

Specification for Manual Tools Procurement

Standard Specifications for Various Types of Manual Tools for Procurement

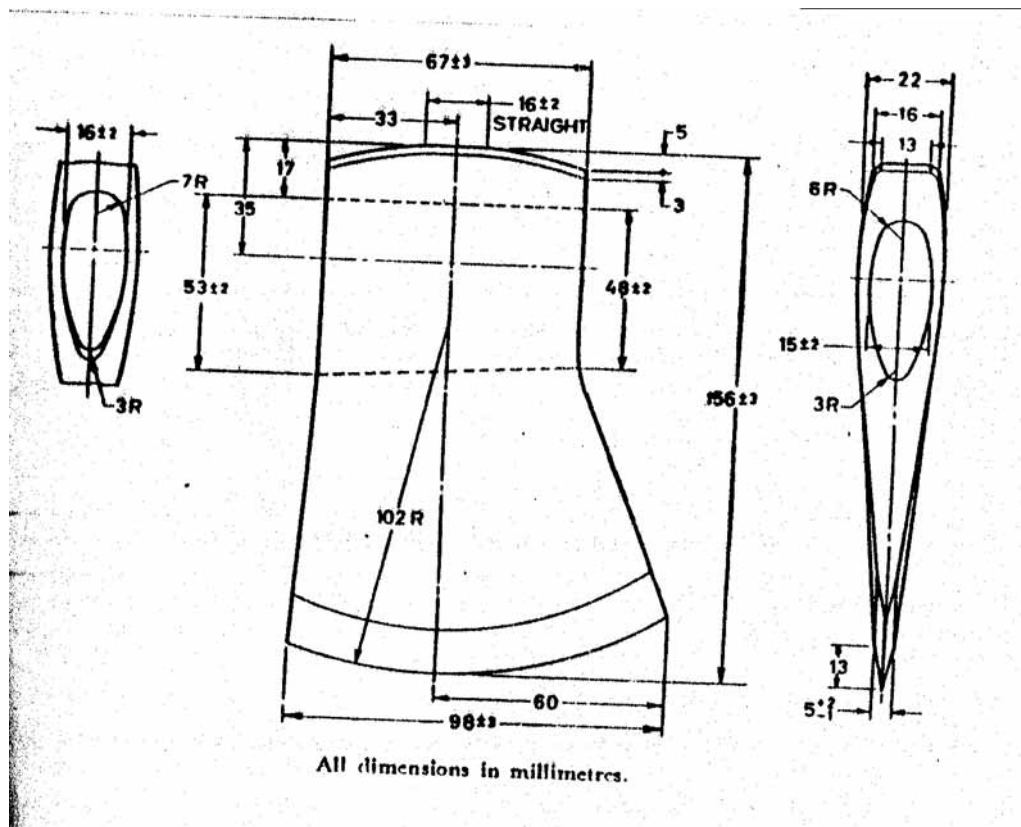
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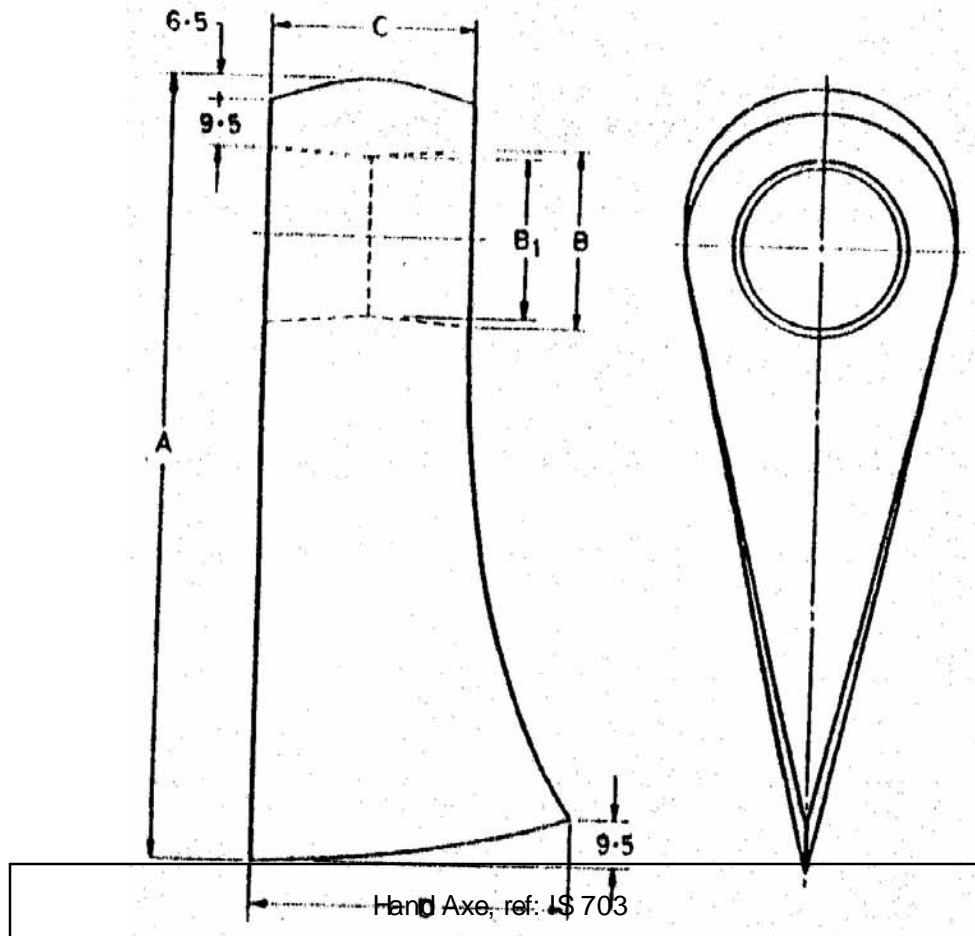
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Specification of AXE - Annex-C/a

