



Method #2C Neutralization System

(Dual Treatment Neutralization System)

Example Guide Specification ACID WASTE CENTRALIZED "pH" NEUTRALIZATION SYSTEM

Acid chemical dual-stage, active & passive, neutralization / dilution system shall be Method #2C to include limestone treatment and chemical feed/mixing back-up, as manufactured by Town & Country Plastics, LLC with single source responsibility for this entire system.

System shall be complete as shown on the drawings and per manufacturers instructors and shall consist of the following

1. Tank #1 (Limestone Neutralization/Dilution)

Model #NT-_____, with Diameter: _____ by Height: _____.

NOTE: Please see attached sizing document.

This tank shall be constructed of molded, seamless High Density Polyethylene (HDPE) conforming to ASTM Specification D-#1248 latest edition and shall have necessary inlet, outlet and vent connections. All connections shall be same size, unless vent is smaller. Tank shall be complete with matching heavy-duty, reinforced bolted cover with Neoprene gasket and necessary bolts, nuts and washers. 100 gallon tanks and larger shall have 1/2" thick x 3" high reinforcing bars welded underneath the cover. 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. Tank #2 (Mixing and Finishing)

To be same as above Tank #1, Model #NT-_____, with Diameter: _____ by Height: _____.

Also, tank #2 to have 6" vertical mixer flanged connection with gasketed blind flange to prevent fume leakage and 3" gasketed, flanged pH probe inlet and support assembly connection and two 1" chemicals (acid & caustic) feed connections in tank sidewall.

3. Sampling Tank #3 (Model #NT-5M / HDPE)

This molded High-Density Polyethylene (HDPE) tank (approx. 11" diameter by 14" high I. D.) shall have the same size inlet and outlet (no vent) connections as the tanks above. This tank cover will have another final 3" gasketed, flanged pH probe inlet and support assembly in cover. This tank shall be supported by a steel stand or concrete blocks, as furnished and installed by contractor. Stand shall be epoxy painted by contractor. Cover to be 1/2" thick to support probe assembly.

4. Tank #4 (Acid Feed Tank/Drum Model #D-55M / HDPE)

This drum tank shall be molded of High-Density Polyethylene (HDPE) and shall be standard 55-gallon size. Tank shall have one 2" threaded fill connection, one 2" threaded vent connection and one 1" threaded drain connection and one 1 1/4" threaded connection for low level float assembly (for alarms). Contractor to furnish and install necessary acid solution prior to job completion.

5. Tank #5 (Caustic/Alkali Feed Tank/Drum Model #D-55M / HDPE)

This drum tank shall be the same as Tank #4, but contractor shall furnish necessary caustic / alkali solution, prior to job completion.



6. Agitator (Mixer)

Mixer shall be T&C series "F" direct drive for vertical mounting through tank cover; 1/3 horse power, 120V, single phase, 60 cycle 1750 RPM. Shaft and propeller shall be constructed of type #316 stainless steel. Contractor to furnish and install strong metal bracket to give extra support to mixer/agitator (epoxy painted), to wall or ceiling. Mixer shaft length shall terminate about half way up to outlet centerline. Signal to mixer power starter relay to be a solid 4-amp signal from control panel contacts.

7. Low Liquid Level Alarm Assemblies

Two T & C model #PP-44T low liquid level floats & alarm assemblies shall be constructed of Polypropylene (PP) and shall include a light and horn alarm. These units are independent of the control panel below.

Each assembly to come with switch box, pilot (running) light, alarm light, buzzer and transformer with contacts.

