



भारतीय मानक ब्यूरो BUREAU OF INDIAN STANDARDS

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व्यापक परिचालन मसौदा

हमारा संदर्भ : सीईडी 43/टी-86

04 नवम्बर 2022

तकनीकी समिति : मृदा एवं नींव इंजीनियरी विषय समिति, सीईडी 43

प्राप्तकर्ता :

- 1 सिविल इंजीनियरी विभाग परिषद, सीईडीसी के सभी सदस्य
- 2 मृदा एवं नींव इंजीनियरी विषय समिति, सीईडी 43 के सभी सदस्य
- 3 रूचि रखने वाले अन्य निकाय।

महोदया/महोदय,

निम्नलिखित मसौदा संलग्न है:

प्रलेख संख्या	शीर्षक
सीईडी 43 (21137)WC	मृदा परीक्षण के लिए संघनन रैमर – विशिष्ट का भारतीय मानक मसौदा (IS 9198 का पहला पुनरीक्षण) (ICS No. 93.020; 13.080.20)

कृपया इस मसौदे का अवलोकन करें और अपनी सम्मतियाँ यह बताते हुए भेजे कि यह मसौदा प्रकाशित हो तो इस पर अमल करने में, आपको व्यवसाय अथवा कारोबार में क्या कठिनाइयाँ आ सकती हैं।

सम्मतियाँ भेजने की अंतिम तिथि: 05 दिसम्बर 2022

सम्मति यदि कोई हो तो कृपया अधोहस्ताक्षरी को ई मेल द्वारा madhurima@bis.gov.in पर या उपरलिखित पते पर, संलग्न फॉर्मेट में भेजें।

यदि कोई सम्मति प्राप्त नहीं होती है अथवा सम्मति में केवल भाषा संबंधी त्रुटि हुई तो उपरोक्त प्रलेख को यथावत अंतिम रूप दे दिया जाएगा। यदि सम्मति तकनीकी प्रकृति की हुई तो विषय समिति के अध्यक्ष के परामर्श से अथवा उनकी इच्छा पर आगे की कार्यवाही के लिए विषय समिति को भेजे जाने के बाद प्रलेख को अंतिम रूप दे दिया जाएगा।

यह प्रलेख भारतीय मानक ब्यूरो की वेबसाइट www.bis.gov.in पर भी उपलब्ध हैं।

धन्यवाद।

भवदीय

ह/-

(अरुण कुमार एस.)

वैज्ञानिक 'ई'/निर्देशक और प्रमुख (सिविल इंजीनियरिंग)

संलग्न: उपरलिखित



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**DRAFT IN
WIDE CIRCULATION**

DOCUMENT DESPATCH ADVICE

Reference	Date
CED 43/T-86	04 November 2022

TECHNICAL COMMITTEE:

SOIL AND FOUNDATION ENGINEERING SECTIONAL COMMITTEE, CED 43

ADDRESSED TO:

1. All Members of Civil Engineering Division Council, CEDC
2. All Members of Soil and Foundation Engineering Sectional Committee, CED 43
3. All other interests

Dear Madam/Sir,

Please find enclosed the following draft:

Doc. No.	Title
CED 43 (21137)WC	Draft Indian Standard Compaction rammer for soil testing — Specification (<i>First Revision of IS 9198</i>) (ICS No. 93.020; 13.080.20)

Kindly examine the draft revision and forward your views stating any difficulties which you are likely to experience in your business or profession, if this is finally adopted as National Standard.

Last Date for comments: 05 December 2022

Comments if any, may please be made in the enclosed format and emailed at madhurima@bis.gov.in or sent at the above address.

In case no comments are received or comments received are of editorial nature, you will kindly permit us to presume your approval for the above document as finalized. However, in case comments, technical in nature are received, then it may be finalized either in consultation with the Chairman, Sectional Committee or referred to the Sectional Committee for further necessary action if so desired by the Chairman, Sectional Committee.

The document is also hosted on BIS website www.bis.gov.in.

Thanking you,

Yours faithfully,

Sd/-

(Arun Kumar S.)
Sc. 'E'/Director & Head (Civil Engg.)

Encl: As above

BUREAU OF INDIAN STANDARDS

DRAFT FOR COMMENTS ONLY

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Draft Indian Standard

COMPACTION RAMMERS FOR SOIL TESTING — SPECIFICATION

(First Revision of IS 9198)

Soil and Foundation Engineering
Sectional Committee, CED 43

Last date of Comments:
05 December 2022

Soil and Foundation Engineering Sectional Committee, CED 43

FOREWORD

(Formal clauses to be added later)

There is a series of standards on methods of testing of soils. It has been recognized that reliable and inter-comparable test results can be obtained only with the standard testing equipment capable of giving that desired level of accuracy. With this objective, a series of specifications covering the requirements of equipment used for testing soils have been published to encourage their development and manufacture in the country.

