PROJECT TITLE : **SUPPLY, INSTALLATION AND COMMISSIONING OF PRESSURE RELIEF/SUSTAINING VALVE**

LOCATION : **Different Areas at Calamba City(Laguna Hills/Sirang Lupa)**

I. SCOPE OF WORKS AND SPECIFICATIONS

FOR THE SUPPLY OF LABOR , MATERIALS AND SUPERVISION FOR THE ABOVE PROJECT TITLE

A. VALVE VAULT

A.1 EARTHWORKS

☐ 1 Removal of Existing Pavement: All concrete pavement surfaces to be removed shall be scored with concrete sawing equipment; provided, that any Portland cement concrete base under asphaltic mix surface will not be required to be scored by sawing. Asphaltic concrete pavement shall be removed to clean straight lines.

☐ 2 Concrete sidewalks, curbs and gutter required to be removed shall be cut to the nearest score marks.

☐ 3 The walls and faces of all excavations in which workers are exposed to danger from unstable ground shall be guarded against by a shoring system, sloping of the excavation, or some other applicable method. The contrary shall furnish, install, and maintain such sheeting, bracing, etc., as may be necessary to protect the workers and prevent any movement of earth which could injure or delay the work or endanger adjacent structures. In excavations which workes may be required to enter , excavated or other materials shall be effecively stored and retained at 600mm or more from the edge of excavation. All excavation and terenching operations shall conform to any and all national, provincial and local safety requirements.

☐ 4 Excavation beneath proposed structures. Except where otherwise specified for a particular structure ordered by the engineer, excavation shall be carried to the grade of the bottom of the footing or slab. Where shown and ordered, areas beneath proposed structures shall be over-excavated. When such over-excavation is shown in the drawings, both over-excavation and subsequent backfill to the required grade shall be performed by the contractor at his own expense. When such over-excavation is not shown but is ordered by the engineer, such over-excavation and any resulting backfill will be paid for under a separate unit price bid item if such bid item has been established: otherwise payment will be made in accordance with negotiated prices. After the required excavation or over-excavation has been completed, the exposed surface shall be scarified to the depth of 150 mm (6 in.) brought to optimum moisture content, and rolled with heavy compaction equipment to 95% of maximum density.

☐ 5 Excavation beneath areas to be paved : Excavation under areas to be paved shall extend to the bottom of the aggregate base, if such base is called for; otherwise it shall extend to the bottom of paving. After the required excavation has been completed, the exposed surface shall be scarified, brought to optimum moisture content, and rolled with heavy compcation equipment to 90% of maximum.

☐ 6 Disposal of excess Excavated Material: Remove and dispose all excess excavated material in manner approved by Engineer.

- ☐ 7 Rock excavation shall include removal and disposal of any kind of rock which cannot be excavated without blasting or the use of rippers, and all boulders or other detached stones each having a volume of 0.25 cubic meter or more as determined by physical measurements by the Engineer.

A.2 CONCRETE AND REINFORCED CONCRETE

- ☐ 1 Preparation of Equipment : All the equipment for mixing and transporting concrete shall be clean. Debris shall be removed from spaces to be occupied by concrete. Forms shall be properly coated. Masonry filler units that will be in contact with concrete shall be well drenched. Reinforcement shall be thoroughly clean or deleterious coatings. All latiance and other unsound material shall be removed before additional concrete is placed against hardened concrete.

- ☐ 2 Mixing, Placing, and Curing of Concrete : All concrete shall be mixed until there is uniform distribution of materials and shall be discharged completely before mixer is recharged. Curing shall be maintained above 10ºC and moist condition for at least first 7 days after placement.

- ☐ 3 Formworks Design and Removal : Forms shall result in the final structure that conforms to shapes, lines, and dimension of members as required by the design drawings and specifications. It should be tight to prevent to prevent leakage of mortar; also it shall be properly braced and tied together to maintain position and shape. Form shall be removed in such manner as not to impair safety and serviceability of the structure. All concrete shall have sufficient strength not to damaged thereby.

- ☐ 4 Reinforcement : At time concrete is placed steel reinforcement shall be free from coating that would destroy or reduce bond. Steel reinforcement shall be cut to its desired length as specified on the plan.

- ☐ 5 General Procedures : All concrete work shall be done in accordance with the " Standard Specifications of Concrete and Reinforced Concrete " as adopted by the Philippine Government and the current American Concrete Institute "Building Code Requirements for Reinforced Concrete" (ACI 318-63) in so far as they do not conflict or are not inconsistent with the specific provisions specified herein.