Name of the Product	Axe of different types as Hand, Felling, Felling estate pattern, and Felling Trade pattern, as per description in BOQ.
Standard	IS 703 - 1966 (Revised) for shape and tests, locally made
Material specification	High Carbon steel
Hardness	N/A
Workmanship and Finish	Good finish without any imperfections like Cracks, Burrs, Pits, Scales etc. and such other physical defects.
Size and Weight	As specified in the BOQ
Handles	Appropriate wooden handles
Tentative sketch	As provided below



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Weight	A	B	B1	C	D
kg	+3	+3	+3	+3	+3
1.35	152	35	32	41	64
1.80	171	35	32	51	70
2.25	200	38	35	51	76
2.70	216	41	38	51	83

Note – The tolerances on B and B1 are subject to the maintenance of a taper of 3.2 mm along the eye

Felling Axe, Trade pattern ref: IS 703

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Specification of CHISEL - Annex-C/b

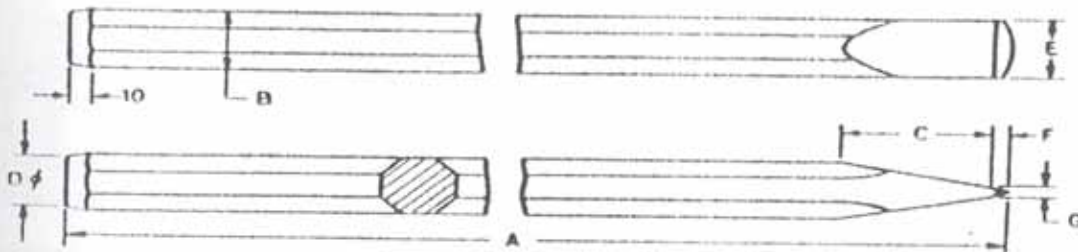
Name of the Product	Chisel of different types, as per description in BOQ
Confirming Standard	NA, Locally made
Material specification	High carbon with EN9 or equivalent grade
Hardness	NA
Workmanship and Finish:	Good finish without any imperfections like Cracks, Burrs, Pits, Scales etc. and such other physical defects.
Size and Weight	As specified in the BOQ
Tentative sketch	NA