The equipment covered in this standard is used for determination of water content-dry density relation of soil in accordance with IS 2720 (Part 7) : 1980 'Methods of test for soils: Part 7 Determination of water content-dry density relation using light compaction (*second revision*)' and IS 2720 (Part 8) : 1983 'Methods of test for soils: Part 8 Determination of water content-dry density relation using heavy compaction (*second revision*)'.

This standard was first published in 1980. The present revision has been taken up with a view to incorporating the modifications found necessary as a result of experience gained in the use of this standard. Also, in this revision, the standard has been brought into latest style and format of Indian Standards, and references to Indian Standards, wherever applicable have been updated. The other major modifications incorporated in this revision of the standard are given below:

- a) Mechanical compaction rammers, both light and heavy, has been included in addition to existing manual compaction rammer has been modified.
- b) Correct Indian Standard for forging quality mild steel has been referred.
- c) Making clause has been updated to also indicated manual or mechanical type of compaction rammer.
- d) BIS certification marking clause has been modified to align with the revised *Bureau of Indian Standards Act, 2016*.

This standard contributes to the Sustainable Development Goal 9 - Industry, Innovation and Infrastructure: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

BUREAU OF INDIAN STANDARDS

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Draft Indian Standard

COMPACTION RAMMERS FOR SOIL TESTING — SPECIFICATION

(First Revision of IS 9198)

Soil and Foundation Engineering
Sectional Committee, CED 43

Last date of Comments:
05 December 2022

1 SCOPE

This standard covers the requirements for compaction rammers both for light and heavy compaction used for determination of the water content-dry density relation of soils.

2 REFERENCES

The following standards contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication the editions indicated are valid. All standards are subject to revision, and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
1239 (Part 1) : 2004	Steel tubes, tubulars and other wrought steel fittings — Specification: Part 1 Steel tubes (<i>sixth revision</i>)
1875 : 1992	Carbon steel billets, blooms, slabs and bars for forgings — Specification (<i>fifth revision</i>)
2102 (Part 1) : 1993	General tolerances: Part 1 Tolerances for linear and angular dimensions without individual tolerance indications (<i>third revision</i>)
4170 : 1967	Specification for brass rods for general engineering purposes

3 MATERIALS

The materials of construction of the different component parts of the compaction rammer of both light and heavy type shall be as given in Table 1.

**Table 1 Materials of Construction of Different Component Parts of
Compaction Rammer (Light and Heavy)**
(Clause 3)

	Part	Material	Specific Requirements, if any	Conforming to Indian Standards
(1)	(2)	(3)	(4)	(5)
i)	Rammer foot	Mild steel or brass	Smooth finish and chrome plated	IS 1875 IS 4170
ii)	Shaft	Mild steel	-	IS 1875
iii)	Handle knob	Mild steel	-	IS 1875
iv)	Guide pipe	Mild steel drawn pipe	-	IS 1239 (Part 1)
v)	Washer	Gasket rubber vulcanized	-	Vulcanized rubber

4 DIMENSIONS

Dimensions with tolerances of different component parts of compaction rammer shall be as detailed in Fig. 1 to Fig. 4. Except where tolerances are specifically mentioned against the dimensions, all dimensions shall be taken as nominal dimensions and tolerances as given in IS 2102 (Part 1) shall apply thereon.

5 MANUAL COMPACTION RAMMER, LIGHT

The light manual compaction rammer shall be as shown in Fig. 1 to Fig. 3. The mass of the moving parts of the rammer shall be $2.6 \text{ kg} \pm 25 \text{ g}$. The length of the guide pipe shall be such so as to give a fall of $310 \pm 0.5 \text{ mm}$. The free end of the rammer foot shall be square with the sides and shall be finished smooth. Provision shall also be made to secure this to the shaft with a pin to prevent it from unscrewing while on use. It shall be chrome plated. It shall be provided with air vents at both ends as shown in Fig. 3, and a suitable guide for the shaft of the rammer shall be screwed on to the pipe at the top end. The washer shall be as shown in Fig. 2 and shall be minimum 1.5 mm thick.

6 MANUAL COMPACTION RAMMER, HEAVY

The heavy manual compaction rammer shall be as shown in Fig. 1, Fig. 3 and Fig. 4. The mass of the moving parts of the rammer shall be $4.9 \text{ kg} \pm 50 \text{ g}$. The length of the guide pipe shall be such so as to give a fall of $450 \pm 0.5 \text{ mm}$. The free end of the rammer foot shall be square with the sides and shall be finished smooth. Provision shall also be made square it to the shaft with a pin to prevent it from unscrewing while on use. It shall be chrome plated. The washer shall be as shown in Fig. 4 and shall be of minimum 1.5 mm thick.