- ☐ 6 Testing : Testing of masonry materials shall be done by applicable government bodies or their authorized agencies, according to testing procedures and other relevant requirements needed for such tests. In absence of the above, testing shall be bed one in accordance with ASTMC 140-70, Method of Test for Concrete Masonry Units.

A.3 BACKFILL/RESTORATION

- ☐ 1 After the forms have been removed from footings, wall foundations, beams, etc., and when the concrete work is hard enough to resist pressure resulting from fill, the materials from excavations shall be used for backfilling around them fill for general grading purposes and backfill materials shall be as approved by the, free from roots, refuse and vegetable matter. Fill and backfill shall be placed in layers not exceeding six (6) inches and compacted thoroughly while being sprinkled or moistened with water. No materials having plasticity index greater than 6 shall be used for fill or backfill, under slab.

- ☐ Barricades and warning lights satisfactory to the Engineer shall be provided and maintain for all in which case of heavy steel plates, adequately braced bridges or other type of crossing capable of supporting vehicular traffic shall be furnished.
- ☐ 2 Concrete pavement shall be replaced with the same kind or better material in conformance with the latest specifications, rules and regulation, and subject to the inspection and approval of the agency having jurisdiction.

A.4 MATERIALS SPECIFICATIONS

Manhole Frame

- ☐ 1 The manhole frame and cover shall be round manufactured from cast iron or ductile iron conforming to ASTM A-126, Class B or ASTM A-536-80, Class 400 respectively.
- ☐ 2 The frame depth shall not exceed 200mm and four (4) bolt holes shall be provided for anchoring purposes.
- ☐ 3 The cover shall be 800mm – 1000mm in diameter. The face of the cover shall include the name and/or logo of Calamba Water District. The name/logo shall be cast into the cover during manufacture.
- ☐ 4 The cover shall be connected to the frame with a hinged. A locking mechanism shall be included to prevent unauthorized access.
- ☐ 5 The cover shall be one-man operable and shall be designed for a maximum highway loading.
- ☐ 6 Certification: The manufacturer shall furnish a sworn statement that the inspection and metallurgical and pressure tests have been results thereof comply with the requirements of the applicable Standard(s) herein specified. A copy of the Certification shall be submitted to Calamba Water District.

Concrete

- ☐ 1 Portland cement: Cement shall conform to the Standard Specifications for READY MIXED CONCRETE, ASTM C-94. An air-entraining admixture, conforming to ASTM C-260, shall be added to Type I, Type II or Type III Portland Cement.
- ☐ 2 Aggregates: All aggregates used for concreting shall conform to ASTM-33 and shall be checked daily for any variances in moisture current. Said variances shall be corrected and/or taken into consideration for each batch.
- ☐ a. Coarse Aggregates: Shall be uniformly and evenly graded for each application in accordance A.C.I. Standard 318. Unless otherwise approved, aggregate shall be sound, crushed, angular grantic stone. Smooth or rounded stone (river rock) shall not be acceptable.
- ☐ b. Fine Aggregates: Shall consist of natural sand, manufactured sand or a combination thereof.

B. PRESSURE RELIEF/ SUSTAINING VALVE

B. 1. Valve Installation

- ☐ 1 The Contractor shall install all valves as shown on the Drawings.
- ☐ 2 Existing pipe outside wall surfaces and flange adaptor should be cleaned of any foreign materials such as scale, metal shaving or slags.
- ☐ 3 Valves, non coated pipings/flanged adaptor should be covered with Petrolatum Tape
- ☐ 4 Pressure sustaining valves including flange adaptor to be installed per manufacturer's recommendation.

B.2. Pressure Relief/ Sustaining Valve Specifications

☐ Origin	Israel
☐ Valve Pattern	Globe
☐ End Connections	PN 16 Flanged Type
☐ Working Temperature	Ambient
☐ Body and Actuator	Ductile Iron
☐ Internals	SS
☐ Diaphragm	Synthetic Rubber Nylon Fabric Reinforced
☐ Seals	Synthetic Rubber
☐ Coating	Fusion Bonded Epoxy, RAL 5005(Blue) approved for Drinking Water

PILOT SYSTEM SPECIFICATIONS

Pilot

- ☐ Body — Bronze
- ☐ Elastomer — Synthtic Rubber
- ☐ Spring — SS
- ☐ Tubing — Copper
- ☐ Fittings — Brass

FEATURES

- ☐ ES Type Wide Body
- ☐ In line Servicable
- ☐ Balanced Seal Disk
- ☐ Flexible Design
- ☐ Stainless Raised Set
- ☐ V-Port Throttling Plug
- ☐ Line Pressure Driven
- ☐ Obstacle Free, Full Bore

C. PIPES AND FITTINGS

Unplasticized Polyvinyl Chloride Pipe

☐ 1 Pipe Description: Pipes and fittings shall conform to the requirements of AWWA C900 or PNS 65 and shall be pressure Class 150 (Series 8).

