

Name of work:- Disconnection works of old network at various locations and other miscellaneous works at various site under Dharoi RWSS, Ta. Vadnagar, Dist : Mehsana under M & R to Dharoi RWSS.

DETAILED SPECIFICATION

Item No. 1

Providing and supplying in standard length ISI mark rigid unplasticised PVC pipes suitable for potable water with ring fit joint including cost of rings, as per IS specification no. 4985/1988 including all local and central taxes, transportation, freight charges, octroi, inspection charges, loading, unloading, conveyance to the departmental stores and including cost of jointing material etc. complete.

315 mm dia PVC pipe, 6 Kg/Cm²

110 mm dia PVC pipe, 6 Kg/ Cm²

For Indian manufacturers a valid license issued by the Bureau of Indian Standards for marking the PVC pipes with ISI mark is a mandatory requirement both for PVC pipes & rings
Standards

- The UPVC Pipes to be manufactured, supplied and delivered under the scope of this contract shall be manufactured in accordance and confirming to IS:4985-2000 or its latest revision or amendments or other authoritative standard that ensure at least a substantially equal quality to the IS:4985-2000 or its latest revision or amendments
- Elastomeric sealing ring shall be as per specification of IS – 5382-1985, and ISO: 4633-1996 or it shall be EPDM rubber ring.
- The dimensions, material compositions, tests etc. shall be as per IS:4985-2000 or with its latest revision or amendments.
- The minimum wall thickness weight shall be as per Appendix I of the tender.
- The colour of pipes shall be as per IS 4985-2000
- Bureau of Indian Specifications (BIS) / Indian Standard (IS) shall mean the Latest version issued by BIS. The material from which the pipes are made shall consist substantially of unplasticised polyvinyl chloride conforming to IS: 10151, to which may be added only those additives that are absolutely needed to facilitate the manufacture of the polymer, and the production of sound, durable pipes of good surface, finish, mechanical strength and opacity.

The bulk density of the UPVC compound shall be 0.50 to 0.53 and the density of UPVC pipe shall be 1.40 to 1.46 g / cm³.

The additional of the manufactures own rework material shall comply to clause 4.2 of IS: 4985.

PVC resin of suspension grade K-66/K-67 shall be used for extrusion of UPVC pipe.

Unit weight and minimum wall thickness of unplasticized ring fit type PVC pipes are as per IS 4985-2000.

Pipes supplied must be purchased from the latest vendors approved by GWSSB at the time of purchase of pipes.

Mode of Measurement and Payment

Measurement shall be paid on RMT basis as per payment schedule.

Item No.2

Excavation for pipe line trenches for water supply, sewerage line, manhole etc. all with shoring and strutting if required as per required gradient and line including safety provisions using site rails and stacking excavated stuff including up to all required lead cleaning the site etc. complete for all lifts and strata as specified. In all sorts of soil and soft murrum,

Upto 1.50 mt depth

Upto 1.50 to 3.00 mt depth

GENERAL

1.1 The excavation for trenches will generally, refer to open excavation for trenches in wet / dry conditions for pipe laying work.

CLEARING OF SITES:

The site on which the pipelines are to be laid and shown on plan and the area required for setting out and other operations shall be cleared and all obstruction loose stones and materials, rubbish of all kinds, stumps, brushwood as trees shall be removed as directed the roots shall be entirely grubbed up.

The products of the clearing to restocked in such a place and in such a manner, as directed by the engineer in charge.

In jungle clearings, all trees not specially marked for preservation, bamboo's jungle wood and brushwood shall be cut down their roots grubbed up. All wood and materials from the clearing shall be the property of the Board shall be arranged as directed by the Board Engineer or his authorized agent, the material pronounced as useful by the Engineer will be conveyed and properly stacked as directed within the specified limit. Unless materials will be burnt or otherwise disposed off as directed.

All holes or hollows whether originally existing or produced by digging up roots, shall be carefully filled up with earth, well earth, well rammed leveled off, as may be directed.

3.0 SETTING OUT:

The center lines of all pipe trenches etc. shall be given by the Engineer-in-charge and it will be the responsibility of the contractor to install substantial reference marks, bench marks, etc. and maintain them as long as required true to line, level curve and slopes. The contractor shall assure full responsibility for alignment, and dimension of trench.

The labor materials etc. required for setting out and establishing benchmarks and other reference marks shall be arranged by the contractor at his own cost.

4 EXCAVATION

The excavation incl. Bailing out of water for the pipe trenches shall also incl. Removal of all materials of whatever nature and whether wet or dry condition necessary for laying of pipelines exactly in accordance with alignment, levels grades and curves shown on the plans or as directed by the Engineer-in-charge. Trenches shall be excavated to the exact width and depth according to the size of pipe and the sides shall be left vertical as far as possible or according to the angle of repose of various soils. Unless there is a specific extra provision in the contract for shoring and strutting or for cutting side slopes the contractor shall at his own cost do the necessary shoring and strutting or cutting of slopes to a safe of repose or both approved by the Engineer-in-charge. As per Site condition if Extra width or depth require then prior permission of concern chief engineer is require. The contractor shall notify the Engineer before starting excavation to enable him to take cross sectional levels for purpose of measurements before the ground is disturbed. The bottom of the trenches shall be leveled both longitudinally and transversely or slopped as directed by the Engineer. The contractor shall at his own cost to remove such portions of boulders or rocks, as are rectified to make the bottom of the trench level. No filling shall be allowed to bring the trench to level. If by contractor's mistake excavation is made deeper than shown on the plans and if ordered by the Engineer the extra depth shall have to be made with selected excavated stuff only with

watering, remedying etc. as directed, by the Engineer and at the cost of the contractor. Other hard excavation shall be cleared of all sorts and loose materials and cut to firm surface, either level, stepped as directed by the Engineer. The Engineer may order such charges in the dimensions and alignment of pipe trench as may be deemed necessary to secure satisfactory cover over pipeline. The contractor shall, at his own expense, make provision for bailing out of draining water and the trenches shall be kept free of water, during laying work.