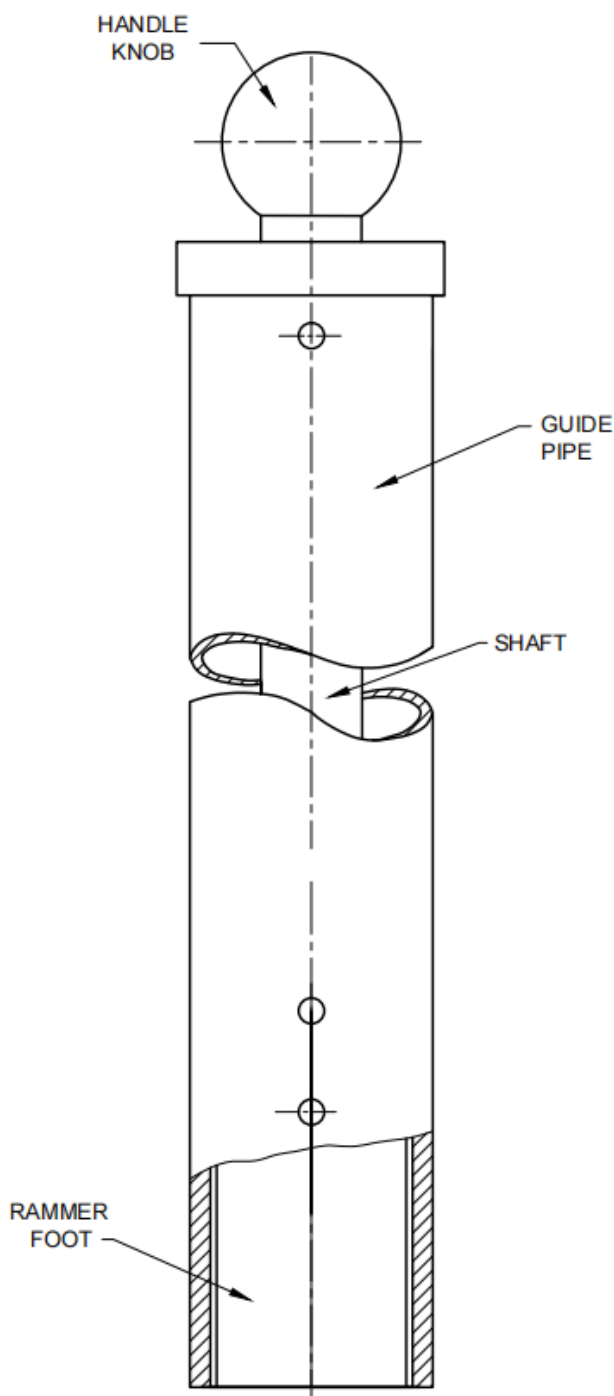
7 MECHANICAL COMPACTION RAMMER, LIGHT

The light mechanical compaction rammer shall be as shown in Fig. 5 and Fig. 6. The mass of moving parts of the rammer shall be $2.6 \text{ kg} \pm 25 \text{ g}$. The rammer shall operate mechanically by power operated machine. The design of rammer shall be such as to give a fall of $310 \pm 4 \text{ mm}$ from the surface of the specimen and provide uniform and complete coverage of specimen surface. The machine shall be equipped with a resettable blows counter device. Provision shall be made to stop the machine on completion of set numbers

of blows. The machine shall be equipped with a mechanical means to support the rammer when not in use.

