

PROJECT TITLE

**PURCHASE OF ASSORTED SIZES OF CEMENT COATED AND CEMENT LINED SPIRAL WELDED STEEL PIPES**

OWNER

**GENERAL SANTOS CITY WATER DISTRICT**

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**TECHNICAL SPECIFICATIONS**

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**1. GENERAL SCOPE**

This specifies the materials, application, supply and delivery of **Assorted Sizes of Cement Coated and Cement Lined Spiral Welded Steel Pipes** purposely manufactured for conveying water under normal condition with temperature not to exceed 90°F (32°C).

**2. GENERAL REQUIREMENTS**

2.1 Quality Assurance

All manufacturing tolerances must be in accordance to LWUA, AWWA and all applicable standards unless specifically excluded.

2.2 Bidders/Manufacturer Qualification

Bidders who are fully experienced, reputable, qualified in supplying products and shall comply with these specifications as applicable.

Pipes supplied shall be the product of one manufacturer that has not less than five (5) years successful experience manufacturing pipe in the Philippines of the particular type and size indicated. All pipe manufacturing including cylinder production, lining, coating shall be produced by one manufacturer. The pipe manufacturer must have a certified quality assurance program.

**3. PROJECT DELIVERABLES**

**A. CEMENT COATED AND CEMENT LINED**

| Qty. | Unit | Thickness | Description   |
|------|------|-----------|---|
| 298  | pcs  | 4.78mm    | 300mm x 6m Cement Lined / Cement Coated Spiral Welded Steel Pipes |
| 20   | pcs  | 4.78mm    | 200mm x 6m Cement Lined / Cement Coated Spiral Welded Steel Pipes |
| 5    | pcs  | 4.78mm    | 150mm x 6m Cement Lined / Cement Coated Spiral Welded Steel Pipes |

**4. MATERIALS**

Supplied pipes shall conformed to AWWA, ASTM and other applicable standards hence failure to such may be rejected before final acceptance.

#### 4.1 Reinforcement

Pipe reinforcement for pipe coating shall be mesh wire or gauge wire type and shall conform to the requirements of ASTM A82.

#### 4.2 Portland Cement

Portland cement shall conform to the requirements of ASTM C150 for type I or type II cement, or as otherwise specified.

#### 4.3 Sand

Sand shall consist of inert materials having hard, strong, durable, uncoated grains conforming to the requirements of ASTM C33.

#### 4.4 Mixing Water

Water shall be clean, colorless, and free from injurious quantities of organic matter, alkali, salt, or other impurities that might reduce the strength, durability, or other desirable qualities of the mortar.

#### 4.5 Curing Compound

Curing compound for curing cement-mortar linings and coatings shall comply with ASTM C309.

#### 4.6 Paint

The paint material applied to the interior of pipe or fittings shall be free from contaminants that may be harmful to the end user of the potable water.

### **5. SURFACE PREPARATION**

#### 5.1 Cleaning Surfaces

All surfaces to be mortar lined or mortar coated shall be cleaned to remove loose or other foreign matter that could interfere with the adherence of the cement mortar.

### **6. MORTAR LINING / COATING**

#### 6.1 Cement Mortar

Cement Mortar shall be composed of cement, sand, and water well mixed and of proper consistency to obtain a dense, homogenous lining that will adhere firmly to the pipe surface.

#### 6.2 Thickness

Cement mortar lining and coating shall be uniform in thickness.



Thickness shall as follows:

| Nominal Pipe Size (mm) | Outside Diameter (mm) | FID (mm) | Min. Wall thickness (mm) | EXP ID | AN OD  | DED E | Cement Lining (mm) | Cement Coating (mm) |
|------------------------|-----------------------|----------|--------------------------|--------|--------|-------|--------------------|---------------------|
| 300                    | 335.56                | 300.00   | 4.78                     | 338.56 | 348.12 | 76.20 | 13                 | 25.40               |
| 200                    | 221.56                | 200.00   | 4.78                     | 224.56 | 234.12 | 76.20 | 6                  | 25.40               |
| 150                    | 171.56                | 150.00   | 4.78                     | 174.56 | 184.12 | 76.20 | 6                  | 25.40               |

Cement mortar coating shall have uniform minimum thickness for all sizes of pipes unless otherwise specified. Ends of coating shall be uniform and square to the longitudinal axis of the pipes.

### 6.3 Lining

Straight sections of pipe shall be lined by use of a spinning machine specifically designed and built for the purpose of rotating the pipe section and centrifugally applying cement-mortar linings to the interior of steel pipe or by a method known to provide equivalent results. When required to prevent distortion or vibration during the spinning, each section of pipe shall be suitably braced with external or internal supports appropriate to the equipment. In lining application, the entire quantity of mortar shall be placed without interruption and distributed uniformly.

### 6.4 Coating

The external protection of steel pipe shall be a reinforced cement-mortar coating applied over the outer surfaces of the pipe sections.

### 6.5 Curing of Lining / Coating

In general, linings shall be accelerated cured or moist cured or an alternative method maybe substituted provided, it produces an equivalent or better cured lining/coating.

### 6.6 Coating Cracks

Care shall be observed to minimize the occurrence of cracks in the mortar coating. The need for the repair of cracks must be determined by GSCWD after inspection if required such cracks shall be repaired by the supplier at no additional cost of the district.

### 6.7 Mortar Lining Test Cylinders

The test cylinders shall be made in conformance with ASTM C31, ASTM C39 and to be tested with the required parameters in an approved laboratory.

## 7. HANDLING

### 7.1 Delivery

Care shall be exercised during loading, hauling and unloading to prevent damage to any of the components of the pipes. Plastic end caps shall be securely fastened to pipe ends of completed pipe for protection of the cement-mortar lining. End caps shall be maintained in place until time of installation.

## 7.2 Transportation

Regardless of which mode of transportation is used, lined and coated steel pipe is valuable cargo and should be handled as such. Utmost care should be observed during transit if possible proper stowing to offset the pipe's pitching, shifting, distortion and rolling motion, cross braces/bar should be placed for the pipe end damage protection. Such damages encountered during transportation shall be supplier/manufacturer full obligation.

## 7.3 Equipment

Equipment for handling coated pipe must include nylon straps, wide canvas or padded slings, wide padded forks, and skids designed to prevent damage to the coating.

## 8. TESTING & INSPECTION

A pre-production testing will be conducted with Five (5) representatives from procuring entity. Cost of inspection such as transportation, meals, allowances, accommodations and other related expenditures shall be shouldered by the winning bidder.

Testing requirements shall include weight, tensile, thickness and other as required for plate and concrete quality assurance.

## 9. DELIVERY

Within **Seventy Five (75)** Calendar Days after receipt of Purchase Order total number of pipes is expected including testing and inspection. Pipes should be delivered to the site designated by the GSCWD.

## 10. LIQUIDATED DAMAGE (LD)

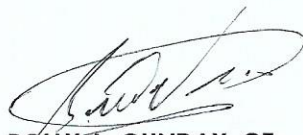
The winning bidder is subject to the imposition of liquidated damages in every batch of delivery in case of delay in rendering its obligation until actual delivery.

The applicable rate is one tenth (1/10) of one(1) percent of the cost of the undelivered portion for every day of delay.

Computation of the said liquidated damages shall conform to the provision of RA 9184.

Prepared by:

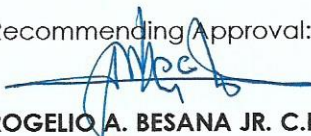
  
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