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Specification of CROWBARS - Annex-C/c

Name of the Product	Crowbar of different types, as per description in BOQ.
Confirming Standard	IS 704 -1968 (1st Revision)
Material specification	T60 grade sted with Phosphorus = 0.05 % max, Sulphur = 0.05 % max. The supplier shall provide the evidence of the specification of material from the manufacturer.
Hardness	320 to 400 HV tested anywhere of the working end
Workmanship and Finish	Good finish without any imperfections like Cracks, Burrs, Pits, Scales etc. and such other physical defects.
Size and Weight	As specified in the BOQ
Tentative sketch	As provided below

All dimensions in millimetres.



Nominal Weight kg	Length A ±.25	Width Across Flats B	Length of Chisel End C	Dia- meter of Hammer End D	Ground Portion			Static Load Test	
					Width E	Cutting Edge F	Thick- ness at Start of Cutting Edge G	Distance Between Grip and Loading Point P*	Load HV* kg
3	1 000	22	65	20	22	6	5	710	68
4	1 000	25	70	22	25	6	5	750	91
5	1 000	30	70	25	30	8	6	760	136
6	1 000	32	75	30	32	8	6	790	181
5	1 650	22	65	20	22	6	5	1 450	34
7	1 650	25	70	22	25	6	5	1 450	45
9	1 650	30	70	25	30	8	6	1 450	68
11	1 650	32	75	30	32	8	6	1 450	91

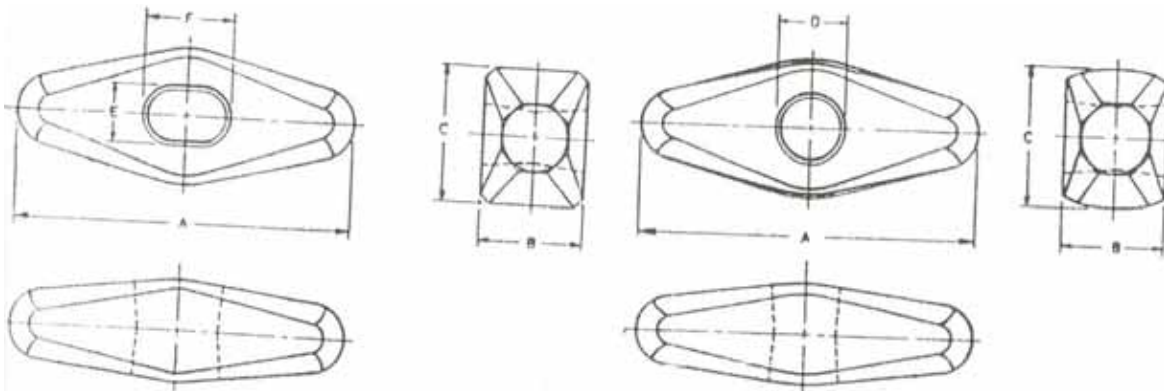
Octagonal Crowbar, ordinary, ref: IS 704

Octagonal Crowbar, ordinary, ref: IS 704

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Specification of HAMMERS - Annex-C/d

Name of the Product	Hammers of different types, as per description in BOQ
Confirming Standard	IS 841 - 1968 (1st Revision)
Material specification	Carbon = 0.45 ~ 0.65%, Manganese = 0.55 ~ 0.75 %, Phosphorus = 0.06 % max, Sulphur = 0.06 % max, Silicon = 0.35 % max. The supplier shall provide the evidence of the specification of material from the manufacturer.
Hardness	520 to 640 HV tested at striking face and peins only
Workmanship and Finish	Good finish without any imperfections like Cracks, Burrs, Pits Scales etc. and such other physical defects. The striking face and peins shall be slightly convex and chamfered at app. 45°.
Size and Weight	As specified in the BOQ
Handles	Appropriate wooden handles
Tentative sketch	As provided below



