

PROJECT TITLE

PURCHASE OF ASSORTED SIZES OF UPVC PIPES SERIES 8 & 10, FIXED SEAL

OWNER

GENERAL SANTOS CITY WATER DISTRICT

TECHNICAL SPECIFICATIONS

GENERAL SCOPE

This section specifies the requirements for **unplasticized polyvinyl chloride (uPVC)** pipes **fixed seal type** with nominal outside diameter of **90mm to 225mm** intended for the conveyance of potable water under pressure of temperature up to 45°C for use below ground. The pipe shall conform to the requirements of the Philippine National Standard Specification for **Unplasticized Polyvinyl Chloride (uPVC)** pipes for Potable Water Supply (PNS 65:1993) except as otherwise specified herein.

A. Definitions

For the purpose of these specifications, the following definitions shall apply:

1. Nominal Pressure (PN) – The normal maximum internal pressure that the pipes can sustain continuous use. This is expressed in megapascal (MPa) at 28° C.
2. Design maximum induced stress – The estimated maximum tensile stress on the wall of the pipe along the transverse axis due to internal pressure to which the pipe can be subjected continuously without failure. This is used in calculating the wall thickness of the pipe. For the purpose of this standard, the maximum induced stress is 8.5 MPa at 28°C.
3. Pipe series (s) – It is used in classifying the pipe, which is ratio of the design maximum induced stress to the nominal pressure of the pipe. The pipe series number maybe rounded off to the nearest whole number.

4. Nominal Dimension – Nominal Dimension and values indicated herein are minimum limits as defined in this standard.

5. Unplasticized polyvinyl chloride (uPVC) pipe. A pipe produced basically from an exclusion grade PVC material of high molecular weight which does not contain any plasticizer.

uPVC PIPE SCHEDULE

Description	Quantity	Thickness(mm)
225mmØ x 6m uPVC Pipe Series-8, Fixed Seal	656 pcs	12.90 – 14.39
110mmØ x 6m uPVC Pipe Series-10, Fixed Seal	1,500 pcs	5.30 – 6.03
90mmØ x 6m uPVC Pipe Series-10, Fixed Seal	2,000 pcs	4.40 – 5.04

B. TECHNICAL SPECIFICATION:

Pipes classification shall be in accordance with the pipe series and/or the nominal pressure as follows:

1. Series 8 (PN 1.03 MPa/149.35PSI)
2. Series 10 (PN 0.86 MPa / 125 PSI)

REQUIRED TESTING:

Sampling and Testing

The winning bidder shall prepare one set of sample per diameter and shall be taken randomly for testing in accordance with the methods and procedures specified in this standard.

1. Dimensions

a. Standard Configurations

Should conform to the approved shop drawing provided by the District.

b. Length

The length of the pipe shall be taken means the effective length which is Six (6) meters.

c. Joints

uPVC Pipes shall be push-on type joint with fixed seal and additional **One (1) uPVC Coupling/Hub for every size** of uPVC Pipes.

2. Physical Characteristics

a. Appearance

The pipe shall be homogenous throughout and free from cracks, holes, encrustations and other foreign inclusions. Excessive die lines and/or stress marks (particularly in the socket and bell groove) as well as discernible material marking are not allowed. The ends of the pipe shall be cleanly cut and square to the axis of the pipe.

b. Color

The color of the pipe shall be blue nearest to RAL 5012 and shall be uniform throughout the entire surface of the pipe.

c. Effect of Materials on Water Quality

When used under the conditions for which they are designed, non-metallic materials in contact with, or likely to come into contact with potable water shall not constitute a toxic hazard, shall not support microbial growth and shall not rise to unpleasant taste or odor, cloudiness or discoloration of the water. Concentration of substances, chemicals and biological agents leached from materials in contact with potable water, and measurements of the relevant organoleptic/physical parameters shall not exceed the maximum values recommended by the World Health Organization in its publication "Guidelines for Drinking Water Quality" Vol. 1 "Recommendations (WHO, Geneva, 1984). If lead or mono/di-alkyl tin compounds are permitted to be used as stabilizers, the quantities of the lead or tin measured as metals shall be determined in accordance with the method described in PNS 966/ISO 3114.

d. Physical Properties.