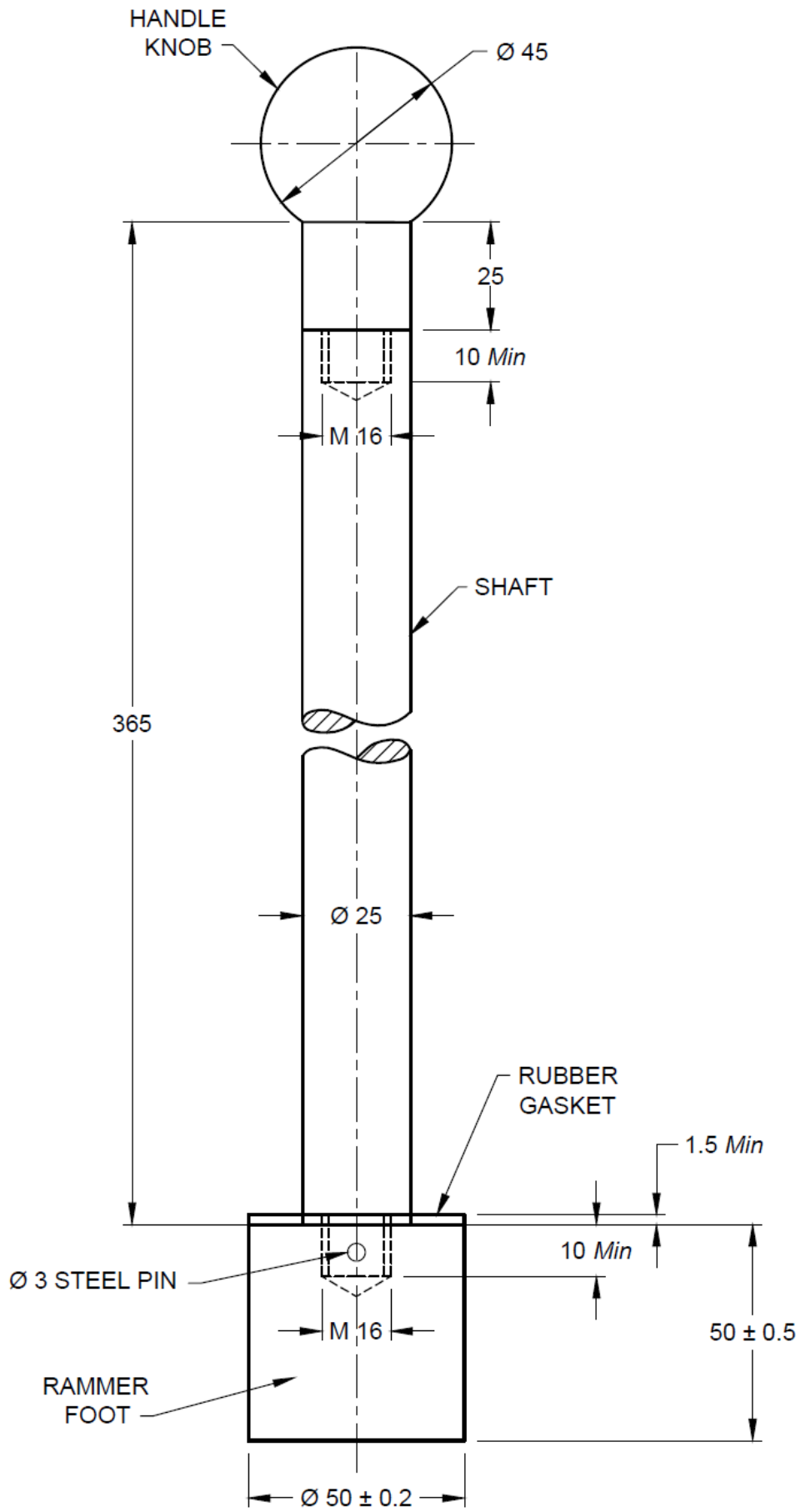
8 MECHANICAL COMPACTION RAMMER, HEAVY

The heavy mechanical compaction rammer shall be as shown in Fig. 7 and Fig. 8. The mass of moving parts of the rammer shall be $4.9 \text{ kg} \pm 50 \text{ g}$. The rammer shall operate mechanically by power operated machine. The design of rammer shall be such so as to give a fall of $450 \pm 4 \text{ mm}$ from the surface of the specimen and shall provide uniform and complete coverage of specimen surface. The machine shall be equipped with a resettable blows counter device. Provision shall be made to stop the machine on completion of set numbers of blows. The machine shall be equipped with a mechanical means to support the rammer when not in use.



