

SURAT MUNICIPAL CORPORATION
[HYDRAULIC DEPARTMENT]

Tender Notice (On-Line) No.: DMC/HYD/06/2026-2027

Work No.: 02

Issued To: _____

Name of works: Strengthening of existing 1524 mm M.S water supply line supporting M.S truss structure at Varachha water works Khadi Bridge, Varachha main road in East zone area, Surat (4th Attempt).

VOLUME: II

**GENERAL TECHNICAL SPECIFICATIONS
&
ITEM WISE TECHNICAL SPECIFICATION**

DATE OF SUBMISSION OF TENDER FEE, E.M.D & NECESSARY DOCUMENTS, CERTIFICATES ETC. IN HARD COPY	:	On or before Dtd 24/07/2026 Up to 17:00 Hrs.
<i>(BY SPEED POST / RPAD THROUGH POSTAL AUTHORITY ONLY)</i>		

LAST DATE OF SUBMISSION OF ON- LINE TENDER	:	Dtd: 16/07/2026 up to 18.00 Hrs.
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: To be submitted to:

The Chief Accountant
Accounts Department,
SURAT MUNICIPAL CORPORATION,
Muglisara, Surat-390 003.



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9.0 TECHNICAL SPECIFICATIONS

9.1 PREAMBLE

1. In the specification “as directed” / “approved” shall be taken to mean, “as directed / approved by the Engineer-in-charge”.
2. Wherever a reference to any Indian Standard appears in the specifications, it shall be taken to mean as a reference to the latest edition of the same in force on the date of agreement.
3. In “Mode of Measurement” in the specification wherever a dispute arises in the absence of specific mention of a particular point or aspect, the provisions on these particular point or aspects in the relevant Indian Standards shall be referred to.
4. All measurements and computations, unless otherwise specified, shall be carried out nearest to the following limits.

(i)	Length, width and depth (height)	.	0.01Mt.
(ii)	Areas	.	0.01Sq.mt
(iii)	Cubic Contents	.	0.01Cu.mt.

In recording dimensions of work the sequence of length, width and height (depth) or thickness shall be followed.

5. The distance, which constitutes lead, shall be determined along the shortest practical route and not necessarily the route taken. The decision of the Engineer-in-charge in this regard shall be taken as final.
6. Where no lead is specified, it shall mean “all leads”.
7. Definite particulars covered in the items of work, though not mentioned or elucidated in its specifications shall be deemed to be included therein.
8. Any material specified in detailed specification of items shall be of quality and property as mentioned in the respective general specifications of materials mentioned in this tender.
9. Approval of the samples of various materials given by the Engineer-in-charge shall not absolve the Contractor from the responsibility of replacing defective material brought on site or materials used in the work found defective at a later date. The Contractor shall have no claim to any payment or compensation whatsoever on account of any such materials being rejected by the Engineer-in-charge.
10. The contract rate of the item of work shall be for the work completed in all respects.
11. No collection of materials shall be made before it is got approved from the Engineer-in-charge.
12. Collection of approved materials shall be done at site of work in a systematic manner. Materials shall be stored in such a manner as to prevent damage deterioration or intrusion of foreign matter and to ensure the preservation of their quality and fitness for the work.
13. Materials, if and when rejected by the Engineer-in-charge, shall be immediately removed from the site of work.



14. No materials shall be stored prior to, during and after execution of a structure in such a way as to cause or lead to damage on overloading of the various components of the structure.
15. All work shall be carried out in a workmanlike manner as per the best techniques for the particular item.
16. All tools, templates, machineries and equipments for correct execution of the work as well as for checking lines, levels, alignment of the works during execution shall be kept in sufficient numbers and in good working condition on the site of work.
17. The mode, procedure and manner of, execution shall be such that it does not cause damage or overloading of the various components of the structure during execution and after completion of the structure.
18. Special modes of construction not adopted in general Engineering practice, if proposed to be adopted by the Contractor, shall be considered only if the Contractor provides satisfactory evidence that such special mode of construction is safe, sound and helps in strength and quality. Acceptance of the same by the Engineer-in-charge shall not, however, absolve the Contractor of the responsibility of any adverse effects and consequences of adopting the same in the course of execution or completion of the work.
19. All installations pertaining to water supply and fixtures thereof as well as drainage lines and sanitary fittings shall be deemed to be completed only after giving satisfactory tests by the Contractor.
20. The Contractor shall be responsible for observing the rules and regulations imposed under the "Minor Minerals Act" and such other laws and rules prescribed by Government from time to time.
21. All necessary safety measures and precautions (including those laid down in the various relevant Indian Standards) shall be taken as also of the work itself.
22. The testing charges of all materials shall be borne by the Contractor.
23. Approval to any of the executed items for the work does not in any way relieve the Contractor of his responsibility for the correctness, soundness and strength of the structure as per the drawings and specifications.
24. All works shall be carried out strictly as per detailed technical specification provided in the tender. If not specified, the work shall be executed according to relevant applicable IS codes and standard engineering practice. In such case decision of the Engineer-in-charge shall be final and binding to the Contractor and in no case the Contractor will claim any extra for the same.
25. If Tenderer feels that detailed technical specifications for item mentioned in Schedule "B" are not provided with the tender, he will raise such points before quoting rates and submitting the tender. No claim on the basis of such argument shall be entertained during the course of work.
26. All measurements shall be considered as mentioned in the drawings / schedule / detailed specifications.



27. The Schedule of Quantities and Rates are to be read for the purpose of pricing in conjunction with instructions of tenderers, technical specifications, drawings and General conditions for contract for Civil works.
28. The price quoted in the summary of costs, sheets of schedule of quantities and rates shall be of all inclusive value for the work described including all costs and expenses which may be required in for the execution of the work described together with all general risks, liabilities and obligations set for the or implied in the document on which the tender is based.
29. The quantities furnished are approximate. In the even of actual quantities varying form those furnished herein below or items detailed or added. The percentage (plus/minus) quoted for the entire work shall remain, firm and no extra claims in this respect will be entertained. The payment shall be made based on the actual quantities in the complete work.
30. All works shall be carried out strictly as per detailed specification whether actually specified or not If not specified, as per directions of owner/Engineer-in-charge.
31. Percentage (plus/minus) quoted by tenderer shall be firm even if the contract is split.
32. Percentage (plus/minus) and the total amount entertained in the summary of cost. Sheet of schedule of quantities and Rates shall be written in ink and shall be entered both in figures and words.
33. Detailed specifications of items of work are described under section Detailed Technical Specification for each item of schedule of quantities and Rates. The section gives guidelines to the reference of relevant clauses of specifications and mode of measurement, Tenderer shall read this in conjunction with other technical specifications and quote accordingly.
34. The measurements shall be as described in the detailed Technical specification of items of work, all measurements being not in accordance with the drawings with no allowance for waste.
35. If Tenderers need any clarifications, they should obtain the same in writing from Owner/ Engineer-in-charge. No notice will be taken of any verbal discussion in such matters.
36. For the work to be carried out at river bed level, contractor has to make his won arrangement for dewatering/ diverting river water or sub soil water by making katcha earthen dam, applying dewatering pump or any other mean convenient as per site condition.
37. If Tenderers need any clarifications, they should obtain the same in writing from Owner / Engineer-in-charge.



Mm	Millimetres
Cm	Centimetres
Mt.	Metres
Km.	Kilometres
Sq.mt.	Square Metres
Cu.mt.	Cubic Metres
R.Mt.	Running Metres
No.	Numbers
C.I.	Cast Iron
R.C.C.	Reinforced Cement Concrete
Wt.	Weight
Kg.	Kilogram
M.T.	Metric Tonne
M.D.	Meter Depth
M.S.	Mild Steel
I.S.	Indian Standard
D.I.	Ductile Iron

HYDRAULIC ENGINEER
SURAT MUNICIPAL CORPORATION,
SURAT.

SIGNATURE AND SEAL OF THE CONTRACTOR:

NAME AND ADDRESS:

DATE:



9.2 GENERAL SPECIFICATIONS OF MATERIALS

M-1 Water

Water shall not be salty or brackish and shall be clean, reasonably clear and free from objectionable quantities of silt and traces of oil and injurious alkalis, salts, organic matter and other deleterious material which will either weaken the mortar or concrete or cause efflorescence or attack the steel in R.C.C. Container for transport, storage and handling of water shall be clean. Water shall conform to the standards specified in I.S. 456-2000.

If required by the Engineer-in-charge it shall be tested by comparison with distilled water. Comparison shall be made by means of standard cement tests for soundness, time of setting and mortar strength as specified in I.S. 269 –1976. Any indication of unsoundness, change in time of setting by 30 minutes or more or decrease of more than 10 percent in strength of mortar prepared with water sample when compared with the results obtained with mortar prepared with distilled water shall be sufficient cause for rejection of water under test.

Water for curing mortar, concrete or masonry should not be too acidic or too alkaline. It shall be free of elements which significantly affect the hydration reaction or otherwise interfere with the hardening of mortar or concrete during curing or those which produce objectionable stains or other unsightly deposits on concrete or mortar surfaces.

Hard and bitter water shall not be used for curing.

Potable water shall generally be found suitable for curing mortar or concrete.

M-2 LIME:

Lime shall be hydraulic lime as per I.S. 712-1973. Necessary tests shall be carried out as per I.S. 6932 (Parts I to X) 1973.

The following field tests for limes are to be carried out –

A very rough idea can be formed about the type of lime by its visual examination. I.e. fat lime bears pure white colour. Lime in form of porous lumps of dirty white colour, indicates quick lime, and solid lumps indicate the unburnt lime stone.

Acid tests for determining the carbonate content in lime. Excessive amount of impurities and rough determination of class of lime.

Storage shall comply with I.S. 712-1973. The slaked lime, if stored, shall be kept in a weather proof and damp proof shed with impervious floor and sides to protect it against rain, moisture, weather and extraneous materials mixing with it. All lime that has been damaged in any way shall be rejected and all rejected materials shall be removed from site of work.

Field testing shall be done according to I.S. 162-1974 to show the acceptability of materials.

M-3 CEMENT

Cement shall be ordinary Portland cement as per latest amendment of I.S. 12269 of 53 grade or Portland slag cement as per I.S. 455 –1989.



M-4 WHITE CEMENT:

The white cement shall conform to I.S. 8042-1978.

M-5 SAND:

Sand shall be natural sand, clean, well graded, strong, durable and gritty particles free from injurious amounts of dust, clay, kankar nodules, soft or flaky particles, shale, alkali, salts, organic matter, loam, mica or other deleterious substances and shall be got approved from the Engineer-in-charge. The sand shall not contain more than 8% of silt as determined by field tests. If necessary the sand shall be washed to make it clean.

