

TRANSNET LIMITED

S420 (1999)

SPECIFICATION FOR CONCRETE WORK

“PREVIEW COPY ONLY”

TRANSNET LIMITED

S420 (1999)

SPECIFICATION FOR CONCRETE WORK

CONTENTS

1.	SCOPE	3
2.	INTERPRETATION	3
3.	MATERIALS	4
	3.1 Cementitious Binders	4
	3.2 Aggregates	5
	3.3 Curing Compound	5
	3.4 Admixtures	5
	3.5 Cover Blocks	5
	3.6 Underwater Concrete	5
4.	PLANT AND EQUIPMENT	6
	4.1 Tremie	6
	4.2 Underwater Buckets	6
5.	CONSTRUCTION	6
	5.1 Approval of Aggregates	6
	5.2 Concrete Quality	6
	5.3 Batching	7
	5.4 Concrete Placing	7
	5.5 Concrete placed under water	7
	5.6 Concrete placed by Tremie	8
	5.7 Concrete placed by Underwater Bucket	8
	5.8 Concrete placed in sacks	8
	5.9 Grouted Concrete	9
	5.10 Concrete placed by Pumping	9
	5.11 Construction Joints	9
	5.12 Curing	9
	5.13 Recprds	11
6.	TOLERANCES	11

7. TESTING 12

 7.1 Frequency of Sampling 12

 7.2 Acceptance Criteria 12

 7.3 Penalty 12

 7.4 Underwater Concrete 13

8. MEASUREMENT AND PAYMENT 13

ANNEX A : CEMENT : STANDARDS AND SELECTION 14

“PREVIEW COPY ONLY”

TRANSNET LIMITED

S420 (1999)

SPECIFICATION FOR CONCRETE WORK.

1. SCOPE

This specification covers requirements for plain, reinforced and prestressed concrete.

2. INTERPRETATION

Supporting Specifications

Plain and reinforced concrete shall comply with SABS 1200 G and with the supplementary requirements contained herein. Prestressed concrete shall comply with SABS 1200 GF. In addition, the following specifications shall apply where relevant:

SABS 763 : 1988 Hot-dip (galvanised) zinc coatings

SABS 1083 : 1994 Aggregates from natural sources

SABS 0100-2 : 1992 The Structural use of concrete - Part 2 : Materials and execution of work.

SABS ENV 197-1 Cement - composition, specifications and conformity criteria.
Part 1 : Common cements

SABS 1491-1 : 1989 Portland cement extenders - Part 1 : Ground granulated blast furnace slag.

SABS 1491-2 : 1989 Portland cement extenders - Part 2 : Fly ash

SABS 1491-3 : 1989 Portland cement extenders - Part 3 : Condensed Silica Fume

3. MATERIALS

3.1 Cementitious Binders

3.1.1 Cement

Common cements, complying with SABS ENV 197.1, as summarised in Annex A, shall be used for all concrete work. On no account shall masonry cements be used for concrete work, even if the strength designations are the same as for common cements.

3.1.2 Coastal Zones

In all wet applications and within one kilometre of the sea, unless otherwise specified in the project specifications, one or more of the following cementitious binders shall be used in all applications including prestressed concrete.

- (i) Portland blastfurnace cement, type III/A, certified as containing not less than 40% and not more than 50% milled granulated blastfurnace slag (MGBS), or a blend of Type I Portland cement with not less than 40% and not more than 50% MGBS. MGBS shall comply with SABS 1491 Part 1.
- (ii) Portland fly ash cement type II/B-V or Portland fly ash cement type II/B-W, certified as containing not less than 25% and not more than 30% fly ash shall comply with SABS 1491 Part 2.

3.1.3 Alkali Reactive Aggregate

If coarse aggregate known to be alkali reactive, are to be used in the proposed concrete, then one or more of the cementitious binders listed under (i) and (ii) above shall be used.

The equivalent Na_2O content, defined as $\% \text{Na}_2\text{O} = \% \text{Na}_2\text{O} + (0,658\% \text{K}_2\text{O})$ shall be limited as follows:

Malmesbury Group metasediments	:	2,1 kg/m ³
Table Mountain Group orthoquartzite:		2,8 kg/m ³
Cape Granite	:	4,0 kg/m ³

3.1.4 Alkali Reactive Cement

In addition to, or as an alternative to the precautions specified under 3.1.3 above, the equivalent alkali content of the Portland cement type I and the quantity of alkali per cubic metre of concrete shall be limited as directed by the Engineer. This applies to both site mixed and ready mix concrete. Certificates stating the equivalent alkali content of each delivery of cement to

site or to the ready mix depot supplying concrete to site, shall be provided by the Contractor.

3.1.5 Sulphate Resisting Cement

Where sulphate resisting Portland cement is specified, the fly ash cement specified in 3.1.2.(ii) may be used as a substitute.

3.2 Aggregates

3.2.1 Fine and coarse aggregate shall comply with the relevant clauses of SABS 1083.

3.2.2 Where aggregates have constituents which, in the opinion of the Engineer, may give rise to damage due to alkali-aggregate reactions, the provisions of 3.1.3 and 3.1.4 shall be applicable.

3.3 Curing Compound

In all cases where a concrete curing compound is specified, the curing compound shall be a clear or white pigmented membrane forming material complying with ASTM specification C 309, except that the maximum permissible water loss in the test shall be 0,40 kilogram per square metre.

Alternatively, the concrete curing compound shall be acceptable if the treated concrete retains 90% or more of its mixing water when subjected to the test set out in British Standard Specification 8110 Part 1 - Chapter 6.6.

3.4 Admixtures

Admixtures containing chlorides will not be permitted in reinforced concrete.

3.5 Cover Blocks

Cover blocks used to ensure the cover to reinforcement shall be made of cement mortar. They shall be dense and have a minimum 28 day crushing strength of 50 MPa, and shall be cured in water for at least 14 days before being used. Steeldale cover blocks or similar approved proprietary items shall be used - site made blocks will not be permitted. Spacer blocks made of plastic will not be permitted.

3.6 Underwater Concrete

3.6.1 The maximum size of aggregate shall be 50mm, and the aggregates shall be well graded. To ensure a plastic, cohesive mix, at least 10% of the fine aggregate shall pass the 300µm sieve, and at least 2%, the 150µm sieve.

3.6.2 Except in the cases of concrete placed in sacks or grouted concrete the slump shall be between 140 and 200mm.

3.6.3 Sacks shall be made of jute or other porous material.

- 3.6.4 The requirement in clause 5.5.5.7 of SABS 1200 G for concrete placed by tremie, that the quantity of cement in the concrete mix shall be increased by 20%, shall also apply to concrete placed underwater by other means.

4. PLANT AND EQUIPMENT

4.1 Tremie

A tremie shall consist of a hopper and a watertight tube, of diameter to suit the size of aggregate. The tube shall extend from slightly below concrete level to above the water surface, and shall be constructed in sections with watertight couplings so that it can be shortened as the concrete level rises, by removing sections above the water surface. It shall be strong enough to withstand the full hydrostatic pressure, even if a partial vacuum develops in the pipe. The tremie shall be supported so as to permit rapid lowering when necessary to retard or stop the flow of concrete. If required, the discharge end of the pipe shall be equipped with a valve to allow for dewatering of the tremie and control of concrete distribution.

4.2 Underwater Buckets

Underwater buckets shall have bottom doors of the drop bottom or roller gate type. The doors shall be latched in such a way that they cannot be opened until the bucket has reached the bed upon which the concrete is to be deposited. If air is used to open the bottom doors, the air shall discharge through a pipe to the surface. The doors shall be surrounded by a steel skirt. The top of the bucket shall be fitted with double canvas flaps to protect the concrete from wash when it enters the water and descends.

5. CONSTRUCTION

5.1 Approval of aggregates

Evidence of compliance of the aggregates with the requirements of 3.2 above, shall be furnished as early as practicable. If required by the Engineer, the Contractor shall submit 40kg samples for approval at least 6 weeks before concrete construction is to be commenced. No aggregate shall be delivered for use in the works until approval is given.

5.2 Concrete Quality

5.2.1 Quality Assurance Plan

Before the start of any concrete work on site, the Contractor shall submit a quality assurance plan which will ensure compliance with specification and provide acceptable documentary proof that all specified operations have been carried out satisfactorily.

5.2.2 Potential heat Generation

Measures, subject to the approval of the Engineer, shall be applied to reduce heat development in concrete of which the minimum dimension to be placed during a single pour is larger than 600mm, provided that the cement content exceeds the following :

Cement types I and II/ * S		Cement types II/B-V and II/B-W	
	kg/m ³		kg/m ³
Reinforced concrete	400		450
Prestressed concrete	500		550

5.3 Batching

5.3.1 Cement

All cementitious binders shall be batched by full sack or by mass batching with approved precision weighing equipment.

5.3.2 Aggregates

- (i) All aggregates shall be precisely measured by mass using approved precision weighbatching equipment, unless otherwise permitted by the Engineer:
- (ii) Should any variation in the composition of the aggregate become apparent, the Engineer shall be notified and a further sample of aggregate submitted immediately for his approval.

5.4 Concrete Placing

5.4.1 Inspection of Excavation

The size, shape and depth of any excavation shall be approved by the Engineer before concrete is placed.

5.4.2 Inspection of Reinforcement

Unless otherwise permitted by the Engineer, no concrete shall be placed until the fixed reinforcement has been accepted by him.

5.5 Concrete placed under water

- 5.5.1 The Contractor shall furnish to the Engineer in good time for his approval, details of the method of construction that he proposes to use.

- 5.5.2 Underwater concrete for piles shall be placed by tremie in accordance with SABS 1200 F.
- 5.5.3 Underwater concrete shall not be placed in water colder than 2°C.
- 5.5.4 Unless otherwise permitted, the technique adopted for placing of concrete, and any cleaning of the bed, shall be designed to prevent the washing out of cement from the concrete mixture, minimise the segregation of materials and the formation of laitance, and prevent the flow of water through or over new concrete less than 24 hours old. Concrete shall not be moved after placing, e.g. by lateral movement of tremie pipes. No vibration shall be carried out until the top of the concrete is above water level.
- 5.5.5 Unless otherwise permitted, concreting of any element shall be continuous to completion.
- 5.5.6 The bed shall be cleaned of silt and loose material. No concrete shall be placed until the Engineer has approved the bed.

5.6 Concrete placed by Tremie

- 5.6.1 Concreting by tremie shall be done in accordance with clause 5.5.2.2 of SABS 1200 F, but with the words "bore" and "casing" replaced by "space to be filled with concrete".
- 5.6.2 When concrete is deposited, the tremie shall penetrate into the concrete and shall be slowly raised to discharge a uniform flow of concrete.
- 5.6.3 Concreting shall continue to a level such that when unsound concrete has been removed, a sound surface will be left at the specified finished level.
- 5.6.4 When concreting over a wide area, tremie spacing shall not exceed 5m.

5.7 Concrete place by Underwater Bucket

The bucket used in underwater concreting shall be completely filled, lowered to the bed and then raised slowly as concrete is discharged.

5.8 Concrete placed in sacks

- 5.8.1 Immediately prior to placing, sacks shall be filled with concrete to two-thirds capacity. The openings shall be securely tied or, when directed, sewn up.
- 5.8.2 The sacks of concrete shall be placed by a diver in header and stretcher bond, with their mouths away from the outside surface, so that the whole mass becomes interlocked. Where necessary, steel spikes shall be driven through the sacks after placing to hold them in position.

5.9 Grouted Concrete

- 5.9.1 Coarse aggregate for grouted concrete, 25mm or larger, shall first be placed and compacted in position.
- 5.9.2 Grout, in a colloidal state, shall be pumped into the voids through pipes which shall reach to the bottom of the aggregate. Grout pipes shall be spaced at not more than 1,5m, and shall be withdrawn in such a way that a head of at least 1m of grout is maintained above the grout outlets.