8. pH monitoring, Recording and Alarm System

One T&C Model #K-100AM2 control panel with two (2) probe assemblies, shall be furnished. System includes two (2) immersion type continuous monitoring electrode assemblies with submersible electrode holders, reference measuring and temperature compensating pH electrodes and junction box relays. One pH electrode assembly housing to be installed into sampling tank #3 for recording the effluent discharges and second pH probe assembly to be installed into chemical feed and mixing tank #2 for controlling back-up chemical treatment of effluent (if limestone does not completely reduce the effluent to an acceptable pH level).

pH control panel to be wall mounted, NEMA #12 NEMA #4 HDPE or steel panel finished with epoxy paint, pre-wired and panel shall contain the following components: pH strip chart recorder for approximately one month continuous recording; audible/visual alarms with horn and red alarm lights; panel shall indicate by additional lights, when effluent is below or above, low and high pH set points; audible silencing and push button silencing relay; power fuse to prevent power surge damage; visual pH meter (from 0-14) with signal impulse amplifier, high and low pH points and additional alarm contacts; coarse & fine tune adjustment knobs for superior analog meter (digital not acceptable) to track pH movement and additional similar knobs for adjusting pH recorder; unit to included up to ten (10) feet of pH wiring cable for hook-ups from each tank probe assembly to the pH control panel. Contractor to furnish any low amperage secondary wiring relays and in-line fuses necessary to wire mixer and pumps or valves from control panel. Contractor to run electric wiring and pH cables inside conduit. Contractor to also furnish electric power wiring and power supply for the pH control panel. Panel to have coarse and fine tuning adjustments, as well as temperature tuning. (**Note:** If pH cables are to be run underground or in walls, they should be run through 1" minimum PVC electrical conduits.)

9. Chemical Feed Pumps

Contractor to furnish and install two (2) chemical feed pumps. T&C Model #BC-2CP-MD pumps shall be 115 volts, single phase, 60 cycle and all wetted parts shall be made of polypropylene (PP). Pumps to be magnetic drive, centrifugal type for superior service and non -contact of internal moving pump parts.

Pumps to operate via power starter relays, using solid 4 amp signals from control panel (to turn power on and off as needed, through power starter relays). Variable milliamp signals are not acceptable, even with shielded cables.

10. Chemical Feed Piping

Contractor shall install T&C 1/2" & 3/4" polypropylene (PP) schedule 80 threaded pipes, fittings, unions and valves from acid feed and caustic feed drum tanks to the two (2) PP chemical feed pumps and then to tank #2, (mixing & finishing tanks). All threaded connections shall be adequately sealed with sufficient Teflon tape. See details on how to hook up pumps to drum tanks.

Call us at 732-780-5300 to request a quote.

11. Portable Drum Transfer Pump

One portable polypropylene (PP) drum pump shall be 115 volts, single phase and 60 cycle. Contractor and /or owner can use this portable pump to fill acid and caustic drums (with proper water flushing between use). T&C Model number is #B-2.

12. Limestone Chips

Contractor to supply proper limestone chips (1" to 3" diam.) containing at least 90% calcium carbonate and be a random mixture from 1" to 3" size, for tank #1.

Contractor shall furnish three tank fillings total of limestone chips for tank #1 (one for initial fill and two more for additional fills, for maintenance purposes, given to owner, for later use). Contractor shall fill tank #1 with water first and gently put limestone into tank #1 (as not to damage tank, top gasketing or fittings), up to the bottom (invert) of the outlet connection.

13. 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"

14. Start-Up Training, Instruction & Calibration

T&C to provide the services of an authorized manufacturer's representative and/or factory-trained technician to check installation of equipment into operation and train local operation personnel in the maintenance and operations procedures. The amount of time required for this shall not exceed one business day's labor. Contractor shall install all equipment and components in accordance with Manufacturers recommendation prior to this factory service.

15. Polypropylene System Shut -Off Valve

Contractor to furnish and install one polypropylene manual actuated shot off valve to system off when too low or high pH readings occur; until the pH levels are brought back to an acceptable level. Valve shall be installed in pipeline in front of this system. Threaded PP ball valve to be installed for 4" and smaller drain lines. 150 lb. flanged PP butterfly valve to be installed between two PP flanges with proper gaskets and nuts, bolts and washers, for 6" drain lines or larger.