After each excavation is completed, the contractor shall notify the Engineer to that effect and no laying of pipeline will be allowed to laid until Engineer has approved the depth and dimensions of trenches level and measurements.

The minimum width of trench should be 25 CM on each side of the pipe the rate includes cost of dewatering, blasting if required and as per detailed specification etc complete.

5.0 SHORING AND STRUTTING:

Shoring & strutting and dewatering if required shall have to be carried out by the contractor, for which any extra charge will not be paid During excavation if water connections, sewage connections, telephone lines khalkuva (soak pits) etc. are damaged by the contractor, the same shall have to be restored by the contractor without any extra payment.

6.0 PROTECTION

The contractor shall be entirely responsible for any injury to life and damage to the properties etc. Necessary protection work etc. shall be provided by the contractor.

7.0 The excavation in all sorts of soil, hard murram, soft rock or hard rock or any type of soil shall have to be carried out up to the required depth by the agency, no extra payment shall be given for soft/ hard rock.

8.0 DISPOSAL OF EXCAVATED STUFF

No excavated stuff from trench are to be placed even temporarily nearer than 1.5 meter or greater distance up to 90 meter or as prescribed by the Engineer from the outer edge of trench. All excavated material will be the property of the board. The rate of excavated includes sorting out of useful materials and stacking then separately as directed within specified lead. The excavated stuff suitable and useful for refilling or for other use shall be stacked at convenient places. The materials not useful in any wet shall be disposal off as directed by the Engineer from the outer edge of trench.

8.2 The site should be cleared off on completion of work.

9.0 ADDITIONAL REQUIREMENTS

At the joints of pipes, the trench shall be excavated to an additional depth of 15 cm. and width of 30 cm. And length of 15 cm. beyond the edge of collar on both the sides or as directed. The rate include for such extra excavation made at the joints. The trenches shall be excavated perfectly in straight line. The bottom of the trench shall be kept as per invert level or as directed. To maintain the proper slop the usual method of site rails and boning rods shall be adopted. The contractor shall have to provide and fix and maintain sight rails and boning rod without any extra cost.

If the contractor fails or makes delay to give hydraulic test of the pipe line laid in any of the section, without any genuine reason, he shall be responsible to get any part of the length trenches refill in such case i.e. before tasting for safety of pedestrian and/or vehicular traffic as found necessary by the engineer-in-charge without any extra cost. If found necessary any directed by the Engineer-in-charge. The contractor shall have to excavate the refilled trenches, during hydraulic test without any extra cost.

At all road crossings, trenches shall be excavated only for half width of the road and pipe shall be laid. The other half shall be excavated only after back filling over the laid pipeline is done so as to make it suitable for the traffic. The contractor shall provide direction when the pipeline is to be laid along the road as required and shall maintain the diversion or any part of it, without any extra cost. At all road crossings, the pipe shall be laid below the crest of road.

Mode of Measurement and Payment

Measurement shall be paid on Cum basis as per payment schedule.

Item No.3

Providing and supplying ISI mark CI D/F Sluice Valves as per IS:14846 (Latest Edition) of following class and diameter including all taxes, insurance, transportation, freight charges, octroi, inspection charges, loading, unloading, conveyance to departmental stores, stacking etc. complete.A)

Sluice Valve with ISI Mark Only.

PN-1.6 With hand/wheel cap operated (Alt-1 type long body)

500 mm Dia

450 mm Dia

Design Features

Sluice valve shall conform to IS 14846 (ISI Marked). Except pump house, these valves are to be installed in valve chamber. All valves of pump house and rising mains shall be non-rising stem type.

The valves shall be free from sharp projections, which are likely to catch and hold stringy materials. Valves shall close with clockwise rotation of the hand wheel. The direction of closing and opening shall be marked on the hand wheel.

Necessary joining materials viz. bolts, nuts, washers, packing etc. shall be provided by the contractor at his cost. The valves shall be fixed so as to have axis perfectly horizontal. If required the contractor shall also carry out drilling of holes of appropriate diameter in flanges in required numbers. A hand wheel shall be provided for emergency operation. The hand wheel drive shall be mechanically independent.

The valve design shall take care of the pressure drop across the valve disc in case of partial opening of the valve and shall take care of the erosion and cavitation effect on the body and disc during such operation. Valve(s) subjected to back pressure shall have the valve seat, disc and the operator suitably designed to ensure trouble-free operation. The shaft diameter shall take into consideration, the maximum torque required for the valve operation, the maximum differential pressure across the valve disc when the valve is closed and the shock load due to accidental closure of the valve disc. The disc shall be designed for maximum differential pressure across the valve as well as the shock load due to accidental closure of the valve. Disc design shall offer minimum head loss. Disc shall also offer minimum resistance to flow Disc shape shall be contoured.

Valve seats shall be of a design that permits removal and replacement at site and shall be securely clamped on the body or disc of the valve. Seat material shall be suitable for the operating conditions and handling fluid and may be suitably reinforced, if required. The seat design shall permit easy removal for replacement purposes without the need for removing the valve from the line. No deposited or welded seat rings permitted. The valve bearings shall be of 'self-lubricated' type and shall not have any harmful effect due to handling fluid. Adjustable thrust bearing(s) shall be provided to hold the valve disc securely in the center of the valve seat. Each Sluice Valve shall be provided with a hand wheel for manual operation. For the Valves located at inaccessible position, it shall be provided with extension spindle and floor stand or hand lever / round chain to facilitate manual operation.

Painting

Each valve shall be drained, cleaned, prepared and suitable protected with 2 coats of red oxide and then black bituminous paint for minimum of 150 micron DFT on surfaces before dispatch.

Mode of Measurement and Payment

Measurement shall be paid on No. basis as per payment schedule.

Item No.4

Lowering, laying and jointing in position following C. I./D/F Reflux valves, Butterfly valves, Sluice valves and Air valves including cost of all labour, jointing material, including nut bolts and giving satisfactory hydraulic testing, etc. complete.

Sluice Valve with ISI Mark Only.

