

## ***ITEM WISE SPECIFICATIONS***

**Name of Work:- “Shifting Alignment of Existing 350 mm dia DI K-7 Pipeline from Ranpur offtake to Kumbhardi WTP Damaged due to SSNNL Work. Ta.Dharnidhar Dist: Vav-Tharad Under: M&R to BK-4 Ph-2B RWSS-2026-27**

### **Item wise Specification**

**Item 1.0 Manufacture, Supply & Delivery of Ductile Iron Flange socket spigot bends, tees, reducers or any other specials as per BS-EN-545/1995 Class-A series K12 suitable for use with D.I.Pipes manufactured as per IS:8329/1994 delivery of specials is to be made to GWSSB store or site of works any where in Gujarat including all taxes, liading, unloading, carting, stacking, insurance, inspection charges, octroi etc. complete. with external bitumen & zinc coating & internal cement mortar lining**

#### **Materials and Manufacturing**

The fittings shall be manufactured using ductile iron having the required mechanical and metallurgical properties. The manufacturing process shall ensure sound castings free from cracks, blowholes, shrinkage cavities, honeycombing, inclusions, warping, distortion or any other manufacturing defects.

All dimensions, tolerances, flange drilling, flange thickness, bolt circle diameter, socket dimensions and laying lengths shall conform to the requirements of BS EN 545 and relevant standards applicable to D.I. fittings.

The fittings shall include, but not be limited to:

- Flanged bends of various angles.
- Socket-spigot bends.
- Double socket bends.
- Flanged tees.
- Socket tees.
- Double socket tees.
- Reducers and taper fittings.
- Collars and couplings.
- Puddle flanges.
- Blank flanges.
- Adaptors and dismantling joints, where specified.
- Any other special fitting required for the pipeline system.

#### **Internal Lining**

The internal surface of all fittings shall be provided with factory-applied cement mortar lining conforming to BS EN 545 and relevant standards for potable water applications.

The cement mortar lining shall be dense, smooth, uniform and free from cracks, blisters, peeling or other defects and shall provide protection against corrosion and ensure long service life.

#### **External Coating**

The external surface of all fittings shall be protected with metallic zinc coating and finished with a factory-applied bituminous coating or equivalent approved coating system conforming to BS EN 545 requirements.

The protective coating shall be continuous, uniform and free from pinholes, holidays, peeling or mechanical damage and shall provide adequate protection against atmospheric and soil corrosion.

#### **Inspection and Testing**

All fittings shall be subjected to inspection and testing at the manufacturer's works in accordance with BS EN 545, IS 8329 and approved quality assurance procedures.

The manufacturer shall carry out all routine tests, dimensional checks, visual inspections, coating inspections and hydrostatic tests as required by the applicable standards.

The contractor shall provide all facilities required for inspection by the Engineer-in-Charge or authorized representative without any additional cost.

The cost of all testing, inspection, quality control, certification and documentation shall be deemed to be included in the item rate.

**Marking**

Each fitting shall be clearly and permanently marked with:

- Manufacturer's name or trademark.
- Nominal diameter.
- Pressure class.
- Casting identification number.
- Year of manufacture.
- Standard specification reference.
- Any other marking required under the applicable standards.

**Transportation and Delivery**

The item shall include safe handling, loading, transportation, unloading, stacking and delivery of the D.I. specials at GWSSB stores, project stores, departmental depots or work sites located anywhere within the State of Gujarat.

Proper precautions shall be taken during transportation and handling to prevent damage to the fittings, coatings and linings.

Any damaged fittings shall be replaced by the contractor at no additional cost.

**Scope Included in the Item Rate**

The item rate shall include:

1. Manufacture of D.I. specials conforming to BS EN 545 and IS 8329.
2. Supply of all bends, tees, reducers and other specials.
3. Internal cement mortar lining.
4. External zinc coating and bituminous coating.
5. Foundry operations, machining and finishing.
6. Hydrostatic testing and quality control.
7. Inspection and certification.
8. Loading at manufacturer's works.
9. Transportation to GWSSB stores or work sites anywhere in Gujarat.
10. Unloading, stacking and handling at destination.
11. Packing, insurance and transit protection.
12. Octroi, royalties, duties, GST, taxes and levies as applicable.
13. Submission of manufacturer's test certificates and inspection reports.
14. All labour, materials, tools, plants and incidental charges required for complete supply and delivery.