☐ Comply with ISO 1452 and lead free with 1CP_EOS Method and machine installed Integral Fixed Seal. The seal is glass reinforced polypropylene(PP) highly flexibleEPDM Rubber homogeneous bonded to stiff piping.

☐ 2 Pipe and Fitting Construction: The pipe and fittings shall have steel pipe equivalent or cast iron equivalent outside dimensions. Rating as indicated with integral push-on bell with elastomeric gasket seal on one end and plain beveled on the other end. PVC Pipes and fittings shall be made from clean, blue-pigmented, virgin, NSF approved Class 12454-A or 12454-B PVC compound conforming to the requirements of ASTM D1784. All pipes shall be furnished in lengths of 6 meters.

☐ 3 ***Pipe Dimensions: Pipe shall conform to the following dimensions:***

Nominal Pipe Size, in	2	3	4	6	8	10	12
Nominal Diameter,mm	50	75	100	150	200	250	300
Outside Diameter, mm							
min	63.0	90.0	110.0	160.0	225.0	280.0	315.0
max	63.3	90.3	110.4	160.5	225.7	280.9	316.0
Wall Thickness, mm							
min	3.6	5.2	6.3	9.5	13.4	16.6	18.7
max	4.2	5.9	7.1	10.3	14.4	17.8	20.0

☐ 4 Markings: Pipes to be marked with trace ability codes

☐ 5 Random Testing: For every size, two (2) sample pipes representing each lot of one hundred (100) pieces or less shall be tested for compliance with this specification. Any visible defect or failure to meet the quality standards herein will be grounds for rejecting the entire order.

☐ 6 Certification: The manufacturer shall furnish a sworn statement that the inspection and metallurgical and pressure tests have been results thereof comply with the requirements of the applicable Standard(s) herein specified. A copy of the Certification shall be submitted to Calamba Water District.

Galvanized Iron Pipes

☐ 1 Pipe Description: Pipes shall conform to the requirements of the ASTM A53/A53M or ASTM A120 and shall be Schedule 40.
Pipe fittings shall conform to the requirements of ASME/ANSI B16.3 (Malleable Iron Threaded Fittings Class 150 and 300) and shall be Class 150.

☐ 2 Pipe Construction: The pipe shall be practically straight and both ends of the pipe shall be at right angle to the axis of the pipe. The inside and outside surfaces of the pipe shall be free from injurious defects. Unless otherwise specified, the length of the pipe shall be 6 meters. The tolerance shall be plus 6 meters without negative tolerance. Pipes shall be clearly marked with Trademark, Nominal Size, Length and Class of Pipe.

☐ 3 The pipe threads shall be made according to American Standard Pipe Taper Thread (NPT) with taper angle equal to 1°47'.

☐ 4 Pipe shall be coated with zinc, both inside and outside surfaces, in accordance to
ASTM A153/A153M-05 (Standard Specification for Zinc Coating (Hot – Dip) on Iron and Steel Hardware)

☐ 5 Pipe Dimensions: Pipe shall conform to the following dimensions and weights:

Nominal Pipe Size, in	½	¾	1	1¼	1 ½	2	3	4
Nominal Diameter, mm	15	20	25	32	40	50	75	100
Outside Diameter, mm	21.3	26.7	33.4	42.2	48.3	60.3	88.9	114.3
Wall Thickness, mm	2.8	2.9	3.4	3.6	3.7	3.9	5.49	6.02
Tolerance (outside diameter, mm)	±0.397	±0.397	±0.397	±0.397	±0.397	±1%	±1%	±1%
Tolerance (wall thickness, mm)	-12.5%	-12.5%	-12.5%	-12.5%	-12.5%	-12.5%	-12.5%	-12.5%
Weight per meter, kg	1.27-1.34	1.68-1.78	2.50-2.62	3.38-3.55	3.75-4.23	5.00-5.43	10.3-11.3	14.5-16.1

☐ 6 Pipe Thread: The pipe threads shall be made according to "American Standard Pipe Taper Thread (NPT) with taper angle equal to 1˚47'.

