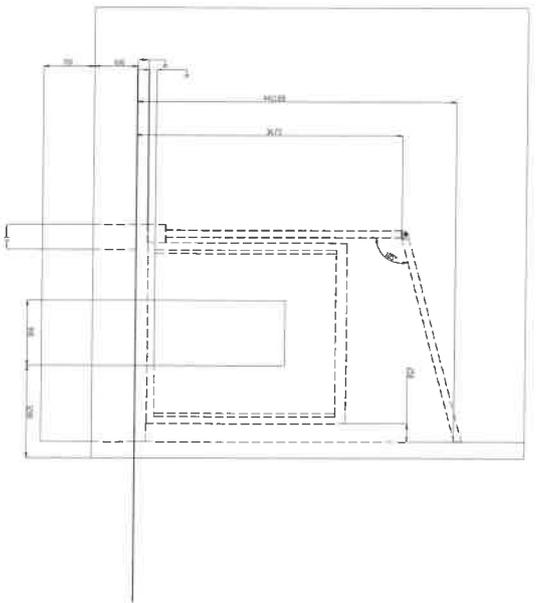
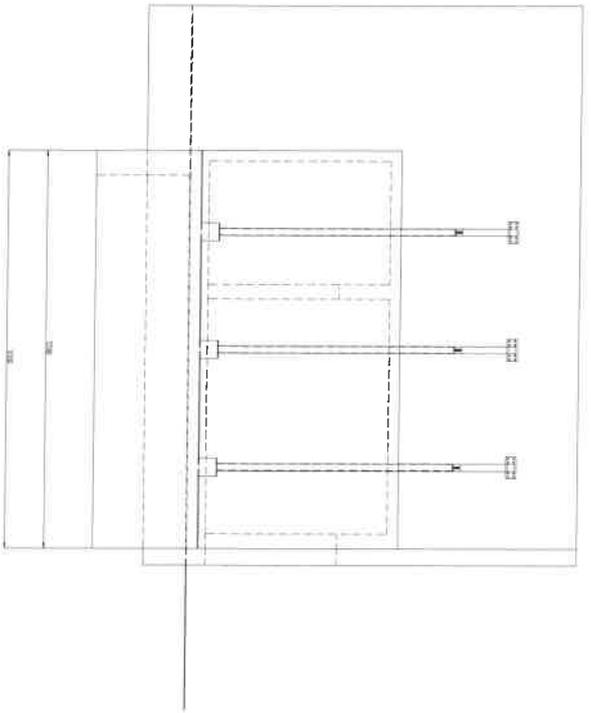


DETAIL B
SCALE 1:5



Use Concrete Curing Machines for protection against air cracks in the area heated. Break and remove all concrete to a depth of 50mm. Re-surface floor with G3 Material at 98% to reduce slip to 300mm.

 <p>public works The Department of Public Works 100 Water Street Cape Town 8001</p>	 <p>A&ES consulting ARCHITECTURE ENGINEERING CONSULTING 100 Water Street Cape Town 8001</p>	<p>Client: [Redacted] Project: [Redacted] Phase: [Redacted] Scale: [Redacted] Author: [Redacted] Check: [Redacted] Date: [Redacted]</p>	<p>Scale: 1:100 Sheet: 1 of 1 Revision: [Redacted]</p>
---	---	--	---