5.10 Concrete placed by pumping

The requirements of clauses 4.2, 5.4, 5.7 and 5.5.5.7 of SABS 1200 G and clause 5.5.2.2 of SABS 1200 F, for concrete placed by a tremie tube, shall also apply to concrete placed by pumping.

5.11 Construction Joints

- 5.11.1 Unless otherwise shown on the drawings, the exact position of horizontal construction joints shall be marked on the formwork by means of grout checks in order to obtain truly horizontal joints.
- 5.11.2 Stub columns, stub walls and stays on footings shall be cast integrally with the footings and not afterwards, even where another class of concrete is being used.
- 5.11.3 Joint lines shall be so arranged that they coincide with features of the finished work.
- 5.11.4 Where new concrete is to be cast against a hardened concrete surface a neat cement slurry mixed to a creamy consistency shall be brushed onto the cleaned concrete surface.
- 5.11.5 At contraction joints (joints having no reinforcement passing through the joint) no bond is required between casts. Contraction joints shall be smooth and shall have one coat of limewash or PVA applied to the older surface prior to casting the newer concrete.

5.12 Curing

5.12.1 Curing Compound

Unless otherwise directed by the Engineer, an approved trafficable, resin-based, white pigmented, membrane-forming curing compound shall be used on slopes flatter than 1 in 1.

On all other concrete surfaces, including beam and slab soffits, an approved clear, aesthetically acceptable membrane-forming curing compound shall be used, unless otherwise directed by the Engineer.

5.12.2 Application Rate

The total application rate shall be as specified by the Supplier, or 0,30 litres per square metre, whichever is the greater. On textured concrete surfaces e.g. concrete roads, the total application rate shall be 0,50 litres per square metre.

5.12.3 Additional Coats

In the case of concrete surfaces with run-off problems, it may be necessary to apply more than one coat of membrane forming curing compound to obtain the specified total or cumulative application rate.

5.12.4 Application

Curing in accordance with SABS 1200 G shall commence on all concrete surfaces as soon as it is practicable in the opinion of the Engineer. For unformed surfaces the compound shall be applied after finishing and as soon as the free water on the surface has disappeared and no water sheen is visible, but not so late that the liquid curing compound will be absorbed into the concrete. For formed surfaces, when forms are removed, the exposed concrete surface shall be wet with water immediately and kept moist until the curing compound is applied. Immediately prior to application, the concrete shall be allowed to reach a uniformly damp appearance with no free water on the surface. Application of the compound should then begin at once. The compound should be applied at a uniform rate with two applications at right angles to each other to ensure complete coverage, and may be applied by hand or power sprayer. Pigmented compounds must be adequately stirred to assure even distribution of the pigment during application, unless the formulation contains a thixotropic agent which prevents settlement.

5.12.5 Windy Conditions

When the wind velocity exceeds 5 m/s and/or the ambient temperature is above 25 °C and/or the relative humidity is below 60%, the initial 24 hour curing of concrete surfaces not covered by formwork shall be carried out by ponding, covering with constantly wetted sand or mats, or continuous spraying in accordance with SABS 1200 G, unless otherwise permitted by the Engineer.

If plastic shrinkage cracks occur, the concrete, while still plastic, shall be re-vibrated and floated. Thereafter it shall be re-coated with curing compound as if no curing has previously taken place.

5.12.6 Marine Structures

For reinforced concrete marine structures moist curing methods shall be used except as otherwise permitted in writing by the Technical Officer. Only fresh, clean water shall be used for curing. The use of seawater shall not be permitted under any circumstances.

5.12.7 Curing Time

The curing period for concrete containing CEM I only shall be 7 days. The curing period for concrete's containing CEM I plus cement extenders (GGBS, FA) shall be 10 days. The period will start on completion of the concrete pour and for formed surfaces shall include the time for which forms are still in place after the pour.

5.12.8 Steam Curing

Steam curing under atmospheric pressure will be permitted, subject to approval by the Technical Officer. Steam curing shall not commence sooner than 5 hours after completion of concrete placement. Temperatures shall be raised to between 60 and 70°C at a rate not exceeding 20°C per hour. The rate of cooling shall also not exceed 20°C per hour.

Records of temperatures recorded on an hourly basis at sufficient locations to ensure that the prescribed temperatures and rates of heating are not exceeded at any point shall be provided to the Technical Officer on a daily basis.

5.13 Records

The Contractor shall maintain the following daily records for every part of the concrete structure and shall make these available at all times during the progress of the work for inspection by the Engineer :

- (i) The date and times during which concrete was placed.
- (ii) Identification of the part of the structure in which the concrete was placed.
- (iii) The mix proportions and specified strength
- (iv) The type and brand of cement.
- (v) The slump of the concrete
- (vi) The identifying marks of test cubes made
- (vii) Curing procedure applied to concrete placed
- (viii) The times when shuttering was stripped and props were removed.
- (ix) The date of despatch of the cubes to the testing laboratory
- (x) The test results.

The records shall be delivered to the Engineer each week except in the case of sub-standard concrete, when the Engineer shall be informed immediately.

6. TOLERANCES

Deviations shall be within the limits listed in SABS 1200 G for Degree of Accuracy II unless otherwise specified in the project specification.

7. TESTING

7.1 Frequency of Sampling

Frequency of sampling and testing shall be as specified in SABS 1200 G.

- (i) If the quantity from which these samples were taken exceeds 40 m³, it shall be subject to the testing of a minimum of 3 sets of samples per day from each grade of concrete placed in each independent structure.
- (ii) If the quantity from which these samples were taken is less than 40 m³, it shall be subject to the testing of a minimum of 2 sets of samples per day.

7.2 Acceptance Criteria

7.2.1 If the Contractor disputes the results of the tests on concrete cubes, the concrete represented by the cubes will be considered acceptable if the Contractor, at his own cost, proves to the satisfaction of the Engineer that the estimated actual strength of cores taken from the structure, determined in accordance with SABS Method 856, is not less than the specified strength.

7.2.2 If the strength of concrete fails to meet the acceptance criteria stipulated, the Engineer may in his sole discretion and in addition to the options listed in SABS 1200 G:

- (i) accept the concrete subject to approved remedial measures being undertaken by the Contractor; or
- (ii) permit the concrete to remain subject to the payment of a penalty.

7.3 Penalty

The penalty referred to in 7.2.2 (ii) will be determined as follows:

$$\text{Penalty} = V \times R \times F$$

where

V = Volume (in the opinion of the Engineer) of concrete of unsatisfactory strength represented by the test result.

R = Relevant scheduled rate.

$$F = 1 - \sqrt{\frac{\text{Average strength of unsatisfactory concrete}}{\text{Specified strength} + 6 \text{ MPa}}}$$

when the relevant scheduled rate (R) includes the cost of formwork or

$$F = 1 - \frac{\text{Average strength of unsatisfactory concrete}}{\text{Specified strength} + 6 \text{ MPa}}$$

when the relevant scheduled rate (R) excludes the cost of formwork or where no formwork was involved.

7.4 Underwater Concrete

In view of the 20% additional cement added in accordance with 3.6.5, replace the words "specified strength" by "specified strength plus 10 MPa" in clauses 7.3.1 to 7.3.3 of SABS 1200 G.

8. MEASUREMENT AND PAYMENT

- 8.1 Unless otherwise provided for in the schedules of quantities, only permanent work will be measured for payment. The cost of temporary work shall be included in the rates tendered.
- 8.2 If the drawings and/or specifications provide for any item which is not separately listed in the schedules of quantities, such item shall be considered as an integral portion of the structure, and its cost shall be included in the rates for related items listed in the schedules of quantities.
- 8.3 All costs arising out of compliance with 3.2.2 including removal of unsatisfactory materials, shall be borne by the Contractor.

ANNEX A

Extract from SABS Specification ENV 197-1

CEMENT : STANDARDS AND SELECTION

In 1996 South Africa adopted new specifications for cement. These ready-to-use, Portland based cements used in building and construction are divided by the specifications into two broad categories: "common" cement intended for use in concrete, although some may be suitable for mortar and plaster mixes, and "masonry" cements intended for bedding mortars and plasters.

"Common" cement types and compositions by mass^[1]

Cement Type	Description	Notation	Clinker K	Granulated Blastfurnace Slag S	Silica Fume D ^[3]	Fly ash		Limestone L	Minor additions & constituents [2]
						Siliceous V	Calcareous W		
I	Portland cement	I	95-100						0-5
II	Portland slag cement	II/A-S	80-94	6-20					0-5
		II/B-S	65-79	21-35					0-5
	Portland silica fume cement	II/A-D	90-94		6-10				0-5
	Portland fly ash cement	II/A-V	80-94			6-20			0-5
		II/B-V	65-79			21-35			0-5
		II/A-W	80-94				6-20		0-5
		II/B-W	65-79				21-35		0-5
	Portland limestone cement	II/A-L	80-04					6-20	0-5
		II/B-L	65-79					21-35	0-5
	Portland composite cement	II/A-M	80-94				6-20 ^[4]		
II/B-M		65-79				21-35 ^[4]			
III	Blastfurnace cement	III/A	35-64	36-65					0-5
		III/B	20-34	66-80					0-5
		III/C	5-19	81-95					0-5
IV	Pozzolanic cement	IV/A	65-89			11-35			0-5
		IV/B	45-64			36-55			0-5
V	Composite cement	V/A	40-64	18-30		18-30			0-5
		V/B	20-39	31-50		31-50			0-5

NOTES:

- [1] The values in the table refer to the cement nucleus, excluding calcium sulphate and any additives.
- [2] Minor additional constituents may be filler or may be one or more of the main constituents unless these are included as main constituents in the cement.
- [3] The proportion of silica fume is limited to 10%.
- [4] The proportion of filler is limited to 5%.

TRANSNET LIMITED / CONTRACTORS / SUB-CONTRACTORS

CONTRACTUAL SAFETY CLAUSES WHICH WILL FORM PART OF ANY RESULTING CONTRACT

The parties agree on the following arrangements according to section 37 (2) of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) to ensure compliance by the mandatory with provisions of the Act.