Nominal Pipe Size, in	½	¾	1	1¼	1 ½	2
Nominal Diameter, mm	15	20	25	32	40	50
Thread per inch	14	14	11 ½	11 ½	11 ½	11 ½
Pitch, in	0.071	0.071	0.087	0.087	0.087	0.087

☐ 7 Coatings: Pipes shall be coated with zinc both inside and outside surfaces.

☐ 8 Random Testing: For every size, two (2) sample pipes representing each lot of one hundred (100) pieces or less shall be tested for compliance with this specification. Any visible defect or failure to meet the quality standards herein will be grounds for rejecting the entire order.

☐ 9 Certification: The manufacturer shall furnish a sworn statement that the inspection and metallurgical and pressure tests have been results thereof comply with the requirements of the applicable Standard(s) herein specified. A copy of the Certification shall be submitted to Calamba Water District.

Galvanized Iron Fittings

☐ 1 Fitting Description: All pipe fittings shall conform to the requirements of " MALLEABLE IRON THREADED FITTINGS CLASS 150 AND 300 (ASME/ANSI B16.3)" and shall be Class 150.

☐ 2 Fitting Dimensions: Fittings shall conform to the following dimensions:

Nominal Pipe Size, in	1/2	3/4	1	1 1/4	1 1/2	2	3	4
Length								
Length	28.45	33.27	38.1	44.45	46.74	57.15	78.23	96.27
Weight, kg	0.11	0.18	0.29	0.43	0.56	0.79	2.34	4.0

Nominal Pipe Size, in	1/2	3/4	1	1 1/4	1 1/2	2	3	4
45° Elbow								
Length	22.35	24.89	28.45	32.77	36.32	42.67	55.12	66.29
Weight, kg	0.07	0.10	0.15	0.38	0.52	0.77	2.11	3.46
St. Elbow								
Length, ME	40.89	48.01	54.1	61.98	67.82	83.06	114.55	114.27
Length, FE	28.45	33.02	38.10	44.45	49.28	57.15	78.23	96.27
Weight, kg	0.11	0.18	0.29	0.49	0.66	1.06	2.99	4.94
Tee								
Length	28.45	33.27	38.10	44.45	49.28	57.15	78.23	96.27
Weight, kg	0.16	0.25	0.41	0.59	0.78	1.19	3.22	5.12
Cross Tee								
Length	28.45	33.27	38.10	44.45	49.28	57.15	78.23	96.27
Weight, kg	0.20	0.29	0.44	0.72	0.86	1.33	3.70	6.76
Coupling								
Length	34.04	38.61	42.42	49.02	54.61	64.26	80.77	93.73
Weight, kg	0.09	0.13	0.22	0.34	0.45	0.66	1.5	2.56
Union Patente								
Length	43.69	51.31	55.63	57.4	62.74	69.85	89.92	97.79
Weight, kg	0.21	0.26	0.41	0.54	0.74	1.09	2.47	4.31
Thickness, mm	2.54	3.05	3.30	3.56	3.81	4.32	5.84	6.60
Tolerance								
Dimension, CF, mm	±1.50	±1.50	±1.80	±1.80	±2.00	±2.00	±2.50	±3.00
Thickness	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10

*Note:

1. All dimensions are in millimeters except where otherwise shown.
2. Center-to-face dimensions apply to elbows, tees and crosses
3. Face-to-face dimensions apply to couplings, unions, etc.
4. ME – Male End, FE – Female End, CF – Center-to-Face

☐ 3 Fitting Thread: All pipe fittings shall be female thread made according to "American Standard Pipe Taper Thread" (NPT).

☐ 4 Coatings: Fittings shall be coated with zinc in accordance to "STANDARD SPECIFICATION FOR ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE (ASTM A153/A153M-05)".

Cast Iron Fittings

☐ 1 Fitting Description: Cast iron fitting shall conform to the requirements of AWWA C110 (American standard for cast iron and ductile iron fittings, 2-in through 48-in., for water and other liquids) or ISO r13 (cast iron pipes, special casting and cast iron parts for pressure mainlines).

☐ Fitting shall have a wall thickness of not less than that of the pipe with which they are used and the ends shall have the ends suitable for making watertight joints.

☐ 2 Fitting Construction: Fittings are manufactured of ductile iron grade 70-50-05 (minimum tensile strength: 70,000psi; minimum yield strength: 50,000; minimum elongation: 5%) as specified in AWWA C110 or C153. The flanges can be tapped for studs when specified. Unless otherwise specified flanges will have bolt holes straddling centerline, bolt hole drilling can be rotated when so specified.