Stone Breaker's Hammers (Oval Eye)

Stone Breaker's Hammer (Round Eye)

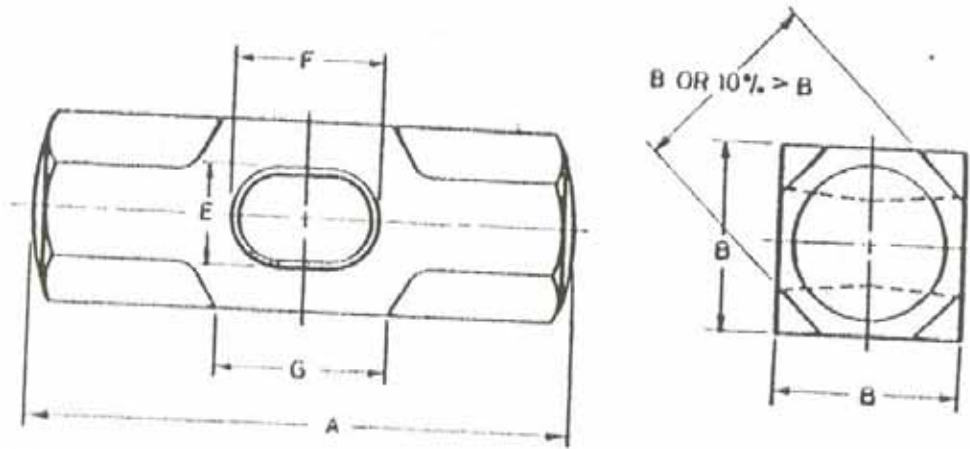
Nominal Weight	A	B	C	D	E	F
G						
500	100	30	40	22	15	25
800	110	40	50	25	20	30
1000	130	40	55	25	20	35

Note – F or details of eye, see Fig. 1.

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All dimensions in millimetres

Hammer, Stone Breakers', ref: IS 841



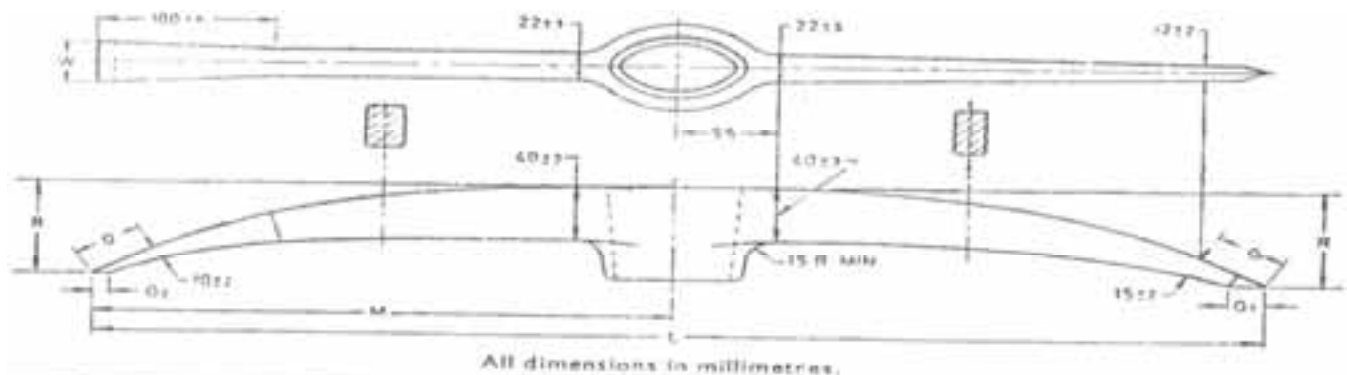
Normal Weight	A	E	F	G	B
Kg					
0.5	80	15	25	25	32
1.0	105	20	32	35	40
1.5	128	20	35	40	45
2.0	135	25	35	40	50
2.5	155	25	35	45	52
3.0	160	25	45	47	55
3.5	170	25	45	50	55
4.0	170	30	45	50	60
5.0	190	30	45	52	65
6.0	210	30	45	52	68
8.0	230	30	50	62	72
10.0	240	30	50	65	80