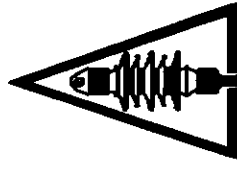
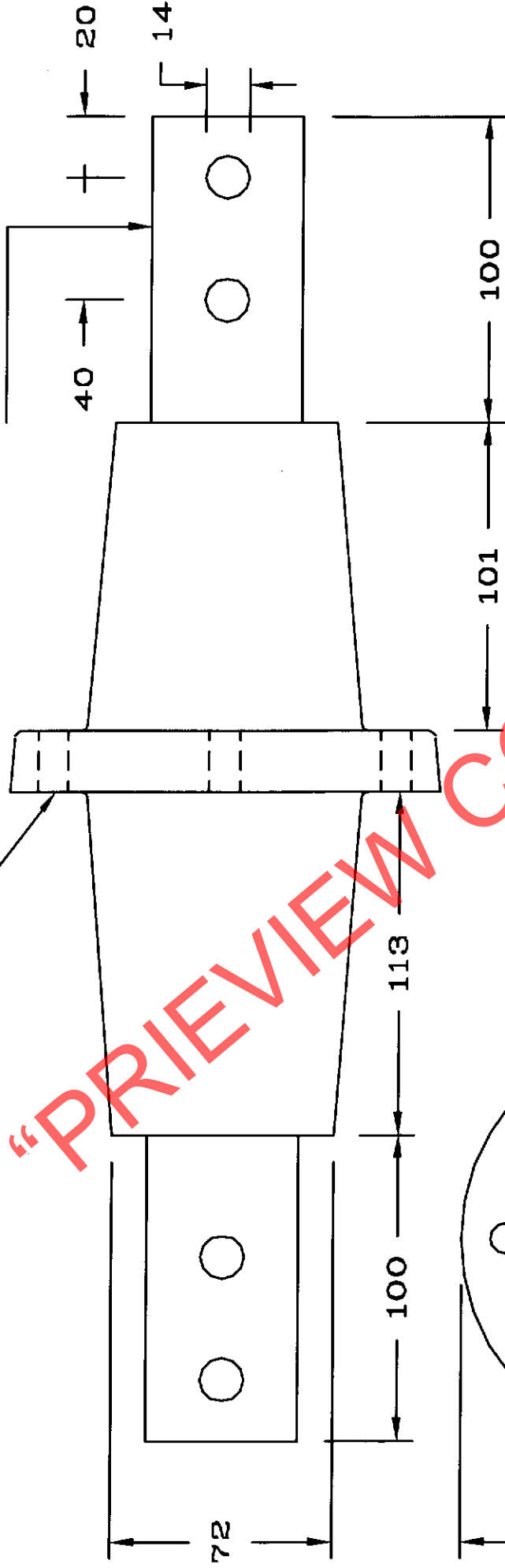
- 1) That the contractor is an “employer” in his own right as defined in section 1 of Act 85 of 1993 and that he must fulfill all his obligations as an employer in terms of the Act.
- 2) The contractor shall comply with the requirements of Act 85 of 1993 in its entirety.
- 3) Where special permits are required, such as electrical switching, hot work permits, etc. the contractor shall obtain them from a person designated by Transnet Limited for this purpose, and all requirements of the contractor must rigidly comply with the permit.
- 4) The contractor shall conduct a risk assessment of the work to be performed by a competent person prior to the commencement of work, to identify risks and hazards that persons may be exposed to, analyse and evaluate identified hazards.
- 5) The contractor shall have a documented Health and Safety Plan based on the risks and hazards identified before commencement of work.
- 6) The Health and Safety Plan shall include the following:
 - 6.1 The safety management structure to be instituted with all appointments in terms of the Act and Regulations
 - 6.2 The safe working methods and procedures to be implemented to ensure work is performed in compliance to the Act.
 - 6.3 The safety equipment, devices and clothing to be made available by the contractor to his employees.
 - 6.4 The site access control measures pertaining to health and safety to be implemented.
 - 6.5 Control measures for ensuring that the Health and Safety Plan is maintained and monitored for the duration of the contract.
- 7) The contractor shall ensure that all work is performed under the close supervision of a person trained to understand the hazards associated with the work performed and who has authority to ensure that the necessary precautionary measures are implemented.
- 8) The contractor must appoint a Health and Safety Co-ordinator to liaise with Transnet Limited on matters pertaining to occupational health and safety.
- 9) The appointed Safety Co-ordinator must liaise at least once a week with the* Health and Safety Section / Risk Manager /Occupational Risk Manager of Transnet Limited.
- 10) The contractor shall furnish the* Health and Safety Section/ Risk Manager/ Occupational Risk Manager of Transnet Limited immediately with full particulars of any sub-contractor which he may involve in the contract in order that the sub-contractor himself can be made aware of all the clauses in this contract pertaining to health and safety.
- 11) The contractor shall stop any subcontractor from executing work which is not in accordance with the Health and Safety Plan or which poses a threat to health and safety of persons.

- 12) The contractor shall ensure that all his employees and visitors undergoes health and safety induction pertaining to the hazards prevalent, proof of such training must be kept on file.
- 13) In the event where the risk assessment reveals the risk relating to working from an elevated position the contractor shall cause the designation of a competent person, responsible for the preparation of a Fall Protection Plan.
- 14) The Fall Protection Plan shall include:
 - 14.1 A risk assessment of all work carried out from an elevated position
 - 14.2 Procedures and methods to address all the identified risks per location
 - 14.3 Evaluation of employees physical and psychological fitness necessary to work at elevated position.
 - 14.4 The training of employees working from an elevated position.
 - 14.5 Procedure addressing the inspection, testing and maintenance of all fall protection equipment.
- 15) The contractor shall advise the * Health and Safety Section / Risk Manager/ Occupational Risk Manager of Transnet Limited of any hazardous situations which may arise from work being performed either by the contractor or his sub-contractor.
- 16) Copies of all appointments required by the act must be given to * Health and Safety Section / Risk Manager / Occupational Risk Manager of Transnet Limited.
- 17) The contractor shall ensure that a Health and Safety File is available which shall include all documentation as required by the Act, copy of his and his subcontractors Risk Assessment and Health and Safety Plan.
- 18) All incidents referred to in Section 24 of the Act involving the contractor and his subcontractor on Transnet Ltd premises, shall be reported as prescribed. Transnet Ltd hereby obtains an interest in the issue of any investigation, formal inquiry conducted in terms of Section 31 and 32 of the Act into any incident involving the contractor, his subcontractor, any person or machinery under his control on Transnet Ltd premises.
- 19) No alcohol or any other intoxicating substance shall be allowed on Transnet Ltd premises. The contractor shall not allow anyone under or suspected to be under the influence of alcohol or any other intoxicating substance on Transnet Ltd premises.
- 20) Contractor to ensure its employees undergo medical surveillance as required by legislation
- 21) Contractor will be required to provide monthly safety performance reports and statistics
- 22) A letter of good standing in terms of Section 80 (Employer to register with the Compensation Commissioner) of the Compensation for Occupational Injuries and Disease Act 1993 (Act 130 of 1993) must also be furnished.
- 23) All clauses in the contract pertaining health and safety forms an integral part of the contract and if not complied with may be construed as breach of contract.

*As applicable

4 @ 10 DIA. HOLES ON 113 PCD

50*16 COPPER CONDUCTOR



**ELECTRICAL
MOULDED
COMPONENTS**

NOTE

1. NOMINAL VOLTAGE = 6.6 KV
2. BUSHING CAN BE SUPPLIED WITH DIFFERENT CONDUCTORS.

"PREVIEW COPY ONLY"

DATE	11/11/88	DRAWN	R.B.	THROUGH BUSHING	
SCALE	A4 1:1	MATL	EPOXY	PART	FTB/4/50.8*16
DWG NAME	6-18	REV.		NUMBER	
		Wgt	5.25 Kg		

Secondary Specifications

“PREVIEW COPY ONLY”

TRANSNET



(REGISTRATION NO.1990/000900/06)
**TRADING AS
TRANSNET FREIGHT RAIL**

MINIMUM COMMUNAL HEALTH REQUIREMENTS IN AREAS OUTSIDE THE JURISDICTION OF A LOCAL AUTHORITY: TEMPORARY FACILITIES FOR CONTRACTOR'S PERSONNEL

1. **CAMPS**

- 1.1 Prior to the erection of any camp, the Contractor shall submit to the Technical Officer, for his approval, details of his proposals as to the site, water supply, sanitation, and size and type of buildings. Where the site is on private land, the Contractor shall submit the written approval for the use of the site of the relevant statutory authority and of the owner and occupier of the land (as applicable).
- 1.2 Camps must not be erected on land infested with field rodents.
- 1.3 Adequate drainage shall be provided to carry off storm and waste water.
- 1.4 Buildings shall be built to a neat and orderly pattern.
- 1.5 All buildings shall have smooth, hard, impervious floors, graded to provide effective drainage and to permit washing.
- 1.6 Camps shall be maintained by the Contractor at his own expense in a clean and tidy condition. The Contractor shall take such steps as the Technical Officer and landowner/occupier may demand to prevent the creation of a nuisance.
- 1.7 When so instructed by the Technical Officer, the Contractor shall, at his own expense, erect suitable screens between the camp and any public road, thoroughfare or railway line.
- 1.8 After removal of a camp, the Contractor shall, at his own expense, restore the site to its original condition to the satisfaction of the Technical Officer and of the landowner and occupier where the site is on private land.

2. **HOUSING**

- 2.1 Every living room shall have cross ventilation, both constant and occasional. Where only one window is provided, it shall not be in the same wall as the door.

- 2.2 Dimensions of living rooms shall be sufficient to allow 3.5 square metres of floor area and 11 cubic metres of air space for each person over the age of 10 years. The floor area of any living room shall not be less than 7,8 square metres.
- 2.3 Flat-roofed quarters shall have a minimum roof height of 3 metres above floor level. For quarters with pitched roofs, the wall height shall be not less than 2,6 metres above the floor with a minimum height above floor of 3 metres at the top of the pitch.
- 2.4 Doors shall not be less than 2m x 0,75m and must be halved.
- 2.5 Windows of each living room shall have an area not less than one twelfth of the floor area and shall be capable of opening to at least half their full area.
- 2.6 In areas where malaria is prevalent, doors and windows must be fitted with gauze screens.
- 2.7 Cooking shelters shall comprise roofed structures, three sides of which shall be enclosed by a weatherproof material, approved by the Technical Officer to a height of at least 1m above ground level.
- 2.7.1 Sleeping quarters shall not accommodate more than 8 persons per room.
- 2.7.2 Pegboards shall be carried on metal or concrete supports and shall be separated by partitions not less than 0,4 metres high extending to within 150mm of the end of the bunk. Pegboards shall be removable for cleaning.

3. WATER SUPPLY AND ABLUTION FACILITIES

- 3.1 The Contractor shall ensure that an adequate and conveniently situated supply of potable water is provided.
- 3.2 Separate buildings for ablution facilities shall be provided. Where approval has been obtained for the housing of both males and females, separate facilities for each sex shall be provided. The proportion shall be 1 cubicle for 20 persons.
- 3.3 Waste water shall be hygienically disposed of.

4. SANITATION

- 4.1 Separate buildings for latrine facilities shall be provided. Where housing are provided for both males and females, separate facilities for each sex shall be provided. The proportions shall be at least one squatting seat for every 15 persons or less in the case of pit latrines, or one for every 10 persons or less in case of pail latrines. Latrines shall be fly proof and sited at least 10 metres from any other building, and shall not face on any public road, thoroughfare, railway line or residential property. Pits shall not be less than 2,5 metres deep and sited not less than 120 metres from nearest underground water source.

- 4.2 Latrines shall be so constructed, situated and maintained, and night soil so disposed of as to prevent access by animals, breeding of flies, pollution of streams and domestic water supplies, and other nuisances. Where a night soil removal service is operated by a competent authority, use of such service shall be obligatory, and the use of pit latrines and atria pits will not be permitted.
- 4.3 At least one refuse bin of adequate size with close fitting lid shall be provided for each building. Refuse bins shall be emptied and cleaned out daily.
- 4.4 Labour shall be employed on camp sanitation duties on the following basis:-
- 4.4.1 Where the number of persons living at the camp is 20 or less - one unit.
- 4.4.2 For additional numbers over 20 living at the camp - one unit per 100 or part thereof.
- 4.5 Unless refuse is removed by a competent authority, it shall be disposed of in pits and covered over daily with a layer of earth or ash of sufficient thickness to prevent depredations by rodents and the breeding of flies.
- 4.6 Adequate measures shall be taken against all vermin and insects responsible for the spread of disease. Any instructions of a competent health authority shall be carried out promptly and implicitly.
- 4.7 Buildings and bed boards shall be treated whenever necessary with an approved insecticide.
- 4.8 The Contractor shall permit and facilitate inspection of the camp and structures on the site by the staff of Transnet or any other competent authority, and shall comply with any reasonable request by such staff or any other competent authority to eliminate any unsanitary condition.
- 4.9 Any outbreak of infectious disease shall immediately be reported telephonically and confirmed in writing to the Technical Officer.
- 4.10 The keeping of animals of any sort is not permitted.
- 4.11 The Contractor shall have on hand at the camp the necessary tools, disinfectants and cleaning materials to maintain and clean the sanitary facilities.