Fittings shall be furnished with mechanical or flanged joints.

☐ *a. Mechanical Joints:* All mechanical joint fittings will be Bell and Bell unless otherwise specified. Mechanical joint fittings shall be rated for 350 psi working pressure for sizes 4"-24".

☐ *b. Flanges:* All flanges are plain without projections and are furnished smooth or with shallow serrations. The flanges can be tapped for studs when specified. Unless otherwise specified flanges will have bolt holes straddling centerline. Bolt hole drilling can be rotated when so specified. Flanged fittings shall be rated for 250 psi working pressure for sizes 4" – 64".

☐ *c. Bolts, Studs and Nuts:* Bolts are hex head machine bolts with regular or heavy hex nuts as specified. Studs with one hex nut each are required for tapped flanges. Bolts, studs and nuts are low-carbon steel per ASTM A307 Grade B; threads are ANSI B1.1 Coarse Thread Series, Class 2A external and Class 2B internal. Recommended studs are the same length as corresponding bolt length with "tap end" threaded approximately the same length as flange thickness.

☐ 3 Coating: All fittings shall be epoxy coated internally and externally in accordance to AWWA C116 (protective fusion-bonded epoxy coatings for the interior and exterior surfaces of ductile-iron and gray-iron fittings for water supply service).

☐ 4 Testing: For every 100 pcs of any size of fittings, at least 3 pcs. shall be chosen at random and subject to a pressure of 1.1 MPa (160 psi). If any sample tested cracks or leaks, the lot represented will be rejected. The manufacturer shall furnish one certified copy of the reports to the Calamba Water District.

☐ 5 Certification: The manufacturer shall furnish a sworn statement that the inspection and metallurgical and pressure tests have been results thereof comply with the requirements of the applicable Standard(s) herein specified. A copy of the Certification shall be submitted to Calamba Water District.

Polyethylene(PE) Tubing

☐ 1 Materials : Shall be made from PE 100 virgin compounds as defined in PNS ISO 4427:2002/AMD 01:2002; PWWA NM 201:2002(Philippine National Standard for Polyethylene Pipes for Potable WaterSupply) or approved equivalent. All compounds shall qualify for a rating of PN 16 (232 psi) for water and as per requirements of above mentioned standards.

☐ HDPE compound used to make pipes shall contain no ingredients that has been demostrated to migrate into water in quantities considered to be toxic and microbial growth hazard. Pipe should be free from unpleasant taste and odor.

☐ 2 Dimensions - The Standard Dimension Ratio (SDR) shall be 11 with nominal dimensions as follows:

Nominal Diameter, in.	½	¾	1	1¼	1½	2	2½	3
Outside Diamenter, mm	20	25	32	40	50	63	75	90
Mean Wall Thk, mm	2.3	2.3	3	3.7	4.6	5.8	6.8	8.2

☐ 3 Marking - All tubing shall be clearly marked at intervals of not more than 0.6 LM with nominal size, type of material(PE 3306 or PE 3406). Standard Dimension Ratio(SDR 11) manufacturer's trade name and production code and seal of approval from an accredited testing laboratory.

☐ 4 Random Testing: For every size, two (2) sample pipes representing each lot of one hundred (100) pieces or less shall be tested for compliance with this specification. Any visible defect or failure to meet the quality standards herein will be grounds for rejecting the entire order.

☐ 5 Certification: The manufacturer shall furnish a sworn statement that the inspection and metallurgical and pressure tests have been results thereof comply with the requirements of the applicable Standard(s) herein specified. A copy of the Certification shall be submitted to Calamba Water District.

Gate Valves

1 **Valve Description**

☐ All valves shall conform to the AWWA Specifications C509 (STANDARD FOR RESILIENT SEATED GATE VALVES). Component parts are constructed of heavy, rugged proportions for extra strength to withstand pipe strain and possible shifting in underground service. Gate valves shall be flange or mechanical joint where the pipelines design pressure is 1.0MPa (150 psi) or less be designed for minimum water working pressure of 1.0 MPa (150 psi).

2 **Valve Construction**

☐ The body shall be cast iron.

☐ The gate valve shall be flanged and mechanical joint. Flanges and drilling shall conform to ISO 7005 – 2

☐ All the resilient gate valves have a full bore with same nominal diameter as the pipeline. The full bore ensures minimum pressure loss, as the valve does not cause any reduction in the flow path, other great advantages are that the full bore allows drilling and facilitates pipe pigging to ensure high quality potable water.