PN-1.6 With hand/wheel cap operated (Alt-1 type long body)

500 mm Dia

450 mm Dia

1.0 Lowering, Laying and Jointing of Sluice valve

- (i) Cast iron double flanged sluice valve/butterfly valves with two tail pieces suitable to pipe shall be supplied by the board and they shall be carted by the contractor at his own cost from the departmental store or any other store as directed. The rate shall include loading, unloading and stacking at site.
- (ii) The sluice valve/butterfly valves and tail pieces shall be examined before laying for cracks and other flows. They shall be undamaged in all respect.
- (iii) The sluice valves/butterfly valves shall be operated before laying.
- (iv) All grits and foreign materials shall be removed from the inside of the valves before placing.
- (v) All the four faces shall be thoroughly cleaned and coated with a thin layer of mineral grease.
- (vi) The tightening of gland shall be checked with a pair of inside-calipers. Clearance between the top of stuffing box and the underside of the gland shall be uniform all the sides.

2.0 JOINTING MATERIAL

- 2.1 The contractor shall provide all necessary jointing materials such as nuts bolts, rubber packing white zinc jute lead wool etc.
- 1.2 All tools and plant required for installation of sluice valve shall be provided by the contractor.
- 2.3 All jointing materials shall be not approved from the engineer-in-charge before us
- 2.4 The nut and bolts shall conform to Item No MSP-19 of specification of materials.
- 2.5 The rubber packing shall confirm all specifications as narrated in Item No MSP-20 of specifications of materials.

3.0 INSTALLATION

- 3.1 The sluice valve/butterfly valve shall be lowered in to the trench carefully, so that no part is damaged during lowering operation.
- 3.2 If necessary, tail pieces shall be fitted with sluice valve first outside the trench and then lowered in to the trench.
- 3.3 The rubber packing shall be three ply and of approved thickness. The packing shall be of full diameter of the flange with necessary holes and the sluice/butterfly valve bore. It shall be even at both the inner and outer edges.
- 3.4 The flange faces thoroughly greased.
- 3.5 If flange faces are not free, the contractor shall use thin fibers of lead wool.
- 3.6 After placing the packing, nuts and bolts shall be inserted and tightened to make the joint.
- 3.7 The valve shall be tightly closed when being installed to prevent any foreign materials from getting in between the working parts of the valve.
- 3.8 Each flange bolt shall be tightened a little at a time taking care to tighten diametrically opposite bolts alternatively.
- 3.9 The sluice valve/butterfly valve shall be installed in such a way that its spindle shall remain in truly vertical position.
- 3.10 The other end of tail piece shall be fitted with pipes so that continuous lines can work.
- 3.11 Extra excavation required for facility of lowering and fixing sluice valve shall not be paid for.

4.0 TESTING

- 4.1 The joints sluice valve/butterfly valve shall withstand the test pressure of pipelines.
- 4.2 Defects noticed during test and operation of sluice valve shall be rectified by the contractor at his own cost without any extra claim to the entire satisfaction of the Engineer-in-charge.

Mode of Measurement and Payment

Measurement shall be paid on No. basis as per payment schedule.

Item No.5

Lowering, laying, fixing and jointing PVC/uPVC/cPVC pipes and specials of following class and diameter including cost of conveyance from stores to site of works including cost of labour, material, cement solvent, giving satisfactory hydraulic testing as per ISI code.

315 mm dia PVC pipe, 6 Kg/Cm²

110 mm dia PVC pipe, 6 Kg/Cm²

- 1) The excavation for trenches shall be done before laying of the pipes as per required depth and width so that adequate space can be made available for joint.
- 2) The pipes & joints shall be procured, supplied by the Contractor at work site at his own cost. Every care shall be taken in carting them to site. During transportation any damage shall be occurring to pipes for fittings the replacement of pipes given by the contractor at his own cost.
- 3) Before laying the pipes it shall be brushed throughout length so that the dust and soil can be removed.
- 4) Reducer bends tees, and adopter etc. to be supplied by the contractor as per requirement.
- 5) All the specials such as bends, tees, reducer, etc. shall be fixed as per instruction of engineer-in-charge in the pipeline.
- 6) The pipe shall be hydraulically tested during the testing no leakage shall be observed. If, leakage observed, it shall be set rightly by the contractor at his own cost as per the instruction of engineer-in-charge. The payment shall be as per payment schedule.

PVC Specials

- 1) Specials as per site requirement shall be supplied by the contractor. The specials should be as per standard and shall be got approved by the Engineer in charge before being used. The specials should be perfectly in working condition and having necessary threads holes etc. as per standard.
- 2) PVC specials should be as per IS standard specification and should be price make. All the specials should be suitable for PVC pipes for which it is being used.

Mode of Measurement and Payment

Measurement shall be paid on RMT basis as per payment schedule.

Item No. 6

Lowering, laying, Jointing & welding in position to correct line & level M.S. Pipe with outer gunniting & inside lining/Epoxy painting on pedestal or chairs upon prepared formation or prepared bedding in trenches the rates include conveyance from store to site of work loading, unloading, joint plastering, hydrotesting etc.complete.

4 to 7 mm thick 273.10 mm dia

The item includes following operations.

- i) Lowering laying pipes and specials in trenches.
- ii) Welding of pipes and specials as per IS. 5822 –1994.
- iii) Testing of welding joint as specified in the IS-5822 –1994 para 6.2
- iv) Hydraulic testing of pipes.

M.S. pipe shall be lowered, laid and jointed by welding including preparation of ends wherever required, grinding as per relevant I.S. Code of welding, testing etc. comp. with hydraulic testing comp. As per IS-5822 – 1994.

SPECIFICATION FOR WELDING:

These specifications cover shop welding as well as site welding for requirement of M.S. pipe in particular length and M.S. SPECIALS following types of joints are considered for connecting the two pipes or pipe and specials.

1. Fillet weld with swaging of one end of pipe.

OR

1. Butt weld without swaging of one end of pipe.

WELDING UNDER RAIN AND STRONG WIND

If welding is to be done during rain or strong wind, suitable protection shall be provided for the parts to be welded and the welder, pre heating of electrodes shall be done so as to remove any moisture. Where this is not practicable, no welding shall be done on piping under such condition.