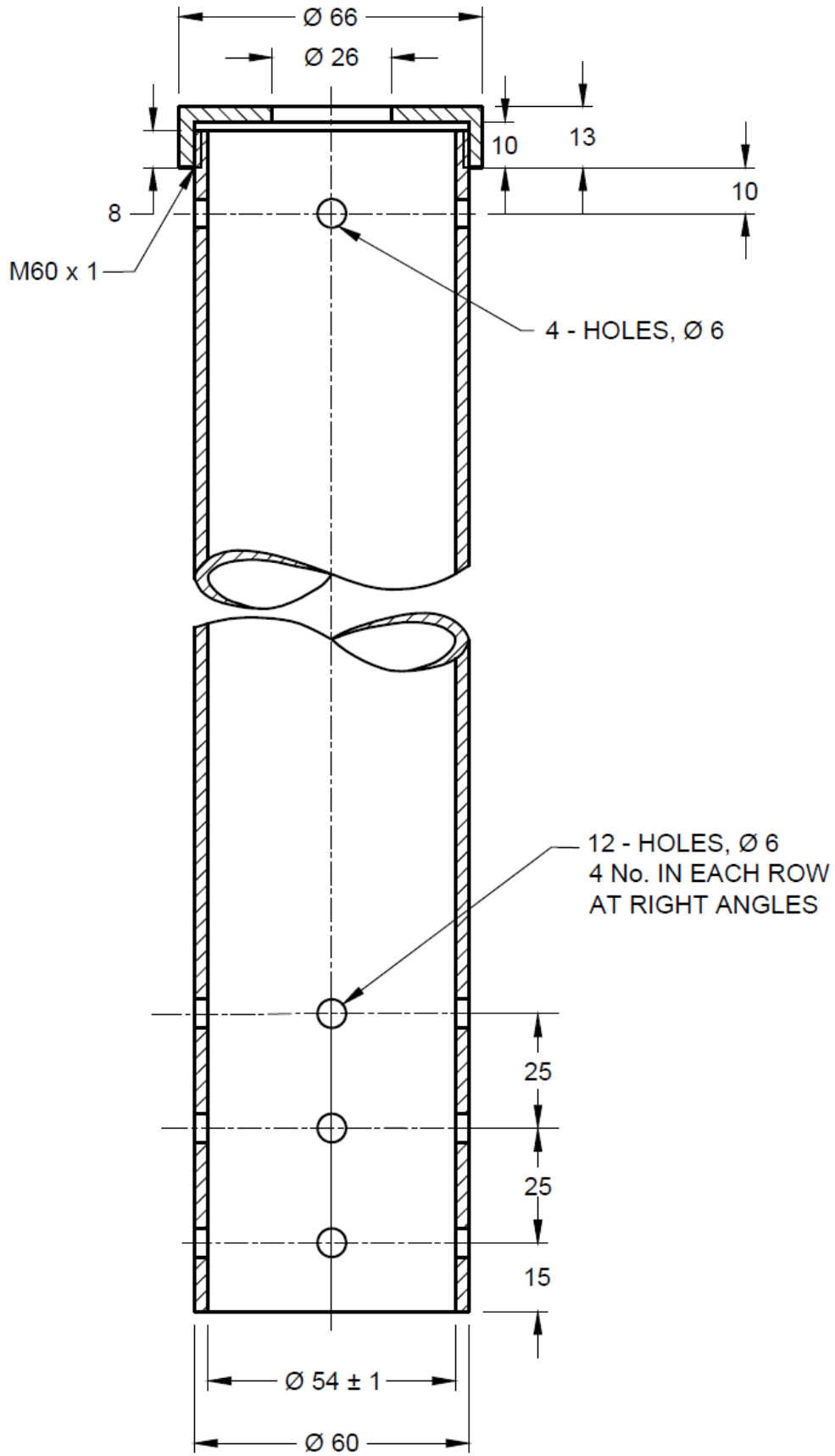
All dimensions in millimetres.

FIG. 1 ASSEMBLY OF MANUAL COMPACTION RAMMER



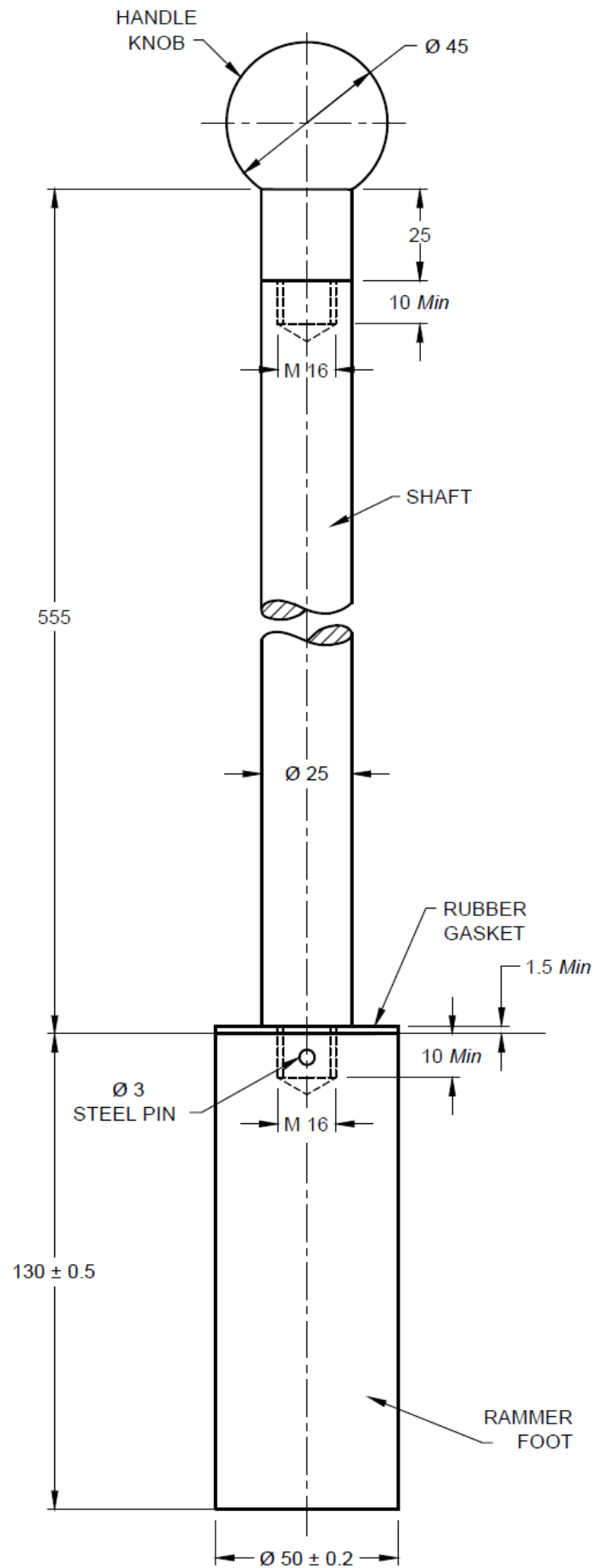
All dimensions in millimetres.