☐ The ductile iron core is full vulcanized with EPDM rubber internally and externally. No iron parts are exposed to the medium and the excellent rubber vulcanization prevents creeping corrosion underneath the rubber.

☐ The fixed integral wedge nut reduces the number of moveable valve parts and risk of malfunction.

☐ The valve shall have 50mm (2 in) square operating nut with cast arrow showing direction in which the nut is to be turned open the valve.

☐ The body and cover bolts and nuts shall meet specifications of ASTM A-307 (rust proofed).

☐ The valve shall be encapsulated and shall conform to the following dimensions:

Nominal Size,	in	2	3	4	6	8	10	12
Nominal Diameter,	mm	50	75	100	150	200	250	300
Length (Face to Face)	mm	178-180	203-205	221-229	267-268	292-295	330-335	356 – 365
Height (above Centerline)	mm	241-326	297-318	334 – 430	443 – 549	544 – 646	627 – 750	785 – 835
Weight	kg	13-18	20-23	26-33	51-53	75 – 83	125 – 133	174 - 193

3 **Coatings**

☐ All valve casting to be shot blasted prior to epoxy coating. Epoxy coating shall conform to AWWA Specifications C550 (PROTECTIVE EPOXY INTERIOR COATINGS FOR VALVES AND HYDRANTS). Body and bonnet are coated internally and externally. Layer thickness shall be 250-400 microns on flat and pressurized parts and 150-300 microns on convex outer edge.

4 **Testing**

☐ For every size and type of wedging mechanism, two sample gate valves representing each lot of one hundred (100) pieces or less shall be tested for reliability of operation. This test is in addition to those required under section 28.2 and 28.3 of AWWA C500. The shell and seat should be tested equal to 1.5 MPa and 1.1 MPa respectively. The manufacturer shall furnish one certified copy of the test reports to the Calamba Water District.

5 **Certification**

☐ The manufacturer shall furnish a sworn statement that the inspection and metallurgical test and pressure test have been results thereof comply with the requirements of the applicable Standard(s) herein specified. A copy of the Certification including compliance with NSF/ANSI 61 shall be submitted to Calamba Water District.

Brass Gate Valves

1 **Valve Description**

☐ Valves shall be full port, screwed-in bonnet and non-rising stem.

2 **Valve Construction**

☐ The valve body, bonnet and solid wedge disc shall be brass conforming to ASTM B584 Alloy C84400-1996 or the latest revision or its equivalent. The minimum pressure rating shall be 125psi saturated steam pressure and 200psi non-shock water, oil or gas.

3 **Valve Dimensions**

☐ Valve shall conform to the following dimensions:

Nominal Pipe Size, in	½	¾	1	1¼	1 ½	2
Nominal Diameter,mm	15	20	25	32	40	50
Length, mm	35 – 43	39 – 45	43 – 54	48 – 61	54 – 63	58 – 72
Height, mm	71 – 72	77 – 84	88 – 98	103 – 116	114 – 125	134 – 153
Handwheel Diameter, mm	54 – 55	54 – 55	60 – 61	72 – 77	72 – 77	80 – 83

4 **Valve Ends**

☐ The valve shall be threaded end conforming to ASME B1.20.1 (NPT)

5 **Testing**

☐ For every size, two (2) sample valves representing each lot of one hundred (100) pieces or less shall be tested for compliance with this specification. Any visible defect or failure to meet the quality standards herein will be grounds for rejecting the entire order.

6 **Certification**

☐ The manufacturer shall furnish a sworn statement that the inspection and metallurgical and pressure tests have been results thereof comply with the requirements of the applicable Standard(s) herein specified. A copy of the Certification shall be submitted to Calamba Water District.

II. ACCEPTANCE

☐ 1. No Leaks

☐ 2. Proper Waste/Debris Disposal

☐ 3. Proper Concrete Restoration

III. OTHERS

☐ 1. Contractor should submit all the necessary documents such as Materials Mill Certificate or equivalent prior to inspection/delivery, Detailed Daily Schedule of Activities during Kick off Meeting, etc...

☐ 2. Consruction Safety and Good Housekeeping must be observed at all Times.

☐ 3. Contractor should include product catalogue of materials in their proposal for evaluation purposes.

☐ 4. Construction of Valve Vault, Repiping and Commissioning Works should be included

NOTES :

1. Reference - LWUA TECHNICAL STANDARDS and CWD EXISITING STANDARDS.
2. Other terms not specified should follow RA 9184

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