All the type of bends, scour tees, air valve, tail pieces of valves and water meters etc. shall be fabricated as per standard practice from M.S. Pipe to be supplied by contractor. The contractor shall have to provide M.S. pipe pieces and 18 to 20 mm thick flanges of required diameter from branch of tees, reducer, enlarger etc. the no extra payment for specials made and same shall be paid on meter basis in item No. 1 supply of M.S. pipe, fillet or butt weld as may be required shall do joints holes of appropriate dia shall be drilled in flanges of specials at appropriate spacing to facilitate jointing sluice valve, water meter, Air valve and other type of valves.

The following codes are applicable for welding.

IS: 814 code for covered electrode for metal Arc welding for mild steel.

IS; 1683-1995 Mechanical testing of metal tensile testing.

IS; 3600 codes of Method of testing fusion welded joints and weld metal in steel.

ELECTRODES:

The contractor shall use preferably Advance or like on over code S.S. Green (Blue) or other electrode as approved by Engineer in charge depending upon the thickness of the plate and type of joint. They shall used standard current and Arc voltage required for the machine in use as per manufacturer's direction. Welding electrodes shall be confirmed to test procedure of IS: 814. The contractor shall submit manufacturer's test certificate for each batch of electrode use by him Electrodes shall be stored unopened in original containers. Electrodes when used shall be free of rust, oil, grease and all other matter, which could be harmful for the good quality of welding.

WELDING PROCESS:

All welding shall be done by manual or automatic shielded arc welding process. Welding shall be done so that there shall be through fusion and complete penetration. Sealing runs in the inside shall be done manually. The joints for seems and circular welding shall be square but as per standard practice as per of IS: 816 shall be accepted.

END PREPARATION:

Ends to be welded will be preferably made by machining, however, preparation of ends may be made by flame cutting, provided all grooves and irregularities are ground off and all the oxidation is removed.

CLEANING:

The ends to be welded shall be properly cleaned. All paint, oil grease, rust and oxide as well as all earth, sand or any other material sticking which could be harmful to the welding should be removed. Ends shall be totally dry while welding. No dirt or debris will be permitted in the pipeline. Prior to alignment the insides of each joint shall be adequately scrapped by approved means to the satisfaction of the Engineer in charge.

ALIGNMENT AND SPACING:

Pipes to be welded shall be aligned and fitted with external line up clamp and spaced in a suitable manner, so as to holds ends during welding at a distance to ensure full penetration. Root opening shall not be more than as specified. Internal off set shall not exceed 1.5 mm. The pipe pieces to be butt shall be coupled by means of pipe coupler or by yokes or bridge,” C” clamps. Owner’s inspector may check & approve the joints fit-up and alignment prior to the commencement of welding.

WELDING TECHNIQUE:**ROOT PASS:****FOR BUTT JOINTS:**

The maximum electrode size shall be 3.15 mm (10 SWG) and the electrode holder shall be connected, having due regard for the polarity requirement of the electrode approved for the use for pipe in horizontal position. Upward technique shall be used for recommended values of current.

The root pass of butt joints, regardless of the technique used, shall be such as to achieve full penetration, however, projection of weld metal in to the pipe bore shall not exceed more than 5 mm Root grooves and defective restart of the welding shall be carefully avoided. For pipes having dia greater than 500 MM all circumference joint shall be welded on both sides i.e. outside and inside.

At each interruption of welding and on completion of each run craters, weld irregularities and slag shall be removed by grinding or chiseling. After the welding is started and until the joints has been completed displacement, shocks, vibration and stresses shall be avoided in order to prevent cracks or breaks in the weld.

FOR FILLET WELDS:

The maximum electrode size shall be 4 MM (8 SWG) on completion of the root pass, any visual defect or irregularity shall be ground off to avoid defects or irregularities in next pass.

JOINT COMPLETION:

Electrode size of more than 8 SWG (4 MM) shall not be allowed for filling of the weld upward technique shall be generally be used for pipe in horizontal and vertical position welding. At each interruption of the welding and after each run of welding is completed, chipping and slag removal shall be done. When the welding is completed, butt joints shall have a cover pass. It shall be slightly convex and fuse in to the surface of the base metal in such a manner as to have a gradual notch free finish and good fusion at the joint edges. Welds shall have a regular appearance and shall be free from defects. Welders Number shall be stamped alongside each weld whenever required by the Engineer in charge/consulting Engineer.

WELDING EQUIPMENT, TOOLS AND SUPPLIES:

All welding machine, line up, beveling machines, cutting torches and other equipment, tools and supplies used in the connection of the welding works shall be kept in good working condition. So as to produce sound welds. The welding machines shall have adequate controls for obtaining current adjustment for all pipelines, welding requirements. Ground clamps shall be of such design as to be dependable and should not deflect the pipe and with as large contact area as is practicable.

PREPARATION OF PIPE FACE FOR WELDING:

Before aligning, assembling and welding pipe faces shall be cleaned by scrapping by wire brushes or by other method approved by Engineer in charge. The corrects of shape and bevel edge will be checked with templates and required corrections carried out before welding.

WELDED JOINTS:

As required in the welding work following points shall be observed. The contractor shall use the standard electrode depending on thickness of the plate and type of joints. They shall also use standard current and voltage required for the machine in use as per the direction of the Engineer in charge. Welding electrodes shall confirm to IAS 814 of Indian or equivalent foreign make of required quality approved by Engineer in charge shall be used wherever possible.

GAS CUTTING:

Gas cutting if required for preparing on site distance pieces, straps etc. and cutting out holes in the pipe line shall have to be carried out by the contractor at his own cost. After cutting the edges shall be made smooth and even by using electrical or pneumatic grinder so as to remove all inequalities. Care shall be taken to see that the shape of the materials cut does not defect in any way at the time of cutting.

Mode of Measurement and Payment

Measurement shall be paid on RMT basis as per payment schedule.