FIG. 2 DETAILS OF LIGHT MANUAL COMPACTION RAMMER FOOT, SHAFT AND KNOB



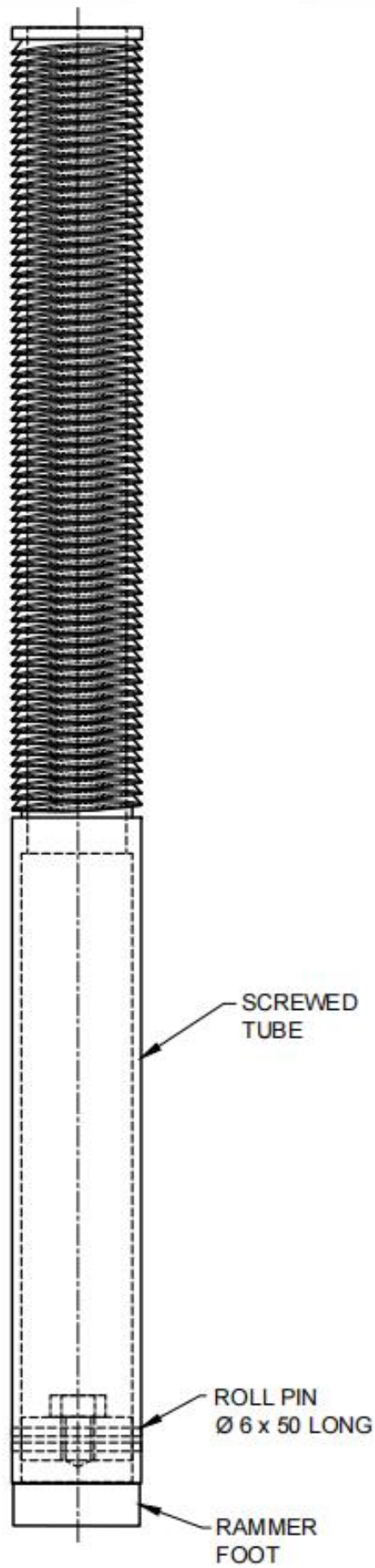
All dimensions in millimetres.

