TOWN & COUNTRY PLASTICS

Customized For Precision

Method # 1B Neutralization System

Example Guide Specification Acid Waste Centralized "pH" NEUTRALIZATION SYSTEM

A. GENERAL:

1. This central acid waste pH neutralizing system shall be a complete pH monitoring and alarm system in which acidity is decreased in a neutralizing sump containing limestone fill, as well as some neutralization of caustics and dilution of acids, caustics and solvents.

2. This central pH neutralizing system shall maintain the wastewater pH between 5.0 and 9.5, or whatever range the local officials require.

3. This system installation shall be in full accordance with the state of _____ Building and Plumbing Codes and meet all requirements of the Local Department of Environmental Protection.

4. This system shall be complete as shown on drawings and shall include but not be limited to: PP shut-off valve, limestone tank, sampling tank with pH probe and a central pH monitoring, recording and alarm panel with pH meter and audible and visual alarms. Entire system and components shall be as manufactured / provided by Town & Country Plastics, LLC, with single source responsibility. T&C has over 40 years' experience in providing these systems. Installation shall be by plumbing contractor and other trades, as needed.

B. LIMESTONE TANK:

1. This tank shall be constructed of molded, seamless High Density Polyethylene (HDPE) conforming to ASTM Specification D-#1248 latest edition and shall have necessary male IPS threaded (MPT) inlet, outlet and vent connections. Inlet and outlet connects to be the same size; vent connection can be the same size or smaller. Tank shall be complete with matching heavy-duty, reinforced bolted cover with Neoprene gasket and necessary bolts, nuts and washers. 1,200 gallon and larger tanks shall have primed steel bands around the outside of the tank walls for extra strength. Inlet shall have internal elbow and dip tube in order to form a deep seal, unless local code requires it differently (such as the state of Ohio, city of White Plains, etc.). Internal HDPE bracing to tank wall shall be done by plastic welding on the longer dip tubes.

2. This limestone tank shall be Model #_____ size and capacity as indicated on drawing, and/or equipment (tank) schedule and shall be Town & Country Plastics, LLC Model # NT Series.

3. Connecting piping shall be sized as shown on drawings.

C. SAMPLING TANK WITH pH PROBE:

1. Tank shall be constructed of molded, seamless High Density Polyethylene (HDPE) conforming the ASTM Specification D-#1248 latest edition. Tank shall be Town & Country Plastics, Inc. Model # NT-5M/HDPE Modified (11" diameter x 14" high) with threaded connections of same size inlet and outlet, same as limestone tank, and pH probe flanged inlet support assembly in ½" thick bolted Neoprene gasketed cover.

   NOTE: If limestone tank is larger than a 650-gallon tank or if connections are 6" and larger, then sampling tank shall be a Model # NT-30M/HDPE (18" diameter × 29" high I.D.).

2. Sampling tank shall be connected directly to the outlet of the limestone tank. Contractor to install and provide an epoxy painted steel supporting stand for sampling tank, or epoxy painted concrete blocks. Tank to have proper gasketing, stainless steel bolts, nuts and washers for bolting sampling tank cover and 6" I.D. flanged pH probe assembly. Cover to have threaded bolt holes for pH flanged bolts, so nuts will not fall in to tank.

3. Connecting drain-line piping shall be sized as shown on drawings. The outlet of the limestone tank shall align up with the inlet of the sampling tank.

D. T&C offers Two options for Monitoring pH:

1. Option #1:
   This pH monitoring, and alarm system shall include pH probe assembly, pH cable with connector and wall mounted control panel and shall be Town & Country Plastics, LLC **Model # K-100AM (no recorder)** with audible and visual alarms.

   Option #2:
   This pH monitoring, recording and alarm system shall include pH probe assembly, pH cable with connector and wall mounted control panel and shall be Town & Country Plastics, LLC **Model # K-100A** compact, inkless pH strip chart recorder with audible and visual alarms.

2. The pH probe assembly is to be installed inside the sampling tank with special pH probe inlet and support assembly through the sampling tank cover. System includes immersion-type electrode assemblies with submersible electrode holders, high-quality, industrial-grade, reference, measuring and temperature compensating pH electrodes and junction box relay. pH electrode assembly protective housing and submersion tube to be made of polypropylene (PP), plastic welded to 6" I.D. flange assembly in cover.