Coarse Sand: The fineness modulus of coarse sand shall not be less than 2.5 and shall not exceed 3.0. The sieve analysis of coarse shall be as under:

I.S. Sieve Designation	% by weight passing sieve	I.S. Sieve Designation	% by weight passing sieve
4.75 mm	100	600 Micron	30 – 100
2.36 mm	90 – 100	300 Micron	5 – 70
1.18 mm	70 – 100	150 Micron	0 – 50

Fine Sand: The finess modulus shall not exceed 1.0. The sieve analysis of fine sand shall be as under –

I.S. Sieve Designation	% by weight passing thru.	I.S. Sieve Designation	% by weight passing thru.
4.75 mm	100	600 Micron	40 – 85
2.36 mm	100	300 Micron	5 – 50
1.18 mm	75-100	150 Micron	0 - 10

M-6 STONE GRIT:

Grit shall consist of crushed or broken stone and be hard, strong, dense, durable, clean, of proper gradation and free from skin or coating likely to prevent proper adhesion of mortar. Grit shall generally be cubical in shape and as far as possible flaky elongated pieces shall be avoided. It shall generally comply with the provisions of I.S. 383-1970.

Unless a special stone of a particularly quarry is mentioned, grit shall be obtained from the best black trap or equivalent hard stone as approved by the Engineer-in-charge. The grit shall have not deleterious reaction with cement.

The grit shall conform to the following gradation as per sieve analysis:

I.S. Sieve Designation	% passing thru' sieve	I.S. Sieve Designation	% passing thru' sieve
12.50 mm	100%	4.75 mm	0-20%
10.00 mm	85-100%	2.36 mm	0-25%

The crushing strength of grit will be such as to allow the concrete in which it is used to built-up the specified strength of concrete.



The necessary tests for grit shall be carried out as per the requirements of I.S. 2386 (Parts I to VIII) 1963, as per instruction of the Engineer-in-charge. The necessity of test will be decided by the Engineering –in-charge.

M-7 LIME MORTAR:

LIME: Shall conform to specification M-2. WATER: water shall conform to specification M-1. SAND: Sand shall conform to specification M-5.

PROPORTION OF MIX: Mortar shall consist of such proportions of slaked lime and sand as may be specified in the item. The slaked lime and sand shall be measured by volume.

PREPARATION OF MORTAR: Lime mortar shall be prepared by wet process as per I.S. 1625-1971. Power driven mill shall be used for preparation of lime mortar. The slaked lime shall be placed in the mill in an even layer and ground for 180 revolutions with sufficient water. Water shall be added as required during grinding (care being taken not to add more water) that will bring the mixed material to a consistency of stiff paste. Thoroughly wetted sand shall then be added evenly and the mixture ground for another 180 revolutions.

STORAGE: Mortar shall always be kept damp, protected from sun and rain till used up, covering it by tarpaulin or open sheds.

USE: All mortar shall be used as soon as possible after grinding. It should be used on the day on which it is prepared. But in no case mortar made earlier than 36 hours shall be permitted for use.

M-8 CEMENT MORTAR:

Water shall conform to specification M-1. Cement shall conform to specification M-3. Sand shall conform to M-5.

PROPORTION OF MIX: Cement and sand shall be mixed to specified proportions, sand being measured by measuring boxes. The proportion of cement shall be by volume on the basis of 50 Kg. /bag of cement being equal to 0.0342 cu.m. The mortar may be hand mixed or machine mixed as directed.

PREPARATION OF MORTAR: In hand mixed mortar, cement and sand in the specified proportions shall be thoroughly mixed dry on a clean impervious platform by turning over at least 3 times or more till a homogeneous mixture of uniform colour is obtained. Mixing platform shall be so arranged that no deleterious extraneous material shall get mixed with mortar or mortar shall flow out. While mixing, the water shall be gradually added and thoroughly mixed to form a stiff plastic mass of uniform colour so that each particle of sand shall be completely covered with a film of wet cement. The water cement ratio shall be adopted as directed.

The mortar so prepared shall be used within 30 minutes of adding water. Only such quantity of mortar shall be prepared as can be used within 30 minutes.

M-9 STONE COURSE AGGREGATE FOR NOMINAL MIX:

Coarse aggregate shall be of machine crushed stone of black trap or equivalent and be hard, strong, dense, durable, clean and free from skin and coating likely to prevent proper adhesion of mortar.

The aggregate shall generally be cubical in shape. Unless special stones of particular quarries are mentioned aggregates shall be machine crushed from the best black trap or equivalent hard stone as approved. Aggregate shall have no deleterious reaction with cement. The size of the coarse aggregate for



plain cement concrete and ordinary reinforced cement concrete shall generally be as per the table given below. However, in case of reinforced cement concrete the maximum limit may be restricted to 6 mm. less than the minimum lateral clear distance between bars or 6 mm. less than the cover whichever is smaller.

TABLE

I.S. Sieve Designation	Percentage passing for single sized aggregates of Nominal size			I.S. Sieve Designation	Percentage passing for single sized aggregates of Normal size		
	40 mm	20 mm	16 mm		40 mm	20 mm	16 mm
80 mm	-	-	-	12.50 mm	-	-	-
63 mm	100	-	-	10.00 mm	0-5	0-20	0-30
40 mm	85-100	100	-	4.75 mm	-	0-50	0-50
20 mm	0-20	85-100	100	2.36 mm	-	-	-
16 mm	-	-	85-100				

NOTE: This percentage may be varied somewhat by the Engineer-in-charge when considered necessary for obtaining better density and strength of concrete.

The grading test shall be taken in the beginning and at the change of source of materials. The necessary tests indicated in I.S. 383-1970 and I.S. 456-2000 shall have to be carried out to ensure the acceptability. The arrangement shall be stored separately and handled in such a manner as to prevent the intermixing of different aggregates. If the aggregates are covered with dust, they shall be washed with water to make, them clean.

M-10 BLACK TRAP OR EQUIVALENT HARD STONE COARSE:

Aggregate for Design Mix concrete: Coarse aggregate shall be of machine crushed stone of black trap or equivalent hard stone and be hard, strong, dense, durable, clean and free from skin and coating likely to prevent proper adhesion of mortar.

The aggregates shall generally be cubical in shape, unless special stones of particular quarries are mentioned, aggregates shall be machine crushed from the best, black trap or equivalent hard stones as approved. Aggregate shall have no deleterious reaction with cement.

The necessary tests indicated in I.S. 383-1970 and I.S. 456-2000 shall have to be carried out to ensure the acceptability of the material.

If aggregate is covered with dust it shall be washed with water to make it clean.

M-11 BRICK BATS AGGREGATE:

Brick bat aggregates shall be broken from well burnt or slightly over burnt and dense bricks. It shall be homogeneous in texture, roughly cubical in shape, clean and free from dirt of any other foreign material. The brickbats shall be of 40 mm to 50 mm size unless otherwise specified in the item. The under burnt or over burnt brick shall not be allowed.

The brick bats shall be measured by volume by suitable boxes as directed.



M-12 BRICKS:

The bricks shall be hand or machine molded and made from suitable soils and kiln burnt. They shall be free from cracks and flaws not nodules of free lime. They shall have smooth rectangular faces with sharp corners and shall be of uniform color. The bricks shall be molded with a frog of 100 mm x 40 mm and 10 mm to 20 mm deep on one of its flat sides. The bricks shall not break when dropped on the ground from a height of 600 mm.

The size of modular bricks shall be 190 mm x 90 mm x 90 mm.

The size of conventional bricks shall be as under:
225 x 110 x 75 mm.

Only bricks of one standard size shall be used on one work. The following tolerances shall be permitted in the conventional size adopted in a particular work.

Length	:	3.00 mm
Width	:	1.50 mm
Height	:	1.50 mm

The crushing strength of the bricks shall not be less than 35 kg./Sq.cm. The average water absorption shall not be more than 20% by weight. Necessary tests for crushing strength and water absorption etc. shall be carried out as per I.S. 3495 (Part I to IV) –1976.

M-12 A FLYASH BUILDING BRICKS

The fly ash building bricks shall confirm to IS-13757, IS-5454, IS-12894, IS-3495, IS-3812. The frog of 80 to 100 mm X 40 mm X 10 to 20 mm size

The size of modular bricks shall be 190 mm X 90 mm X 90 mm.

The size of conventional brick shall be 230 mm X 110 mm X 70 mm.

Only bricks of one standards size shall used on one work. The following tolerances shall permitted in the conventional size adopted in a particular work:

Length:	± 3 mm
Width :	± 2 mm
Height :	± 2 mm

The physical characteristic of bricks shall be as follows –

The minimum compressive strength of Burnt Clay Fly ash building bricks shall not be less than 70 kg/sq. cm. And the test shall be conforming to IS-3495 (Part-I)

The average water absorption shall not be more than 20 percentage by weight and the test shall confirm to IS-3495 (Part – 3). Sampling of fly ash building bricks and criteria for conformity shall be as per IS: 5454

M-13 STONE:

The stone shall be of the specified variety such as Granite / Trap stone/Quartzite or any other type of good hard stones. The stones shall be obtained only from the approved quarry and shall be hard, sound, durable and free from defects like cavities, cracks, sand holes, flaws, injurious veins, patches of loose or soft



materials etc. and weathered portions and other structural defects and strength. The stone with round surface shall not be more than 5% of dry weight. When tested in accordance with I.S. 1134 – 1974. The minimum crushing of the strength of the stone shall be 200 Kg./Sq.cm. unless otherwise specified.

The samples of the stone to be used shall be got approved before the work is started.

The Khanki facing stone shall be dressed by chisel as specified in the item for khanki facing in required shape and size. The face of the stone shall be so dressed that the bushing on the exposed face shall not project by more than 40mm. from the general wall surface and on face to be plastered it shall not project by more than 19 mm nor shall it have depressions more than 10 mm from the average wall surface.

M-14 MILD STEEL BARS:

Mild steel bars reinforcement for R.C.C. work shall conform to I.S. 432 (Part-I) – 1982 and shall be of tested quality. It shall also comply with the relevant part of I.S. 456-2000.

All the reinforcement shall be clean and free from dirt, paint, grease, mill scale or loose or thick rust at the time of placing.