FIG. 3 DETAILS OF GUIDE PIPE



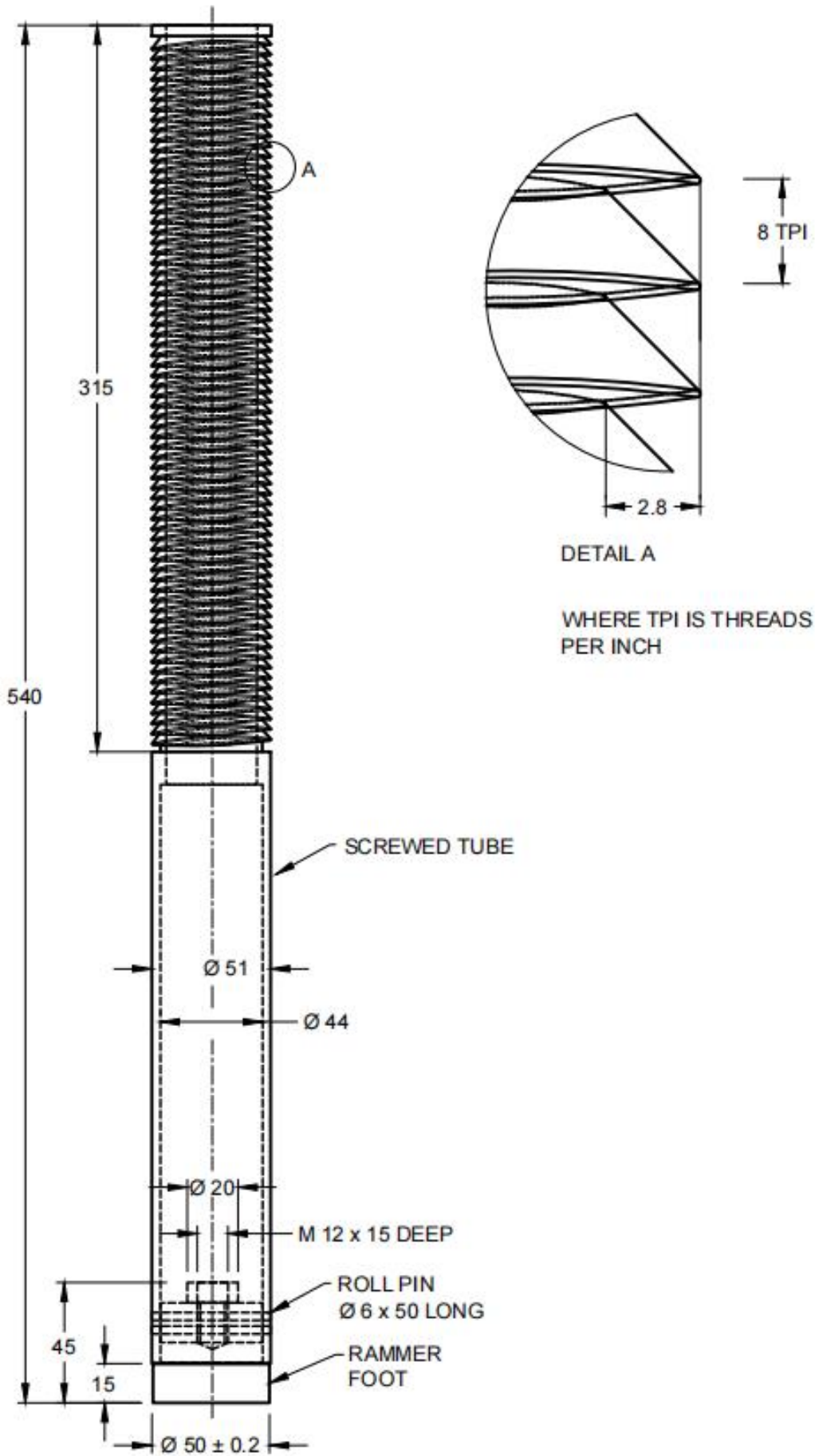
All dimensions in millimetres.

FIG. 4 DETAILS OF HEAVY MANUAL COMPACTION RAMMER FOOT, SHAFT AND KNOB



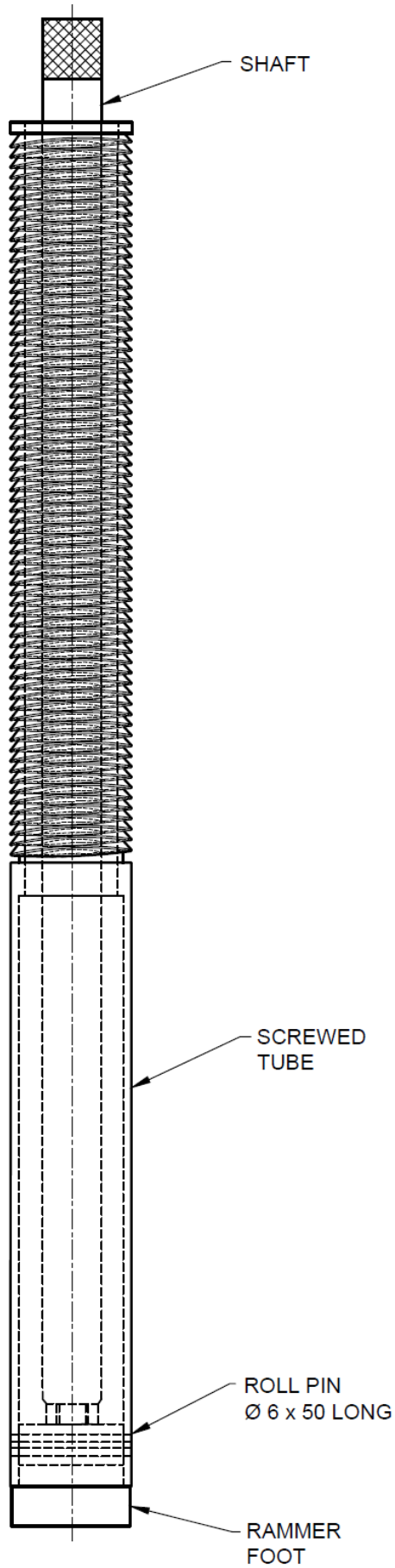
All dimensions in millimetres.