16. LEAK DETECTION FLOAT ASSEMBLIES WITH CONTAINMENT TANK(S)

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.

EXTRAS BY OTHERS:

- a. TANK STEEL STAND (EPOXY COATED) OR CONCRETE BLACK FOR SUPPORTING SAMPLING TANK.
 - b. SUPPORT BRACKET (EPOXY COATED) FOR MIXER.
 - c. CHEMICALS FOR TANKS #4 AND #5.
 - d. SECONDARY WIRING CONDUITS AND THREE POWER STARTER RELAYS TO MIXER AND TWO PUMPS
 - e. INTERCONNECTING PIPING, ADAPTERS AND FITTINGS. (ALSO, IF FLANGES USED, THEN BOLTS NUTS & WASHERS AND GASKETS.)
- CONTRACTOR SHALL VIDEO TAPE STARTUP INSTRUCTIONAL TRAINING AND GIVE COPY TO OWNER'S REPRESENTATIVE.

Operations & Maintenance Manuals and Perishables

Manufacturer shall furnish operation and maintenance manuals to be given to contractor (for turning over to owner), prior to system startup, training and calibration, which should take place when system is ready for operation, by owner.

System perishables are monthly inkless chart papers, limestone chips and pH electrodes.

Safety Ventilation and Safety Equipment

Entire system shall be sealed to prevent fumes from entering room. Tanks shall be appropriately vented, as shown on drawings and mentioned above. Tanks # 4 and # 5 shall be tied into the acid waste vent stack(s), just like tanks # 1 and # 2. However, tanks # 4 and # 5 shall not tie into the same vent stack at exactly the same location. These two tank vents shall be tied into the same stack, at least ten feet (10 ft.) apart, for safety reasons.

See details for separate ventilation fan and / or ducting for this room, which is not part of this neutralization system.

See details for eye wash and emergency shower, which is also not part of this neutralization system.

Warranty and Insurance

Entire system shall include a one-year warranty on all components, except pH electrode.

Manufacturer shall provide insurance certificate for equipment and system being provided, herein. Manufacturer shall show that this type of system is part of their standard products.

Drain line Hookups

A regular sanitary drain line house trap or in-line trap shall be installed after this system, to prevent sanitary or sewer gases from coming back into this neutralizing system.

Notes: Depending on the tank size, generally over 650 gallons. A larger sampling tank and a chemical holding tanks may be needed. The chemical feed pumps may also need to be increased to a larger size.



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 (1/2) 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 be 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 3/4 GPM to 1 1/2" 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.)