№ 10/2023	02/21
-----------	-------

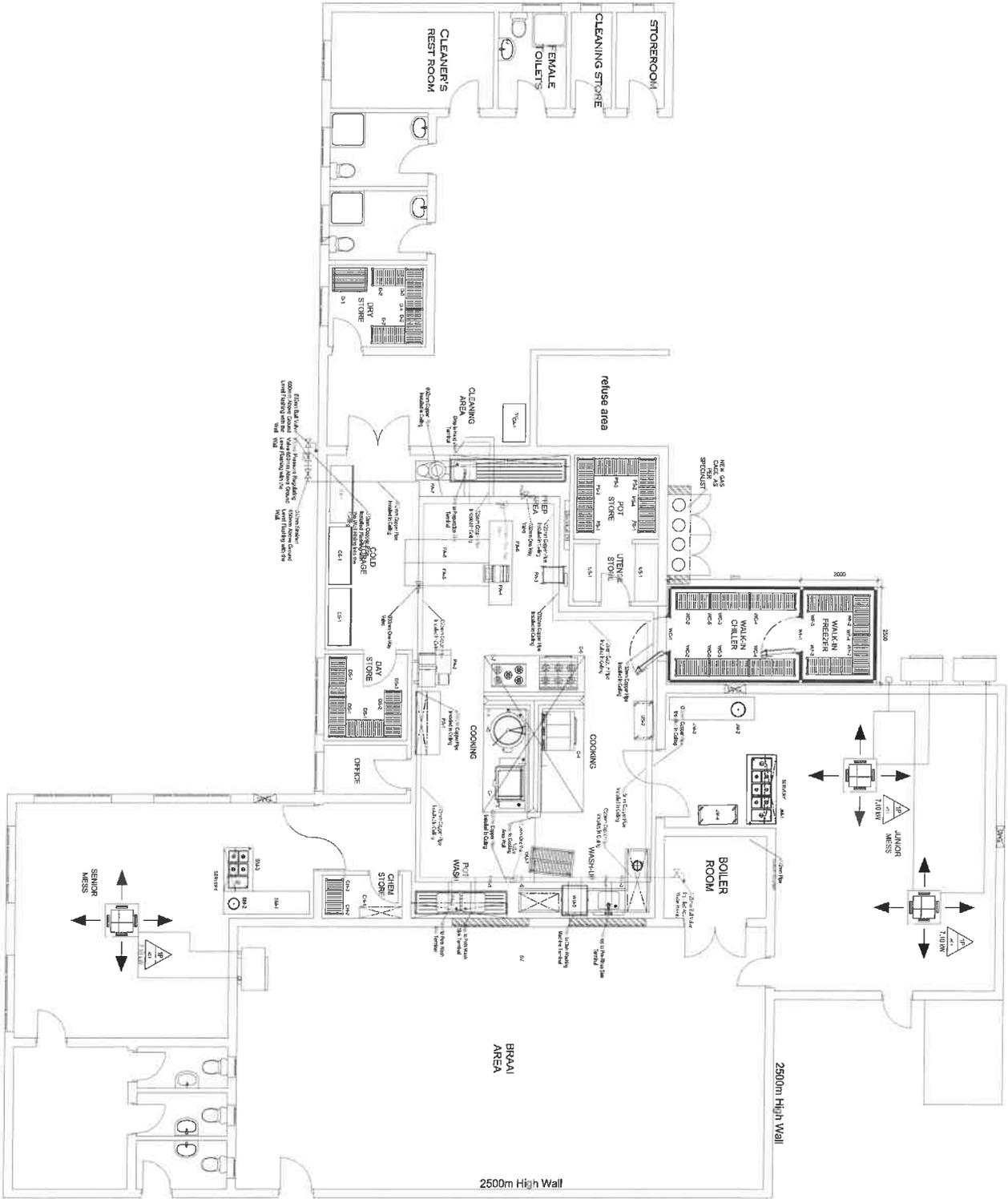
Содержание: 1. Общие сведения. 2. Технические условия. 3. Спецификация. 4. Состав работ. 5. Расчеты. 6. Заключение.

Исполнитель: ООО «АЭС Консалтинг»
 Адрес: 125080, г. Москва, ул. Мясницкая, д. 20, стр. 1
 Контакт: +7 (495) 105-10-10