For the purpose of payment, the bar shall be measured correct up to 10 mm length and weight payable worked out as per the rate specified below:

i)	6 mm	0.22 Kg/Rmt.	viii)	20 mm	2.47 Kg/Rmt.
ii)	8 mm	0.39 Kg/Rmt.	ix)	22mm	2.98 Kg/Rmt.
iii)	10mm	0.62 Kg/Rmt.	x)	25 mm	3.85 Kg/Rmt.
iv)	12 mm	0.89 Kg/Rmt.	xi)	28 mm	4.83 Kg/Rmt.
v)	14 mm	1.21 Kg/Rmt.	xii)	32 mm	6.31 Kg/Rmt.
vi)	16 mm	1.58 Kg/Rmt.	xiii)	36 mm	7.31 Kg/Rmt.
vii)	18 mm	2.00 Kg/Rmt.	xiv)	40 mm	9.86 Kg/Rmt.

M-15 HIGH YIELD STRENGTH STEEL DEFORMED BARS: (CRS- Corrosion Resistant Steel and TMT)

High yield strength steel deformed bars shall be either cold twisted or hot rolled and shall conform to I.S. 1786-1985. Or I.S. 1139-1966 respectively.

Other provision and requirements shall conform to specification no. M-14 for Mild Steel bars.

M-16 HIGH TENSILE STEEL WIRES:

The high tensile wires for use in pre-stressed concrete shall conform to I.S. 2090-1962.

The tensile strength of the high tensile steel bars shall be as specified in the item. In absence of the given strength, minimum strength shall be taken as per para. 6-1 or the I.S. 1785-1962. Testing shall be done as per I.S. requirements.

The high tensile steel shall be free from loose mill scale, rust, oil, grease or any other harmful matter. Cleaning of steel bars may be carried out by immersion in solvent solution, wire brushing or passing through a pressure box containing carborundum.

The high tensile wire shall be obtained from manufacturers in coils having diameter not less than 350 times the diameter of wire itself so that wire springs back straight on being uncoiled.

M-17 MILD STEEL BINDING WIRE:



The mild steel wire shall be of 1.63 mm or 1.22 mm (16 or 18 gauge) diameter and shall conform to I.S. 280 –1972).

The use of black wire will be permitted for binding reinforcement bars. It shall be free from rust, oil, paint, grease, loose mill scale or any other undesirable coating which may prevent adhesion of cement mortar.

M-18 STRUCTURAL STEEL:

All structural steel shall conform to I.S. 226 – 1965. The steel shall be free from the defects mentioned in I.S. 226 –1975 and shall have a smooth finish. The material shall be free from loose mill scale, rust pits or other defects affecting the strength and durability. Rivet bars shall conform to I.S. 1148-1973.

When the steel is supplied by the Contractor. Test certificates of the manufacturers shall be obtained according to I.S. 226-1975 and other relevant Indian Standards.

M-19 SHUTTERING:

The shuttering shall be either of wooden planking of 30 mm minimum thickness with or without steel lining or of steel plates stiffened by steel angles. The shuttering shall be supported on battens and beams and props of vertical ballies properly cross braced together so as to make the centering rigid. In places of Ballie props, bricks pillar of adequate section built in mud mortar may be used.

The form work shall be sufficiently strong and shall have camber, so that it assumes correct shape after deposition of the concrete and shall be able to resist forces caused by vibration of concrete, live load of men, working with it and other incidental loads associated with it. The shuttering shall have smooth and even surface and its joints shall not permit leakages of cement grout.

If at any stage of work during or after placing concrete in the structure, the form work sags or bulges out beyond the required shape of the structure, the concrete shall be removed and work redone with fresh concrete and adequately rigid form work. The complete form work shall be got inspected by and approved from Engineer-in-charge, before the reinforcement bars are placed in position.

The props shall consist of bullies having 100 mm minimum diameter measured at mid length and 80 mm at the end and shall be placed as per design requirement. These shall rest squarely on wooden sole plates 40 mm. thick and minimum bearing area of 0-10 sq.m. laid on sufficiently hard base.

Double wedges shall further be provided between the sole plate and wooden props so as to facilitate tightening and easing of shuttering without jerking the concrete.

The timber used in shuttering shall not be so dry so as to absorb water from concrete and swell or bulge nor so green or wet so as to shrink after erection. The timber shall be properly swan and planed on the sides and the surface coming in contact with concrete. Wooden form work with metal sheet lining or steel plates stiffened by steel angles shall be permitted.

As far as practicable, clamps shall be used to hold the forms together and use of nails and spikes avoided.

The surface of timber shuttering that would come in contact with concrete shall be well wetted and coated with soap solution before the concreting is done. Alternatively coat of raw linseed oil or oil of approved manufacture may be applied in place of soap solution. In case of steel shuttering either soap solution or raw linseed oil shall be applied after thoroughly cleaning the surface. Under no circumstances black or burnt oil shall be permitted.



The shuttering for beams and slabs shall have camber of 4 mm per meters (1 in 250) or as directed by the Engineer-in-charge so as to offset the subsequent deflection. For cantilevers, the camber at free end shall be 1/50 of the projected length or as directed by the Engineer-in-charge.

M-20 PAINTS:

Oil Paints:

Oil paints shall be of the specified colour and shade, and as approved. The ready mixed paints shall only be used.

However, if ready mixed paint of specified shade or tint is not available white ready mixed paint with approved strainer will be allowed. In such a case, the Contractor shall ensure that the shade of the paint so allowed shall be uniform.

All the paints shall need with the following general requirements –

Paint shall not show excessive setting in a freshly opened full can and shall easily be re-dispersed with paddle to a smooth homogeneous state. The paint shall show no curling, levering, caking or colour separation and shall be free from lumps and skins.

The paint as received shall brush easily, possess good leveling properties and show no running or sagging tendencies.

The paint shall not skin within 48 hours in three quarters filled closed container.

The paint shall dry to a smooth uniform finish free from roughness, grit unevenness and other imperfections.

Ready mixed paint shall be used exactly as received from the manufacturers and according to their instructions and without any admixtures whatsoever.

Enamel Paints:

The enamel paint shall satisfy in general requirements as mentioned in specification of oil paints. Enamel paints shall conform to I.S. 2933-1975.

M-21 CAST IRON PIPES AND FITTINGS:

All soil, waste, vent and antisiphonage pipes and fittings shall conform to I.S. 1729-1964. the pipes shall have spigot and socket ends with head on spigot end. The pipes and fittings shall be true to shape, smooth, cylindrical their inner and outer surfaces being as nearly as practicable concentric. They shall be sound and nicely cast and shall be free from cracks, laps, pin holes or other imperfections and shall be neatly dressed and carefully fettled.

The end of pipes and fittings shall be reasonably square to their axis.

The sand cast iron pipes shall be of the diameter as specified in the description and shall be in length of 1.5 M., 1.8 M. & 2.0 M. including socket ends of the pipe unless shorter length is either specified or required at junction etc. The pipes and fittings shall be supplied without ears unless specified or directed otherwise.

Tolerances: The standard weights and thickness of pipes shall be as shown in the table below. A tolerance up to minus 10% may however be allowed against these standard weights.



Sr. No.	Nominal Dia	Overall Thickness	Weight of Pipe Excluding Ears		
			1.5M. long	1.8M. Long	2M. Long
1.	75 mm.	5.0 mm.	12.83 Kg.	16.52 kg.	18.37 kg.
2.	100 mm.	5.0 mm.	18.14 kg.	21.67 kg.	24.15 kg.
3.	150 mm				
4.	250 mm				

A tolerance up to minus 15% in thickness and 20 mm. in length will be allowed. For fittings tolerance in lengths shall be plus 25 mm. and minus 10 mm.

The thickness of fittings and their socket and spigot dimensions shall conform to the thickness and dimensions specified for the corresponding sizes of straight pipes. The tolerance in weights and thickness shall be the same as for straight pipes.

HYDRAULIC ENGINEER
SURAT MUNICIPAL CORPORATION,
SURAT.

SIGNATURE AND SEAL OF THE CONTRACTOR: -

NAME AND ADDRESS: -

DATE: -



9.3 ITEMWISE DETAILED TECHNICAL SPECIFICATIONS (IDTS): -

DTS No. 1

Excavation for foundation including sorting out and stacking off useful materials and disposing of the excavated stuff up to 50 mt. lead and all lift, watering etc. comp. (A) loose or soft soil with manual labors (1) 0 To 1.5 MT Depth (2) 1.5 To 3.0 MT Depth (3) 3.0 To 5.0 MT Depth.

1.1.0 GENERAL

1.1.1 Any soil which generally yields to the application of pickaxes and shovels or jumpers or scarifiers phawaras rakes or any such excavation implement or organic soil, gravel, silt, sand turf loam, clay, peat etc. fall under this category.

1.2.0 CLEARING THE SITE

1.2.1 The site on which the structure is to be built shall be cleared, and all obstructions, loose stone, materials and rubbish of all kind, bush, wood and trees shall be removed as directed. The materials so obtained shall be the property of the Corporation and shall be conveyed and stacked as directed within 50 Mts. lead. The roots of the trees coming in the sides shall be cut and coated with a hot asphalt.

1.2.2 The rate of site clearance is deemed to be included in the rate of earth work for which no extra amount will be paid.

1.3.0 SETTING OUT

After clearing the site, the center lines will be given by the Engineer-in-charge. The contractor shall assume full responsibility for alignment, elevation and dimension of each and every part of the work. The contractor shall supply labour, materials etc. required for setting out the reference marks and bench marks and shall maintain them as long as required and directed.

1.4.0 EXCAVATION

The excavation in foundation shall be carried out in true line and level and shall have the width and depth as shown in the drawings or as directed. The contractor shall do the necessary shoring and shuttering at his own cost and as approved by the Engineer or his Consultant. The payment for such precautionary measures shall be included in this work. The bottom of the excavated area shall be leveled both longitudinally & transversely as directed by removing and watering as required. No earth filling will be allowed for bringing it to level, if by mistake or any other reason excavation is made deeper or wider than that shown on the plan or as directed. The extra depth or width shall be made up with concrete of the same proportion as specified for the foundation concrete at the cost of the contractor. The excavation upto 1.5 Mts. depth shall be measured under this item. The site conditions may require excavation in parts as per schedule of excavation. No extra payment will be claimed for this operation schedule.

1.5.0 DISPOSAL OF EXCAVATED MATERIALS

1.5.1 No materials excavated from the foundation trenches, of whatever kind they may be, are to be placed even temporarily upto 1.5 Mts. or at the distance prescribed by the Engineer, from the outer edge of excavation. All materials excavated shall remain the property of the Corporation. Rate of excavation shall include sorting out of useful materials and stacking them separately as directed within the specified lead. Materials suitable and useful for backfilling or other use shall be stacked in convenient places but not in such a way as to obstruct free movement of men,



animals and vehicles or encroach upon the area required for constructional purposes. The site shall be left clean of all debris on completion.