Item No. 7**MS specials****MS Specials Plain & Socket Ends****Above 300mm Dia****1.0 GENERAL**

1.1 M.S. specials shall confirm to IS 7322-1974 or latest I.S.S for steel cylinder specials standards applies to specials for use in distribution system of water supply project and in sewer lines and irrigation work.

1.2 The details given below briefly cover the requirements of materials design, dimension and tests for specials.

1.3 The specification covers specials having

- (a) Spigot and socket ends.
- (b) Plain ends or slipin type and suitable for field welding.
- (c) Flanged ends for connection with valves and accessories.

2.0 CLASSIFICATION

2.1 Steel cylinder specials shall have the following classifications.

CLASS	TEST PRESSURE
1,2,3	15 KG / CM ²
4,5	25 KG / CM ²
SPECIAL CASE	25 KG / CM ²

As a general guide the corresponding working pressure for such specials shall be taken as 50 % and 67 % of the above valves for pumping main and gravity respectively.

3.0 DIMENSIONS**3.1 LENGTH OF SPECIALS**

The essential dimensions for bends, tees, scour tee and flanged details, shall be as indicated in I.S. 7, 1332-1974, or its latest revision.

4.0 MANUFACTURE

4.1 Steel core: The steel core shall be formed by shaping and welding together steel plates of specified thickness. Filter lap welding or butt welding may be adopted for all longitudinal and circumferential welds.

Mode of Measurement and Payment

Measurement shall be paid on Kg. basis as per payment schedule.

Item No. 8**Gas Cutting of MS Pipe/Plates**

Gas cutting (Either square cut or V cul) pipes, plates etc. including all costs for the following thickness. Above 5 mm up to 10 mm

GAS CUTTING:

Gas cutting if required for preparing in site distance pieces, straps etc. and cutting out holes in the pipe line shall have to be carried out by the contractor at his own cost. After cutting the edges shall be made smooth and even by using electrical or pneumatic grinder so as to remove all inequalities. Care shall be taken to see that the shape of the material cut does not defect in any way at the time of cutting.

The rate shall include the welding equipments, tools and plant, welding machine and required materials for gas cutting work etc. complete. And shall be paid on running meter basis as per work done for relevant thickness of plates as shown in schedule-B of the Tender.

Mode of Measurement and Payment

Measurement shall be paid on RMT basis as per payment schedule.

Item No. 9

Dewatering by pumping set of required capacity including temporary platform carting pumping at site and fixing the same in position including all accessories, and fuel and labour etc. complete.

Pump set of Capacity

2 Pump set, 20 HP Capacity, 24 Hours

1.0 PUMPING

1.1 Necessary pumping sets required, shall be provided by the contractor for dewatering the excavation trenches, pits, or water pools on work site and for keeping the same dry while laying concrete or masonry of pipeline etc. will sets of the required capacity and in adequate numbers and stages shall be provided for the purpose. The pumping forms the trenches or by a pump installed outside the excavated the incoming water in the foundation trench may not enter into fresh concrete or masonry work and wash out any part of concrete or mortar. No pumping shall be allowed during laying of concrete, masonry or pipeline, unless it is done from a suitable sump, separated from concrete masonry or pipeline by a suitable and effective method. The pumping shall be done in such a way that no damage is caused to the work or adjoining properties by blows, vibrations, subsidence etc.

1.2 The contractor shall make his own arrangement at his cost for necessary labours, materials, pumps engine and/or electric mortar and other suitable machinery and devices required for speedy and satisfactory dewatering.

1.3 In case, the foundation pits or trenches are filled up due to the accumulation of surface flow during the progress of works or during rains or due to other cause all pumping required for dewatering the pits or trenches and removing silt shall be done by the contractor without any extra cost.

1.4 The water from the excavated trenches or pits have to be disposed off satisfactorily, in conformity, with the rules in force and approved by the Engineer. In case of developed area, where sewer or open gutters are provided the water may be disposed off to such nearest sewer or in case of undeveloped area, where sewerage system is not introduced the water may be led to the nearest natural drain or tank through properly dug channels or through pipes.

1.5 The disposal of water shall, in no case, cause hindrance in convenience or nuisance to the inhabitation of the surrounding area or cause damage to the adjoining properties and structures. Municipal or Government rules and regulations, in force, shall be complied with and the rights of private property owner shall be respected regarding disposal of water.

1.6 The contractor shall be responsible for all incident formalities such as obtaining permission of local bodies of concerned authorities/persons to lead the water to the open channels making use of lands and properties, owned by private persons or public bodies, etc. and for the damage caused during the execution of the items.

2.0 THE RATE OF THIS ITEM IS INCLUDING OF THE FOLLOWING

2.1 All labour, materials, pumps plants, equipments, staging scaffolding, shoring, strutting and providing sump etc. and other arrangements necessary for dewatering during excavation, concreting, masonry work, pipe laying testing and construction of other items required dewatering.

2.2 Dewatering the trenches, foundation pit, water pools, on work site and keeping the same in dry conditions, during the progress of work, mentioned above.

2.3 Dewatering till all the items, requiring dewatering are fully completed. This shall also include the time required for passing a foundation laying, jointing and testing pipeline and taking the measurement of all items requiring dewatering.

2.4 Removing stuff of any sort, which might find access in to the trenches by blowing, slip or due to any other cause, what so ever from the sides or bottom of foundation or excavation or from elsewhere during after or due to dewatering.

2.5 Leading water to the nearest nalla or open or underground drains, with all the incidental requirements such as obtaining permissions from municipal and other local bodies and private parties paying compensations, if any etc.

2.6 Paying compensation for the injury to the workmen and the public or damage to the adjoining properties and structure during and on account of dewatering and disposal of water.

Mode of Measurement and Payment

Measurement shall be paid on Hp/hr. basis as per payment schedule.

Item No. 10

Welding in all positions with required number runs, for M.S.Pipes internally and/or externally including gauging wherever necessary, fixing appurtenances and other accessories in connection with pipe laying work as per specification.