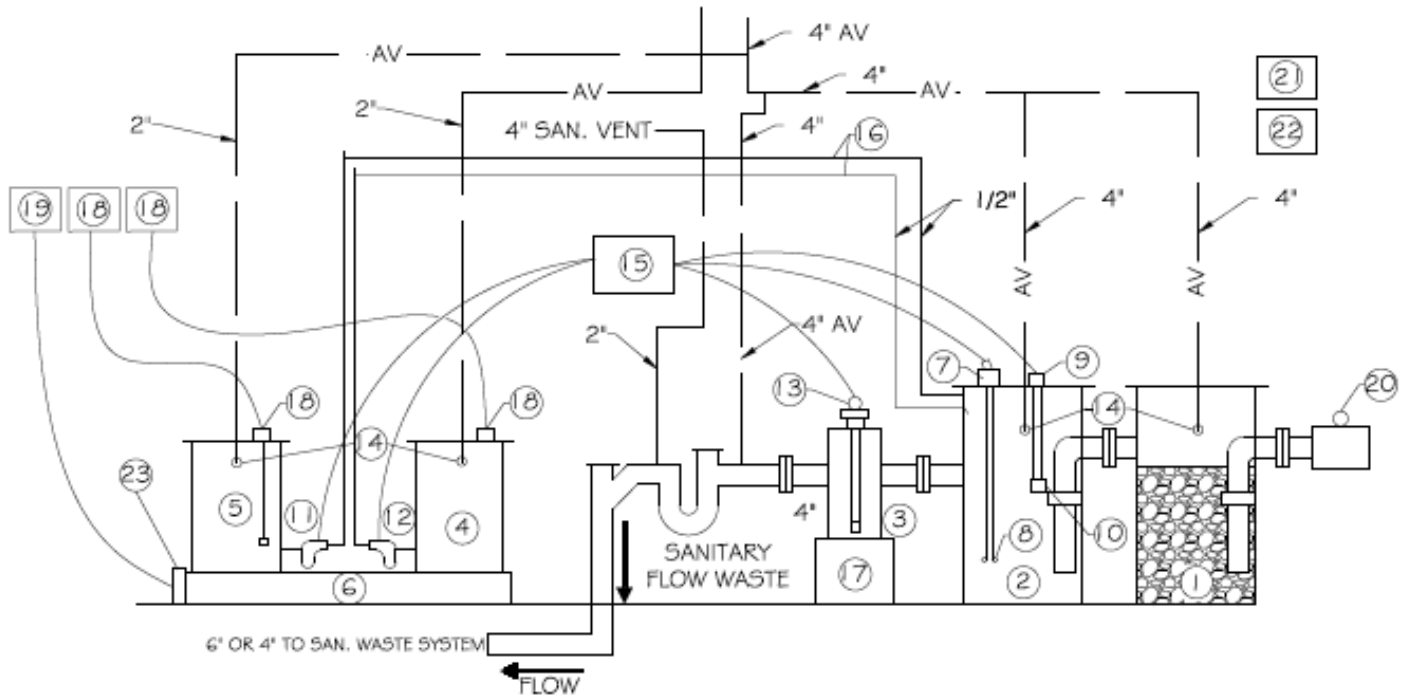
Pick Tank Size:

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.)	Stnr'd. 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 2C Drawing



① LIMESTONE NEUTRALIZING / DILUTION TANK #1

② MIXING AND FINISHING TANK #2

③ SAMPLING TANK #3

④ ACID FEED TANK #4 (ACID REAGENT TANK)

⑤ CAUSTIC / ALKALI FEED TANK #5 (CAUSTIC REAGENT TANK)

⑥ SPILL CONTAINMENT PALLET

⑦ CHEMICAL AGITATOR / MIXER

⑧ AGITATOR SHAFT AND MIXING BLADE

⑨ PH PROBE ASSEMBLY

⑩ PH PROBE SENSOR

⑪ CAUSTIC CHEMICAL FEED PUMP

⑫ ACID CHEMICAL FEED PUMP

⑬ PH PROBE ASSEMBLY WITH SUPPORT

⑭ ACID VENT CONNECTIONS

⑮ CONTROL PANEL

⑯ THREADED PP SCHEDULE 80 PIPE*
WITH THREADED JOINTS
WITH TEFLON TAPE

⑰ CONCRETE PAD OR EPOXY COATED STEEL STAND, BY INSTALLER

⑱ LOW LIQUID LEVEL ALARM ASSEMBLIES

⑲ POLYPROPYLENE LEAK DETECTOR WITH SWITCH BOX AND ALARMS

⑳ POLYPROPYLENE SHUT OFF VALVE

㉑ MODEL #WMS-1 SIGN

㉒ MODEL #WMS-2 SIGN

㉓ PP-44T LEAK DETECTION FLOAT ASSEMBLY TO BE INSTALLED
IN SPILL CONTAINMENT PALLET AND/OR PIT FLOOR

*T&C CAN PROVIDE AT EXTRA COST,
IF LIST OF P-V-F GIVEN TO T&C BY
PLUMBING CONTRACTOR, PRIOR TO
INSTALLING*