1.5.2 Disposal of excavated materials is subject to the following - Unsuitable materials obtained from clearing site and excavation shall be disposed off within a lead of 50 Mts. as directed. Useful materials obtained from clearing site & excavation shall be stacked within lead of 50 Mts. beyond the building area as directed. Materials suitable for back-filling shall be stacked at convenient places within a lead of 50 Mts. and will be allowed to be used by the contractor on payment at rates laid down in the contract or if not so laid down, at scheduled rates of the Division or at mutually agreed rates if there are no such rates in the schedule of rates.

1.6.0 MODE OF MEASUREMENT AND PAYMENT

1.6.1 The measurement of excavation in trenches for foundation shall be made according to the sections of trenches shown on the drawing or as per sections given by the Engineer-in-charge of as directed. No payment shall be made for surplus excavation made in excess or above requirements or due to stopping and sloping back as found necessary on account of conditions of soil and requirements of safety or construction schedule requiring excavation to be done in parts.

1.6.2 No extra payment shall be made for temporary pumping of water / sewage due to abnormal adverse conditions / climate.

1.6.3 The rate shall be for a unit of one cubic meter.

DTS No. 2

Providing and filling rubbles including hand packing and filling interstices with quarry spalls behind abutments and between returns as directed.

Details specification same as per item description and as directed by Engineer-in-charge.

The rate shall be for a unit of one cubic meter.

DTS No. 3

Providing & laying C.C 1:3:6 (1 cement : 3 coarse sand : 6 Crushed stone aggregate 20mm Nominal size) & curing comp. excl. cost of form work in :(a) foundation & Plinth.

3.1.0 Materials:-

Water shall conform to M-1.

Cement shall conform to M-3.

Sand shall conform to M-5.

Stone aggregate 20 mm nominal size shall conform to M-9.

3.2.0 WORKMANSHIP :

3.2.1 General :-

Before starting concreting the bed of foundation trenches shall be cleared of all loose materials, levelled, Watered and rammed as directed.

3.2.2 Proportion of Mix :-

The proportion of cement, sand & coarse aggregate shall be one part of cement, 3 parts of sand & 6 parts of stone aggregate shall be measured by volume.

3.2.3 Mixing :-



The concrete shall be mixed in a mechanical mixer at the site of work. Hand mixing may however be allowed for smaller quantity of work if approved by Engineer-in-charge. When hand mixing is permitted by the Engineer-in-charge in case of break down of machineries and in the interest of the work, it shall be carried out on a water tight platform and care shall be taken to ensure that mixing is continued until the mass is uniform in colour and consistency. However in such case 10% more cement than otherwise required shall have to be used without any extra cost. The mixing in mechanical mixer shall be done for a period 1 1/2 to 2 minutes. The quantity of water shall be just sufficient to produce dense concrete of required workability for the purpose.

3.2.4 Transporting and placing the concrete :-

The concrete shall be handed from the place of mixing to the final position in not more than 15 minutes by the method as directed and shall be placed into its final position, compacted and finished within 30 minutes of mixing with water i.e. before the setting commences.

The concrete shall be laid in layers of 15 cms to 20 cms.

Compacting :-The concrete shall be rammed with heavy iron rammer and rapidly to get the required compaction and to allow the interstices to be filled with mortar.

3.2.5 Curing :-

After the final set, the concrete shall be kept continuously wet, if required by ponding for a period of not less than 7 days from the date of placement.

3.3.0 Mode of measurements and payment :-

The concrete shall be measured for its length, breadth and depth, limiting dimensions to those specified on plan or as directed. The rate shall be for a unit of one cubic meter.

DTS No. 4

Boring holes 3.5 mt. deep in ordinary soil (for cast in situ piles) & disposal of the surplus excavated soil as directed within a lead of 50 M. For following diameter of piles.

(a) 200 mm dia.

(b) 250 mm dia.

(c) 300 mm dia.

4.0 Workmanship :

4.0.1 The ground shall be roughly levelled and after making the position of piles, holes shall be bored with a spiral angle to the 2.50 m. depth and specified diameter using boring guide.

4.0.2 The bore holes shall be truly vertical and of uniform bore throughout specified depth. After boring to the required depth, the bore shall be cleared off the loose soil and disposal of surplus excavated stuff as directed within a lead of 50 m.

4.1 Mode of measurement and payment :

4.1.1 The rate for boring holes shall include.

(a) Roughly levelling the ground in positions where piles are to be provided.

(b) Making the position of piles by pegs and boring guide and also for shifting of boring guide.

(c) Bailing out water, if any, met with during boring.

(d) Disposal of surplus excavated soil within a lead of 50 m. and.

(e) All tools, plants, equipments and labour required for satisfactory completion of work.

4.1.2 The rate shall be for a unit of one R.mt.

Extra for under reaming inside the bore holes for under reamed piles of following nominal diameter (i) 200 mm (ii) 250 mm (iii) 300 mm



4.2 Workmanship :

4.2.1 The relevant specifications of Item No.4 shall be followed except that after boring to the required depth, the bore shall be enlarged at the bottom by an under reamer 2 to 2 1/2 times the diameter of the bore as directed. It shall be ensured that the bore for the pile shall be enlarged to the correct diameter.

4.3 Mode of measurements and payment :

4.3.0 The rate shall be for a unit of one R.mt.

DTS No. 5

Providing & laying cement concrete 1:1.5:3 (1 cement:1.5 sand:3 graded stone agg. 20 mm nominal size) & curing comp. Includ. cost of form work but exclu. Cost of reinforcement for reinforced concrete work in : (A) Foundation, footing, Base of columns and Mass concrete

5.1.0 Materials :-

Water shall conform to M-1,

Cement shall conform to M-3.

Sand shall conform to M-5.

Grit shall conform to M-6.

Graded stone aggregate 20 mm nominal size shall conform to M-9.

5.2.0 General :-

5.2.1 The concrete mix is not required to designed by preliminary tests. The proportion of the concrete mix shall be 1:1.5:3 [1 cement: 1.5 coarse sand: 3 graded stone aggregate 20 mm nominal size] by volume Concrete work shall have exposed concrete surface or as specified the item.

5.2.2 The designation ordinary M-100, M-150, M-200, M-250 specified as per I.S. corresponding approximately to 1:3:6 1:2:4, 1:1:1, 1/2: 3 and 1:1:2 nominal mix of ordinary concrete by volume respectively with conforming to IS:456.

5.2.3 The ingredients required for ordinary work, containing one bag of cement of 50 kg. by weight [0.0342 cu.m.] for different proportion of mix shall be as under.

Grade	Toral quantity of dr aggregate by volume per 50 Kg. of cement t be taken as the sume of individual volume of fine and coarse aggregate maximum	Proportion of fine aggregate of coarse aggregate	quantity of water per 50 Kg. of cement maximum
M-100 (1:3:6)	300 Liters	Generally 1:3 for fine aggregate to coarse aggregate by volume but subject to and upper limit	35 Liters
M-150 (1:2:4)	220 Liters		32 Liters
M-200	160 Liters		30 Liters



(1:1.5:3)			
M-250 (1:1:2)	100 Liters		27 Liters

- 5.2.4 The water cement ratios shall not be more than those specified in the table. The cement content of the mix specified in the table shall be increased if the quantity of water in a mix has to be increased to overcome the difficulties of placement and compaction so that the water cement ratio specified in the table is not exceeded.
- 5.2.5 Workability of the concrete shall be controlled by maintaining a water cement ratio that is found to give a concrete mix which is just sufficiently wet to be placed and compacted without difficulty with the means available.
- 5.2.6 The maximum size of coarse aggregate shall be as large as possible within the limits specified but in no case greater than one fourth of the minimum thickness of the member, provided that the concrete can be placed without difficulty so as to surround all reinforcement thoroughly and to fill the corners of the form.
- 5.2.7 For reinforced concrete work, coarse aggregates having a nominal size of 20 mm generally considered satisfactory.
- 5.2.8 For heavily reinforced concrete members as in the case of the ribs of main beams the nominal maximum size of coarse aggregate should usually be restricted to 5 mm, less than the minimum clear distance between the main bars, or 5 mm, less than the minimum cover to the reinforcement whichever is smaller.
- 5.2.9 Where the reinforcement is widely spaced as in solid slabs, limitations of size of the aggregate may not be so important and the nominal maximum size may some times be as great as or greater than the minimum cover.
- 5.2.10 Admixture may be used in concrete only with approval of Engineer-in-charge based upon the evidence that with the passage of time; neither the compressive strength of concrete is reduced nor are other requisite qualities of concrete and steel impaired by the use of such admixtures.
- 5.3.0 **WORKMANSHIP :**
- 5.3.1 **General :-** The bars shall be kept in position by the following method:
In case of beam and slab construction, sufficient number of precast cover blocks in cement mortar 1:2 [1 cement 2 coarse sand] about 4 x 4 cms. section of thickness equal to the specified cover shall be placed between the bars and shuttering as to secure and maintain the requisite cover of concrete over the reinforcement.
In case of cantilevered or doubly reinforced beams or slabs, the main reinforcing bars shall be held in position by introducing cabin spacers or supports bars at 1.0 to 1.2 metres centres.
In case of columns and wall, the vertical bars shall be kept in position by means of timber templates with slots accurately cut in them, the templates shall be removed after concreting has been done below it. The bars may also be suitably tied by means of annealed steel wires to the shuttering to maintain their position during concreting.
All bars projecting from pillars, columns, beams, slabs etc. to which other bars and concrete are to be attached or bounded to later on, shall be protected with a coat of thin neat cement grout, if the bars are not likely to be incorporated with succeeding mass of concrete within the following 10 days. This coat of thin neat cement shall be removed before concreting.
- 5.3.2 **Proportioning :-**
Proportioning shall be done by volume, except cement which shall be measured in terms of bags of 50 kg. weight. The volume of one such bag being taken as 0.0342 cu. metre Boxes of suitable sizes shall be used for measuring sand and aggregate. The size of the boxes [internal] shall be 35x25 cms. and 40 cms. deep. While measuring the aggregate and sand, the boxes shall



be filled without shaking, ramming or hammering. The proportioning of sand shall be on the basis of its dry volume and in case of damp sand, allowances for bulking shall be made.