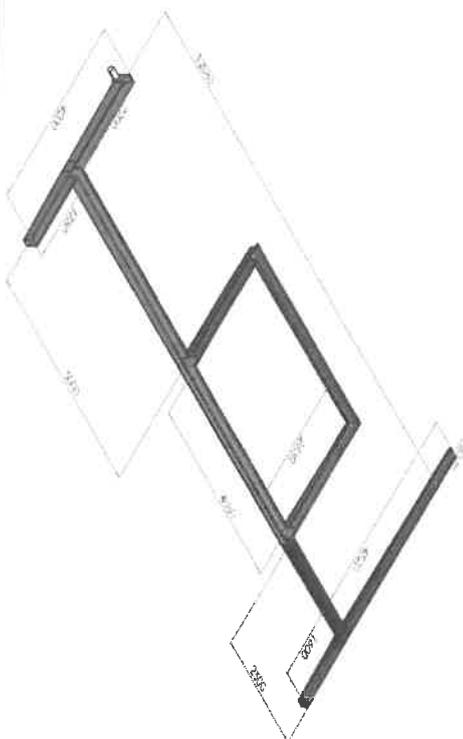
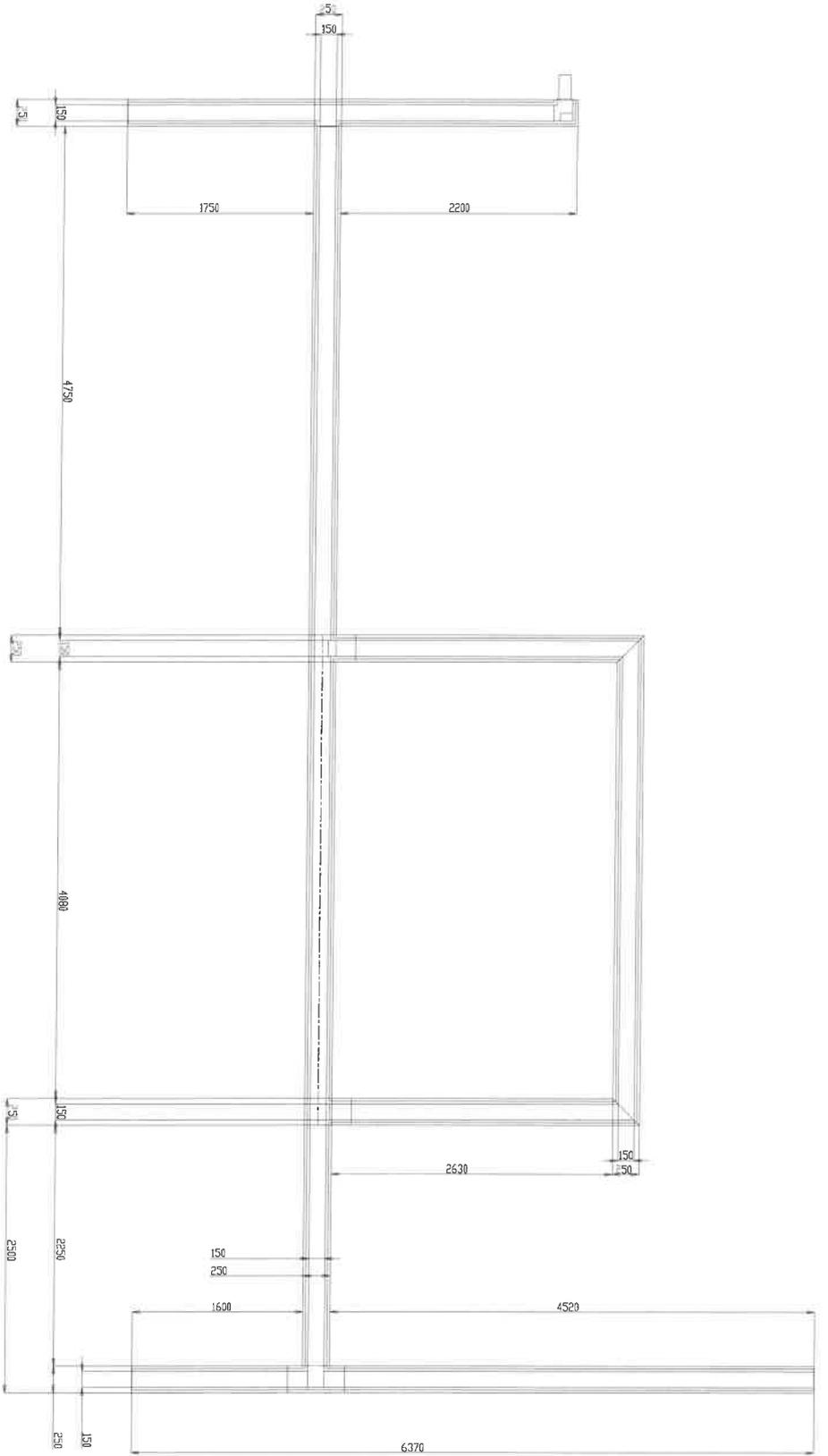
АЭС consulting
 ООО «АЭС Консалтинг»
 125080, г. Москва, ул. Мясницкая, д. 20, стр. 1
 Тел: +7 (495) 105-10-10
 E-mail: info@aes-consulting.ru