The pipe shall conform to the Physical properties as specified

e. Resistance to Acetone

The pipe shall not show signs of delamination or disintegration when immersed with acetone. Flattening and/or swelling of the pipe shall not

be deemed to constitute failure when tested in accordance with PNS 978/ISO 3472.

f. Resistance to Sulfuric Acid

The mass of the specimen shall not increase by more than 0.316 g when tested in accord with PNS 979/ISO 3474. The effect of the acid on the surface appearance of the specimen (roughening, bleaching or blackening) shall be ignored.

3. MECHANICAL PROPERTIES

The pipes shall conform with the applied pressure for the hydrostatic pressure test indicated in Table 5 of PNS G5,1993 when tested in accordance with PNS 509/ISO 1167.

a. Hydrostatic pressure test requirement

1. Burst Pressure – The pipe shall withstand the applied pressure for at least 60 seconds without failure. The value for the induced stress used in calculating pressure requirement is 3.8 MPa (550 psi) for Series 10 and 4.56MPa (660 psi) for Series 8 at 28°C

2. Short term Pressure – The pipe shall withstand the applied pressure for at least one hour without failure. The value for the induced stress used in calculating pressure requirement is 3.6 MPa (520 psi) for Series 10 and 4.3MPa (620 psi) for Series 8 at 28°C.

b. Resistance to external blows

The true impact of the batch at 28°C shall not exceed 10% when tested in accordance with PNS 967/ISO 3127.

NOTE: The true impact rate is the total number of broken test pieces divided by the number of blows, expressed as percentage as if the whole batch had been verified. In practice, tests are drawn at random from batch and only estimate of the true impact rates are obtained.

c. Flattening

The pipe shall not allow evidence of splitting, cracking and breaking when flattened to a minimum of 40% of its outside diameter when tested in accordance with 800/ASTMD2241.

d. Joints

Joints shall be used for sizes 90mm up to 225mm to be Machine installed Integral Fixed Seal. The seal should be glass reinforced polypropylene (PP) homogeneously bonded to highly flexible EPDM Rubber.

Marking

The pipe shall be clearly marked with the following information spaced at intervals of not more than one meter.

1. Name of Product
2. Nominal outside diameter, mm
3. Series and/or Nominal pressure, MPa
4. Manufacturer's name and/or its recognized trademark with One (1) inch font size bold marking using laser printed
5. The words "Made in PHL" or "Made in the Phil."
6. The words "For Potable Water"
7. The words "General Santos City Water District" with One (1) inch font size bold marking using laser printed
8. Bell insertion marking at spigot end

DELIVERY SCHEDULE

Within **Ninety (90) Calendar Days** after receipt of Purchase Order, the total number of pipes is expected including testing and inspection. Pipes should be delivered to the site designated by the General Santos City Water District.

SPECIAL PROVISION:

- A pre-delivery testing shall be conducted with the presence of Five (5) representatives from GSCWD within Four (4) days which already include departure and arrival from purchasing entity at plant site. Cost of inspection such as transportation, meals, allowances, accommodations and other related expenditures shall be shouldered by the winning bidder.
- The winning bidder shall shoulder the cost incurred during hauling and unloading at the designated area of General Santos City Water District.

- The winning bidder is required to produce an additional one length for every size of uPVC Pipe for the required testing specimen.
- The winning bidder is required to provide plastic food wrap at both ends of the pipes.
- The Supplier is subject to the imposition of liquidated damages in case of delay in rendering its obligation until actual delivery.


The Contractor shall pay liquidated damages to the Owner if he fails to complete the work within the time agreed upon. It is understood that said payment is not a penalty but a fixed sum representing the liquidated damages for each calendar day of delay.


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

Prepared by:



MARIA CELIA N. DANDAN, CE
TWG Member

- on leave -
JUDY A. LIM-PASMAN, LLB
REE
TWG Member


ROLLY A. GUNDAY, CE
TWG Member


MICHAEL S. GABALES,
TWG Head

Recommending Approval:


ROGELIO A. BESANA JR. C.E., R.M.P
Manager A - Engineering and Construction Dept.

Approved:


ARN B. GELLANGARIN, P.M.E
General Manager A