Hammer, Double Face Sledge, ref: IS 841

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Specification of PICKS - Annex-C/e

Name of the Product	Picks of different types, as per description in BOQ.
Confirming Standard	IS 273 - 1973 (2nd Revision with amendments on July 1975 and September 1976)
Material specification:	T60 grade steel with Phosphorus = 0.05 % max, Sulphur = 0.05 % max. The supplier shall provide the evidence of the specification of material from the manufacturer.
Hardness	315 to 415 HV tested at point ends
Workmanship and Finish	Good finish without any imperfections like Cracks, Burrs, Pits, Scales etc. and such other physical defects
Size and Weight	As specified in the BOQ
Handles	Appropriate wooden handles
Tentative sketch	As provided below



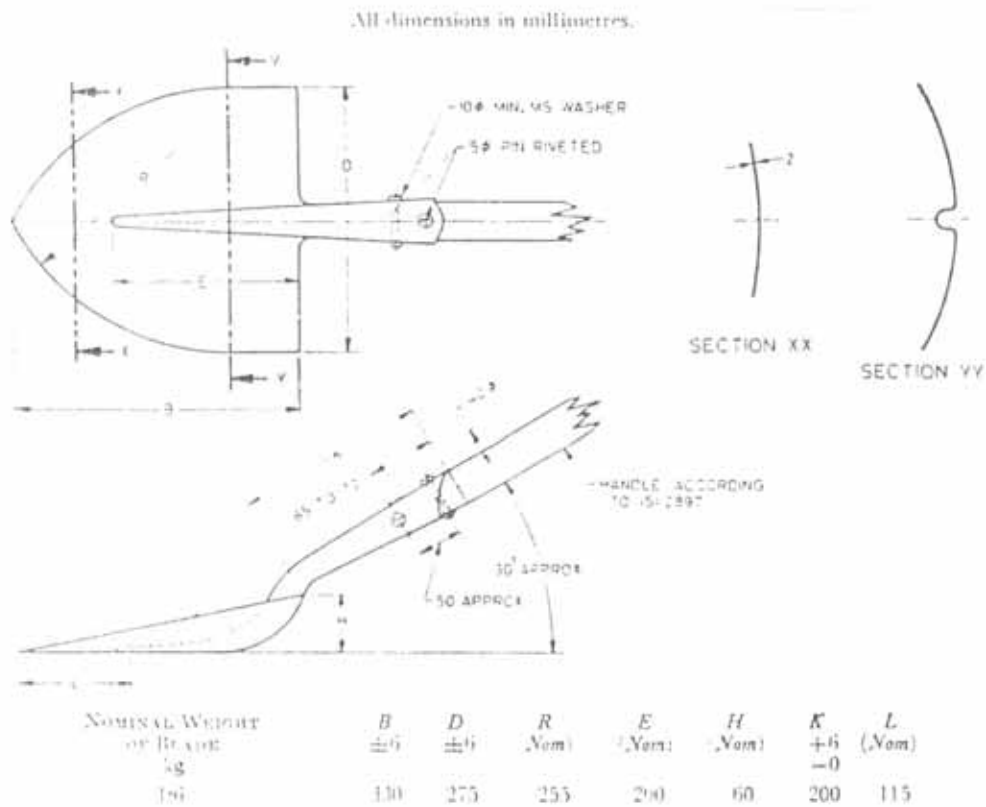
Nominal Mass in kg	Overall Length L	Half Length M	Rise of point & chisel R	Width of Chisel W	Ground Portion		
					G	G1	G2
- 7.5%	± 13	± 6	± 6	± 3	± 5	± 3	± 3
- 2.5%							
3.2	640	320	70	32	40	20	10

Picks, Chisel Narrow and Point End, ref: IS 273

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Specification of General Purpose Round Nose SHOVEL - Annex-C/f