№ 10/2023	02/21
Исполнитель:	ООО «АЭС Консалтинг»
Адрес:	125080, г. Москва, ул. Мясницкая, д. 20, стр. 1
Контакт:	+7 (495) 105-10-10
E-mail:	info@aes-consulting.ru



1. All work to be done in accordance with the relevant standards and specifications.
 2. All work to be done in accordance with the relevant standards and specifications.
 3. All work to be done in accordance with the relevant standards and specifications.
 4. All work to be done in accordance with the relevant standards and specifications.
 5. All work to be done in accordance with the relevant standards and specifications.

<p>Public Works Department of Public Works 100 Water Street Cape Town 8001</p>	<p>DAES consulting ARCHITECTURAL TECHNOLOGY 100 Water Street Cape Town 8001</p>	<p> Project Name: _____ Project No: _____ Date: _____ Drawn by: _____ Checked by: _____ Approved by: _____ </p>	<p> Scale: _____ Date: _____ Project No: _____ </p>
---	--	--	---



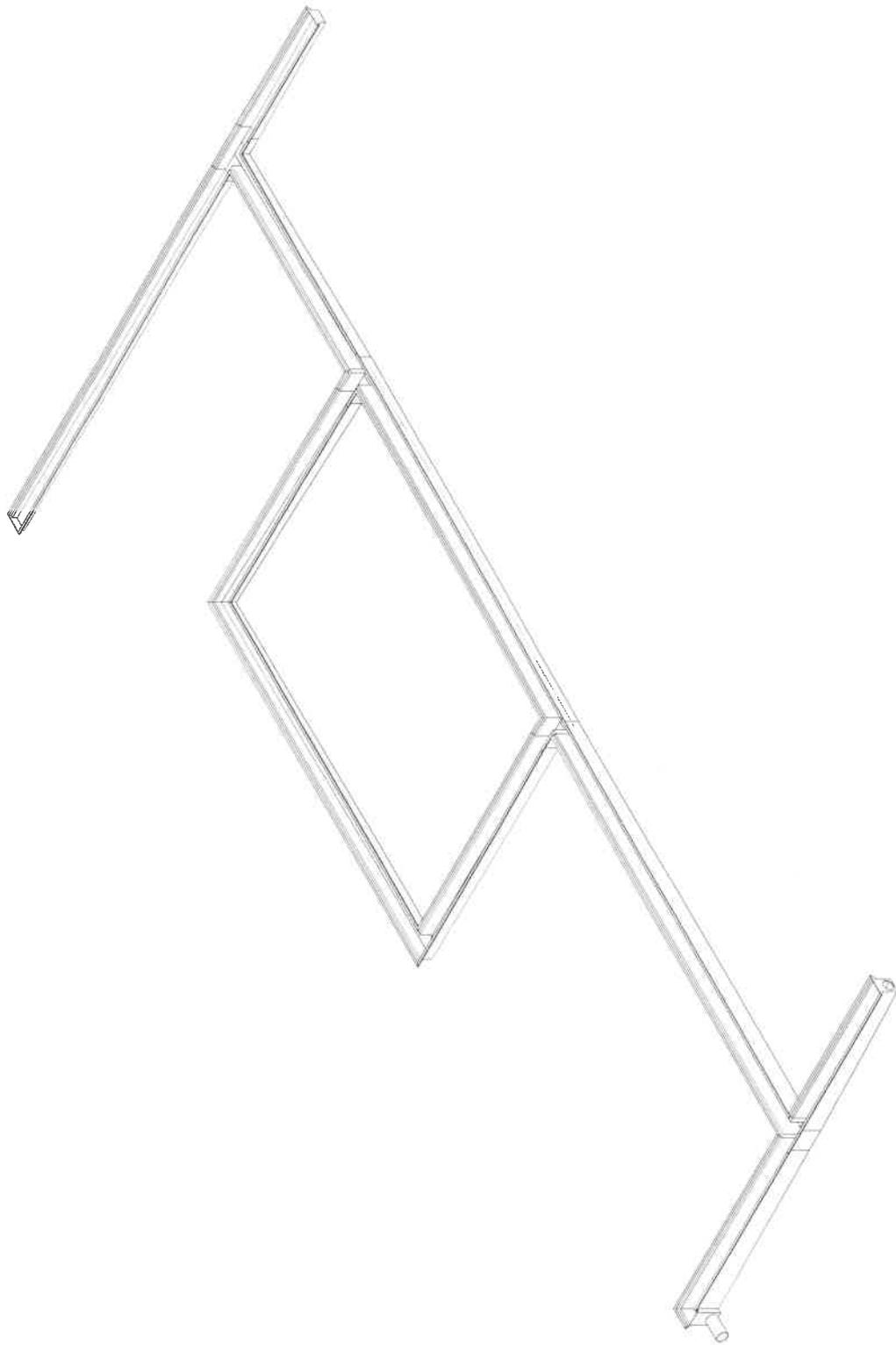
№ 1016
 10/10/2016
 10/10/2016

Содержание
 1. Общие сведения
 2. Описание помещений
 3. Технические характеристики помещений
 4. Спецификация помещений
 5. Заключение

Информация о проекте
 Проект №: 1016
 Дата: 10/10/2016
 Автор: [Имя]
 Проверен: [Имя]

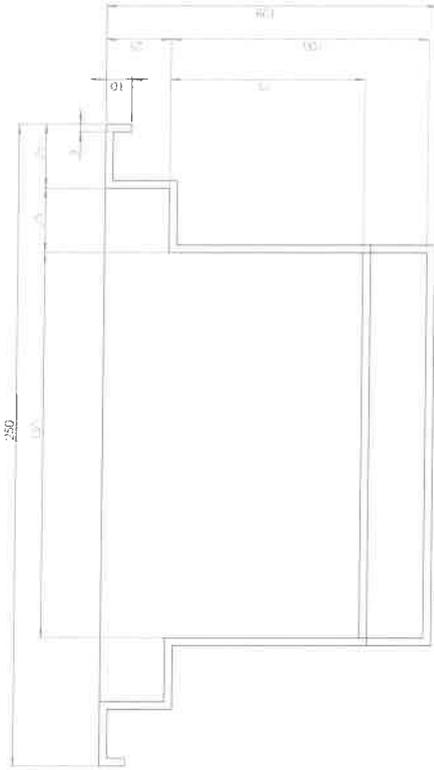
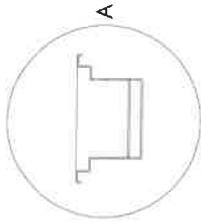


№ 1016	10/10/2016	10/10/2016
10/10/2016	10/10/2016	10/10/2016
10/10/2016	10/10/2016	10/10/2016
10/10/2016	10/10/2016	10/10/2016
10/10/2016	10/10/2016	10/10/2016

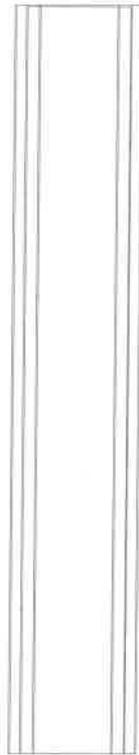


NO.	DESCRIPTION	QTY	UNIT	REMARKS
1	CHANNEL			
2	MANHOLE			
3	VALVE			
4	PIPE			
5	CONCRETE			
6	STEEL			
7	BRICK			
8	PAINT			
9	LABOR			
10	OTHER			

