

Foreword

The formulation of this national standard was initiated by the Agricultural Machinery Testing and Evaluation Center (AMTEC) under the project entitled "Enhancing the Implementation of AFMA Through Improved Agricultural Engineering Standards" which was funded by the Bureau of Agricultural Research (BAR) of the Department of Agriculture (DA).

This standard has been technically prepared in accordance with PNS 01-4:1998 (ISO/IEC Directives Part 3:1997) – Rules for the Structure and Drafting of International Standards.

The word "shall" is used to indicate requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted.

The word "should" is used to indicate that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others, or that certain course of action is preferred but not necessarily required.

In the preparation of this standard, the following documents/publications were considered:

AMTEC Test Reports on Drilling Rigs

Agricultural Mechanization Development Program (AMDP), University of the Philippines Los Baños (UPLB) Model II Drilling Rig – Operator's Manual

Republic Act No. 7394 otherwise known as "The Consumer Act of the Philippines" enacted on July 22, 1991.

Agricultural Machinery – Drilling Rig – Specifications

1 Scope

This standard specifies the requirements for drilling rig used for agricultural purposes. This standard is applicable only to water-well drilling rigs.

2 References

The following normative documents contain provisions, which, through reference in this text, constitute provisions of this National Standard:

PAES 102:2000, Agricultural Machinery – Operator’s Manual – Content and Presentation

PAES 103:2000, Agricultural Machinery – Method of Sampling

PAES 128:2002, Agricultural Machinery – Drilling Rig – Methods of Test

3 Definitions

For the purpose of this standard the following definitions shall apply:

3.1**drilling rig**

structural assembly which is used to drill holes for the purpose of water-well construction (see Figure 1)

3.2**drilling pipe**

serves as an adaptor of the drill bit and conduit of water jet channel (see Figure 1)

3.3**drill bit**

bit attached to the end of the drilling pipe which is directly in contact with the soil formation and serves as cutting device during drilling operation (see Figure 1)

3.4**main rig assembly**

structure which supports the entire drilling system (see Figure 1)