FIG. 5 ASSEMBLY OF LIGHT MECHANICAL RAMMER



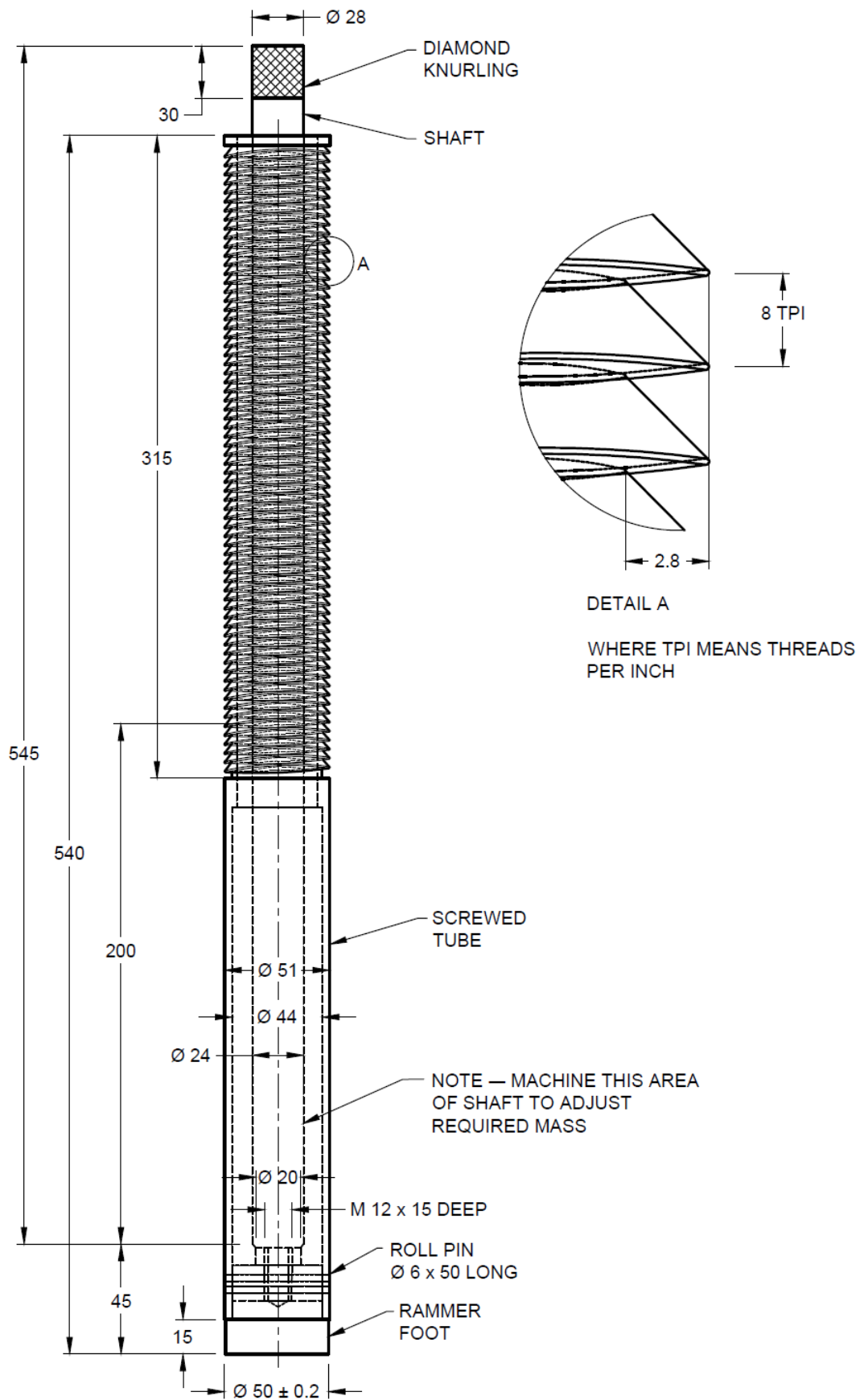
All dimensions in millimetres.

FIG. 6 DETAILS OF LIGHT MECHANICAL RAMMER FOOT AND SCREWED TUBE



All dimensions in millimetres.

FIG. 7 ASSEMBLY OF HEAVY MECHANICAL RAMMER



All dimensions in millimetres.

FIG. 8 DETAILS OF HEAVY MECHANICAL RAMMER FOOT AND SCREWED TUBE AND SHAFT

9 MARKING

9.1 The following information shall be clearly and indelibly marked on each component of the apparatus in such a way that it does not interfere with the performance of the apparatus:

- a) Name of manufacturer or his registered trade-mark or both;
- b) Type of rammer (that is light or heavy);
- c) Whether the rammer is manual or mechanical;
- d) Whether the rammer foot is of mild steel or brass; and
- e) Date of manufacture.

9.2 BIS Certification Marking

The product conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed there under, and the product may be marked with the Standard Mark