DATE: _____
DRAWN BY: _____
CHECKED BY: _____
SCALE: _____

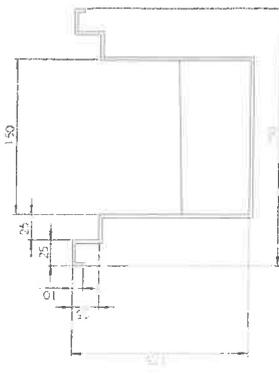
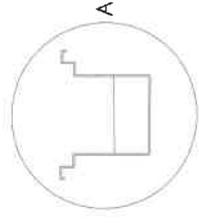
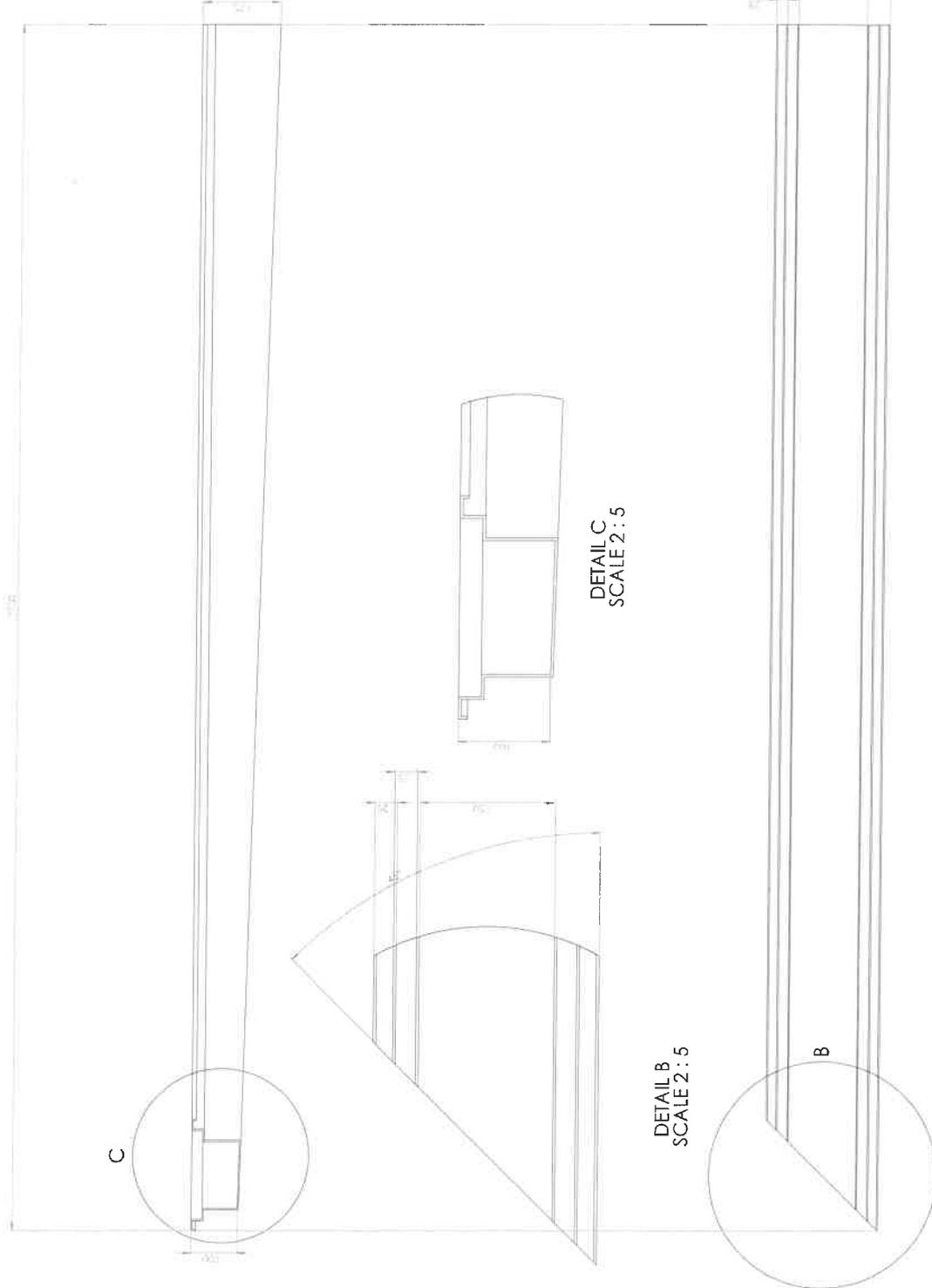