3. pH control panel shall be pre-wired, requiring only a single point electric power 115 V supply, wall mounted in NEMA# 12 or NEMA#4 epoxy painted fiberglass enclosure containing the following components: Audible / visual alarms with horn alarm and red alarm lights, audible alarm silencing and push button / toggle silencing relay. Two adjustable time delay switches shall be provided from zero delay to 10 minutes, for high pH and low pH conditions. Also, separate low and high lights shall indicate when bad low and high pH conditions occur, until situation corrects itself or separate alarm light and horn are activated. Visual pH meter (from 0-14) with signal impulse amplifier, high and low pH points and alarm contacts for remote alarming. Unit shall include 10-ft of special coaxial wiring cable for hook-up from junction box-relay (on probe assembly) to the pH control panel. Additional pH extension cables available. Panel shall also include an operational power (pilot) light, to advise when power in panel is on.

E. LIMESTONE CHIPS:

1. Limestone chips shall be of a random mixture of 1" to 3" diameter containing at least 90% calcium carbonate. (T&C limestones contain about 95% calcium carbonate.)

2. Provide supply of limestone chips sufficient for a total of two (2) fillings, which include initial filling at time of system start-up and one additional fill to be given to owner to do maintenance, later.

F. SPECIAL WARNING / MAINTENANCE SIGNS:

Provide signs stenciled in black letters, 1" high on acrylic plastic backgrounds.

Signs shall read:

Model # WMS-1 SIGN: APPROX. 16" HIGH × 32" LONG

"IMPORTANT - BASIN MUST BE INSPECTED FREQUENTLY AND NEUTRALIZING AGENT REPLACED WHEN NECESSARY. FAILURE TO DO SO MAY RESULT IN SERIOUS DAMAGE TO PIPING SYSTEMS.

DATE LAST INSPECTED_____"

Model # WMS-2 SIGN: APPROX. 10" HIGH × 20" LONG

"IMPORTANT - ALWAYS WEAR EYE PROTECTIVE GEAR, RUBBER GLOVES AND CARBON FILTER MASK WHEN RE-CHARGING THE TANK WITH LIMESTONE CHIPS.

FURTHER INFORMATION CONTACT: Town & Country Plastics, LLC"

G. TRAINING INSTRUCTION, DEMONSTRATION AND CALIBRATION:

1. Contractor shall install all equipment and components in accordance with manufacturer's recommendations, local codes and safety requirements and in a professional plumbing installation manner.

2. Upon completion of the installation, the Contractor shall provide the services of an authorized manufacturer's representative to check installation of equipment, place equipment into operation, calibrate pH panel and sensor, and demonstrate fully the operation and care of all equipment to designated owner's personnel (custodial and lab / chemical user staff). This is to be videotaped or CD by contractor and a copy is to be given to owner.

3. The instruction period shall be equivalent to up to one (1), eight (8)-hour working day.

4. The Contractor shall deliver to the owner or Construction Authority operation and maintenance manuals (O&M manuals)

5. These instruction folders shall also contain drawings for pictures of equipment showing parts, their names and number, to facilitate the ordering of spare parts.

H. ELECTRICAL WIRING:

1. Electrical subcontractor to provide one Duplex outlet (115V, single phase, 60 Hertz) power for this pH panel, and hook-up horn provided by T&C.

2. If sampling tank is below ground or in concrete pit and panel is mounted above ground, electrical contractor shall also provide 1" or larger PVC conduit (open ended), from concrete pit through building wall or floor.

Also, another one (1) inch PVC conduit is needed for the leak detector in the bottom of the sealed concrete pit, from the pit to the building.

3. If more than 50-ft. pH cable is needed from sampling tank to pH panel, plumbing contractor shall purchase special pH extension cable(s), as needed, at extra cost.

I. SYSTEM SHUT OFF:

1. Contractor shall install and provide polypropylene valve to occasionally shut system chemical drain-line off, prior to limestone tank, obtained from T&C. 4" and smaller will be threaded Polypropylene (PP) ball valve. 6" and larger will be flanged Polypropylene (PP) butterfly valve with flange spool pieces. Check with T & C for drawing detail on proper 6" and larger flanged valve installation.