The D.I. specials shall be supplied complete in all respects and shall conform to approved specifications, relevant standards and directions of the Engineer-in-Charge.

**MODE OF MEASUREMENT AND PAYMENT**

Measurement and payment shall be paid on Kg. basis

**Item No.2 Excavation for pipe line trenches incl. all safety provision using site rails and stacking excavated stuff up to a lead of 90 mts. Cleaning the site etc. complete for lifts and strata as specified including dewatering**

**In all sorts of soil and soft murrum****1.0 GENERAL**

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

**2.0 CLEARING OF SITES:**

**2.1** 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.

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

**2.3** 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.

**2.4** 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:**

**3.1** 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.

**3.2** 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.

### **4.0 EXCAVATION**

**4.1** 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 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. 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 changes 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 earth cover over the pipe shall be 1.5 m for HDPE pipe and 1.0 m for all other types of pipe. The minimum width of trench should be 25 CM on each side of the pipe (Except PVC pipeline) the rate includes cost of dewatering, blasting if required and as per detailed specification etc complete.

Width for PVC Pipes shall be 0.60 m.

### **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**

6.1 The trenches shall be strongly fenced and red light signal shall be kept at night and arrangement of watchman to prevent accidents should be done, sufficient care protective measure shall be taken to see that the excavation shall not affect or damage the adjoining structure. The contractor shall be entirely responsible for any injury to life and damage to the properties etc. Necessary protection work such as guide ropes, crossing places, barricades, caution boards etc. shall be provided by the contractor.

7.0 The excavation in all sorts of soil, hard murrum, 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**

8.1 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**

9.1 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 read.

9.2 The contractor shall break the road surface by excavation chiseling to the exact width and length as shown on the drawing or as directed by the Engineer-in-charge.

The excavated stuff shall be deposited in uniform layers to avoid mixing with other kind of materials at non-objectionable place or as directed by the Engineer-in-charge.

## **10.0 MEASURMENT AND PAYMENT**

10.1 The payment of excavation shall not be made separately of this item as pipe line work item is a consolidated item which includes excavation.

10.2 This item of excavation shall include unless and otherwise mentioned.

- (a) Clearing of site.
- (b) Setting out work including all materials and labour.
- (c) Providing and subsequently removing, shoring and strutting outing slopes etc.
- (d) Excavation and removal and staking of all excavated stuff as directed.
- (e) Necessary protection including labour materials equipment etc. to ensure safety and protection against risk or accident.

- (f) Providing facilities for inspection and damage to property if caused during progress of work.
- (g) Compensation for injury to life and damage to property if caused during progress of work.
- (h) Restoring of water supply connections, sewer connections, telephone lines, khal kuva, soak pit etc. if damaged by contractor without extra payment.
- (i) Dewatering of excavated pit trench during the progress of work.
- (j) Clearing the site on completion of works directed by the Engineer.

**ITEM NO.3 Lowering, laying/resing and jointing C.I S&S Spun pipes suitable for Tyton joints / Mortar lined DI pipes of various Classes with CI /MS specials of following diameters in proper position, grade and alignment as directed by Engineer-in-charge including hydraulic testing etc. complete.**

DI K-7 350mm Dia.

**GENERAL:**

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.

The trenches shall be well leveled so that pipes are laid evenly among them. The pipes shall be fixed within two rubber rings to be supplied by department at the place shown in schedule A, if directed by the Engineer-in-charge or mentioned in item of schedule B. The specification for titan joints i.e. Rubber Rings shall be as per details specification material section.

The contractor shall make his own arrangement for obtaining permission for storing & stacking of pipes etc. from land boards whether they are Government, Municipal Local Bodies or Private land owner.

Every pipes before lowering into the trenches shall be got checked and thoroughly cleaned and the beds of the trenches shall be properly graded and leveled as required on the line, without any claim for extra cost whether it is required. The pipe shall be carefully lowered into the trenches with the help of a suitable type of chain pulley blocks, which shall first be approved by the Engineer-in-Charge. Each pipe shall be properly jacked and the spigot perfectly fixed into the socket. No jointing operation shall be started unless the gradients levels are approved by the Engineer-in-Charge or his representatives.