5.3.3 Mixing :-

5.3.3.1 For all work, concrete shall be mixed in a mechanical mixer which along with other accessories shall be kept in first class working condition and so maintained throughout the construction. Measured quantity of aggregate, sand and cement required for each batch shall be poured into the drum of the mechanical mixer while it is continuously running. After about half a minute of dry mixing measured quantity of water required for each batch of concrete mix shall be added gradually and mixing continued for another one and half minute. Mixing shall be continued till materials are uniformly distributed and uniform colour of the entire mass is obtained and each individual particle of the coarse aggregate shown complete coating of mortar containing its proportionate amount of cement. In no case shall the mixing be done for less than two minutes after all ingredients have been put into the mixer.

5.3.3.2 When hand mixing is permitted by the Engineer-in-charge for small jobs or for certain other reasons, it shall be done on the smooth watertight platform large enough to allow efficient turning over the ingredients of concrete before and after adding water. Mixing platform shall be so arranged that no foreign material gets mixed with concrete nor the mixing water flow out. Cement in required number of bags shall be placed in a uniform layer on top of the measured quantity of fine and coarse aggregate, which shall also be spread in a layer of uniform thickness on the mixing platform. Dry coarse and fine aggregate and cement shall then be mixed thoroughly by turning over to get a mixture of uniform colour. Specified quantity of water shall then be added gradually through a rose can and the mass turned over till a mix of required consistency is obtained. In hand mixing, quantity of cement shall be increased by 10 percent above that specified.

5.3.3.3 Mixer which have been out of use for more than 30 minutes shall be thoroughly cleaned before putting in a new batch, unless otherwise agreed to by the Engineer-in-charge. The first batch of concrete from the mixture shall contain only two thirds of normal quantity of coarse aggregate. Mixing plant shall be thoroughly cleaned before changing from one type of cement concrete to another.

5.3.4 Consistency :

The degree of consistency which shall depend upon the nature of the work and methods of vibration of concrete, shall be determined by regular slump test in accordance with I.S. 1199 : 1959. The slump of 10 mm to 25 mm shall be adopted when vibrators are used and 80 mm when vibrators are not used.

5.3.5 Inspection :

5.3.5.1 Contractor shall give the Engineer-in-charge due notice before placing any concrete in the forms to permit to inspect and accept the formwork and forms as to their strength, alignment and general fitness but such inspection shall not relieve the contractor of his responsibility for the safety of men, machinery, materials and for results obtained. Immediately before concreting, all forms shall be thoroughly cleaned.

5.3.5.2 Centring design and its erection shall be got approved from the Engineer-in-charge. One carpenter with helper shall invariably be kept present throughout the period of concreting. Movement of labour and other persons shall be totally prohibited for reinforcement laid in position. For access to different parts suitable mobile platform shall be provided so that steel reinforcement in position is not disturbed. For ensuring proper cover, mortar blocks of suitable size shall be cast and tied to the reinforcement. Timber, kapachi or metal pieces shall not be used for this purpose.

5.3.6 Transporting and laying :-



- 5.3.6.1 The method of transporting and placing concrete shall as approved. Concrete shall be so transported and placed that no contamination segregation or loss of its constituent material takes place.
- 5.3.6.2 All form work shall be cleaned and made free from standing water dust snow or ice immediately before placing of concrete. No concrete shall be placed in any part of structure until the approval of Engineer-in-charge.
- 5.3.6.3 Concreting shall proceed continuously over the area between construction joints. Fresh concrete shall not be placed against concrete which has been in position for more than 30 minutes unless a proper construction joint is formed. Concrete shall be compacted in its final position within 30 minutes of its discharge from the mixer. Except where otherwise agreed to by the Engineer-in-charge concrete shall be deposited in horizontal layers to a compacted depth of not more than 0.45 metre when internal vibrators are used and not exceeding 0.30 metre in all other cases.
- 5.3.6.4 Unless otherwise agreed to by the Engineer-in-charge, concrete shall not be dropped into place from a height exceeding 2 meters.
- 5.3.6.5 When trunking or chutes are used they shall be kept close and used in such a way as to avoid segregation. When concreting has to be resumed on a surface which has hardened, it shall be roughened, swept clean, thoroughly wetted, and covered with a 13 mm thick layer of mortar composed of cement and sand in the same ratio as in the concrete mix itself, this 13 mm layers of mortar shall be freshly mixed and placed immediately before placing of new concrete. Where concrete has not fully hardened, all laitance shall be removed by scrubbing the wet surface with wire or bristle brushes, care being taken to avoid dislodgement of any particles, of coarse aggregate. The surface shall then be thoroughly wetted, all free water removed, and then coated with neat cement grout, The first layers of concrete to be placed on this surface shall not exceed 150 mm in thickness and shall be well rammed against old work, particular attention being given to corners and close spot.
- 5.3.6.6 All concrete shall be compacted to produce a dense homogeneous mass with the assistance of vibrators, unless otherwise permitted by the Engineer - in - charge for exceptional cases such as concreting under water where vibrators cannot be used. Sufficient vibrators in serviceable condition shall be kept at site so that spare equipment is always available in the event of breakdowns.
- 5.3.6.7 Concrete shall be judged to be compacted when the mortar fills the spaces between the coarse aggregate and begins to cream up to form an even surface. Compaction shall be completed before the initial setting starts i.e. within 30 minutes of addition of water to dry mixture. During compaction. It shall be observed that needle vibrators are not applied on reinforcement which is likely to destroy the bond between concrete and reinforcement.
- 5.3.7 Curing :-
Immediately after compaction, concrete, weather including rain, running water, shocks, vibration, traffic, rapid temperature changes frost and drying out process it shall be covered with wet sacking, hessian or other similar absorbent material approved, soon after the initial set and shall be kept continuously wet for a period of not less than 14 days from the date of placement. Masonry work over foundation concrete may be started after 48 hours of its laying but curing of concrete shall be continued for a minimum period of 14 days.
- 5.3.8 Sampling and Testing of concrete :-
- 5.3.8.1 Samples from fresh concrete shall be taken as per IS 1199:1999 and cubes shall be made, cured and tested at 7 days and 28 days as per requirements in accordance with IS 516:1959. A random sampling procedure shall be adopted to ensure that each concrete batch shall have a reasonable chance of being tested i.e. the sampling should be spread over the entire period of concreting and cover all mixing units. The minimum frequency of sampling of concrete of each grade shall be in accordance with following.



5.3.8.2	Quantity of concrete in the work	No. of samples
	1-5 Cmt.	1
	6-15 Cmt.	2
	16-30 Cmt.	3
	31-50 Cmt.	4
	51-and above	4+one additional sample for each additional 50 cmt or part there of.

Note:- At least one sample shall be taken from shift. The test specimens shall be made from each sample, five for testing at 7 days and the remaining five at 28 days. The samples of concrete shall be taken on each day of the concreting as per above frequency. The number of specimens may be suitably increased as deemed necessary by the Engineer-in-charge when procedure of tests given above reveals a poor quality of concrete and in other special cases.

5.3.8.3 The average strength of the group of cubes cast for each day shall not be less than the specified cube strength of 150 kg/cm² at 28 days. 20% of the cubes cast for each day may have value less than the specified strength provided the lowest value is not less than 85% of the specified strength. If the concrete made in accordance with the proportion given for a particular grade does not yield the specified strength such concrete shall be classified as belonging to the appropriate lower grade. Concrete made in accordance with the proportions given for a particular grade shall not, however, be placed in a higher grade on the ground that the test strength are higher than the minimum specified.

5.3.9 Stripping :

5.3.9.1 The Engineer-in-charge shall be informed in advance by the contractor of his intention to strike the form work. While fixing the time for removal of form work, due consideration shall be given to local conditions, character of the structure, the weather & other conditions that influence the setting of concrete and of the materials used in the mix. In normal circumstances [generally where temperatures are above 20°C] and where ordinary concrete is used forms may be struck after expiry of period.

5.3.9.2 All form work shall be removed without causing any shock or vibration as would damage the concrete. Before the soffit are removed, the concrete surface shall be exposed, where necessary in order to ascertain that the concrete has sufficiently hardened. Centring shall be gradually and uniformly lowered in such a manner as to permit the concrete to take stresses due to its own weight uniformly and gradually. Where internal metal ties are permitted they or their removeable parts shall be extracted without causing any damage to the concrete and remaining holes filled with mortar. No permanently embedded metal part shall have less than 25 mm. Cover to the finished concrete surface. Where it is intended to re-use the form work, it shall be cleaned and made good to the satisfaction of the Engineer-in-charge. After removal of form work and shuttering, the EXECUTIVE ENGINEER shall inspect the work and satisfy by random checks that concrete produced is of good quality.

5.3.9.3 Immediately after the removal of forms all exposed bolts etc. Passing through the cement member and used for shuttering or any other purpose shall be cut inside the cement concrete member to a depth of at least 25 mm. below the surface of the concrete and, the resulting hole be filled by cement mortar. All fins caused by form joints, all cavities produced by the removal of form ties and all other holes and depression, honeycomb spots, broken edges or corners and other defects, shall be thoroughly cleaned, saturated with water and carefully pointed and rendered true with mortar of cement and fine aggregate mixed in the proportions used in the grade of concrete that is being finished and so as dry consistency as is possible to use. Considerable pressure shall be applied in filling and pointing to ensure thorough filling in all voids. Surfaces which are pointed shall be kept moist for a period of 24 hours.



- 5.3.9.4 If rock pockets/honeycombs in the opinion of the Engineer-in-charge are of such an extent or character as to effect the strength of the structure materially or to endanger the life of the steel reinforcement, he may declare portions of the structure affected.
- 5.4.0 Mode of measurement and payment :
- 5.4.1 The consolidated cubical contents of concrete work as specified in item shall be measured. The concrete laid in excess of section shown on drawings or as directed shall not be measured. No deductions shall be made for.
- [a] Ends of dissimilar materials such as joints, beams, posts, girders, rafters, purlin, trusses, corbels and steps etc. upto 500 sq.cm. in section.
- [b] Opening upto 0.1 sq.m.
- [c] The volume occupied by reinforcement shall not be deducted from R.C.C. work.
- 5.4.2 The rate includes cost of all materials labour, tools and plant required for mixing, placing in position vibrating and compacting, finishing as directed, curing and all other incidental expenses for producing concrete of specified strength. The rate includes the cost of form work.
- 5.4.3 The rate shall be for a unit of one cubic metre.

DTS No. 6

Providing & fixing IS Mark TMT Bar FE 500D reinforcement for R.C.C. work incl. bending, binding & placing in position etc. comp. Upto G.L./P.L.