J. LEAK DETECTION:

1. If tanks are installed in a sealed concrete pit, below ground, a Model # PP-44T polypropylene leak detection float is to be mounted on bottom of pit floor. The electrical switch box with operational (pilot) light, alarm light, chrome buzzer and transformer, shall be mounted by the electrical subcontractor; who shall provide 115V, single phase, 60Hertz power and necessary conduits from switch box/transformer to leak detection float assembly.

NOTES TO ENGINEER: Make sure tank room or concrete pit is properly ventilated. Also, detail sanitary vents and running or house trap, after sampling tank. Ask for T&C drawing detail on this.

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Sizing Neutralization / Dilution Tanks

FORMULA TO USE:

Sink Fixtures **X** Flow Rate **X** Minimum Retention Time **X** Maximum Percentage Usage **=** Usable Sizing Capacity

IMPORTANT INFORMATION ON EACH ABOVE:

Sink Fixtures:
Single student, teacher or lab sinks are 1 sink fixture units. Sinks with two (2) faucets are two (2) sink fixture units. Double and triple compartment sinks are two (2) or three (3) sink fixture units. Cup sinks are one-half (½) sink fixture units.

Flow Rate:
Floor drains can either be three (3) to five (5) sink fixture units or no sink fixture units. (Some engineers do not include them in flow rates in some cases where they are strictly used for emergency showers only.) Add to flow rate any additional equipment that may to down the lab drain line. As an example add the flow rate of discharge of glass washers, steam bath, water circulation units, etc. These flow rates are available from the manufacturer of the equipment.

Standard for rates for sink fixtures vary from ¾ GPM to 1 ½" GPM. Typically, most engineers use 1 GPM.

Minimum Retention Time:
Minimum retention times should not be less than 15 minutes to 30 minutes (the more sinks in a system, the lower retention time you can use).

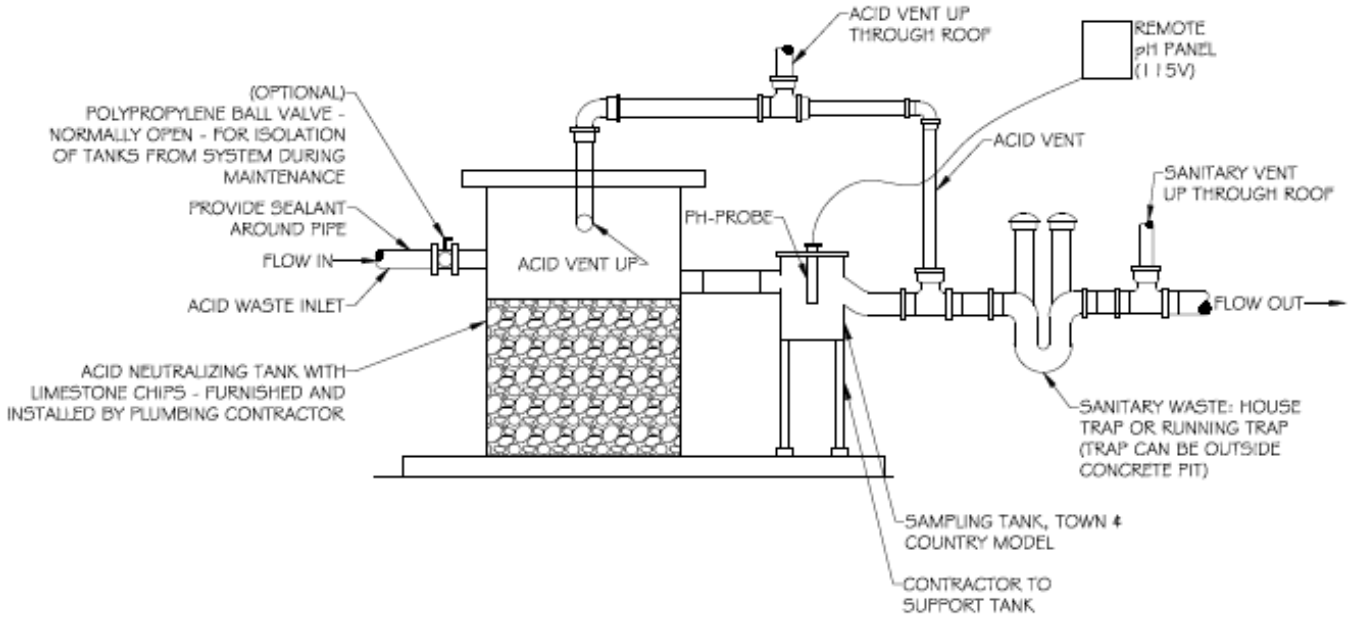
Maximum Percentage Use:
The percentage in use (usage) varies from 20% to 50%. 20% is one sink unit in 5 being used. 25% is one sink in 4 being used. 33.3% is one sink unit in 3 being used. 50% is one sink unit in two being used. (The more sinks in a system, the lower the percentage you can use.)