3.4**surging stem**

jetting stem

light weight pipes used during high velocity flow (jetting) operation

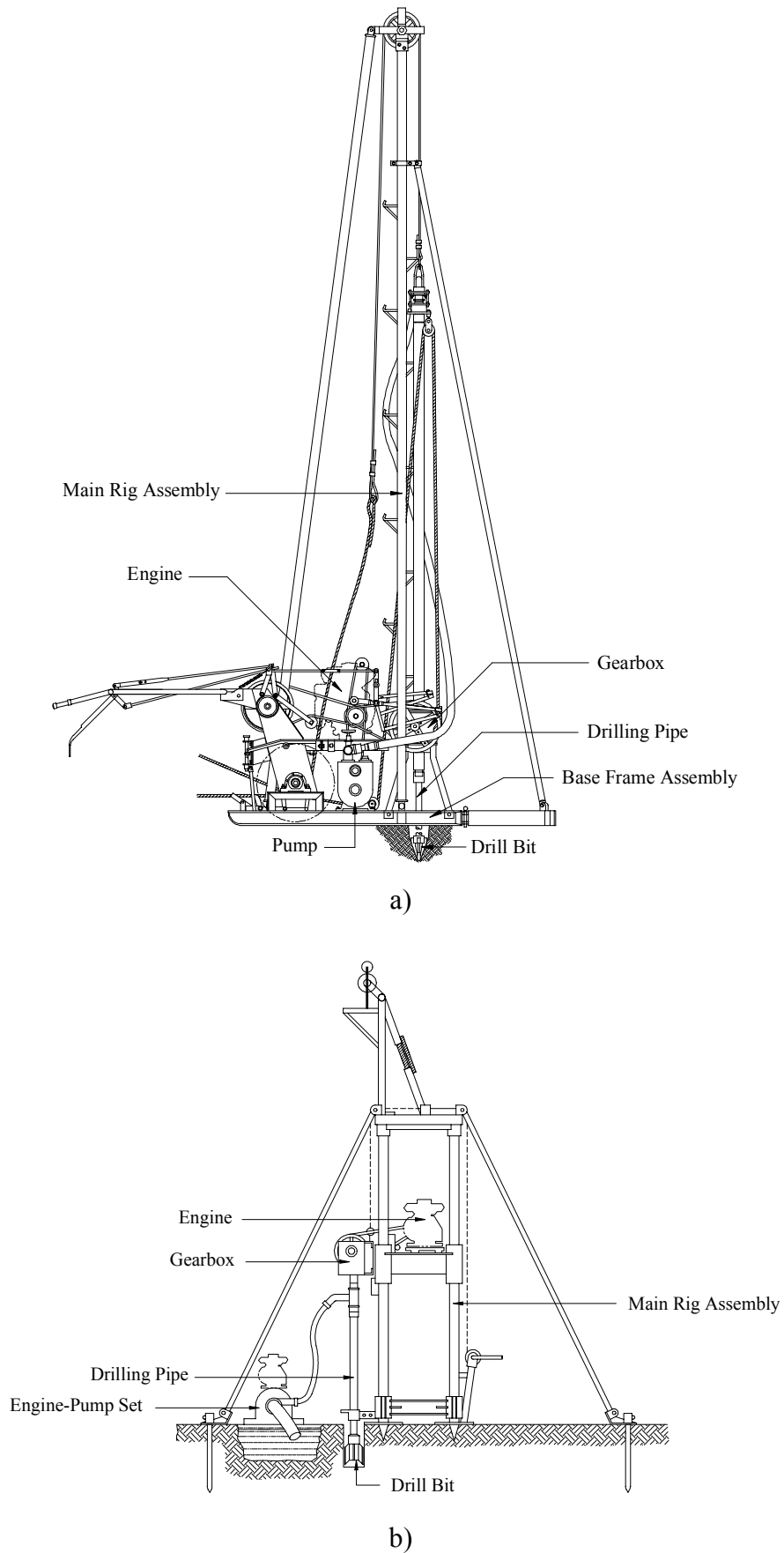


Figure 1 – Typical Drilling Rig Designs and its Main Components

4 Classification

The classification of drilling rig according to the boring action shall be as follows:

4.1 Rotary

A type of drilling rig in which the mode of drilling is done by using a rotating drill bit that cut and loosen the soil thus producing a hole of required diameter.

4.2 Percussion

A type of drilling rig in which the mode of drilling is done by alternately raising and dropping either an external weight (solid steel or wood) or the drilling stem itself, causing the impact of the drill bit to the soil, thus producing a hole of required diameter.

4.3 Combination

A type of drilling rig in which the mode of drilling is done by rotary action and percussion.

NOTE For all types of drilling rig, water jet is applied to facilitate boring.

5 Materials of Construction

5.1 The drilling rig shall be generally made of steel materials.

5.2 Black Iron (BI) pipe with “square” thread of at least Schedule 40 shall be used in the manufacture of drill pipe and main rig assembly; and at least Schedule 20 shall be used in the manufacture of surging stem.

5.3 Carbon steel with at least 80% carbon content (AISI 1080) or high speed steel with molybdenum shall be used in the manufacture of drill bit.

6 Performance Requirements

The drilling rig when tested in accordance with PAES 128 shall conform to the following requirements:

6.1 The drilling rig shall be easy to set-up and operate.

6.2 In case of combination type of drilling rig, drilling shall be readily switched from rotary to percussion mode to suit different soil conditions or geologic formation.

6.3 Water jetting shall facilitate the removal of soil aggregates in the borehole.

6.4 The drilling rig shall be capable of drilling at least 30-meter depth and a minimum borehole diameter of 100 mm.

6.5 The noise emitted by the machine measured 50 mm away from the operator's ear level shall not be more than 92 db (A).*

7 Other Requirements

7.1 The drilling rig shall be portable, or self-transportable, and can be easily dismantled into sub-assemblies. It can be set-up, operated and dismantled by at most three persons.

7.2 The drilling rig shall be stable such that it can be set-up even in sloping ground and can be operated even under hard geologic formation.

7.3 The drilling rig shall be provided with safety features such that its moving parts are adequately guarded to protect the operator.

7.4 A by-pass mechanism for the drilling fluid shall be provided so as to eliminate turning the pump on and off during drilling and surging.

7.5 The drilling rig shall be of simple design in which small workshops can fabricate and repair it using locally available materials.

7.6 The drilling rig shall be provided with different types of drill bits to suit different geologic formation.

7.7 The drilling rig shall be provided with adjustable dish plate assembly or similar device attached to the main base frame for stability.

7.8 The drilling rig shall be provided with quick release couplings in connecting one part to another (i.e. suction hose to pump, pump to discharge hose, etc).

8 Workmanship and Finish

8.1 The drilling rig shall be free from manufacturing defects that may be detrimental to its operation.

8.2 Any uncoated metallic surface shall be free from rust and shall be appropriately painted if necessary.

8.3 The drilling rig shall be free from sharp edges and surfaces that may injure the operator.

* Allowable noise level for six (6) hours of continuous exposure based on Occupational Safety and Health Standards, Ministry of Labor. Philippines.1983.

9 Warranty for Construction and Durability

9.1 Warranty against defective materials and workmanship shall be provided for parts and services except for consumable maintenance parts (i.e. belts, drill bits, etc) within six (6) months from the purchase of the drilling rig.

9.2 The construction shall be rigid and durable without breakdown of its major components within six (6) months from purchase by the first buyer.

10 Maintenance and Operation

10.1 Each drilling rig shall be provided with appropriate tools for assembly, operation and dismantling.

10.2 An operator's manual which conforms to PAES 102 shall be provided.

11 Sampling

The drilling rig shall be sampled for testing in accordance with PAES 103.

12 Testing

Sampled drilling rig shall be tested in accordance with PAES 128.

13 Marking and Labeling

Each drilling rig shall be marked in English language with the following information using a plate, stencil or by directly punching it at the most conspicuous place:

13.1 Registered Trademark of the Manufacturer

13.2 Brand

13.3 Model

13.4 Serial number

13.5 Name and address of the manufacturer

13.6 Name and address of the importer, if imported (optional)

13.7 Country of manufacture (if imported) / "Made in the Philippines" (if manufactured in the Philippines)

13.8 Safety/precautionary markings