- 6.1.0 MATERIALS
- 6.1.1 Thermo-Mechanically Treated steel bars (high yield strength steel deformed bars) shall conform to M-15
Mild steel binding wires shall conform to M-17.
- 6.2.0 WORKMANSHIP
- 6.2.1 The work shall consist of furnishing and placing reinforcement to the shape and dimensions shown as on the drawings or as directed.
- 6.2.2 Steel shall be clean and free from rust and loose mill scale at the time of fixing in position and subsequent concreting.
- 6.2.3 Reinforcing steel shall conform accurately to the dimensions given in the bar bending schedules shown on relevant drawings. Bars shall be bent cold to specified shape and dimensions or as directed, using a proper bar bender, operated by hand or power to attain proper radius of bends, bars shall not be bent or straightened in a manner that will injure the material. Bars bent during transportation or handling shall be straightened before being used on the work. They shall not be heated to facilitate bending. Unless otherwise specified for mild steel a "U" type hook at the end of each bar shall invariably be provided to main reinforcement. The radius of the bend shall not be less than straight part of the bar beyond the end of the curve shall be at least four times the diameter of the bar. In case which are not round and in case of deformed bars, the diameter shall be taken as the diameter of the circle having an equivalent effective area. The hooks shall be suitably encased to prevent any splitting of the concrete. The cold twisted steel bars shall be used without hooks at the ends. Deformed bars without hooks shall, however, comply with relevant anchorage requirements.
- 6.2.4 All the reinforcement bars shall be accurately placed in exactly the same position as shown on the drawings, and shall be securely held in position during placing of concrete by



annealed binding wire not less than 1 mm. in size, and by using stay blocks or metal chair spacers, metal handers, supporting wires or other approved devices at sufficiently close intervals. Bars shall not be allowed to sag between supports nor displaced during concreting or any other operations of the work. All devices used for positioning shall be of non-corrodible material. Wooden and metal supports shall not extend to the surface of the concrete, except where shown on the drawings. Placing bars on layers of freshly laid concrete as the work progresses for adjusting bar spacing shall not be allowed. Pieces of broken stone or brick wooden blocks shall not be used. Layers of bars shall be separated by spacer bars, precast mortar blocks or other approved devices. Reinforcement after being placed in position shall be maintained in a clean condition until completely embedded in concrete. Special care shall be exercised to prevent any displacement of reinforcement in concrete already placed. To prevent reinforcement from corrosion, concrete cover shall be provided as indicated on drawings. All the bars are to be spliced and which are likely to be exceeding 10 days shall be protected by a thick coat of neat cement grout.

- 6.2.5 Bars crossing each other where required shall be secured by binding wires (annealed) of size not less than 1 mm. in such a manner that they do not slip over each other at the time of fixing and concreting.
- 6.2.6 As far as possible, bars of full length shall be used, in case this is not possible, overlapping of bars shall be done as directed. when practicable, overlapping bars shall not touch each other, but be kept apart by 25 mm. or 125 times the maximum size of the coarse aggregate whichever is greater between them. Where not feasible, overlapping bars shall be bound with annealed wires, not less than 1 mm. thick twisted tight. The overlaps shall be staggered for different bars and located at points, along the span where neither shear nor bending moment is maximum.
- 6.2.7 Wherever indicated on the drawings or desired by the Engineer-in-charge, bars shall be joined by couplings which shall have a cross section sufficient to transmit the full stresses of bars. The ends of the bars that are joined by coupling shall be upset for sufficient length so that the effective cross section at the base of threads is not less than the normal cross section of the bar. Threads shall be standard threads. Steel for coupling shall conform to I.S-226.
- 6.2.8 When permitted or specified on the drawings, joints of reinforcement bars shall be welded so as to transmit their full stresses. Welded joints shall preferably be located at points when steel will not be subjected to more than 75% of the maximum permissible stresses and welds so staggered that at any one section not more than 20% of the rods are welded. Only electric welding using a process which excludes air from molten and conforms to any or all other special provisions for the work shall be accepted. Suitable means shall be provided for holding bars securely in position during welding. It shall be ensured that no voids are left in welding and when welding is done in two or three stages, previous surface shall be cleaned properly. Ends of the bars shall be cleaned of all loose scale, rust, grease, paint and other foreign matter before welding. Only competent welders shall be employed on the work. The M.S. electrodes used for welding shall conform to I.S. 814. Welded pieces of reinforcement shall be tested. Specimen shall be taken from the actual site and their number and frequency of test shall be as directed.

6.3.0 MODE OF MEASUREMENT & PAYMENT

- 6.3.1 For the purpose of calculating consumption, wastage shall not be permitted beyond 7.5%. Excess consumption over 7.5% will be charged at penalty rate.
- 6.3.2 Reinforcement shall be measured in length including overlaps, separately for different diameters as actually used in the work. Where welding or coupling is resorted to, in place do lap joints, such joints shall be measured for payment as equivalent length of overlap as per design requirement. From the length so measured, the weight of reinforcement shall be



calculated in tonnes on the same basis of as per M-15 even though steel is supplied to the contractor by the department on actual weight. Length shall include hooks at the ends. Wastage and annealed steel wire for binding shall not be measured and the cost of these items shall be deemed to be included in the rate for reinforcement.

6.3.3 The rate for reinforcement includes cost of steel binding wires, its transporting from departmental store to work site, cutting, bending, placing and fixing in position as shown on the drawings and as directed. It shall also include all devices for keeping reinforcement in approved position, cost of joining as per approved method and all wastage and spacer bars.

6.3.4 The rate shall be for unit of one Kg.

DTS No. 7

Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm. in depth consolidating each disposed layer by ramming and watering.

7.0.0 FILLING AND DISPOSAL OF THE EXCAVATED STUFF :

The excavated stuff of the selected type shall be used in filling the trenches and plinth or leveling the ground in layers. Under no circumstances black cotton soil shall be used for filling the trenches and plinth. The earth to be used for filling shall be free from salts organic or other foreign matter. All clods of earth shall be broken. As soon as the work in foundation has been completed and measured the site of foundation shall be cleared of the debris, brick bats, mortar dropping and filled with earth in-layers not exceeding 20cms. Each layer shall be adequately watered, rammed and console-dated before the succeeding layer is alid. The earth shall be rammed with iron rammers where feasible and with the butt ends of crow-bere where rammers cannot be used. When filling reaches finished level. The surface shall be flooded with water for atleast 24 hours and allowed to dry and then rammed and consolidated.

The balance of the excavated quantity shall be removed by the contractor from the site of work to a place as directed with lead upto 50 M. and all lift.

7.1.0 MODE OF MEASUREMENTS AND PAYMENT :

The payment shall be made for filling in plinth and trenches. No deduction shall be made for shrinkage or voids. If consolidated as instructed above.

The rate shall be for a unit of one cubic metre.

DTS No. 8

Filling in foundation and plinth with brick Bats Chhara in layers of 20cm. thickness including watering, ramming and consolidating etc. complete.

8.0.0 Material Quality: Brick bats (broken brick pieces) and chhara (brick aggregate) must be clean, hard, and free from salts, organic matter, or clay.

8.1.0 Layering: Filling must be executed in horizontal layers not exceeding 20 cm in loose thickness.



- 8.2.0 Watering: Each 20 cm layer shall be adequately watered to reach optimum moisture content for maximum density.
- 8.3.0 Compaction (Ramming): Each layer must be thoroughly consolidated using iron/wooden rammers or mechanical vibratory rollers. In confined spaces, the butt ends of crowbars should be used to ensure no voids remain.
- 8.4.0 Final Settlement: Once the filling reaches the finished plinth level, the surface must be flooded with water for a minimum of 24 hours to allow for final natural settlement. After drying, a final round of ramming is required to achieve the exact intended floor profile.
- 8.5.0 Measurement: Quantities are calculated in Cubic Meters (Cu.m.).

DTS No. 9

Providing Staging of Steel Trussels for supporting steel section or a pipe section. It includes the cost of using Trussels bolting, welding, using extra steel supports as required for stability of staging. Staging designed to be approved from Engineer in charge.

- 9.0.0 Design Standards: Staging must be designed to withstand dead loads, live loads, and erection stresses (e.g., wind, seismic) as per IS 800:2007.
- 9.1.0 Material Grades: Use structural steel sections (angles, channels, or pipes) conforming to IS 2062 or equivalent.
- 9.2.0 Fabrication & Stability:
- 9.2.1 Welding: All welding must follow IS 814 (electrodes) and IS 816 (process). Welds must be continuous and free from defects.
 - 9.2.2 Bolting: Use high-strength friction grip (HSFG) or black bolts as specified. All bolts must be tightened to the required torque.
 - 9.2.3 Extra Supports: The rate includes providing vertical columns, horizontal tie-beams, and diagonal bracings as required to maintain the verticality and stability of the staging.
- 9.3.0 Approvals: Prior to fabrication, the contractor must submit Detailed Staging design for approval by the Engineer-in-Charge.
- 9.4.0 Mode of Measurements: Quantities are calculated in Cubic Meters (Cu.m.).

DTS No. 10

Steel work welded in built up sections, framed work including cutting, hoisting, fixing in position and applying a priming coat of red lead paint



- (A) in beams & joists channels angles, tees, flats with connection plates or angle cleats as in main & cross beams, hip & trussed purlins connected to common rafters & the like.**
- (B) For work like chain link fencing, above compound wall etc.**
- (C) in trusses & trussed purlins upto 25m.Span &15m.Overall height.**

10.0.0 LAYING OUT :

The steel structures, as shown in the drawings or as per directions of the Engineer-in-charge, shall be laid out on a level platform to full scale and to full size in parts. A steel type shall be used for measurements to ensure maximum accuracy.

Wooden templates 12 mm to 19 mm thick or steel templates shall be made to correspond to each connecting gusset plate and rivet holes shall be accurately marked on them and drilled. The templates shall be laid on the steel members and holes for riveting and bolting marked on them. The ends of the steel members shall also be marked for cutting. The base of steel columns and the position of anchor bolts shall be carefully set out.

10.1.0 FABRICATION :

The steel sections as specified shall be straightened and cut square and accurately to correct lengths. The cut ends exposed to view shall be finished smooth. No two pieces shall be welded or otherwise jointed to make up required length of a member except as indicated in the drawing or otherwise specifically permitted by the Engineer - in - charge. All straightening and shaping to form shall be done by application of pressure and not by mannering. Any bending or cutting shall be carried out in cold condition (unless otherwise directed) in such a manner as not to impair the strength of the metal.