The pipes shall be laid complete in centerline ranged accurately by means of a string attached to both marked center of site rails and no deviation shall be permissible without the permission of Engineer-in-Charge. The pipe shall be laid in reasonably dry trenches and no circumstances on slushy bedding.

The pipes shall be brushed before lowering any laying or remove any soil or dirt etc. that may have accumulated.

The inside socket and outside of the spigot-shall be carefully cleaned. The pipe shall be lowered carefully with socket and toward and the flow of water or up till or as directed and spigot and should be carefully inserted into the socket and the space shall be filled with the joint.

**TESTING OF WATER PIPES:**

After each section of the pipeline has been completed it shall be tested for water tightness before being covered. The contractor shall at his own cost fill up water in pipe line and given

necessary hydraulic test section by section and the pipe line shall stand the pressure which shall stand the pressure which shall exceed the working pressure by (a) 50% of the highest pressure in the section.

(b) 30m whichever is less without showing any leakage or sweating anywhere in the pipes joints specials valves etc. if any defect are found the contractor shall be made good the same at his own cost.

Any leaking joints shall be made good and above test pressure in to be lowered gradually after satisfactory test is & over.

GWSSB will not be able to provide water for testing of the pipelines & water containers of the project. This shall have to be managed by the contractor at his costs and risk.

The hydraulic test shall be given again if considered necessary by the Executive Engineer or his representative to show that no further leakages or sweating is there. The contractor shall have to make necessary arrangements for water testing as well as plugging the opening of pipes etc. as directed without claiming any extra cost. The pipelines shall be kept filled with water for a work lines shall be kept filled with water for a week or till it is situated for testing is done.

If the pipe lines are laid in detached sanctioned & not in continuous length due to any reasons such as non-availability of specials or due to obstacle etc. The contractor shall see that no end of pipes length is kept open-ends are immediately covered up either by suitable blank flange or cap slug or by means of double layer gunny bags clothes tied properly by mild steel wire without any claim for extra-cost.

The rate shall be per meter of pipe line laid including all specials and fitting jointly etc. Cutting and waste shall not be paid separately. The length shall be measured not on the straight line and curves along the center line over the pipe and specials correct up to 1 cm.

**Payment shall be as per Rmt basis**

**Item No. 4 Refilling of pipeline trenches incl. ramming, watering, consolidating disposal of surplus stuff as directed within a radius of 3 km. 1) Refilling As Directed.**

- 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 150mm 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 300mm 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 1200mm 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 maintenance period of 24 months from 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**

The measurement shall be taken per Cum basis or as per Relevant item of Sch-B.

**Item No. 5 Making job connection for old pipes in connecting the pipeline with existing main & inserted of specials incl. cost of excavation, cutting of pipes, dewatering, testing etc. complete incl. all jointing materials etc. complete. (excluding cost of specials pipe & fitting) Job work.**

1. The job work for connecting the pipeline with old existing main and inserted of specials. It shall be carried out as per instruction of Engineer-in-charge.
2. During the job work old existing main shall not be damaged any way; otherwise the contractor shall be rectified without any extra cost.
3. The rate includes excavation, refilling, jointing of pipes, cutting & threading of pipe as and when required jointing materials, specials & testing of pipeline etc.
4. Connection shall be covered with C.C. work without any extra cost.
5. If any tools & plants required for job work; contractor shall bring it.