Welding for Pipe thickness above 7mm

WELDING

The welding work shall be carried out as per general specification of item no of MS pipe welding work except that the welding work shall be of butt joints for plates of various thickness as mentioned in item of schedule B of tender

FOR BUTT JOINTS

The maximum electrode size shall be 3.15 mm (10 SWG) and the electrode holder shall be connected, having due regard for the polarity requirement of the electrode approved for the use for pipe in horizontal position . Upward technique shall be used with the recommended values of current.

The root pass of butt joints, regardless of the technique used, shall be such as to achieve full penetration. However, projection of weld metal in to pipe bore shall not exceed more than 5 mm. Root grooves and defective restart of the welding shall be carefully avoided for pipe having dia greater than 500 mm All circumferential joint. The welding work shall be carried out on both sides of plates.

At each interruption of welding and on completion of each run, spatter, weld irregularities and slag shall be removed by grinding or chiseling. After the welding is started and until the joint has been completed displacements, shocks, vibration or stresses shall be avoided in order to prevent cracks or breaks in the weld.

The rate shall include the welding equipments, tools and plant, welding machine and required materials for welding for welding work etc. complete. And shall be paid on running meter basis as per work done for relevant thickness of plates as shown in schedule B of the Tender

Mode of Measurement and Payment

Measurement shall be paid on RMT basis as per payment schedule.

Item No. 11

Hiring of crane including driver & diesel

16 tone

- Hiring crane for handling material as well as removing, fixing & Carting work.
- Crane should be taken while handling material. Take appropriate precautions while handling material. In case of any injuries or damage, the Agency shall be responsible for the same.
- Removing & Fixing Work Can be Carried out as per Engineer in charge Instruction.
- Necessary carting shall be done by agency without any extra cost to site of work.

Mode of Measurement and Payment

Measurement shall be paid on Day basis as per payment schedule.

Item No. 12

Refilling the pipeline trenches incl. ramming, watering, consolidating desposal of surplus stuff as directed within a radius of 3 km.

On completion of the pipe laying operations in any section, for a length of about 100m and while further work is still in progress, refilling of trenches shall be started by the Contractor with a view of restricting the length of open trenches. Pipe laying shall closely follow the progress of Trench Excavation and the Contractor shall not permit unreasonably excessive lengths of trench excavation to remain open while awaiting testing of the pipeline. If the Engineer considers that the Contractor is not complying with any of the foregoing requirements, he may prohibit further trench excavation until he is satisfied with the progress of laying and testing of pipes and refilling of trenches. The excavated material nearest to the trench shall be used filling. Care shall be taken during backfilling, not to injure or disturb the pipes, joints or coating. Filling shall be carried out simultaneously on both sides of the pipes so that unequal pressure does not occur. Walking or working on the completed pipeline unless the trench has been filled to height of at least 30cm over the top of the pipe except as may be necessary for tamping etc., during backfilling work.

The remaining portion of the trench may be filled in with a mixture of hard and soft material free from boulders and clods of earth larger than 150 mm in size if sufficient quantity of good earth and murrum are not available. The trench shall be refilled so as to build up to the original ground level, keeping due allowance for subsequent settlement likely to take place. The top 300 mm layer or fertile agricultural soil shall be kept aside during excavation and shall be laid in layers near ground level during refilling.

To prevent buckling of pipe shell of diameters 1200 mm and above, pipes shall be strutted from inside while the work of refilling is in progress, for which no separate payment shall be made.

Strutting shall be done by means of strong spiders having at least 6 arms which shall be sufficiently stiff to resist all deformation. Spiders shall be provided at a maximum interval of 2m & shall be welded in such a way that internal coating does not get burnt.

The Engineer shall, at all times, have powers to decide which portion of the excavated materials shall be for filling and in which portion of the site and in what manner it shall be so used.

If any material remains as surplus it shall be disposed of as directed by the Engineer, which includes loading, unloading, transporting and spreading as directed within all lead. If the Contractor fails to remove the earth from site within 7 days after the period specified in a written notice, the Engineer may arrange to carry out such work at the Contractor's risk and cost or may impose such fine for such omission as he may deem fit. Particular care shall be taken to keep the trench dry during the entire refilling operation.

If suitable material for refilling is not available for excavation the Contractor shall bring earth, murrum of approved quality as directed by the Engineer.

No mechanical plant other than approved compacting equipment shall run over or operate within the trench until backfilling has reached its final level or the approval of the Engineer has been obtained.

Subsidence in filling in : Should any subsidence take place either in the filling of the trenches or near about it during the completion of the Contract Works, the Contractor shall make good the same at his own cost or the Engineer may without notice to the Contractor, make good the same in any way and with any material that he may think proper, at the expense of the Contractor. The Engineer may also, if he anticipates occurrence of any subsidence, employ persons to give him timely notice of the necessity of making good the same, and the expenses on this account shall be charged to the Contractor.

Mode of Measurement and Payment

Measurement shall be paid on Cum. basis as per payment schedule.

Item No. 13

Construction of RCC valve chambers of required size for sluice valves, butterfly valves etc. as per detailed drawing and specification and as per instruction of Engineer -in-charge. Walls of the chambers should constructed in C.C. 1:2:4 and P.C.C. should be done in 1:3:6 Rate also includes RCC top cover in C.C. 1:2:4 incl.CI/MS Steps size of chamber 1.30 X 1.30 m and 1 Mt. deep with precast slab in two parts.15mm

For 1mtr Extra Depth

Aggregate

The course aggregate and the fine aggregate for the concrete shall be hard, clean, tough & durable and shall be free from all deleterious matter such as dust, lump of clay, soft & flaky pieces, shale alkali, organic matter.

The materials shall be got approved by the Engineer-In-Charge or his agent.

Proportion

The proportion of course and fine aggregate shall be that one part of cement, three parts of fine aggregates & Six parts of course aggregates by volume. The proportion of cement & water of the water cement ratio shall be as specified, having regard to the nature of work & strength to be developed.

Mixing

Whether the concrete is mixed by hand or in a mechanical mixture. It shall be thoroughly mixed and the concrete placed in its final position with the minimum of delay. Every pieces of aggregate shall be uniformly coated by cement paste.