All stiffeners shall be formed by pressure, and where practicable, the metal shall not be cut and welded in making these. In major works or where so specified, shop drawings giving complete details and information for the fabrication of the component parts of the structure, including the locating, type, size, length and details of rivets, bolts or welds shall be prepared in advance of the actual fabrication and approved by the Engineer-in-charge. The drawing shall indicate the shop and filed rivets, bolts and welds. The steel members shall be distinctly marked or stenciled with paint with the identification marks as given in the shop drawings. The bars shall be thickened at the ends so as to provide for screwed threads and gradually tapered off to meet their normal section.

Great accuracy shall be observed in the fabrication of various members. Do that these can be assembled without being unduly packed strained or forced into position and when built-up shall be true and free from twists, bricks buckles or open joints.

Before making holes in individual members, for fabrication the steel work intended to be riveted or bolted to gather shall be assembled or clamped properly and tightly so as to ensure close abutting or lapping of the surface of the different members. All stiffeners shall be tightly both at top and bottom without being drawn or caulked. The abutting joints shall be cut of dressed true and straight and fitted close together, We splice plates and fillers under stiffeners shall be cut to fit within 3 mm of flange angles. We plated or girders which have no cover plates shall have their ends flush with the top of angles forming the flanges unless otherwise required. The we plates, when spliced shall have clearance of not more than 6 mm.



The erection clearance for cleated ends of members connecting steel to steel preferably be not greater than 1.5 mm. The erection clearance at the ends of beams without web cleats shall not be more than 3 mm. at each end but where for practical reasons, greater clearance is necessary, suitably designed seating shall be provided.

Pins and rollers shall be accurately turned to gauge. These shall be straight and smooth and free from flaws. The roller bearing shall be provided with adequate arrangement for holding the girders or truss resting on it, from lateral displacement.

Expansion bed plates shall be planed true and smooth. The planning of bed plates shall be done in the direction of the movement of the girder or truss resting on it.

Column splices and butt joints of struts and impression members depending on contract for trees transmission shall be accurately machined and closebutted over the whole section. In column caps and bases, the ends of shafts together with the attached gussets, angles, channels etc. after riveting together shall be accurately machinised so that the parts connected butt against each other over the entire surface of contract. Connecting angles or channels shall be fabricated and placed in position with great accuracy so that they are not unduly reduced in thickness by machining.

The ends of all bearing stiffeners shall be machined or ground to fit tightly both at the top and bottom.

All holes shall generally be drilled to the required size and at the required position. Sub-punching shall be permitted, provided it is done 3 mm. less in diameter and reamed thereafter to the required size.

Holes for rivets and black bolts shall be large by 0.4 to 6 mm. as shown in appendix-I under column "Coarse" than the nominal diameter of the rivets or black bolts depending upon the dia of rivets. Holes for turned and fitted bolts shall be drilled or reamed large by 0.2 to 3 mm. depending upon the dia of bolts as shown in Appendix under column "Medium".

When the number of plates or sections to be riveted together exceeds three or when their total thickness is 90 mm or more, holes shall be drilled or reamed in position, after the members are assembled and the parts firmly hold together by clamps. Before riveting or bolting up or welding finally. The members shall be taken part and all burrs removed.

Holes shall have their axis perpendicular to the surface bore through. The drilling or reaming shall be free from burrs and the holes shall be clean and accurate.

The work or fabrication shall be completed in the work shop as far as it is practicable to do so. Site jointing shall be done with rivets or turned and fitted bolts, or black bolts or welding as shown in drawings or as directed by the Engineer-in-charge. Generally, the following principles shall govern the use of rivets, turned and fitted bolts and black bolts :-

[i] Rivets or turned and fitted bolts shall be used where the connection is such that slip under load has to be avoided.

[ii] Black bolts may be used very sparingly where a force is carried through a connecting without impact, vibration or reversal of stresses (unless such reversal is due to wind forces.)

In the case of welding, holes shall only be made for the bolts used for temporary fastening as shown in drawings.



10.2.0 WELDING :

Welding shall be generally be done by electric process. The electric arc method being economical, is usually adopted. Where public electricity is not available, a suitable generator shall be arranged. Gas welding shall be resorted to using oxyacetylene flame with specific period approval of the Engineer-in-charge.

Gas welding shall not be permitted for structural steel work. Gas welding requires heating of the members to be welded along with the welding rod and is likely to create temperature stresses in the welded members. Precautions shall therefore be taken to avoid distortion of the members due to these temperature stresses.

The work shall be done as shown in the shop drawings which should clearly indicate various details of the joints to be welded, type of welds, shop and site welds, as well as the types of electrodes to be used. Symbols for welding on plans and shop drawings shall be according to IS : 813-1061. As far as possible, every effort shall be made to limit the welding that must be done after the structure is erected so as to avoid the improper welding that is likely to be done due to heights and difficult positions of scaffolding etc. apart from the aspect of economy.

10.3.0 PREPARATION OF SURFACE :

Surfaces which are to be welded together, shall be free from loose mill-scale, rust, paint, grease or other foreign matter. A coating of boiled linseed oil shall be permitted.

10.4.0 PRECAUTIONS :

All operations connected with welding and cutting equipment shall conform to the safety requirement given in IS : 818-1968 for "Safety and Health requirements in Electric and Gas welding and Cutting Operations".

The following points shall be borne in mind during the process of welding :-

[a] Welds shall be made in the flat position. Wherever practicable.

[b] Arc length, voltage and amperage shall be suited to the thickness of materials, type of groove and other circumstance of the work.

[c] The sequence of welding shall be such that where possible, the members which offer the greatest resistance to compression are welded first.

All defective welds which shall be considered harmful to the structural strength shall be cut out and rewelded.

Finished welds and adjacent parts shall be protected with clean boiled linseed oil and after all slag has been removed. Welds and adjacent parts shall be painted after the same are approved by the Engineer-in-charge.

All the members shall be thoroughly cleaned of rust, scales dust etc. and given a priming coat of lead painting before fixing them in position.

10.5.0 RATE : The rate shall be for a unit of one Quintle.

DTS No. 11

Scraping oil paint from steel and other metal surface and making the surface even (with Hand Scraping.)

11.0.0 Scope of Work



- Description: Systematic removal of old oil paint, loose rust, mill scale, and other foreign matter from steel and metal surfaces using hand scraping tools to achieve a smooth, even finish ready for recoating.

11.1.0 Technical Execution (Hand Scraping)

- Pre-Cleaning: Before scraping, all oil, grease, and dirt must be removed using solvent cleaning (e.g., mineral turpentine or approved chemical degreasers).
- Scraping Process:
 - Use heavy-duty hand scrapers, steel wire brushes, or chipping hammers for thick or flaking paint.
 - Leveling: The surface must be scraped evenly to remove high spots and "feathered" at the edges of remaining paint to ensure a smooth transition for the new coat.
 - Hand Sanding: Follow scraping with emery paper (No. 220 or 240) or steel wool to remove fine burrs and provide a "key" for the primer.
- Final Dust Removal: After scraping, the surface must be wiped clean with dry rags, a vacuum cleaner, or compressed air to ensure no dust remains before the primer application.

11.2.0 Measurement

- Unit of Measurement: Measured in Square Meters (Sq.m.).

DTS No. 12

Providing and applying outer coating of approved brand non toxic anticorrosive Epoxy paint with Zinc rich primer of approved make as specified in specification with 250 to 325 micron thickness as directed by the engineer in charge.

12.0.0 Scope of Work

- Description: Application of a high-performance, two-component (2K) protective coating system consisting of a Zinc-Rich Epoxy Primer followed by a non-toxic Anticorrosive Epoxy Topcoat to achieve a total dry film thickness (DFT) of 250 to 325 microns.

12.1.0 Material Specifications

- 12.1.1 Primer: Two-component Epoxy Zinc-Rich Primer must contain high-purity zinc dust to provide cathodic protection.
- 12.1.2 Topcoat: Non-toxic, high-build anticorrosive epoxy paint. For potable water or food-grade applications, the paint must meet specific hygiene and non-toxicity standards.
- 12.1.3 Thickness Requirements:
 - 12.1.3.1 Primer Coat: Applied at 50–75 microns DFT.
 - 12.1.3.2 Topcoat(s): Multiple coats to achieve the remaining thickness, typically 100 microns per coat for high-build versions, reaching the total specified range of 250–325 microns.

12.2.0 Measurement

- Unit of Measurement: Measured in Square Meters (Sq.m.).

DTS No. 13

Providing and Fixing of Chemical Anchor Bolt of 20 mm diameter having 5.8 Grade Carbon Steel, Zinc Plated of fischer or equivalent make, using chemical Mungo make MIT



700RE or equivalent (Epoxy Mortar Chemical) make including cost of all equipments, tools, material, labour, etc. Standard procedure as mentioned in manufacturer's specifications shall be strictly followed, which shall be submitted and got approved from the authority prior to start of work. The rate shall also include cost of drilling of hole of required diameter and depth as mentioned in manufacturer's specification, cleaning the hole with required air blower and other necessary tools and tackles, positioning, providing and grouting chemical, allied fixtures and fasteners, etc. Item includes necessary scaffolding, staging, labour, tools and equipments, etc. complete as directed by the engineer-in charge.

Details specification same as per item description and as directed by Engineer-in-charge.

- Unit of Measurement: Measured in per Nos. (Numbers)

DTS No. 14

Dismantling steel work including dismantling and stacking the materials with all lead and lift.

14.1.0 WORKMANSHIP

14.1.1 The term **Dismantling** shall imply carefully taking apart or removing steel structural members without causing damage to the sections or the surrounding structure. This item includes dismantling steel work in trusses, stanchions, beams, purlins, pipes, and other structural frames composed of sections like angles, channels, I-beams, or tubes.

14.1.2 **Systematic Process:** Dismantling shall be done in a systematic manner, generally in the reverse order of erection. All rivets, bolts, and nuts shall be removed carefully. For welded structures, cutting shall be done precisely using gas cutters or mechanical cutters as approved by the **Engineer-in-Charge** to ensure the members remain serviceable for future use.

14.1.3 **Safety and Stability:** Before commencing work, the contractor must ensure necessary **propping, scaffolding, and temporary bracing** are provided to prevent the sudden collapse of any part of the structure. The safety of workmen and protection of the adjoining property is the sole responsibility of the contractor.

14.1.4 **Handling and Stacking:** Structural members shall not be dropped from a height. They must be lowered to the ground using pulleys, cranes, or manual ropes as necessary. All dismantled steel shall be sorted into:

1. **Serviceable Materials:** These shall be cleaned of mortar, rust, or loose paint, and stacked neatly by size and section at the site or delivered to the **S.M.C. Store** as directed.
2. **Unserviceable Materials/Scrap:** These shall be stacked separately and disposed of as directed.