DETAIL A
SCALE 1 : 1

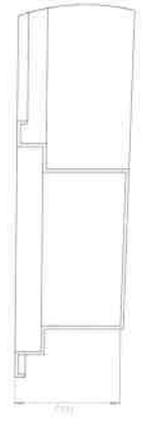


PROJECT INFORMATION		DRAWING INFORMATION	
PROJECT NO.	1000000000	DRAWING NO.	1000000000
DATE	10/10/2010	SCALE	1:1
DRAWN BY	...	CHECKED BY	...
DESIGNED BY	...	APPROVED BY	...
...

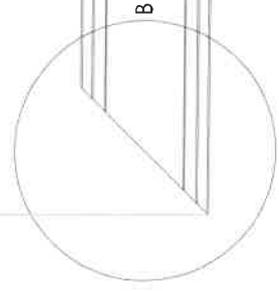
Channel B



DETAIL A
SCALE 2 : 5

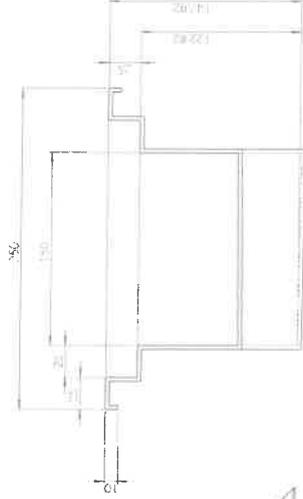
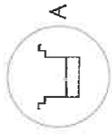


DETAIL C
SCALE 2 : 5



DETAIL B
SCALE 2 : 5

PROJEKTOVAZNA KARTICA		OPIS		MATERIJAL		KOD		DOKUMENTACIJA	
BR.	OPIS	BR.	OPIS	BR.	OPIS	BR.	OPIS	BR.	OPIS
1	OPIS	1	OPIS	1	OPIS	1	OPIS	1	OPIS
2	OPIS	2	OPIS	2	OPIS	2	OPIS	2	OPIS
3	OPIS	3	OPIS	3	OPIS	3	OPIS	3	OPIS
4	OPIS	4	OPIS	4	OPIS	4	OPIS	4	OPIS
5	OPIS	5	OPIS	5	OPIS	5	OPIS	5	OPIS
6	OPIS	6	OPIS	6	OPIS	6	OPIS	6	OPIS
7	OPIS	7	OPIS	7	OPIS	7	OPIS	7	OPIS
8	OPIS	8	OPIS	8	OPIS	8	OPIS	8	OPIS
9	OPIS	9	OPIS	9	OPIS	9	OPIS	9	OPIS
10	OPIS	10	OPIS	10	OPIS	10	OPIS	10	OPIS