Name of the Product	General Purpose Round Nose Shovel of different types, as per description in BOQ.
Confirming Standard	IS 274 (Part 1) - 1966 (2nd Revision with amendments on July 1975 and September 1976)
Material specification	Carbon = 0.45 ~ 0.65%, Manganese = 0.55 ~ 0.75 %, Phosphorus = 0.06 % max, Sulphur = 0.06 % max. The supplier shall provide the evidence of the specification of material from the manufacturer.
Workmanship and Finish	Good finish without any imperfections like Cracks, Burrs, Pits, Scales etc. and such other physical defects
Size and Weight	As specified in the BOQ
Handles	Appropriate wooden handles as per IS 2897 – 1965
Tentative sketch	As provided below



Shovel, Round Nose, ref: IS 274

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Specification of Single Wheel type WHEELBARROW - Annex-C/g

- As per the following some sheets attached herewith

1.1.1 MATERIALS HANDLING DEVICE

Wheelbarrow

(Reference: Mechanics Training Center, Balaju, Kathmandu)

This report contains the Product Design Specification (PDS) for a wheelbarrow. The intention is to produce a wheelbarrow that will be comparative with those already available on the market.

PERFORMANCE

- 1.1 To carry any materials (particularly stone and soil) from one place to another.
- 1.2 Must be able to withstand the exerting force.
- 1.3 Must be able to carry the minimum load of 200 Kg.
- 1.4 Must be easy to operate- it is expected that the user age group will range from 15 years young men or women to adults.
- 1.5 Must be easy to operate in rough landscape.
- 1.6 When the device is in use, it should be easy to load and unload.

ENVIRONMENT

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- 2.1 Normal Use: Device will be used on the roads, lanes and provisional bridges
- 2.2 Resistance to adverse weather: The device will normally be exposed on the outside of the store or building, then it must be able to withstand all extreme weather conditions.
- 2.3 Corrosion Resistance: The unit should be resistant to corrosion.
- 2.4 Dust and dirt: Components that would be inhibited from operation by dust or dirt should be protected (i.e. sealed bearings).

LIFE IN SERVICE

- 3.1 A minimum of 10 years is required. The product will be used minimum 8 hours to maximum 12 hours a day.
- 3.2 The sub assembling parts may need to be replaced if required (i.e. bush or bearing, handle etc.)

MAINTENANCE

The design should comply with the following:

- 4.1 Minimal maintenance required.
- 4.2 Where screws, bolts and washers are used, ISI standards must be complied.
- 4.3 Any parts that do require replacement or greasing should be accessible without the need for special tools or equipment.

WEIGHT

- 10.1 The weight of the device should be kept to a minimum; however, strength must be the principal factor of the device

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10.2 The total weight of the device, including fittings, should no greater than 33 kg.

AESTHETICS

11.1 Robust image must be projected to the customer.

11.2 There should be attractive appearance.

MATERIALS

12.1 Bowl should be made of 2mm (14 gauge) Steel Sheet.

12.2 Steel handle should be made of 14-gauge steel tube 1" diameter.

12.3 Leg should be made of the 6x40 mm M.S flat.

12.4 Bowl supports should be made of from 40 x 40 x 3.5 mm Angle.

12.5 Bowl should be reinforced by MS rod 16 mm diameter.

12.6 Bearing should be Z-Z (two sides sealed).

12.7 Nuts, bolts and washers should be ISI standard.

PRODUCT LIFE SPAN

This should be as long as possible. However, it greatly depends on customers feedback. If required, modification will be made as per customers requirement.

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ERGONOMICS

14.1 Height, length and diameter of handle should be easy to handle and operate.

14.2 No sharp edges will be exposed.

CUSTOMER

The customer will be development agencies, construction companies, farmers, households and different government and private offices.

PROCESSES

16.1 There are no limitations to the manufacturing process as there are no constraints on the manufacturing facility

TESTING

17.1. In the case of parts being purchased from an outside company, visual inspection will be carried out.

17.2. All the parts will be inspected before despatch from the company.

4.4 The necessary of tools for maintenance are: spanners No. 15-13, 26-27, a merchant hammer, a sleeve if required to replace bearings.