**Payment shall be made on Number basis of complete item.**



**Item No. 6 Providing and laying cement concrete 1:2:4 (1- Cement : 2 Coarse sand : 4-graded stone aggregates 20 mm nominal size) and curing complete excluding cost of formwork in (A) Foundation and Plinth**

1. The work shall be carried out as per the description of the item and as per the specification laid down in PWD hand book vol. I & II ( Revised ) and as per the instruction of engineer in charge.
2. The proportion of the concrete shall be one part of a approved quality portland cement  
two parts of sand and four parts of coarse aggregate by volume.  
The sand shall be coarse angular sharp free from any impurities such as foreign materials dirt, dust etc.
3. coarse aggregates shall be of black trap stone. It shall be hard angular. It shall be free from any impurities, such as dirt, dust or any foreign materials. The size of the coarse aggregates shall be of 6mm to 20mm size.
4. The cement shall be of approved quality ISI mark Portland cement for RCC work. The make shall be as approved by E.I.C.
5. The ingredient shall be mixed on water tight platform in dry condition and potable water shall be added & water cement ratio is to be maintained as per I.S 450-1980 /
6. It revise Addition in required quantity to achieve desired workability of mix. The mixing shall be done the by machine mixer.
7. The necessary centering and form work shall have to be provided by the contractor without any extra cost. It must be leak proof T & P articles required for the job shall have to be brought by the contractor without any extra cost.
8. The work shall be carried out in such a way as to get the smooth surface without requirement of plaster. During concreting, consolidation shall be done by the using the needle vibrator.
9. The payment shall be made on cu.mt. basis.

**Item No. 7 Transportation of pipe loading & unloading with a crane, Dhanera sub. Dn Store to Kumbhardi Site**

**GENERAL :**

- 1.0 Item covers the transporting & labour charges for loading, unloading & stacking pipes all type and size, cement steel, all hard ware building materials, including the cost for loading, unloading by crane handling only & stacking as directed.

**2.0 MATERIAL & EQUIPMENT & LABOUR**

- 2.1 Material & equipment like Crane or Hydra Machine required for transporting, carting, loading, unloading & stacking of materials shall brought by the contractor at his own cost & risk.
- 2.2 All necessary arrangement for transporting materials from source of supply shall be made by the contractor at his own cost. Trucks, lorries, equipment such as automatic crane etc. shall be required for transportation, carting, loading, unloading & stacking in required quantity made available by the contractor.
- 2.3 All materials shall be protected against damages, loss etc. during transporting from one place to another place.
- 2.4 If any damages occurs at the time of transporting, carting, loading, unloading & stacking to the labours, vehicles, machinery & even other person or any accident while traveling the carting contractor & his staff will be responsible for the same the contractor has to bear all the expenditure for the same.

### 3.0 WORKMANSHIP

- 3.1 Transporting work of material shall be carried out by without damage to material. If material is damage during transportation, necessary recovery shall be made from the bill of contractor.
- 3.2 All materials shall be protected against damages, loss etc. during transporting from one place to another. If any materials found loss or damaged or change in shape by any means, the same shall be not accepted by the department.
- 3.3 Work shall be carried out as per instruction of Engineer-in-charge. Loading, unloading and stacking shall be carried out as per instruction of Engineer-in-charge.

### 4.0 MODE OF MEASUREMENT AND PAYMENT

- 4.1 Rate is for transporting of materials shall be for from source of supply the under office D.E.E., P.H.S.S/Dn., Vav/ Dhanera to Site of works/ Store of as per details of item of tender.
- 4.2 No any extra payment shall be made for excess in K.M. if required to change the route in case of rain or road damaged or any other reason.

Rates shall be paid on unit of Job basis of transporting actual work done from source to target place mention in Schedule: 'B' & rates includes the labour charges for loading, unloading & stacking work carried out as per item of the tender.

#### **Item No.08 Removing of existing pipeline incl removal of specials, valves jointing material including Carting and stacking of removed material from site of work to the department store as excl. excavation and Refilling**

➤ **Removing of Existing pipeline**

- 1) Removing of existing pipeline should be done carefully.
- 2) During removal of existing pipeline agency has keep in mind that the pipeline should not be damage.
- 3) 10 % of damage of existing pipeline is acceptable. And the damaged pipeline section provided by office. Above 10% new pipeline section should be provided by agency.

**Including in to -:** Carefully Removing the existing pipeline, loading onto trucks, transporting to the departmental store (Charda Store), and unloading & neatly stacking as directed by the Engineer-in-Charge. The rate shall include all labour, tools & tackles, loading, unloading, transportation, handling, and all incidental charges required for complete execution of the work.

. The payment shall be made on RMT. basis.

Signature of Contractor

Executive Engineer  
Public Health Works Division  
Deesa