5. **RATIONS**

Rations, where supplied by the Contractor, shall be stored in a suitable and rodent proof building with sufficient shelving.

ooOoo

TRANSNET



TRANSNET LIMITED
(Registration no. 1990/000900/06)

**SAFETY ARRANGEMENTS AND PROCEDURAL COMPLIANCE
WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT
(ACT 85 OF 1993) AND APPLICABLE REGULATIONS**

1. **General**
- 1.1 The Contractor and Transnet Limited (hereinafter referred to as "Transnet") are individual employers, each in its own right, with their respective duties and obligations set out in the Occupational Health and Safety Act, Act 85 of 1993 (the Act) and applicable Regulations.
- 1.2 The Contractor accepts, in terms of the General Conditions of Contract and in terms of the Act, his obligations as an employer in respect of all persons in his employ, other persons on the premises or the Site or place of work or on the work to be executed by him, and under his control. He shall, before commencement with the execution of the contract work, comply with the provisions set out in the Act, and shall implement and maintain a Health and Safety Plan as described in the Construction Regulations, 2003 and as approved by Transnet, on the Site and place of work for the duration of the Contract.
- 1.3 The Contractor accepts his obligation to complying fully with the Act and applicable Regulations notwithstanding the omission of some of the provisions of the Act and the Regulations from this document.
- 1.4 Transnet accepts, in terms of the Act, its obligations as an employer of its own employees working on or associated with the site or place of work, and the Contractor and Project Manager or his deputy shall at all times, co-operate in respect of the health and safety management of the site, and shall agree on the practical arrangements and procedures to be implemented and maintained during execution of the Works.
- 1.5 In the event of any discrepancies between any legislation and this specification, the applicable legislation will take precedence.
2. **Definitions**
- 2.1 In this Specification any word or expression to which a meaning has been assigned in the Construction Regulations, shall have the meaning so assigned to it, unless the context otherwise indicates: -
- 2.2 The work included in this Contract shall for the purposes of compliance with the Act be deemed to be "**Construction Work**", which, in terms of the Construction Regulations, 2003 means any work in connection with: -

- (a) the erection, maintenance, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure;
- (b) the installation, erection, dismantling or maintenance of fixed plant where such work includes the risk of a person falling;
- (c) the construction, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system or any similar civil engineering structure; or
- (d) the moving of earth, clearing of land, the making of an excavation, piling, or any similar type of work;

2.3 **"competent person"** in relation to construction work, means any person having the knowledge, training and experience specific to the work or task being performed: Provided that where appropriate qualifications and training are registered as per the South African Qualifications Authority Act, 1995 these qualifications and training shall be deemed to be the required qualifications and training;

2.4 **"contractor"** means principal contractor and **"subcontractor"** means contractor as defined by the Construction Regulations, 2003.

2.5 **"fall protection plan"** means a documented plan, of all risks relating to working from an elevated position, considering the nature of work undertaken, and setting out the procedures and methods applied to eliminate the risk;

2.6 **"health and safety file"** means a file, or other record in permanent form, containing the information required to be kept on site in accordance with the Act and applicable Regulations;

2.7 **"Health and Safety Plan "** means a documented plan which addresses the hazards identified and include safe work procedures to mitigate, reduce or control the hazards identified;

2.8 **"Risk Assessment"** means a programme to determine any risk associated with any hazard at a construction site, in order to identify the steps needed to be taken to remove, reduce or control such hazard;

2.9 **"the Act"** means the Occupational Health and Safety Act No. 85 of 1993.

3. Procedural Compliance

3.1 The Contractor who intends to carry out any construction work shall, before carrying out such work, notify the Provincial Director in writing if the construction work:-

- (a) includes the demolition of a structure exceeding a height of 3 metres; or
- (b) includes the use of explosives to perform construction work; or
- (c) includes the dismantling of fixed plant at a height greater than 3m, and shall also notify the Provincial Director in writing when the construction work exceeds 30 days or will involve more than 300 person days of construction work and if the construction work:-
 - includes excavation work deeper than 1m; or
 - includes working at a height greater than 3 metres above ground or a landing.

- 3.2 The notification to the Provincial Director shall be on a form similar to Annexure A of the Construction Regulations, 2003, also shown in Annexure 1 of this Specification. The Contractor shall ensure that a copy of the completed notification form is kept on site for inspection by an inspector, Project Manager or employee.
- 3.3 The Contractor shall, in accordance with the Act and applicable Regulations, make all the necessary appointments of competent persons in writing on a form similar to Annexure 2 of this Specification and deliver copies thereof to the Project Manager. Copies should also be retained on the health and safety file.
- 3.4 Subcontractors shall also make the above written appointments and the Contractor shall deliver copies thereof to the Project Manager.
- 3.5 In the case of a self-employed Contractor or any subcontractor who has the appropriate competencies and supervises the work himself, the appointment of a construction supervisor in terms of regulation 6.1 of the Construction Regulations, 2003 will not be necessary. The Contractor shall in such a case execute and sign a declaration, as in Annexure 3, by which he personally undertakes the duties and obligations of the "Chief Executive Officer" in terms of section 16(1) of the Act.
- 3.6 The Contractor shall, before commencing any work, obtain from the Project Manager an access certificate as in Annexure 4 executed and signed by him, permitting and limiting access to the designated site or place of work by the Contractor and any subcontractors under his control.
- 3.7 Procedural compliance with Act and Regulations, as above, shall also apply to any subcontractors as employers in their own right. The Contractor shall furnish the Project Manager with full particulars of such subcontractors and shall ensure that they comply with the Act and Regulations and Transnet's safety requirements and procedures.
- 4. Special Permits**
Where special permits are required before work may be carried out such as for hotwork, isolation permits, work permits and occupations, the Contractor shall apply to the Project Manager or the relevant authority for such permits to be issued. The Contractor shall strictly comply with the conditions and requirements pertaining to the issue of such permits.
- 5. Health and Safety Programme**
- 5.1 The Tenderer shall, with his tender, submit a Health and Safety Programme setting out the practical arrangements and procedures to be implemented by him to ensure compliance by him with the Act and Regulations and particularly in respect of: -
- (i) The provision, as far as is reasonably practical, of a working environment that is safe and without risk to the health of his employees and subcontractors in terms of section 8 of the Act;
 - (ii) the execution of the contract work in such a manner as to ensure in terms of section 9 of the Act that persons other than those in the Contractor's employment, who may be directly affected by the contract work are not thereby exposed to hazards to their health and safety;
 - (iii) ensuring, as far as is reasonably practical, in terms of section 37 of the Act that no employee or subcontractor of the Contractor does or omits to do any act which would be an offence for the Contractor to do or omit to do.

- 5.2 The Contractor's Health and Safety Programme shall be based on a risk assessment in respect of the hazards to health and safety of his employees and other persons under his control that are associated with or directly affected by the Contractor's activities in performing the contract work and shall establish precautionary measures as are reasonable and practical in protecting the safety and health of such employees and persons.
- 5.3 The Contractor shall cause a risk assessment contemplated in clause 5.2 above to be performed by a competent person, appointed in writing, before commencement of any Construction Work and reviewed during construction. The Risk Assessments shall form part of the Health and Safety programme to be applied on the site and shall include at least the following:
- (a) The identification of the risks and hazards that persons may be exposed to;
 - (b) the analysis and evaluation of the hazards identified;
 - (c) documented Health and Safety Plan, including safe work procedures to mitigate, reduce or control the risks identified;
 - (d) a monitoring and review plan.
- 5.4 The Health and Safety Plan shall include full particulars in respect of: -
- (a) The safety management structure to be instituted on site or place of work and the names of the Contractor's health and safety representatives and members of safety committees where applicable;
 - (b) the safe working methods and procedures to be implemented to ensure the work is performed in compliance with the Act and Regulations;
 - (c) the safety equipment, devices and clothing to be made available by the Contractor to his employees;
 - (d) the site access control measures pertaining to health and safety to be implemented;
 - (e) the arrangements in respect of communication of health and safety related matters and incidents between the Contractor, his employees, subcontractors and the Project Manager with particular reference to the reporting of incidents in compliance with Section 24 and General Administrative Regulation 8 of the Act and with the pertinent clause of the General Conditions of Contract forming part of the Contract and
 - (f) the introduction of control measures for ensuring that the Safety Plan is maintained and monitored for the duration of the Contract.
- 5.4 The Health and Safety programme shall be subject to the Project Manager's approval and he may, in consultation with the Contractor, order that additional and/or supplementary practical arrangements and procedures be implemented and maintained by the Contractor or that different working methods or safety equipment be used or safety clothes be issued which, in the Project Manager's opinion, are necessary to ensure full compliance by the Contractor with his obligations as an employer in terms of the Act and Regulations. The Project Manager or his deputy shall be allowed to attend meetings of the Contractor's safety committee as an observer.

- 5.5 The Contractor shall take reasonable steps to ensure that each subcontractor's Health and Safety Plan is implemented and maintained on the construction site: Provided that the steps taken, shall include periodic audits at intervals mutually agreed to between the them, but at least once every month.
- 5.6 The Contractor shall stop any subcontractor from executing any construction work, which is not in accordance with the Contractor's, and/or subcontractor's Health and Safety Plan for the site or which poses a threat to the health and safety of persons.
- 5.7 The Contractor shall ensure that a copy of the Health and Safety Plan is available on site for inspection by an inspector, Project Manager, agent, subcontractor, employee, registered employee organisation, health and safety representative or any member of the health and safety committee.
- 5.8 The Contractor shall consult with the health and safety committee or, if no health and safety committee exists, with a representative group of employees, on the development, monitoring and review of the Risk Assessment.
- 5.9 The Contractor shall ensure that all employees under his control are informed, instructed and trained by a competent person regarding any hazard and the related work procedures before any work commences, and thereafter at such times as may be determined in the Risk Assessment.
- 5.10 The Contractor shall ensure that all subcontractors are informed regarding any hazard as stipulated in the Risk Assessment before any work commences, and thereafter at such times as may be determined in the Risk Assessment.
- 5.11 The Contractor shall ensure that all visitors to a construction site undergoes health and safety induction pertaining to the hazards prevalent on the site and shall be provided with the necessary personal protective equipment.
- 6. Fall Protection Plan**
- 6.1 In the event of the risk and hazard identification, as required in terms of clause 5.3 of this Specification, revealing risks relating to working from an elevated position the contractor shall cause the designation of a competent person, responsible for the preparation of a fall protection plan;
- 6.2 The Contractor shall implement, maintain and monitor the fall protection plan for the duration of Contract. The Contractor shall also take such steps to ensure the continued adherence to the fall protection plan.
- 6.3 The fall protection plan shall include:-
- (a) A Risk Assessment of all work carried out from an elevated position;
 - (b) the procedures and methods to address all the identified risks per location;
 - (c) the evaluation of the employees physical and psychological fitness necessary to work at elevated positions;
 - (d) the training of employees working from elevated positions; and
 - (e) the procedure addressing the inspection, testing and maintenance of all fall protection equipment.

7. Hazards and Potential Hazardous Situations

The Contractor and the Project Manager shall immediately notify one another of any hazardous or potentially hazardous situations which may arise during performance of the Contract by the Contractor or any subcontractor and, in particular, of such hazards as may be caused by the design, execution and/or location and any other aspect pertaining to the contract work.

8. Health and Safety File

8.1 The Contractor shall ensure that a health and safety file is opened and kept on site and shall include all documentation required as per the Act and applicable regulations, and made available to an inspector, the Project Manager, or subcontractor upon request.

8.2 The Contractor shall ensure that a copy of the both his Health and Safety Plan as well as any subcontractor's Health and Safety Plan is available on request to an employee, inspector, contractor or the Project Manager.

8.3 The Contractor shall hand over a consolidated health and safety file to the Project Manager upon completion of the Construction Work and shall in addition to documentation mentioned in the Act and applicable Regulations include a record of all drawings, designs, materials used and other similar information concerning the completed structure.

“PREVIEW COPY ONLY”

ANNEXURE 1

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993

Regulation 3(1) of the Construction Regulations

NOTIFICATION OF CONSTRUCTION WORK

-
-
- 1(a) Name and postal address of principal contractor:

- (b) Name and tel. no of principal contractor's contact person:

2. Principal contractor's compensation registration number: _____
- 3.(a) Name and postal address of client:

- (b) Name and tel no of client's contact person or agent:

- 4.(a) Name and postal address of designer(s) for the project:

- (b) Name and tel. no of designer(s) contact person:

5. Name and telephone number of principal contractor's construction supervisor on site appointed in terms of regulation 6(1).