14.1.5 **Lead and Lift:** The rate includes all labor and equipment required for dismantling, as well as the transport (**lead**) and vertical movement (**lift**) of the materials to the designated stacking area or store within the specified radius.

14.2.0 MEASUREMENT



All work shall be measured in its original position before dismantling. The weight of the steelwork shall be calculated based on standard weight tables (IS Codes) or actual weight if specified by the Engineer-in-Charge.

- **Dimensions:** Measured to the nearest **0.01 mt.**
- **Weight:** Calculated to the nearest **1.0 kg.**
- No deductions shall be made for rivet or bolt holes.

14.3.0 RATES

The rate shall include the cost of:

- All labor, tools, and specialized equipment (gas cutters, pulleys, scaffolding).
- Temporary shoring and bracing to maintain the stability of the remaining structure or adjoining property.
- Careful removal of bolts, rivets, or cutting of welds.
- Cleaning, sorting, and stacking serviceable materials.
- Disposing of debris and cleaning the site upon completion.
- All **lead and lift** charges to the specified S.M.C. storage location.

Unit of Measurement: The rate shall be for a unit of **One Kilogram (Kg)**

DTS No. 15

Demolition including stacking of serviceable materials with all lead and lift. (i) RCC Work

15.1.0 WORKMANSHIP :-

The term Demolition shall consist of one or more parts of the building as specified or shown in the drawing. Demolition implies taking up or down or breaking up. This shall consist of demolishing whole or part of work including all relevant items as specified or shown in the drawings. The demolition shall always be planned before hand and shall be done in reverse order of the one in which the structure was constructed. This scheme shall be got approved from the Engineer-in-charge before stating the work. This however will not absolve the contractor from the responsibility of proper and safe demolition.

Necessary propping, the shoring and or under pinning shall be provided for the safety of the adjoining work or property, which is to be left intact, before dismantling and demolishing is taken up and the work shall be carried out the such away no damage is caused to the adjoining property.

Wherever required, temporary enclosures or partitions shall also be provided. Necessary precautions shall be taken to keep dust nuisance down as and where necessary.

Dismantling shall be done in a systematic manner. All materials which are likely to be damaged by dropping from a height. The or demolishing roofs, masonry etc. shall be carefully removed first. The dismantled articles shall be passed by hand where necessary, lowered the ground (as not thrown) and then properly stacked as directed.

All materials obtained from demolition shall the property of Corporation unless otherwise specified and shall be kept in safe custody until handed over to any store to Surat Municipal Corporation as specified the Engineer-in-charge.



Any serviceable materials, obtained during dismantling demolition, shall be separated out and stacked properly on site or any store of S.M.C. as directed, with all lead and lift. All unserviceable materials, rubbish etc. shall be stacked as directed by Engineer-in-charge. On completion of work the site shall be cleared of all debris rubbish and cleaned as directed.

15.2.0 Rates :

Measurements of all work except hidden work shall be taken before demolition or dismantling and no allowance for increase in bulk shall be allowed. The demolition of lime concrete shall be measured under this item. Specification for deduction for voids, openings etc. shall be on same basis as the employed for construction of work.

All work shall be measured in decimal system as fixed in its place subject to the following limit, unless otherwise stated hereinafter : (a) Dimensions shall be measured to the nearest 0.01 mt. (b) Areas shall be worked out to the nearest 0.01 cum.

The rate shall include cost of all labour involved and tools used in demolishing and dismantling including scaffolding. The rate shall also include the charges for separating out and stacking the serviceable materials properly and disposing the unserviceable materials with all lead and lift. The rate also includes for temporary shoring for the safety of the portion not required to be pulled down or of adjoining property and providing temporary enclosures or partitions where considered necessary.

The rate shall be for a unit of one cubic metre.



10.0 GENERAL PERFORMANCE DATA

THE TENDERERS SHALL SUBMIT ALL DETAILS ASKED IN THIS SECTION

IF NEEDED, MORE PAGES CAN BE USED BUT THE FORMAT GIVEN SHALL BE STRICTLY FOLLOWED

ATTACH ALL NECESSARY SUPPORTING DOCUMENTS AS ASKED FOR IN VARIOUS SECTIONS AND SUBSECTIONS OF THE TENDER DOCUMENT



10.1 DECLARATION BY THE TENDERER

I/We hereby declare that I /We have examined the site of **Strengthening of existing 1524 mm M.S water supply line supporting M.S truss structure at Varachha water works Khadi Bridge, Varachha main road in East zone area, Surat (4th Attempt).**

and pursued in detail and examined closely the specifications and its intents and contents of the tender documents before quoting my / our rates.

I/We agree to be bound by and comply with all articles of the tender and the contract documents that shall be executed with The Surat Municipal Corporation.

I/We have also inspected the site location and satisfied myself / ourselves regarding the quality, quantity, availability and transport facilities for construction materials such as earth, stone, sand, cement, and equipments etc. through the network of available roads and path ways required for the work.

HYDRAULIC ENGIENER,
SURAT MUNICIPAL CORPORATION

SIGNATURE AND SEAL OF THE CONTRACTOR:

NAME AND ADDRESS:

DATE:



10.2 TENDERER'S / CONTRACTOR'S CERTIFICATE / UNDERTAKING

I/We hereby declare that I/We have persued in detail and examined closely the specifications / general terms and conditions / special terms/important instructions/notes described in the tender documents. I/We hereby agree to be bound by and comply with all such specifications/terms, conditions, etc.

I/We also certify that I/We have visited the site and inspected the location of the proposed work and have collected all information required before quoting my / our rates.

HYDRAULIC ENGIENER,
SURAT MUNICIPAL CORPORATION

SIGNATURE AND SEAL OF THE CONTRACTOR:

NAME AND ADDRESS:

DATE:



10.3 DETAILS OF PROPRIETOR / PARTNERS OF THE FIRM

[1]

Affix passport size photograph here	Size
-------------------------------------	------

Specimen signature of the Contractor
Name and address

[2]

1	2	3	4
AFFIX LATEST PASSPORT SIZE PHOTOGRAPH OF ALL PARTNERS IN CASE OF PARTNERSHIP AGENCY			

Specimen signature, name and addresses of all the partners in case of partnership agency.

- | | 1 | 2 | 3 | 4 |
|-----|--|---|---|---|
| [3] | Submit certified copy of registered partnership deed in case of Partnership Firm. | | | |
| [4] | Submit certified copy of the power of Attorney of the signing authority. | | | |
| [5] | Attach complete organizational chart of the firm. | | | |
| [6] | In case of Government royalty applicable to Tenderer, it is compulsory to submit a receipt of royalty payment with tender. | | | |
| [7] | The Photograph and specimen signature of Contractor will be cross-checked, whenever Contractor receives payment in account section of The Surat Municipal Corporation. | | | |
| [8] | The specimen signature of Contractor will be cross checked by Account Department of the State Municipal Corporation in case of representative of Contractor along with letter of authority of person who signed an agreement receives payment. | | | |
| [9] | In case of octroi applicable to the goods of supplier / Tenderer, the Tenderer / supplier has to submit attested copies of all octroi receipts. | | | |

HYDRAULIC ENGINEER
SURAT MUNICIPAL CORPORATION
SURAT.

SIGNATURE AND SEAL OF THE CONTRACTOR:
NAME AND ADDRESS:
DATE:



10.4 DETAILS OF TECHNICAL PERSONNEL WHO SHALL BE IMMEDIATELY DEPUTED FOR THIS WORK

Name of Tenderer:

Sr. No	Designation	Name	Length of Service in the firm	Qualifications	Professional experience and details of work carried out*	Remarks
1	2	3	4	5	6	7
1	Project Manager					
2	Senior Site Engineers(Civil)					
3	Assistant Site Engineers (Civil)					
4	Clerk of Works					
5	Others					

Signature of Tenderer

Name and address

Date

- Indicate here in details like, the name of the project, the capacity on which the individual worked and for what length of time, etc.



10.5 TENDERER'S PROPOSED COMPLETION SCHEDULE IN THE FORM OF BAR/PERT/CPM CHART OR ANY OTHER METHOD AS APPROVED BY THE SURAT MUNICIPAL CORPORATION.

HYDRAULIC ENGINEER,
SURAT MUNICIPAL CORPORATION

SIGNATURE AND SEAL OF THE CONTRACTOR:

NAME AND ADDRESS:

DATE:



10.6 REQUEST FOR REFUND OF EMD

Date:

To
Municipal Commissioner
Surat Municipal Corporation
Surat

Sir,

I/We have tendered for the work of _____
_____ and have paid Earnest Money Deposit
Amounting to Rs. _____ drawn by
_____. The receipt No. _____ Dated _____ issued
by the Corporation is attached herewith.

In case my / our tender is not accepted, kindly arrange to refund the amount of Earnest Money Deposit paid by me / us as per the details referred above.

Advance stamped Receipt duly signed on Revenue Stamp of Rs. 1.00 is also enclosed herewith.
Signature of Contractor

Address _____

Encl: As Sated.



10.7 ADVANCE STAMP RECEIPT

Received with thanks the sum of Rs. _____ (In words _____) Only from The Surat Municipal Corporation being the refund of Earnest Money Deposit placed by me / us vide SMC's Receipt No. _____ dated _____ along with the tender paper for the _____

Date:

(Revenue Stamp)

(Signature of the Tenderer)

f.w.c. in the Accountant

b) For remarks whether the _____ deposit amounting to Rs. _____ placed on _____ by Shri / M/s. _____ in connection with the work of _____ stands in full in the name of the aforesaid party (R.No. _____ Dated _____)

HYDRAULIC ENGINEER
Surat Municipal Corporation

F.W.Cs.to HYDRAULIC ENGINEER

To deposit of Rs. _____ Place on _____ by Shri / M/s. _____ stands in full in the name of the aforesaid party.

Accountant

Submitted,

For favour of sanction of refund Rs. _____ being the amount of _____ deposit placed on _____ vide Receipt No. _____ by Shri _____ / Ms. _____ in connection with the work of _____

_____ as the tender of the above party has been accepted / had not been accepted and the concerned Contractor has paid security deposit of Rs. _____

for the above referred work on dated _____. The party has also executed an agreement for the above work. The above deposit stands in full in the name of the said party as certified by the Accountant on _____. The expenditure will be debited on B.H.G. Tender Deposit Account.

Sanctioned Accordingly,

Assistant Engineer / Jr. Engineer

Dy. Engineer,

Hydraulic Engineer,

Deputy Municipal Commissioner (D)