4.5 Spare parts like bush, nuts & bolts, bearings, handles are easily available from the company.

TARGET PRODUCT COST

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Our aim at NMW is to produce a strong wheelbarrow that will fall into the lower price range. The average retail cost of the present wheelbarrow is NRs 4500.00. The target cost for this device should be between NRs. 4000.00- 4100.00.

COMPETITION

- 6.1 Structo Nepal: Structo Nepal manufacture a wide range of material handling devices. However, being one of the biggest manufacturers of Nepal, they are busy with large structural works.
- 6.2 National Structure & Engineering: National Structure also manufacture the wheelbarrows. Although they offer lower price, it seems they do not have many choice of designs.
- 6.3 Engineering firm in Ramkot: This company manufactures wheelbarrows which will be in direct competition to the wheelbarrows to be manufactured.
- 6.4 BTTC: BTTC manufacture good quality wheelbarrows but they do not manufacture in bulk. They also encourage entrepreneurs to come up with good quality wheelbarrows in the market.

TRANSPORT

- 7.1 Transport will be by road.
- 7.2 Transport can be by air where there is no road access like Jumla, Humla.

QUANTITY

Market analysis indicates that there is good demand.

MANUFACTURING FACILITY

There is no constraint on manufacturing facility; all tools and machines are in place and in use.

SIZE

- 9.1 Length not greater than 62 inches

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9.2 Breadth not greater than 26 inches

9.3 Depth not greater than 16 inches

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Typical sketches of Wheelbarrow

Specification of SICKLE - Annex-C/h

- I. **Name of the Product:** Sickle of different types, as per description in BOQ.
- II. **Confirming Standard:** NA
- III. **Material specification:** Carbon Steel
- IV. **Hardness:** NA
- V. **Workmanship and Finish:** Good finish without any imperfections like Cracks, Burrs, Pits, Scales etc. and such other physical defects
- VI. **Size and Weight:** C = 6m m and B = not less than 35mm at apex of curvature as shown in the sketch below
- VII. **Handles:** Appropriate wooden handles
- VIII. **Tentative sketch:** NA

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Specification of SPADE - Annex-C/i

- I. **Name of the Product:** Spade, small for hilly area

- II. **Confirming Standard:** NA

- III. **Material specification:** Carbon Steel

- IV. **Hardness:** NA

- V. **Workmanship and Finish:** Good finish without any imperfections like Cracks, Burrs, Pits, Scales etc. and such other physical defects

- VI. **Size and Weight:** Blade cutting edge width = 100mm, thickness at mid of the spade = 8mm, weight of the spade = not less than 1.4kg, Overall length = not less than 275mm

- VII. **Handles:** Appropriate wooden handles

- VIII. **Tentative sketch:** NA

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Specification of TROWEL - Annex-C/j

- I. **Name of the Product:** Trowel as per description below

- II. **Confirming Standard:** NA

- III. **Material specification:** Normal Mild steel

- IV. **Hardness:** NA

- V. **Workmanship and Finish:** Good finish without any imperfections like Cracks, Burrs, Pits, Scales etc. and such other physical defects

- VI. **Size and Weight:** No 8, Pooja make or equivalent with 155mm length and 110mm width

- VII. **Handles:** Appropriate wooden handles

- VIII. **Tentative sketch:** NA

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Specification of PAN - Annex-C/k

- I. **Name of the Product:** Pan, Un ribbed as per description

- II. **Confirming Standard:** NA

- III. **Material specification:** Mild steel

- IV. **Hardness:** NA

- V. **Workmanship and Finish:** Good finish without any imperfections like Cracks, Burrs, Pits, Scales etc. and such other physical defects

- VI. **Size and Weight:** Minimum 450 dia., Thickness = Minimum 1mm, slightly concave

- VII. **Handles:** NA

- VIII. **Tentative sketch:** NA