Pick Tank Size:
Please refer to the NT tank data sheet for actual usable capacities of our Neutralizations Tanks both with and without limestone to choose the tank that has the correct capacity for the job. The model # of the tank is much greater than the useable capacity of the tank. Choose method of Neutralization, such as method #1B, #2C or other. We have guide specifications and suggested drawings for each method desired.

Neutralization Tank Dimensions & Fittings Data

Tank Model #	Tank Cap. Gallons	Actual Approx. Usable Capacity, Gallons		I.D.* Dia. x Ht. (in.)	Wall Thickness (in.)	Approx. Weight, (lbs.)	Stnrd. inlet & outlet Conn. Sizes, (in.)	Recom'd. Vent (Optional) Conn. Size, (in.)
		W/O ◆ LC	With ◆ LC					
NT-5	5	3	1	11 x 14	3/16	10	1-1/2 or 2	1-1/2 or 2
NT-5M ◇	5	3	1	11 x 14	3/16	10	1-1/2 or 2	1-1/2 or 2
NT-15	15	7	2	18 x 15	3/16	20	1-1/2 or 2	1-1/2 or 2
NT-30	30	19	6	18 x 29	3/16	35	3	2 or 3
NT-55	55	35	12	22 x 36	3/16	50	4	3 or 4
NT-100	100	77	26	28 x 42	1/4	85	4	3 or 4
NT-150	150	105	35	31 x 48	1/4	100	4	3 or 4
NT-175	175	135	45	30 x 60	1/4	125	4	3 or 4
NT-200	200	137	46	36 x 48	1/4	125	4 or 6	4 or 6
NT-275	275	186	62	42 x 48	1/4	160	4 or 6	4 or 6
NT-300	300	230	76	36 x 74	5/16	175	4 or 6	4 or 6
NT-350	350	243	81	48 x 48	5/16	200	4 or 6	4 or 6
NT-500	500	395	132	52 x 60	3/8	225	4 or 6	4 or 6
NT-550	550	447	149	48 x 72	3/8	275	4 or 6	4 or 6
NT-650	650	548	183	48 x 84	3/8	375	4 or 6	4 or 6
NT-700	700	565	188	55 x 70	3/8	450	4 or 6	4 or 6
NT-800	800	612	204	60 x 66	3/8	500	4 or 6	4 or 6
NT-1000	1000	844	281	66 x 72	3/8	550	4 or 6	4 or 6
NT-1100	1100	894	298	60 x 90	3/8	575	4 or 6	4 or 6
NT-1200	1200	1052	351	69 x 84	3/8	600	4 or 6	4 or 6
NT-2000	2000	1559	521	84 x 84	1/2	850	4 or 6	4 or 6
NT-3000	3000	2203	735	95 x 97	1/2	1300	4 or 6	4 or 6

Neutralization System Method 1B Drawing



NOTES:

1.) THE PLUMBING CONTRACTOR SHALL FURNISH AND INSTALL THE ACID NEUTRALIZING TANK, SAMPLING SUMP, PH MONITORING ALARM SYSTEM AND MAKE ALL REQUIRED PIPING CONNECTIONS. FURNISH AND INSTALL PH CONTROL PANEL, WALL MOUNTED NEMA 4X OR 12, STEEL PANEL FINISHED WITH EPOXY PAINT, PRE-WIRED. (SEE SPECIFICATIONS)
2.) ELECTRICAL CONTRACTOR TO FURNISH AND INSTALL ALL WIRING CABLE FROM JUNCTION BOX PROBE ASSEMBLY TO CONTROL PANEL & CONDUIT. ALSO PROVIDE ELECTRIC POWER TO CONTROL PANEL. COORDINATE WITH ELECTRICAL CONTRACTOR. (SEE SPECIFICATION)

Neutralization System Method 1B Pit Installation