6. Name/s of principal contractor's construction sub-ordinate supervisors on site appointed in terms of regulation 6(2).

7. Exact physical address of the construction site or site office:

8. Nature of the construction work:

9. Expected commencement date: _____
10. Expected completion date: _____

“PREVIEW COPY ONLY”

11. Estimated maximum number of persons on the construction site:

12. Planned number of contractors on the construction site accountable to the principle contractor:

13. Name(s) of contractors already chosen.

Principal Contractor

Date

Client

Date

- * THIS DOCUMENT IS TO BE FORWARDED TO THE OFFICE OF THE DEPARTMENT OF LABOUR PRIOR TO COMMENCEMENT OF WORK ON SITE.
- * ALL PRINCIPAL CONTRACTORS THAT QUALIFY TO NOTIFY MUST DO SO EVEN IF ANOTHER PRINCIPAL CONTRACTOR ON THE SAME SITE HAD DONE SO PRIOR TO THE COMMENCEMENT OF WORK.

“PREVIEW COPY ONLY”

ANNEXURE 2

(COMPANY LETTER HEAD)

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT 85 OF 1993) :

SECTION/REGULATION: _____

REQUIRED COMPETENCY: _____

In terms of _____ I, _____

representing the Employer) do hereby
appoint _____

As the Competent Person on the
premises at _____

(physical address) to assist in compliance with the Act and the applicable Regulations.

Your designated area/s is/are as follows :-

Date : _____

Signature :- _____

Designation :- _____

ACCEPTANCE OF DESIGNATION

I, _____ do hereby accept this Designation and
acknowledge that I
understand the requirements of this appointment.

Date : _____

Signature :- _____

Designation :- _____

ANNEXURE 3

(COMPANY LETTER HEAD)

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT 85 OF 1993) :

DECLARATION

In terms of the above _____ am personally assuming the
Act I, _____ duties
and obligations as Chief Executive Officer, defined in Section 1 of the Act and in terms of
Section 16(1), I will, as far as is reasonably practicable, ensure that the duties and obligations
of the Employer as contemplated in the above Act are properly discharged.

Signature :- _____

Date : _____

“PREVIEW COPY ONLY”

ANNEXURE 4

(LETTER HEAD OF BUSINESS DIVISION OR UNIT OF TRANSNET LIMITED)

SITE ACCESS CERTIFICATE

Access to : _____ (Area)
Name of _____
Contractor/Builder :- _____
Contract/Order No.: _____

The contract works site/area described above are made available to you for the carrying out of associated works
In terms of your contract/order
with
(company
) _____

Kindly note that you are at all times responsible for the control and safety of the Works Site, and for persons under your control having access to the site.

As from the date hereof you will be responsible for compliance with the requirements of the Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended, and all conditions of the Contract pertaining to the site of the works as defined and demarcated in the contract documents including the plans of the site or work areas forming part thereof.

Signed : _____ Date : _____
PROJECT MANAGER

ACKNOWLEDGEMENT OF RECEIPT

Name _____ of _____ I,
Contractor/Builder :- _____

*do hereby acknowledge and accept
the duties*

*and obligations in respect of the Safety of the site/area of Work in terms of the
Occupational Health and Safety Act; Act 85 of 1993.*

Name : _____ Designation : _____

Signature : _____ Date : _____

Tenderer OH & S Management System Questionnaire

This questionnaire forms part of TFR tender evaluation process and is to be completed by all Tenderer's and submitted with their tender offer. The objective of the questionnaire is to provide an overview of the status of the Tenderer's OH&S management system. Tenderer's will be required to verify their responses noted in their questionnaire by providing evidence of their ability and capacity in relevant matters. **TFR will verify accuracy of this information during the physical visit as part of the tender evaluation.**

The information provided in this questionnaire is an accurate summary of the company's occupational health and safety management system.		
Company Name:		
Signed:	Name:	
Position:	Date:	
Tender Description:		
Tender Number:		
Tenderer OH&S Management System Questionnaire	Yes	No
- Is there a written company health and safety policy? - If yes provide a copy of the policy		
- Does the company have an OH&S Management system e.g NOSA, OHSAS, IRCA System etc - If yes provide details		
- Is there a company OH&S Management System, procedures manual or plan? - If yes provide a copy of the content page(s)		
- Are health and safety responsibilities clearly identified for all levels of Management and employees? - If yes provide details		
- Are safe operating procedures or specific safety instructions relevant to its operations available? - If yes provide a summary listing of procedures or instructions		

<p>- Is there a register of injury document? If yes provide a copy</p>		
<p>- Are Risk Assessments conducted and appropriate techniques used? - If yes provide details</p>		
<p>Describe briefly how health and safety training is conducted in your company:</p>		
<p>- Is a record maintained of all training and induction programs undertaken for employees in your company? - If yes provide examples of safety training records</p>		
<p>- Are regular health and safety inspections at worksites undertaken? -If yes provide details</p>		
<p>- Is there a procedure by which employees can report hazards at workplaces? - If yes provide details</p>		
<p>- Is there a workplace health and safety committee?</p>		
<p>- Are employees involved in decision making over OH&S matters? - If yes provide details</p>		
<p>- Are there employee elected health and safety representatives? - Comments</p>		
<p>- Is there a system for recording and analysing health and safety performance statistics including injuries and incidents? - If yes provide details</p>		

<p>- Are employees regularly provided with information on company health and safety performance?</p> <p>- If yes provide details</p>		
<p>Is company registered with workmen's compensation and up to date?</p> <p>- If yes provide proof of letter of good standing</p>		
<p>- Has the company ever been convicted of an occupational health and safety offence?</p> <p>- If yes provide details</p>		

Safety Performance Report

Monthly DIFR for previous months

Previous Year	No of Disabling Injuries	Total Number of employees	DIFR per month
Jan			
Feb			
Mar			
Apr			
May			
Jun			
Jul			
Aug			
Sep			
Oct			
Nov			
Dec			

DIFR = Number of Disabling injuries x 200000 divided by number of manhours worked for the period

Signed
(Tenderer)

TRANSNET



(REGISTRATION NO.1990/000900/06)
**TRADING AS
TRANSNET FREIGHT RAIL**

ADDENDUM NO. 1 TO THE E 7/1 (JULY 1998)

**SPECIFICATION FOR WORKS ON, OVER, UNDER OR ADJACENT TO RAILWAY LINES AND NEAR
HIGH VOLTAGE EQUIPMENT.**

Clause 13 Blasting.

Delete this clause in its entirety

Clause 17 General.

Sub-clause 17.1

Include the words "on request only" after the word "contract" in the fourth line.

Clause 27 Blasting.

Delete this clause in its entirety

“PREVIEW COPY ONLY”

TRANSNET



TRANSNET LIMITED
(REGISTRATION NO. 1990/000900/06)

E7/1 (July 1998)

**SPECIFICATION FOR WORKS ON, OVER, UNDER OR ADJACENT TO RAILWAY LINES AND NEAR
HIGH VOLTAGE EQUIPMENT**

(This Specification shall be used in Transnet Contracts)

CONTENTS

<u>CLAUSE</u>	<u>DESCRIPTION</u>	<u>PAGE NO'S</u>
1.	<u>DEFINITIONS</u>	3
	<u>PART A - GENERAL SPECIFICATION</u>	
2.	Authority of officers of Transnet	4
3.	Contractor's representatives	4
4.	Occupations and work permits	4
5.	Speed restrictions and protection	5
6.	Roads on Transnet property	5
7.	Clearances	5
8.	Stacking of material	5
9.	Excavation, shoring, dewatering and drainage	5
10.	Falsework for structures	6
11.	Piling	6
12.	Underground services	6
13.	Blasting	6
14.	Rail trolleys	7
15.	Signal track circuits	7
16.	Penalty for delays to trains	7
	<u>PART B - ADDITIONAL SPECIFICATION FOR WORK NEAR HIGH-VOLTAGE ELECTRICAL EQUIPMENT</u>	
17.	General	8
18.	Work on buildings of fixed structures	8
19.	Work done on or outside of rolling stock, including loading and unloading	8
20.	Use of equipment	9
21.	Carrying and handling material and equipment	9
22.	Precautions to be taken when erecting or removing poles, antennae and trees	10
23.	Use of water	10
24.	Use of construction plant	10
25.	Work performed under dead conditions under cover of a work permit	10
26.	Traction return circuits in rails	11
27.	Blasting	11
28.	High-voltage electrical equipment not maintained and/or operated by Transnet	11

ANNEXES

1. Horizontal clearances 1 065 mm gauge
2. Vertical clearances 1 065 mm gauge
3. Clearances 610 mm gauge
4. Platform clearances

1 DEFINITIONS

The following definitions shall apply :

Authorised Person. A person whether an employee of Transnet or not, who has been specially authorised to undertake specific duties in terms of Transnet Freight Rail's publication SAFETY INSTRUCTIONS: HIGH-VOLTAGE ELECTRICAL EQUIPMENT, and who holds a certificate or letter of authority to that effect.

Barrier. Any device designed to restrict access to "live" high-voltage electrical equipment.

Bond. A short conductor installed to provide electrical continuity.

Contractor. Any person or organisation appointed by Transnet to carry out work on its behalf.

Dead. Isolated and earthed.

Electrical Officer (Contracts). The person appointed in writing by the responsible Electrical Engineer in Transnet as the person who shall be consulted by the Contractor in all electrical matters to ensure that adequate safety precautions are taken by the Contractor.

Executive Officer. The person appointed by Transnet from time to time as the Executive Officer to act according to the rights and powers held by and obligations placed upon him in terms of the Contract.

High-Voltage. A voltage normally exceeding 1 000 volts.

Live. A conductor is said to be "live" when it is at a potential different from that of the earth or any other conductor of the system of which it forms a part.

Near. To be in such a position that a person's body or the tools he is using or any equipment he is handling may come within 3 metres of live exposed high-voltage electrical equipment.

Occupation. An authorisation granted by Transnet for work to be carried out under specified conditions on, over under or adjacent to railway lines.

Occupation Between Trains. An occupation during an interval between successive trains.

Project Manager. The person or juristic person appointed by Transnet from time to time as the Project Manager, to administer the Contract according to the powers and rights held by and obligations placed upon him in terms of the Contract.

Responsible Representative. The responsible person in charge, appointed by a contractor, who has undergone specific training (and holds a certificate) to supervise staff under his control to work on, over, under or adjacent to railway lines and in the vicinity of high-voltage electrical equipment.

Supervisor. The person or juristic person appointed by Transnet from time to time as the Supervisor, to administer the Contractor's performance and execution of the Works according to the powers and rights held by and obligations placed upon the Supervisor in terms of the Contract.

Total Occupation. An occupation for a period when trains are not to traverse the section of line covered by the occupation.

Work on. Work undertaken on or so close to the equipment that the specified working clearances to the live equipment cannot be maintained.

Work Permit. A combined written application and authority to proceed with work on or near dead electrical equipment.

PART A - GENERAL SPECIFICATION

2. AUTHORITY OF OFFICERS OF TRANSNET

- 2.1 The Contractor shall co-operate with the officers of Transnet and shall comply with all instructions issued and restrictions imposed with respect to the Works which bear on the existence and operation of Transnet's railway lines and high-voltage equipment.
- 2.2 Without limiting the generality of the provisions of 2.1, any duly authorised representative of Transnet, having identified himself, may stop the work if, in his opinion, the safe passage of trains or the safety of Transnet assets or any person is affected. **CONSIDERATIONS OF SAFETY SHALL TAKE PRECEDENCE OVER ALL OTHER CONSIDERATIONS.**

3. CONTRACTOR'S REPRESENTATIVES

- 3.1 The Contractor shall nominate Responsible Representatives of whom at least one shall be available at any hour for call-out in cases of emergency. The Contractor shall provide the Supervisor with the names, addresses and telephone numbers of the representatives.
- 3.2 The Contractor guarantees that he has satisfied himself that the Responsible Representative is fully conversant with this specification and that he shall comply with all his obligations in respect thereof.