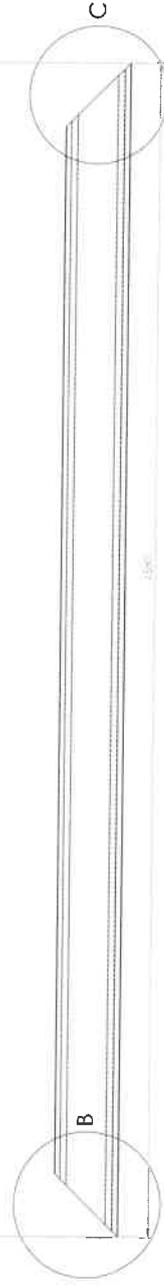


DETAIL A
SCALE 1 : 2

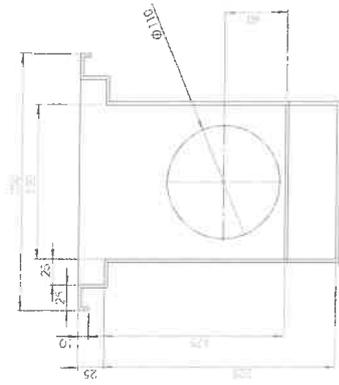
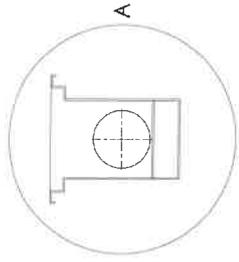
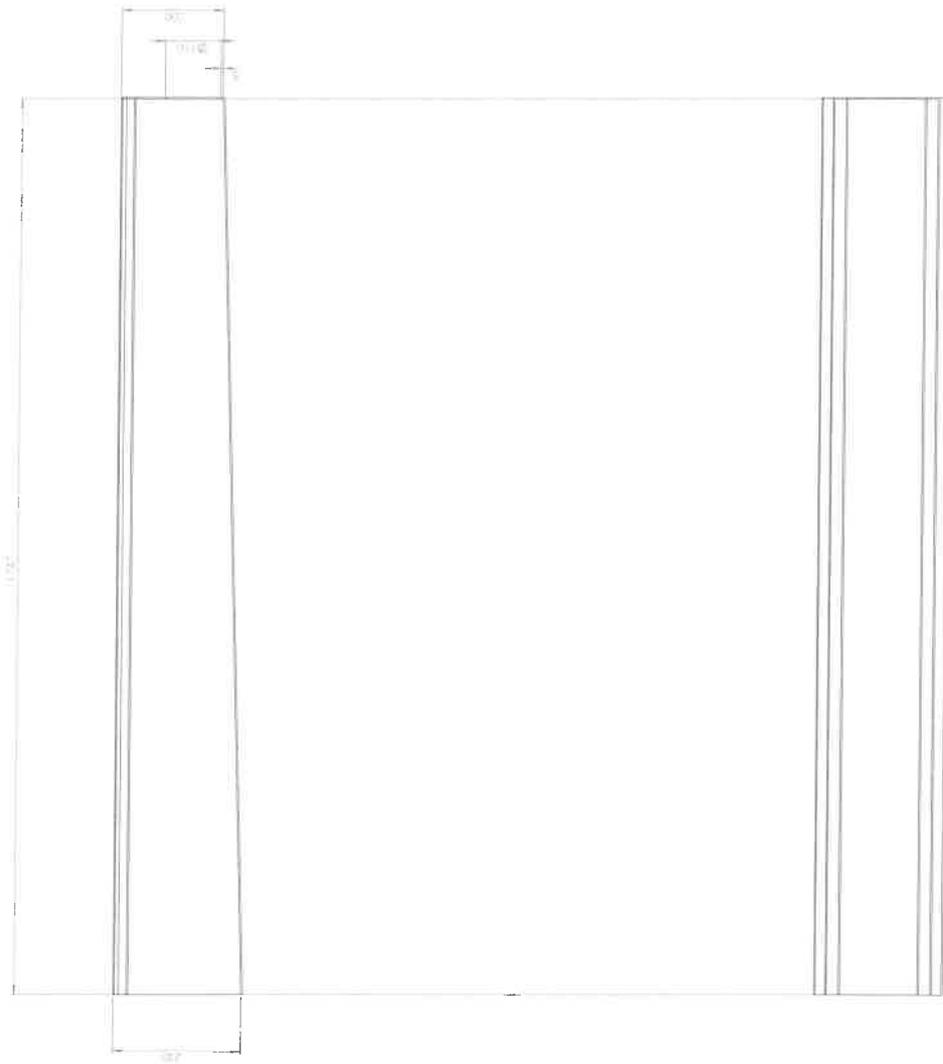


DETAIL C
SCALE 1 : 5

DETAIL B
SCALE 1 : 5



PROJECT INFORMATION	
PROJECT NO.	10000000000000000000
DATE	10/10/2020
SCALE	1:1
Channel F	



DETAIL A
SCALE 2 : 5

PROJECT NO.	DATE	SCALE	BY	CHECKED
112	11/10	2:5		
<p>Channel</p>				