Laying & Consolidation

The concrete must be laid gently (Not dumped) from height so as not to pent segregation of aggregates .after placing it shall be well compacted by tampl and/or mortar to cream up. In no case ramming shall be prolonged after the cement has begun to take its initial set. In no case, more water is added in order to reduce the work of completion.

Curing.

As soon as the concrete has set sufficiently the surface shall be protected from rapid drying by being covered with wet sand, wet gunny bags or where possible by foaming shallow pools of water on the top. The setting shall be continued for at least 10 days & usually two to three weeks.

Workmanship

Water stops shall be cleaned before placing them in position. Oil or grease shall be removed thoroughly using water and suitable detergents. Water stops shall be procured in long lengths as manufactured to avoid joints as far as possible. Standard L or T type of intersection pieces shall be procured for use depending on their requirement. Any non-standard junctions shall be made by cutting the pieces to profile for jointing. Lapping of water stops shall not be permitted. All jointing shall be of fusion welded type as per manufacturer's instructions. Water stops shall be placed at the correct location/level and suitably supported at intervals with the reinforcement to ensure that it does not deviate from its intended position during concreting and vibrating. Care shall also be taken to ensure that no honey-combing occurs because of the serrations/end grips, by placing concrete with smaller size aggregates in this region. Projecting portions of the water stops embedded in concrete shall be thoroughly cleaned of all mortar/ concrete coating before resuming further concreting operations. The projecting water stop shall also be suitably supported at intervals with the reinforcement to maintain its intended position during concreting so as to ensure that it does not bend leading to formation of pockets. In addition, smaller size aggregates shall be used for concreting in this region also.

Precast Reinforced Cement Concrete Slab with key holes in two parts 15 mm

Precast Reinforced cement concrete top slab shall be casted in pieces for covering the chamber. Necessary keyholes shall be provided at appropriate place for operation of spindle of valve. The minimum thickness of slab shall be 100 mm and same shall be casted in C.C. of M20 grade. The required reinforcement shall be provided. The top & bottom surface of precast slab shall be finished with cement mortar 1:3.

Extra depth of valve chamber. beyond 1.00 mt. depth.

The work shall be measured and paid for additional meter depth of chamber beyond 1.0 m depth. The work in general shall be carried out as per instructions & approval of engineer in charge.

The concrete shall consist of one part of ordinary Portland cement conforming to IS 269-1976 Three parts of well graded angular best quality river sand free of dust and organic matter and size 1 mm. To 3 mm and Six parts of approved quality black trap kapachi of size 12 mm to 25 mm. All C.C. work shall be carried out as per I.S.S. regulations and as per standing practice and ordered prevailing in PWD. All the items are to be carried out as per details supplied and as required and directed by the engineer in charge or his authorized agencies. The work will have to be strictly as per approved design and as directed by the engineer in charge.

Mode of Measurement and Payment

Measurement shall be paid on No. basis as per payment schedule.

Item No. 14

Drilling of 600 mm dia Horizontal borehole for watermain pipeline crossing under the road incl in all strata with required length incl fixing of 500mm dia MS/RCC casing pipe with pushing etc complete Various size of pipe for 273.1 to 355.6 mm dia watermain.

Without Water Main & With RCC Casing Pipe

At railways or Road, public highways, at such other crossings as are shown in the construction drawings issued by the company the pipeline shall be installed in MS casing pipes conforming to the specifications given herein.

The casing pipes shall be installed in accordance with the details given in drawing and the casing, bushing and insulators, etc., shall be installed on the carrier pipe as detailed in drawings. Casing pipe size shall be about 100 mm (Hundred millimeters) larger than the carrier pipe to facilitate the insertion of the later without disturbing the casing pipe and to provide adequate drainage, Casing shall be installed with even bearing throughout its length and shall slope towards one end, as specified or desired by the engineer-in-charge. The ends of the casing shall be sealed to outside of carrier pipe in accordance with the details given in drawing.

Before installation, holes for installing vent pipes shall be cut and burrs if any shall be removed. The welding of both carrier pipe and casing pipe shall be done in accordance with the welding specifications, given herein. Before installing the casing pipe, it should be cleaned of all internal obstructions and during installation care should be taken to keep the inside clean.

The section of carrier pipe to be placed in any casing shall be closed at each end, hydrostatically tested preferably with dead weight tester for at least two hours. Only on successful completion of this test, shall the carrier pipe section be inserted in the casing pipe. The installation of casing may open cut as circumstances may permit or require as directed by the engineer-in-charge.

The installation of casing in bended section of the carrier pipe shall be performed by meter bends of the casing pipe provided that the length of each meter cut out of casing pipe shall be such as to provide a clearance of at least 1-1/2" between the inside of the casing pipe and the outside of the coated carrier pipe. Excavation for casing installation shall be immediately backfilled at the completion of the work with suitable solid matter and packed thoroughly to prevent seepage of water into the excavation.

ROAD, RAILWAY AND IRRIGATION CANAL CROSSINGS:

At road, canal and railway crossings the work shall be performed to the specifications of local authorities or such public bodies as may be in charge (S) of roads, railways and canals to be crossed.

In case, however the minimum requirements of the governing agencies are less than those set out in the drawing or the specifications given herein, then the requirements given in the drawings and the specifications given for encased line shall be followed.

Whereas the casing pipe in the case of encased line to be laid normal by boring, tunneling, engineer-in-charge may at his discretion permit open-cuts to be made for the installation of casing provided, however, that the TENDERER shall procure the necessary permit / license for the same from competent authority. At locations wherein the open cut methods are permitted, the TENDERER shall pass the carrier pipe through the casing located in the trench after the approval of the engineer-in-charge in writing and care shall be exercised to avoid damage to pipe coating and wrapping during this operation. The TENDERER shall produce a certificate in writing from concerned authorities for its satisfactory restoration and payment therefore.

At all crossings the carrier pipe shall be laid straight without bends so that if necessary the pipe at a later date may be replaced without cutting the casing. The carrier pipe shall extend at least 2 meters beyond the end of casing pipe at either end.