4. OCCUPATIONS AND WORK PERMITS

- 4.1 Work to be done during total occupation or during an occupation between trains or under a work permit shall be done in a manner decided by the Supervisor and at times to suit Transnet requirements.
- 4.2 The Contractor shall organise the Works in a manner, which will minimise the number and duration of occupations and work permits required.
- 4.3 Transnet will not be liable for any financial or other loss suffered by the Contractor arising from his failure to complete any work scheduled during the period of an occupation or work permit.
- 4.4 The Contractor shall submit to the Supervisor, in writing, requests for occupations or work permits together with details of the work to be undertaken, at least 14 days before they are required. Transnet does not undertake to grant an occupation or work permit for any particular date, time or duration.
- 4.5 Transnet reserves the right to cancel any occupation or work permit at any time before or during the period of occupation or work permit. If, due to cancellation or change in date or time, the Contractor is not permitted to start work under conditions of total occupation or work permit at the time arranged, all costs caused by the cancellation shall be born by the Contractor except as provided for in clauses 4.6 to 4.8.
- 4.6 When the Contractor is notified less than 2 hours before the scheduled starting time that the occupation or work permit is cancelled, he may claim reimbursement of his direct financial losses caused by the loss of working time up to the time his labour and plant are employed on other work, but not exceeding the period of the cancelled occupation or work permit.
- 4.7 When the Contractor is notified less than 2 hours before the schedule starting time, or during an occupation or work permit, that the duration of the occupation or work permit is reduced, he may claim reimbursement of his direct financial losses caused by the loss of working time due to the reduced duration of the occupation or work permit.
- 4.8 Reimbursement the Contractor for any loss of working time in terms of 4.6 and 4.7, shall be subject

to his claims being submitted within 14 days of the event with full details of labour and plant involved, and provided that the Supervisor certifies that no other work on which the labour and plant could be employed was immediately available.

- 4.9 Before starting any work for which an occupation has been arranged, the Contractor shall obtain from the Supervisor written confirmation of the date, time and duration of the occupation.
- 4.10 Before starting any work for which a work permit has been arranged, the Responsible Representative shall read and sign portion C of form No. T.1276 signifying that he is aware of the limits within which work may be undertaken. After the work for which the permit was granted has been completed, or when the work permit is due to be terminated, or if the permit is cancelled after the start, the same person who signed portion C shall sign portion D of the T.1276 form, thereby acknowledging that he is aware that the electrical equipment is to be made "live". The Contractor shall advise all his workmen accordingly.

5. SPEED RESTRICTIONS AND PROTECTION

- 5.1 When speed restrictions are imposed by Transnet because of the Contractor's activities, the Contractor shall organise and carry out his work so as to permit the removal of the restrictions as soon as possible.
- 5.2 When the Supervisor considers protection to be necessary the Contractor shall, unless otherwise agreed, provide all protection including flagmen, other personnel and all equipment for the protection of Transnet's and the Contractor's personnel and assets, the public and including trains. Transnet will provide training free of charge of the Contractor's flagmen and other personnel performing protection duties. The Contractor shall consult with the Supervisor, whenever he considers that protection will be necessary, taking into account the minimum permissible clearances set out in appendixes 1 to 4.
- 5.3 The Contractor shall appoint a Responsible Representative to receive and transmit any instruction, which may be given by Transnet personnel providing protection.

6. ROADS ON TRANSNET PROPERTY

The provision of clause 25 of the E.5, General Conditions of Contract, or clause 23 of the E.5 (MW), General Conditions of Contract for Maintenance Works, shall apply to the use of existing roads on Transnet's property.

7. CLEARANCES

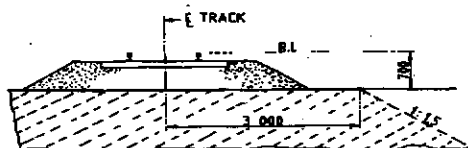
- 7.1 No temporary works shall encroach on the appropriate minimum clearances set out in Annexure 1 BE97-01 Sheets 1,2, 3 and 5 of 5.

8. STACKING OF MATERIAL

- 8.1 The Contractor shall not stack any material closer than 3 m from the centre line of any railway line without prior approval of the Supervisor.

9. EXCAVATION, SHORING, DEWATERING AND DRAINAGE

- 9.1 Unless otherwise approved by the Supervisor any excavation adjacent to a railway line shall not encroach on the hatched area shown in Figure 1.



- 9.2 The Contractor shall provide at his own cost any shoring, dewatering or drainage of any excavation unless otherwise stipulated elsewhere in the Contract.
- 9.3 Where required by the Supervisor, drawings of shoring for any excavation under or adjacent to a railway line shall be submitted and permission to proceed obtained, before the excavation is commenced.
- 9.4 The Contractor shall prevent ingress of water to the excavation but where water does enter, he shall dispose of it as directed by the Supervisor.
- 9.5 The Contractor shall not block, obstruct or damage any existing drains either above or below ground level unless he has made adequate prior arrangements to deal with drainage.

10. **FALSEWORK FOR STRUCTURES**

- 10.1 Drawings of falsework for the construction of any structure over, under or adjacent to any railway line shall be submitted to the Supervisor and his permission to proceed obtained before the falsework is erected. Each drawing shall be given a title and a distinguishing number and shall be signed by a registered professional engineer certifying that he has checked the design of the falsework and that the drawings are correct and in accordance with the design.
- 10.2 After the falsework has been erected and before any load is applied, the Contractor shall submit to the Supervisor a certificate signed by a registered professional engineer certifying that he has checked the falsework and that it has been erected in accordance with the drawings. Titles and numbers of the drawings shall be stated in the certificate. Notwithstanding permission given by the Supervisor to proceed, the Contractor shall be entirely responsible for the safety and adequacy of the falsework.

11. **PILING**

- 11.1 The Supervisor will specify the conditions under which piles may be installed on Transnet property.

12. **UNDERGROUND SERVICES**

- 12.1 No pegs or stakes shall be driven or any excavation made before the Contractor has established that there are no underground services, which may be damaged thereby.
- 12.2 Any damage shall be reported immediately to the Supervisor, or to the official in charge at the nearest station, or to the traffic controller in the case of centralised traffic control.

13. **BLASTING**

- 13.1 The provisions of clause 23 of the E.5, General Conditions of Contract or clause 21 of the E.5 (MW), General Conditions of Contract for Maintenance Work, shall apply to all blasting operations undertaken in terms of the Contract.
- 13.2 The Contractor shall provide proof that he has complied with the provisions of clauses 10.17.1 to 10.17.4 of the Explosives Regulations (Act 26 of 1956 as amended).
- 13.3 Blasting within 500m of a railway line will only be permitted during intervals between trains. A person appointed by the Supervisor, assisted by flagmen with the necessary protective equipment, will be in communication with the controlling railway station.
Only this person will be authorised to give the Contractor permission to blast, and the Contractor shall obey his instructions implicitly regarding the time during which blasting may take place.

- 13.4 The flagmen described in 13.3, where provided by Transnet, are for the protection of trains and Transnet property only, and their presence does not relieve the Contractor in any manner of his responsibilities in terms of Explosives Act or Regulations, or any obligation in terms of this Contract.
- 13.5 The person described in 13.3 will record in a book provided and retained by Transnet the dates and times -
- (i) when each request is made by him to the controlling station for permission to blast;
 - (ii) when blasting may take place;
 - (iii) when blasting actually takes place; and
 - (iv) when he advises the controlling station that the line is safe for the passage of trains.

13.6 Before each blast the Contractor shall record in the same book, the details of the blast to be carried out. The person appointed by the Supervisor and the person who will do the blasting shall both sign the book whenever an entry described in 13.5 is made.

13.7 The terms of clause 27 hereof shall be strictly adhered to.

14. **RAIL TROLLEYS**

14.1 The use of rail trolleys or trestle trolleys on a railway line for working on high voltage equipment will be permitted only if approved by the Supervisor and under the conditions stipulated by him.

14.2 All costs in connection with such trolley working requested by the Contractor shall, unless otherwise agreed, be borne by the Contractor, excluding the costs of any train protection services normally provided free of charge by Transnet.

15. **SIGNAL TRACK CIRCUITS**

15.1 Where signal track circuits are installed, the Contractor shall ensure that no material capable of conducting an electrical current makes contact between rails of a railway line/lines.

15.2 No signal connections on track-circuited tracks shall be severed without the Supervisor's knowledge and consent.

16. **PENALTY FOR DELAYS TO TRAINS**

16.1 If any trains are delayed by the Contractor and the Supervisor is satisfied that the delay was avoidable, a penalty will be imposed on the Contractor of R5 000 per hour or part thereof for the period of delay, irrespective of the number of trains delayed.

PART B - ADDITIONAL SPECIFICATION FOR WORK NEAR HIGH-VOLTAGE ELECTRICAL EQUIPMENT

17. GENERAL

17.1 This specification is based on the contents of Transnet Freight Rail's publication SAFETY INSTRUCTIONS, HIGH-VOLTAGE ELECTRICAL EQUIPMENT, as amended, a copy of which will be made available on loan to the Contractor for the duration of the contract. These instructions apply to all work near live high-voltage equipment maintained and/or operated by Transnet, and the onus rests on the Contractor to ensure that he obtains a copy.

17.2 The Contractor's attention is drawn in particular to the contents of Part I, Sections 1 and 2 of the Safety Instructions : High-Voltage Electrical Equipment.

17.3 The Safety Instructions : High-Voltage Electrical Equipment cover the minimum safety precautions which must be taken to ensure safe working on or near high-voltage electrical equipment, and must be observed at all times. Should additional safety measures be considered necessary because of peculiar local conditions, these may be ordered by and at the discretion of the Electrical Officer (Contracts).

17.4 This specification must be read in conjunction with and not in lieu of the Safety Instructions : High-Voltage Electrical Equipment.

17.5 The Contractor shall obtain the approval of the Electrical Officer (Contracts) before any work is done which causes or could cause any portion of a person's body or the tools he is using or any equipment he is handling, to come within 3 metres of any live high-voltage equipment.

17.6 The Contractor shall regard all high-voltage equipment as live unless a work permit is in force.

17.7 Safety precautions taken or barriers erected shall comply with the requirements of the Electrical Officer (Contracts), and shall be approved by him before the work to be protected is undertaken by the Contractor. The Contractor shall, unless otherwise agreed, bear the cost of the provision of the barriers and other safety precautions required, including the attendance of Transnet staff where this is necessary.

17.8 No barrier shall be removed unless authorised by the Electrical Officer (Contracts).

18. WORK ON BUILDINGS OR FIXED STRUCTURES

Before any work is carried out or measurements are taken on any part of a building, fixed structure or earthworks of any kind above ground level situated within 3 metres of live high-voltage equipment, the Electrical Officer (Contracts) shall be consulted to ascertain the conditions under which the work may be carried out.

18.2 No barrier erected to comply with the requirements of the Electrical Officer (Contracts) shall be used as temporary staging or shuttering for any part of the Works.

18.3 The shuttering for bridge piers, abutments, retaining walls or parapets adjacent to or over any track may be permitted to serve as a barrier, provided that it extends at least 2,5 metres above any working level in the case of piers, abutments and retaining walls and 1,5 metres above any working level in the case of parapets.

19. WORK DONE ON OR OUTSIDE OF ROLLING STOCK, INCLUDING LOADING OR UNLOADING

19.1 No person shall stand, climb or work whilst on any platform, surface or foothold higher than the normal unrestricted places of access, namely -
(i) the floor level of trucks;

- (ii) external walkways on diesel, steam and electric locomotives, steam heat vans, etc. and
- (iii) walkways between coaches and locomotives.

When in these positions, no person may raise his hands or any equipment or material he is handling above his head.

- 19.2 In cases where the Contractor operates his own rail mounted equipment, he shall arrange for the walkways on this plant to be inspected by the Electrical Officer (Contracts) and approved, before commencement of work.
- 19.3 The handling of long lengths of material such as metal pipes, reinforcing bars, etc should be avoided, but if essential they shall be handled as nearly as possible in a horizontal position below head height.
- 19.4 The Responsible Representative shall warn all persons under his control of the danger of being near live high-voltage equipment, and shall ensure that the warning is fully understood.
- 19.5 Where the conditions in 19.1 to 19.3 cannot be observed the Electrical Officer (Contracts), shall be notified. He will arrange for suitable Safety measures to be taken. The Electrical Officer (Contracts), may in his discretion and in appropriate circumstances, arrange for a suitable employee of the Contractor to be specially trained by Transnet Freight Rail and at its costs, as an Authorised Person to work closer than 3 metres from live overhead conductors and under such conditions as may be imposed by the Senior responsible Electrical Engineer in Transnet.

20. USE OF EQUIPMENT

20.1 Measuring Tapes and Devices

- 20.1.1 Measuring tapes may be used near live high-voltage equipment provided that no part of any tape or a person's body comes within 3 metres of the live equipment.
- 20.1.2 In windy conditions the distance shall be increased to ensure that if the tape should fall it will not be blown nearer than 3 metres from the live high-voltage equipment.
- 20.1.3 Special measuring devices longer than 2 metres such as survey staves and rods may be used if these are of non-conducting material and approved by the responsible Electrical Engineer in Transnet, but these devices must not be used within 3 metres of live high-voltage equipment in rainy or wet conditions.
- 20.1.4 The assistance of the Electrical Officer (Contracts) shall be requested when measurements within the limits defined in 20.1.1 to 20.1.3 are required.
- 20.1.5 The restrictions described in 20.1.1 to 20.1.3 do not apply on a bridge deck between permanent parapets nor in other situations where a barrier effectively prevents contact with the live high-voltage equipment.

20.2 Portable Ladders

- 20.2.1 Any type of portable ladder longer than 2 metres may only be used near live high-voltage equipment under the direct supervision of the Responsible Representative. He shall ensure that the ladder is always used in such a manner that the distance from the base of the ladder to any live high-voltage equipment is greater than the fully extended length of the ladder plus 3 metres. Where these conditions cannot be observed, the Electrical Officer (Contracts) shall be advised, and he will arrange for suitable safety measures to be taken.

21. CARRYING AND HANDLING MATERIAL AND EQUIPMENT

- 21.1 Pipes, scaffolding, iron sheets, reinforcing bars and other material, which exceeds 2 metres in

length, shall be carried completely below head height near live high-voltage equipment. For maximum safety two or more persons so as to maintain it as nearly as possible in a horizontal position should carry such material. The utmost care must be taken to ensure that no part of the material comes within 3 metres of any live high-voltage equipment.

21.2 Long lengths of wire or cable shall never be run out in conditions where a part of a wire or cable can come within 3 metres of any live high-voltage equipment unless the Electrical Officer (Contracts) has been advised and has approved appropriate safety precautions.

21.3 The presence of overhead power lines shall always be taken account of especially when communications lines or cables or aerial cables, stay wires, etc. are being erected above ground level.

22. **PRECAUTIONS TO BE TAKEN WHEN ERECTING OR REMOVING POLES, ANTENNAE, TREES ETC.**

22.1 A pole may be handled for the purpose of erection or removal near high-voltage equipment under the following conditions:

(i) If the distance between the point at which the pole is to be erected or removed and the nearest live high-voltage equipment is more than the length of the pole plus 3 metres, the work shall be supervised by the Responsible Representative.

(ii) If the distance described in (i) is less than the length of the pole plus 3 metres, the Electrical Officer (Contracts) shall be consulted to arrange for an Authorised Person to supervise the work and to ensure that the pole is earthed where possible. The pole shall be kept in contact with the point of erection, and adequate precautions shall be taken to prevent contact with live high-voltage equipment.

22.2 The cost of supervision by an Authorised Person and the provision of earthing shall, unless otherwise agreed, be borne by the Contractor.

22.3 The provisions of clauses 22.1 and 22.2 shall also apply to the erection or removal of columns, antennae, trees, posts, etc.

23. **USE OF WATER**

23.1 No water shall be used in the form of a jet if it can make contact with any live high-voltage equipment or with any person working on such equipment.

24. **USE OF CONSTRUCTION PLANT**

24.1 "Construction plant" entails all types of plant including cranes, piling frames, boring machines, excavators, draglines, dewatering equipment and road vehicles with or without lifting equipment.

24.2 When work is being undertaken in such a position that it is possible for construction plant or its load to come within 3 metres of live high-voltage equipment, the Electrical Officer (Contracts) shall be consulted. He will arrange for an Authorised Person to supervise the work and to ensure that the plant is adequately earthed. The Electrical Officer (Contracts) will decide whether further safety measures are necessary.

24.3 The cost of any supervision by an Authorised Person and the provision of earthing shall, unless otherwise agreed, be borne by the Contractor.

24.4 When loads are handled by cranes, non-metallic rope hand lines shall be used, affixed to such loads so as to prevent their swinging and coming within 3 metres of live high-voltage equipment.

24.5 Clauses 24.1 to 24.4 shall apply mutatis mutandis to the use of maintenance machines of any nature.

25. **WORK PERFORMED UNDER DEAD CONDITIONS UNDER COVER OF A WORK PERMIT**

- 25.1 If the Responsible Representative finds that the work cannot be done in safety with the high-voltage electrical equipment live, he shall consult the Electrical Officer (Contracts) who will decide on the action to be taken.
- 25.2 If a work permit is issued the Responsible Representative shall -
- (i) before commencement of work ensure that the limits within which work may be carried out have been explained to him by the Authorised Person who issued the permit to him, and that he fully understands these limits.
 - (ii) sign portion C of the permit before commencement of work;
 - (iii) explain to all persons under his control the limits within which work may be carried out, and ensure that they fully understand these limits;
 - (iv) care for the safety of all persons under his control whilst work is in progress; and
 - (v) withdraw all personnel under his control from the equipment on completion of the work before he signs portion D of the work permit.

26. **TRACTION RETURN CIRCUITS IN RAILS**

- 26.1 DANGEROUS CONDITIONS CAN BE CREATED BY REMOVING OR SEVERING ANY BOND.
- 26.2 Broken rails with an air gap between the ends, and joints, at which fishplates are removed under "broken bond" conditions, are potentially lethal. The rails on either side of an air gap between rail ends on electrified lines shall not be touched simultaneously until rendered safe by Transnet personnel.
- 26.3 The Contractor shall not break any permanent bonds between rails or between rails and any structure. He shall give the Supervisor at least 7 days written notice when removal of such bonds is necessary.
- 26.4 No work on the track which involves interference with the traction return rail circuit either by cutting or removing the rails, or by removal of bonds shall be done unless the Electrical Officer (Contracts) is consulted. He will take such precautions as may be necessary to ensure continuity of the return circuit before permitting the work to be commenced.

27. **BLASTING**

- 27.1 The Contractor shall obtain the permission of the Electrical Officer (Contracts) before blasting, and shall give at least 14 days notice of his intention to blast.
- 27.2 No blasting shall be done in the vicinity of electrified lines unless a member of Transnet's electrical personnel is present.
- 27.3 The terms of clause 13 hereof shall be strictly adhered to.

28. **HIGH-VOLTAGE ELECTRICAL EQUIPMENT NOT MAINTAINED AND/OR OPERATED BY TRANSNET**

Where the work is undertaken on or near high-voltage electrical equipment which is not maintained and/or operated by Transnet, the Occupational Health and Safety Act No. 85 of 1993, and Regulations and Instructions, or the Mines Health and Safety Act (Act 29 of 1996), shall apply.

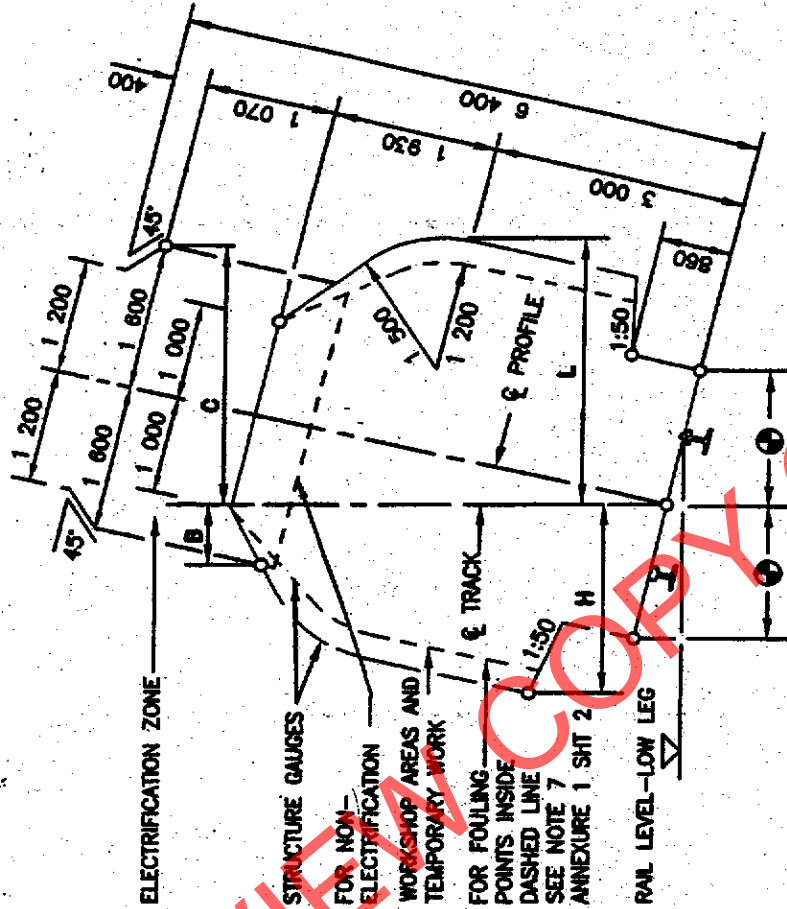
Such equipment includes: -

- (i) Eskom and municipal equipment;
- (ii) the Contractor's own power supplies; and
- (iii) electrical equipment being installed but not yet taken over from the Contractor.