At railway crossings the TENDERER shall eliminate unnecessary bending of pipe to conform to the contour of ground by gradually deepening the ditch at such approaches as directed by the engineer-in-charge. Where the installation of the casing has been made by open cut TENDERER shall install suitable temporary bridge work ensuring the safety of the traffic aids and safeguards for protection of the public safety, or he shall provide suitable diversions as desired by the engineer-in-charge.

At all railways pipeline crossings shall be bored with horizontal boring machine.

The method of carrying out a cased crossing by boring for various crossings on this pipeline route shall be jointly inspected by the representative of the COMPANY and TENDERER for each category of work prior to commencement of actual work.

Pipeline under railway track and irrigation canal an applicable portion of the right-of-way shall be encased in accordance with the specification. This item of work shall include, necessary clearing and grading required therefore, trenching to the depths and widths required, welding of casing and carrier pipes, testing, lowering in, installation of vent assemblies, end seals, insulator and all other fittings that may be required, backfilling, clean up, complete restoration to the original condition and further strengthening and protective works as may be required. The work shall be carried out in accordance with the drawings and as directed

by the engineer-in-charge. For various operations mentioned above, the specifications pertaining to these operations shall apply in addition to the specifications given herein.

The TENDERER shall be permitted to use William Sons type Neoprene seals in place of concrete end seals for the crossings. The item shall be procured by the TENDERER himself as per the provisions under the appropriate head of work in case TENDERER so desires. The representative of the COMPANY may also be associated to determine the quality of the material and its delivery schedule from the open market. However, the particular work defined under the proper head shall not be delayed on account of non-availability of Neoprene end seals. In such case, concrete seals may be provided.

On both ends of pushing concrete supports are to be provided as per direction of engineer-in-charge.

Mode of Measurement and Payment

Measurement shall be paid on RMT basis as per payment schedule.

Item No. 15

Providing C.C.M.: 100 for encasing pipes using trap metal size 12 mm to 50 mm incl. form work curing consolidation etc. complete for various location on pipe line

(A) Using trap metal 40 mm size

The concrete shall consist of one part of ordinary Portland cement conforming to IS 269-1976 Three parts of well graded angular best quality river sand free of dust and organic matter and size 1 mm. To 3 mm and Six parts of approved quality black trap kapachi of size 12 mm to 40 mm. All C.C. work shall be carried out as per I.S.S. regulations and as per standing practice and ordered prevailing in PWD. All the items are to be carried out as per details supplied and as required and directed by the engineer in charge or his authorized agencies. The work will have to be strictly as per approved design and as directed by the engineer in charge.

Aggregate

The course aggregate and the fine aggregate for the concrete shall be hard, clean, tough & durable and shall be free from all deleterious matter such as dust, lump of clay, soft & flaky pieces, shale alkali, organic matter.

The materials shall be got approved by the Engineer-In-Charge or his agent.

Proportion

The proportion of course and fine aggregate shall be that one part of cement, three parts of fine aggregates & Six parts of course aggregates by volume. The proportion of cement & water of the water cement ratio shall be as specified, having regard to the nature of work & strength to be developed.

Mixing

Whether the concrete is mixed by hand or in a mechanical mixture. It shall be thoroughly mixed and the concrete placed in its final position with the minimum of delay. Every piece of aggregate shall be uniformly coated by cement paste.

Laying & Consolidation

The concrete must be laid gently (Not dumped) from height so as not to prevent segregation of aggregates. After placing it shall be well compacted by tamper and/or mortar to cream up. In no case ramming shall be prolonged after the cement has begun to take its initial set. In no case, more water is added in order to reduce the work of completion.

Curing.

As soon as the concrete has set sufficiently the surface shall be protected from rapid drying by being covered with wet sand, wet gunny bags or where possible by forming shallow pools of water on the top. The setting shall be continued for at least 10 days & usually two to three weeks.

Workmanship

Water stops shall be cleaned before placing them in position. Oil or grease shall be removed thoroughly using water and suitable detergents. Water stops shall be procured in long lengths as manufactured to avoid joints as far as possible. Standard L or T type of intersection pieces shall be procured for use depending on their requirement. Any non-standard junctions shall be made by cutting the pieces to profile for jointing. Lapping of

water stops shall not be permitted. All jointing shall be of fusion welded type as per manufacturer's instructions. Water stops shall be placed at the correct location/level and suitably supported at intervals with the reinforcement to ensure that it does not deviate from its intended position during concreting and vibrating. Care shall also be taken to ensure that no honey-combing occurs because of the serrations/end grips, by placing concrete with smaller size aggregates in this region. Projecting portions of the water stops embedded in concrete shall be thoroughly cleaned of all mortar/ concrete coating before resuming further concreting operations. The projecting water stop shall also be suitably supported at intervals with the reinforcement to maintain its intended position during concreting so as to ensure that it does not bend leading to formation of pockets. In addition, smaller size aggregates shall be used for concreting in this region also.

Mode of Measurement and Payment

Measurement shall be paid on Cum. basis as per payment schedule.

Item No.16

Labour charges for repairing of leakage in PVC pipeline of folling dia meter at different places including necessary excavation manually or by mechanise excavation, dewatering removing of mud, cleaning of pipe and leakage portion, cutting the pipeline & removing piece of pipe from trench with inlusive of mechanical devices JCB, Hydra/Crain if necessary & labours required with providing material such couplers, solution etc. comp. (incl. all material but Exclu. cost of pipe)

315 mm Dia

- The work shall be carried out as per Item Description & instruction of Engineer in charge.
- No extra Payment paid for Dewatering, Excavation, Mud Removing, JCB, Hydra & Crane etc.
- No damage shall be occurred to existing line/structure.
- If any damage occurred, it should be rectified by the contractor at his own cost.
- The connection work shall be put into commission into its original condition after completion of the main work.

The payment shall be made on number basis as per price bid.

Sign of Contractor

Executive Engineer
P.H. Dharoi Project Division
MEHSANA