“PREVIEW COPY ONLY”

ANNEXURE 1
SHEET 1 of 5
AMENDMENT

HORIZONTAL CLEARANCES :
1 065mm TRACK GAUGE



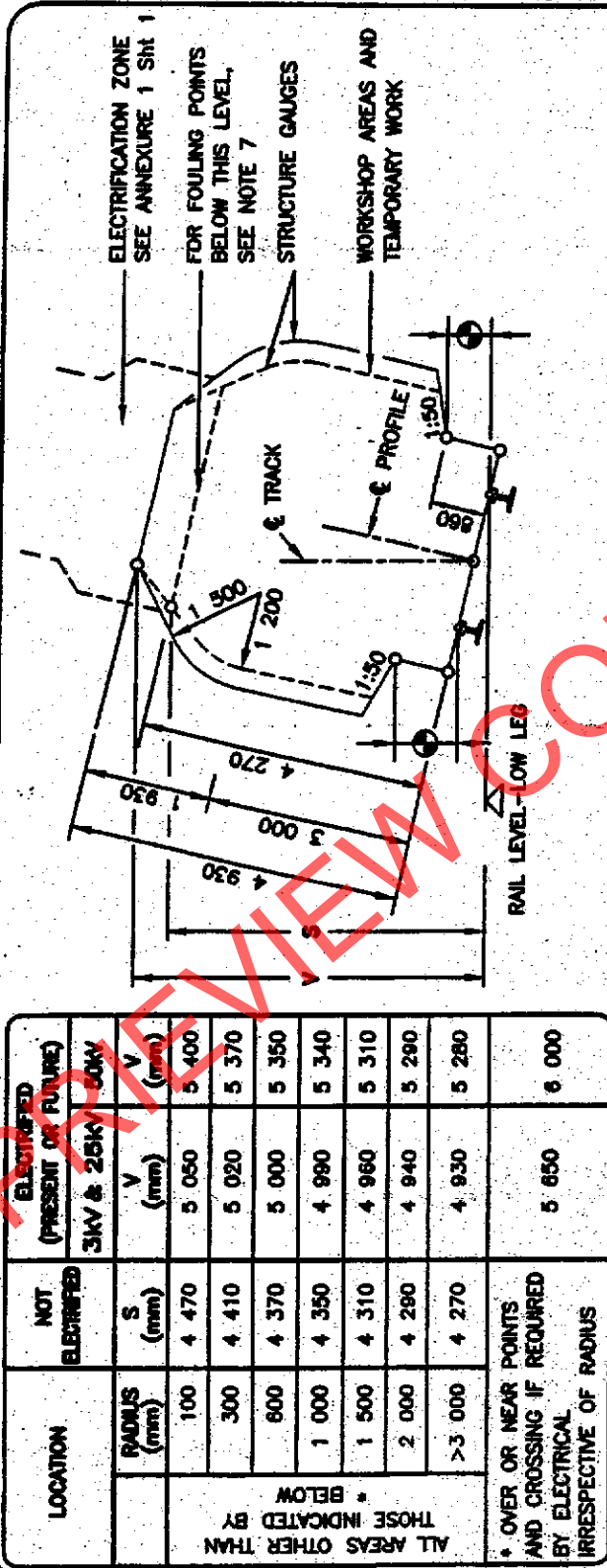
RADIUS (m)	WITH CANT		NO CANT		WITH CANT	
	H (mm)	L (mm)	H & L	B (mm)	C (mm)	G (mm)
90	2 730	3 090	2 780	1 130	2 100	2 100
100	2 700	3 030	2 750	1 140	2 050	2 050
120	2 650	2 970	2 700	1 160	2 010	2 010
140	2 620	2 920	2 660	1 175	1 990	1 990
170	2 590	2 870	2 630	1 190	1 970	1 970
200	2 570	2 820	2 600	1 205	1 950	1 950
250	2 550	2 790	2 580	1 230	1 920	1 920
300	2 540	2 760	2 560	1 250	1 900	1 900
350	2 530	2 730	2 540	1 270	1 890	1 890
400	2 520	2 710	2 530	1 290	1 875	1 875
500	2 510	2 680	2 520	1 320	1 850	1 850
600	2 500	2 660	2 510	1 340	1 830	1 830
800	2 490	2 620	2 500	1 365	1 790	1 790
1 000	2 480	2 600	2 490	1 380	1 760	1 760
1 200	2 480	2 580	2 490	1 200	1 730	1 730
1 500	2 480	2 550	2 480	1 415	1 700	1 700
2 000	2 480	2 500	2 480	1 440	1 660	1 660
3 000	2 470	2 470	2 470	1 500	1 600	1 600
>5 000	2 460	2 460	2 460	1 600	1 600	1 600

REMARKS:

1. H AND B IS THE REQUIRED HORIZONTAL CLEARANCE ON THE OUTSIDE OF THE CURVE BASED ON MINIMUM CANT.
2. L AND C IS THE REQUIRED HORIZONTAL CLEARANCE ON THE INSIDE OF THE CURVE BASED ON MAXIMUM CANT.
3. INTERMEDIATE VALUES MAY BE INTERPOLATED BY THE ENGINEER IN CHARGE.
4. FOR WORKSHOP AREAS AND TEMPORARY WORK, CLEARANCES H AND L MAY BE REDUCED BY 300mm.
5. Ⓢ SEE ANNEXURE 1 SHEET 3 FOR PLATFORM CLEARANCES.
6. ALSO REFER TO REMARKS 4 TO 8 OF ANNEXURE 1 SHEET 2.

ANNEXURE 1
SHEET 2 of 5
AMENDMENT

VERTICAL CLEARANCES :
1 065mm TRACK GAUGE



REMARKS:

1. V IS THE REQUIRED VERTICAL CLEARANCE EXCEPT WHERE REDUCED CLEARANCE S APPLIES.
2. S IS THE MINIMUM VERTICAL CLEARANCE FOR STRUCTURES AND TEMPORARY WORK OVER NON-ELECTRIFIED LINES.
3. INTERMEDIATE VALUES MAY BE INTERPOLATED BY THE ENGINEER IN CHARGE.
4. FOR APPLICATION AT CURVES
 - 4.1 APPLY INCREASED CLEARANCES FOR CURVES TO POINTS 3m BEYOND THE ENDS OF THE CIRCULAR CURVE.
 - 4.2 REDUCE CLEARANCES AT A UNIFORM RATE OVER THE REMAINDER OF THE TRANSITION CURVE.
 - 4.3 FOR NON-TRANSITIONED CURVES REDUCE AT A UNIFORM RATE OVER A LENGTH OF 15m ALONG STRAIGHTS.
5. NEW STRUCTURES: SEE BRIDGE CODE.
6. TUNNELS: SEE DRAWING BE 62-35.
7. FOULING POINTS: SEE CLAUSE B.1.
8. CLEARANCES ARE BASED ON 15m BOGIE CENTRES AND 24,2m VEHICLE BODY LENGTH.
9. SEE ANNEXURE 1 SHEET 3 FOR PLATFORM CLEARANCES.

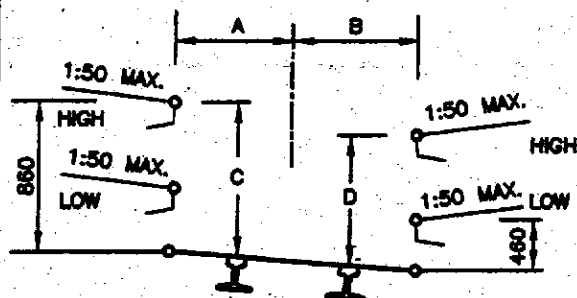
BE 97-01 Sht 2 of 5 DATE : JUNE 2000

ANNEXURE 1
SHEET 3 of 5
AMENDMENT

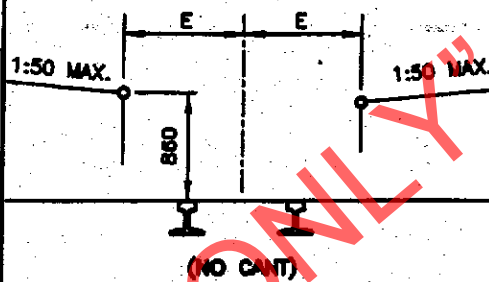
CLEARANCES : PLATFORMS

PLATFORMS : TRACK GAUGE 1 065mm

PASSENGERS



GOODS



RADIUS (m)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
90	1 690	1 820	890	810	1 840
100	1 650	1 790	890	810	1 810
120	1 610	1 740	890	810	1 780
140	1 580	1 700	890	810	1 720
170	1 550	1 680	890	810	1 690
200	1 530	1 630	890	820	1 670
250	1 520	1 600	890	820	1 640
300	1 520	1 580	890	830	1 620
350	1 520	1 560	880	830	1 600
400	1 520	1 550	880	840	1 590
500	1 520	1 540	880	850	1 580
600	1 520	1 530	870	850	1 570
800	1 520	1 520	860	860	1 560
1 200	1 520	1 520	860	860	1 550
2 000	1 520	1 520	860	860	1 540
3 000	1 520	1 520	860	860	1 530
STRAIGHT	1 520	1 520	860	860	1 520

REMARKS:

1. NO CANT TO BE APPLIED EXCEPT WHEN THE GOODS PLATFORM IS ON A RUNNING LINE.
2. INTERMEDIATE VALUES MAY BE INTERPOLATED BY THE ENGINEER IN CHARGE.
3. 5m TO MAIN STATION-BUILDINGS AND 3m TO ALL OTHER STRUCTURES.
4. TOLERANCES : SEE CLAUSE 8.0.10.

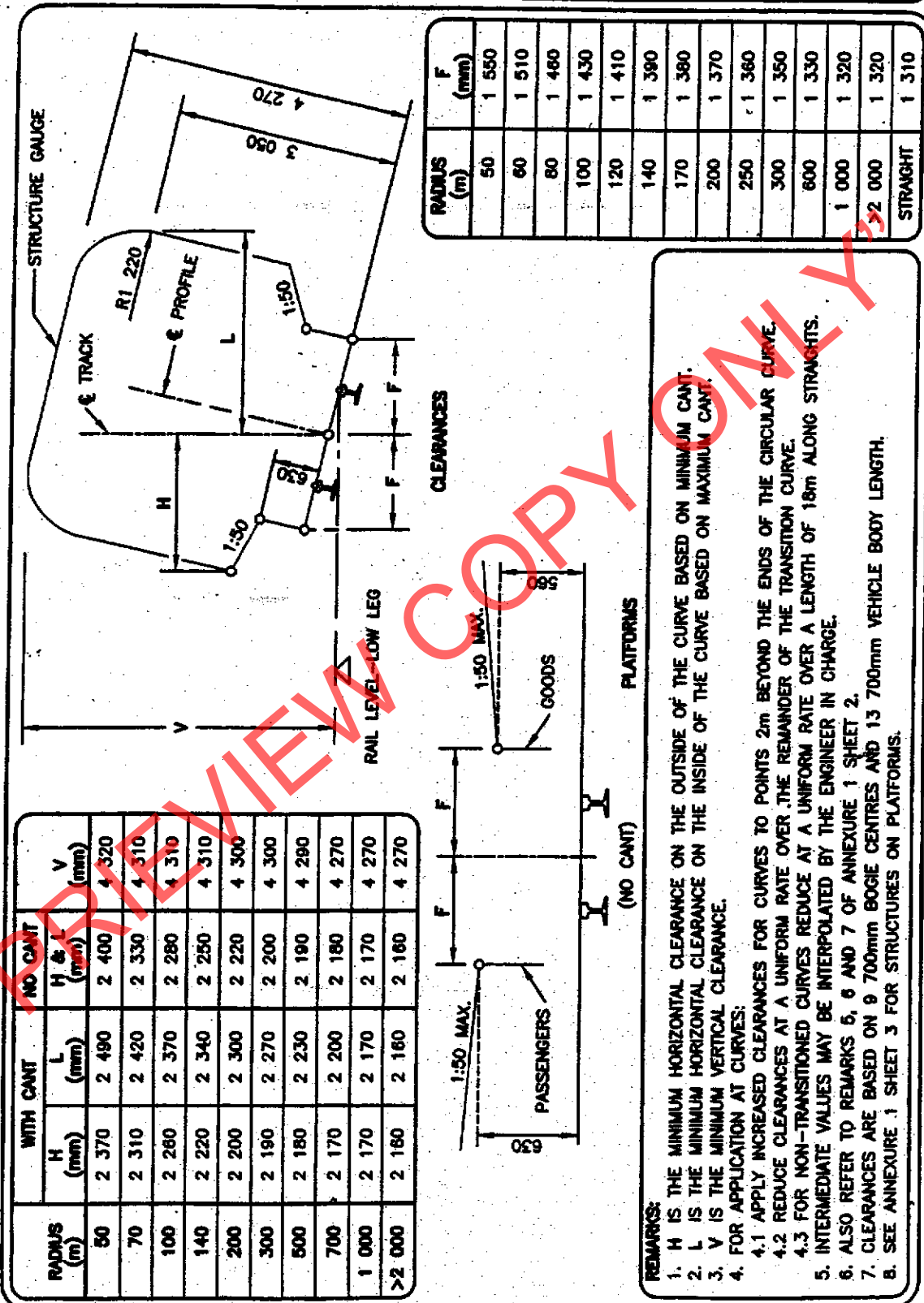
STRUCTURES ON PLATFORMS : 1 065mm AND 610mm TRACK GAUGE



BE-97-01 Sht 3 of 5 DATE : JUNE 2000

ANNEXURE 1
SHEET 5 of 5
AMENDMENT

CLEARANCES : 610mm TRACK GAUGE



BE 97-01 Sht 5 of 5 DATE : JUNE 2000